



PACIFIC ISLANDS
CLIMATE ADAPTATION SCIENCE CENTER

External Review Team Final Report

Prepared with and on behalf of the PI CASC External Review Team

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Background Information

The United States Geological Survey (USGS) **National Climate Adaptation Science Center (NCASC)** serves as the national office for the Climate Adaptation Science Center (CASC) network. NCASC provides leadership and guidance on administration, partnerships, information management, and communications. In addition to its management capacities, NCASC conducts research on cross-regional and national science priorities ([USGS NCASC website](#)).

The CASC Network was established in 2010 to develop scientific information focused on climate impacts, adaptation and resilience of plants, fish, wildlife, and their habitats — in response to evolving environmental conditions in every state in the nation. The current configuration of the CASC Network involves a central node – NCASC, which manages nine Regional CASCs (RCASCs) that serve as regional hubs. The scientific products and services delivered by the CASC Network support natural and cultural resource managers, primarily at federal, state, and Tribal resource management entities, as they address adaptation to climate change. *This content and additional information about the NCASC/RCASC enterprise is sourced from and can be accessed at <https://casc.usgs.gov>.*

The USGS National and the CASC Network is a partnership-driven program that teams USGS and University “Hosts” with scientific researchers, natural and cultural resource managers, local communities, and decision-makers, with the goal of helping fish, wildlife, water, land and people across the country adapt to changing climate-based conditions ([USGS CASC website](#)). Each regional CASC collaborates with its own set of regional consortium partners ([map website link](#)) and is configured as a Federal-Academic partnership containing both a federal USGS-staffed component and a parallel university-based component located in their respective region. The Host-Universities (and associated consortia of institutions) were selected through a competitive Request for Proposal process and funded through a 5-year cooperative agreement (hereafter referred to as “Host Agreement, or HA”) awarded by USGS. Two cycles of this funding have been provided since 2010. This review covers Cycle II.

Each Host-University proposed to implement administrative management tasks and a range of activities aligned with the CASC mission, which were accepted and agreed upon in a Hosting Agreement with USGS. These tasks and activities were a central focus of the External Review model.

“The mission of the Climate Adaptation Science Centers (CASCs) is to deliver science to help fish, wildlife, water, land, and people adapt to a changing climate. We work directly with land managers and other partners to create research and tools that can be applied directly to adaptation decisions. Our network is comprised of nine regional CASCs and one National CASC.

The National and Regional CASCs conduct research to provide resource managers, native communities, and other partners with the scientific information and decision-making tools they need to understand and adapt to the effects of climate change on fish, wildlife, water, land, and

people. CASCs collaborate with managers, scientists, and Tribal organizations both inside and outside the government, to address science needs and inform adaptation planning.

The CASC network places emphasis on generating actionable science, information and products that address identified science needs and are directly usable in supporting resource management decisions, actions, and plans. Development of actionable science requires scientists to work iteratively with the intended end users of the scientific product, such as resource managers and native communities.” [USGS CASC About Us Website](#)

The 5-Year External Review of USGS RCASC Host Universities and their associated consortia is designed to gain information and insights from external reviewers about the activities and effectiveness of each RCASC Host-University, and to inform decisions about USGS’s future development and administration of Host-University partnerships. This report and external review relate to the **Pacific Islands CASC** and the Host Agreement with the **University of Hawai’i Mānoa** (UHM or Host) and its associated Consortium of academic institutions for Cycle II funding. It is not intended to be a review of USGS or NCASC activities, although there may be recommendations that concern both. Additional information about the purpose, value, and record of CASC external reviews can be found [here](#).

RCASCs, including PI CASC, are cooperative, dual-led entities comprised of the Host university and a local USGS administrator and team. NCASC has requested that this external review focus solely on the Host university-side of the Center, to compile input from outside experts on how the university has managed its side of the effort under the Cooperative Agreement. As such, the recommendations in this report are meant to be reviewed and addressed by BOTH the Host and USGS sides of the PI CASC so that issues can be addressed and corrected as a cooperative effort.

This introductory material was provided by the External Review Team (ERT) Manager, in coordination with USGS.

About the Review Process

The external review of RCASC Host-Universities is designed to gain information and insights from external reviewers about the activities and effectiveness of each RCASC Host-University, and to inform decisions about USGS's future development and administration of Host-University partnerships.

Donna Silverberg Consulting ([DS Consulting](#)) is the External Review Manager selected by the NCASC through an open solicitation to design, coordinate, and conduct the structural and operational review component of the external reviews for all eight RCASC Host-Universities, including report writing with and on behalf of the ERT. The 2024 DS Consulting team consists of:

Donna Silverberg, JD (Principal and External Review Team Lead, Facilitator, & Manager)
Tina Patterson, MA Dispute Resolution, (Project Advisor and ERT Facilitation Support)
Nancy Pionk, JD (ERT Facilitation Support)
Emily Stranz, MA Conflict Resolution (ERT Facilitation Support)
Colby Mills, BA Anthropology (Logistics and ERT Facilitation Support)
Charles Wiggins, JD, LLM (Final Report Editor)

Purpose of the Review (from the USGS contract with Donna Silverberg Consulting)

- 1. Assess the competencies, efficiencies, challenges, and areas for improvement** of each RCASC Host-University in managing the administrative requirements and terms and conditions of the corresponding host agreement.
- 2. Assess the contribution** by each RCASC Host-University and associated consortium with respect to:
 - a. Scientific achievements on climate impacts and vulnerability science;
 - b. Collaborative efforts with partners to develop adaptation products applicable to priority regional decision-making;
 - c. Education and Training of early career professionals; and
 - d. Outreach and Communication services;
- 3. Review the effectiveness** of each RCASC Host-University and associated consortium in meeting the goals established under their current host agreements.
- 4. Aid** the NCASC in developing improved requirements for re-competition of the next university host agreements.

External Review Model Framework

1. What was the Host's proposed approach described in their Proposal Narrative to NCASC for selection and funding (PN)?
2. What did the Host implement and how did they do it?
3. So what: What did the Host learn? How did they respond and adjust?

External Review Categories and Process Schedule

The PI CASC External Review Team (ERT) was asked to focus on specific categories stemming from the Host-University's Proposal Narrative. These categories and their respective dates are

demonstrated in the table below. Daily summaries of the ERT Sessions and a listing of session attendees can be found in the Appendices.

	April 15 2024	April 16 2024	April 17 2024	April 18 2024	April 19 2024
Topic	 Administrative Management 	 Scientific Achievements Collaborative Efforts 	 Capacity Building Outreach & Communications 	Overall Effectiveness towards Host's Proposed Goals	90-Min ERT-Only Debrief Session

External Review Team

Review team composition:

ERT members were nominated by USGS administrators and then selected by the External Review Manager based on the following criteria, with a goal of having an ERT that had varying degrees of experience and expertise to suit the CASC. Each member had:

1. Scientific, administrative, and/or stakeholder engagement process knowledge.
2. Working knowledge of the CASC Network.
3. Time, willingness, and support to serve on the ERT.
4. No conflict of interest (e.g., not currently receiving funding from any CASC, nor expecting to receive funding from the CASC they were reviewing in the next funding cycle).

PI CASC ERT Members were:

- **Moana Ulu Ching**, Senior Program Manager, Conservation International Hawai'i
- **Dr. Jackie Dingfelder**, Adjunct faculty, Portland State University
- **Dr. Emile Elias**, Director, Southwest Climate Hub, US Department of Agriculture (USDA)
- **J. Michael Hudson**, Regional Climate Change Coordinator, Supervisory Fish and Wildlife Biologist, US Fish and Wildlife Service (USFWS)
- **Dr. Michelle McClure**, Director, Pacific Marine Environmental Laboratory, National Oceanic and Atmospheric Administration (NOAA).

All ERT members signed Conflict of Interest and Non-Disclosure agreement forms prior to participating in the review. These forms are maintained by the External Review Manager.

Host University Background

The ERT learned that the University of Hawai'i at Mānoa (UHM), the University of Hawai'i at Hilo (UHH), and the University of Guam (UOG) submitted their proposal in 2019 to continue work with their federal partners in the Pacific Islands Climate Adaptation Science Center as the University Consortium Host. They sought “to increase support of the resources of the Department of the Interior and the mission of the US Geological Survey National Climate Adaptation Science Center for the people of the United States and its affiliated Pacific Islands by co-producing, delivering, and utilizing vital, place-based actionable science toward the benefit of resource management that incorporates adaptation sciences, strong partnerships, and a workforce for the future” (Proposal Narrative, page 2).

To do this, they planned to build off the PI CASC Host Consortium's prior 6-year experience to

- 1) Utilize science to identify best practices to manage land and water resources and adapt to changes in the environment.
- 2) Restore trust with local communities including Native Hawaiians and Indigenous peoples of the Pacific and those that serve them.
- 3) Solidify mutual interests between the US and the US-Affiliated Pacific Islands (USAPI) within the context of climate adaptation (Proposal narrative, page 1).

The PI CASC Host and Consortium include the following institutions in their proposal narrative and the Host Agreement with USGS:

UHM – The host of the PI CASC was proposed to be co-administered at UHM by the Sea Grant College Program (Sea Grant) within the School of Ocean and Earth Science and Technology (SOEST). UHM is the only Carnegie 1 research institution in the Pacific region and serves as a land-, sea-, and space-grant institution for Hawai'i. UHM serves ~18,000 students including 13,500 undergraduate and 4,500 graduate students. Partners on the UHM campus include researchers across all schools and colleges, including SOEST and the College of Tropical Agriculture and Human Resources (including Land Grant Extension); the College of Social Sciences, especially faculty from the Departments of Geography, Economics, and Urban and Regional Planning; Hawai'iinuiākea, the School of Hawaiian Knowledge; and the Water Resources Research Center (WRRC).

UHH - Research and graduate programs have had significant collaboration among researchers, resource managers, and educators, which includes partnerships through UHH's Hawai'i Cooperative Studies Unit with the USGS Pacific Islands Ecosystems Research Center (PIERC), the USGS Cooperative Fishery Research Unit, and researcher participation in the Hawai'i-Pacific Islands Cooperative Ecosystems Studies Unit (HPICESU) with DOI agencies focused on coral reef health, species responses to changing conditions, assessment of cultural resources, climate data management, and community outreach.

UOG - Serves as a key research institution in the Pacific with many research capabilities relevant to PI CASC, including environmental science (climate, watersheds, groundwater, aquifers, and Geographic Information Systems (GIS)), marine biology (including corals and fisheries), natural resource management, impacts of coastal development and use, and Micronesian and social science research on impacts of climate and land use changes on island communities. UOG has several on-site research facilities, such as the Water and Environmental Research Institute (WERI), Marine Laboratory (ML), Center for Island Sustainability (CIS), UOG Sea Grant, and the Micronesian Area Research Center.

PI CASC Mission statement:

- To deliver science to help fish, wildlife, water, land, and people adapt to a changing climate. ([from webpage](#)):
- Vision (*also from webpage*): To develop science and other knowledge products and capabilities designed to support policy and management directed toward the sustainability of interconnected human and ecological communities and the conservation of species of concern in Hawai'i and the Pacific Islands.

PI CASC Key Goals, Expectations, and Deliverables:

As noted in the Host's Proposal Narrative: The proposed goal of the PI CASC is to use collaborative research processes to develop a wide range of research products that were actionable and have a "far greater probability of use by cultural and natural resource managers due to direct, iterative, and vested involvement of manager networks within the development of applied research". The objective is to create "knowledge networks."

Findings of the ERT – Administrative Management

	Institutional Development <i>Staffing, Leadership Team, and Consortium Members</i>		Fiscal Management <i>Budget, awards, and grant management</i>
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The ERT finds that the Host institution has a long history of facilitating multi-year and collaborative efforts successfully. The ERT finds that, based on the information presented, UHM has competent personnel and effective and efficient administrative operations to manage the PI CASC Host agreement. The administrative team understands the USGS funding and subaward management process and, over the past ten years working with USGS/NCASC, have recently developed a functional program to support the administration of grants and awards. The primary leadership team is passionate and committed to enhancing the region’s capacity to understand and adapt to climate changes in the Pacific Islands.

That said, the ERT finds the Leadership Team should address accounting challenges regarding timing of funds delivery (especially to UOG) and make clearer attribution to the multiple funding sources the Host receives. As it stands, the ERT saw that the financial portions of the annual reports do not lay out what is funded in ways that are consistent with the descriptions offered by the three key components of the Host/consortium. More about these opportunities for improvement are addressed below.

Administration and Management

The Host and Consortium Leadership (i.e., the principal leaders/researchers from each of the three universities) appear to have good connection with each other and strong connections to academic and policy leaders across the region, although connections in the outlying territories were weaker than those within the Hawaiian Islands. Presentation and discussions with the ERT painted a picture of a team that knows and interacts with these leaders on a regular basis, even though all are spread across a vast geographic area. The Consortium leadership team meets on a periodic basis to share updates and information with each other. ERT members had the impression that staff and collaborators are passionate and care deeply about building climate resilience in the USAPI.

The ERT learned through presentation and discussion that UHM has fiscal and administrative staff who are skilled at managing federal awards and subawards. Staff experience and knowledge of UH fiscal systems and timelines appear to be professional. The group has grown in the past 11 years and has improved upon systems and processes. It has put people and systems in place to help with fiscal and administrative issues – specifically, Elyse Hahn Larsen has helped make things more manageable and better responds to queries from the federal CASC. In addition, the Host and Consortium have leveraged their funds so that the \$900K per year from USGS has expanded to approximately \$3M per year. As a result, PI CASC supports and is supported by a combined network that includes: Sea Grant (University of HI, State of HI, and NOAA), UOG, and UHH; Inter-Agency Agreements (IAAs) from climate adaptation services

(USGS, PI CASC); Grad scholars and communication professionals (USGS and PI CASC); Network partnership liaison (USGS, NCASC); and PI Regional Invasive Species and Climate Change (RISCC-USFWS; RISCC-USGS).

Leadership & Management Approach and Challenges:

The ERT finds that UHM and the Consortium, with over a decade of stability as the Host Institution for the PI CASC, has developed expansive relationships throughout the region, and is making significant strides to leverage the USGS HA funds to do a great deal more than originally proposed. The Leadership team, comprised of directors from UHM, UOG, and UHH, is passionate and cares about their students, producing effective climate adaptation science, and building a robust program that serves the Pacific Islands and the NCASC Network.

The ERT notes that the Host and Consortium's connection with smaller, more distant islands is not as strong as with Hawai'i and believes this warrants development of an outreach strategy for engaging these more distant areas. In addition, to support healthy future organizational development, the ERT urges the Host and Consortium leaders to work with the USGS leadership team to bring more cohesion with each other and amongst Consortium members, who report disconnection since the Covid pandemic that needs attention.

The ERT notes that the creativity and resourcefulness of the leveraged funding not only expands the overall capacity of the CASC, but also the Sea Grant program. This creativity is admirable. Still, this has created challenges for communications and branding, and accountability of funding and appropriate attribution of the PI CASC. The ERT found it challenging to make a clear distinction between Sea Grant and PI CASC efforts, and heard others have similar challenges. The closely tied relationship between the two entities (e.g., the overlap of leadership, administrative staff, and fiscal staff) not only created confusion for ERT members, but the ERT heard it also has created tensions between the Host and USGS staff. One-on-one conversations between the ERT and the USGS PI CASC team indicated USGS does not consistently get information requested from the Host and are uncertain about financial delineation between PI CASC funds and Sea Grant funds. For example, accounting separation of the Sea Grant funds from the PI CASC funds was repeatedly requested, but not provided until requested by the ERT.

The perception that the Sea Grant Program and PI CASC are the same entities and, therefore the PI CASC has no clear identity, is a major challenge the ERT sees for the Host, Consortium, and the USGS leadership of the PI CASC. Director Lerner, admittedly, has his hands full serving as director of both entities while also 'acting' as the interim SOEST Dean. The ERT heard that regularly scheduled meetings of the Consortium and USGS Regional Administrator teams have become less frequent. These challenges, and ideas to overcome them, are addressed below.

Administrative Fiscal Management:

The ERT finds that the Host is managing the administrative and fiscal requirements of their HA with USGS well. The ERT finds that the Host has a solid administrative infrastructure, the pre- and post-award administrators are knowledgeable, and the CASC is supported by in-kind

and additional funds to benefit the enterprise. The ERT recommends creating a clearer system for attributing funding sources and levels in a way that builds trust and fosters clear accountability across programs and campuses.

The ERT heard that UH-Manoa has not been able reliably to transfer funds to UOG in a timely manner, slowing work. The ERT is unsure whether the UH fiscal staff work directly with UOG fiscal or if they work through the Host's administrative team. ERT members think direct and regular lines of communication between fiscal staff might be helpful.

Administrative Competencies & Efficiencies

The ERT finds that the Host is administering the program competently and the Host's fiscal management is efficient and effective. Strengths include:

- Great at leveraging limited assets with a small staff to generate larger federal research funds from the National Aeronautics and Space Administration (NASA), NOAA, and others to accomplish the USGS CASC mission.
- Appears to be good coordination among consortium partners.
- The Host has experience and proven success with grant administration.
- Good fiscal management and reporting processes in place.
- A committed set of academic partner institutions that understand the CASC.
- UOG and UHH have done impressive work with limited funding.
- Consortium members appreciate UHM's centralized administration of grants, subawards, and coordination.
- Low overhead costs (for a university).
- Utilizing Sea Grant program and staff to provide additional efficiencies (see below for challenges this also presents).
- Partnerships with other Federal agencies provide the opportunity to creatively move money through IAAs (e.g., NOAA-Sea Grant).

Administrative Challenges

The ERT noted the following challenges based on what they read and heard:

- The COVID-19 pandemic occurred during this grant cycle, which created delays, cancellations, and inefficiencies at all levels across the university consortium and the USGS. Despite these challenges, the Host and Consortium were able to adapt the program.
 - For example, they conducted the interactive forums and workshops via Zoom, allowing them to achieve most objectives described in their proposal.
- Place-based challenges of this region are unique and important to note: the vast geographic distribution of the USAPI makes collaboration challenging because of time-zone differences and travel costs. The history of colonialism and racism in the region makes trust-building paramount, and trust-building takes time.

- Issues of trust are worsened by the perception that responses to climate change are functionally a zero-sum game, and some populations, accustomed to being marginalized, will require greater trust-building.
- Internal relationships and communication between the CASC's Host and USGS regional staff have been challenged by location changes and overall busy-ness of both leadership and staff.
 - Not enough dedicated staffing on both sides.
- Graduate scholar opportunities were not developed consistently with the senior science advisors as laid out in the proposal.
- PI CASC did not have enough funds in the proposal/HA to support the full cohort of undergraduate partnerships.
- PI CASC has not been able to expand the manager climate corps beyond UHH and USAPI.
- Substantial leadership change at UHH has been challenging for all involved; and
- Grant processing can be slow, mostly due to Federal government bureaucracy, which created added challenges to those already in play, due to the federal budget timeframe and academic years not aligning perfectly.

Opportunities for Improvement

While challenges hampered continuous progress, the ERT finds that Host and Consortium have begun to overcome a variety of administrative challenges. These would be best supported by developing and maintaining productive working relationships with the USGS Regional Administrator and Science Lead.

The ERT suggests considering the following administrative opportunities to strengthen the longevity of the PI CASC:

- Clarify the overall goals, objectives, and PI CASC identity as separate from the Sea Grant program.
 - Consider naming a managing leader who has the capacity to provide oversight, guidance, and cohesion for all parts of the Host and Consortium. Consider one who is separate (yet connected to) the Sea Grant program, and who can focus specifically on the needs of the staff, partners, projects, and external entities who are or could be doing work with the PI CASC.
 - For reporting purposes, separate which projects are PI CASC, and which are Sea Grant, and acknowledge which projects are run by/funded by the Host/Consortium as opposed to the USGS-side of PI CASC.
 - Work with USGS to build in fiscal transparency that would support discussions with USGS and other funders (e.g., develop and maintain the pie charts developed for the ERT and share those regularly with partners)

- Currently, UHM and UHH have an independent undergraduate and graduate program. There might be good reasons for this, but the ERT is concerned it is disjointed. As such, the rationale for this system should be clarified.
- Enhance the non-leadership connections among regional PI CASC Consortium partners on the ground (i.e., implementing PI CASC activities). The ERT assumes this is working and would like to see it highlighted more.
- In its overview, the PI CASC stated that decolonizing academic and research areas was to be a leading element of its work, however there are few Indigenous processes, relationships, or leadership shown in the administrative spaces of PI CASC. If these assets do exist, they should be highlighted, with clear examples of how Indigenous values and principles (not just Hawai'i) are foundational in the management of PI CASC.
- PI CASC should evaluate the pros and cons of adding more partners into the Consortium to broaden inclusion of other groups on a 5-year award. This in turn would allow partners to apply for an annual award (e.g., NGO, county, city, etc.) through Consortium partners.
 - UOG is in an ideal setting for coordinating with Pacific Island partners.
- The ERT assumes that the science advisors led or participated in many of the research projects (ERT members could connect a few names that they knew), but the role of the advisory group should be much more visible, if in fact it plays a significant role in guiding the development of the science agenda.
- PI CASC (Host and USGS) leaders should focus on building trusting internal relationships and communication within the Consortium and between the Consortium and USGS directors and staff. They should also continue to remove barriers that the challenges noted above present. Though specifically not a part of this evaluation of the Host, the ERT believes this concern is important and needs to be addressed soon.

RECOMMENDATIONS: Administrative

As noted above, the ERT finds that the Host institution has a solid institutional structure in place to support the PI CASC, and to develop the future workforce in all aspects of the Host's endeavors. The ERT offers the following recommendations as areas that could strengthen the Host's administrative capabilities:

- 1) **Work to clearly identify and brand PI CASC efforts** as distinct from Sea Grant efforts. There is both internal and external confusion about the PI CASC niche within the Sea Grant domain.
 - a. Consider building a campus-wide team to apply for the next iteration of the funding, including other Colleges within the UH system. Also, consider sharing funds and administrative opportunities and challenges.

- 2) **Consider incorporating more departments across the campus or create a process for funding the partner universities directly**, by sending funds to UHH and UOG at the initiation of the next agreement. Remove the administrative challenges, responsibility, and overhead from UH-Manoa to ease the administrative burden for UHM while also providing an opportunity to distinguish the PI CASC as its own identity.
- 3) **Broaden inclusion of Indigenous perspectives and other partners in the next 5-year award** (NGO, county, city, etc.) so they can apply for an annual award through consortium partners.
 - a. Add Indigenous people to your Consortium's leadership team.
 - b. Consider broadening partnerships to other universities, community colleges within the UH system and in outlying Pacific islands, and to other organizations, such as non-profit organizations working with Indigenous partners.
 - c. Consider including Cooperative Extension via the Land Grant system. This would allow for focus on more of the science elements included in the PI CASC science priorities document.
- 4) **Consider hiring a Host Director of PI-CASC** who has no Sea Grant duties and assumes all the administration of the HA. The ERT suggests this person should report to someone outside SOEST – perhaps to the UH Provost or President. This would allow for timelier reporting and would support strengthening and building relationships.
- 5) **If there is an increase in funds** from \$900K per year to \$2M per year:
 - a. Prioritize efforts in the USAPI, including additional funding directly to UOG so it can expand CARM; and
 - b. Consider hiring cooperative extension agents.
- 6) **Hold an internal annual meeting to review the CASC vision, mission, and distinct activities.** What makes the PI-CASC unique? Can everyone involved articulate how they contribute to the broader mission of PI-CASC?

Findings of the ERT – Outreach and Communications

	Outreach & Communications <i>Manage and transfer information and data related to research activities</i>
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The ERT finds that the Host and Consortium have developed a team of communications specialists that has created a strong communications plan, strong outreach and engagement, and some internal brand development. Major in-person events (~10 per year), social media, an up-to-date website, a newsletter, and other creative media serve as the basis for outreach and communications in a region that is geographically vast. Outreach products include thematic factsheets, student program one-pagers, and university focused one-pagers. PI CASC hosts a regular seminar series (25 seminars with 45 speakers). The ERT notes that the communications team did a good job of updating their website following the initial 5-year review.

Specific products and programs that enhance outreach and communications that were developed by the Host and Consortium and the ERT noted include:

- A colorful, interactive website that focuses on Projects, Products and Programs that engages readers and researchers alike.
- Web support for a variety of topics and programs such as:
 - The Pacific Drought Knowledge Exchange,
 - The Pacific RISCC,
 - The Education Hub, and the
 - PI-AK collaboration website.
- Pacific Pandanus – a monthly newsletter highlighting the activities and research of the PI-CASC and its partners.
- The PI Sea Level Rise (SLR) Explorer, an interactive tool presenting sea-level rise research projects and tools across the Pacific.
- Accessible science portfolios that are specific to a variety of projects.
- Infographics that explain analytics of the PI CASC.
- UOG has made separate communication efforts that have been useful in its region. For example, it has moved away from Twitter and moved toward Linked In.
- The ‘Slice of PI-CASC’ seminar series, designed for a wide audience to learn about climate adaptation research and science-to-management applications for Hawai’i, the US-Affiliated Pacific Islands, and beyond. The series uses YouTube to distribute information and covers a variety of topics.
- Drone Corps, a program through which students are being trained to pilot drones to capture imagery and video for science and news such as damage assessments from hurricanes and volcanoes and the status of coral reefs in the region.

Communication Challenges

The ERT notes that the primary communication challenge appears to be what ERT members perceived as an “identity crisis” of who and what is PI CASC. There are many outreach efforts and communications products, a strong testament to the existing talented team. The ERT heard that those with knowledge behind the scenes at UH are often confused as to who and what PI CASC is, especially as it relates to the Sea Grant program. As noted above, for first-time external viewers, such as the ERT, the message is somewhat understandable, but not completely clear. The question then becomes, is outreach both internal and external? If one or the other, the ERT suggests tailoring the narrative to that audience. If the answer is both, then a hybrid communication approach is necessary to set clear context and content.

Mitigation Strategies to overcome these challenges

The ERT notes that it is challenging to produce effective communications about climate adaptation science in local settings, let alone regional communications. This is made harder when forced to utilize a pieced-together approach based on the broad geography the PI CASC serves. ***The ERT finds that the Host and Consortium appear to have addressed this challenge by securing support for a full-time communications person who can bring communications together in a cohesive format, while continuing to maximize the Consortium’s leveraging power in other areas of the region.***

Some promising examples ERT members noted:

The ERT notes that the Host and Consortium put a great deal into their communication effort by hiring a relatively big team of people to work on outreach and communications. This group has combined standard outreach activities with novel ideas, such as the story map and the communications plan. This is a strong component of PI CASC on the Host side and certainly brings more people to PI CASC, raising awareness of the various programs.

- The SLR tool is a good example of climate adaptation science synthesis. The science portfolios are strong and something that would be helpful to conduct annually.
- The single website source of PI CASC products likely provides good information on products and graduate student research collaborations.
 - It might be helpful if vignettes of application and impact of those research products could be provided by the managers and/or on the ground partners.
- PI CASC ‘Communities of Practice’ are described on the website in various ways, sharing examples of strong collaborations.
 - The ERT notes that this work is very promising and suggests that the communications team highlight PI CASC’s contributions to each Community of Practice in greater detail to establish strong contributions to climate adaptation research and efforts.
- The PI CASC photo with the elected officials is a great example that suggests the far-reaching impacts of the communications and relationships the Host and Consortium have developed over time.

RECOMMENDATIONS: Outreach and Communications

The ERT finds that a thorough, thoughtful evaluation of existing communication and outreach channels, with an emphasis on a clear PI CASC brand, may lead to more notable impacts.

- **Conduct a thorough, thoughtful evaluation of existing communication and outreach to develop a focused communication and outreach implementation strategy.**
 - a. Expand evaluation of outreach efforts to ensure the building of climate resilience. Think broadly about how these efforts are changing management actions, and document these by tracking the implementation of scientific advancements, evaluating changes in equity, and noting changes in relationships and trust. Examples could be policies or plans in which CASC documents or PIs are cited, or numbers of graduate students that have gone to and stayed in public service such as water management, local government, or conservation.
 - b. **Consider adding federal representation on the communications team** as you continue to update and implement the communication strategy. The PI CASC brand could be made more impactful by expanding to include the participation and ideas of federal side of the CASC.

Findings of the ERT – Scientific Achievements

	Scientific Achievements <i>Scientific Achievements on climate impacts, vulnerability, and adaptation science</i>
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The ERT finds that the Host has been successful in developing a climate science program supported by the Host University and Consortium which is informed, in part, by their excellent work with students, researchers, and by relationship building with communities.

The bulk of PI CASC’s actionable science is supported through graduate students and programs to support changes in knowledge of natural resource managers in the USAPI and Hawaii.

Programs include:

- The PI CASC Graduate Scholars program, which supports climate adaptation and capacity building across the Pacific by funding full-time graduate students at UH or UOG working toward advanced degrees in climate and climate adaptation research. The program adds to the graduate students’ training by offering supportive interaction in a cohort and professional development opportunities in community relationship building, science communication, and scientific presentations.
- The Climate Adaptation for Resource Management (CARM) program, a fellowship and continuing education opportunity at UOG for natural resource managers and professionals in Guam to bolster their professional capacity through higher learning in academia and to further the technical capacity of the agency they serve.
- The Management Climate Corps (MCC) program, created to support and connect natural resource managers, researchers, cultural practitioners, policy professionals, community leaders, and graduate students on Hawai’i Island. The MCC builds adaptive capacity locally by identifying existing professional networks and expanding them through manager-driven research projects and collaborative forums.

The ERT noted the following publications and projects:

- Publications:
 - 2020 – 7 peer-reviewed publications
 - 2021 – 8 peer-reviewed publications
 - 2022 – 6 peer-reviewed publications
 - 2023 – 15 peer-reviewed publications (these numbers reflect what was reported in corresponding year’s annual report. Publication date is +/- one year).
- Research projects (PI CASC consortium funded):
 - 2020 – 21 projects; 2021 – 13 projects; 2022 - 20 projects; 2023 - 17 projects

Students from the above noted programs presented the ERT with examples of projects that included work on mangroves, agroforestry, work with a practitioner network, and

birds/mosquitos. Numerous ERT members highlighted the very good demonstration of the social science project from UHM scholar, Kapono, and its application in shoreline and nearshore fisheries management. ERT members noted they would “love to see and hear more of the student research projects that are more closely linked into a management agency and community partners”. While they did find more examples online that showed connections to management agencies, they were in the minority.

The ERT commends the Host’s climate adaptation science contributions in the following areas:

- The CARM program is an exceptionally effective way to build capacity within existing structures. ERT notes that the socio-economic situation of Guam and other Pacific Islands lends itself to increasing skills and expertise of those who are already working in the system, rather than relying on external institutions. Due to the educational landscape in the outlying islands, local natural resource management agencies often do not have a large pool of people with post-graduate education. These same people are often very interested in building their expertise and skills, but there is an ‘activation barrier.’ This innovative program seeks out people who want to engage and provides pathways for them to do so.
- Projects such as the biochar project and the mosquito project at Hakalau were very well-tied into actionable, land management-relevant science. Both addressed important components of managing specific, at-risk systems.
- Using social science in conservation projects is of great interest to ERT members, and the two projects that explicitly did this, the project at Kūlana Noi’i and the project involving ‘influencers’ were good first steps.
- An ERT review of the projects listed on the PI CASC page shows a good range of projects from coastal ocean to higher elevation forest. That said, it appears to ERT members that there is a bias in projects toward Hawai’i in general (as opposed to American Samoa, Palau, NMI, etc.).

What factors limited the Host’s scientific achievement results?

- The COVID-19 pandemic significantly limited travel, face-to-face efforts, and funding progress at the PI CASC. COVID transformed the landscape, being both a challenge, but also building high flex and hybrid opportunities.
- Changes in key personnel across the consortium limited progress in some cases or changed key deliverables from research to synthesis products.
- Time and coordination limited the scientific achievement results.
- Limited reporting/sharing on direct community engagement for research design and findings application.
- While the PI CASC is building a climate-informed work force, the ERT notes they are challenged by their own internal culture. The Host, Consortium and USGS staff all noted that they should make more time, intentionally, to build healthy relationships among their internal PI CASC members.

- Host and Consortium members noted they need to expand into Micronesia and better engage the USAPI.
- ERT members did not see many projects explicitly related to the Science Focus Area “adaptation and survival in low islands and atolls” (though some of the coral work may count toward this).
- The ERT also notes that the field as a whole is just learning how to address ‘people’ questions within the context of conservation and climate science, and the Host’s projects were examples of early efforts to do so. The ERT encourages the CASC to be more daring or experimental with this type of work.
 - For example, while it is clear that repeated exposure to a particular ecosystem or place is important for feeling engaged with, committed to, and part of that place (findings that are true elsewhere), are there specific socio-economic or demographic factors that make people more likely to engage in the first place in the PI region? Are there ways to enhance people’s willingness to volunteer for the first time? Or to persist in their visits to that place? In addition, and importantly, what do local communities want from land and natural resource managers that they are not getting?

What factors mitigated these challenges? (i.e., what did they do instead?):

- The ERT thought the graduate student work and manager programs at UH-Hilo and UOG were very strong and held great potential for the future.
- There is an understandable lag between good climate science research project findings being translated into management or formal/informal actions on the ground; as such, highlighting the potential applications and likely desired outcomes that individuals and communities could experience would be helpful in telling the PI CASC story.

The ERT finds that the science conducted at the PI CASC is solid, useful, and clearly use-driven. The ERT finds that the Host-funded research projects and recent publications indicate high-value climate-related science in response to end-user questions and needs.

At the same time, ERT members note that it was difficult to discern what science was supported by the Host’s USGS CASC funding and what was supported by other funding. As a result, the ERT found it difficult to discern the magnitude of the accomplishments, and how much progress has been made toward the CASC’s goals without clear links back to the key themes. One ERT member noted “I just didn’t feel like I knew what the PI CASC was trying to accomplish in the end as a body or portfolio of [scientific] work”.

Another ERT member offered:

“Overall, I think the advisors of the students (and PI CASC as a whole) may want to consider a science model for their students that includes a bigger picture question – i.e., what is the conservation or climate science overarching principle or question, and then use the specific projects as examples. (E.g., the mosquito project could have a more general question about invasive species’ patterns of incursion under climate change, or

in a deeply ridged system, etc.). The projects would then have greater relevance to a wider variety of regions and types of projects. It may be that the students are doing this, but it did not come through well.”

RECOMMENDATIONS: Scientific Achievements

To build on what the Host has accomplished so far, the ERT suggests the Host and its team consider the following:

- 1) **In future presentations, show the alignment of projects with the PI CASC’s priority themes of importance, and explain how specific projects are chosen for support.**
 - a. Show alignment of research products and projects to CASC’s ‘4 Overarching Principles’ so you can develop metrics to determine your success attaining them.
 - i. Some basic statistics, such as how many projects for each theme, as well as some sub-goals for each of the science focal areas would be useful to anyone trying to assess success.
 - b. Gain and then show a better understanding of the science being accessed and how it is being used (more than just anecdotally)
 - i. Which agencies and individuals are using the results from CASC projects? Are the results being cited in agency decision making? Are scientific staff referencing or reading these results? What kinds of presentations would increase agency uptake? How can additional agencies be introduced to and use CASC science?
- 2) **Strategically link student research projects around regional climate impacts and issues to your Communities of Practice and with the PI CASC priorities.**
 - a. Then, clarify those linkages when reporting on Center successes.
- 3) **Create a Sea Level Rise Network with a position responsible for building and maintaining it** that includes all relevant partners and is done in collaboration with the Federal PI CASC.
 - a. Use this network to foster manager peer-to-peer relationship building; share recent scientific advancements; and focus on the solution-space.
- 4) **Bring to the surface more bio-cultural accomplishments and efforts.** Bring forward more bio-cultural accomplishments and efforts by linking social sciences to ecological work. Then, disseminate those successes and failures to others.

Findings of the ERT – Collaborative Efforts

	Collaborative Efforts <i>Collaborate with stakeholders to develop and deliver adaptation products applicable to priority decision-making</i>
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The ERT finds that the Host and Consortium has produced excellent collaborative efforts with communities, student researchers, regional and national researchers, and the Alaska CASC (AK CASC). There is a noteworthy focus on building trusting relationships, meeting the needs of the people with whom they are working, and ‘science to action’ in their collaborative work. However, the ERT learned that the Host has internal challenges within the Consortium (with UHH and USGS, in particular) that, when addressed with the same focus devoted to work with external partners, will enhance the overall collaborative efforts of the PI CASC. The Host appears to have developed and maintained strong and far-reaching topical and regional relationships, forming ongoing collaborations. The degree to which the Host enhances how engaged PI CASC is as a Center in those collaborations, and the benefits (or limitations) PI CASC has in those spaces, was not clear to the ERT.

The ERT finds the Host and Consortium’s contributions in the area of Collaborative Efforts take the following forms:

- Sea Level Rise (SLR) Dialogues have led to an online information platform to share research and management applications. The Host is working to establish and expand the PI SLR ‘science to action network’ by providing management capacity. Part of this effort is the development of the Pacific Islands SLR Project Explorer, which the ERT finds to be an excellent online tool. The ERT finds the work around the SLR tool is intriguing and demonstrates good collaboration. ERT members see room for this collaborative effort to grow: A lack of community engagement in the SLR tool could be addressed. ERT members were surprised by this apparent oversight given how PI CASC is housed within Sea Grant, which has deep and laudable experience in community engagement.
- Science summits and student symposia have brought together student and other researchers to share research, ideas, and enthusiasm. The first, Pacific Islands Climate Adaptation Science Summit, was held online in 2020. After Covid-19, a Hawaii Climate Adaptation Science Summit was held in 2023. Most recently, PI CASC was engaged in Hawaii Climate Week in 2024.
- Kūlana Noi’i at PI CASC has been focused on engaging local communities effectively and has utilized cooperative efforts between researchers and managers to create actionable climate adaptation science. The process-project was created to minimize harms to Indigenous communities, provide equity, and protect Indigenous knowledge by teaching researchers and managers to continually ask: How do we carry ourselves as we conduct our work? Are we ethical? Do we stand tall? The primary pillars of this program, shared

and discussed at the front end, are respect, reciprocity, self-awareness, self-capacity, and communications. For longer term maintenance of relationships and engagement over time, the process involves:

- Maintaining a long term focus;
 - Community engagement and co review;
 - Knowledge stewardship; and
 - Accountability.
- ERT members were intrigued that an unintended benefit of work in this area is an acknowledged hunger among researchers to conduct co-produced science, resulting in specific network-building among these researchers.
- On a national level, the ERT views the Host's CASC/Sea Grant partnership as a good example of how PI CASC has benefited the broader CASC network. Their own in-depth experience with Sea Grant enabled them to create a nationwide Community of Practice with other CASCs. As reported, the Community of Practice grew from the realization that they were seeing great partnerships in Hawaii. As a result, they put together a proposal that was funded by NCASC to help support, grow, and learn from the CASC/Sea Grant collaborations.
- The ERT heard of a unique PI CASC-AK CASC collaboration (called PI-AK) which appeared to take good advantage of existing and new relationships between the two CASCs. The collaboration between the two CASCs originally focused on “Ridge to Reef, and Icefield to Ocean” because of several similarities in geographies: both CASCs serve regions of extreme ruggedness with difficulty getting from place to place. Both also share strong ties between natural resources, communities, and a sense of place. Through informal discussions they realized working together could be enhancing for one another. Ways they have done this include:
 - Funding seven cross-CASC projects.
 - Student exchanges that allow students to experience and do research in both settings.
 - Student collaboration.
 - Modeling and downscaling in rugged habitats.
 - Working together to explore how to manage increased and extreme flooding.
 - Researching stream ecology and food webs together.
 - Developing best practices in working with Indigenous communities, including data sovereignty, relationship building, and respecting Indigenous knowledge and knowledge sources.
 - Looking at climate adaptation from a holistic perspective.

The ERT finds that the Host and Consortium's external collaborative efforts is an area in which they have excelled:

- ***Kūlana Noi'i is an excellent tool for university-based researchers to embrace, with definite applications outside the university (based on the community collaborators). PI CASC is a great space to implement Kūlana Noi'i and the ERT urges the PI CASC to take greater advantage of the opportunities afforded by this work. The ERT notes that the Host made the origins of the resource clear (Sea Grant + Hawai'i NGO + community partners as the original developers).***
- ***The PI-AK collaboration is a useful model for other national CASCs to incorporate, if appropriate. The ERT suggests considering the creation of a conceptual synthesis of this unique collaborative effort, if such an effort would benefit the CASC network.***

Other notable collaborative effort examples include:

- Loko I'a - work with native Hawaiian fishponds.
- Engagement with the National CASC Network Climate Adaptation Fellows Program which supports dual/simultaneous competition for mentors and fellows.
- Integrating social and cultural considerations into planning and community-based monitoring to reach marine conservation goals.
- UHM leads noted strong connections to Honolulu City, County, and State of Hawai'i climate commissions. ERT members would like to have seen more detail on those collaborations with either direct or indirect ties to PI CASC efforts AND what PI CASC-related science is involved in those commission spaces.

Based on review of the PI CASC research projects on the website, ERT members note the majority of projects appeared to do an impressive job of crossing consortium campuses and/or involving multiple university departments in a single project. However, ERT members note that management agencies, who would be responsible for implementing “actionable science”, were less prominent than ERT members would have expected. One portion of this review is about showing and highlighting the direct ways Host/Consortium supported actionable science is being used in climate actions across the region, but several ERT members felt they had to put pieces together to make any direct linkages. As an acknowledgement of this, one member noted, “Everyone is working so hard within the PI CASC ‘ohana, and I know the intentions are to showcase those linkages, but they didn’t come through as strongly as I’m sure it was hoped”. PI CASC needs to demonstrate how it cultivates and fosters linkages to local natural resource management agencies.

The ERT noted factors which limited the Host’s collaborative efforts, process, and results:

- COVID impacted the ability for many projects to work together in person.
- The geographic expanse of the Pacific Islands region limited capacity of outlying partners, and the challenges of travelling to remote areas limited collaboration.
- To ensure Indigenous knowledge is incorporated into all collaborative efforts and build capacity outside of Hawaii, the Host and Consortium should help make clearer connections to this knowledge for scientists, planners, and policy makers.

- Internal relationships have not been supported as well as external relationships. As a result, internal CASC collaboration appears to be limited, especially with the Federal CASC.
 - Strong collaboration needs to include both federal and Consortium members, not just one or the other. Current tensions have led to an acknowledged dysfunction which overshadows other efforts. It appears to the ERT that important, internal relationships are not prioritized.
- There appears to be a disconnect across the Consortium that could be addressed through good faith collaboration, with more frequent dialogue, and stronger checks and balances in place.

The ERT finds that the Host overcame some of these challenges by using virtual platforms, hosting an excellent website full of communication tools and products, and bringing together groups who might not otherwise be communicating.

The ERT urges both the Host and USGS side to engage in intentional work to bridge the divide between the Host and Federal side of the CASC as soon as possible.

RECOMMENDATIONS: Collaborative Efforts

- 1) **Create a conceptual synthesis of the PI-AK effort** that focuses on the uniqueness of the collaboration. Follow this with a special publication that compiles the work being done through the PI-AK program. This would provide an opportunity to highlight common areas the two regions share, while also providing a model for others to emulate.
 - a. Several members of the ERT felt that the purpose of this cross-regional collaboration was unclear and suggest that the collaboration's goals and objectives be honed. The large Indigenous populations in both regions may provide a focal area for future scientific inquiry.
- 2) **Consider building a broader, campus-wide team** to apply for the next funding iteration that includes other UH system colleges to share funds and administrative opportunities and challenges.
 - a. Cooperative Extension via the Land Grant system should be included/considered. This would allow for focus on more of the science elements included in the PI CASC science priorities document.
- 3) **Conduct a robust evaluation of Kūlana Noi'i training.** Showing the number of people trained in Kūlana Noi'i principles is appropriate, but more information about this excellent work could help to expand its breadth and value locally and more broadly.
 - a. How does implementing Kūlana Noi'i in PI CASC efforts result in ethical and reciprocal collaborations?
 - b. What changes or impacts has the training had on conducting actionable science?

- c. How are the changes or impacts of Kūlana Noi'i experienced in climate action spaces (i.e., what looks different from before?).
 - d. What resulting relationships are established and maintained?
 - e. What might others learn from the model and its implementation? Is it transportable?
 - f. Should the training for researchers doing actionable climate adaptation science in the region be mandatory rather than voluntary?
- 4) **Include the CASC-Sea Grant Liaison (or similar type extension) in the next cooperative agreement.** The role staff has played is laudable and should be continued as one of the PI CASC's networking functions.
- 5) **Obtain trusted outside assistance to facilitate more functional internal relations** between the Host, Consortium, and federal sides of the CASC. While this recommendation may be outside the ERT's mandate, they note that all the needed elements of good collaboration exist: shared values, dedicated and passionate people, and funding resources. Now, the group needs to come together to develop a shared vision for how they can move beyond co-existence (and expressed irritation), while still thriving as a single, clearly branded PI CASC.

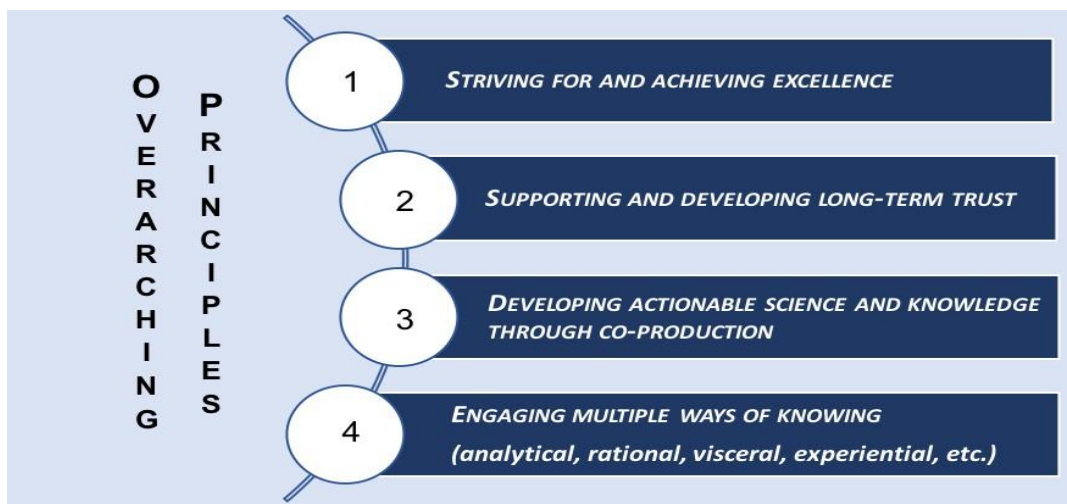
Findings of the ERT – Capacity Building

	Capacity Building <i>Educate and train to build capacity of early career professionals and others</i>
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The ERT finds impressive results from the Host and Consortium’s Capacity Building activities.

The Host and Consortium provide a good suite of graduate and undergraduate student experiences (interactive science work, presentation opportunities, and academic and professional networking). They have completed this aspect of the work on all fronts: through outreach to communities (such as agricultural, marine, and Native Hawaiian communities), organizations (through workshops and engagement), and students (through curriculum development, workshops, interactive programs and symposia, and associated degree and certificate programs). In addition to these programs, the Host and Consortium support students through coordinating with existing or larger activities, such as Science Summits, Hawaii Climate Week, and support for NCASC conference attendance. Offering Hybrid events has been particularly helpful in this region because of the vast area.

The Host’s Proposal Narrative introduced the following overarching principles for the Center’s collaborative, co-produced work which ERT members found compelling:



The ERT finds that, overall, the Host and Consortium are running a strong capacity building program. The Host and Consortium have been very effective designing, implementing, and evaluating their capacity building, and have contributed novel approaches for the field.

Attributes and specializations of these programs that stand out to ERT members:

- UHM - Graduate Scholars Program
 - Funds graduate students through the HA budget.

- Is place-based and focuses on co-developed climate adaptation science.
- Is building capacity for the next generation of climate adaptation.
- Has produced 22 graduate students over the past 5 years.
 - Notably, the federal side also supports students through these programs outside of the HA.
- UOG – CARM
 - Designed for co-development of science and capacity building.
 - Provides opportunities for natural resource agency employees to get higher degrees by producing a thesis that addresses a management question/need (“Flipping the Script”). The resource manager is the student.
 - To be eligible, participants must: be able to study and/or work in Guam, preferably holding a bachelor’s degree, be employed by a natural resource agency, enroll in MS program, and maintain a 3.0 grade point average.
 - Costs \$82k per annum for 4 fellows.
 - Students notably have produced The Guam Guy podcast and a thesis which is feeding directly into USFWS policy.
- UHH - Manager Climate Corps

The presentation articulated strong connections and direct data on undergraduate to graduate student experiences supported by PI CASC. This program:

 - Looks at social science to focus on how to affect human behavior to overcome human inaction despite climate science results. Because, as was noted in the presentation, “if we keep focusing on rational behavior, we are going to miss a majority of the human condition.” As a result, this program looks at ways people know and act:
 - Instinct, Group think, visceral responses, etc.
 - Focuses on PRESENT, LOCAL, PERSONAL, with a goal of supporting long-term place-based relationships.
 - Relies on existing practitioner networks:
 - Accountable to specific seascapes/landscapes.
 - Prioritizes long-term relationships over projects.
 - Trust.
 - Recognizes multiple knowledge forms and sources.
 - Focuses on Co-production.
 - In its implementation, the program:
 - Has completed eleven manager-driven, diverse research projects (3 cohorts – 11 grad students).
 - Currently is in its 4th MCC cohort.
 - Has developed MCC case studies on policy impacts to show the program’s value-added to overall science-to-action.
 - <https://toolkit.climate.gov/case-studies/reality-check-collaborative-research-contributes-real-life-policy-decisions>

Additional UHH Capacity Building Programs that add value for students include:

- Tropical Conservation Biology and Environmental Science (TCBES).
- Heritage Management.
- Pacific Internship Programs for Exploring Science (PIPES).
- UHM & UOG - Summer Undergraduate Research Program (SURF)
 - Provides undergraduates with valuable summer research experiences and professional development opportunities at PI CASC.
 - Builds cohort cohesion and PI CASC program loyalty:
 - Over 4 summers – 67 applicants from 25 institutions.
 - 19 paired students from 7 institutions for multiple years.
 - Multiple study backgrounds and a variety of project topics.
 - Looking to improve the program by soliciting applications earlier, improving mentor recruitment, expanding in person interactions, and working on hybrid opportunities for non-Oahu students.
 - Unsolicited feedback received from students indicates this is a valuable experience.

Challenges that limit the Host's capacity building success that the ERT notes are:

- COVID-19-related shutdowns made inter-institution collaborations more difficult and forced cancellations of some in-person activities, which were postponed to later in the year.
- Geographic space across the Pacific.
- Difficulties recruiting fellows to the CARM program; People want to get advanced degrees, but some are hesitant to go back to school.
- Strained relationships between the USGS and the Host institution, UHM, and UHH likely limited capacity-building activities.
- Because Sea Grant is such a strong supporter of the College, broadening capacity-building to other organizations and other creative partnerships might be limited.
- Lack of mentors for undergraduate programs.
- Lack of funding to support a targeted number of undergraduate scholars.
- Duplication of efforts with undergraduates in the SURF and PIPES programs.

The ERT notes that the Host limited some of these challenges in a variety of ways:

- Much of the Consortium's strength comes from their students becoming partners and going back to resource management positions. Their graduates now become partners – especially the UHH's MCC program and UOG's CARM program.
- The place-based capacity building efforts, built upon a Sea Grant-developed way of working, are strong, and build and extend capacity by including decision-makers and Indigenous people.
- Virtual and small gatherings, implemented during Covid, have continued post-Covid as a means of including people at a distance in their vast region.

The ERT finds that the Host and Consortium have designed highly effective programs for their students and, with added Intra-Consortium collaboration, could have an even more robust and exemplary climate science adaptation capacity-building program.

RECOMMENDATIONS: Capacity Building

- 1. Analyze and evaluate all capacity-building efforts.**
 - a. Place an emphasis on the connectedness between research projects and the CASC's 4 overarching principles driving research, education, and outreach.
 - b. Build on UOG's excellent and effective CARM program. If not already tracking the following, the ERT recommends:
 - i. How many CARM graduates stay in their manager positions?
 - ii. Document examples of successful application of CARM thesis results.
- 2. Create additional opportunities for more Pacific Island scholars' cultural spaces** that are self-directed and/or facilitated by PI CASC/PI CASC partners. If the programs are seeking to fully engage Pacific Island students, those students could benefit from offering a consistent, authentic, and intentional cultural space.
- 3. Continue to create additional opportunities for students from different programs to connect with each other.**
 - a. For example, continue to support novel approaches using students'/scholars' expertise to connect with each other and their communities. Draw on examples from The Guam Guy Podcast, YouTube, and Kapono's work.
- 4. Enhance collaboration between PIPES and SURF programs,** and reduce unnecessary conflicts or duplication created by two similar undergraduate programs.
 - a. PIPES has 30+ years of working with Pacific Island undergraduates in conservation and climate science student projects, while SURF is a new CASC project. Avoid potential conflicts and anticipated risks that might affect one or both programs regarding:
 - i. Student recruitment
 - ii. Mentor recruitment
 - iii. Student/applicant confusion on PI CASC affiliation (SURF and PIPES)
 - iv. Mentor confusion on PI CASC affiliation (SURF and PIPES)
 - v. Non-UH (outside organization or agency) confusion about PI CASC affiliation (SURF and PIPES)

Findings of the ERT – Overall Effectiveness towards Host Agreement

The ERT agrees that the Host and Consortium met the goals set out in their Cycle II Proposal to USGS. The ERT finds that the Host has been particularly effective with its capacity-building and external collaborative efforts (especially Kūlana Noi'i and PI-AK), and encourages sharing these experiences with the CASC Network, if it has not done so already. The ERT finds that the Host, Consortium, and USGS teams are comprised of passionate and committed individuals, all of whom share a desire to continue to improve and build a top-rate, forward looking CASC.

OVERALL ERT RECOMMENDATIONS

In addition to the recommendations noted above, the ERT makes the following recommendations about the review process and suggested approach for the Host, PI CASC, and consideration by NCASC with the entire CASC Network:

For this Host:

- While the values of reciprocity and trust are elevated for work with external partners in a place-based manner, the ERT believes assistance is needed to strengthen relationships between the Consortium and federal PI CASC partners. The ERT believes the Consortium Leadership Team and USGS (or, at a minimum, the Host and USGS directors) would benefit from facilitated discussions to shift relationships and reach the ultimate goals of the PI CASC. In addition, the ERT recommends the Consortium:
 - a. Hold an internal annual meeting to review the CASC vision, mission, and distinct activities. What makes the PI CASC unique? Can everyone involved articulate how they contribute to the broader mission of PI CASC?
 - i. Include a clear impact statement related to climate resilience.
 - b. Show alignment of research products and projects to the 4 overarching PI CASC principles so you can develop metrics to determine success attaining them.
- **Work to clearly identify and brand PI CASC efforts** (as distinct from Sea Grant and other Sea Grant efforts). There is internal and external confusion about whether there is a PI CASC niche within the Sea Grant domain.
 - a. Consider hiring a Director of PI CASC on the UH host award side who has no duties associated with another large Federal Program (e.g., Sea Grant) and, as such, can focus on the leadership and development of the PI CASC.
 - i. Consider shifting PI CASC reporting requirements to someone outside SOEST – perhaps the UH Provost or President. The ERT believes this could support timelier reporting and build new relationships for NCASC.
 - b. Consider building a campus-wide team to apply for the next iteration of funding, including other Colleges within the UH system, and share funds and administrative opportunities and challenges. Also, consider Cooperative Extension

via the Land Grant system. This would allow for enhanced focus on more science elements included in the PI CASC science priorities document.

- c. Consider partnering more with community colleges within the UH system: There are 10 colleges in the system, but only 2 are currently engaged. Expand engagement to community colleges in Samoa, Palau, and other islands.
 - d. Engage a Climate Extension agent to focus on tools that can aid in science translation.
 - e. Engage more with other islands as much as they would like. Go directly to them and create a position (or multiple positions) that is specific to engagement with Indigenous communities across the Pacific.
- **If there is an increase in funds** from \$900K per year to \$2M per year, prioritize efforts in the USAPI, including additional funding directly to UOG to expand CARM and hire cooperative extension agents.
- a. If a choice must be made between expanding the geographic reach of the PI CASC and maximizing the potential to leverage funds, the ERT recommends opting for greater inclusiveness to islands not currently served by the CASC.
- **For Guam:**
- a. Expand CARM to other islands in Micronesia.
 - b. Develop (or plan) more GIS and remote sensing training for the region.
 - c. Reimagine what might be an appropriate way to expand GIS capacity.
- **For Manoa:** Expand and empower the Consortium and leadership across the project by including UHH, other community colleges, and other islands.
- a. Consider intentionally adding Fellows from USAPI who can go back to their communities with the knowledge and skills they have gained through their work with PI CASC.
 - b. Increase engagement with land grant and sea grant climate extension areas.

For the PI CASC (Host and USGS)

- **Align on mission, vision, and values and overcome current differences.** While the values of reciprocity and trust are elevated for work with external partners in a place-based manner, they need to be strengthened between the components of the Consortium, and with the federal PI CASC partners. Some form of facilitated discussions should occur soon to shift relationships and reach the ultimate goals of the PI CASC.
- **Work together to clarify the PI CASC brand.** The PI CASC logo is easily recognized and should be retained, but the elements of a brand need to be defined. Work with an outside professional communications consultant and include both the federal PI CASC and the Host

to co-develop the brand and a shared internal understanding, which can then ripple out to external partners.

- a. Clearly articulate the project goals and desired outcomes/objectives that the PI CASC is hoping to accomplish, then align the messages more clearly.
 - i. A stronger collaboration between PIPES and SURF might be one way to accomplish this.
- **Conduct a formal evaluation of capacity building and engagement efforts** across the PI CASC
 - a. Gain a better understanding of the science being accessed and how it is being used (more than just anecdotally)
- **Get outside feedback more regularly:**
 - a. Expand use of the Science Advisory Committee (SAC) and the Senior Scientist Advisors (SSA) mentioned in the proposal, but not during the review, to include representation from these bodies at annual Cooperators' meetings to expand the feedback opportunities beyond this 5-year review.
 - b. Hold annual check-ins with all the communities engaged to solicit feedback, including local and Indigenous communities, state, federal, and other organizations.

For Future Hosts:

- Consider restructuring the award so that the full amount of funding goes directly to the partner universities at the project initiation phase. This would remove some of the administrative burden mentioned by Dr. Lerner and might allow for more timely funding and streamlined reporting from the partner institutions. It also would likely reduce overall overhead costs by reducing the 'pass-through'.
- Broaden inclusion of other partners on the 5-year award so they can apply for an annual award through Consortium partners. Consider broadening partnerships to other universities and to other organizations, such as non-profit organizations working with Indigenous partners.
- Create a position responsible for building a Sea Level Rise Network to include all relevant partners and in collaboration with the Federal PI CASC. Use this network to foster manager peer-to-peer relationship building, to share recent scientific advancements, and to focus on the solution-space. What adaptations are people trying and are they working?
 - a. Similarly, wildfire is a growing climate-related concern, but there appears to be limited coordination among researchers focused on wildfire.
- Expand to USAPI, as funding allows.
- Expand evaluation metrics to learn whether project efforts are building climate resilience. Think broadly about how these efforts are changing management actions, document progress by tracking the implementation of scientific advancements, evaluating changes in equity, and measuring changes in relationships and trust.

- Consider de-centralizing leadership from UHM and distribute it more equitably across the Consortium. Encourage funding UOG directly and give them clear leadership to address people and place-based issues closer to their location (e.g., the Marshall Islands)
- Build on programs to expand PI CASC's capacity building efforts with the goal of enhancing leadership of Native Hawaiians and Indigenous researchers, scholars, resource managers, climate practitioners, and policy makers on PI CASC and, more broadly, in the sector addressing climate change in the Pacific Islands.
 - a. Model this last point by including these leaders on the Consortium core team and SAC/SSA, and/or create a compensated and well-engaged NH/IP Advisory Council.
- Maintain and/or build upon the capacity building programs established in this funding cycle (Undergrad Research Fellows, Grad Scholars, MCC, CARM, etc.).
- Involve additional partner institutions (e.g., community colleges, NGOs, native Hawaiian/Indigenous organizations, etc.).

For USGS and the NCASC Network

- Increase the PI CASC annual budget to be more in line with AK CASC, recognizing the geographic expanse of the PI region, the difficulty of engagement, and the cost of conducting research.
- Expand the use of SACs and SSAs to include representation from these bodies at annual Cooperators' meetings, thereby expanding external feedback opportunities beyond this 5-year review.

REGARDING THE EXTERNAL REVIEW PROCESS
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➤ **The ERT finds that the review process was....**

- Thorough, however, it felt a bit rushed as there is so much information to cover.
- Well-organized and responsive to the individual needs of the Consortium members.
- Somewhat surprising because we learned, on the final day, about the friction within the teams. It took 4 days for this to surface and I'm glad the process allowed for a flexible meeting agenda in response to individual needs.
- Well-organized to inform the development of the report.
- Provided the space for discussion with the PI CASC in large and small group closed door sessions.
- Was respectful of everyone's time.
- Was a lot of effort for a relatively small effort of the Host and Consortium.

➤ **For future external reviews, the ERT recommends:**

- Including interviews with additional partners.
- Holding one-on-one meetings with different campuses or partners early in the process.
- Conducting a thorough review of the process itself to determine how it may best improve for the next review period.
- Hold the reviews in person, as this increases the efficiency of the event.
- NCASC provides greater guidance about what the review should include – in particular, templates for how the administrative and financial information should be presented for the required review.

END OF REPORT CONTENT

Scrivener's Note: This report was compiled by Donna Silverberg Consulting in active coordination with the ERT Members listed on page 2. The ERT Members reviewed and refined multiple drafts until all Members could support having their names acknowledged on this Final ERT Report.

APPENDICES

Appendix 1 – External Review Session Attendees

Attendees for all or part of the sessions, alphabetical by last name (affiliations included).

ERT Members: Ulu Ching (Conservation International Hawai'i), Jackie Dingfelder (Portland State University), Emile Elias (USDA-SW Climate Hub), Michael Hudson (USFWS), Michelle McClure (NOAA-PMEL).

Host, Consortium and CASC Presenters: Anela Akana (PICASC-UHM), Allison Bidlack (AKCASC-UAF), John Borja (PICASC-UOG), Michael Bruno (UHM), Kapono Gaughen (UHM), Katy Hintzen (PICASC-UHM), Tressa Hoppe (UHM), Mari-Vaughn Johnson (PICASC-USGS), Patrick Keeler (Nature Conservancy), Heather Kerkerling (PICASC-USGS), Romina King (UOG), Élyse Hanh Larsen (PICASC-UHM), Scott Laursen (PICASC-UHM/UHH), Becca Lensing (Knauss Marine Policy Fellow), Rachel Lentz (PICASC-UHM), Beth Lenz (PICASC-UHM), Darren Lerner (PICASC-UHM), Stephanie Mladinich (USGS), Jonathan Price (PICASC-UHH), Brad Romine (PICASC-UHM), Sharon Ziegler-Chong (PICASC-UHH).

USGS Observers (for all or some of the sessions): Doug Beard (USGS-NCASC); Molly Cross (USGS-NCCASC), Elissa Welch (MWCASC-UMN).

Donna Silverberg Consulting Facilitation Team: Facilitator, Donna Silverberg; Session Reporting and Support, Colby Mills, Tina Patterson, Nancy Pionk, and Emily Stranz.

Appendix 2 – Daily Review Session Agendas and Facilitator’s Summaries

Day 1 – Administrative Management

DAY 1	April 15, 2024: Administrative Management Purpose: Reflect on the competencies, efficiencies, challenges, and areas for improvement of the Host University in managing the administrative requirements and terms and conditions of the corresponding host agreement, with a focus on <i>institutional development</i> and <i>fiscal management</i> review categories.	
Time (HST)	Activity	Participants and Affiliation
10:00-10:30a	External Review Team - Closed Door Get settled & focused on tasks for the week and Day 1	Facilitation Team ERT Members ONLY
10:30-10:45a	Welcome, Introductions, & Role Clarification Brief welcome, round of introductions of ERT Members, PI-CASC Team, and USGS Team, and clarify roles	Donna Silverberg, ERT Manager/Facilitator, DS Consulting
10:45-11:15a	Welcome The Pacific Islands CASC: Regional Context, Mission, and Vision	Michael Bruno, UHM Provost Darren Lerner, PI-CASC Consortium Director
11:15a-12:00p	<i>Institutional Development: Organizational Management and Leadership, Staffing, and Key Elements</i> Overview of the PI-CASC’s administration, structure, Host institution, and consortium	Darren Lerner, PI-CASC Consortium Director
12:00-12:30p	Facilitated Dialogue and Discussion with ERT, and Q&A Regarding <i>Administration, Leadership, and the PI-CASC Consortium Structure</i>	Facilitation Team PI-CASC Team ERT members
12:30-1:30p	Lunch Break (1 hour) <i>To avoid Zoom fatigue: Please turn off and step away from your computer screen if possible</i>	
1:30-2:00p	<i>Review of Fiscal Management</i> Fiscal team, processes, and procedures	Darren Lerner, PI-CASC Consortium Director Brad Romine, Consortium Deputy Director Élyse Larsen, Fiscal Manager
2:00-2:30p	Facilitated Dialogue and Discussion with ERT, and Q&A Regarding <i>Fiscal Management</i> What are the Host’s competencies, efficiencies, challenges, and areas for improvement?	Facilitation Team PI-CASC Team ERT members
2:30-3:00p	External Review Team - Closed Door Initial reflections on the day: questions, concerns, insights	Facilitation Team ERT Members ONLY

DAY 1: Facilitator's Summary
April 15, 2024, 10:00 am – 3:00 pm Hawaiian Standard Time
Topic: Administrative Management

Prepared by DS Consulting Facilitation Team

The following summary is intended to capture basic discussion, reflections, concerns, and insights from the session. It is not a verbatim transcript but has links to the presentation.

Attendees present for all or part of the meeting (in alphabetical order):

ERT Members: Ulu Ching (Conservation International Hawai'i), Jackie Dingfelder (Portland State University), Emile Elias (USDA-SW Climate Hub), Michael Hudson (USFWS), Michelle McClure (NOAA-PMEL).

Host, CASC and Consortium Presenters: Anela Akana (PICASC-UHM), Michael Bruno (UHM), Katy Hintzen (PICASC-UHM), Mari-Vaughn Johnson (PICASC-USGS), Heather Kerkering (PICASC-USGS), Romina King (UOG), Élyse Hanh Larsen (PICASC-UHM), Scott Laursen (PICASC-UHM/UHH), Rachel Lentz (PICASC-UHM), Beth Lenz (PICASC-UHM), Darren Lerner (PICASC-UHM), Jonathan Price (PICASC-UHH), Brad Romine (PICASC-UHM), Sharon Ziegler-Chong (PICASC-UHH);

Session Observers: Doug Beard (USGS-NCASC), Molly Cross (USGS-NCCASC);

DS Consulting Team: Facilitator: Donna Silverberg, Reporting and Support: Colby Mills, Emily Stranz.

Purpose: Reflect on the competencies, efficiencies, challenges, and areas for improvement of the Host University in managing the administrative requirements and terms and conditions of the corresponding Host Agreement, with a focus on institutional development and fiscal management review categories.

Welcome, Introductions & Role Clarification

Facilitator and External Review Process Manager, Donna Silverberg, welcomed the group to Day 1 of the 5-year External Review of the Pacific Islands Climate Adaptation Science Center's (PI-CASC) performance on its Host Agreement (HA) with the USGS and conducted a round of introductions that included: PI-CASC External Review Team (ERT) Members; PI-CASC Host, University of Hawai'i at Mānoa (UHM or Host), leadership and team; PI-CASC USGS leadership, PI-CASC Consortium Members; and session observers. Donna explained that the CASC is made up of USGS and the Host Consortium. The Consortium includes the Host University (UHM) and other partner universities, including University of Hawaii Hilo (UHH) and University of Guam (UOG). The review only focuses on the efforts of the Host.

Doug Beard, Senior Administrator of the National Climate Adaptation Science Center (NCASC) thanked everyone for participating in this week and for help the ERT will provide informing NCASC's request for proposals later this year. Michael Bruno, Provost (UHM) also welcomed and thanked the group, noting that PI-CASC is one of the University's most important efforts as it aligns perfectly with the University's mission. He appreciated the current partners of the PI-CASC and welcomed more.

The Pacific Islands CASC: Regional Context, Mission, and Vision

PI-CASC Host University/Consortium Director, Darren Lerner (UHM), provided an overview of the PI-CASC, along with University Provost, Michael Bruno (UHM). The presentation slides can be viewed [here](#). The PI-CASC started in 2012 as the Pacific Islands Climate Science Center (PICSC). In 2018, Darren (of UH Sea Grant) submitted the second proposal to USGS to continue hosting PI-CASC at UHM, which resulted in the

2019 HA award (cooperating agreement between UHM and USGS), which is now under review by the ERT.

Darren explained that the PI-CASC includes a geographic area of Hawai'i and the U.S. Affiliated Pacific Islands, which is larger than most of Canada and the continental U.S. combined. The area includes roughly 2,000 inhabited islands and atolls, rich cultural diversity, including around 20 Indigenous languages spoken, and thousands of plants and animal species that are unique to the islands. Darren spoke to the harmful and lasting impacts of the institutionalization of colonialism and racism which took culture and resources from Indigenous people. Climate change further exacerbates the sense of vulnerability for people living in the region. Because Indigenous peoples in the Pacific Islands are not protected under federal law, they may face additional challenges in asserting cultural, land, and human rights.

The mission of the National Climate Adaptation Science Center (NCASC) is to deliver science to help fish, wildlife, water, land, and people adapt to a changing climate. PI-CASC considers how to make this mission place based given the histories, lived experiences, and diversity of ecosystems, animals, and people. To start, the USGS-formed Science Advisory Committee (SAC) established science themes that the PI Consortium used to develop science themes and focal areas that were most relevant to the expertise and interest of their region (see slide 14).

Questions and Comments from the ERT

- *Question/Comment:* How did you incorporate Indigenous knowledge into the process of identifying focal areas and science themes, and why is Indigenous knowledge only specifically called out under the agroforestry and aquaculture systems?
 - *Response:* The USGS federal team developed the science agenda and themes via the SAC before the Host Award currently under review was competed. The process for determining the themes (5 themes each with 3 focal areas) and focus areas in the science agenda is a federal function, not a Host function. This separation is part of the NCASC system set up. USGS decides the science focus and the Host then meets those needs through working with partner universities, students, and researchers. The PI-CASC took the SAC outcomes and further engaged with them, bringing more indigenous focus to the process of implementing the HA.
- *Question/Comment:* Regarding the science themes, who decided what themes to focus on at PI-CASC?
 - *Response:* As noted, the themes were determined by the USGS SAC; the Consortium considered and prioritized where they could best support the themes moving forward and picked those that the Consortium had most capacity to progress. As a result of cross engagement with collaborators, the Consortium narrowed the field focus on and incorporated the focus areas into the proposal.
- *Question/Comment:* When the Consortium narrows focus, does the USGS have to approve that?
 - *Response:* Yes, USGS reviews and approves the PI-CASC focus via the acceptance and approval of the proposal and HA.
- *Question/Comment:* Is there a revised science agenda? Or is the PI-CASC using the old science agenda?

- *Response:* There is not yet a new science agenda; USGS will be putting out a new science agenda in the future, which will include many of the same concepts, as they are still relevant.
- *Question/Comment:* USGS sets the science, but it is not in a vacuum, it is determined by the SAC, which include partners, scientists, etc. The SAC designs the science agendas to be broad enough to fit specific focus areas and research under the themes.
- *Question/Comment:* For the focus areas blocked out on slide 14, do those go away, or is another funding source/program responsible for focusing effort on them outside of the Host?
 - *Response:* Yes, between PI-CASC, USGS, and others, all the focus areas are advanced. The Host focuses on the ones highlighted; there are inter-agency agreements (IAAs), for example, which fund work on the other focus areas.

Institutional Development: Organizational Management and Leadership, Staffing, and Key Elements

Darren provided an overview of the Host's administration, structure, Host institution, and Consortium: The Host works closely with USGS and U.S. Department of Interior to form the core administration; UHM, UHH and UOG make up the Consortium; and there are several additional partners, such as Sea Grant and NOAA that support PI-CASC work via funding. The presentation slides can be viewed [here](#).

Darren explained that the funding composition across the consortium and partners varies over time, and today's presentation is a snapshot in time. One tool that the Host and partners use for funding research are the IAAs, which have been vital in transferring funds from the federal side to the Host, via USGS, to NOAA, NOAA to National Sea Grant Office, and then National Sea Grant develops an opportunity for PI-CASC (UHM) to utilize. *[Facilitator's Note: PI-CASC USGS added later that IAAs were developed to provide additional funds to the Consortium to support PI-CASC as the Host award was insufficient to meet the goals in the HA.]* PI-CASC uses the IAA funds for climate adaptation services, paying graduate scholars, and partial funding of positions such as the network partnership liaison, and Pacific Regional Invasive Species and Climate Change (RISCC-FWS and USGS). These various funding sources support the PI-CASC Consortium Faculty and Staff positions. Darren showed diagrams depicting which funding sources support PI-CASC positions, and to what percentage. In the diagram, the 'consortium fund' is from USGS for the Host.

Darren walked the ERT through the Key Elements of the HA, specifically calling out aspects of the Key Elements that PI-CASC has not fully implemented or implemented differently than noted in the HA. In slides 13-28, the elements noted in orange text signify those that PI-CASC has not fully implemented as written. Darren noted that, throughout the week, the presentations will dive deeper into the Key Elements. Today, his presentation focuses on the challenges that the Host has experienced. Darren provided the following examples:

- Under Education, Training and Capacity Building, the HA stated that, "Graduate Scholar opportunities will be developed with the Senior Science Advisors (SSA) and partners...". The SSA was engaged in the development effort, but not in every aspect of developing the scholar opportunities. *[Facilitator's Note: PI-CASC USGS later added that the SSA team has not been convened during this period of performance.]*
- Similarly, under Education, Training, and Capacity building the HA states that PI-CASC will seek to engage 10 or more undergraduates annually; however, funding limitations have supported 6 undergraduates to be engaged with research projects so far. *[Facilitator's Note: PI-CASC USGS*

later added that IAAs have provided supplemental funding beyond HA funds to support students, numbers remain below HA estimated numbers.]

Darren touched on other aspects of the Key Elements within the HA that PI-CASC has implemented over the duration of the HA, including cross-disciplinary cultural knowledge, communications, and data management, providing physical space, and administration. Presentations in the coming days will provide more details on the Key Elements.

Dialogue and Discussion with the ERT Regarding Administration, Leadership, and the PI-CASC Consortium Structure

- *Question/Comment:* Do you or could you propose to work with other institutions outside of the U.S. or U.S. affiliated programs? For example, are there opportunities to learn from and partner with Australia and the work they are doing on coral reefs?
 - *Response:* If we had the right collaborations, yes. There have been conversations over the last few years about opportunities that go outside the U.S. borders. If we are using HA funds to produce deliverables in the U.S. and Pacific Islands, we could bring together partnerships that result in something bigger and broader. We would just need to be mindful of the pieces and the deliverables because we can't use funds to do work in Australia. *[Facilitator's Note: PI-CASC USGS later added that there are three nations within their purview as USAPI – the Freely Associated States of Palau, Federated States of Micronesia, and the Republic of the Marshall Islands.]*
- *Question/Comment:* There have been a lot of leadership changes and rotation at UHH. Was this planned, did it present challenges, and how has it worked out?
 - *Response:* It was not part of the plan or the cooperative agreement; from the Host's perspective, it was based on needs and availability. The UHH leadership takes the CASC very seriously, however UHH is small, and people wear many hats. There have been changes due to timing, sabbaticals, retirement, etc., however, there has also been stability and consistency despite the changes.
- *Question/Comment:* Does USGS have a limit for administrative overhead as a fiscal sponsor? Can you say more about the overhead at the institutions?
 - *Response:* For this HA, UHM got in under the Research rate for administrative overhead, with a locked rate of 36.5% of TMDC. Since then, that rate has increased to 45.5%. At UOG, the indirect costs (IDC) are 39% of total modified direct costs.
- *Question/Comment:* Have the resources been sufficient for staffing needs and, outside of salaries, is there enough funding across the 3 institutions for other work? Are there enough funds to do the work?
 - *Response:* The Host has utilized or applied the HA funding across various positions and used other funding sources to fill gaps. Across the three universities the HA funding break up is roughly: \$140k to UOH, \$230k to UHH, and \$530k to HHM annually.
 - *Response:* We can always appreciate more funding, but leveraging existing funds is the answer. Leveraging is about partnerships with others and leads to potential for synergies. In the Islands there is a shortage of human beings, so we must leverage what little we have, and be strategic to get all the good work done. We have done this, for example, by combining HA funds with funds from other sources, such as NASA and USDA grants.

- *Response:* In addition to the HA, USGS has provided IAA funds and other funds for efforts such as the UOH's CIS conference (\$5k annually).

Review of Fiscal Management

Darren provided an overview of the Host's fiscal team, processes, and procedures, with support from PI-CASC Fiscal Manager, Élyse Larsen. The presentation slides can be viewed [here](#). Darren introduced the PI-CASC Fiscal Team, which includes a total of 6 people, ranging from 5-50% FTE, paid for using both PI-CASC and Sea Grant funds. *[Facilitator's Note: PI-CASC USGS later added that the Consortium Deputy Director 0.5FTE is not all fiscal management, and the Consortium Director does contribute some fiscal oversight.]*

They explained that fiscal management of the USGS CASC funds is complex. All Consortium monies that come in from USGS first go into the University of Hawaii system, then through an internal ORS before distribution to UHM. UHM moves the funds to the School of Ocean and Earth Science and Technology (SOEST), then to Sea Grant, which has cooperative agreements with PI-CASC partners. The cooperative agreements with Sea Grant are the vehicles for UOG, UHH, and associated Research Principal Investigators (R-PIs) to get the funds. Those eligible to receive funding through the HA are R-PIs within the PI-CASC. The federal solicitation process, another way for R-PIs to receive funding is a multi-step process, detailed in slides 9-13. These funds are separate from the HA Consortium funds received by PI-CASC/UHM.

Questions and Comments from the ERT

- *Question/Comment:* Please clarify if the process described is the process that the Consortium engages in to get USGS Consortium funds, or is this process used to award partner institutions their funds, or projects through USGS directly?
 - *Response:* USGS uses the process described when they put out a solicitation which R-PIs who are part of the PI-CASC can apply for. This is part of the agreement that UHM has as the Host University, the agreement to manage the federal funds awarded to someone within the consortium; USGS has limited who is legally responsible for the funds they provide – the Administrative Principal Investigator (A-PI, and currently Darren), has responsibility for those funds. The HA consortium funding, which is around \$900k annually, follows much of the same process, but is not quite as detailed. Once the Consortium funds are awarded to UHM, sub-awards are developed for UOG and UHH. For the sub-awards, each entity identifies how they will use the funds in a detailed budget. They do not have to go through the process described above to use those funds – for example, graduate students can be funded internally through various pathways.
- *Question/Comment:* Do you have any graphs or tables to describe total funding into the PI-CASC and how PI-CASC spends those funds, e.g., salary, grad students, and division between institutions? A high-level summary of how much money you get, and how is it spent?
 - *Response:* No, but we could think on how best to show that; there are some complications (for example, funds extended over fiscal years) that make it more challenging to pull together than it sounds. In addition, all recipients report fiscal expenditures through UHM Host to ORS, which delivers final fiscal reporting to USGS.
- *Question/Comment:* How do you make sure that the funds awarded were well spent and the work was completed? Do you require a report from R-PIs?

- *Response:* The R-PIs report directly to USGS regarding solicitation funds. The Host does fiscal reporting which is reported to the federal Office of Acquisitions and Grants. Budget spending is reported by each institution separately.
- *Response:* With regards to reporting on USGS cooperative agreements made through the solicitation process, the R-PI is awarded through a cooperative agreement. Then there is a kickoff meeting with the R-PI and A-PI and/or other PI-CASC representatives. The Host also provides an award letter to the R-PI, and annual and final reports are sent to PI-CASC. The Consortium does not track the R-PI efforts; that happens on the federal USGS side.
- *Response:* A good resource to see the results/impacts of funds that go to R-PIs is the [Highlights of PI-CASC Projects & Activities at the UOG](#) document.
- *Question/Comment:* How often is there a federal solicitation and do they include all CASCs?
 - *Response:* In general, they are annual across the CASCs. However, USGS can opt not to do them, and instead do selected projects (for example, if there were previously good proposals that did not get funded in a prior solicitation). The goal is to run the solicitations for all CASCs at the same time. NCASC just recently [released a solicitation](#).
- *Question/Comment:* Are there challenges in managing the federal funding coming in?
 - *Response:* The PI-CASC Fiscal Manager works closely with USGS to go through the budgets. They have been able to work together on challenges that come up. PI-CASC is in a much better place today having a dedicated PI-CASC Fiscal Manager on the team. Élyse came to the PI-CASC team with a knowledge of federal agency processes and has been incredibly helpful having her as the point person to deal with PI-CASC funds.
- *Question/Comment:* Are the pathways to fund graduate students different between the universities and if so, are there any challenges there?
 - *Response:* Yes, there are differences in pathways to fund and in the salaries, both across and within the universities (there are differences within schools, departments, etc.). It is a struggle to level the playing field. At UHM, there has been some effort to standardize the graduate salaries.
- *Question/Comment:* Can you give us a sense of the volume of Statements of Interest and proposals in the solicitation process – what is the volume, what are you taking in? And related to that, is there ever a case where good proposals are lost due to the complex nature of the solicitation process?
 - *Response:* The Host and Consortium are involved after USGS has done some initial vetting and is close to understanding which proposals they want to fund; so, the volume is different at the Consortium than USGS. At the Consortium, it is 6-8ish annually, and at USGS, it is closer to 30-35. At the consortium stage, we have come close to losing a good proposal due to the process but did not. Some good proposals have made it through USGS-side vetting and just couldn't get funded due to limited funding. USGS has the freedom to consider funding those competitive proposals in a following year without recompetiting them.

Facilitated Dialogue and Discussion with the ERT, and Q & A regarding Fiscal Management

Donna led a facilitated discussion between ERT Members and the PI-CASC and Consortium on Fiscal Management. ERT Members were asked to consider the following:

- What are the Host's Competencies, Efficiencies, Challenges, and Areas for Improvement? What can we learn from them?
- *Question/Comment:* There is clearly a significant administrative process. What could be done to help with administrative challenges?
 - *Response:* There have been opportunities over the years for leadership discussions among USGS, Consortium directors, etc., and there have been helpful improvements along the way (for example, having the solicitation process detailed above, which previously did not exist and was more ad hoc). To identify challenges that could realistically be improved on now would require some time to consider how, as an enterprise, we could improve together.
 - *Response:* From UOG's perspective, there have been administration challenges (such as different expectations for invoicing periods) that have caused a lot of extra effort to resolve. Those challenges can be a barrier and, when they arise, the universities work together to fix them.
- *Question/Comment:* In looking at the makeup of the Consortium, is there anyone you are missing in the Pacific Islands that might be another partner in the Consortium?
 - *Response:* Yes. Some of the challenges are the level of capacity at community colleges, and how to continue to work with community colleges to build capacity to be consortium partners. [*Facilitator's Note: PI-CASC USGS later added that other institutions/entities that could join include NGOs, continental universities, East-West Center, APCSS, state and county entities, etc.*]
- *Question/Comment:* Within the Consortium now, all the partners are academic institutions, are you limited to that? What about NGOs, can they be part of the consortium, or respond to proposals?
 - *Response:* Yes, we can partner with other types of organizations and other CASC consortiums include different organizations, including Indigenous Peoples groups, non-profits, etc. We can include non-consortium partners in subawards. However, unless the organization is part of the HA and thus the Consortium, they are not allowed to submit a proposal on their own through the USGS solicitation. They must partner with a PI who is within a HA member institution.
 - *Response:* There are a variety of organizations that can be included in a HA – and then they would be part of the consortium – including Indigenous groups and Native Hawaiian Organizations, state, county governments, cities/townships, non-profits, independent school districts, special district governments, etc.
 - *Response:* UOG and UHH both currently partner with non-profit organizations and have found creative ways of including organizations that are not included in the HA, formally and informally. For example, NGOs will talk to UOG about projects that they are supportive of and UOG can share information up the chain to see if there are funding opportunities.

- For an example of research projects [check out this page](#).

Donna thanked the ERT, CASC & Consortium Members, and Observers for their participation, engagement, and attendance at the session. With that, the meeting was adjourned.

ERT Reflections on the Day

The ERT met in closed session to discuss what they had heard throughout the day. Clarifying substantive questions for the Host to answer during the remaining sessions, and/or comments included:

- *Question/Comment:* What is the overarching goal for the Consortium (and how do the four principles fit into that?)
- *Question/Comment:* To be sure we are all on the same page when you move to the science portion: how do YOU define co-production?
- *Question/Comment:* The ERT heard that Mari-Vaughn took three different approaches to reviewing graduate proposals: Why was that? And, has the process improved because of one or another of these approaches? *[Facilitator's Note: PI-CASC USGS later added that the Regional Administrator's approach to the selection of scholars from the Sea Grant award process was decided by the Consortium Director. USGS was not included in this year's SURF or MCC process and has never been part of the CARM process.]*

This session summary is respectfully submitted by the DS Consulting Facilitation Team. Edits are welcome and can be sent to your Day 1 Scribe: Emily Stranz (emily@dsconsult.co) or team support Colby Mills (colby@dsconsult.co).

Day 2 – Capacity Building and Scientific Achievements

DAY 2	April 16, 2024: Capacity Building and Scientific Achievements Purpose: Reflect on the Host University and associated academic consortium's contributions with respect to <i>capacity building</i> and <i>scientific achievement</i> .	
Time (HST)	Activity	Participants and Affiliation
10:00-10:15a	External Review Team - Closed Door	Facilitation Team ERT Members ONLY
10:15-10:20a	Brief Daily Introductions and Setting the Day	Facilitation Team, PI-CASC Team ERT Members
10:20-10:30a	<i>Scientific Achievements on Climate Impacts, Vulnerability, and Adaptation Science:</i> Overview of research focus areas and introduction of capacity-building programs	Brad Romine, PI-CASC Consortium Deputy Director
10:30-11:50a	<i>Capacity Building: Workforce Development for the Next Generation</i> (15-min presentations, 5-min Q&A) - UHM Graduate Scholars program: goals and structure - CARM program: goals and structure - MCC program: goals and structure - SURF program: goals and structure	Beth Lenz, Graduate Scholars Coordinator Rachel Lentz, Undergraduate Research Coordinator Romina King, UOG Lead Scott Laursen, MCC Coordinator Jonathan Price, UHH Lead
11:50a-12:45p	Lunch Break (55 Minutes) <i>To avoid Zoom fatigue: Please turn off and step away from your computer screen if possible</i>	
12:45-1:30p	<i>Science Achievements: Part 1</i> (12-min presentations, 3-min Q&A) - Becca Lensing (PhD): <i>Microbial biogeochemical cycling across a chronosequence of mangrove introductions across Hawai'i</i> - Tressa Hoppe (PhD): <i>Enhancing social-ecological resilience and ecosystem services through restoration of coastal agroforestry</i> - Kapono Gaughen (MS): <i>Integrating social and cultural considerations into planning and community-based monitoring to reach marine conservation goals</i>	Moderated by Brad Romine, PI-CASC Consortium Deputy Director
1:30-1:35p	Break (5 minutes) <i>To avoid Zoom fatigue: Please turn off and step away from your computer screen if possible</i>	
1:35-2:05p	<i>Science Achievements: Part 2</i> (12-min presentations, 3-min Q&A) - Stephanie Mladinich (MS): <i>Pockets and pathways to invasion: Towards developing improved mosquito monitoring methods in high-elevation forests on Hawai'i Island</i> - Patrick Keeler (MS): <i>Biochar as a mitigation tool for soil rehabilitation in Guam's badlands and savannah grasslands</i>	Moderated by Brad Romine, PI-CASC Consortium Deputy Director

2:05-2:35p	Facilitated Dialogue and Discussion with the ERT, and Q&A Regarding Capacity Building and Scientific Achievements: - How is the Host University managing their capacity building and actionable science programs? What is/isn't working well? - What are the Host University and its consortium contributing to climate science and future capacity? Were there limitations and how were they mitigated?	Facilitation Team PI-CASC Team ERT Members
2:35-3:00p	External Review Team – Closed Door Initial reflections on the day: questions, concerns, insights	Facilitation Team ERT Members ONLY

DAY 2: Facilitator's Summary
April 16, 2024, 10:00 am – 3:00 pm Hawaiian Standard Time
Topic: Capacity Building and Scientific Achievements

Prepared by DS Consulting Facilitation Team

The following summary is intended to capture basic discussion, reflections, concerns, and insights from the session. It is not a verbatim transcript but has links to the presentation.

Attendees present for all or part of the meeting (in alphabetical order):

ERT Members: Ulu Ching (Conservation International Hawai'i), Jackie Dingfelder (Portland State University), Emile Elias (USDA-SW Climate Hub), Michael Hudson (USFWS), Michelle McClure (NOAA-PMEL);

Host, CASC and Consortium Presenters: Anela Akana (PICASC-UHM), John Borja (PICASC-UOG), Kapono Gaughen (UHM), Katy Hintzen (PICASC-UHM), Tressa Hoppe (UHM), Mari-Vaughn Johnson (PICASC-USGS), Patrick Keeler (Nature Conservancy), Heather Kerkering (PICASC-USGS), Romina King (PICASC-UOG), Scott Laursen (PICASC-UHM/UHH), Becca Lensing (Knauss Marine Policy Fellow), Rachel Lentz (PICASC-UHM), Beth Lenz (PICASC-UHM), Darren Lerner (PICASC-UHM), Stephanie Mladinich (USGS), Jonathan Price (PICASC-UHH), Brad Romine (PICASC-UHM), Sharon Ziegler-Chong (PICASC-UHH);

DS Consulting Team: Facilitator: Donna Silverberg, Reporting and Support: Nancy Pionk and Tina Patterson.

Purpose: Reflect on the Host University and associated academic consortium's contributions with respect to capacity building and scientific achievements.

Daily Introductions and Setting the Day:

Facilitator and External Review Process Manager, Donna Silverberg, welcomed the group and conducted a round of introductions that included: PI-CASC ERT Members; PI-CASC Host University of Hawai'i at Mānoa (UHM) leadership and team; PI-CASC Consortium Members; and PI-CASC USGS leadership. She reminded the group that the ERT was doing a 5-year review of the Host and Consortium's implementation of their Host Agreement (HA) with USGS.

Scientific Achievements on Climate Impacts, Vulnerability, and Adaptation Science

PI-CASC Host University/Consortium Deputy Director, Brad Romine (UHM), provided an overview of the PI-CASC's research focus areas and introduced the Consortium's capacity-building program. Presentation slides can be viewed [here](#). He noted that the Consortium supports graduate funding (student stipend, Sea

Grant funds science research) in the following PI-CASC Science focus areas: drought in the Pacific Islands, coastal adaptation and planning, forest conservation in a changing environment, core questions for natural and cultural resource managers, and adaptation and survival in low islands and atolls

Brad explained that Graduate Scholars are invited to participate in research and outreach, co-production workshops, and other activities to further their understanding and future capacity. The Consortium also supports graduate scholars in presenting their research at conferences and symposia, as funding allows. Graduate student salaries/tuition are funded through the HA budget and graduate scholars on USGS-funded projects are also invited to participate. The Program features place-based projects which are co-developed to address local needs. There also are opportunities for professional development, networking, and undergraduate research.

Each consortium member has its own program for graduate scholars, allowing the place-based, relationship aspects of the work to develop from local needs and people. Each year, the consortium supports between 10 and 16 students on consortium funds. PICASC-USGS funded an additional 14 students who also were included in graduate scholar activities.

Capacity Building: Workforce Development for the Next Generation

PI-CASC Graduate Scholars Coordinator, Beth Lenz (UHM), provided an overview of the PI-CASC's Graduate Scholars program and professional development. Presentation slides can be viewed [here](#).

The program is focused on developing activities for professional development and creating a sense of cohort among the students. The challenges of supporting a cohort include asynchronous timelines and coordinating with students and PIs across islands, universities, departments, and programs. Participation in the program is required for students that are funded by UHM, and requested of students funded via the federal solicitation, consequently, investment by students and buy-in from graduate advisors is another challenge.

The program engages students around professional development which includes opportunities to *Meet the Experts* in a Science to Management Policy Panel where experts share career pathways and offer career advice in a Q&A session format; an early career panel; and guidance on salary negotiation. Students are also offered Science Communication opportunities to present their science at symposiums and informal community settings, and learn about effective science communication (e.g., Blog writing, Story Maps, and presentations). There is also a Service and Community Engagement component which provides opportunities to volunteer and engage in service-learning. One opportunity, the Kūlana Noi'i Community Workday, provides guidance on how to build more trusting and generative relationships. *[Facilitator's Note: PI-CASC USGS staff later added that Workdays are not specific to graduate scholars, and they are extended an opportunity to join the Sea Grant-driven practice.]* The students participate in community service with partners for the first half of the day and then discuss scenario exercises regarding accountability. Students also have participated in National CASC's Climate Adaptation Early Career Workshop. Students participating in the program have received multiple awards and recognition from a variety of schools and organizations.

See also:

- [PI-CASC Research Projects](#)
- [PI-CASC Graduate Scholars Projects](#)
- [PI-CASC Students + Post Doc Directory](#)

Questions and Comments from the ERT

- *Question/Comment:* You mentioned that many of the graduate students were working in the field. How much interaction do graduate students have with the policymakers such as influencing state legislatures and local policies? We hope that this research is used to inform and make changes and have long-lasting effects. How are you helping to facilitate this interaction with students?
 - *Response:* Students are getting real time connectivity to policy. PI-CASC is a partner with Hawai'i Climate Week, which is run by the Hawai'i Climate Commission at the state level. The Commission has created space for students to present at their events. The leader of the Commission has also come to talk with students about what is needed to translate that data into something that is digestible by staffers. Becca Lensing, a former graduate student, has received a prestigious Marine Policy Fellowship in Washington D.C. working with USFWS on management policy. Stephanie Mladinich is working at USGS, currently, but as of the day she presented has accepted a position as the Climate Adaptation Services Specialist with the SC CASC and will be concurrently working toward her PhD. Students are getting connected to federal entities. Extension faculty, who are not PICASC positions, also work very closely with local government in helping to inform science-informed policy development. As for impact, this is something we would like to track better in the future.
 - *Chat Comment by Consortium Member:* This is an example of impacts amid policy professionals: U.S. Climate Resilience Toolkit: <https://toolkit.climate.gov/case-studies/reality-check-collaborative-research-contributes-real-life-policy-decisions>
- *Question/Comment:* How did you address the challenge of asynchronous timelines?
 - *Response:* We look for the most optimal time to start on-boarding sessions and are flexible and adaptive as to when students are coming on board. It requires “old-school” communication and coordination (via telephone calls to students). We work to identify students’ skills and interests, and experts they would like to meet so they have stronger connectivity with the program.
- *Question/Comment:* The presentation was great in showing your relationship building with students, being responsive to their needs, and following up/linking back to qualitative feedback from students. Have you developed any quantitative metrics to self-evaluate capacity-building?
 - *Response:* We don’t currently have an extensive ‘Impacts and Reflections’ form or process that we send out to students. We keep track of students’ work, activities, and where they are going (alumni tracking). *[PI-CASC USGS staff later added that the PI-CASC website’s project pages are all in future tense; any tracking is not public-facing.]*

Romina King (UOG) presented on the Climate Adaptation for Resource Management program (CARM). Presentation slides can be viewed [here](#). See also, links to the [CARM landing page](#) and [CARM Projects](#).

The CARM program is a fellowship opportunity that targets non-traditional students who work with natural resource agencies. The students are employees of natural resource agencies who become part-time students. Their thesis is an applied, actionable science project based on their employer’s needs (i.e., answers a management question/supports a policy question). UOG helps students find a mentor and plan their research proposal. John Borja is UOG’s CARM Coordinator. CARM was created to improve communication between academics and natural resource managers so that both can benefit. It is a

student-partnership model where students are co-producing science with natural resource managers; in this case the resource manager is the student.

The program's estimated cost per year is \$82,000, which covers tuition and fees (three fellows, coordinator salary -partial), conference travel, and an educational stipend. Romina shared information on the experience of individual CARM fellows (see slides). One CARM fellow was chosen as a [Planet Forward Finalist](#). The CARM program is scouting for new natural resource employees for the next education cycle and considering expansion to other islands in Micronesia and increasing professional development and continuing education opportunities.

Questions and Comments from the ERT

- *Question/Comment:* Is it challenging to find people who want to join or are you at capacity?
 - *Response:* A lot of resource managers want to get their master's degree but can be intimidated about going back to school later in life. We try to encourage them. Capacity is limited by the budget we have. We are growing slowly and methodically. Students are studying part-time, so getting their degree takes longer.
- *Question/Comment:* For students who are more traditional, do you provide workshops on how to apply for government jobs?
 - *Response:* Some students already know because they are in government jobs. We provide guidance for Government of Guam job applications which can require specific jargon.
 - *Chat Response from Consortium Member:* For UHM Grad Scholars - our students (UHM, UHH, UOG) are open to academic positions and other types of jobs, they are exploring career options. It is not primarily focused on academia only. Our invited panelists have shared insights in navigating USAJobs and interview processes. We have not had a dedicated session on job applications yet and love the idea.
- *Question/Comment:* Across all the programs, it seems CASC might be a great place to provide conservation-oriented leadership training.
 - *Response:* Patrick Keeler, who was a natural resource manager and now is at the Nature Conservancy, was on a panel to talk about leadership in conservation. We try to provide as much exposure to agencies as possible.
- *Question/Comment:* Are there touchpoints or potential touchpoints between CARM and the Graduate Scholar program? Have all three student programs ever aligned or are there ways that students are linked together?
 - *Response:* There are some touchpoints. I hope we can capitalize on more touch points in the future. I would love to see more interactions. Travel is a huge barrier for a lot of students, as it is expensive to travel between islands.
 - *Response from Consortium Member:* One area where we tried to bring students together was the Center for Island Sustainability (CIS) annual meeting in Guam every other year. This has not always been possible due to Covid and other planned events such as Hawai'i Climate Week.
 - *Chat Response from Consortium Member:* In-person opportunities included 2022 Guam Trip for CIS and 2022 Early Career Professional Development Workshop hosted by the

National CASC. This year we tried to get the CARM fellows to Hawai'i Climate Week to present but had issues with logistics unfortunately. *[PI-CASC USGS later added that sending students to CIS in 2024 was in the HA. And they noted that it seemed there wasn't as much interest in this until it was too late.]*

Scott Laursen (UHM/UHH), Manager Climate Corps Coordinator, and Jonathan Price (UHH) presented on the PI-CASC Manager Climate Corps (MCC). Presentation slides can be viewed [here](#).

MCC applies a relational approach to climate adaptation research based on an understanding from social science, that if you want climate adaptation science to be used on the ground, it must be based in the present, with a local focus, and felt as personal. The goal of MCC is to support long-term, place-based relationships and collaborative, practitioner-driven research projects by uniting local management and research networks through the process of knowledge co-production. Scott reviewed MCC foundational elements for community-driven research which include drawing on existing practitioner networks and recognizing and engaging multiple knowledge forms and knowledge co-production, in which managers and researchers co-lead the project from inception to delivery, with full engagement by students.

Jonathan noted the unique context for MCC on Hawai'i with its diverse climate and coastal environment, diversity, and number of managers from National Parks to small non-profits, and many cultural and environmental NGOs. Since 2019, MCC cohorts have been engaged in 11 manager-driven research projects, with 11 graduate students funded at UHH. Details of these projects can be found [here](#).

UHH Academic Programs include a Master of Science Program in Tropical Conservation Biology and Environmental Science (TCPES) (14 PI-CASC students since 2019), Heritage Management Master of Arts in the Department of Anthropology (2 PI-CASC students since 2019), and the [Pacific Internship Programs for Exploring Science \(PIPES\)](#) which is a 30-year-old internship program engaging undergraduate students from Hawai'i and Pacific Islands (and funded from a number of different pathways) (8 PI-CASC interns). Jonathan reviewed the synergies between the PIPES program alumni and PI-CASC graduate students.

Questions and Comments from the ERT

- *Comment:* USGS has been able to complement some of the ongoing efforts including an IAA aide to help co-fund more students. Their research is funded by Sea Grant, but the student is funded by PI-CASC. We have moved funding through the IAAs. USGS also was able to support two students on an MCC-project.
- *Comment:* Noted that this is a small amount of money for the number of projects and the previous comment provides some understanding of other mechanisms for getting those projects funded.
- *Consortium Member:* There are a lot of synergies in these partnerships. We are a small campus and know and work with each other. There are also several TCBE graduates who work with research managers across the Island. The projects are required to be developed with resource managers and place-based efforts often bring in additional partners and have people working with the county and state.
- *ERT Chat Comment:* I recall something about 2.5 dollars for every 1 dollar in the Host Agreement? Does that equal >\$3 million per year in students, programs, and projects? That is some synergy!
[Facilitator's Note: PI-CASC later added that the \$2.5 extramural for each \$1 HA funding is a conservative estimate and does not result in an operation at ~\$2.5-3M for a 900k investment]

currently. PI-CASC USGS added that USGS is not privy to these numbers, and this does not consider the additional work USGS puts into ORISE and assistance to UH.]

PI-CASC Undergraduate Research Coordinator, Rachel Lentz (UHM) presented on the Summer Undergraduate Research Fellowship (SURF). Presentation slides can be viewed [here](#). The goal of the program is to provide valuable summer research experience in climate science to undergraduates without prior research exposure. The program provides professional development opportunities, builds cohort cohesion, and PI-CASC program loyalty. Students are matched with a faculty mentor based on their interests. They receive a stipend and are expected to attend workshops and present at a final symposium in August. Over 4 summers, the program had 67 applicants and 19 paired students from 7 institutions. SURF [Project topics](#) include climate effects on vegetation, sustainable forestry and restoration, climate effects on hydrology systems and marine life, coastal and marine ecosystems, and sea-level rise impacts.

The Summer 2024 Program has 24 applications from 11 institutions. *[Facilitator's Note: PI-CASC USGS later added that they continue their efforts to be included in the decision-making for how federal funds are invested.]* The program will include a new workshop with Planet Forward on building science communication skills with creative story telling. There will also be a social cohort building opportunity and an increased stipend of \$7,000. In the future, the program intends to solicit applications earlier to expand reach, improve mentor recruitment, expand in-person interactions, and work on hybrid opportunities to include non-O'ahu students. This summer they are experimenting by having an Alaskan Student participate in the program.

Questions and Comments from the ERT

- *Question/Comment:* Darren mentioned yesterday the proposed collaborative work between SURF and PIPES. There seem to be two undergraduate efforts within PI-CASC. Can you speak about how you work together and if the programs are separate, what kind of challenges, benefits, or impacts does this have on the work?
 - *Response:* PIPES is an independent program, not funded by PI-CASC. SURF is funded by PI-CASC. When we started SURF, we thought we might be able to leverage some synergy and capitalize on the inroads PIPES had made in this area. Due to COVID, we were not able to start this. Because PIPES is a fabulous program based on the Big Island of Hawai'i, we thought we would focus SURF on O'ahu to give students experience doing research here. We would be interested in talking with PIPES about their methods. I like the idea of SURF as a stand-alone, distinct program.
 - *Response from Consortium Member:* Sometimes PIPES' projects are climate-related, sometimes they are not. In projects involving climate change or adaptation, PIPES is partnering with PI-CASC's MCC students.
 - *Response from Consortium Member:* There are opportunities to work more closely with PIPES.

The disruption of the pandemic limited a lot of collaboration ideas. We are now starting to think about how we can link in with Indigenous frameworks.
 - *Response from Consortium Member:* With SURF, the intent is to have this be a dual competition like how we manage the NCASC Climate Adaptation Postdoctoral Fellowship Program (CAP) in our regional approach. We are working to grow it (SURF) to a point so

that principal investigators/mentors across the campus see value and are motivated to compete and apply. There is building enthusiasm from mentors and those that have participated have reported the experience highly positively.

Science Achievements

Brad moderated two segments of science presentations from PI-CASC graduate and post-graduate students. *[Facilitator's Note: PI-CASC USGS later added that the first three student presentations were/are part of the Sea Grant-PICASC cobranded strategy (PICASC paying stipends and SG funding science), the fourth presentation is MCC, and final presentation is CARM.]*

Former Graduate Scholar and current Knauss Marine Policy Fellow, Becca Lensing, presented on “Microbial biogeochemical cycling across a chronosequence of mangrove introductions across Hawai’i.” Presentation slides can be viewed [here](#).

Becca reviewed the vital role of estuaries and fishponds in Hawai’i and the impact of non-native mangrove forests on Hawaiian coastal ecosystems. As the complete removal of mangroves is unlikely, the success of local fisheries depends on informed management of invasive mangrove forests through biocultural restoration of estuaries. Her research was focused on understanding what the impacts are to microbial producers, nutrient cyclers, and decomposers to help local fisheries understand and manage impacts. The research included a microbial community analysis of disturbed microbial ecosystems on fishponds, which sampled the first oldest growth mangrove forest up to present day growth, and samplings from a fishpond where stewards have been removing mangroves with sampling that included the present removal to first removal. This sampling allows the researcher to ask questions about the microbial community that looks forward and backward. With Covid, the researchers could not travel to fishponds, so the focus turned to analyzing archival samples. The research detected a shift in the dominant eukaryotic genera with profound implications to food-web dynamics. She noted that biocultural restoration supports healthy and resilient Hawaiian coastal ecosystems. [Microbial biogeochemical cycling across a chronosequence of mangrove introductions across Hawai’i – Pacific Island Climate Adaptation Science Center \(hawaii.edu\)](#)

Former Graduate Scholar and current PhD student, Tressa Hoppe (UHM), presented on “Enhancing social-ecological resilience and ecosystem services through restoration of coastal agroforestry.” Presentation slides can be viewed [here](#). Tressa noted that agroforestry is a spectrum of land-use systems that integrate trees and crops and can range from trees in pastures to stewarded, multi-story forests. Indigenous agroforestry systems were historically abundant in Hawai’i. Forty percent of agricultural land in Hawai’i is unmanaged which can lead to forest fire risk and spread of invasive species. The research project considered the question: how do we support community-based agroforestry restoration in the context of climate change? She shared information on the efforts to support a community-based agroforestry restoration site (Pu’ulani), measure climate mitigation and social-ecological benefits, and organize and foster a knowledge exchange among community-based agroforestry practitioners. Takeaways from the project are that unmanaged agricultural lands and non-native forests have high potential for restoration through agroforestry. There was a significant increase in benefits over a short time (at Pu’ulani). Adaptive management, co-production, and a bio-cultural approach can help overcome challenges.

Questions and Comments from the ERT

- *Question/Comment:* Can you tell us more about the practitioner network – how it came to be and what is needed to help it grow?

- *Response:* The network was the product of dissertation research and interviews with agroforestry practitioners by another student, Zoe Hastings Silao, who is now working with the USDA to support that practitioner network. Practitioners' interviews indicated the number one thing needed was to talk with each other and share information about what works. The main thing needed is additional outreach to spread the word.
- *Question/Comment:* We've heard about the importance of biocultural restoration. What are some of the biocultural indicators you are tracking?
 - *Response:* The primary indicators are looking at the surveys of volunteers, tracking the uses of items that were harvested.

Former Graduate Scholar and current PhD student, Kapono Gaughen (UHM), presented on "Integrating social and cultural considerations into planning and community-based monitoring to reach marine conservation goals." Presentation slides can be viewed [here](#).

Kapono noted that typical natural resource management approaches focus on humans addressing environmental issues caused by human activity. The effectiveness of the solution is measured via biological and environment indicators. The impact on place-based communities is not measured, and these approaches tend to leave the community-environmental relationships unaddressed. Kapono reviewed the method and approach to developing socio-cultural principles (i.e., fundamental values or goals that communities wish to perpetuate or enhance through management) and indicators (measurable factors used to describe the state of a principle). Efforts included participatory focus groups over Zoom with participants who had close relationships/community-based stewardship of the environment. The project developed 9 socio-cultural principles with 6-14 quantitative and qualitative indicators (see slides). The project also tested a new approach using influencer social media marketing to connect with target audiences.

Questions and Comments from the ERT

- *Comment:* This research is a great example of the applicability of this graduate research to actionable management.
- *Question/Comment:* Was there anything surprising to you in this work? How has it shifted what you will do moving forward?
 - *Response:* The biggest interest to me was the difficulty in operationalizing the data gathering from a managerial perspective. This was a big lift for the resource agency that was trying to manage something in a non-traditional way. The second biggest find was that the influence approach worked better than expected. DAR is the first environmental management agency who sponsored influencers to try to reach affected communities.

Former MCC Scholar, Stephanie Mladinich (USGS), presented on "Pockets and pathways to invasion: Towards developing improved mosquito monitoring methods in high-elevation forests on Hawai'i Island." Presentation slides can be viewed [here](#).

Stephanie reviewed the impacts of invasive mosquitos on avian species in Hawai'i. The impacts have been aggravated by climate change. As temperatures have risen, the range of avian disease-carrying mosquitos has expanded into high elevation forest bird refugia leading to rapid population declines and extinctions of high elevation forest birds. The management concern is that, under current bird and mosquito monitoring protocols, invasion could go on until it is too late. Her research focused on developing an

effective early warning system for detecting mosquito invasion. She considered monitoring adult mosquito populations using a low-cost continuous methodology, determining the distribution, persistence, and patterns of larval occupancy, and assessing climate conditions.

Questions and Comments from the ERT

- *Question/Comment from Graduate Student:* Do you know why we do not have human-malaria carrying mosquitoes in the Islands?
 - *Response:* We are just fortunate. All these introductions were accidental.
- *Question/Comment:* In terms of developing the design of your project, did you bring partners into the project (e.g., refuge and scientists)?
 - *Response:* There was an initial plan when I went in and then I continued to partner. The Departments of Forestry and Wildlife and USGS were active in designing questions and providing resources to carry it out. It was a great experience to see how agencies come together to answer a question that is relevant for monitoring across the state.

Former CARM Scholar, Patrick Keeler (The Nature Conservancy), presented on “Biochar as a mitigation tool for soil rehabilitation in Guam’s badlands and savannah grasslands.” Presentation slides can be viewed [here](#).

Patrick’s goal was to show research and academic-based projects can be designed with a scientific method and existing natural resource management goals. The idea is that scientists can give resource managers research findings they can directly apply in the field. Patrick reviewed the project area, which was designated as a NOAA Habitat Blueprint Area. The area has important natural resource attributes and is threatened by erosion, issues related to invasive species, fires, and off-roading which have a negative impact on water quality.

Biochar is the carbon-rich product created when biomass (such as wood, manure, or crop residues) is heated in a closed container with little or no available air. It can be used to improve water quality, reduce soil emissions of greenhouse gases, and improve soil in other ways. The project tested the use of Biochar with outplantings of two species of trees, Acacia, and Narra, at the AS Gadao Reforestation Site, a 100-acre Landscape Scale restoration project. All the Narra experienced mortality due to several environmental factors. The Acacia had a better survival rate and got significant results for the treatments in the savannahs. The study’s conclusions were 1) That the forestry use of acacia as a nursery is supported due to the species’ resilience and ability to grow in Guam’s southern environs and soils, and 2) Biochar does appear to have positive impact on tree width and height.

Questions and Comments from the ERT

- *Question/Comment:* With the attempts to replant various areas, is there any evidence that mycorrhiza relationships might be lacking?
 - *Response:* There is research being done on this in UOG’s agricultural program. I didn’t investigate it for this research.
 - *Chat comment:* CJ Paulino, CARM fellow, looked at fungi for limestone forests, particularly for ifit.
- *Question/Comment:* Is there any work with biochar to treat the soil as a whole, rather than with individual plants?

- *Response:* Most of the biochar work is being done in the NW. Most experiments here have been biochar plots.
- *Response from Consortium Member:* A USDA climate commodities project is using biochar to augment soils for farmers and to sequester carbon.
- *Question/Comment:* How much is biochar used in Guam? Is it an adaptation solution that managers are considering?
 - *Response:* We created kilns from low-cost materials and hope to show agricultural producers they can use them easily in their fields. We would like to use material from invasive vegetation.

Facilitated Dialogue and Discussion with the ERT, and Q & A regarding Capacity Building and Scientific Achievements

Donna led a facilitated discussion between ERT Members and the PI-CASC and Consortium on capacity building and scientific achievements:

- *Question/Comment:* These projects are engaging the community of end users of the science that's being produced. Students/PIs: what were the ways that you engaged that community and how did the PI-CASC support that?
 - *Response from Graduate Student:* I am a member of the community and had connections to other people working in that domain. For testing of the socio-cultural indicators, we heavily relied on members of communities that intimately understood particular environments. As for balancing how to take this centralized framework and reapply it to more nuanced place-based management, I will let you know when I finish my Ph.D. in three years! I appreciate PI-CASC's willingness/flexibility to let me explore these new routes (such as the social media aspect which was untested).
 - *Response from Consortium Member:* From an administrative viewpoint, how do we make sure there are pathways to community engagement? Each of these projects is different in their own right and are very intentionally place-based and formed by each host institution. MCC is bringing managers, researchers, and students together. In CARM, the managers ARE the students. There are metrics embedded in the Sea Grant award that require researchers to engage with the community to co-produce their projects. Across all of this, there are opportunities for researchers to learn how to engage the community better, combined with the need to co-produce the work for best results.
 - *Response from Consortium Member:* The students here want to stay, grow, and give back to their communities. MCC was created to help researchers be a part of existing networks. We continue to ask: How do we help students bring their sense of kuleana (right, privilege, concern, responsibility) and whole connections to their communities and places? (See Day 3 presentation on this topic).
- *Question/Comment:* You've shared some amazing examples of place-based, decision-relevant actionable climate science. Now that you've been doing this for a while, what's working well and what are the new frontiers or challenges?
 - *Response from Consortium Member:* We have these place-based opportunities that are doing quite well. MCC began before this HA and was the beginning of our student engagement. An area we'd like to do more is bringing people together across PI-CASC for

in-person events, connecting students across programs, and finding opportunities beyond virtual ones.

- *Response from Consortium Member:* UOG would love to expand out into Micronesia and better engage the USAPI. We are creating more hybrid classes for teaching at the other islands because managers there might be primary providers for family and extended family, so they can't quit their job. We are asking: How can we meet them where they are and empower them?
- *Response from Graduate Student:* One issue at the frontier of place-based management: people on the ground are not conceiving of what management is in the same way as managers. This is one avenue of needed research.
- *Response from Consortium Member:* One of the biggest challenges with continuing in this area for the Consortium is the whole effort of data agreements and collaborations (i.e., how are we going to work together?) Communities are saying they want to partner but need tools to enable conversations on how we are going to work together.
- *Response from Consortium Member:* I would like to emphasize opportunities to bring students together in-person and outside. Climate change comes with a lot of mental, emotional, and physical strife and grief. We need to create space for students to learn together outside.
- *Response from Consortium Member:* Trust doesn't happen over one- or two-year cycles. It happens much more slowly. Once you've earned it, it happens very quickly. Funding and degree cycles are not always in sync with those relationships. Workshops on short-term scales are not going to mend the gaps created by decades of mistrust.
- *Response to summary from PI CASC USGS:* Data sovereignty, ownership of data/knowledge, etc. Is something that MUST be addressed by all hosts. The challenge is that it requires interfacing with DOI bureaucracy and rules, so UHM or UoG cannot make a sweeping declarative rule – it has to work withing the Federal confines.
- *Question/Comment:* I am curious to see how, in the implementation of these research projects, the engagement has created internal UH transformations that might create better dynamics between university and community research agendas and knowledge co-productions?
 - *Response from Consortium Member:* For the CARM program, we were called upon by the President of the university to highlight the program as one path forward to engage non-traditional students and build workforce development. As a faculty who came from those networks, I try to maintain trust and encourage other faculty to take this approach as well.
 - *Response from Consortium Member:* We have worked hard to empower the resource managers to be the experts instead of academics. By doing this, I have seen a shift. Research managers also serve as affiliate faculty, on committees, and are included in publications and presentations.
 - *Response from Consortium Member:* We are seeing change. Kūlana Noi'i has been a real key component of change. *[Facilitator's Note: PI-CASC USGS later added that they are unaware of any training, a PI, or manager partners in one of these workshops.]* It is a very significant collaboration among nonprofits. As we engage students, it is participation by the willing. We still don't recognize metrics (at the academic level) that value or reward

the relationships that we are talking about. Scientists may not be motivated to engage and will focus on research or tenure-based activities first, which are rewarded. This is a national question of how we move academia in a productive forward path so the science can truly address the needs of the globe?

- *Chat Comment:* DOI is also iteratively co-developing guidelines and training on appropriate engagements, including language, and how to incorporate various knowledges into management.
- *Chat Comment:* The Nā Pua No'eau program was a model, in my experience, for long-term engagement.
- *Chat Comment:* Long-term relational endeavors across diverse worldviews are at once innovative and old school in relation to trust (something that move very quickly, but typically requires more than 1-2 years to develop: <https://pi-casc.soest.hawaii.edu/news/climate-change-immersion-camp/>. Additionally in relation to sustaining relationships: <https://pi-casc.soest.hawaii.edu/news/international-cop26-recognition-for-mcc-coastal-erosion-partnership/>.
- *Question/Comment:* Question for later sessions: It is clear that PI-CASC collaboration is a network, and collaborating across funding sources, there is an abundance of useful questions and partners. Where do you show your priorities through your funding? How do you determine those priorities?

Donna thanked the ERT, CASC & Consortium Members, and Observers for their participation, engagement, and attendance at the session. With that, the meeting was adjourned.

ERT Reflections on the Day

The ERT met in closed session to discuss what they had heard throughout the day. Clarifying substantive questions for the Host to answer during the remaining sessions, and/or comments included:

- *Question/Comment:* What would be some things they would highlight where they would like to grow/challenges?
- *Question/Comment:* Would like to ask questions regarding challenges during one-on-one time.

This session summary is respectfully submitted by the DS Consulting Facilitation Team. Edits are welcome and can be sent to your Day 2 Scribe: Nancy Pionk (nancy@dsconsult.co).

Day 3 – Collaborative Efforts and Communications & Outreach

DAY 3	April 17, 2024: Collaborative Efforts and Communication & Outreach Purpose: Reflect on the Host University and associated academic consortium's contributions with respect to <i>collaborative efforts</i> and <i>communication & outreach</i> .	
Time (HST)	Activity	Participants and Affiliation
10:00-10:15a	External Review Team - Closed Door	Facilitation Team ERT Members ONLY
10:15-10:25a	Brief Daily Introductions and Setting the Day	Facilitation Team, PI-CASC Team, ERT Members
10:25-11:10a	<i>Collaborative Efforts Part 1: Building Partnerships</i> (10-min presentations, 5-min Q&A) • PI-AK (Allison & Darren) • SLR Dialogues (Brad) • CASC-Sea Grant Liaison (Katy) • Congressional Affairs (Darren)	Darren Lerner, PI-CASC Consortium Director Allison Bidlack, AK CASC PI-AK Coordinator Brad Romine, PI-CASC Consortium Deputy Director Katy Hintzen, Extension Specialist
11:10-11:55a	<i>Collaborative Efforts Part 2:</i> (10-min presentations, 5-min Q&A) • PI-CASC Science Summit and Climate Week, Student Symposia (Darren & Brad) • Innovations to CAP (Darren) • Kūlana Noi'i (Katy)	Darren Lerner, PI-CASC Consortium Director Brad Romine, PI-CASC Consortium Deputy Director Katy Hintzen, Extension Specialist
11:55a-12:50p	Lunch Break (55 Minutes) <i>To avoid Zoom fatigue: Please turn off and step away from your computer screen if possible</i>	
12:50-2:00p	<i>Science Communication & Outreach: Manage and Transfer Information and Data Related to Research Activities</i> • Strategies • Products & tools • Support services • Future work	Anela Akana, Communications Lead John Borja, Guam Communications Coordinator Rachel Lentz, Communications Specialist
2:00-2:30p	Facilitated Dialogue and Discussion with the ERT, Regarding <i>Capacity Building and Communication & Outreach:</i> • How do collaborative efforts of the Host University and its consortium enhance their overall program effectiveness? • What are the Host University/consortium's communication & outreach efforts' contribution to climate adaptation? • What factors limited outreach and communications? How were they mitigated?	Facilitation Team PI-CASC Team ERT Members

2:30-3:00p	External Review Team - Closed Door Initial reflections on the day: questions, concerns, insights	Facilitation Team ERT Members
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DAY 3: Facilitator's Summary
April 17, 2024, 10:00 am – 3:00 pm Hawaiian Standard Time
Topic: Collaborative Efforts and Communications & Outreach

Prepared by DS Consulting Facilitation Team

The following summary is intended to capture basic discussion, reflections, concerns, and insights from the session. It is not a verbatim transcript but has links to the presentations.

Attendees present for all or part of the meeting (in alphabetical order):

ERT Members: Ulu Ching (Conservation International Hawai'i), Jackie Dingfelder (Portland State University), Emile Elias (USDA-SW Climate Hub), Michael Hudson (USFWS), Michelle McClure (NOAA-PMEL);

Host, CASC and Consortium Presenters: Anela Akana (PICASC-UHM), John Borja (PICASC-UOG), Allison Bidlack (AKCASC-UAF), Katy Hintzen (PICASC-UHM), Mari-Vaughn Johnson (PICASC-USGS), Heather Kerkering (PICASC-USGS), Romina King (UOG), Scott Laursen (PICASC-UHM/UHH), Rachel Lentz (PICASC-UHM), Beth Lenz (PICASC-UHM), Darren Lerner (PICASC-UHM), Jonathan Price (PICASC-UHH), Brad Romine (PICASC-UHM), Sharon Ziegler-Chong (UHH);

DS Consulting Team: Facilitator: Donna Silverberg, Reporting and Support: Colby Mills, Emily Stranz.

Purpose: Reflect on the Host University and associated academic consortium's contributions with respect to collaborative efforts and communications & outreach.

Daily Introductions and Setting the Day

Facilitator and External Review Process Manager, Donna Silverberg, welcomed the group and conducted a round of introductions that included: PI-CASC ERT Members; PI-CASC Host, University of Hawai'i at Mānoa (UHM), leadership and team; PI-CASC USGS leadership; and PI-CASC Consortium Members.

Collaborative Efforts: Building Partnerships

PI-CASC Host University/Consortium Director, Darren Lerner (UHM), and AK CASC Coordinator, Allison Bidlack (AKCASC-UAF), provided an overview of the Pacific Islands-Alaska CASC (PI AK CASC) collaboration. Presentation slides can be viewed [here](#). Darren explained that this effort is part of PI-CASC's Education, Training and Capacity Building key elements, specifically their commitment to cross-disciplinary and cultural knowledge sharing through regional collaboration. The PI AK CASC collaboration stemmed from informal small group conversations around the similarities of the two geographically separate regions and developed into an intentional partnership focused on finding ways to engage in science and learning together with mutual benefit.

The collaboration has taken a phased approach:

- Phase 1 (2018-2020) included multiple meetings and 7 research projects focused on "ridge to reef, ice field to ocean ecosystems". Research covered topics such as understanding flood mechanisms, streamflow variability impacts on fish and nutrient load, and modeling and downscaling climate in these rugged and steep topographies, with limited data and infrastructure

to support getting it. The research included 4 graduate students and resulted in several publications. *[Facilitator's Note: PI-CASC USGS later added that the 2018 meeting in HI happened prior to this HA cycle. Additionally, significant momentum was lost during the pandemic, and there was not much follow up with the 7 original pilot projects.]*

- Phase 2 (post-pandemic to 2024) focused on how to work collaboratively across geographies to co-produce science, best practices for working with Indigenous communities, decision making in the face of climate change, and how to approach challenges from a science and community perspective. Funding for research came from the federal side, and the Consortium provided people time.

Questions and Comments from the ERT

- *Question/Comment:* Is the intention to have graduate student scholarships in the final year of the program?
 - *Response:* Yes, we have an opportunity to engage students in the 6th year. From the beginning, the intention was to have this effort be very student-centered, but funding and COVID made for challenges. So, USGS provided funding for research, which has led to great projects. In AK, we are working with a Native corporation to get student internships for 2025, and in PI we also are working with PIPES and SURF. *[Facilitator's Note: PI-CASC USGS later added that in the proposed SOW for Y6 there are no funds set aside to support PI-AK specifically.]*
- *Question/Comment:* Did the Federal side of PI or AK CASCs participate?
 - *Response:* Yes, both federal and consortium folks have participated in the meetings, discussions, and research. And there are monthly calls that include all the partners from PI AK CASC and the federal side.
- *Question/Comment:* Are there any plans to publish this work?
 - *Response:* Possibly, we have been thinking and talking about ideas for publication of a synthesis paper and will continue conversations in the future to figure out what it looks like. We are waiting for our grad students to publish their works first.
- *Question/Comment:* Is this two-CASC collaboration effort unique amongst the CASCs?
 - *Response:* Yes, largely. There are other CASC regions working together, and there have been conversations on collaborations between regional CASCs. To date, this collaborative relationship is deeper and more developed than others.

PI-CASC Host University/Consortium Deputy Director, Brad Romine (UHM), presented on the Pacific Islands Sea Level Rise (SLR) Adaptation Science Dialogues as an example of a collaborative communication effort. *[Facilitator's Note: PI-CASC USGS later added that, while they have tried to push the Consortium to move this forward and even offered funding for a grad student, it has remained stalled and mostly obsolete for around 3 years.]* Presentation slides can be viewed [here](#). PI-CASC partners expressed a need for enhanced collaboration, communication, and consistency for using research in decision making and planning for sea level rise. PI-CASC convened a series of dialogues to support improving communication and cooperation. The first dialogue was between science organizations and researchers; then the discussion broadened to include resource managers; and the 3rd dialogue session brought the research focus-group back together to discuss and identify next steps.

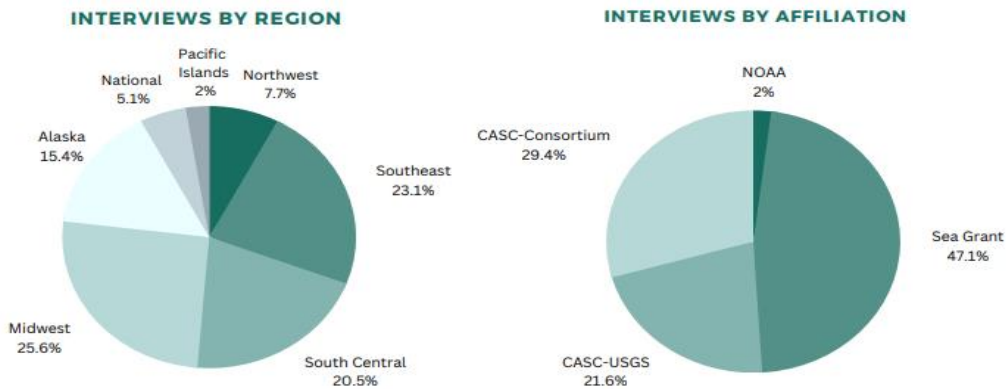
For next steps, the research focus group considered creating a sea level rise science-to-action network, increasing two-way communications and partner efforts, having more dialogues, and establishing online information platforms. Further, the SLR Dialogues have so far focused on HI, however, some would like to expand the discussions to include the Marshall Islands, American Samoa, and Guam.

Questions and Comments from the ERT

- *Question/Comment:* How much interaction does the SLR program have with NOAA's Sea Level Rise program?
 - *Response:* Quite a bit, we are representing the Sea Grant and PI-CASC on a regional group looking at climate services and participate in conversations on NOAA's Sea Level Rise Viewer tool. The program uses the tool regularly and found that there is a need for site-specific tools that go beyond the high tide tool.
- *Question/Comment:* Is the State of HI engaged in the SLR effort for their planning purposes; is there a formal conduit to the State?
 - *Response:* Yes, we have a longstanding partnership with the State of HI, they pay for part of Brad's position and provide funds for tools, mapping, and science; the State of HI is on the cutting edge of sea level rise work. This work needs to be place-based; the HI islands are high islands, others like the Marshall Islands and atolls are lower and need their own place-based tools. *[Facilitator's Note: PI-CASC USGS later added that this effort is not tied to PI-CASC, it has been a struggle to align roles related to SLR.]*
- *Question/Comment:* Within the dialogue focus groups, were communities of place included to provide insights into the overall effort and specific products?
 - *Response:* Involving communities of place is an important part of the next round of dialogues, as the first round focused on research and governments. The Science Summits (see below) have included engagement with NGOs and community groups, but there needs to be more for the next steps and long-term sustainability of the SLR work.
- *Question/Comment:* Have you been travelling to the Marshall Islands and American Samoa for this effort?
 - *Response:* Federal partners and a UHM graduate student have, but most of the work with the Marshall Islands and American Samoa has been through our extension services. Also, the Sea Grant has two full time faculty in American Samoa and Marshall Islands, and a small portion of their time is to support and connect with PI-CASC efforts. *[Facilitator's Note: PI-CASC USGS later added that the Sea Grant extension agents in American Samoa and Marshall Islands do respond when engaged, but they are not representing PI-CASC in their respective regions. The agent in American Samoa wears more of a PI-CASC hat sometimes, because she is funded on a PI-CASC award to do so.]*
- *Question/Comment:* Will this network grow over time, or stay focused on dialogues? Will it stay place-based?
 - *Response:* Yes, it needs to grow. The impacts of SLR are only going to increase, and cooperation and coordination needs to continue to improve. The program can also look to the non-US affiliated islands to learn from their experience, as they are also impacted. There are a lot of science and good mapping tools available now, which is shifting the conversation from science gathering to focus on actions.

- *Question/Comment:* What about adaptation planning? Do you have plans to address the ‘so what now’?
 - *Response:* Yes, and the reality is that folks are stretched thin and there is limited capacity of resources. A part of addressing this limiting factor is through building capacity via the graduate fellows; helping to build the next generation of scientists and resource managers will help with adaptation planning.

PI-CASC Extension Specialist, Katy Hintzen (UHM), presented on the PI-CASC-Sea Grant Climate Adaptation Liaison efforts. *[Facilitator’s Note: PI-CASC USGS later clarified that Hintzen is supported by NCASC and Sea Grant, not PI-CASC, and her effort has focused on bringing together Sea Grant and the CASC network, with little benefit to PI-CASC. USGS also noted that engaging PICASC more directly would be a benefit to both programs]* Presentation slides can be viewed [here](#). This program, funded by NOAA and NCASC, is aimed at bringing the NOAA Sea Grant programs into synergistic partnership with the USGS CASCs to “facilitate integration of federally funded research and end-user needs focused on climate adaptation” to scale up efforts to a broader network and impact.



The NOAA Sea Grant is a national program made up of 34 universities located around the country. The program aims to enhance the practical use and conservation of coastal and marine resources to support a sustainable economy and environment. The two networks are distinct but have many shared values around building trusting relationships with resource managers, mentoring next generation users, and collaboratively developing actionable science. To kick off this effort, the liaison established an advisory body to inform activities and objectives of the liaison role, conducted a national needs assessment to understand the current state of relationship across the Sea Grant and CASC networks, and used the information gathered to form a framework of the liaison’s effort. The framework includes awareness building; informal networking; regional and thematic connections; workshops, training, and education; and establishing an extension community of practice.

The Climate Adaptation Liaison is fiscally supported by PI Sea Grant and National CASC.

- *Question/Comment:* Was the CASC to Sea Grant networking already there, or is this another PI-CASC innovation?
 - *Director’s Response:* This is sort of a PI-CASC innovation – we were seeing fruitful relationships between these two organizations locally, so thought that, with a bit of work, we could learn from it and broaden the impact. PI-CASC believes in the synergy of these

programs and wanted to consider and explore how to build on that and really expand. NCASC supported funding part of the effort for a couple of years, and we've used Sea Grant funds to sustain it (it is not in the HA).

- *Question/Comment:* Sea Grant makes sense for PI-CASC; but in other locations, USDA extension might be a more likely partnership. Are you thinking about finding efficiencies with land grants to get your work out?
 - *Response:* Sea Grant is also inland in some areas, but yes, we are working with both sea and land grant extensions. As the liaison, we get to know what the various partners in various locations need and want, and work with the extension services to try to meet those needs.
- *Question/Comment:* Seems that the partnership is going beyond just CASC and Sea Grant. Are there others involved?
 - *Response:* Yes, there have been lots of folks who want to engage so the scope of partners has expanded beyond CASC and Sea Grant.

Collaborative Efforts Cont.

Brad presented on PI-CASC's Science Summits, Climate Week and Student Research Symposia. Presentation slides can be viewed [here](#). Over the period of the HA, there have been five Science Summits and research symposia events. In April 2019, regional partners met in Guam for strategic planning and a meeting which included science users from Guam and the Western Pacific Region. In November 2020, PI-CASC conducted a virtual PI-CASC Science Summit, with over 200 attendees. This summit focused on partnerships and included discussion panels and networking. In 2020, they held a PI-CASC student research symposium, with 19 students presenting in-person and online. Topics ranged from forestry to ocean resources. Again in 2023, PI-CASC hosted another PI-CASC Science Summit. Lastly, in 2024, PI-CASC held a conference for Hawaii Climate Week, with talks from graduate students on a range of topics; this effort engaged policy makers, high school students, and professionals.

Darren presented on the PI-CASC's collaborative approach to NCASCs Climate Adaptation Post-Doc (CAP) program. Presentation slides can be viewed [here](#). For the CAP program, PI-CASC puts out calls for post-docs and mentors at the same time, and highly encourage multi-disciplinary teams, and long-term research funding opportunities.

Katy presented on Kūlana Noi'i which is PI-CASC's approach to establishing and sustaining cooperative efforts between researchers and managers in a reciprocal and ethical manner. Presentation slides can be viewed [here](#). *[Facilitator's Note: PI-CASC USGS later added that Kūlana Noi'i is Sea Grant's approach, rather than PI-CASC's. It has been offered as a tool to students, but USGS is unaware of any PI-CASC PIs invited/participating.]* The Kūlana Noi'i is a nationally recognized process that focuses on how researchers carry themselves as they conduct research and partnerships with Indigenous communities – encouraging respect, accountability, and ethical engagement that is generative to everyone in the partnership. Kūlana Noi'i grew from a request from a local stewards and caretakers in He'eia ahupua'a (land division) who saw a need for a set of guidelines on ethical and reciprocal partnerships with the many university and government partners in the area. It was put together by a collaborative partnership team, with a committee of local stewards who considered: what does a good partnership look like? As part of the development effort, academic literature was reviewed, workshops were held with stewards, community, and researchers, and through that, 8 themes emerged: respect, reciprocity, self-awareness and capacity, communication, long-term focus, community engagement and review, knowledge stewardship, and

accountability. This work is about building and nurturing relationships and connections, learning given, and learning received, and energy to sustain long term relationship and focus.

Through this program, professional development and ethics training is offered to all involved in PI-CASC, and as part of the training, participants spend time in conservation projects, sharing food, discussion, and scenario activities. Kūlana Noi'i has been federally recognized by the Biden Administration and featured as part of a federal webinar series. PI-CASC continues to incorporate Kūlana Noi'i into work efforts, as are many others in a broader collective effort.

Questions and Comments from the ERT

- *Question/Comment:* Are you going to expand Kūlana Noi'i?
 - *Response:* This process originated in HI and there are some pieces that are transferrable and relevant; however, it is not a 'cut and paste' type of thing. It needs to be locally driven to fully resonate and be meaningful. If other communities are interested in support from PI-CASC on localized efforts, we could assist, but it cannot be brought into a community of place.
- *Question/Comment:* Do you see these seeds spreading into other areas, e.g., PI-CASC folks carrying it forward in their work with Indigenous communities?
 - *Response:* We would really benefit from assessment and evaluation of the trainings; it is elective, so those who participate already have an interest in place-based efforts and are dedicated to learning about ethical engagement – they are already interested to some extent. A lot of folks at PI-CASC are doing really good work with Indigenous communities, but it is hard to say how much of that can be attributed as an outcome of the Kūlana Noi'i.
 - *Response:* There has not been a quantitative assessment; however, anecdotally, we know the answer is yes. The question unanswered is to what extent is Kūlana Noi'i spreading and making a difference? And how can we use a formal assessment to improve and advance?
- *Question/Comment:* How many PI-CASC PIs have been trained in Kūlana Noi'i?
 - *Response:* Not sure, we would need to dig that out of the 700 people that have gone through the training. PI-CASC has been offering trainings consistently since 2018 to most of the PI-CASC researchers. It is required as part of the PI agreement with graduate students through the Sea Grant program. We can and do offer the training to other PIs and students funded by the federal solicitation, but they do not require this training in their solicitation, so it is volunteer based. The process has been very impactful for students, both those who already have the Kūlana Noi'i mindset, and those who do not. It helps create relationships and validation and is eye opening.

Science Communication & Outreach: Manage and Transfer Information and Data Related to Research Activities

PI-CASC Communications Lead, Anela Akana (UHM), University of Guam Communications Coordinator, John Borja (UOG), and PI-CASC Communications Specialist, Rachel Lentz (UHM), provided an overview of PI-CASC's communications and outreach strategies, products and tools, support services, and future work. Presentation slides can be viewed [here](#). *[Facilitator's Note: PI-CASC USGS later added that Anela's and Patrick's positions were made possible through supplemental IAA funding from PI-CASC USGS. Comms*

Team members do not spend all their allotted FTE time in Comms.] The PI-CASC communications team consists of three people, along with two fellows (ORISE Fellows hired by USGS-PICASC); ranging from .1-1.0 FTE.

Anela explained that, in 2021 PI-CASC revised the strategic communications plan that was developed in 2019; the plan was developed by the consortium and USGS and drew on the work of other CASCs. It includes key components such as programmatic cross-cutting elements, goals, objectives, audiences, and evaluation methods. The plan focuses on elements such as collaboration, fostering capacity building and workforce development, and strengthening communication.

John spoke to PI-CASC's brand development efforts. Efforts are around creating recognition of the PI-CASC name, personnel, and logo, with the goal of the broader community being familiar with PI-CASC, its work, and climate information more broadly. To do so, PI-CASC engages with local and regional leaders, multi-agency work and workshops, and engages with the public through outreach, such as STEM events.

Rachel added details on PI-CASC's website, which was redesigned and updated in 2020. The new website pulls all consortium members into one site with one branding. The website focuses on projects, products, and programs. The PI-CASC provides information on opportunities (including funding), climate resources, newsletters, and seminar videos, as well as a local "Happenings" page with information on events. Visits are increasing with time, and spike with special events, such as Climate Week. Analytics show the page has had 43,000 visits since 2021 from the Pacific and worldwide. Further, the PI-CASC provides website support to partner organizations, linking materials and websites via the PI-CASC site.

PI-CASC has a wide variety of other outreach efforts including: a monthly newsletter which reaches 650 recipients from NGOs, government, university staff and students; StoryMaps; social media presence; one-pagers for students and university leadership engagements; tailored posters for natural resource agencies; engagement with media and public officials; booths and participation at events; and the "Slice of PI" speakers series, that shares climate adaptation research and science-to-management applications in an informal setting (with pie!).

Questions and Comments from the ERT

- *Question/Comment:* Given the focus on multiple partnerships and synergies, have there been challenges in maintaining an independent identity of PI-CASC and the Consortium, while also elevating the synergies and partnerships?
 - *Response:* It is an interesting challenge and balance to support partnerships while also having some ownership at times. We are all working together, co-production is key, so on the project pages, you see the PI-CASC, and all the other organizations who are contributing to the effort. We show all the partners involved. The strongest thing that we can do to promote the identity of PI-CASC is to deliver to the folks we engage with. And then they speak for us. Having partners speak for the work we do with them and the support we provide is vital.
- *Question/Comment:* With respect to the information being accessed on the PI-CASC website, do you track what information/science is being accessed, and do you have any qualitative/quantitative information on HOW science is being used?
 - *Response:* Yes, we have some analytics, but not related to how the information is being used. In Communications, which is always the question we are seeking to understand:

how are communications being utilized on the other end? It is a work in progress.

[Facilitator's Note: PI-CASC USGS later added that the Consortium tracks the number of IP hits but has been reluctant (for 5+ years) to develop or apply any other sort of tracking mechanisms.]

- *Question/Comment:* Great work, and it is HARD! You've done a really nice job. How did you get to where you are? You've done brand development, website development, so much work. Was it internally led, or did you consult with others?
 - *Response:* The origin of the strategy plan was pulled together quickly and was based off other CASC plans, then it sat for a while until we were ready to dig deeper into the details and create the offshoots. PI-CASC worked with a 'special projects' person from Sea Grant, who had a communications background. The implementation plan came next and provided examples of how to take what we have and send it outward in a comprehensive way.
- *Question/Comment:* Regarding the post climate event posters that PI-CASC made for the Guam Department of Agriculture, how did those come about? Did the Department come to you?
 - *Response:* This is an example of the trust building and relationships that have been talked about over the week. The Department of Agriculture regularly comes to PI-CASC to help support their work. For example, through the Drone Corps (a PI-CASC partnership with NASA) PI-CASC can provide aerial imagery, which the Department will ask for when they are doing reforestation efforts to document and have visual data on the resource.

Darren presented on the PI-CASC's congressional affairs and followed-up on questions from the ERT regarding the PI-CASC budget (see Day 1 summary). Presentation slides can be viewed [here](#).

Darren explained another contribution the Host makes to the NCASC enterprise (all CASCs), that also is not in the HA, is working with congressional staffers and on the "Hill" in Washington DC. Host leadership takes biannual visits to the Hill, participates in monthly discussions with other CASC Host leadership, and helped to develop a programmatic request for money for the enterprise. As a result, the CASCs have been successful in increasing federal appropriations substantially (more than doubled since 2019). Darren noted that the Regional CASCs came about via an Executive Order from the Department of the Interior. The CASC Hosts have been working over the years to draft a CASC Act which would fully authorize the CASCs into the future. Darren continues to work with Senate and House staff to help it move forward.

Regarding questions on PI-CASC fiscal management and budget, Darren provided follow-up details and response.

- *Question/Comment:* How are fiscal management efforts distributed or impacted by various components?
 - *Response:* The IAA makes up 26%, the HA 29%, and USGS's open solicitations contribute around 45%. These numbers come from a look at the combination of two years, and is roughly calculated, but are a good snapshot of the different components. The HA funds are distributed as follows: travel 9%, faculty and staff 20%, student research 67%, print, pubs, materials, supplies 4%. This is all based on the \$900k that is provided annually for the HA and does not include additional funds that USGS allocates to complement PI-CASC efforts, such as the ORISE fellowships; this is rough, and there are nuances.
- *Question/Comment:* How do you prioritize where you spend funding on science?

- *Response:* PI-CASC looks at the regionally developed science themes and compares the proposals to the focal areas to see where there is the best alignment. The Senior Science Advisors are still in the mix; they have continued over time to be engaged in funding opportunities but have not continued to be used as an advisory body directing science. Instead, the direction of science is driven by the science agenda.
- *Question/Comment:* Are you leveraging similarly across all the pie pieces?
 - *Response:* Yes, for the most part. It is relative to where PI-CASC puts that leveraging. This is only the funding coming through USGS/PI-CASC.
- *Question/Comment:* Does the 20% for faculty and staff include overhead?
 - *Response:* No, IDC is not included. For UHM, IDC costs are 45.5% - more than faculty and staff, and less than student research costs. Over the 5-year HA, IDC is about \$1M. UOG's IDC is 39% of Total Modified Direct Cost and includes salary, fringe, travel, supplies, but does not apply to stipends or tuition. The HA also routes other funding through the Hawaii university systems, overhead for UHM to manage those funds is \$1.9M in the last five years (this is in addition to the overhead associated with the HA). For those solicitation funds, the overhead goes to the departments that are awarded.

Donna thanked the ERT, CASC & Consortium Members, and USGS for their participation, engagement, and attendance at the session. With that, the meeting was adjourned.

This session summary is respectfully submitted by the DS Consulting Facilitation Team. Edits are welcome and can be sent to your Day 3 Scribe: Emily Stranz (emily@dsconsult.co).

Day 4 – Overall Effectiveness Towards Host Agreement

DAY 4	April 18, 2024: Overall Effectiveness Towards Host Agreement Purpose: Review the <i>overall effectiveness</i> of the Host University and its consortium in meeting the goals established under their current Host Agreement; and aid the NCASC in developing improved requirements for re-competition of the next university hosting agreement	
Time (HST)	Activity	Participants and Affiliation
10:00- 10:15a	External Review Team - Closed Door	Facilitation Team ERT Members ONLY
10:15- 10:30a	Brief Daily Introductions and Setting the Day	Facilitation Team, PI-CASC Team & ERT Members
10:30- 11:15a	Review and Recap - PI-CASC: Successes, effectiveness, and next steps - Clarifying questions from ERT Members	Facilitation Team, PI-CASC Team & ERT Members
11:15- 11:30a	Break (15 Minutes) <i>To avoid Zoom fatigue: Please turn off and step away from your computer screen if possible</i>	
11:30a- 12:30p	Facilitated Dialogue and Discussion with the ERT and PI-CASC Team Regarding the <i>Overall Effectiveness</i> Addressing the Host Agreement Remaining questions from prior days	Facilitation Team PI-CASC Team ERT Members
12:30- 1:00p	Closing Remarks & Adjournment	Facilitation Team PI-CASC Team ERT Members
1:00- 2:00p	Lunch Break (1 Hour) <i>To avoid Zoom fatigue: Please turn off and step away from your computer screen if possible</i>	
2:00- 3:00p	External Review Team - Closed Door Discuss ideas and insights gleaned from the four days: - What stands out? What needs comment in the ERT report? - What are your thoughts about the overall effectiveness of this Host with regards to its work in all areas? - What recommendations come to mind for inclusion in your report? Clarify next steps in the process: - What is due and when? - Follow-up Zoom	Facilitation Team ERT Members ONLY

DAY 4: Facilitator's Summary
April 18, 2024, 10:00 am – 3:00 pm Hawaiian Standard Time
Topic: Overall Effectiveness Towards Host Agreement

Prepared by DS Consulting Facilitation Team

The following summary is intended to capture basic discussion, reflections, concerns, and insights from the session. It is not a verbatim transcript but has links to the presentations.

Attendees present for all or part of the meeting (in alphabetical order):

ERT Members: Ulu Ching (Conservation International Hawai'i), Jackie Dingfelder (Portland State University), Emile Elias (USDA-SW Climate Hub), Michael Hudson (USFWS), Michelle McClure (NOAA-PMEL);

Host, CASC and Consortium Presenters: Anela Akana (PICASC-UHM), John Borja (PICASC-UOG), Katy Hintzen (PICASC-UHM), Mari-Vaughn Johnson (PICASC-USGS), Heather Kerkerling (PICASC-USGS), Romina King (PICASC-UOG), Scott Laursen (PICASC-UHM/UHH), Rachel Lentz (PICASC-UHM), Darren Lerner (PICASC-UHM), Jonathan Price (PICASC-UHH), Brad Romine (PICASC-UHM), Sharon Ziegler-Chong (PICASC-UHH);

Session Observers: Molly Cross (USGS-NCCASC), Elissa Welch (MWCASC-UMN);

DS Consulting Team: Facilitator: Donna Silverberg, Reporting and Support: Colby Mills, Nancy Pionk.

Purpose: Review the overall effectiveness of the Host University and its consortium in meeting the goals established under their current Host Agreement; and aid the NCASC in developing improved requirements for re-competition of the next university hosting agreement.

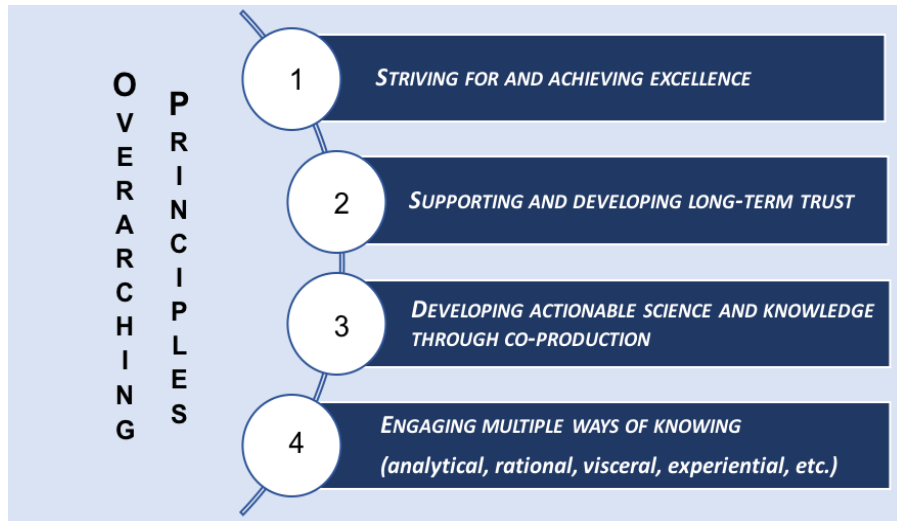
Daily Introductions and Setting the Day

Facilitator and External Review Process Manager, Donna Silverberg, welcomed the group and conducted a round of introductions that included: PI-CASC ERT Members; PI-CASC Host, University of Hawai'i at Mānoa (UHM), leadership and team; PI-CASC USGS leadership, PI-CASC Consortium Members; and session observers.

Facilitated Dialogue and Discussion with the ERT regarding the Overall Effectiveness of the Host

Donna led a facilitated discussion between ERT Members and the PI-CASC and Consortium on the overall effectiveness of the Host and Consortium in meeting the Host Agreement with USGS for the PI-CASC.

To begin, Donna recalled Darren's presentation on Day 1 of the 4 principles that guide the work of the Host and PI-CASC. The ERT was curious to learn how successful the group felt they had been in striving toward meeting those principles. For reference, the principles are noted below:



- *Response from PI-CASC Host University/Consortium Director, Darren Lerner (UHM):* These principles were developed prior to the proposal and informed the beginnings and development of the Manager Climate Corps (MCC), which was initiated before the current funding cycle and Host Agreement. In developing the current proposal, we sought to have the principles be more encompassing and utilized them to guide the proposal and work that we did. We think our efforts have been significant. In fact, this review has helped us to see more clearly how encompassing our programs are, the differences between our various programs, and how they interconnect. Where they interconnect is under these over-arching principles. There are things that we didn't envision when we wrote the proposal, such as how Kūlana Noi'i has been incorporated into our work. We have evolved along the way and is helpful to see it all in one place now.
- *Response from Consortium Member:* The 4 Principles were from UHM's first five-year Host Agreement with USGS/NCASC. They served as MCC's foundational elements and guided the defining community beyond the human community and includes multiple ways of knowing. These foundational principles have expanded beyond the Pacific region: The CASC Evaluation Working Group centers on Aparna Bamzai-Dodson's [work](#) from her Ph.D. focusing on how to develop metrics of evaluation for the Centers. The working group, and her paper, noted that the answer is up to local practitioners. It is more important to start with local place and people to determine what success looks like. It is important to honor quantitative modalities in research, but first, evaluate through qualitative approaches (grounded theory, structured interview processes, etc.). I am beyond thrilled with the growth of engagement, locally, regionally, and nationally.
- *Chat Response from Consortium member:* MCC foundational elements: <https://pi-casc.soest.hawaii.edu/pi-casc-programs/center-programs/mcc/>. A new action item adopted by the National Climate Extension Initiative: "Aid in the shift from a central focus on information exchange and accumulation towards a deepened recognition of embodied knowledge across diverse worldviews. Engage diverse knowledge forms in support of long-term person-to-person and person-to-nature relationships that are rooted in descendent-led pathways, particularly within underrepresented and unheard communities." Such inclusive

foundations hold strong capacity to empower sustainable, adaptive, and resilient human behavior, driving action through unprecedented social-ecological change.

- *Chat Response from Consortium member:* For UOG, the co-production model is reflected in our PICASC affiliated programs and actions, such as CARM and Drones Corps.

Questions and Comments from the ERT

- *Question/Comment:* Have you done any feedback surveys of partners, especially, Native Hawaiians and Indigenous partners, to get feedback of their perspective?
 - *Response from Consortium Member:* This is 80% of what I do. What is wonderful about deeply place-based, local connectivity is that I am always engaging and asking questions. In 2015 (before the current HA), we did semi-structured interviews for the primary intent of engaging networks and sustaining that engagement. We are now at version 2.0 of MCC – which has become dramatically relational and trusted. It is not just information exchange: it starts with this constant connectivity. Still, we are conscious that hiring pathways and notions of tenure don't always honor these notions of moving beyond funding and publication mechanisms toward the time required to earn trust. The PI-CASC Host and Consortium have really pushed that envelope forward.
 - *Response from Consortium Member:* In Guam, we are in direct contact with natural resource management agencies, and they are our students. They call us whenever they need advice and consulting (for example, for input on a climate action plan and policy). We get direct feedback from resource managers of the projects; however, we don't document formally because we know how busy they are and want to respect their time. For the future, this may be a matter of getting partners testimonials on the record.
 - *Response from USGS PI-CASC leadership:* On the federal side, we often get data calls on the impact of the funding and recognize this as a glaring gap on our ability to speak to what we are achieving. We can highlight particular awards and relationships that we built, but that is it. I have brought on an Oak Ridge Institute for Science and Education (ORISE) Fellow who is reaching out to PIs to gauge their interest in doing deeper evaluations. During the next three years of her fellowship, she will be conducting deep interviews with PIs, post doc students, and others who have left the university to learn about their experience with PI-CASC, co-produced knowledge, and how it has affected them. The Fellow will be developing reports on this effort, which is supported from the federal side and does not route funds through the Consortium.
 - *Chat Response from Consortium Member:* Any documenting of engagement should start with community-driven definitions of engagement, community, etc., rather than a priori determined categories of impacts.
 - *Chat Response from Consortium Member:* Maybe the Survey Monkey will explain that with our MCC projects, we do that through conversations half-way through the graduate projects (1 year) and at the end, looking at how the collaborations have served the project and the outcome. So not in a survey, but in a conversation.
 - *Chat Response from Consortium Member:* I totally agree with the need for capacities Mari-Vaughn is speaking of!
 - *Chat Response from Consortium Member:* John shared an impacts report yesterday or the day before for UOG specific PICASC projects.

- *Question:* You have talked about engaging networks, establishing relationships, and earning trust. Your proposal narrative includes statements about the prior and continuing work of the PI-CASC being built on several things, specifically, utilizing science, restoring trust with local communities, and solidifying mutual interest between US and the US-Affiliated Pacific Islands (USAPI). Regarding restoring trust with local communities, including Native Hawaiians and Indigenous peoples, we have talked about establishing relationships and earning the trust; however, that is different than restoring trust. Can you speak to how you feel you are doing in terms of restoring trust?
 - *Response from Consortium Member:* “Restore” may have been the wrong word to convey our intent. It is important to understand that we were not in a vacuum as we were writing this proposal. There was a community engaged in ongoing climate adaptation work involving other entities and organizations. When you look at these organizations and entities, there is a diversity of levels at which people have been engaged in relationship-building with Indigenous communities. Kūlana Noi’i is an example of the ongoing work we are doing. It is a recognition that this is the space that we want to work in deeply. Our approach goes beyond the DOI language to work with natural resource managers and cultural managers so they can change the way they are doing things and be better prepared and includes a deep dive into relationship-building and incorporating a better understanding of different knowledges across our region to better inform actions and outcomes. *[Facilitator’s Note: PI-CASC USGS later added that this is an example of ongoing work that Sea Grant is doing and is limited to Hawai’i. It can be applied to PI-CASC but is not a PI-CASC product and is limited to Hawai’i].*
 - *Response from Consortium Member:* This language may have been put there for Guam, which is a territory/colonial possession of the U.S. As such, there is a lot of distrust from local residents with the federal government and the military, and a perspective that the University is elitist. We must build trust with community and natural resource managers that the university is approachable, that we are making science approachable, and that we are not out to take more land or restrict fishing. We are there to get public perceptions and knowledge and see where ecosystem restoration and management can intersect with public interest. In Guam, we do a lot of work building and restoring trust.
 - *Response from PI-CASC Host University:* It would have rung truer if it said, “building and restoring trust.” We are only twelve years old – there is a whole legacy of broken trust, and there is still a lot of work to do to build trust.
 - *Response from Consortium Member:* There is probably an argument that there is a need to restore trust across the country, so this could ring true for all the CASCs. It is a multi-generational project to do the work to build and restore trust. One of the ways PI-CASC does this is to consider whose needs, values, and perspective is centered in climate adaptation science and what kind of knowledge is deemed as valuable or legitimate for climate adaptation decisions. These questions are important for trust and are something that PI-CASC is thoughtful and strategic about in trying to build that trust.
 - *Chat Response from Consortium Member:* To add to the above comment - the work that PI-CASC did with the Hui Malama Loko I’a on climate needs assessment is a good example of centering on the values of community and NH communities. Final Report Link: <https://kuahawaii.org/huimalamalokoia/resilientlokoia/>.
 - *Response from USGS PI-CASC leadership:* I appreciate the perspective the university and consortium are sharing in this discussion. Relationships matter. Trust matters. Diverse

knowledge systems matter. This is an award from the DOI. The DOI continues to manage lands across the Pacific, as a federal entity, with authority over land management, near-shore management, and decisions around cultural resources. It is incumbent on us, as PI-CASC, to continue to serve the DOI to build community trust and to incorporate the DOI into this effort.

- *ERT Chat Question:* It's amazing to hear you talk about your perception that long-term trust is developing. In my experience, trust is usually about relationships between people - do you think that this makes staff turnover even more costly? How can we make trust more resilient institutionally - so that the trust is between groups of people and not individuals - or can you/we?
 - *Response:* Definitely! This was spoken of universally across practitioners and managers in our 2018 MCC publication. *[Facilitator's Note: PI-CASC USGS later added that this was published and based on info prior to this HA.]* Relationships alone are constantly interrupted by shifting political arenas/drivers from "above" all while turnover is constant. I feel that much of our resilience is what we do in our "unpaid" time (community service) earning trust. There is no way to circumvent the time necessary to earn trust, and it can be maintained as folks move from one position to the next (the trust follows the person, not the position). Additionally, there is a critical distinction between engaging relational pathways and engaging/supporting relationality/kinship, a profoundly different scenario:
<https://journals.sagepub.com/doi/abs/10.1177/14744740211029287>
- *Question:* What types of operational changes have each of the Consortium institutions needed to make to be part of the CASC? What lessons have you learned from your internal and inter-institutional work?
 - *Response from Consortium Member:* We experienced a leadership transition as one PI-CASC lead retired and had challenges with loss of knowledge with others retiring. *[Facilitator's Note: PI-CASC USGS later added that this change did not occur during this HA cycle.]* During this transition, we had to hire an administrative assistant part-time to help deal with accounting, procurement, and financial reporting. The Host and USGS were very responsive in providing guidance despite the organizational challenges on our side. We also experienced challenges with mentors/natural resource managers leaving positions for other jobs.
 - *Response from Consortium Member:* For PI-CASC Guam, my comms position was initially a shared role with three other programs: UOG Sea Grant, NASA Guam EPSCoR, and NSF Guam EPSCoR. It's currently now a shared role with PI-CASC and NASA Guam EPSCoR.
 - *Response from Consortium Member:* One challenge has been the accounting related to how the project is being funded. For example, a two-year project might have to be split into multiple years. It would be much easier if it were awarded in one agreement, and additive into the same agreement. We've made it work. *[Facilitator's Note: PI-CASC USGS later added that this is true for IAAs, not Cooperative Agreements.]*
 - *Response from PI-CASC Host University:* The Host has more of the administrative role and has allocated more funding to administrative processes and to leverage funding. Before the Host Agreement, we were just Sea Grant; now this is a Center distributed in different islands. The Consortium members have a different relationship than a Co-PI on a grant: it is a collaboration. Working with people who are funded partially takes time. We have always had fiscal support, but we didn't have it dedicated in the way we needed it to be early on. We now have a dedicated, go-to person regarding questions for fiscal stuff.

- *Question:* What have you learned from the inter-consortium operations about what works best? We've heard the desire for face-to-face opportunities; what else would help?
 - *Response from Consortium Member:* There are challenges with meeting in-person. The time zone differences are a challenge which impacts travel authorizations. Also, initially, it took a long time to get funding to UOG. The funding situation has improved, and we now can do no-cost extensions to deal with Guam delay. *[Facilitator's Note: PI-CASC USGS later added that the lag time between the arrival of USGS funds to being in the hands of the Lead PI is substantial.]*
 - *Response from Consortium Member:* The pandemic improved everyone's ability to meet virtually. We were able to attend the Center for Island Sustainability annual meeting in Guam remotely. It increased accessibility.
 - *Response from Consortium Member:* From a communications perspective, we were siloed in our individual universities. This has vastly improved, with numbers of connections across campus and across islands. We are constantly keeping in touch. The PI-CASC Consortium and USGS are willing to adjust and shift to be able to work more cohesively and closely together.
 - *Response from Consortium Member:* One area of challenge is that the federal side and university use different communication platforms (Microsoft v. Google). While not ideal, we are making it work.
 - *Response from Consortium Member:* We try to strike a balance to allow individual universities to approach place-based solutions that meet their locations best, while also trying to coordinate a single, cohesive PI-CASC across this huge region. How we approach that evolves and is an ongoing challenge. I feel good about leaving room for the place-based approaches.
 - *Chat Response from Consortium Member:* In some ways the pandemic helped advance the ability of us to meet on a regular basis as a full consortium, by the prevalence of Zoom. Admittedly, not in person, but we are able to keep more in touch and up to date with each other through our monthly all-hands meetings. And from the comms perspective, instituting monthly and then weekly meetings as a group has really helped with keeping in touch with each other, organizing cooperative actions, etc.
 - *Chat Response from Consortium Member:* 100% of my networking within the National Extension Climate Initiative has been virtual, a dramatic decrease in my carbon footprint. Zoom was super helpful for PI-CASC even long before Covid-19; critical back in 2016 to bring folks in Guam to this experience: <https://pi-casc.soest.hawaii.edu/news/climate-change-immersion-camp/>.

Individual Breakout Discussions with the ERT

To encourage an open and honest dialogue, ERT Members were provided space to talk with individual leadership sections of the PI-CASC. Each small group session considered the question:

- *Looking into the future: what ideas or opportunities exist for the CASC that you would love to see?*

Whole Group Closing Session

Donna led the group through a reflection of what they appreciated about the week's efforts. Participants noted:

- It was rewarding to reflect on the five years and see all that has been accomplished, the wonderful people we work with, and to receive external feedback.
- There is a much deeper understanding of the PI-CASC by everyone.
- There was much learning that will be integrated in individuals' work.
- It is important to collaborate even where it is painful, because that is where the good things happen – life comes from turbulent spaces.
- Synergies exist and need to be engaged through very vulnerable pathways.
- Everyone's time and attention across different time zones was appreciated.
- The framing of questions and approach of 'listening to learn' was appreciated.
- The significant amount of people who care about the success of the program.
- The thoroughness and thoughtful presentations.
- The sincerity and passion for projects.
- The creativity and relationships that have developed.

Donna thanked the ERT, CASC & Consortium Members, and Observers for their participation, engagement, and attendance at the session, and throughout the week. With that, the Review was adjourned.

ERT Reflections on the Day

The ERT met in closed session to discuss what they had heard throughout the four days and to begin to coalesce around their recommendations for their report.

*This session summary is respectfully submitted by the DS Consulting Facilitation Team.
Edits are welcome and can be sent to your Day 4 Scribe: Nancy Pionk (Nancy@dsconsult.co) and support
staff Colby Mills (colby@dsconsult.co).*

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