



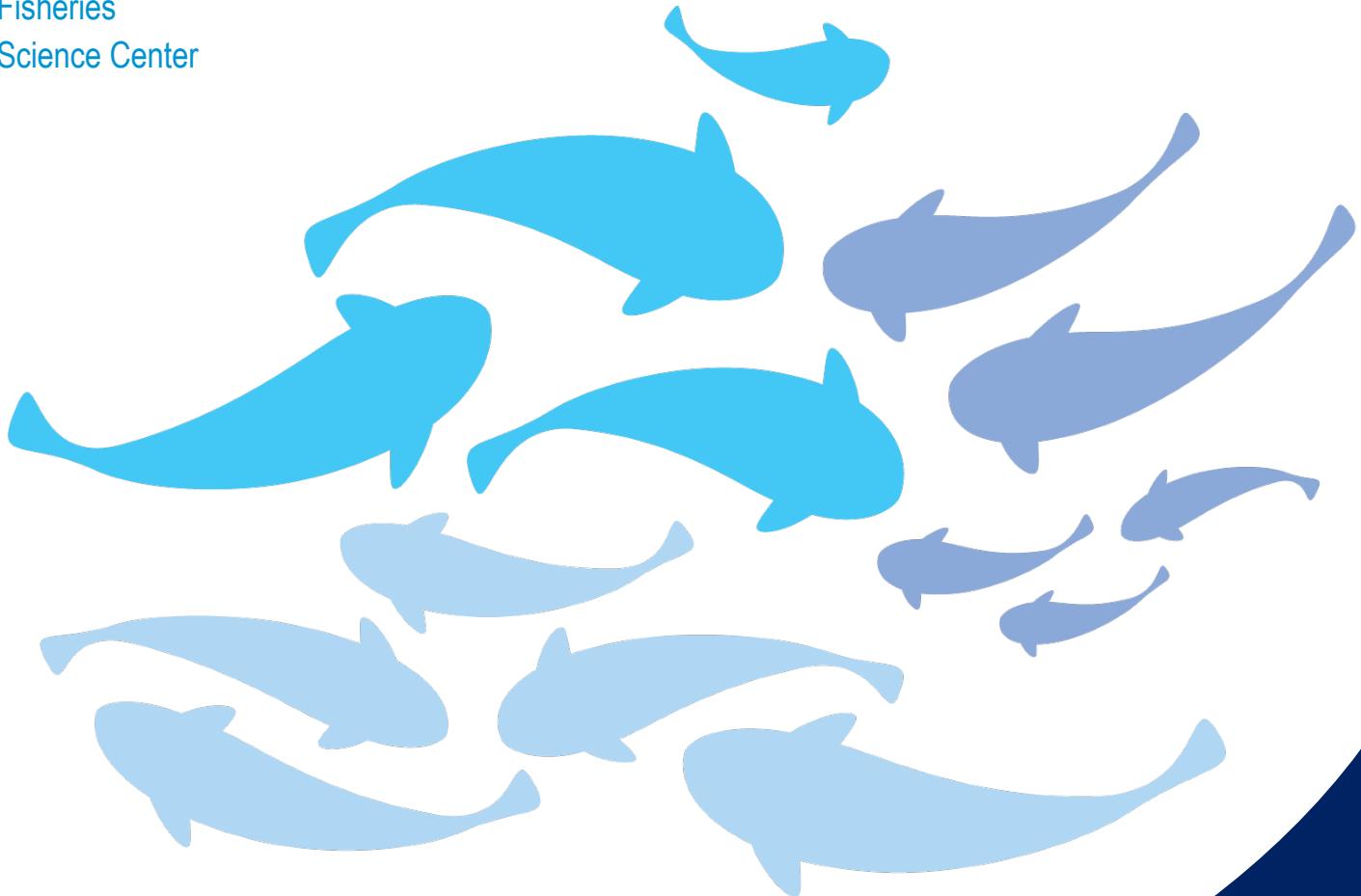
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Summary Report from the 6th Collaborative Climate Workshop, 9–11 April 2024

Ann K. Barlow, Beth Lumsden, Phoebe Woodworth-Jefcoats



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Ann K. Barlow^{1,2}, Beth Lumsden¹, Phoebe A. Woodworth-Jefcoats¹

¹ Pacific Islands Regional Office
National Marine Fisheries Service
1845 Wasp Boulevard
Honolulu, HI 96818

² Present affiliation:
Office of National Marine Sanctuaries
76 Kamehameha Avenue
Hilo, HI 96720

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Pacific Islands Fisheries Science Center
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
1845 Wasp Boulevard, Building #176
Honolulu, Hawai'i 96818

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Executive Summary

The Pacific Islands Regional Action Plan (PIRAP) highlights the climate work happening in the Pacific Islands region (PIR). Since 2017, PIFSC has hosted the Collaborative Climate Workshops where NOAA Fisheries staff from across the Inouye Research Center (IRC) came together with the Western Pacific Regional Fisheries Management Council (Council) staff to examine and promote climate projects through a scientific lens. These next 5 years of workshops will be hosted by PIRO and will have a management and implementation focus. This 6th Collaborative Climate Workshop, the first with the management lens, challenged those same participants to think creatively, outside their usual channels, and to find ways to work together to try to mitigate the impacts of climate change in the PIR. The workshop's engaging sessions endeavored to increase each participant's understanding of how management is informed by and guides climate data collection and research questions relative to the full swath of NOAA Fisheries concerns in the Pacific.

By the end of the workshop, staff expanded their personal networks, increased their collective understanding of the key climate issues and projects in the Pacific Islands region, and increased their understanding of the interconnectedness of management and climate science and data.

Background

In 2016, the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (Fisheries) enacted the NOAA Fisheries Climate Science Strategy (Link et al., 2015) as part of its proactive approach to better track, forecast, and incorporate information on changing climate conditions into living marine resource management. Because the drivers and impacts of climate change vary greatly by geographic location, customized Regional Action Plans for climate science (RAPs) articulate the regional climate science needs and specific action items to address them. By creating action plans at the regional level, NOAA Fisheries is tailoring its response to meet specific climate challenges and forging critical local partnerships. The initial RAPs were 5-year plans covering fiscal years 2017–2021 (Peterson et al., 2021).

“Internal Annual Collaborative Climate Science Workshops” was an action item in the initial PIRAP (Polovina et al., 2016). This forum offered a place for regional staff to learn about climate-related information needs, ongoing scientific research, and data available or being developed. Staff from across the NOAA enterprise, including NOAA Fisheries Pacific Islands Regional Office (PIRO) and Pacific Islands Fisheries Science Center (PIFSC), the NOAA National Environmental Satellite, Data, and Information Service (NESDIS), and the Western Pacific Regional Fishery Management Council (Council), as well as by several members of Council advisory bodies attended the first five workshops. The 5th workshop was also the first to be opened to external climate collaborators across the region and used innovative methods to increase engagement and participation (Woodworth-Jefcoats et al., 2022). The updated [PIRAP](#) (Woodworth-Jefcoats et al., 2023) continues to prioritize this collaborative space to focus on how climate science informs and is guided by management and policy actions.

The 6th Collaborative Climate Workshop, held 9–11 April 2024, provided an opportunity for staff from the Council and all the PIR Fisheries Divisions and Programs to meet and collaborate on the development of new and creative solutions to mitigating regional climate impacts on NOAA trust resources as well as the communities we serve. The workshop’s participatory sessions were designed to engage all staff on the full swath of NOAA Fisheries concerns in the Pacific. Each session endeavored to increase participant understanding of how management is informed by and guides climate data collection and research questions. The [Collaborative Climate Workshop google site](#)¹ hosted information about the workshop, including the agenda, invitation, surveys, and any other relevant material.

The goals of the 6th workshop were to (1) Increase the collective understanding of how management is informed by and guides climate data collection priorities and research

¹ Collaborative Climate Workshop google site (requires an @noaa.gov email address):
<https://sites.google.com/noaa.gov/pirap/climate-workshop>

questions, (2) provide an update on the Lalo Resilience Project process and outcomes, a previous workshop priority, and (3) facilitate a collaboration space to engage staff from all divisions and programs. Output from the 6th workshop includes (1) internal networks analysis, (2) a workshop report, with breakout session specific action items, and (3) action items to better meet external partners' climate-related needs.

Workshop Sessions

Workshop sessions prioritized in-person attendance with virtual accommodations provided upon request. In-person attendance was encouraged to motivate staff to strengthen and build new connections with their colleagues. In each session, participants provided feedback via an exit poll and an online form. Please see [Appendix A](#) for the annotated agenda.

Session One

Welcome and Workshop Introduction

The first session focused on building networks and supporting effective communication. It began with a coffee social meet and greet. The PIFSC 501c3, Honolulu Area Laboratory Employees Association (HALEA) provided coffee and donuts, encouraging people to gather in the atrium to connect and talk story. Each division developed a poster that highlighted its specific connection to climate and showed images of staff members and team structure. These posters were displayed during the coffee social and remained available throughout the workshop. The posters, as submitted for this event, are available on the [Climate Workshop website](#). During the social, attendees were encouraged to participate in a voluntary network analysis; a “big wall” experiment that provided an opportunity to visualize connections between people and projects. Participants chose an avatar and drew connections to those with whom they work. They were encouraged to draw new connections throughout the workshop as people added their names and projects ([Figure 1](#)). The opening welcome session culminated in remarks shared by the PIFSC science and research director and the PIRO regional administrator, followed by a brief video about the people and cultures of Oceania shared on behalf of the Council’s executive director.

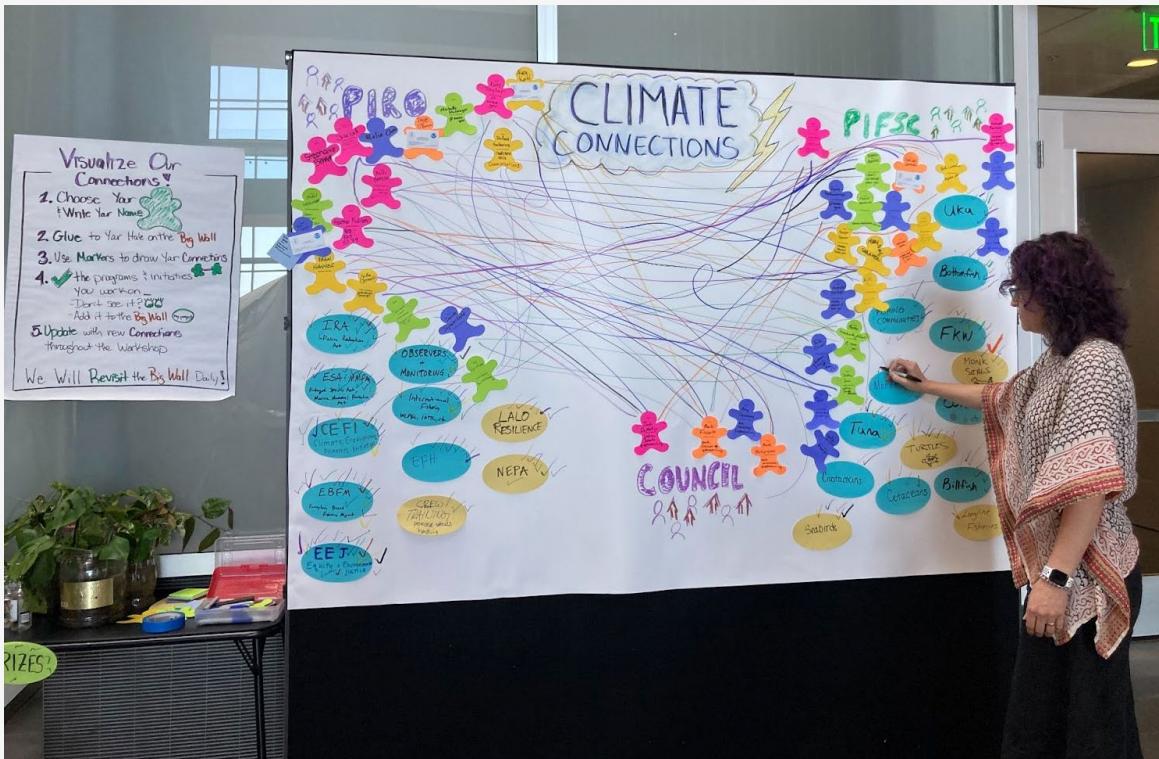


Figure 1. Workshop participant adds climate connections to the network analysis.

Communications

After the welcoming remarks the PIRO Communications team took the podium to share the importance of developing strategic messages. This crash course in strategic communication included some important guidance for developing messages—including a reminder that messaging is not about you; it is about your audience. Participants went into breakout rooms with four randomly assigned scenarios to practice identifying their target audience, choosing the most appropriate way to share information with that audience, and developing key messages that would resonate with them. Each group shared its key messages back in plenary for feedback.

Key Takeaways: Session One

Staff members were eager to connect and improve their understanding of the organizations' divisions and structures. Strategic messages should be short, simple, and conform to three points: (1) avoid jargon, (2) be specific, and (3) tell a story!

Sessions Two and Three: Climate-Informed Management

The second and third sessions focused on NOAA Fisheries mandates: the Magnuson Stevens Act (MSA), National Environmental Protection Act (NEPA), Endangered Species Act (ESA), and the Marine Mammal Protection Act (MMPA) and directives, Monuments and Proclamations, REDACTED, International Fisheries, and Ecosystem Based Fisheries Management (EBFM) that guide our work. For each talk, a representative from PIRO and one from PIFSC introduced their area of expertise. Each session was followed by a 45-minute breakout session to allow participants to explore the nuances of the various topics. The sessions concluded with a panel discussion where the subject matter experts shared highlights from their breakout and answered questions.

Magnuson Stevens Act (MSA): David O'Brien (PIRO Sustainable Fisheries Division) & Marlowe Sabater (PIFSC Fisheries Research and Monitoring Division)

MSA is the primary law that governs the management of marine fisheries in U.S. federal waters. Since its passage in 1976, it has supported the long-term biological and economic stability of the nation's marine fisheries. In addition, the MSA ensures that fisheries management is a transparent and public process that integrates science, management, technological innovation, and collaboration among the fishing industry, communities, and federal agencies charged with managing the trust resources.

Key Takeaways: MSA Breakout Discussion

The genesis and application of the MSA and its adaptive processes support its ability to respond to climate change needs through scientific data collection and engagement with the public and stakeholders. MSA is built with the flexibility and mechanisms to turn the best available scientific information into positive action. Once the science is shared with managers, the lengthy process that translates the science into steps toward better conservation and management can begin. The data-poor environment of the PIR can complicate discussions around the best steps forward. Creativity is needed when considering new and better ways to collect, process, and analyze data.

National Environmental Protection Act (NEPA): Kate Taylor (PIRO Directorate)

The NEPA is an umbrella policy that requires federal agencies to consider the environment in their actions. NEPA does not supersede other federal mandates; however, it requires federal agencies to prepare detailed statements about the environmental impact and alternatives to any major federal actions that affect the environment. While NEPA does not direct any specific result, it is a decision support tool that facilitates coordination by integrating compliance

requirements that may otherwise proceed independently and informs and involves the public in the decision-making process.

Key Takeaways: NEPA Breakout Discussion

NEPA is 45 years old and ready for an update. It is deployed to ensure that federal agencies consider the environment, including climate change, and communicate with stakeholders. NEPA is not regulatory; it is a decision tool that ensures appropriate documentation about decisions that impact, in this case, fisheries and the people who depend upon them.

Endangered Species Act (ESA): Danielle Jayewardene (PIRO Protected Resources Division) & Tom Oliver (PIFSC Ecosystem Sciences Division)

The speakers used the ESA Section 4 recovery planning process and progress for 15 Indo-Pacific reef corals to highlight how the Act is applied in practice, including to address the corals' main threat of climate-driven ocean warming. A recovery plan is a central organizing tool for guiding a species' recovery process. It identifies the endpoint of the process by defining the criteria to assess when recovery is achieved and the protections of the ESA are no longer necessary. The ultimate goal of a recovery plan is to remove the species from the ESA listing. This process does not prescribe any specific activity and allows for a lot of creativity to achieve that goal. There are a number of active projects supporting coral recovery in the PIR such as distribution modeling, artificial intelligence-assisted image identification, determining and monitoring vital rates, and establishing temperature thresholds. In developing the activities to enact and prioritize over the next 5–10 years, researchers are using climate scenario planning as a tool to avoid extinction and recover corals in the face of climate uncertainty.

Key Takeaways: ESA Section 4 Recovery Planning Breakout Discussion

The ESA Section 4 Recovery Plan breakout session shared more about the steps to advance from the current working draft recovery plan with a vision, strategy, and large actions which will be refined then solicited for public comment and review. A challenge to the recovery plan specific to coral is the need for a high level of international cooperation and an approach that supports the entire ecosystem's health and vitality, including commercially relevant fisheries. The shift to ecosystem planning requires an implementation strategy that provides a flexible pathway to achieve the recovery goal(s) of listed species. Policy changes are often slower than the rate at which the climate is changing, so the approach becomes multi-pronged to buy time through interventions that limit non-climate related stressors, like preventing runoff during thermal stress events. The sentiment of this discussion is summed up in Danielle Jayewardene's statement that, "Climate change is hard, but we can get creative in how we address it."

Action Item:

1. Form a relationship with the U.S. State Department representatives to achieve U.S. goals within these international fora. This relationship can be initiated in the Workshop's regional partners session (see [Session Six: Regional Partners](#)).

Session Two Panel Discussion Key Takeaways: Climate-Informed Management, Part 1

Addressing climate change requires a new business model for resource managers and challenges all of us to rethink assumptions of how tools found within the NOAA Fisheries mandates are implemented. Traditional stock assessment techniques do not necessarily tell the entire story when climate change parameters are included, but the MSA has the flexibility to address impacts at both a rapid response rate and for long-term planning. Similarly, ESA affords flexibility for recovery planning and NEPA helps shine light on how a suite of mandates can layer on one another to establish protections. Networks, partnerships, and coordination amongst agencies are essential to any effective response to the challenges posed by a changing climate.

Monuments and Proclamations: Kaipo Perez (PIRO Habitat Conservation Division) & Hannah Barkley (PIFSC Ecosystem Sciences Division)

A presidential proclamation designates an area as a monument based on its unique and significant biological and/or cultural resources. The management of these areas is often cooperative and includes NOAA, the U.S. Fish and Wildlife Service (FWS), and state and/or territorial governments. NOAA Fisheries has delegated its management authority to PIRO to co-manage four Pacific monuments. PIRO coordinates closely with PIFSC scientists for research to inform place-based management. The Pacific Monuments are in various stages of maturity.

- The *Papahānaumokuākea Marine National Monument* [management plan](#), finalized in 2008, is currently being updated. A Monument Management Board oversees the Monument's daily operations. The board consists of seven members from NOAA Office of National Marine Sanctuaries, NOAA Fisheries, FWS Ecological Services and Refuges Program, State of Hawai'i Divisions of Aquatic Resources and Forestry and Wildlife, and the Office of Hawaiian Affairs.
- The *Mariana Trench Marine National Monument* is cooperatively managed by FWS, NOAA Fisheries, and the CNMI government. The recently established Mariana Trench Monument Advisory Council released [the Mariana Trench Marine National Monument management plan](#) in 2024.

- The *Pacific Islands Heritage Marine National Monument* is cooperatively managed by FWS and NOAA Fisheries. Their draft monument management plan and environmental assessment are under development. The teams developing the management plans are working to reconnect indigenous cultures to their sacred places. One of the ways this is being done is through a [renaming process](#). The [final renaming and cultural recognition report](#) is now available online.
- *Rose Atoll Marine National Monument* is cooperatively managed between NOAA and FWS in cooperation with the government of American Samoa. While there is no requirement to establish a monument management plan, there are multiple plans that provide guidance for the site, including the [National Marine Sanctuary of American Samoa's Sanctuary Management Plan](#), the [USFWS Comprehensive Conservation plan for Rose Atoll National Wildlife Refuge](#), and the [WPFMC's American Samoa Fisheries Ecosystem Plan](#).

To address climate change impacts in the monuments, research is needed to identify information gaps, conduct vulnerability assessments, and collaborate to align management actions with the resources impacted.

Key Takeaways: Presidential Proclamations and Research to Support Monument Management Planning Breakout Discussion

Monuments are the only place-based areas that NOAA Fisheries has responsibility to manage. Their designation and collaborative management structure lend additional tools to other agency authorities and can also come with the challenges of shared responsibilities. Monument management plan development and revision are coordinated between regional managers and PIFSC scientists to address climate vulnerability and establish research questions.

Action Items:

1. Take concerted efforts toward better internal communication
 - a. Monuments Day: Host a day dedicated to each monument, or an “All the Monuments Day,” with an open invitation to all staff to celebrate and honor these unique places.
 - b. Create a monuments dashboard that clearly communicates key information, timelines, and initiatives to interested stakeholders, further enhancing opportunities to share and collaborate.

REDACTED

This section has been redacted.

International Fisheries: Jason Philibotte (PIRO International Fisheries Division) & T. Todd Jones (PIFSC Fisheries Research and Monitoring Division)

NOAA Fisheries uses a spectrum of tools to address the science and management of highly migratory species whose ranges and management needs span multiple basins and geopolitical lines. International cooperation within and among fishing nations is done through Regional Fisheries Management Organizations which provide the space and foundation for the management of these highly migratory species. Multi-country, multi-stock, and multi-gear fisheries require choices about tradeoffs among conservation, economic benefits, and socioeconomic concerns. Fisheries management of highly migratory species in this context is already very complicated and becomes more complicated when climate change is considered. There are initiatives underway to integrate stock movements with climate change models, explore the impact of climate change on target species distribution, test assumptions, and adapt management measures to meet the goals of the fishery.

Key Takeaways: International Fisheries Breakout Discussion

Climate change compounds the challenges of International Fisheries Management and NOAA Fisheries obligations to managing U.S. tuna fisheries in the Pacific basin. Major components of the challenge are the climate-driven redistribution of tuna and gathering the science that supports management regimes in the Western and Central Pacific areas. As aspects of the climate such as ocean temperatures change, tuna are being displaced from traditional fishing grounds into areas outside the exclusive economic zones of Pacific Island nations. While the U.S. may actually benefit from the shifting stocks as they approach the U.S. EEZ, other small island developing states may suffer economic hardship with less access to the resource. In the policy realm, if the data show these stocks move into a fully protected area, there will be a need to understand the impacts to the U.S. fishing fleet and make appropriate management decisions to balance extraction and conservation.

Ecosystem-Based Fisheries Management (EBFM): Savannah Lewis (PIFO Sustainable Fisheries Division) & Beth Lumsden (PIFSC Ecosystem Sciences Division)

EBFM means taking a holistic look at the forces impacting living marine resources such as habitat needs, predator-prey dynamics, reproductive opportunities, competition for resources, and the human impacts and needs associated with those species. As climate change disrupts ecosystems, communities respond and adapt to those changes. Understanding the

interconnectedness of ecosystem components is essential to maintaining resilient and productive ecosystems and associated human communities. To assess the vulnerability of the nearshore and deep-water ecosystems, the PIR applies a variety of tools, such as the Hawai‘i Ecosystem Status Report, uku report card, [TurtleWatch](#), the Council’s Social, Economic, Ecological and Management process, and management strategy evaluations, among others. Recently, the PIR began focusing on the application of an EBFM approach to our understanding of the uku fishery. The application of EBFM is innately Hawaiian, as pono² practices see human well-being and ecosystems as interconnected. With that in mind, the team intends to translate the uku success to a model for future PIR endeavors.

Key Takeaways: EBFM Breakout Discussion

The breakout session’s primary question was, “How can we do EBFM better?” EBFM is the process by which we manage NOAA trust resources within a changing climate. We can change the way we do business right now by establishing achievable goals and setting target dates for accomplishing them that are presented to leadership (both as an expectation for support and obligation for meeting a deadline). However, we need to more clearly specify our EBFM goals related to climate and create a timeline to meet those goals. This can be aided by linking management discussion with scientific dissemination.

Action Items:

1. In rollout plans for science products, PIFSC, in collaboration with PIRO and possibly General Counsel, should explore ways to communicate the management implications of each science product (e.g., white paper, tech memo, journal article). This would require exploring how best to discuss the topics and issues without committing to a particular management pathway or being policy prescriptive.
2. Create scenarios and plan for different potential pathways or outcomes so that we are not managing in a crisis but rather are prepared for various scenarios should they arise.
3. Establish and communicate achievable goals, including target dates and timelines that are shared with leadership.

Session Three Panel Discussion Key Takeaways: Climate-Informed Management, Part 2

In addition to rethinking the current business model of resource management, notable observations included the importance of clearly communicated objectives and vision, and attention to balancing the objectives between U.S. and international perspectives. Expanding

² In Hawai‘i, pono is an overarching principle that essentially means to do what is right and/or proper. For more information, please see Nā Puke Wehewehe ‘Ōlelo Hawai‘i. <https://big.ly/4dGwCsy>

beyond the U.S. borders requires choices, concessions, and attention toward benefits and losses as climate-induced shifts in stocks occur with cascading socioeconomic impacts of these shifts reaching far from the water into communities.

Session Four: A Mock Exercise—Science Informing the Management Process

This session asked participants to engage in a mock exercise to examine how a theoretical climate-related fishery conflict in the territories prompted a Council management action and explored the options available to assist. Facilitators walked participants through the many science elements needed for the management decision-making process:

- understanding the oceanographic conditions including observing changes to SST and productivity;
- observing trends in fish biology including size and age distributions, productivity, and spawning time and frequency;
- understanding how this information would be compared against the historical stock assessments and stock status to observe any change in composition over time; and then
- evaluating the economics and human dimensions of these observed changes to the environment and fish.

Managers use the resulting scientific information to create thoughtful benchmarks, assess tradeoffs, and create a plan to recover the stock and the fishery. In the fictional scenario posed, the Guam bottomfish fishery collapsed and there was a fishing boom in the neighboring islands of CNMI. Guam requested the Council back their access to the “new” bottomfish grounds. Breakout groups took this suite of information into a simulated Fishery Council action.

Key Takeaways: Mock Council Action

The breakout groups brainstormed ideas to manage this hypothetical situation. Participants discussed the levers and options available to respond, potential additional science products needed to proceed and inform the management action(s), the timing and responsiveness of the action to the needs of the communities impacted. They then attempted to develop a suite of alternatives. Participants came back together in plenary to share ideas and discuss how climate considerations could be incorporated into Council alternatives and actions. With all the components and tradeoffs to consider, envisioning an outcome that seemed fair, balanced, and sustainable was very challenging and helped highlight the difficulties of managing fisheries in a changing climate.

Session Five

Council Scenario Planning

The Council presented their plans to use Inflation Reduction Act funding to conduct two scenario planning exercises to explore challenges of managing both (1) “big boat” and (2) “small boat” fisheries. Springing from the stories developed during a scenario planning process, the Council hopes to be better positioned to understand geographic challenges as well as planning for possible changes in infrastructure, fishery development, permitting and regulatory needs, market changes, advances in monitoring, and community shifts.

Case Study: Developing a Resilience Strategy for Lalo

The Lalo Resilience project kicked off in earnest in 2020 during the 4th Climate Workshop in the wake of scientific reports of impacts to protected species at Lalo after Hurricane Walaka in 2018 (Woodworth-Jefcoats et al., 2021). The multi-year collaborative process, beginning from the project’s inception, used the spectrum of NOAA skills and expertise as a cross-line office priority area with focus by the NOAA Pacific Regional Executive Board (PREB). The PREB established a Lalo steering committee to develop a nuanced understanding of the climate-related impacts within Lalo and identify measures to mitigate the identified impacts. The steering committee leveraged the expertise gathered at the 4th and 5th Climate Workshops to develop a shared understanding of the state of knowledge of the area, collaborate with a Monument working group to develop resilience options to inform the Monument Management Board (MMB), and contributed to the nomination package for a [NOAA Habitat Focus Area](#). The workshop participants who had been part of the Lalo project as subject matter experts were pleased to receive an update on the entire process and helped the MMB develop their shared vision and implementation strategy for Lalo. The recommendations were handed off to the Papahānaumokuākea Marine National Monument Management Board in the spring of 2024 for prioritization and implementation (Marra, 2022; Barlow, 2024).

Back to the Future

The second part of this session reviewed the results of the network analysis that grew over the course of the workshop through the additions to the “big wall.” The wall was designed to help visualize the relationships between individuals within PIRO, PIFSC, and the Council around the many ways climate impacts all NOAA Fisheries mission-related responsibilities. The initial count revealed 47 discrete nodes (individuals) with a connection density ranging between 17% and 44%. The initial analysis identified 26 projects with a climate nexus. Though this was only a rudimentary analysis, there are possibilities to bolster the strength of these connections. Following on the discussion of the “big wall,” the networking and engagement tool discussion

continued with a brief introduction to the [Ecosystem, Climate, Habitat, and Ocean \(ECHO\)](#) cards and an invitation to join the simple networking and partnering space.

Action Items

1. Refine and refocus the connections by conducting a formal network analysis.
2. Supervisors use the self-identified projects from the “big wall” as a baseline to understand staff effort and follow up on prioritization.

NOAA Fisheries Wrap-Up

The final hour of session five was an opportunity to reflect on the workshop as a whole, hear from leadership, and get near-real time feedback from participants for future climate coordination efforts.

Following five science-focused workshops, participants overwhelmingly found the time spent at the first management-focused workshop useful, educational, and an excellent opportunity to build personal and professional networks. Given the enormity of the issues around climate change, sharing space with others who are actively using scientific data to effect positive change was widely appreciated. Focusing on mandates educated participants on the NOAA Fisheries mission and tools and illuminated ways to employ the mandates as tools to adapt and respond to the climate change challenge. The “tools in the toolbox” approach was an inspirational way to break out of traditional silos where our work often places us.

Participants shared that they liked the blend of active participation and passive listening, but they found it difficult to narrow down breakout topics as all were interesting to pursue. They agreed that they would have liked more time in the breakouts and more opportunities to delve deeper into the topics.

Overall, supervisors found it a worthwhile experience for themselves and their staff. Leadership closed with remarks emphasizing the positive collaborative atmosphere, the need to work together and act rapidly in the face of the climate crisis. They also remarked on the importance of setting near-term priorities to make changes now while it is still possible.

Action Item:

1. Strongly encourage staff to attend the portions of the workshop open to external participants to encourage respectful engagement and signal the value placed on their contributions.

Session Six: Regional Partners

The sixth and final workshop session was open to regional partners including online participants. The session began with introductions by all participants who were asked to share their organization's connection to climate. Introductions were followed by prepared remarks to more deeply explore the many ways NOAA Fisheries science and management impact local external entities. There were three breakouts: data and information products, opportunities for students, and international collaborations.

Key Takeaways: Data and Information Products Breakout Discussion

The data and information products breakout discussion focused mostly on broad data access issues while highlighting a few specific needs and successful examples to serve as models for future work. Throughout the discussion, there was deep appreciation for the work that goes into making data available. Serving data requires resources, infrastructure, and dedicated personnel. At the moment, many of our regional data pipelines are brittle in that they rely on single individuals managing data as an ancillary aspect of their workload. Yet, as one participant noted, "investing in data management would enhance collaboration." Successful data sharing examples discussed included the [HICEAS storymap](#), [Coral Reef Watch](#), and PMEL's [TAO site](#). As our region moves ahead with implementing NOAA's [Climate, Ecosystems, and Fisheries Initiative](#), [Open Science](#), and [Data Modernization Strategy](#), building robust data management and access infrastructure should be a top priority for leadership.

Action Item:

1. Develop and share a series of web stories and/or other products highlighting PIFSC's various data streams.

Key Takeaways: Student and Career Opportunities Breakout Discussion

Many people are interested in careers in marine science, some specifically at NOAA, but there are few opportunities for engagement at middle/high school ages. For college-age students, few internship opportunities offer sufficient funding for a 10–12 week stay in Hawai'i despite NOAA-level guidance to make all internships paid endeavors. Lodging, food, and transportation to/from and on the island are just a few of the considerations that PI interns struggle with, in addition to holding a full-time, salaried position. Additionally, many summer interns require U.S. citizenship, so people from the territories do not qualify. Some internships have higher qualification requirements (e.g., SCUBA certification and advanced science degrees) greatly narrowing the opportunities for as many students to embark on this career path. However,

there are many [opportunities at NOAA](#) and other natural resource agencies to meet many age and educational levels as well as varying career goals.

It was noted that the Restoration Center provides funds to local organizations to help SCUBA certify potential applicants. Partners such as Sea Grant are essential to help support access to NOAA for university students through the Hollings Scholarships and the PIR-based Grau fellowship, and these require substantial matching funds from a host office.

Action Item

1. Connect with students in marine science clubs in high schools and junior highs. They have already self-selected based on their interests which provides an opportunity to help them make career choices.

Key Takeaways: International Collaboration

The international collaboration breakout indicated a broad sense in light of all the ongoing work, greater collaboration and connection with stakeholders and community members is necessary. There were needs voiced around the correct protocols and mechanisms to connect with experts and governments in countries that share stewardship duties and overlap with the geographical range of U.S. trust resources. Such collaboration is essential to help align government resources with the needs of the communities impacted by climate change. The State Department Bureau of Oceans and International Environmental and Scientific Affairs can help smooth diplomatic barriers that may exist or arise.

Action Items:

1. Connect ESA Coral Recovery with a State Department representative around the current recovery planning process.
2. Build protocols around working with the U.S. Department of State and other nations to connect experts in the U.S. with experts in other countries to meet shared climate needs.

Next Steps

This workshop was the first held after the handoff of steering committee leadership from PIFSC to PIRO. It offered a refreshing and highly effective shift in focus. The management-centered approach not only grounded our discussions in real-world application but also deepened participants' understanding of how to translate science into strategy and impact using tools we already have. Feedback from the participants made it clear that this new perspective significantly enriched the experience and it raised our "collective understanding of the interconnectedness of management and climate science and data" (a workshop goal).

At the same time, we recognize a moment of transition. While PIRO took the mantle for this workshop, they decided not to continue hosting the workshop series moving forward. While we are grateful for the support that helped make this gathering a success, the future of these synergistic opportunities is unclear.

Looking ahead, there is more uncertainty. If future climate-focused efforts like this workshop are paused or discontinued, it is not because the problem is solved. The urgency remains as changing environmental conditions continue to challenge our communities, our resources, and our management systems. The authors express their hope that this is not the final workshop in the series. We have more to learn, share, and achieve in this challenging arena.

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Appendix A—Annotated Agenda as of 14 March 2024

Introduction: The 6th Collaborative Climate Workshop will provide an engaging opportunity for staff from the council and all the PIR Fisheries Divisions and Programs to come together, challenge participants to think creatively, outside their usual channels, as we work together to address climate change in the Pacific Islands Region. The workshop's participatory sessions are built on input from division chiefs and designed to engage the full swath of NMFS concerns in the Pacific. Each session endeavors to increase participant understanding of how management is informed by and guides climate data collection and research questions.

By the end of the workshop, we plan to have provided scaffolding for our networks, built our collective understanding of the key climate projects in the Pacific Islands Region and raised our understanding of the interconnectedness of management and climate science and data.

Background: The Collaborative Climate Workshops are based on the Pacific Islands Regional Action Plan (PIRAP) that highlights the work done in the Pacific Islands Region. These workshops were hosted by PIFSC for 5 years and examined projects through a scientific lens. The next 5 years of workshops will be hosted by PIRO and will have a management and implementation focus.

Workshop Outcomes:

1. Increased understanding of how management is informed by and guides climate data
2. collection priorities and research questions
3. Update on the Lalo Resilience Project process and outcomes
4. Collaboration space and engaged staff from all divisions and programs

Workshop Outputs:

1. Internal Networks Analysis
2. Workshop report
3. Breakout Session Specific Action Items

Agenda:

Day 1, Session 1a: Welcome and Workshop Introduction.

April 9, 2024 8:30am - 10:40am

Location: Atrium and Auditorium

This session is designed to welcome participants and increase understanding of all Divisions' connection to climate. We will host a 60 min poster session in the atrium with coffee and snacks. Each division has created a poster that shares their connection to climate and their team members. Leadership from PIRO, PIFSC, and Council will be invited to share their vision for the region.

- Facilitators: Ann Barlow (HCD) and Phoebe Woodworth-Jefcoats (ESD)
- Presenters: Charles Litnan (PIFSC), Kitty Simonds (Council), Sarah Malloy (PIRO)

Day 1, Session 1b: Communications

April 9, 2024 10:40am - 12pm

Location: Auditorium and Breakout rooms

This session will help participants to recognize their personal and organizational hubs and networks. We will develop a "BIG WALL" network analysis, develop a framework to coproduce strategic messages, and breakout into small groups to practice creating strategic messages.

- Facilitated by Ann Barlow (HCD), Stephanie Bennett (DIR), with additional facilitators for breakout sessions
- Presenters: Stefanie Gutierrez (DIR), Stephanie Bennett (DIR), and Ann Barlow (HCD)

Day 1, Session 2: Climate Informed Management - part 1

April 9, 2024 1pm - 4pm

Location: Auditorium and Breakout rooms

This session will look at NMFS primary mandates and how they account for changing climate conditions in our implementation. (MSA, NEPA, ESA, and MMPA). Participants will be introduced to four of the NMFS primary mandates in a plenary session and panelists will each lead a breakout session to dive deeper into their specific area of expertise.

- Facilitators: Kaipo Perez (HCD), Ann Barlow (HCD), with additional facilitators for mini-sessions
- Presenters: Gerry Davis (HCD), David O'Brien (SFD) and Marlowe Sabater (FRMD), Kate Taylor (DIR), Danielle Jayawardene (PRD) and Tom Oliver (ESD), and Diana Kramer (PRD) and Jason Baker (PSD)

Day 2, Session 3: Climate Informed Management - part 2

April 10, 2024 9am - 12pm

Location: Auditorium and Breakout rooms

This session will look at other NMFS priorities and how they account for changing climate conditions in our implementation. (Monuments and Proclamations, REDACTED, International, and EBFM). Participants will be introduced to four additional NMFS directives in a plenary

session and panelists will each lead a breakout session to dive deeper into their specific area of expertise.

- Facilitators: Kaipo Perez (HCD), Ann Barlow (HCD), with additional facilitators for mini-sessions
- Presenters: Hannah Barkley (ESD) and Kaipo Perez (HCD), Michelle Chow (DIR) and Revere Wood (DO), T. Todd Jones (FRMD) and Jason Philbotte (IFD), and Beth Lumsden (ESD) and Savannah Lewis (SFD)

Day 2, Session 4: Mock Action Item: Science Informing Management Action

April 10, 2024 1pm - 4pm

Location: Auditorium and Breakout rooms

This session will help participants understand how NMFS uses investments in science products to inform fisheries regulations and where/how climate information can be incorporated into the process. Participants will be introduced to the process and a problem, followed by breakouts to discuss alternatives, and concluding with a discussion of how climate fits into a highly prescribed, and, at times, political process.

- Facilitators: Savannah Lewis. (SFD) and Mark Fitchett/Josh DeMello (Council)
- Presenters: Savannah Lewis (SFD), Kisei Tanaka (ESD), Eva Schemmel (FRMD), Rob Ahrens (FRMD), Hing Ling (Michel) Chan/Kirsten Leong (ESD), Brett Schumacher (SFD)

Day 3, Session 5a: Case study-Developing a Resilience Strategy for Lalo³

April 11, 2024 9am - 10am

Location: 1651/1653

This 1/2 session will open with discussing the value and use of scenario planning as a tool in fisheries management. The Lalo Steering committee will share a real-life example by providing an orientation to the Lalo Resilience Project process - genesis, outcomes, and future.

- Facilitators: Ann Barlow (HCD), Charles Litnan (DO)
- Presenters: Mark Fitchett (Council), Kilo Ka'awa-Gonzales (FWS), John Marra (NESDIS), Phillip Howard (ONMS), Charles Litnan (DO), Ann Barlow (HCD), Amanda Boyd (FWS), and Jeida Ostrowski (HCD)

Day 3, Session 5b: Back to the Future

April 11, 2024 10am - 12pm

Location: 1651/1653

Reflect on the past 2 1/2 day; look at the BIG WALL and network analysis and think about what project(s) could use some focused attention and what networks can be built/strengthened.

³ Limited Ford Island and IRC access supported by PIRO OMI—Jay Aleshire

Consider if we as NMFS in the PIR increased our understanding of how management is informed by and guides climate data and research questions (did we meet our workshop goals). Leadership will provide closing remarks.

- Facilitators: Ann Barlow (HCD), Kate Taylor (DIR), and Stephanie Bennett (DIR)
- Presenters: Phoebe Woodworth-Jefcoats (ESD), Sarah Malloy (DIR), Kitty Simmonds (Council), Charles Litnan (DO)
- Notetakers: Revere Wood (DO)

Day 3, Session 6: Regional Partnerships

April 11, 2024 1pm - 4pm

Location: 1651/1653 and Breakout Rooms

This session will invite external partners who are implementing climate change management efforts to present on their work. Partners who wish to share a lightning talk will be given 2-3 minutes to share about their work's intersections with climate, followed by breakout rooms focused on Data and Information Products, Career and Student Opportunities, and International Collaborations to guide participants to explore opportunities to further relationships and opportunities to learn from and leverage our expertise in support of NMFS goals. Note: this session will be broadcast using WebEx to facilitate broad regional participation.

- Facilitators: Ann Barlow (HCD) and Phoebe Woodworth-Jefcoats (ESD) *with additional facilitators for breakouts*
- Presenters: Lani Watson (OHC), Dan Polhemus (FWS), Leon Geschwind (PIRO), Maya Watson (UH SeaGrant), Jim Potemra (UH)

Logistics:

Date: April 9-11, 2024

Online options for remote staff available upon request.

IRC Rooms - varies by session:

Room A: Ford Island - 1567 - Conf Rm - Common B176 1st Fl

Room 1: Ford Island - 1564 - Conf Rm - Common B176 1st Fl

Room 2: Ford Island - 1377 - Classroom - Common B176 1st Fl

Room 3: Ford Island - 1653 - Training Rm - Common B176 1st Fl

Room 4: Ford Island - 1651 - Computer Tr Lab- Common B176 1st Fl

Steering Committee Members:

Ann Barlow - PIRO

Phoebe Woodworth-Jefcoats - PIFSC

Beth Lumsden - PIFSC

Kate Taylor - PIRO

Mark Fitchett - Council

Josh DeMello - Council

Appendix B—Participant List⁴

NOAA Fisheries and Council Participants, Sessions 1–5

Name and Affiliation

Name and Affiliation	Email Address
Adam Kurtz (PIRO PRD)	adam.kurtz@noaa.gov
Alex Kahl (PIRO SFD)	alex.kahl@noaa.gov
Alex Loomis (OHC Restoration Center)	alexander.loomis@noaa.gov
Alexandria Barkman (PIRO HCD)	alexandria.barkman@noaa.gov
Ann Barlow (PIRO HCD)	ann.barlow@noaa.gov
Amy Vandehey (Council)	amy.vandehey@wpcouncil.org
Ariel Halperin (PIFSC ESD)	ariel.halperin@noaa.gov
Beth Lumsden (PIFSC ESD)	Beth.Lumsden@noaa.gov
Brittany Huntington (PIFSC ESD)	brittany.huntington@noaa.gov
Camryn Allen (PIFSC PSD)	camryn.allen@noaa.gov
Charles Littnan (PIFSC DO)	Charles.Littnan@noaa.gov
Chelsey Young (PIRO PRD)	chelsey.young@Noaa.gov
Chuck Wheeler (PIRO PRD)	chuck.wheeler@noaa.gov
Danielle Jayewardene (PIRO PRD)	Danielle.Jayewardene@noaa.gov
Dawn Golden (PIRO PRD)	dawn.golden@noaa.gov
David O'Brien (PIRO SFD)	David.Obrien@noaa.gov
Erin Reed (PIFSC FRMD)	erin.reed@noaa.gov
Eva Schemmel (PIFSC FRMD)	Eva.Schemmel@noaa.gov
Fatima Sauafea-Le'au (PIRO HCD)	fatima.sauafea-leau@noaa.gov
Frank Parrish (PIFSC ESD)	frank.parrish@noaa.gov
Hannah Barkley (PIFSC HCD)	Hannah.Barkley@noaa.gov
Heather Nelson (PIRO SFD)	heather.nelson@noaa.gov
Hing Ling Chan (PIFSC ESD)	hingling.chan@noaa.gov
Irene Kelly (PIRO PRD)	irene.kelly@noaa.gov
Jared Makaiau (PIRO SFD)	Jared.Makaiau@noaa.gov
Jason Mehlinger (PIRO SFD)	Jason.Mehlinger@noaa.gov
Jeida Ostrowski (PIRO HCD)	Jeida.Ostrowski@noaa.gov
Jennifer Stahl (PIFSC FRMD)	jennifer.stahl@noaa.gov
Jessie Bohlander (PIFSC PSD)	Jessich.bohlander@noaa.gov
Jessica Perelman (PIFSC ESD)	jessica.perelman@noaa.gov
Johanna Wren (PIFSC ESD)	johanna.wren@noaa.gov
Josh Demello (Council)	joshua.demello@wpcouncil.org

⁴ Participants who RSVP'd or participated in the network analysis are listed here. Day-of sign-in sheets were not used.

Joy Smith (PIFSC ESD)	joy.smith@noaa.gov
Justin Suca (PIFSC ESD)	justin.suca@noaa.gov
Kaipo Perez (PIRO HCD)	kaipo.perez@noaa.gov
Kate Taylor (PIRO DIR)	kate.taylor@noaa.gov
Kaylyn McCoy (PIFSC ESD)	kaylyn.mccoy@noaa.gov
Kisei Tanaka (PIFSC ESD)	kisei.tanaka@noaa.gov
Kristen Dahl (PIFSC FRMD)	Kristen.Dahl@noaa.gov
Kristina Dauterman (PIRO PRD)	Kristina.dauterman@noaa.gov
Kristine Buccianeri (PIRO HCD)	kristine.buccianeri@noaa.gov
Lance Smith (PIRO PRD)	lance.smith@noaa.gov
Lani Watson (OHC Restoration Center)	lani.watson@noaa.gov
Lansing Perng (PIFSC ESD)	lansing.perng@noaa.gov
Lynn Rassel (PIRO SFD)	Lynn.Rassel@noaa.gov
Malia Chow (PIRO HCD)	malia.chow@noaa.gov
Marlowe Sabater (PIFSC FRMD)	Marlowe.Sabater@noaa.gov
Mark Fitchett (Council)	mark.fitchett@wpcouncil.org
Mark Mitsuyasu (Council)	mark.mitsuyasu@wpcouncil.org
Marylou Staman (PIFSC PSD)	marylou.staman@noaa.gov
Michelle Barbieri (PIFSC PSD)	Michelle.Barbieri@noaa.gov
Michelle Chow (PIRO DIR)	Michelle.chow@noaa.gov
Michelle McGregor (PIRO SFD)	micelle.mcgregor@noaa.gov
Morgan Short (OHC Restoration Center)	morgan.short@noaa.gov
Phoebe Woodworth-Jefcoats (PIFSC ESD)	phoebe.woodworth-jefcoats@noaa.gov
Pua Borges (PIDO SFD)	pua.borges@noaa.gov
Revere Wood (PIFSC DO)	revere.wood@noaa.gov
Richard Hall (PIRO HCD)	richard.hall@noaa.gov
Rini Ghosh (PIRO SFD)	rini.ghosh@noaa.gov
Robert Ahrens (PIFSC FRMD)	robert.ahrens@noaa.gov
Ryan Rykaczewski (PIFSC ESD)	ryan.rykaczewski@noaa.gov
Sarah Malloy (PIRO DIR)	sarah.malloy@noaa.gov
Savannah Lewis (PIRO SFD)	savannah.lewis@noaa.gov
Sean Hanser (PIRO HCD)	Sean.Hanser@noaa.gov
Shannon Ruseborn (OHC Restoration Center)	shannon.ruseborn@noaa.gov
Stefanie Gutierrez (PIRO DIR)	Stefanie.Gutierrez@noaa.gov
Stephanie Bennett (PIRO DIR)	stephanie.bennett@noaa.gov
Todd Jones (PIFSC FRMD)	todd.jones@noaa.gov
Tom Oliver (PIFSC ESD)	tom.oliver@noaa.gov
Tori Spence (PIRO SFD)	Tori.spence@noaa.gov

Tye Kindinger (PIFSC ESD)
Vikram Khurana (PIFSC PSD)

tye.kindinger@noaa.gov
vikram.khurana@noaa.gov

Session 6 Participants and Affiliation

Name and Affiliation

Name and Affiliation	Email Address
Alex Barkman (PIRO HCD)	Alexandria.Barkman@noaa.gov
Amanda Pollack (FWS Refuges Inventory and Monitoring Program)	amanda_pollack@fws.gov
Ann Barlow (PIRO HCD)	Ann.Barlow@noaa.gov
Arlene Pangelinan (PIRO HCD)	arlene.pangelinan@noaa.gov
Asuka Ishizaki (Council)	asuka.ishizaki@wpcouncil.org
Beth Lumsden (PIFSC ESD)	Beth.Lumsden@noaa.gov
Camryn Allen (PIFSC PSD)	camryn.allen@noaa.gov
Dan Polhemus (FWS)	dan_polhemus@fws.gov
Danielle Jayewardene (PIRO PRD)	Danielle.Jayewardene@noaa.gov
Dawn Golden (PIRO HCD)	dawn.golden@noaa.gov
Domingo Ochavillo (DMWR)	ochavill@gmail.com
Fatima Sauafea-Le'au (PIRO HCD)	fatima.sauafea-leau@noaa.gov
Glenn White (USCG)	glenn.h.white@uscg.mil
Jason Mehlinger (PIRO SFD)	Jason.Mehlinger@noaa.gov
Jeida Ostrowski (PIRO HCD)	jeida.ostrowski@noaa.gov
Jim Potemra (UH)	jimp@hawaii.edu
Joy Smith (PIFSC ESD)	joy.smith@noaa.gov
Kaley Vatalaro (REPI)	vatalaro_kaley@bah.com
Kisei Tanaka (PIFSC ESD)	Kisei.Tanaka@noaa.gov
Kristina Dauterman (PIRO PRD)	Kristina.Dauterman@noaa.gov
Lani Watson (OHC Restoration Center)	Lani.Watson@noaa.gov
Leon Geschwind (NOAA OCAO)	Leon.Geschwind@noaa.gov
Lucia Hossekova (UH)	hossekova@hawaii.edu
Mark Fitchett (Council)	mark.fitchett@wpcouncil.org
Mark Fox (REPI)	Mark.R.Fox@noaa.gov
Marylou Staman (PIFSC PSD)	marylou.staman@noaa.gov
Maya Walton (UH Sea Grant)	waltonm@hawaii.edu
Phoebe Woodworth-Jefcoats (PIFSC ESD)	Phoebe.Woodworth-Jefcoats@noaa.gov
Rachel Ryan (State Department)	ryanrl@state.gov
Sean Hanser (PIRO HCD)	Sean.Hanser@noaa.gov
Shannon Ruseborn (OHC Restoration Center)	Shannon.Ruseborn@noaa.gov
T. Todd Jones (PIFSC FRMD)	Todd.Jones@noaa.gov

Appendix C—List of Acronyms

CNMI	Commonwealth of the Northern Mariana Islands
EBFM	Ecosystem-Based Fisheries Management
ECHO	Ecosystems, Climate, Habitat, and Oceanography
ESA	Endangered Species Act
FRMD	Fisheries Resource and Monitoring Division
FWS	US Fish and Wildlife Service
HALEA	Honolulu Area Laboratory Employees Association
IRC	Inouye Regional Center
MMB	Monument Management Board
MMPA	Marine Mammals Protection Act
MSA	Magnuson Stevens Act
NEPA	National Environmental Protections Act
NESDIS	National Environmental, Satellites, Data, and Information Service
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
ONMS	Office of National Marine Sanctuaries
PIRAP	Pacific Islands Regional Action Plan for climate science
PIFSC	Pacific Islands Fisheries Science Center
PIR	Pacific Islands Region
PIRO	Pacific Islands Regional Office
PREB	Pacific Region Executive Board
RAP	Regional Action Plan for climate science