Approaches to Climate Resilient Marine Fisheries

FishSCORE2030 Workshop

May 7-9, 2025

Gulf of Maine Research Institute

Portland, ME

FishSCORE 2030
Fisheries Strategies for Changing Oceans and Resilient Ecosystems

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

LENFEST OCEAN PROGRAM

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Workshop Agenda

Wednesday, May 7th - Information exchange and mutual learning

Objectives

- Learn from a wide range of processes, assessments, tools, and management strategies currently being used to advance climate resilience marine fisheries systems
- Identify commonalities and differences in approaches to climate resilience, including processes, technical tools, policy contexts, and knowledge systems
- Lay the foundation for collaborative discussion by building mutual understanding of participants' work and experience

8:30 - 9:00 Arrivals and networking

9:00 - 9:30 Welcome and overview of the workshop

- *Logistics*
- *Introductions: name, organization, and where you are joining from*
- *Agenda for the meeting*

9:30 - 9:45 Introduction to the FishSCORE2030 Program

- *Goals of FishSCORE2030*
- *Provide understanding of aligned projects*

9:45 - 10:00 Goals of this workshop

- *How does this workshop integrate with FishSCORE2030?*
- *Expected outcomes and products*

Full group discussion and Q&A

10:00 - 10:20 Morning break: Bingo activity

10:20 - 11:15 Lightning talks: Topic 1 - Frameworks and processes (5 min each)

- *Purpose: Gain an understanding of the variety of frameworks and processes that are used to support resilience, and the contexts in which they are applied*
- *This session is open to other staff and researchers at GMRI*

Full group discussion and Q&A

11:15 - 12:00 Lightning talks: Topic 2 - Science and innovation (5 min each)

- *Purpose: Gain an understanding of the variety of frameworks and processes that are used to support resilience, and the contexts in which they are applied*
- *This session is open to other staff and researchers at GMRI*

Full group discussion and Q&A

12:00 - 1:30 Lunch provided at the Gulf of Maine Research Institute

1:30 - 2:25 Lightning talks: Topic 3 - Assessments and tools (5 min each)

- *Purpose: Gain an understanding of what approaches are being used for climate resilience assessment and planning, including their strengths, limitations and/or context-specific applications*
- *This session is open to other staff and researchers at GMRI*

Full group discussion and Q&A

2:25 - 2:45 **Afternoon break**

2:45 - 3:40 **Lightning talks: Topic 4 - Management contexts (5 min each)**

- *Purpose: Gain an understanding of the types of management approaches that are incorporating considerations of climate impacts and resilience, and the contexts in which they are being applied*
- *This session is open to other staff and researchers at GMRI*

Full group discussion and Q&A

3:40 - 4:15 **Full group discussions and reflections**

- *Purpose: Share reflections on commonalities and differences among the work presented in order to prepare for Day 2's goal of synthesizing key themes and insights from lightning talks to identify cross-cutting challenges and opportunities*

4:15 - 4:30 **Wrap up, review plan for Day 2**

4:30 **Adjourn**

6:00 **Dinner**
Old Port Sea Grill
93 Commercial St
Portland, ME 04101

Thursday, May 8th - Collaborative synthesis and problem solving

Objectives

- Synthesize key themes and insights from lightning talks to identify cross-cutting challenges and opportunities
- Facilitate small-group collaboration to co-identify the major institutional, technical, cultural, or governance barriers to action, and brainstorm potential strategies for addressing them
- Build relationships and shared understanding among participants to support future coordination, with a focus on how strategies vary across fishery systems and contexts

7:45 - 8:00 **Arrivals and networking**

8:00 - 9:00 **Hybrid session: Reflecting on commonalities and differences among regions and fisheries**
Zoom link
Meeting ID: 820 3396 4067, **Passcode**: 031663

- *Examples of work to implement the Climate Risk Framework in Australia and to strengthen the resilience of small-scale fishers in Mozambique*

Full group discussion

9:00 - 9:30 **Morning break and networking session**

9:30 - 10:40 Resilience panel sessions and participatory activities

- *Purpose: Reflect on insights from the lightning talks on the four key resilience themes and identify cross-cutting topics*
  - *The session aims to build a shared understanding of what resilience means in practice across diverse fisheries, and to spark dialogue around promising approaches, gaps, and ideas for collective action*
- *This session is open to other staff and researchers at GMRI*

Full group discussion and Q&A

10:40 - 11:45 Small group discussions on resilience

- *Purpose: Discuss the attributes that confer resilience in fishery systems, and how these differ among different fishery types and regions*

11:45 - 1:00 Lunch provided at the Gulf of Maine Research Institute

1:00 - 2:30 Breakout groups

- Purpose: Work in small groups to understand:
  - Various strategies for or pathways to climate-resilient fisheries
  - Lessons learned / best practices for co-developing resilience assessments and strategies
  - Barriers/challenges to the effective implementation of climate resilience measures
  - Policy and management strategies for advancing climate resilience strategies

2:30 - 2:45 Afternoon break

2:45 - 3:45 Report out from breakout groups

3:45 - 4:00 Wrap up, reflect on topics to revisit, and review plan for Day 3

4:00 Adjourn

5:25 Meet at Casco Bay Ferry Terminal
56 Commercial Street
Portland, Maine 04101

5:25 Meet at Casco Bay Ferry Terminal
56 Commercial Street
Portland, Maine 04101

5:45 - 8:45 Casco Bay Cruise*

- *Casco Bay Cruise with pizza dinner provided.*
- *There are inside and outside areas on the boat, but please bring warm clothes to ensure your comfort.*

**Please note that the date of the Casco Bay Cruise was moved to occur on Day 2 of the workshop. If weather conditions do not permit the cruise, we will gather as a group for pizza dinner across the street at Hobsons Landing.*

Friday, May 9th - Road-mapping and action planning

Objectives

- Explore how to bridge the gap between resilience assessments and implementation
- Co-develop a roadmap that includes key considerations, enabling conditions, and next steps to help move resilience planning into management practice
- Capture key lessons, insights, and shared priorities from across the workshop to inform future synthesis

8:30 - 9:00 Arrivals and networking

9:00 - 9:10 Welcome and overview of the day

- *Purpose: Review agenda, goals for the day and any housekeeping items*

9:10 - 10:10 Setting priorities, defining products, and next steps

- *Purpose: Identify shared priorities, potential products from the workshop, and concrete next steps to guide continued collaboration*

10:10 - 10:30 Morning break

10:30 - 12:00 Working towards products and outcomes (part I)

- *Purpose: Collaboratively work in small groups to synthesize the outcomes of this workshop*

12:00 - 1:00 Lunch provided at the Gulf of Maine Research Institute

1:00 - 2:30 Working towards priorities and outcomes (part II)

- *Purpose: Collaboratively work in small groups to synthesize the outcomes of this workshop*

2:30 - 3:30 Report back from small groups

- *Revisit priorities, next steps, and potential synthesis products based on small-group discussions*

3:30 - 4:00 Closing remarks and wrap up

- *Reflect on key takeaways from the workshop, celebrate progress, and outline what's next for the network and this group*

4:00 Adjourn

LIGHTNING TALKS

Frameworks and Processes

Wednesday, May 7th

10:30 - 11:15 AM

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Topic 1 - Frameworks and Processess

NOAA Changing Ecosystems and Fisheries Initiative (CEFI)

Roger Griffis, National Oceanic and Atmospheric Administration

The National Oceanic and Atmospheric Administration (NOAA) has launched implementation of the Changing Ecosystems and Fisheries Initiative (CEFI) to provide fisheries managers and fishing dependent communities with actionable information to prepare for and respond to rapidly changing marine ecosystems. The Initiative is building a nation-wide Decision Support System (System) that links climate, ocean and ecosystem information to provide robust future scenarios and advice for climate-informed decision making. The System is composed of four components to ensure operational delivery of products and services across multiple time and spatial scales. Build out the System is underway including regional outlooks of future ocean conditions (seasonal, interannual 1-10 yrs, multi-decadal), and regional decision support teams to provide decision makers with early warnings, tools and strategies to increase resilience of marine resources and the communities that depend on them.

FAO's normative and field work in support of climate-resilient fisheries

Xuechan Ma, Food and Agriculture Organization

FAO is actively supporting countries in developing and updating climate-resilient fisheries management plans, as well as integrating fisheries into climate change adaptation plans and strategies. This presentation aims to share FAO's available policy frameworks and tools, highlight the processes supported by FAO, and invite feedback from the workshop group on potential synergies with other relevant efforts to build climate-resilient fisheries.

At the core of FAO's climate work is the Adaptation Toolbox, which compiles a comprehensive set of adaptation options for fisheries and aquaculture and is organized into three broad areas of intervention: institutional adaptation, livelihood adaptation, and measures for risk reduction and management. One of the key rationales underlying the Adaptation Toolbox is that an effective fisheries management system is often the best adaptation and the first foundation of climate-resilient fisheries. Integrating climate change adaptation into national and local fisheries management and the use of climate data and information in decision-making are a critical element of climate-resilient fisheries management. Available FAO policy frameworks and tools include, for example, the ecosystem approach to fisheries (EAF) planning tool, and guidance on good practices to climate proof the fisheries management cycle. FAO is translating these into adaptation action on the ground, including incorporating climate change considerations into the EAF management plans supported by the EAF-Nansen Programme. Also, in terms of processes, climate change is often included on the agenda of the FAO Committee on Fisheries (COFI), which is the sole global inter-governmental forum addressing major issues related to aquatic foods; there is also ongoing effort to include climate change into the questionnaires for implementing the FAO Code of Conduct for Responsible Fisheries (CCRF). Another crucial aspect of FAO's work is supporting the integration of fisheries into climate change adaptation planning and implementation. To operationalize the Adaptation Toolbox, FAO has developed a range of science-based frameworks and tools, such as early adaptation frameworks, adaptation policy cycle, and the ClimeFish adaptation planning tool. Through field projects, FAO is supporting countries in formulating fisheries sectoral adaptation plans and including fisheries into broader national climate strategies. At the global level, FAO is promoting inclusion of fisheries in international climate policymaking

processes such as the United Nations Framework Convention on Climate Change (UNFCCC), and has (co-)developed guidelines on integrating fisheries into the Nationally Determined Contributions (NDCs) and National Adaptation Plans (NAPs).

Ecosystem approaches to (and) climate resilient fisheries in Canada

Alida Bundy, Fisheries and Oceans Canada

Fisheries are complex, social-ecological systems, that require holistic, transdisciplinary ecosystem-based approaches for sustainable management, particularly in the context of climate change. Canada is exploring a number of ways to ensure that its fisheries are resilient and adaptable to a changing climate, ranging from oceanographic and climate modelling and prediction, including environmental variables in assessment models, to the development of more holistic frameworks and strategies. Some of these efforts, and how they are linked, will be described in this presentation.

An RFMO approach to climate-resilient fisheries

Daniel Crear, Inter-American Tropical Tuna Commission

The Inter-American Tropical Tuna Commission (IATTC) manages tuna and tuna-like species along the Eastern Pacific Ocean. At IATTC's 101 st annual meeting in August 2023 a resolution on climate change was adopted that recognized the impacts climate change is having on target and non-target species, as well as the fisheries, and that these impacts could affect the long-term conservation and sustainability of fish stocks covered by the Antigua Convention. Given the adoption of this resolution, IATTC staff reviewed various tools and frameworks, that other countries and international organizations developed to promote climate-resilient fisheries. Based on this review, a proposed climate change workplan for IATTC was developed by the staff, which incorporated key components, workshops, and a timeline that would provide the backbone to help IATTC become more climate resilient. In early 2025, IATTC had its first workshop on climate change where staff, participants from member countries, other RFMOs, NGOs, and external experts came together to present and discuss the importance and preliminary staff recommendations of the main goal, scope, and framework of IATTC's proposed climate change workplan. As a result of the 3-day virtual workshop, the IATTC staff revised their recommendations for the Commission. These recommendations will be presented to IATTC scientific committee and will hopefully be taken up for adoption by the Commission at its 103 rd annual meeting in September 2025.

Understanding the 'social' in social-ecological: progress made in the southern Benguela, South Africa

Louise Gammage, University of Cape Town

Resilience thinking in marine social-ecological systems demands more than ecological metrics; it also requires clear insight into the social fabrics that make adaptation possible. Integrated approaches such as the ecosystem approach to fisheries management and marine spatial planning are widely endorsed yet remain hard to realise because human dimensions are seldom well understood. I share insights from tools developed for and with small-scale fishers in South Africa's southern Benguela - contributing to our growing 'toolbox' for whole-of-system fisheries management. These have the potential to contribute to equipping fishers to proactively respond to change whilst providing decision-makers such as managers a clearer view of social vulnerability, opportunity and leverage points. Collectively, these methods demonstrate how inter- and transdisciplinary research can convert abstract resilience theory into practical decision aids that is still grounded in community-based research whilst at the same time transcending management scales.

Climate Change Impacts on South Greenland Coastal Communities through Indigenous Perspectives

Jay Kim, Gulf of Maine Research Institute

The Arctic is warming at a rate 4 times faster than the global average, and is particularly vulnerable to climate change effects. South Greenland faces many of the same climate change impacts as other arctic coastal systems, which challenge local economies, food availability, and indigenous way of life. In collaboration with indigenous research partners at Innovation South Greenland including local guides, sheep farmers, hunters, and fishers, we conducted six semi-structured interviews with hunters and fishermen of various backgrounds from two key locations in South Greenland, Narsaq and Qaqortoq during the summer of 2023. This exploratory study aimed to examine the impacts of climate change on fishing and hunting in regard to self-sufficiency, which we define as "the ability to sustain oneself and livelihood, including but not limited to the ability to earn income, the ability to access food, and the ability to practice culture." Preliminary results show that regulations and Danish colonization were some of the biggest barriers to climate change adaptations by hunters and fishermen. Food, market, and opportunity accessibility was also identified as interests for further development. Education was identified as a crucial tool for increasing resilience. Reciprocity and inclusion of indigenous voices, as well as use of local resources and services when conducting research on indigenous land were identified as key steps in knowledge co-production.

This research highlights various steps toward co-production of indigenous knowledge across multiple cultural and international barriers. We hope that this research can contribute to the future co-production of indigenous knowledge and research.

LIGHTNING TALKS

Science and Innovation

Wednesday, May 7th

11:15 - 12:00 PM

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Topic 2 - Science and Innovation

Understanding social resilience in the southern New England lobster fishery

Katherine Maltby, Gulf of Maine Research Institute

The southern New England American lobster fishery has experienced substantial declines in lobster abundance since the late 1990s, resulting in profound social, cultural, and economic impacts on individuals and communities. Through interviews with fishery participants and an analysis of news articles, we examined the social resilience of lobstermen to understand how they have responded over time and what shaped their choices and decisions. Our findings highlight a diversity of individual and collective responses, ranging from those focused on livelihood adjustments to those more focused on agency and collective action, of which have been shaped by many multi- and cross-scale factors from individual to institutional levels. We reflect on the approach and frameworks used to understand resilience within our work, as well as highlight potential priorities for research and management in the region going forwards.

Bridging theory and practice: empirically testing resilience frameworks in coastal systems

Xochitl Elias, University of Vigo

Resilience theory for marine social-ecological systems has advanced significantly, offering frameworks that integrate ecological and social dimensions. Yet, as climate change increasingly impacts coastal communities, e.g. small-scale fisheries, it is critical to empirically test these frameworks to inform real-world decision-making. In our lab we examined two key resilience concepts, adaptive capacity and adaptation pathway, through case studies in two climate change hotspots (Mexico and Japan). We identify patterns in how adaptive capacity influences community responses, particularly under varying levels of climate stress. Our findings highlight the importance of multi-level interactions, especially between governance structures and individual actors, in shaping resilience outcomes. By grounding theory in empirical observation, we reveal limitations in current frameworks and identify opportunities to refine them. This iterative process helps ensure that resilience theory more accurately reflects the complex, context-dependent dynamics of climate change adaptation.

Climate-driven species shifts, fisheries responses and the role of MPAs in the Spanish Mediterranean

Marina Sanz-Martín, Instituto Español de Oceanografía (IEO)

The Mediterranean Sea is among the most vulnerable ecosystems globally, facing intense cumulative pressures and high climate risk. The Mediterranean MPA network present high climate exposure, with distinct differences between the eastern and western basins. Long-term monitoring of demersal communities in the Spanish Mediterranean reveals a trend of species contrary to a northward expectation, due to the environmental heterogeneity of the region. Landings of bottom-trawl fisheries appear linked to seasonal climate variations, while small-scale fisheries (SSF) landings respond to warming trends. Marine Protected Areas (MPAs) in some regions of the Spanish Mediterranean show varying effectiveness in SSF landing, with better outcomes where areas were designated with SSF fishing interests in mind.

The Status, Progress, and Challenges of the UN Ocean Decade project "Seafood Free"
Wenbin Zhu, Zhejiang Ocean University

Recalling the LYC stock fluctuations, over-exploitation was a typical example of the commons of tragedy, which led to the collapse during late 1970s through 1980s. Study found that the population dropped down to below a critical level due to the overfishing of spawning stock in wintering ground. Allee effect threshold is determined by the segmented regression to around 40000 tons in catch per year. To reach the critical level is the pioneering study of Seafood Free. The seeding and larval system of LYC (gold and low-temperature seeding) was selected to experience low temperature period, and to condition the wild environment for a high survival. Long time series of monitoring and assessment of LYC was conducted. In combination with the historical data, the study showed overfishing and winter SST were crucial factors to control collapse or not. The tag and recapture experiment was used for evaluating the effect of stock enhancement,and the recapture rate was 0.2% for 18cm released size, and 0.02% for 10cm released size. The released strategy from small to large size could significantly increase the survival rate of LYC. To sum up, Seafood Free investigated the interaction and adaption between different life stages and natural environments, and will further enhance the collaborative study with all partners.

Coral reef ecosystems under climate change: a biodiversity hotspot
Joseph Nyingi Kamau, Kenya Marine Fisheries Research Institute

Coral reefs are sensitive indicators of environmental changes, provide crucial ecosystem services, protect coastlines, and play a significant role in global climate change mitigation. Preserving coral reefs is vital not only for ocean health but also for enhancing the resilience of coastal communities and the planet against climate change. Due to their sensitivity to sea temperature and ocean acidity, coral reefs function as early warning systems for climate change. Monitoring the health of these reefs offers valuable insights into ocean conditions and climate-related risks. They are highly biodiverse ecosystems, supporting key marine species that are important for food security and livelihoods. Evaluating the vulnerability of coral reefs to climate change is critical for understanding the impacts on ecosystems and the services they provide. Healthy reefs act as natural barriers against coastal erosion and storms, benefiting local communities. Moreover, they sequester and store carbon dioxide, contributing to climate change mitigation. Coral reefs also support tourism and local economies, making it essential to assess their vulnerability to plan for potential impacts on these industries. These assessments inform adaptation and conservation strategies, as the health of coral reefs is linked to global climate feedback loops; when they experience bleaching and die due to rising sea temperatures, it affects the carbon balance.

LIGHTNING TALKS

Assessments and Tools

Wednesday, May 7th

1:30 - 2:25 PM

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Topic 3 - Assessments and Tools

A global synthesis of climate vulnerability assessments for fisheries: What we have learned and where we are going

Yunzhou Li, Stony Brook University

Climate vulnerability assessments (CVAs) have become a vital tool for identifying species, regions, and stakeholder groups most at risk from climate change and for informing effective and targeted strategies to support fisheries adaptation. Since the first application to marine fisheries in 2009, their use has expanded significantly—yet questions remain about how effectively they have been implemented, what insights have emerged, and what challenges persist. This presentation provides a global overview of current CVA practices in marine fisheries, with a focus on the diverse methodological approaches developed across various social-ecological contexts. It will also present the geographical distribution of CVA efforts, highlighting key areas of progress and persistent gaps. Finally, the talk will outline new opportunities that could advance more meaningful CVA practices toward climate-resilient fisheries.

Climate Resilient Fisheries planning tool: A case study with Mujeres del Mar de Cortés in Bahía de Kino, Sonora

Niza Contreras, University of California, Santa Cruz

For my master's in Coastal Science and Policy, I partnered with the Mexican organization Comunidad y Biodiversidad (COBI) to analyze community-based fisheries solutions through a climate resilience lens. As a component of my work, I conducted a workshop in April 2023 with members of a women-led fishing cooperative from Bahía de Kino, Sonora in order to apply the Climate-Resilient Fisheries (CRF) Planning Tool developed by the SNAPP CRF Working Group. This workshop was a valuable case study in understanding the utility of the CRF Planning Tool for small-scale fishery contexts. Overall, the participants appreciated the experience of completing the tool because it highlighted their existing successes and strengths while also outlining potential next steps to address ongoing challenges. However, the preparation required in advance of the workshop (e.g., translating materials) and the complexity of the tool itself revealed the limitations of the tool's accessibility to non-English-speaking and non-scientific audiences. By receiving feedback from the participants on their experiences with the CRF Planning Tool, and reflecting on my own experience planning for and facilitating the workshop, I have been able to provide insight and recommendations on how the tool can be modified to better suit the unique contexts of small-scale fisheries.

Evaluating local-level Resilience to inform Climate Adaptation Strategies: lessons learned from two Spanish Fisheries

Marta Albo-Puigserver, Instituto Español de Oceanografía (IEO)

To co-develop recommendations for the Spanish Climate Adaptation Plan, we conducted two workshops with scientific community and four workshops with small-scale fishing communities in the Balearic Islands and Asturias. The primary goal was to identify barriers limiting fishing activities, assess resilience across ecological, socioeconomic, and governance dimensions, and propose local management measures to enhance resilience Although climate change was not a major concern for all communities, barriers such as over-regulation, bureaucracy, and lack of generational turnover were identified as key factors affecting adaptive capacity. Despite regional differences, socio-economic and

governance resilience attributes were highlighted as the most urgent areas for action. While effective communication between the scientific and fishing communities was challenging, participants responded positively to the co-production of knowledge in these workshops..

Vulnerability assessment, idiosyncrasy and scalability of adaptations in Timor-Leste fishing communities

David Mills, WorldFish

The GEF Ikan Adapt project seeks to build resilience to climate change among small-scale fisheries and aquaculture communities in Timor-Leste. The project focuses on co-design and pilot implementation of locally and externally led adaptation actions with 20 communities across 7 of the 13 municipalities in the country. Building on available physical vulnerability analysis, at the municipal level we employed the EU INFORM climate risk framework, modified in format to focus on livelihood vulnerability. At the community level, a toolbox of participatory rural appraisal approaches was utilized to understand key livelihood assets for women and men, and their vulnerability. This led to co-design workshops and implementation processes tailored to adaptations. The approach raised significant questions about the nexus between the effectiveness of bespoke solutions and scalability – examples will be used to illustrate these challenges.

Sea Change Australia: Co-developing options to adapt to a changing climate for fisheries and aquaculture in Australia

Julia Santana-Garcon, University of Tasmania

Climate change poses a growing threat to fisheries and aquaculture in Australia. Fisheries and aquaculture stakeholders across Australia need relevant climate information tailored to their changing needs. They also need ways to share how they are currently dealing with climate change and how they could improve their responses.

The national project 'Sea Change Australia' brings together fishers, aquaculture producers, industry, managers, and researchers to co-develop climate-resilient options for strong and healthy fisheries and aquaculture sectors in Australia. Specifically, this initiative aims to: (1) Facilitate access to climate relevant information and improve knowledge exchange between researchers, managers, and industry. (2) Understand the seafood sector's needs and knowledge gaps to support existing and potential climate adaptation efforts. And, (3) co-develop practical, localised options for climate adaptation, while supporting communities of practice and highlighting success stories, to strengthen the health and resilience of fisheries and aquaculture sectors in Australia.

Assessing and planning for climate resilience in Fijian fishing communities

Katherine Mills, Gulf of Maine Research Institute

Small-scale marine fisheries around the world are critical sources of food and livelihoods for millions of people, and many of them are threatened by myriad impacts associated with climate change. As a small island nation, Fijian fisheries are on the frontline of experiencing and adapting to climate impacts. Working with three small-scale, Indigenous fishing communities in Fiji, we have adapted the Climate Resilient Fisheries Planning Tool to support resilience assessment and planning. Using participatory community workshops, key informant interviews, and focus group discussions, this work has identified: (1) existing and future vulnerabilities to climate impacts; (2) features of the fisheries and communities that support or constrain resilience; and (3) strategies for enhancing climate resilience in these fisheries. Results are yielding forward-looking recommendations that can be applied within the communities and aided by complementary measures through regional and national authorities.

LIGHTNING TALKS

Management Contexts

Wednesday, May 7th

2:35 - 3:40 PM

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Topic 4 - Management Contexts

Onramps for Climate and Ecosystem Information in the U.S. Federal Fisheries Science to Management Pipeline

Jocelyn Runnebaum, The Nature Conservancy - Maine

Climate change is already and will continue to have far-reaching and multiscale impacts on commercially and recreationally relevant fisheries, fisheries management, and fishing communities. In response, calls for fisheries to be climate-ready and climate-resilient have become almost ubiquitous across spheres of marine management. It has proven difficult to define and conceptualize what climate-ready fisheries is and how it can and should differ from the current management regime.

Many current proposals to operationalize climate readiness focus on specific aspects of stock assessments. However, because climate manifests in complex and intersectional ways across marine social-ecological systems, climate-ready fisheries necessitate a comprehensive transformation of fisheries governance. This paper proposes initial steps towards that transformation by:

1. Mapping the current U.S. federal fisheries management regime to identify onramps for climate informed decision making; and
2. Proposing examples of specific actions at each onramp to utilize climate information or other similar interventions necessary for climate readiness.

Our recommendations also identify specific onramps, or locations, in the fisheries science to management pipeline information gaps exist and justice-based approaches for helping fisheries management adapt to climate change.

Linking Risk Signals to Action: A Framework for Adaptive Fisheries Management

Leigh Fletcher, Ocean Systems Lab

This presentation describes the development and application of a Risk Assessment Framework (RAF) designed to support the Caribbean Fishery Management Council (CFMC) in implementing Ecosystem-Based Fisheries Management (EBFM) in the U.S. Caribbean. The RAF is a scorecard-based tool that quantifies relative risk to fisheries management outcomes arising from changes in ecological conditions, socio-economic pressures, and habitat degradation. Risks were selected for evaluation based on threats and drivers identified through the Council's conceptual modeling of the U.S. Caribbean marine ecosystem. Primary threats and drivers were associated with data-driven indicators that could be evaluated for change over time using datasets that are included in the U.S. Caribbean Ecosystem Status Report (ESR) currently under development by NOAA and other publicly available sources. The indicators are sorted and scored in four categories: Ecosystem-Level Function, Distortive Pressure Sensitivity, Socio-Economic Sensitivity, and Coral Reef Sensitivity. An Aggregate Risk Score is calculated using categorical scores and score adjustments for data gaps. Scores signal increasing, decreasing or consistent risk to management achieving its strategic objectives. The RAF also contains a series of relational tables that identify which risk categories are likely to impact the achievement of each of the Council's 22 strategic objectives, and which management tools might be most suited for mitigating different types of risk. These tables enable the Council to translate the risk signals to management action by incorporating risk scores into decision-making processes. Funding for the development of the RAF was provided under NOAA NMFS grant NA20NMF441008.

Assessing climate readiness: the NPFMC experience
Bill Tweit, Washington State Department of Fish and Wildlife

Prior to developing a roadmap and workplan for improving NPFMC climate resilience, the NPFMC assembled a task force to assess the current state of NPFMC readiness for confronting climate challenges. The report was instrumental in developing a work plan and also affirmed the importance of the tools currently under development and implementation. The results of the readiness assessment is presented, along with an overview of some of the tools currently being implemented and refined.

Fisheries Management in a Changing Ocean
Ferran Bustos, Institut Català de Recerca per a la Governança del Mar (ICATMAR)

The rise in ocean temperatures is altering species composition and distribution, affecting fisheries and the socioeconomic fabric that depends on them. The effects of climate change on the Mediterranean Sea, a semi-enclosed basin, are particularly severe. The Catalan Institute of Research for the Governance of the Sea (ICATMAR) is a collaborative body jointly established by the Catalan Regional Government and the Spanish National Research Council (CSIC). It was created to provide high-quality scientific advice to the administration on issues related to the marine environment in Catalonia. Since 2019, ICATMAR has been conducting continuous and comprehensive monitoring of fishery resources along the Catalan coast, and since 2023, it has expanded its efforts to include oceanographic monitoring and forecasting. ICATMAR provides critical data to detect ecological changes such as shifts in species distribution and abundance, as well as the emergence of invasive species. It also provides long-term data series to inform administration's decisions and support science-based fisheries management aimed at building sustainable and resilient fisheries in the face of climate change.

Co-management Models for Fisheries and Ocean Health: CO-MANAGEMENT2030+
Layla Osman, NGO Conectar para Conservar (CPC)

Small-scale fisheries are globally important for food security, nutrition, poverty eradication, and other contributors to sustainable livelihoods for millions of people around the world, and for maintaining healthy ecosystems for a sustainable future. Fisheries management is not simple, as it requires data and science, and collaboration between those who fish, those who research, and those who regulate and manage fisheries. In some situations, fisheries co-management models that bring together people, science, and a strong governance strategy are proving effective for securing marine resources and maintaining the health and function of marine ecosystems upon which everything depends. Fishing is not just fish–it is also families, livelihoods, culture and our future. People are the agents of change and co-management is an important part of the solution that the world needs. Co-management avoids many of the shortcomings of top-down approaches, for example failing to align the scale of management to that of more localized ecosystem processes, or inadequate engagement and support of local resource users that account for local needs.

CO-MANAGEMENT2030+ (CM30) was recently endorsed as an Action of the UN Decade of Ocean Science for Sustainable Development 2021-2030 under the Decade Programme "Fisheries Strategies for changing oceans and ecosystems by 2030" (FishSCORE;

https://oceandecade.org/es/actions/co-management-models-for-fisheries-ocean-health/). CM30 will work to enhance fishers and other stakeholders' understanding and engagement with models of co-management, providing capacity building and knowledge exchange, in support of gender equity, participation and the effective climate resilient management of ocean resources. Our strategies are: 1) Putting people at the center facilitating co-management learning networks; 2) Supporting the creation of co-management marine refuges, 3) Co-designing technology solutions for fishing community co-management empowerment; and 4) Supporting, implementing and developing co-management public policies.

Toward U.S. Climate-Ready Fisheries: A roadmap for our nation's fisheries and fishing communities, including recommendations for achieving fair and equitable quota allocation policies

Matthew Seely, Environmental Defense Fund

Climate change is fundamentally altering ocean ecosystems. With warming waters, ocean acidification, sea level rise and more, U.S. fisheries — and the communities that depend on them — must adapt to new ecological, social, management and economic challenges. To ensure our fisheries and fishing communities continue to thrive in changing conditions, it is critical to integrate climate change considerations into science and management practices to promote resilience — that is, work toward "climate-ready" fisheries. EDF has identified eight comprehensive actions to achieve climate-ready fisheries in the U.S., and we offer national- and regional-level recommendations under each action that can be tailored to specific issues and contexts. One specific challenge for regional managers will be to ensure quota allocations remain fair and equitable under changing ocean conditions. Despite this, there is little guidance on best practices for adapting allocation policies to climate change. We synthesize the diverse allocation policies used to manage U.S. federal fisheries (491 stocks, 42 management plans, 8 regions) and evaluate the vulnerability of these policies to climate change. Ultimately, we identify eight best practices for improving the ability for allocation policies to advance their fairness and equity goals under climate change.

HYBRID SESSION

Regional Commonalities and Differences

Thursday, May 8th

8:00 - 9:00 AM

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

FishSCORE 2030
Fisheries Strategies for Changing Oceans and Resilient Ecosystems

LENFEST OCEAN PROGRAM

Promoting resilience on the Mozambique's marine fisheries

Jorge Mafuca, Mozambique Oceanographic Institute

Fisheries are recognized as important in Mozambique, yet they are increasingly threatened by over-exploitation and climate change. In Mozambique there is a heavy reliance on marine fisheries. From a food security and local economy perspective, the critical sector is the artisanal fisheries which comprises over 90% of the total landings and provides food and livelihood for millions of people, particularly in the coastal zone. Regarding economic value and earning foreign currency, the most valuable industrial / semi-industrial fisheries are the shallow-water shrimp, the deep-water crustacean and the rocky bottom demersal. The current stock assessment for these sectors indicates that the main stock species are fully- or over-exploited. Limited data are available for the artisanal fishery, but it is likely that the same status applies to this sector. Globally, well-managed fisheries have been among the most resilient to climate change - overall, fisheries best practices confer ecological resilience by providing a portfolio of options to fishers and a buffer against losing target stock. Ideally, the best practices include scientifically informed catch limits, accountability measures, regional flexibility in policy practices, protection of essential fish habitat (Marine Protected Areas), and effective monitoring, control and surveillance. Mozambique has a relatively well-managed industrial/semi-industrial fishery. However, the artisanal fishery, due to its spatial scattering, multi-gear and multi-species nature, presents a huge challenge. Facing the future with climate change will require increased attention to reduce stressors to the social–ecological systems in which fisheries exist and persist.

Integrating Climate Change into Fisheries Management: A Risk-Based Approach

Dan Corrie, Australian Fisheries Management Authority

Climate change is rapidly reshaping Australia's marine ecosystems, posing significant challenges for fisheries management. To ensure the long-term sustainability of Commonwealth fisheries, AFMA has developed and is trialling a Climate Risk Framework. This presentation will explore the impacts of climate change on marine ecosystems and fisheries, highlighting the urgent need for adaptive management strategies. We will delve into the development and implementation of AFMA's Climate Risk Framework, which employs a risk-based approach to assess climate-related threats and inform management decisions. By integrating climate considerations into existing management practices, AFMA aims to build resilience and adaptability into Commonwealth fisheries. This presentation will explore the framework's application, including case studies and lessons learned. We will discuss the importance of collaboration between scientists, managers, and industry stakeholders in developing effective climate adaptation strategies. By sharing our experiences and insights, we hope to foster a broader understanding of the challenges and opportunities presented by climate change and inspire innovative solutions for the future of our fisheries.

Futures of Seafood

Beth Fulton, CSIRO

Australia's oceans are increasingly crowded spaces and ones undergoing some steep changes due to climate change. Given this, and the many market, economic, technological and other challenges facing Australia's seafood producers what could the future hold?

In 2024 a co-designed, multi-disciplinary and collaborative study began to map, model and describe Australia's ocean use from 2000-2040, to see what seafood production's place in that picture is and to see if this crowded space is reaching a tipping point. The simple answer is, it's complicated. Climate change is making a difficult situation much harder, and the picture is different depending on where you are around Australia. However, there is hope, especially if Australian regulators and communities can take a more integrated and long-term view to how they manage the many different parts of Australia's marine socioecological systems.

BioSketches

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

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Alida Bundy
Fisheries and Oceans Canada

Alida Bundy is a 1st generation Canadian, having moved to Vancouver from the UK to study for her PhD in 1993. She fell in love with a Canadian, then with Canada, moved to Nova Scotia and stayed. She is a research scientist with Fisheries and Oceans Canada at the Bedford Institute of Oceanography, Canada. Her research focuses on providing ecosystem-based science advice for sustainable oceans management. Alida uses interdisciplinary approaches to further understanding of how marine socio-ecological systems respond to change and has developed tools to aid this research. Currently she is leading the Maritimes Region EBM Initiative. In her spare time, Alida loves to swim (year round), cycle, hike (with her Coonhound), kayak, garden and generally be outdoors.

Allison Shields
Environmental Defense Fund

Allison Shields is Senior Manager for U.S. Fisheries & Ocean Policy at Environmental Defense Fund (EDF). Allison works collaboratively with internal and external partners to develop and advocate for climate-ready solutions for the U.S. fishery management system. Her work includes advocacy before the regional fishery management councils, NOAA Fisheries, and Congress. She also works with members of the fishing industry to build their capacity through trainings and partnerships. Prior to joining EDF in 2023, Allison worked for Conservation Law Foundation where she focused on sustainable management of New England's groundfish fishery, habitat protection, and ocean planning. Allison holds a B.A. in Marine Science from Boston University.

Bill Tweit
North Pacific Fisheries Management Council

I have served as the Washington state representative on the NPFMC since 2005, and as Vice Chair of the Council for about a decade. For me, serving on the NPFMC is the capstone of a career in fisheries that began in 1975, in the aftermath of the famous Boldt decision that clearly established the treaty rights of many Northwest Indian tribes. I was a salmon biologist for one of those tribes until 1988 when came to work for the state of Washington. Over the years, I changed roles to become the agencies policy lead for Columbia River issues and designee on the NPFMC. My wife and I live in Olympia, WA where we enjoy birding, the local symphony orchestra, travel, and family time.

Ben Cotton
Gulf of Maine Research Institute

Ben Cotton (M.S. Economics) is a research associate at the Gulf of Maine Research Institute Coastal and Marine Economics Lab. He is deeply interested in understanding market dynamics of marine products and in how people perceive and interact with Maine's coastal and marine environments. He is currently supporting multiple projects, including working waterfront resiliency, fish price volatilities due to both human and environmental caused stressors, and socioeconomic analyses of marine energy resources in the Gulf of Maine.

Beth Fulton
CSIRO

Dr Beth Fulton is a Chief Research Scientist with CSIRO where she helps lead work integrated oceans stewardship and the blue economy. In shaping the strategic direction for CSIRO's research in this area, she is building off nearly 30 years of work developing various system modelling tools for looking at marine ecosystems, sustainability and climate adaptation. Beth is also an Adjunct Professor and Deputy Director at the Centre of Marine Socioecology, a centre focuses on working collaboratively to find transdisciplinary, equitable and sustainable solutions to the problems facing coasts and oceans

Carly Lovas
Gulf of Maine Research Institute

Carly Lovas is a research associate working under Dr. Kathy Mills in the Integrated Systems Ecology group at the Gulf of Maine Research Institute. Her work primarily consists of understanding past and future species distribution shifts along the Northeast United States, as well as assessing the social and governance structures that dictate access to certain fisheries. Carly is primarily interested in localizing and contextualizing these large scale, long term changes to inform fisheries management decisions and bolster coastal community resilience.

Claire Enterline
Gulf of Maine Research Institute

Claire Enterline is a marine ecologist and program manager who coordinates FishSCORE2030, a United Nations Ocean Decade Programme that is co-developing knowledge and tools for assessing and operationalizing climate resilience in diverse fisheries. She facilitates and participates in a broad range of activities to implement FishSCORE2030, including supporting communications, facilitating on-the-ground climate-resilient fisheries projects, and contributing to implementation strategy development. Beyond the FishSCORE2030 programme, her research explores the impacts of climate change on coastal and marine habitats, and marine species use of these habitats. Her work has focused on characterizing the marine benthic environment of the Gulf of Maine, assessing blue carbon stocks in marshes and eelgrass beds, developing habitat restoration practices to support ecosystem health, and understanding shifting habitat use by marine species under climate change.

Daniel Corrie
Australian Fisheries Management Authority

Dan Corrie is a Senior Manager at the Australian Fisheries Management Authority (AFMA), where he focuses on Climate Adaptation & Strategic Reform. In his role, Dan ensures information about climate change impacts are integrated in AFMA's decision making by collaborating with managers, fishers, and scientists. Based in the regional fishing town of Lakes Entrance, Victoria, he works to identify and establish best-practice science and management processes. Dan holds degrees in Marine Biology, Natural Resource Management, and Public Administration, and has been with AFMA for 13 years, holding various management and strategy roles.

Daniel Crear
Inter-American Tropical Tuna Commission

Dr. Dan Crear is the Senior Quantitative Vulnerable Species Ecologist in the Ecosystems and Bycatch Program at the Inter-American Tropical Tuna Commission. Prior to IATTC, his work focused on studying marine species distributions and movements in relation to anthropogenic factors, such as climate change. While working with NOAA, Dan developed habitat models for vulnerable species to assess and modify large, closed areas designed to reduce bycatch in highly migratory species fisheries. Dan's current work uses fisheries, environmental, and telemetry data with quantitative methods to understand the relationship between species and their environment to help reduce bycatch-fisheries interactions. He is also interested in predicting how a changing climate may alter those interactions, as well as to develop climate-resilient fisheries and adaptation plans. Dan values conducting applied science that can be directly integrated into fisheries management and emphasizes the importance of properly communicating science and engaging to various stakeholders in participatory approaches.

David Mills
WorldFish

I am a Principal Scientist with WorldFish, Research Lead for the WorldFish Timor-Leste Country Program, and lead the WorldFIsh Production Systems Science Team globally. My PhD is fisheries ecology from the University of Tasmania. I have been with WorldFish for 19 years, conducting diverse fisheries, ecological and livelihood research in west Africa, south east Asia and the Pacific. I was a principal investigator on the recent Illuminating Hidden Harvests program on the sustainable development contributions of small-scale fisheries globally. I currently lead the GEF funded Ikan Adapt program in Timor-Leste, focused on building climate resilience among small-scale and subsistence fisheries and aquaculture communities. Out of work hours, food gardening, sailing and music are my happy spaces.

Emily Knight
Lenfest Ocean Program

Emily Knight is senior outreach manager with the Lenfest Ocean Program and later this summer will be joining Blue Convergence Fund as its outreach and engagement director. Similar to the Lenfest Ocean Program, Blue Convergence Fund seeks to fund management and policy relevant research to help communities solve the pressing ocean and coastal challenges they face. Emily's trained in oceanography and has spent the last 15 years working to link science and management.

Ferran Bustos
Institut Català de Recerca per a la Governança del Mar (ICATMAR)

Ferran Bustos is a biologist specializing in marine and fisheries biology. He has been working for over three years at ICATMAR, where he focuses on the monitoring of fisheries resources along the Catalan coast through field sampling and data analysis. His work contributes to scientific studies that support sustainable fisheries management, and he is also involved in outreach and communication activities.

Jacob Eurich
Environmental Defense Fund

Dr. Jacob Eurich is a Fisheries Scientist at the Environmental Defense Fund, where he studies the impacts of climate change on natural-human systems. These changes create complex trade-offs between environmental and human wellbeing. Jacob's research lies at this intersection of global change ecology, marine resource governance, and human health. He focuses on understanding how fisheries management, conflict, and equity affect food security and livelihoods in communities that rely on blue foods. Collectively, his research uses knowledge co-production and community-engaged science to build climate resilience in marine fishery systems. He is an adjunct Research Associate at the Marine Science Institute, UC Santa Barbara, Principal Investigator for the Pacific Planetary Health Initiative, and a coordinating member of FishSCORE2030 under the UN Decade of Ocean Science. Previously, he was a Resident Researcher at Mahonia Na Dari in Papua New Guinea, a Scientist at California's Department of Fish and Wildlife, and held Postdoctoral Scholar appointments at UC Santa Barbara's Marine Science Institute and National Center for Ecological Analysis and Synthesis. He earned his PhD in Marine Ecology from the ARC Centre of Excellence for Coral Reef Studies and James Cook University.

Jay Kim
Gulf of Maine Research Institute, University of Maine

Jay (they/them) is an interdisciplinary researcher at the Gulf of Maine Research Institute, and is currently finishing their PhD at the University of Maine. They approach fisheries science with a biology, economics, sociological, and commercial industry background. They have research experience in multiple facets of fisheries including climate and habitat suitability modeling, bio-economic modeling, agent based modeling, socio-ecological systems, and indigenous systems. Their current work focuses around the American lobster fishery and Arctic communities.

Jocelyn Runnebaum
The Nature Conservancy

Jocelyn Runnebaum, PhD is currently the Marine Program Manager at The Nature Conservancy in Maine, focused on the sustainable use of Gulf of Maine ecosystems, connecting science to management, and supporting key-parties to be active and valued partners in the policy and management of marine resources. Jocelyn sits on several advisory bodies in support of marine resource management including: the Maine Department of Marine Resources Advisory Council, Maine Offshore Wind Research Consortium, the New England Fisheries Management Council's Climate and Ecosystem Steering Committee and is the former Chair of the Marine Fisheries Advisory Committee to NOAA Fisheries. Before joining TNC, Jocelyn worked for the Alaska Department of Fish and Game as a Fisheries Biologist providing technical support and advice on federal fisheries management on behalf of the state. Jocelyn has a Bachelor of Science degree in Biology from Stephen F. Austin State University in Nacogdoches, TX and a Ph.D. in Marine Biology from the University of Maine in Orono. Before earning her Ph.D., Jocelyn commercially fished for salmon in Alaska, trained sled dogs for an Iditarod musher, and was a Peace Corps volunteer in Zambia working with small scale fish farmers.

Joseph Kamau
Kenya Marine Fisheries Research Institute

Joseph Kamau is a Principal Research Scientist at the Kenya Marine Fisheries Research Institute, where he has dedicated over 30 years to advancing our understanding of marine ecosystems, particularly within the Western Indian Ocean. As the head of the Oceanography and Hydrography Department, Joseph specializes in biogeochemistry and environmental sciences, addressing critical issues surrounding climate change and its effects on marine resources. For most of his career, Joseph has focused on understanding how climate change affects marine ecosystems and the fisheries that rely on them. His research encompasses various disciplines, including nutrient cycling, marine biodiversity, and the impacts of changing ocean conditions. He is particularly involved in bioprospecting, where he explores potential applications of marine biodiversity for biotechnology and sustainable development. His work not only informs local and international policy on fishing and marine resource management but also engages local communities in sustainability practices. In addition to his research, Joseph is an active member of several professional organizations, including the Western Indian Ocean Marine Science Association (WIOMSA), UKRI International Development Peer Review College, and Golden key International. He frequently presents his findings at both national and international conferences, sharing insights that promote a greater understanding of ocean health and resilience in the face of climate change. Outside of his professional responsibilities, Joseph is passionate about community engagement and education. He often collaborates with communities to raise awareness about marine conservation and the importance of sustainable practices.

Jorge Mafuca
Mozambique Oceanographic Institute

I hold an MSc in Fisheries Conservation and Management and am a Senior Fisheries Researcher at the Mozambique Oceanographic Institute. With over 20 years of experience, I've conducted stock assessments for Mozambique's marine and freshwater fisheries. I've developed management plans for key fisheries, including shrimp stocks and line fisheries, and designed strategies for managing ecosystems like mangroves and coral reefs, addressing marine pollution. Currently, I coordinate nature-based solutions to boost coastal resilience through mangrove restoration and am part of the team revising fisheries regulations.

Julia Santana Garcon
University of Tasmania

Dr Julia Santana Garcon is a climate change and fisheries research fellow at the Institute for Marine and Antarctic Studies (IMAS) at the University of Tasmania, and a member of the Centre for Marine Socioecology. Julia is project manager and researcher for Sea Change Australia, a project that brings together fishers, aquaculture producers, industry, managers, and researchers to co-develop climate-resilient options for strong and healthy fisheries and aquaculture sectors in Australia. Her research focuses on improving our understanding of marine ecosystems and how these are affected by human activities and global change. Working across a variety of universities, government, research agencies and

NGOs in Australia and Spain, she has established a strong international collaboration network and gained experience in leading, coordinating, and working as part of diverse research teams in a broad range of environments.

Kanae Tokunaga
Gulf of Maine Research Institute

Dr. Kanae Tokunaga is a Senior Scientist in Coastal and Marine Economics at the Gulf of Maine Research Institute (GMRI). She applies economic modeling, data science, and interview and survey approaches to study how humans interact with coastal and marine natural resources. Her recent work focuses on understanding climate change impacts and climate-induced adaptation and transformation in fisheries and aquaculture systems and the socioeconomic impacts of offshore wind energy development on coastal communities. Current portfolio includes investigations of distributional consequences of climate changes and application of foresighting in eliciting preferences and evaluating tradeoffs for individuals and communities to invest in climate adaptation and transformation. Her training is in economics, but most of her current work is inter- or transdisciplinary, collaborating with natural and social scientists, fishery and aquaculture stakeholders, and coastal communities. Prior to joining GMRI in 2019, she received a Ph.D. in Economics and Ocean Policy Certificate from the University of Hawaii and worked as a researcher at the University of Tokyo in Japan

Katherine Maltby
Gulf of Maine Research Institute

Kat is a social scientist at GMRI, whose research primarily focuses on examining how fisheries are affected by climate change and how these systems can adapt. Drawing on social-ecological systems thinking, she works to explore how people perceive and respond to climate-driven changes, what affects their ability to do so, and what this means for the resilience of fisheries systems. Her broader interests include understanding social wellbeing, considering the value of holistic, integrated approaches to ocean management and governance issues, and how other challenges aside from climate change shape the lives of people who live and work on the coast.

Katherine Mills
Gulf of Maine Research Institute

Dr. Katherine Mills is a senior research scientist at the Gulf of Maine Research Institute in Portland, Maine. She earned her Ph.D. in Natural Resources at Cornell University. As a quantitative fisheries ecologist, Kathy studies marine ecosystem changes and fish-ecosystem-fishery relationships. Her research focuses on the Gulf of Maine and Northeast US Shelf and investigates (1) how physical and ecosystem conditions are changing; (2) how these changes affect fish populations, biological communities, and marine fisheries; and (3) how fisheries and fishing communities can effectively respond. Much of her work is interdisciplinary and collaborative, involving scientists and stakeholders to understand and inform management of fisheries as coupled social-ecological systems and to support climate adaptation and resilience in marine fisheries. Kathy extends her work to broader regions in several ways. She serves as a chair of the ICES-PICES Strategic Initiative on Climate Change Impacts on Marine Ecosystems, through which she helps advance

research, communicate findings, and synthesize information about climate change impacts, adaptation, and advice across the North Atlantic and North Pacific regions. In addition, she co-leads a UN Ocean Decade program—Fisheries Strategies for Changing Oceans and Resilient Ecosystems by 2030 (FishSCORE), which facilitates a global network of scientists, stakeholders, and practitioners seeking to support resilience in marine fisheries.

Kristin Kleisner
Environmental Defense Fund

Dr. Kristin Kleisner, Ph.D., is a Lead Senior Scientist and the Associate Vice President for Oceans Science at EDF. Her work is focused on understanding the multiple benefits generated by fisheries systems, including food, climate and biodiversity outcomes. Specifically, she is leading research to investigate the impacts of climate change on the distribution and productivity of fish stocks and understand the implications of these changes for fisheries management systems around the world. Kristin has also worked extensively to elevate the role of aquatic foods in the global food policy dialogue and to help value aquatic foods for their nutritional content. Currently she is leading a team of scientists investigating the potential of blue carbon and technical marine carbon dioxide approaches to deliver a suite of benefits to people and nature while minimizing adverse outcomes and risks. Kristin worked previously as a joint research scientist for NOAA's Northeast Fisheries Science Center in Woods Hole and The Nature Conservancy on the development of ecosystem-based models to explore the effect of climate change on fish stock distributions in New England. She also led research on the development of fisheries, food security, and ecosystem status indicators with IndiSeas (www.indiseas.org), FAO, UNESCO, and the Sea Around Us project. She was a co-PI on the Science for Nature and People Partnership (SNAPP) Working Group on Climate Resilient Fisheries and is a co-lead on the UN Ocean Decade FishSCORE 2030 programme. She has published over 50 peer-reviewed studies in the fisheries and oceanographic literature and holds a PhD in Marine Biology and Fisheries from the Rosenstiel School of Marine and Atmospheric Science at the University of Miami.

Layla Osman
ONG Conectar para Conservar

Layla Osman, PhD is a marine ecologist, fishery scientist, and leader in people-centered approaches in the theory and practice of ocean conservation and sustainable development. With more than 20 years of experience working in conservation, small-scale fisheries and ocean protection, facilitating processes with multiple stakeholders, designing environmental and capacity-building programs, workshops and national and international conferences. Specializing in research, strategy design, coaching and systematization of learning process, transformation and evolution of systems, organizations and people. Expert in learning networks, co-management and human-centered tools to innovate and advance in fisheries and ecosystem health and resilience. Working experience from Chile to Cuba, Latin America.

Leigh Fletcher
Ocean Systems Lab

Leigh Fletcher is an environmental consultant specializing in coastal risk assessment, environmental policy, and climate resilience planning. She developed the Risk Assessment Framework (RAF) for the Caribbean Fishery Management Council supporting the Council's transition to ecosystem-based fisheries management. Leigh holds a J.D., an M.P.A., and an M.S. in Environmental Science and Policy, and has over 25 years of experience in environmental management and law. Her work focuses on advancing climate resilience initiatives across marine and coastal ecosystems, including fisheries management, community adaptation planning, and environmental monitoring. She co-owns water quality labs, and an environmental consulting firm based in the U.S. Virgin Islands.

Louise Gammage
University of Cape Town

Dr Louise Gammage is an environmental geographer specialising in marine sustainability. She works in inter- and transdisciplinary contexts, developing transformative methodologies and tools to promote system-based governance. Her current research addresses marine social-ecological systems (SESs) and fisheries in South Africa. Louise explores innovative methodologies to overcome challenges related to scale and decision-making within complex adaptive systems. Her work aims to understand drivers of change in SESs, enhancing both present and future decision-making processes. She focuses particularly on empowering local stakeholders, such as fishers, to build capacity and improve their well-being, while simultaneously informing broader governance and policy decisions. She is currently a research fellow with the Marine and Antarctic Research Centre for Innovation and Sustainability (MARIS) at the University of Cape Town, South Africa.

Marina Sanz-Martín
Instituto Español de Oceanografía (IEO)

Dr. Marina Sanz-Martín (she/her) is an expert in climate change ecology, specializing in the impacts of climate change on species distributions and fisheries catches in the Mediterranean Sea, with a focus on the Spanish sector. She is currently a postdoctoral researcher at the Spanish Institute of Oceanography and a visiting scholar at Stanford University's Hopkins Marine Station. She is the PI of the CLISSARTES project. Previously, her research explored climate-driven ecological changes in the Arctic Ocean. Her current work focuses on the climate exposure of Mediterranean Marine Protected Areas (MPAs), aiming to identify potential marine climate refugia.

Marta Albo Puigserver
Instituto Español de Oceanografía (IEO)

Marta Albo-Puigserver is a marine environmental scientist and postdoctoral researcher at the Spanish Institute of Oceanography in the Balearic Islands. She has contributed to several research projects on topics such as food-web dynamics, fisheries co-management, and climate vulnerability assessments. Currently, Marta leads the VADAPES-2 and ReFISH-Food projects, focusing on the impacts of global change and anthropogenic stressors on small-scale fisheries. She works on developing climate change adaptation strategies that integrate environmental, cultural, and socioeconomic factors to ensure the sustainability and resilience of the fisheries supply chain in the Balearic Islands.

Matthew Seeley
Environmental Defense Fund

Matthew Seeley is a senior manager for U.S. Fisheries & Oceans at Environmental Defense Fund (EDF). Matt works broadly on developing resilient fisheries solutions through research, stakeholder engagement, and advocacy. Matt currently focuses on projects to develop equitable and climate-ready allocation policies, implement electronic technologies that advance data modernization, and support long-term fishing community resilience through adaptive management. Additionally, Matt leverages his previous work experience as staff with both the Mid-Atlantic and Western Pacific Fishery Management Councils to help advocate for climate ready fisheries solutions at the regional and national levels. Matt has a B.S. from the University of Massachusetts Amherst and a M.S from the University of Texas Marine Science Institute.

Miles Tepper
Environmental Defense Fund

Miles Tepper is a Master's student in Environmental Policy & Management with a focus on Ocean and Coastal Resource Management at the Middlebury Institute in Monterey, California. He is currently working on EDF's Ocean Science Team as the Fisheries Resilience Strategies Intern. Miles has a background in public policy, local government, sustainability and nonprofit management from New Orleans to the Bay Area.

Niza Contreras
University of California, Santa Cruz

Born and raised in San Francisco, I have spent all of my life on the California coast, getting my BS in ocean science at Stanford and my MS in Coastal Science and Policy at UC Santa Cruz. My research has focused on socio-ecological systems, the marine social sciences, and decolonial research methods, with particular focus on Mexican small-scale fisheries. Outside of my work with the ocean, I can be found backstage as a theatrical technician or on the couch with my cats as I work on my most recent novel.

Roger Griffis
National Oceanic and Atmospheric Administration

Roger Griffis is a marine ecologist recently retired from NOAA's National Marine Fisheries Service Office of Science and Technology in Silver Spring, Maryland. As Climate Change Coordinator, he helped lead efforts to increase the production and use of climate-related information to fulfill the agency's mission mandates for fisheries, protected species and habitats in a changing climate, including the NOAA Changing Ecosystems and Fisheries Initiative (CEFI).

Sarah Close
Blue Convergence Fund

Sarah Close is responsible for identifying new funding priorities and managing grantmaking on Blue Convergence Fund's Resilient Fisheries and Fishing Communities portfolio. With over a decade of experience at the intersection of grantmaking, usable science, and marine ecosystem management and conservation, Sarah is a leader in her field. Previously, Sarah was a Senior Officer for the Lenfest Ocean Program at The Pew Charitable Trusts. There, she managed a grantmaking portfolio focused on changing ocean conditions, supporting work on fisheries and management of protected areas. She also worked at the National Oceanic and Atmospheric Administration's Climate Program Office, developing expertise in adaptation and resilience, and program management. Sarah holds a bachelor's degree in Biology and Environmental Studies from Bowdoin College and a Ph.D. in Zoology from Oregon State University.

Wenbin Zhu
Zhejiang Ocean University

Wenbin Zhu, PhD, professor, Doctoral Supervisor. Serving as a boarding member of the Fishing Gear Expert Committee of the Ministry of Agriculture and Rural Affairs, and a boarding member of the Fishing Branch of the Chinese Fisheries Society. Mainly engaged in scientific research in the fields of marine fishing, fishery resources, and offshore fisheries. Led the development of China's first "Marine Fishing Log Specification" standard and introduced the scientific observer system into China's offshore fisheries for the first time. In terms of offshore fishing, the company mainly engages in resource exploration, research and development of friendly fishing equipment, fishing situation forecasting, and development strategies. It has conducted fishery resource exploration and investigation in the Southwest Atlantic and the Gulf of Oman four times.

Xochitl Elías
University of Vigo

I am a postdoctoral researcher at the Future Oceans Lab at the University of Vigo in Spain. I hold a PhD in Marine Science, Technology and Management from the University of Vigo and a Master's in Marine Biology from the University of Bremen in Germany. My research focuses on the resilience of social-ecological systems to climate change, bridging theory and practice through empirical case studies in coastal communities across Mexico, Japan, and Spain. I'm particularly interested in understanding how adaptive capacity and responses are shaped in different contexts. Currently, my work explores the integration of resilience and sustainability, especially through the emerging lens of regeneration. I am also incorporating art-based methods as a tool for engagement and knowledge co-production during research. Through this interdisciplinary approach, I aim to support more inclusive and transformative climate adaptation pathways.

Xuechan Ma
Food and Agriculture Organization

Xuechan Ma is a Fishery Resources Officer (Climate Change) at the Fisheries and Aquaculture Division of the Food and Agriculture Organization of the United Nations (FAO). She has worked at FAO for more than 5 years. In her current role, she supports the integration of climate change considerations across various fisheries and aquaculture areas of work, and engagement with the United Nations Framework Convention on Climate Change (UNFCCC), as well as the development of climate change knowledge products, policy guidance, and project documents. Xuechan holds a PhD in international law from Leiden University in the Netherlands and received master's and bachelor's degrees in law from Peking University in China. She is the author of a book on the law of the sea and over 20 research papers on topics of ocean, climate change, natural resources governance, environmental law, and dispute settlement.

Yunzhou Li
Stony Brook University

Yunzhou Li (pronounced Yoon-Joe) is a Research Scientist at Stony Brook University. Trained as an interdisciplinary marine scientist, she has broad research interests including marine protected areas (MPAs), climate-resilient fisheries, fisheries social-ecological systems, international fisheries management, and marine policy. She currently leads a Lenfest-funded project on climate vulnerability assessment for China's fisheries systems and works on risk assessment for spatial overlap of American lobster fisheries and North Atlantic Right Whales under a changing environment.

Additional information

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

FishSCORE 2030
Fisheries Strategies for Changing Oceans and Resilient Ecosystems

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Logistics

Parking and transportation

If you are driving a vehicle to the workshop, there is ample parking at the Gulf of Maine Research Institute's parking lot (350 Commercial St., Portland, ME 04101). You can park here free of charge. Please alert one of the workshop hosts that you have parked in the lot so they can help you get a parking pass from the front desk to display on your dashboard.

If you are staying only for the day of each workshop (leaving during the evening/night), please park in one of the visitor spots on the far side of the lot on the left. If you are staying in Portland for the entire workshop, you may park for free in the lot overnight. The Aloft hotel where your accommodation is booked is across the street.

Accommodations

Your accommodation is booked at:
Aloft Portland Downtown Waterfront ME
Address: 379 Commercial St, Portland, ME 04101
Phone: (207) 761-6000

The hotel is located directly across the street from the Gulf of Maine Research Institute. Costs for the hotel room have been directly paid by FishSCORE2030 (unless you have made specific cost-sharing arrangements with the FishSCORE2030 leads prior to the workshop). You will need to pay for any incidentals or food purchased from the hotel, please do not add these to the hotel bill.

Reimbursements

Unless you have a specific, pre-arranged cost-sharing or other arrangement with the FishSCORE2030 leads, we are happy to provide reimbursement for your air travel, mileage or ground transportation, meals not provided as part of the workshop, and incidentals.

You will need to provide receipts/invoices for all airfare and associated costs, parking, and transportation costs (taxis, rental cars, Uber rides, etc.).

You do not need to provide receipts for mileage driven in your own car, or for food and incidentals. We are able to reimburse mileage at a rate of $0.70/mile. We can reimburse food and incidentals at the US Federal GSA rate for Portland, Maine. We will only reimburse meals not provided as part of the workshop.

The form for submitting these reimbursements is available here. Please download the form to fill it out.

Additional activities while you're in Portland

No car/transportation needed:

- Portland Old Port (including events): https://www.portlandoldport.com/
- Portland Tourist information: https://www.visitportland.com/
- List of local restaurants that serve local and sustainable seafood: https://gmri.org/projects/gulf-of-maine-tastemakers/
- Portland Food Map: https://www.portlandfoodmap.com/
- Lucky Catch Lobster Cruises: https://www.luckycatch.com/
- Portland East End Promenade and Bike Path: https://www.portlandmaine.gov/1222/5487/Eastern-Promenade
- Portland Museum of Art: https://www.portlandmuseum.org/
- Portland Observatory: https://www.portlandlandmarks.org/observatory
- Victorian Mansion: https://victoriamansion.org/
- Casco Bay Lines to some of the Casco Bay Islands (Peaks Island or Long Island are great!): https://www.cascobaylines.com/
- Luke's Lobster: https://lukeslobster.com/

Car/transportation needed:

- Local and express bus routes: https://www.gpmetro.org/local-and-express-routes/
- Portland Head Light in Cape Elizabeth, Maine: There are some tours that provide transport to the lighthouse, in addition to other Portland sights. For more information: https://portlandheadlight.com/

FishSCORE 2030
Fisheries Strategies for Changing Oceans and Resilient Ecosystems

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

LENFEST OCEAN PROGRAM