FishSCORE2030 Approaches to Climate Resilient Marine Fisheries Workshop Summary

May 7-9, 2025
Gulf of Maine Research Institute, Portland, ME

This workshop brought together global practitioners, researchers, and managers to explore pathways for strengthening climate resilience in marine fisheries. Grounded in the UN Ocean Decade programme FishSCORE2030 (Fisheries Strategies for Changing Oceans and Resilient Ecosystems by 2030), the workshop aimed to bridge the gap between resilience assessment frameworks and practical, context-specific actions, including approaches and implementation strategies.

Our goals for the workshop:

- Share information on various forms of resilience assessments, strategies, and outcomes within marine fishery systems
- Foster collaboration among practitioners to strengthen connections between resilience assessment frameworks and real-world fisheries management applications
- Co-identify barriers and challenges to the effective implementation of climate assessments or adaptation measures
- Co-develop and refine strategies for overcoming these challenges by exploring how solutions vary by fishery system, region or country, cultural systems, and management structures
- Develop a roadmap for moving assessments to action, outlining practical steps and considerations for different fisheries contexts
- Synthesize the experiences of the attendees in their work to build resilience into their fisheries, reflecting pathways for enhancing resilience, barriers to adaptation, and recommendations for mainstreaming resilience planning into fisheries management

Below we summarize the workshop proceedings. The discussions and learnings from the workshop will be incorporated into FishSCORE's next steps and future initiatives.

FishSCORE2030 Workshop – Day 1 Summary

Theme: Information Exchange and Mutual Learning
Date: May 7, 2025

Framing the Challenge

The workshop opened with an overview of climate change impacts on fisheries, emphasizing variability across geographies and systems and highlighting the need for new management tools, approaches and strategies for dealing with climate impacts on fisheries. The goals and aims of the FishSCORE2030 program were highlighted, noting the key goal of working to link global ocean science with societal benefits, with a focus on sustaining fisheries as sources of food and employment while safeguarding marine ecosystems.

The FishSCORE2030 program developed after a Science for Nature and People Partnership (SNAPP) Working Group on Climate Resilient Fisheries investigated some of the theoretical and practical underpinnings of climate resilience within social-ecological fisheries systems. The SNAPP working group reviewed attributes of climate resilience and developed 18 case studies to understand resilience in practice. This led to the creation of the Climate-Resilient Fisheries Planning Tool (CRFPT), which outlines a six-step process to define, assess, and plan for climate resilience in fishery systems. This history was presented to the workshop participants to provide context for the goals and objectives of the workshop.

Lightning Talks

In 5-minute presentations, participants discussed case studies and approaches to different climate-related fisheries issues within their regions of study. The presentations were organized into four sessions: Frameworks & Processes, Science & Innovation, Assessments & Tools, and Management Contexts. Speaker biographies and abstracts are available in the Workshop Program.

Session 1: Frameworks and Processes

Speakers shared diverse approaches:

- NOAA's CEFI system, which integrates modeling and decision support
- FAO's normative approaches and field implementation for resilience planning
- Canada's approaches to ecosystem-based management and a national strategy for climate-resilient fisheries
- IATTC's climate change resolution and workplan
- Stakeholder perspectives on drivers of change and social vulnerability indicators in the southern Benguela region
- Co-production of knowledge around climate change impacts in Indigenous communities of south Greenland

The discussion raised questions about indigenous responses to climate change, the integration of climate frameworks into existing systems, and the equitable adoption of management measures. Various participants stressed the importance of engagement, the need for diverse approaches,

adopting ecosystem approaches to tackle climate-related challenges in fisheries, and challenges in applying global frameworks at local levels.

Session 2: Science and Innovation

Case studies from the U.S., Mexico, Japan, China, Kenya, and the Mediterranean illustrated:

- Adaptive strategies in response to social and ecological stressors associated with the collapse of the Southern New England lobster stock
- Resilience supported by governance responses in Mexican fisheries and by exposure-reducing responses in Japanese fisheries
- Value of marine protected areas in supporting small-scale fisheries under warming conditions in some regions of the Mediterranean
- Multi-faceted approaches for recovering the large yellow croaker in China
- Climate vulnerabilities and climate resilience recommendations for small-scale fisheries in Kenya

Discussion following the presentations focused on the role of flexible governance to support resilience; challenges in communication and management frameworks; the need to support the agency of diverse participants; and the complexity of supporting climate resilience together with overall fisheries and community resilience.

Session 3: Assessments and Tools

Presenters applied vulnerability assessments (e.g., climate vulnerability assessments (CVAs)) and the Climate Resilience Fisheries Planning Tool (CRFPT, climateresilientfisheries.net) across geographies, discussing the:

- Global increase in the application of CVAs, and growing consideration of ecological and socioeconomic vulnerabilities
- Long-term goals of a women-led fishing cooperative in Mexico that were elucidated using the CRFPT
- Adaptation strategies for small-scale fishing communities in Spain identified using the CRFPT process
- Application of the Ikan Adapt framework to identify vulnerabilities and inform investment decisions in Timor-Leste
- Approach of the Sea Change project in co-developing options for fisheries and aquaculture in Australia to adapt to a changing climate
- Adaption and application of the CRFPT to identify climate resilience strategies with Fijian coastal Indigenous fishing communities

The review emphasized applied, real-world case studies and highlighted challenges in integrating diverse tools across systems. Discussion centered on topics such as evolving climate vulnerability and resilience assessment approaches, challenges limiting policy uptake, and the importance of co-development and empowering fishers to navigate policy systems. The importance of co-management through the inclusion of local and Indigenous knowledge, and empowering fishers to influence policy were also underscored.

Session 4: Management Contexts

Speakers highlighted adaptive governance and co-management strategies, including:

- Efforts to map US fishery management council decision processes to identify entry points for climate information
- Risk assessment to evaluate threats to fishery management objectives in the Caribbean and support climate assessments within the Caribbean Fishery Management Council
- Use of ecosystem and climate information to inform fisheries management in the North Pacific (US)
- ICATMAR's monitoring programs and co-management approaches for climate-resilient fisheries in Catalonia
- Co-management models for fisheries and ocean health in Chile and other Latin American countries
- Best practices for fair, equitable, and climate-adaptive allocation policies in US fisheries

Approaches focused on integrating climate information into decision cycles of centralized management systems and facilitating participatory co-management arrangements in decentralized management systems. Discussions recognized co-management as a powerful tool, emphasizing inclusive, human-centered decision-making where fishers play an active role. While both formal and informal approaches can be effective, long-term success depends on early engagement, relationship-building, and institutional continuity through succession planning and mentorship. Acknowledging regional differences and incorporating flexibility, equity, and multi-species dynamics were discussed as key to resilient, adaptive fisheries management.

Final Reflections - Day 1

In group discussion, participants emphasized:

- The importance of building from existing systems, rather than designing new ones
- Blending top-down and bottom-up approaches
- Agency, flexibility, and co-benefits as keys to successful adaptation
- Challenges in translating tools into action and aligning timelines across governance levels
- Need for stronger integration of climate science in fisheries management
- Urgency of scalable, inclusive strategies

Written reflections by participants further echoed themes of collaboration, cross-sector learning, and the value of community-centered approaches.

FishSCORE2030 Workshop – Day 2 Summary

Theme: Collaborative Synthesis and Problem Solving
Date: May 8, 2025

Hybrid session: Reflecting on commonalities and differences among regions and fisheries

This session hosted three virtual presentations discussing local and regional efforts to improve climate and overall resilience in fisheries through formal management, scenario modeling, and research undertaken together with fishers. These included:

- The Australian Fisheries Management Authority is piloting a Climate Risk Framework with a four-step process (risk identification, system assessment, residual risk, and management advice) across 15 species. A 3–5 year reassessment cycle is planned, and the risk framework will be incorporated into species management.
- Australia's Futures of Seafood initiative uses scenario modeling to understand the influence of a variety of drivers and support long-term seafood industry planning. Through workshops to engage with the seafood community and First Nations, this effort is undertaking future scenario planning to understand how regulation, social perception, seafood production, external pressure, economics and operations, spatial squeeze, and governance impact future resilience to climate change.
- In response to recent changes in laws impacting fishing methods, the Mozambique Oceanographic Institute is supporting efforts to build resilience in small-scale fisheries focused on developing sustainable practices, expanding potential fishing opportunities, advancing co-management, and engaging global partners.

Discussion themes included managing participant fatigue, integrating Indigenous sovereignty, and confronting physical climate threats (e.g., storms and gear loss). The need for coordinated networks like FishSCORE was highlighted.

Panel Discussions: Pathways to Resilience

Panel 1 explored diverse pathways to resilience that are shaped by social, environmental, and governance contexts. The panelists discussed stressed that:

- Lived experience, especially in low-trust or post-conflict environments, is essential to designing appropriate adaptations
- Aligning management priorities and project timelines with long-term community needs was flagged as a persistent challenge
- Frameworks such as IAdapt can help scale the conversations to local and regional experiences and develop context-specific resilience strategies
- Livelihood diversification commonly emerged as a key strategy

Panel 2 focused on implementation of practical resilience strategies in diverse fishery systems. The panelists discussed the importance of:

- Working directly with fishers through community-led collaboration, co-management, and accessible science communication provides a better understanding of actual needs
- Keeping all stakeholders–especially scientists and managers–aligned and engaged is key, and tools like ecosystem status reports can help build understanding and spark dialogue

- Long-term monitoring and cross-border collaboration to improve management and to implement approaches such as gear innovation were central to regional resilience in the Mediterranean

Key takeaways included the importance of trust-building, ethical engagement, sustained funding, and co-designing tools with fishers. Panelists also emphasized the need to address power dynamics and ensure reciprocal partnerships.

Morning Breakout Activity: Exploring Attributes of Climate-Resilient Fisheries

Through small-group discussions, participants identified attributes (defined in step 4 of the Climate Resilient Fisheries Planning Tool, climateresilientfisheries.net) that most influence resilience in a fishery system with which they are familiar. Participants were asked to rank the top three attributes they felt contributed to climate resilience, discuss their choices as a group, and then determine if they could reach consensus on the top three attributes that confer resilience across fishery systems. The attribute most commonly selected as the most important for individual systems was "Adaptive Governance" (seven individuals) followed by "Efficient and Effective Governance Systems", "Inclusive Governance", "Species & Habitat Diversity" and "Stock Status" (each attribute selected by two individuals). When discussing which attributes supported resilience across fishery systems, the top attributes selected were different for all groups, and included "Species/Habitat Diversity, "Wealth/Reserves", "Knowledge and Learning", and "Inclusivity/Agency". "Adaptive Governance" was not identified as the top attribute by any group for conferring resilience across fishery systems.

Afternoon Breakout Discussion Groups: Strategies for Climate-Resilient Fisheries

In the afternoon, participants broke out into groups to discuss four topics:
- Strategies for / 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

Each group addressed the questions:
- What are the key questions and knowledge gaps that remain regarding this topic?
- What challenges or opportunities are there to advance work within this topic?

Strategies for or pathways to climate-resilient fisheries:
- Questions / knowledge gaps: Commonalities and distinctions between management needs/goals vs. community needs/goals, risk communication in co-designing strategies, need for common / shared definitions and language
- Challenges: Tensions between community needs and top-down goals; lack of integrated, frameworks for decision-making; availability of and ability to use data (including traditional ecological knowledge; TEK), mistrust of data and scientific processes, decision-makers need to build capacity, political and power dynamics
- Opportunities: Increased funding for innovation, better use of forecasts and forward-looking data to make management decisions, and building institutional resilience as foundation for climate resilience

Lessons learned / best practices for co-developing resilience assessments and strategies:

- Questions / knowledge gaps: Do we have a framework for co-development (including clear understanding and expectations)? How do we measure the impact of actions? Who bears the burden of responsibility for climate measures? What incentives facilitate participation in a co-development process?
- Challenges: Timeline mismatches, research silos, cultural barriers, ethical concerns with extractive relationships, different perceptions of value of participation
- Opportunities: Identification of early and meaningful engagement opportunities, using shared language, developing communities of practice, supporting long-term reciprocity

Barriers / challenges to the effective implementation of climate resilience measures:

- Questions / knowledge gaps: Understanding and accounting for local context, data gaps and different levels of data across species, connecting science to management
- Challenges: Management rigidity, stakeholder fatigue, colonial legacies, systemic mismatches between ecological and community recovery timelines, different perceptions of risks by individuals and communities, potential for maladaptation
- Opportunities: Collaborative goal setting involving different actors in the system, building trust among partners, understanding impacts of choices/decisions on resilience, flexibility within management structures, boundary spanners and translators to create common language between scientists, managers, other groups

Policy and management strategies for advancing climate resilience:

- Questions / knowledge gaps: What level of uncertainty do we manage for? What strategies are appropriate for different levels of uncertainty?
- Challenges: Fast evolution of conditions, slow response time, high disenfranchisement of fishers, data rich systems become data poor as system changes
- Opportunities: Increased support for data collection, innovation, transparent governance, accountability measures, financial resources, promoting governance systems that are adaptive and can better navigate uncertainty

Cross-cutting themes emphasized the centrality of flexibility, trust, communication, equity in opportunity, pace and uncertainty of actions, and co-development of resilience strategies.

Final Reflections - Day 2

Closing discussions centered on key lessons, barriers, and opportunities:

- *Lessons*: Early, inclusive communication; co-developed approaches and strategies; shared ownership; and bridging across scales
- *Barriers*: Resource limitations, misaligned timelines (and lack of transparency about them), psychological toll of changes that affect livelihood, adaptation to multiple changes simultaneously (environmental, governance, economic)
- *Opportunities*: Scenario planning, building trust, enhancing agency, participatory governance, flexible and adaptive management systems, international adoption of climate standards, household and community decisions

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FishSCORE2030 Workshop – Day 3 Summary

Date: May 9, 2024
Theme: Collaborative Action Planning and Product Development

Day 3 of the workshop focused on translating ideas into action. Through collaborative discussions and working sessions, participants identified shared priorities, discussed implementation strategies, and proposed products to support climate-resilient fisheries. Key themes included contextualizing climate resilience across different systems, the need for knowledge sharing across systems through creative and engaging communication, and bridging and integrating science, management, and community needs.

Establishing Priorities and Shared Vision

Participants began by exploring implementation goals and opportunities for convergence, viewed through the lens of forecasting and fore sighting. Core themes included:

- Aligning adaptation timelines with decision-making cycles
- Translating science into accessible, context-specific language
- Understanding how national governance and local realities interact
- Recognizing the value of integrating diverse knowledge systems
- Highlighting the importance of documenting both successes and failures

A synthesis activity revealed broad use of participatory tools, a focus on social and ecological resilience, and strong interest in storytelling and narrative approaches as mechanisms for learning and engagement.

Morning Working Sessions: Brainstorming Priorities and Outcomes

Participants divided into four breakout groups to brainstorm and discuss potential outputs:

- *Group 1 - Co-Development & Implementation*: Proposed a fisheries resilience implementation tool focused on system-level planning, co-developed with fishery participants and managers to address mismatched timelines and enable forward-looking strategies. The group discussed that there are issues of differences in time-scale between needs, capacities, and implementation opportunities, and that these should be considered in developing such a resource.
- *Group 2 - Lessons and Resources*: Recommended a repository of stories that share both successes and challenges of climate resilience assessment and implementation efforts. Additionally, the group discussed the need for a glossary of tools and frameworks that can be used for resilience assessments and planning, and the need for communication products (e.g., briefs, story maps) to share cross-system lessons and acknowledge legal and political constraints.
- *Group 3 - Learning Networks & Knowledge Sharing*: Emphasized the value of sharing examples and stories of experiences and lessons-learned. This could be accomplished through communities of practice and networks that facilitate discussion and information sharing about management principles, collaboration building (especially between scientists and communities), how to approach and frame resilience for different audiences, and the collection and long-term archival of data and data systems. The group

also stressed the need for more information on social aspects of resilience, and saw an opportunity in intersections with learning networks and social networks. The group advocated for connecting across disciplines, including resilience work in terrestrial systems, overall resilience planning in policy fields, and engagement with fisher-led networks.
- *Group 4 - Capacity Strengthening & Certification*: Proposed a foundational climate resilience fisheries training course geared towards participants within fisheries, as well as a small grants mechanism linked to learning and participation. The group discussed possible collaboration with the FAO certification e-courses and a climate-resilient co-management learning network. The group also discussed metrics that could be tracked for understanding resilience within a fishery (e.g. MSY, community stability), and the need to make the link between the analytical side of fisheries and resilience planning to implementation.

Key Themes Across Morning Sessions

- *From Frameworks to Implementation*: Emphasis on resources that serve fishers, managers, and communities, potentially through learning networks and capacity strengthening resources such as certification courses
- *Tool and Resource Compilation*: Development of a publicly-available tool glossary, comparison matrix for tool selection, and an accessible resource, similar to a resource hub, to help guide resilience planning
- *Storytelling as Data*: Stories were seen as powerful data sources to support climate assessments and decision-making, with the potential of using structured templates to aid comparability
- *Operationalizing CRF*: Participants outlined pathways to connect assessments to action through scenario planning, workflow simulations, and policy timelines, and identified the need for implementation resources
- *Creative Communication*: Ideas included short-form video, art-science collaborations, and guidebooks to broaden public engagement and intergenerational learning

Afternoon Working Sessions: Working Towards Priorities and Outcomes

In the afternoon, participants divided into groups to advance key themes identified in the morning sessions. Some of the key themes identified above were combined to focus discussions on three topics. These included:

Implementation Experiences (Facilitated by Kathy Mills): The group discussed how success and failure narratives can inform effective implementation efforts, focusing on the following themes:
- *Utilize stories to show how strategies and actions can be applied to enhance resilience* - Many tools exist that provide guidance in the identification of climate hazards and impacts and the development of resilience strategies. There is an opportunity to gather and share narratives about the use of these tools, as well as efforts to improve resilience that did not use specific tools, to recommend measures that improve resilience. In this way, stories can be valuable data sources where we can extract themes and metrics, focus on typologies or markers to help identify actions that support resilience, and provide overall guidance without excessive detail.

- *A narrative template can aid in the comparability of stories* - Using a defined framework to share stories will help others in identifying effective strategies and potential tools that may apply to their system, as well as identifying potential limitations to certain strategies in specific contexts.
- *There are challenges in navigating extensive qualitative data* - There is a need to translate narratives into actionable insights for decision-makers, but we must ensure such a story-sharing tool remains beneficial for different kinds of users, avoiding the pitfalls of overcomplication or oversimplification. Understanding and describing the typologies, markers, and characteristics of the fishery system in each narrative can help individuals align their fishery with previous examples without getting lost in details.

The group identified these next steps:

- Investigate existing resources that have collected stories to help guide future action. Resources, such as the "Seeds of Good Anthropocenes" project, provide examples of methods to collect stories and develop synthesis from different narratives.
- Digest existing tools and case studies. Compile existing tools and utilize existing tools databases and develop an understanding of which tools have been used in different kinds of fisheries systems and contexts. Within this, there should be a focus on the methods of how the tool was employed such that stories can share success and challenges in their efforts.
- Draw from lessons learned by adaptation strategies beyond fisheries. Consider integrating methods from other resilience and adaptation fields into the narrative framework.
- Create a template for stories. A framework for narratives that includes objectives, context, actions taken, outcomes, lessons learned, and future plans of each action will aid comparability among narratives. This should be developed and trialed with a small number of cases.

Tool and Resource Compilation (Facilitated by Jacob Eurich): The group focused on the need to develop a global toolkit and resource hub to facilitate the uptake of climate resilience tools and frameworks. The discussions highlighted several key ideas for future action:

- *There is a need for a centralized resource for climate resilience planning tools* - There are multiple tools and frameworks already available to aid in climate vulnerability assessments, resilience planning, and implementation across a variety of different organizations, platforms, and contexts. Managers, communities, and those working with fisheries can be overwhelmed by this fragmented landscape and access. There is a need to provide a resource hub with fit-for-purpose guidance to increase the access and usability of the existing tools.
- *Various tools apply to different types of fisheries* - Tools and frameworks are often designed for one or a few types of users (e.g. researchers, managers, industry) and stages of resilience planning (e.g. risk assessment, adaptation, engagement, communication, implementation). The resource hub could provide a matrix or other user-friendly guidance to show which tools have been designed for different groups and stages. Tools and methods that pertain to resilient and sustainable aquaculture will also be included.
- *Incorporate real-world examples into a resource hub* - To develop applicable guidance for tools selection, it is important to understand who the actual users of tools have been or will be, which may be different than who it was designed for. There is a need to provide case studies, stories of successes and challenges, and additional resources to aid in the

selection of tools based on the fishery type, climate impacts, needs for resilience planning, and implementation opportunities.
- *The resource hub should evolve over time* - The resources hub should be updated over time to include more examples of the tools' uptake or to provide additional or revised guidance for tool selection based on feedback by users.

The group identified the following next steps to advance this work:
- Create an online resource hub with a compilation and analysis of tools and frameworks for both fisheries and aquaculture. This should include a glossary of tools and information about which target groups and planning stages of each tool was designed for (e.g. developed for use by researchers, managers, and fishers to determine climate hazards and impacts), and a comparison of data requirements and effort associated with each tool.
- Include case studies and application stories in the resource hub. Case studies highlighting the use of tools in diverse geographic and governance contexts will provide context for users, and should be updated over time as more tools are used.
- Develop communication and guidance materials for the use and uptake of the global toolkit. In practical, plain-language, provide a guidebook for using the global toolkit. Additionally, develop resources specifically designed for fisheries managers and policy makers to select tools that are best matched to their fishery systems and needs for climate resilience planning and implement the results.

Knowledge to Action (Facilitated by Kanae Tokunaga): The group discussed tangible strategies to take actions towards climate resilience. Several distinct ideas have emerged from the conversation:
- *Art exhibit and art-inspired communication approaches to inspire action* - Through working with artists, we can better communicate the needs and ideas for taking actions and developing strategies towards climate resilient fisheries. Arts can evoke emotions and reach deep in individuals' minds to affect action.
- *Incorporate various types of knowledge into developing climate resilient fisheries strategies* - Climate resilient fisheries strategies can benefit from incorporating different ideas and knowledge types. This in turn can foster equity. It is important that the process reaches key individuals and entities.
- *Guide management decisions and developing efforts* - There are already various assessments and tools available for fishing communities, but there is a lack of tangible ways to incorporate them in management. There can be different ways to achieve this, and on-ramps may look different depending on existing systems and structures. Additionally, case studies can provide context and lessons-learned, and examples of the process of developing on-ramps. This work can also inform development of international standards or enhancement of existing international standards to support climate resilient fisheries at the global level.
- *Different audiences will view and require pathways to resilience differently* - Ways to utilize resilience assessments and tools as well as what climate resilient fisheries look like will vary by audience. There need to be ways to allow the user audience to choose their pathways themselves, and there can be ways to provide a menu of options based on the existing knowledge. Risk tolerances may vary by individuals, entities, and scales and levels of decisions.

These topics discussed and highlighted above are intertwined. The group generated the following product and project ideas to address these topics, some tackling multiple topics and challenges:

- Develop relationships with artists and co-host workshops, exhibits, and performances. Consider involving local communities to take part in the planning, organization, and performances.
- Contribute to international standards. This will require further communication with international organizations (e.g., FAO's Voluntary Guidelines for SSF (https://www.fao.org/voluntary-guidelines-small-scale-fisheries/en) and NGOs.
- Develop games and simulations to support communities to make decisions about paths to climate resilient fisheries. There are several existing games and tools that can be referenced. Some ideas for new resources included development of a decision support flow chart that helps communities explore their existing conditions and a set of plausible options based on information and other resources available.
- Inventory tools and other resources. There are many existing tools and resources, however communities need to spend time identifying the best tool for them, and may not have the resources or experience with different tools to find the best match for their needs. Creating an inventory can help different groups discover the best set of tools for their fisheries and their needs.
- Map a theory of change. There is still a lack of knowledge about how changes happen that support climate resilience in fisheries. We can benefit from an investigation and development of a theory of change to better understand how fisheries can become climate resilient.

Final Reflections - Day 3

In discussions following the breakout groups, participants identified potential opportunities to advance following the workshop:

- Climate Resilience Co-Management Working Group, including a co-learning network
- Use of backcasting and scenario planning to align long-term goals
- Adaptation of existing tools (e.g., FishPath, FISHE, CRFPT) to support resilience planning
- Commitment to ensure tools are useful across scientific, policy, and community contexts
- Global toolkit, or tool glossary, for resilient fisheries and aquaculture, which includes an online user-friendly interface, similar to a resource hub
- Introductory CRF training course proposal
- Concept note for a small grants mechanism linked to training
- Methods paper synthesizing tools and communication strategies
- Use storytelling and narratives to provide context and examples to increase the uptake and implementation of climate resilience planning in fisheries management

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Next Steps

After three days of discussion, participants identified common challenges and practical steps for moving resilience planning into action. Rather than the workshop being an endpoint, participants and the FishSCORE leadership see the convening as an opportunity for new collaborations and initiatives. Many emphasized the value of staying connected through the FishSCORE Network, webinars, and structured working groups, as well as through informal channels of knowledge exchange. There was strong interest in translating insights into tangible outputs that are grounded in real-world fishery case studies, through working groups, policy-relevant syntheses, and other collaborations.

The activities described below will be some of the next steps resulting from the discussions of the workshop.

- **Policy/Implementation Resources:**
    - Resources to support the implementation of climate resilience strategies in policy and management structures and processes were identified as a key need in the workshop discussions. Specifically, the need to facilitate discussions and collaborations to identify and address policy barriers and enablers in order to develop efficient, widely applicable strategies and resources for climate-resilient fisheries was identified as a way to support implementation and strengthen capacity across different scales. This work will be incorporated into the workplan of the nascent FishSCORE working group *Operationalizing Climate Resilience Assessments and Strategies in Fisheries Management and Policy*. This group will aim to develop accessible and easily understandable resources for policy-makers, fisheries managers, and those who serve as liaisons to these groups.

- **Global Toolkit for Resilient Fisheries and Aquaculture in a Changing Climate**:
    - The workshop identified the need for a resource hub that summarizes and compiles available methods, tools and frameworks to inform climate resilient fisheries and aquaculture systems. Particularly, an open-source global toolkit that offers easier access, better usability, and fit-for-purpose guidance for managers, communities, and industry who are trying to build resilience. To address this need, FishSCORE is developing a new working group that will analyze the application of tools across diverse contexts and all stages of the resilience pathways. The toolkit working group will develop two key outputs: 1) a peer-reviewed publication that compiles and analyzes existing tools and frameworks for climate adaptation, identifying gaps, overlaps, and opportunities for integration; and 2) a centralized, user-friendly, publicly-accessible and free platform to help users identify appropriate tools based on specific needs. This resource hub will help enable smarter, more efficient climate-informed decision-making in building climate-resilient fisheries strategies. The working group has identified leadership and a team structure, established a concept note and timeline, drafted a scorecard approach for comparing climate adaptation tools and frameworks, and is seeking funding.

- **Climate Resilient Fisheries Co-Management Learning Network**:
    - The workshop brought together stories of successful co-management in practice during the lightning talk sessions. With these new case studies, participants used the workshop to further refine a third working group, which was based on a previously endorsed project under FishSCORE called Co-management Models for Fisheries and Ocean Health (CO-MANAGEMENT2030). Participants identified the need to convene diverse stakeholders to exchange knowledge, foster collaboration, bridge traditional and scientific expertise, and co-create solutions. Networks were identified as a first step towards encouraging experimentation, innovation, and long-term visioning. With that consensus, participants agreed that the working group should foster collaboration and facilitate knowledge exchange among organizations and communities. Moving forward, the working group will serve as a global platform to connect diverse actors committed to advancing co-management as a pathway for climate resilience, equity, and sustainability in small-scale fisheries. The working group has established goals, case studies, and bi-monthly meetings, which will work towards an e-book of successful co-management initiatives.

Implementation Synthesis Manuscript

To build on the insights shared during the workshop, a synthesis manuscript will be drafted that focuses on examples of implementation of climate-resilient practices in fisheries. Drawing from the 24 case studies presented at the workshop (through a one-slide template activity to collect data), and three days of in-depth discussion, the manuscript will explore the conditions, challenges, and strategies shaping implementation across diverse systems. Key themes will include: 1) the importance of co-produced knowledge in building legitimacy and relevance; 2) the central role of cross-sector collaboration in moving from planning to action; and 3) the value of flexible, user-driven tools that reflect local realities. The synthesis will aim to elevate practical, real-world experiences while offering actionable guidance to support climate-ready fisheries in a range of ecological, socio-economic, and governance contexts. Ongoing contributions from workshop participants will be essential to ensure the final product reflects the diversity of voices and experiences represented at the workshop. Preliminary themes emerging from the manuscript effort that will likely remain as the key conclusions include:

- *Co-production is essential but is often under-supported*: While often cited by fishery practitioners as a best practice, evidence of full co-production remains uncommon. Increasing co-production can, and should, allow for plural values and perspectives to enter into the management process.
- *Shared tools can support diverse goals*: Flexible, user-centered tools that meet the users where they are can help move things forward, despite data limitations.
- *Social dimensions are the main implementation bottlenecks*: Progress is more often constrained by fragmented governance, trust deficits, and misaligned timelines than by technical limitations or data gaps.
- *Partnerships and place-based knowledge matter*: Effective implementation depends on long-term relationships, local partners, and investments in social capital and co-learning networks.

- *Experiential knowledge remains underutilized*: Many examples surfaced during the workshop, but these are rarely captured in formal publications or planning documents. Mechanisms are needed to better track and share these lessons - especially around failure, barriers, and challenges.

We also plan to develop a conceptual framework that outlines the social foundations of climate-resilient fisheries. Building on themes and conclusions from the workshop, this effort will center on knowledge co-production, and related terms, to further define social concepts as they pertain to resilience in fishery systems. This will help with terminology clarity, as terms like co-creation, co-development, and co-design are often used interchangeably, and provide a practical bridge between theory and action. It will also help to clarify how socially grounded strategies, such as shared decision-making, community-led monitoring, and integrated knowledge systems, can support responses to climate change.

All workshop participants will be invited to contribute as co-authors on the implementation synthesis manuscript. This may include reviewing and commenting on the draft, providing additional case-specific insights, or contributing to the text or figures. To ensure the final product reflects the perspectives shared during our workshop, co-authors will be asked to approve submission.

Summary

The workshop was a starting point for developing a shared roadmap to strengthen climate resilience in marine fisheries. The working groups and implementation synthesis activity, which includes all workshop participants, will continue to shape this moving forward. The next steps for FishSCORE will focus on applying those lessons. Together, these efforts will continue to advance FishSCORE's broader goal of building healthy marine ecosystems, resilient fisheries, and more equitable outcomes in the face of a changing climate.

Full Workshop Agenda

Wednesday, May 7th

- 8:30-9:00 Arrivals and networking
- 9:00-9:30 Welcome and overview of the workshop
- 9:30-9:45 Introduction to the FishSCORE2030 Program
- 9:45-10:00 Goals of this workshop
- 10:00-10:20 Morning break: Coffee and refreshments available in the hallway
- 10:20-11:15 Lightning talks: Topic 1 – Frameworks and processes (5 mins each)
- 11:15-12:00 Lightning talks: Topic 2 – Science and innovation (5 mins each)
- 12:00-1:30 Lunch break: provided at the Gulf of Maine Research Institute
- 1:30-2:15 Lightning talks: Topic 3 – Assessments and tools (5 mins each)
- 2:15-2:45 Afternoon break
- 2:45-3:30 Lightning talks: Topic 4 – Management contexts (5 mins each)
- 3:30-4:00 Full group discussion and reflections
- 4:00-4:30 Wrap up, review plan for next day
- 4:30 Adjourn

Thursday, May 8th

- 7:45-8:00 Arrivals and networking
- 8:00-9:00 Hybrid session: Reflecting on commonalities and differences among regions and fisheries
- 9:00-9:30 Morning break and networking session
- 9:30-10:40 Resilience panel sessions and participatory activities
- 10:40-11:45 Small group discussions about resilience
- 11:45-1:00 Lunch provided at the Gulf of Maine Research Institute
- 1:00-2:30 Break out groups: assessments and 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 that to revisit, and review plan for next day
- 4:00 Adjourn

Friday, May 9th

- 8:30-9:00 Arrivals and networking
- 9:00-9:10 Welcome, overview of the day
- 9:10-10:10 Setting priorities, defining products, and next steps
- 10:10-10:30 Morning break
- 10:30-12:00 Working towards products and outcomes (part I)
- 12:00-1:00 Lunch provided at the Gulf of Maine Research Institute
- 1:00-2:30 Working towards priorities and outcomes (part II)
- 2:30-3:30 Report back from small groups
- 3:30-4:00 Closing remarks and wrap up
- 4:00 Adjourn