

Navigating Management and Governance Complexity in a Changing Environment

East Coast Climate Change and Fisheries Governance Workshop

Pre-Workshop Discussion Document
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This document was developed by the Fisheries Leadership & Sustainability Forum to support discussions at the East Coast Climate Change and Fisheries Governance Workshop, March 19-21 in Washington, DC, and is based on ideas shared by the workshop steering committee, decision makers, and staff of the three East Coast regional fishery management councils and Atlantic States Marine Fisheries Commission.

This is not intended to be comprehensive, but rather to prompt reflection, support discussion and help generate questions to explore at the workshop. Participants are encouraged to contribute additional information and perspectives.

Introduction

The impacts of climate change on East Coast marine ecosystems are a reality. Fishery managers, scientists, and stakeholders have observed noticeable shifts in the geographic distributions, productivity, and life history characteristics of many important marine fisheries. These trends, which appear to be linked with climate-driven ecological changes, are likely to have a substantial impact on fisheries management. Climate change raises challenging questions regarding the capacity of our current fisheries governance framework to respond to these changes within, as well as across, jurisdictions.

The current and potential impacts of climate change on marine ecosystems, and the challenges of managing marine fisheries in a changing environment, have recently become a topic of national focus. NOAA Fisheries is developing a climate science strategy that will help support climate-ready fisheries management, and climate change was an area of focus at the recent Managing Our Nation's Fisheries 3 Conference. While the understanding of climate changes impacts on marine ecosystems continues to evolve, integrating climate science into the fisheries management process is a long term endeavor, and managers are likely to encounter changes in the short term that may warrant a management response. Fishery managers can contribute to this discussion now, by identifying the opportunities and challenges involved in addressing anticipated as well as unexpected changes.

The purpose of the East Coast Climate Change and Fisheries Governance Workshop is to convene managers and staff of the New England, Mid-Atlantic and South Atlantic Fishery Management Councils, Atlantic States Marine Fisheries Commission, and NOAA Fisheries, in order to identify existing or potential climate-related effects on the

management and governance of East Coast marine fisheries, and identify potential next steps toward responding and adapting to climate change. This workshop is an opportunity to leverage participants' collective expertise and knowledge of East Coast fisheries management and governance to explore the challenges of managing fisheries in a changing environment.

Workshop objectives:

- Explore the existing and potential impacts of climate change on the management and governance of East Coast marine fisheries, with an emphasis on the policy implications of shifting fishery distributions and changing productivity;
- Evaluate processes for documenting and acknowledging climate-related changes and initiating a management response;
- Identify key management questions, concerns and information needs to guide future research and coordination between management bodies;
- Examine the flexibility of the existing management framework to accommodate climate-related governance challenges; and
- Discuss potential solutions and next steps for adapting and responding to climate change, and identify opportunities to maintain a dialogue between East Coast fishery management partners.

Workshop context

Management and governance of East Coast marine fisheries is complicated. At the federal level, fisheries are managed by three regional fishery management councils under the auspices of the Magnuson-Stevens Act (MSA), with implementation and support functions provided through two separate NMFS regions and headquarters. At the interstate level, the Atlantic States Marine Fisheries Commission coordinates the conservation of coastal and anadromous fisheries through a compact among the fifteen East Coast states and in partnership with NOAA Fisheries and U.S. Fish and Wildlife Service under the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA).

Management plans developed by the councils under MSA are implemented through federal regulations for federal waters, while management plans adopted by ASMFC under the ACFCMA are implemented through state regulations for state waters. Within the mandates of the MSA and the ACFCMA, decision makers follow different decision-making processes and are subject to different regulatory requirements and timelines. The council process for developing federal regulations must comply with the National Environmental Policy Act (NEPA), Administrative Procedures Act (APA) and other federal laws.

East Coast fishery management partners, including the three councils, Commission, NOAA Fisheries, and East Coast states, participate in managing a total of 49 different federal and interstate fishery management plans, many of which include multiple species and stocks. The alignment of species distributions with management jurisdictions, the diverse and often complicated life histories of managed species, and interactions between

fisheries frequently require collaboration among management partners. This complex system of individual and shared authority, information and interests involves a corresponding network of pathways and mechanisms for interactions between management partners. This governance complexity is overlaid with management complexity, associated with the wide range of biological, ecological, social, and economic management objectives identified for East Coast fisheries, and the array of tools used to support them. Climate change will introduce even greater complexity and uncertainty into an already complicated decision-making framework. These changes will test the capabilities of our governance framework, as well as the responsiveness and flexibility of fishery specific management measures.

The focus of this workshop on governance calls for a clear definition of and distinction between governance and management, and how each may be involved in responding to climate change.

Governance refers to the structure, principles and process for decision-making.
Management refers to the decisions and tradeoffs that occur within this framework.

Management response is the process of responding to specific issues, problems, and challenges as they arise, and governance adaptation is the process of changing governance structure and principles in response to new challenges. Both management response and governance adaptation may be involved in addressing climate change concerns.

Workshop approach

This workshop will draw on the experiences and collective insight of decision makers and staff, in order to take a cross-cutting look across fisheries and explore the questions and considerations involved in addressing the impacts of climate change. The workshop agenda includes a series of large and small group facilitated discussions, culminating in a discussion in which participants will consider the following questions:

- What are the roles of each fishery management partner (Councils, Commission, NOAA Fisheries), and other bodies in responding and adapting to a changing environment?
 - In the short term?
 - Over the longer term?
- What types of climate change concerns could be addressed through a management response? What types may require governance adaptation?
- What challenges and opportunities might be addressed proactively? Reactively?
- What are the goals, values, and mandates for fisheries management that are involved in responding and adapting to environmental change?
- Do we have the flexibility and the tools we need?

Pre-workshop rapid assessment

In preparation for this workshop, Fisheries Forum staff collaborated with the workshop steering committee and with council and Commission staff to develop a rapid assessment approach to explore management and governance complexity, and current or anticipated climate change concerns across managed fisheries. The rapid assessment consisted of a set of questions designed to collect information on a) observed or potential impacts on managed stocks and/or fisheries from climate change, b) management measures and communication/coordination mechanisms in place, and c) perceptions of the ability of the governance system to address/respond to current or future climate change impacts.

The purpose of these rapid assessments is to describe the current state of knowledge regarding climate change impacts and concerns for managed fisheries, and in particular to help identify intersections with the workshop focus on management and governance. The rapid assessments were completed by council and Commission staff, and represent an investment of their time as well as an effort to share their experience and insight. The assessments are not intended to be comprehensive or serve as a comparison between fisheries; rather they are a first pass at gathering information that is relevant to our discussion, and will serve as living documents that can be refined and updated over time to incorporate new information and perspectives.

The information obtained through this rapid assessment was valuable for supporting the development of this workshop, framing workshop discussions, and providing a starting point for discussion among management partners. The completed rapid assessments are compiled by region and available as a reference in support of this workshop and future discussions on the topic of climate change. This information also serves as the substantive basis for this pre-workshop discussion document. Workshop discussions will build on this initial rapid assessment by drawing on participants' fishery and region-specific experiences to explore cross-cutting challenges, exemplify the distinction between management response and governance adaptation, and support an examination of tools, possible solutions, and next steps.

This pre-workshop discussion document draws on the information, ideas and questions generated through the rapid assessment, and is organized into three sections.

- I. Current and potential biological, ecological, social, and economic impacts
- II. Attributes of fisheries and fishery management plans
- III. Mechanisms for coordinating, communicating, and sharing responsibilities

I. Biological, ecological, sociocultural, and economic impacts

While the biological and ecological impacts associated with climate change are not the focus of this workshop, understanding the range of potential impacts is important for identifying information needs, framing discussions about adaptation and response, and for meeting the conservation and management mandates and objectives of MSA and ACFCMA in a changing environment. Similarly, anticipating the sociocultural and economic impacts of climate change is not the direct focus of this workshop, yet understanding and elucidating the range of potential impacts is valuable for formulating questions, identifying what is perceived to be at risk, and examining how climate change may interact with social and economic management objectives. This section is not intended to be comprehensive or predict specific impacts; rather, this is meant as a thought exercise and an effort to explore possible scenarios.

Biological and ecological impacts

Climate change is anticipated to impact the productivity and distribution of East Coast marine fisheries. NOAA Fisheries is investing in research to understand the range of potential responses of East Coast fisheries and marine ecosystems, to assess the vulnerability of fish stocks, and to provide information in support of decision-making. The information from this portion of the rapid assessment is included here to provide insight into the extent to which general and species-specific concerns and information needs have been identified in the management realm.

Impacts to managed stocks are likely to include changes to productivity (increased/decreased) as well as distribution (range expansion, contraction, or shift). These changes may in turn have implications for the success of conservation and management measures, including expectations for rebuilding timelines. The ability to detect these changes is closely tied with information availability; some stocks are assessed regularly while others are infrequently assessed or data-poor. With regard to some fisheries there is an indication of the direction in which this change might occur. For many fisheries, however, council and Commission staff noted uncertainty about what environmental changes might occur, how different stocks might respond, and implications for the fisheries that they support. Responses focused more on impacts associated with changes to temperature than with other environmental changes such as acidification.

Generally, responses noted the potential for impacts to the distribution of each species by life stage (eggs, larvae, juveniles, and adults); life processes including growth, recruitment, and reproduction, with implications for species productivity, spatial and temporal distribution, migration patterns, and other characteristics. The rapid assessments reflected a wide range of other factors that were identified as conditioning the impacts of climate change to managed fisheries, including stock structure, species mobility, migratory patterns, life history complexity (especially for anadromous species), thermal niche, habitat dependence/fidelity, susceptibility to disease and parasites, and growth

processes (e.g. calcification). The identification of these factors highlights the value of baseline information about the biology, life history, and ecology of managed species.

The effects of climate change on the productivity and/or distribution of individual species will also impact, and be impacted by, interactions between species. Rapid assessment responses focused in particular on predator-prey interactions, noting the significance of a species' ecosystem role (e.g. forage base, keystone predator) as well as impacts related to the spatial and temporal overlap and relative abundance of species. Finally, the effects of climate change on marine fisheries will be linked to other impacts and policy decisions outside the authority of marine fisheries management. Specific concerns identified in the rapid assessments included the availability and quality of estuarine and beach habitat, coastal development, water quality, freshwater inflow, interactions with non-managed and/or protected species including birds and marine mammals, and impediments to the passage of anadromous species.

Social and economic concerns

Climate-related impacts to the productivity and distribution of East Coast marine fisheries will also have sociocultural and economic implications. As with biological and ecological impacts, the information obtained through this section of the rapid assessment is included here to provide insight into the general concerns and current or potential impacts that are being discussed in the management realm.

The rapid assessments reinforced that the impacts of changing fishery productivity and distributions will be felt at many levels of organization, including individuals, businesses, communities, states, and regions; and by a wide range of interests that include harvesters as well as other dependent businesses, dealers, processors, consumers, and others involved in commercial, for-hire and recreational fisheries. Impacts may be felt in terms of fishery access, availability, timing, and other factors. Across this range of user groups and levels of organization, impacts may be conditioned by factors that include dependence on a particular fishery, diversification and participation in multiple fisheries, financial resources (i.e. to enter/exit/shift between fisheries), level of specialization in terms of gear, vessels, processing capacity, knowledge and skills; substitutability of the product (or the experience, especially in the case of recreational fisheries), fishery value, scale, linkages between fisheries, and the level of stability or variability characteristic of different fisheries.

As with the biological and ecological impacts of climate change, it can be difficult to anticipate the direction in which specific changes will occur. This uncertainty is compounded by the challenge of anticipating human behavior and decisions, and by the broader context of the human environment in which these changes occur. The rapid assessment responses identified several questions related to the impact of shifting fishery distributions. What might change: the participants in the fishery? Their homeports? How far they travel? Where they land their catch? How will the answers to these questions impacts to costs and expenditures? These factors may be affected by other factors that are outside the realm of marine fisheries management, including fuel prices, shoreside infrastructure, and a wide array of other factors and decisions that affect the ability of an

individual, community or other group to adapt. Finally, the magnitude of these impacts may be influenced by stock status, and again the nature of this impact is not always easy to predict. In some overfished or depleted fisheries, respondents suggested that existing challenges would be compounded by climate change, while in other cases the impacts may be less pronounced if effort has already shifted away from a particular fishery.

II. Attributes of FMPs and fisheries that could influence adaptive response

The attributes of fisheries, and fishery management plans, introduce another layer of complexity to the potential impacts of climate change on East Coast fisheries. Fishery management plans at the federal, interstate and state level can be designed to achieve a range of biological, ecological, social, and economic objectives, supported through decisions and design features that specify the conditions for accessing fishery resources. These objectives and design features are overlaid against expectations regarding the productivity and distribution of marine fisheries. The process of responding to climate change will involve recalibrating from an underlying premise of stability, to one of change.

The rapid assessments provide an opportunity to look across fisheries and regions to identify the attributes of fisheries and fishery management plans that may facilitate, constrain, or otherwise impact our ability to respond to change. For each fishery, the rapid assessment collected information about the management measures currently in place, and perceptions about the ability of the governance system to accommodate response in a timely manner. At the fishery or FMP level, perceptions of adaptability can be influenced by factors such as stock status, or level of participation (for example, whether the fishery is fully utilized or overcapitalized.) Individual fisheries and FMPs can also be a moving target, since at any point in time there are additional decisions and actions under development. Therefore, rather than assessing the adaptability of individual fisheries, this information has been aggregated to provide a cross-cutting look across fisheries at the decisions and design features that are perceived to influence the adaptive capacity of fisheries.

This section draws from rapid assessment responses, as well as conversations with the workshop steering committee, council and Commission staff, and workshop participants, to provide an overview of the topics that are considered relevant to this discussion of climate change and governance. Some of these topics reflect attributes and characteristics of fisheries, and some reflect specific tools, decisions and design features of fishery management plans. This overview is not intended to be comprehensive, and recognizes that the effect of these decisions and design features will depend on what changes occur. This is intended to provide a starting point for reflecting on the attributes of different fisheries, FMP objectives, the decisions and design features we use to operationalize those objectives, and how all of these factors may present challenges—or opportunities—for responding to environmental change.

General features of the management process

The ability of the management system to address climate change depends on features of the management framework, and inherent differences between the management process at the federal and interstate levels. Management plans adopted by ASMFC under the ACFCMA are implemented through state regulation for state waters, while management plans adopted by the Councils under MSA are implemented through federal regulations for federal waters. The timelines and applicable laws are different under each process.

The mechanism used to make a change influences the timeline for management action. For example, if a management response to address climate change can be accomplished through a specifications process, then changes can be implemented in less than a year. If changes require an amendment to a fishery management plan, the process could take one to three (or more) years. Another factor is the number of management authorities involved and the type of management arrangement. If a species or FMP is managed by one management authority, then that organization has the ability to establish priorities and implement changes as quickly as the management process allows. The process will likely be slower with joint fishery management plans and complementary management plans, where additional complexities and coordination are necessary.

General features of FMPs

Most fishery management plans contain basic features that are considered fundamental to the conservation and management mandates of MSA and ACFCMA, and the need to balance access by different user groups. These features are broadly applicable to most fisheries and constitute a starting point for introducing additional features to support specific management objectives.

Input and output controls – Most Council and Commission managed fisheries utilize output controls, in the form of annual catch limits paired with accountability measures, or quotas; and all utilize input controls that may include possession and bag limits, minimum/open and closed seasons, gear restrictions, protection of vulnerable life history stages (e.g, seasonal spawning closures), limitations on participation through permits and limited entry, and in a few cases moratoria (e.g. river herring.)

Commercial/recreational allocations – Across East Coast fisheries there is a wide range of allocation scenarios, including fisheries that are predominately or exclusively utilized by one user group, and fisheries that are allocated between users. Commercial and recreational fisheries are likely to be impacted differently by climate change. Allocation between user groups may influence the adaptive capacity of a fishery as a whole, given the inherent challenges and tradeoffs involved in balancing access by different user groups.

Examples:

- Exclusively commercial: Surf clams and ocean quahogs (MAFMC)
- Primarily commercial: Groundfish (NEFMC)
- Mixed: Summer flounder, black sea bass, scup, bluefish (MAFMC/ASMFC)
- Primarily recreational: Dolphin/wahoo (SAFMC)

Spatial and temporal management measures

Spatially and temporally oriented management measures are used for a variety of purposes that can include habitat protection, effort management, bycatch reduction, and distributing access and opportunity between user groups. Environmental change may impact the effectiveness and alignment of existing measures with fishery management objectives.

Examples:

- Catch of longfin squid is allocated into three trimesters. (MAFMC)
- The Atlantic herring fishery is managed using area-based sub-ACLs. (NEFMC)
- The northeast multispecies fishery includes year-round and seasonal closed areas and gear-restricted areas. (NEFMC)

State quotas/targets and mechanisms for transferability

Some fisheries allocate state-by-state quotas for one or more components of a fishery, devolving some decision-making to the individual states while achieving a shared conservation standard. There are divergent views on whether state allocations facilitate or constrain flexibility. These allocation decisions are typically based on historical landings, and may be perceived as differentially allocating opportunity and access among states if the allocation of quota no longer aligns with the distribution of the fishery. The conditions for transferring quota between states vary by fishery.

Example: The summer flounder fishery is managed using state by state quotas for the commercial fishery, and “conservation equivalency” in the recreational fishery (states establish their own management measures, which must achieve the same conservation benefit as coastwide regulations). (MAFMC/ASMFC)

Linkages between fisheries and shifting effort

With very few exceptions, fisheries do not occur in isolation, and climate change may impact fisheries directly as well as indirectly through the linkages that exist between participants, vessels, gear types, processing capacity and shoreside infrastructure, and other components of a fishery. These linkages are considered especially significant with regard the potential for effort and participation to switch between fisheries in response to changing productivity and shifting distributions. “Shifting” can describe different behaviors, including targeting another species within the same complex, increasing or decreasing reliance on a fishery, and leaving or entering a new fishery. There are several factors that may encourage, discourage, facilitate, or constrain the potential for effort to shift within and between fisheries.

Diversification/specialization – The potential for effort to shift between fisheries can depend on existing relationships or overlap between fisheries in terms of participation, vessel type, gear type, extent of geographical and/or seasonal overlap, the skill set and knowledge of participants, and other factors.

Examples:

- Bluefish provides supplemental income for participants in other fisheries. (MAFMC)
- Monkfish and skates are caught in conjunction with groundfish trawl and gillnet gear. (NEFMC)
- The surf clam and ocean quahog (MAFMC), red crab (NEFMC), and golden crab (SAFMC) fisheries are highly specialized.

Fishery utilization, permit availability, latent capacity – The potential for effort to shift into a fishery can depend on the extent to which quota is utilized, and factors such as the availability of permits, the different categories of permits that exist, linkages between permits, and other conditions that can constrain or release effort.

Examples:

- There is latent effort in some of the currently less-active categories in the scallop fishery. (NEFMC)
- Permit consistency requirements in New England and Mid-Atlantic fisheries prevent the splitting of limited access permits associated with a vessel; permits must be transferred as a package. (NEFMC, MAFMC)
- The commercial snapper-grouper fishery includes a “2 for 1” program, in which new entrants must purchase two transferable vessel permits to qualify for one newly issued permit. (SAFMC)
- The snapper grouper fishery also includes endorsements for golden tilefish (longline) and black sea bass (pot) to limit participation and effort shift within the snapper grouper fishery (SAFMC)

Stock status/constraining stocks – Stock status, the relative vulnerability of different stocks to climate change impacts, and the constraints imposed rebuilding stocks affect the incentives and the potential opportunities for effort to shift between fisheries.

Examples:

- Gulf of Maine and Georges Bank cod are constraining stocks within the northeast multispecies fishery. (NEFMC)
- Yellowtail flounder is a constraining stock in the northeast multispecies fishery, as well as in the scallop and small mesh fisheries. (NEFMC)

Interactions between fisheries

In addition to the linkages between fisheries associated with shifting effort, there are also interactions between fisheries such that changes to the productivity or distribution of one fishery could impact the potential to access another.

Forage – Some species support directed fisheries and are also an important source of forage to other directed fisheries. Managers in some regions are considering whether important forage stocks warrant precautionary management.

Example: Squid, mackerel and butterfish (MAFMC) and herring (NEFMC) are important forage species that also support directed fisheries.

Bait - Some fisheries support harvest for multiple purposes, including supply of bait for other fisheries. A change in the productivity and/or distribution of the bait species or the target species could have implications for both fisheries. Climate change could affect the supply, demand, price, and regional availability of bait species, and in turn, facilitate or constrain access to secondary target species. Conversely, climate change impacts to target species could affect demand and utilization of bait species.

Example: Atlantic herring is used as bait for tuna and lobster.

Bycatch interactions/incidental catch – Changes to productivity and distribution are likely to affect catch composition and bycatch interactions, including interactions between fisheries as well as fishery interactions with species protected under the ESA and MMPA. FMPs may include mechanisms to manage and/or limit interactions between bycatch and target species, and specify whether incidental catch can be landed. These mechanisms could create more or less flexibility depending on how they are constructed (e.g., to allow opportunistic harvest, reduce regulatory discards, create incentives to avoid).

Examples:

- The Atlantic herring fishery includes catch caps for river herring (will be implemented in 2014) (NEFMC)
- The longfin squid fishery includes a butterfish discard cap (MAFMC).
- The Mid-Atlantic golden tilefish fishery, which is managed under an individual transferable quota (ITQ) program, includes an allocation of catch and a trip limit to account for incidental harvest. (MAFMC)

Landings outside the jurisdiction of a lead management authority

Climate change could increase the frequency of species encountered outside the jurisdiction of the managing authority. Some encounters are rare, while in other cases encounters may be frequent enough to introduce questions about whether the species can be legally harvested, whether landings are accounted for, and whether these encounters could affect stock status or the success of a rebuilding plan. Several mechanisms can be used to account for landings out of jurisdiction.

Regulations in state waters

For a federally managed species, the effect of “out of range” landings can depend on whether there are regulations in place at the state level, such as a commercial trip limit or recreational bag limit.

Example: Some snapper grouper species managed under the South Atlantic Fishery Management Council’s snapper grouper FMP, particularly snowy grouper and blueline tilefish, may be caught and landed off the coast of Virginia. The state of Virginia instituted a recreational possession limit for grouper and tilefish

species with a mandatory reporting requirement, along with a commercial possession limit for tilefish and a landing limit for grouper species.

Definition of the management unit

Where there are known landings outside the jurisdiction of a managing authority, the definition of fishery management units can determine the options available for regulating and accounting for landings in another management partner's jurisdiction. In most cases the fishery management unit was defined with the initial development of a fishery management plan. (The closely related issue of how management partners communicate and share management responsibilities is addressed in more detail in the following section.)

Examples:

- The Mid-Atlantic Fishery Management Council manages the squid, mackerel and butterfish fishery management plan. There are substantial landings of squid in southern New England, particularly Rhode Island. The management unit includes the entire East coast.
- The South Atlantic Fishery Management Council considered extending the snapper-grouper management unit into the Mid-Atlantic region, but did not pursue this action.
- The management unit for the SAFMC's Coastal Migratory Pelagics fishery management plan extends into the Mid-Atlantic region.
- The management unit for the South Atlantic Fishery Management Council's Dolphin/Wahoo FMP includes the entire East coast.

Catch share programs

Several East Coast fisheries are managed using catch share programs, which vary in management objectives and design elements. There may be features of these programs that facilitate response to change, as well as features that constrain. For example, catch share programs may provide increased flexibility for participants to enter or exit a fishery and for effort to shift between regions, but the cost of acquiring permits and quota shares could create a capital barrier to entry. Decisions about eligibility, initial allocations, accumulation limits, and other features of a program designed to support social and economic objectives may also affect how a fishery is impacted by change. Some fisheries also include different categories or tiers of participation, which may be impacted by, and respond differently to change.

Examples:

- Under the northeast multispecies (groundfish) sector management program, participants form voluntary groups which develop operations plans and receive an allocation of the ACL for each stock, together termed annual sector contribution (ACE). Portions of ACE can be leased on an annual basis, but ACE cannot be permanently transferred between sectors. Non-sector (common pool) vessels continue to fish under days-at-sea effort controls. The Council is working on an amendment to address accumulation limits and fleet diversity. (NEFMC)

- The surf clam and ocean quahog fishery is managed under a long-standing individual transferable quota (ITQ) system. Quota shares can be freely transferred and there are no accumulation limits, resulting in increasing consolidation and vertical integration since the inception of the program. (MAFMC)

III. Mechanisms for coordinating, communicating, and sharing responsibilities

There are a number of pathways and mechanisms used to communicate and coordinate management responsibilities between regions and among East Coast management partners. These channels can be formal and informal, and support a wide range of functions that include informing, representing interests, consulting, collaborating, and sharing authority and decision making responsibilities. Responses to the rapid assessments highlighted the following examples of the communication and collaboration pathways and mechanisms utilized by East Coast management partners.

Communication and Coordination Pathways

- NOAA Fisheries (federal) and Councils (regional)
- NOAA Fisheries (federal) and ASMFC (interstate)
- States and ASMFC (interstate)
- States and Councils (regional)
- Councils (regional) and ASMFC (interstate)
- NEFMC/MAFMC/SAFMC (interregional)
- NOAA Fisheries/ASMFC/Councils and Canada/DFO (international)
- NOAA/ASMFC/Councils and USFWS/FERC (other federal agencies)

Communication and Coordination Mechanisms

“A seat at the table”: Membership on ASMFC and Councils

Membership can be either voting or non-voting. Examples include: the Regional Administrator sits on each Council; NOAA holds a seat at ASMFC; ASMFC holds a seat on each council; Council Liaisons between regions (i.e. MAFMC has dedicated council members who serve as liaisons with NEFMC and SAFMC; two MAMFC council members sit on the NEFMC groundfish committee; NEFMC and MAFMC have seats on the SAFMC dolphin/wahoo committee).

Joint FMPs

(i.e., summer flounder, scup, black sea bass, bluefish)

Management partners implement management programs that are the same. Partners schedule meetings together to discuss and take management action at the same time. The management partners vote on identical motions, and motions are not valid unless both partners adopt the same motion.

Complementary Management

(i.e. spiny dogfish, Spanish mackerel, Atlantic herring, winter flounder)

Management partners try to make management complementary, but the process is separate. The meetings and motions are done separately, but partners make a good-faith effort to complement management programs.

Recommendations for complementary measures in federal waters

(i.e. any species that does not have a federal FMP, such as lobster, coastal sharks)
In the absence of a federal FMP, ASMFC can make recommendations to NOAA Fisheries for complementary management action in federal waters.

Transboundary management

(i.e. New England groundfish)

Transboundary stocks of Georges Bank Cod, haddock and yellowtail are managed under the US/Canada Resource Sharing Understanding, through the Transboundary Management Guidance Committee (TMGC) process.

Staff level communication and coordination

- Formal – State and federal agency, council and commission staff serve as members of council support bodies (i.e. SSC, plan teams, technical teams). In addition, formal letters are sent between management partners to communicate management decisions, concerns, and other shared management issues.
- Informal – there is significant staff level communication with regard to specific stocks or other shared issues.

State director overlap between Commission and Council membership

State directors have a seat on both ASMFC and the Councils, and serve as an important conduit of information between the management partners as voting members of both.

Dual council membership (NC and FL)

Dual membership on Councils facilitates coordination with respect to areas of adjacent jurisdictions.

Scientific and data collection partnerships

Management partners interact with, and may overlap in their participation on/communication with, data collection networks (ACCSP), scientific endeavors (SEAMP, MARMAP), ocean observing networks (SECOORA, MARACOOS), and broader partnerships such as USGS Landscape Conservation Cooperatives.

Membership on supporting committees

(i.e. Technical Committee, Advisory Body, Plan Development Team)

Where the management until for the stock extends beyond a council's jurisdiction, membership on plan development teams, technical teams and advisory bodies, as well as public outreach are inclusive of the entire fishing region.

In addition to communication and coordination pathways that facilitate ongoing management, East Coast fisheries managers also utilize a number of more general, or

more issue focused channels. The gathering of council members, council leadership and NOAA Fisheries staff at national conferences, regional workshops and coordination meetings (such as Council Coordination Committee and Northeast Region Coordinating Council) provide formal and informal opportunities to communicate.

Looking ahead: Workshop discussions

Climate change will introduce additional uncertainty and complexity into an already complicated decision-making framework. While information about the potential or projected impacts of climate change can help inform decision-making, addressing the impacts of climate change will also involve decisions and tradeoffs in the management realm. By thinking about these decisions and tradeoffs now, in the short term, fishery managers can be better prepared to respond to changes as they arise.

The rapid assessment provides a starting point for examining the attributes of fisheries, fishery management plans, and the management process that are perceived to influence flexibility and responsiveness to change. The climate change and governance workshop will leverage the group's experience to continue exploring these areas, and identify the questions and considerations that will continue to frame our discussion of climate change. These discussions will culminate in an examination of potential pathways and next steps for responding and adapting to change.