

East Coast Climate Change Scenario Planning

Implications and Preliminary Ideas for Fishery Management

October 2022

1. Introduction

The East Coast Scenario Planning Initiative has engaged hundreds of stakeholders in conversations about how climate change might affect the future of fishery management on the East Coast. In recent months, participants have settled on a framework creating four scenarios, each describing a different future that fishery managers and others might face.

Based on the scenario matrix, the four stories were distinguished by two critical uncertainties. The horizontal uncertainty described the difference between a future of unpredictable conditions (where science struggled to provide adequate information) and a future of predictable conditions (where science proved adequate to inform fishery management and other decision-making). The vertical uncertainty described the difference between a future where stocks (in aggregate) were maintained or increasing, and a future where stocks were declining.

The Initiative is now in the Application phase, where we apply the scenarios to help (i) identify the consequences for future fishery governance and management and (ii) suggest recommendations for changes to existing approaches or arrangements.

This Application phase began with a series of three brainstorming sessions, bringing together a cross-section of representatives from participating management organizations. Participants were asked to consider the specific challenges and opportunities that each scenario poses for fishery managers, and then asked to generate ideas for possible changes and actions that are needed for fishery governance and management to be effective in the future. The purpose of these sessions was not to reach conclusions. Instead, it was to identify *preliminary* ideas that will help kick off scenario discussions at Council and Commission meetings in Fall 2022, and subsequently at a Summit Meeting in early 2023.

This report provides a summary of comments and reactions gathered when discussing each scenario. In the manager brainstorming sessions, we divided comments across four main thematic areas: (i) cross-jurisdictional governance and management, (ii) data and science, (iii) alternative ocean uses, and (iv) adaptability. The summary starts with a brief overview using the matrix structure. This is followed by more detailed ideas per scenario. The comments are then followed by some analysis of common themes and issues that appeared relevant across multiple scenarios. These recurring themes are important to capture, since they often represent the most important issues that need to be addressed as they are likely to emerge no matter which scenario occurs in the future.

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2. Ideas and Reactions by Scenario

Below is an outline of preliminary challenges, opportunities and options for each scenario that were generated in the manager brainstorming sessions. The following pages contain more detail for each scenario.

Ocean Pioneers

A future of unpredictable conditions and maintained / increasing stocks

- Climate change creates governance 'turf wars', requiring organizations to compromise on jurisdictional control
- Without accurate information, decisions might be made on a more qualitative basis
- Current stock assessment process unlikely to work, and could prompt moves towards simpler harvest control rules
- Vessels and new ocean users offer opportunities for fish & environmental data collection

Checks and Balance

A future of relatively predictable conditions and maintained / increasing stocks

- Focus on access and participation from small fleets and low-income recreational fishermen
- Focus on joint management of stocks rather than switching from one management body to another
- More emphasis on new technology, biological sampling in ports
- Consider how new ocean users have a seat at the table

Compound Stress Fractures

A future of unpredictable conditions and declining stocks

- Consider managing spatially or by species, or both?
- Give specialized fishermen the opportunity to move up & down coast; allow fixed fishermen to move from one species to another
- Consider how to respond when previously reliable indices for managed species are no longer reliable
- Collaborate with other users for real-time monitoring

Sweet & Sour

A future of predictable conditions and declining stocks

- Informally work through solutions to determine best approaches before formalizing changes too quickly
- Deliberately make strategic choices around declining stocks
- Further develop climate-informed status reports like State of the Ecosystem / Vulnerability Assessments
- As aquaculture products increase in popularity, increase efforts to market wild-caught seafood

Ocean Pioneers

Cross-Jurisdictional Governance & Management

- Current governance structure will not work well in this scenario
- Climate change is creating a governance turf war, particularly between Councils
- Species or trophic level boards/teams may work better than regional management bodies
- Move away from state-by-state management
- Challenging to balance community level considerations against regional/national benefit
- Consider how to have more interaction and collaboration between management bodies
- Balance against challenge of too many participants leading to cumbersome and slow processes
- Governance model needed that can more easily adapt to fluctuating conditions
- Increased flexibility needed for permitting/landing: who can land the fish and where
- Need better/more creative ways to link emerging science with management strategies such as allocations
- States have less resources available to adapt and would rely on ASMFC process more
- If science can't keep up with stock shifts, how do we decide who should manage them?
- Organizations are going to have to prepare to compromise on jurisdictional control

Adaptability

- Need to address bureaucratic factors that slow down process; determine where efficiency can be gained
- Continued virtual meetings are a potential way to increase efficiency
- Need transparency and public input, but need to find a way to make that process more efficient
- Managers will need tools to make decisions with less information/certainty (e.g., more management strategy evaluation; simulation tested control rules)
- Managers may also need to make some decisions on more of a qualitative basis
- Simple management strategies may work better than complex plans
- Communication may need to adapt to manage public expectations
- Commercial fleet likely would shift to larger vessels and processing at sea

Data and Science

- Our current stock assessment process will not work given fluctuating and unpredictable conditions; much too slow and cumbersome
 - Assessment metrics may also need to change
 - Might need to move toward simpler Harvest Control Rules
- Increased data (on fish and environmental conditions) needed from fishing industry and other sources
- New data sources must be able to be incorporated into management process quickly
- Artificial intelligence could produce advice more rapidly
- Need better spatial recreational data; current surveys inadequate to detect shifts
- More recreational catch accounting in general will be needed
- Fishery independent surveys will need to change to better capture species shifts
- Science that does not align with perceptions/experiences on the water will pose challenges for managers
- If public sees that science is not well informing management process, will be difficult to sustain funding
- Current science structure is framed around current management structure: will need rethinking if governance system changes

New Ocean Uses

- Leverage new ocean uses as an opportunity for fish and environmental data collection
- Need for better spatial data to help with planning and evaluation of new ocean uses
- Consider deconflicting proactively through ocean zoning
- Recreational shore access needs to be actively maintained as other ocean uses increase activity on shore

Compound Stress Fractures

Cross-Jurisdictional Governance & Management

- Consider managing spatially, not by species, or a combination of the two
 - Both domestically and internationally
- Work with foreign entities to figure out how to bring fish back home
- Increase participation in committees and liaisons on other Councils
 - Allow these members to vote
- Be more inclusive of all states in management decisions
- Focus on accurate, clear communication to mitigate frustration

Adaptability

- Permit system could be adapted to allow fishing what is available instead of species-based
- Reduce timeframe for actions (many actions currently take 2+ years)
- Give states the ability to transfer quota based on who needs it year-by-year
- Reevaluate rebuilding guidance based on new environmental conditions
- Either give specialized (by species) fishermen the ability to move up and down the coast or allow fixed (by location) fishermen to move from one species to another
- Create a permit system that allows fishermen to easily change gear types
- Consider if triggers/pre-determined decision rules can streamline development of fishery management actions
- Consider reducing effort in fair and equitable ways

Data and Science

- Move towards real-time monitoring feeds instead of surveys
- Collaborate with wind and aquaculture on monitoring
- Shift focus to problematic areas
- Work towards continued availability of funding for surveys that represent long time series and/or are critical for stock assessments
- Understand species' habitat needs are, and what habitat bottlenecks might be as species distributions shift
- View as an opportunity to collaborate with fishing industry on data collection
- Ensure that science used for management is representative of conditions on the water
- Create flexibility to use new data sources for management
- Streamline QA/QC so that data can be used more rapidly following collection
- Determine how to respond when previously reliable indices for managed species are no longer reliable
- Recognize that we might need more/higher resolution data to understand a variable system
- Work towards climate-informed assessments, projections, and status determinations
- Enhance existing trawl surveys to ensure that they address data needs
- Take advantage of offshore structures for wind and aquaculture as data collection platforms

New Ocean Uses

- Collaborate with real-time monitoring and reporting and increase communication between users

Sweet & Sour

Cross-Jurisdictional Governance & Management

- Clarify responsibilities for aquaculture permitting, and Council/Commission role and interest
- Craft strategies/policies for when a management response is needed due to shifting stocks
 - Consider federal/state issues and whether the shift is expected to be lasting or ephemeral; goal to avoid whiplash
- Need to develop clear/formulaic criteria for jurisdictional changes (i.e., shifting management of a species from one body to another, or enacting joint governance)
- Consider current adaptation strategies that should be continued/expanded and perhaps formalized
- Opportunity should be provided to more informally work through solutions to determine best approach before formalizing changes (e.g., through NMFS policy guidance or written agreements) too quickly
- Governance decisions are extremely tough when managers must make choices that could affect their own jobs/organizations
- Formulaic allocation methods based on distribution don't always account for historical social and economic importance
- Prohibit imports that do not meet US conservation standards
- Move from single species to ecosystem-based management
- Develop scheme where decision making is done by businesses (commercial or charter)

Adaptability

- Deliberately make strategic choices with declining stocks: for example, fleet contraction/reduction, or restrict effort across all current participants
- Consider new/increased utilization of species not previously fished, or occurring on the high seas
- Explicitly acknowledge that behavioral change (e.g., shifting towards harvesting and processing new species) is challenging
- Consider how much we let market forces vs management affect adaptation
- May need more international agreements as fish shift across borders
- Cultivate a culture of being more proactive instead of reactive

Data and Science

- Enhance/augment existing trawl surveys to ensure that they address data needs
- Take advantage of offshore structures for wind and aquaculture as data collection platforms
- Prioritize allocation of time/funds towards data collection to support increased science needs
- Increase collaborative data collection
- Improve coordination around NOAA surveys in different regions; standardize methods and design
- Focus on data storage and access
- Ensure assessment models are robust to new realities/variability in system; or develop new approaches
- Allocate resources strategically between fishery independent and dependent data collection
- Continue to advance and improve climate informed status reports like State of the Ecosystem Reports and Vulnerability Assessments
- Assessment techniques should include climate informed recruitment information

New Ocean Uses

- Educate consumers on how to appreciate and prepare seafood
- Behavioral change of watermen from fishing to aquaculture is difficult
- Engage in robust and data-driven spatial planning to better evaluate where to locate ocean activities
- Plan for how to integrate wild capture fisheries and aquaculture. One idea here might be planning for when aquaculture operations wish to culture council or commission managed species, and whether a regulatory response is needed from the commission and councils)
- As availability of aquaculture products increases, put effort into developing markets for wild-caught seafood to ensure survival of industry

Checks & Balance

Cross-Jurisdictional Governance & Management

- Focus on and modify joint management approaches to make sure all are represented
- Focus more on access and participation from small boat fleets and middle/lower class recreational fishermen or they may be lost
- Coordinate and work on coastal resiliency to address environmental justice issues and provide access and ensure access remains available
 - Note: increased access comes at a price; may drive up costs of fish making seafood less accessible
- Need clarity and guidance on when changes in distribution should lead to jurisdictional shifts in management
- Need to be mindful of current limited access rights and permit qualifications when making governance changes - removing access/rights may be a conundrum
- Need to consider flexibility in fishery permitting and access at federal and state level and in combination

Adaptability

- Maintain and increase shoreside access for anglers
- Focus on joint management of stocks as opposed to switching from one management body to another (i.e., one Council would have primary administrative authority in cooperation with other Councils)
 - Note: this could slow things down
- To understand new fisheries, we need data to understand what is there now to understand when there is a shift in distribution
- Use data to make more real-time decisions

Data and Science

- More emphasis on new tech, biological sampling in ports
- Work towards more efficiency in existing surveys since we are already struggling to maintain them, and resources are already limited

New Ocean Uses

- Collaborate and share data with other ocean users
- Consider ways to work with the commercial space industry to accommodate rocket launches. (i.e., closures 4-5 hours before and 1-2 hours after)
- Consider whether other ocean users will need a seat at the fishery management table, as advisors or otherwise, to allow for better collaboration
- Establish clear and consistent communication across sectors

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3. Common Issues Across Scenarios

The following issues emerged as particularly important across multiple scenarios. This provides an initial list of some of the problems that fishery managers are faced with, and will need to address as climate change has an increasing impact of ocean and shoreside conditions:

- Challenges of the current cross-jurisdictional structure: particularly in unpredictable scenarios, participants recognized the limitations of the current regional structure and felt that it would be unlikely to work in the future. But setting up a structure that accommodates moving stocks is tricky. Groups considered whether species / trophic level structures might offer a more suitable approach in uncertain conditions. Or is there a way of managing by location, rather than species?
- Groups also talked through the mechanics of changing management responsibilities. Should formal rules and criteria be established to indicate when a species requires an alternative management approach, or should such transitions be decided informally? It will be important to establish approaches that create consistency/continuity and avoid whiplash.
- Managers will need to make decisions with less clarity and certainty. Will this involve more simulations and MSEs? Or can decision-making be achieved by devising simpler management strategies as opposed to more complex plans? What needs to be done to manage public expectations about decision-making in situations of inadequate information?
- Fishery management is sure to involve more collaboration. This might be across management bodies, international partners, or with new ocean users. How can we ensure more regular (and intensive) collaboration without it leading to cumbersome and time-consuming processes? Or can we envisage new processes that can accommodate new voices? And what is the purpose of collaboration? Is it to ensure that all are consulted as decisions are made? Or should fishery managers see more collaboration as a way of learning and innovating (e.g., new data sources, biological sampling, supplementing changes in fisheries production)?
- What's the suitable balance of funding and attention in data and science? Is it more important to maintain, or even expand, sample sizes and improve the efficiency of existing surveys (e.g., trawl surveys)? Or should more attention be placed on establishing new sources of data (e.g., real-time from vessels, collaboration with wind energy installations)? Should we consider how fishery surveys could gather additional environmental data?
- Our current stock assessment processes and methods may not work well in a world where more timely information is needed to ensure a management process that is nimble and responsive. Can we find ways to speed up stock assessment development

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and review processes? Are there assessment methods or other metrics that might allow for more real-time resource evaluation? How do we balance the desire to incorporate more data, ecosystem information, and climate information with the need to streamline the assessment process?

- There were recurring needs identified for increased flexibility around permitting and landing. Could there be movement towards a system of permitting fishing for what's available, rather than for particular species? Can specialized fishermen move up and down the coast? Is there a role for management to support adaptation of fishermen and communities or should this be left to market forces? Are there other ways management can support fisher adaptation?
- As the ocean gets busier, there were numerous calls to investigate spatial planning and ocean zoning to minimize conflicts. Improved spatial data was also referenced on numerous occasions. Are there opportunities to expand coordination and partnerships with new ocean users to ensure an orderly expansion of ocean users?
- As coastal areas get busier with people and commercial uses, fishery managers might have to get involved in maintaining and increasing shoreside access and increased participation for anglers, and more generally as a vehicle for environmental justice.

This list of "common issues" should serve as a broad agenda for discussion and action. It is a daunting list of challenges, many of which are long-standing and complex (and given climate change, the complexity and urgency is set to increase). This leads to a couple of implications:

- i. It will be important to identify some practical ways in which fishery managers can make progress and achieve some "quick wins" around these issues
- ii. Quick wins won't be enough. Fishery managers will need to consider new approaches (and new ways of thinking) to address these and other challenges in future. This might involve more flexible approaches to strategy and decision-making, such as imagining future scenarios, option generation, experimentation, and adaptability.

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4. Forthcoming Council and Commission Discussions

The sections above provide a starting point for discussions at Councils and Commission in meetings in November and December. At those sessions, participants will be asked to:

- Review the ideas and reactions by scenarios (Section 2). Do you agree that the issues raised above are the most significant and relevant for this initiative? Are we missing any major issues, challenges or opportunities? What actions make sense to explore in each scenario?
- Review the Common Issues Across Scenarios (Section 3). Do you agree that the issues raised in this section are the most significant and relevant for this initiative? Are the issues, challenges and opportunities described accurately? As you think about what fishery managers will be facing given climate change in the years ahead, is this a good list? What would you add?
- Identify a short list of issues that you feel are particularly relevant for your organization, in that they comprise the most important factors that your organization needs to deal with.
- Propose potential actions that should be discussed at the Summit meeting when representatives from all organizations will gather to propose actions to pursue.
- Discuss the need to develop new approaches to flexible decision-making, such as option generation and experimentation.