



New England Fishery Management Council

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MEETING SUMMARY

Climate and Ecosystem Steering Committee

Via webinar

July 27, 2026

The Climate and Ecosystem Steering Committee (CESC) met on July 27, 2026 to:

- Discuss the July 2026 Modular Ocean Model 6 (MOM6) quarterly climate forecast provided by NOAA's Changing Ecosystems and Fisheries Initiative (CEFI),
- Learn about outcomes of a recent Scientific and Statistical Committee (SSC) workshop to advance development of dynamic biological reference points (DRPs),
- Learn about the updated Fish and Shellfish Climate Vulnerability Assessment (CVA) 2.0, including methods and forthcoming results,
- Receive a presentation on a national climate and ecosystem on ramps project and provide direction on NEFMC-specific work,
- Receive updates on other issues of general interest to the steering committee, and
- Discuss other business, as necessary.

MEETING ATTENDANCE: John Pappalardo (Chair); Geoff Smith (Vice Chair), Katie Almeida, Dr. Joe Caracappa, Dr. Jeremy Collie, Anthony DiLernia, Travis Ford, Dr. Lisa Kerr, Dr. Gareth Lawson, Dr. Kathy Mills, Jackie Odell, Dr. Michelle Staudinger, and Megan Ware (all Steering Committee members present); Michelle Bachman, Emily Bodell, Connor Buckley, Jennifer Couture, Robin Frede, and Jonathon Peros, (NEFMC staff); Daniel Salerno, Melanie Griffin, Melissa Smith, Kelly Whitmore (additional NEFMC members or designees); Dr. Andrew Ross, Dr. Willy Goldsmith, Dr. Katherine Gallagher, Matt Seeley, and Mike Drexler (invited presenters). In addition, 18 other people attended.

KEY OUTCOMES

- The Steering Committee was appreciative of the updates on the MOM6 quarterly regional ocean forecast, the DRP workshop, CVA 2.0, and the on ramps mapping work.
- The Steering Committee emphasized clear communication when considering moving towards dynamic reference points, recognizing that reference point changes have ripple effects, and that identifying mechanisms behind changes in stock dynamics would be ideal, although it might not be possible to do so. The Steering Committee recommended that reference point changes should build on prior research and management work. Generally, the issues raised by the Steering Committee were discussed by the SSC at their workshop.
- The Steering Committee offered various recommendations for ways to enhance the presentation of the CVA 2.0 results forthcoming later this year.
- The Steering Committee agreed that staff, working with the Process Mapping Subcommittee, should develop case studies for two past and three future on ramps for climate and ecosystem information.

- Past cases: (1) inclusion of ecosystem variables in the yellowtail flounder assessments and (2) integration of CVA 1.0 results into the updated Risk Policy.
- Future cases: (1) use of CVA 2.0 results for Risk Policy and other applications, (2) use of Ecosystem and Socioeconomic Profiles to enhance assessments, further development of dynamic reference points, or support designation of ecosystem component species, and (3) development of integrated and standardized (across FMPs) fishery information reports, including integration of on-the-water and industry observations.

WELCOME AND INTRODUCTIONS

The Chair welcomed Steering Committee members to the meeting and summarized the outcomes of the previous meeting on March 27. There were no changes to the agenda.

QUARTERLY OCEAN FORECASTS

Ms. Bachman shared the July 2026 MOM6 ocean conditions forecast (<https://www.gfdl.noaa.gov/experimental-regional-ocean-forecasts/>), which estimates future seafloor and surface conditions. The lead forecast author, Dr. Andrew Ross from NOAA's Geophysical Fluid Dynamics lab, was available to answer Steering Committee questions.

Dr. Ross noted that the outlook has remained consistent in recent quarters. Spring sea surface temperature (SST) was and is forecast to be quite warm in both the tropical North Atlantic and the Gulf of St. Lawrence, which is a well-known signature of the winter Pacific El Niño. He noted that the El Niño signal is not very evident in the Gulf of Maine where near average SST conditions are expected. The cooler bottom temperatures (BT) forecast in January for the Northeast US Shelf have been even more persistent than what was predicted in prior forecasts. Dr. Ross noted that the very cool weather in late January and February was not predicted by the global seasonal model that drives the forecasts. These cool conditions earlier in the year are likely contributing to the persistent lower BT presently observed. The forecast suggests the cooler bottom waters will diminish over the next year. They are considering whether adjustments to the model would have allowed it to predict these cool bottom conditions. A polar vortex, which may have driven the cold weather this past winter, is difficult to predict more than a few weeks in advance and thus might not be easily captured in a quarterly forecast. He noted eMOLT data are useful for groundtruthing forecast accuracy. Dr. Ross confirmed that the global model that forces the regional ocean model includes ocean, atmosphere, and land dynamics, and therefore captures all El Niños/La Niñas, the North Atlantic Oscillation, and other major climate modes. Overall, the models are performing well but there is always room for improvement.

Steering Committee discussion:

A few Steering Committee members discussed whether the forecasts and hindcasts had been or could be compared to fishery performance to see which conditions align with good or poor resource or fishery conditions. Dr. Ross noted that they had not done this work but the hindcasts would allow them to make such comparisons. Steering Committee member Dr. Caracappa said that this is work they have been considering, especially in the context of the forthcoming updates to the Fish and Shellfish Climate Vulnerability Assessment, and that they'd welcome feedback on which aspects of ecology and habitat use the Council would be interested in. For example, environmental influences on growth rates, mortality rates, or distribution shifts, which are all different angles of the same question, i.e., how do ocean habitat changes affect fishery populations?

Public comment

There was no public comment on this agenda item.

DYNAMIC REFERENCE POINTS

Dr. Willy Goldsmith, Pelagic Strategies, presented the outcomes and next steps from a June 2026 SSC workshop on dynamic biological reference points, or DRPs. The workshop built on prior regional and

national workshops and was an opportunity to both educate SSC members on the current state of this work and develop a plan for how to implement DRPs in New England. DRPs can account for the impacts of broad and persistent change and enable more responsive management as these conditions are changing. The workshop included development of conceptual approaches such as a five-step workflow for considering DRPs, as well as identification of possible indicators that DRPs would be appropriate for a stock, and a list of initial candidate stocks. The workflow would include (1) scoping / screening, (2) evaluation of shift, (3) integrating information into science advice, (4) integrating information into policy and management, (5) and review and monitoring of system performance. Stocks discussed during the workshop as having evident productivity shifts included Southern New England / Mid Atlantic Yellowtail Flounder, Atlantic Herring, Southern New England / Mid-Atlantic Winter Flounder, and White Hake. Possible candidate stocks for DRP development included White Hake, Georges Bank Atlantic Cod, and Witch Flounder. The SSC meeting in August will build on progress made at the workshop. The Steering Committee could support this work in the future through review and development of indicators, or in other ways.

Steering Committee discussion:

The Steering Committee appreciated the presentation. One member wondered if the SSC discussed needing to know why a change is occurring in a stock, such that a DRP might be appropriate to develop, or only that a change is occurring? Dr. Goldsmith noted that workshop attendees agreed that knowing the mechanism would be optimal but just understanding that change is occurring would be sufficient for moving forward with a dynamic reference point.

Another Steering Committee member asked if the SSC discussed the challenges of moving towards use of DRPs in a time when we have fewer scientific resources available. Dr. Goldsmith agreed that this was an undercurrent of discussion throughout the meeting and that we would want to leverage existing products such as the SOE report and consider how to streamline DRP development and implementation given available resources.

Another Steering Committee member noted that there was a lot of disruption in earlier rounds of reference points updates during previous Groundfish Assessment Review Meeting (GARM) processes, and that changes to reference points have ripple effects in terms of catch advice and other management and fishery outcomes. The discussion emphasized importance of transparency and communication around what we are doing if we change reference points and/or make them dynamic. Dr. Goldsmith confirmed that the SSC discussed the issue of transparency in communication throughout the workshop.

The Steering Committee asked about whether Bell et al. 2014¹ and more recent follow-on work was considered as a foundation for workshop discussions. Dr. Goldsmith noted that yes, various case studies were presented, and that there has been continual evolution of our understanding of the dynamics of various stocks.

Public comment

There was no public comment on this agenda item.

CLIMATE VULNERABILITY ASSESSMENT 2.0 UPDATES

Dr. Katherine Gallagher, NOAA Northeast Fisheries Science Center and lead analyst for the Fish and Shellfish Climate Vulnerability Assessment 2.0, described the assessment methods and planned outputs. She highlighted similarities and differences between the initial 2016 assessment in terms of both methods and results. Dr. Gallagher and colleagues have been working with staff at the New England and Mid-

¹ Bell R.J., D.E. Richardson, J.A. Hare, P.D. Lynch & P.S. Fratantoni (2014). Disentangling the effects of climate, abundance, and size on the distribution of marine fish: an example based on four stocks from the Northeast US shelf. ICES Journal of Marine Science 72(5): 1311-1322. <https://doi.org/10.1093/icesjms/fsu217>

Atlantic Councils and Atlantic States Marine Fisheries Commission to identify 42 priority species to include in the assessment and to determine how best to present the results. This collaboration led to a decision to present results at the stock level in addition to the species level. Staff-to-staff engagement will continue as the project progresses.

The trait- and process-based risk evaluation used to estimate climate sensitivity is largely unchanged from the prior assessment, relying on expert scoring. Updates include revisions to the way life history traits and complexity in reproductive strategy are evaluated. Considerations related to communication by sound-producing species were also added to the risk evaluation. Habitat dependencies and bottlenecks are also being considered. Dr. Gallagher emphasized their goal is to understand mechanisms for why species shifts are happening and how climate change can impact species fitness.

The results of the updated CVA will be spatially explicit, which is a change from how the initial CVA results were reported, and exposure is being estimated temporally (across years and seasons) and spatially using an ensemble of species distribution models (SDMs). These SDMs rely on state and federal fishery independent surveys as well as fishery dependent observer program data, combined with environmental data. The SDMs estimate which environmental variables have a greater influence on the species distribution, and climate exposure can be estimated with respect to just these important variables and with respect to all environmental variables included in the model. Final CVA products will include maps, summary statistics, and species narratives, and the code will be shared via a GitHub repository.

Steering Committee discussion:

The Steering Committee asked about timing; results for the first 40 species should be available by the end of 2026, and there is the potential for expanding to include other species in the future.

Dr. Gallagher emphasized the importance of transparency and collaboration in the process, and shared plans to provide detailed methods, species narratives, and data via an updated website that should be launched by the end of the year. The methods will summarize data quality and model limitations. Results will include summary tables and maps that reflect stock specific differences as well as the species overall vulnerability. The team is open to feedback on the usefulness of information presented. Dr. Gallagher also plans to publish the results.

The Steering Committee asked about characterizing uncertainty in the vulnerability ratings, and Dr. Gallagher explained the use of bootstrap methods and data quality scores based on expert feedback.

A Steering Committee member observed that the CVA will directly inform the climate vulnerability risk policy factor, which is the only of the five factors that is forward-looking. Understanding the timescale of the forecasts being used for the CVA, and the potential update frequency, will help with this integration. Dr. Gallagher noted that repeating the exposure analysis with new oceanographic forecasts is quick once updated forecasts from MOM6 are available, and exposure calculations could be redone annually. The frequency of refitting SDMs will depend on availability of resources but might occur every five years. A decadal climate forecast is being used based on the recommendation of fishery managers.

A concern was raised about the potential mismatch between quantitative and qualitative measures in the vulnerability assessment. The Steering Committee member suggested comparing the results of CVA 1.0 and 2.0 to understand whether any differences are on the sensitivity side, or the exposure side, or both. Dr. Gallagher acknowledged the challenge and mentioned ongoing efforts to investigate the mismatches and compare prior and new results. She noted that so far, it seems that when the sensitivity score changes, the attributes driving the change are primarily the same, but the scores are increasing. A Steering Committee member recommended being clear on the reference period used for the evaluation when communicating results.

Public comment

There was no public comment.

MAPPING ON RAMPS FOR CLIMATE AND ECOSYSTEM INFORMATION INTO MANAGEMENT

Matthew Seeley, Environmental Defense Fund, and his colleague Mike Drexler, Ocean Conservancy, shared progress to date on an ongoing nationwide project to identify, catalog, and diagram on ramps for climate and ecosystem information into fisheries management. This was followed by a brief staff presentation suggesting priority case studies for past and future opportunities specific to New England. The case studies will use process diagrams developed for the national project and draw from examples identified in other regions where appropriate. These examples have been assembled by Mr. Seeley's team in consultation with Council staff and others in six regions.

Mr. Seeley noted that there has been slow uptake of climate information into management. He explained that the complexity of the management process makes it labor-intensive for researchers to tailor information products to support these processes, unless they have an in-depth understanding of the steps and opportunities. Thus, the team's goal is to develop simple models of how these processes work and describe which climate and ecosystem products and tools might be used at different steps in the process. This includes case studies from various Councils to serve as inspiration for future work. They are working to build an integrated data system that contains the process maps, climate tools, and examples, which will be easy to use and explore. Mr. Drexler is leading this aspect of the work. This detailed investigation has helped them to identify gaps and opportunities.

Council staff suggested focusing on specific case studies to document how climate or ecosystem information has improved management decisions. The case studies could include challenges, lessons learned, and future opportunities. Suggested case studies included: (1) Incorporating updated estimates of species climate vulnerability as a factor in the Council's Risk Policy, as informed by the forthcoming CVA 2.0; (2) Including climate variables in additional stock assessments, informed by Ecosystem and Socioeconomic Profiles and aligned with dynamic reference points work, and (3) Working across FMPs to standardize and unify reports of fishery performance, and integrating these products into decision making processes. The State of the Ecosystem report was identified as a useful context for management decisions and a potential subject for a bigger picture case study about the use of the report and its influence on management priorities.

Steering Committee discussion:

A Steering Committee member asked about the target audience for the process maps and their intended use. Mr. Seeley explains that the maps are intended for a variety of audiences, from the public to Council Plan Development Teams. The maps can be simplified for public understanding and detailed for internal technical use, and the goal is to make them accessible and useful for different stakeholders.

A Steering Committee member suggested distinguishing between direct and contextual applications of ecosystem information.

Another member noted that they find the action-to-tool table structure more intuitive and suggested considering the hierarchical application of tools. The importance of understanding the sequence of tool application in each of the potential on-ramps was highlighted. The need for clear documentation of how tools have been used in the past and their impact on management decisions was also emphasized.

Staff proposed focusing on three areas for the subcommittee as noted above. The case studies will look back at past assessments and look forward to the updated Climate Vulnerability Assessment. Case study write ups will likely combine narrative and slides, with a focus on specific opportunities and challenges. The subcommittee will continue to iterate and share progress with the national team and other councils.

The next steps for the Steering Committee were discussed, including potential meetings next year to review project results. Staff will lead the subcommittee work.

Public comment

There was no public comment.

ADDITIONAL UPDATES AND OTHER BUSINESS

The Steering Committee Chair and staff highlighted the availability of a memorandum summarizing other recent work expected to be of interest to members and relevant to the committee's work. There were no questions on these topics, and no other business was brought forward.

Ms. Bachman thanked the outgoing chair, Mr. Pappalardo, for his leadership in helping to form the committee and guide its first two years of work.

The Climate and Ecosystem Steering Committee meeting adjourned at 12:30 p.m.