

Eastern Maine Coastal Current Collaborative

State of the Science Conference Discussion Summary

EM3C is a partnership between the Maine Center for Coastal Fisheries, the Maine Department of Marine Resources, and the NOAA Fisheries Northeast Fisheries Science Center. The purpose of the collaborative is to develop a scientific framework to support ecosystem based fisheries management in eastern Maine. An ecosystem based approach allows consideration of multiple components of the region defined by the eastern Maine coastal current - including people, animals, plants, and highlights the connections from rivers to estuaries to offshore waters. EM3C is unique in developing science to support an ecosystem approach because it is building knowledge and connections from the local level.

In June 2019 the inaugural event of the Eastern Maine Coastal Current Collaborative (EM3C) convened 150 collaborators, including members of the Passamaquoddy tribe, fishermen, non-governmental organizations, research institutions, engaged citizens, and government agencies, from the municipal to the federal level. Attendees ranged from early-career to long-term contributors. The two day conference, which was held on the University of Maine at Machias Campus, included short presentations and breakout discussions summarized herein.

Demonstrating EM3C's commitment to drawing upon local knowledge to inform a research framework to support ecosystem based fisheries management, we structured the conference using the social-ecological systems framework defined in the pioneering work of Nobel Prize winning economist [Elinor Ostrom](#). We focused discussions around four habitat-related themes: watersheds, intertidal, coastal, and offshore,

with a half-day focus on each theme. Each of the habitat themes had short presentations on i) local perspectives, ii) important species in the habitats, iii) important ecological aspects of the habitats, iv) important human activities in the habitats, and v) important governance frameworks in and across the habitats.

Presenters came from a wide variety of backgrounds including fishermen; local government; state, federal and tribal representatives; and university professors. Following the presentations, small groups of participants gathered to discuss information available, data gaps, and barriers to an ecosystem approach related to the theme. We went beyond a traditional conference by emphasizing group discussions between people with different expertise and perspectives so that we could maximize information sharing and collaborative learning. Conversations were wide ranging, and note-takers captured the discussions. This document summarizes those conversations into what we hope serves as an invitation for new and existing collaborators and stakeholders to join the EM3C effort.

This document provides a discussion overview followed by a summary of specific, frequently occurring comments, and closes with a brief description of follow on activities. Plenary presentations can be found archived on the conference [website](#).

Breakout Discussion Overview

We broke into eight different discussion groups, previously assigned to each conference registrant. Conference planners attempted to get broad coverage in each group by assigning registrants to sections based on a participant's self-assessment of ecosystem based fishery management familiarity, stakeholder group, and discipline. Participants were assigned the same group for all of day 1 (upland and nearshore) and then convened with new assignments for all of day 2 (nearshore and offshore). Each group consisted of approximately 20 people, including a designated notetaker and facilitator who were tasked with leading discussions toward defining elements of a vision for fisheries and human communities in the sub-ecosystem or habitat that had been previously presented in plenary. Facilitators asked participants the following questions.

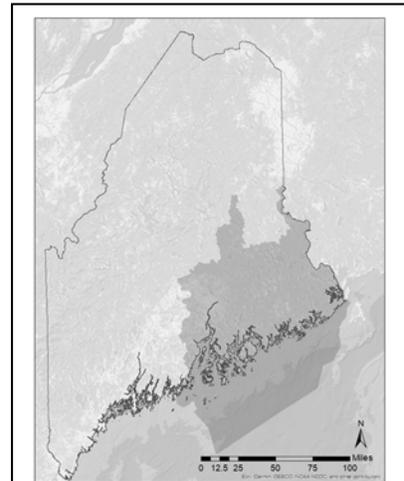
1. *Identify who is in play? (what is their capacity- or challenges to participation)*
2. *What do we know, and what do we need to know more about?*

Recurring themes across the two days' discussion were about engagement (e.g. who needs to be involved, how and what do we need to communicate?), why EBFM? (e.g. is the current model of fisheries management not working?, do we need EBFM because of climate change?), and values (e.g. of EM3C, of the region). Additionally we heard participants' concerns about climate vulnerabilities, community resilience, and individual social vulnerabilities playing into the region's future. Would we focus on species that are likely climate change resilient, or those of highest value? Softshell clam landings and prices are among the most volatile in the region and is harvested by the individuals who are most socially vulnerable. How would we identify, and account for, social and natural variation occurring at differing scales within the region?

Specific Comments by Habitat

Upland

- Participants frequently referred to improving fish passage, but questioned the biological impact of increasing alewife abundances on headwater systems, and physical impacts to rivers and streams including distribution of pollutants and nutrients. Is there any conclusive evidence that improving fish passage has an overall positive effect on marine ecosystems? What is the connectivity between these systems?



Eastern Maine is among the most fisheries dependent regions in the United States, stretching southwest from Passamaquoddy Bay at the Canadian border to the confluence of the Penobscot River. The region is territorial lands of the Wabanaki who mourn the loss of fish passage since the 19th Century. Joint efforts have invested in restoring passage which has succeeded with rapid returns but we were reminded that there is still a long way to go.

- Participants emphasized a need for fine scale data that would capture variation between rivers. We could use remote sensing and citizen science to achieve this, but must coordinate networks of data accessible by a central node.
- Oftentimes watershed management occurs at a town or even at the individual dam owner level. State and federal regulation exists, but maybe EBFM could better connect local and broader management practices.
- How can different groups be brought together, what goals might align across them? Who defines goals and priorities for EBFM?
- It is paramount to understand the distinct values of the different upland rights and stake holders. Participants suggested using existing networks and developing collaborations with community leaders as well as increasing engagement with industry, the state and the public.

Intertidal

- What is the status and population trends of various intertidal species (i.e., green crab, softshell clam, periwinkles, rockweed, mussels, birds, etc)? What are observed and predicted trends in environmental conditions (i.e., water quality, temperature, pollutants) and ecosystem interactions (i.e., changing species distributions, connections with upland and nearshore systems)?
- Participants commented on the successes of co-management in this system, but also noted some challenges: variation in levels of community engagement and leadership, difficulty collaborating with both state and municipalities, and expanding co-management to incorporate multiple species.
- Communication requires trust and personal connection. Discussants offered examples of situations where communication was possible given open-mindedness, long-term relationships, and trust building opportunities. This is possible in small, structured meetings.
- Varied interests and values intersect in the intertidal. Valuing different types of knowledge will be important to the process of weighing short and long term goals for the system. Can this be achieved by a traditional cost/benefit analysis? What other tools do we have?
- There is a general sense of there being a lot of data, but no one is putting it to use, so therefore this system is thought to be data poor. How can we include oral histories or local ecological knowledge to understand more?

Nearshore

- How would an ecosystem approach set goals for management and at what (which) scale(s) should it focus?
- How can we better understand the linkages between watersheds and marine habitats? How can we better understand linkages/similarities and differences

between bays, or spatial differences within habitats? What are the physical and biological trends and how does this interact with existing linkages? Are stable states changing? Was there ever such a thing as a stable state?

- What are the goals or priorities between fisheries? How will they be determined? Would we use economic, ecosystem, or community-defined metrics of success? Who decides?
- How can we best connect existing datasets: historical with contemporary, US with Canada, conventional with traditional?
- What is driving aquaculture development in Maine? What has allowed it to grow? Who is doing it and what are the economic benefits for community resilience and wild fisheries?
- There is a lack of fisheries and economic diversity. Losing lobster with nothing else to turn to would be devastating to this region. How do we preserve a fishing tradition and culture without killing ourselves?

Offshore

- How can we work across jurisdictions? Maine relies on effective fisheries management but is usually out-voiced in federal issues. Place-based, local and state management were suggested. Adaptive management was highlighted for its ability to recognize and respond to changing conditions and relationships between ecosystem, management, social and economic factors. Is EBFM an appropriate tool, or would simplifying be more effective than trying to better understand complexity?
- Ecosystem complexity and changing conditions perplexed many participants. How can we simplify while also taking an ecosystem approach? Should we be monitoring keystone species or trophic guilds or primary production in a simplified approach?
- Participants described the need to continue the multi-perspective discussion facilitated in this conference. Management must continue this approach more broadly. Trust is central to communication in this way and is easier to build on smaller scales. How can offshore stakeholders build trust as the work across bigger and bigger geographies and jurisdictions?
- Participants described the need for increased bathymetric mapping, eDNA, and acoustics for better understanding species distributions. More collaborations can improve research capacities, such as working with fishermen, local NGOs, tribes, and municipalities.
- Who defines the goals of EBFM here and how do they do it? How is culture change considered? Fishing is this region's iconic identity as a way of life, not just its economy. How do we reconcile the five year timeline of EM3C with longer time frames such as NOAA, or the tribes?
- How can we better understand the demographic trends in this area? Social vulnerability is not well understood, but felt deeply. Social uncertainties are the hardest uncertainties in EBFM.

- Who are the stakeholders in this habitat? How are they defined and how do we understand their connection to the other habitats in this area?
- What are the economic benefits of non-fishing coastal or ocean activities, including conserved lands or wind farms? How are these benefits and impacts distributed across individuals, sectors, and municipalities?

Growing the EM3C Effort

Recent research at the University of Maryland surveyed 186 practitioners across the US about barriers to ecosystem based management. The most frequently cited (27%) non-science barrier to implementing ecosystem based management was the “resources to successfully cross boundaries and fully involve stakeholders”. EM3C’s foundational and innovative concept is to fully involve a broad array of stakeholders to successfully cross boundaries to identify a regional vision for an ecosystem approach and framework for implementing it. This is reflected in the group of stakeholders involved in the State of the Science Conference Steering Committee, the design of conference presentations, those who participated in compelling discussions over the two days, and our collective interest and commitment to not only convene subsequent semi-annual conferences, but the **necessary** networking, collaborative research, citizen science, and broad community engagement for collective learning in the interim.

As Jon Hare said in his closing remarks, this a career-long effort that will not be achieved in 3 or 5 or 10 years. But we must start where we can, taking an ecosystem approach- what the Passamaquoddy identify as “N’tolonapemk”- meaning our relative’s place. That all living beings and the ecosystem are interconnected and inter-dependent in so many ways, humans included. To better understand our interconnectedness, we must make new connections in an effort to broaden and strengthen our individual networks. We plan to coordinate several engagement, collective learning, and collaborative research opportunities over the next year around several of the themes or topics highlighted in this Discussion Summary.

If you are interested, join the EM3C listserv (EM3C@LISTS.MAINE.EDU) and use the listserv to invite EM3C colleagues to your own engagement and research efforts.