

Ecosystem Based Management Work Group Meeting #3 Summary

Boston Marriott Long Wharf, Boston, MA

July 27, 2016; 10am - 5pm

Attendees

EBM Work Group: Mary Boatman (BOEM), Margherita Pryor (EPA), Bruce Carlisle (NE RPB Member – Massachusetts), Kathryn Ford (NE RPB Alternate – Massachusetts), Kathy Mills (Gulf of Maine Research Institute), Peter Auster (UConn)

Marine life Data and Analysis Team (MDAT): Pat Halpin, Jesse Cleary and Corrie Curtice (Duke University)

Northeast Ocean Data Portal Working Group: Marta Ribera (TNC)

Mid-Atlantic Ocean Data Portal Working Group: Jay Odell (TNC), Ed Camp (MARCO)

National Center for Ecological Analysis and Synthesis (NCEAS): Courtney Scarborough, Jamie Afflerbach

NROC: Nick Napoli, Emily Shumchenia, John Weber, Katie Lund

Northeast RPB: Betsy Nicholson (NOAA – RPB Federal Co-lead), Chris Tompsett (DOD), Michele Desautels (USCG), Meredith Mendelson (Maine), Robert Labelle (BOEM), Ted Diers (NH)

This meeting was open to the public; approximately 65 participants, including those listed above, attended in-person.

Agenda

- Overview of the draft Northeast Ocean Plan with focus on key elements of EBM
- Review progress illustrating the draft Important Ecological Area (IEA) Framework, and obtain input from the EBM Work Group on key questions and decisions related to the use of existing marine life and habitat data to characterize IEA Component 1 – Areas of High Productivity and IEA Component 2 – Areas of High Biodiversity, and consider implications for characterizing IEA Components 3 through 5
- Introduce the Ocean Health Index (OHI) and provide an overview of the process and timeline for developing an OHI for New England
- Provide an opportunity for the public to comment on progress with the IEA Framework and the OHI

Outcomes

1. The draft NE Ocean Plan includes elements of ecosystem based management.

- The ocean planning process is itself an example of EBM. By developing data and looking at interactions across sectors, resources, and jurisdictions at a broad geographic scale, the Plan contains the foundation for advancing many elements of EBM. The focus on marine life and data (including today's conversation about IEAs) is thus one aspect of EBM.
- Participants suggested that case studies of specific ecosystem component and human use interactions could be used to test plan data and processes and to help advance EBM

2. Progress made and input received on the IEA Framework

- There is need to clarify the technical and analytical process for how IEAs are going to be developed and determining agencies' use and application. This conversation would help inform the IEA development process and determine the types of products that will be useful to decision-

makers. RPB members noted that IEAs are not intended to become areas with specific management objectives, and represent one aspect of a longer-term effort to improve our understanding of the functions and relationships among ecosystem components.

- Some felt that there are sufficient data to make significant progress illustrating the IEA Framework
- Emphasis on using peer reviewed data, published methods, or both
- Uncertainty and survey extents need to be considered and provided
- Data classification, visualization and interpretation need more consideration
- Specific recommendations for the various data/analyses used in IEA Components 1 and 2

3. Introduction to the OHI

- The RPB will set up a work group and consider the work plan for the OHI
- Early OHI milestones include determining how the ten OHI goals relate to regional ocean planning, and defining the geographic extent of the analysis and any sub-regions in the analysis

Background

The format of the meeting was as follows: NROC, MDAT, and Data Portal staff presented discussion topics, maps, and/or data for the EBM Work Group and attending RPB members. Then, questions and comments were taken from the wider group of participants. There was interaction and discussion on all topics among all groups throughout the day. At the end of the meeting, participants also were encouraged to offer formal comments on the topics covered during the meeting. These comments are captured in the Appendix.

The meeting opened with an update on the Northeast ocean planning process. The draft Northeast Ocean Plan was released on May 25, and the public comment period closed on July 25. Many public comments received during the comment period, including at the public meetings held throughout New England in June, focused on the importance of maintaining and updating the Northeast Ocean Data Portal, and how to advance and clarify the IEA concept. RPB members noted that IEAs are not intended to become areas with specific management objectives, and represent one aspect of a longer-term effort to improve our understanding of the functions and relationships among ecosystem components.

Ecosystem based management is defined in the draft Northeast Ocean Plan (p. 28) according to the “Scientific Consensus Statement on Marine Ecosystem Based Management”:

Ecosystem-Based Management is an integrated approach to management that considers the entire ecosystem, including humans. The goal of EBM is to maintain an ecosystem in a healthy, productive and resilient condition so that it can provide the services humans want and need. EBM differs from current approaches that usually focus on a single species, sector, activity or concern; it considers the cumulative impacts of different sectors.

(1) Ecosystem based management is a process embedded in ocean planning

NROC staff presented examples of how the draft Plan addresses key elements of EBM. In addition to compiling in one place thousands of data layers on marine life, habitat, and human uses, the Plan’s science and research priorities are framed to focus on issues that will help advance an EBM approach. Discussion among the EBM Work Group, RPB members, and participants centered on these themes:

- The ocean planning process itself is an example of EBM; we are on the path towards EBM through the ocean planning process
- An EBM approach enables better decision-making through the use of data (particularly spatial data) and other information such as expert knowledge; characterizing IEAs contributes to, and is a component of, this effort
- Case studies or examples of how data can be used to address interactions among specific ecosystem components and human uses would serve to test plan data and processes, familiarize managers and decision-makers with what information is available, and help advance EBM

(2) Progress made and input received on the IEA Framework

Following the previous meeting of the EBM Work Group in January 2016, the RPB recommended that illustrations of IEA Components 1 and 2 could be explored using existing Plan data and information. In response, a group including NROC staff, MDAT, the Northeast Ocean Data Portal Working Group, and the Mid-Atlantic Ocean Data Portal Working Group presented progress illustrating IEA Components 1 and 2, as well as initial thoughts on illustrating Components 3-5.

The group presented maps and data in SeaSketch on each topic, followed by questions and feedback from participants.

The discussion covered two important topics; A) feedback and input on the process of illustrating IEA Components through the use of existing data, and B) very specific comments and recommendations on the particular datasets and analysis methods presented.

A) Feedback and input on the process of illustrating IEA Components and the use of existing data

- *There is need to clarify the technical and analytical process for how IEAs are going to be developed and determining how agencies' use and application*

The EBM Work Group and RPB members discussed the challenges in developing data with limited knowledge of the specific management questions to be answered or issues to be addressed. This is a central issue in developing data/using science to support ocean planning – regional ocean planning occurs at a broad geographic scale and must comprehensively cover a range of topics, whereas decision-making often occurs at local scales and for more discrete and narrow subjects. These challenges did not deter participants from continuing work on IEAs, but it was recognized that there should be a conversation among federal RPB members regarding exactly how this information will be used. Importantly, this conversation would help inform the data development process and determine the types of products that will be useful to decision-makers.

- *There are sufficient data to make significant progress illustrating the IEA Framework*

Some participants noted that the Northeast is particularly data-rich. The team presented numerous existing data layers as well as new

IEA Definition

As defined in the Draft Framework, Important Ecological Areas for Northeast Ocean Planning are habitat areas and the species, guilds, or communities critical to ecosystem function, resilience, and recovery. IEAs include areas/species/functional guilds/communities that perform important ecological functions (e.g., nutrient cycling, provide structure) that are further defined by five Components.

Five Components of IEAs:

1. Areas of high productivity—includes measured concentrations of high primary and secondary productivity, known proxies for high primary and secondary productivity, and metrics such as food availability
2. Areas of high biodiversity—includes metrics of biodiversity and habitat areas that are likely to support high biodiversity
3. Areas of high species abundance including areas of spawning, breeding, feeding, and migratory routes—support ecological functions important for marine life survival; these areas may include persistent or transient core abundance areas for which the underlying life history mechanism is currently unknown or suspected
4. Areas of vulnerable marine resources—support ecological function important for marine life survival and are particularly vulnerable to natural and human disturbances
5. Areas of rare marine resources—distribution and core abundance areas of state and federal ESA-listed species, listed species of concern and candidate species, and spatially rare habitats

data, using existing and accepted methods¹, to illustrate Components 1 and 2 (a summary of the feedback on these data is presented under B). Because several aspects of Components 3-5 relate to existing regulatory programs, a number of ready-made products already exist addressing these Components, but key questions remain regarding how to combine expert-developed data with more quantitative or observational data (e.g., Essential Fish Habitat designations and observations of fish biomass).

- *Emphasis on using peer reviewed data, published methods, or both to characterize Components*

The EBM Work Group highlighted the importance of using peer-reviewed data, methods and products to support IEA Components. The data presented for Components 1 and 2 were derived from existing peer-reviewed work or using peer-reviewed methods. The methods for the majority of the MDAT individual species products (from which many summary products and IEA layers are derived) are published in peer-reviewed journals and/or reports. MDAT will submit a manuscript that describes the methodology used to construct summary products (i.e., species richness, diversity, total abundance/biomass, and core area abundance/biomass) for publication in a peer-reviewed journal. This information can presently be found in the MDAT technical documentation².

- *Uncertainty and survey extents need to be considered and provided*

Characterizations of uncertainty (e.g., companion maps of uncertainty metrics and/or sensitivity analyses) as well as the precise survey extents of the underlying data are important factors for interpreting maps and data. Presently, the majority of existing marine life data on the Portal provide this information, and new data layers characterizing IEA Components should take a similar approach where possible.

- *Data classification, visualization and interpretation need more consideration*

Participants emphasized the need to think carefully about how data are represented and visualized in final maps. This important consideration links directly to their use by decision-makers. In order to maximize the utility of IEA Components, maps should clearly represent units, convey the significance of the magnitude of the data values, and consider representation of thresholds.

B) Specific comments and recommendations on the particular datasets and analysis methods presented

The EBM Work Group recommended continued work and refinement of the draft data layers characterizing Components 1 and 2, and to begin work characterizing Components 3-5. In addition to the points raised under (A), the EBM Work Group highlighted the need for more work on: developing diversity metrics, considering the role of core abundance/biomass areas in characterizing Components, and the methodologies used to build core abundance/biomass area products and composites of core abundance/biomass areas. Specific comments pertaining to each component are listed below:

¹ NROC staff, MDAT, and Data Portal staff are compiling a list of references for the peer-reviewed literature pertaining to the methods and approaches used to develop the maps and data presented in SeaSketch, which will be made available to the public. This bibliography will also be available to EBM Work Group members as they undertake detailed review of the data.

² As part of the MDAT review process, the MDAT technical documentation is being revised and compiled into a single document, which will be linked on the Portal and included as an Appendix in the final Plan. Presently, the technical information resides in four documents:

For marine mammal species: http://northeastoceandata.org/files/metadata/MDAT/MDAT_Mammals_technical.pdf

For avian species: http://northeastoceandata.org/files/metadata/MDAT/MDAT_Avian_technical.pdf

For fish species: http://northeastoceandata.org/files/metadata/MDAT/MDAT_Fish_technical.pdf

For all summary products: http://northeastoceandata.org/files/metadata/MDAT/MDAT_SummaryProducts_technical.pdf

Component 1	Component 2	Components 3-5
<ul style="list-style-type: none"> • Expand analyses of chlorophyll-a bloom strength and persistently high chlorophyll-a anomalies for the Northeast region with consideration of existing peer-reviewed approaches and acknowledgement of year-to-year variability • Examine other approaches to map zooplankton in the region and consider how to deal with spatially sparse data • Address benthic productivity • Explore linkages between primary and secondary productivity • Identify and map major geophysical features such as canyons, seamounts, and areas of complex seafloor 	<ul style="list-style-type: none"> • Need to better understand similarities and differences between maps of various diversity metrics (Shannon’s diversity index, Gini-Simpson diversity index, and species richness) for marine life and how they can be interpreted • Consider core abundance/biomass area methods and synthesis options • Maps of feeding guild richness for birds (based on core abundance areas) could be useful and this approach could be expanded for cetaceans and fish • Coordinate with New England Fishery Management Council (NEFMC) on approaches to map seafloor composition • Identify and map major geophysical features such as canyons, seamounts, and areas of complex seafloor 	<ul style="list-style-type: none"> • Use existing data layers such as Essential Fish Habitat, Critical Habitat, and Habitat Areas of Particular Concern as initial data layers under Components 3-5 • Consider expert judgment in identifying areas of spawning, breeding, feeding, and migratory routes • Coordinate with NEFMC on seafloor habitat vulnerability • Coordinate with NEFMC and the Mid-Atlantic Fishery Management Council on cold-water corals

(3) Introduction to the OHI

Courtney Scarborough from NCEAS provided an overview of the process and timeline for developing the OHI in New England. The OHI seeks to assess coupled human-natural system health, provide easy-to-understand metrics describing ocean health in part by incorporating sustainability indicators, and allow adaptability to different contexts. The OHI approach is flexible and can adapt to local priorities; it is also transparent through being explicit about its methods and assumptions, uses a quantitative approach through sensitive, numeric results, and is repeatable/easily updated through time. Previous applications have focused on ten public goals and sub-goals, including: food provision, artisanal fishing opportunities, natural products, carbon storage, coastal protection, tourism and recreation, livelihoods and economies, sense of place, clean waters, and biodiversity. These goals can be redefined or renamed when the OHI is brought into new places like the Northeast.

Discussion between the EBM Work Group and RPB members focused on determining how the ten OHI goals relate to regional ocean planning, and how to define the geographic extent of the analysis. The RPB members who were present expressed interest in developing a work group to assist the EBM Work Group in addressing these issues. In addition, it was noted that RPB members’ existing work to understand ocean planning goals—as part of the plan development process—could help inform potential OHI goals. RPB members stressed the need to involve stakeholders in the OHI process and to consider existing indicator frameworks in the region, including the Integrated Sentinel Monitoring Network.

Meeting Summary: Next Steps

1. With the EBM Work Group, continue to develop, review, and refine data supporting Components 1 and 2
2. Develop initial illustrations of Components 3-5
3. Use SeaSketch to obtain feedback from the EBM Work Group
4. Continue exploration of the OHI application in the Northeast, with consideration of existing indicator programs in the region

Appendix: Public Input on IEA Framework and OHI

During the last portion of the meeting, members of the public were invited to provide input on the IEA framework and OHI. They offered the following comments.

Dr. Heather Leslie, professor in the School of Marine Sciences and director of the University of Maine's marine laboratory, the Darling Marine Center:

I am grateful to be able to participate today. I have two points—the first about outcomes of the plan and the second about the nature of human-ocean interactions. These comments flow from my scholarship on ocean ecosystems and ecosystem-based management in particular, over the last 15 years.

First, I believe that continued reflection on science's roles in implementation of the plan is very important. I commend the work of the EBM Working Group, the RPB, and the many researchers and practitioners who have enabled us to get to this point—we are engaged in an unprecedented effort to make good on EBM in the Northeast and this is very exciting and promising. However, if our attention in the implementation phase is primarily on improved understanding of marine life and resources, I think that we will fail in meeting the Goals set out by the RPB in January 2014 and fall short of the NOP mandate.

Our model for impact should be much bolder and consistent with first goal adopted by the RPB: healthy ocean and coastal ecosystems. These ecosystems include the human communities who are deeply connected to and dependent on the natural systems and the benefits, or ecosystem services that they provide. Knowledge creates understanding and ultimately, action. Strong and strategic science—together with other ways of knowing—local and tribal knowledge in particular (as called out in Goal 2 by the RPB)—will enable us to continue to generate the understanding that we need to take action, and to ensure healthy oceans and coastal human communities into the future.

Second, the six science priorities suggest a linear model where ecosystem change influences marine life and resources and these marine resource changes impact human activities. The plan recognizes the importance of integrating knowledge of ecosystem connectivity and dynamics into management; I was very glad to see that. But reciprocal interaction—people's changing perceptions and use of the ecosystem influencing marine life and ecosystem change—is not invoked. This reciprocity is vital for this plan to result in meaningful improvements in our coastal communities and the northeast ocean, and to sustain both into the future.

I suggest that Science Priority 4's text be amended to include explicit acknowledgement of the reciprocal interactions among humans as part of coastal and marine ecosystems. It would be beneficial to specifically reference the coupled social-ecological systems (or human-natural systems) framework as a framework to guide synthesis and prioritization of further study of the many elements of ecosystem health, dynamics, and change cited in Chapter 5. Relatedly, I respectfully suggest that Science Priority 3 be expanded to include "the vulnerability of marine resources and coastal human communities to specific stressors."

Thank you for the opportunity to comment and for your work to date.

Priscilla Brooks, Conservation Law Foundation:

I want to commend all the folks involved in this effort. It has been an incredible effort. This is exciting work around identifying IEAs and the OHI. All of our heads are spinning about all the data, modeling and questions posed. That is part of the scientific process. I think a lot of progress has been made and it's important to recognize that. This group has advanced IEAs significantly.

It is our hope that the RPB will articulate much more clearly in their final plan the process and a timeline for completing this work. We see IEAs as playing a critical role in ocean ecosystem functioning and resilience. It is important we complete this work as soon as possible, including figuring out how this information is feeding into decision-making. Based on the significant advancement identifying these components I see here, we hope the RPB can complete mapping the components and getting them up onto the data portal by the end of year, and in 2017 complete its first attempt at IEAs. We recognize the effort won't be perfect and there will be data gaps.

It is important for the RPB to convene a work group to tackle how this information would be used in decision-making and what agency commitments would look like, and to articulate to stakeholders that IEAs are not necessarily no go zones. There's a perception that this is an "end run" to create marine protected areas. In truth, multiple uses may occur in these areas—it depends on the values of a particular IEA and compatibility with other uses. This gets to the issue of compatibility and ensuring the plan has steps to address them.

Lastly, it is exciting to see the OHI and imagine thinking more holistically about assessing our ocean's health. Nevertheless, there still need to be plan implementation and performance metrics. These metrics represent something different from OHI. For example, they could look at how successful the pre-application consultation with stakeholders has been, or how successful the Ocean Plan has been in changing the way agencies are communication with each other states and tribes. These represent different measures from the OHI.

Giancarlo Cicchetti, U.S. EPA Office of Research and Development:

The RPB is moving in a great direction. EBM is about informed spatial decisions that are about ecosystems and people. You need the IEAs to give you the spatial piece, and to understand where we want to make these decisions and about what. By coordinating the day around spatial decisions, we saw these issues start to come together. Also, the data we've seen today suggest that things seem to be sliding coastward. That makes sense because we are talking to people on the coast and people care about the coast. The mere process of adopting the OHI means this effort will be driven coastward, and I think that is a good thing.

Ben Haskell, NOAA Stellwagen Bank National Marine Sanctuary:

Managed areas need to be explicitly acknowledged. For example, the Stellwagen Bank National Marine Sanctuary was created in 1992. Even before then, however, people knew it was a special area for anecdotal reasons. It's still special and I suspect it will pop out in the data portal as special. Other regions besides Stellwagen Bank share these characteristics. At some point, IEAs and managed areas will need to come together and be reconciled.