Gulf of Maine Ecosystem-Based Management Toolkit Survey Report

Gulf of Maine
Council on the
Marine Environment

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March 2008

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Marine Environment

The Gulf of Maine Council on the Marine Environment was established in 1989 by the Governments of Nova Scotia, New Brunswick, Maine, New Hampshire, and Massachusetts to foster cooperative actions within the Gulf watershed. Its mission is to maintain and enhance environmental quality in the Gulf of Maine to allow for sustainable resource use by existing and future generations.

Gulf of Maine Council on the Marine Environment

COMPASS

Communication Partnership for Science and the Sea

ECOSYSTEM-BASED MANAGEMENT TOOLS NETWORK

Survey conducted by

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This survey was conducted as part of the ongoing collaboration of the Gulf of Maine EBM Toolkit Work Group (www.gulfofmaine.org/EBMWorkGroups). We thank all survey participants for their generous contributions of time, effort, and ideas.

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Waterview Consulting is an independent firm that works at the intersection of science, management, and communications. For information about Waterview Consulting, go to www.waterviewconsulting.com.

The Communication Partnership for Science and the Sea (COMPASS) is a collaborative effort to advance marine conservation science and communicate scientific knowledge to policymakers, the public, and the media. Its mission is to accelerate the pace of solving important marine environmental problems. COMPASS gratefully acknowledges funding to support this survey from The Gordon and Betty Moore Foundation. For information about COMPASS, go to www.compassonline.org.

The EBM Tools Network promotes awareness, development, and effective use of tools for ecosystem-based management in coastal and marine environments and their watersheds. The EBM Tools Network gratefully acknowledges funding for Network coordination from The David and Lucile Packard Foundation. For information about the EBM Tools Network, go to www.ebmtools.org.

Intelligent Marine Planning is an independent consultancy supporting the EBM Tools Network and the Gulf of Maine EBM Toolkit Work Group. For information about Intelligent Marine Planning, contact Dan Dorfman, Senior Planner/Principal, at dandorfman@intelligentmarineplanning.org.

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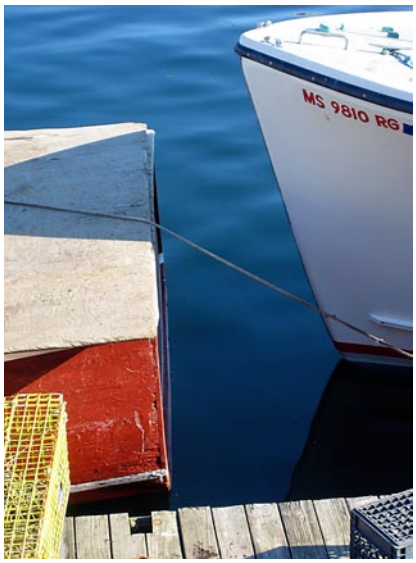
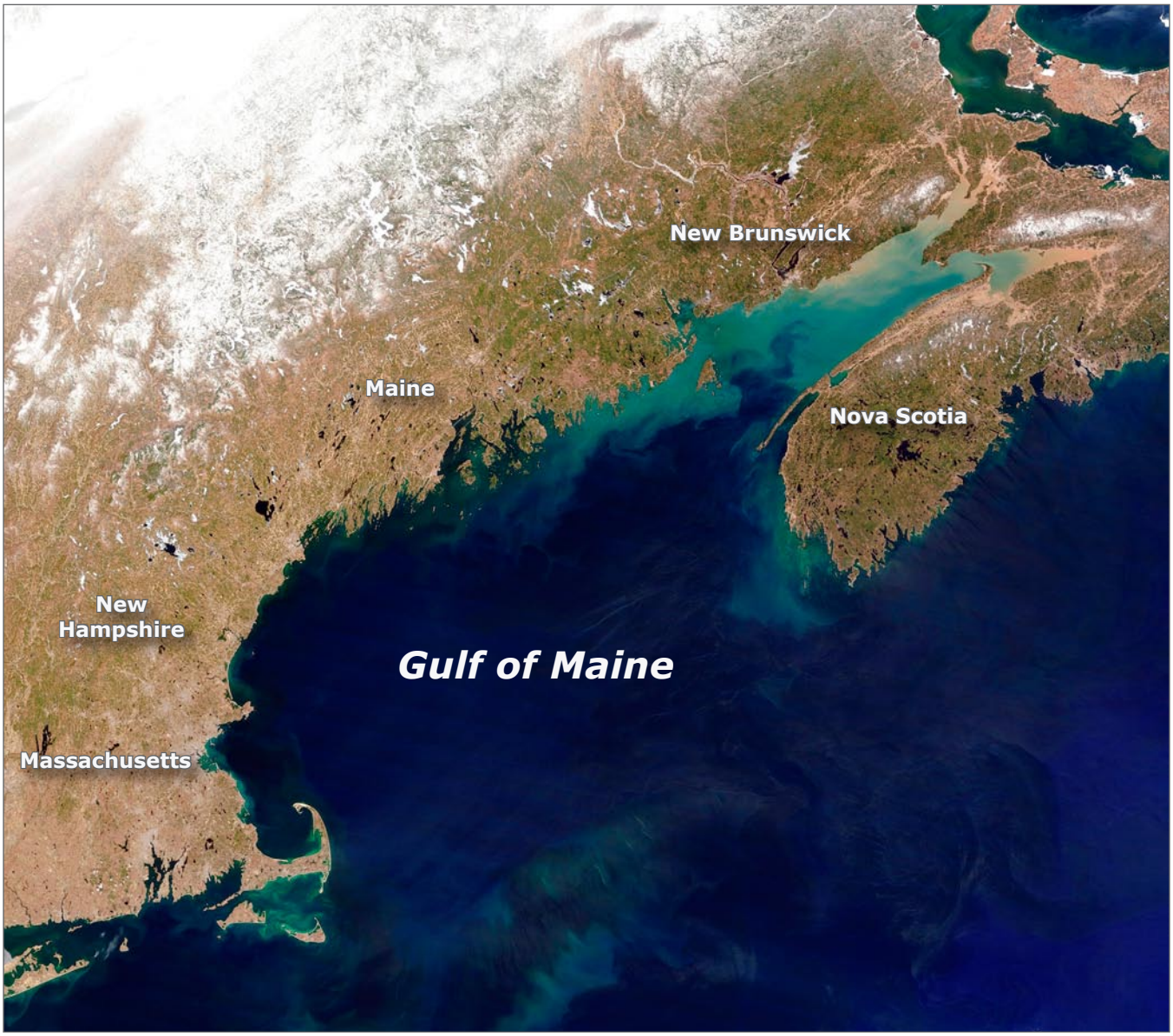
Front cover: ferry in Penobscot Bay, Maine (GoBot). Front cover insets: whale breaching (Matthew Hull); fishing boat at sea (Armando Estudante); swimming at Cape Cod (© Peter H. Taylor); salmon aquaculture pens (GoBot)

Opposite page and back cover: salt marsh (Josh Bousel); ship in Boston Harbor (W. Paul); fishing boats (David Gale)

Table of Contents





Satellite image courtesy of Satellite Oceanography Data Lab, School of Marine Sciences, University of Maine

Executive Summary




Photographs (left to right): whale (Matthew Hull); fishing boats (Chris Seufert); coast (Woodley Wonderworks); Asian shore crab, *Hemigrapsus sanguineus* (Jenn Forman Orth)

Many government agencies and non-governmental organizations (NGOs) from the United States and Canada are collaborating to advance ecosystem-based management (EBM) in the Gulf of Maine region.

The Gulf of Maine is a semi-enclosed sea that is renowned as one of the world's richest marine ecosystems. It is bordered by Nova Scotia, New Brunswick, Maine, New Hampshire, and Massachusetts. Because of the growing variety and intensity of human uses of the Gulf of Maine, effective management is imperative to support ecosystem integrity and economic prosperity in the region.

Seventy-six representatives from government and NGOs in the United States and Canada participated in a regional EBM workshop in March 2007. They identified 7 Action Items as the top priorities for advancing EBM in the region. One of the Action Items was the development of a Gulf of Maine EBM Toolkit.

Workshop participants recommended that the Toolkit initiative should make existing EBM tools more accessible; provide a targeted set of tools adapted to the region's needs; develop new tools for this region; and respond to the evolving needs of coastal managers. After the workshop, a Work Group formed to pursue development of the Toolkit.

As an initial step in the Toolkit development process, the Gulf of Maine Council on the Marine Environment and the Communication Partnership for Science and the Sea (COMPASS), in association with the EBM Tools Network, conducted an online survey of EBM practitioners in September and October 2007. The Gulf of Maine Ecosystem-Based Managment Toolkit Survey was designed to provide information about tools needed by EBM practitioners in the region.

Key findings of the survey are outlined in the box (right). See Appendix B for complete survey results.

Gulf of Maine EBM Toolkit Survey: Key Findings

Major Obstacles to Implementing EBM

- Lack of money, time, or people to do EBM
- Lack of established methods for implementing EBM
- Lack of understanding or information on the ecosystem

Important Management Issues

- Coastal habitats assessment and mitigation
- Stakeholder and/or community engagement
- Habitat restoration
- Marine protected area management
- Biodiversity conservation

Management Capacity Needed

- Understanding how the ecosystem functions
- Engaging stakeholders in decision-making
- Communicating management processes to stakeholders
- Visualizing possible development and resource use scenarios

Types of Information Needed

- Case studies of present-day management situations in the Gulf of Maine region and how EBM could be or has been applied
- Forward-looking assessments of how the Gulf of Maine ecosystem is likely to change and implications for management
- Spatially explicit information about human activities affecting the Gulf of Maine and its watershed
- Information about how the Gulf of Maine ecosystem functions

Training Needs

- Training to understand conceptual framework of EBM and general approaches for putting EBM into practice
- Training to better understand the ecosystem context in which management occurs and that management decisions affect

Introduction

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Overview

Many government agencies and non-governmental organizations (NGOs) from the United States and Canada are collaborating to advance ecosystem-based management (EBM) in the Gulf of Maine region.

Bordered by the northeastern United States and the Canadian Maritime Provinces, the Gulf of Maine is a semi-enclosed sea that is renowned as one of the world's richest marine ecosystems. Along the western and northern shores of the Gulf of Maine lie the cities, towns, and watersheds of Massachusetts, New Hampshire, Maine, New Brunswick, and Nova Scotia. The legendary fishing grounds of Georges Bank mark the southern and eastern boundary.

The Gulf of Maine has supported a long tradition of fishing, marine transportation, coastal development, and recreation. Given the growing variety and intensity of human uses, effective management is imperative to support ecosystem integrity and economic prosperity in the region. Among the existing and proposed activities affecting the Gulf of Maine are the following:

- Aquaculture
- Development of coastal lands
- Discharge of sewage and other pollutants
- Energy production and distribution (e.g., wind farms, pipelines, liquefied natural gas terminals)
- Fishing
- Recreation and tourism
- Seabed mining
- Telecommunications (e.g., seabed cables)
- Transportation (e.g., docks, piers, dredging)

In addition, climate change is likely to have major impacts on sea life and human activities in the Gulf of Maine in the future.

Regional EBM Workshop

In March 2007, 76 representatives from dozens of government and non-governmental organizations in Canada and the United States participated in a two-day workshop called "An Integrated, Ecosystem-based Approach to Regional Ocean Management: Creating a Policy-relevant Science Vision". The workshop was convened by the Communication Partnership for Science and the Sea (COMPASS) and held at the University of New Hampshire.

At the workshop, participants identified 7 Action Items as priorities for advancing EBM in the Gulf of Maine:

- Action Item 1: EBM pilot projects
- Action Item 2: Modeling consortium
- Action Item 3: Data access and coordination
- Action Item 4: EBM toolkit
- Action Item 5: A vision for EBM in the Gulf of Maine
- Action Item 6: Communications infrastructure
- Action Item 7: EBM forum for young scientists

After the workshop, seven Gulf of Maine EBM Work Groups formed and began to implement each of the Action Items. Members represent academia, NGOs, and government agencies in the United States and Canada.

For information about the Gulf of Maine EBM Work Groups, go to www.gulfofmaine.org/EBMWorkGroups.

For information and materials from the March 2007 workshop, including presentations and a post-workshop summary, go to www.gulfofmaine.org/ebm/meeting2007.

Need for a Regional EBM Toolkit

Action Item 4 from the March 2007 workshop called for development of a Gulf of Maine EBM Toolkit, a regionally appropriate set of technological tools and other tools that practitioners can use to implement EBM. Workshop participants envisioned the Toolkit as tailored to address the unique challenges facing managers and other coastal decision-makers around the Gulf of Maine. The workshop identified the following objectives for the Gulf of Maine EBM Toolkit Work Group:

1. Create and support tools to help managers make more informed decisions that enable them to draw on the most relevant science.
2. Create products that help decision-makers understand coastal/ocean status and trends.
3. Empower stakeholders to bring relevant science to legislators, other sectors and the public.

Workshop participants recommended that the Toolkit initiative should make existing EBM tools more accessible; provide a targeted set of tools adapted to the region's needs; develop new tools for this region; and respond to the evolving needs of coastal managers. They recommended that the Toolkit should assist managers and policy-makers with the following tasks:

- Evaluating cumulative impacts of human activities on coastal and marine habitats
- Setting conservation and management priorities
- Conducting scenario analyses to understand the effects of management decisions
- Analyzing tradeoffs among different activities and ecosystem services

As examples, workshop participants suggested that the Toolkit could include data visualization and synthesis tools; a set of Gulf of Maine place-based case studies; and state-of-the-environment reports. Workshop participants also suggested that the Gulf of Maine EBM Toolkit Work Group consider ways to integrate existing resources such as the EBM Tools Network (www.ebmtools.org) and The Nature Conservancy's decision-support toolkit for coastal managers (www.marineebmtoolkit.org).

See Appendix A for a complete summary of Action Item 4: EBM Toolkit from the March 2007 workshop.

Survey Objectives

After the workshop, an EBM Toolkit Work Group formed and began the process of implementing Action Item 4. To build on the initial ideas generated at the workshop, the Gulf of Maine Council on the Marine Environment and Communication Partnership for Science and the Sea (COMPASS), in association with the EBM Tools Network, conducted a survey of EBM practitioners around the region, including those not present at the workshop. The objective of the Gulf of Maine Ecosystem-Based Management Toolkit Survey was to provide information about tools that coastal decision-makers need. The survey was designed to gather region-specific information from EBM practitioners about the following topics:

- Management issues and situations to which they seek to apply EBM
- Critical obstacles to implementing EBM
- Types of tools that could facilitate practice of EBM

The EBM Toolkit Work Group intends to use the survey results to identify priorities for the Toolkit and to plan phases of Toolkit development. The survey was not designed to measure attitudes and opinions about the desirability of EBM. Rather, it was designed to gather information about tools needed by people involved in ocean and coastal management, if EBM were to be advanced in the region.

Beyond the Toolkit initiative, the results of the survey will be useful to all Gulf of Maine EBM Work Groups and other organizations interested in EBM.

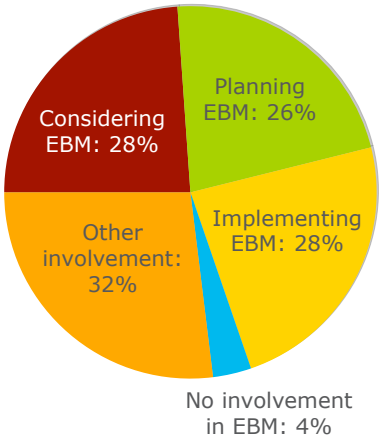
Armando Estudante

Freshly caught scallops on the deck of a fishing boat.

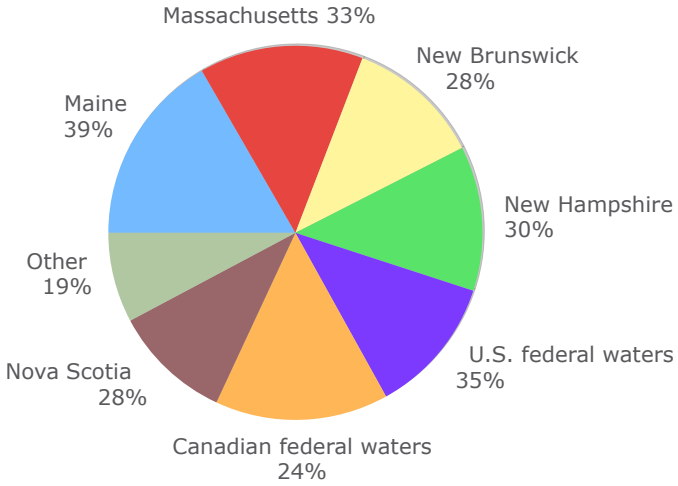
Survey Method

The Gulf of Maine EBM Toolkit Survey was conducted from September 6 to October 4, 2007. Invitations to participate in the survey were emailed directly and via listserves to all participants in the regional EBM workshop (see above) and an estimated 150 other people whose work relates to EBM in the Gulf of Maine. Some participants may have received the survey as a forwarded email from the original invitees and listserves.

Conducted using SurveyMonkey.com, the survey had 32 questions with multiple choice and/or written responses. The format and some of the questions were adapted from a worldwide survey conducted by the



How Are Survey Participants Involved in EBM?



Where Are Survey Participants Working?

EBM Tools Network (2007). Questions and multiple-choice options were revised to make them regionally appropriate, and questions were added to accomplish the specific objectives of the EBM Toolkit Work Group.

Survey Response

Fifty-five people participated in the survey. It is estimated that the survey invitation was sent to 225 people[1], indicating a response rate of 24%. This response rate is typical for web surveys (Kaplowitz et al. 2004). As with any survey, the possible effects of nonresponse bias should be considered (Sax et al. 2003).

As a comparison, a global survey conducted by the EBM Tools Network, using similar methods, was sent to more than 300 people around the world, and survey findings were based on 91 responses from people in 35 countries and regions (EBM Tools Network 2007).

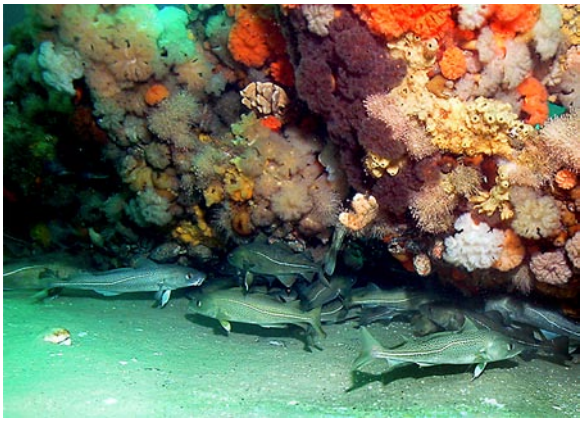
In the Gulf of Maine EBM Toolkit Survey, the majority of participants (53%) identified themselves as working in government at the local, state, provincial, or federal level. Others said they worked for academic institutions (18%) and non-profit/non-governmental organizations (16%). A few said they worked for community-based groups, museums/aquariums, consulting firms, or other organizations.

With regard to their involvement in EBM, participants were divided evenly among considering EBM (28%), planning EBM (26%), implementing EBM (28%), and other involvement (32%). Two respondents (4%) said they had no involvement in EBM.

Survey participants indicated that their EBM activities are spread evenly around the region: Maine (39%), Massachusetts (33%), New Brunswick (28%), New Hampshire (30%), Nova Scotia (28%), U.S. federal waters in or near the Gulf of Maine (35%), Canadian federal waters in or near the Gulf of Maine (24%), and other (19%).

Twenty-one participants provided supplemental written responses about the geographic focus of their work. They said they work on spatial scales ranging from local sites, such as a bay or wildlife refuge, to large regions, such as the entire Gulf of Maine or northeastern United States.

In written responses, 49 survey participants identified their focal ecosystem and/or habitat(s). They said they work on diverse systems such as rivers, coastal watersheds, salt marshes, and offshore waters of the continental shelf. Most said their EBM activities focus on nearshore waters and/or the land-sea interface. For example, rivers and watersheds were indicated in 15 responses, salt marshes in 11 responses, estuaries in 16 responses, intertidal areas in 8 responses, eelgrass in 5 responses, and coastal waters in 21 responses. In contrast, only 7 responses clearly indicated a focus on offshore waters.



NOAA

Stellwagen Bank National Marine Sanctuary.

[1] The exact number of people who received the survey is not known for reasons that are typical of web surveys. For example, the emailed invitation may have been blocked by recipients' spam filters, the original invitation may have been forwarded to other recipients, and the survey invitation was distributed to list-serves for which exact numbers of subscribers were not available.

Gulf of Maine EBM Toolkit Survey: Key Findings

This page presents a few of the most significant findings from the survey. Appendix B provides all data and written responses for the 32 survey questions.

Woodley Wonderworks

Coastal development along a salt marsh and estuary.

Major Obstacles to EBM

Survey participants identified the following as the major obstacles to implementing EBM.

- Lack of money, time, or people to do EBM
- Lack of established methods for implementing EBM
- Lack of understanding or information on the ecosystem

See Question 4 in Appendix B.

Important Management Issues

Survey participants are most interested in applying EBM to the following issues.

- Coastal habitats assessment and mitigation
- Stakeholder and/or community engagement
- Habitat restoration
- Marine protected area management
- Biodiversity conservation

See Question 9 in Appendix B.

Management Capacity

Survey participants are most interested in developing capacity in the following management activities.

- Understanding how the ecosystem functions
- Engaging stakeholders in decision-making
- Communicating management processes to stakeholders
- Visualizing possible development and resource use scenarios

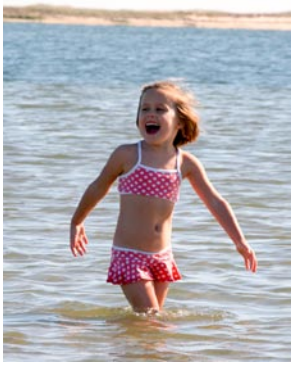
See Question 10 in Appendix B.

Types of Information

Survey participants are most interested in receiving the following types of information.

- Case studies of present-day management situations in the Gulf of Maine region and how EBM could be or has been applied
- Forward-looking assessments of how the Gulf of Maine ecosystem is likely to change and implications for management
- Spatially explicit information about human activities affecting the Gulf of Maine and its watershed
- Information about how the Gulf of Maine ecosystem functions

See Question 12 in Appendix B.



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Training Needs

Survey participants said they primarily need the following types of training.

- Training to understand the conceptual framework of EBM and general approaches for putting EBM into practice
- Training to better understand the ecosystem context in which management occurs and that management decisions affect

See Question 18 in Appendix B.

EBM Toolkit Recommendations

Micah Maziar

1. Focus on addressing the survey's Key Findings

The Gulf of Maine EBM Toolkit Survey provided insight into the on-the-ground realities of how people are trying to advance EBM in the region, challenges they are facing, and potential ways to address the challenges. The topic of EBM is large, complex, and multifaceted. One challenge in developing the Gulf of Maine Ecosystem-Based Management Toolkit is to keep it focused, rather than attempting to address every aspect of EBM. The Key Findings (see page 5) provide areas of focus for Toolkit planning and development.

2. Use data and written responses to refine Toolkit plans

While the Key Findings provide general guidance, the data and written responses in Appendix B contain valuable information and ideas that can be used to develop specific components of the Toolkit. These ideas should be considered within the context of the Key Findings.

3. Provide practical information on EBM and ecosystem

In general, people engaged in ocean and coastal management around the Gulf of Maine appear to accept the broad concept of EBM. However, they are grappling with the specifics of how to advance EBM in their day-to-day work. Survey participants expressed need for two overarching types of information that could be provided in the Toolkit. They said they need

- specific, practical information about how to do EBM in the Gulf of Maine and
- information about the ecosystem context and effects of management actions.

4. Focus on information, not data

The survey showed that EBM practitioners in the Gulf of Maine primarily seek relatively high-level information about EBM and the ecosystem, as opposed to raw data and technical tools for specific tasks. The survey participants indicated that the Toolkit could help address this gap by providing "tools" such as examples of EBM implementation (actual case studies and hypothetical scenarios) and science-based information about linkages among ecosystem functions, ecosystem services, and human impacts. Such information could be provided in many ways ranging from text and maps to interactive scenarios. It seems that over time EBM practitioners might express more need for raw data and task-oriented technical tools after they have dealt with the larger, overarching questions about how to implement EBM.

5. Enhance efficiency

Survey participants overwhelmingly cited lack of money, time, and people as the biggest obstacle to implementing EBM. While the Gulf of Maine EBM Toolkit cannot address this need directly, the Toolkit could enable

organizations to be more efficient and effective within the constraints of available resources.

6. Prioritize tools that address coastal issues

Implementing EBM along the coast, rather than offshore, emerged as the primary interest of survey respondents. This finding seems to reflect the higher diversity of human activities that directly affect coastal waters compared to offshore waters. Therefore, the Toolkit could focus, at least initially, on information and tools useful in nearshore waters and coastal watersheds.

7. Provide tools for visualizing future scenarios

The survey indicated that EBM practitioners need tools that enable them to look ahead and understand potential outcomes and tradeoffs of different management decisions. An example would be interactive maps showing future ecological conditions and human dimensions under different scenarios. Qualitative or conceptual information—rather than precise, quantitative information—may be sufficient in these decision-support tools.

8. Facilitate manager-stakeholder collaboration

The survey indicated that EBM practitioners want tools for communicating with stakeholders about management issues and for engaging stakeholders in devising management solutions. The Toolkit could address this need by providing tools and information that are appropriate not only for managers but for a broader audience of interested citizens. In effect, the Toolkit could serve as a bridge for communication and mutual understanding between managers and stakeholders. For example, information and tools for "understanding how the ecosystem functions" and "visualizing possible development and resource-use scenarios" (see question 10 in Appendix B) could be produced for managers and stakeholders.

Bodhisoma

9. Facilitate synergy among EBM efforts

Findings of the Gulf of Maine EBM Toolkit Survey could

W. Paul

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be useful for many initiatives beyond the Toolkit itself. In particular, clear opportunities exist for synergy among all the Gulf of Maine EBM Work Groups addressing Action Items from the 2007 regional workshop (see Introduction and www.gulfofmaine.org/EBMWorkGroups).

Keith Carver

The Toolkit initiative could support all the Work Groups and help them accomplish their goals:

- Materials from the EBM Pilot Projects and Modeling Consortium Work Group (Action Items 1 and 2) could be made available in the Toolkit in the form of case studies, modeling tools, and implementation guidelines.
- The Data Access and Dissemination Work Group (Action Item 3) could use the Toolkit as a vehicle for sharing data sources, perhaps with custom data-discovery tools.
- Outputs of the EBM Vision Work Group (Action Item 5), such as a regional framework for EBM, could be disseminated through the Toolkit.
- The Toolkit could serve as a key component of a communications infrastructure (Action Item 6).
- The Toolkit could serve as an online component of the EBM Forum for Young Scientists (Action Item 7).

Along with the regional EBM Work Groups, the survey results provide useful insights for other organizations and EBM activities in the Gulf of Maine and beyond.

10. Further engage survey participants

Many of the survey participants said that they were interested in being engaged further in the Toolkit planning and development process, such as taking part in discussions or interviews. Some participants also indicated that their organizations potentially could offer support for the Toolkit and other regional EBM activities.

References Cited

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Appendix A:
Summary of Action Item 4 from 2007 Regional EBM Workshop

Action Item 4: Regional Ecosystem-Based Management Toolkit*

What Participants concurred that there is a need to make existing EBM tools more accessible and to continue responding to coastal managers evolving needs. This would entail promoting and adapting other initiatives (e.g., EBM Tools Network, TNC EBM Toolkit, etc.). Further, there was concurrence that complementary work in other areas of the world could be transferred to the Gulf of Maine. Examples of these tools include web-based visualization and decision-support tools, data integration techniques, watershed point and non-point source assessments, communication methods, mass-loadings, etc. In sum, there was a call for the development and dissemination of an EBM toolkit.

Goal To develop an ecosystem-based management toolkit and/or adapt an existing toolkit to meet the needs of practitioners in the Gulf of Maine.

Objectives

1. Create and support tools to help managers make more informed decisions and that enable them to draw on the most relevant science.
2. Create products that help decision-makers understand coastal/ocean status and trends.
3. Empower stakeholders to bring relevant science to legislators, other sectors and the public.

Examples of Possible Products

- Enhancing the Gulf of Maine Ecosystem Indicator (ESIP) efforts to create indicators and state of the environment reports that describe ecosystem health and the state of human communities.
- Data synthesis tools that provide monitoring and observing data products that are useful to managers.
- A set of Gulf of Maine place-based case studies that apply, communicate, and reflect upon their experiences.
- Decision-making tools to assist managers and policy-makers with evaluating cumulative impacts of human activities on coastal and marine habitats, setting conservation and management priorities, conducting scenario analyses to understand effects of management decisions, and analyzing tradeoffs among activities and services.

An Opportunity Participants indicated that a host of EBM tools were available (and evolving), yet they were difficult to locate and apply. There was a sense that managers would make more scientifically informed policy decisions if these tools were more readily accessible. In addition, through sustained communication between scientists and managers the needed EBM resources would be better articulated.

How To be determined by work group.

Who

Potential Lead Individuals/Entities

- Peter Taylor, Waterview Consulting (contractor for Gulf of Maine Council on the Marine Environment)

Work Group Members**

1. Sarah Carr, EBM Tools Network
2. Kathryn Ford, Massachusetts Division of Marine Fisheries
3. Mike Fogarty, National Marine Fisheries Service
4. Kats Haya, Canada Department of Fisheries and Oceans
5. Heather Leslie, Brown University
6. Zach Ferdana, The Nature Conservancy
7. Kimberly Heiman, COMPASS
8. Susan Farady, The Ocean Conservancy
9. Jesse Mechling, U.S. National Oceanic and Atmospheric Administration
10. Dan Dorfman, Intelligent Marine Planning
11. Kathy Mills, Great Bay National Estuarine Research Reserve
12. Betsy Nicholson, U.S. National Oceanic and Atmospheric Administration
13. David Keeley, Gulf of Maine Council on the Marine Environment

Links to Other EBM Action Items

The EBM Toolkit could be linked to all other potential action steps. The information transcends the others' goals and toolkit training could be brought to different locations throughout region.

* Action Item 4 is one of the 7 Action Items that resulted from a two-day workshop in March 2007 called "An Integrated, Ecosystem-based Approach to Regional Ocean Management: Creating a Policy-relevant Science Vision". The workshop was convened by the Communication Partnership for Science and the Sea (COMPASS) and held at the University of New Hampshire. For workshop information and materials, including presentations and a post-workshop summary, go to www.gulfofmaine.org/ebm/meeting2007. For updates on all 7 Action Items, go to www.gulfofmaine.org/EBMWorkGroups.

** This list of members was compiled shortly after the workshop in March 2007. An updated list of members is available at www.gulfofmaine.org/EBMWorkGroups. Individuals or organizations interested in participating in the Gulf of Maine EBM Toolkit initiative are encouraged to contact Verna Delauer (Verna.DeLauer@unh.edu) or Peter Taylor (www.waterviewconsulting.com).

Appendix B:
Results of the Gulf of Maine EBM Toolkit Survey

The Gulf of Maine Ecosystem-Based Management Toolkit Survey was conducted in September and October 2007. Survey participants were 55 people whose work related to ecosystem-based management (EBM) in the Gulf of Maine region. For more information about the survey, go to www.gulfofmaine.org/ebm.

1. How are you and your organization currently involved in ecosystem-based management?

Considering EBM	15	27.8%
Planning EBM	14	25.9%
Implementing EBM	15	27.8%
No involvement	2	3.7%
Other	17	31.5%

Answered question: 54
Skipped question: 1

Written responses:

1	We do not call what we do EBM, however, we take an integrated and ecosystem-based approach to decision making involving land use and development approvals.
2	Developing indicators based on entire ecosystem.
3	Working in Muscongus Bay to develop local interest in marine area management and local involvement in modeling the ecosystem
4	Maine developed a Bay Management Plan and is implementing EBM in Taunton Bay as a pilot project.
5	We are informal sci. education facility and want to be able to include EBM information in our programming.
6	research related
7	habitat restoration
8	Using for assessment of salt marsh restoration and watershed management
9	We are operating under the auspices of a comprehensive conservation plan and a habitat management plan, both of which are ecosystem based.
10	I am a Ph.D student researching the potential for ecosystem-based governance in the Gulf of Maine region
11	Undertaking scientific research which hopefully will support EBM
12	GoM Area Program of CoML is formualting a framework and developing a demonstration project of a model that goes from process science to management measures.
13	Set up experimental aquaculture site for a short-term stop gap protecting bays and inlets
14	The U.S. Fish and Wildlife Service (FWS)is implementing the report "Strategic Habitat Conservation"(July 2006). For more information ,please see the FWS website
15	I do research in the science branch of the institute and EBM goes under the umbrella of managers.
16	intersted in assessing EBM as integration tool
17	It is concept frequently discussed.
18	Advise others who manage lands and resources.
19	It is a long path but in fisheries management the logical progression is from single species to multi-species to elements of ebm.
20	We are on a committee set up to advise the DMR oommissioner on management policies for the local bay.
21	we have been using it in our association bay management agreements since 2002 agreements
22	planning, participating in, and conducting monitoring and research on coastal wetland restoration projects
23	Studying the concept of EBM
24	Reseach, visioning--serving in advisory capacity to NEFMC and ASMFC
25	We talk about it, but not really getting any closer.
26	Advocating for implementation of EBM

27	there is resistence here to pointing to EBM as a cure-all, but at the same time we have worked on marine reserves in other parts of the world.
28	Developing EBM research program
29	science support
30	Dealing with EBM through New England Fishery Management Council, Stellwagen Bank Advisory Council and own state waters initiatives.
31	EBM will be a part of the Coastal Managment Framework the Province of Nova Scotia is currently developing

2. Where are your current or potential ecosystem-based management activities focused?

Maine	21	38.9%
Massachusetts	18	33.3%
New Brunswick	15	27.8%
New Hampshire	16	29.6%
Nova Scotia	15	27.8%
U.S. federal waters in or near the Gulf of Maine	19	35.2%
Canadian federal waters in or near the Gulf of Maine	13	24.1%
Other	10	18.5%

Answered question: 54
Skipped question: 1

Written responses:

1	Throughout the four Canadian Atlantic provinces
2	Muscongus Bay
3	Taunton Bay
4	We are interested in following marsh restoration trajectories in all of these locales
5	I am connected to both the Rachel Carson National Wildlife Refuge and the Parker River National Wildlife Refuge.
6	EBM is of little use without participation by all involved jurisdictions
7	Canadian marine and aquatic ecosystems
8	Also the EEZ Georges Bank, Southern New England & the Mid-Atlantic
9	GoM Area Program goes from the shore to the seamoiunts and bottom of continental slope, Halifax line to Nantucket Shoals
10	all 13 states within the FWS Northeast Region and District of Columbia
11	Rhode Island
12	Bay of Fundy
13	Saint John River
14	I work in NS, have focused on halifax Harbour due to needs, proximity and funding
15	provincial-federal consortium in Quebec
16	There are no planned EBM activities in MA - that I am aware
17	Rhode Island - we (the Narr. Bay NEP (NBEP.org) are working with the state and trying to steer them towatrds an ecosystem-based mgt system....required by a new state law but still not clear how it will be done.
18	All federal coastal waters
19	Taunton Bay, 10 miles north of Bar Harbor.
20	Phoenix Islands We are looking toward engaging more fully in the Gulf of Maine.
21	See #1

3. What ecosystem or habitat types do your ecosystem-based management activities focus on?

1	intertidal and subtidal habitats
2	Coastal lands from lower low water to higher high water; coastal waters; watersheds drining into GOM
3	watershed and coastal ecosystems
4	aquatic
5	Fisheries
6	We are focused on an embayment, its two major estuaries, and the terrestrial area of the surrounding towns and islands.
7	Estuarine systems
8	Gulf of Maine
9	Ecosystem = Gulf of Maine Habitat types = estuarine, intertidal, salt marsh
10	Poorly-flushed estuaries and bays including: eelgrass, benthic macroalage, and benthic infauna.
11	shellfish resources, salt marsh, eelgrass
12	coastal wetland restoration, fish runs
13	Tidal wetlands, coastal watersheds, estuarine waters
14	Marine systems, including salt marshes and adjacent lands
15	Salt marshes and adjacent estuarine and upland habitats. Parker River NWR is largely situated on the barrier island of Plum Island.
16	Coastal, near-shore, and watersheds
17	Oceanographic characteristics of the Gulf of Maine from the coastal shelf (~100m depth) out to the continental shelfbreak
18	Rivers, oceans, wetlands
19	coastal ecosystems where aquaculture operations occur or have the potential to occur
20	Estuaries and near shore ecosystems
21	land based development impacts on wetlands, estuaries, and other water systems as well as wildlife habitat
22	A ull range in the EEZ
23	Broad concept: all Foci: some deep sea and some offshore banks)Stellwagen, Platts, Cashes Ledge, etc. Cobscook/Passamaquoddy
24	Intertidal and subtaidal marine-specifically Cobscook Bay
25	terrstrial, freshwater, estuarine, and marine
26	marine and estuarine
27	Saint John River from heastwaters to estuary and surrounding coastal area
28	Harbour receiving raw sewage eflluents
29	benthic alteration
30	There are no active EBM projects in MA.
31	Resource protection, conservation and restoration
32	eelgrass
33	for now - estuarine
34	All, but focus is on coastal and estuarine
35	Ecosystem of Taunton Bay, which includes habitats based on marsh grass, eelgrass, rockweed, kelp, phytoplankton, and mudflat diatoms.
36	near shore eusturine
37	coastal wetlands; salt marshes
38	Cape Cod Bay!!!
39	Open Ocean, Coastal, socio-economic impacts, public policy debates--who wins and who losses
40	entire Gulf of Maine and its watershed
41	no particular focus, but as approriate for the acitvity and in relation to conservation and sustainabilty objectives in the southwest Bay of Findy and Gulf of Maine
42	Fisheries, coastal zone management, protected specie protection

43	U.S. Gulf of Maine marine and coastal ecosystems.
44	all types
45	Work will be conducted across all marine ecosystems
46	salt marsh shellfish reefs seagrass meadows tidal rivers
47	Generally, habitat important for juvenile groundfish, especially cod and pre-spawning and spawning cod; submerged aquatic vegetation (SAV)and "hard" bottom (e.g., cobble and boulder)
48	Future implementation of the Coastal Management Framework will focus primarily on Coastal ecosystems
49	freshwater, estuarine and coastal aquatic habitats and watersheds

4. Which of the following obstacles have you encountered with respect to implementing ecosystem-based management?

	Not a problem		Something of a problem		Severe problem	*Response count*
Resistance to trying new management process	3	6	17	10	6	*42*
Lack of understanding of EBM or clear project objectives	2	2	16	15	8	*43*
Lack of acceptance of EBM principles	5	13	17	7	1	*43*
Different sectors or agencies resist working together	1	5	13	12	10	*41*
Lack of established methods for implementing EBM	0	3	5	22	13	*43*
Lack of understanding or information on ecosystem	1	7	12	13	11	*43*
Lack of information about human uses of ecosystem	1	12	13	8	8	*44*
Inability to organize, manage, or use data	3	10	17	8	5	*43*
Lack of technical capacity to perform needed analyses	5	14	8	12	3	*44*
Inability to interest or involve agencies or governments	6	8	19	5	2	*40*
Inability to interest or involve stakeholders	6	13	16	5	1	*41*
Lack of money, time, or people to do EBM	1	2	9	11	24	*47*

Answered question: 47
Skipped question: 8

5. Which other sectors, institutions, agencies, or municipalities do you most interact with? In your opinion, what challenges do they face in taking a more coordinated, collaborative approach to coastal ocean management?

1	state, federal, NGO, academic; overlap and gaps in jurisdiction and management objectives
2	All sectors involved in development including local planning agencies, municipalities, land owners, developers. Biggest challenges are lack of information/education, lack of time to plan and implement new approaches to development, lack of a one-stop shop approach to regulating development.
3	Federal and State/Provincial levels of government plus varied stakeholders
4	State agencies; agencies have enough trouble meeting existing mandates. Whose job is it to create this new management approach? Also, death by meetings! What initiatives are important? What should be prioritized?
5	Scientists, conservation groups, resource users, municiaplities, stae planning agency. The legal framework and financial support for this work is woefully inadequate. It is very difficult to get a project off the ground. There is no real leadership to transition to a new marine managemetn regime in this state.
6	Other state natural resource agencies, municipalities, fishermen's groups. Challenges include lack of time, knowlege, understanding of EBM, resources to engage.
7	public, UNH, NH Parks & Rec. NOAA It's hard for us to answer this because we are not practitioners (that's why did not answer #4). However my sense is that the principle limiting factor is the time required to support needed structural/agency changes. Appears to be agreement that needs to be done and there is a willingness to do it, just how to add that to their work load if no $ to support that effort.
8	Academic - challenge is moving from research to public decision support in their work Coastal municipalities - challenge is seeing beyond municipal boundaries to the broader ecosystem
9	State, local, and federal government, in that order. We also interact w/ universities. The challenge is that university staff like to be paid. They also are usually much more technically-inclined than government staff.
10	a variety of funding agencies, other academic institutions
11	State and Federal agencies
12	In Maine, all coastal resources are devoted to regulatory functions, with little left over for science to support ecosystem based management. This state needs serious federal support to improve the management of its nationally significant coastline.
13	We interact with NOAA (who will not give restoration funds directly to another federal agency so we try to find local partners), other federal agencies such as NRCS, state agencies, local municipalities and NGOs.
14	Lack of resources, lack of knowledge, institutional fragmentation that separates ocean and coastal from land-based impacts, lack of knowledge and participation on the part of communities/the public.
15	Other government agencies: Cohesive, coordinated approaches/processes to incorporate EBM into their exiasting management structures within and between agencies.
16	LOCAL GOVERNMENT
17	Fisheries management is not set up to incorporate information on physical characteristics that might be impacting fished populations.
18	All municipalities that fall within Nova Scotia - differing mandates and concern about expectations of them. Federal government - coordinating collaboration, is difficult and lack of funds.
19	Federal and provincial government departments responsible for managing aquaculture and the aquaculture industry. There are a lot of unknowns, and how do you measure when you have it right!
20	Federal agencies, NGOs. Time and money.
21	mostly local governments and interest groups, though some of both at the state level most serious challenge is lack of understanding of inter-relatedness of issues, understanding of second and third tier impacts and unintended consequences
22	State agencies, local governments and resource centers. Strong opiions are basis for break in communication-opinios formed from lack of clear objective information about ebm
23	Primary are with states,local governments, other federal agencies, NGO's, and private sector (e.g., agriculture, energy, and fishery issues).
24	provincial and federal agenices, city of Saint John, major industrial suers. Porblems relate to the fractured nature of responsibilities, and the inability to approach it from a cumulative effects focus
25	I collaborate with many people in various sectors of society and countries, in the EU there is a push for giant proposals involving too many people and lack of renewal to continue developing in the initial direction, in some cases,... some depts face political resistance to developments, various difficulties depending on who you speak to...
26	municipalities who approach issues from different political, socio-economic, and related angles; a need to see on-the-ground progress/successes rather than new labels, new wrapping of existing info, etc.

27	We are interactiing with scientist, governemntal departements and agencies, municipilaties, NGO's... The challeng: cope with coastal erosion under current and a changing climate context
28	MA Division of Marine Fisheries faces challenges of being responsible for promoting fisheries which at times does not incorporate concepts of ecosystem.
29	Interact at national and state level; with universities and colleges; with regional organizations such as New England Interstate Water Pollution Control Commission
30	Local government and NGOs
31	University researchers, state govt. environmental management agencies (CZM and envir. pollution & F&W). Greatest challenge for them (state of RI) : multiple problems - all severe - #1 funds - state agencies have been receiving budget cuts annually of ~ 5-10% w/ no clear indication this will change - no one pressuring politicians or highlighting this + many social programs receiving similar cuts and so headlines on people before environmental issues -Related- EBM would be new so not a "decrease in effort" from decision-makers / state legislator / gov, etc. #2 - not been done and present funds do not have specific goal of accomplishing this + fed funds a very significant source - most within agencies used to doing specific functions / tasks with their funds (same for many many many years-e.g., F&W trawls w/ no analysis or TMDLs for fecal coliform) and have little interest in changing/ dealing w/ retraining etc. #3 - no one is collecting the data that would be required - decent benthic fish trawl data - little data on plankton or pelagic fish and most from very limited areas down-bay, not near the major problems / pollution sources (e.g., for eutrophication issues) - 2004 RI state law requires development of "systems level plan" that will have aspects of EBM, but also strongly focuses on economic growth / stability within marine aspects + help shoreline human demands such as dock growth / marina slip increases etc. with pro-development goal that may actually increase environmental stress impacts in a legal way. A number of administrators/politicians hear that EBM includes human needs within its ecosystem context and focus on this - they assume this means there will be a shift from primarily environmental protection focus to "humans first" focus. This approach will cause even more problems than present protection attempts because it may try to embed a "human needs" priority over management decisions. I see this as the "great red herring of environmental protection" danger for EBM within the present structure - it must require some minimal ecosystem parameter measurements at an adequate temporal and spatial scale, and require
32	Biggest problem is coordination and communication between those desiring to implement, then other problems are not having simple procedures in place to follow, sufficient knowlege of action-reaction between stress-response in the environment and between human activities and environmental response, and little understanding of how people value ecosystem services.
33	Maine DMR is the prime mover in this project. It is backed up by the Joint Standing Committee on Marine Resources of the Maine Legislature. Three towns are on the committee of advisors, along with a biologist, conservationist, worm digger, mussel dragger, lobsterman, seaweed harvester, and residents of 3 local towns. We have just begun meeting together, so are setting ground rules in place, The group is facilitated by UM Extension educators.
34	real estate developers, commercial fishing interests, coastal land trusts. Lack of interest or conflicts of interest in actually doing ecosystem based planning and management
35	provincial & federal gov't universities community groups municipalities individuals (property owners) challenges - in all case financial support, education, regulatory & legislative deficiencies, hurtles & road blocks, inconsistent application of existing regulations & legislation.
36	NOAA Fisheries; MA CZM; EPA; U.S. Coast Guard; MEP; towns bordering Cape Cod Bay. ** Just getting everyone coordinated, on the same page, and in the same mindset. Remember, though, we are not resource managers.
37	NEFMC, NMFS, NOAA Fisheries, NCCOS---turf issues, control issues--lack of ability to ask the right questions--what are we managing and why?
38	NGO's, federal and provincial agencies and university the challenge is to identify what is the specific outcome you want from the EBM (i.e. resource mangaemnt, sustainable evnironment, marine resource use) and gathering the information and applying it to the manage,ent objectives
39	Government agencies and programs are restrained by legilative and regulatory authority. All will also say they are restrained by funding--this is not true, they simply need to move funding. They problem with government agencies is that people have no incentive to move toward EBM approach. They are happy with status quo, or making slight changes. EBM, to truly be effective needs to come as directive from top and bottom--stakeholders need to want to have it, and government agencies and legislators need to make it legally possible.
40	U.S. NGOs, state and federal agencies in the U.S. Gulf of Maine, legislators and other elected officials. Challenges to NGOs are to work together on common EBM agendas in complementary ways instead of isolated and/or competitive ways. Agencies seem hamstrung by lack of resources, turf protection issues, bureacracy generally and lack of political leadership. Elected leaders and decision makers do not hear from enough constituent members and hence don't have the political courage to be more forthwright in supporting a different approach to management.
41	academic & research scientists -- not always interested in engaging in management discussions
42	and state management agencies - they have the mandate to do EBM but not the resources
43	NOAA, state CZM programs, NERRs, Time and money for collaboration (between states and especially US-Canada). Time and money for data management and analysis to support decisionmaking

44	New England Fishery Management Council, Atlantic States Marine Fisheries Commission, Gulf of Maine Council, Mass. Marine Fisheries Institute. The biggest challenges continue to be no agreement as to the definition of EBM,inadequate data on which to construct EBM strategies/measures, indequate monitoring mechanisms to determine success of EBM once implmented in whatever form, and federal law, e.g., Magnuson Act, that will prevent innovative, effective EBM.
45	Through implementation of the Coastal Management Framework, the Government of Nova Scotia will need to collaborate with a broad range juridictions and stakeholders. A key challenge will involve collaborating with other stakeholders to increase the capacity of the Government of Nova Scotia.
46	Industry, natural resource users, educational institutions Major challenge- having the expertise and the funds required

6. Briefly describe one or more real issue or situation in your day-to-day work that would benefit from application of ecosystem-based management.

1	trying to reduce nutrient inputs into estuary
2	Subdivision planning on coastal lands; those who plan the subdivisions do not think about EBM until late in the process when regulators get involved with subdivision approval; as a result subdivisions are planned (but not necessarily approved) without water resources, in areas where habitat or species should be protected, etc.
3	Impact of dredging cobble habitat on various life stages of cod.
4	Mangement of shellfish harvest areas for Public Health as well as for multiple uses such as both clamming and mussel harvesting. There is a general lack of understanding of the National Shellfish Sanitation Program and how to deal with pollution problems that result in shellfish closures. In terms of conflicts over harvesting clams and mussels, there is a need for better science on environmental factors that affect settlement of clams and mussels, the impacts of harvest practices, and the need to balance multiple user needs, in addition to perception problems of wealthy shoreline owners.
5	Two issues that visitors usually ask us about are: Gulf of Maine fisheries and coastal development. They want to know what's really going on, and what's being done by agencies, regulators (etc.) to change or stop bad practices.
6	I deal with NPDES discharge permits, power plant and desal intakes, and with the siting of large coastal infrastructure, in general. Each of these (permitting, siting, management of facilities) would benefit from a more wholistic EBM approach rather than using charismatic or economically beneficial sentinel species to drive management decisions.
7	Good data on the ongoing loss of shoreland zone buffers in coastal watersheds and estuaries would lead to more responsible different land-use decisions at the municipal level.
8	EBM is great if you already have the answer for "What is the most effective means for dealing with situation X?" However, we are often operating at the cutting edge of an ecosystem problem and require funds for investigatory/research in order to identify the ecosystem level forcing functions (why is Phragmites suddenly appearing everywhere) rather than simply treating symptoms (let's just spray the heck out of Phragmites).
9	n/a
10	Developing coastal policies. Resource management decisions.
11	It would be helpful to know the environmental sensitivities of various species so that I would know which physical characteristics and events would be of most interest for people concerned with those species.
12	Coastal wetland management - the development community pushes to allow some opportunity for development in coastal areas though it is difficutl to manage sustainably.
13	The assessment of a new or existing aquaculture site.
14	To quantify the balance of restoration of eelgrass versus the need for watershed wide stormwater control versus advanced treatment of waste water to get the best aquatic habitat.
15	encouraging public understanding and gathering political will to direct growth in more compact patterns, particularly in small communities without public sewer/water to limit sprawling into more pristene environments. this includes the will to adopt and enforce meaningful regulations and invest in the infrastructure and/or allow private investment to reduce the inevitable impacts of higher densities in appropriate locations necessary as an alternative to dispersed development across a wider and wider landscape. dilution is not the solution to pollution.
16	N/A We're not an agency
17	Recovery and restoration of atlantic salmon. Issues involve multiple jurisdictions, private sector interests, states, and significant NGO interest and involvement.
18	increasing industrial development, installation of nwew city sewage treatment and increased dredging activities in same coastal area
19	Closure of shellfish beds due to water quality issues
20	Scientific knowlegde transfer to help decision making process

21	Ocean Management Eelgrass Habitat Management
22	Assess alternative future scenarios for habitat as modified by sea-level rise and associated land deformation
23	My program (Narragansett Bay estuary Program is one of the EPA funded NEPs and takes a watershed-based approach that tries to include an ecosystem-based perspective. Because of limited funding, the greatest challenge we have found is inadequate technical tools in terms of modeling ecosystem response at a level of prediction useful to managers and a lack of adequate data to encompass the trophic responses beyond the human-needs level (plenty of commercial fish data - little plankton response data etc.) An adequate EBM framework that lays out a scientifically-valid minimal dataset and ecosystem reponse model with associated management response schemes would be very helpful. Such a model would need to incorporate the impacts of the various local climate shift implications (shifts in temp./rainfal/rainfall intensity etc) as presently projected for a regional level resolution.
24	Real world: I work in EPA Office of Research. The regulatory arm has not sufficiently embraced ecosystem management stratgies for coastal areas for the research arm to have this as a highest priority and well-funded funded area of research.
25	Resolving conflicts between migratory shorebirds and wormers/clammers regarding Corophium volutator, the shorebirds' main food. Also, avoiding conflict between horseshoe crabs at the northern limit of their global range and mussel harvesters who wish to drag in the vicinity, where often eelgrass is present or potentially present.
26	impact of shoreside development on water quality in marine environments
27	Everyone would have a baseline concept from which to work.
28	A loaded question--the devil is in the details, lack of trust---there is a set of people who get it, another set of people who don't get, but have the potential with information and mediation, and there are those who don't get it and never will.
29	Provision of scienctific advise to Management in the Department of Fisheries and Oceans in formulating policy and responses regarding use of marine resources and habitat, for example aquacuture siting/licence requests, management of existing and requests for new harvest fisheries, impacts on Marine potected areas, energy (oil and gas, LNG, tidal power) are some current examples
30	N/A
31	Management planning for the Stellwagen Bank NMS would benefit from an EBM approach, particularly by activating the Zoning Working Group that was formed nearly 3 years ago and has only met 3 times since then. The agency has given lip service to doing this but it is not happening in reality as the management planning process is hopelessly delayed and derailed.
32	We're trying to promote Ocean Literacy, including the concept that everything is connected -- if we could point to EBM as a standard, with examples of how it is implemented (and successful) in real life, that would be helpful. Also re: education, we present ecosystems in our exhibits, and we could describe those in EBM terms... On the technical side, we work on sustainable fisheries, which of course lends itself well to EBM.
33	Understanding the impacts of fisheries closed areas
34	I am a researcher, not a manager, so this may not apply.
35	Predator-prey interactions especially impact of spiny dogfish on Gulf of Maine cod rebuilding efforts. For example, recent, published scientific data indicate that in 1998 abundance of age 1 cod was 5.8 million fish. Dogfish consumed 2.2 million juvenile cod. Perhaps as much as 4.7 million juvenile cod were consumed. The implications of this sort of consumption especially when localized in cod coastal nursery grounds is obvious.
36	Better EBM will assist the Government of Nova Scotia in making sound and informed decisions regarding coastal management.
37	Assessing the cumulative effects of development projects

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7. Do you feel that you know how to apply EBM to the issue(s) or situation(s) you described? Why or why not?

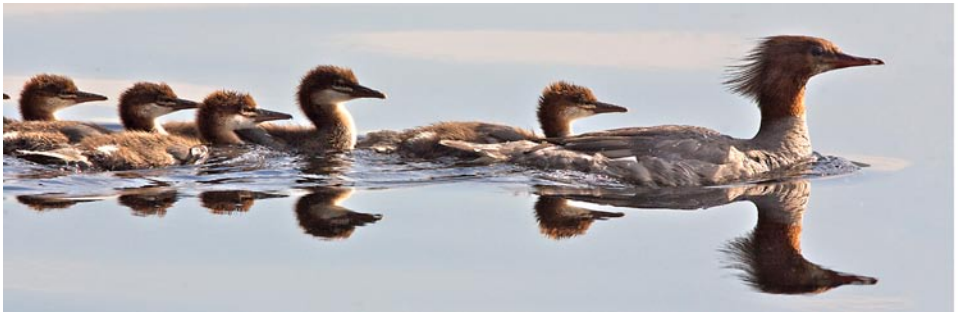
1	trying to engage partners on many levels; opening channels of discussion; partnership funding all being attempted
2	Yes, some ecosystem considerations are applied once the subdivision meets the regulatory process. Some are not, since EBM implies a complexity that exceeds the information available, for example.
3	For the most part. The data exists, the area is well defined and mapped adequately. But in terms of EBM, the human dimension is better valued. Therefore, the economic impact of a dredging project on cod habitat isn't properly balanced. I.e. the cod isn't valued as highly as coastal property (even if an economic assessment may show otherwise--the natural resource valuation routinely gets ignored in the face of a more tangible human valuation).
4	No. We do not have sufficient data, no models, little to no capacity to develop them or sufficient staffing and time to engage with stakeholders at the level required.
5	We try to incorporate the concept of EBM in answering the questions as a ray of hope for our (human) addressing such complex issues. The concept is usually greeted w/ a sigh of relief and a better understanding of the intricacies of these issues.
6	In my experience, EBM has been used on a case-by-case basis and in different ways by different divisions of the same agency or agencies within our state. So, my response would be that I and others need more training in what EBM is expected to be, so that we can be more consistent in applying EBM principles.
7	I'm not the manager, but I certainly can provide the ecosystem knowledge we have to bear on a particular issue. Unfortunately, there is not a great knowledge base of coastal ecology and hydrology from which to draw.
8	See above
9	n/a
10	Not really. It would be helpful to have a checklist or lens...sort of a "how-to-guide" of steps I should take to incorporate EBM into a given decision or planning process.
11	No because it hasn't been comprehensively considered.
12	Not really. What factors of the ecosystem are the most important to consider. Surely you can't consider all impacts on all aspects of the ecosystem. Also scale issues - how large of an ecosystem do you consider? Also what are the indicators - are they appropriate for my particular situation and local areas?
13	Sort of. We lack some basic info.
14	not really. been trying to do it for most of my nearly 30 years in the field. the issues are complicated and we need tools to help present the issues in ways that are understandable to the public and local officials who most often are the decision makers unless, of course, those at the top release large sums of money for infrastructure and technical assistance and direct most of the capital spending to areas that demonstrate their willingness and commitment to manage and direct growth accordingly
15	We are trying to optimize definitions, objectives and approaches as part of our research
16	Yes. Long standing relationships between the partners, and use of tools such as structured decision-making, peer review of science, management, and listing actions.
17	lack of background data, lack of coordianting body, lack of joint efforts
18	yes
19	No. There is no clear guidance or consensus on how to approach EBM. Working for a networked (coordinating) agency requires consensus building, and consensus building has largely not started.
20	yes
21	No. For all the above reasons - what is the minimal multi-trophic level dataset needed? what model(s) is/are available that can actually reach a necessary level of predictability for managers who may need to limit resource users who may take them to court over the restrictions? How to best deal with the intra-agency initial resistance to change? How get funds that focus on an EBM goal so it gets done ?
22	Yes.
23	The goal is ecological sustainability over the long term, which means holding human uses below the threshold of the ecosystems minimal maintenance requirements. We are reinventing the wheel here, so I know we are not sure of what we're doing because landings data are not available on which to base estimated allowable landings.
24	yes
25	Not really. As I've noted, PCCS is a science and research institution, and not a resource management agency.
26	Not really, at this point it seems like "new wine in old bottles" or "old wine in new bottles" not sure which--maybe both--either way we have a ways to go---but it is moving discussions and communication in a way that is different from that which we know was not successful in the past.
27	In principal yes, but generaly methods and data are insuficient
28	N/A

29	I think so or at least know how to get started but without the agency committing itself to the process it's hard to know.
30	we could do it, but it won't contribute to the larger effort if we do not use common terminology and examples
31	No, because the objectives have not been clearly articulated
32	as above
33	Yes and no. Analytical methods to assess impacts of different EBM approaches are lacking, and as noted above, federal law prevents EBM particularly if EBM involves removing dogfish biomass from key cod nursery grounds. Biomass for all species must be increased to very high targets even if that objective is unachievable or unwise. Low fishing mortality targets to achieve high dogfish biomass prevent anything more than very low removals (i.e., very low bycatch amounts are allowed by the federal government).
34	The Goverment of Nova Scotia has yet to implement it Coastal Managment Framework. Once this work begins, there will be a need to communicate with other departments and jurisdictions about how they currenly manage the coast and what information or EBM pratices could assist in this effort.
35	To a certain extent, if the science is available

8. Describe the types of skills, knowledge, or methods that you and your colleagues need to practice ecosystem-based management in your day-to-day work, but that you do not currently have.

1	networking is a key (i.e. knowing lots of connected people)
2	Suffucient information is the huge missing piece. Although we have some information on speices and habitat, often we have no real up to date information on a particular location. An accelerated efoort at populating GIS layers should be made.
3	Data management and GIS-type skills. Better direction about framework and goals of EBM--mandates and performance standards.
4	understanding of ecological processes in the marine environment, lack of baseline data such as habitat mapping, lack of modeling expertise, lack of socio-economic information, lack of skills to engage with stakeholders.
5	We could use more concrete examples of where/how EBM is being implemented, or specific problems being addressed. Status reports to show progress or lack thereof (which can be instructional as well) would help a lot.
6	I think more state workers need to understand statistical design and applications of statistics to the data that are collected and then used to monitor the results of management decisions that have ecosystem-wide ramifications.
7	We need adequate biological change monitoring of coastal habitats and species populations.
8	My colleagues are persuaded by OMB to pursue "acres restored" not "lessons learned" which strongly urges a cookie cutter approach in order to gain the highest "success rate."
9	Better understanding of practical applications of EBM--from theory to proactice. What tools are at our finger tips. And what we can expect if we incorporate EBM (since this is what we will need to communicate to senior decision makers).
10	More time for conversations with fishermen, fisheries managers, conservation officers, and others working with particular species to find out which physical oceanographic information would be most useful to them
11	Overall education and common practices, successes and failures.
12	I need to have a better understanding on expectations before this can be answered.
13	Better accounting of all the impacts to an ecosystem, their relative weights and difficulty in controlling those impacts.
14	explainging complex concepts simply and with visualization tools model ordinances, especially for smaller jurisdictions training for professionals in the design and delivery of management systems
15	There exist only prelim models at this time that quantitatively deal with the trade-offs and the ecosytstem services that must be modeled. Most models are very narrow.
16	We need additional skills such as Structured decision-making, graphic representation of threats and/or overlaps with biological, ecological, social, and economic data utilizing GIS methodology, and increased capacity and funding to use these skills.
17	There is need for data, multidisciplinary knowledge, and a better undertsnading of the methodology

18	I think we need to reach a working model before you cn get to this - Once you have a good model, it will need to be "boiled down" and menu-driven so managers can plug in their values. Right now I feel the concept is at the research level and needs to reach a successful rediction lcapability before arguing over what training is needed. Get the understanding of the system first (I don't believe it is there yet) and then boil it down so you have trainable components. For example, ecosystem reponses are clearly nonlinear to many forces , including temperature due to cascade effects (both bottom up and top down). Yet few even attempt to look at nonl;inear dynamic approach to ecosystem modeling . You need to hire some applied nonlinear mathematics experts to this issue and let them dig in - if they know the math - you can link them up with ecologists to explain the parts of the system and how they seem to respond. We are now approaching a data capability that has continuous long-term datasets developing. That lack of high temporal resolution (required for a nonlinear approach) is now disappearing at least for limited areas (e.g., Narr. Bay RI has 12 continuous WQ buoys now running). You/we are ready to let the physicist/applied mathematicians loose to tell us what is really driving things instead of insisting on forcing linear regressions that have not worked in over 30 years!
19	We don't practice management, we practice collection and interpretation of data and methods that make it easier for others to practice management. Hence, having more stateholders demanding well-funded research in support of Ecosystem-based management would be helpful.
20	Stakeholders are not used to thinking in ecological terms, so need to acquire that skill in order for EBM to succeed.
21	we do extensive baywide environmental monitoring, but don't have the time to do effective GIS mapping
22	N/A
23	an understanding and "street smarts" that other US federal agencies (i.e., USFS and NPS) have learned from nasty, messey fights with terstrial systerms (i.e., Spotted Owl, Greater Yellowstone Ecosystem, etc.)
24	It would be helpful to have a glosary of "Ecosystem Terminology" which is also standardized between US and Canada. A "Decision Support System" with variable scales and incorporates scientific and socio-exonomic data. The US/Canada Oceans Working Group has initated preparation of and "Ecosystem Overview" for the Gulf odf Maine Bay of Fundy. This will provide a resource of ecological information that will be important for any EBM. Such overviews are needed.
25	N/A
26	In our last meeting of the Zoning Working Group last year, we got hopelessly bogged down in trying to determine what scientific criteria to use in determining if EBM is being achieved. Amidst everyone's general desire that decisions be made based on science, there are limitations based on data and resources to the science that is actually useful and available. As mostly lay people on this group, we weren't prepared to determine what criteria would be the best measures. It also seems that a basic understanding and use of GIS information would be helpful in those processes that are using mapping tools.
27	the outcome of SeaWeb's efforts will be useful.
28	Clear policy objectives
29	na
30	New and realistic modelling tools (fisheries and ecosysytem) and ability to test those models (e.g., data). Far greater fish stock assesment expertise (people and methods). Amount and distribution of bottom habitat potentially negatively impacted by commercial fishing gear (e.g., trawling and dredging)
31	I can not answer this from my current position. I am involved in a inter-departmental initiative not day to day regulatory enforcement.
32	Compliance and effectiveness monitoring of mitigative and restoration activities



Keith Carver

Mergansers in Muscongus Bay, Maine.

9. How interested are you or your organization in developing capacity in the following areas to help plan for or implement ecosystem-based management?

	No interest		Moderate interest		Strong interest	*Response count*
Watershed management	2	2	13	4	16	*37*
Land-use planning	4	7	8	2	16	*37*
Coastal access management	2	7	12	6	10	*37*
Coastal habitats assessment and mitigation	0	2	6	10	22	*40*
Marine zoning	2	8	6	7	14	*37*
Marine protected area management	1	5	5	12	16	*39*
Fisheries management	1	8	10	3	16	*38*
Management of coastal and marine industries	5	3	8	8	14	*38*
Biodiversity conservation	1	2	10	10	17	*40*
Habitat restoration	0	3	9	9	19	*40*
Stakeholder and/or community engagement	0	3	7	7	23	*40*

Answered question: 40
Skipped question: 15

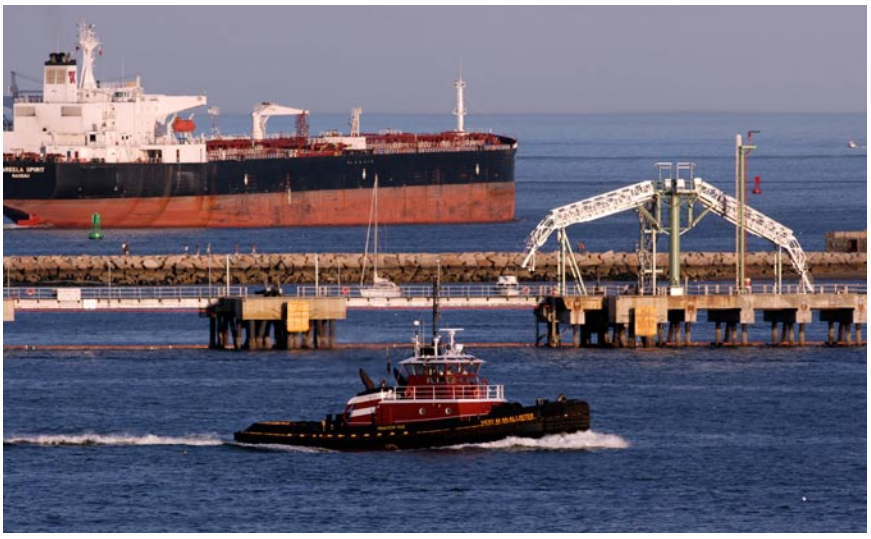
10. How interested are you or your organization in developing capacity in the following areas to help plan for or implement ecosystem-based management?

	No interest		Moderate interest		Strong interest	*Response count*
Collecting ecosystem data	0	3	10	7	19	*39*
Collecting information on human communities	1	10	13	6	10	*40*
Managing data	2	5	14	12	7	*40*
Understanding how the ecosystem functions	0	0	12	5	23	*40*
Developing conceptual models of ecosystem processes or communities	0	4	12	11	13	*40*
Analyzing or modeling ecosystem processes	2	3	12	11	12	*40*
Analyzing economic or social impacts of management actions	2	6	12	9	11	*40*
Visualizing possible development and resource use scenarios	0	4	9	10	17	*40*
Using decision support tools to help with specific types of decisions	0	6	10	11	13	*40*
Conducting monitoring and assessment	1	3	8	10	17	*39*
Engaging stakeholders in decision making	0	3	7	10	20	*40*
Communicating management processes to stakeholders	1	3	6	10	20	*40*

Answered question: 40
Skipped question: 15

11. Are there other areas where you would be interested in developing additional capacity to help plan for or implement ecosystem-based management?

1	Basic information/education for the general public; facilitating data layer sharing for GIS
2	Inter-agency communication.
3	The Seacoast Science Center would be very willing to host meetings, workshops, seminars (etc.). Our new Gregg Interactive Learning Studio has extensive video conference/distance learning capabilities if you want to link to other groups.
4	Honestly, we need more people who are biologists or have biological/statistical training.
5	Understanding the linkages between land-use and the ecology of estuaries and the open waters of the Gulf of Maine
6	The USFWS has certain "trust species" for which it has a high responsibility. A recent document on Strategic Habitat Conservation takes a regional approach to supporting the needs of these species. If your EMB could incorporate at least some links to this process, it would be extraordinarily useful to us.
7	No
8	Extend the experience :(Canadian maritimes and Quebec provinces, New england states)
9	I think the technical / scientific aspect of EBM is minimized in your list - I think we are still too far from predicatbility to start jumping on the human aspect, and even in your list there is a hint that EBM will somehow let humans "do more" of the presently limited activities with less resistance from environmental protection regulations.
10	GOod survey. Can you make it available as part of the council's web site so that people can consider these questions beyond the framework of the current compilation?
11	Volunteers are scarce and require training and supervision. We do not have sufficient organizational bulk to sustain a stakeholder program that can be truly effective.
12	Above covers it...
13	Vision and values. I think we need to more broadley engage the american public in this debate. This in not a NMFS issue, a commerical fishing issue, this is debate should be approached in the same context as that of drilling for oil in Alaska, fighting a war in Iraq....
14	raise people's overall knowledge and understnading of how the ecosystem works and how management decisions may affect it
15	Questions 9 and 10 are answered from an agency perspective, not personal. My personal views would be strong interest in every area for question #9.
16	No.
17	public education & outreach
18	No comment
19	Although ecosystem management is critical and central to coastal managment Nova Scotia also needs to consider how industry and communities needs can also be addressed as sustainably as possible. All about balance.



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12. How much do you need or want the following in order to implement ecosystem-based management?

	Strong need or want	Moderate need or want	Low need or want	No need or want	*Rating average*	*Response count*
Case studies: present-day management situations in the Gulf of Maine region and how EBM could be or has been applied	27	11	2	0	*1.38*	*40*
Forward-looking assessments of how the Gulf of Maine ecosystem is likely to change and implications for management	28	9	3	0	*1.38*	*40*
Spatially explicit information about human activities affecting the Gulf of Maine and its watershed	27	9	4	0	*1.43*	*40*
Information about how the Gulf of Maine ecosystem functions	24	10	5	1	*1.58*	*40*
Consensus statement from scientific and management experts on regional priorities for ocean and coastal management in the Gulf of Maine	23	9	8	0	*1.63*	*40*
Technological tools for doing EBM	21	14	4	1	*1.63*	*40*
Case studies: past management situations in the Gulf of Maine region and how EBM could have been applied	16	19	4	1	*1.75*	*40*
Descriptions of why particular management practices do or do not embody EBM	15	15	9	1	*1.90*	*40*

Answered question: 40
Skipped question: 15

13. Do you or your organization use any specialized software or models for your ecosystem-based management work? Examples include Marxan, CommunityViz, Ecopath with Ecosim, Atlantis, N-SPECT, ISAT, CVAT, C-Plan, NatureServe Vista, Oceanmap, etc.

Yes	12	30%
No	18	45%
I'm not sure	12	30%

Answered question: 54
Skipped question: 1

14. If yes, please list the specialized software, models, or other technology tools that you use.

1	Marxan
2	We have a GIS tool developed in house for using various land use layers in concert with each other. OpenCite provides at-desk ecosystem, land use and ownership information for environmental and development decision making.
3	Ecopath, spatial analysis tools in ArcMap.
4	N-Spect, will be using Ecopath with Ecosim and NatureServe Vista in the near future
5	CommunityViz
6	community viz
7	Unsure
8	CommunityViz
9	GIS Seafloor mapping technologies and visualization tools
10	Not as eduacated or aware of the strengths and weaknesses of these tools.
11	Atlantis
12	marsh database marsh MD eelgrass site selection model

15. Are there specific processes for which you need tools but have not been able to find appropriate ones?

1	a simple computer-bsed tool to help developers consider environmental and social as well as economic decisions when designing their projects. Such a tool would indicate regulatory information and also practical ecosystem information. Simple questions, like is there a stream or wetland on your property; are there species at risk on your property. This kind of approach could be used for marine applications as well.
2	Visualizations, "game-playing."
3	We need good particle (LaGrangian) circulation modelling of the linkages between estuaries and near-shore waters. The models exist, but oddly enough require data to be applied!
4	It would be helpful to have tools that deal with hydrologic flows through marsh ecosystem that can deal with both tidal restoration projects and projections of sea level rise.
5	No
6	Not sure because I'm not aware what's out there.
7	community outreach about aquaculture so that public debate is based on facts not hype
8	I think we need a tool to actively promote two-way information flow to all those with a vested interest in marine ecosystems (i.e., all life as we know it on the planet).
9	No.
10	No
11	No comment
12	In development.

16. Are there tools that you know of that you would like to see us develop training for?

1	no
2	Ecopath, spatial analysis tools in ArcMap. Anything free or that we already have access to that will help.
3	ecopath ecosim and xl's riskoptimizer may be good training tools for those exploring ebm models
4	Unsure
5	Taking some action towards tools to use public input into management decision making. For example how do you plan to integrate or share my comments with management professionals to these open ended questions. I think that the meeting scoping requirements of NEPA has followed the letter of the law--while not considering legislative intent.
6	Not specifically.
7	No
8	No comment
9	Possibly later.

Joe Dunckley

17. Are you coordinating with other organizations, agencies, institutions, or municipalities in the region and if so, what are the barriers to better coordination and interaction?

1	yes, time constraints on meeting; everyone can't make time or have setups for Webex
2	Yes, we are starting to coordinate better. At first, the main problem was that various organisations all operate under regulations developed independantly. For example, building permits could be issued in spite of environmental regulation to the contrary. We are fixing this now.
3	Yes. Barriers include a lead agency that attempts sole ownership of the lead instead of engendering a sense of shared ownership and commitment to the process.
4	Cooperation isn't always mandated, especially with ocean issues. Time is a big barrier, but largely because there is no one portal or tool or newsletter or conference that serves as an appropriate forum for coastal and marine issues. I get about six different coastal and coastal management email newsletters each week; each with slightly different info (but plenty overlapping). For regional planning/research/data sharing, is there a more efficient method to communicating than meetings? Can meetings that do occur be more efficient and product oriented?
5	Time is one of the largest barriers.
6	Financial support for face time
7	State officials need to have prior permission to attend meetings out of state....even if only going to NH or nearby MA!! Or vice versa.
8	Time and resources.
9	Yes. Time and resources.
10	funding
11	yes, coordinating. no serious barriers other than time!
12	Yes Maintaining active and frequent communication between and among all stakeholders on resource issues is essential. Currently limited by time and availability of key partners.
13	We are trying to work with Environment Canada, Fisheries & Oceans, provincial Environment and natural Resource Agencies, watershed groups
14	As much as we can, but it is a challenge to keep all connections open. When agencies hire contractors who are on and off the job, that also makes it harder to keep things going. For example, we need to coordinate with you, but I didn't realize how far along your effort was until receivng the survey. We being EPA/ORD/AED and other parts of EPA, who are also developing tools for managers. CONTACTS marilyn ten Brink (tenbrink.marilyn @epa.gov) and naomi detenbeck (detenbeck.naomi@epa.gov).
15	Many members of our advisory committee are fearful of rocking the boat and upsetting local community members. They tend to be cautious. I personally maintain better relationships with like-minded groups than some members of the advisory group.
16	yes but we are viewed as commercial advocates and therefore suspect
17	Just time and funding to build communications bridges among watershed-using constituencies...
18	yes--people and groups need to listen more and talk less...
19	Yes, NGO's, other Provinical and Federal departments, Industry Sector While there are communications mechanisms in effect they could be better Standardized use of terminology and clear definition of EBM
20	Yes. Barriers include competition for scarce resources and lack of common agenda.
21	yes... funding to staff the effort (everyone seems to think networking and collaborating is free!)
22	Yes - time and resources
23	capacity
24	Money
25	Establishment of consistent management expertise with NGOs

18. How strongly do you need or want the following:

	Strong need or want	Moderate need or want	Low need or want	No need or want	*Rating average*	*Response count*
Training to understand the conceptual framework of EBM and general approaches for putting EBM into practice	15	13	8	2	*1.92*	*38*
Training to better understand the ecosystem context in which management occurs and that management decisions affect	14	14	9	1	*1.92*	*38*
Training in specific technological tools to do EBM	10	17	9	2	*1.08*	*38*

Answered question: 38
Skipped question: 17

19. Would you be interested in attending ecosystem-based management training in the following venues?

	Not interested		Moderately interested		Strongly interested	*Response count*
Workshops at professional conferences	3	3	14	15	4	*39*
Workshops in your community or region	3	2	10	9	14	*38*
Workshops at your job site	8	2	10	9	9	*38*
Workshops at a centralized training facility	2	8	9	12	7	*38*
Web-based trainings	8	4	8	12	7	*39*
Courses at a university	7	13	11	4	3	*38*

Answered question: 39
Skipped question: 16

20. If there are any other venues where you would be interested in receiving ecosystem-based management training, please describe them.

1	Training in concert with other events, for example, Gulf of Maine Council meetings or annual regional workshops of BoFEP, etc.
2	Again, we would be happy to be the site for a training session; do not have internal expertise to conduct same.
3	I don't see myself as the end-user of EBM tools, as I am a scientist and not a manager
4	We have a national training center (NCTC in Shepherdstown, WV) that while outside GOM is available for use and has free lodging for FWS personnel. Just came back from a week of training there.
5	The USFWS training facility at Shepardstown, WV (NCTC)
6	Time and money place severe constraints on further training. We are pushing the envelope of community responsibility here. We know we have to do something to increase the probability of ecosystem sustainability, but don't have a nest egg to back us up.
7	A specialized, intensive three-day seminar, after which a ceritificate in EBM could be issued.
8	Courses...web tools, stakeholder tools
9	No comment

21. How much time could you spend at an ecosystem-based management training?

Half a day	2	5.1%
One day	16	41.0%
2-3 days	12	30.8%
Other (please specify)	9	23.1%

Answered question: 39
Skipped question: 16

Written responses:

1	If the governor tells me to go for a week, I will.
2	Time available largely depends up time of year (winter is best) AND what take home APPLICABLE skills will be rec'd
3	for a good session, 1 week
4	One or two days
5	It depends on the needs and the purpose of the training
6	PRobably none.
7	(speaking personally for myself only)
8	devil is in the details
9	Depends on the issues and importance to the implementation of the Framework

22. Are you able to travel within your country (U.S. or Canada) to receive training?

Yes	32	84.2%
No	6	15.8%

Answered question: 38
Skipped question: 17

23. Are you able to travel internationally between U.S. and Canada to receive training?

Yes	23	62.2%
No	14	37.8%

Answered question: 37
Skipped question: 18

Devin Ford

Windmill in Hull, Massachusetts.

24. Might your organization be interested in sponsoring an EBM training workshop tailored to regional/ local issues? What issues should it focus on? What resources could you provide (such as logistics support, funding, communication with participants)?

1	unlikely
2	communication with participants some funding such as sponsoring a lunch or coffee break NB Environmental Trust Fund might provide funding if their criteria are met
3	Interested but no capacity to do so at this time.
4	We could sponsor a small workshop 10-20 people. Focusing on fisheries and fish habitat issues. We could provide location, maybe lunch, and notetaking.
5	Maybe. Fisheries issues. Could provide a meeting place.
6	We can provide the space, video conferencing capability). We could so some logistic support--handling registrations for example--but not travel and accommodations. We could also arrange refreshments, but not pay for them.
7	I cannot answer this question. My guess is that our organization could supply some logistical support.
8	Yes - we have space, interest, and an audience, but no funding for new initiatives
9	Possibly
10	We do not have the meeting facilities here (see comment on NCTC above). Salt marshes and coastal ecosystems in developing watersheds
11	Coastal and/or watershed. Logistics support, communication, space, etc.
12	Possibly on the scientific underpinnings for EBM?
13	The Department could consider co-sponsoring, if the opportunity was presented. Local issues include land-use planning and coastal management.
14	Yes. Issues mentioned above. Logitics, communications, little if any funding
15	Yes. Focus on estuarine water quality as it relates to habitat restoration. Space, communication.
16	we would participate
17	Until more resolution about need, unsure about this response
18	We could help with lonline courses, or logistics for holding courses
19	I do not know yet
20	?
21	We have limited funds, but would try to help with logistics for a RI workshop - depending on what info is being covered and how much we are really dealing with ecosystem vs human questions
22	YES, some part of EPA ought to be able to provide a lot of support.
23	Bridging between individuals holding widely differing points of view.
24	I doubt we have the capacity.
25	tools and pratical applications
26	Yes Facilities support communication with participants Some funding support could be requested
27	Perhaps. A workshop could focus on ongoing processes such as the SBNMS Zoning Working Group or the NEFMC Habitat Amendment. We could provide some logisitical and communications support.
28	yes... all negotiable, as we would like to serve as a convenor for this type of workshop/discussion.
29	Yes
30	no
31	No comment
32	Cannot say at this time
33	There is an interest, but any training would have to be approved with regional and/or national head quarters

25. What organizations or venues currently provide professional development training to you or other people from your organization?

1	Human Resources training is offered by government, for government Universities offer extended learning courses Some private sector training
2	Dalhousie University in Halifax - their Marine Affairs Program that provides students with a 12-month Master of Marine Management degree.
3	Professional conferences, in-house stats training, university courses/teaching.
4	Atlantic States Marine Fisheries Commission
5	UNH New Eng. Mus. Assoc.
6	MassBays Program, EPA New England
7	none
8	NCTC (USFWS) National conference organizations
9	Internal HR training. Not much else.
10	Federal, municipal, environmental non-government organizations, private
11	CSC, UNH Coop Ext.
12	Maine Association of Planners Northern New England Chapter American Planning Association American Planning Association
13	none, we pursue this in an academic setting--not familiar with training opportunities
14	USFWS National Conservation Training Center (NCTC) located in West Virginia. Professional organizations such as AFS, Wildlife Society, FEI, etc
15	Universities
16	RI SeaGrant, Univ.RI etc.
17	Professional societies, regional organizations, and various federal agencies.
18	UM Extension, DMR
19	Not much, Ilearn by listening, and considering...
20	Open, usually by contract
21	None that I'm aware of.
22	AZA, ASLO, AGU, NMEA, NSTA, Nat'l Association of Interpretors, Marine Studies Consortium
23	No comment
24	Not in a position to say at this time.
25	Universities, technical colleges, government-sponsored training and events

26. What professional meetings or conferences do you or people from your organization routinely attend?

1	research (Estuarine Research Foundation) and conservation (i.e, land trust type) meeting
2	various conferences and workshops on environmental and planning themes. Atlantic Planners Institute annual workshop BoFEP workshops
3	The Coastal Zone Canada conference series (next event in Vancouver, British Columbia, May 23-25, 2008 http://www.czca-azcc.org/html/conferences/czc08_papers.html. Also The Coastal Society's biennial conference series; next event in Los Angeles, CA, June 29 - July 2, 2008 http://www.thecoastalsociety.org/conference/tcs21/TCS-21call.pdf
4	American Fisheries Society, Estuarine Research Federation (and NEERS), ICES.
5	AFS, ERF, GOMCME, NEFMC, ASMFC
6	New Eng. Mus. Assoc. Marine Educators: National, New Eng. Gulf of ME
7	ERF; Seminars at Waquoit Bay, Wells, and Great Bay NERRs.
8	National and regional estuarine research, social research, and marine education meetings
9	ERF
10	SWS ERF New England Estuarine Research Society (NEERS)
11	Planning conferences, Marine science workshops, fisheries meetings

12	National and international scientific conferences, regional conferences for planning ocean observing systems, and dealing with specific scientific issues such as Paralytic Shellfish Poisoning/red tide
13	CAAL, CCME, local organizations
14	Coastal States Organization, Regional CZM meetings, Gulf of Maine Council meetings.
15	Maine Association of Planners Northern New England Chapter American Planning Association American Planning Association Maine State Planning Office
16	ASLO, ICES, AGU
17	too numerous to list. AFS, Wildlife Society, ASMFC, SETAC, etc
18	Society Environmental Toxicology and Chemsitry Aquatic Toxicity Workshop American Fisheries Society
19	Scientific conferences, workshops, brainstorming meetings
20	ERF, NEANS othersci groups
21	ERF, AGU, SEATAC, also fisheries, Coastal Zone, Limnology, and Ecology, and regional conferences
22	Not sure. We are largely amateurs, not professionals.
23	Advisory Committee meetings, AFS (sometimes) ISRm, ICES..
24	Open, international and national professional scientific workshops and conferences
25	Regularly scheduled NOAA agency meetings i.e. NEFMC and SBNMS meetings; other conferences and meetings as relevant and appropriate to New England regional work.
26	see #25
27	AFS, ICES, RARGOM
28	erf
29	ASMFC meetings

27. How interested are you or others from your organization in the following types of training/support?

	Not interested		Moderately interested		Strongly interested	*Response count*
Half-day overview of EBM tools held at a professional conference	3	3	20	5	5	*36*
Half-day overview of EBM tools held in your local community	5	2	13	6	9	*35*
One-day workshop on a few EBM tools relevant to your work held at a professional conference	2	6	10	13	5	*35*
One-day workshop on a few EBM tools relevant to your work held in your local community	5	1	9	8	13	*35*
Multiple-day workshop on tools relevant to your work held in your local community	6	5	8	10	6	*35*
Multiple-day workshop on tools relevant to your work held at a centralized training facility	4	6	16	7	4	*37*
Web-based training modules on tools relevant to your work	5	6	9	11	6	*37*
On-going technical support for using EBM tools	3	5	13	8	8	*37*

Answered question: 37
Skipped question: 18

28. What type of organization do you work for?

Federal government	10	26.3%
State/regional government	9	23.7%
Academic institution	7	18.4%
Non-profit/non-governmental organization (NGO)	6	15.8%
Museum/aquarium	2	5.3%
Local government	1	2.6%
Consultant	1	2.6%
Community-based group	1	2.6%
Other (please specify)	1	2.6%
Industry	0	0.0%

Answered question: 38
Skipped question: 17

Written responses:

1	Provincial government
2	Federal-state-ngo partnership
3	provincial gov.
4	Para-governmental research consortium
5	UNH

29. Which of the following best describes your role in your organization or ecosystem-based management project?

Academic or government research	8	20.5%
Other (please specify)	8	20.5%
Coastal zone management	7	18.0%
Fisheries management	5	12.8%
Watershed management	4	10.3%
Biodiversity conservation	3	7.7%
Education/outreach	2	5.1%
Habitat management	1	2.6%
Concerned citizen	1	2.6%
City/county planning	0	0.0%
Protected area management	0	0.0%
Water quality management	0	0.0%
Industry planning/management	0	0.0%

Answered question: 39
Skipped question: 16

Written responses:

1	Watershed Management Community Planning
2	public outreach/education
3	Fish and Wildlife Management on a habitat/ecosystem basis
4	Coastal, watershed, protected areas, water quality, habitat management
5	state, regional, and local land use planning with a smart growth and environmental bent
6	fish and wildlife management along with a intensive national network of National Wildlife Refuges.
7	Knowledeg brooker in a consortium dealing with climate change and adatation issues
8	National Estuary Program

9	monitoring of basic ecosystem components
10	our role is to coordinate and design cooperative bay managment planms. We also do training for growers
11	Fierhies Management is the major focus but all the above are within my Department's mandate

W. G. Davis

30. What is your technical background?

Basic computer skills only	15	39.5%
Some experience using GIS or other specialized software tools for data processing and analysis	11	29.0%
Extensive experience using GIS or other specialized software tools for data processing and analysis	3	7.9%
Other (please specify)	9	23.7%

Answered question: 38
Skipped question: 17

Written responses:

1	MS in Zoology; 15 years head of museum
2	Ecological Data analysis
3	pretty well understand basis of GIS, but haven't mastered tool because of infrequency of use - I generally partner with someone who has the technical experience with the tool
4	I'm a research leader and these specialties are generally done by people in my group
5	Resource managers
6	Biological (field) Oceanographer / Marine ecologist
7	digital photography, charting, report writing, communication, for starters.
8	fisheries biology, agricultural economics
9	WOw!! A very limited view of Ecosystem Management.
10	Policy Land use planning Process and public engagment
11	Understand use of relational databases

31. Which of the following best describes your current interest in ecosystem-based management tools?

I would like to gain a basic understanding of tool capabilities and their potential value for addressing institutional problems	17	43.6%
I would like to gain sufficient knowledge to manage technical staff applying the tools	9	23.1%
I would like to become an expert tool user	3	7.7%
I would like to be able to train others to use the tools	1	2.6%
Other (please specify)	9	23.1%

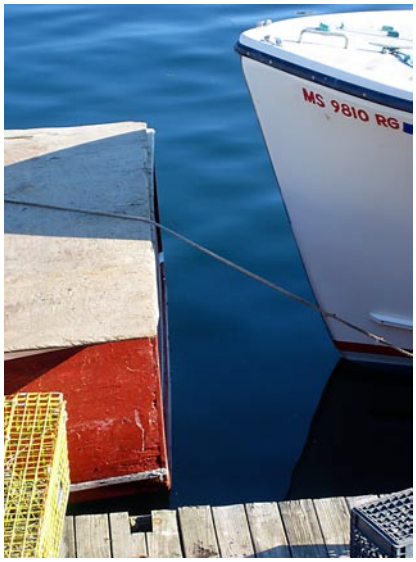
Answered question: 39
Skipped question: 16

Written responses:

1	I would like to see the development and implementation of these tools for use by coastal managers.
2	Initially I would like to gain a basic understanding of available tools and capabilities. Next I would like to become an expert tool user if deemed appropriate
3	I am interested in helping to formulate and improve approaches and models and promote their use
4	The Northeast Region is currently engaged in pilot activities managing landscape based resource issues.
5	I am not convinced any of this is ready for prime time training of the professional managers. Unless you can convince me that the ecomodels can predict what the oxygen levels will be in Narragansett upper Bay of you were to decrease the nitrogen load by 30, 40, or 50 % or what the response of the benthic fishery will be to a 2, 3 or 4 degr.C increase, then I think we are all putting the horse before the cart is even well-built! Sorry to sound like a grump, bu as a scientist I hate to see managers become disappointed when they see the "incredible science tool " being offered is so crude that it can only tell you "it's cold" when you see snow on the ground. We need ecosystem management to have a level of predictability that is adequate for managers to believe what they are saying when they limit a catch or require level of treatment down to X. I do not personally believe we are even in the ballpark yet!
6	I would like to be able to provide effective tools, ona regional and national basis.
7	I want to be an effective member of an advisory committee in establishing precedents for community-based, regional bay management in the State of Maine. My neck is stuck way out of my shell.
8	Tools that develop trust...
9	I would like to identify potential resources for the Gov of Nova Scotia to assist in implementing its Coastal Managemnt Framework.

32. Is there any other information you would like to share with us?

1	This survey was way too long.
2	This quest-aire focused on EBM practioners, wheras I am a researcher
3	No
4	think i've said enough...sorry to bend your ear so long...probably not the response you want from the survey
5	see my contact info. I'll send an email to you also (but I'm out most of this next week).
6	Each ecosystem is different; I believe it is important to learn from local experience rather than learning a set of general principles that may or may not be relevant.
7	I am a communicator by education, experience and training. But marine conservation is a large part of my work.
8	This is a positive first step.
9	My research & conservation colleagues (Heather Tausig, Michael Tlusty, Scott Kraus) may have a different take than I do on these questions, it may be worth checking in with them as well.
10	Many of your questions suggest answers to EBM exist and that usable definitions are avilable. It's just a question of me being exposed to the answers and definitions as well as the tools for EBM. Even after years of discussing EBM, little progress has been made in getting managers any closer to EBM. If the answer to EBM is "just be very precautionary," then I'm dissapointed. For fisheries managers, if the answer is "just establish a network of marine reserves and dramatically restrict when and where some types of fishing gear may be used" then I'm more than a little dissapointed. I don't want supposed EBM to be the "grease" for management approaches some groups or organizations want implemented. I'm very open to all possibilities and options, but I don't want to be obliged to proceed in a certain direction under the guise of EBM.



Gulf of Maine
Council on the
Marine Environment

The mission of the Gulf of Maine Council on the Marine Environment is to maintain and enhance environmental quality in the Gulf of Maine to allow for sustainable resource use by existing and future generations.