

I. EXECUTIVE SUMMARY

Ecosystem-based management (EBM) is an approach to achieving sustainability and ecosystem conservation using a cooperative, ecology-based management system. The goal of the Environmental Law Institute's (ELI's) EBM project is to identify the governance mechanisms capable of translating EBM concepts into concrete practices through the examination of seven case study regions. This Report is a first step in this process. The Report considers three main components of EBM governance: (1) the structure and function of regional organizations; (2) options for EBM implementation under existing federal environmental laws; and (3) sector-based implementation of EBM goals and objectives. It describes EBM components of the seven case study regions that relate to common EBM goals and actions. It identifies existing federal laws that may enable EBM implementation in some circumstances. And it describes sector-based laws and institutions that take an ecosystem approach to management.

DEFINING EBM

Based on existing EBM definitions, ELI applies the following EBM goals and actions in its initial assessment of regional programs:

- **GOALS**
 - Sustainability
 - Conservation and Protection to Ensure Ecological Health

- **ACTIONS TO ACHIEVE GOALS**
 - Achieve Balance among Human and Ecological Values
 - Coordinate and Cooperate
 - Understand the Science so as to Make Informed Decisions
 - Define Success and be Accountable
 - Be Adaptive

REGIONAL ORGANIZATION

CASE STUDY REGIONS

California Ocean Protection Council

Chesapeake Bay Program

Great Lakes (International Joint Commission, Great Lakes Commission, Great Lakes Regional Collaboration)

Gulf of Maine Council on the Marine Environment

Gulf of Mexico Alliance

Puget Sound Partnership

San Luis Obispo Science and Ecosystem Alliance

These case study regions have published plans with fundamental goals that relate to sustainability, conservation, and protection to ensure ecological health. The major focus of this project is to understand how the organizations' governance structures and functions achieve their fundamental goals of healthy and sustainable oceans.

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Achieve Balance among Human and Ecological Values. The regional organizations' plans consider human uses and needs as well as the need for conservation and protection of ecosystems. One challenge that must be addressed in this balancing act is managing the designated ecosystem under the existing governance structure. There is an overarching need to reconcile ecosystem boundaries with jurisdictional boundaries and to enable institutions to respond to both rapid and slow ecosystem changes. Although this report does not assess how regional organizations set ecological boundaries, once set, their various approaches to *reconciling ecological issues with jurisdictional boundaries* include:

- Tailoring the ecological issues addressed to the program membership
- Creating multiple membership categories, each based on an institution's relationship to the issue or jurisdictional constraints

Examples of approaches to address *slow ecosystem - fast governance* include:

- Long-term monitoring programs to understand slow ecosystem changes over successive administrations
- Use of historical data sets for decision-making
- Maintaining institutional memory

Examples of approaches to address *fast ecosystem - slow governance* include:

- Contingency plans to respond to hazardous spills
- Rapid response programs to prevent introduction and spread of invasive species

Coordinate and Cooperate. A major function of regional programs is to enable coordinated and cooperative management of an ecosystem. ELI examined several components of coordination and cooperation, including founding mechanisms that outline an organization's authority to act, organization structure and membership, how regional programs address competing and conflicting uses and needs, how organizations may enable institutional harmonization, and the role of stakeholders in the management process.

Founding mechanisms include treaties, soft-law transboundary agreements, congressionally authorized state compacts, soft-law multi-state agreements, state law, state executive orders and appropriations, and non-governmental grassroots approaches. Founding documents often set up organizational structure and membership. Regional organizations range from bodies that are composed only of government officers and appointees to ones with broad membership that includes government officers, NGOs, industry, and other stakeholders.

A major focus for this project is to identify and understand how regional organizations address competing and potentially conflicting ocean and coastal uses and needs. Some ways that they are addressing or are seeking to address this challenge are:

- creating dispute resolution systems to solve conflicts
- establishing the authority to impose sanctions for non-compliance
- requiring a majority quorum for decision-making
- requiring consensus for decision-making
- creating a system of compromise during the strategic planning phase
- valuing competing uses relative to one another

Another component of regional organization is the ability to harmonize existing programs. This can occur in a variety of ways. It can include the harmonization of legislation, as is seen in the Chesapeake Bay region, as well as harmonization of information, including efforts to standardize data.

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Finally, collaborative and cooperative approaches include public participation, ranging from education and outreach to a direct role for members of the public in decision-making.

Understand the Science so as to Make Informed Decisions. Regional programs recognize the importance of science-based management that addresses the complexity, interconnectedness, and dynamic nature of ecosystems. Some approaches to enabling the use of science among institutions include:

- Coordinated monitoring programs, including contributing to or working with the Integrated Ocean Observing Systems
- Development of consistent standards and indicators of ecosystem health
- Increased funding for ecosystem-based research
- Mechanisms to deliver scientific information to managers and the public
- Mechanisms for information-sharing across scientific disciplines and institutions
- Development of new tools to enable EBM

Define Success and be Accountable. Regional organizations define their vision of EBM success through the development of management plans. ELI reviewed the management plans for the seven case-study regions and identified (1) types of information included in each plan and (2) specific ecosystem and governance goals that are the basis for regional action.

The plans include the following *types of information*:

- Description of the ecosystem impacts driving the need for action
- One or more overarching objectives for each major category of issue
- Specific action items that will be undertaken in a specified period of time for each overarching objective, including short-term goals and long-term actions
- Rationale for actions
- Cost estimate for actions
- List of lead and/or cooperating institutions to implement each action item
- List of laws, policies, and agency programs related to specific action items or objectives

Specific ecosystem and governance goals include:

- Restore, protect, and enhance fish/shellfish fisheries
- Preserve, protect, restore, and improve habitats and species
- Achieve, improve, and maintain water quality
- Enhance governance capacity and performance
- Improve understanding of ocean and coastal ecosystems, including research, mapping, and monitoring
- Improve public awareness and promote stewardship
- Prevent, eradicate, and control aquatic invasive species

Regional organizations use a variety of mechanisms to create *accountability* in order to achieve implementation. These include:

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- providing dates to achieve defined goals as a way to gauge progress
- creating annual achievement reporting requirements

Be Adaptive. Several regional programs take steps toward adaptive management. These include developing plans with specific and measurable goals, updating regional plans on a regular schedule based on a review of previous achievements, continuous monitoring, and communicating results to the public.

EBM OPPORTUNITIES UNDER EXISTING LAWS AND PROGRAMS

Existing environmental laws and programs may enable implementation of EBM concepts. This report examines key federal laws that offer opportunities for EBM implementation, including the Coastal Zone Management Act (CZMA), the essential fish habitat (EFH) provisions of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and the total maximum daily load (TMDL) provisions of the Clean Water Act (CWA).

The ***Coastal Zone Management Act (CZMA)*** is a federal law that provides monetary incentives for states to set up coastal management programs that consider a multitude of ocean and coastal uses. The CZMA calls upon state and federal agencies to take actions to properly manage the coastal environment, many of which align with the actions to achieve ecosystem goals described in the previous section. States are able to define their coastal zone to include state marine waters and adjacent shoreline that strongly influences or is influenced by the marine environment. Under the CZMA states create regional plans that consider multiple ocean uses. The Act also enables coordination among neighboring states and between the coastal state and federal agencies when undertaking activities that may affect the coastal zone.

The National Oceanic and Atmospheric Administration (NOAA) manages federal fisheries pursuant to the ***Magnuson-Stevens Fishery Conservation and Management Act (MSA)***. While limited in scope to fisheries, the Act's ***essential fish habitat provisions*** could provide some opportunity to conduct place-based EBM in critical fishery areas. One of the purposes of the MSA is "to promote the protection of essential fish habitat in the review of projects conducted under Federal permits, licenses, or other authorities that affect or have the potential to affect such habitat."¹ NOAA is to coordinate with other federal agencies regarding conservation and enhancement of essential fish habitat. Also, the MSA requires other federal agencies to consult with NOAA for actions that may adversely affect essential fish habitat. This enables fisheries managers to evaluate whether actions taken by other sectors will adversely impact critical fishery areas, and to potentially evaluate cumulative impacts based on multiple agency actions in essential fish habitat areas.

The goal of the ***Clean Water Act (CWA)*** is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."² Under the CWA, if water bodies or segments are impaired by pollutants, states must establish the ***total maximum daily load (TMDL)*** of pollutants necessary to achieve the applicable water quality standards.³ States implement this provision by creating TMDL reports that include a description of the geographic area, applicable water quality standards, an assessment of the problem, and the pollutant loading capacity for the water body. As a document that describes the geography, the health of the water body, and the source of the problems, these TMDL reports could be used as a basis for EBM planning. Traditionally, water bodies are divided into segments, and each segment is assessed individually. Newer approaches to water quality management include watershed management and the creation of watershed TMDLs. Also, some TMDLs have been developed for bays and estuaries, and the question remains as to whether TMDLs could be developed further into the marine environment.

¹ Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. § 1801(b)(7).

² Federal Water Pollution Control Act [hereinafter Clean Water Act or CWA], 33 U.S.C. §1251(a).

³ *Id.* § 1313(d).

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The **National Estuary Program (NEP)** is created under Section 320 of the Clean Water Act. To date, 27 estuaries have been designated as being estuaries of national importance. While limited spatially to estuarine environments, NEPs have several EBM components including a coordination and planning mechanism that results in a comprehensive management plan, broad stakeholder participation, science-based management approach, and goals that consider biological integrity and human uses. NEPs are involved in two of the case study regions, Puget Sound and Morro Bay, and the Puget Sound NEP management plan is currently being used by the Puget Sound Partnership as the action agenda until a new plan is created.

SECTORAL IMPLEMENTATION

To gain a better understanding of the sector-based laws and institutions necessary for EBM implementation, ELI defined six implementation categories based on the types of ecosystem issues typically addressed by regional organizations: (1) water quality and quantity; (2) habitat conservation, preservation, and restoration; (3) living resources; (4) land use; (5) maritime activities; and (6) human health and well-being. Within each of these categories, existing laws and institutions may stand out as examples that align with EBM principles and objectives.

Water quality and quantity. This category includes laws, programs, and institutions that focus on regulating or restricting activities that impact marine and freshwater quality and quantity. Specific examples highlighted and studied in this report include:

- Agricultural Nutrient Management Plans in the Chesapeake Bay Watershed
- Great Lakes Preservation Laws in Michigan

Habitat conservation, preservation and restoration. Several laws and institutions seek to conserve, preserve, and restore habitat for the purpose of protecting biodiversity and important places. Examples include:

- Agency Cooperation for Coastal Habitation Protection Plans in North Carolina
- Submerged Aquatic Vegetation Protective Zones in Maryland
- Marine Managed Areas Improvement Act in California

Aquatic living resources. The living resources category includes laws and institutions that regulate or manage individual species or groups of species, including management of target and non-target species. Examples include:

- North Carolina Coastal Habitat Protection Plan
- Governor's Salmon Recovery Office in Washington
- Ecosystem Approach to Fisheries Management in California

Land use. Laws and policies affect the uses of lands, development patterns, decisions to engage in activities, and the practices employed on the lands. Examples include:

- Critical Area Preservation Programs in the Chesapeake Bay Watershed
- Forestry Riparian Easements in Washington
- Permitting Restrictions near Aquatic Resources in Maine

Maritime activities. This section includes laws and institutions related to shipping and navigation and non-living resource use or extraction. Examples include:

- Ballast Water Release Permitting in Michigan
- Preservation Measures in Oil, Gas, and Mineral Leases in Mississippi
- Preventing Ecological Damage from Anchored Oil Vessels in Maine

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Human health and well-being. This category focuses on laws and institutions that directly target human health and well-being, including recreational, cultural, economic, and human health issues. Examples include:

- Washington's Beach Environmental Assessment, Communication, and Health (BEACH) Program
- Prohibition on Importing Certain Marine Organisms in Maine
- Pollution Prevention through Restricted Drain Usage in Michigan