

An **Ecosystem Approach to Management (EAM)** is one that provides a comprehensive framework for living resource decision making. In contrast to individual species or single issue management, EAM considers a wider range of relevant ecological, environmental, and human factors bearing on societal choices regarding resource use.

NOAA defines EAM as a geographically specified, adaptive approach that takes account of ecosystem knowledge and uncertainties, considers multiple external influences, and strives to balance diverse societal objectives. Implementation will need to be incremental and collaborative. NOAA recognizes that transition to and implementation of an ecosystem approach to management needs to be incremental and collaborative.

NOAA's Seven Characteristics of EAM:

1. Geographically Specified Areas
2. Adaptive Management
3. Takes Account of Ecosystem Knowledge & Uncertainty
4. Strives to Balance Diverse Societal Objectives
5. Considers Multiple External Influences

6. Incremental
7. Collaborative

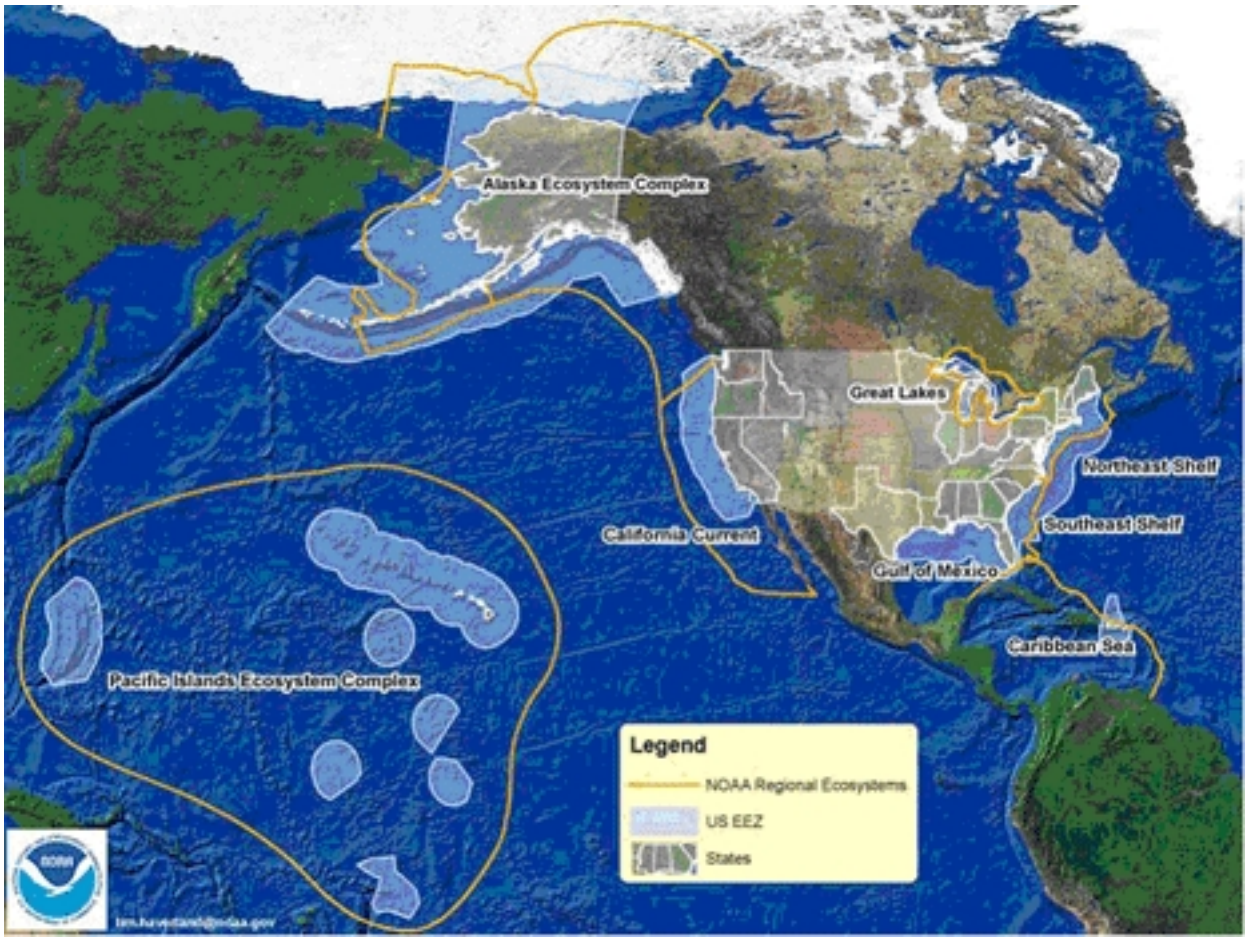
Geographically Specified Areas

Geographically Specified Areas - Place and issue based, with appropriate boundaries defined by the scope of the problem, area of influence, and the potential area over which solutions may be applied.

EAM is inherently linked to a place. Yet resource management often crosses traditional political boundaries and is influenced by ecosystem drivers, such as oceanographic and climatic conditions, and socioeconomic factors. Due to the dynamic nature of the environment, boundaries may be "fuzzy" or imprecise at times, but they help to provide a framework for the implementation of EAM by focusing us on the place and the issue. To be credible and fully accepted, boundaries should be established so that they are appropriate to the issue being addressed and identified through an open process. Ultimately, boundaries form the basis for scientific investigation and collaborative management strategies.

Using the internationally recognized Large Marine Ecosystem model, NOAA worked with partners and stakeholders to delineate eight Regional Ecosystems. However, NOAA recognizes that these boundaries may change according to the issue being addressed. By working geographically, we can engage affected partners and stakeholders, identify and address information gaps, minimize duplication of efforts, and focus on priority issues that are the most compelling resource management challenges for a region.

NOAA Regional Ecosystems of the United States
Based on Large Marine Ecosystems



Adaptive Management

Adaptive Management - Routinely and systematically evaluate information, and in doing so monitor results and alter science and management strategies to achieve the desired ecosystem condition

Adaptive management is a well accepted concept within the resource management community that describes a way of managing the dynamic nature of ecosystems in the face of uncertainty. To be effective, adaptive management should be based on an open and mutually agreed upon process for monitoring and assessing the outcome of management actions, allowing for mid-course corrections along the way to achieve the desired outcome. This is accomplished through the use of credible models, decision-support tools, monitoring strategies, performance indicators, and the selection of target thresholds for action.

Adaptive management also takes into account socioeconomic considerations, stakeholder participation, conflict resolution, legal and policy barriers, and institutional challenges. Being

adaptive requires people and institutions to be flexible, innovative, and highly responsive to new information and experiences. Adaptive management succeeds when there are clear linkages among information, actions, and results and a strong climate of trust among partners.

Considering external influences, factors, and stressors sets EAM apart as a holistic approach to management, as compared to single species or single issue management. In addition to looking at the broad range of influences within a region, we need to try to understand the impact of factors beyond our control. Considering local, state, federal, and international actions and sharing data are also critical to success.

Takes Account of Ecosystem Knowledge and Uncertainty

Takes Account of Ecosystem Knowledge and Uncertainty - Collect and integrate relevant ecological and socio-economic information, identify uncertainties and gaps regarding ecosystem processes, and incorporate them into management decisions

EAM builds upon existing institutions and information collected for a variety of specific purposes and provides a framework to combine data for additional value. This approach allows us to identify science priorities to reduce uncertainties, leading to better understanding of the effects of policy choices. Incorporating risk management into decision processes also helps account for uncertainty. As such, EAM can be implemented with information that is currently available. However, it is critical to continue learning about ecosystem components and processes so risks can be minimized, management actions targeted and monitored, and future actions adapted as needed to ensure that scientific and management efforts change as ecosystems change. By integrating our existing knowledge, identifying and working to fill information gaps, and developing predictive models, we can minimize management risks. In combination with being adaptive, we are able to respond quickly to natural or human-induced changes in the environment.

The principle of taking account of ecosystem knowledge and uncertainty is illustrated in the management approach taken by the Convention on the Conservation of Antarctic Living Marine Resources (CCAMLR) . CCAMLR joined the Antarctic Treaty System amid concerns about the effect of krill harvest on other marine populations. Although CCAMLR aims to conserve marine life, it does not exclude rational harvesting activities. Balancing these pressures is not simple and requires a great deal of information about the ecosystem. As such, CCAMLR has adopted a ‘precautionary’ approach, considering uncertainties when making management decisions in a manner that strives to

minimize the long term adverse effects on the resource, rather than delaying decisions until all necessary data are available.

Strives to Balance Diverse Societal Objectives

Strives to Balance Diverse Societal Objectives - Develop a fair and transparent process working with stakeholders to identify and evaluate options and tradeoffs and arrive at solutions that maximize societal benefits for this and future generations

Some of the necessary steps involved with balancing societal objectives include identifying stakeholders and their needs, recognizing that objectives may be in conflict at times, developing creative solutions, and understanding tradeoffs. This process ensures that all points of view and types of information, including traditional knowledge, are considered, and that people understand the reasons for a particular decision. When the process is fair and transparent, more and more partners will be willing to engage in EAM.

Considers Multiple External Influences

Considers Multiple External Influences - Take into account relevant ecological and anthropogenic factors affecting coastal and ocean ecosystems, including those outside NOAA’s authority and the defined regional ecosystem

Considering external influences, factors, and stressors sets EAM apart as a holistic approach to management, as compared to single species or single issue management. In addition to looking at the broad range of influences within a region, we need to try to understand the impact of factors beyond our control. Considering local, state, federal, and international actions and sharing data are also critical to success.

The Chesapeake Bay Program is a prime example of the value and importance of considering external influences. State and federal agencies with authority over every part of the watershed were brought together to develop management plans. In addition to improving the health of the Bay, other important considerations included the need to preserve the integrity of historically valuable fisheries and their dependent communities, while accommodating growing population pressures and tourism.

Incremental

Incremental - A stepwise approach to implementation that includes a systematic process of monitoring, evaluation, and adaptation to achieve a desired outcome

The move toward EAM occurs along a continuum through a series of evolving advances, as opposed to an abrupt paradigm shift. Goals, like long-term visions, are best achieved when they are broken down into manageable objectives and projects. Collaborators work together, following an agreed upon plan, to make stepwise progress towards a common goal. The term incremental does not necessarily imply a smooth progression forward, as both setbacks and advances may occur along the way to achieving the goal.

Collaborative

Collaborative - Work with a broad spectrum of partners and stakeholders to pool resources and knowledge and share efforts to achieve mutual goals

Many key elements must be in place for collaborative EAM to be effective. The optimal mix of collaborators must voluntarily unite to work together in a partnership for action. A clear vision of what needs to be accomplished must be articulated, along with well-defined goals, responsibilities, and outcomes. People will bring unique contributions to the table and be motivated by diverse incentives. Leadership should be inclusive, encouraging sharing of information and opinions. Decision making processes should be transparent. Partners and stakeholders are part of the solution and realize that their goals will best be achieved by working together.

One of the best models of a collaborative approach can be seen in the work of the Coral Reef Task Force .
Twelve federal agencies work together with seven U.S. states, territories, and freely associated states to coordinate their coral reef conservation activities. The Local Action Strategy work plans, which outline goals, objectives and projects to address locally relevant threats to coral reef ecosystems, represent the input of thousands of stakeholders.

http://ecosystems.noaa.gov/why_an_eam.htm