

NOAA Integrated Ecosystem Assessment (IEA) Program 3-year Plan (2014-2016)

November 13, 2013

Vision (*where do we want to be in the future in terms of growth, achievements, and development*):

The NOAA IEA Program strives to provide the sound interdisciplinary, ecosystem-based science, tradeoff evaluation, and management advice required to ensure the sustainable delivery of a broad spectrum of benefits and services from our Nation's marine, coastal, estuarine, and Great Lakes ecosystems; thus, enhancing the well-being of current and future generations.

Mission (*What do we do? How do we do it? For whom do we do it?*):

The mission of the NOAA IEA Program is to provide an interdisciplinary analytical framework to support effective Ecosystem-Based Management of our Nation's marine, coastal, estuarine, and Great Lakes resources. IEAs assess the status of ecosystems in relation to defined societal goals and objectives; examine the cumulative impacts of natural and anthropogenic stressors; and analyze the cumulative risk of these stressors to US marine and coastal ecosystems. IEAs provide vital information to resource managers by evaluating the effect of possible management actions upon all focal ecosystem (including human) components in relation to their current state and societal goals; assessing tradeoffs among potentially competing objectives; and ultimately producing scientific analyses and products to help inform management decisions within an ecosystem context. By providing the scientific support for EBM, IEAs aim to support healthy and resilient communities, economies, ecosystems, and human well-being.

Introduction:

The NOAA IEA Program oversees the direction and execution of IEAs within US Large Marine Ecosystems (LME). The Goals and Objectives for this 3-year strategic plan build upon one another. This means that progress will be carried over from one year to the next year(s) allowing the IEA program to build upon strengths and successes as the plan is implemented. In this way we will achieve the program's vision and mission and sustain the program through the future. The Steering Committee is charged with the responsibility of monitoring progress of the strategic plan, but the implementation of the plan will succeed by each region taking on responsibilities related to their area's particular Objectives and Goals within the broader context of the 3-year plan.

In the context of the 3-year plan, "Goals" are discrete things that the IEA program would like to accomplish and "Objectives" are the means for accomplishing these "Goals". The IEA program has not prescribed how to accomplish these "Objectives", because the IEA Steering Committee feels the regions can best define and develop this methodology as they implement the specific "Objectives". Their strategies for success can then be documented in their respective annual work plans and used to inform the IEA process.

The IEA Program's Steering Committee is responsible for the creation of strategic planning documents to help guide regional IEA programs with their planning efforts. These include the 3-year strategic plan as well as an annual "directives" document. The purpose of the annual directives document is to define the specific Goals and Objectives for each year. This document can then provide current guidance to the regions and allow incorporation of identified annual priorities during development of their region-specific annual work plans. The purpose of this 3-year Strategic Plan is to provide longer-term priorities of the program. This document will also be essential in annual planning for each regional IEA to ensure that current work aligns with longer-term IEA Goals. This Strategic Plan will be refreshed on a 3-year cycle, with the Steering Committee responsible for development of the subsequent 3-year Strategic Plan before the end of the current plan's 3-year period.

The IEA Program's defined Vision, Mission, Goals, and Objectives will be used in the development and delivery of the IEA's defined performance measure(s) (PM) required by NOAA management and budget to evaluate program progress. The performance measure will also be revisited during the Strategic Planning process following the same 3-year program-planning horizon. It is important to note that while performance measures are established during the Strategic Planning phase, success in meeting these measures as well as the IEA Program's rate of progress will be highly influenced by the level of available fiscal support for the program.

Pillars of the Plan:

There are four "pillars" to the IEA strategic plan. The elements of the IEA process diagram generally will fall within one or more of these. They are:

- 1) *Science Research and Development* -- This pillar includes, but is not limited to, the science behind IEA products. These may include methodologies, indicators, risk assessments, models, and other products developed and used during each IEA process.
- 2) *Transferring Scientific Knowledge to Management* -- Also defined as Decision-Support, this pillar includes engagement with management partners to assist in identification of management objectives; conversion of science to products useful for management purposes' converting science into management action; Management Strategy Evaluations (MSE), and other steps.
- 3) *Communication* -- This pillar results in effective communication through outreach and collaboration with stakeholders; development of products that convey scientific findings on the health of marine, coastal, estuarine, and Great Lakes ecosystems in an open and transparent format on a regular basis; and provision of timely and sound scientific advice to managers and the general public.
- 4) *Evaluation* -- This final, but important pillar provides information on how effectively science-based decision-support has been provided and used by management during the IEA process. This can include steps such as gap analysis, which identifies what we are missing in the process to help improve decision-support (center section of the IEA loop; Fig. 1). These types of analyses can also identify lessons learned during the process, which will be used to inform next steps and future strategic planning efforts.

Goals and Objectives:

Goal 1(Overarching): More fully implement the IEA in at least one additional US LME (as part of anticipated rolling regional implementation assuming at least [limited] level funding)

- **Objective 1:** Each US LME with IEA funding will develop a 3-year plan to implement an IEA within their LME. These plans should layout clear activities to ensure successful IEA implementation in relation to national and regional goals, objectives, scientific resources, and overcoming challenges listed in the Goals 2-4.
- **Objective 2:** Establish and evaluate ecosystem goals in collaboration with resource managers and stakeholders
- **Objective 3:** Define ecosystem indicators relative to ecosystem goals and assess their status
- **Objective 4:** Develop tools (e.g. models, reference points, etc.) needed to effectively implement the IEA in each region
- **Objective 5:** Perform ecosystem risk assessment
- **Objective 6:** Develop and “publish” Ecosystem Status Report in each region
- **Objective 7:** Perform and deliver finalized MSEs through ongoing collaboration with managers
- **Objective 8:** Evaluate effectiveness of the IEA implemented management actions with managers

Goal 2: Identify methodology to develop *Reference Points*

- **Objective 1:** Create a cross-regional, cross Line-Office team focused on the development of reference points and management decision rules suitable for the national IEA initiative
- **Objective 2:** Develop a document reviewing current reference point methodologies and suggested path for the IEA program/regions to develop reference points
- **Objective 3:** Develop best practices for the methodology to develop regional reference points
- **Objective 4:** Incorporate methodology and use of reference points in full IEA implementation in each region

Goal 3: Develop framework to fully incorporate Human Dimensions into IEA development and implementation

- **Objective 1:** Establish a set of guidelines for human dimensions aspects of IEA research, so that social and economic components of the ecosystem are routinely and consistently included in IEA implementation from the outset of development
- **Objective 2:** Present and discuss ways Human Dimensions work may be incorporated into IEAs at annual IEA meeting
- **Objective 3:** Determine how to define EBM goals and objectives via stakeholder engagement. These goals and objectives must be specific enough to be able to quantify the current status of the ecosystem relative to the goals and objectives and quantify via MSE whether proposed management strategies moves us closer to or further away from the goals and objectives

- Objective 4: Create a set of economic and well-being indicators with which researchers may establish a consistent link between ecosystem health and economic and social well-being
- Objective 5: Conduct an assessment of human dimensions needs for ecosystem-based management so that the SC can compare to existing human dimensions work, conduct a gap analysis, and appropriately incorporate into IEA implementation
- Objective 6: Regional Ecosystem Status Reports incorporate all relevant human dimensions indicators and analyses

Goal 4: Ensure climate-change is being appropriately incorporated into IEAs

- Objective 1: Assess how well climate-change information is being incorporated into IEA analyses
- Objective 2: Identify key climate indicators affecting system structure and function in marine, coastal, estuarine, and Great Lakes ecosystems
- Objective 3: Incorporate climate drivers into ecosystem models serving as operating and assessment models in IEAs
- Objective 4: Evaluate system-wide structure and function in relation to climate projections to provide long-term perspective on ecosystem health
- Objective 5: Ensure climate change is incorporated into all IEA analyses that span a temporal scale of greater than a decade

The NOAA IEA Approach

Management Strategy Evaluation

MSE is useful to help resource managers consider the system trade-offs and potential for success in reaching a target which helps make informed decisions. It uses simulation through ecosystem modeling to evaluate the potential of different management strategies to influence the status of natural and human system indicators and to achieve our stated ecosystem objectives.

Analyze & Evaluate Uncertainty & Risk

Ecosystem analyses and models evaluate risk to the indicators and thus the ecosystem posed by human activities and natural processes. These methods incorporate the degree of uncertainty in each indicator's response to pressures. This determines incremental improvements or declines in ecosystem indicators in response to changes in drivers and pressures and to predict the potential that an indicator will reach or remain in an undesirable state.

Taking, Monitoring, and Assessing Action

Based on the MSE, an action is selected and implemented. Monitoring of indicators is important to determine if the action is successful; if yes, the status, trends, and risk to the indicators continue to be analyzed for incremental change; otherwise as part of adaptive management, the outcomes need to be assessed and evaluated to refine relevant aspects of the process towards achieving objectives.

For more information visit: www.noaa.gov/iea

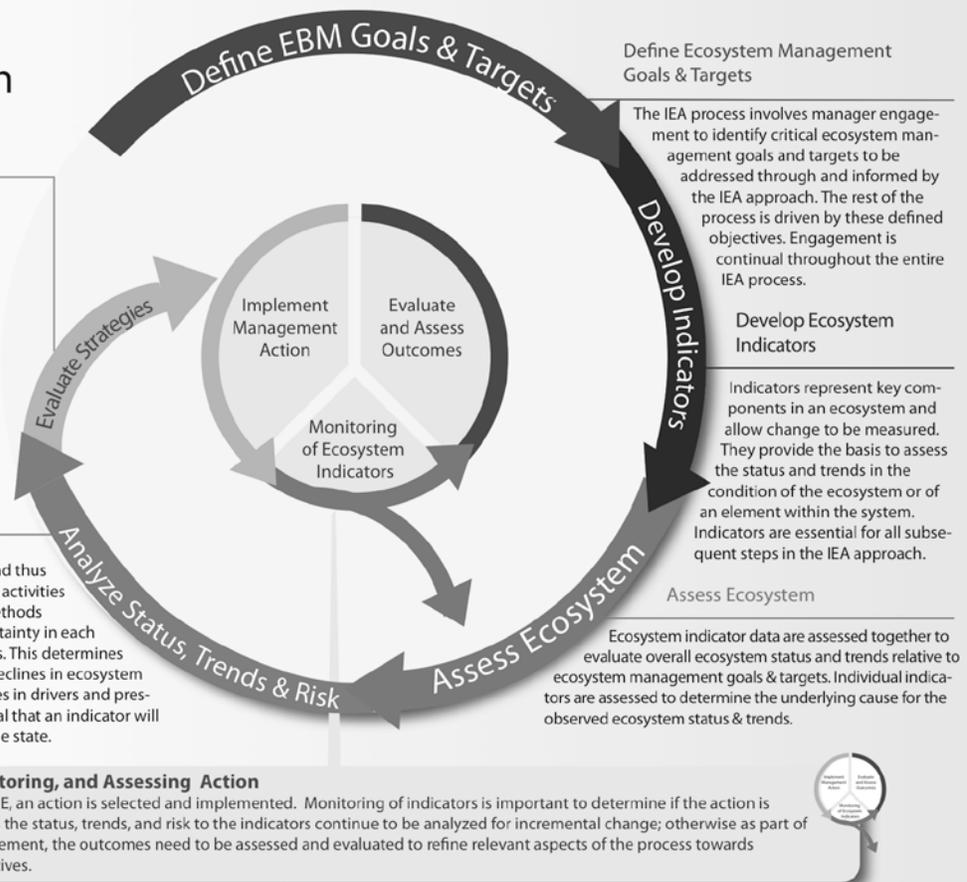


Figure 1. The NOAA IEA approach