

## **Ecosystem-Based Management- A New Goal Under NOAA's Strategic Plan**

**By James P. Burgess**

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NOAA's Strategic Plan, completed on March 31, 2003 after extensive input from over one thousand external and internal stakeholders from seven different regional locations across the Nation, created four overarching strategic goals for NOAA, including:

1. Protect, restore, and manage the use of coastal and ocean resources through ecosystem-based management;
2. Understand climate variability and change to enhance society's ability to plan and respond;
3. Serve society's needs for weather and water information;
- and 4. Support the Nation's commerce with information for safe, efficient, and environmentally sound transportation.

While these Goals provide for enhanced focus for NOAA climate programs, water quality and quantity programs and broad support for NOAA marine aviation and surface transportation programs and information, the broadest change within NOAA may be the development of a single Goal for ecosystem-based management of ocean and coastal resources. The development of this single goal should lead to a series of actions, starting with the identification of ocean and coastal ecosystems and a definition of ecosystem-based management to implementation of NOAA's large list of ocean and coastal programs on a holistic basis rather site by site and species by species approaches, and include social and economic implications of management decisions on humans. Using the new NOAA Strategic Plan as a starting point, the author will examine the necessary steps, kinds of science and new management approaches that will need to be considered for NOAA to seriously address this new approach to its ocean and coastal resource management responsibilities. Based on this examination, the author will identify some of the new skills, observations and observation systems, modeling capabilities and new partnerships that NOAA will need to obtain to ensure success in its delivery of this new ecosystem-based management goal.

This author was the Acting Director of NOAA's Office of Strategic Planning during the develop of NOAA new Strategic Plan. Despite this fact, the author does not claim any special insight as to NOAA's intentions. Rather, the views expressed in this paper are the personal views of the author and expressively not the official views of NOAA.

### **What is an ecosystem and what is ecosystem- based management?**

While NOAA's Strategic Plan, which by design is a very brief sixteen pages, provide much insight as to how the Agency might define ecosystems and ecosystem-based management, but neither term is explicated defined. This author is an economist by training and has worked in coastal and ocean resource management for over twenty-five years which provides with the knowledge that biological definitions of term are best left to biologists. Therefore this author highly recommends anyone deeply interested in this

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topic read “The Report of the Ecological Society of America; Committee on the Scientific Basis for Ecosystem Management” (By ESA as found at <http://www.sdsc.edu/ESA/ecmtest.htm> However for readers convenience, below are the two definitions directly from the above source:

*An ecosystem is defined as, "a spatially explicit unit of the Earth that includes all of the organisms, along with all components of the abiotic environment within its boundaries" (Likens 1992). – ESA*

*Ecosystem Management is management driven by explicit goals, executed by policies, protocols, and practices, and made adaptable by monitoring and research based on our best understanding of the ecological interactions and processes necessary to sustain ecosystem structure and function*

The Society’s report goes on to state that: Ecosystem Management must include the following: *1. long-term sustainability as fundamental value, 2. clear, operational goals, 3. sound ecological models and understanding, 4. understanding complexity and interconnectedness, 5. recognition of the dynamic character of ecosystems, 6. attention to context and scale, 7. acknowledgment of humans as ecosystem components, and 8. commitment to adaptability and accountability.*

### **What does NOAA plan to do under it’s new Protect, Restore, and Manage the Use of Coastal and Ocean Resources through Ecosystem-Based Management?**

The complete NOAA Strategic Plan, including the full text of the Agencies new goal can be found on the NOAA home page as follows: <http://www.osp.noaa.gov> . This paper only abstract certain portions of the entire plan with a heavy focus on needed follow-up actions to make the new goal a reality.

The NOAA Strategic Plan states that ... *NOAA will strive to manage multiple aspects of sustainable ecosystems, including fisheries resources, threatened and endangered species, marine mammals, biodiversity, important habitats that support those resources, and the impacts of ecosystem-based management decisions on the economy and communities. Ecosystem management will also require improved understanding of the pressures—both natural and human-induced—that change ecosystems. Recognizing that the Agency will not obtain these results immediately, the Plan goes on to state: In the short term, NOAA will apply this new ecosystem focus by giving increased priority to: habitat protection and restoration for all species; interactions of target species management decisions with nontarget species and ecosystem effects; and partnerships with international organizations, foreign governments, Federal agencies, state and local governments, academia, and nongovernmental organizations in applying ecosystem approaches to coastal, ocean, and Great Lakes resource management.*

The Plan goes on describe its goal wide ecosystem strategy by stating that: *NOAA will invest in improved understanding of ecosystems, identification of regional ecosystems, development of ecosystem health indicators, and new methods of governance to establish*

*the necessary knowledge, tools, and capabilities to fully implement ecosystem-based management of coastal, ocean and Great Lakes resources.*

Ultimately, NOAA intends to measure its success in accomplishing its Goal wide ecosystem strategy through the following measures:

- *Increased number of regional ecosystems identified and monitored with agreed-to indicators of ecosystem health.*
- *Increased number of ecosystems where ecological functions and linkage to human activities and impacts are adequately understood for management purposes.*
- *Increased number of models linking climate/weather/atmosphere with ecosystem/hydrology made operational to assess and predict natural and human-induced changes in the ocean and coastal environment.*
- *Increased number of coastal, ocean, and Great Lakes areas (including coastal watersheds) with Federal, state, and local government or nongovernmental management plans using ecosystem best management practices and approaches.*

Because NOAA's major coastal and resource strongest mandates such as the Magnuson-Stevens Fisheries Management Conservation Act, the Endangered Species Act, the Marine Mammal Protection Act, the Marine Sanctuary Act are primarily focused on species management or site specific management practices, operating and measuring on the basis of ecosystem-base management principles will require time. Moreover, as the NOAA plan describes, specific strategies will need to be developed in the following areas:

**Monitor and Observe:** NOAA will need to build an Integrated Observing And Data Management Systems For Marine Ecosystems. To do this NOAA will need to acquire new observation platforms and facilitate the use of existing platforms in the collection of the most information useful for multiple components of the NOAA mission. In the near term, NOAA will have to define its ecosystem geographically with the full knowledge that such ecosystem will contain input and output to the system. Once defined, the Agency will need to develop environmental indicator of ecosystem health and ensure collection of baseline data of the biological, chemical, physical, geological, indicators for its ecosystems.

**Understand and Describe:** NOAA will need to expand ecosystem research that focuses on advancing its capabilities to conduct research and scientific investigations in support of scientifically sound policy and ecosystem-based management decision-making. Research to more fully understand the effects of ecosystem stressors on species and other ecosystem health factors is critical. Without such scientific information, management decisions cannot fully incorporate ecosystem effects of those decisions not can he cost and benefit of multiple objectives be fully evaluated.

**Assess and Predict:** NOAA will need to develop new ecosystem models based on the above described research to be able to predict changes to the various ecosystem health

indicators under differing management regimes and changes in short and long term natural conditions.

**Engage, Advise and Inform:** NOAA will need to greatly improve its capability and capacity to educate the public and other federal, state, industry and nongovernmental decision-makers on ecosystem principles, environmental health indicators, the effects of multiple stressors on ecosystem health in close partnership with organizations that may have greater capacity to reach sectors of the public or decision-makers.

**Manage:**

NOAA will need to develop improved decision- making by using scientific ecosystem understanding and observations to ensure that the Agencies decisions fully account for ecosystem effects of the various management alternative. On an on-going basis, this can be best accomplished through fully embracing the National Environmental Policy Act requirements and processes as this Act and its implementing guidelines incorporate effects on the ecosystem of the various alternatives even when the legislative mandates of a particular statute requires a lesser standard. Ultimately, new governess mechanisms will need to be developed to take ecosystem effects into better account. Because there are many federal agencies, states, localities, industry and nongovernmental organizations and foreign nations which have jurisdiction over portions and aspects of ecosystems and ecosystem stressors, NOAA will need to develop new and enhance existing partnerships to accomplish its goal to improve the health of coastal, ocean and Great Lakes ecosystems.

**Conclusion:**

NOAA has challenged itself to a major task of developing ecosystem-based management to improve ecosystem health. NOAA has been challenged by the public and national leaders as evidenced by the recent work of the Oceans and PEW Commissions to take on this challenge. NOAA will need support from many parties, public and private to show significant progress towards this challenge over the next five years.