

# MARES Project – Goals and Objectives for Ecosystem Management

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## Summary

Goals for managing the South Florida coastal marine ecosystem emerge stepwise through the four activities of the MARES project. Ecosystem goals consist of the following elements:

- **qualitative goals [for the ecosystem]** (from the ICEMs);
- **quantifiable ecosystem goals** (from the QEIs);
- **desired future conditions that address issues of concern** (from consultation with managers);
- **regional ecosystem report card**; and
- **recommended future research priorities**

The MARES Project focuses on goals and objectives - the full title of the project is “Marine and Estuarine Goal Setting for South Florida.” Therefore, it is incumbent on us not only to keep goals and objectives in sight throughout the project but also to be able to describe how project activities relate to marine and estuarine goal setting. This communication discusses the goals and objectives for the project as a whole, for elements of the project, and the more general topic of setting goals for regional management of coastal marine ecosystems of South Florida. The following discussion is drawn from the project proposal and communications provided on the MARES website and other sources as noted.

## Overall Project Goals

The MARES project will engage agency scientists/managers/policymakers, academics, and environmental organizations in a systematic process to collaboratively develop integrated conceptual ecosystem models and quantitative ecosystem indicators in an effort to determine **desired future conditions** of the entire coastal **ecosystem** of South Florida.

The overall goal is “to reach a science-based consensus about the defining characteristics and fundamental regulating processes of a South Florida coastal marine ecosystem that is both sustainable and capable of providing the diverse **ecosystem services** upon which our society depends.” This directly addresses the NOAA Ecosystem Goal: *to protect, restore and manage the use of coastal and ocean resources through an **ecosystem approach** to management.*

## ***Definitions***

An **ecosystem** is a geographically specified system of organisms (including humans), the environment, and the processes that control its dynamics. The environment is the biological, chemical, physical, and social conditions that surround organisms. When appropriate, the term environment should be qualified as biological, chemical, physical, and/or social.<sup>1</sup>

An **ecosystem approach to management** is management that is adaptive, geographically specific, takes account of ecosystem knowledge and uncertainties, considers multiple external influences, and strives to balance diverse societal objectives.<sup>2</sup>

**Ecosystem services** are the benefits people obtain from ecosystems. These include provisioning services such as food and water; regulating services such as flood and disease control; cultural services such as spiritual, recreational, and cultural benefits; and supporting services, such as nutrient cycling, that maintain the conditions for life on Earth.<sup>3</sup>

**Desired future conditions** describe ecosystem goals (see below). Ecosystem goals comprise a combination of ecological goals and human dimensions goals.

## ***Project Activity Goals and Objectives***

The MARES project will conduct five types of activities:

- scientific/technical workshops to develop integrated conceptual ecosystem models;
- scientific/technical workshops to develop quantitative ecosystem indicators;
- consultation (workshops and briefings) with resource managers to gain perspectives on separate agency goals;
- meetings and communications with stakeholders and the public; and
- suggest and prioritize future research directions towards identified management goals.

## ***Integrated Conceptual Ecosystem Models (ICEM)***

ICEMs are essential to establish consensus, set goals and define those ecological indicators one must measure to assess the productivity, diversity, stability, and resilience of the ecosystem (i.e. the health and status of that ecosystem). The objective of the ICEM workshops is to produce

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<sup>1</sup> NOAA, 2003. Making “ecosystems” part of NOAA’s shared vocabulary. NOAA internal communication attached to memo from M. Sissenwine (NOAA Fisheries) to J. Kelly, Jr. (NOAA Executive Panel) dated November 7, 2003.

<sup>2</sup> NOAA, 2003.

<sup>3</sup> Millennium Ecosystems Assessment, 2003. Ecosystems and human well-being: a framework for assessment. Island Press, Washington, DC.

Integrated Conceptual Ecological Models (ICEMs), with supporting text, and explicit **qualitative goals [for the ecosystem]**. Implicit in these models are sociologic and economic human dimensions attributes.

Outputs of each of the CEM workshops are expected to include:

- ICEMs, with accompanying text and a contextual qualitative vision statement
- Identification of an initial suite of defining characteristics/ecological/social parameters to serve as the starting point for the Indicator Workshops
- Identification of scientific needs and gaps (critical uncertainties) of ecological, sociological and economic characteristics

### **Quantitative Ecosystem Indicators (QEI)**

The QEI workshop will develop (articulate) quantitative desired conditions for the ecosystem (targets), identify gaps in current scientific understanding, and prioritize subsequent research, modeling, and monitoring activities. The goal will be [to identify] realistic and useful indicators, which could then be the starting point for specific **quantifiable ecosystem goals**.

Outputs of this [activity] will be a substantial technical product for each possible indicator that includes at a minimum:

- Scientific consensus on the quantitative desired future condition. This quantitative description is equivalent to the development of a performance measure target (in the language being used in CERP)
- A description of the current trajectory (status/trends), using available monitoring data
- Analysis of the relevant stressors/drivers, using available field data, or numerical models
- An explicit discussion of the gaps in the information required to rigorously assess the degree of change in an indicator and the cause of that change

### **Issues of Concern and Desired Future Conditions**

Results from the scientific/technical workshops will be disseminated and additional input acquired by conducting targeted briefings for resource managers and planners as well as facilitated workshops specifically for stakeholder groups. The goal is to establish a consensus amongst the decision-makers, stakeholders, and scientists as to future management strategies. We will interact with natural resource managers, policymakers, and the public early in the post-Indicator Workshop process of refining the quantitative desired conditions/goals.

The identification of a comprehensive well-defined set of “issues of concern” will be critical to project success. Once developed, such issues can be translated into a set of specific assessment questions that can be addressed scientifically. These assessment questions can then be used to select appropriate indicators and set goals. Discussions among scientists, managers, stakeholders

and the general public are required to identify the issues of concern, and to refine issue-oriented assessment questions.

The output of this suite of activities will be:

- a document identifying the natural resource and societal goals, **issues [of concern]**, and indicators that are critical for managers and policy makers;
- a recommendation on how these issues [of concern] can be incorporated into the ecosystem goals (i.e. **desired future conditions**); and
- a recommendation of future research directions and priorities towards reaching identified management goals.

### **Regional Ecosystem Report Card**

The last step in the goal setting process will be the development of a science-based “Report Card” encapsulating for policy-makers and the public the current health of South Florida’s coastal ecosystems. The report card will be developed using the quantitative goals developed for the integrated SFTME, though it may not include all of them. The report card will emphasize the goals, issues and indicators that have been identified as critical for managers and policy makers.

### **Future Research Directions**

The last step in the goal setting process will be the recommendation of future research priorities and directions. These will be come out of information gaps as identified by ICEM and QEI building process.