Relevance of MARES to Agency and Organizational Participants

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Summary

This whitepaper describes the information needs and perspectives of management agencies and non-governmental agencies participating in the MARES project and how results of the project meet these needs.

Background

The overall objective of the MARES project is to develop consensus around quantitative goals that will sustain a healthy regional marine ecosystem. The various different agencies collaborate in the management of the coastal marine ecosystem. Each agency has its own unique perspective and legal mandates that guide its work, and a regional consensus must take all of these perspectives into account. The approach taken in the MARES project is to allow management agencies to contribute throughout the MARES process (at each step) see Table 1, and to communicate directly with managers on the application of the results of the project workshops and reports to support the activities of management agencies.

NOAA/Florida Keys National Marine Sanctuary (FKNMS)

The FKNMS, through a co-trustee partnership between NOAA and the State of Florida, is responsible for management of natural and maritime heritage resources in a nearly 2,900-square-nautical-mile area surrounding the Florida Keys and extending west to Tortugas Bank. The Sanctuary's science program is defined in its management plan and further refined in a Comprehensive Science Plan. The science plan includes a conceptual model of major drivers affecting a set of ecological attributes, and identifies a set of management objectives and associated research and monitoring needs. This plan was completed in 2002 and is critically in need of an update. Developing Integrated Conceptual Ecological Models (ICEM), goals and indicators not only for the Florida Keys and Dry Tortugas but also the areas upstream of the FKNMS and hydro-dynamically connected to it will be of great utility to reformulating scientific and management plans for the FKNMS. In particular this would permit expanding the scope of the Sanctuary's science plan to more explicitly address external influences on the condition of sanctuary resources. These include the effects of Everglades restoration on Florida Bay and the southwest Florida shelf, both of which adjoin the Sanctuary. In addition, the Sanctuary has a long-standing program of socioeconomics and human dimensions science and will contribute to and benefit from inclusion of the human dimensions perspective in the proposed research. At the most recent FKNMS Advisory Board meeting, a decision was made to rely upon and incorporate MARES human dimension science indicators rather than to develop their own.

Table 1: Management agencies represents who have contributed to MARES project

Participating Agency	Agency Employees/Representatives
NOAA/Florida Keys National Marine Sanctuary (FKNMS)	Billy Causey
NOAA/National Marine Fisheries Service (NMFS)	Joan Browder, John Lamkin, Joe Serafy
U. S. Department of the Interior (DOI)/National Park Service (NPS)	Carol Mitchell (Leaders Group), Dave Hallac, Bob Johnson, William Perry
U. S. DOI/Fish & Wildlife Service (FWS)	Patrick Pitts
U. S. Environmental Protection Agency (EPA)	Pat Bradley
U.S. Army Corps of Engineers (Jacksonville District)	David Tipple, RECOVER Co-Chair
South Florida Water Management District (SFWMD)	Peter Doering, Grant Graves, Dave Rudnick, Patty Sime, Patty Goodman
Florida Fish and Wildlife Conservation Commission (FWC)	John Hunt (Leaders Group)
Florida Department of Environmental Protection (DEP)	Chantal Collier
Miami-Dade Department of Environmental Regulation and Management	Steve Blair, Susan Markley

NOAA/National Marine Fisheries Service (NMFS)

The NOAA Southeast Fisheries Science Center has particular interest in the total system ICEM for South Florida because of its mandate to provide scientific data for the long-term management of marine resources that utilize coastal areas as feeding and nursery grounds. The total system ICEM, by linking fresh water flows, northern and southern estuarine ecosystems, adjacent coastal habitats and the South Florida shelf areas will contribute significantly to SEFSC's understanding of how coastal ecosystem dynamics, including human influences, affect federally managed resources.

U. S. Department of the Interior (DOI)/National Park Service (NPS)

The South Florida Natural Resources Center at Everglades National Park is responsible for providing scientific tools to NPS managers of Everglades, Biscayne, and Dry Tortugas National

Parks, as well as to Big Cypress National Preserve. Science information and tools are used by managers in support of the NPS mission of preserving natural resources for future generations.

Documents that convincingly articulate the scientific consensus on specific quantifiable ecosystem goals for the near-shore coastal system of South Florida will serve as an important reference for Everglades and Biscayne National Parks during their involvement in Comprehensive Everglades Restoration Plan (CERP) and South Florida Ecosystem Restoration. Quantifiable ecosystem goals, and their relationship to management actions via conceptual ecological models, are a critical component of the CERP. They are important for estimating the potential benefit of restoration projects to the National Parks using computer models, and for assessing the actual progress of restoration through monitoring of NPS resources. This will be of great service not only to the South Florida Natural Resources Center but also to the upper management of the NPS.

Goals and conceptual ecological models developed for the southwest Florida shelf and the FKDTR will be of particular use to Everglades and Dry Tortugas National Parks in identifying specific resource indicators and their links to management actions such as those in NPS General Management Plans, Resource Stewardship Plans, and Science Plans. Given that marine resources frequently pay no attention to protected area boundaries, identification of actions that could be coordinated among the community of protected areas managers would be important. A Florida Keys focus would link specifically to ongoing interagency science planning for the Dry Tortugas National Park Reserved Natural Area (managed by the NPS and the Florida Fish and Wildlife Commission, FWC). Finally, attaining the project goals will contribute to answering the overarching restoration questions posed in the DOI Science Plan.

The indicators and ICEMs for the southwest Florida shelf and the Florida Keys/Dry Tortugas will be of particular interest to these Parks in refining resource management and science plans. The Keys/Dry Tortugas workshops will provide a forum for exchange of information regarding the interagency NPS/FWC program to assess the efficacy of the Dry Tortugas National Park Research Natural Area. Moreover the incorporation of human dimensions into the ecosystem is a good start for looking at how alternative management proposals will affect both the "natural" and the human environments.

U. S. DOI/Fish & Wildlife Service (FWS)

The MARES ICEMs will assist the U.S. Fish and Wildlife Service's (FWS) Coastal Program to meet its primary goal to conserve and restore habitat for fish and wildlife species, by developing geographic focus areas in South Florida. The establishment of feasible and quantifiable goals and targets for South Florida will aid the Service's efforts in the recovery and protection of trust resources, including Federally-listed threatened and endangered species. The MARES project will benefit the Service, which is a CERP partner, by contributing to the refinement of CERP performance measures in the Southern Coastal Systems region, and perhaps other regions. Also, the Service anticipates that MARES will help in the development of critical elements of our Strategic Habitat Conservation initiative.

The FWS is very supportive of the MARES Project's integration of human dimension science into its coastal and marine ICEMs, indicators, and performance measures. Doing so will underline the importance of ecosystem services to the citizens of South Florida, such as the role of mangroves for storm surge attenuation or wetlands for water storage and purification--services that are important to the safety and well-being of people. From the FWS perspective, including the human dimension in the project should help identify potential conflicts between people and wildlife, especially threatened and endangered species. For example, the effects of urban and agricultural development pressure on critical habitats and listed species can be identified and, hopefully, resolved. Including the human dimension will also better address how people, wildlife, and habitats may be affected by increasing impacts of climate change and sea level rise. One of the highest future priorities will be the identification and quantification of water management tradeoffs between the urban landscape and natural areas in the face of sea level rise. Including human dimension science upfront in the process will enable the FWS and other agencies to identify tradeoffs, address conflicts, and better manage the system.

U. S. Environmental Protection Agency (EPA)

The EPA South Florida Geographic Initiative targets efforts to protect and restore various communities and ecosystems impacted by environmental problems. Under this initiative, EPA needs input from stakeholders to develop and implement community-based approaches to mitigate diffuse sources of pollution and cumulative risk.

EPA's Office of Research and Development is working collaboratively with Region 4 on research, integrated monitoring, and assessment related to Florida's coral reef ecosystems in Monroe, Miami-Dade, Broward, Palm Beach, and Martin Counties, including *inter alia*:

- Scale-appropriate models to forecast future condition
- Assessment of individual and multiple stressors and their prioritization
- Benefits analysis of potential policy decisions
- Management strategies to restore areas and reduce risk that are cost-effective and stakeholder-driven

EPA's challenge is how to improve environmental decision making in South Florida and thus result in measurable environmental and socioeconomic outcomes. The MARES ICEMs will be based upon current knowledge of the South Florida marine ecosystem and will result in an improvement to our understanding of the components and their interactions. The manager/stakeholder workshops will help connect scientific findings to the user community.

U.S. Army Corps of Engineers (Jacksonville District)

The Corps traditionally has several categories of benefits considerations as they perform planning studies and write decision documents for projects which ultimately may reach Congress for authorization in a Water Resources Development Act. One of these benefit categories is called "Other Social Effects" which normally captures other secondary considerations but has not been the primary benefit category to justify a project from the "Federal Interest" perspective as

has the National Economic Development or National Ecosystem Restoration benefit categories. The considerations and potential advancement of human dimensions science and its practical application that MARES may prove to be useful and applicable for application in other Federal, state and local programs, planning efforts, and economic and environmental analyses. Advance and national acceptance of additional benefit categories for environmental and ecosystem restoration projects and initiatives is indeed welcomed.

South Florida Water Management District (SFWMD)

The vast majority of citizens in the SFWMD's 16 county area reside along the coastline of the Atlantic Ocean or Gulf of Mexico. A goal of the District, as part of its mission to improve water quality and natural systems, is the protection and restoration of estuarine ecosystems along this coastline. Environmental science provides a basis for defining the environmental needs of these systems and identifying targets for improved water management. Specific programs and projects concerning the management of coastal systems include the internationally prominent CERP (for the benefit of not only the Everglades wetlands, but also Biscayne Bay, Florida Bay, Whitewater Bay, Caloosahatchee River Estuary, St. Lucie River Estuary, and Indian River Lagoon), minimum flows and levels (for management decisions regarding the balance of ecosystem needs and human water supply needs), planning of water management operations, and water quality improvement projects (e.g. storm treatment area design, construction and operation, and pollutant load reduction goal setting).

It is critical to the District that a consensus be achieved as to the essential characteristics of sustainable and restored coastal ecosystems as well as coastal ecosystem restoration targets and indicators. The District needs a comprehensive integrated framework for evaluation of the South Florida coastal ecosystems. To date, the District's efforts to evaluate these systems have largely been localized, focused on individual estuaries and their watersheds (for example, Florida Bay and the Everglades). Such an approach as the MARES project is valid and necessary, but neglects potential interactions of estuarine dynamics with more offshore areas. While estuaries may be strongly affected by water management, other management actions (e.g. fisheries) affect broader-scale dynamics and can directly or indirectly affect the state of our estuaries. It is essential that multiple agencies integrate their management strategies. A large-scale inclusive interagency approach could enable analysis of the interactions of different portions of the greater coastal system and potential trade-offs regarding management decision making. Finally, progress is needed towards improving our ability to assess ecosystem services as part of a broad consideration of environment and society to help the District improve benefits analysis, an essential step in many of our large-scale environmental projects (especially those being done in partnership with the U.S. Army Corps of Engineers).

Florida Fish and Wildlife Conservation Commission (FWC)

The FWC does not actively conduct restoration activities in the coastal areas. However, they are responsible for the management of fisheries throughout state waters. Today, they focus their management actions on single species, but recognize more and more that the overarching ecosystem changes being experienced by coastal areas and coral reefs are critical factors in the health of the fisheries for which the FWC is responsible.

One of FWC's internal goals is to move management activities toward the broader issues of managing the fisheries within an ecosystem context. A consensus building process and the prospect of improved benchmarks for South Florida ecosystem restoration will be an important step in moving FWC management activity to better include ecosystem processes. Furthermore, to the extent that setting these benchmarks aids in restoration, they will likely also serve the fundamental FWC goal of sustainable fisheries in State waters.

Florida Department of Environmental Protection (FDEP)/Coral Reef Conservation Program (CRCP)

The FDEP/CRCP's mission includes directing and coordinating implementation of the Southeast Florida Coral Reef Initiative (SEFCRI), a local action strategy to reduce key threats to the southeast Florida coral reef ecosystem. The coral reefs off southeast Florida comprise the northern third of the Florida Reef Tract, extending 105 miles from the northern border of Biscayne National Park in Miami-Dade County to the St. Lucie Inlet in Martin County. Florida's coral reefs provide habitat for over 6,000 species and sustain south Florida's fisheries, tourism, and recreation, generating more than 71,000 jobs and $6.3 billion in annual sales and income. The long-term vision of SEFCRI is to develop an effective strategy to preserve and protect southeast Florida's coral reefs and associated reef resources, emphasizing balance between resource use and protection, in cooperation with all interested parties.

Through the SEFCRI, FDEP/CRCP is generating data and working with stakeholders to achieve this vision. Regional stakeholder working groups will evaluate the data collected, balance human use in the region with the need to protect reefs from the threats overuse can create, and prioritize a list of management alternatives for the southeast Florida region. The MARES ICEMs, white papers, and indicators can be utilized by the working group to support the implementation of the SEFCRI vision.

In addition to the management agencies, two non-governmental organizations are "using" MARES data, products and process to advance their environmental agendas. Both are participating (as co-PIs) in the MARES process including workshop participation and report creation.

The Nature Conservancy

Since 1951 The Nature Conservancy's (TNC) mission has been "to preserve the plants, animals and natural communities that represent the diversity of life on earth by protecting the lands and waters they need to survive." Today, the "they" in TNC's mission statement has been replaced in spirit with a "we." People and their relationships with nature are in the center of the organization's conservation strategies. As such, TNC is keenly interested in improving collective understanding of the interrelationships between biophysical resource conditions and the human dimensions of resource use and management. The marine and estuarine elements of South Florida's socioecological system are directly affected by - even dominated by - people in an enormous variety of ways both negative and positive, but these relationship are poorly understood and often taken for granted. Human dimensions, sciences including economics, sociology, and social psychology, are essential disciplines for increasing understanding of the

connections between society and the environment and communicating about those relationships with decision makers who are in a position to strike a delicate balance for nature and people.

The National Audubon Society

Audubon's mission is to conserve and restore natural ecosystems, focusing on birds and other wildlife for the benefit of humanity and the earth's biological diversity. The organization has been active in South Florida since 1935 when renowned ornithologist Robert Porter Allen established the Tavernier Science Center to study Roseate Spoonbills in Florida Bay. The project that he founded is ongoing today and is one of myriad projects that have been performed at the Tavernier Science Center since its inception. The foci of these studies range from corals, to sea grass and mangrove based fish production, to the causes of nesting failure in various bird species and the importance of migratory birds to tropical forests. Currently, Audubon in general, and the Tavernier Science Center in particular, are focused on how Everglades Restoration efforts will affect the estuarine and marine habitats of Florida Bay, Biscayne Bay, the southwest Florida shelf, and the marine habitats of the Florida Keys. Its priorities are to perform scientific research that leads to policy decisions that ensure that restoration efforts have a positive benefit, not only on the Everglades, but on the downstream marine environment as well. Audubon will use outcomes of the project to direct its research efforts in South Florida and to help advance sound policy decisions in restoring America's Everglades.