

LAND BASED SOURCES OF POLLUTION AND WATER QUALITY ACTION PLAN

Issue 1: Determining the Extent and Condition of the Resource

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ISSUE 1: Determining the Extent and Condition of the Resource

Coral reefs and their associated habitats are important biological and economic resources for southeast Florida. However, there is a lack of qualitative and quantitative information concerning the extent, nature and overall condition of this fragile and very important component of the ecosystem. Existing information on the overall condition of coral reef resources and the factors which influence and control their distribution and health have not been adequately analyzed and compiled and more data are needed.

GOAL: Characterize the existing condition of the coral reef ecosystem.

[Objectives 1 and 4]

Assemble and assess existing data on the condition of the southeast Florida coral reef resources and establish a long-term coral condition monitoring program for the counties in the SEFCRI geographic region.

[Objective 2]

Assemble existing water quality data and establish a long-term status and trends water quality monitoring program for the coastal and offshore waters of Miami-Dade, Broward, Palm Beach, and Martin Counties.

[Objective 3]

Determine which environmental factors will be used to assess the condition of the coral reefs.

[Objective 5]

Assess the data and identify data gaps.

Project 4ⁱ: Establish a Technical Advisory Committee (TAC) to collect, review and assess data and identify data gaps, conduct technical workshops, and advise the SEFCRI Team and the Land-Based Sources of Pollution and Water Quality (LBSP) focus team.

The TAC will be composed of scientists with expertise in coral reef ecology, coral biology, coral pathology, coral physiology, water quality, mapping/remote sensing, etc. Compile existing data on the status of the natural environment in the geographic area of interest (coastal waters of Miami-Dade, Broward, Palm Beach, and Martin Counties) and develop cause-effect relationships. Assess the existing data and make recommendations as to what additional information is necessary/required and prioritize data gaps.

Project 12^r: Expand the Florida Keys Coral Reef Evaluation & Monitoring Project (CREMP) to Southeast Florida (SECREMP) (Figure 4).

Project 11: Establish an integrated data management program with the Fish and Wildlife Research Institute (FWRI).

Project 25: Establish a long-term coastal water quality monitoring program in the SEFCRI geographic region.

Project 26: Develop a volunteer monitoring program related to LBSP and reef communities.

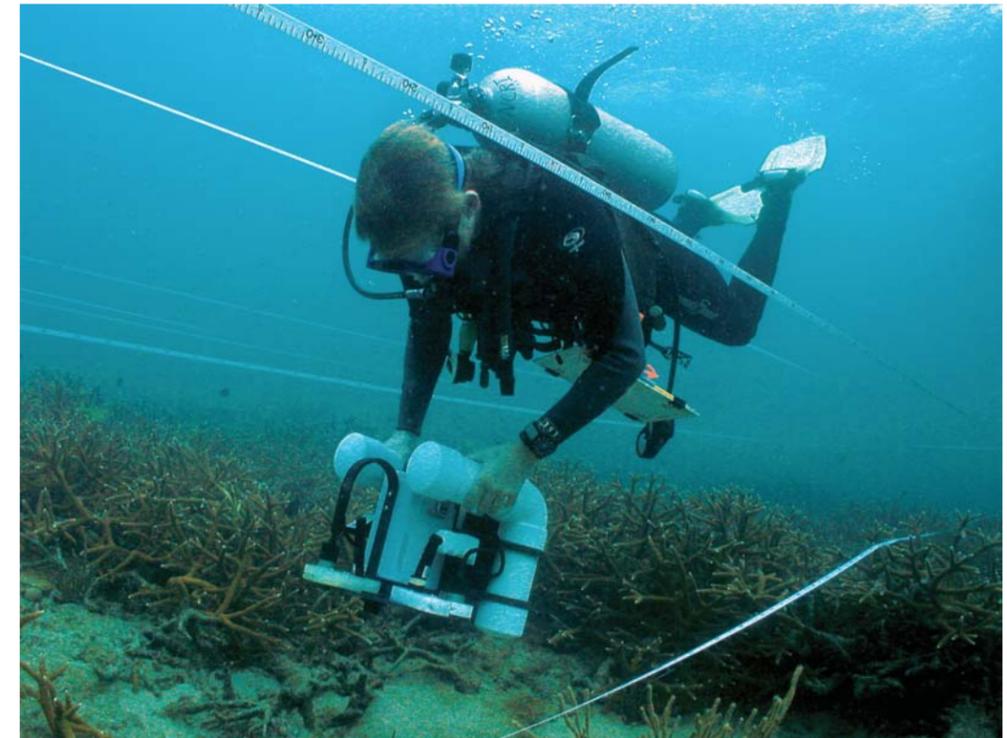


Figure 4: The unique, nearshore staghorn coral (*Acropora cervicornis*) stands of Broward County are surveyed as part of the Southeast Florida Coral Reef Evaluation and Monitoring Program.

[Objective 6]

Using existing high resolution Laser Airborne Depth Sounder (LADS) bathymetric mapping data, acquire and overlay habitat information to map the benthic habitats of Broward County.

Project 6^r: Establish a Sub-Work Group responsible for generating required maps. Identify and compile available data and identify data gaps. Determine strategies to close data gaps. Generate maps for Broward County.

[Objective 7]

Using existing high resolution LADS bathymetric mapping data, acquire and overlay benthic habitat information to map the benthic habitats of Palm Beach County.

Project 7: Establish a Sub-Work Group responsible for generating required maps. Identify and compile available data and identify data gaps. Determine strategies to close data gaps. Generate maps for Palm Beach County.

[Objective 8]

Using existing high resolution LADS bathymetric mapping data, acquire and overlay habitat information to map the benthic habitats of Miami-Dade County.

Project 8: Establish a Sub-Work Group responsible for generating required maps. Identify and compile available data and identify data gaps. Determine strategies to close data gaps. Generate maps for Miami-Dade County.

[Objective 9]

Acquire high resolution bathymetry and habitat data to map the benthic habitats of Martin County.

Project 9: Establish a Sub-Work Group responsible for generating required maps. Identify and compile available data and identify data gaps. Determine strategies to close data gaps. Generate maps for Martin County.

[Objective 10]

Map the nearshore benthic habitats of the SEFCRI geographic region.

Project 10: Acquire high-resolution, multi-spectral imagery to map the benthic habitats within the 0-6 meter depths along the entire SEFCRI geographic region.

ISSUE 2: Determining the Sources and Extent of Pollution

Significant pollution loads to coastal waters, from both point and non-point sources, may be impacting the coral reefs. The sources need to be identified and the relative and absolute contributions of each source need to be defined and quantified.

GOAL: Quantify, characterize, and prioritize the land-based sources of pollution that need to be addressed based on identified impacts to the coral reef ecosystem.

[Objective 1]

Assemble existing data to quantify and characterize the sources of pollution and identify the relative contributions of point and non-point sources.

Project 11: Assemble existing data to quantify and characterize the sources of pollution and identify the relative contributions of point and non-point sources.

Project 13: Conduct a technical workshop on the outcomes of Project 1, and prepare a written summary of the workshop (to be held in conjunction with Project 15).

[Objective 2]

Develop a mass balance budget for the geographic region of interest to address nutrients, carbon, and other pollutants of concern.

Project 14: Create a Working Group which will meet every 6 months to: quantify amounts of pollution; identify the sources of pollution; determine residence time of pollutants in specific geographic areas; determine the frequencies of major pollution events; and develop a gross nutrient budget. Hire a post doctoral candidate to derive the mass balance equation and prepare a report identifying the primary point and non-point sources of pollution. The post doctoral candidate will also serve as the LBSP Project Coordinator, working closely with the TAC and LBSP team to secure funding and do the implement this and other LBSP projects.

Project 27: Quantify amount and flow rate (flux) of pollution transported by groundwater to the coastal waters.

Project 28: Determine flux of pollutants exiting offshore wastewater outfall pipes and net flux to reef communities.

Project 29: Determine flux of pollutants exiting ocean inlets and net flux to reef communities.

Project 30: Determine flux of pollutants from oceanic sources to coastal waters.

Project 31: Determine flux of pollutants from atmospheric sources to coastal waters.

ISSUE 3: Determining the Link between the Resource and Pollution

While there is insufficient information to definitively link degradation of coral reef habitat with land-based sources of pollution, there are ample data to indicate that nutrients and other pollutants are negatively impacting the corals and other biological resources in southeast Florida. Biological indicators of land based pollutants, such as the proliferation of nuisance species of algae, need to be identified for the coral reefs and associated habitats of southeast Florida, and cause/effect relationships involving land-based sources of pollution, transport pathways, and biological communities need to be further investigated and better understood.

GOAL: Identify how land-based sources of pollution affect southeast Florida coral reef ecosystems.

[Objective 1]

Identify the links between pollution and coral reef resources.

Project 21: Review state and local water quality standards applicable to coral reef communities and conduct a literature search to identify the links between pollution and the health/condition of coral reef communities.

Project 51: Conduct a bio-marker study to identify and trace specific contaminants that negatively impact coral reefs.

Project 15: Conduct a technical workshop on the outcomes of Project 2 and 5, and prepare a written summary of the workshop (to be held in conjunction with Project 13).

Project 17: Conduct Stakeholder meeting(s) to present new LBSP information.

Project 32: Identify sources and signals of land-based pollutants in southeast Florida using stable isotopes as a sewage signal in octocorals and macroalgae/Lyngbya tissue.

Project 33: Identify sources and signals of land-based pollutants in southeast Florida using human enteroviruses as an indicator of fecal contamination.

[Objective 2]

Determine priority areas that need to be surveyed for additional biological and water quality pollutant indicators.

Project 18: Conduct technical workshop(s) to determine priority areas that need to be surveyed for additional biological and water quality pollutant indicators.

ISSUE 4: Designing and Implementing Activities to Reduce Land-Based Sources of Pollution Affecting the Coral Reef Ecosystem

Actions are needed to reduce water pollution directly by using Best Management Practices (BMPs), prohibiting or restricting certain activities, modifying existing regulations, and/or focusing enforcement. Other actions may be designed to make the regulatory/management system work more efficiently, leading indirectly to reduced pollution.

GOAL: Reduce the impacts of land-based sources of pollution to the coral reef ecosystem.

[Objective 1]

Compile a comprehensive list of agencies and other entities and all ongoing/planned programs, projects, and activities that address land-based pollutants (sediments, nutrients, pesticides, ground water, etc.) entering the coastal waters of southeast Florida. Identify gaps, problems, and resource needs associated with ongoing projects and activities.

Project 3*: Contact appropriate agencies/entities and request information: compile a list of agencies/entities and programs/projects/activities and; generate an associated report that addresses gaps, problems, and resource needs associated with ongoing projects and activities. This effort will include: reviewing Surface Water Improvement and Management (SWIM) plans in geographic areas of interest; reviewing Total Maximum Daily Loads (TMDL) in geographic areas of interest; reviewing the Indian River Lagoon Comprehensive Conservation and Management Plan; reviewing the Comprehensive Everglades Restoration Program (CERP) plans as they relate to the southeast Florida coast; compiling existing data; conducting technical workshop(s) to review and assess the compiled data; identifying gaps in information/data; and conducting special studies/research to fill information/data gaps.

[Objective 2]

Design activities to reduce pollution from the highest priority sources of pollution.

Project 19: Research/identify existing BMPs that appropriately and effectively address the identified high priority sources of pollution.

Project 20: Develop specific projects (engineering/management actions) for designated hot spots.

Project 21: Conduct a technical workshop to evaluate the outcomes of Project 19 and implement Project 20.

[Objective 3]

Initiate the implementation of engineering/management actions to reduce pollution from the highest priority sources.

Project 22: Identify the responsible agency/agencies and secure funding.

Project 23: Implement priority engineering/management actions.

ISSUE 5: Lack of Public Awareness

Lack of public awareness and understanding contribute to the negative effects of land-based sources of pollution on water quality and coral reefs.

GOAL: Increase public awareness and understanding of the effects of land-based sources of pollution on water quality and coral reefs.

[Objective 1]

Work in close coordination and cooperation with the Awareness and Appreciation focus team.

Project 24: Educate and inform stakeholders, including the general public, about the value and importance of the coral reef ecosystem of southeast Florida, land-based sources of pollution, pollution impacts on the resource, and the strategies recommended to address the problems.