

Florida Keys National Marine Sanctuary

Water Quality

Management Issue

Nutrient loading, storm water, and other pollution discharges to the waters of the Florida Keys can result in changes of ecosystem structure and function that cascade throughout the Florida Keys National Marine Sanctuary (FKNMS or Sanctuary).

Description

Congress directed the U.S. Environmental Protection Agency and the State of Florida, in conjunction with NOAA, to develop a Water Quality Protection Program (WQPP) for the FKNMS. Although components of this program attempt to quantify the relative importance of natural and anthropogenic nutrient and other pollutant loadings from local, subregional (south Florida), and regional (Loop and Florida Currents) sources, critical water quality research does not exist.

Questions and Information Needs

- 1) What are the nutrient and contaminant loadings from Florida Bay and the Gulf of Mexico into waters surrounding the Florida Keys?
- 2) What are the impacts of episodic events, such as rainfalls, major storms, and upwellings, on water quality upstream and within the Sanctuary?
- 3) How does nutrient load flux in the water column during upwelling events, particularly at the reef tract?
- 4) What is the organic and nutrient loading contribution of decomposing seagrass and algae wrack that accumulates along shorelines and in canals and other confined water bodies, in near shore waters?
- 5) Are there injection wells and/or arrays of wells not functioning properly and are they acting as sources of pollution to local ground water?
- 6) What are the geochemical changes in wastewater injected into disposal wells as it passes through Key Largo limestone or Miami limestone, and are these changes detrimental to local water quality?
- 7) What are the effects of pest control sprays (e.g., mosquito control) on non-target organisms?
- 8) Can a nutrient loading model be developed for the FKNMS ecosystem using existing research and data?

Scientific Approach and Actions

- Design and implement an efficient water quality monitoring program with sufficient spatial and temporal breadth to quantify (differentiate) both the natural and anthropogenic inputs of nutrients to FKNMS waters
- Determine the role of turbidity and other non-nutrient factors in limiting biological resources
- Assess the effects of mosquito spray and other toxicants on non-target living resources
- Assess the risk of poorly functional wastewater collection and treatment systems on public health
- Develop thresholds and target levels for nutrients and other pollutants that may be harmful to various components of the FKNMS ecosystem
- Eliminate or reduce the impact of anthropogenic nutrients, human pathogens, and other pollutants on biological communities and public health
- Develop a nutrient loading model for the FKNMS ecosystem

Potential Key Partners and Information Sources

US Environmental Protection Agency; Florida Department of Environmental Protection; Florida Department of Economic Opportunity; Monroe County Government, Florida International University, South Florida Water Management District

Updated: 12/02/14

For More Information -- <http://www.sanctuaries.noaa.gov/science/assessment>

Management Support Products

- A long-term water quality monitoring program was established in the FKNMS in 1995. Regularly scheduled monitoring samples should be supplemented with samples timed to include episodic events such as rainfalls, major storms, and upwellings to quantify the impacts of those events on water quality parameters in the Sanctuary
- Additional monitoring stations located in the Gulf of Mexico north of the middle Keys should be permanently added to the monitoring network. This would allow for a more accurate assessment of the nutrient loadings from distant, upstream sources to the North (e.g., Caloosahatchee River)
- Groundwater monitoring must be added to the suite of sampling targets to continually assess the impact of injected wastewater and stormwater on water quality in the Sanctuary
- GIS contour maps of seasonal/annual variability of water quality parameters
- GIS contour maps of seasonal/annual variability of groundwater and surface water data around injection wells to examine their influence on water quality

Planned Use of Products and Actions

- The Water Quality Protection Program (WQPP) of the Florida Keys National Marine Sanctuary will help “recommend priority corrective actions and compliance schedules addressing point and non point sources of pollution to restore and maintain the chemical, physical, and biological integrity of the Sanctuary, including restoration and maintenance of a balanced, indigenous population of corals, shellfish, fish and wildlife, and recreational activities in and on the water” (Florida Keys National Marine Sanctuary and Protection Act of 1990)
- Use results to develop or enhance education and outreach products
- Contribute to the data record on long term monitoring of water quality in the Sanctuary

Program References

FKNMS Management Plan

- Water Quality Action Plan (Chapter 3.4.4)

ONMS Performance Measures

- Number of sites in which water quality, based on long-term monitoring data, is being maintained or improved

Other Documents

- FKNMS Comprehensive Science Plan (2002)
- Florida Keys National Marine Sanctuary and Protection Act of 1990
- FKNMS Draft Management Plan references (2005)
- FKNMS Condition Report (2011)

Updated: 12/02/14

For More Information -- <http://www.sanctuaries.noaa.gov/science/assessment>