



Periphyton Monitoring and Protocol Status, 2017

Importance and Overview:

Periphyton is a common and ecologically important component of South Florida non-forested wetlands, such as those found in the Big Cypress National Preserve (BICY). It is a critical basal component of the food web of these wetlands where it is responsible for a large proportion of primary production, creation of calcitic soil (marl), and control of nutrient upwelling. Periphyton communities (e.g., diatoms) change compositionally in direct response to changes in nutrients, salinity, and water management. Diatom composition reflects changes in these environmental variables as they occur over prolonged periods of time, and thus provides a better holistic indicator of water quality than monthly water-column measurements.

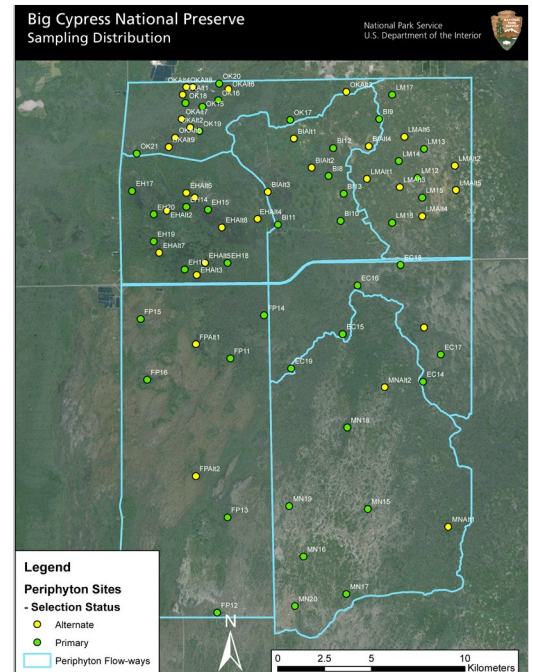
Diatom community structure is an important index of water quality and overall wetland health. Diatoms are used by state and federal agencies as a system-wide indicator for Everglades Restoration. The long-term monitoring of diatoms provides resource managers with a more complete picture of a biological community responding to water quality and implications for future water-management decisions.

Objectives and Approach:

The overall goal of the monitoring is to assess water quality within the aquatic ecosystems in Big Cypress National Preserve through the use of diatom metrics. The South Florida/Caribbean Network is currently targeting marshes as this was deemed of highest priority. The proposed sampling design is a stratified random sample of marshes within each basin to establish permanent sites.

The specific objectives of periphyton monitoring are to:

1. Characterize the status of BICY marsh communities as nutrient-affected or unaffected, based on:
 - a. Total phosphorus concentration in periphyton tissue.
 - b. The relative abundance of diatom indicator species of nutrient-enriched and non-enriched environments.
2. Determine the long-term trends of diatom assemblages.



The above map shows a revised sampling design to be implemented in the 2017–2018 dry season. The new design applies a stratified random component for site selection within a preferred habitat. A Western BICY Vegetation Map was used to determine all sampleable freshwater graminoid marsh habitat.



South Florida/Caribbean Network

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http://science.nature.nps.gov/im/units/sfcn/monitor/water_quality/periphyton.cfm

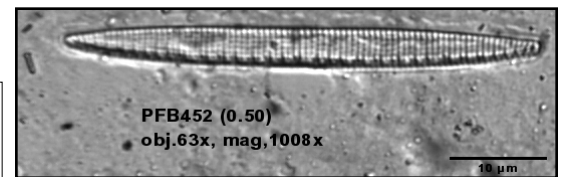
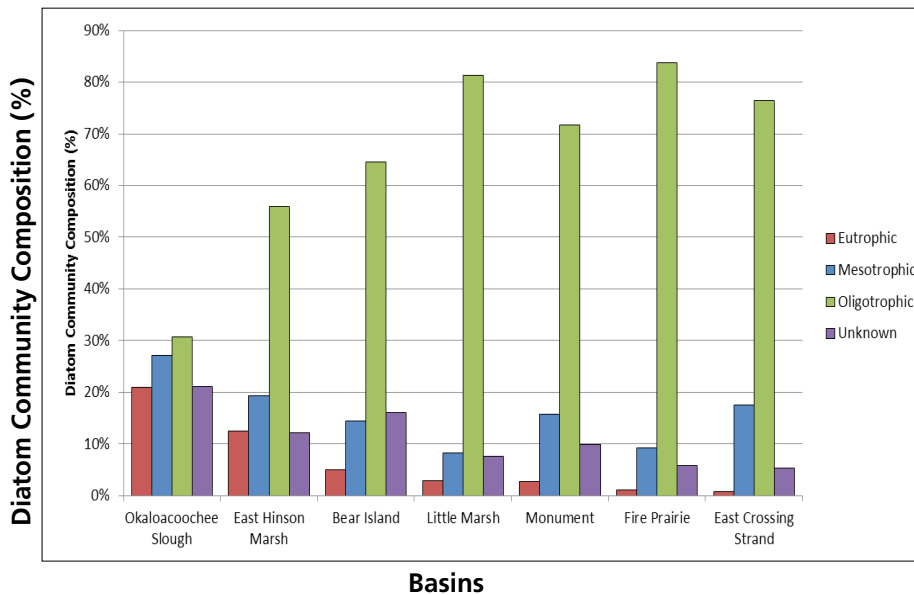
Protocol Status and Results

The periphyton protocol has been completed and submitted for regional review. Sampling for periphyton is expected to occur in the 2017–2018 dry season which will allow for testing of the revised sampling design.

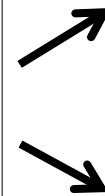


Above: Affected site in East Hinson Marsh, left, versus unaffected site in Little Marsh, right.

Indicator Species Relative Abundance



Nitzschia amphibia, a diatom encountered in eutrophic (high-nutrient) conditions.¹



Mastogloia smithii, a diatom encountered in oligotrophic (low-nutrient) conditions.²

The relative abundance of diatom indicator species for each of the basins in the northwest corner of BICY (2009-2013). Eutrophic taxa (red bars) favor high-nutrient environments while oligotrophic taxa (green bars) favor habitats with low-nutrient conditions. Mesotrophic taxa (blue bars) can tolerate a broader range of nutrient concentrations.

¹Krammer K. & Lange-Bertalot H. (1997). "Susswasserflora von Mitteleuropa", Vol.2, pg.109, Fig.78:25,26.

²Patrick, R., & Charles, R. (1966). "The Diatoms of the United State exclusive of Alaska and Hawaii", Vol.1, p.300, Pl.20, Fig.8,9.



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