

ORAL PRESENTATION

THE USE OF DIATOM COMMUNITIES AS INDICATORS OF WATER QUALITY IN FOUR TROPICAL, KARSTIC WETLAND SYSTEMS

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Diatom communities respond quickly and predictably to changes in water quality and are therefore employed as bioindicators in aquatic monitoring programs. This technique, however, is only useful when information exists about the resident diatom assemblage and its response to environmental change. For many karstic wetlands in the Caribbean and Central American region, no such information is available. As an alternative, it may be possible to use relevant information from another very similar wetland system.

The Florida Coastal Everglades (FCE) wetland system is very similar with respect to climate, geology, hydrology and vegetation, to wetlands found in Jamaica, the Yucatan region of Mexico and parts of Belize. Additionally, several studies have shown that the unique diatom flora of the FCE varies predictably in response to water quality.

This study aimed to determine **(i)** the level of similarity between the periphyton diatom communities from karstic wetland sites in Belize, Mexico, Jamaica and comparable sites within the FCE, **(ii)** the relationship between periphyton TP levels and diatom community composition at these sites, and **(iii)** the feasibility of employing diatoms as indicators of water quality at these sites, using models relating diatom community composition to water quality from comparable sites within the FCE.

Multiple wetland sites in Belize, Mexico and Jamaica were visited between 2006 and 2008, during wet and dry seasons. At each site physico-chemical data was collected along with periphyton samples. The periphyton samples were processed in accordance with standard methods to obtain biomass and TP measures, and to identify and enumerate diatom species. Various aspects of the diatom communities were then compared to previously compiled data on diatom communities from various parts of the FCE. SIMI analysis was used to determine the level of similarity between the systems and Non-Metric Multidimensional Scaling was used to identify relationships between diatom communities and water quality.

Results showed that diatom communities from comparable sites within the four wetlands were very similar with respect to composition and diversity. Diatom community composition showed a strong relationship to periphyton TP levels and although several species demonstrated optimal TP ranges that varied in breadth, fairly distinct assemblages were present at the lower and upper ends of the TP range. This suggests that in karstic wetlands that are similar to the FCE, such as those found in Belize, Mexico and Jamaica, diatoms can effectively be used as indicators of water quality by employing environmental models developed for the FCE.