

Josette LaHee - Progress to date

My dissertation project comprises three main components:

- i. An examination of the development of periphyton mats within a shallow, limestone based coastal Everglades wetland habitat
- ii. An investigation of the effects of nutrient enrichment on these periphyton mats
- iii. A survey of periphyton mats from similar wetland habitats in Jamaica.

Experimental work was done from May to early September of 2006 to address the first two components of the project. Samples collected were processed using multiple techniques, so as to provide information on a number of periphyton mat characteristics, including mat structural characteristics, community composition, productivity levels and nutrient content. Analyses are currently being conducted and it is expected that the final results of these experiments will be available by April 2007.

I anticipate that these data will elucidate trends with respect to (i) changes in periphyton mat community composition, structure and function throughout a developmental period and (ii) changes in these same characteristics in response to nutrient enrichment. It is expected that community composition will change considerably over time, such that early, mid and late stage communities will be discernable. Additionally, I expect to find significant differences between mat communities grown under control and nutrient enriched conditions, and hopefully identify particular species and/or species assemblages that can be used as indicators of the un-enriched and enriched states.

These experiments will be repeated this year (from April to August) using an improved experimental design which will facilitate more reliable sampling and hence produce more sound data.

For the third component of my project, I traveled to Jamaica where I collected periphyton mat samples from two wetland habitats.



Saline wetland habitat in St. Elizabeth, south western Jamaica.



Floating periphyton mat in freshwater wetland habitat in St. Elizabeth south

These samples have been processed and I am currently working on identifying the species of diatoms found within the mat samples. Considering the similarity of the Jamaican wetland habitats to those found in the coastal Everglades, it is possible that both areas support similar mat communities. It is also possible, however, that these wetland habitats could have developed structurally analogous periphyton communities, but with different species compositions. By examining and comparing these communities, I will hopefully be able to address these issues.

I plan to return to Jamaica on two more occasions this year in order to collect more periphyton samples from a wider variety of wetland habitats, thereby producing a more robust set of survey samples.

Upon completion of my experiments and field surveys this year, I plan to finalize the analysis of my results and complete and defend my dissertation by the end of 2008.

It is my hope that the outcome of this project will provide the scientific community with empirical evidence which can be used to test specific hypotheses regarding theories of community development and the effects of environmental perturbation on developmental projections. The information will also be of use to scientists employing diatom communities in monitoring programs, as it will help to define the specific response of diatom communities within periphyton mats to nutrient enrichment. In addition, information on the ecology of shallow, calcium carbonate based wetland systems in the Caribbean/Central American region is severely lacking. This study will therefore serve as an opportunity for gathering scientific information from wetland habitats in a region where little work of this kind has been done and about which little is known.

Furthermore, considering the biological, social, cultural and economic importance of wetland habitats, it is imperative that steps be taken to conserve these habitats. Any conservation strategy would benefit greatly from techniques which will allow us to detect changes in these systems. This study may therefore be of additional benefit as it can provide conservationists and environmental managers with a tool that may be used to monitor wetland habitats and detect changes in these habitats due to anthropogenic influences.

Research such as my own cannot be conducted without the provision of funding to cover the various costs associated with field and laboratory work. I am therefore grateful to the Garden Club of America for providing financial assistance which has, to a large extent, allowed me to conduct this work. In addition, by publicizing such work via their websites and newsletters, the GCA is also assisting with efforts geared towards disseminating information about the research being conducted by young researchers throughout the country. The support I have received from the GCA is therefore very much appreciated and will hopefully be deemed a worthwhile investment.