

## ORAL PRESENTATION

### EFFECT OF PHOSPHORUS ON PERIPHYTON MAT STRUCTURE AND COMPOSITION USING EXPERIMENTAL MICROCOSMS

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Periphyton is one of the most productive elements in the Florida Everglades ecosystem ( $17-10,371 \text{ g C m}^{-2} \text{ yr}^{-1}$ ) existing as cohesive mats that attain biomass levels higher than those found in many other wetlands. The Everglades is a historically oligotrophic system (water total phosphorus  $< 10 \text{ ug L}^{-1}$  in unenriched marsh), such that enrichment of this limiting nutrient, resulting from agricultural and urban development, can alter ecosystem metabolism. Small increases in phosphorus loading can result in major changes to periphyton productivity, structure, and composition. To determine the mechanisms driving observed enrichment responses, we exposed periphyton mats to enhanced phosphorus concentrations in sealed 6.5 L reaction vessels. A second set of antimicrobial treatments was used to examine how nutrients change the interaction among autotrophic and heterotrophic mat components. Dissolved oxygen sensors recorded measurements at 15 minute intervals and mat biomass, composition, nutrients and extracellular polysaccharide (EPS) concentrations were measured before and after a 4 day incubation period. Results show significant differences in EPS concentrations ( $p = 0.011$ ) when enriched with phosphorus, an increase in chlorophyll a ( $p = 0.018$ ) in response to antimicrobial additions, and numerous synergistic responses to combined phosphorus enrichment and antimicrobial addition treatments. Results of this study are important in gaining an understanding of the mechanisms by which the periphyton mat disassembles.