Life Restoration should be lived so vividly and so intensely that thoughts of another life restoration, or of a longer life-restoration, are not necessary” (modified from M. Stoneman-Douglas)

Enjoy our session (and the Everglades!)
What we know about periphyton in relation to nutrients and hydroperiod

Community shifts and food web changes with effects of long-term phosphorus enrichment in Everglades wetlands

Dominance by a few species increases substantially with oligotrophy and drought


What we know about periphyton in relation to nutrients and hydroperiod

With higher hydroperiod and phosphorus, species richness increases (left) and dominance decreases (right), but opportunistic taxa replace ‘native’ algae.


But how does water flow impact P supply & periphyton-based food webs?

Challenge: scaling up from microscopic communities to landscape-scale periphyton cover & community changes

Phosphorus Cycle


H₂O

Phosphorus increases cause mats to break down


Source: Synthesis of Everglades Research and Ecosystem Services (SERES) project
Everglades Periphyton: open questions and challenges

1. How can we improve our understanding of periphyton ecology and dynamics to enhance our predictions of periphyton under potential climate / restoration scenarios?
   a) devise mechanistic functions in periphyton / ecological models and linking these with biogeochemical models;
   b) better simulate top-down controls, food web responses, and spatio-temporal dynamics

2. What do we still need to discover about these enigmatic carpets of algae?

3. How can we better apply new & old knowledge on the role of periphyton for Everglades restoration? And how do we communicate it to / with people, including decision-makers?

To conserve fish, wading birds, alligators, we need to protect microorganisms
What do we still need to discover about these enigmatic carpets of algae?

The conceptual model of the Everglades Landscape Model (ELM). State variables are in oval boxes, linked by the major flow pathways among those variables. Abbreviations: P = Phosphorus; C = Carbon; OM = Organic Matter; Photo-Bio = Photosynthetic Biomass of macrophytes; NonPhoto-Bio = NonPhotosynthetic Biomass of macrophytes; Standing Detr. = Standing dead Detritus; Floc = Flocculent layer on/above soil.


Proposed conceptual ecological model for freshwater Everglades periphyton.

Communication starts with awareness – “Diatom of the month” series

http://floridacoastaleverglades.blogspot.com

17 monthly posts by 7 authors: > 2,300 people reached on Facebook + > 14,300 impressions on Twitter = Some impact on ? 8,000-16,600 people?
“Periphyton Responses to Water Flow and Nutrient Loading and Implications for Everglades Restoration” (Session 21)

0) Luca Marazzi (FIU), Ph.D. - Introduction: “Periphyton: Complex Ecological Indicators of Regional and Global Environmental Changes in a Subtropical Wetland under Restoration” (10 min.)

1) Barry H. Rosen, Ph.D. (USGS)
Why the Primary Producers (Algae and Cyanobacteria) are the Key Early Responders to Nutrient and Water Flow Changes in the Everglades (15 min.)

2) Sue Newman, Ph.D. (SFWMD)
Effects of Increased Flow and Associated Phosphorus Loads on Microbial Responses (15 min.)

3) Evelyn Gaiser, Ph.D. (FIU)
Landscape-Scale Changes in Periphyton Under Contrasting Water Management and Climate Change Scenarios (15 min.)

4) Erik Tate-Boldt, MSc (SFWMD)
The Influence of Altered Flow Regimes on Aquatic Ecosystem Metabolism in an Everglades Marsh (15 min.)

5) Sarah Bornhoeft, MSc (FIU)
Influence of an Experimental Sheet Flow Regime on Aquatic Food Webs of the Central Everglades (15 min.)

Q&A – Discussion (15 min.)

Let’s make the most of our next 90 minutes in Great Cypress room!