

Indian River Lagoon Basin Management Action Plan

Technical Meeting
July 9, 2009



Sebastian Inlet Camera

Seagrass 101

Why do we care about seagrasses?

- They
 - Are natural components of a marine/estuarine ecosystem
 - Abundant seagrass beds are an indicator of a healthy ecosystem
 - Provide valuable habitat for marine animals, especially nursery areas for fish
 - Have declined in many areas because of mans' activities

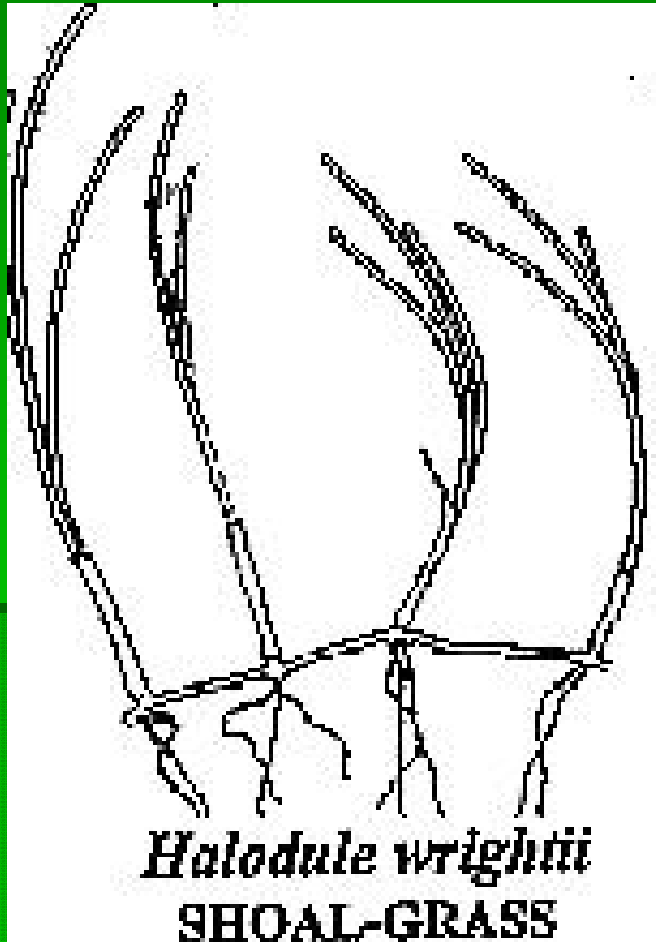
Seagrasses in general

- Are green vascular plants
- Grow through the process of photosynthesis, a light intensity-dependent process
- Obtain nutrients (nitrogen and phosphorus) primarily—but not exclusively—from sediments

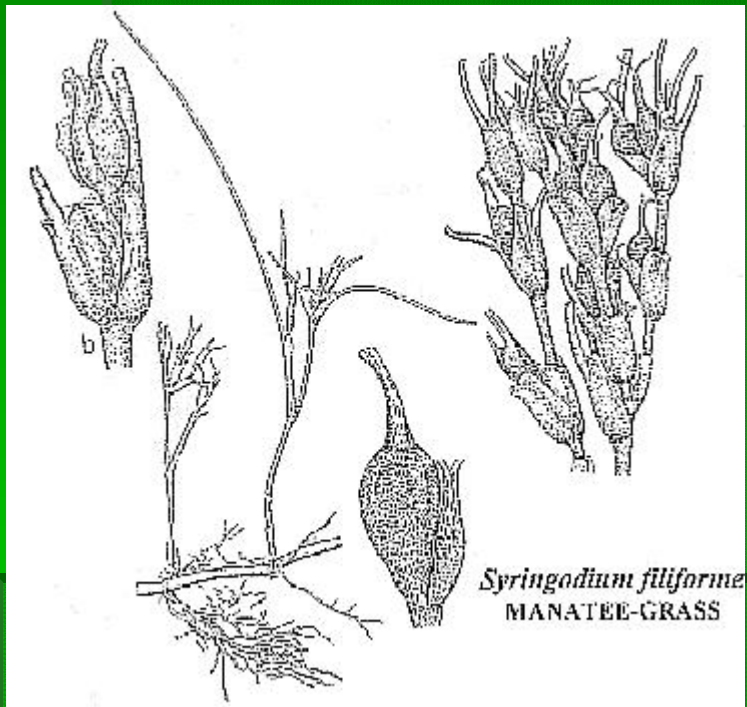
Common IRL seagrasses

- Shoal grass
- Manatee grass

Shoal grass



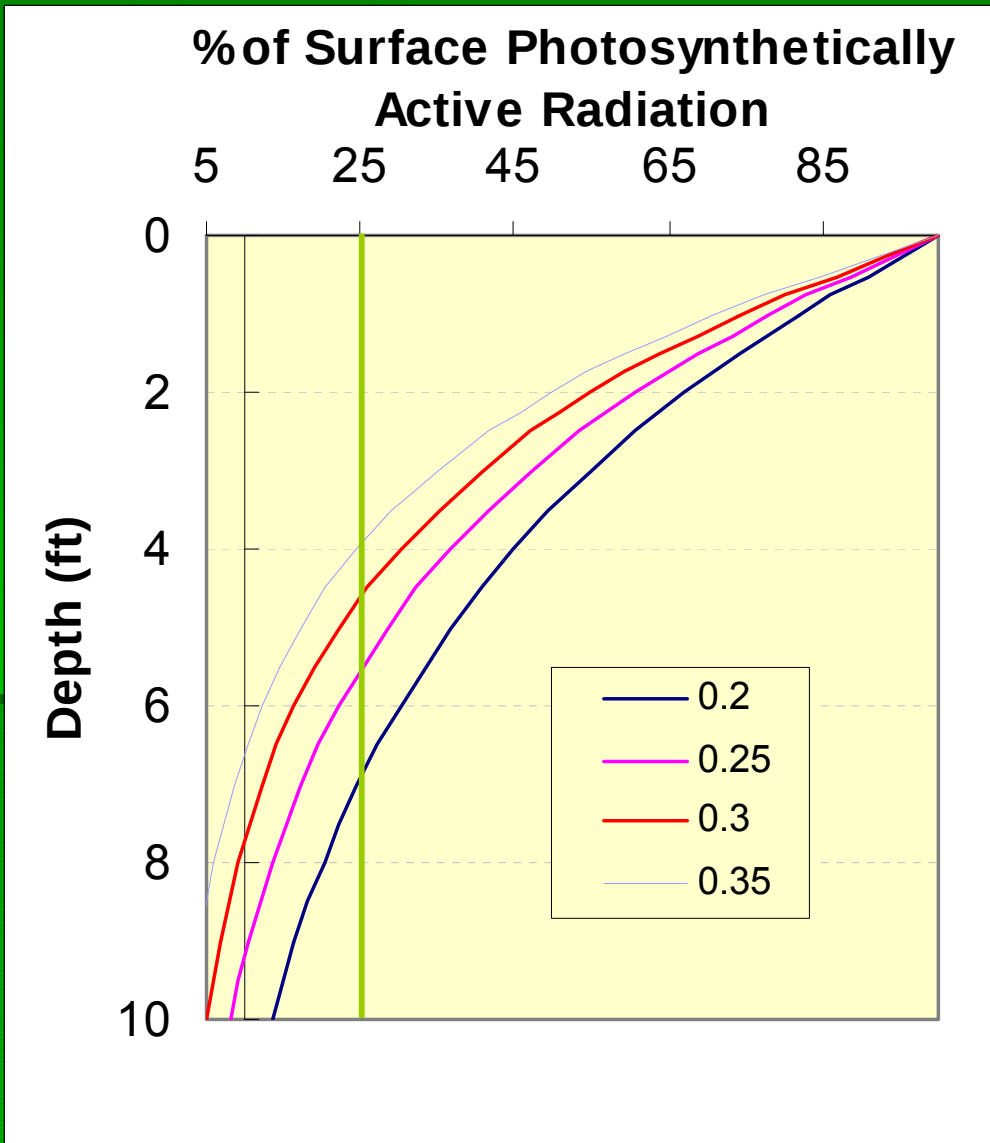
Manatee grass



Factors affecting seagrass

- Primary limitation on seagrass distribution with depth is availability of light
- Light availability is determined by
 - Chlorophyll in microscopic algae in water
 - Total suspended solids (turbidity)
 - Epiphyte (attached plant) growth on seagrass
 - Shading from free-floating algae

Light penetration in water



Higher concentrations of chlorophyll and total suspended solids increase the light extinction coefficient.

Notice that higher extinction coefficients lead to less light at a given depth.

Seagrass with epiphytes



The more epiphytes on seagrass blades, the less light that can be used for seagrass photosynthesis

Nutrient effects

- Higher concentrations of nitrogen and phosphorus in the water lead to
 - Increased concentrations of microscopic algae in the water column
 - Increased density of epiphytes on seagrass blades
- Both reduce light available to seagrass at a given depth

Nutrient effects

- Higher concentrations of nutrients in the water may also lead to increased growth of macroalgae
- Macroalgae can break off and form windrows of floating algae
- Windrows collect in shallow areas and shade or smother seagrasses

Reducing nitrogen and phosphorus loads to IRL

- Reduces nitrogen and phosphorus concentrations in IRL water
 - Decreases microscopic algae in water
 - Decreases growth of macroalgae
 - Also reduces the amount of total suspended solids in the water column
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- All improve light intensity at depth, increasing depth at which seagrasses can grow

QUESTIONS?

Projects Eligible for Credit in the IRL BMAPs

BMAP Framework

- Three BMAPs will be developed to address each subbasin and its associated tributaries:
 - North IRL
 - Central IRL
 - Banana River Lagoon
- Detailed allocations (total nitrogen [TN] and total phosphorus [TP] reductions) to responsible parties will be determined for each subbasin through the BMAP process.

North IRL NPDES Facilities

- Cocoa/J. Sellers
- Cape Canaveral Power Plant
- Reliant Energy
- Rockledge
- Melbourne RO
- Additional facilities may be added with the tributaries

North IRL MS4s

- FDOT, District 5
- Brevard County
- City of Cocoa
- City of Indian Harbor Beach
- City of Melbourne
- City of Titusville
- Town of Indialantic
- Town of Rockledge
- Volusia County
- Additional MS4s may be added with the tributaries

Central IRL NPDES Facilities

- South Beaches, WWTF
- Melbourne Grant, WWTP
- Barefoot Bay, WWTF
- Vero Beach, City of
- Vero Beach, RO
- Indian River County West, WWTF
- Indian River County South RO
- Additional facilities may be added with the tributaries

Central IRL MS4s

- FDOT, District 4 & 5
- Turnpike Authority
- Brevard County
- City of Melbourne
- City of Palm Bay
- City of Sebastian
- City of Vero Beach
- St. Lucie County
- Town of Indialantic
- Town of Indian River Shores
- Town of Malabar
- Town of Melbourne Beach
- Indian River County
- Additional MS4s may be added with the tributaries

BRL NPDES Facilities

- Morton Salt
- Cape Canaveral
- Cocoa Beach

BRL NPDES MS4s

- Brevard County
- City of Cape Canaveral
- City of Cocoa Beach
- City of Indian Harbor Beach
- City of Satellite Beach
- Patrick Air Force Base

Project Credit

- To achieve the TN and TP reductions, each responsible party will provide projects and programs that reduce nutrient loads.
- Pounds reduced will be subtracted from the total allocation for those projects completed January 1, 2006 and later.
- Credit only counts for treatment above and beyond any permitted requirements.

BMAP Project Information

- Responsible party
- Project name
- Project location - waterbody identification (WBID) number
- Load reduction(s) from project-TN, TP, TSS
 - Although TSS is not a required reduction
- Implementation schedule and completion dates
- Links to NPDES permits (if any)
- Estimated cost
- Funding sources and partners

Project Maintenance

- In order to receive credit, projects must be operated and properly maintained as permitted.
- Operation and maintenance records may be requested as part of the project review process.
- Any projects not operated as permitted, including older projects not included for specific credit, could result in additional reduction requirements by the responsible entity.

Types of Projects

- Standard stormwater treatment best management practices (BMPs) include:
 - Off-line and on-line retention
 - Wet pond
 - Dry detention
 - Baffle box
 - Nutrient (2nd generation) baffle box
 - Catch basin inserts/inlet filters
 - Swales
 - Infiltration trench

Types of Projects, cont'd

- Provisional BMPs include:
 - Stormceptor (TP only)
 - Continuous deflective separation (CDS) unit (TP only)
 - Street sweeping
 - Public education and outreach efforts
- Other project options include:
 - Denitrification systems
 - Regional projects
 - Other innovative ideas

Future Growth Considerations

Addressing Future Growth

- Section 403.067(7)(a)(2), Florida Statutes, requires: BMAPs to:
 - “...identify the mechanisms by which potential future increases in pollutant loading will be addressed.”
- No allocation for new development.
- New discharges cannot increase existing load and must meet “net environmental improvement” for Environmental Resource Permit (ERP) program requirements.

Addressing Future Growth

- Local governments are encouraged to pursue low impact development (LID) standards and Florida friendly landscaping to further minimize the impacts of existing development, new development, and retrofit projects through local development regulations (LDRs).

ERP Requirements

- Any ERP application must include documentation of compliance with state water quality standards (WQS).
- The project cannot adversely affect the quality of receiving waters such that WQS will be violated.
- Conditions for issuance include not causing harm to water resources or causing violations of WQS.

ERP Requirements, cont'd

- Since impaired waters do not meet WQS, cannot allow increased load of pollutants of concern.
- New development must result in a “net environmental improvement” from existing loads.

Low Impact Development (LID)

- LID is an approach to development that uses land planning, design practices, and technologies to conserve and protect natural resources and reduce infrastructure costs.
- LID measures can help to reduce loads from associated with future growth.

LID, cont'd

- Nutrient reduction credit cannot be assigned for LID; however, these activities could reduce required load reductions in future BMAP iterations.
- More information can be found at:
<http://lowimpactdevelopment.org/>

Questions?

Amy Tracy, Basin Coordinator
FDEP

Amy.Tracy@dep.state.fl.us

850-245-8506

Tiffany Busby, Facilitator
Wildwood Consulting
TLBusby@wildwoodconsulting.net

904-797-2721

Bob Kelly, Technical Support
SAIC

Robert.A.Kelly@saic.com

703-375-2013