## The Florida Senate

### COMMITTEE MEETING EXPANDED AGENDA

**ENVIRONMENTAL PRESERVATION AND CONSERVATION**

**Senator Dean, Chair**

**Senator Abruzzo, Vice Chair**

**MEETING DATE:** Wednesday, December 11, 2013  
**TIME:** 9:00 — 11:00 a.m.  
**PLACE:** Toni Jennings Committee Room, 110 Senate Office Building  

**MEMBERS:** Senator Dean, Chair; Senator Abruzzo, Vice Chair; Senators Altman, Bullard, Gardiner, Grimsley, Latvala, Simpson, and Soto

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<th>BILL NO. and INTRODUCER</th>
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<td>Presentation on Sediment Accumulation and Removal in the Indian River Lagoon by Dr. John Trefry, Professor, Marine and Environmental Systems, Florida Institute of Technology</td>
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Other related meeting documents
Muck Accumulation and Removal in the Indian River Lagoon System

John H. Trefry, Florida Institute of Technology

Presentation to The Florida Senate Environmental Preservation and Conservation Committee
December 11, 2013

(Photo Credit: NASA)
Muck Accumulation and Removal in the Indian River Lagoon System

John H. Trefry, Florida Institute of Technology

Presentation to The Florida Senate
Environmental Preservation and Conservation Committee
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(Photo Credit: NASA)
... one of the most biologically diverse estuaries in the continental United States with more than 3,500 species of animals, plants and fungi.
Indian River Lagoon

Economic value of $3.7 billion/yr
11 million recreational users 15,000 full/part-time jobs

(Photo Credit: Paul Shidel)
During the past year, the Indian River Lagoon received wide coverage by the local and national press.

At the center of this attention were deaths of

- >100 dolphins
- >200 manatees
- >300 pelicans

MELBOURNE, Fla. — The first hint that something was amiss here, in the shallow lagoons and brackish streams that buffer inland Florida from the Atlantic’s salt water, came last summer in the Banana River, just south of Kennedy Space Center.
These recent impacts followed one **superbloom** of algae plus other algae blooms from 2011 to present.

*Photo Credit: Florida Today*

July 31, 2012, Banana River Lagoon, west of Port Canaveral Locks

*(Photo Credit: Florida Today)*
The algae blooms block sunlight and have already destroyed 47,000 acres of seagrass.
For >6 decades, a variety of substances have been carried with runoff to the lagoon:

- Excessive freshwater
- Soil, grass cuttings, other vegetation
- Nutrients (nitrogen, phosphorus)
- Some heavy metals, pesticides
One product of these inputs is Indian River Lagoon MUCK

(Photo Credit: Florida Today)
Indian River Lagoon

MUCK

Natural sand and shell (pre-1950)

>75% H$_2$O (by wt.), ~90% H$_2$O (by vol.). Solids are >60% silt + clay, >10% organic matter

(Trefry et al., 1987)
Muck ...

- Increases turbidity and inhibits seagrass growth.
- Promotes oxygen depletion in sediment and water.
- Stores and releases nutrients.
- Covers the natural bottom and destroys natural communities of organisms.
- Accumulates potential pollutants.
Muck Distribution

Indian R. Lagoon

Banana R. Lagoon

(SJRWMD, 2013)
Muck maps are a composite of surveys by Trefry et al. (1990, 2007) and Riegl et al. (2009). (SJRWMD, 2013)
An estimated 5-7 million yd$^3$ of muck cover the bottom of the northern and central lagoon system.

A step forward in solving our problem is to begin a multi-year process of dredging muck from the Indian River Lagoon.

Proposed Dredging for Eau Gallie R. (625,000 yd$^3$, $20^+M$)
As dredging proceeds:

- Upland inputs of muck must be further decreased.
- Regular scientific assessment should be carried out to evaluate and optimize the dredging process.

Muck maps are a composite of surveys by Trefry et al. (1990, 2007) and Riegl et al. (2009).

(SJRWMD, 2013)
Reasons for Optimism

Loss of 47,000 acres of seagrass
Scottsmoor to Fort Pierce Inlet

Area (thousands of acres)

(SJRWMD, 2013)

Superbloom
Take-Home Message

• The Indian River Lagoon is in a period of critical decline.

• Muck has been accumulating in the lagoon for decades.

• A multi-year effort of removing muck is needed now along with continued reduction of inputs of muck components to help restore the system.
Acknowledgements for funding and collaboration in muck studies

St. Johns River Water Management District
South Florida Water Management District
Indian River Lagoon National Estuary Program
Florida Institute of Technology
and its Indian River Lagoon Research Institute
Brevard County
Florida Inland Navigation District
Thank you!