Relative District Spending on IRL Initiative Programs

Construction

Wetlands

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PLAID

IRL General Programs

The Blue Team will strive to discriminate relationships between climatologic, hydrologic, hydrodynamic, nutrient loading and/or water quality variables and the recently observed shifts in chlorophyll a

Update Existing Models

2Q 2014

Complete Residence Time Models

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Convert CH3D to EFDC

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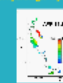

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Indian River Lagoon Algal Initiative: Update on the IRL Models

- Improve the scientific understanding of the primary producer/consumer communities, their drivers and linkages, that can instigate and maintain phytoplankton blooms
- Apply this improved understanding toward sound management of the controllable drivers for the purpose of preventing or minimizing major blooms harmful to seagrasses.

Thank you

Questions ?

Indian River Lagoon Algal Initiative: Update on the IRL Models

Peter Sucsy
St. Johns River Water Management District
Bureau of Engineering and Hydro Science

Basin Management Plan Technical Meeting
December 10, 2013
Palm Bay, Florida

St. Johns River Water Management District

Prezi

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SAV

Bio

IRLABI

Geo

IRL General Programs

NEP

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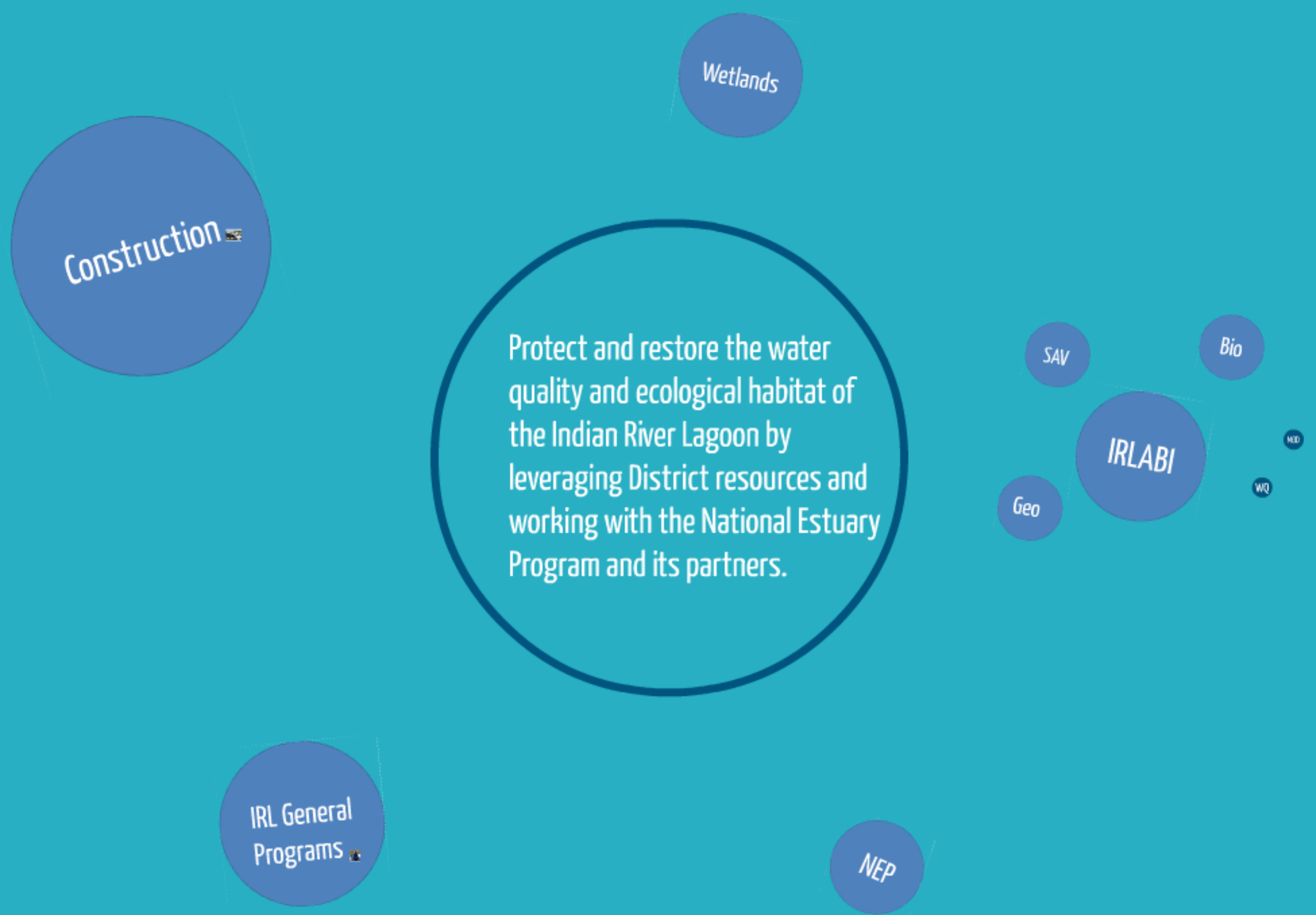

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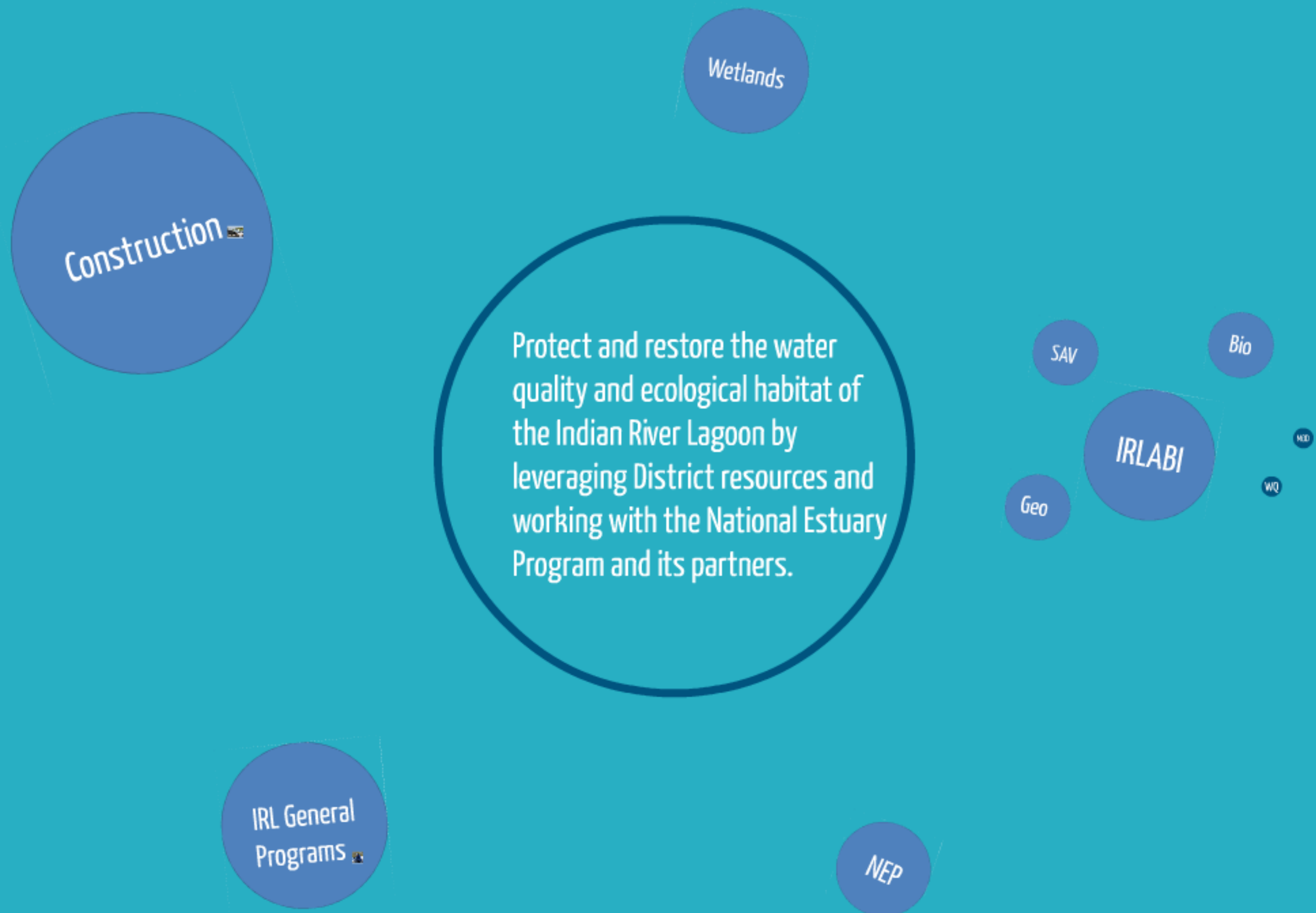

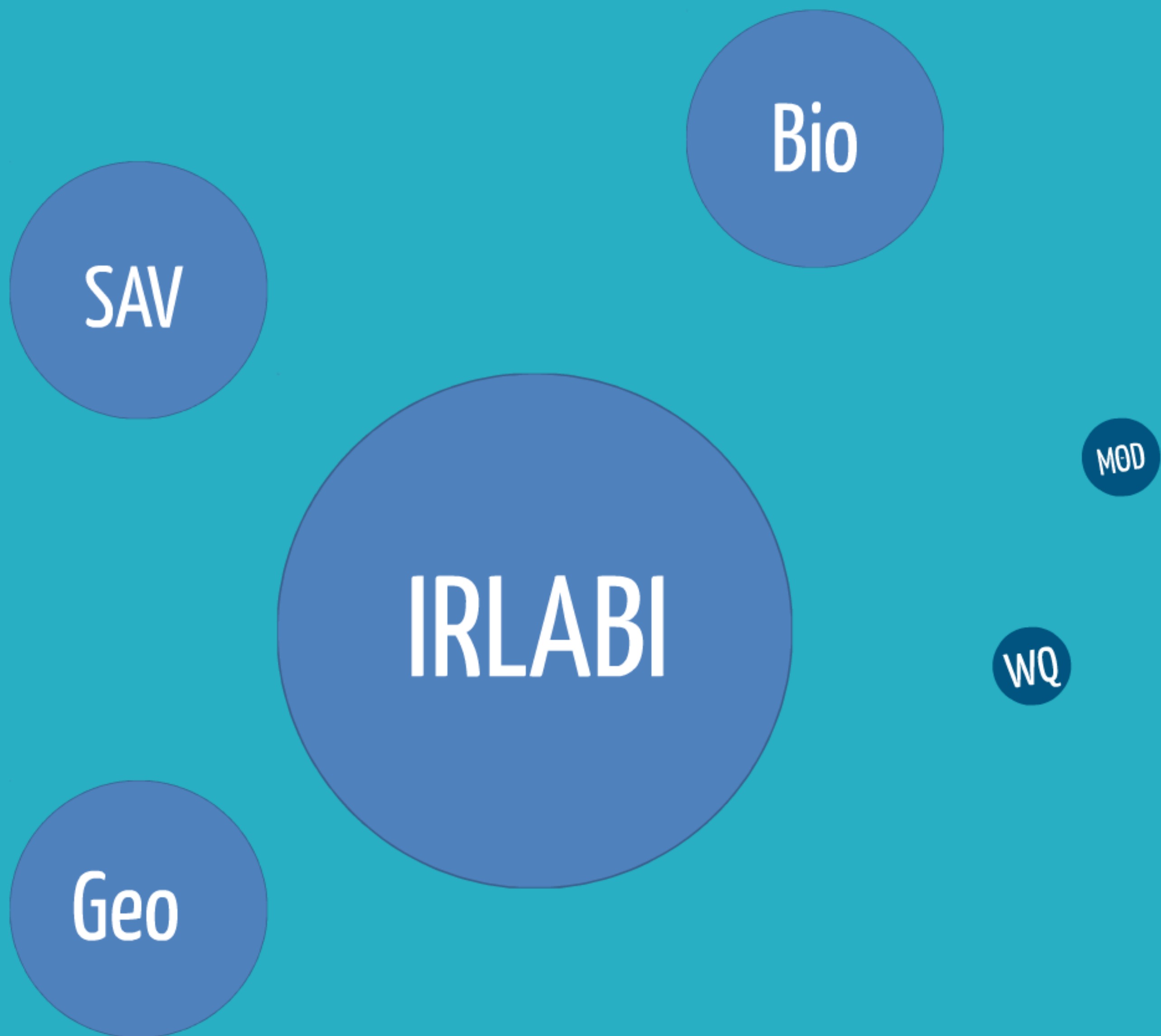
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MOD

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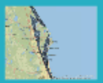

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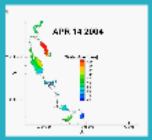

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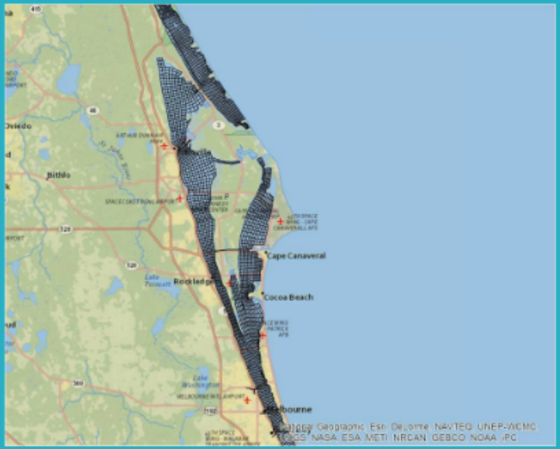

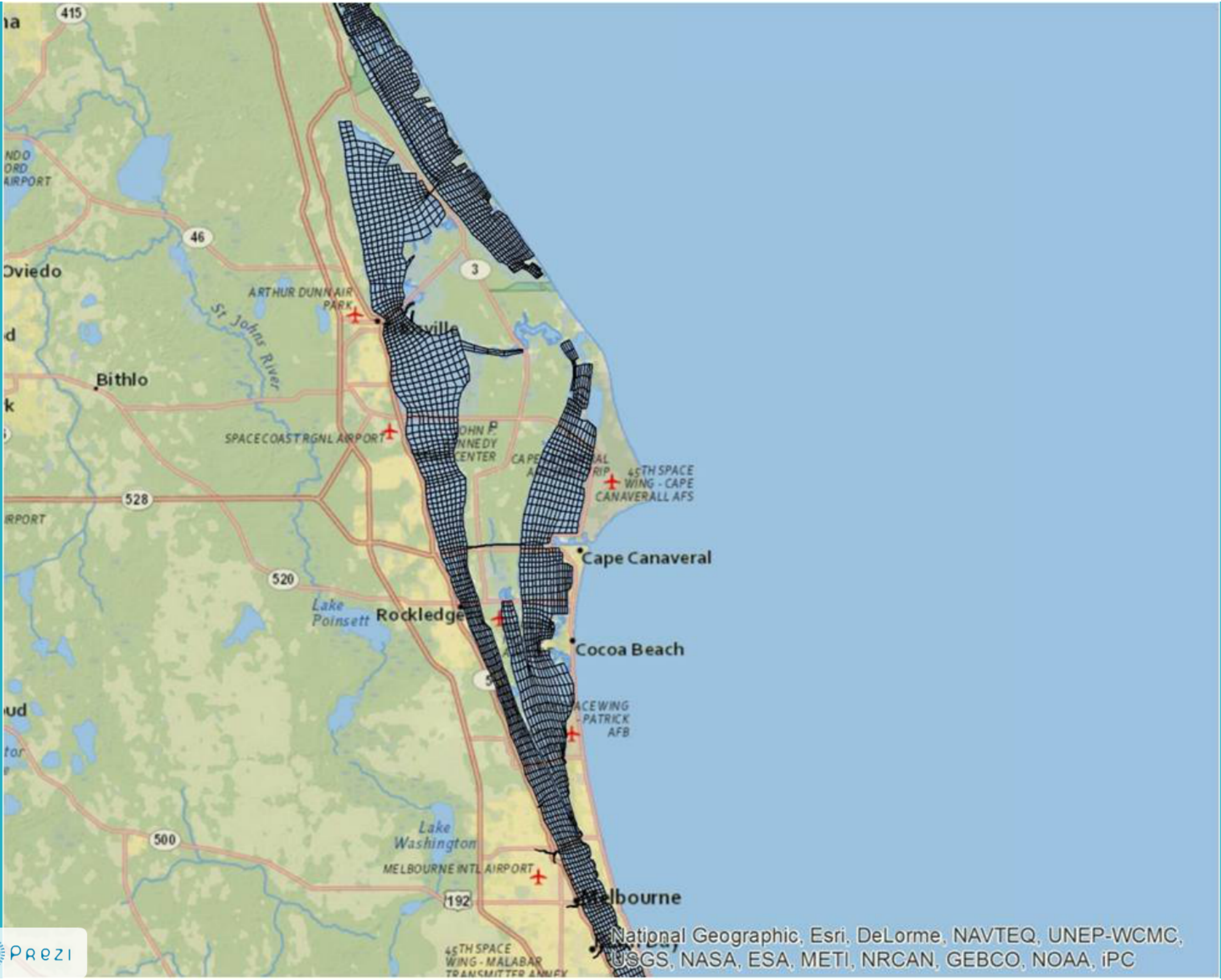

415
Oviedo
46
3
ARTHUR DUNN AIR PARK
St Johns River
Bithlo
SPACECOASTRGNL AIRPORT
528
45TH SPACE WING - CAPE CANAVERALL AFS
Cape Canaveral
520
Lake Poinsett
Rockledge
Cocoa Beach
500
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45TH SPACE WING - MALABAR TRANSMITTER ANNEX
National Geographic, Esri, DeLorme, NAVTEQ, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, iPC

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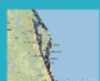

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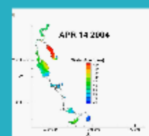

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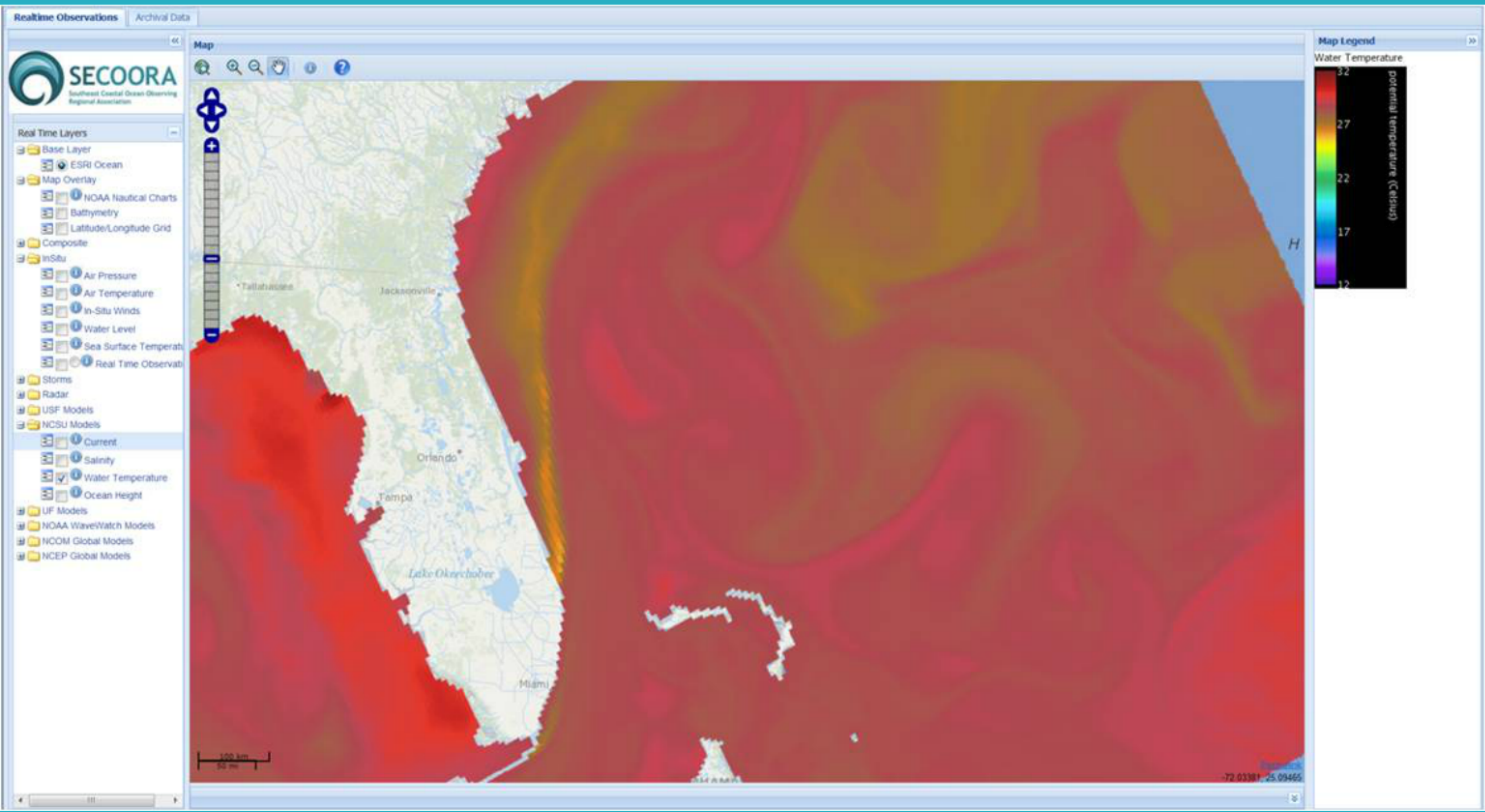

Realtime Observations
Archival Data
SECOORA
Southeast Coastal Ocean Observing Regional Association
Real Time Layers
Base Layer
ESRI Ocean
Map Overlay
NOAA Nautical Charts
Bathymetry
Latitude/Longitude Grid
Composite
InSitu
Air Pressure
Air Temperature
In-Situ Winds
Water Level
Storms
Radar
USF Models
NCSU Models
Current
Salinity
Water Temperature
Ocean Height
UF Models
NOAA WaveWatch Models
NCOM Global Models
NCEP Global Models
Map
Jacksonville
Orlando
Tampa
Lake Okeechobee
Miami
100 km
Map Legend
Water Temperature
32
27
22
17
12
potential temperature (Celsius)

Prezi

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Environmental Fluid Dynamics Code (EFDC)

The Environmental Fluid Dynamics Code (EFDC Hydro) is a state-of-the-art hydrodynamic model that can be used to simulate aquatic systems in one, two, and three dimensions. It has evolved over the past two decades to become one of the most widely used and technically defensible hydrodynamic models in the world. EFDC uses stretched or sigma vertical coordinates and Cartesian or curvilinear, orthogonal horizontal coordinates to represent the physical characteristics of a waterbody. It solves three-dimensional, vertically hydrostatic, free surface, turbulent averaged equations of motion for a variable-density fluid. Dynamically-coupled transport equations for turbulent kinetic energy, turbulent length scale, salinity and temperature are also solved. The EFDC model allows for drying and wetting in shallow areas by a mass conservation scheme. The physics of the EFDC model and many aspects of the computational scheme are equivalent to the widely used Blumberg-Mellor model and U. S. Army Corps of Engineers'Chesapeake Bay model. EFDC's role in the TMDL Toolbox will be to provide necessary hydrodynamic inputs to WASP, the advanced receiving water quality model.

WWQTCS Info

- WWQTCS Home
- Technical Support
- Tools
  - Watershed Models
    - Basins
    - LSPC
    - WAMView
    - SWMM
    - WARMF
  - Water Quality Models
    - WASP
    - QUAL2K
    - Aquatox
    - EPD-RIV1
  - Hydrodynamic Models
    - EFDC
    - EPD-RIV1
  - Database
- Training

EFDC Preprocessor

In order to facilitate the setup and application of EFDC, a preprocessor is being developed. The preprocessor will be composed of two major components: the Curvilinear Grid Generator and the EFDC Model Interface. Together these components will enable users to generate curvilinear-orthogonal grids, simulate aquatic systems in 1, 2, or 3-dimensions, link 2-D grids to 1-D grids, quickly and easily set and change critical modeling parameters, and make use of watershed loading model results and monitoring data for boundary conditions.

The Curvilinear Grid Generator will enable a user to generate curvilinear-orthogonal grids that are required for the numerical model. It will significantly decrease the repetitive effort typically required through manual grid generation methods. Grid generation will be conducted interactively and intuitively through the interface and associated controls. Key features of the tool will include:

- GIS interface
- Model domain designation through user control point designation
- Automatic insertion of grid boundary points based on control point designation
- Automatic curvilinear-orthogonal grid generation
- Model grid conversion to GIS shape file format
- Cell mapping between EFDC and WASP

Once a grid has been generated, it's necessary to set and calibrate pertinent modeling parameters. The EFDC interface will simplify the setup and application of EFDC through a user-friendly graphical interface and associated windows. It will support input of EFDC model run control and model parameter designation, and it will link directly to boundary condition/source data, e.g. watershed model output and point source contributions. Key features of the tool will include:

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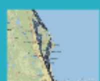

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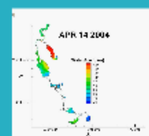

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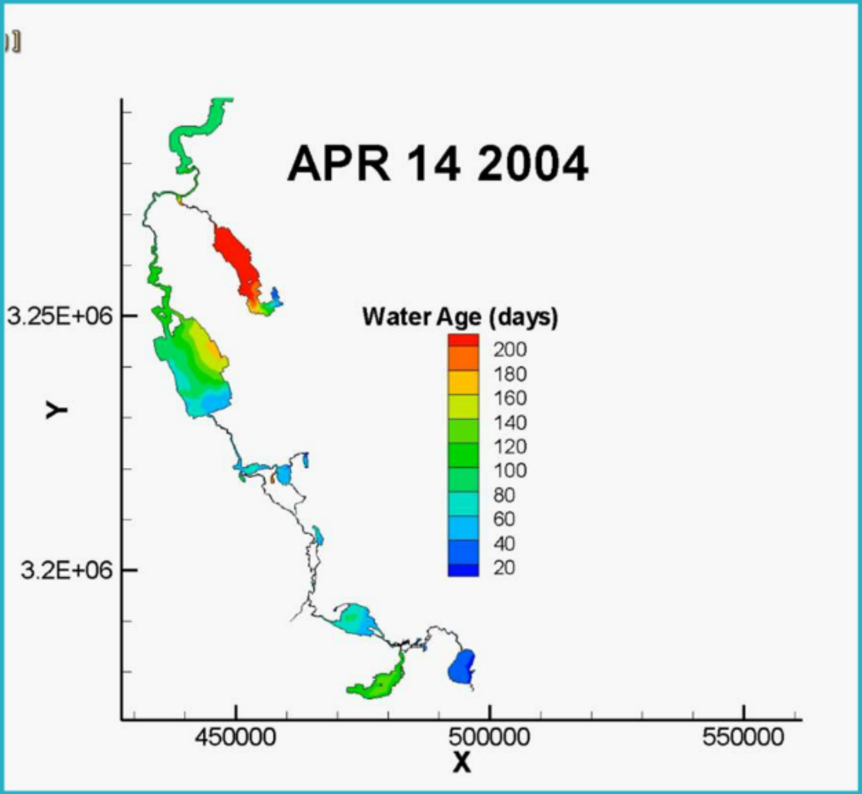

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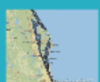

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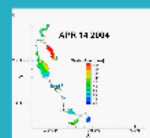

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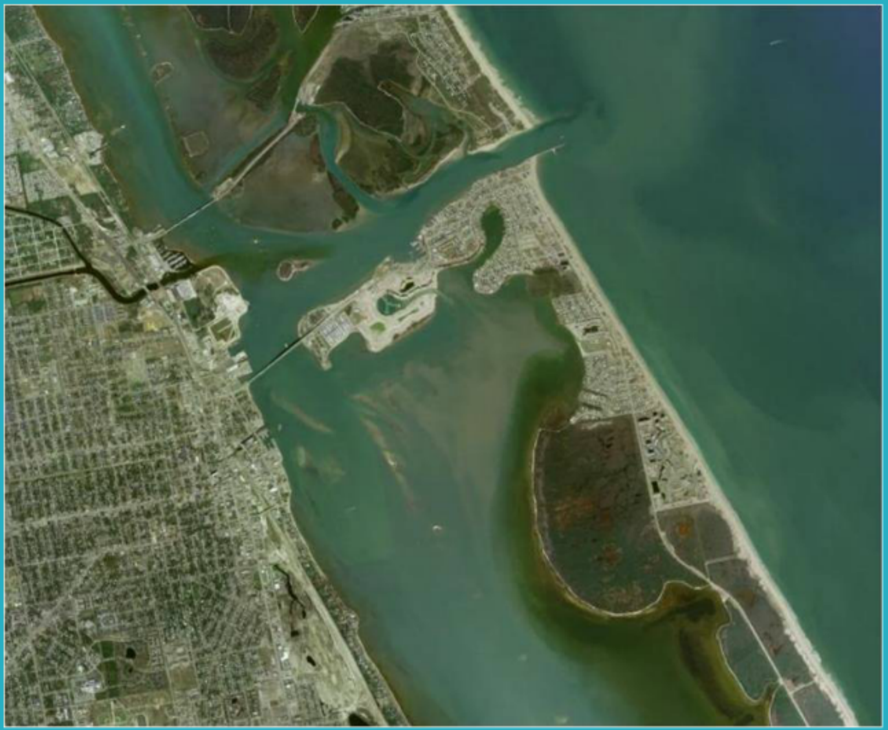

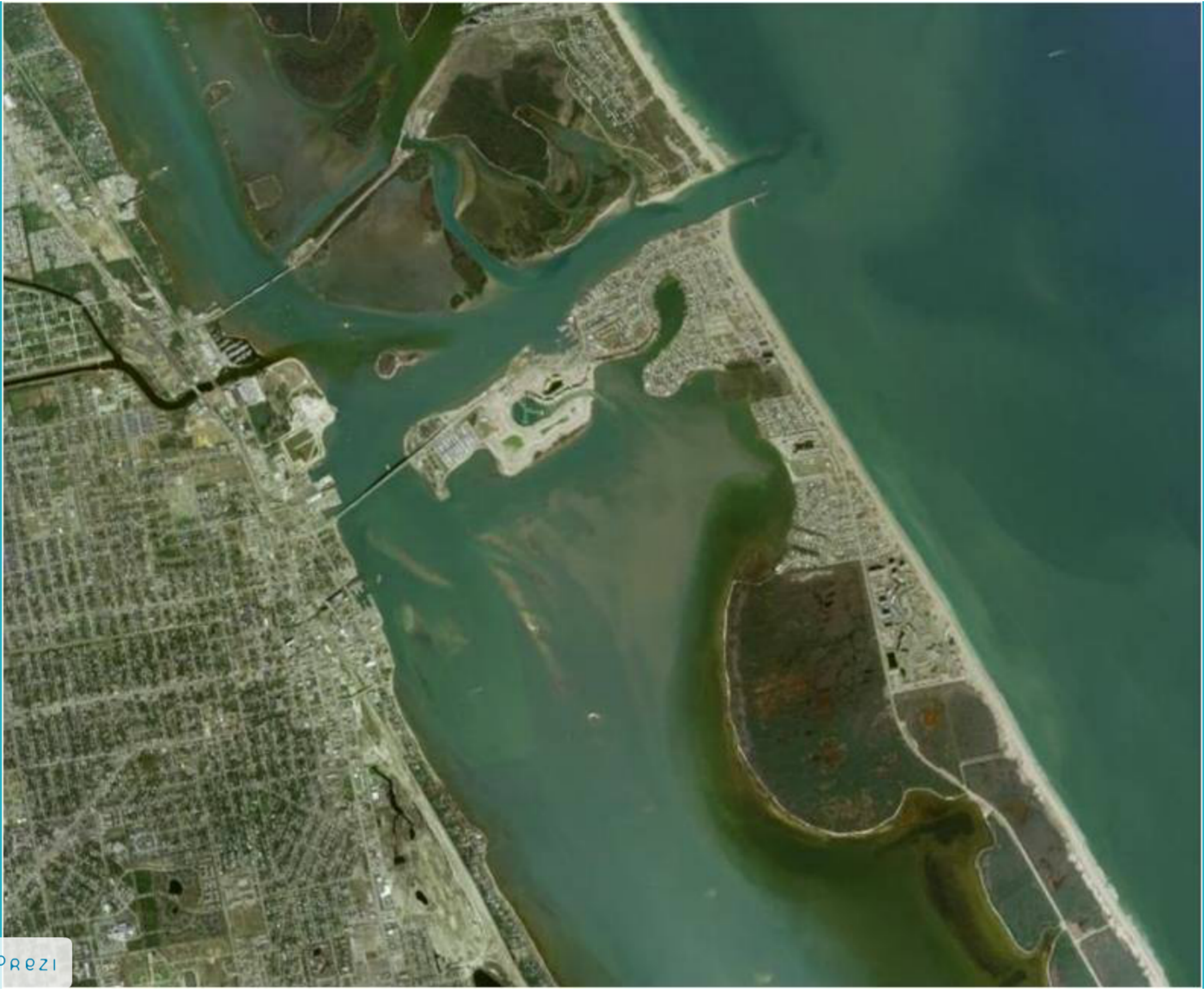

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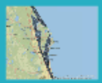

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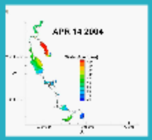

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psucsy@sjrwmd.com
386-329-4455

St. Johns River
Water Management District

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