

# Information and Assessment Tools to Support Management and Research Priorities in the GTM Research Reserve



NATIONAL CENTERS FOR **COASTAL OCEAN SCIENCE**  
National Ocean Service

# 2014 GTM NERR Ecological Assessment



Center for Coastal Environmental Health and Biomolecular Research

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Field operations: J.D. Dubick, P. Key, P. Pennington, J. Wade

Contaminant analysis : E. Pisarski, L.A. Reed, B. Shaddrix

Sediment toxicity analysis : K. Chung

Nutrients, chlorophyll, fc analysis: J. Wade



GTM NERR

Project planning:

N. Dix, J. Lynn, M. Shirley

Field operations:

N. Dix, J. Lynn



Alpha/Versar

Enumeration of benthic infauna, analysis of sediment grainsize and TOC



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# 2014 GTM NERR Ecological Assessment

## GRTS Sampling Design

Subtidal estuarine

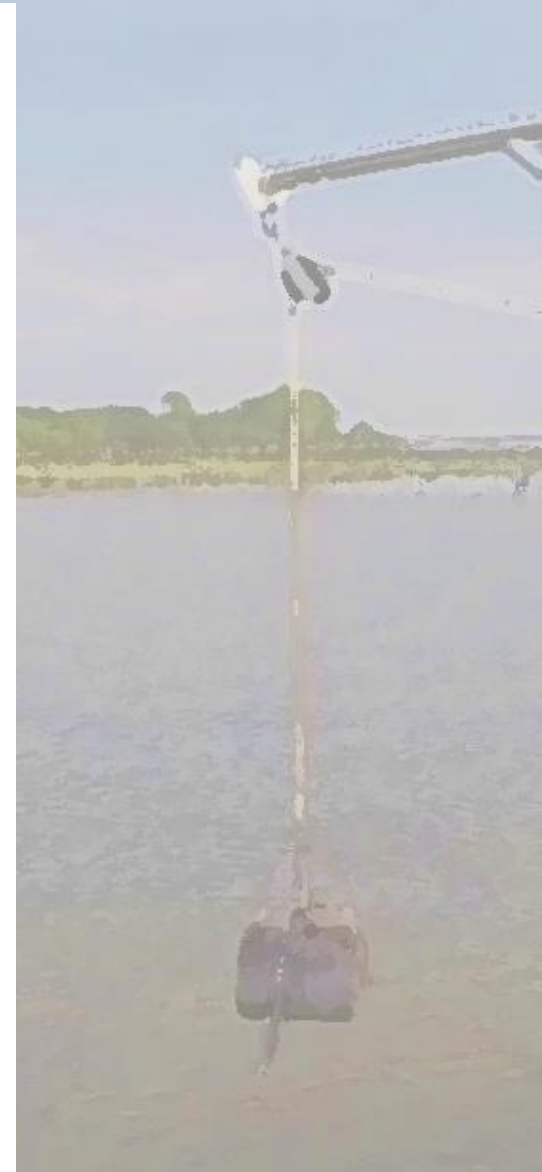
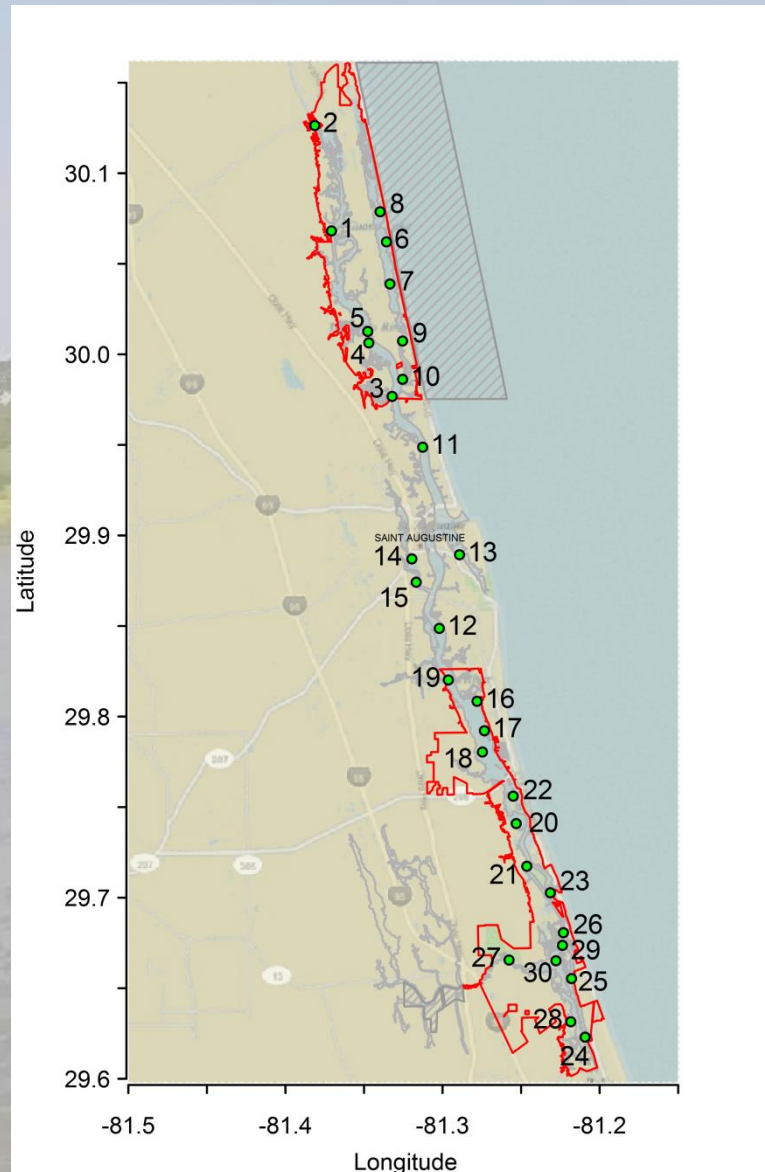
Total: 30 stations

GTM-North: 10 stations

GTM-South: 15 stations

St. Augustine: 5 stations

July 28 – August 8, 2014



<b>Matrix</b>	<b>Parameters</b>	<b>Collection method</b>
Water	Depth, Temp, Sal, DO, pH	YSI multiparameter sonde
	Nutrients, Chlorophyll, TSS, Turbidity, Fecal coliform bacteria	Near-surface water sample
Sediment	Benthic Infauna	Young sediment grab (0.04 m <sup>2</sup> ), 2 replicates
	% Silt+Clay, TOC	Composite of upper 3 cm of sediment from multiple grabs
	Chemical Contaminants (Metals, PAHs, PCBs, Pesticides)	Composite of upper 3 cm of sediment from multiple grabs
	Sediment Toxicity (Microtox solid-phase, Microtox solvent-extract, Reporter gene assay)	Composite of upper 3 cm of sediment from multiple grabs
Tissue	Chemical Contaminants (Metals, PAHs, PCBs, Pesticides)	<p>6 – 12 oysters from each station having live oyster beds</p> <p>2 – 3 specimens of at least one target finfish species* per station</p> <p>* Target finfish: Family Sciaenidae (spot, croaker, whiting, seatrout, and red drum), Lutjanidae (snapper), Paralichthyidae (flounder), and Mugilidae (mullet)</p>

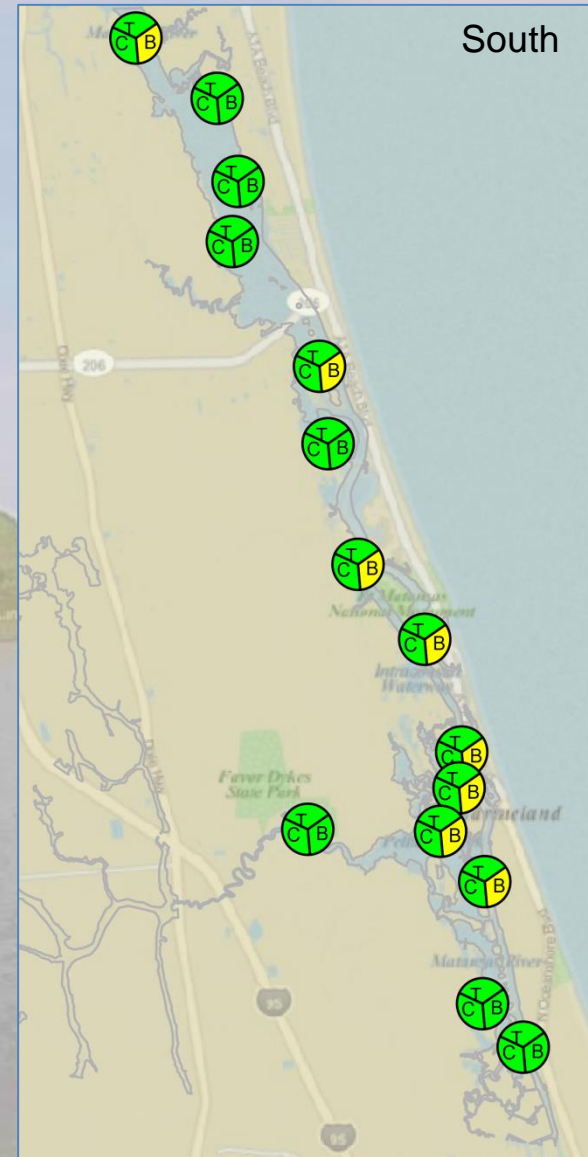
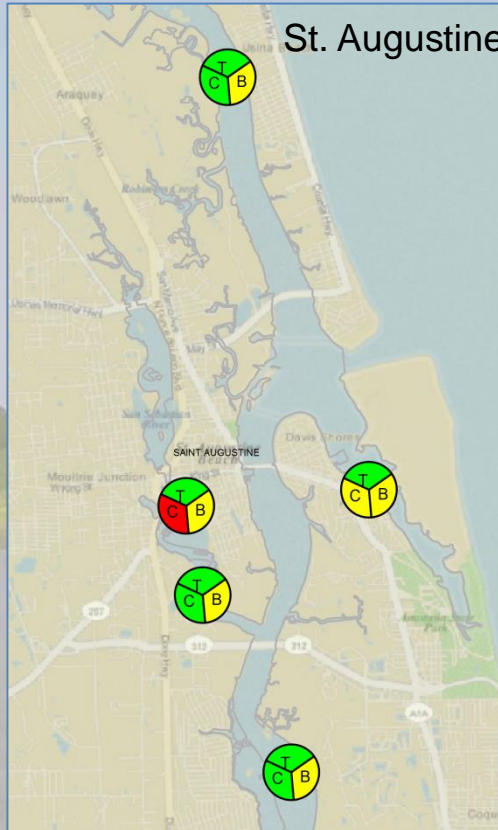
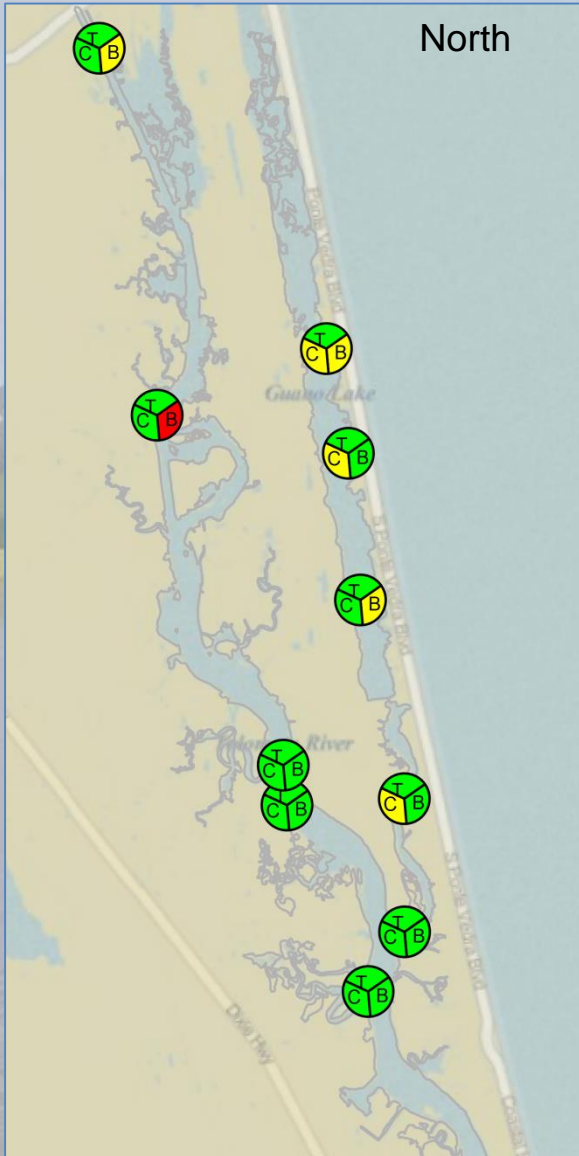




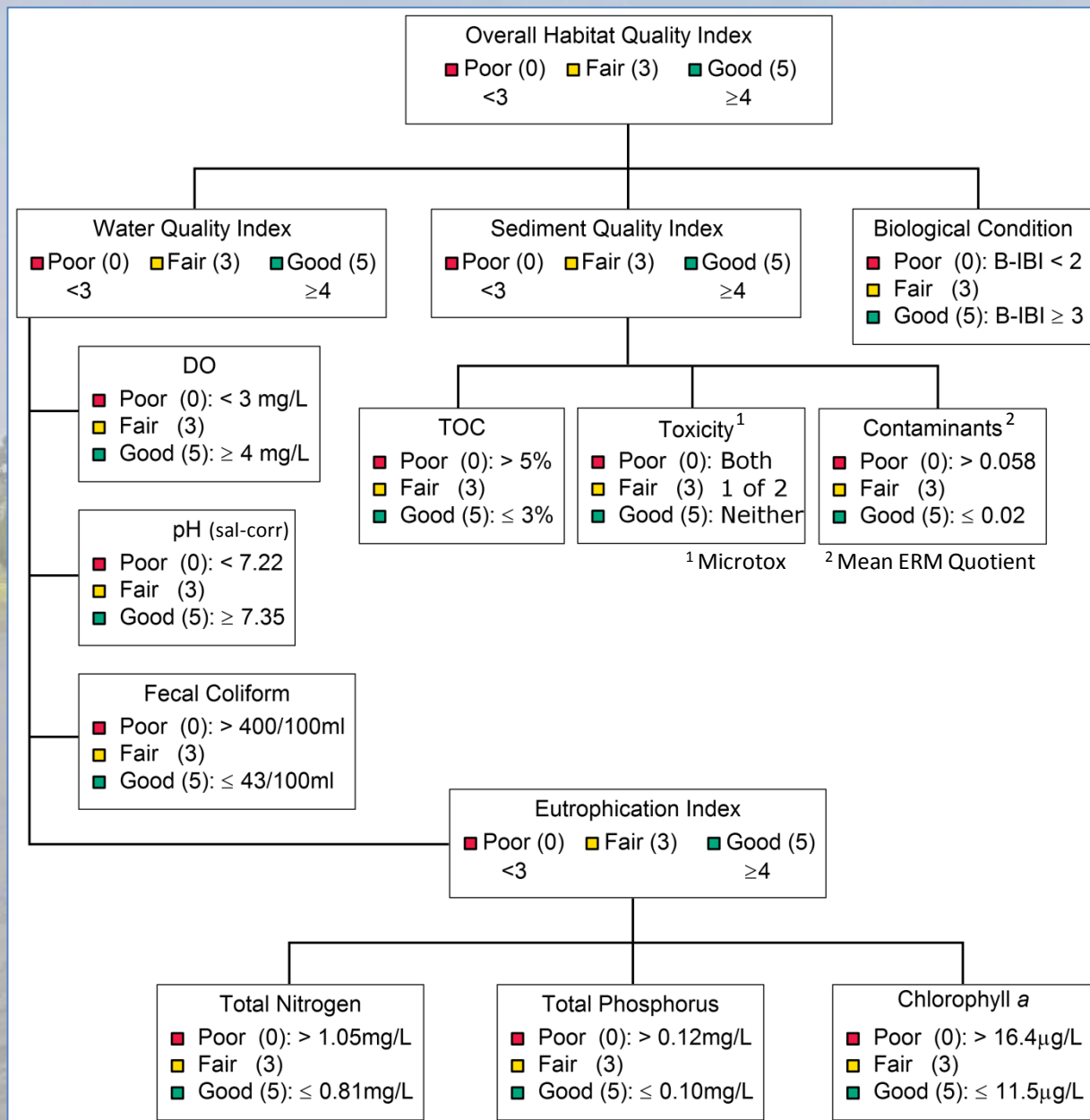




# Sediment Quality



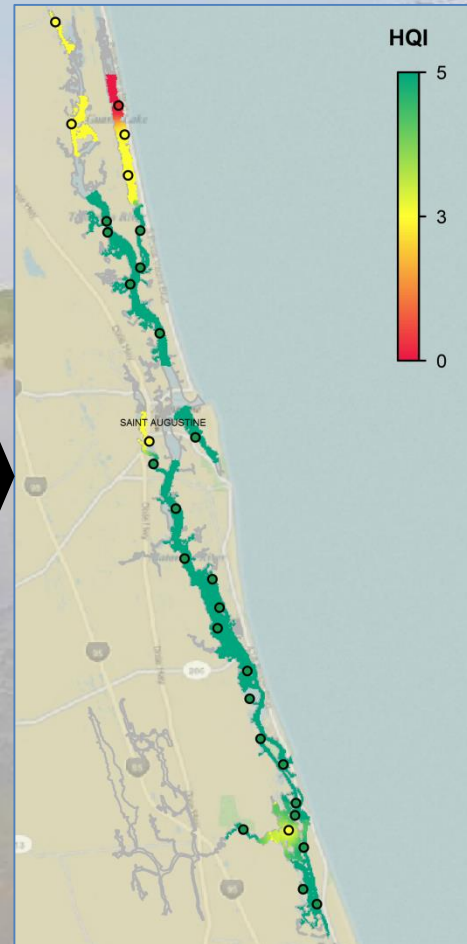
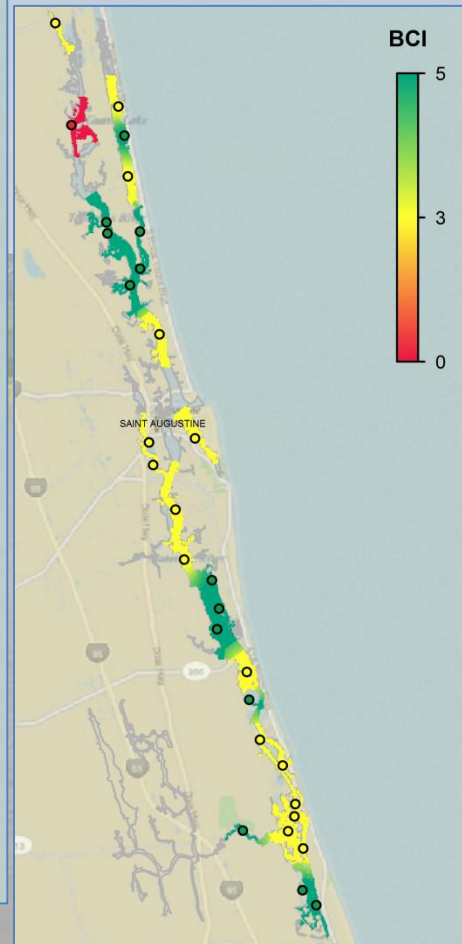
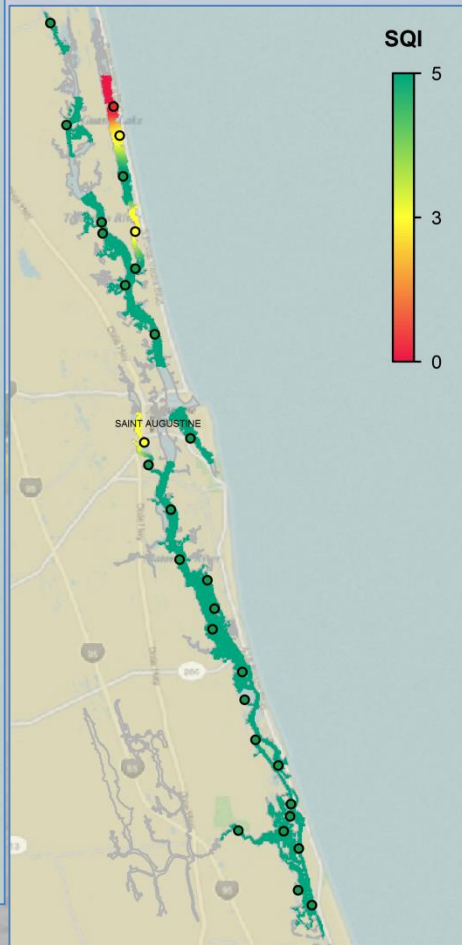
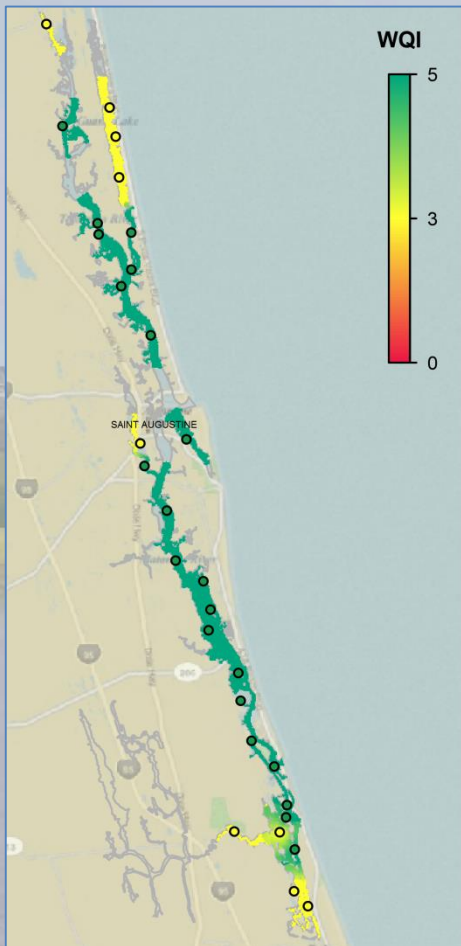
- |  |                           |                                    |
|--|---------------------------|------------------------------------|
|  | Healthy benthos           | : B-IBI 3.0-5.0                    |
|  | Intermediate/some stress: | B-IBI 2.0-2.5                      |
|  | Unhealthy benthos         | : B-IBI 1.0-1.5                    |
|  | Low                       | : Mean ERM Quotient $\leq 0.02$    |
|  | Intermediate:             | Mean ERM Quotient $> 0.02 - 0.058$ |
|  | High                      | : Mean ERM Quotient $> 0.058$      |
|  | No toxicity:              | Neither of 2 assays significant    |
|  | Moderately toxic:         | 1 of 2 assays significant          |
|  | Highly toxic:             | Both assays significant            |



Modified from: Balthis et al. 2015. An Integrated Assessment of Habitat Quality of National Estuarine Research Reserves in the Southeastern United States. *Integr Environ Assess Manag* 11(2): 266-275.



# Integrated Measures of Habitat Quality



# Data Access

nbj.noaa.gov

products.coastalscience.noaa.gov/rea

NOAA | NOS | NCCOS

## National Benthic Inventory

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## NCCOS Regional Ecological Assessments

Home About Us Our Research Projects Publications **Products** News Where We Work

You are here: Overview / Browse Data

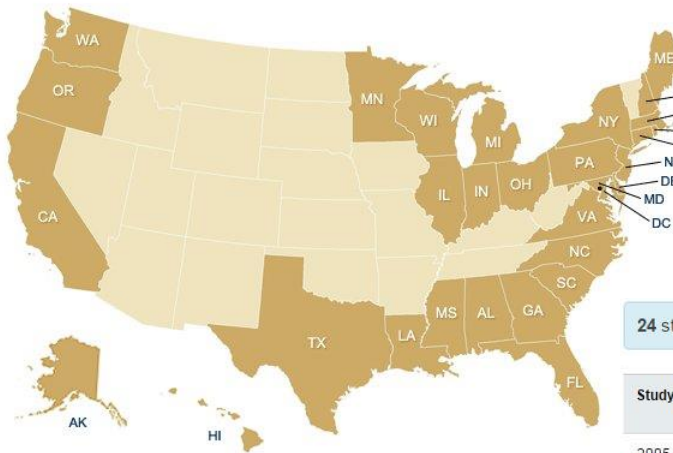
Overview Projects Individual Studies Data By Project Full Taxa List In Your State

Viewing: Home / Datasets / Data in Your State

### Regional Map



### Data in Your State



24 studies found for South Atlantic region.

Study	Project	Water Quality	Water Nutrients	Benthic Infauna	Sediment Characteristics	Sediment Chemistry	Sediment Toxicity	Tissue Chemistry
2005 Grays Reef NMS	Grays Reef NMS Benthic Assessment	✓		✓	✓	✓		✓
2006 North Carolina NERRS	NERRS Regional Environmental Assessments	✓	✓		✓	✓	✓	✓
2009 Sapelo Island NERRS	NERRS Regional Environmental Assessments	✓	✓	✓	✓	✓	✓	✓
2014 GTM NERRS	NERRS Regional Environmental Assessments	✓	✓	✓	✓	✓	✓	✓







# Prioritizing Areas for Further Study and Remediation

## Fecal Coliform

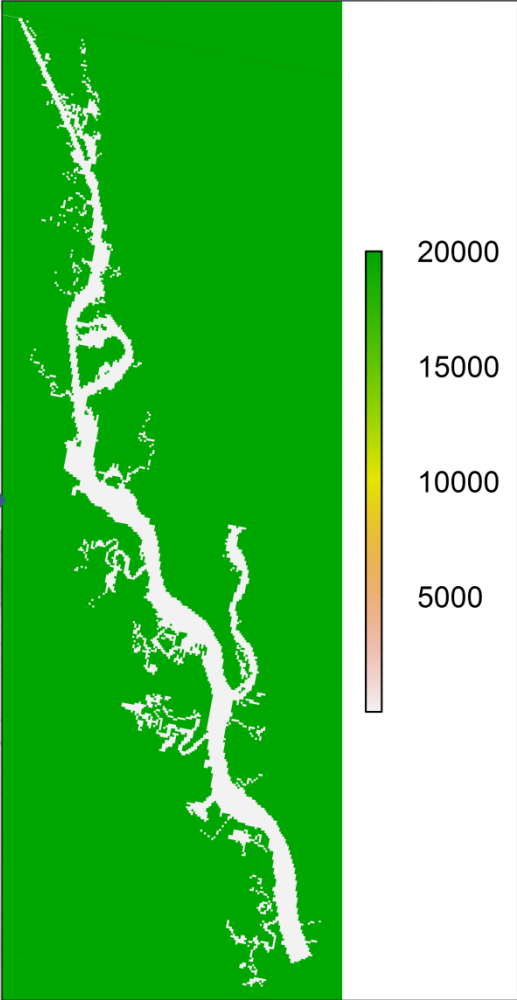
- Florida DEP STORET
- EPA STORET Legacy data
- GTM NERR FC monit.
- NCCOS 2014 Ecol. Assess.

20,526 monthly FC means  
253 stations  
1970s - 2015

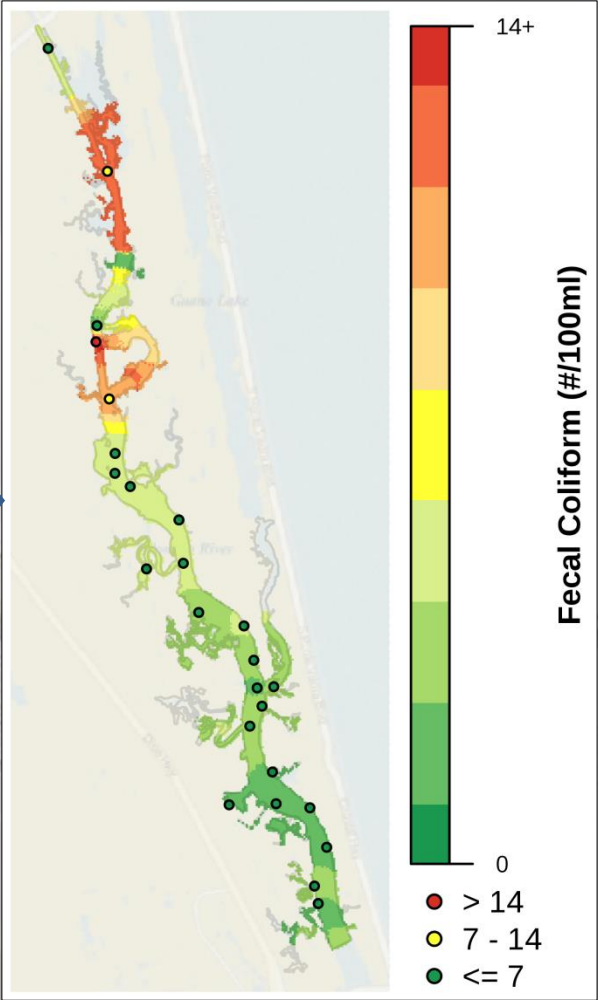
# Spatial Interpolation by Inverse Path Distance Weighting in R



Base layers



Cost raster  
(50m resolution)

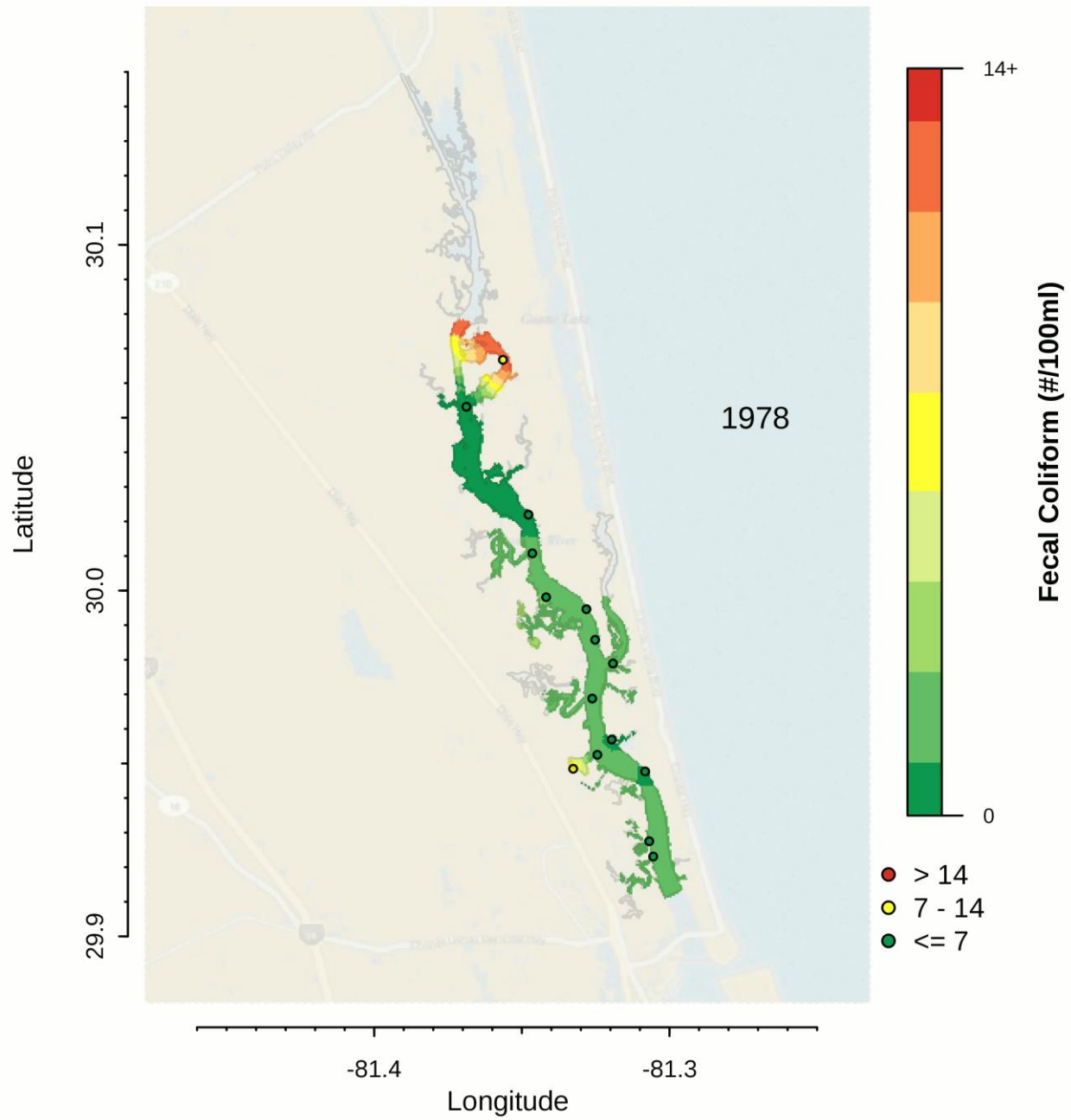


Interpolated raster



Fecal Coliform (#/100ml)

# Tolomato/Guana River





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## Fecal Coliform

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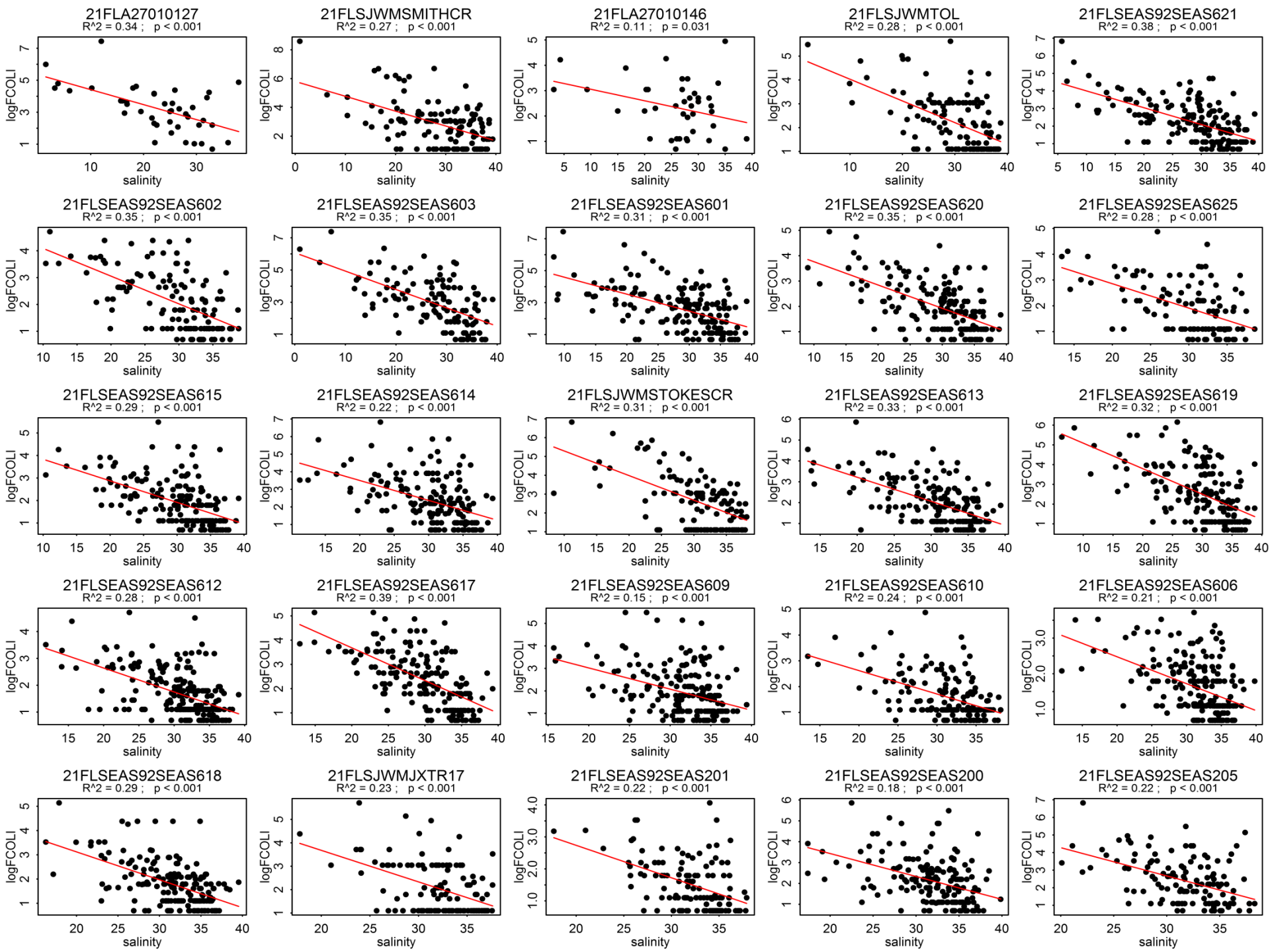
## Water Quality / Nutrients

- Florida DEP STORET
- GTM NERR SWMP data
- NCCOS 2014 Ecol. Assess.

20,526 monthly FC means  
253 stations  
1970s - 2015

18,602 monthly salinity means  
312 stations  
1970s - 2016

15,819 monthly means  
233 stations  
1970s - 2014



Questions?

