Evaluation of Broader Water Quality Assessments for Coastal National Parks

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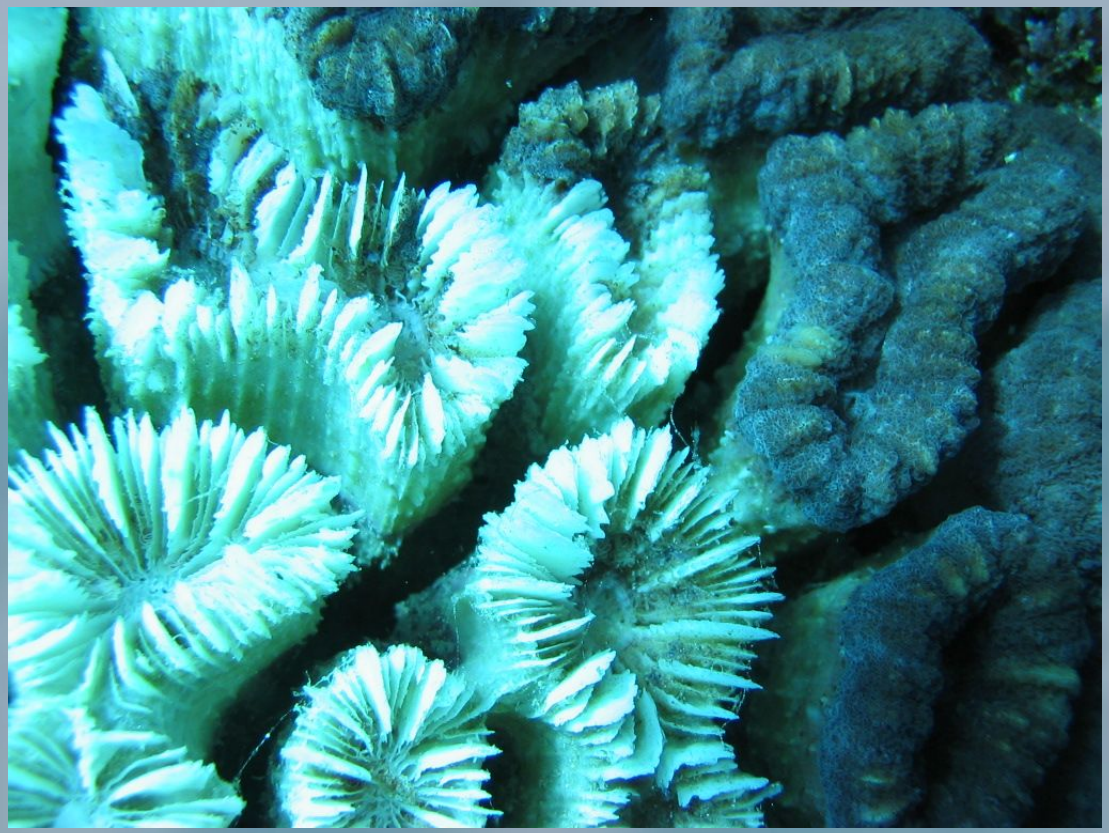
National Park Service

Water Resources Division

What we are trying to AVOID…

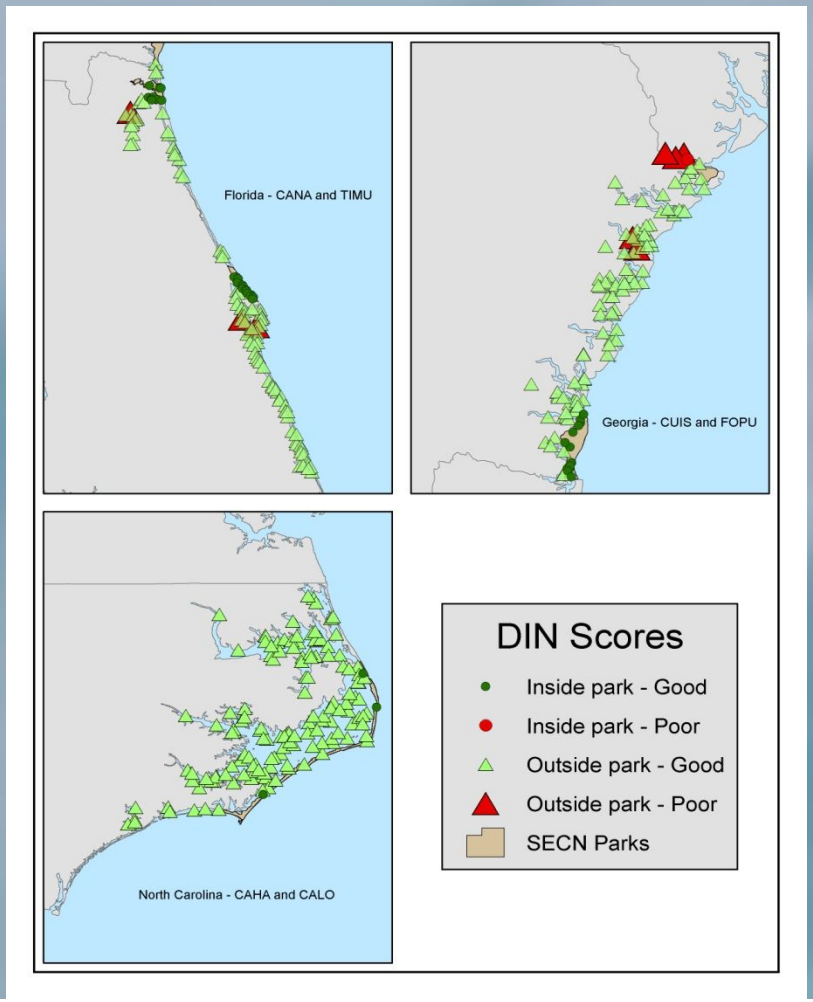


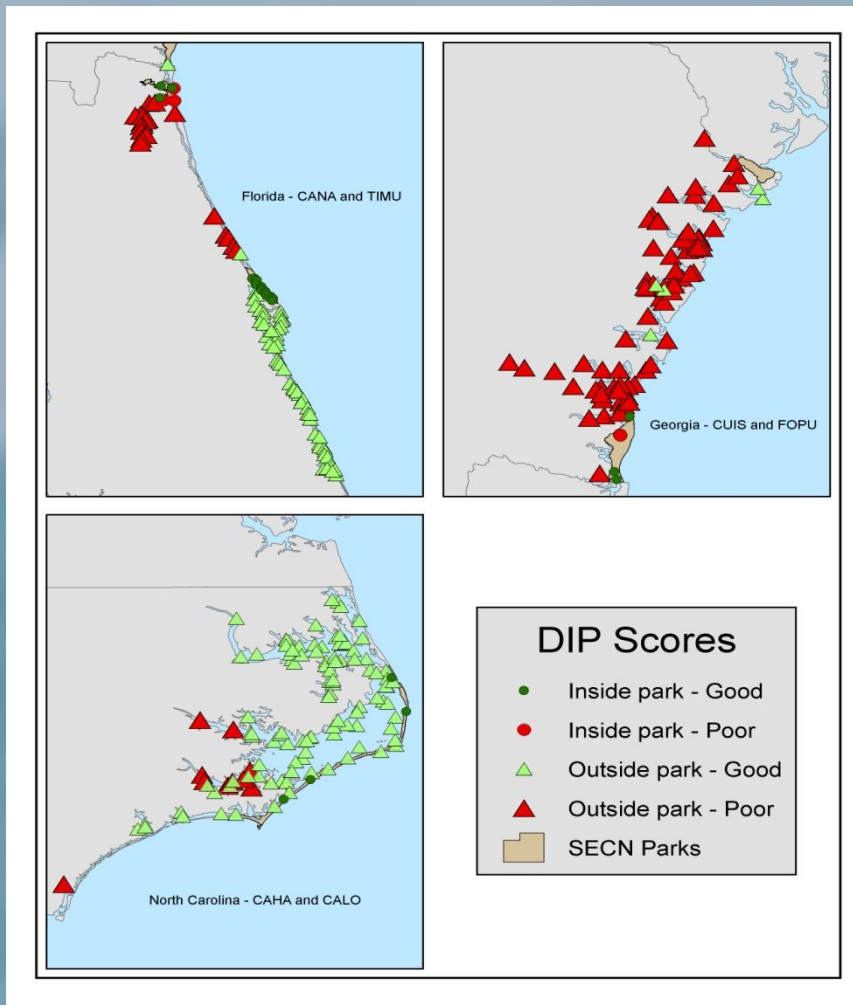
Vital Signs Monitoring

- System divided into 32 networks of parks with similar resources
- Systematic monitoring of key natural resources (*Vital Signs*) at all parks with natural resources
- Long-term monitoring with management relevance
  - Explicit objectives
  - Planning for integration

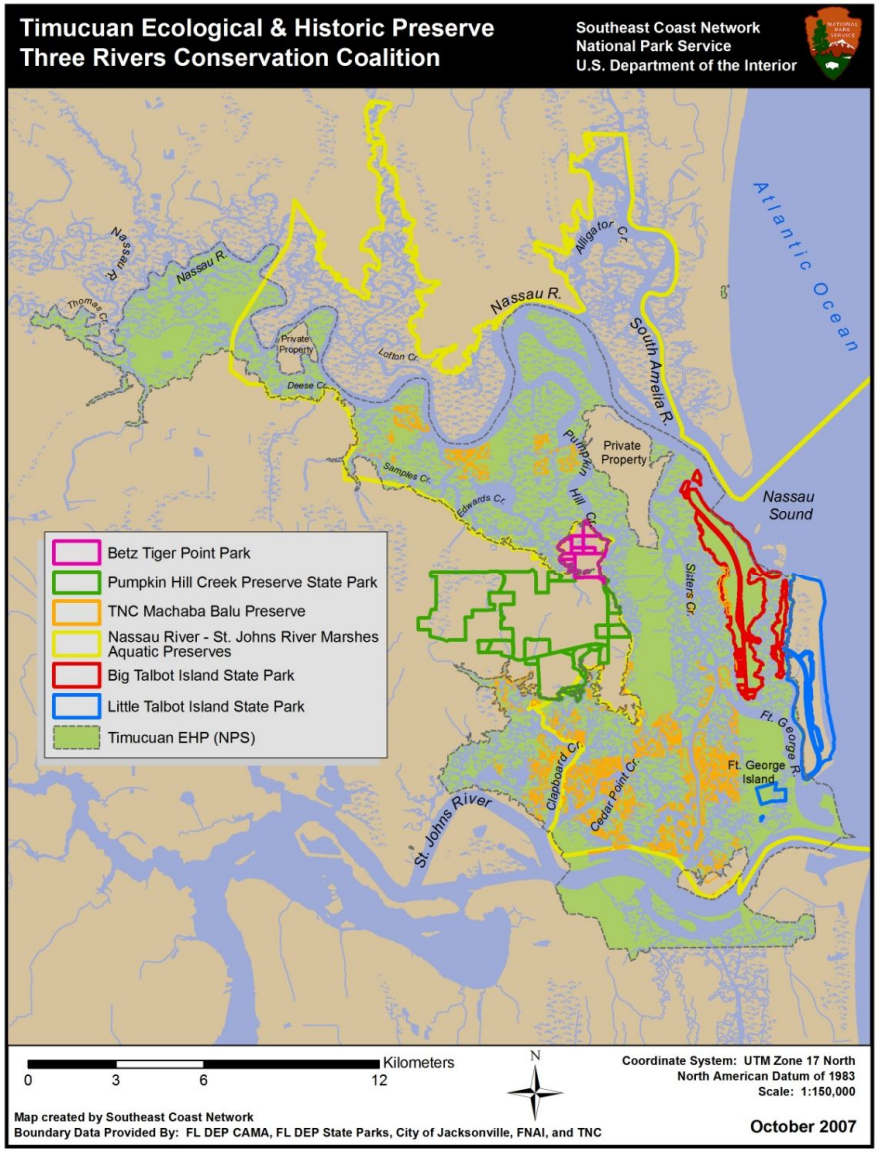
Local Water Quality Issues

Large Scale Water Quality Issues



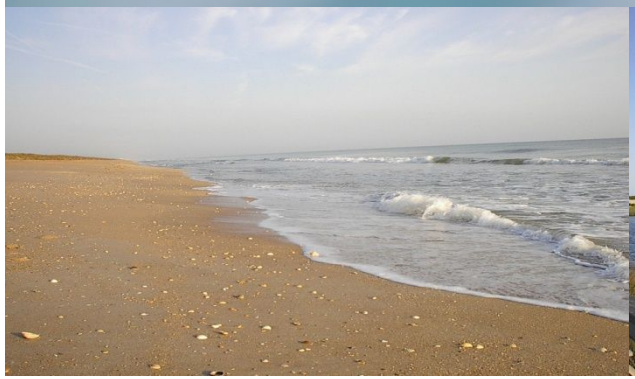


Organizations Working Together

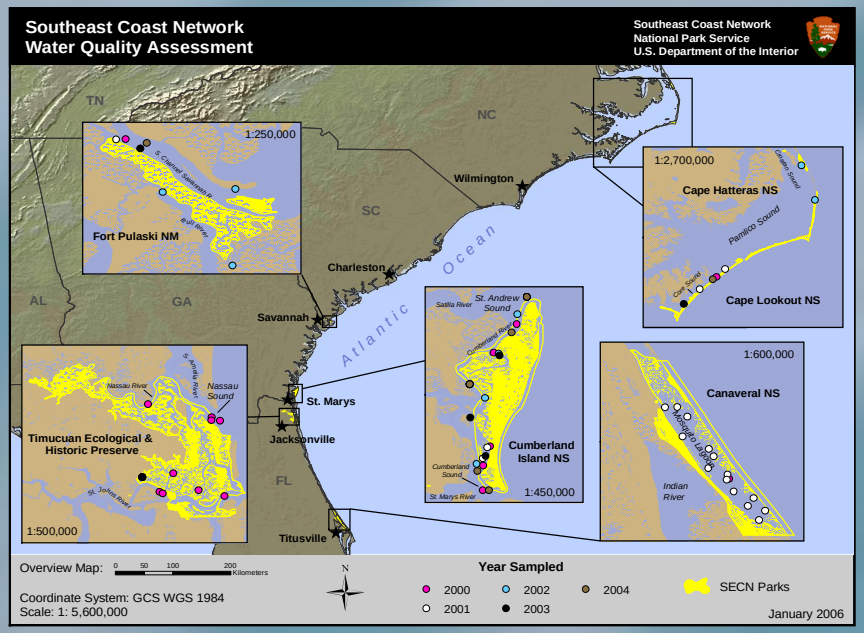


Pilot Projects

- Probabilistic Surveys
- Water Quality Data Synthesis



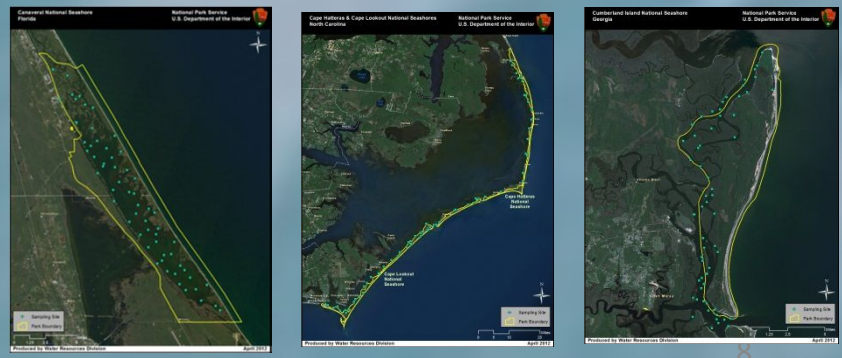
Probabilistic Surveys in National Parks



Southeast Big Picture

National Park of American Samoa

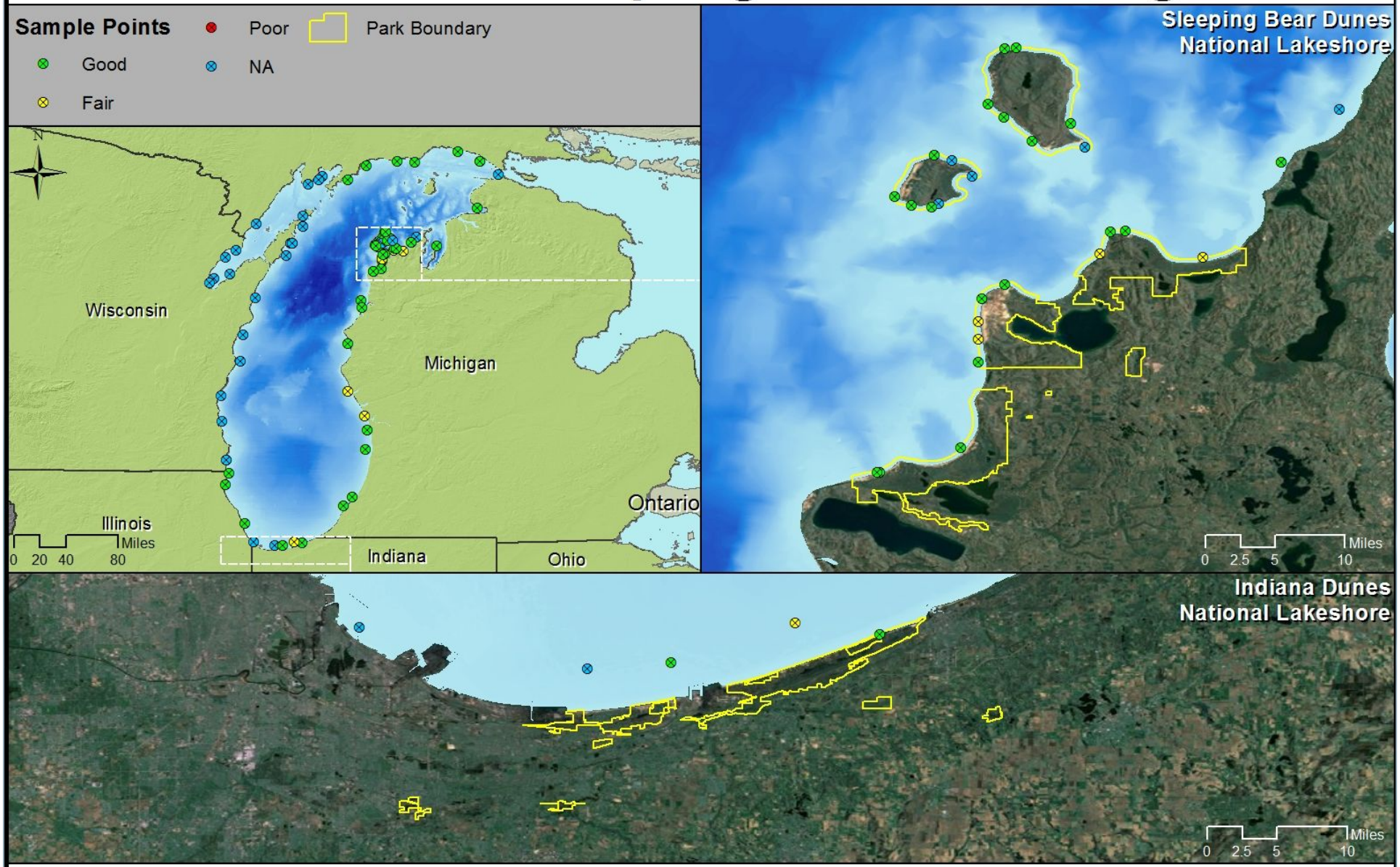
Southeast Coast Network Monitoring Program



Lake Michigan

National Park Service
U.S. Department of the Interior

2010 Great Lakes Sampling for Lake Michigan



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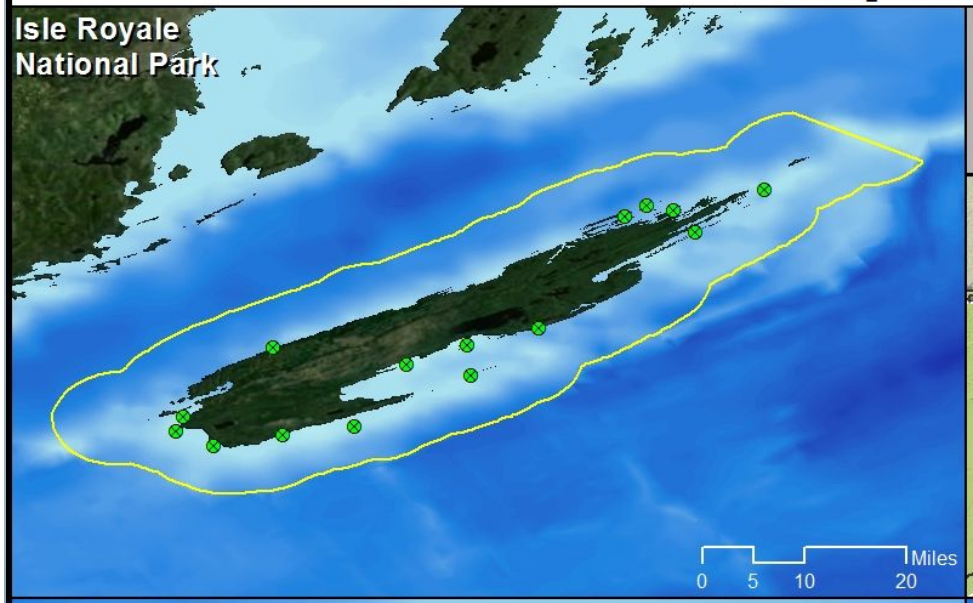
April 2012

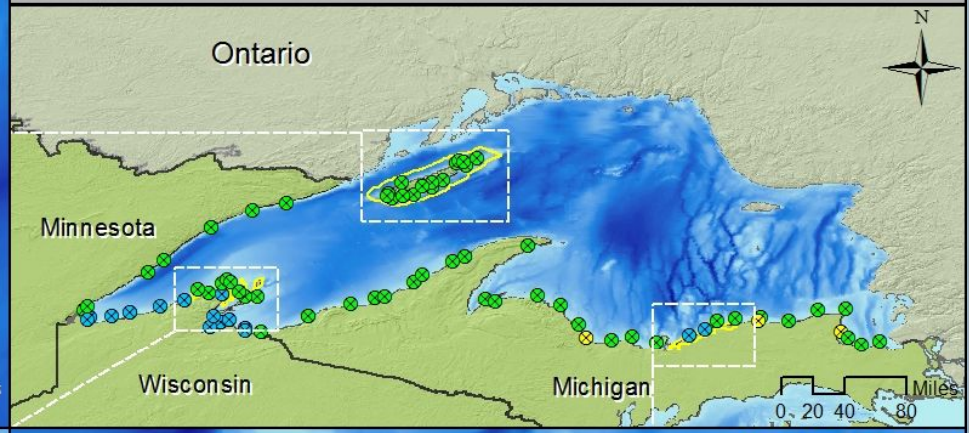
Lake Superior

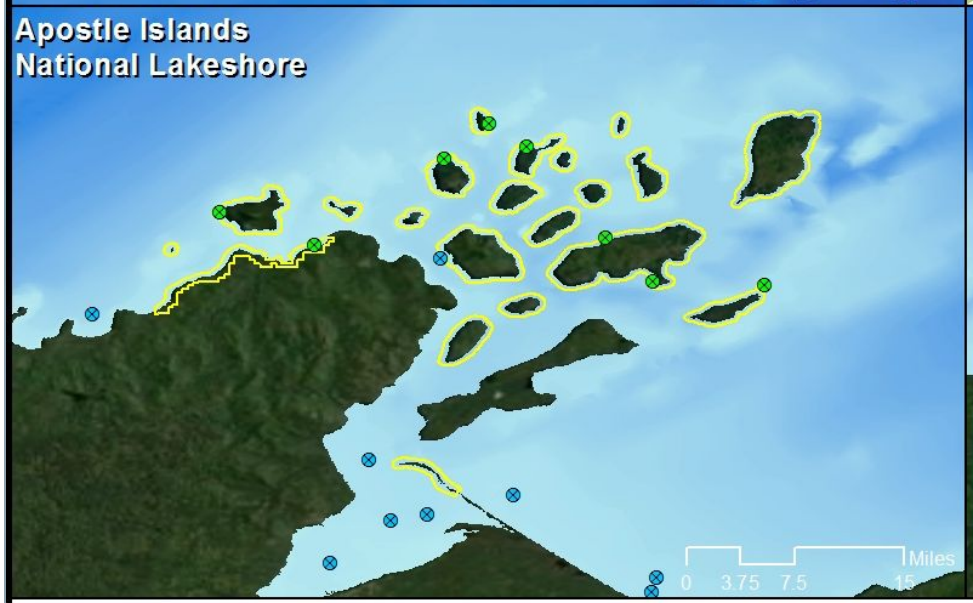
National Park Service
U.S. Department of the Interior

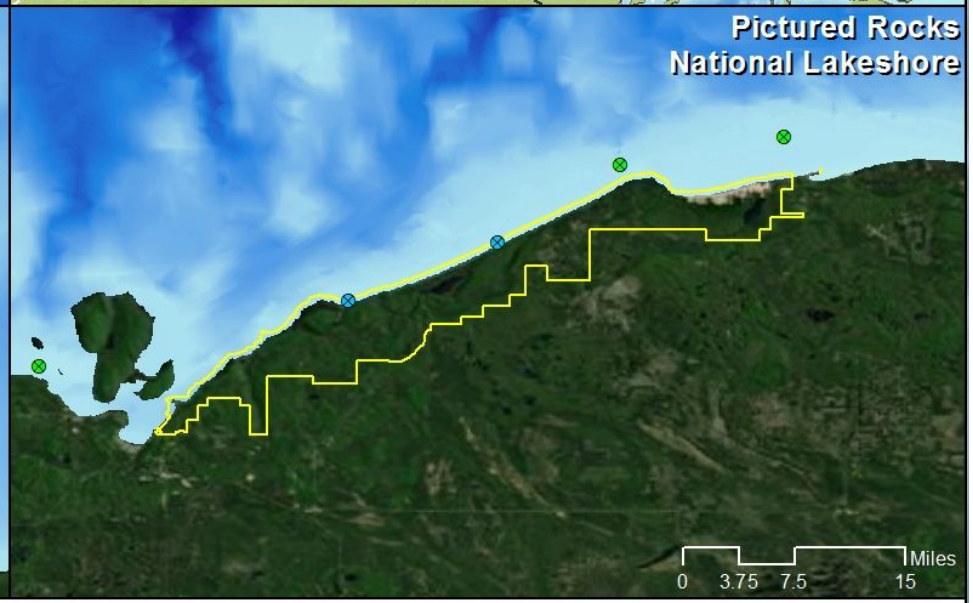
2010 Great Lakes Sampling for Lake Superior



Sample Points
Good
Fair
Poor
NA
Park Boundary







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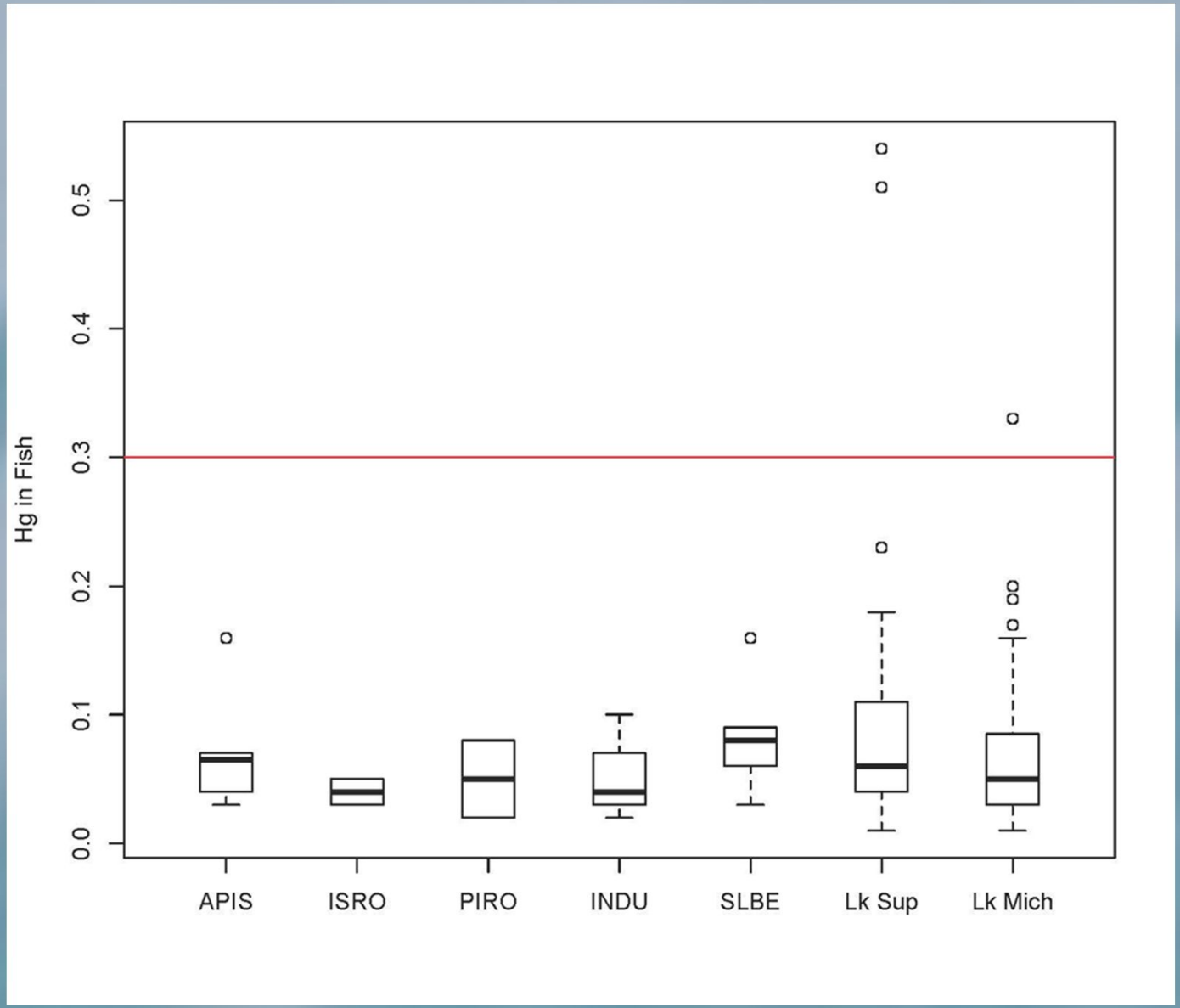
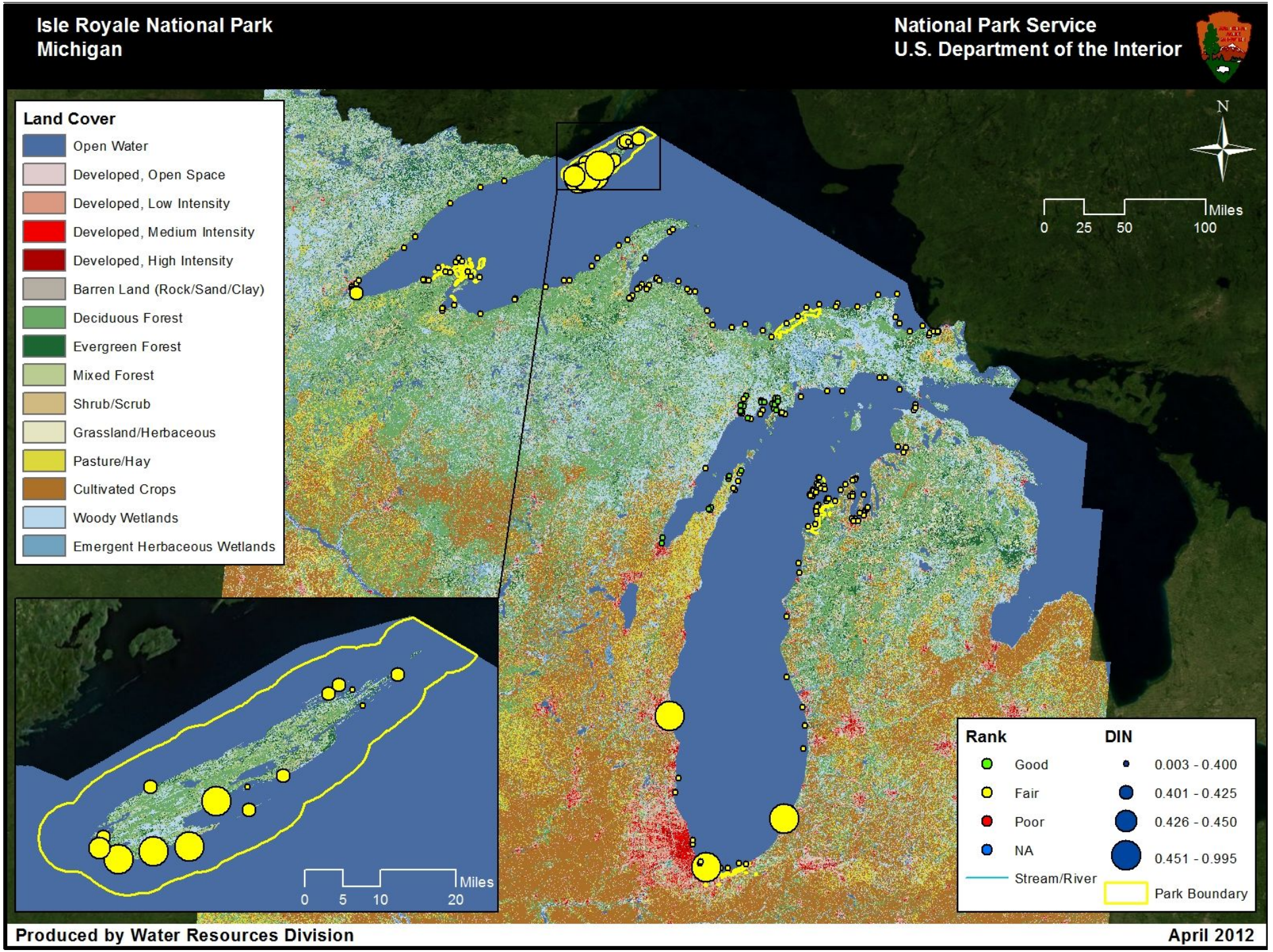

Hg in Fish
0.0
0.1
0.2
0.3
0.4
0.5
APIS
ISRO
PIRO
INDU
SLBE
Lk Sup
Lk Mich


Isle Royale National Park
Michigan
National Park Service
U.S. Department of the Interior
Land Cover
Open Water
Developed, Open Space
Developed, Low Intensity
Developed, Medium Intensity
Developed, High Intensity
Barren Land (Rock/Sand/Clay)
Deciduous Forest
Evergreen Forest
Mixed Forest
Shrub/Scrub
Grassland/Herbaceous
Pasture/Hay
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands
N
Miles
0 25 50 100
Miles
0 5 10 20
Rank
Good
Fair
Poor
NA
Stream/River
DIN
0.003 - 0.400
0.401 - 0.425
0.426 - 0.450
0.451 - 0.995
Park Boundary
Produced by Water Resources Division
April 2012

Probabilistic Surveys

Positives

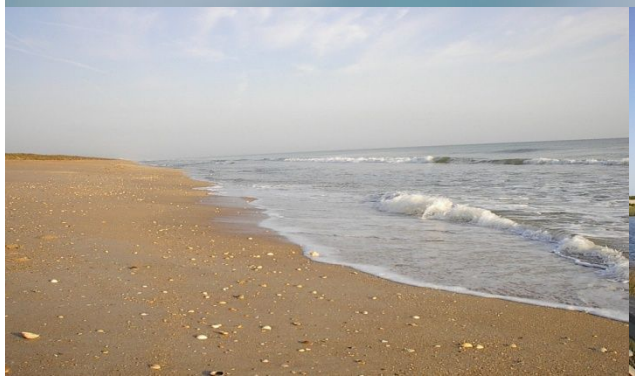
- Data directly comparable to data collected outside park boundaries.
- Gives us a big picture view of water quality.
- Possible cost-sharing with EPA.
- Easy for managers to understand.

Negatives

- A snapshot once every 5 years.
- No seasonal trends.
- Expensive

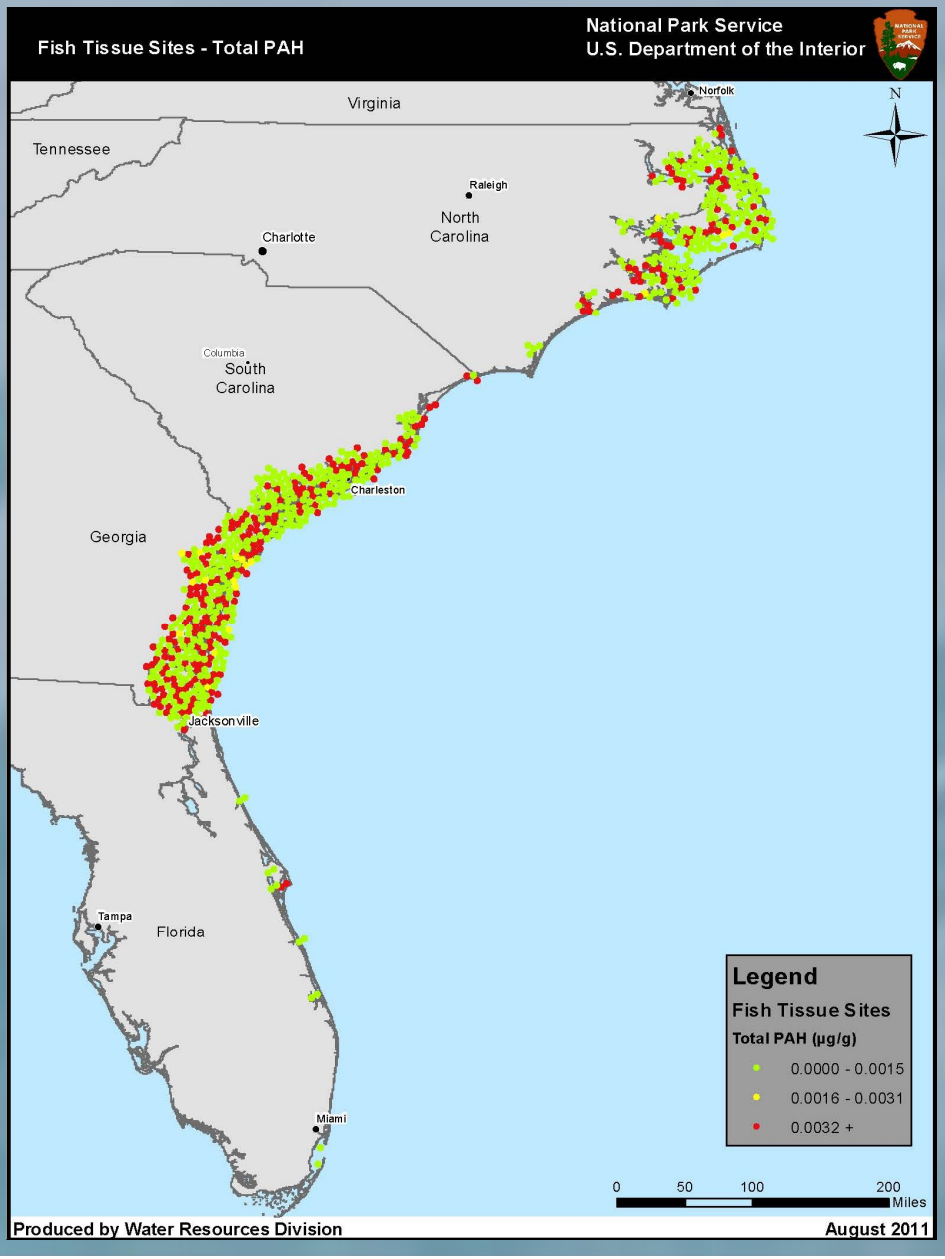
Pilot Projects

- Probabilistic Surveys
- **Water Quality Data Synthesis**



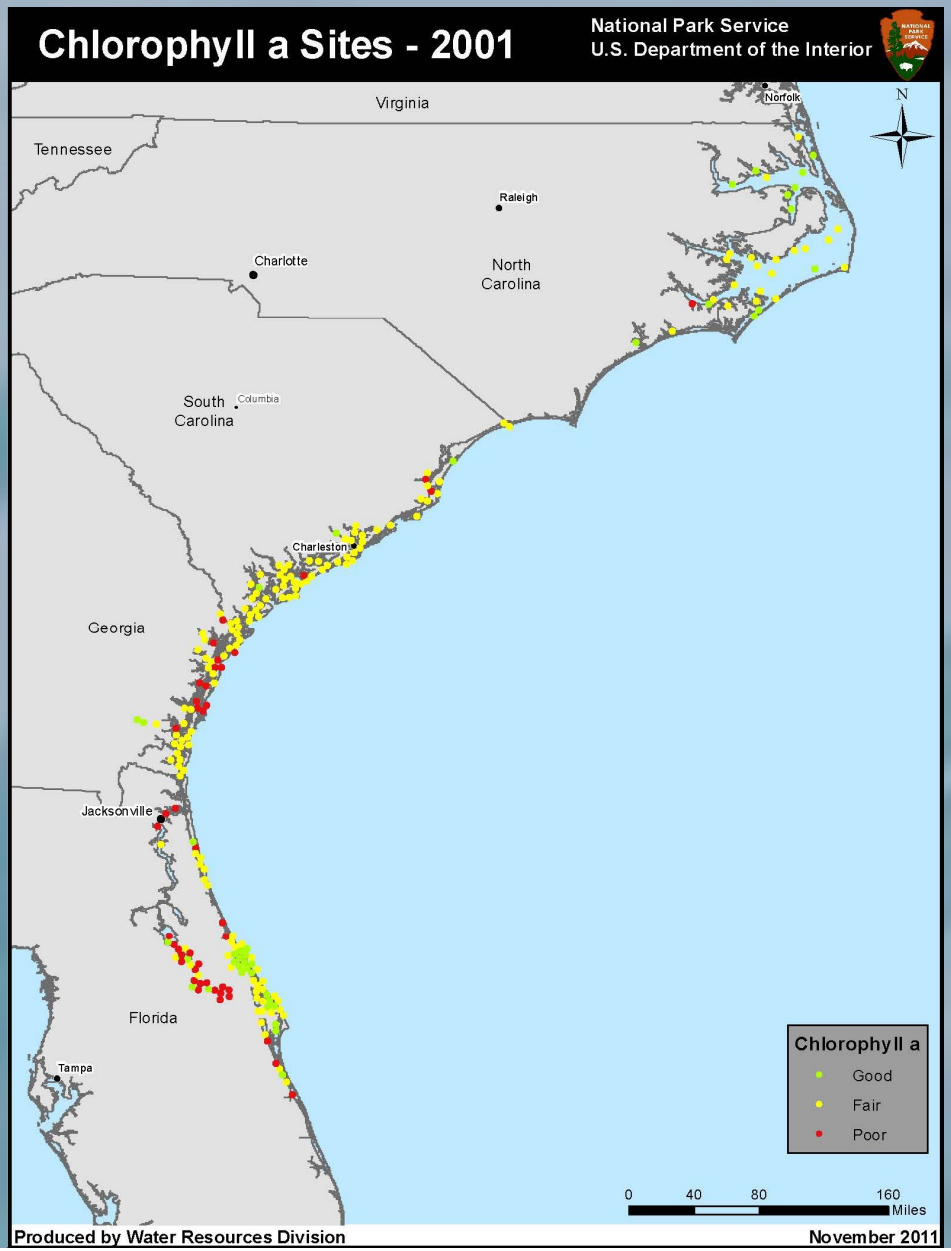
Fish Tissue and Sediment

- Regionally, elevated arsenic, polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs).
- Very little sediment contamination evident.



Southeast Water Quality Concerns

- Elevated chlorophyll *a* raises concerns about eutrophication and harmful algal blooms.
- Low dissolved Oxygen in Georgia parks.
- High Dissolved Inorganic Nitrogen and Dissolved Inorganic Phosphorus inside and outside park boundaries.



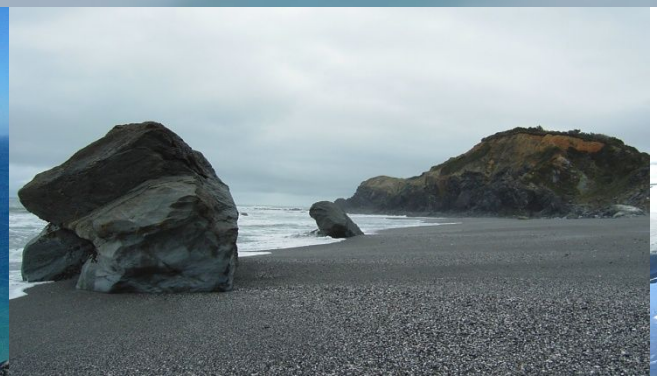
Water Quality Data Synthesis

Positives

- Gives us a big picture view of water quality.
- Allows analysis of non-traditional parameters.
- Provides guidance for future efforts.
- Seasonal patterns.

Negatives

- Analysis depends on what data are available.
- Synthesis limited by varying sampling designs and time scales.
- Limited in ability to interpret the data.



QUESTIONS?