STATE OF THE BAY – INDICES?

MBNEP SAC Meeting

May 25, 2016

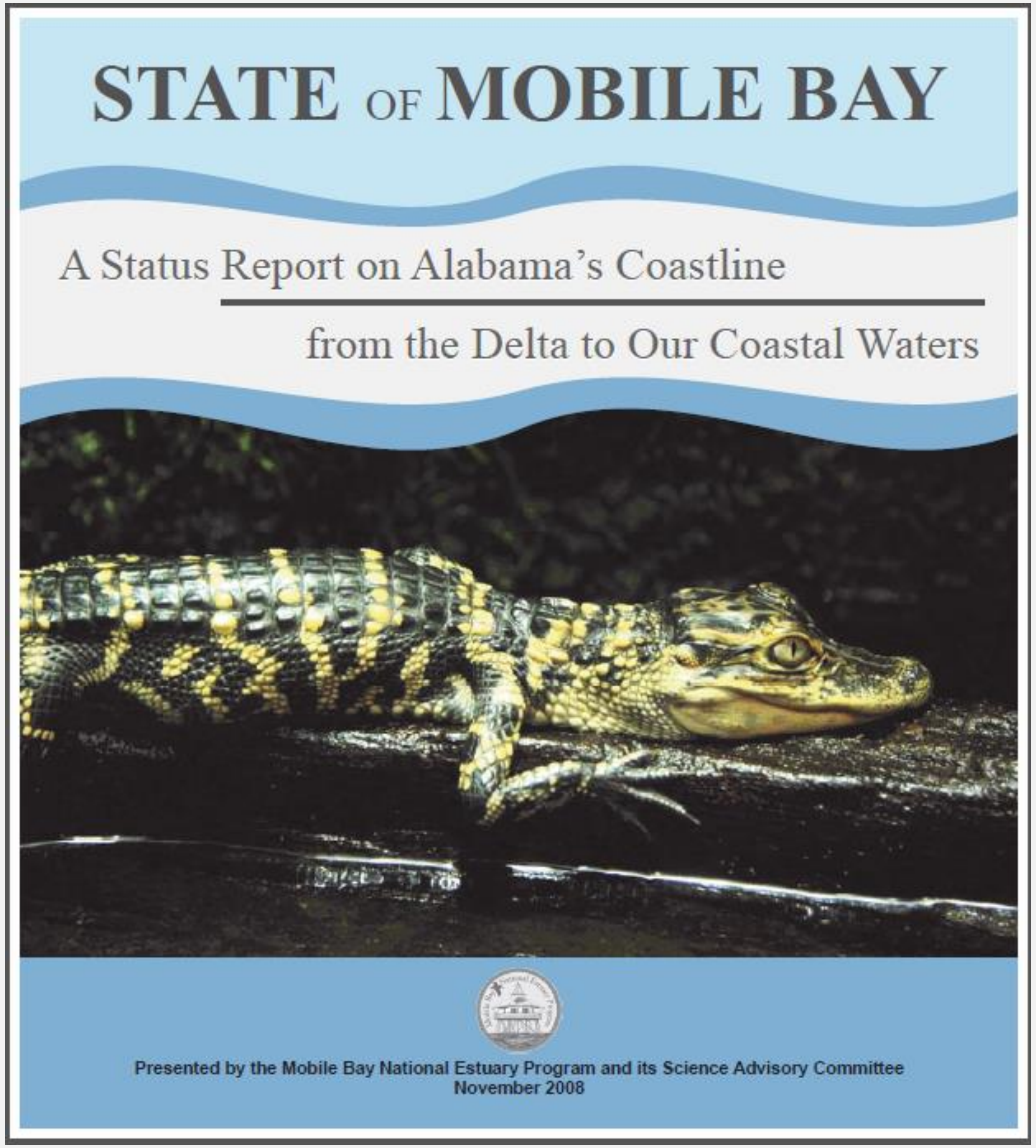
Killian Room

OUTLINE

- State of the Bay
- Example Indices
  - Chesapeake Bay
  - Tampa Bay
- Previous Parameters
- Available Data

2008 STATE OF THE BAY

- 15 indicators
  - Human Impacts (3)
  - Habitats (3)
  - Living Resources (3)
  - Water Quality (5)
  - Community Involvement (1)
- Captured a lot about the bay
- Educational
- No interaction or synthesis of indicators



EXAMPLES OF OTHER ESTUARY SYNTHESIS – CHESAPEAKE BAY

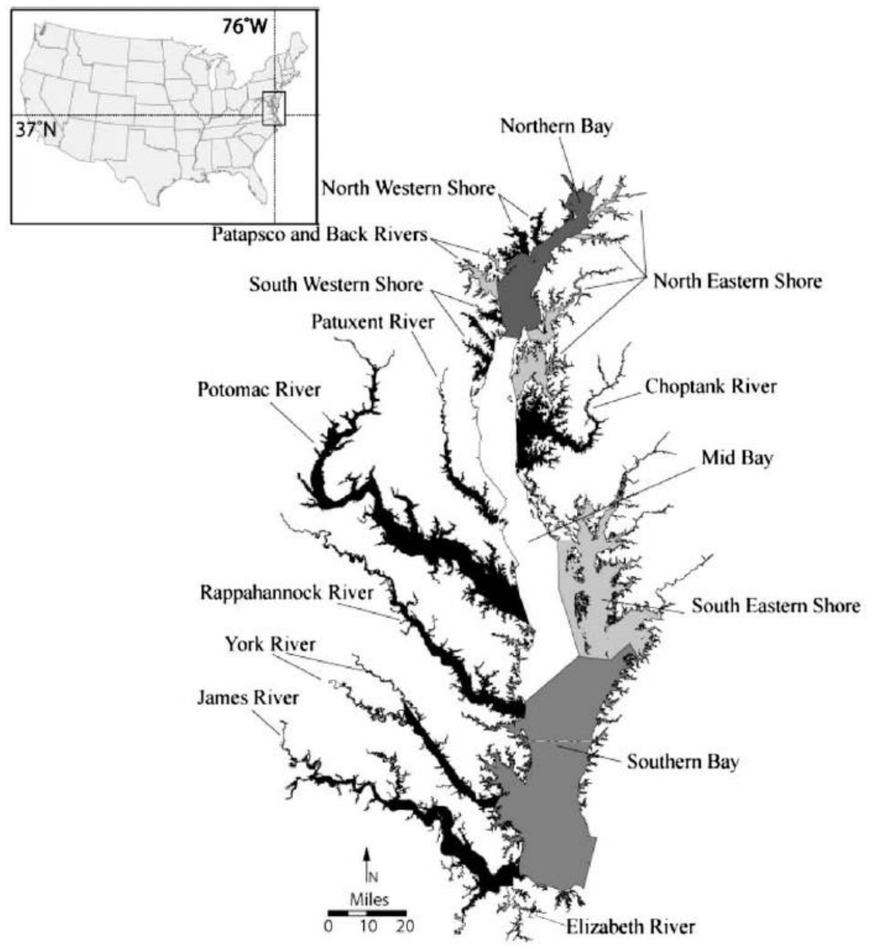
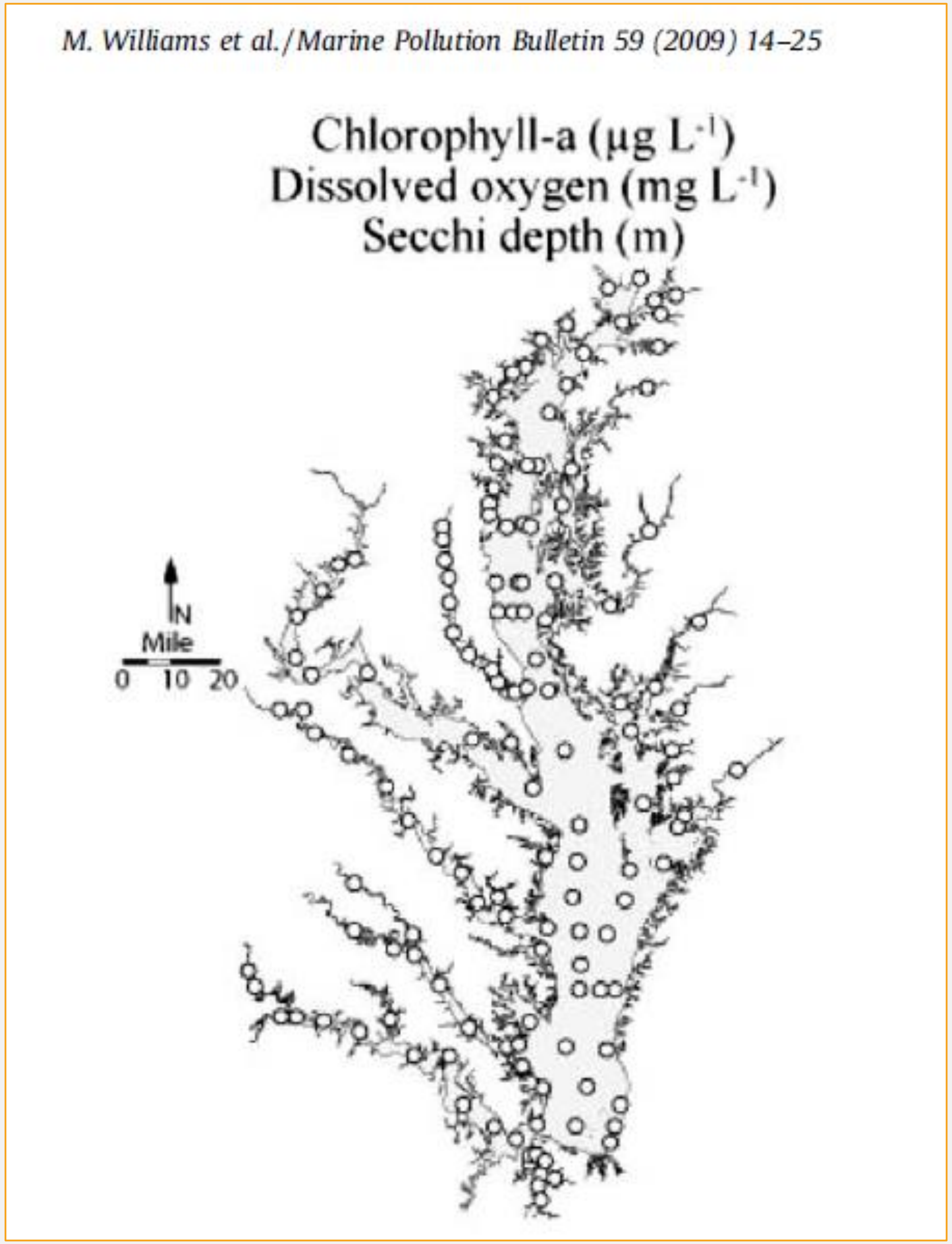


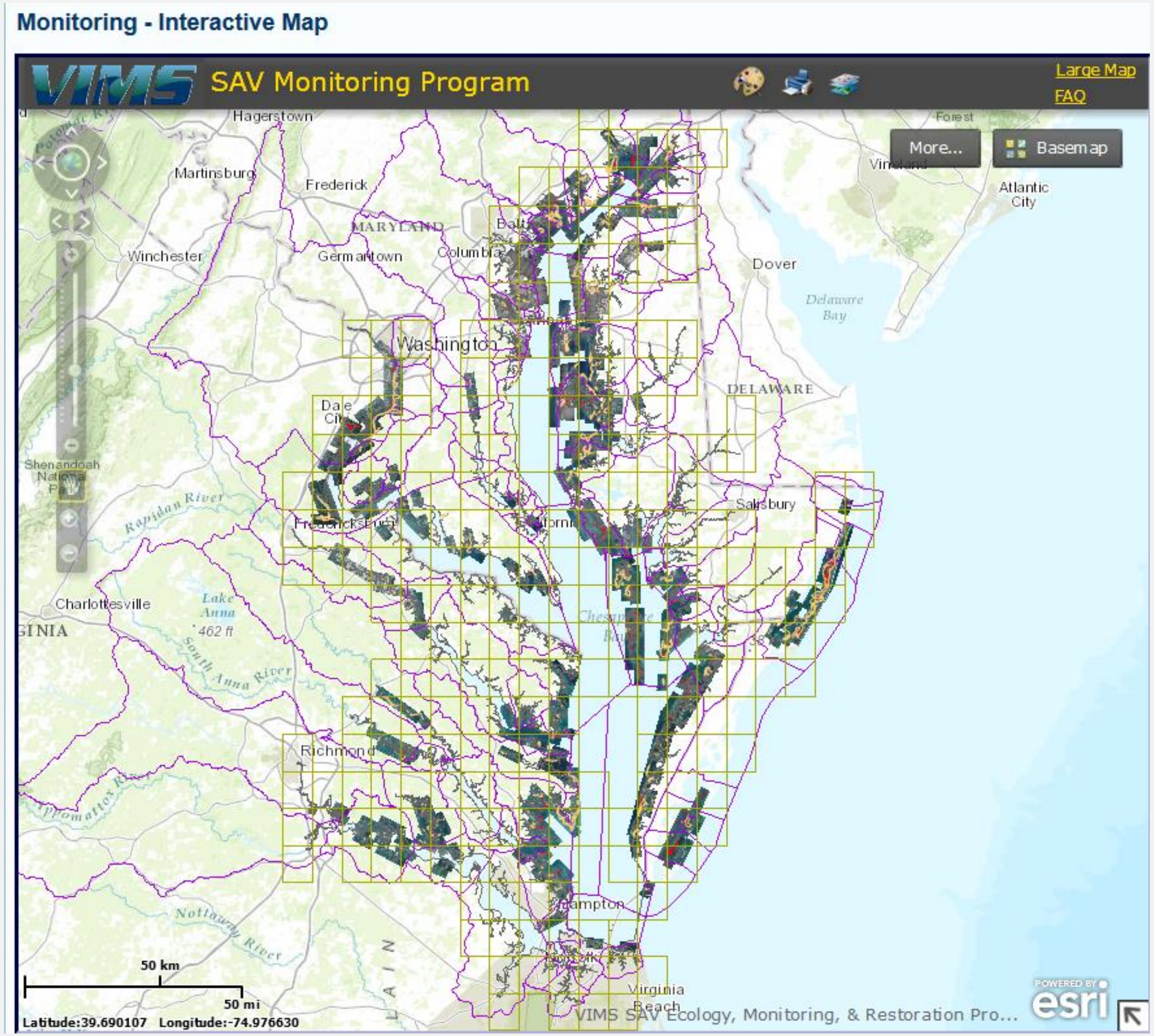
Fig. 1. Location of the Chesapeake Bay on the eastern seaboard of the continental USA. Reporting regions used in this analysis are identified.

- Williams et al 2009
- Data from 1985 - 2007
- Utilized existing indices
  - Chl-a
  - DO
  - Secchi
  - Phytoplankton IBI (P-IBI)
  - Benthic Macroinvertebrate (B-IBI)
  - SAV

CB –WATER QUALITY

- Secchi
- DO – whole column
- Chl-a – surface
- Monthly or bi-monthly
- 152 fixed sites
- Different growing seasons
- Thresholds
- n(fail):n(total)

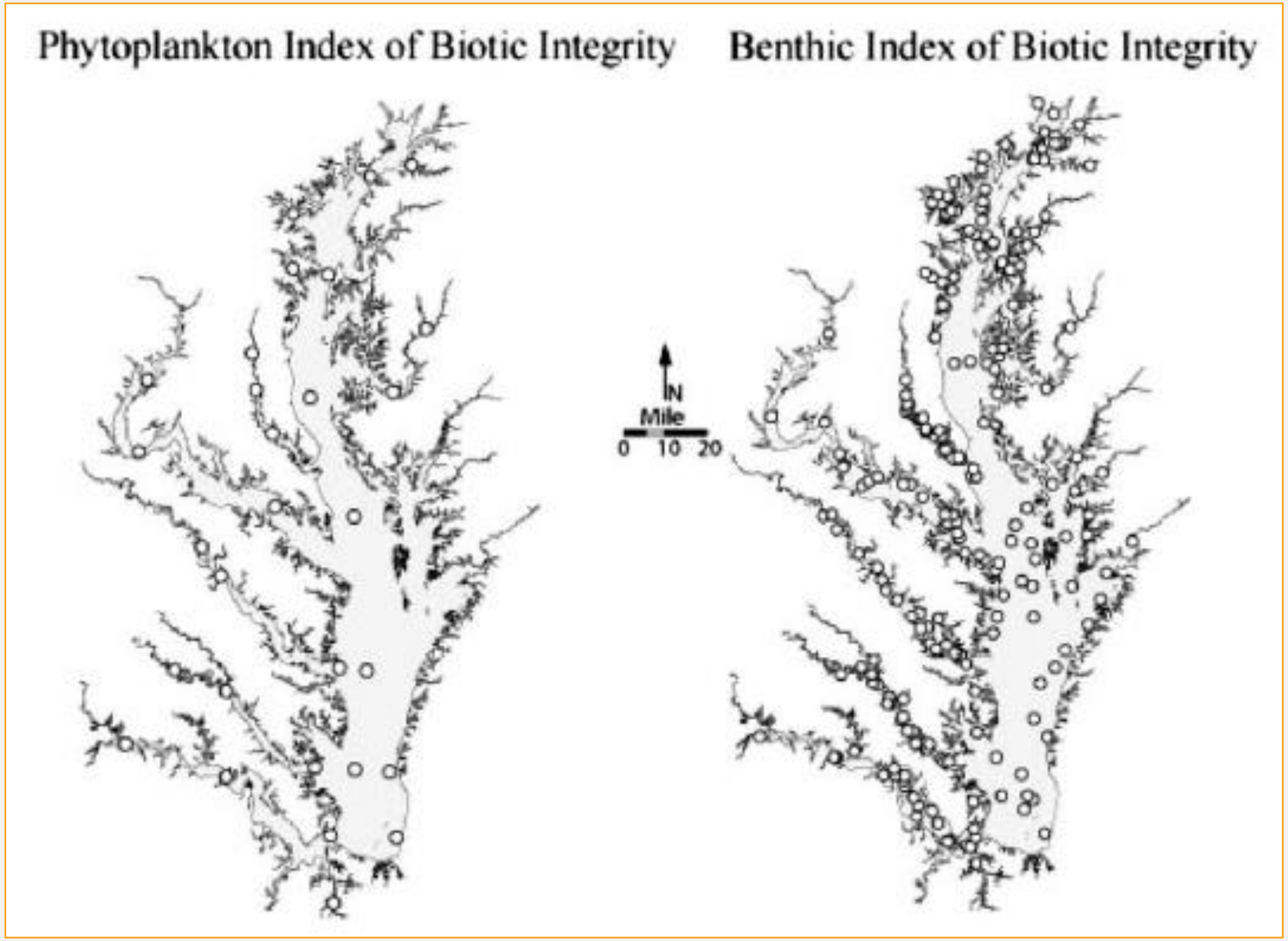




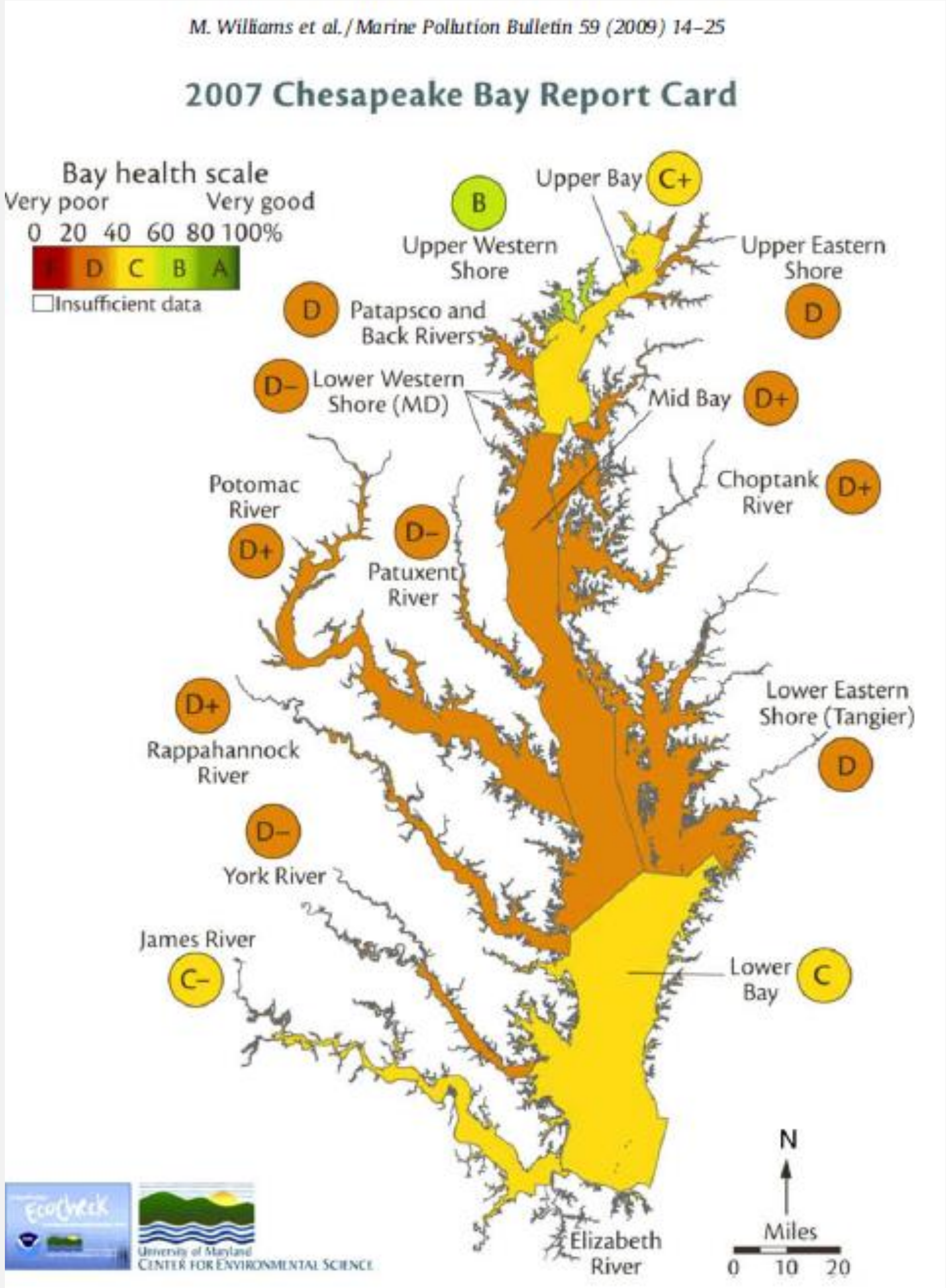
CB - SAV

- Annual surveys
- Restoration goals for each “zone”
- n(fail):n(total)

CB IBIS



- Annual surveys
- Index scores: pass fail
- n(fail):n(total)

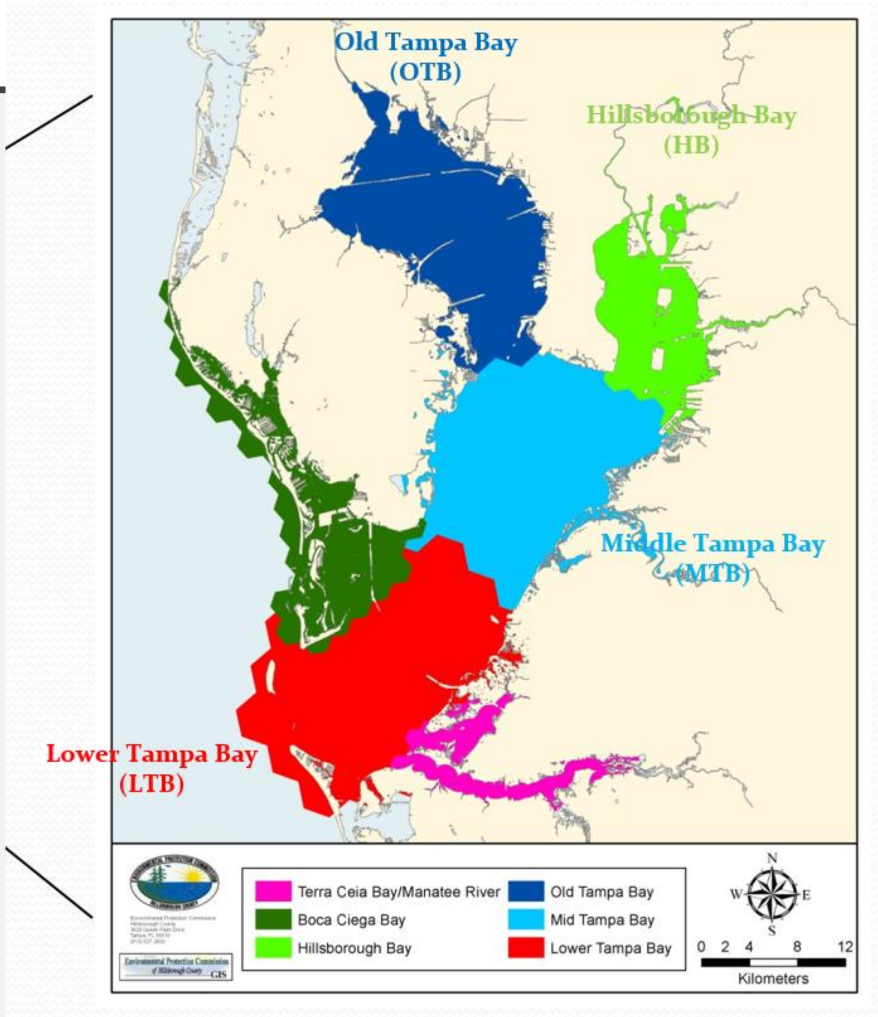


CB INDEX – OTHER POINTS

- Aggregated up to one score per area
- Sensitive to flow
- Identified that B-IBI and SAV are slower to respond – less flow variable
- No N or P b/c "no defensible ecological health-based thresholds"

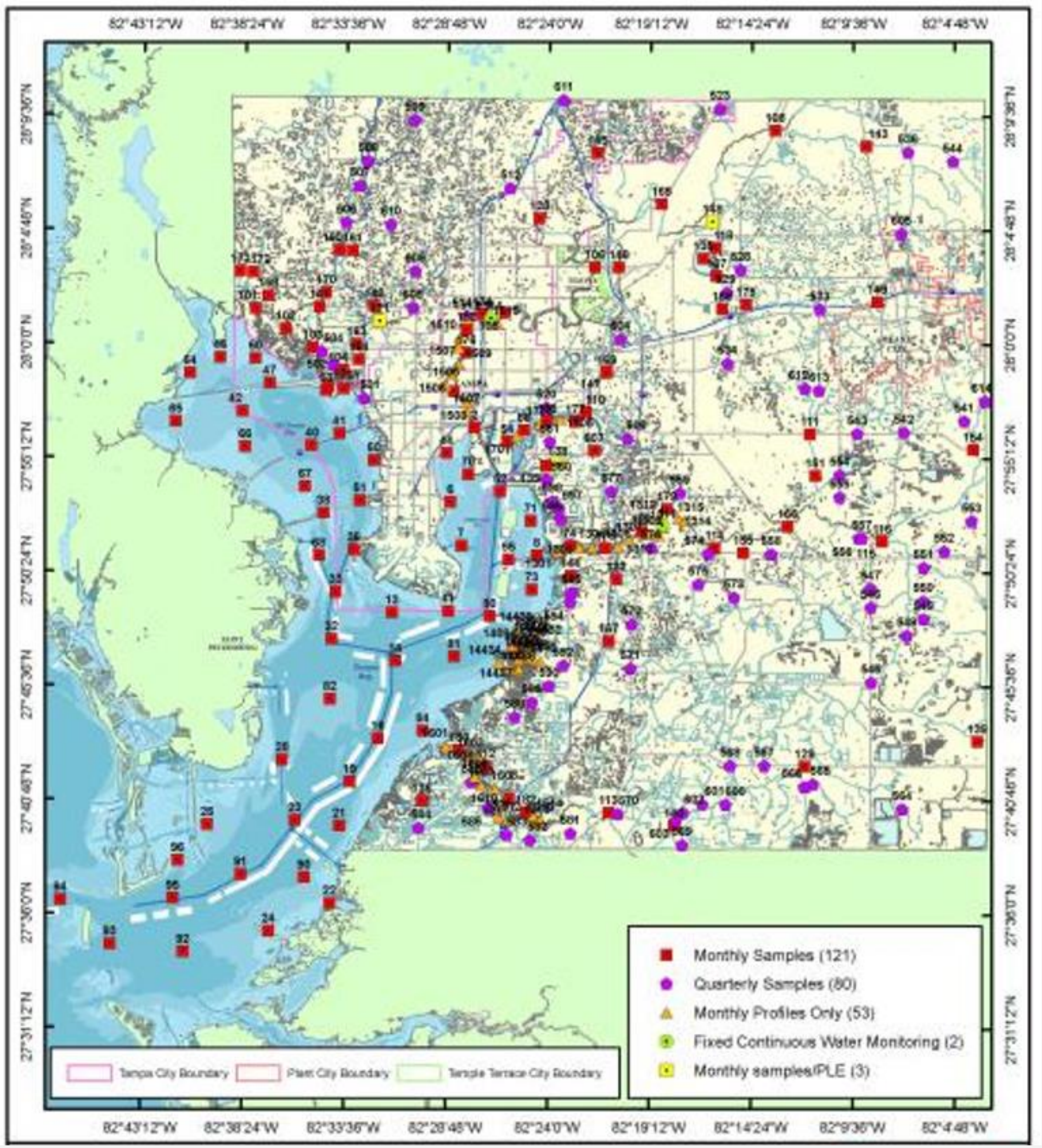
TAMPA BAY INDEX

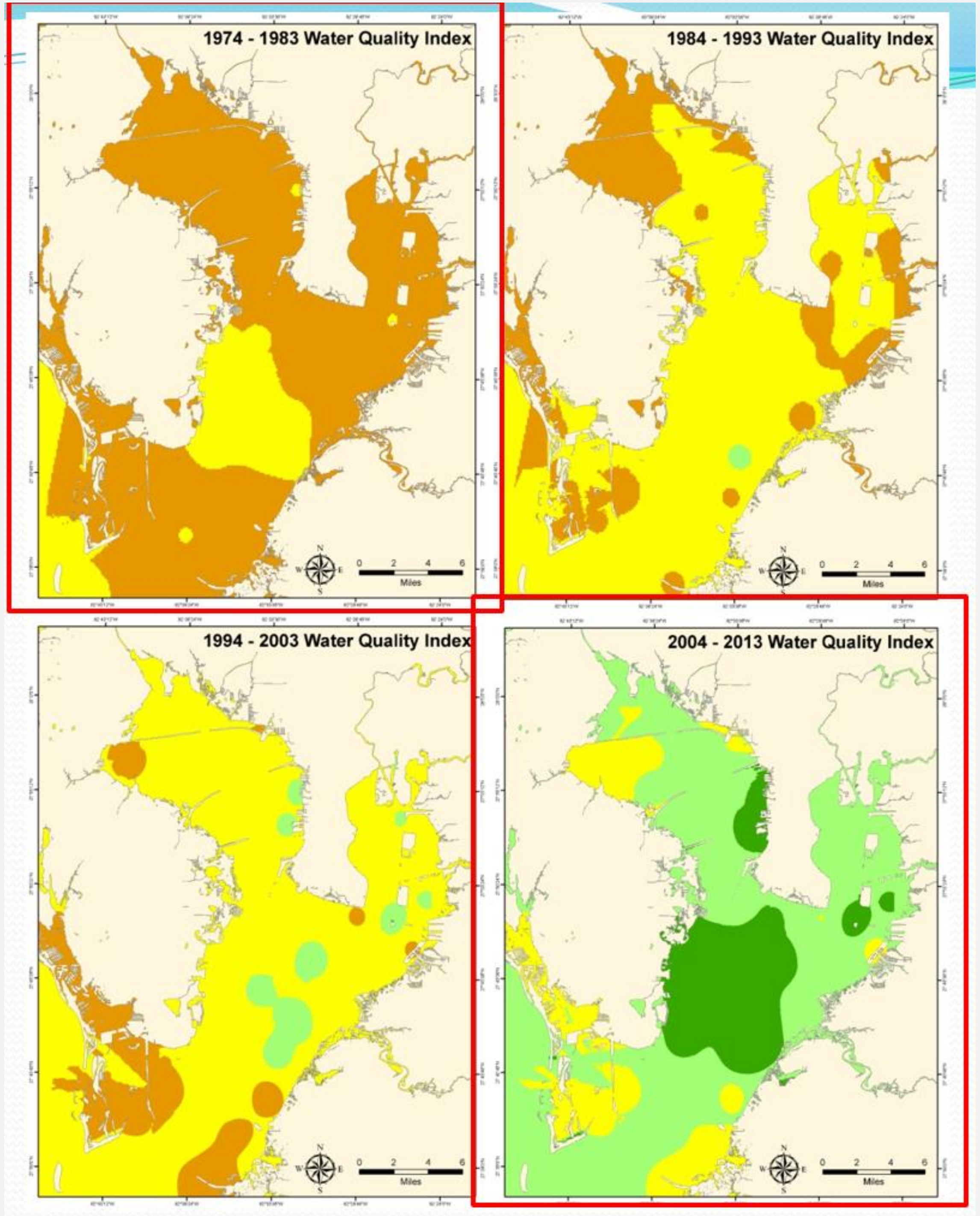
- In prep
- Monitoring data 1974 – 2015
- No indices – direct parameters
  - Chl-a
  - Total N
  - Total P
  - Bottom DO
  - Fecal Coliform
  - Secchi
  - Turbidity



TAMPA BAY INDEX

- Monthly sampling (252 stations)
- Thresholds for each – pass/fail
- Score for each parameter





TAMPA BAY INDEX

- Mean of each score x 100
  - Final score = report card grade
- Show clear temporal and spatial changes

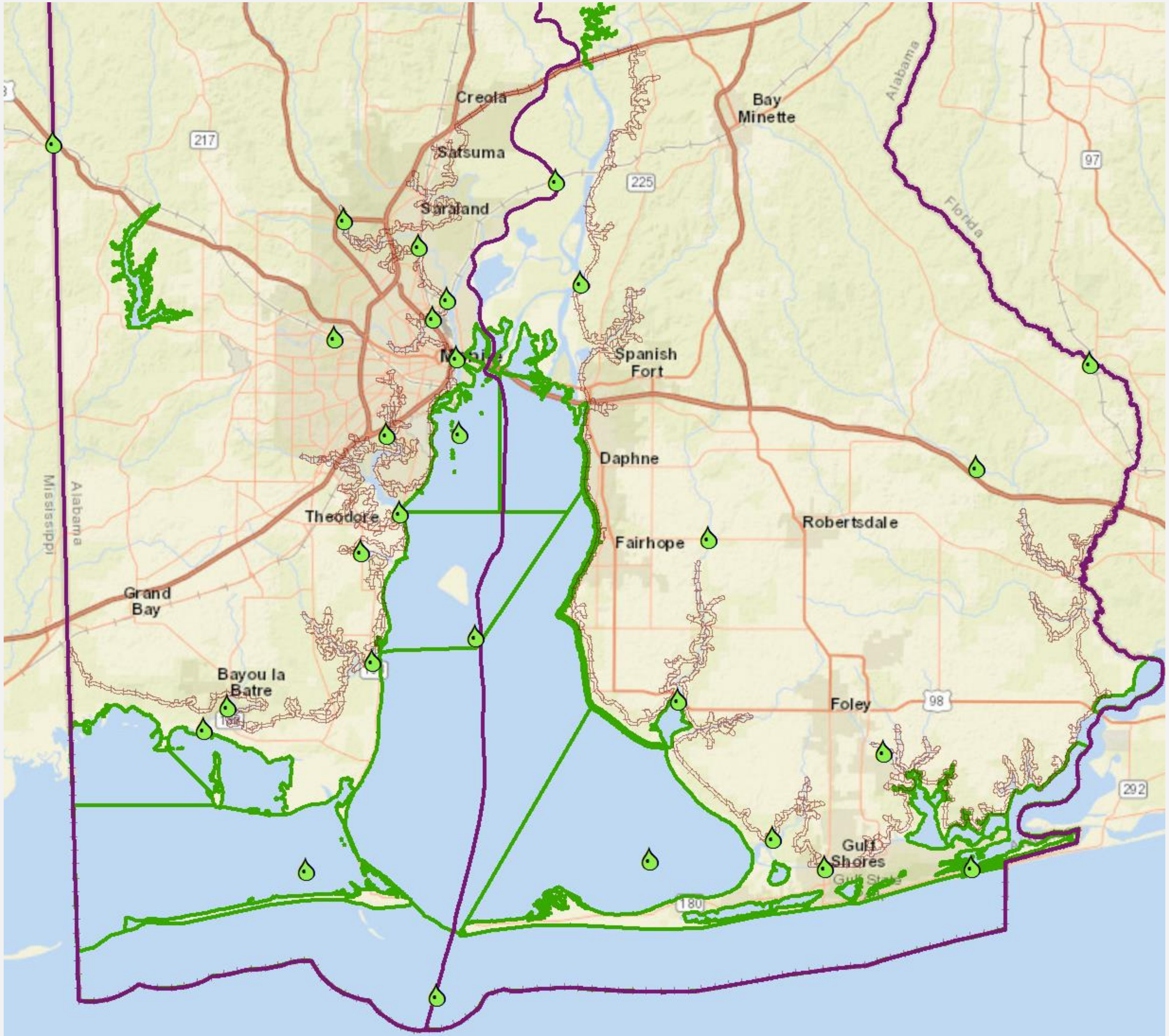
COULD WE DO THIS? – WHAT'S IN THE STATE OF THE BAY

- **Human Impacts**
  - Population Change
  - Land Use Change
  - Hydrologic and Bathymetric Changes
- **Habitats**
  - Acres of Habitat
  - Acres of Protected or Restored Habitat
  - Shoreline Change
- **Living Resources**
  - Sustaining Fishery Populations
  - Threatened/Endangered Species
- **Water Quality**
  - Toxicity
  - Pathogens
  - Nutrients
  - Municipal Wastewater Permit Violations
  - 303(d) – listed streams
- **Community Involvement**
  - Outreach and Education

COULD WE DO THIS? AVAILABLE DATA

- Land use change (Annual – Landsat)
- Population change (Census, ?)
- Habitat maps (2002, 2009, 2016)
- Historical USACOE habitat maps?
- Acres of protected habitat
- Fisheries landings
- Endangered species

- MBNEP continuous monitoring – DO
- ADPH monitoring – Pathogens
- ADEM coastal monitoring – DO, nutrients, Turb, Secchi, Photic, Chl-a, Pathogens, Metals
- 303(d) listings
- Chl-a (remote sensing?)
- Turbidity (remote sensing?)
- What else??


Creola
Bay Minette
Satsuma
Saraland
Spanish Fort
Daphne
Theodore
Fairhope
Robertsdale
Grand Bay
Bayou la Batre
Foley
Gulf Shores
Mississippi
Alabama
Florida
217
225
97
98
292
180

Mobile River (PORTS)
Alabama
Meaher Park
Mobile Bay
Middle Bay Light
Weeks Bay (NERRS)
Mississippi
Cedar Point
Bon Secour
Grand Bay (NERRS)
Dauphin Island
Katrina Cut
Perdido Pass
Fort Morgan (PORTS)
Farewell Buoy (PORTS)
Orange Beach AL Buoy (NDBC)

SHOULD WE DO THIS?
PLEASE DISCUSS