Collaborative Use of SWMP Data in the Aftermath of a Phosphate Spill

Grand Bay National Estuarine Research Reserve

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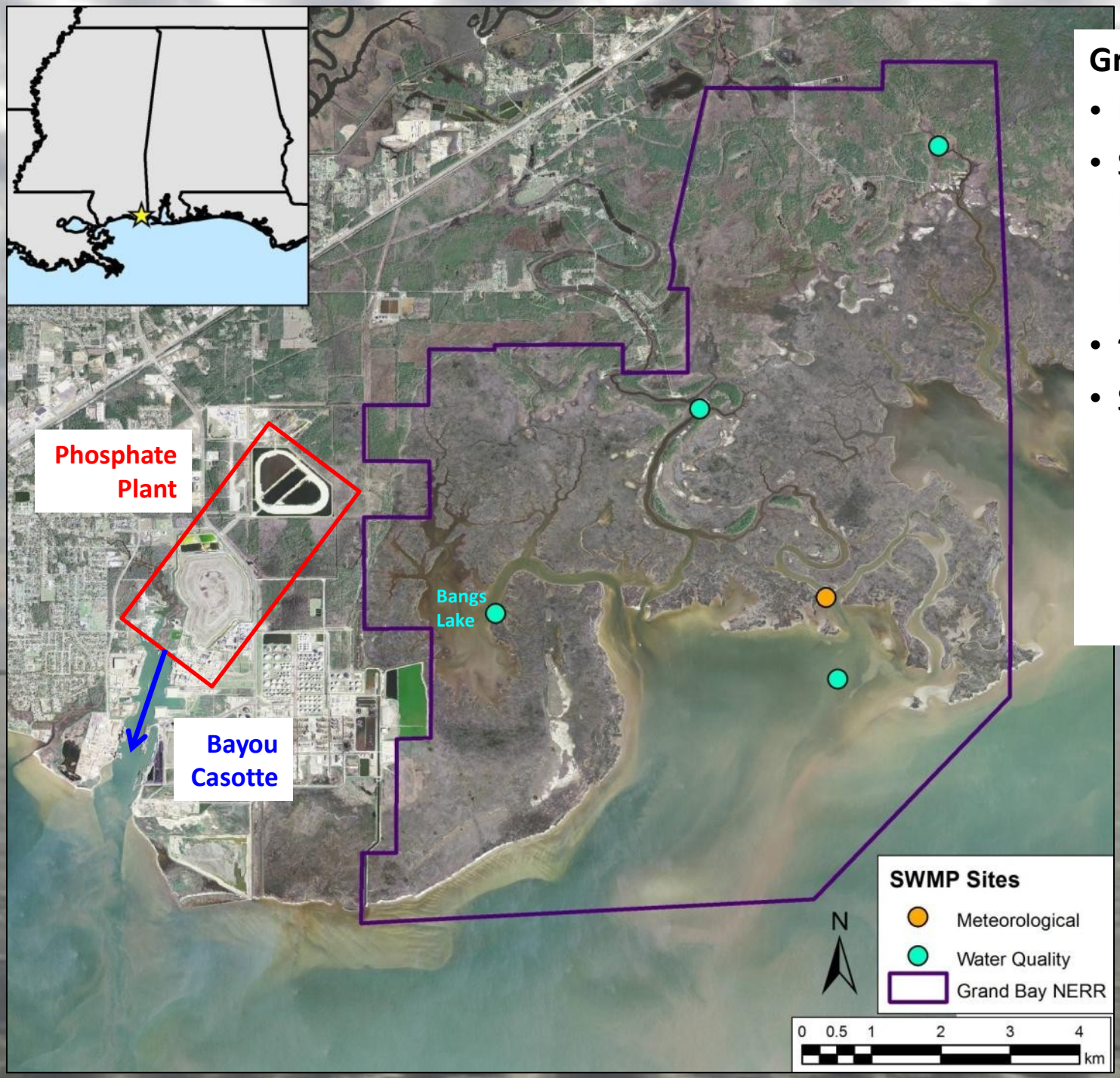
Background photo: Christina Mohrman



Grand Bay NERR

- Established 1999
- State Partner: MS Dept. of Marine Resources (DMR)
- ~18,400 acres
- System is:
  - Shallow
  - Marine-dominated
  - Micro-tidal

The Setting: April 2005

- SWMP Monitoring:
  - Water Quality stations running since January 2004
  - First Nutrient sampling March 2005
- Very rainy spring led to a discharge into Bayou Casotte

Photo: Chris May

The start of the problem in Bangs Lake

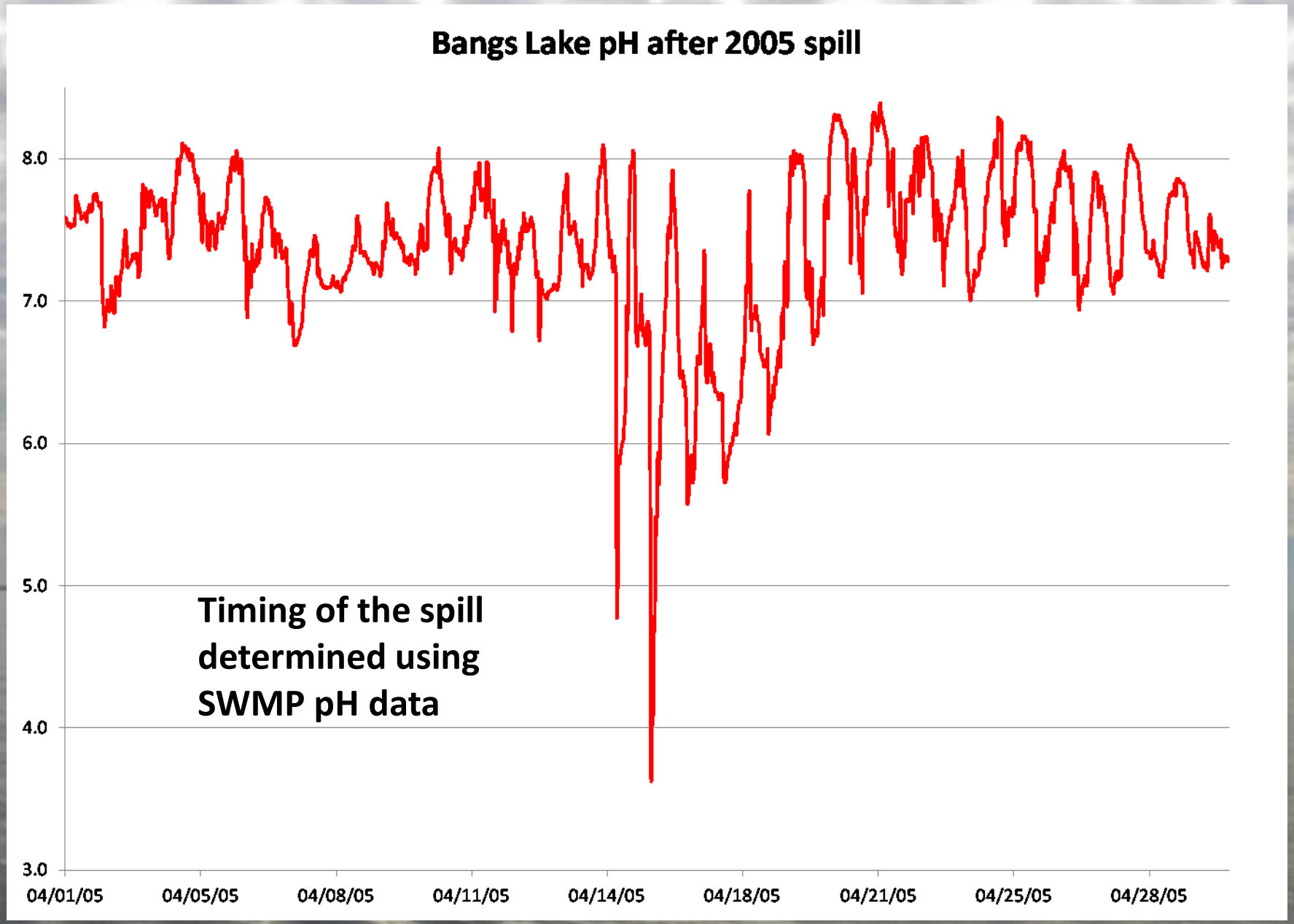
Photos: MS Department of Environmental Quality

- Phone calls about dead fish alerted NERR and DEQ to problem
- First DEQ visit to Bangs Lake was 4/18, which was days after the spill.

- Eventual estimate of >100,000 fish and blue crabs killed.

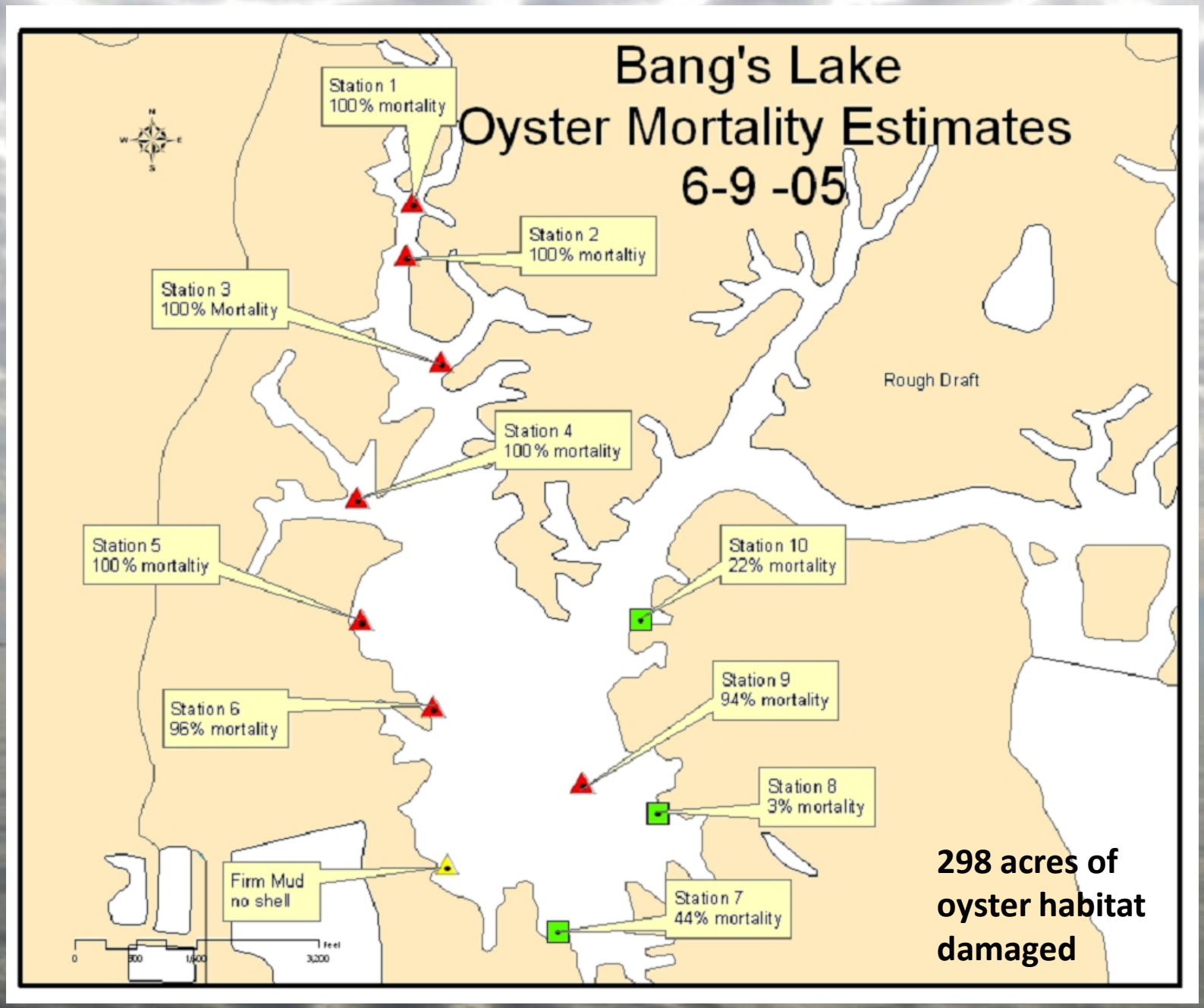
The Spill: Aerial View

Photo : Chris May


Bangs Lake pH after 2005 spill
8.0
7.0
6.0
5.0
4.0
3.0
04/01/05
04/05/05
04/08/05
04/11/05
04/14/05
04/18/05
04/21/05
04/25/05
04/28/05
Timing of the spill determined using SWMP pH data

Coordination Between Agencies

- DEQ had regulatory authority and was the lead agency
- DMR Fisheries and NERR staff:
  - Provided local expertise – helped determine extent of damage
  - Assisted in fish counts, site evaluations, resource valuation
- NERR staff provided data directly to DEQ
- In-person meetings were held on the coast and in Jackson
- By all accounts, agencies worked well together



Graphic : MS Department of Marine Resources

Photos : Chris May

Algae Blooms

Vegetation Damage

Photo: Chris May

Photos: Chris May

Estimates of vegetation loss:

- 25 acres browned initially
- 15 acres killed

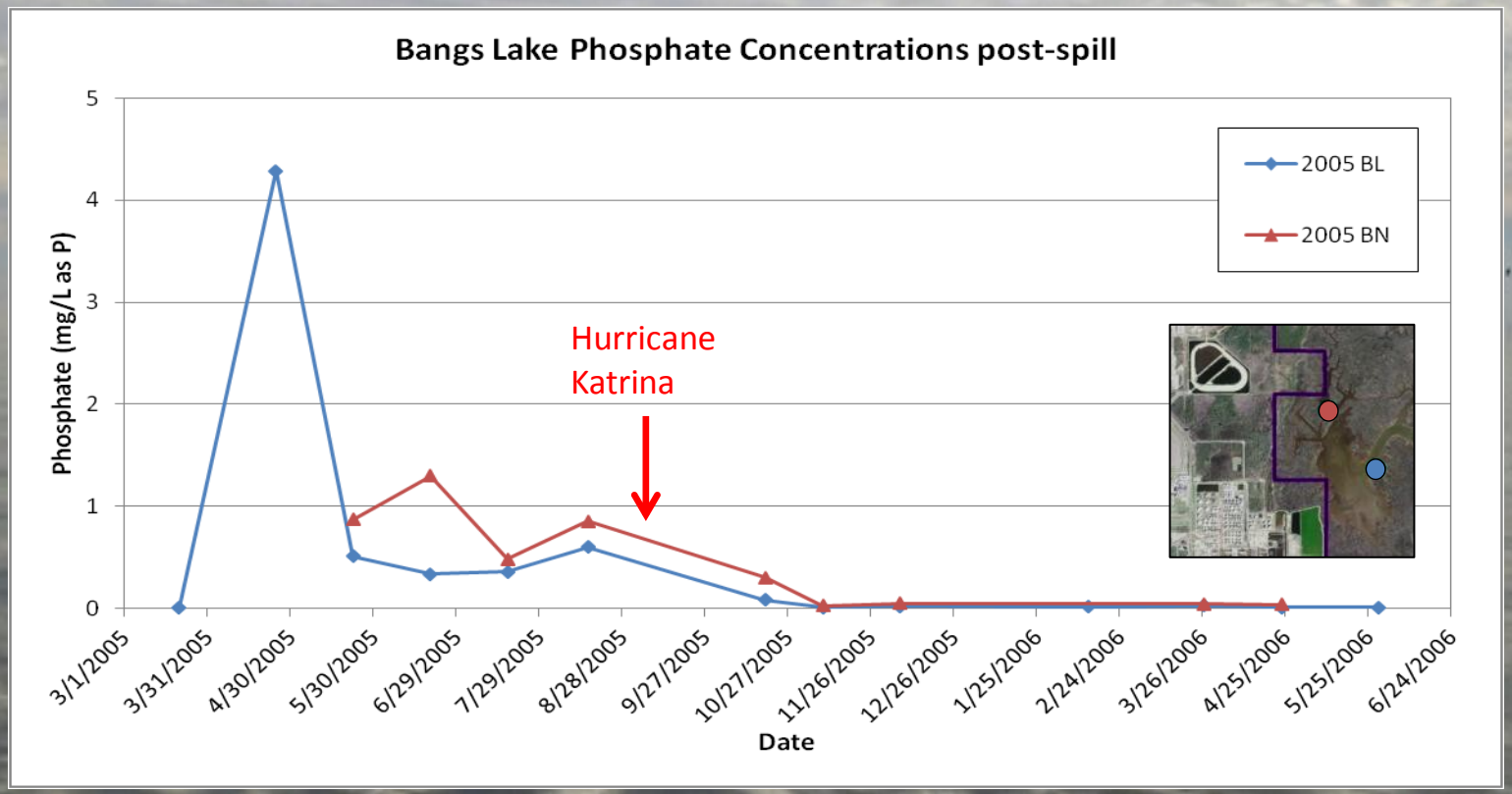
Summary of Damages

Information from MS DMR

- Total monetary loss of resources ~ **$2.6 million**
  - >100,000 fish and blue crabs killed, and this is likely an underestimate
  - 298 acres of oyster growing areas damaged
  - 15 acres of marsh lost
- Decrease in number of crab traps and recreational fishermen on the water for 3-4 months after spill

Uses of SWMP Data - 2005 Event

- By DEQ:
  - Pinpointed timing of incident
  - Indicated when contaminant levels returned to normal
- Educational activity in the High School Estuaries 101 Physical Science curriculum



Uses of SWMP Data (Generally)

- Signal problematic events
  - Real-time data can alert staff to a problem
  - Determine whether an event is acute or ongoing
  - Allow for more intense sampling if needed
- Provide context for incidents
- Encourage collaboration
- Recent data has led to productive interactions with fellow researchers and DEQ

Photo: Grand Bay NERR

Resolution of 2005 Spill

- January 2008: Phosphate company and MS DEQ entered into Agreed Order
- Fines and assessments led to:
  - Real-time telemetry system with data alerts
  - Bangs Lake North NUT station
  - Additional fine put toward sewer connections in Jackson County
- Improvements in Phosphate Company management, oversight, and storm preparations
  - Raised levee
  - Caustic material now kept on-site
  - Geotextiles now kept on-site
  - DEQ stays in contact when storms are approaching

Lessons Learned

- Local Expertise is key
- Data matters
  - Baseline monitoring
  - Timing is important
  - Quality! QAPP if necessary
- Build relationships early – know who you need to talk to
  - Regulatory agency
  - Collaborators at other institutions

Top photo: Christina Mohrman

Bottom photo: Chris May

Questions?

Photo:
Christina Mohrman