

***Building a Water Quality
Monitoring Program for
Alabama Lakes***

**Alabama Department of Environmental
Management**

Presentation Outline

- **Brief Review of WQ Monitoring Programs**
- **Review of our Reservoir Monitoring Program**
- **The Good, The Bad, and The Ugly**
- **Concluding Statements**

The River State



✓14 Basins

✓629 Subwatersheds

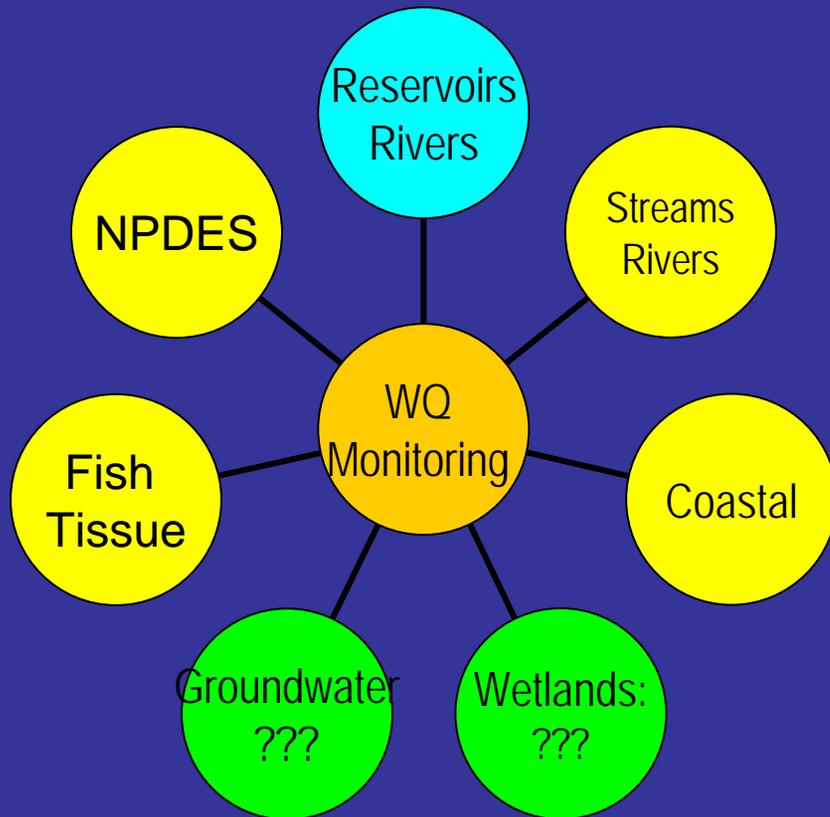
✓77,248 stream miles

✓490,472 acres in 43 reservoirs and lakes

✓3,600,000 acres of freshwater wetlands

✓390,398 acres of estuaries, tidal waterways, and bays

ADEM



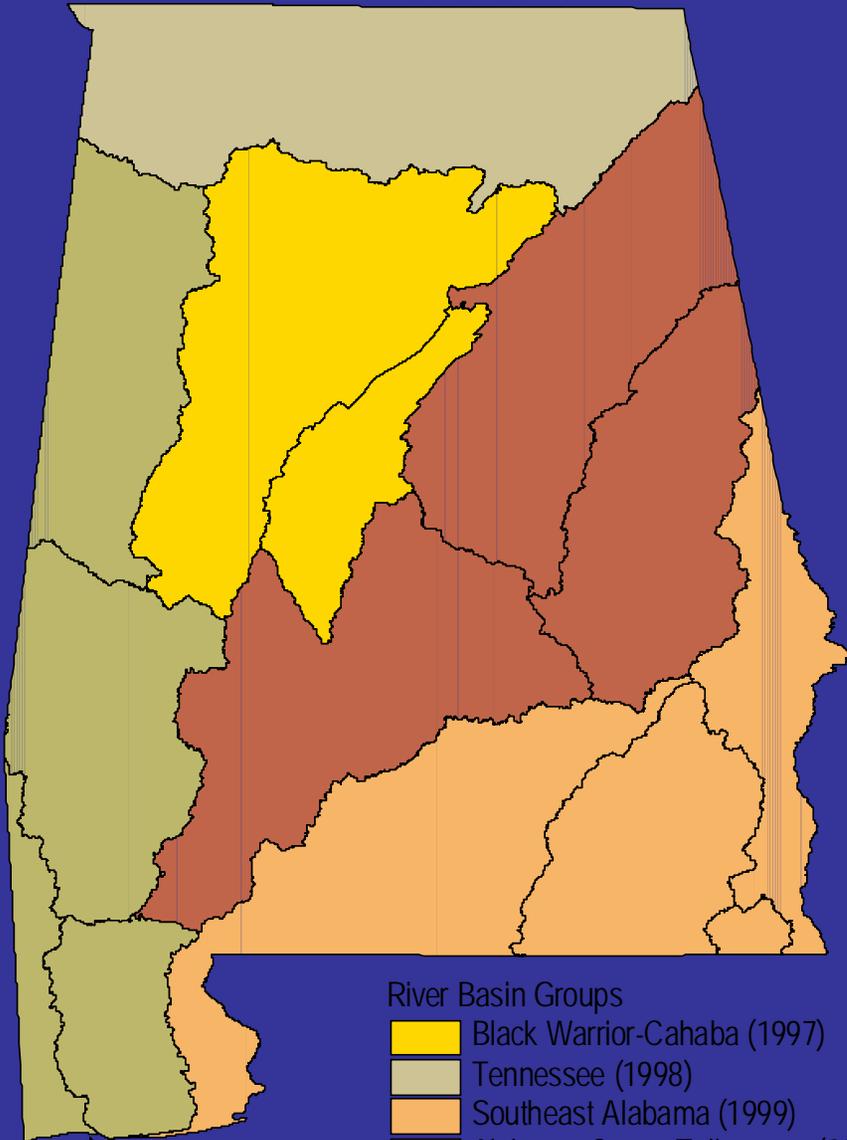
Monitoring Programs

- ✓ Coastal Monitoring Program
- ✓ Fish Tissue Monitoring Program
- ✓ Rivers & Reservoirs WQ Program
- ✓ Ecoregional Reference Program
- ✓ Alabama Monitoring and Assessment Program
- ✓ Point Source Assessments
- ✓ NPS Assessments
- ✓ Special Monitoring Programs

Monitoring Objectives

- **Status and trends**
- **Identify high quality waters**
- **Impaired waters**
- **Evaluate program effectiveness**
- **Causes and sources**
- **Establish water quality standards**
- **Management programs**

Monitoring Strategy



River Basin Groups

- Black Warrior-Cahaba (1997)
- Tennessee (1998)
- Southeast Alabama (1999)
- Alabama-Coosa-Tallapoosa (2000)
- Escatawpa-Mobile Bay-Tombigbee (2001)

Monitoring conducted on a 5 year basin rotation

Coordination and collaboration among monitoring program and agencies

Tiered/phased monitoring

Adaptive program design

EPA Evaluation: ADEM Program

- **Well-rounded program**
- **Adaptive management approach**
 - optimal use of resources
 - consistent with TMDL process
- **Clearly defined progression**
 - screening-level to intensive monitoring
- **Rotational basin approach**
 - shifts monitoring efforts to targeted waters according to current needs
- **Monitoring resources : increase by at least 30%**

Reservoir Water Quality Monitoring Program



Bankhead Reservoir: Warrior Basin



Dannelly Reservoir: Alabama Basin



West Point Reservoir: Chattahoochee Basin



Demopolis Reservoir: Tombigbee Basin



Martin Reservoir: Tallapoosa Basin

Lake Martin Dam



WWW.LAKEMARTIN.COM

Jordan Reservoir: Coosa Basin



Reservoir Monitoring Timeline

1985-1996

- **1985: Statewide Survey I: EPA & ADEM**
- **1989: Statewide Survey II: ADEM & AU**
- **1990: ADEM RWQM Program
Clean Lakes Program Phase I**
- **1994: GA/AL Water Allocation Surveys**

ADEM Reservoir Water Quality Monitoring Program

- **Established in 1990.**
- **All publicly-accessible, multi-use reservoirs**
- **Objectives:**
 - **develop an adequate water quality database**
 - **establish trophic status trends**
 - **satisfy Section 314(a) of the Clean Water Act**

ADEM Reservoir Program 1990-1996

- **Two-year rotation**
- **Spring and summer**
- **Mainstem stations only**
- **In situ measurements**
- **Photic zone sample collection**
- **Nutrient, chlorophyll a analysis**
- **Bacteriological samples**
- **Phytoplankton community analysis**
- **1994: GA/AL Water Allocation Surveys**

Reservoir Monitoring Timeline 1997-2004

- **1997: Basin Intensive Surveys begin**
- **1998: Clean Lakes Studies end**
- **2001- 04: Nutrient Criteria /Compliance begin**

ADEM Reservoir Program 2004

- **Three concurrent sampling rotations**
 - **Intensive surveys**
 - 5 year basin rotation
 - Monthly/algal growing season
 - **Critical Period**
 - 2 year
 - August only
 - **Compliance Monitoring**
 - Lake-specific nutrient criteria
 - Monthly/algal growing season
 - Rotation to TBD

Intensive Survey Methods

- **Monthly: April-October**
- **Basin lakes sampled within one-week**
- **Same time of day, month each year**
- **Five-year rotation**
- **Mainstem, trib embayments, rivers**
- **In situ measurements.**
- **Photic zone sample collection.**
- **Nutrient, chlorophyll a analysis.**
- **Algal Growth Potential Tests (AGPT).**
- **Bacteriological samples**

Critical Period Methods

- **August only**
- **Two-year rotation**
- **Basin lakes sampled within one-week**
- **Same time of day, month each year**
- **Mainstem stations only**
- **In situ measurements.**
- **Photic zone sample collection.**
- **Nutrient, chlorophyll a analysis.**
- **Bacteriological samples**
- **Diel monitoring: multiprobe (Aug only)**

Compliance Monitoring Methods

- **Monthly: April-October**
- **Basin lakes sampled within one-week**
- **Same time of day, month each year**
- **Rotation TBD**
- **Mainstem stations only**
- **In situ measurements.**
- **Photic zone sample collection.**
- **Nutrient, chlorophyll a analysis**

ADEM Reservoir Program Changes

- **Added**
 - Basin rotation intensive surveys
 - Tributary embayments
 - Rivers
 - Nutrient Criteria/Compliance monitoring
 - Diel monitoring by multiprobe.
- **Dropped**
 - Spring sampling
 - Phytoplankton community analysis
- **Continued**
 - Summer (critical period) 2-year rotation
 - Sampling regime at each station

Rivers & Reservoirs: Physical/Chemical WQ Assessments



Rivers & Reservoirs: Physical/Chemical WQ Assessments



Rivers & Reservoirs: Biological WQ Assessments



The Good

The Bad

The Ugly!

The Good

- **Expert mentor**
 - **Internal Support**
 - **Baseline data**
 - **Clean Lakes Program**
 - **Simplicity**
 - **Consistency**
 - **Dedication**
- = *Successful program***

The Bad

- Limited funding
- Limited staff
- Large state
- 14 River basins
= *Less data*

The Ugly!

- **Inconsistent funding**
 - Loss of Clean Lakes Program
 - Inconsistent Section 319 funding
 - **Personnel turnover**
- = *Ugly Situation***

Future Needs

- 1. Dedicated monitoring funds**
- 2. Personnel**
- 3. Tributary loading studies**
- 4. Expand diel monitoring**
- 4. Expand AGPT**
- 5. Reinstitute phytoplankton analysis**

Conclusion

- **Measures of program success**
 - **Application of data**
 - **Can you use it?**
 - **How you use it**
 - **Quality of data**
 - **Quantity of data**

Conclusion

- **Requirements for program success**
 1. **Adequate, consistent funding**
 2. **Substantial effort (Hard work)**
 3. **Consistent effort over time**
 4. **Significant level of expertise, training, and oversight.**

Conclusion

There are no shortcuts or quick fixes!

CLICK ON MAP FOR
LEGEND

