An Integrated Approach of Research, Outreach and Management in the Tallapoosa River Basin, Alabama

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A Transferable Model of Stakeholder Partnerships for Addressing Nutrient Dynamics in Southeastern Watersheds

Three-year, integrated project funded by the USDA, Cooperative State Research, Education and Extension System

**TWP Goals...**

- Optimal technology mix for basin-level research
- Comprehensive aquatic science outreach to the public
- Transferable model for river basin management
INSTITUTIONAL PARTNERS:

ADEM  MTCWP
City of Alexander City  Camp ASCCA
Lake Watch of Lake Martin  Alexander City Schools
Alabama Cooperative Extension  Tallapoosoa County Schools
Lake Wedowee Property Owners Association

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Land Use Effects on Lake Quality
TWP LAKE SAMPLING

Determine Lake Trophic Status
THE TROPHIC STATE INDEX

OLIGOTROPHIC

EUTROPHIC

enrichment

Trophic State Index

Wedowee

Big Creek

Inland

Thurlow

Yates

Lewis Smith

Bear Creek

Guntersville

Pickwick

Wheeler

Demopolis

Purdy

Wilson

Jordan

Weiss

Logan Martin

Neely Henry

Lay

Mitchell

Millers Ferry

Eutrophic

Mesotrophic

Oligotrophic
LAKE HARRIS TROPHIC STATE INDEX
1989-2001

Tallapoosa above confluence
Dam Forebay

Trophic State Index vs Year

- Eutrophic
- Mesotrophic
- Oligotrophic
LAKE MARTIN TROPHIC STATE INDEX
1989-2004

Trophic State Index

Year

Tallapoosa downstream of Hwy 280
Dam Forebay

Eutrophic
Mesotrophic
Oligotrophic

(38.1
(37.4
(33.0
(44.9
(45.8
(49.4
(n=6)
(n=6)
(n=2)
(n=5)
(n=2)
(n=2)
)
)
)
)
)

(34.0
(41.0
(41.7
(42.9
(49.2
(51.0
(n=6)
(n=6)
(n=2)
(n=5)
(n=6)
(n=6)
)
)
)
)
)

(50.3
(53.0
(49.9
(51.1
(50.8
(n=6)
(n=6)
(n=6)
(n=6)
(n=6)
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(37.4
(37.8
(38.4
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(45.3
(45.7
(n=6)
(n=6)
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(37.4
(n=6)
)

(41.3
(n=6)
)

(42.8
(n=6)
)

(51.0
(n=6)
)

(49.2
(n=6)
)

(53.0
(n=6)
)

(51.0
(n=6)
)
NUTRIENT STANDARDS IN ALABAMA

- AFA EUTROPHICATION COMMITTEE
- 2001 GOVERNOR’S EXECUTIVE ORDER
- WATER WARS
TWP Research

High Tech Alternative

Standard Methods

Low Tech Alternative
AU STANDARD METHODS
SAMPLING ON LAKE MARTIN
A - F - areas for side-by-side sampling with ADEM/AU Fisheries and Lake Watch of Lake Martin (LWLM)

- ADEM sites (5)
- AU Fisheries sites (20)
- LWLM Active shoreline sites (6)
- LWLM inactive shoreline sites (10)
- New LWLM open-water sites (6)
CHLOROPHYLL a - LAKE MARTIN

April-October 2004

Corrected Chlorophyll a (ug/L)

0.5 meter sample
Photic zone composite

Eutrophic
Mesotrophic
Oligotrophic

Sample Site

6.5 ug/L
2.6 ug/L
SECCHI DISK VISIBILITY - LAKE MARTIN

April-October 2004

Sample Site

Oligotrophic

Mesotrophic

Eutrophic

Secchi Disk Visibility (meters)
GAGED STREAMS

Birdsong Creek

Jones Creek
DOWNLOADING GAGE DATA

Rice Branch near Hawk, AL
GAGE DATA

NUTRIENT CONCENTRATIONS

Data are means (values above bars) of 11 sample dates from 2/12/04 to 10/12/04. Bracket on bar represents minimum and maximum values.
CITIZEN VOLUNTEER DATA

versus

AU STANDARD METHODS DATA
pH - LAKE MARTIN
AU vs. LWLM, April-October 2004

Sample Site

Sandy Creek Embayment
Mainstem @ Bay Pine
Elkahatchee Creek Embayment
Coley Creek Embayment
**Secchi Disk Visibility - LAKE MARTIN**

**AU vs. LWLM, April-October 2004**

![Bar chart showing Secchi Disk Visibility (m) for different sites and times.](chart)

- **Sandy Creek Embayment**: 2.5 m (Auburn University), 2.6 m (Lake Watch of Lake Martin)
- **Mainstem @ Bay Pine**: 3.1 m (Auburn University), 3.1 m (Lake Watch of Lake Martin)
- **Elkahatchee Creek Embayment**: 2.1 m (Auburn University), 2.2 m (Lake Watch of Lake Martin)
- **Coley Creek Embayment**: 1.2 m (Auburn University), 1.1 m (Lake Watch of Lake Martin)

**Sample Site**

- **Oligotrophic**
- **Mesotrophic**
- **Eutrophic**
TOTAL PHOSPHORUS TESTING

Reagents

Digestion

Reading in Colorimeter
LAKE SAMPLING
2005

Lake Wedowee – April 2005
CHLOROPHYLL a - MARTIN versus WEDOWEE

Martin lower lake mean is of AU site 4, ADEM sites 1 and 2 for Apr-Oct, 2004 (n=42); Martin upper lake mean is of AU site 19, ADEM sites 4 and 5 for Apr-Oct, 2004 (n=42).

Wedowee lower lake mean is of AU sites 1, 3 and 5 for Apr 2005 (n=3); Wedowee upper lake mean is of AU sites 8, 9 and 11 for Apr 2005 (n=3).
TWP Education and Extension

- Teacher Workshops
- Aquatic Science Curricula
- Camp ASCCA Displays
- “State of Our Watershed” Conference
- TWP Website
Linking Alabama Water Watch Volunteers to Classrooms for Improved Aquatic Science Education

A project funded by the Auburn University Environmental Institute

Water Watch Volunteers
- Resource Persons for Aquatic Science Introduction
- In-classroom Demos of Stream Monitoring
- Outdoor Activities: Living Streams, Critters in the Creek

AWW Program
- Training and Technical Support for Volunteers
- Data Management and Dissemination
- Online Aquatic Science Resources for Teachers and Adult Groups
- Training Future Science Teachers at AU

Monitor to Educator Links

Future Teachers and Current Educators
- Utilize AWW Education Manuals
- Opportunities for Outdoor Classroom
- AWW Data in Classroom Exercises
- Energize Students to Protect Natural Resources

Inter-Departmental Collaboration

Department of Curriculum and Teaching
- Future Teachers Exposed to Aquatic Science Programs: Project Wet, Project Learning Tree, AWW
- Correlate AWW materials to Alabama Course of Study
- Place Future Teachers in Schools with Aquatic Science Projects

Contributors:
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Charles Eck, Mitzie Sowell, and Virginia Wilcox of Department of Curriculum and Teaching

* A statewide, volunteer water monitoring program coordinated through Auburn University.
* 75 groups actively monitoring streams and lakes in Alabama.
* 1,600 sites monitored on 600 waterbodies.

For more information:
888-844-4785
aww@aces.edu
www.alabamawatervatch.org

The AWW series, Citizen Guide to Alabama Rivers, will have an interactive Jeopardy Game for teachers to use in the classroom and will eventually be made available online.
Living Streams Field Work
High School Students Observe TWP Research
State of Our Watershed Conference – 2005
Tallapoosa Watershed Project

TWP News

State of Our Watershed Conference
The Conference took place at Caneo, ASUCCA on May 5 & 6
The Outlook comments, May 9, 2005

This project is funded by
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For more information about other CSREES projects and Water Quality in Alabama click on the map.
Tallapoosa Watershed Project

Plans for 2005-07

- Watershed Modeling of Nutrients/Sediments
- Aquatic Science Curricula Development
- Cost-Efficiency Study (optimal technology mix)
- 2nd “State of Our Watershed” Conference
- Broad-based Extension of Research Findings

www.twp.auburn.edu