Water Quality Monitoring (and more) for the Protection of Smith Lake

Bill Deutsch, Eric Reutebuch and Sergio Ruiz-Cordova
Alabama Water Watch
April 3rd, 2009
Water Quality Monitoring (and more) for the Protection of Smith Lake

- AWW Program update
- Water monitoring in the Black Warrior Basin
- Overview of WCSLA water sampling activities
- Water quality trends
- WCSLA Water Data – What good is it?
- Recommendations
ALABAMA WATER WATCH

Program Update
A program dedicated to developing Citizen Volunteer Water Monitoring of Alabama’s lakes, streams and coasts.

Cumulative 1992-2009

- 255 Citizen Groups
- 1,250 Training Sessions
- 4,900 Certified Monitors
- 1,950 Sites
- 56,000 Water Quality Records
- 40 Active Citizen Trainers
- 1,300 Workshops (~ 100/year)
Welcome to Alabama Water Watch

Alabama Water Watch (AWW) educates citizens about water issues in Alabama and the world. It promotes citizen volunteer water monitoring and personal involvement in watershed stewardship through environmental education, protection and restoration, and advocacy. AWW has two components, the Program and the Association.

The Program is coordinated from the Auburn University Department of Fisheries and Allied Aquacultures and provides training, technical backstopping and data management for citizen monitors, educators and the general public.

The non-profit Alabama Water Watch Association is an affiliation of monitoring groups and citizens that works closely with the program to improve both water quality and policy. AWW is one of a group of programs and projects that promote Community-Based Watershed Stewardship at the watershed, river basin and international scale.

AWWARENESS
AWW’s online Newsletter

- Master Gardeners partner with AWW
- 12th Annual State of the Lake Address
- Winston County Water Watchers promote water protection
- Best School Project
- Alabama Rivers Alliance Conference

News & Media
Group History Page updated with new features

AWW's Group history page has been updated with new features. You can now examine the number of records by month for Chemistry, Bacteria and totals. Links to Chemistry and Bacteria charts for each site within a group are also available. Off-site links to County and HUC information is provided. To take a quick look at the new page you can click here or visit the page in the Menu under Groups and Group Histories. For managing your Group's progress over time this is the page to visit.

AWW Map Module

How to use AWW's Interactive Map

Open Map

Standard Map Legend and Button Functions

Short-cut to AWW Maps & Charts

AWW Site code: [ ]

Google Maps

[Map!]

Chemistry Histories [v]

Chart!
Volunteer Water Sampling in the Black Warrior Basin
AWW Monitoring in the Black Warrior
Lewis Smith Lake

- Sipsey Fork
- Rock
- Crooked
- Ryan
- Simpson
- Clear
- Dismal
- Dam Forebay

21,000 acres of water, 944 square miles of watershed
Volunteer Citizen Monitoring in the Smith Lake Watershed

- Winston County Smith Lake Advocacy Inc.
- Smith Lake Environmental Preservation Committee
- Cullman Co. SWCD
- Camp McDowell
- Smith Lake Civic Association
Two local citizen groups monitor the waters of Smith Lake as a part of Alabama Water Watch. The Smith Lake Civic Association (SLCA) formed in 1976 on the Sipsey Fork (west side) of the lake, and the Smith Lake Environmental Preservation Committee (SLEPC) formed in 1995 on the Ryan Creek arm (east side) of the lake. Both groups are working to preserve and enhance the water quality of Smith Lake and the tributary streams flowing into the lake. Primary activities of the two groups are 1) water chemistry testing of several sites (eight active sites) on the lake by citizen monitors (see map), 2) Styrofoam and trash clean-ups twice a year by both groups, and 3) interaction with various agencies to positively impact the lake’s watershed management policies.

The SLCA (△) and SLEPC (○) water quality sampling sites on Smith Lake, SLCA site 1 and SLEPC site 1 are labeled (data shown on next page)
Citizen Monitoring in 2009

Green = active sample site; Red = inactive sample site
WCCLA CITIZEN DATA
Groups in the Warrior Watershed participating in Chemistry Site Histories

<table>
<thead>
<tr>
<th>Select Group</th>
<th>Group Abbrev</th>
<th>Group Name</th>
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<th>Active Sites</th>
<th>Inactive Sites</th>
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## Sites in Group participating in Chemistry Site Histories (16)

### Current Chart: Chemistry Histories

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<tr>
<th>Select Site</th>
<th>Waterbody</th>
<th>Description</th>
<th>County</th>
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### Monitor Sampling Events between 4/1/2008 and 4/1/2009 for the Group Winston County Smith Lake Advocacy Inc

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Bacteriologica Monitoring
Site 10025007 – Crooked Creek near CR936
WCSLA Monitors – Dean and Paul Gillette
Site 10025007 – Crooked Creek near CR936
WCSLA Monitors – Dean and Paul Gillette

E. coli for AWW Site: 10025007 in Cullman County
Crooked Creek, located in the Warrior watershed, No. of Samples: 1
Latitude: 34.0675 N, Longitude: -87.1107 W Hydrologic Unit Code (HUC11): 031601100408
Site 10025012 – Rock Creek
WCSLA Monitor – Gwen Blackburn, Warne Lambert

No. of E. coli colonies per 100 mL

- > 600 unsafe for human contact
- 200-600 maximum for infrequent human contact
- < 200 safe for frequent human contact

E. coli for AWW Site: 10025012 in Winston County
Rock Creek, located in the Warrior watershed, No. of Samples: 1
Latitude: 34.123 N, Longitude: -87.1772 W Hydrologic Unit Code (HUC11): 031601100404
CULCO Monitoring in the Smith Lake Watershed

Ryan Creek
Site 12
(10029012)
CULCO Site 12 (10029012) – Ryan Creek @ Swafford Road Bridge
Citizen Monitor: Bob Keefe

No. of E. coli colonies per 100 mL:
- > 600 unsafe for human contact
- 200-600 maximum for infrequent human contact
- < 200 safe for frequent human contact

Average count of E. coli (log):
- Jan 04: 50
- Jan 05: 50
- Jan 06: 50
- Jan 07: 50
- Jan 08: 50
- Jan 09: 50

E. coli for AWW Site: 10029012 in Cullman County
Ryans Creek, located in the Warrior watershed, No. of Samples: 44
Latitude: 34.145 N, Longitude: -86.89444 W Hydrologic Unit Code (HUC11): 031601100502
Water Chemistry Monitoring

- Site Trends -
Apply trend line with caution!
SLCA Monitoring on Smith Lake

Site 1
(10010001)
SLCA Site 1 (10010001) – Smith Lake @ Duncan Bridge
Citizen Monitors: Jim Beason and John Kulbitskas

Dissolved Oxygen at site 10010001 in Winston County, AL
Smith Lake (Warrior Watershed) 116 samples
Latitude: 34.00107 N, Longitude: 87.22122 W Hydrologic Unit Code (HUC11): 03160110070
--- 5 ppm minimum Dissolved Oxygen required for Fish and Wildlife Classification
Duncan Bridge – a Closer Look
Snapshot of Smith Lake

Water Quality
Overall Assessment of the Lake

- E. coli
- Pretty darn clean!
- 1 low DO in 181 readings;
  Range in pH: 6-8.5

Based on more than 2,000 water quality records (1,916 water chemistry, 114 bacteria; as of 11/2008)
WCSLA Water Data

• What good is it?
Give us a helping hand,

to make your data the best it can be!
Tip #1
Verify Your ID and Password

AWW Password: 

AWW Contact ID: 

Submit

I forgot my password or contact ID

Click here to learn how to start entering AWW data online.

Auburn IT carries out maintenance nightly from 1am to 5am and Sunday mornings. Avoid entering data during these times.

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New Chemistry Record

AWW Site Code: 07011003  Sample Time: 09:30

Site Description: Pepperell Branch at Thomason Drive crossing in Opelika

Select Monitor(s)
Use Ctrl key for multiple monitors.

Sample Date: 01/31/2009  Show All Chem Data

Open 6 Parameter Charts  Open Bac Parameter Chart  Continue Data Entry..
Site 07011003 is located in HUC12: 031501100203 in Lee County and is currently in the Group Save Our Saugahatchee. Site is located on Pepperell Branch. This site was first sampled on 6/5/1997 and last sampled on 2/8/2009. Total No. of Chemistry records: 64, Bacteria Records: 25, and Bioassessment Records: 0

Number of Sampling Events: 64

| Sample Date | Access | Tides | Air Temp | Water Temp | pH | DO1 | DO2 | Hard Drops | Alk Drops | Turb 1 | Turb 2 | Secchi | Comments |
|-------------|--------|-------|----------|------------|----|-----|-----|------------|-----------|--------|--------|--------|---------|----------|
| 05 Jun 1997 | 1      | 99    | 19.5     | 19         | 8  | 7.15| 7.15| 4          | 43        | 2      | -      | -      | NA      |
| 06 Jul 1997 | 1      | 99    | 32.5     | 25.5       | 8  | 4.55| 4.55| 6          | 23        | 1      | -      | -      | NA      |
| 02 Aug 1997 | 1      | 99    | 31       | 24.5       | 8.5| 3.2 | 3.2 | 4          | 85        | 1      | -      | -      | NA      |
| 07 Sep 1997 | 1      | 99    | 27       | 24         | 8  | 7.6 | 7.6 | 5          | 13        | -      | -      | -      | NA      |
| 05 Oct 1997 | 1      | 99    | 25.5     | 20.5       | 8  | 8.3 | 8.3 | 6          | 9         | 0      | -      | -      | NA      |
| 07 Dec 1997 | 1      | 99    | 8        | 7.75       | 7  | 7   | 7   | 6          | 10        | 1      | -      | -      | NA      |
| 20 Jan 1998 | 1      | 99    | 7.5      | 9.5        | 7  | 9.7 | 9.7 | 7          | 11        | 2      | -      | -      | NA      |
| 15 Feb 1998 | 1      | 99    | 15.5     | 10.5       | 7  | 9.2 | 9.2 | 6          | 10        | 1      | -      | -      | NA      |
| 13 Mar 1998 | 1      | 99    | 12.5     | 11.5       | 7  | 9.1 | 9.1 | 5          | 10        | 2      | -      | -      | NA      |
| 22 Mar 1998 | 1      | 99    | 13.5     | 13.5       | 7  | 7.2 | 7.2 | 7          | 10        | 1      | -      | -      | NA      |
| 11 Apr 1998 | 1      | 99    | 10       | 10.5       | /  | 6.5 | 6.5 | 6          | 11        | 1      | -      | -      | NA      |
| 05 Jul 1998 | 1      | 99    | 29       | 27         | 7  | 6.5 | 6.5 | 7          | 14        | 1      | -      | -      | NA      |
| 02 Aug 1998 | 1      | 99    | 26.5     | 24.5       | 7  | 7   | 7   | 7          | 14        | 1      | -      | -      | NA      |
| 27 Feb 2004 | 1      | 99    | 6        | 9          | 7  | 10.7| 10.6| 5          | 11        | 2      | -      | -      | NV      |
| 26 Mar 2004 | 1      | 99    | 21       | 19         | 7.5| 9.6 | 9.8 | 6          | 12        | 2      | -      | -      | bmps at SOS/City of Opelika demo site are in a state of disrepair-sediment entering stormwater sewer |
| 28 May 2004 | 1      | 99    | 25       | 22         | 7  | 7.2 | 7   | -          | 14        | 0      | -      | -      | grass clippings dumped on right bank, poor erosion control on adjacent property to southwest |
| 30 Jun 2004 | 1      | 99    | 25       | 25         | 7.5| 8   | 8.4 | 6          | 13        | 0      | -      | -      | temperatures are approximate (WT 3deg) (AT 5deg). did not have thermometer in kit |
| 30 Jul 2004 | 1      | 99    | 25.5     | 24.5       | 7  | 6.6 | 6   | 5          | 12        | 0      | -      | -      | NV      |
| 20 Aug 2004 | 1      | 99    | 24       | 24.5       | 7.5| 8   | 8.4 | 7          | 14        | 0      | -      | -      | after short rain, water up only slightly |
| 23 Sep 2004 | 1      | 99    | 24.5     | 22         | 7  | 7.8 | 8.1 | 8          | 16        | 0      | -      | -      | NV      |
| 26 Oct 2004 | 1      | 99    | 21       | 20         | 7  | 7.6 | 7.8 | 6          | 14        | 0      | -      | -      | NV      |
| 30 Nov 2004 | 1      | 99    | 17       | 15         | 7  | 8.8 | 8.6 | 6          | 14        | 0      | -      | -      | tested with Christina Harnelink who attended most recent AWW training course in Auburn, AL |
| 27 Jan 2005 | 1      | 99    | 11.5     | 11.5       | 7  | 8.4 | 8   | 4          | 37        | 0      | -      | -      | NV      |
| 21 Feb 2005 | 1      | 99    | 19       | 17         | 7  | 8.6 | 8.6 | 5          | 11        | 3      | -      | -      | NV      |
| 29 Apr 2005 | 1      | 99    | 19.5     | 21         | 7  | 8.1 | 8.2 | 5          | 12        | 0      | -      | -      | NV      |
| 29 Jun 2005 | 1      | 99    | 24.5     | 24         | 8  | 6.2 | 6.6 | 4          | 43        | 3      | -      | -      | NV      |
Tip #2
Welcome to Alabama Water Watch

Alabama Water Watch (AWW) educates citizens about water issues in Alabama and the world. It promotes citizen volunteer water monitoring and personal involvement in watershed stewardship through environmental education, protection and restoration, and advocacy. AWW has two components, the Program and the Association.

The Program is coordinated from the Auburn University Department of Fisheries and Allied Aquacultures and provides training, technical backstopping and data management for citizen monitors, educators and the general public.

The non-profit Alabama Water Watch Association is an affiliation of monitoring groups and citizens that works closely with the program to improve both water quality and policy. AWW is one of a group of programs and projects that promote Community-Based Watershed Stewardship at the watershed, river basin and international scale.

AWWARENESS
AWW's online Newsletter
- Master Gardeners partner with AWW
- 12th Annual State of the Lake Address
Secchi at AWW Site 07004037 (# Samples: 31)
Site Location: at Peninsula Dr (near old US 431) at in Randolph County
Latitude: 33.3663 N, Longitude: -85.4835 W
Model for Community-Based Water Monitoring

People + Technology

Credible Data

Local Knowledge to Action

Environmental Education
Protection, Restoration
Advocacy

Sustainable Groups and Programs

Watershed Stewardship and Quality of Life
Environmental Education

AWW trains 30 teachers in the Exploring Alabama’s Living Streams Curriculum at Camp McDowell

Winston County Natural Resources Council FAWN (Forestry Awareness Week Now program)
- WCSLA volunteers:
  - Mary Ann Crunk and Judy Lambert
- 2 day program for all 6th graders from the 5 schools in Winston County
- Total = 348 students and 17 teachers
Protection/Restoration

Spring 2008 Clean Up – 17.81 tons!!
Protection/Restoration:
Watershed Management Plan

References:
www.adem.state.al.us/Education%20Div/Nonpoint%20Program/Guidance/319Grant.htm
www.epa.gov/owow/nps/watershed_handbook
The Saugahatchee Watershed Management Plan – Cleaning Up the Creek

- Project locations in the watershed
- Low Impact Development
- Water Conservation
- Constructed Wetland
- Storm Drain Marking
  (AL Sustainability Initiative)
- Education & Outreach
- Stream Restoration

This project is partially funded by the Alabama Department of Environmental Management through a Clean Water Act Section 319(h) nonpoint source grant provided by the U.S. Environmental Protection Agency-Region 4.
~ 2 dozen restoration projects

- Good examples of what can be done
Welcome to the Choctawhatchee, Pea and Yellow Rivers Watershed Management Authority. Our agency represents a wide and diverse area of land covering a major portion of the southeastern part of Alabama. The Authority was created in 1991 by the Alabama Legislature for the purpose of “developing and executing plans and programs relating to any phase of conservation of water, water usage, flood prevention, flood control, water pollution control, wildlife habitat protection, agricultural and timberland protection, erosion prevention, and control of erosion, floodwater and sediment damages.”

Vision Statement

“To develop and execute plans and programs relating to water resource management for citizens within the Choctawhatchee, Pea and Yellow River Watersheds to ensure water resources are wisely developed, properly used, and enhanced for present and future generations.”

Strategic Management Elements

The Strategic Management Elements of the Authority are: water quantity, water quality, flood control, and education. The Authority addresses water-related issues and opportunities under these major categories in the 2,328,000 acres of the Choctawhatchee, Pea and Yellow River watersheds within the counties of Barbour, Bullock, Coffee, Covington, Crenshaw, Dale, Geneva, Henry, Houston, and Pike. We encourage you to visit the additional links provided within our menu section to obtain further information about our agency and its work.
Fifth Annual State of Our Watershed Conference – The Tallapoosa River Basin

Moving Toward More Effective Water Policy

Our Goal: Basin-level Water Management
that sustains both human needs and aquatic life

- Location: Betty Carol Graham Technology Center at Central Alabama Community College, Alexander City, Al
- Date: May 13 – 14 (half-day on the 14th)
- Topics:
  - Overview of the Tallapoosa River Basin Management Plan
  - Evaluation of alternatives in river basin management in southern states
  - Community participation in visioning better water policy for the Tallapoosa Basin
- Keynote Speaker: Senator Kim Benefield, Chairperson, Permanent Joint Legislative Committee on Water Policy and Management
- For more information, visit www.bwp.auburn.edu

Sponsors and Organizers:
Recommendations
Secchi Disk
(thank you Fr. Pietro!)

Abiogenic turbidity

Biogenic turbidity
Application of Secchi Readings

Possible New Monitoring Sites

Sipsey Fork
Brushy
Rock
Crooked
Ryan
Simpson
Clear
Dismal
Crooked
Simpson
Contact AWW at:

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