



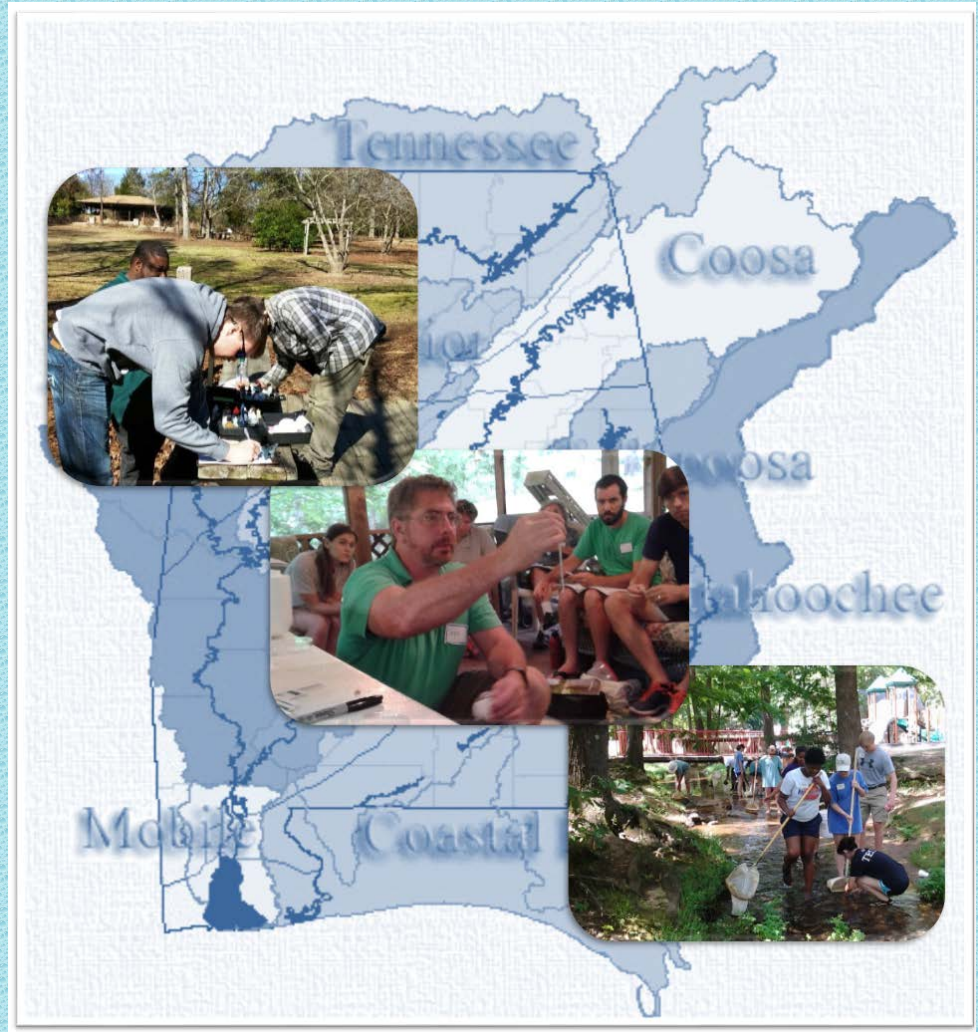
**Community-Based
Watershed Stewardship
through
Citizen Volunteer
Monitoring of Alabama's
Lakes, Streams & Coasts**

by

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ALABAMA WATER WATCH ANNUAL REPORT

- 2015 -



Alabama Water Watch
AU Water Resources Center
Auburn University

February 2016

***It's not a shrimp...
It's a Water Spirit!***

The AWW logo is an aquatic insect called a CADDISFLY. This particular caddisfly is named HYDROPSYCHE, and is an important member of stream communities throughout Alabama.

The name **Hydro*psyche** means **Water * Spirit**.

It is, therefore, a fitting symbol of the growing "spirit" of involvement, enthusiasm and concern for Alabama's water resources that citizens have *shown through Alabama Water Watch*



The Alabama Water Watch Program is part of the Auburn University Water Resources Center in the Alabama Agriculture Experiment Station and receives support from AAES and the Alabama Cooperative Extension System.

Cover photo: Some of the many AWW activities of 2015: citizen volunteers in the AU Arboretum getting trained in water chemistry monitoring (top); Taylor Steele training new monitors in bacteriological monitoring (center); and Opelika students conducting a stream bioassessment in Rock Brook Creek (bottom).

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1. EXECUTIVE SUMMARY

1. Alabama Water Watch (AWW) is a statewide program dedicated to promote community-based watershed stewardship through developing citizen volunteer monitoring of Alabama's lakes, streams and coastal waters. The AWW Program, formerly in the Auburn University (AU) Department of Fisheries, became part of the AU Water Resources Center and relocated to the CASIC Building in the Auburn Research Park in 2013. AWW is funded primarily by the Alabama Agricultural Experiment Station (AAES) and the Alabama Cooperative Extension System (ACES). Other funding is obtained through securing grants from governmental and private sector funding sources. This report covers activities from January 2015 through December 2015.

2. AWW conducted 110 training sessions with a total of 694 certifications; about 70% were conducted by or with a citizen trainer. Thirty-eight water chemistry workshops (341 people), 23 bacteriological workshops (170 people), three *Exploring Alabama's Living Streams* workshops (67 people), 28 recertification sessions (66 people), one training of trainers (9 people), two trainer refresher workshops (9 people), and 13 trainer internships were completed in 2015.

3. Since 1993, Alabama Water Watch has received 82,441 water quality data forms from citizen monitors in all of the major basins in Alabama. Over 2,327 cumulative sites on about 842 waterbodies have been monitored statewide and all data reside on the AWW statewide database.

4. Seventy groups (320 active monitors) collected and submitted water quality data from nine of the 10 major basins in 2015. Seven new groups joined AWW in 2015. A total of 3,041 data records was received at the AWW office in 2015.

5. Three data interpretation sessions were held in 2015 - one with Lake Watch of Lake Martin, one with Lake Harding Homeowners Association, and one with Friends of Locust Fork River. AWW responded to 14 official requests for data from organizations including ADEM, ADPH, GSA, Auburn University, University of Alabama at Huntsville, Mobile Bay NEP, TTL, Living River Environmental Center, cities of Auburn, Opelika, Daphne and Pell City; as well as various AWW groups and individual monitors.

6. AWW staff attended AWW monitoring group meetings such as those of Lake Harding Homeowners Association, Save Our Saugahatchee, Friends of Locust Fork River and Lake Watch of Lake Martin. AWW personnel participated in numerous conferences, including the Environmental Education Association of Alabama Annual Conference, the Alabama Water Resources Conference, the ADEM Annual Nonpoint Source Conference, the Troy University Business of Water Conference, the Cahaba Connections Conference, the Alabama Clean Water Partnership Annual Conference and our AWW Annual Conference.

7. Program Accomplishments and Initiatives for 2015 included the publication of 21 articles on the AWW web blog and others in other media, and participation in numerous environmental education events. Over 90% of AWW data received during the report period was entered online, and over 1,300 people were subscribed to the AWW list-serve. Several proposals were submitted to various agencies to help support the statewide citizen water monitoring program and environmental education activities that have made AWW a model for other states and countries.

2. AWW PERSONNEL AT AUBURN UNIVERSITY

All personnel listed have duties as staff of the AU Water Resources Center along with their work with the AWW Program.



Eric Reutebuch, M.S.

Program Director (January 1996 - present) - Eric has a M.S. in Fisheries from Auburn University. He began working with AWW on a part-time basis in 1996 and transitioned to full-time in 2006. He assumed the position of AWW Associate Director in July 2013 upon Bill Deutsch's retirement, and became Director in 2014. He coordinates AWW Program activities, serves as the co-PI on a USDA-AFRI Project and an AL-WRRI Project, writes articles and publications showcasing AWW groups, and conducts data interpretations with AWW groups.

Sergio S. Ruiz-Córdova, M.S.

Database Coordinator; Global Water Watch Associate Director (April 2001 - present) - Sergio has a B.S. in Marine Biology and a M.S. in Aquatic Ecology from Auburn University. He assumed the position of GWW Associate Director in July 2013 upon Bill Deutsch's retirement. His work with AWW involves programming and maintaining the statewide database and creating data reports. He works through Global Water Watch in several other countries.



Rita Grub, B.S.

AWW Office and Workshop Manager (April 2008 – present) - Rita has a B.S. in Business Administration from Auburn University. Her work primarily involves working with AWW monitors and trainers coordinating workshops and certifications. Rita also serves as an AWW trainer and office manager for AWW, keeping up with monitor/group communications and other office duties. She also supervises the processing of AWW monitor data and new site locations.

Mona S. Domínguez, M.C.P.

Volunteer Monitor and 4-H AWW Program Coordinator (July 2009 – present) – Mona has a B.A. in Anthropology from Sewanee - The University of the South and received her Masters in Community Planning from Auburn University. She coordinates AWW youth education activities. In addition, Mona works on the Global Water Watch and has a half-time appointment working with youth program development with the ACES 4H Program.



William Deutsch, Ph.D.

Founder and long-time Program Director (retired; October 1992 – June 2013) - Bill was a Research Fellow in the AU Department of Fisheries and Allied Aquacultures since 1990. In addition to continuing in his part-time support of the AWW Program, he works through Global Water Watch promoting community-based watershed monitoring and environmental stewardship internationally, in the Philippines, Ecuador, Brazil, China, Thailand, Mexico, Argentina and Kenya.

3. CITIZEN TRAINING

One-hundred-ten training sessions were conducted during the report period (Table 1). About 60% of these workshops were conducted by or with AWW citizen trainers (Tables 2 & 3), and 694 AWW certifications were awarded in 2015.



Taylor Steel conducting an AWW Bacteriological training in Tuscaloosa in August 2015 (pictured in foreground in photo).

Table 1. Workshops and citizens certified by AWW in 2015.		
Type	No. Workshops	No. Certified Trainees
Water Chemistry Monitoring	38	341
Water Chemistry Recertification	24	62
Bacteriological Monitoring	23	170
Bacteriological Recertification	4	4
<i>Exploring Alabama's Living Streams</i>	3	67
Trainer Refresher - Water Chemistry	1	9
Trainer Refresher - Bacteriological	1	9
Water Chemistry Trainer Intern I / II	8	8
Bacteriological Trainer Intern I / II	5	5
Training of Trainers – Water Chemistry	1	9
Training of Trainers – Bacteriological	1	9
Stream Biomonitoring	1	1
Total	110	694*
*Some of the citizen volunteers attended more than one workshop.		

2015 was a good year for the AWW Program based on number of trainings conducted and certifications awarded thanks in large part to our dedicated volunteer trainers:

- 💧 Thirty-eight Water Chemistry Monitoring workshops certified a total of 341 citizens.
- 💧 Twenty-four Water Chemistry Monitoring Recertification sessions were conducted to update 62 citizen monitors as active certified monitors.
- 💧 Twenty-three Bacteriological Monitoring workshops were conducted in which 170 certifications were issued.
- 💧 Four Bacteriological Monitoring Recertification sessions were conducted to update 4 citizen monitors as active certified monitors.
- 💧 Three *Exploring Alabama's Living Streams* were conducted certifying 67 in EALS.
- 💧 One *Trainer Refresher for Water Chemistry Monitoring* workshop was conducted to refresh 9 Water Chemistry Monitoring trainers.
- 💧 One *Trainer Refresher for Bacteriological Monitoring* workshops was conducted to refresh 9 Bacteriological Monitoring trainers.
- 💧 Eight Water Chemistry Trainer Internships were conducted.
- 💧 Five Bacteriological Trainer Internships were conducted.
- 💧 One Water Chemistry Training of Trainers was conducted to train 9 new Water Chemistry Monitoring trainers.
- 💧 One Bacteriological Training of Trainers was conducted to train 9 new Bacteriological trainers.

Twenty-nine trainers conducted the 110 training sessions in 2015 (note, several workshops were taught by a team of two trainers; see Table 2 below). Of these, five are full-time or part-time AWW staff: Eric Reutebuch, Sergio Ruiz-Córdova, Mona Dominguez, Rita Grub and Bill Deutsch. The other 24 are AWW-certified citizen volunteer trainers.

Table 2. AWW Trainers and number of workshops conducted (as lead trainer or assistant) in 2015. An asterisk indicates trainers who are AWW staffers.

No.	AWW Trainer	Number of Workshops
1	Chip Blanton	3
2	Bill Boozer	2
3	Dick Bronson	3
4	Hana Burwinkle	7
5	Marshall Carter	3
6	Bill Deutsch*	2
7	Mona Dominguez*	22
8	Mimi Fearn	3
9	Gene Grimes	1
10	Rita Grub*	24
11	Whitney Henson	4
12	Patti Hurley	2
13	Francine Hutchinson	6
14	Jean Ann Moon	5
15	Mike Mullen	1
16	Jayne Oates	4
17	Judy Palfrey	2
18	Jade Patolo	2
19	Florence Peters	7
20	Eric Reutebuch*	6
21	Linda Ruethemann	2
22	Sergio Ruiz-Córdova*	8
23	Mike Shelton	2
24	Homer Singleton	11
25	Sydney Smith	7
26	Taylor Steele	6
27	Ginger Taylor	3
28	Isabella Trussell	2
29	Susan (Soos) Weber	1
30	Jim Woodrow	2



Sergio RuizCórdova conducting a Bacteriological Monitoring Workshop in May 2015 at SIFAT (Servants in Faith and Technology), Lineville, Alabama.

In 2015, AWW had 42 volunteer trainers (see Table 3 below for water chemistry monitoring trainers, bacteriological monitoring trainers, and stream biomonitoring trainers).



Opelika High School zoology class enthusiastically searching out aquatic critters during a stream biomonitoring outing in Siddique Nature Park.

Table 3. AWW trainers in 2015 (C = water chemistry, B = bacteriological, S = stream biomonitoring); new trainers are highlighted in yellow.		
No.	Trainer	Type
1	Larry Barkey	C
2	Chip Blanton	B,C
3	Bill Boozer	B,C
4	Dick Bronson	B,C
5	Hana Berres	B,C
6	Marshall Carter	B,C
7	Deborah Cearley	B,C
8	Robert C. Davis	B,C
9	Bill Deutsch	B, C, S
10	Mona S. Dominguez	B, C, S
11	Katie Dylewski	B,C
12	Mimi Fearn	B,C
13	Michael Freeman	B,C
14	Gene Grimes	B,C
15	Rita Grub	B,C
16	Whitney Henson	B,C
17	Patti Hurley	B,C
18	Francine Hutchinson	B,C
19	John S. Kulbitskas	C
20	Liz Langston	B,C
21	James Mason	C
22	Christian Miller	C
23	Jean Ann Moon	C
24	Stephen Morros	B,C
25	Michael Mullen	B, C, S
26	Jayme Oates	B,C
27	Judy Palfrey	B,C
28	Jade Patolo	B,C
29	Florence Peters	B,C
30	Linda Ruethemann	B,C
31	Eric Reutebuch	B,C
32	Sergio S. RuizCórdova	B, C, S
33	Wendy Seesock	B,C
34	Mike Shelton	B,C
35	Homer Singleton	B,C
36	Sydney Smith	
37	Taylor Steele	B, C, S
38	Ginger Taylor	C
39	Isabella Trussell	B,C
40	Stephen Tsikalas	B,C
41	Susan Weber	B,C
42	Jim Woodrow	B,C

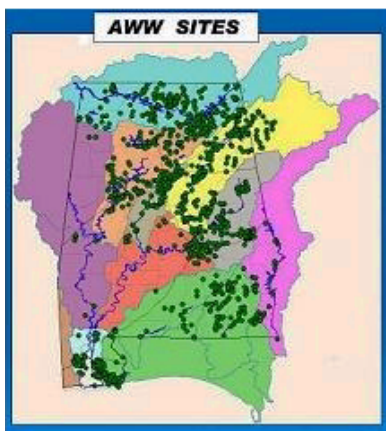
4. AWW CITIZEN GROUPS, DATA AND RESOURCE DISTRIBUTION

Seventy groups collected and submitted water quality data from watersheds throughout the state within the report period (Table 4). Seven new groups formed in 2015:

- ◆ 4-H AWW Bibb County
- ◆ BBG-Girls Scout Troop 31017
- ◆ 4-H AWW Chambers County
- ◆ Guntersville High School FFA
- ◆ 4-H AWW Washington County
- ◆ Sassafras Center for Arts and Environment
- ◆ Woodland Hills Foundation.

Welcome to the AWW team!

A combined total of 3,041 data records were received at the AWW Office during 2015. Since 1993, Alabama Water Watch has received 82,441 water quality data records (66,201 water chemistry and 15,959 bacteriological data records) from citizen monitors in watersheds throughout Alabama. Over 2,300 cumulative sites on 842 waterbodies have been monitored statewide and all data reside on the AWW statewide database.



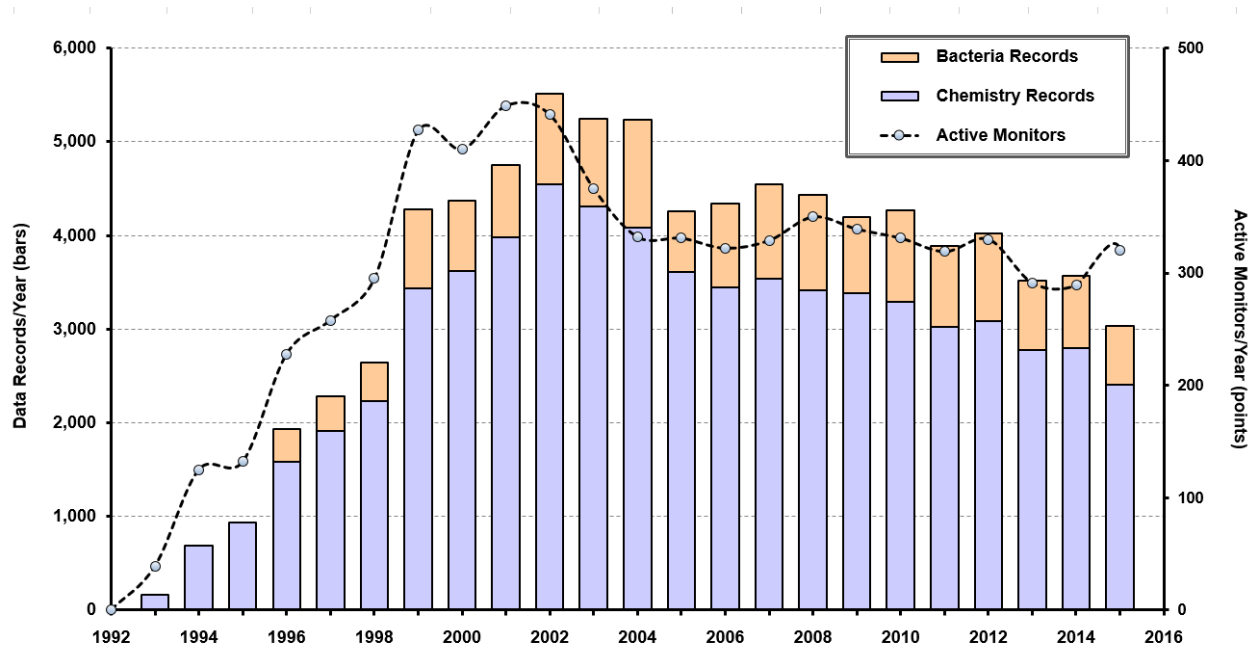
Indicator	Cummulative Numbers	Last Cal Year
Total Water Quality Records	82441	3041
Total Water Chemistry Records	66201	2402
Total Bacteriological Records	15959	635
Total Bioassessment Records	281	4
Total Monitors Certified	6930	537
Total Sampling Sites	2327	410
Total Training Sessions	1984	110
Total Waterbodies Monitored	842	190
Total Citizen Groups	294	69

AWW cumulative statistics – 1992-2015

Table 4. Citizen groups that submitted data to AWW from January 1, 2015 to December 31, 2015 listed by major watershed. (*Groups active in more than one watershed; new groups highlighted in yellow).

No.	Alabama [01]	No.	Tallapoosa [07]
1	Autauga Creek Improvement Committee	35	Chewacla Water Watch
2	Montgomery Catholic Preparatory HS	36	City of Opelika
3	Tri-River Region Water Watch*	37	Coast Guard Auxiliary/Montgomery
		38	E Cubed
	Cahaba [02]	39	Engineers Without Borders AU
4	4-H AWW Bibb County	40	Environmental Awareness Organization
5	BBG-Girls Scout Troop 31017	41	Friends of Chewacla-Uphapee Watershed
6	Cahaba Riverkeeper	42	Friends of Hodnett Creek
7	CRAWSA	43	Jake & Donny Water Watch
8	Friends of Shades Creek	44	Lake Watch of Lake Martin
9	Montevallo Elementary School	45	Lake Wedowee Property Owners Assoc.
10	Montevallo Presbyterian Church	46	Save Our Saugahatchee
			Tri-River Region Water Watch*
	Chattahoochee [03]		
11	4-H AWW Chambers County		Tennessee [08]
12	Chattahoochee RiverWarden	47	Albertville High School Geology Class
13	Friends of Halawakee Creek	48	Asbury High FFA
14	Harding Water Watch	49	Cool Runnings
15	Houston County 4-H	50	Flint Creek Citizens
16	Mill Creek Watershed Management Plan	51	French Mill Partnership
17	Phenix City Intermediate	52	Geraldine High School FFA
		53	Guntersville High School FFA
	Coastal Plain [04]	54	Huntsville Senior Environment Corps
18	Coastal Plain Streams Water Watch	55	Limestone County RSVP
19	Little Lagoon Preservation Society	56	Marshall County RSVP *
20	Ono Island Canal Owners Association	57	North Sand Mountain School
21	Wolf Bay Watershed Watch	58	Sardis High School FFA
		59	Scott Branch Water Watch
	Coosa [05]	60	Wheeler National Wildlife Refuge
22	Fort Payne FFA		
23	Friends of Terrapin Creek		Tombigbee [09]
24	Jacksonville River Monitors	61	4-H AWW Washington County
25	Jake Creek Society		
26	JSU Water Quality Lab		Black Warrior [10]
27	Lake Jordan HOBO	62	Alabama Rivers Alliance
28	Lake Mitchell HOBO	63	Blount County SWCD
29	Lay Lake HOBO	64	Friends of Locust Fork River
30	Logan Martin Lake Protection Assoc.		Friends of Shades Creek *
	Tri-River Region Water Watch*		Marshall County RSVP *
31	Weiss Lake Improvement Association	65	Sassafras Center for Arts and Environment
		66	Smith Lake Civic Association
	Mobile [06]	67	University of Alabama Environmental History Program
32	City of Daphne	68	Watercress Darter Water Qual. Mon. Program
33	Dog River Clearwater Revival	69	Winston Co. Smith Lake Advocacy Inc.
34	Weeks Bay Water Watch	70	Woodland Hills Foundation

A summary of the water chemistry data records and bacteria data records submitted annually and the number of active monitors is presented in the figure below for 1993 through 2015.



Total number of chemistry and bacteria records received per year by the AWW Program and number active monitors/year (lines) from 1993 through 2015.

AWW received requests for various materials and information. All requests, 14 official requests, for AWW data were accommodated. Requests for publications and brochures were received from citizens (Alabama and out of state), educators, AWW monitoring groups, universities and government agencies. Items requested included copies of the Bacteriological Monitoring, Chemistry and Stream Biomonitoring manuals, copies of the *Exploring Alabama's Living Streams* curriculum, volumes from the *Citizen Guide to Alabama Rivers* series, volumes from the AWW Waterbody Report series, copies of *Community-Based Water Monitoring – A Practical Model for Global Watershed Stewardship* and various brochures and pamphlets. Numerous AWW publications were distributed during conferences, group meetings, workshops and other events. Publications are available in digital form from the AWW website at www.alabamawaterwatch.org/resources/publications.

Requests for information and guidance on volunteer water quality monitoring and for citizen water quality data were received and accommodated in a timely matter. All requested AWW data were submitted to ADEM and special data sets were submitted to several monitoring groups and monitors during the report period, including requests from:

- ◆ Alabama Department of Public Health
- ◆ Alabama Department of Environmental Management
- ◆ Geological Survey of Alabama
- ◆ Auburn University
- ◆ University of Alabama at Huntsville

- 💧 TTL, Inc.
- 💧 Mobile Bay National Estuary Program
- 💧 Cahaba Environmental Center, Living River
- 💧 The Lee County Highway Department
- 💧 The City of Auburn
- 💧 The City of Pell City
- 💧 The City of Opelika
- 💧 The City of Daphne

AWW water monitoring data are available online and can be accessed via the internet without a formal request to the AWW Program. Using the AWW *Water Data* website, scores of monitors review and explore their water chemistry and bacteriological data. AWW staff also use this feature to help monitors determine missing data or suspected problems with data values.

5. CONFERENCES AND OUTREACH PRESENTATIONS

Numerous meetings and outreach events were held during this report period in which AWW staff represented the program by expanding partnerships, promoting public relations, and supporting AWW groups.

Data interpretation sessions are meetings where AWW personnel and citizen monitors present, discuss and interpret water quality results obtained by an AWW group (or groups) monitoring their local waterbody. The sessions serve as a summary of years of monitoring effort and put the group's work into a larger context. Citizens are able to share information about sites in their watershed and discuss future monitoring plans. Three data interpretation sessions were presented during 2015, one with Lake Watch of Lake Martin at Dadeville (StillWaters), AL; one with Lake Harding Homeowners Association at Harding Dam, GA; and one with Friends of Locust Fork River at Common Ground, AL.



Eric Reutebuch, AWW Director, presenting an overview of volunteer monitor data for the Cahaba Basin at the Cahaba Connections, the first Cahaba River basin conference, modeled after the Tallapoosa Basin Conference, in May 2015.

Several conferences were attended during 2015 where the AWW staff represented the Program either by giving presentations or as attendees. A list of the most significant presentations at conferences by AWW staff is shown in Table 5 below.

Table 5. Presentations at conferences by AWW staff in 2015.		
Date / Place	Event	Description
1/15/2015, Montgomery, AL	ADEM Nonpoint Source Conference	Eric Reutebuch gave a presentation titled <i>Alabama Water Watch – working for cleaner water in our communities</i> at the 2015 ADEM NPS Conference.
3/20/2015, Columbiana, AL	Environmental Education Association of Alabama	Mona Dominguez gave a presentation about the 4-H AWW Program and other 4-H natural resources and environmental education programs and how to get involved at the 2015 EEAA Conference.
5/15/2015, Living River, AL	Cahaba Connections	Eric Reutebuch gave a presentation titled <i>Citizen Science – AWW Style</i> at the 1 st Annual Cahaba Connections Cahaba Basin Conference.
6/13/2015 Auburn, AL	AWW Annual Gathering/Conference	Eric Reutebuch gave presentations titled <i>Water Watchin’ on the Cahaba</i> , during the Inspirational Sessions, and <i>Alabama Water Watch – What’s Cookin’?</i> , an update of AWW Program activities; Sergio Ruiz-Cordova gave a presentation titled <i>Community-Based Water Monitoring and Watershed Stewardship: the Global Water Watch Experience</i> , and Mona Dominguez gave a presentation titled <i>AWW Youth Education Update</i> , at the AWW Annual Gathering/Conference at the CASIC Building at AU.
9/11/2015, Orange Beach, AL	Alabama Water Resources Conference	Eric Reutebuch gave a presentation titled <i>Alabama Water Watch – Rising to Evolving Water Resource Management Challenges</i> , and Sergio Ruiz-Cordova gave a presentation titled <i>Global Water Watch: An Update of Watershed Stewardship Beyond Alabama</i> at the Alabama Water Resources Conference at Orange Beach, AL.

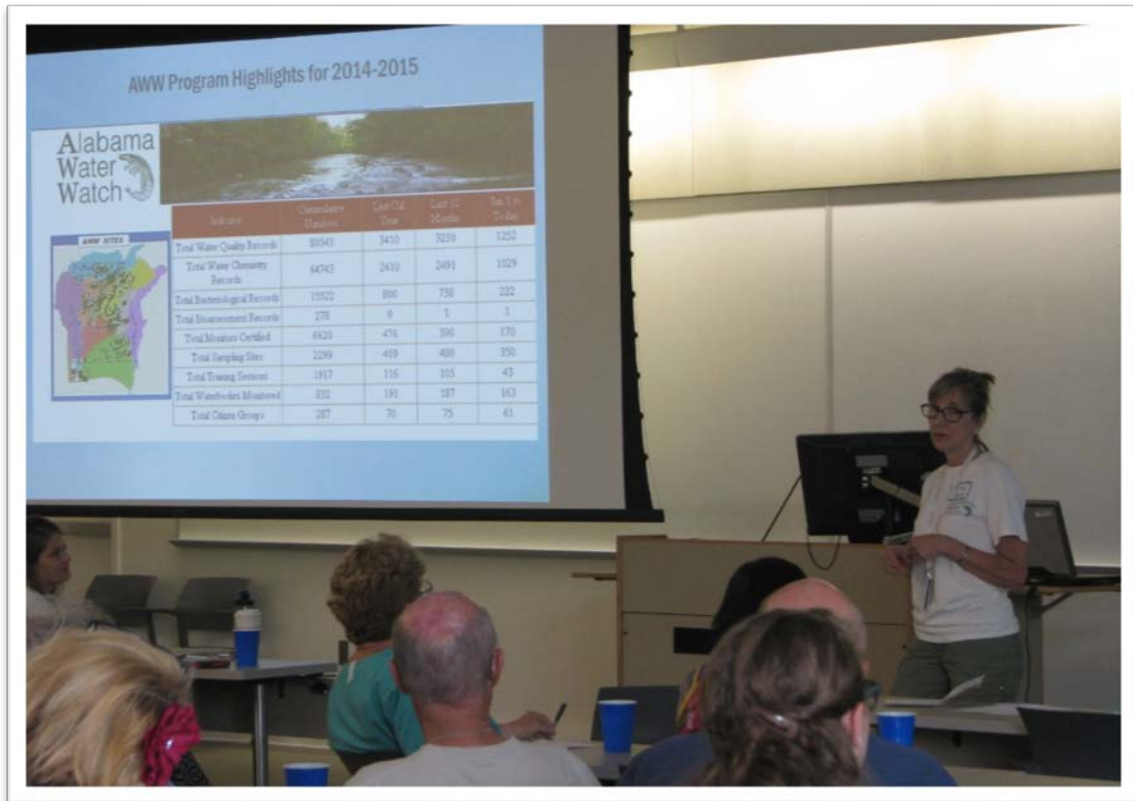
Conferences facilitated by AWW in 2015 included the Cahaba Connections Conference (in partnership with other organizations), the AWW Annual Gathering/Conference, and the Alabama Water Resources Conference.

AWW held its Annual Gathering/Conference at the CASIC Building on June 13, 2015. Participation was robust with 75 AWW monitors, trainers and supporters in attendance, as well as special guests Dr. Lemme and Dr. Brown, Alabama Cooperative Extension System Director and Associate Director, respectively.

Though there were some major challenges and transitions (most notable, retirement of Dr. Fowler/new AU Water Resources Center Director, total re-build of AWW in-house and online databases), the past year was a productive year with lots of achievements; including:

- 💧 80,500 cumulative water quality records (water chemistry, bacteriological, and stream biomonitoring records – as of 6/2015) taken and entered into AWW’s online database;
- 💧 2,300 sites monitored, many on streams not monitored by other state agencies;

- *E. coli* monitoring and postings from some of Alabama’s most treasured and most utilized waterbodies (e.g., the Cahaba River, Lake Martin, Wolf Bay, the Choctawhatchee River, etc.);
- volunteer bacteriological monitoring of public-use waters that has now surpassed the number of monitoring sites done by the state (based on postings at theswimguide.org: volunteer-monitored sites, all freshwater, = 38*; state-monitored sites, all marine, = 25); and,
- more than 1,000 youth inspired by the AWW story in the past year, along with scores of adults.



Rita Grub, AWW Office Coordinator, updating all on AWW achievements, one of which: over **80,000 AWW water quality records** (as of 6/2015) submitted! Kudos to our monitors!

How does AWW achieve these things? The Number 1 ingredient: scores of concerned Alabamians who care about their water and watersheds, and who are willing to get involved to preserve and protect them. Ingredient Number 2: a dedicated, experienced, stable staff that is committed to the waters and the volunteer water monitors and trainers throughout the state. Ingredient Number 3: a strong commitment from both the Alabama Cooperative Extension System and the Alabama Agricultural Experiment Station to support the AWW Program and AWW citizen monitors and trainers in their watershed stewardship efforts. Both Dr. Lemme, ACES Director, and Dr. Brown ACES Associate Director, voiced this support, praising AWW as a highly effective program that positively impacts the lives of Alabamians.



Dr. Lemme, Alabama Cooperative Extension System Director, commending AWW volunteer trainers and monitors on their efforts in protecting the state's waters.

As in years past, AWW recognized volunteer monitors, trainers and groups for their outstanding efforts in watershed stewardship during the past year. 2015 winners were:

- 💧 Mullen Award: **Marty Schulman**, with 68 data records submitted (that's > 1 monitor event per week)!

First runner up: Roger Martin – 66 records

Second runner up: Aren Calton – 60 records!

Third runner up: Sydney Smith – 59 records!

Fourth runner up: Bill Boozer – 54 records!
- 💧 Group of the Year Award: **Coastal Plains Streams Water Watch**, with 318 records submitted (that's almost a sampling event every day)!

First runner up: RSVP Marshall County – 270 records (cumulative records = **9,460!**)

Second runner up: Wolf Bay Watershed Watch – 204 records

Third runner up: Logan Martin Lake Protection Association – 162 records

Fourth runner up: Lake Watch of Lake Martin 152 records
- 💧 Trainer of the Year Award: **Homer Singleton**, for conducting 15 workshops in 2015!

First runner up: Taylor Steele – 9 workshops

Second runner up: Marshall Carter – 8 workshops
- 💧 Environmental Educator Mentoring Award: **Gene and Dorothy Grimes and Flo Peters**
- 💧 Our newest award, the "Snake Sighting" Award (not the most desired): **Sydney Smith**



Dr. Deutsch facilitating an AWW 'Living Timeline' based on water watchers and their stories of when they became involved with the program (veteran water watchers at the bottom of the stairs and new-bees at the top).



Mona Dominguez, AWW Youth Education Coordinator, acknowledging AWW volunteer trainers, AWW monitors and AWW supporters.

Dr. Lemme's point about AWW being a highly effective program that positively impacts the lives of Alabamians was emphasized by presenters during the 'Inspirational Session' which showcased volunteer monitor efforts in:

- Watershed protection (Cahaba Basin),
- Water policy (Saugahatchee and Chewacla watersheds), and,
- Environmental education (Jacksonville State University, Gadsden area streams).



Dan Ballard, Watershed Division Manager for the City of Auburn, Alabama enumerating the many benefits of AWW volunteer monitoring relative to local water resource management.



Jade Patolo and Steven Tsikalas, instructors at Jacksonville State University, describing exciting research and presentations done by them and their JSU students that incorporates AWW water monitoring with geographic studies and analyses.

For more information on the AWW Annual Meeting, go to *Who's watching our water?* in the AWWareness blog, <http://wp.auburn.edu/aww/> .

6. ACCOMPLISHMENTS AND INITIATIVES

Grant Proposals

Mona Dominguez and Sergio Ruiz-Cordova submitted a proposal for \$91,000 titled *Increasing Environmental Literacy and Watershed Stewardship through Youth-Focused Citizen Science* to the EPA Office of Environmental Education in February 2015 (approved in July 2015).

Ash Bullard, Eric Peatman, Joel Hayworth and Eric Reutebuch submitted a proposal for \$883,645 titled *Environmental Effects of Submersed Oil Mats (SOMs) in Alabama Beaches* to the Gulf of Mexico Research Initiative in March 2015 (unfunded).

Charlene Lebleu, Ash Bullard, Eric Reutebuch, Eve Brantley and Christian Miller submitted a proposal for \$187,935 titled *Insuring a Safe and Sustainable Seafood Supply by Mitigating Stormwater Impacts* to the Mississippi-Alabama Sea Grant Consortium in April 2015 (unfunded).

Sergio Ruiz-Cordova and Mona Dominguez submitted a proposal for \$299,997 titled *A Binational Effort to Increase Environmental Literacy and Watershed Stewardship of Gulf of Mexico through Youth-Focused Citizen Science* to the EPA Gulf of Mexico Program in September 2015 (unfunded).

Puneet Srivastava, Eric Reutebuch, Kristin Wood and Yucheng Feng submitted a pre-proposal for \$42,000 titled *Practical Approach to Implementing Farm Bacterial Testing of the FSMA Produce Safety Rule* to the Center for Produce Safety in December 2015 (pending).

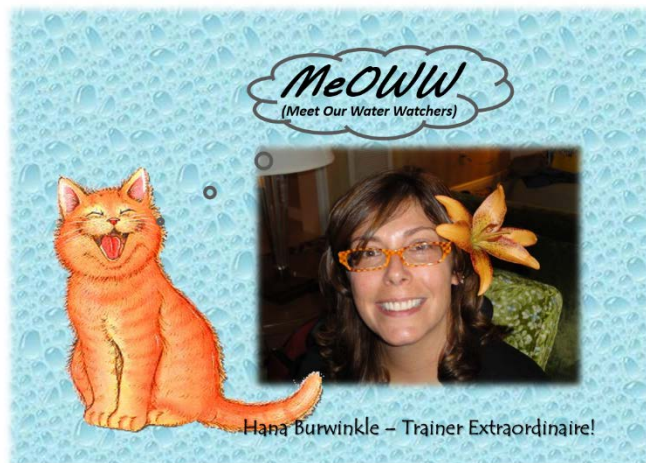
MeOWW

AWW initiated a regular addition to the AWWareness blog, Meet Our Water Watchers, or MeOWW. MeOWW serves multiple purposes:

- showcase AWWs unsung champions who have devoted tremendous time, talent and treasure to promote watershed stewardship in Alabama,
- showcase the water monitoring group efforts of these AWW champions in preserving and protecting local waters, and,
- provide motivation to other volunteer monitors and groups throughout the state through stories of dedication to watershed stewardship.

MeOWW featured 5 exceptional Water Watchers in 2015:

- 💧 Hana Burwinkle, AWW trainer (pictured at right)
- 💧 Francine Hutchinson, AWW trainer
- 💧 Taylor Steele, AWW trainer

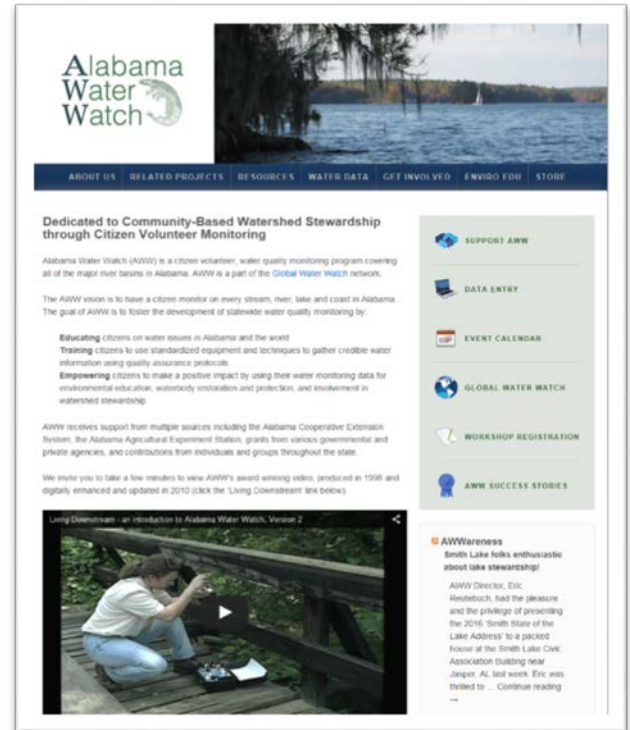


- 💧 Mike Shelton, AWW trainer
- 💧 Michael Freeman, AWW supporter & monitor

Publications

During this report period, the AWW staff wrote or contributed to 21 articles that were posted on the web and numerous others submitted for publication in other media, including the AWW blog (shown at right, www.alabamawaterwatch.org), the AWW *AWW Awareness Newsletter*, *Lake Magazine*, and in the *Alabama Fisheries Association Newsletter* (see examples below). Many of these articles highlight the “Success Stories” of AWW groups and monitors. AWW articles can be accessed at the AWW website or at this link <http://blog.auburn.edu/aww>.

- *City of Daphne purchases AWW water testing kits for local volunteers*
- *There’s an app for that!*
- *AWW is saddened by the loss of an elite water monitor*
- *MeOWW (Meet Our Water Watchers) – Hana Burwinkle, AWW trainer extraordinaire!*
- *AWW Database Transition*
- *For the love of the darter*
- *MeOWW (Meet Our Water Watchers) – Francine Hutchinson, AWW trainer extraordinaire!*
- *We’ll miss you, Dr. Fowler!*
- *Who speaks for the streams?*
- *Who’s watching our water?*
- *We miss you, LaVerne!*
- *2015 AWW Award Winners*
- *Jacksonville River Monitors make a big splash in Alabama*
- *MeOWW (Meet Our Water Watchers) – Taylor Steele, AWW trainer extraordinaire!*
- *MeOWW (Meet Our Water Watchers) – Mike Shelton, AWW trainer extraordinaire!*
- *Auburn student monitors watch over Parkerson Mill Creek*
- *AWW and Wolf Bay Watershed Watch Showcased Nationally*
- *MeOWW (Meet Our Water Watchers) – Michael Freeman, AWW supporter extraordinaire!*
- *We miss you, Gary*
- *Washington County 4-H Watches the Water*
- *The Best AWW Christmas Ever!*



The AWW website continues to be a resource for monitors, interested citizens and agencies. The AWW website has received thousands of visits since it was posted on the internet in August 1998. The *Water Data* section of the AWW website has been an extremely useful tool for monitors and citizens throughout Alabama, and people in other states and over 80 other countries (see www.alabamawaterwatch.org and click *Water Data*). Visitors to the *Water Data* webpages can view data from groups, sites, watersheds and waterbodies. Interactive Google™ maps show monitoring sites by river basin, and allow the public to locate sites and view water data within their areas of interest. Charts, graphs and tables provide multiple ways to view data.

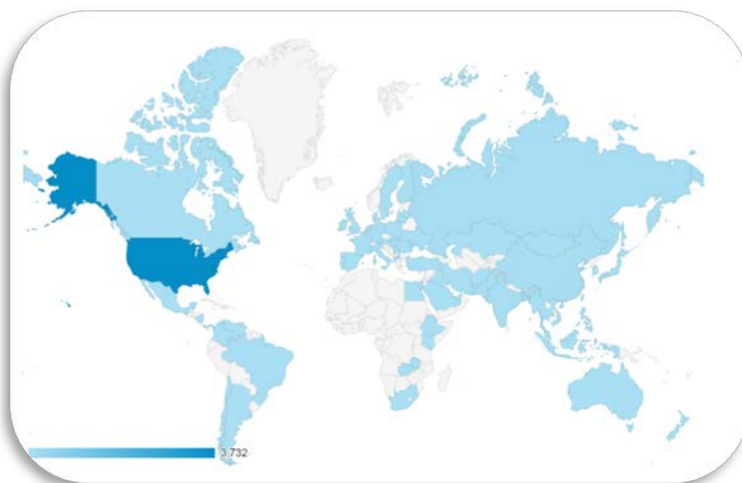
AWW Website Analytics

The new WordPress-based AWW website, www.alabamawaterwatch.org, went live on August 25, 2015. The site was visited by a wide array of people from across the globe from August-December, 2015 (~ 4 months). Here is a summary of these visits:

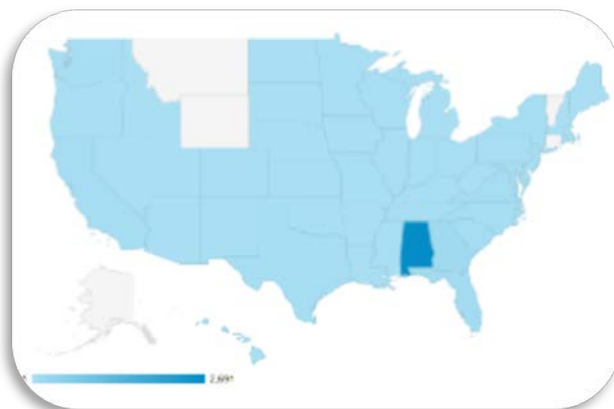
The new WordPress-based AWW website, www.alabamawaterwatch.org, went live on August 25, 2015. The site was visited by a wide array of people from across the globe from August-December, 2015 (~ 4 months).

Here is a summary of these visits:

- ◆ 12,312 page views (3,078/month),
- ◆ Viewed by 69 countries from throughout the globe (see map above),
- ◆ Viewed by 45 of 50 states (at right),
- ◆ 4,344 sessions by 2,517 unique users,
- ◆ average visit of 3.5 minutes,
- ◆ 58% of visits were new visitors.



Global visits to the AWW website



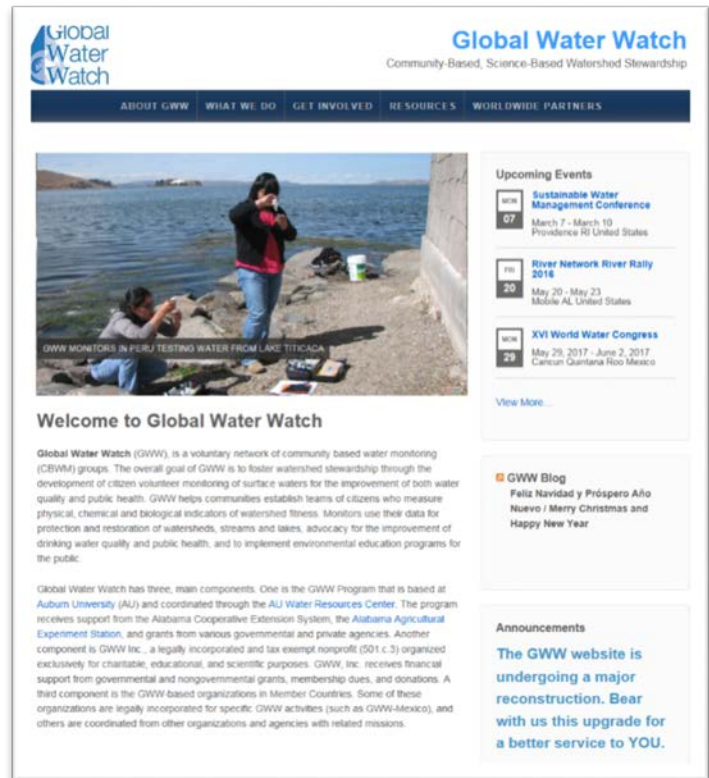
U.S. visits to the AWW website

7. RELATED PROJECTS

Several related projects allow the AWW program to expand its efforts by providing the means to educate citizens about watershed stewardship, encouraging and enabling them to participate in watershed management and other projects designed to protect their local water resources. Numerous meetings and activities were held during this report period; many of these were funded by other projects in which AWW staff represented the program. These activities developed valuable partnerships, enhanced public relations, and supported numerous groups while promoting community-based watershed stewardship. Below is a brief description of these projects.

A. Global Water Watch (GWW)

Global Water Watch (GWW) fosters *Community-Based, Science-Based Watershed Stewardship* (CBWS), through the development of long-term citizen volunteer monitoring of surface waters for determining the condition and trends of water quality and quantity, and for the improvement of both public health and watershed health. CBWS is a participatory process of linking community groups to low-cost and reliable appropriate technologies to obtain credible data, which appropriately analyzed, is transformed to local knowledge that can be used throughout the world via translation to local dialects for implementing environmental education programs, understanding, protecting, and restoring and managing watersheds. This information has the potential to greatly enhance planning and action by local grassroots organizations and natural resource agencies.



The screenshot shows the Global Water Watch website homepage. At the top left is the GWW logo. To the right, the text reads "Global Water Watch" and "Community-Based, Science-Based Watershed Stewardship". Below this is a navigation bar with links: "ABOUT GWW", "WHAT WE DO", "GET INVOLVED", "RESOURCES", and "WORLDWIDE PARTNERS". The main content area features a large photo of two people testing water in a lake, with the caption "GWW MONITORS IN PERU TESTING WATER FROM LAKE TITICACA". Below the photo is a "Welcome to Global Water Watch" section with a paragraph describing the organization's mission and goals. To the right, there is an "Upcoming Events" section listing three events: "Sustainable Water Management Conference" (March 7-10, Providence RI), "River Network River Rally 2016" (May 20-23, Mobile AL), and "XVI World Water Congress" (May 29, 2017 - June 2, 2017, Cancun Quintana Roo Mexico). Below the events is a "GWW Blog" section with a post titled "Feliz Navidad y Próspero Año Nuevo / Merry Christmas and Happy New Year". At the bottom right, there is an "Announcements" section with the text: "The GWW website is undergoing a major reconstruction. Bear with us this upgrade for a better service to YOU."

The GWW Program has been coordinated from Auburn University (AU) for more than 20 years, and is based in the AU Water Resources Center (www.aes.auburn.edu/water). Monitoring protocols are documented in Quality Assurance/Quality Control Plans approved by the USEPA for citizen water testing (water chemistry and bacteriological monitoring). GWW has certified about 1,100 citizen monitors who have submitted more than 7,000 water quality data records from 450 sites on 175 waterbodies beyond Alabama. Data are stored in a customized, online database, which can be accessed by monitors, educators and the general public to analyze, graph, map, share and retrieve summarized data in a variety of ways. GWW projects have led to improved public health, positive impacts on local and national water legislation, and local, regional and national environmental awards.

GWW-CBWS activities have been integrated with fisheries, agriculture, animal production, food security, forestry, education, water resource management, health, and other programs while addressing cross-cutting themes of sustainability, integration, private-sector engagement and role of gender. Currently, active community-based water monitoring programs are being implemented in several countries throughout the world, including: Argentina, Kenya, Mexico, Peru, USA/Alabama, and several others. To learn more about the GWW program visit the program website at www.globalwaterwatch.org.

B. 4-H Alabama Water Watch Program

The 4-H Alabama Water Watch Program (4-H AWW) is the statewide youth volunteer water quality monitoring program created through a partnership between Alabama Water Watch and Alabama 4-H, the youth development program for the Alabama Cooperative Extension System

(ACES). Qualified volunteers and educators lead students in credible data collection and watershed stewardship activities.

4-H AWW increases environmental literacy by building capacity in volunteers and educators to provide youth with an increased awareness and understanding of watershed issues and tools that cultivate the critical thinking skills students need to identify problems related to water quality and to develop solutions for such problems. As students engage in water monitoring activities they are able to interpret the health of local waterbodies, and then to make decisions and offer solutions that will contribute to the maintenance and restoration of the local watershed. With this goal in mind, the 4-H AWW Program accomplished the following outcomes in 2015:



Chambers County 4-H'ers testing Mill Creek.

- ◆ 74 adults were trained to utilize the Exploring Our Living Streams curriculum during three workshops,
- ◆ 1,000+ youth were reached through 4-H AWW outreach and education activities,
- ◆ 70 youth were certified as 4-H AWW water quality monitors,
- ◆ 50 data records were submitted to the AWW database by 4-H AWW groups,
- ◆ the *Exploring Our Living Streams* curriculum was revised and reprinted,
- ◆ a partnership between 4-H AWW Program and the EPA Gulf of Mexico Program Office was established, and,
- ◆ the 4-H AWW Program received a grant from the EPA Office of Environmental Education, \$91,000 for 2-year project!

C. USDA/ Agriculture and Food Research Initiative (AFRI)



AWW staffer sampling a farm stream for bacteria.

The USDA/AFRI project, titled *A Systems Approach to Identifying and Filling Gaps in and Between Knowledge and Practice in Production and Distribution of Local and Regional Foods for a More Secure Food Supply Chain*, is an innovative five-year project based at Auburn University aimed at ensuring the quality and safety of locally and regionally produced meat. This USDA-funded project is led by a multidisciplinary team of professors and extension specialists at AU and Tuskegee who specialize in animal sciences, agriculture economics, food safety, supply chain analysis, marketing, sociology,

business, and environmental sciences. The project goal is to identify consumer perceptions about locally/regionally produced foods and compare that to the perceptions of the farmers/producers.

The information will then be evaluated to develop guidelines and practices aimed toward improving food safety and build teaching modules to deliver the information to farm operators.

The first phase of the project consists of data collection—on-site, environmental bacterial sampling of troughs, barns and equipment as well as microbial sampling of streams located on or near each farm to evaluate water quality. This phase of the project has been completed, and data compilation and analyses are underway.

D. Alabama Water Resources Research Institute (WRRI) Project

The WRRI project, titled *Identification of pollution sources on agricultural farms and evaluation of new fecal indicators for surface water quality monitoring*, pairs AWW staff with AU researchers to evaluate water quality on livestock farms. Luxin Wang, microbiological researcher at AU, and Eric Reutebuch, director of the Alabama Water Watch Program, received a one-year grant from the Alabama Water Resources Research Institute to sample farms in east Alabama.

A recent study conducted by Wang and Reutebuch (unpublished) found that the *E. coli* concentrations downstream of cattle farms were significantly higher than the *E. coli* concentrations upstream of the farms. These results indicated that on-farm management and good agricultural practices need to be improved in order to lower the fecal contamination of surface water. The genus *Bacteroides* has been suggested as an alternative fecal indicator to replace *E. coli* or fecal coliforms because they make up a significant portion of the fecal bacterial population. Most importantly, *Bacteroides* are host specific and can be used as to track the contamination sources. **Objective 1** of this research is to identify water contamination sources by collecting and analyzing surface water samples (upstream and downstream) from different farms and detecting host specific *Bacteroides* groups via real-time PCR assays.



Dr. Wang, Patty Tyler, graduate students and AWW staffs sampling a farm stream for bacteria.

Because of concerns with using *E. coli* as the indicator organisms, several other genera have been proposed for use as an alternative indicator for fecal contamination of surface waters. One of them is *Enterococcus*. An epidemiological study performed by U.S. EPA demonstrated a direct relationship between the density of *E. coli* and *Enterococci* in surface waters and an increase in swimmer-associated gastroenteritis. For freshwater, the current single-sample advisory limits are 235 CFU/100 ml for *E. coli* and 61 CFU/100 ml for *Enterococci* (U.S. EPA, 2000). Another recent study conducted by Wang and Reutebuch (unpublished) found that the concentrations of *Enterococci* present in recreational waters were higher than *E. coli*, which indicates that

Enterococcus may serve as a better indicator microorganism for monitoring fecal contamination in fresh waters, and a better indicator for AWW volunteer monitors to use. Because the higher the concentration of the indicator microorganisms, the better the chance of recovering them, *Enterococcus* may improve AWW bacterial enumeration reliability. Therefore, **Objective 2** of this research is to investigate the development of a water monitoring protocol that is credible and easy-to-use for AWW water quality monitoring groups using *Enterococci* as the indicator microorganism. We will also investigate the feasibility and reliability of volunteer monitors using *Bacteriodes* as an indicator of fecal contamination. Field sampling is ongoing, and will be completed in 2016.

And in conclusion, some of the many reasons that we do what we do:



* The Pygmy sculpin (*Cottus pygmaeus*), a threatened species, found only in Coldwater Spring and its spring run to its confluence with Dry Creek in Calhoun County near Anniston, AL.