

Large-Scale Sampling Events: Using Volunteers to Monitor at the Watershed Level

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Georgia Environmental Protection Division

EPA 319 (h) funded Program

Program Components

- Streams, lakes, coastal waters
- Intro programs
 - Watershed Assessment
 - Visual Stream Survey
- QA/QC Monitoring
 - Chemical
 - Macroinvertebrate
 - Bacterial



Primarily focus on trend monitoring



Georgia Adopt-A-Stream

GEORGIA'S VOLUNTEER WATER QUALITY MONITORING PROGRAM



- Adopt-A-Stream
- Get Involved
- Groups
- Sites
- People
- Data Views
- Data Entry
- Materials & Resources
- Teacher's Corner
- Contact us
- Sign in



NEW Online Data Entry, Data Forms & QC Measures 2014



Meet Anne Stahley



Did you know? You can view monthly summaries of your group's activities, such as the number of events conducted, data reported, hours contributed and more.



Apr 17, 2014	Groups	Sites	Events	Data	Volunteers	Newsletters
Currently active	203	521	4186	18405	2510	Jan-Mar 2014
Database totals	663	1450	23390	121286	20092	Archived

Thursday, April 17 View monthly calendar Print

Thursday, April 17

- 6:00pm [Cobb. Chemical Monitoring Workshop](#)

Saturday, April 19

- 9:00am [Biological, Visual Workshop, Augusta, GA](#)

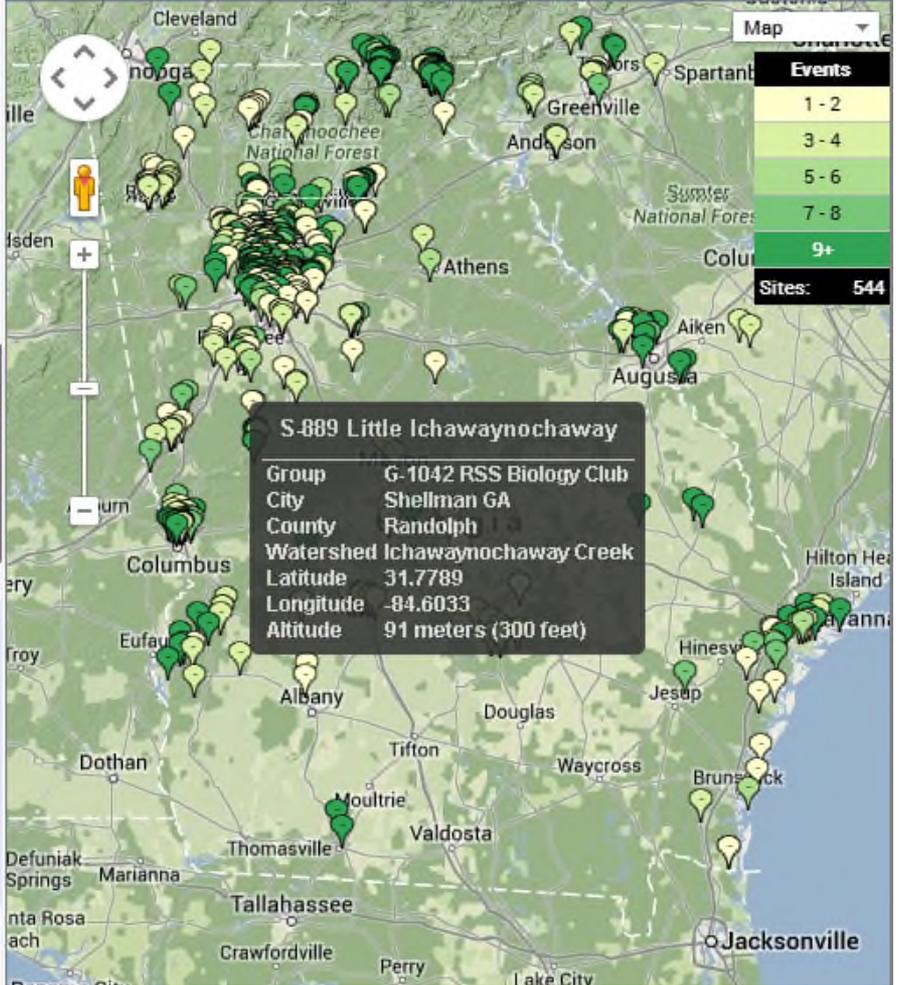
Saturday, April 26

- [Forsyth County - Amphibian Workshop](#)

[Google Calendar](#)

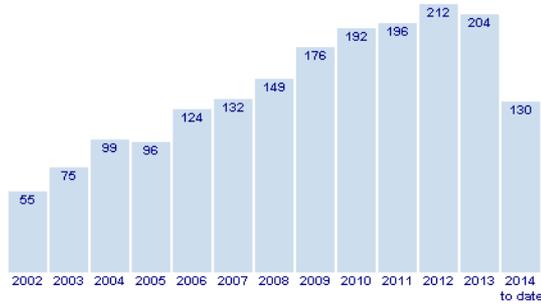
AAS Coordinators and Trainers can post on the calendar. Contact the State Office for more information: aas@qaepd.org.

Show: All active sites

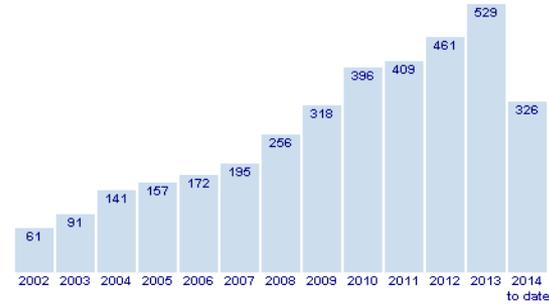


Started in 1992

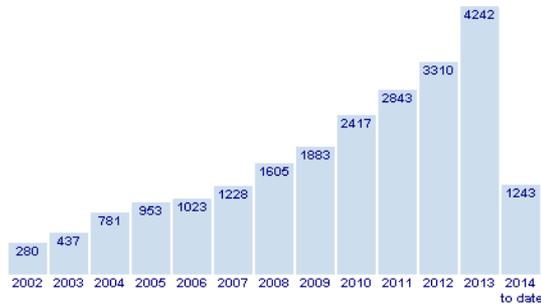
Active Groups by Year



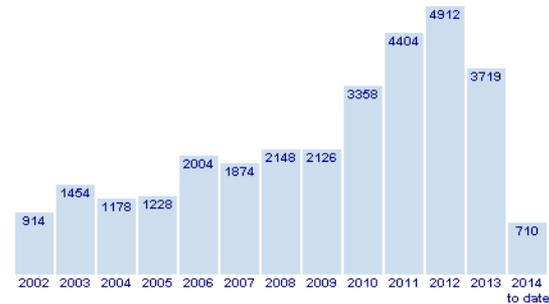
Active Monitoring Sites by Year



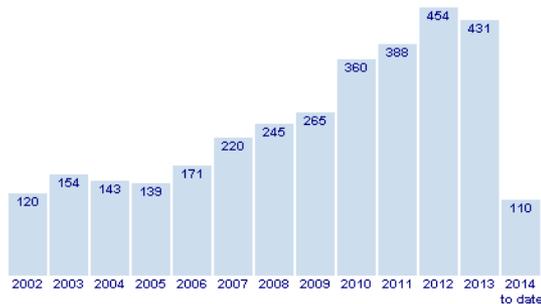
Monitoring Events by Year



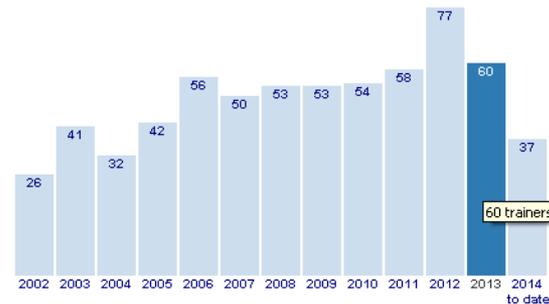
Certifications Earned by Year



Workshops Conducted by Year



Active Trainers by Year



Large Scale Monitoring

- Watershed & longitudinal sampling
- Different names
 - Blitzs, River Adventures, River Rendezvous, B-52
- Duration & # Sites
 - 1 day – 20-30 to 150 sites
 - 1 week – 80-120 sites
- Monitoring Teams
 - 5 to 30 teams
 - 3 to 5 sites per
- Parameters depend on
 - goals
 - Volunteers
 - Resources
 - Funding

Partners

- NGO/watershed, civic groups
- Universities
- Local/state/federal governments
- Businesses and other entities

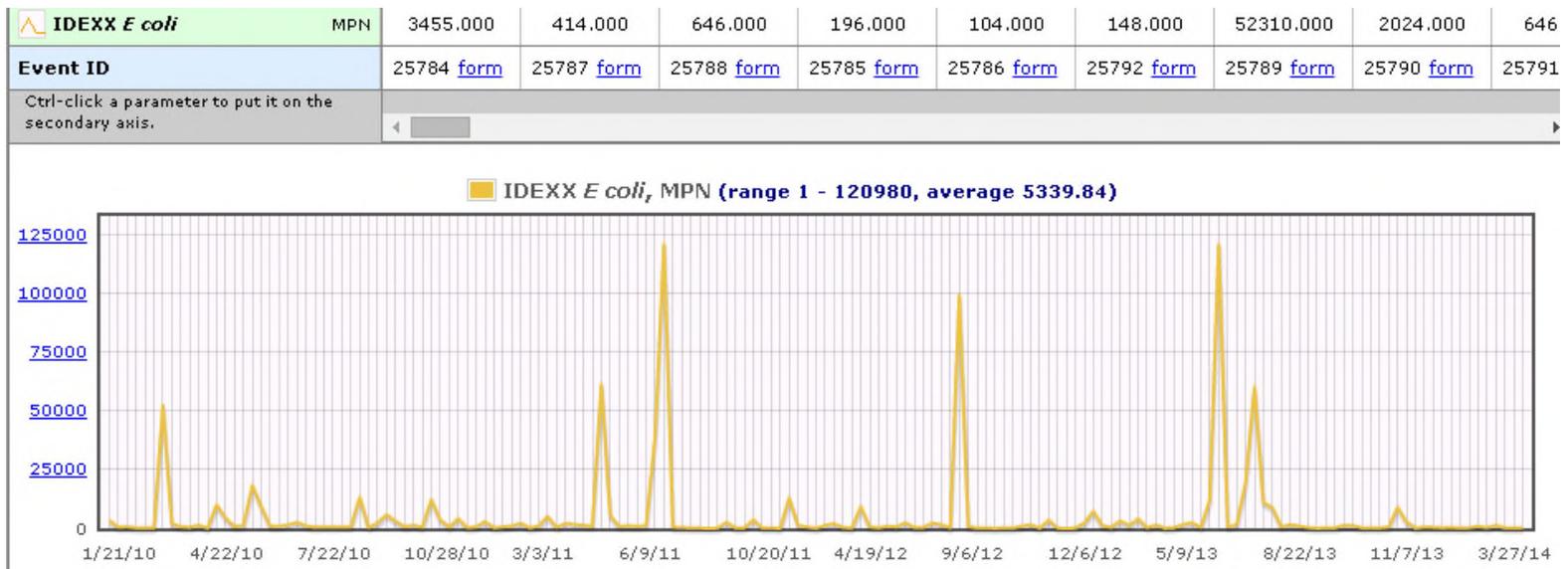
Together they provide:

- Local water knowledge
- Volunteers
- Sampling equipment
- Lab and technical support
- Data interpretation
- Sponsorship

Goals and Outputs

- Targeted sampling
 - Identify hotspots for further sampling
- Trend sampling
 - Learn more about the watershed to bring partners together

One drives the other



Goals and Outputs: Site Selection

Target known problems

- Outfalls, tributaries
- Urban runoff
- Sewage overflows, septic systems
- Agriculture, mining
- Wildlife
- Industry



Hogzilla

Goals and Outputs: Site Selection

Review maps

- Ortho, topo, landuse
- NPDES, mining, land application, landfill
- USGS and GA EPD
- 303d listed streams

- Tap into local experts
- Bring partners to the table

The screenshot displays a GIS interface. A map shows a creek network with various colored markers. A popup window titled "Line Creek" provides detailed information for a specific reach. To the right, a layer control panel lists various data layers and their visibility status.

Line Creek	
FID	517
Reach_ID	R031300050209
Reach_Name	Line Creek
Reach_Loca	Flat Creek to Flint River
Reach_Basi	Flint
Reach_Coun	Fayette/ Spalding/ Coweta
Reach_WB_T	Stream
Reach_WUC	Fishing
Reach_Data	1,10
Reach_Eval	Not Supporting
Reach_Viol	FC
Reach_Vio_	NP
Reach_Ext	15
R_Extent_U	miles
Tier	4a
Notes	TMDL completed FC 2008.
Priority_Y	
Beach_Leng	0

Description	Layer
All layers	
USGS Nationwide Streamflow Gauges	<input type="checkbox"/>
High-Bandwidth (34MB) HUC12 Watersheds	<input type="checkbox"/>
305(b)/303(d) Listed Water 2012	<input type="checkbox"/>
Key: Supporting Not supporting Assessment pending	<input checked="" type="checkbox"/>
GA Land Application Sites --- through 1999	<input type="checkbox"/>
GA Landfills --- through 1999	<input checked="" type="checkbox"/>
GA Surface Mines --- through 1999	<input type="checkbox"/>

Goals and Outputs: Monitoring Methods

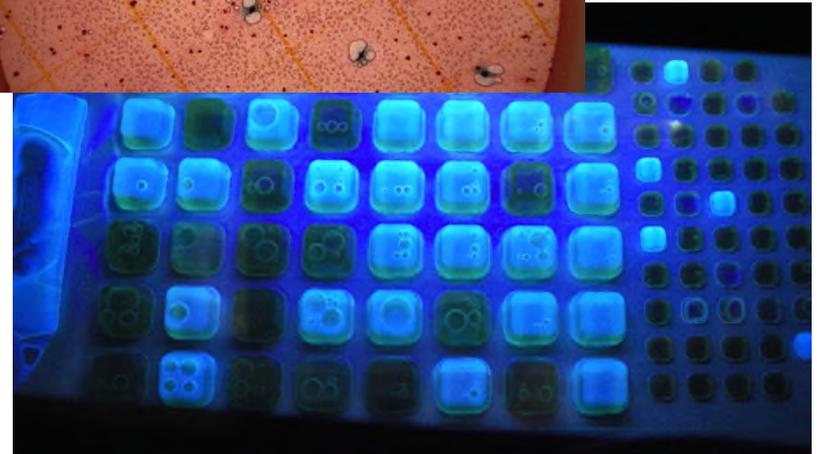
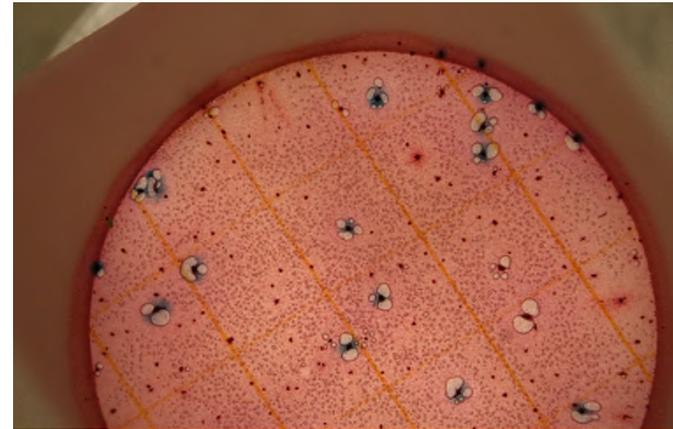
- Chemistries
 - Basic parameters
 - Metals
 - Nutrients
- Bacteria
 - E. coli – lab, IDEXX, Petrifilm
 - Fecal coliform
 - Enterococcus
- Physical characteristics
- Macroinvertebrates



Goals and Outputs: Monitoring Methods

- Lab analysis?
- Field?
- Combination?

Dependent on resources
and partners



Goal & Outputs: Data Considerations

- How will you analyze data?
- Will you share results?
- Write a report?
- Just use internally?

Georgia website/database is available for citizens and partners to enter, view and download data.

Cobb County

- Once a year
- 7 years & counting
- 30 sites in 3 hours
- Partners:
 - Cobb Water System
 - Sierra Club
 - Georgia EPD
 - US EPA



Cobb County

- Data Collection
 - pH, DO, temperature, conductivity
 - Habitat assessment, visual observations, pictures
- Sample Collection
 - Bacteria
 - Nutrients
 - Metals
 - General (TSS, Turbidity)
 - BOD
- Litter Removal



Equipment Needed...

- Field monitoring kits
- Iced coolers (if samples coming back)
- Map (with directions to sampling sites)
- Field data sheets
- Cameras
- Sample bottles

Other Considerations

- Participant waiver
- Training team leaders
- Evaluation
- Initial investment

Outcomes

- Locate sewer spills
- Locate illicit discharges
- Responding to violations
- Data collection, analysis, reporting

- Education
- People Outdoors
- Community fellowship



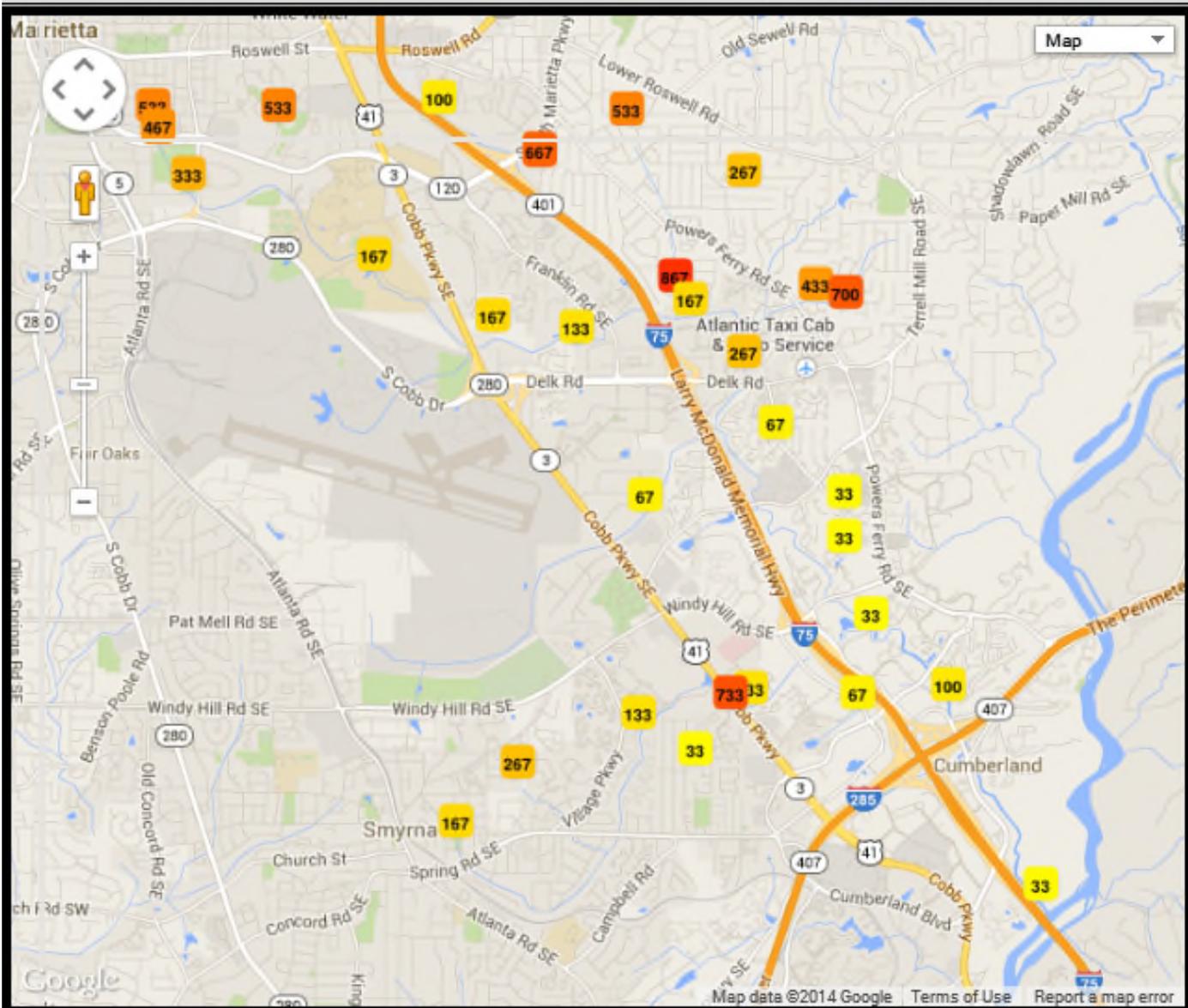
Outcomes

- Helps with trend monitoring sampling
- Identify areas in need of more data
- Confirms water quality health



Watershed Survey – Rottenwood Creek

2007 2008 2009 2010 2011 2012 2013



Choose a parameter:

Ammonia-Nitrogen	mg/L
Bio. Oxygen Demand	mg/L
Chloride	mg/L
Conductivity	µmho/cm
Dissolved Oxygen	mg/L
D.O. Saturation	%
<i>E. coli</i> 3M Petri.	cfu/100mL
<i>E. coli</i> IDEXX	cfu/100mL
Fecal Coliform	cfu/100mL
NOX	mg/L
pH	
Kjeldahl Nitrogen	mg/L
Total Phosphorus	mg/L
Total Suspended Solids	mg/L
Turbidity	NTU
Water Temperature	°C
Habitat Assessment	

- Aluminum (Al) mg/L
- Barium (Ba) µg/L
- Calcium (Ca) mg/L
- Iron (Fe) mg/L
- Lead (Pb) µg/L
- Magnesium (Mg) mg/L
- Manganese (Mn) mg/L
- Potassium (K) mg/L
- Sodium (Na) mg/L
- Strontium (Sr) mg/L
- Zinc (Zn) µg/L
- Hardness mg/L

Markers show:

- Parameter values
- Site IDs

Minimum:	33
Median:	167
Maximum:	867

Watershed Survey – Rottenwood Creek

2007

2008

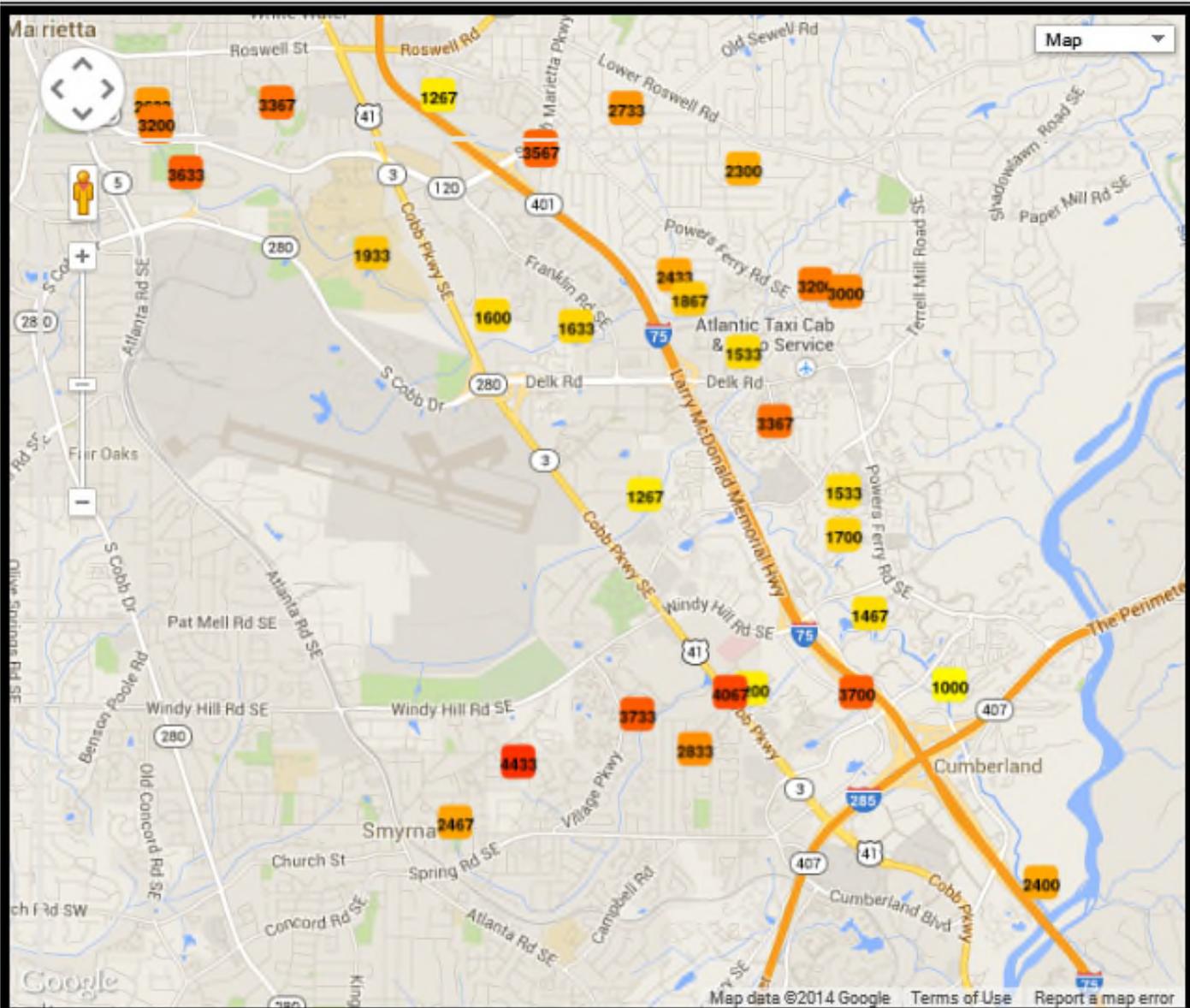
2009

2010

2011

2012

2013



Choose a parameter:

Ammonia-Nitrogen	mg/L
Bio. Oxygen Demand	mg/L
Chloride	mg/L
Conductivity	µmho/cm
Dissolved Oxygen	mg/L
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- Strontium (Sr) mg/L
- Zinc (Zn) µg/L
- Hardness mg/L

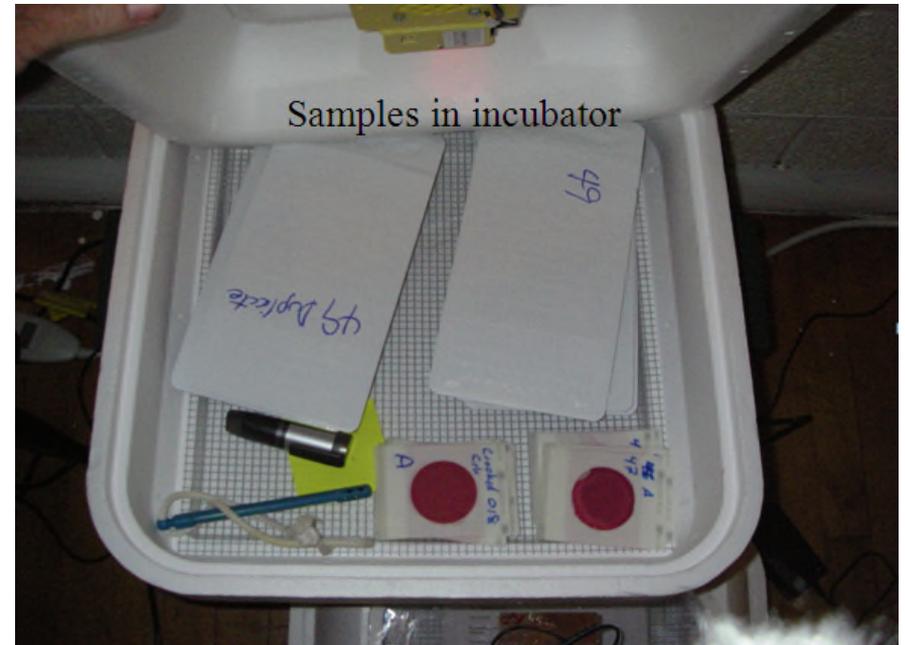
Markers show:

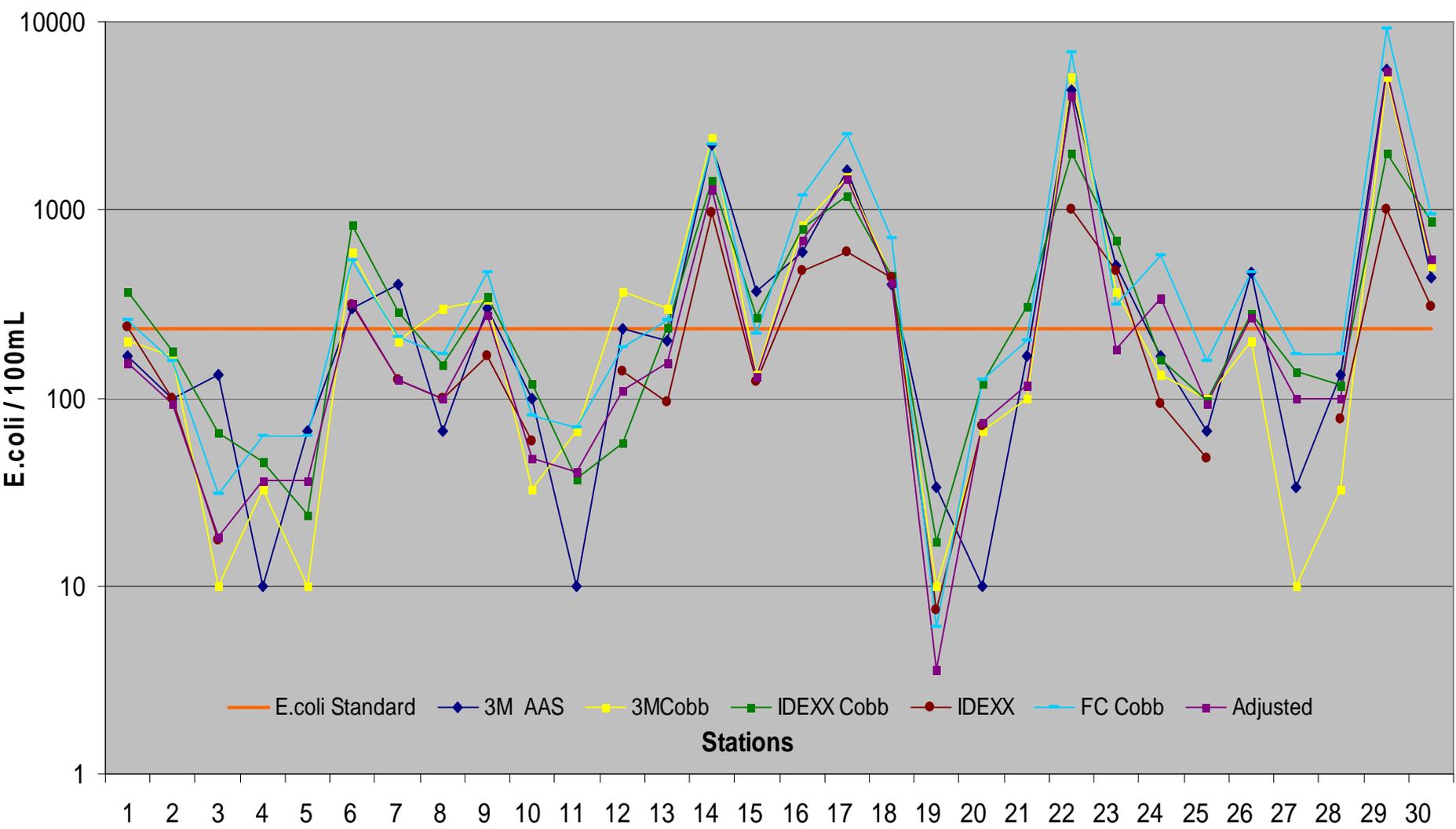
- Parameter values
- Site IDs

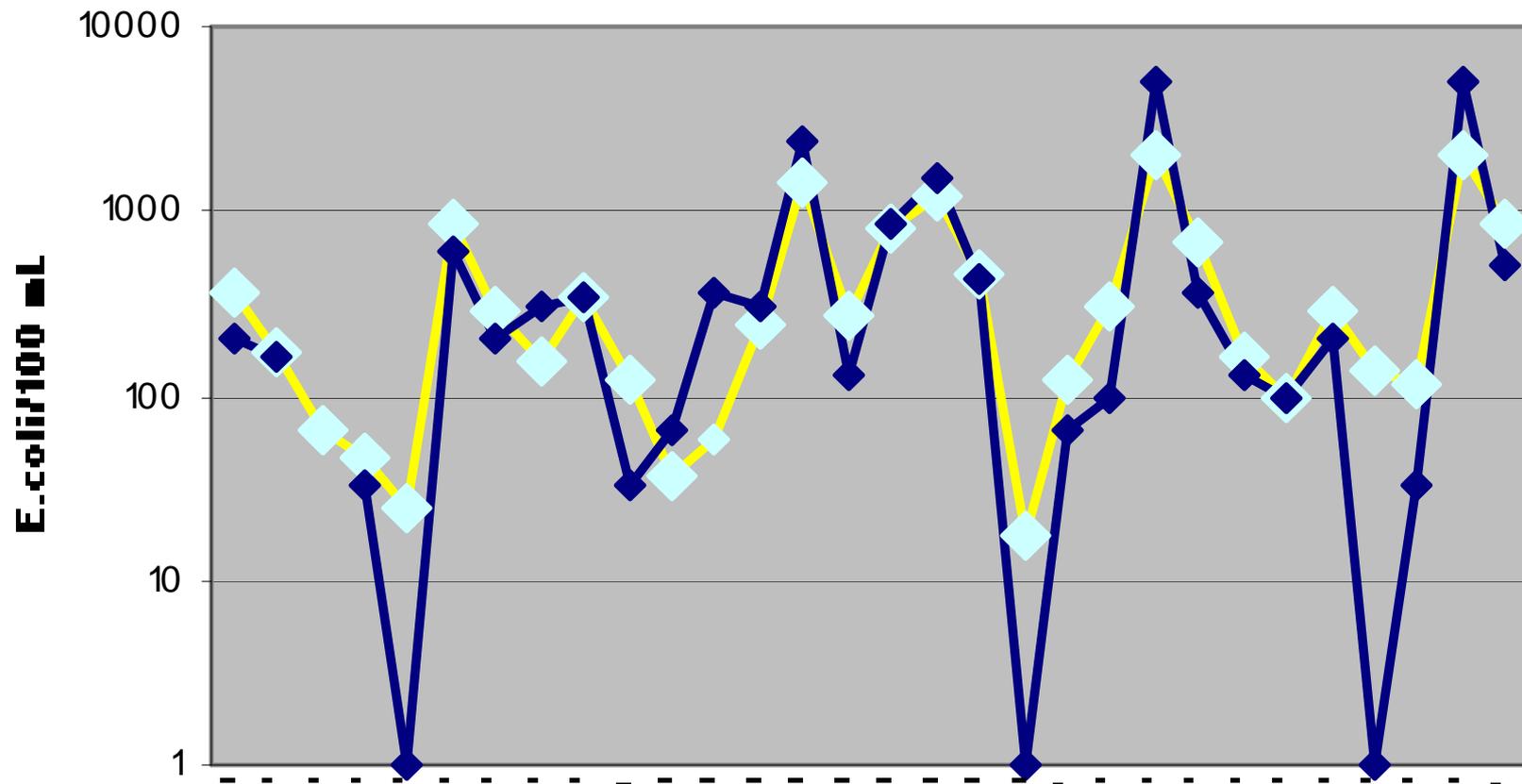
Minimum: 1000	Yellow
Median: 2633	Orange
Maximum: 4433	Red

Special Studies

- Compared
 - Petrifilm *E. coli*
 - IDEXX *E. coli*
 - lab fecal
 - lab *E. coli*
 - \$\$\$\$ lab certified incubator
 - \$50 Styrofoam egg incubator







—◆— Idexx E. coli/100 mL —◆— 3M E. coli/100 mL

Violation of Bacteria WQS

Technique	Agree	Disagree	% Agree
Petrifilm (AAS)	26	4	87
Petrifilm (Cobb)	24	6	80
IDEXX (AAS)	19	5	79
IDEXX (Cobb)	23	7	77

Longitudinal Monitoring

Weeklong paddle on
different river since 2006

- Water quality
monitoring & training

- Site selection
- 30 plus parameters
- 80-120 monitoring sites



Some rivers had almost no data

Longitudinal Monitoring

- Planning, planning, planning
- 12 plus hour days, 99 degree temps, 100% humidity
- In situ, moving labs, overnight to State lab



It's a tough job but somebody's gotta do it.

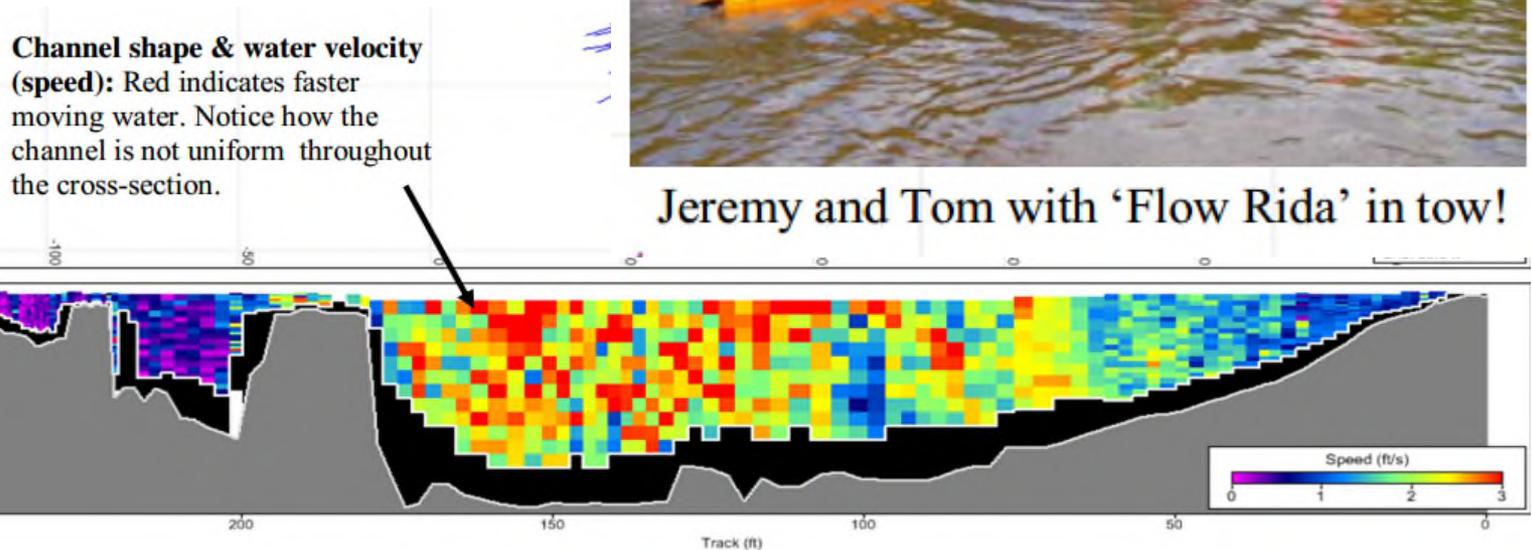
Longitudinal Monitoring

Special studies

- Regulatory vs. volunteer
- bathymetry
- longitudinal study



Jeremy and Tom with 'Flow Rida' in tow!



Outcomes & Successes

QA/QC training

- 15 to 30 participants certified
- 10 teachers trained
- Participants assist with monitoring



Raising awareness

Outcomes & Successes

- Data used in regulatory process
- Permitting decisions
- US EPA
- Methods comparison

- Helps determine future monitoring goals

Violations

- Septic & sewage
- Buffers violations
 - clearing soil
 - cattle in stream
- Elevated bacteria levels
- Point source

Outcomes & Success

- Rayioner pulp plant
- A River's Story: Reclaiming the Altamaha



Conclusion

- Determine goals
- Find partners
- Know what information is needed and will be useful to collect
- Share what you've learned

GEORGIA Adopt-A-Stream

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Editor, Tara Muenz



Paddle Georgia 2013: The Lower Flint River



The 2013 Paddle Georgia (PG) event, coordinated by the Georgia River Network (GRN), took over 300 paddlers down a 106-mile stretch of the Lower Flint River. We began the seven day journey on June 14th just south of the Dam in Warwick that flows through the towns of Albany, Newton and ended our journey at the boat basin in Bainbridge on June 21st.

For the Adopt-A-Stream (AAS) trainers and coordinators, this is a major event that includes chemical monitoring certifications, on the river instruction, education, and water quality sampling and sample processing. We value this opportunity to work with GRN and to meet the many citizens that experience the river with us. Recreation starts with

Large scale, synoptic monitoring events can drive trend monitoring goals and priorities, and vice versa.

Thank you



- Harold Harbert
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- EPA 319 (h) funded Program
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