



**Luke Roberson**  
***Adopt-A-Wetland  
Coordinator***

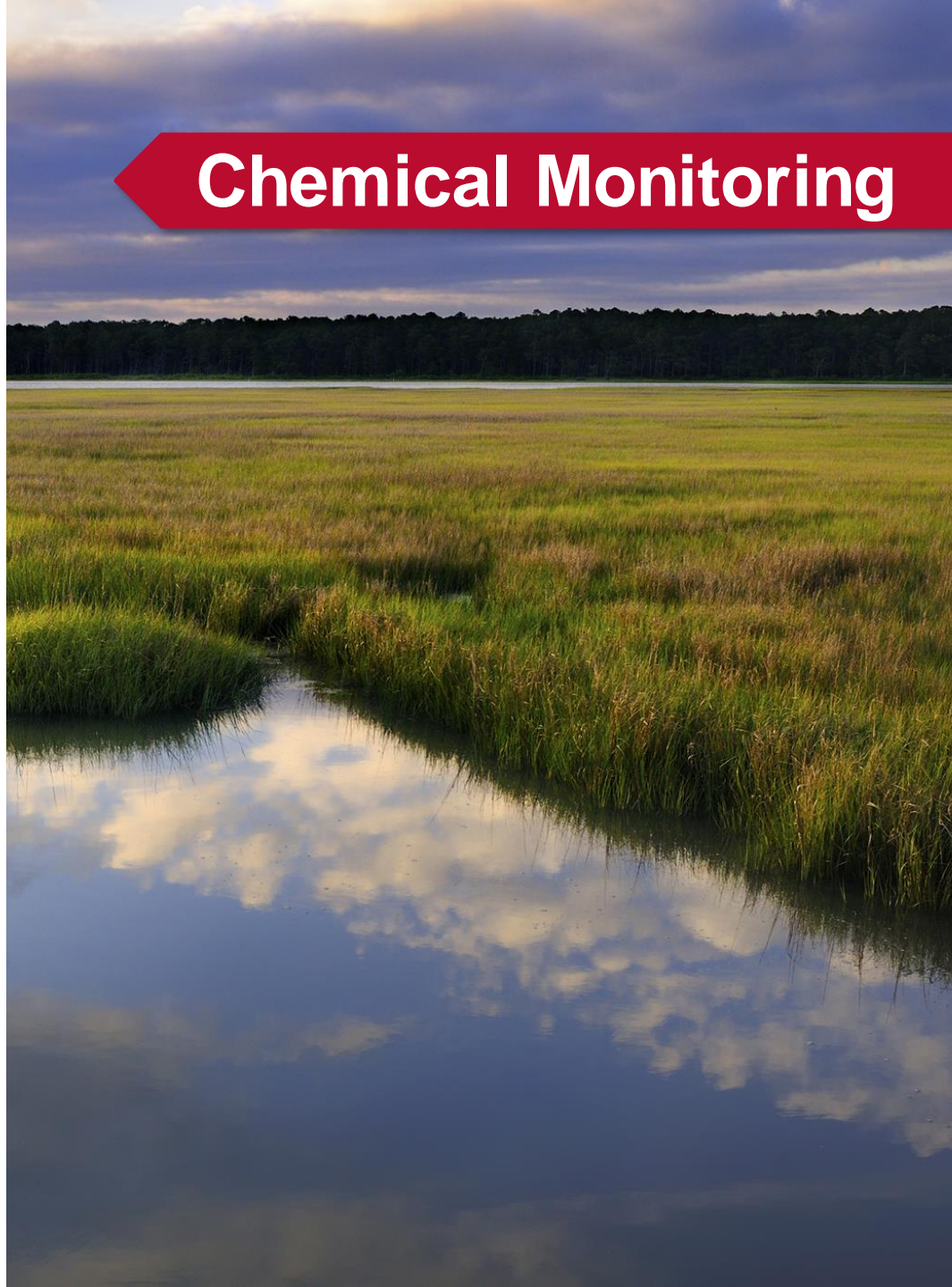
Georgia   
**Adopt-A-Stream**  
Volunteer Water Quality Monitoring



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Georgia Sea Grant  
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**Chemical Monitoring**



Coastal Georgia

# Adopt·A·Wetland



Overview

When/Where

What we sample

Entering Data



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# Overview

## Georgia's coastal volunteer water quality monitoring program

**A** Increase public Awareness

**D** Collect water quality Data

**O** Gather Observations

**P** Encourage Partnerships

**T** Provide Tools & Training



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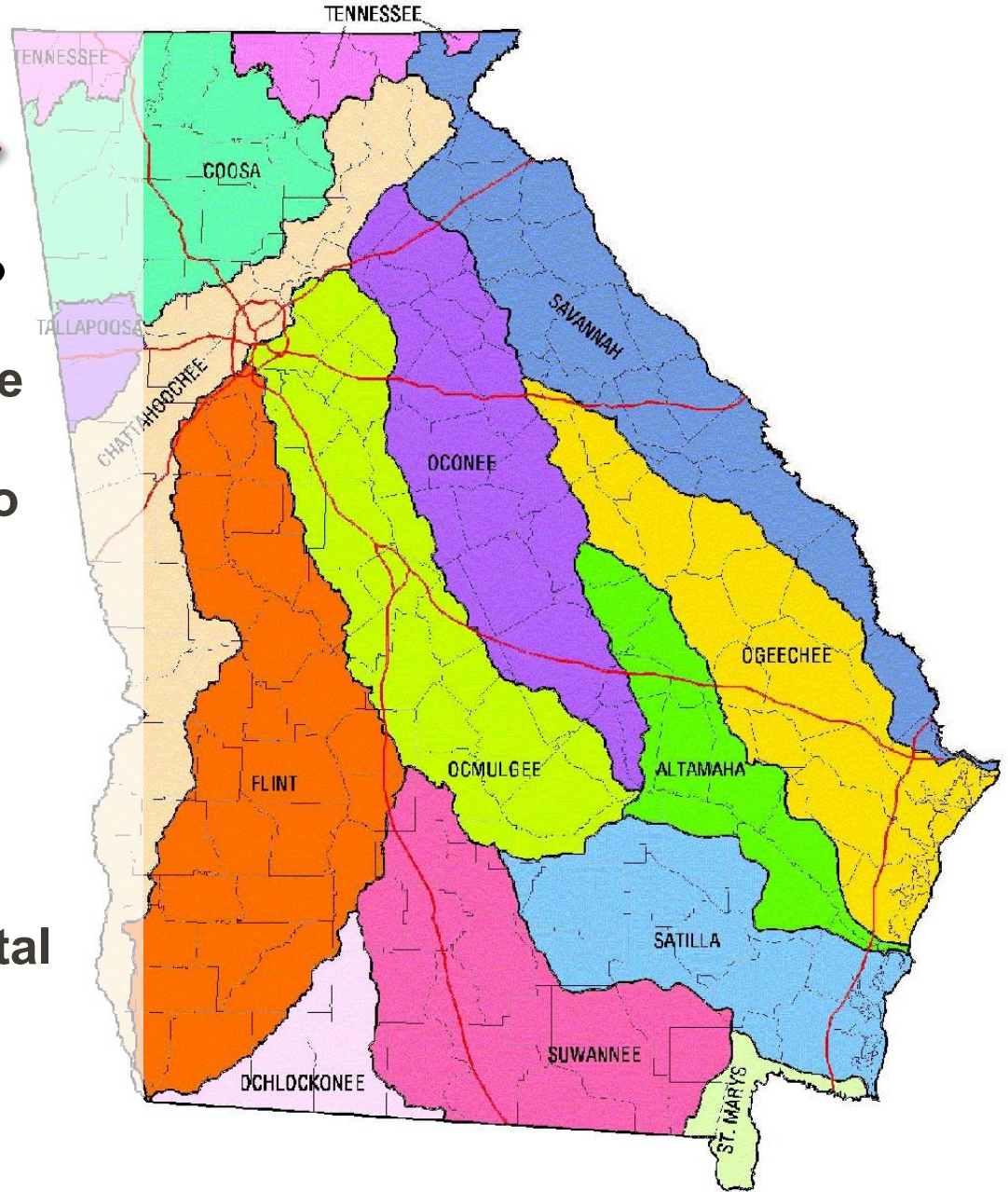
# Overview

- **Purpose**
- To gather information about specific water quality characteristics
- **Quality Assurance/Quality Control**
- Only individuals can be certified
- Certification lasts a year
- Only certified volunteers can submit data
- Certification includes a demo and 80% or better on test



# Overview

- **What is a Watershed?**
- The land area where all the water, sediment and dissolved material drain to a common point.
- Usually a river, lake, wetland, or ocean.
- **What Watershed Are You in Now?**
- There are five major coastal watersheds in Georgia





**Overview**

**When/Where**

**What we sample**

**Entering Data**



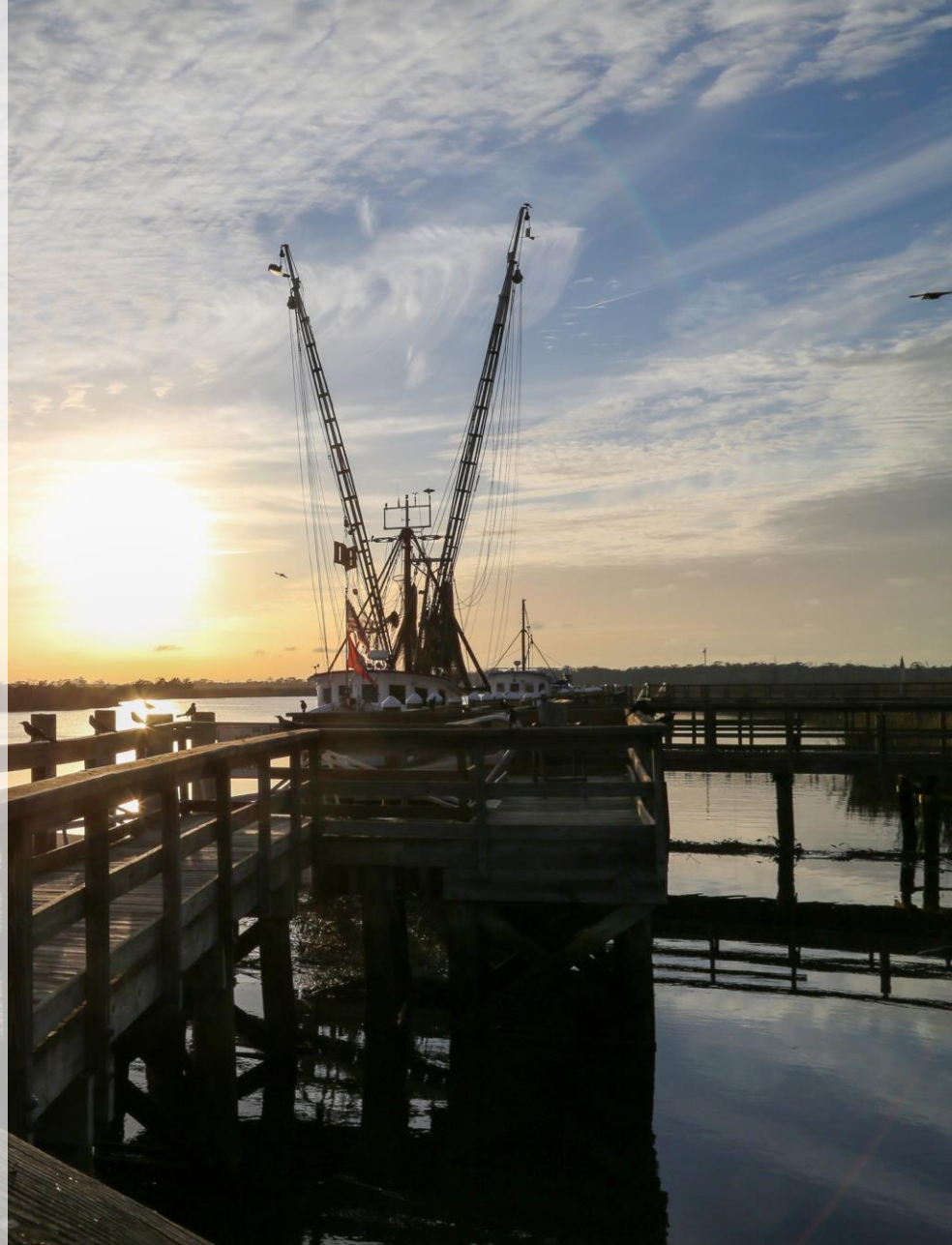
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# When/Where

- **Where to Sample?**
- Well mixed area
- **When to Sample?**
- Same Tidal Stage
- Outgoing High Tide
- Same Time of Day (if possible)
- **How Often?**
- At least once a month



# The Data Can Wait!







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# What we sample

- **Temperature**
- Affects feeding, respiration and aquatic metabolism
- **Dissolved Oxygen**
- Needed for respiration
- As Temperature increases, DO decreases, and vice versa
- **pH**
- Aquatic organisms are sensitive to pH changes
- **Salinity**
- Salinity affects aquatic plants and animals



## Additional Metrics

- **Clarity**
- Affects photosynthesis
- **Conductivity**
- Ability to pass a current
- Changes can indicate red flags for water quality
- **Nutrients**
- Nitrogen
- Phosphorus
- High levels can lead to algae blooms, reducing DO
- Inefficient application of fertilizers or sewage spills



# The Details

## Temperature (°C)

- Measure in shade, air first
- State Standard – 32.2 C (90 F)
- Higher temps, lower DO
- Affects feeding, respiration, and aquatic metabolism



# The Details

## Dissolved Oxygen (mg/L)

- State Standard – Avg 5, no less than 4
- Two samples must be within 0.6 of each other
- Higher temps, lower DO
- DO comes from
  - Diffusion
  - Photosynthesis
  - Turbulent mixing
- Can decrease due to algae blooms



# The Details

## pH

- A measure of Hydrogen ions
- Scale of 0-14, 7 being neutral
- Two samples must be within 0.25 of each other
- State standards between 6 - 8.5
- Some southern GA streams may have pH as low as 3.5
- pH gets higher with increasing salinity. Ocean water is basic



# The Details

## Conductivity (mS/cm)

- A measure of water's ability to pass an electrical current
- Calibrate meter 24 hours prior to sampling
- Deviations from baseline data
- Replaced by salinity in brackish waters
- Events affecting conductivity:
  - Mining operations
  - Agriculture
  - Sewage leaks
  - Urban runoff



# The Details

## Salinity (ppt)

- Measures amount of dissolved salt in water
- Calibrate meter 24 hours prior to sampling
- 2 samples must be within 1.0 ppt
- Seawater is about 35 ppt
- Events affecting Salinity:
  - Rain storms
  - Tidal fluctuations





# The Details

## Clarity (cm)

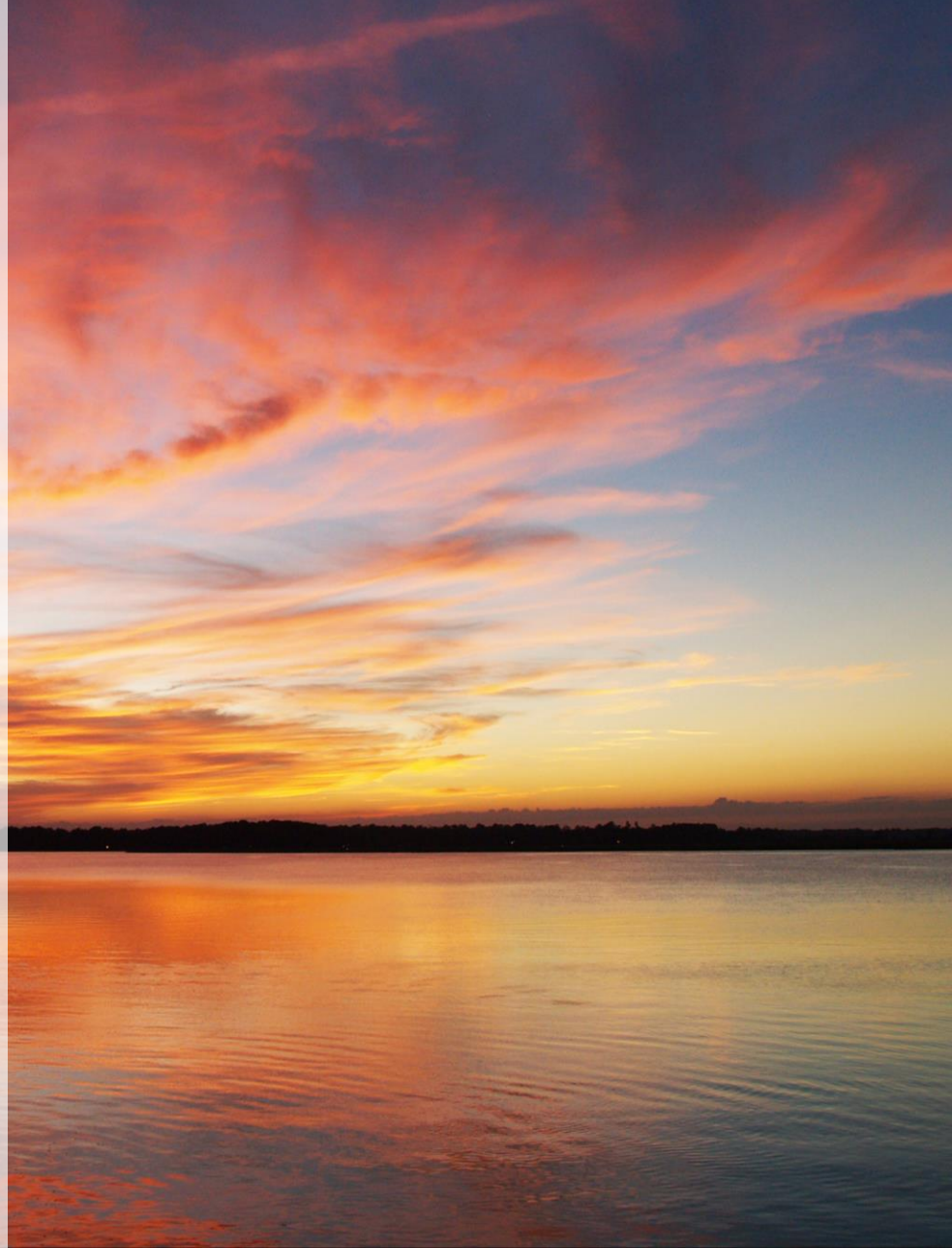
- Measures transparency of water, affects photosynthesis
- Secchi disk lowered into water until it disappears
- 2 samples must be within 10 cm
- Difficult in coastal GA
- Events affecting clarity:
  - Rain storms
  - Tidal fluctuations
  - Development
  - Erosion



# The Details

## Nutrients

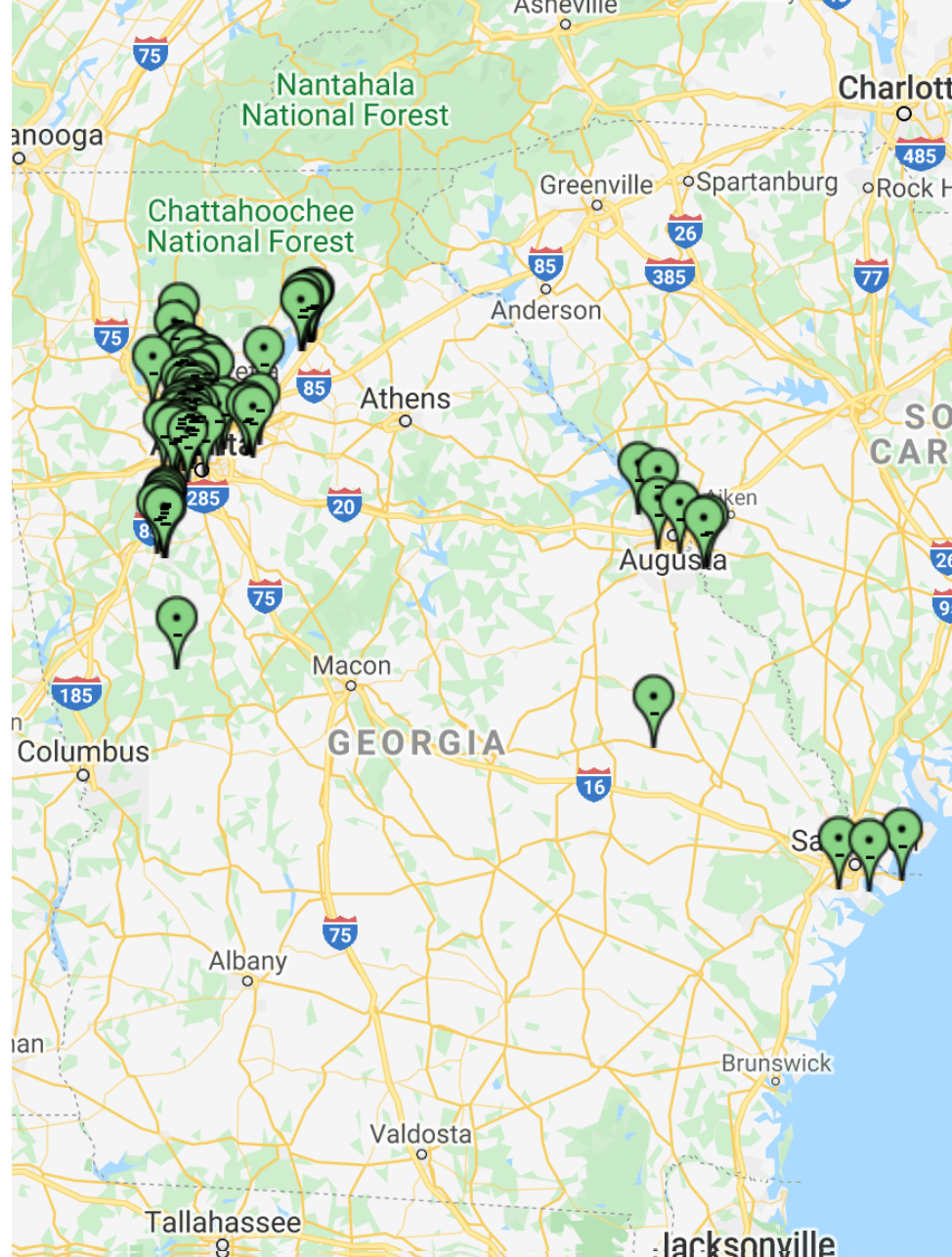
- **Nitrates**
  - A nutrient found in the water from fertilizers or animal waste. Sewage is the main contributor.
  - Normal background levels are below 1ppm
- **Phosphates**
  - A nutrient found in water from soaps, fertilizer, animal waste, industrial effluent and sewage
  - Normal background levels are below 0.1ppm
- **Excess nutrients can cause algal blooms, affect sensitive macroinvertebrates, and decrease dissolved oxygen levels**



# Overview

- **Maintaining your kit**
- **Store in a cool dark place**
- **NOT the back of your car in the summertime**
- **Contact your coordinator for replacement reagents**
  
- **What to do with expired reagents?**
- **Can be disposed of down the sink IF you have a wastewater treatment plant**
- **Large amounts – Contact AAW**





**Overview**

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# GEORGIA ADOPT-A-STREAM: Chemical Form

To be conducted every month

- Qualitative Data
- Weather, Flow, Clarity, Color, Surface, Odor
- Site Photos
- See something strange? Send us photos!
- Quantitative Data
- Meter calibration
- Duplicate sampling fields
- Comments!

SITE INFORMATION	Group Name: _____		Event Date: _____ (MMDDYYYY)	
	Group ID: G- _____ Site ID: S- _____		Time Sample Collected: _____ (HHMM am/pm)	
WEATHER	Stream Name: _____		Time Spent Sampling: _____ (Min)	
	Monitor(s): _____		Total Time Spent Traveling (optional): _____ (Min)	
	Number of Participants: _____		Furthest Distance Traveled (optional): _____ (Miles)	
OBSERVATIONS	<i>Present conditions (check all that apply)</i>			
	<input type="checkbox"/> Heavy Rain		<input type="checkbox"/> Steady Rain	
	<input type="checkbox"/> Intermittent Rain		<input type="checkbox"/> Overcast	
	<input type="checkbox"/> Partly Cloudy		<input type="checkbox"/> Clear/Sunny	
	Amount of rain, if known? Amount in Inches: _____ In Last Hours/Days: _____			
	*Refer to wunderground.com for rainfall data			
	Flow/Water Level: <input type="checkbox"/> Dry <input type="checkbox"/> Stagnant/Still <input type="checkbox"/> Low <input type="checkbox"/> Normal <input type="checkbox"/> High <input type="checkbox"/> Flow (over banks) <small>(check all that apply)</small>			
	Water Clarity: <input type="checkbox"/> Clear/Transparent <input type="checkbox"/> Cloudy/Somewhat Turbid <input type="checkbox"/> Opaque/Turbid			
	Water Color: <input type="checkbox"/> No Color <input type="checkbox"/> Brown/Muddy <input type="checkbox"/> Green <input type="checkbox"/> Milky/White <input type="checkbox"/> Tannic <input type="checkbox"/> Other: _____			
	Water Surface: <input type="checkbox"/> Clear <input type="checkbox"/> Oily sheen: Does it break when disturbed? Yes/No (circle one) <input type="checkbox"/> Algae <input type="checkbox"/> Foam <input type="checkbox"/> Greater than 3" high <input type="checkbox"/> It is pure white Other: _____			
Water Odor: <input type="checkbox"/> Natural/None <input type="checkbox"/> Gasoline <input type="checkbox"/> Sewage <input type="checkbox"/> Rotten Egg <input type="checkbox"/> Fishy <input type="checkbox"/> Chlorine <input type="checkbox"/> Other: _____				
Photos: Please take images to document your observations and changes in water quality conditions. Photo point directions can be found in the manuals. Send photos to AAS@gaepd.org.				
Trash: <input type="checkbox"/> None <input type="checkbox"/> Yes, I did a cleanup <input type="checkbox"/> This site needs an organized cleanup				
CHEMICAL	Conductivity Meter Calibration (within 24hrs of sampling)			
	Date _____ Time _____ Standard Value _____ Initial Meter Reading _____ Meter Adjusted to _____			
	Reagents: Are any reagents expired? <input type="checkbox"/> Yes <input type="checkbox"/> No List any expired: _____			
	Core Tests	Test 1	Test 2	Units
	Air Temp			°C
	Water Temp			°C
	pH (+/-0.25)			Standard unit
Dissolved Oxygen (+/-0.6)			mg/L or ppm	
Conductivity			uS/cm	
COMMENTS	Other Tests			
	Test 1	Test 2	Units	
Secchi Depth (+/- 10)				cm
Chlorophyll a				ug/L
Salinity (+/- 1)				ppt
Any changes since you last sampled at this site? If yes, please describe.				

Please submit data to our online database at [AdoptAStream.Georgia.gov](http://AdoptAStream.Georgia.gov)

## Entering Data



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# Entering Data

- **AdoptAStream.Georgia.gov**
- Get registered
- Enter data
- Generate reports
- Search for sites of interest
- Information about Confluence
- Manuals, Keys, Protocols
- Equipment purchasing info



Georgia  
Adopt-A-Stream  
Volunteer Water Quality Monitoring



Search

Get Involved

Confluence

Citizen Monitoring

Data Views

Data Entry

Materials & Resources

My Profile

## About Us

Adopt-A-Stream encourages individuals and communities to monitor and/or improve sections of streams, wetlands, lakes, or estuaries through

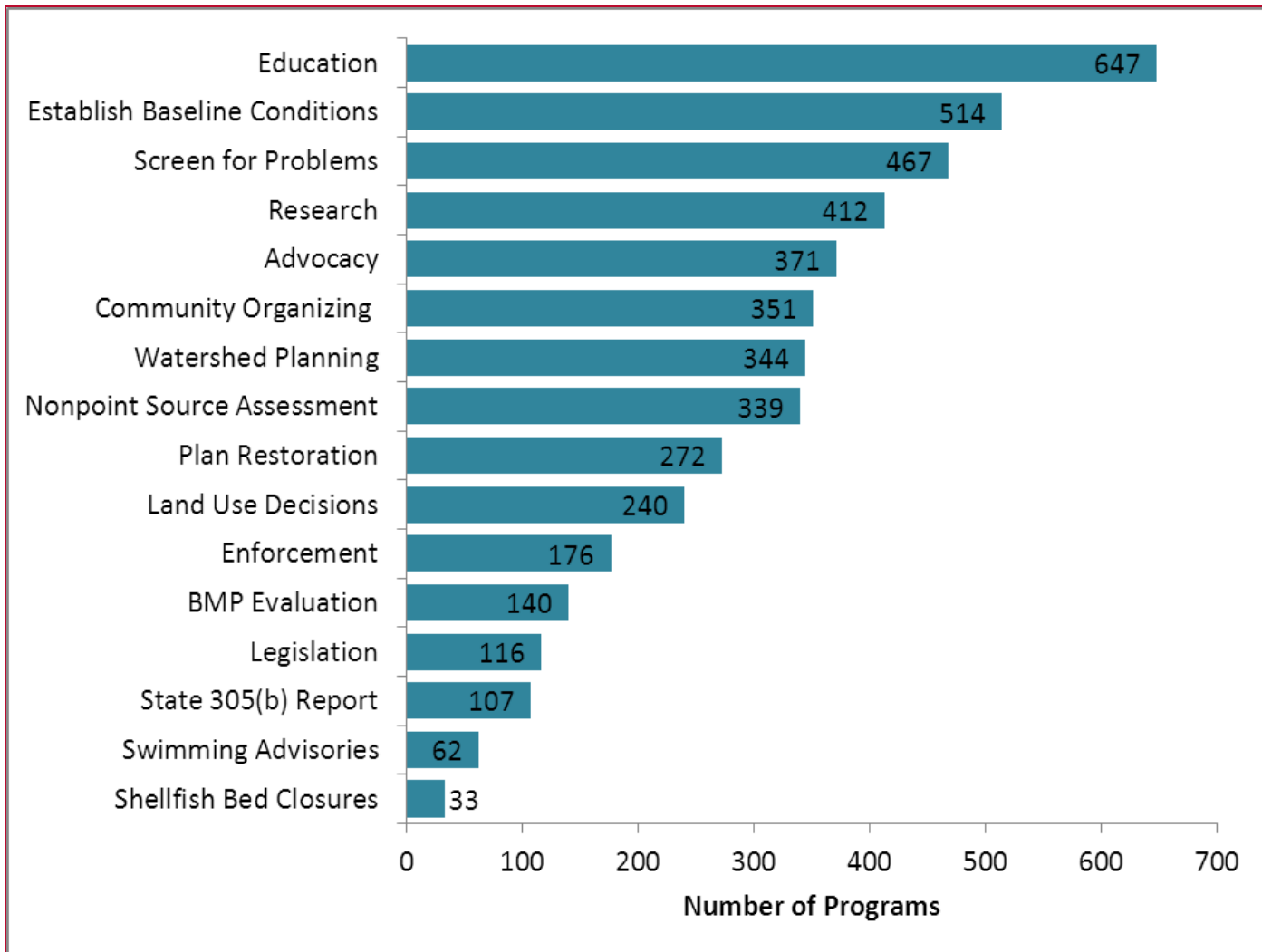


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# Where does my data go?



# Entering Data

- Adopt A Wetland Stats
- Since 2003
- All coastal counties
- Volunteer time counts for about \$25/hour

**29,692 vols trained**

**19,561 data points**

**20,979 hrs**

**\$554,167**



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# Just the Facts...

- **Raise Awareness**
- **Water quality Data**
- **Gather Observations**
- **Encourage Partnerships**
- **Provide Tools and Training**

Once a month

Temperature  
and DO

Well mixed area  
same time of day  
same tidal stage

Care for your kit

What is a  
watershed?

pH in South GA

Water clarity and  
plant growth

Data: on-line database as soon as possible, local program, city & county government & municipality, partners, county commissioners, universities, others?

Excess Organic Matter:  
Causes a decrease in  
dissolved oxygen levels

Conductivity: The ability of water to carry a current. Is affected by mining, agriculture, sewage effluent, urban runoff.

How is oxygen  
introduced into  
water?

Temperature:  
importance of,  
where to measure...

When to  
calibrate?

Parameter	State Standards	Duplicate Precision	Units	
Dissolved Oxygen	Avg of 5, not <4	+/- 0.6	Mg/L or ppm	
pH	6-8.5	+/- 0.25		
Salinity		+/- 1.0	ppt	← Coastal Volunteers
Clarity (Secchi Disk)		+/- 10	cm	← Coastal and Lake Volunteers



# Connect with us



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