

Lake Gaston Association

August 7th, 2019



Jessica R. Baumann

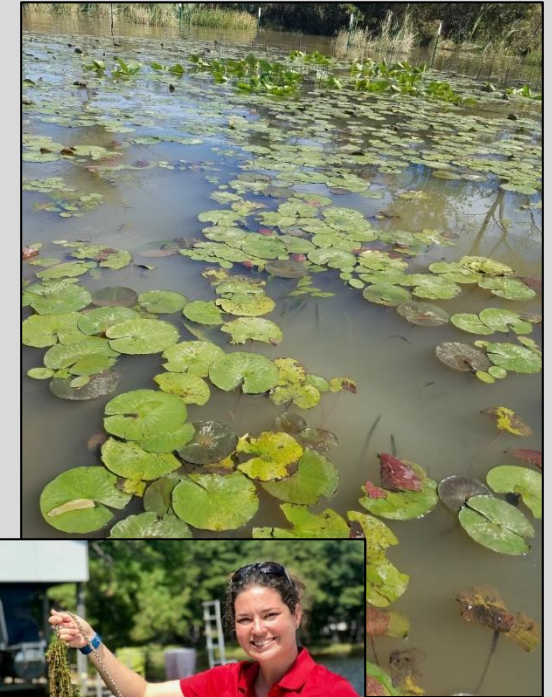
Extension Associate, Lake Gaston
Aquatic Plant Management Program



May 2019 – LGA meeting

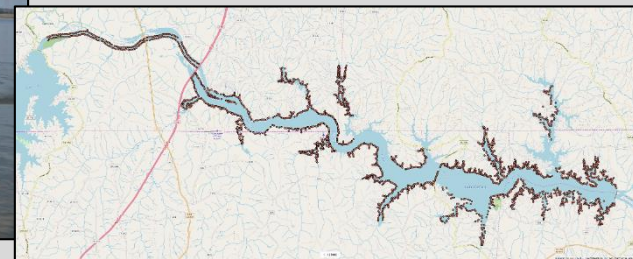
- **Hydrilla**

- 2018 Treatments
- Survey Results
 - Volunteer
 - Sonar
- 2019 Treatment Options



- **Lyngbya**

- 2018 Survey Results
 - Volunteer
- Pilot Study Update



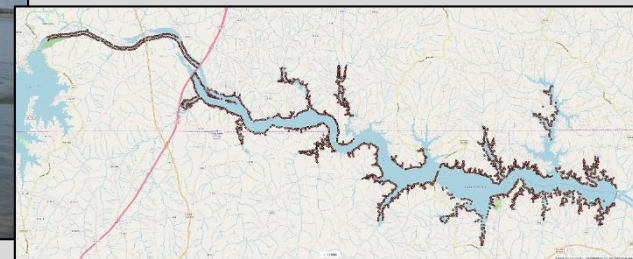
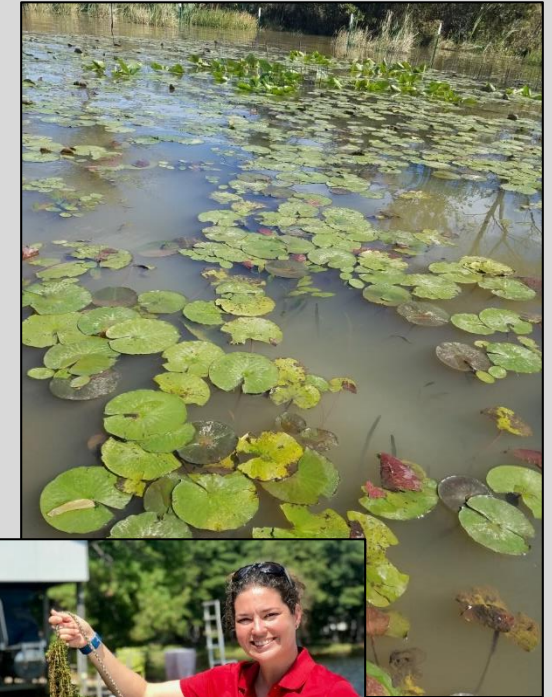
Today's Outline

- **Management Update**

- 2019 Treatments

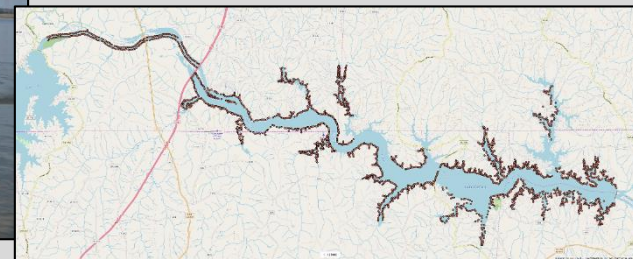
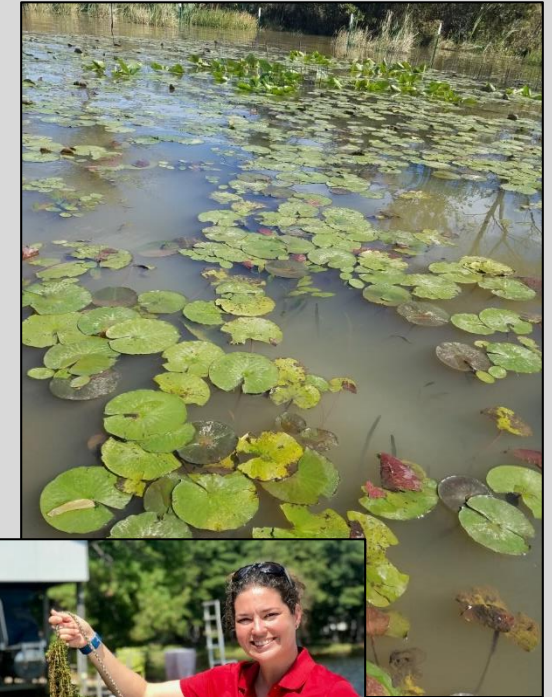
- Hydrilla
 - Lyngbya

- **Volunteer Survey**



Today's Outline

- **Management Update**
 - 2019 Treatments
 - **Hydrilla**
 - Lyngbya

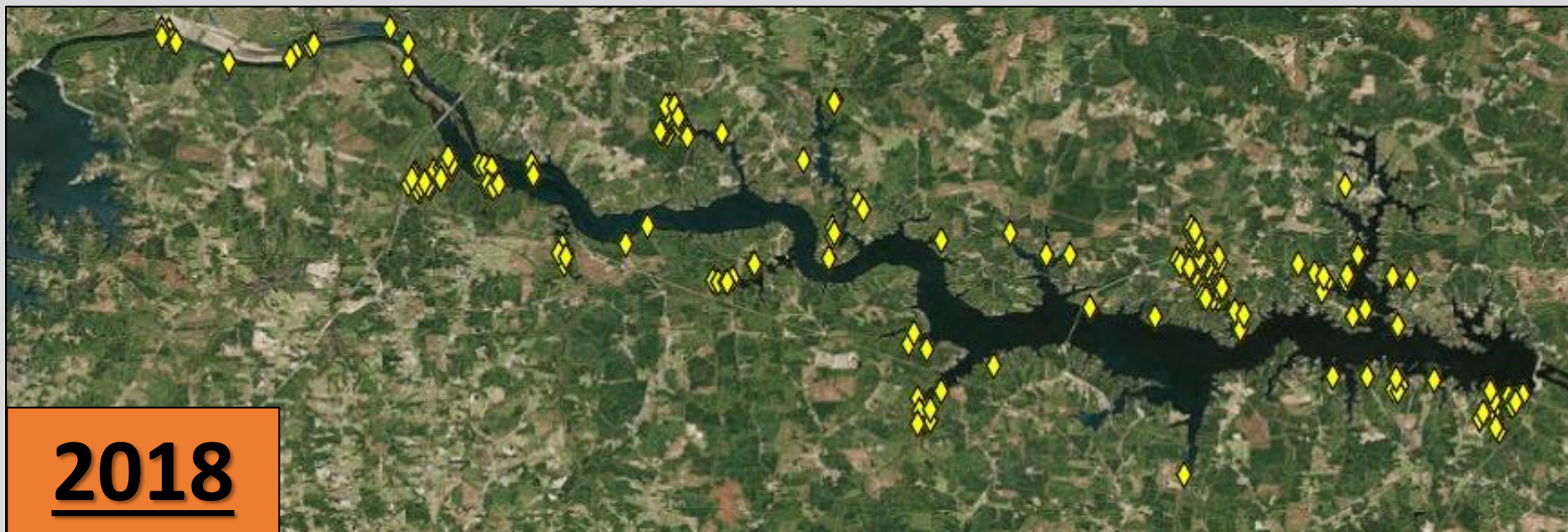


Hydrilla Survey

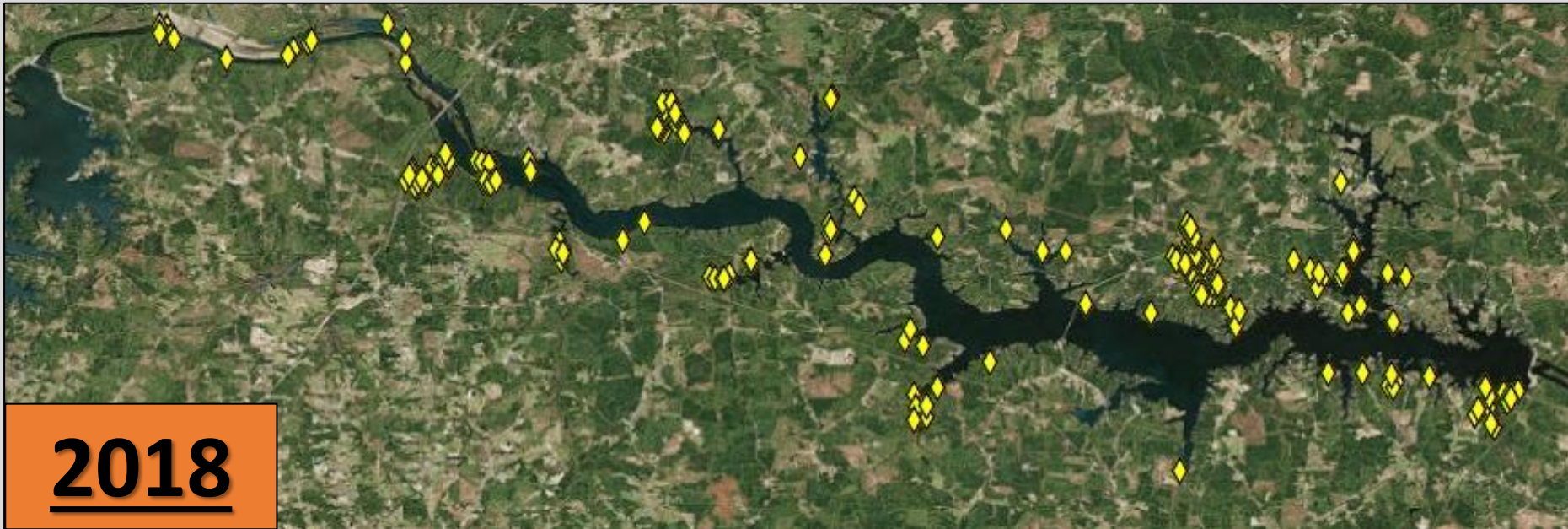


64% Rake Toss

Hydrilla Survey



Hydrilla Survey



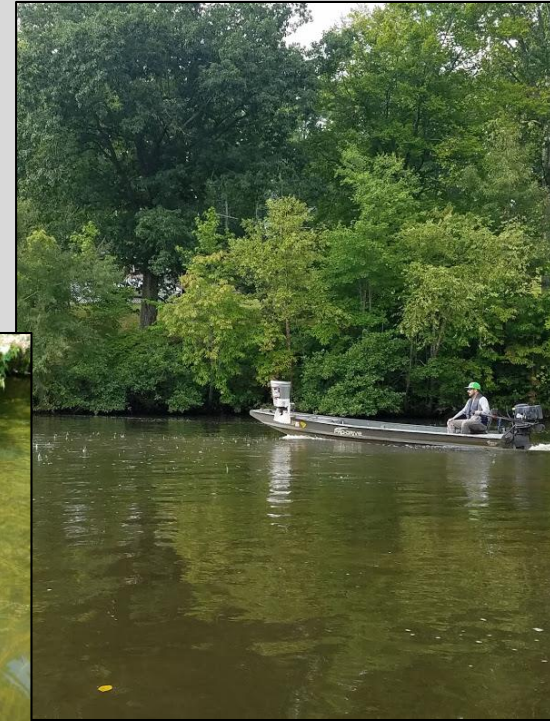
6% Rake Toss

Standing Hydrilla Estimate: 386 acres

Hydrilla Management

Adaptive Management through:

- Chemical Control
 - Herbicides
- Biological Control
 - Grass Carp Stocking



-



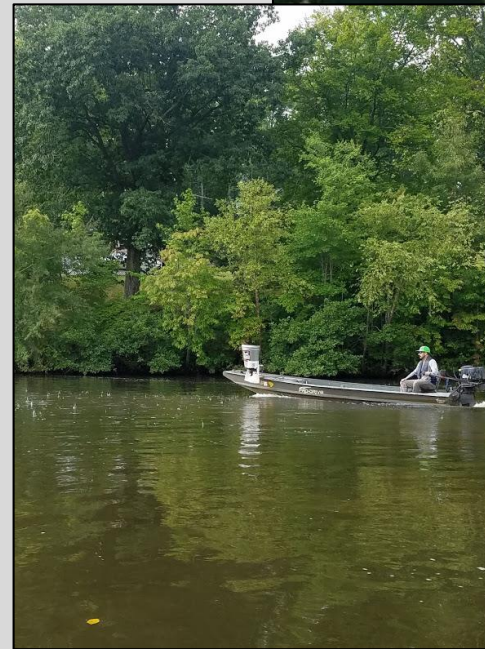
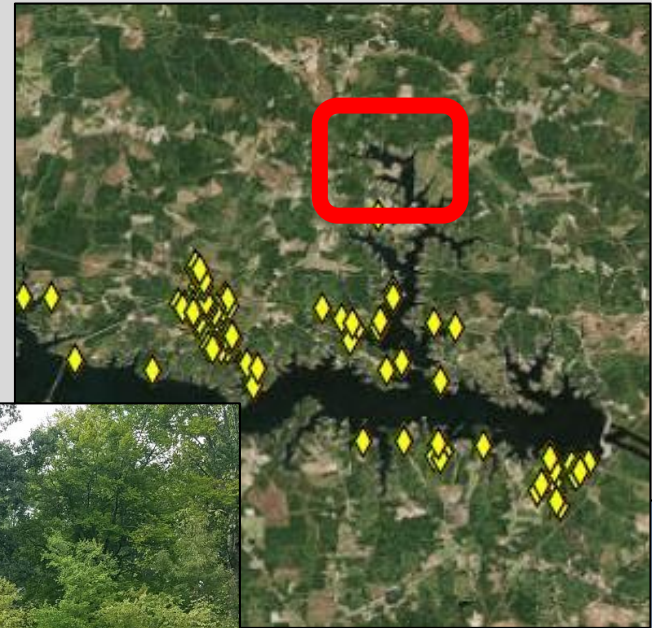
2019 Grass Carp Stocking

- **7,554 Grass Carp**
 - May 16th, 2019
 - Lizard Creek
 - Hawtree Boat Ramp

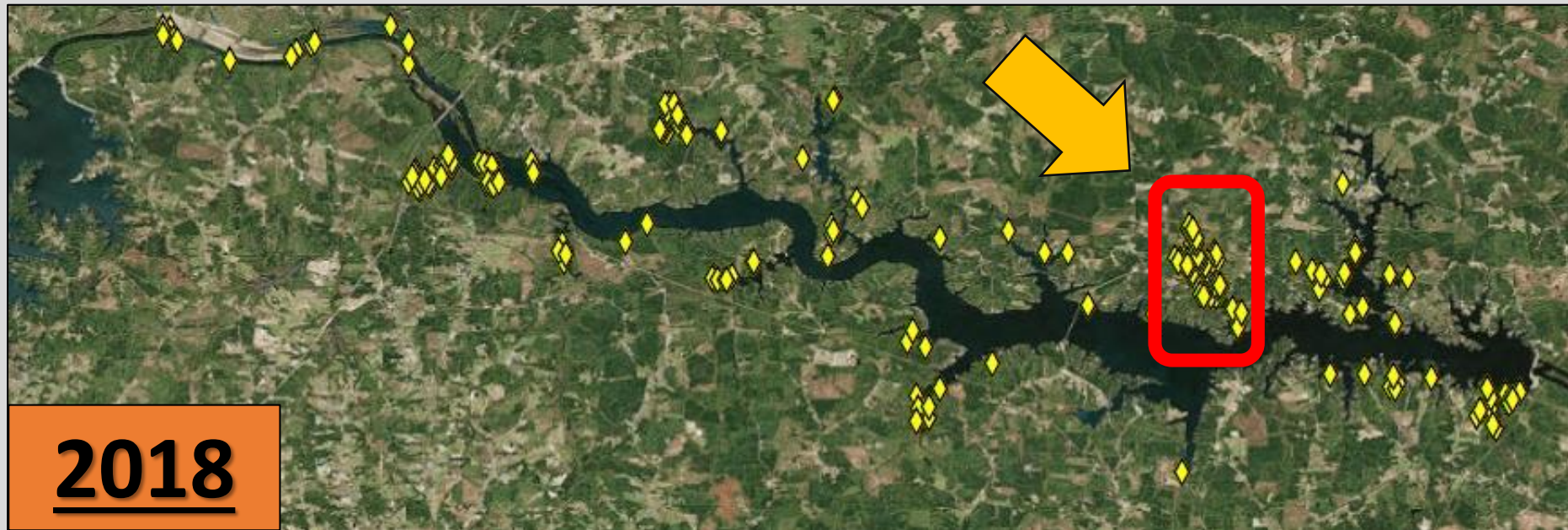


2019 Herbicide Treatments

- **Maximum: 300 acres**
 - **Lizard Creek**
 - 2018: Needed to be Addressed
 - **Upper Pea Hill**
 - 2018: 100 acres - Sonar



Hydrilla Survey



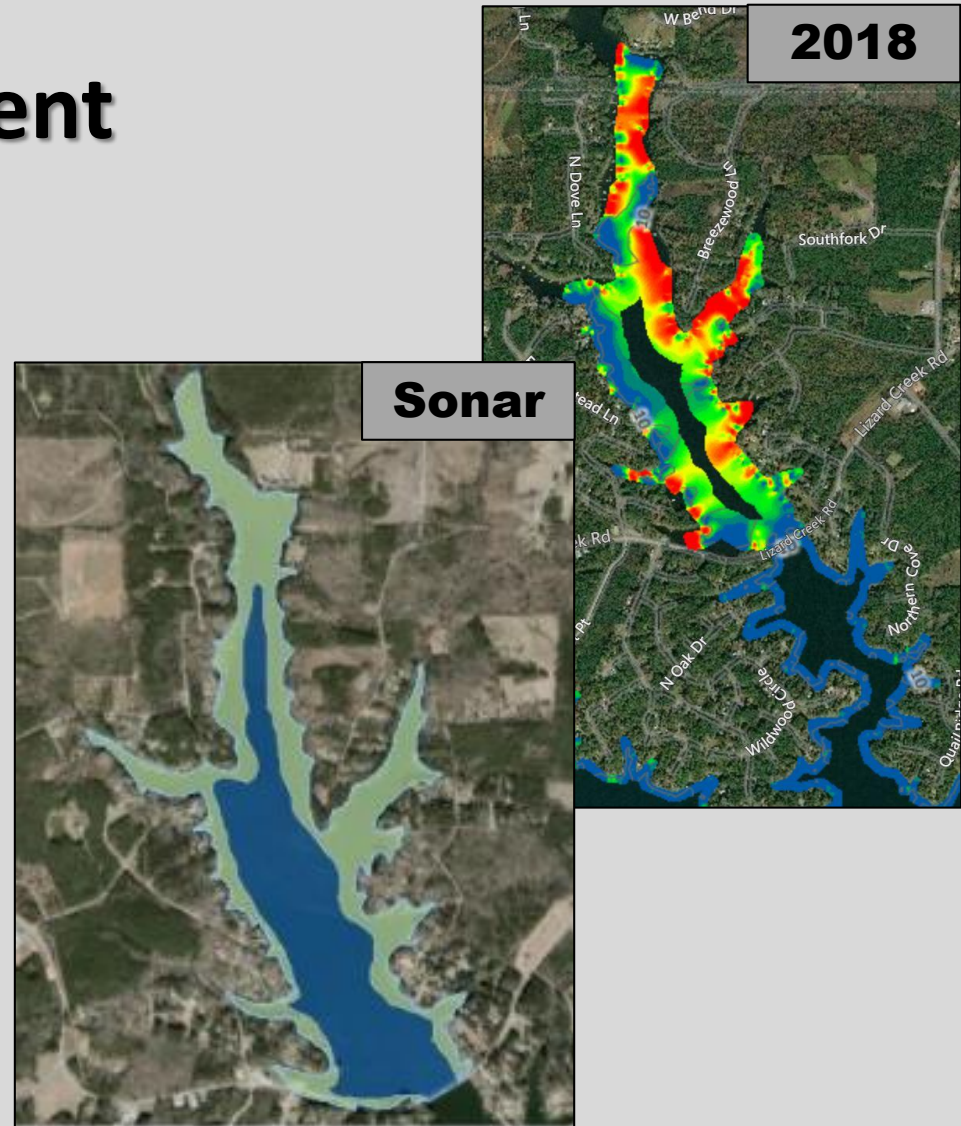
Lizard Creek 2019 Treatment

2019 Herbicide Treatments

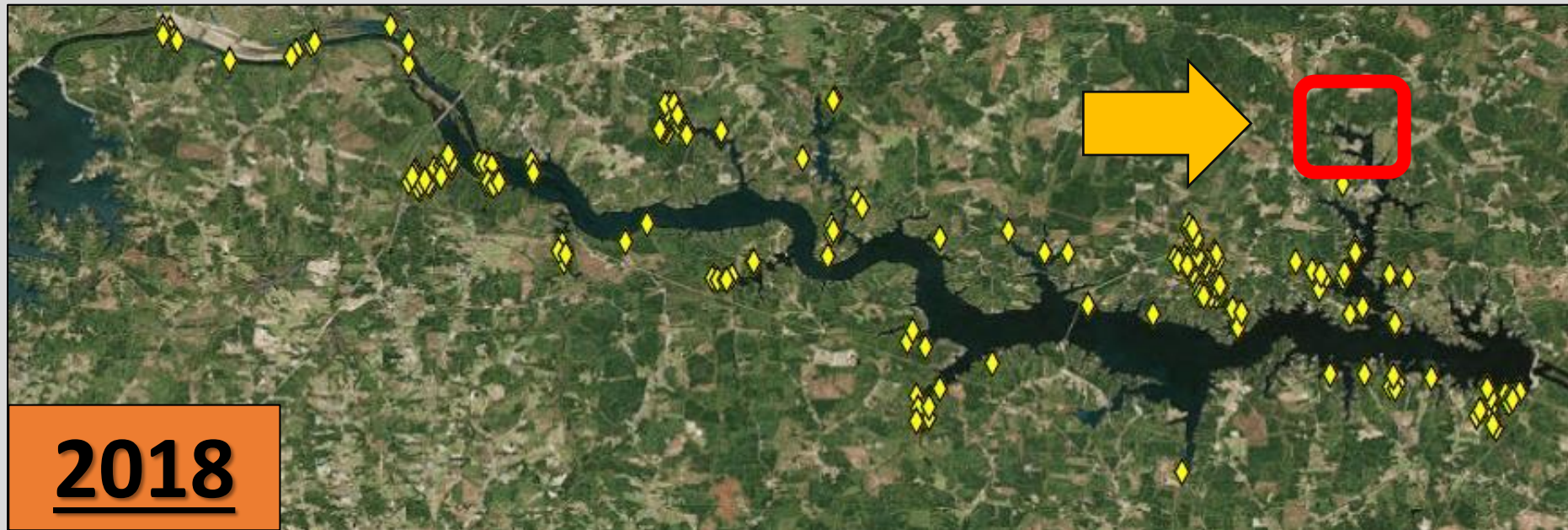
- **Lizard Creek Treatment**

- **163.5 acres - Sonar**

- June 25th
- July 29th
- August 20th
- Upstream of Bridge



Hydrilla Survey



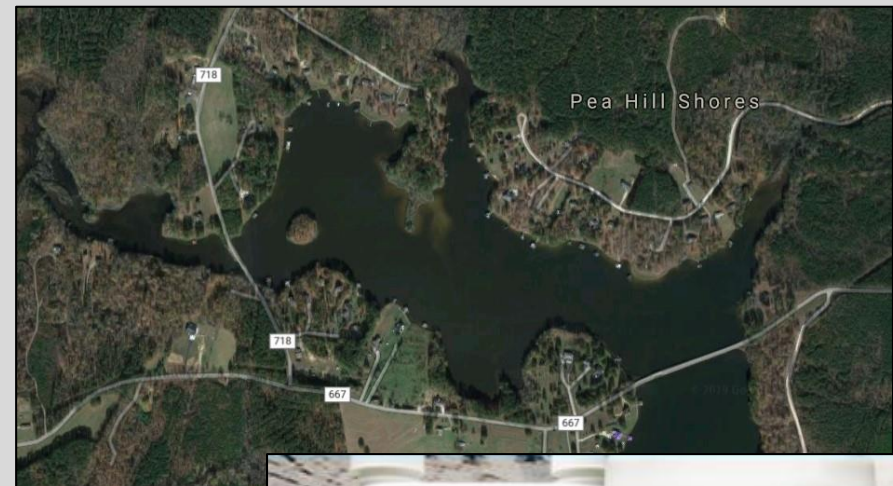
Upper Pea Hill 2019 Treatment

2019 Herbicide Treatments

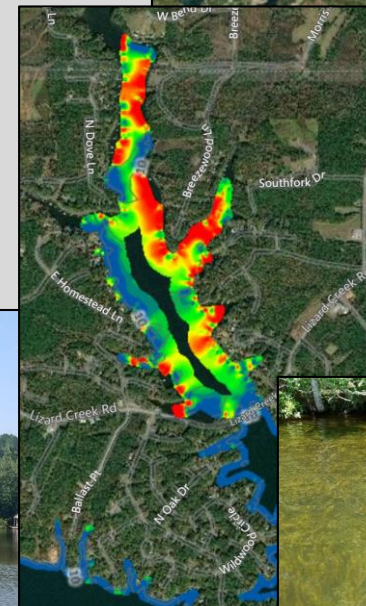
5. A) Evaluate a new, fast acting herbicide for small spot Hydrilla control

Upper Pea Hill - 2019

- ProcellaCOR
 - Require Less Contact Time
 - Fewer Applications
- Still in Design Phase
 - Several Treatment Plots: Upper Pea Hill
 - Possible Plots: Great Creek and 6 Pound

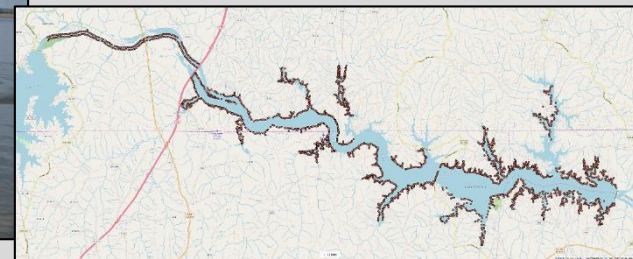
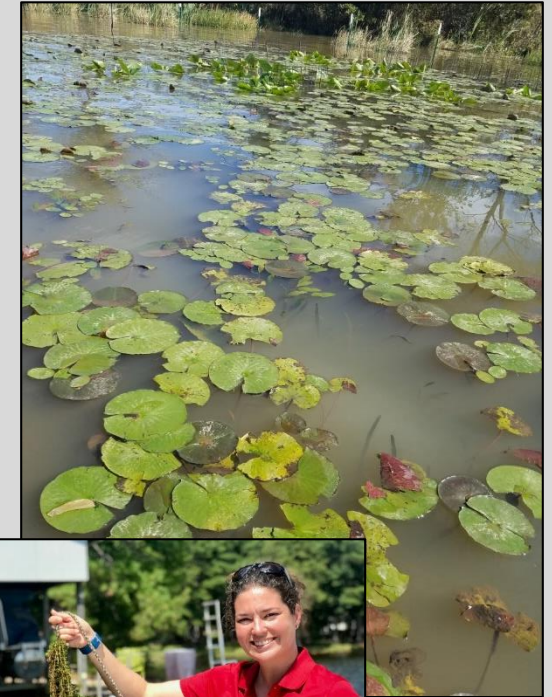


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Today's Outline

- **Management Update**
 - 2019 Treatments
 - Hydrilla
 - **Lyngbya**

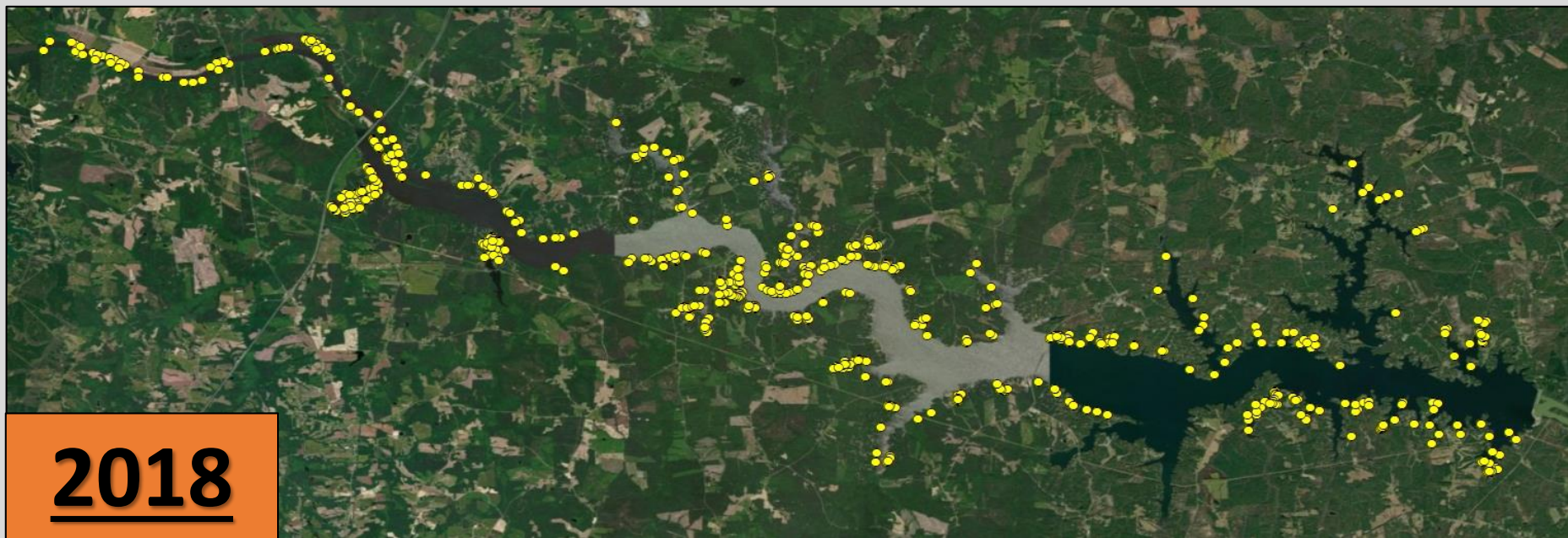


Lyngbya

- Filamentous Cyanobacteria
- Negative Effects:
 - Ecosystem Dynamics
 - Recreational Usage
 - Overall Aesthetics
- Surface Mats Prevalent During Summer Months
- Stinks!
- Little Biological Knowledge
- No Management Protocol

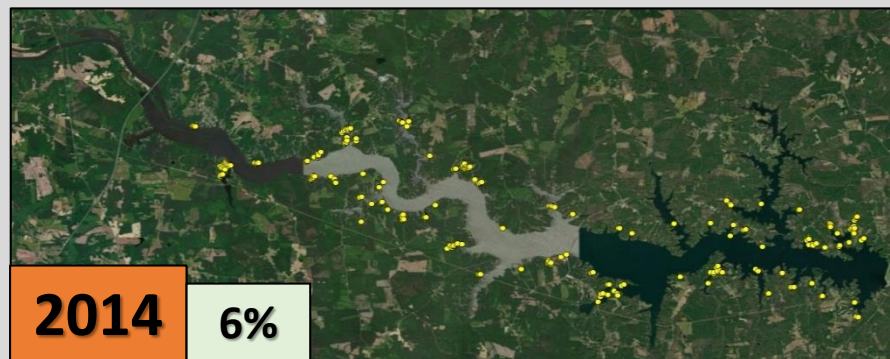
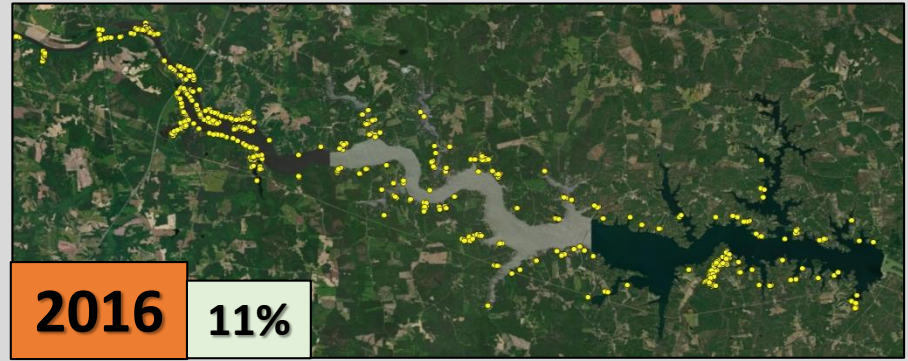


Lyngbya Survey



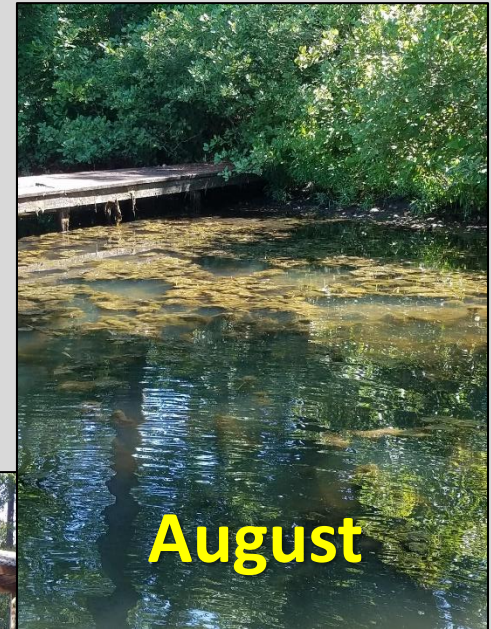
15% Rake Toss

Lyngbya Survey



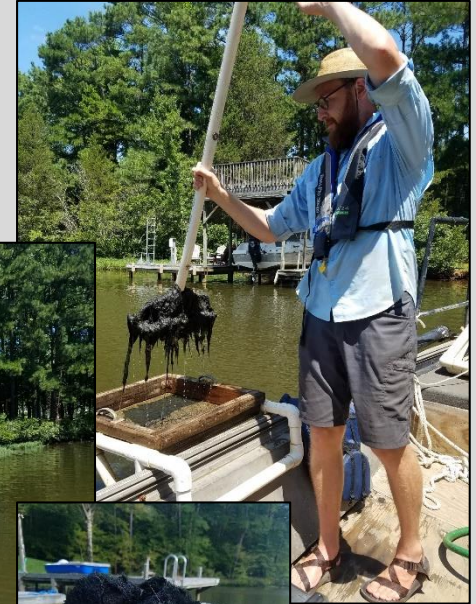
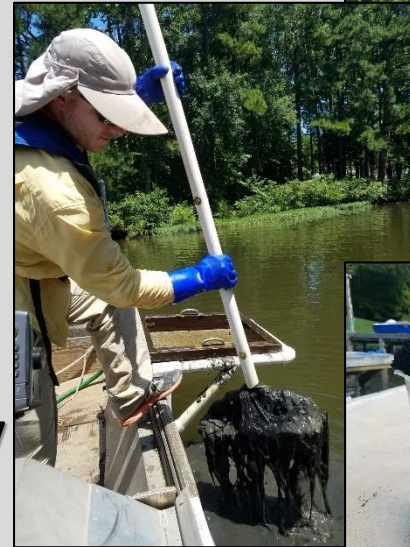
Lyngbya Treatments (2017 / 2018)

- 3 Different Product Companies
- 2 Control Sites
- Treatments
 - July – October
 - Hawtree / Smith / Great
 - Lees / Pretty / Rocky
 - St. Tammany / Lyons / Pretty



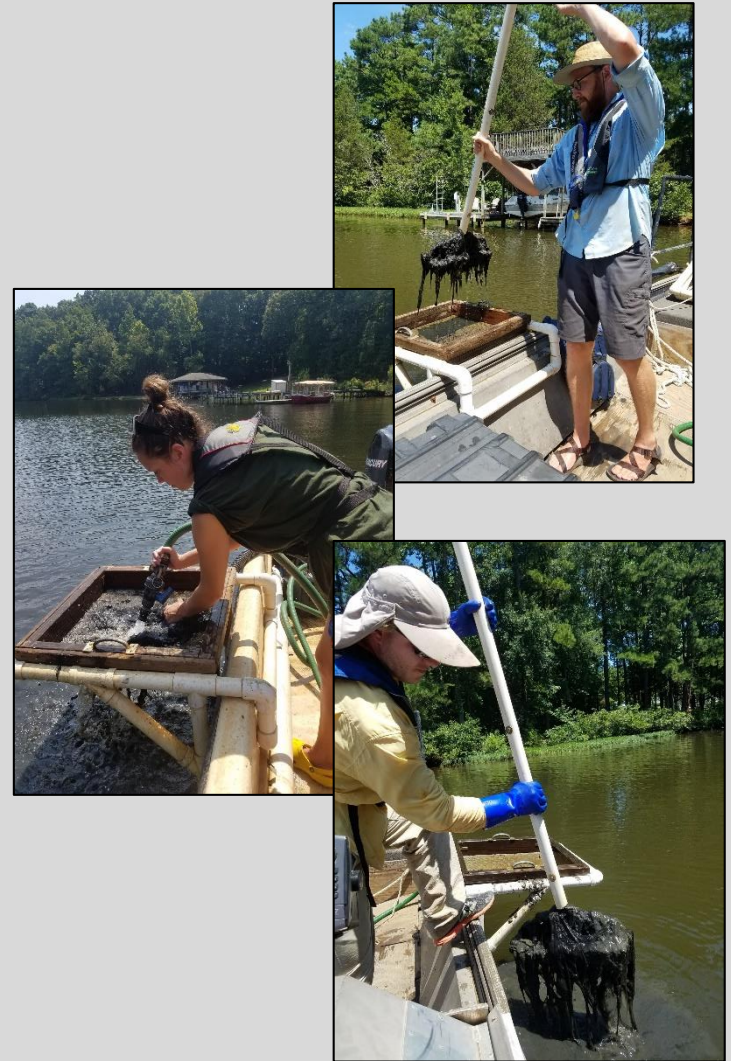
Lyngbya Treatments (2017 / 2018)

- 3 Different Product Companies
- 2 Control Sites
- Treatments
 - July – October
 - Hawtree / Smith / Great
 - Lees / Pretty / Rocky
 - St. Tammany / Lyons / Pretty
- Biomass Sampling
 - June – November
 - Pre-treatment / 30 days post application



Lyngbya Treatments (2017 / 2018)

- No Clear “Best Option”



Lyngbya Treatments (2017 / 2018)

- No Clear “Best Option”
- Issue: Only Sampled Biomass



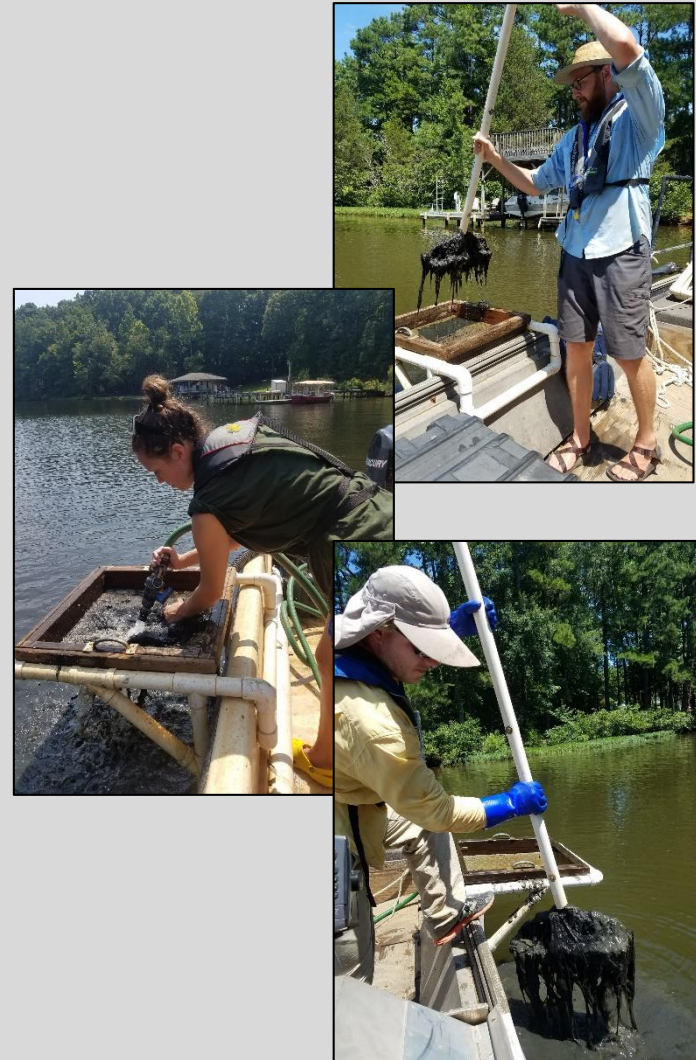
Lyngbya Treatments (2019)

- **Treatment Application**
 - No Change
 - Products / Method



Lyngbya Treatments (2019)

- **Treatment Application**
 - No Change
 - Products / Method
- ***Treatment Timeline***
 - Began Treatments in Early June
 - June 3rd (every 4 weeks)



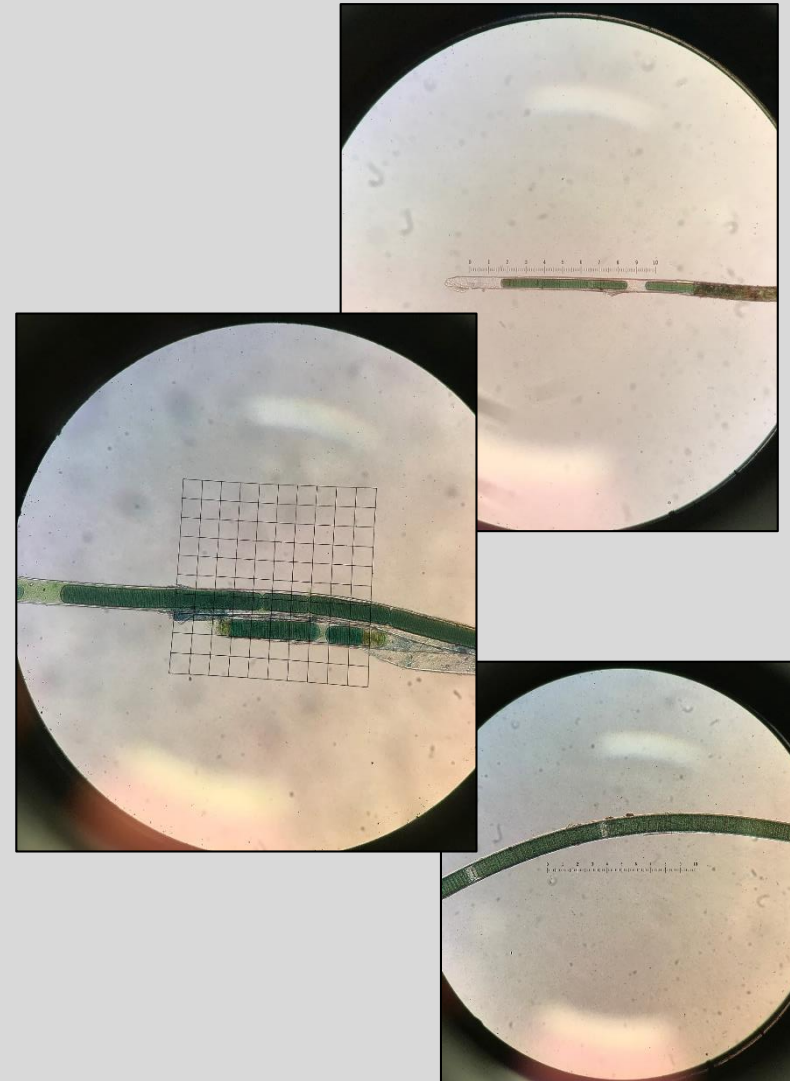
Lyngbya Treatments (2019)

- **Treatment Application**
 - No Change
 - Products / Method
- ***Treatment Timeline***
 - Began Treatments in Early June
 - June 3rd (every 4 weeks)
- ***Sampling Methods***
 - Biomass
 - Viability



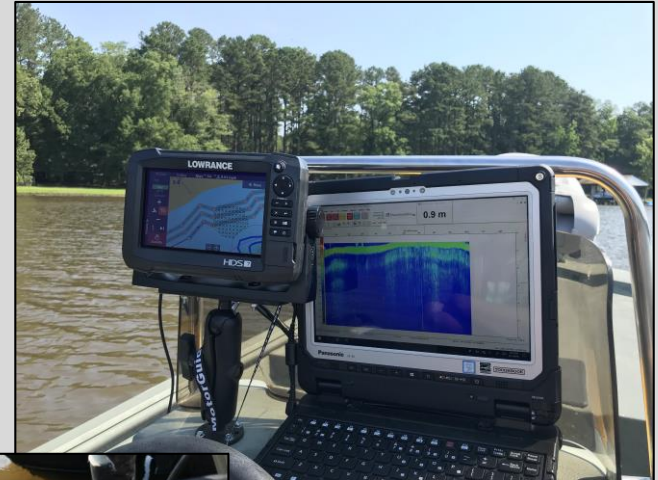
Lyngbya Treatments (2019)

- **Treatment Application**
 - No Change
 - Products / Method
- ***Treatment Timeline***
 - Began Treatments in Early June
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- ***Sampling Methods***
 - Biomass
 - **Viability**



Lyngbya Treatments (2019)

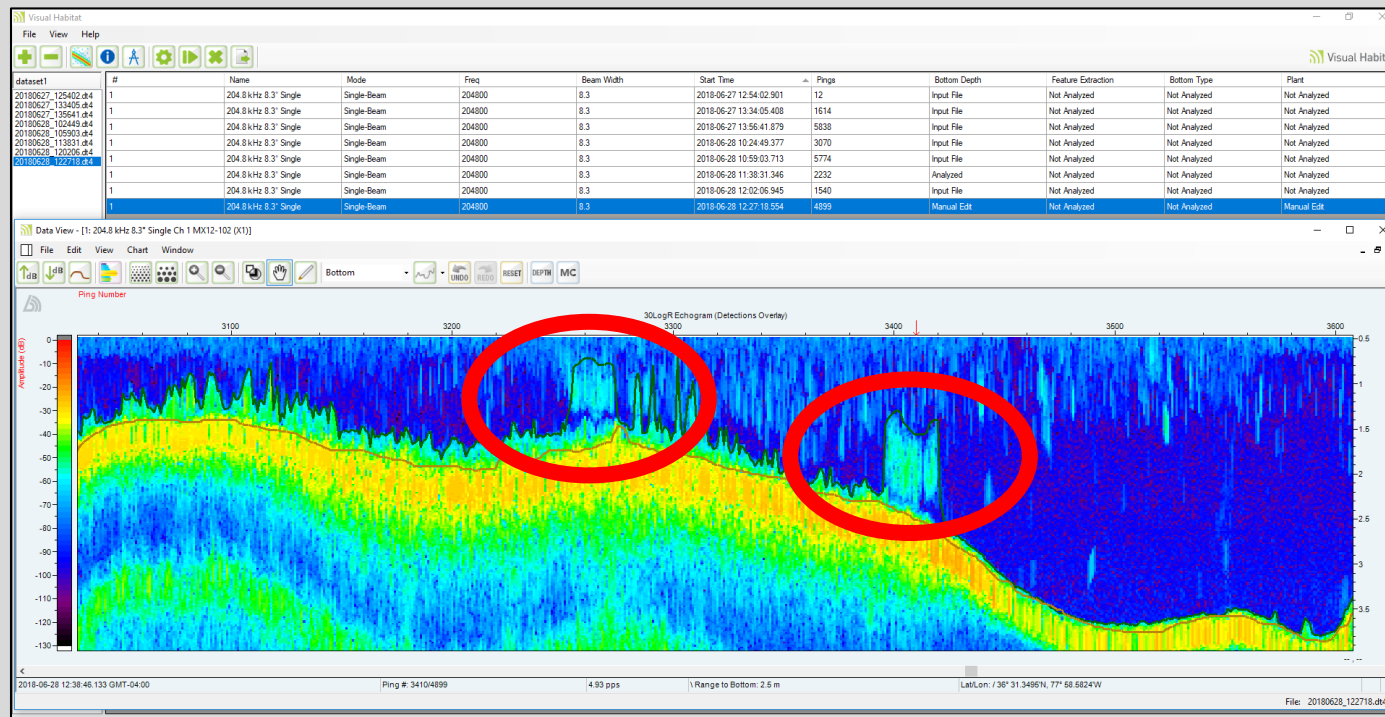
- Treatment Application
 - No Change
 - Products / Method
- *Treatment Timeline*
 - Began Treatments in Early June
 - June 3rd (every 4 weeks)
- *Sampling Methods*
 - Biomass
 - Viability
 - **BioSonics**



Lyngbya Treatments (2019)

Biomass Sampling

- ***Biosonics***
 - Better idea of changes to whole mat



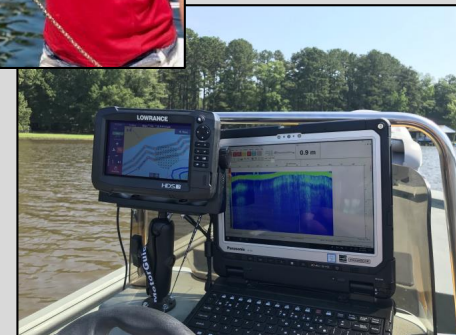
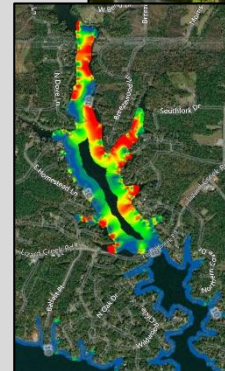
Summary

Hydrilla

- Grass Carp
 - 7,554 fish
- Herbicide Treatments
 - Sonar: Lizard Creek
 - ProcellaCOR: Upper Pea Hill

Lyngbya

- No Changes in Treatments
- New Sampling Protocols
- First Treatment
 - June 3rd



Fall Volunteer Vegetation Survey



Lake Gaston Shoreline



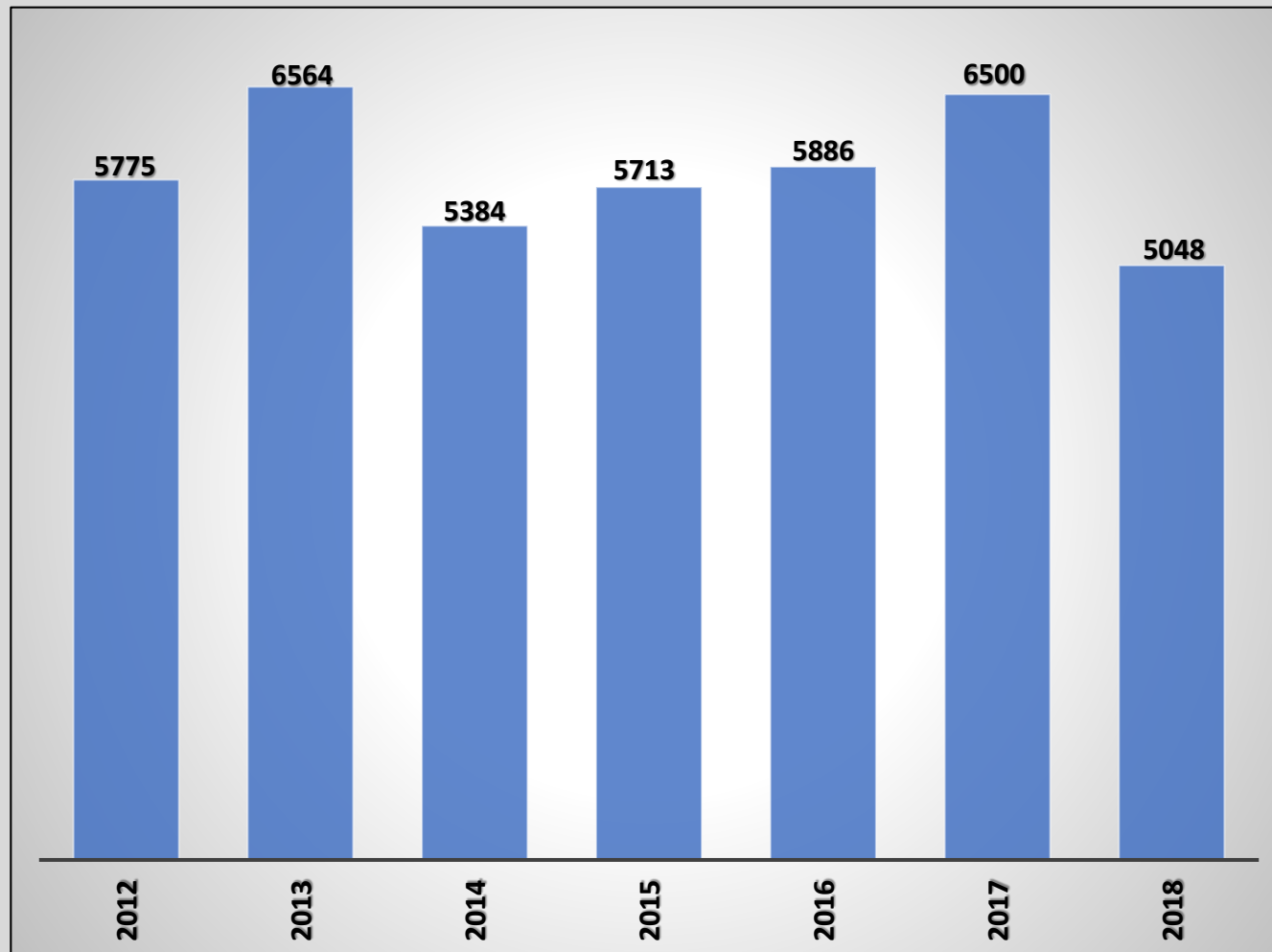
350 Miles of Shoreline

Fall Volunteer Survey

- 60+ Volunteers
- Over 5,000 sample points
- September – October

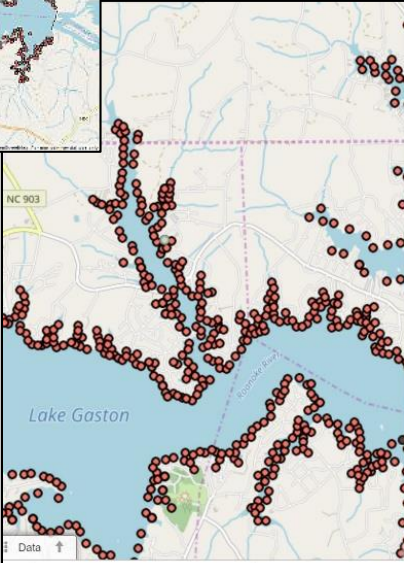
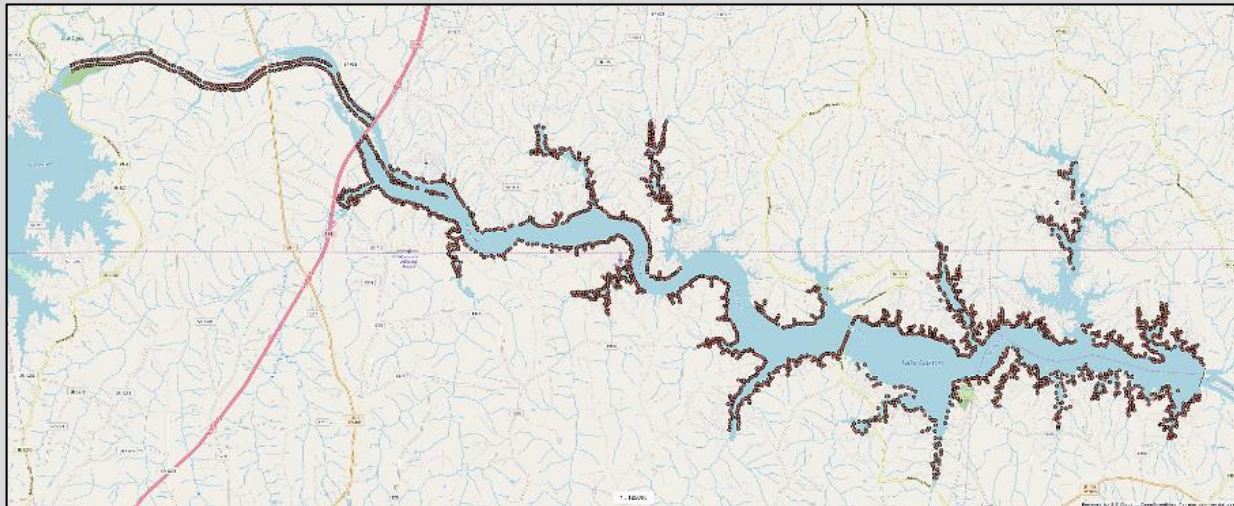


Fall Volunteer Survey



Fall Volunteer Survey

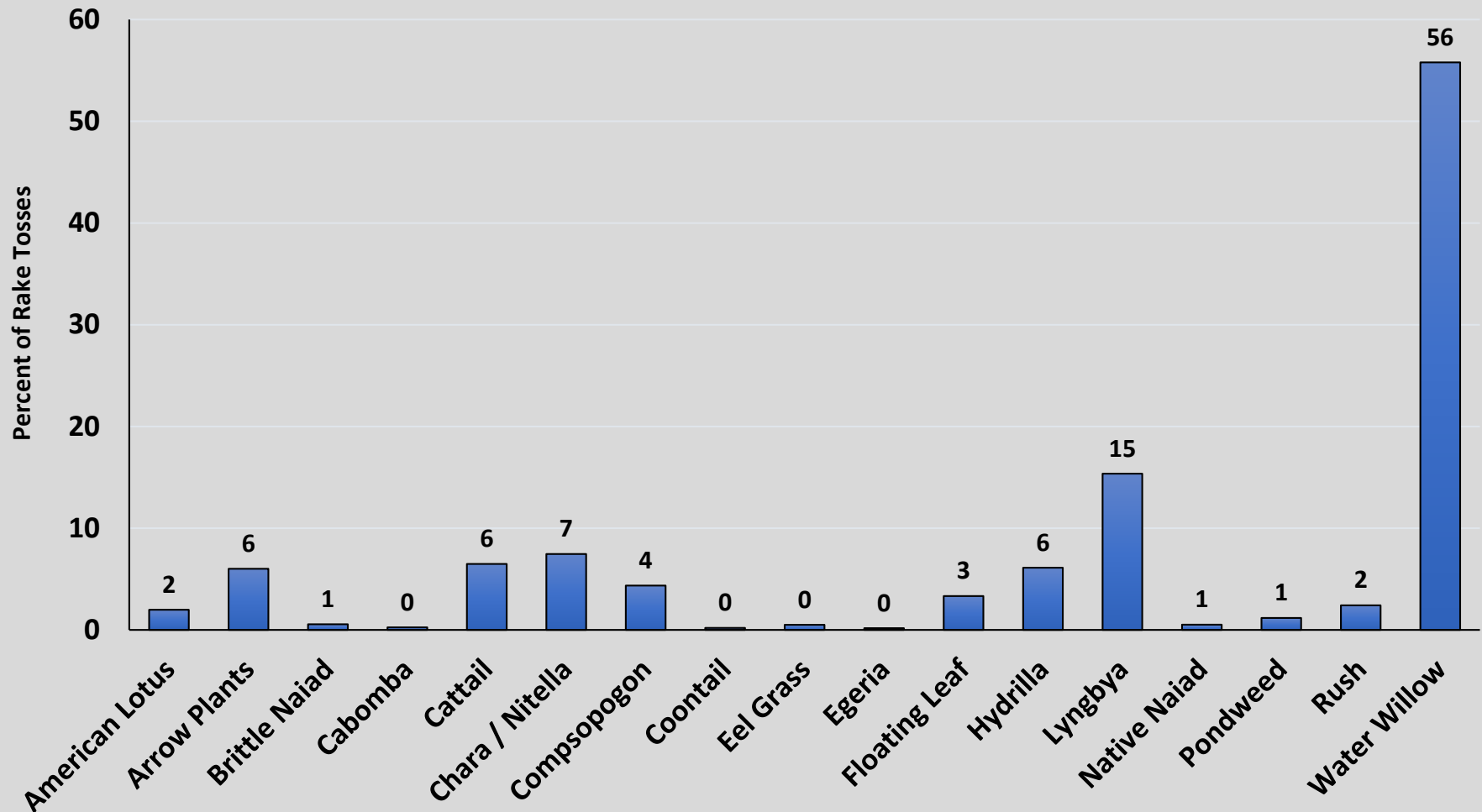
- All Data Uploaded to Cloud Server



your_name	
FID	54
id	54
lat	36.5310806
long	-77.9148633
aquatic plants	HYDRILLA, WATER WILLOW, CHARA/NITELLA
hydrilla length	2
email address	
lga volunteer	
additional comments	
water depth	2
water clarity	0
lyngbya rating	0
device	d77e681706bf40fb
username	lakegastonsurvey9
accuracy	16
heading	282
time	1536419043
photos	
county	

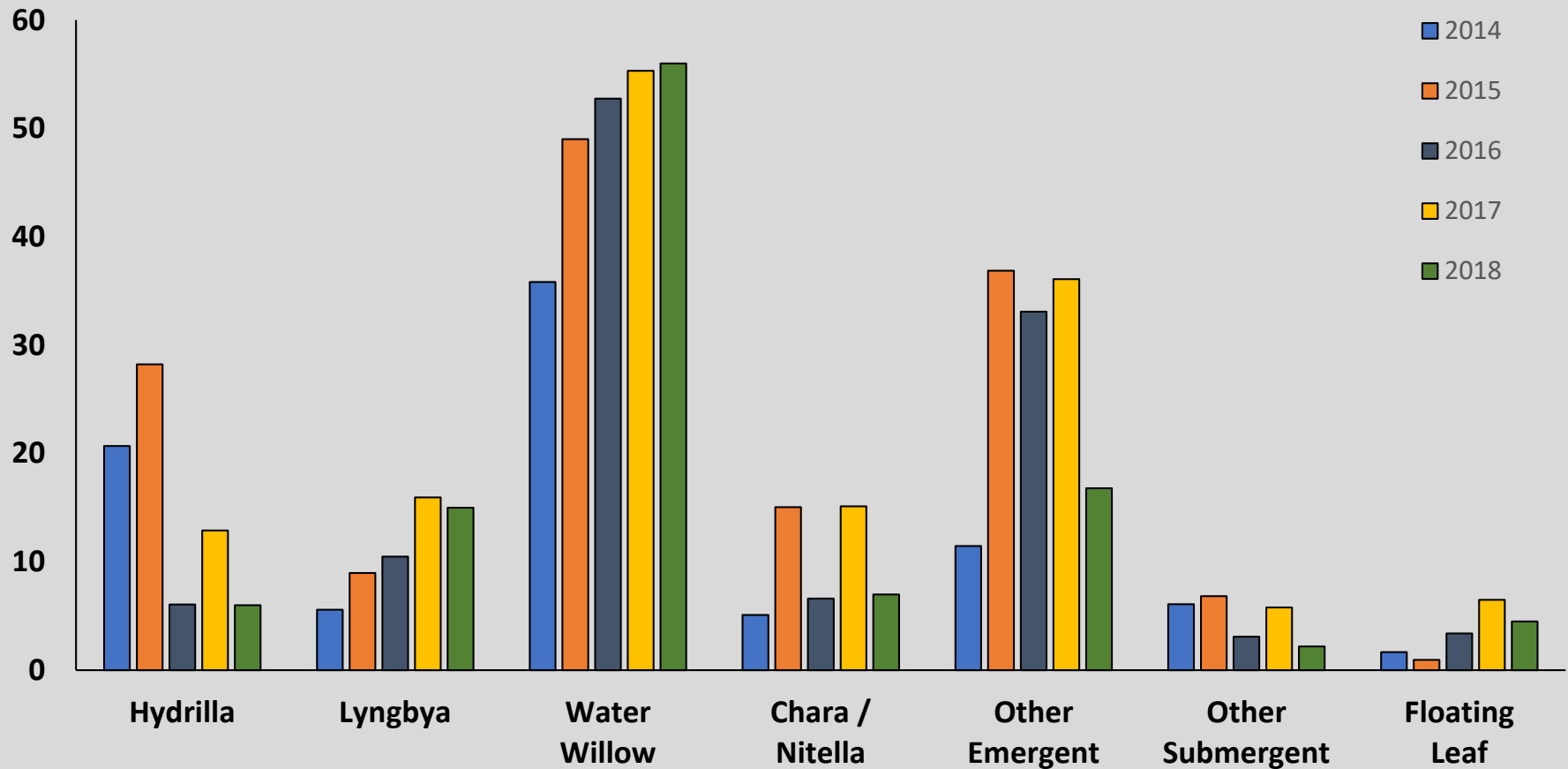
Fall Volunteer Survey

Aquatic Plant Abundance 2018



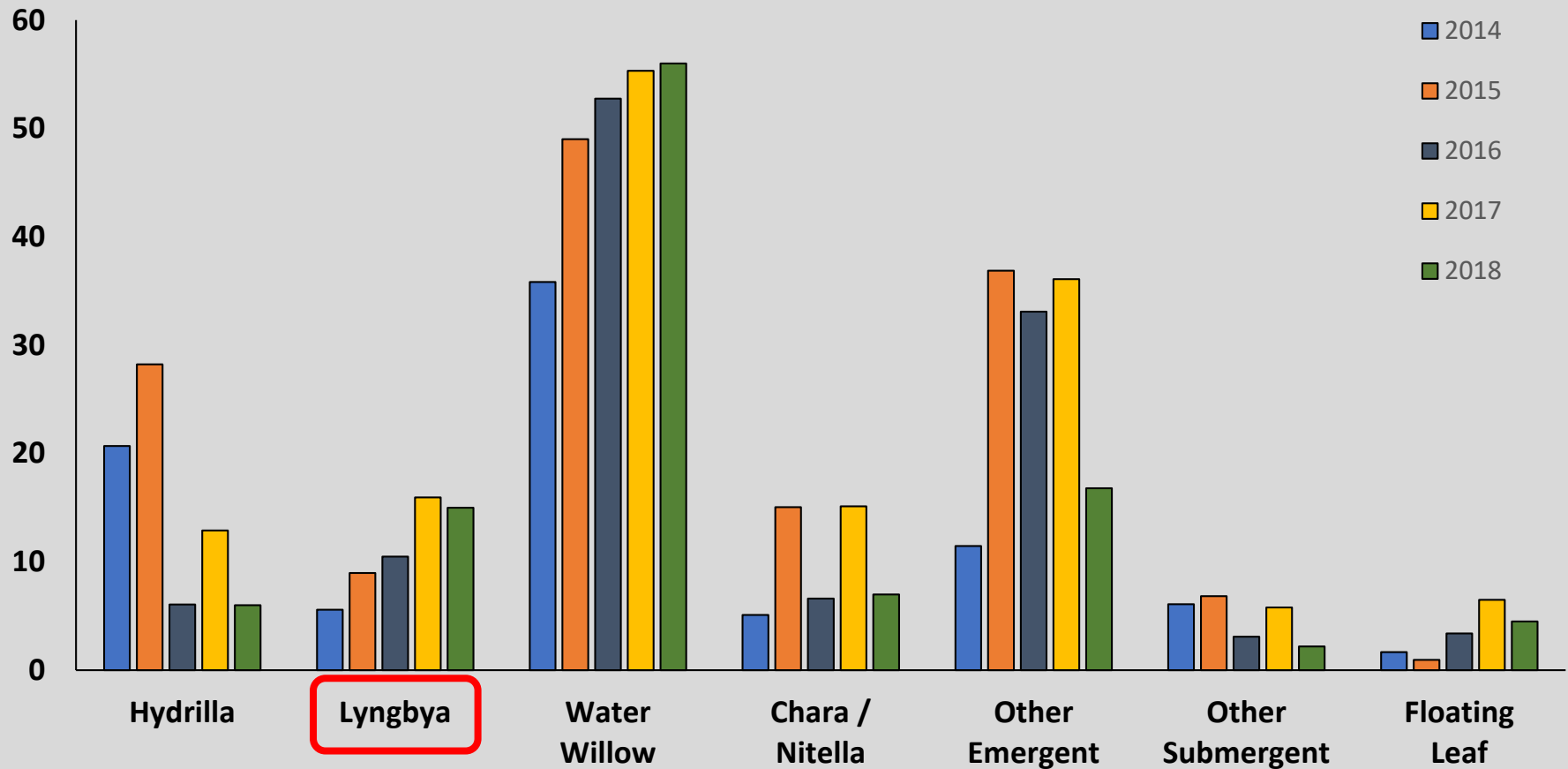
Fall Volunteer Survey

Aquatic Plant Abundance

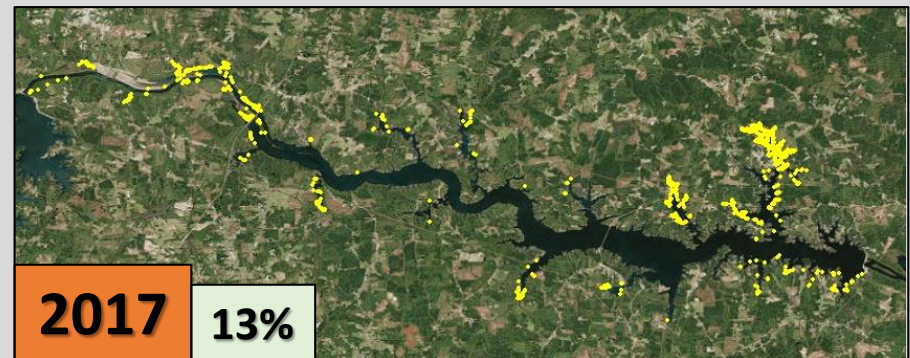
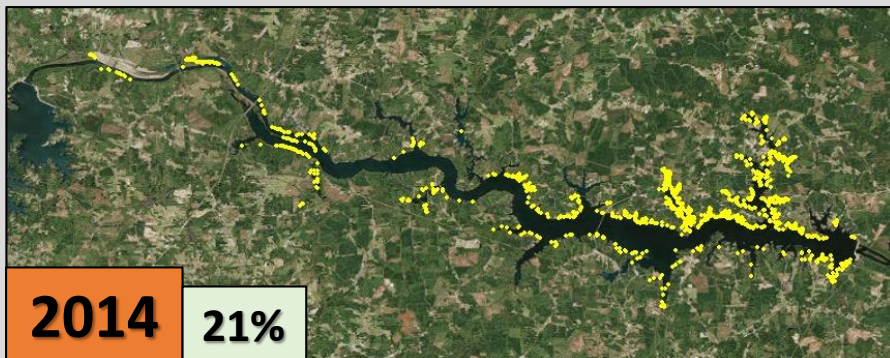
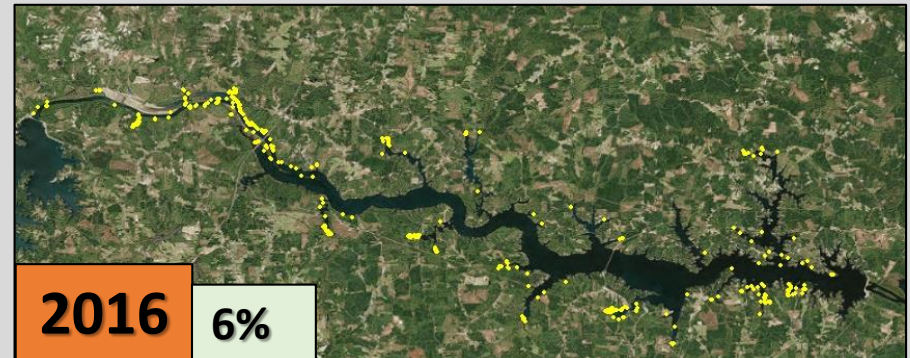
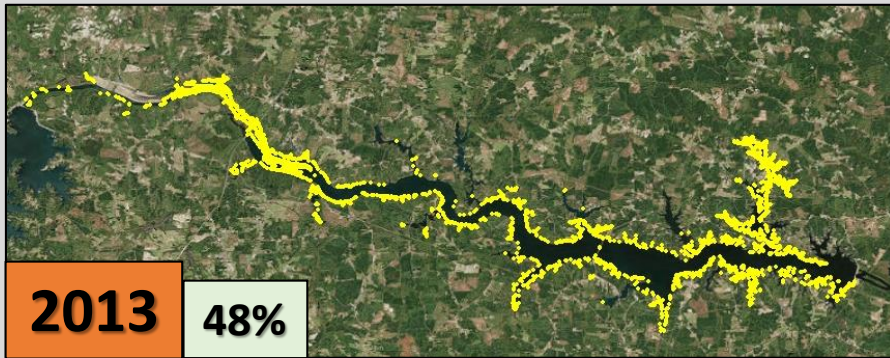
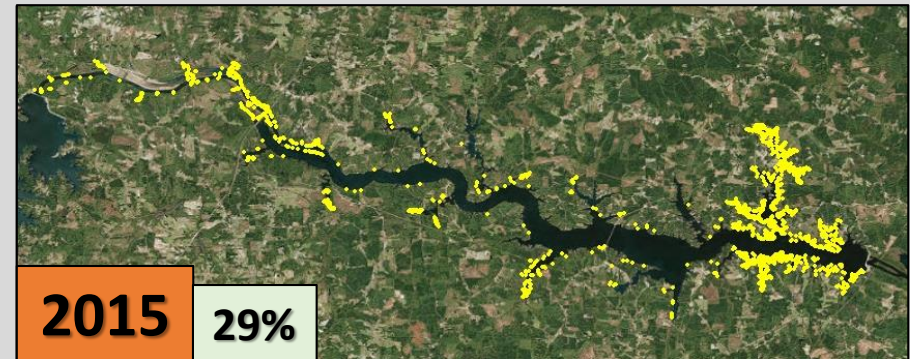
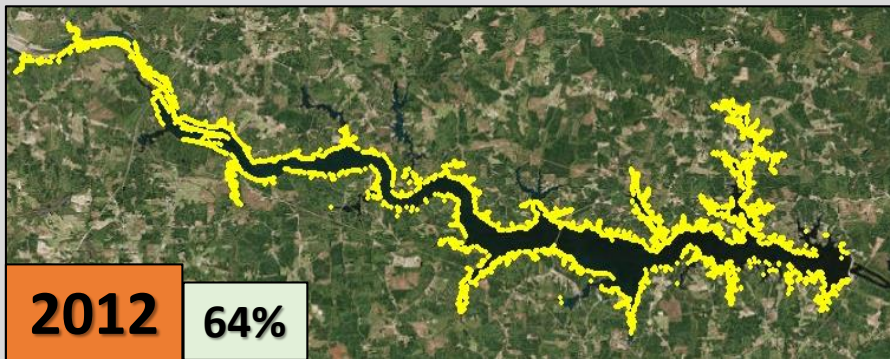


Fall Volunteer Survey

Aquatic Plant Abundance

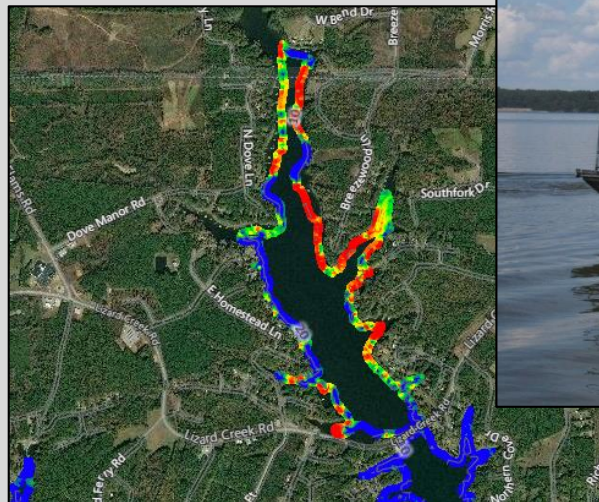


Hydrilla Survey



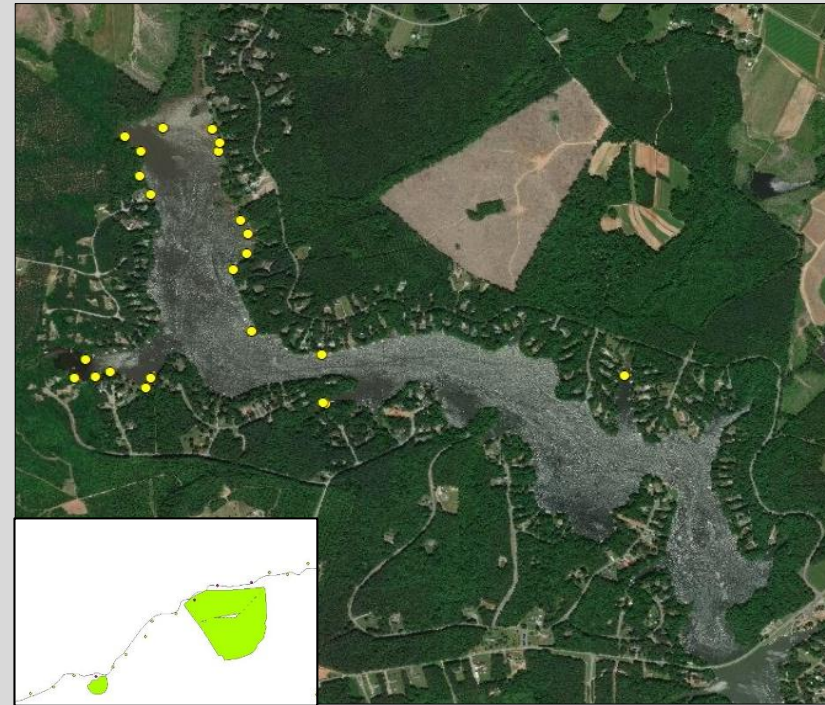
Fall Sonar Survey

- Entire Shoreline Sampled
- Dual Track Sonar
- Data uploaded to BioBase
 - Calculate BioVolume

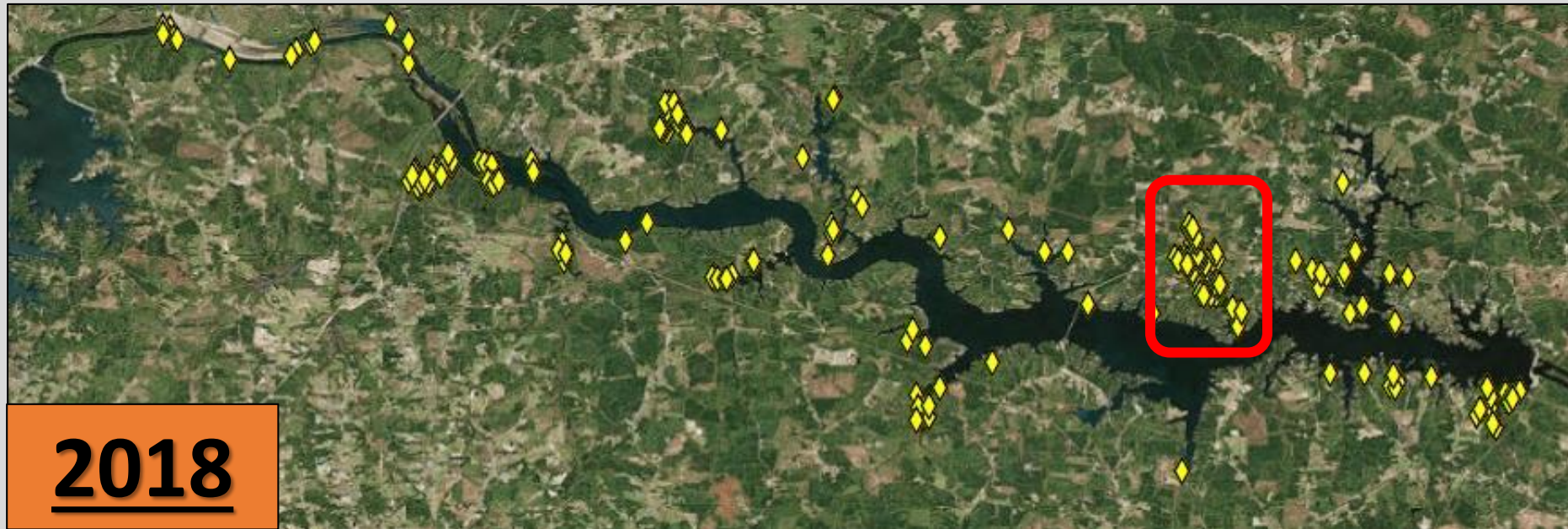


Hydrilla Survey

- **Acreage Estimates - Partial**
 - If Biovolume < 5% BUT Volunteers detect Hydrilla

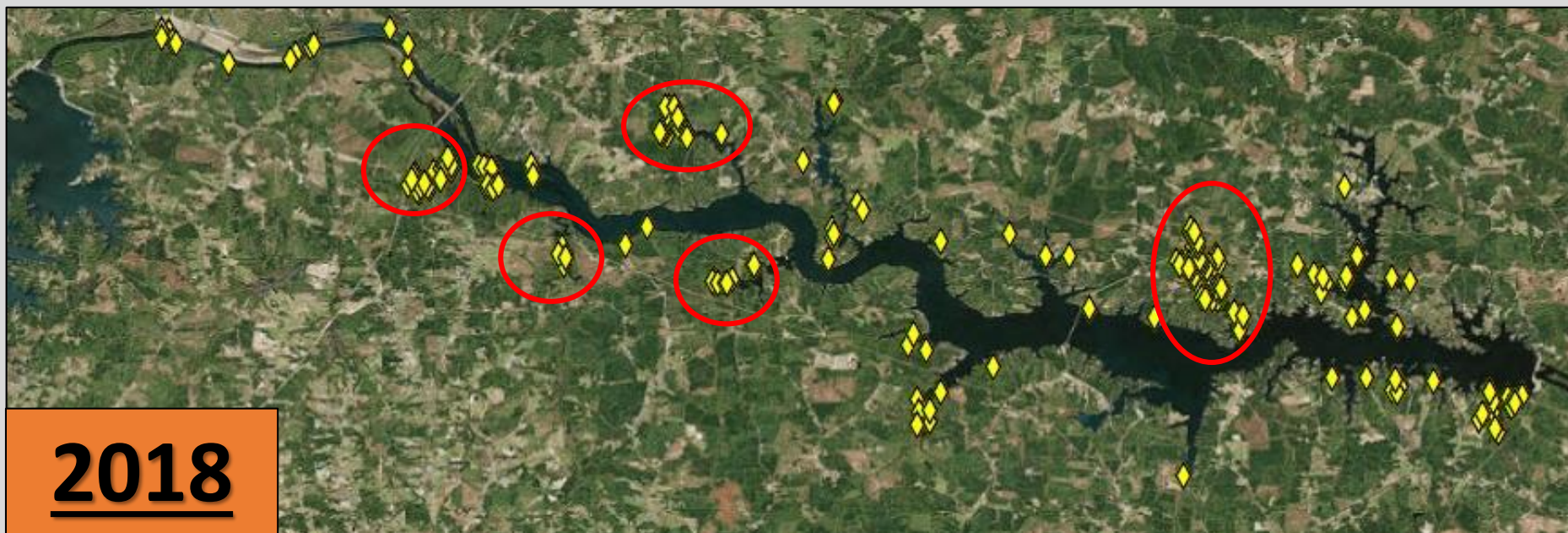


Treatment Plan



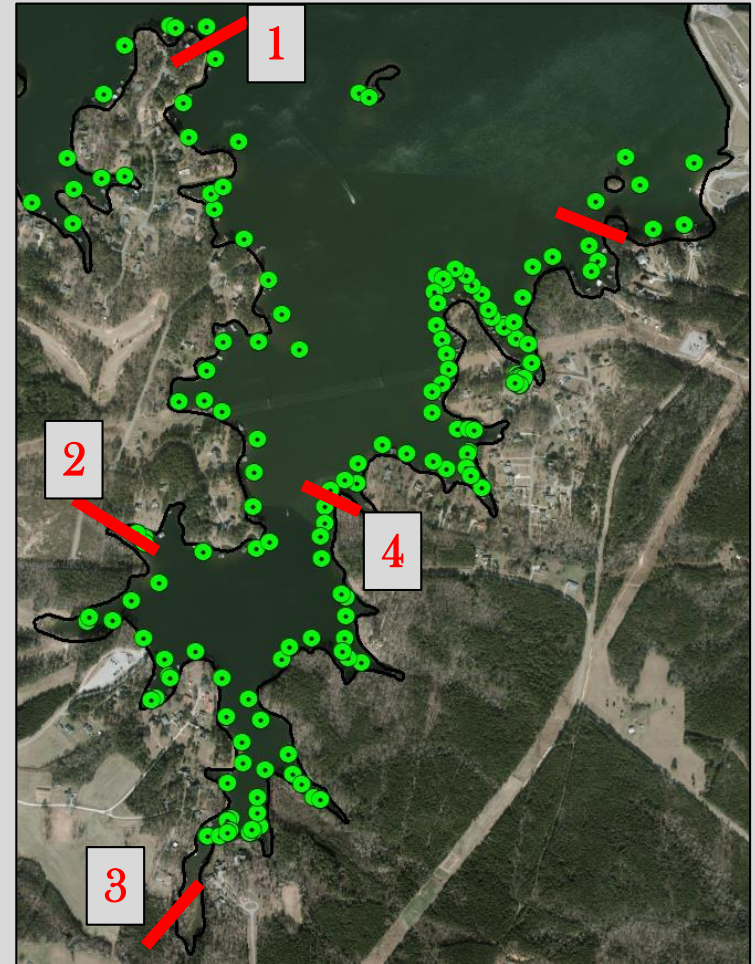
Maximum Treatment Acreage: 300

Future Issues?



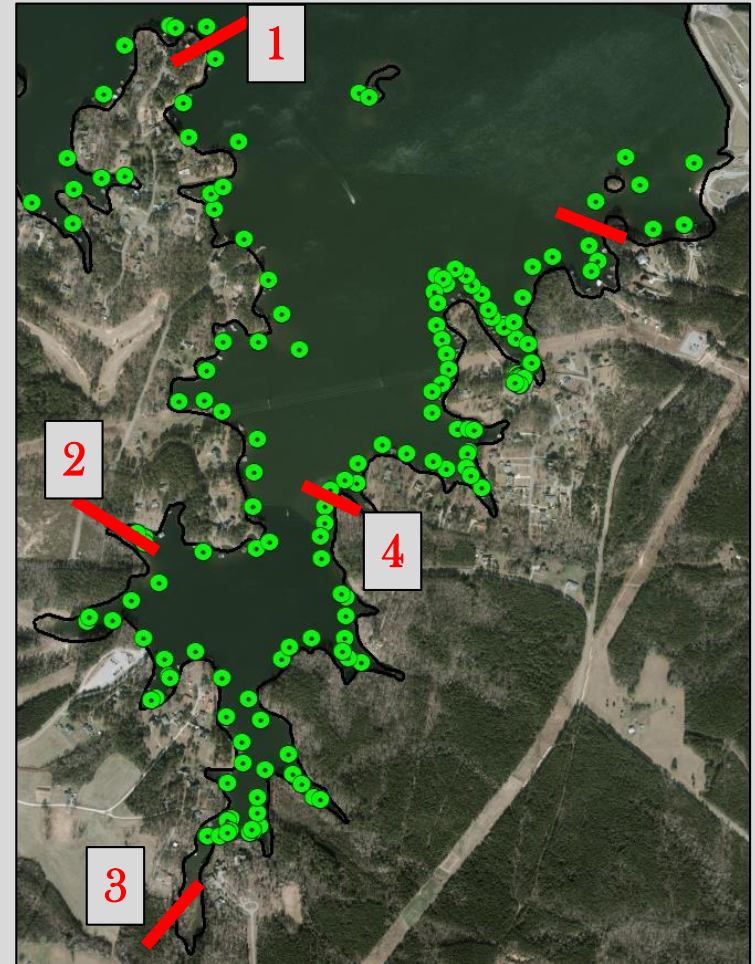
Survey Area

- **Volunteers will sign up for sites**
 - Teams can be created



Survey Area

- **Volunteers will sign up for sites**
 - Teams can be created
- **Sites are 3 miles long**
 - Around 80 sample points



Survey Area

- **Volunteers will sign up for sites**
 - Teams can be created
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 - Around 80 sample points

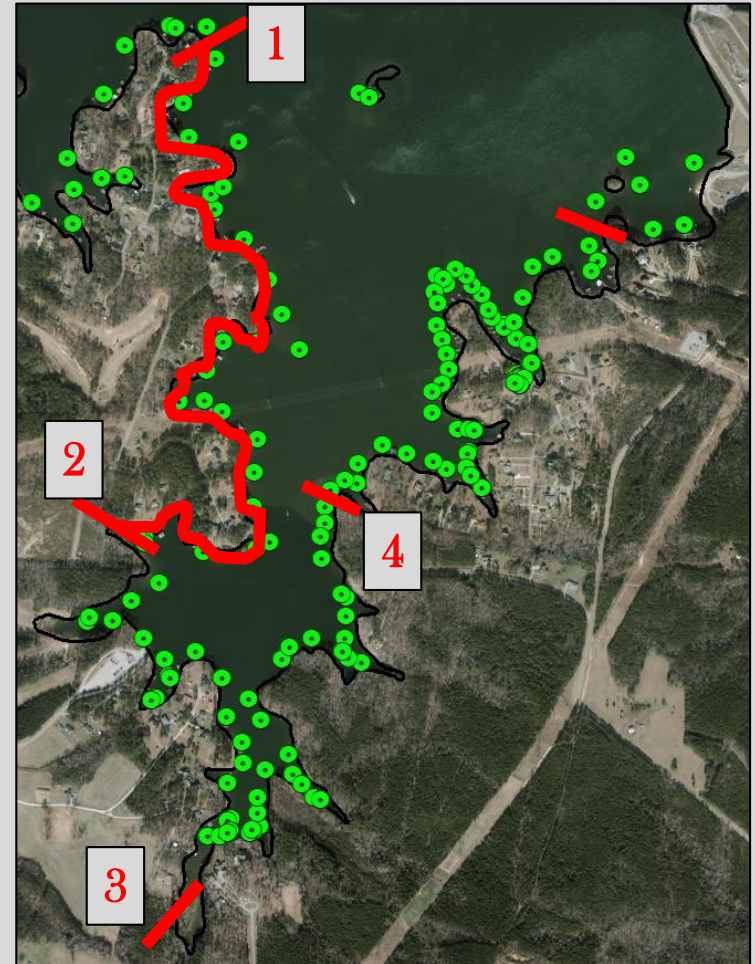
Example:

Site 1: Bruce Johnson

Site 2: Team Wally

Site 3: Team Jeff

Site 4: NCSU



Survey Area

- **Volunteers will sign up for sites**
 - Teams can be created
- **Sites are 3 miles long**
 - Around 80 sample points

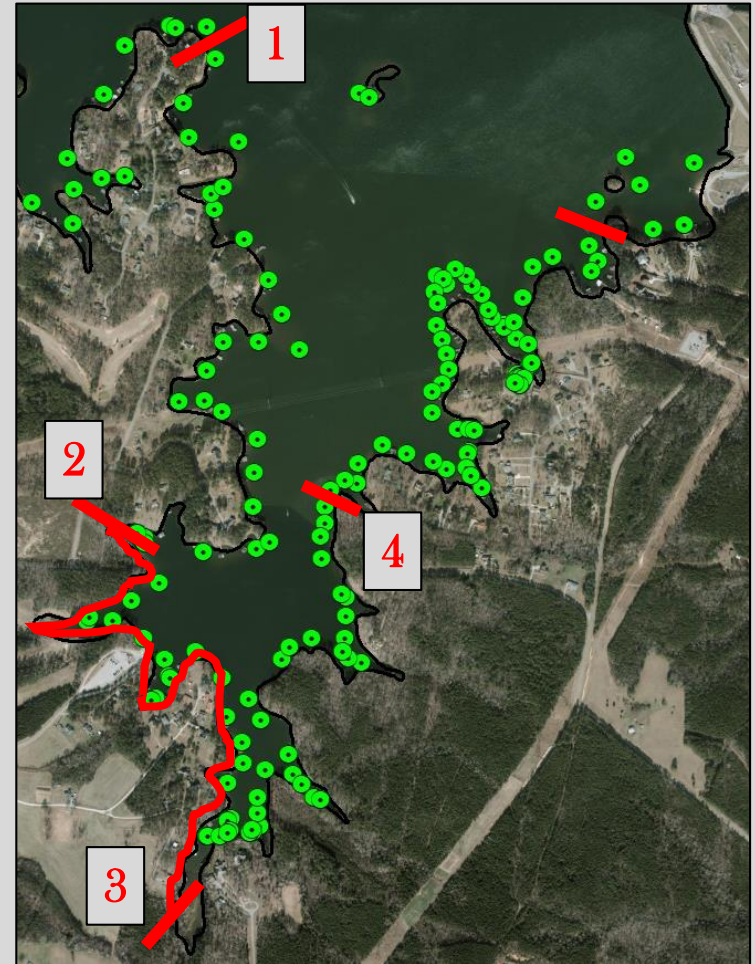
Example:

Site 1: Bruce Johnson

Site 2: Team Wally

Site 3: Team Jeff

Site 4: NCSU



SAMPLING SITES

Boat Roles

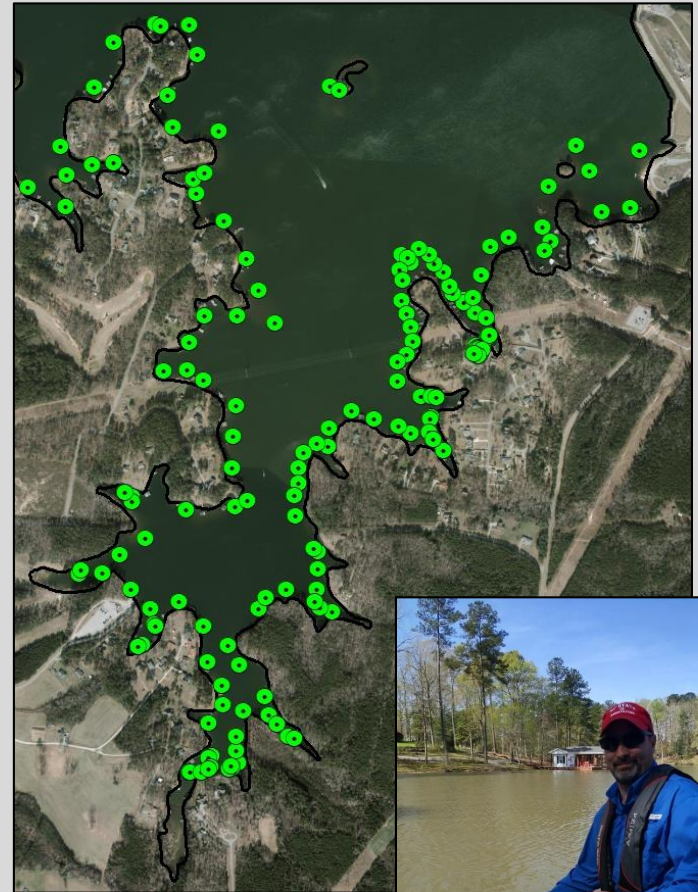
- Driver
- Data Collector
- Recorder



SAMPLING SITES

Boat Roles

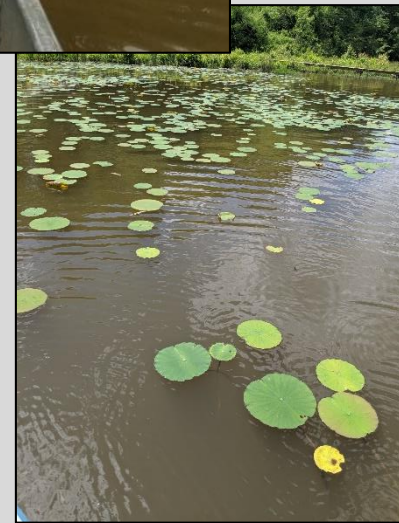
- **Driver**
 - Sites ~ 200 feet apart **
 - No Deeper than 10 feet
- Data Collector
- Recorder



SAMPLING SITES

Boat Roles

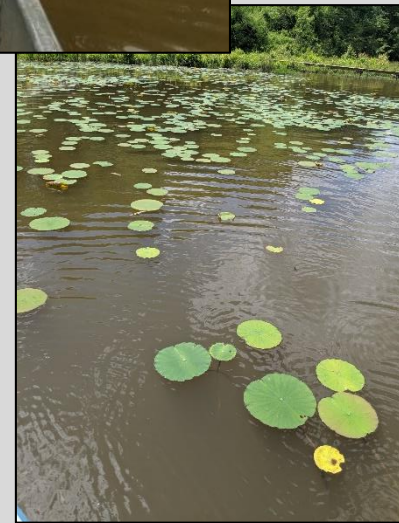
- Driver
- **Data Collector**
 - ID Shoreline Plants
 - Toss Rake
- Recorder



SAMPLING SITES

Boat Roles

- Driver
- **Data Collector**
 - ID Shoreline Plants
 - **Toss Rake**
- Recorder



RAKE

Identify Submerged Plants

- 2 throws per site
- Throw towards shoreline
- Drag on bottom back to boat (~20 ft)
- Clip end of rope to self or boat



SAMPLING SITES

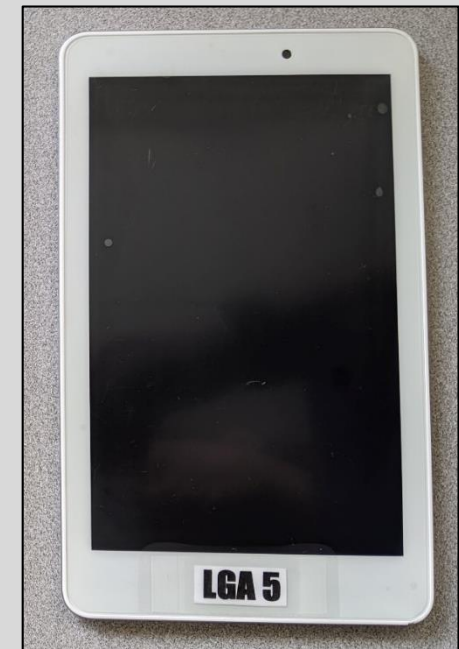
Boat Roles

- Driver
- Data Collector
- **Recorder**
 - Record Data into Tablet



TABLETS

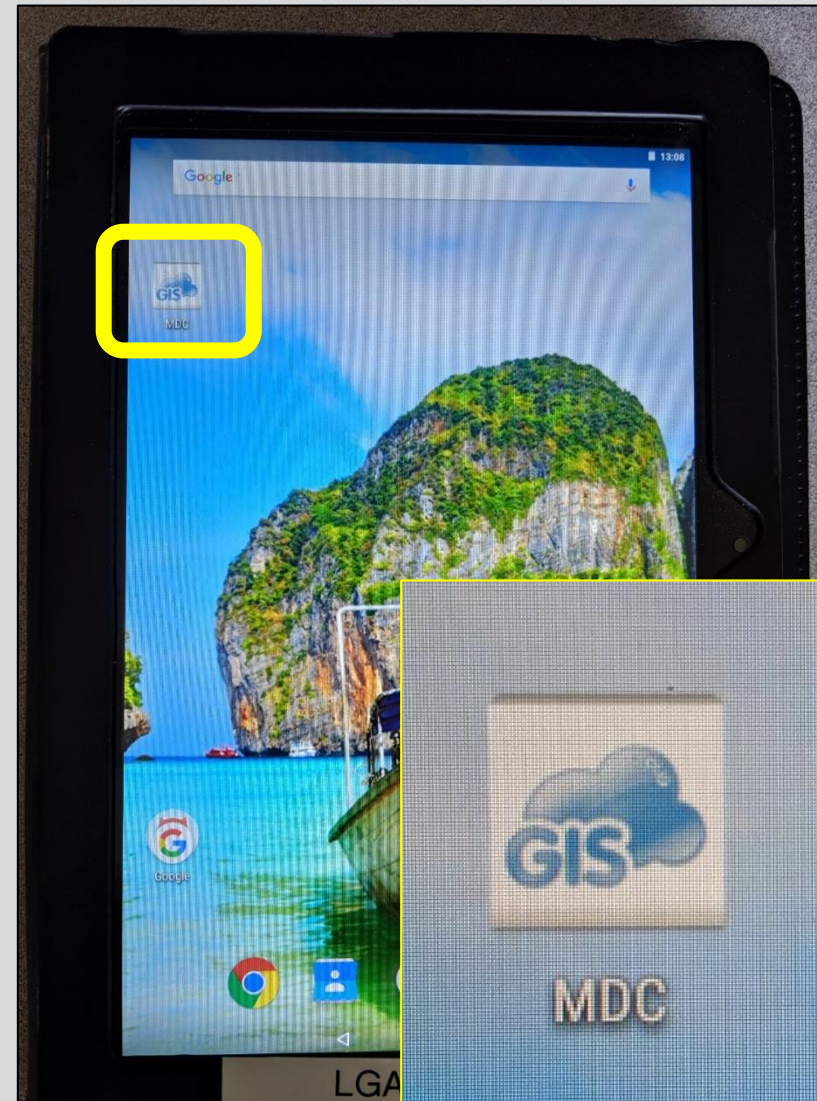
Basics



TABLETS

Basics

- Drag Padlock Up
- Application
 - GIS Cloud



TABLETS

Basics

- GIS Cloud

2019 Survey

☒ GPS ☐ Show on map
☐ Pinpoint Accuracy: 3.7m

Aquatic Plants

- ☐ AMERICAN LOTUS
- ☐ ARROW PLANTS (ARROW ARUM, ARROWLEAF)
- ☐ CABOMBA
- ☐ CATTAIL
- ☐ CHARA/NITELLA
- ☐ COMPSOPOGON
- ☐ COONTAIL
- ☐ EEL GRASS
- ☐ EGERIA / ELODEA
- ☐ FLOATING LEAF (LILY/WATERSHEILD)
- ☐ HYDRILLA
- ☐ LYNGBYA
- ☐ NAIAD (NATIVE)
- ☐ NAIAD (BRITTLE)

☒ Send ☐ Queue ☐ Map ☐ Settings

2019 Survey

☐ WATER WILLOW
☐ PUT IN COMMENTS
☐ NONE

Hydrilla Length (inches)

Lyngbya Rating (1 to 4)
1: trace, 2: sparse, 3: moderate, 4: dense

Additional Comments

LGA Volunteer
First and Last Entry Only

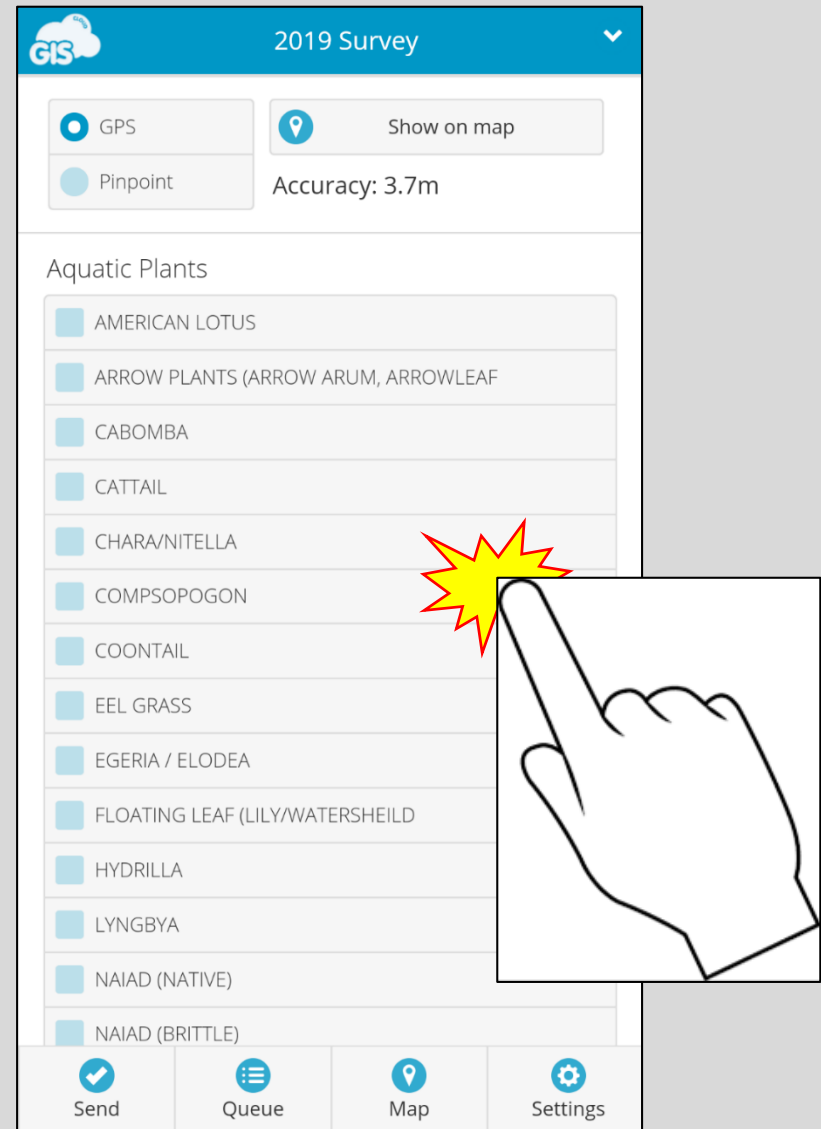
Email Address
First and Last Entry Only

☒ Send ☐ Queue ☐ Map ☐ Settings

TABLETS

Basics

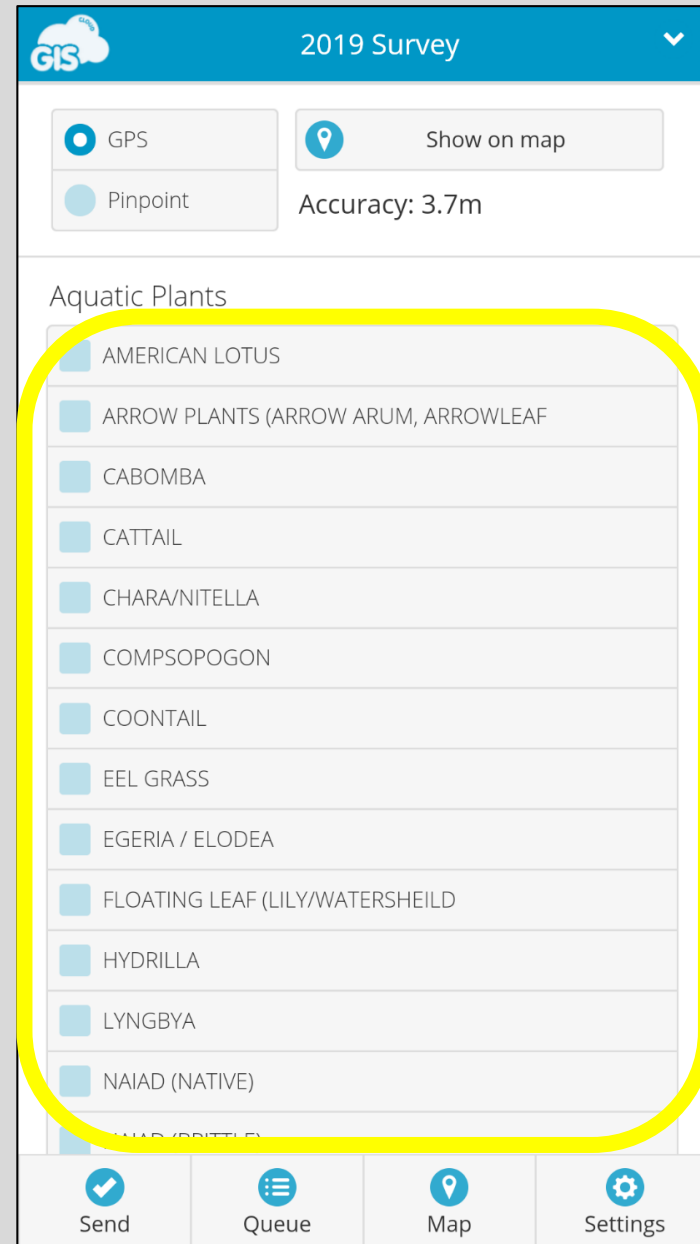
- GIS Cloud
 - Touch Screen



TABLETS

Basics

- GIS Cloud
 - Plant ID
 - ALL plants present



TABLETS

Basics

- **GIS Cloud**
 - Plant ID
 - **First and Last Data Point**
 - Name
 - Email Address

2019 Survey

WATER WILLOW

PUT IN COMMENTS

NONE

Hydrilla Length (inches)

Lyngbya Rating (1 to 4)

1: trace, 2: sparse, 3: moderate, 4: dense

Additional Comments

LGA Volunteer

First and Last Entry Only

Email Address

First and Last Entry Only

Send Queue Map Settings

TABLETS

Basics

- **GIS Cloud**
 - Plant ID
 - First and Last Data Point
 - **Additional Comments**
 - Something Cool
 - Took a Picture

GIS 2019 Survey

☐ WATER WILLOW

☐ PUT IN COMMENTS

☐ NONE

Hydrilla Length (inches)

Lyngbya Rating (1 to 4)
1: trace, 2: sparse, 3: moderate, 4: dense

Additional Comments

LGA Volunteer
First and Last Entry Only

Email Address
First and Last Entry Only

Send Queue Map Settings

TABLETS

Basics

- Hydrilla
 - Length of Plant
 - Inches



GIS

2019 Survey

☐ WATER WILLOW

☐ PUT IN COMMENTS

☐ NONE

Hydrilla Length (inches)

Lyngbya Rating (1 to 4)
1: trace, 2: sparse, 3: moderate, 4: dense

Additional Comments

LGA Volunteer
First and Last Entry Only

Email Address
First and Last Entry Only

☒ Send

☐ Queue

☐ Map

☐ Settings

TABLETS

Basics

- Lyngbya
 - Rating



GIS

2019 Survey

☐ WATER WILLOW

☐ PUT IN COMMENTS

☐ NONE

Hydrilla Length (inches)

Lyngbya Rating (1 to 4)

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Additional Comments

LGA Volunteer
First and Last Entry Only

Email Address
First and Last Entry Only

☒ Send

☐ Queue

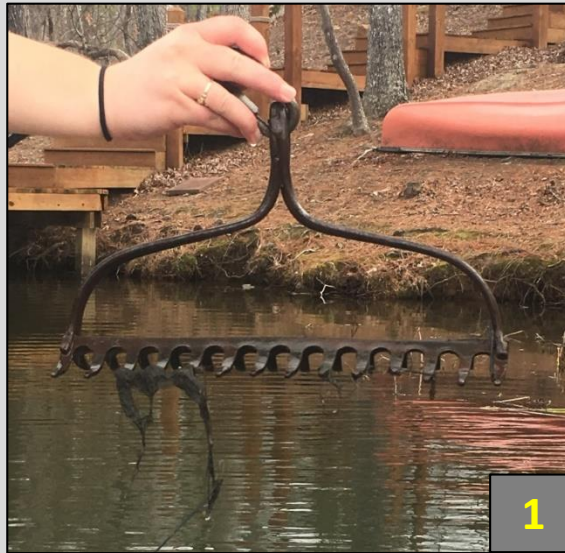
☐ Map

☐ Settings

TABLETS

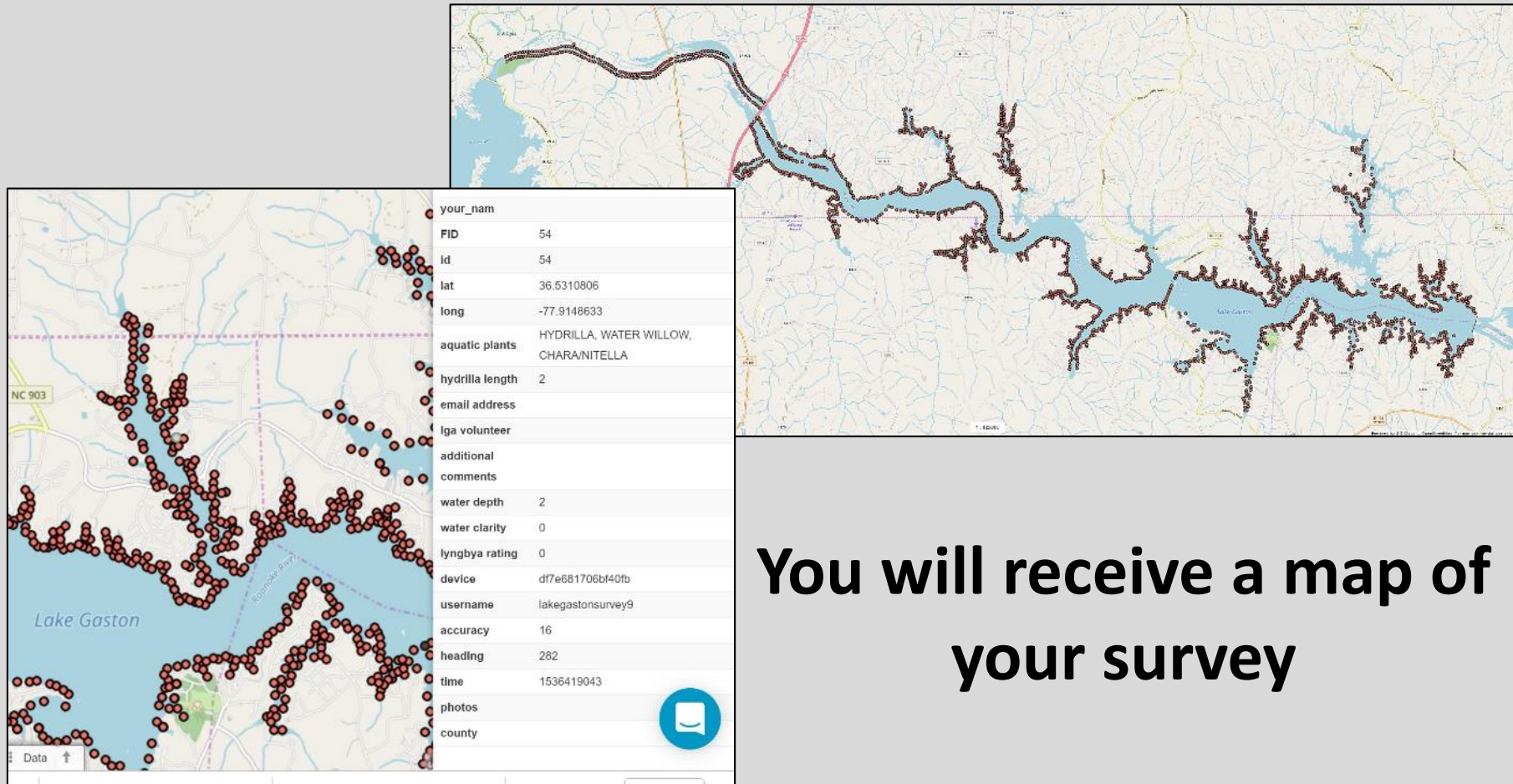
Basics

- Lyngbya
 - Rating
 - 1
 - 2
 - 3
 - 4



TABLETS

Program: GIS Cloud

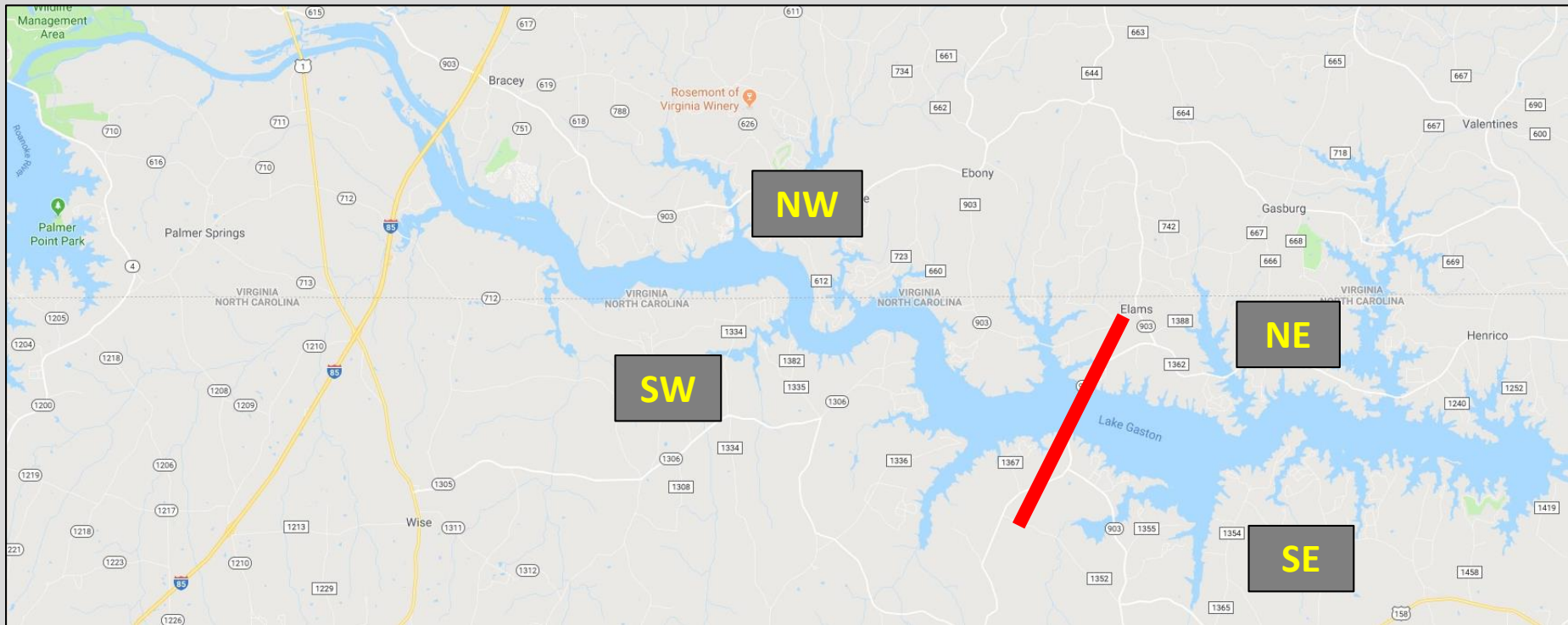


**You will receive a map of
your survey**

TABLETS

Pick up / Drop Off

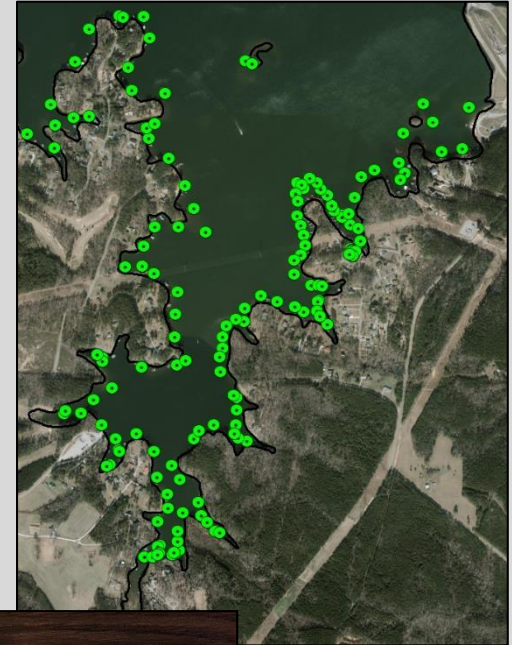
- 4 Zones



TABLETS

Pick up / Drop Off

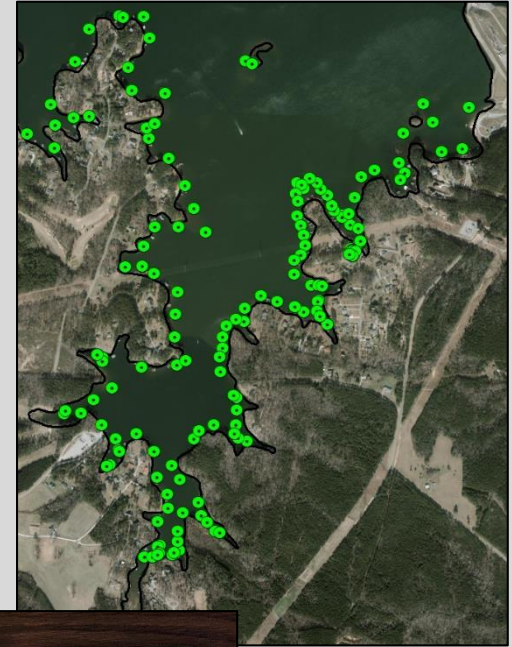
- Reserve Tablets
- Pick Up
 - Can Walk Thru Again



TABLETS

Equipment

- Tablet
- Battery Pack
- “How To” sheet
- Plant ID packet



TRAINING

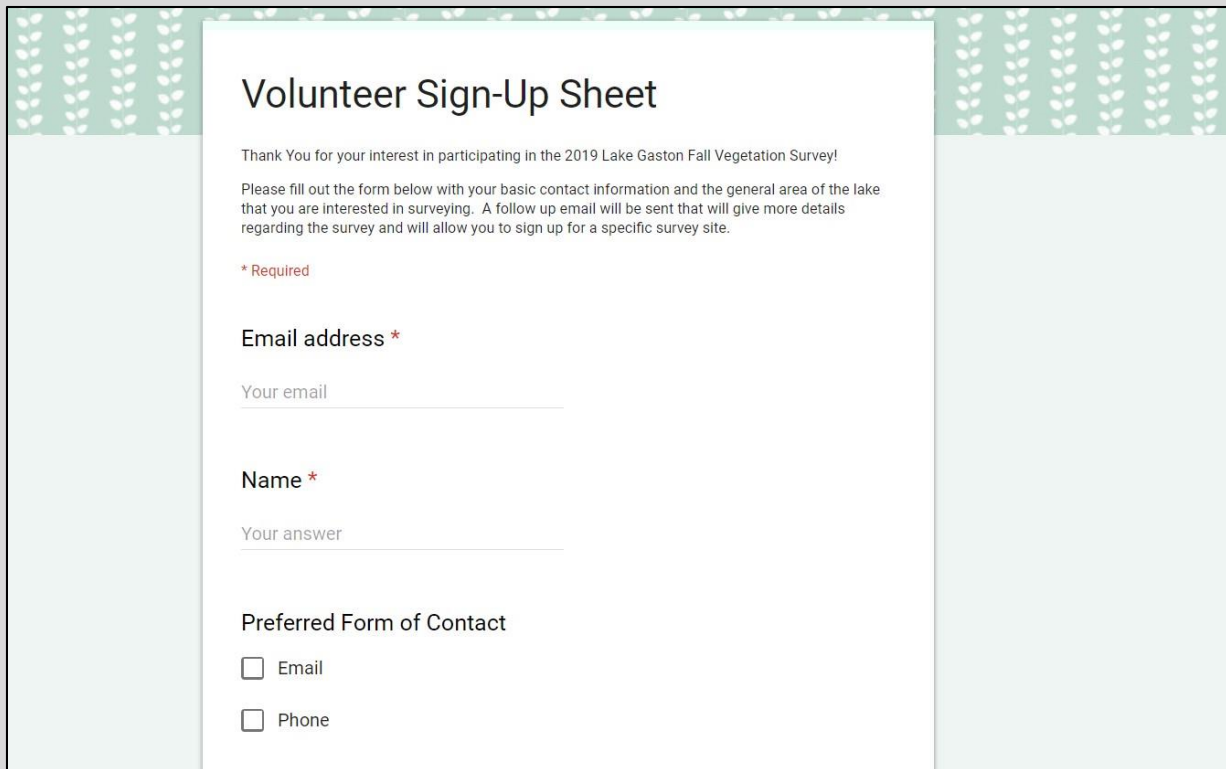
- **Volunteer Training Sessions**
 - 5 sessions
 - Powerpoint Presentation
 - Live Plants
 - Tablets
- **Podcast**
 - MP4 of Powerpoint



Signing UP

Welcome Email

- *Basic Contact Information*

A screenshot of a 'Volunteer Sign-Up Sheet' form. The form is white with a green patterned border at the top. It contains a title, a thank you message, instructions, and three input fields: 'Email address', 'Name', and 'Preferred Form of Contact'. The 'Preferred Form of Contact' section has two radio button options: 'Email' and 'Phone'.

Volunteer Sign-Up Sheet

Thank You for your interest in participating in the 2019 Lake Gaston Fall Vegetation Survey!

Please fill out the form below with your basic contact information and the general area of the lake that you are interested in surveying. A follow up email will be sent that will give more details regarding the survey and will allow you to sign up for a specific survey site.

* Required

Email address *

Your email

Name *

Your answer

Preferred Form of Contact

☐ Email

☐ Phone

Signing UP

Welcome Email

- *Survey Site Request*

Survey Area

This form will allow us to identify the general location of your requested survey area. A follow up email or phone call will occur before September 1st with detailed instructions of how to obtain survey equipment and where to survey.

Have you volunteered for this survey before?

- ☐ Yes
- ☐ No

Would you like to be paired up with a team?

- ☐ Yes
- ☐ No
- ☐ Maybe

General Survey Area

This will help us direct you to the appropriate Area Volunteer Coordinator.

- ☐ Northwest (Upstream of Eaton's Ferry Bridge on North side of lake)
- ☐ Southwest (Upstream of Eaton's Ferry Bridge on South side of lake)
- ☐ Northeast (Downstream of Eaton's Ferry Bridge on North side of lake)
- ☐ Southeast (Downstream of Eaton's Ferry Bridge on South side of lake)

Specific Survey Area

Please fill in if you have a specific area you would like to survey. Example: Lizard Creek north of the bridge

Your answer

Team Name and Members (only if multiple families are surveying)

Your answer

Signing UP

Welcome Email

- *Training Request*

Volunteer Training

We are currently scheduling volunteer training sessions. Please let us know if you are interested in attending one of the training sessions and when your preferred session would occur. Please choose one day option (weekend/weekday) and one time option (morning/afternoon).

Will You be Attending a Volunteer Training?

☐ Yes

☐ No

☐ Maybe

Preferred Training Session Time

☐ Weekday

☐ Weekend

☐ Morning

☐ Afternoon

☐ Anytime

Signing UP

Follow Up

- *Connect with Zone Coordinator*
- *Exact Site to Survey*

Plants

Emergent	Submergent	Floating Leaf	Algae
American Lotus	Brittle Naiad	Floating Leaf	Chara / Nitella
Arrow Plants	Cabomba	Pondweed	Compsopogon
Cattail	Eel Grass	Coontail	Lyngbya
Rush	Egeria		
Water Willow	Hydrilla		
	Native Naiad		
	Watermilfoil		

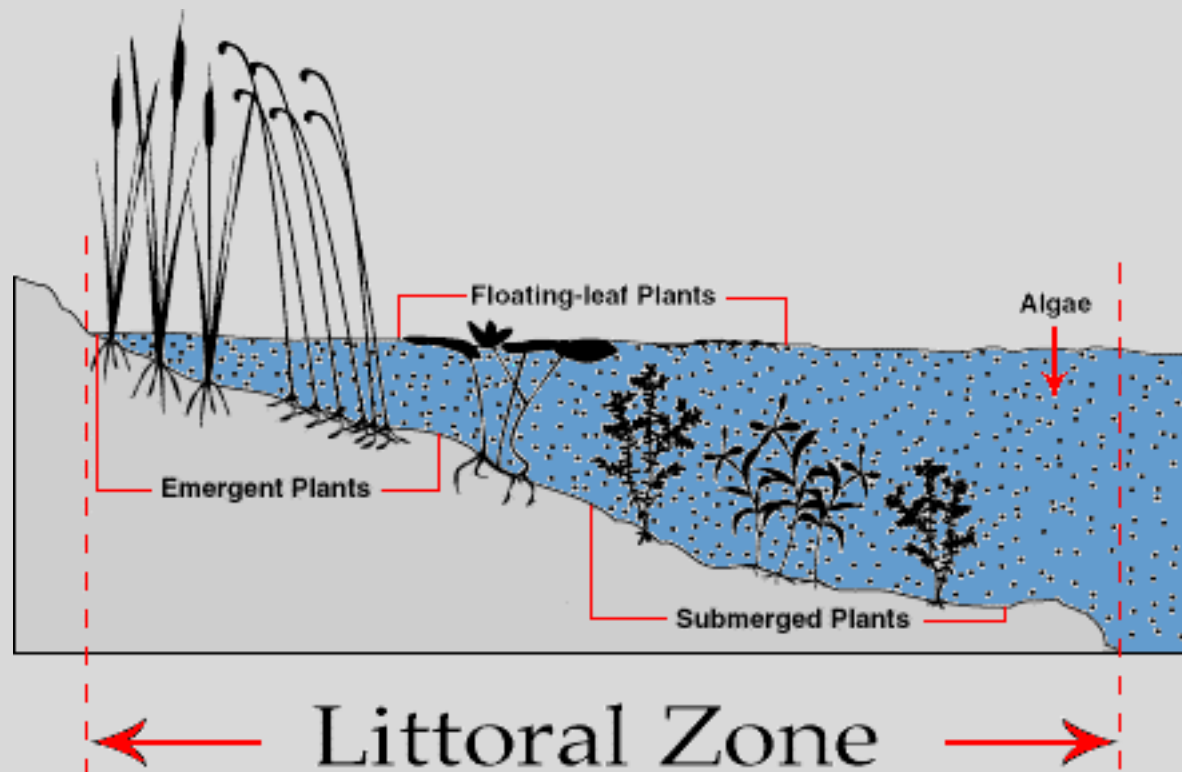
Plants

Emergent

Submergent

Floating Leaf

Algae



Plants

Emergent

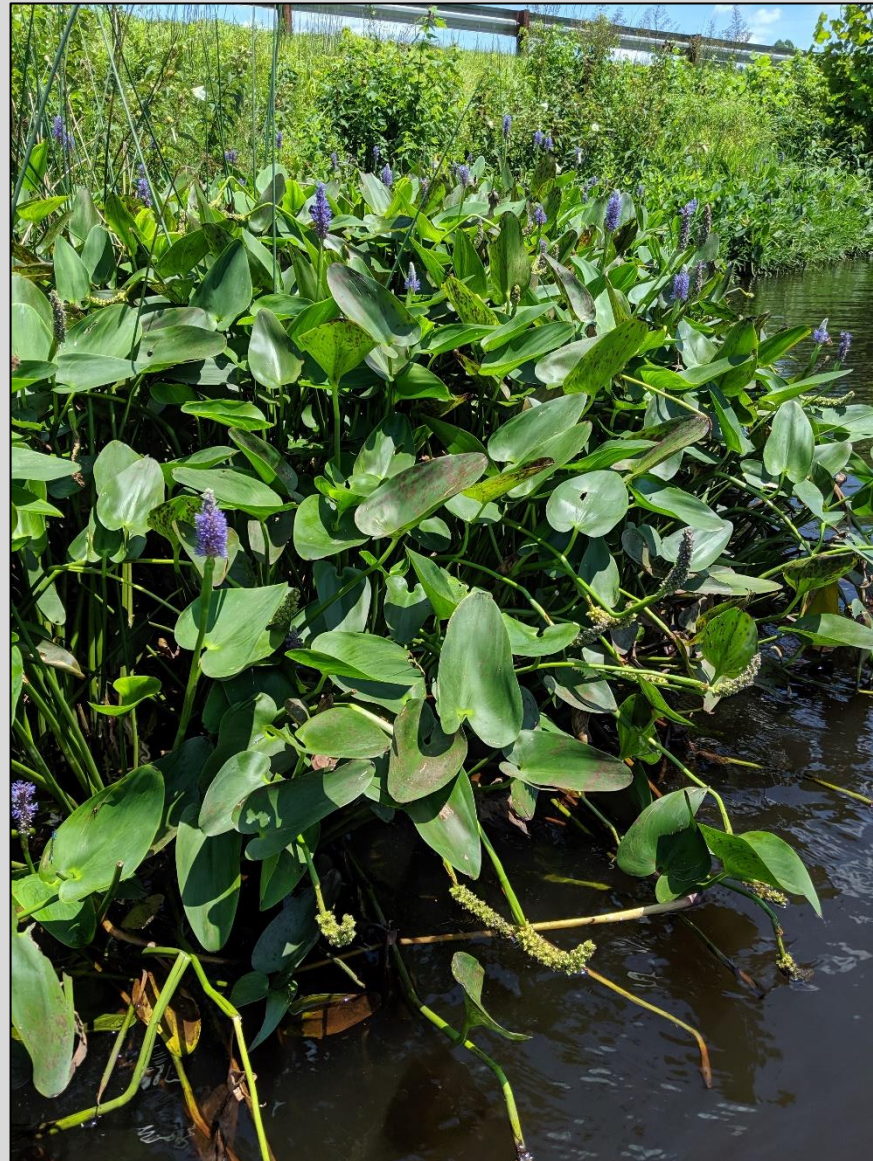
American Lotus

Arrow Plants

Cattail

Rush

Water Willow

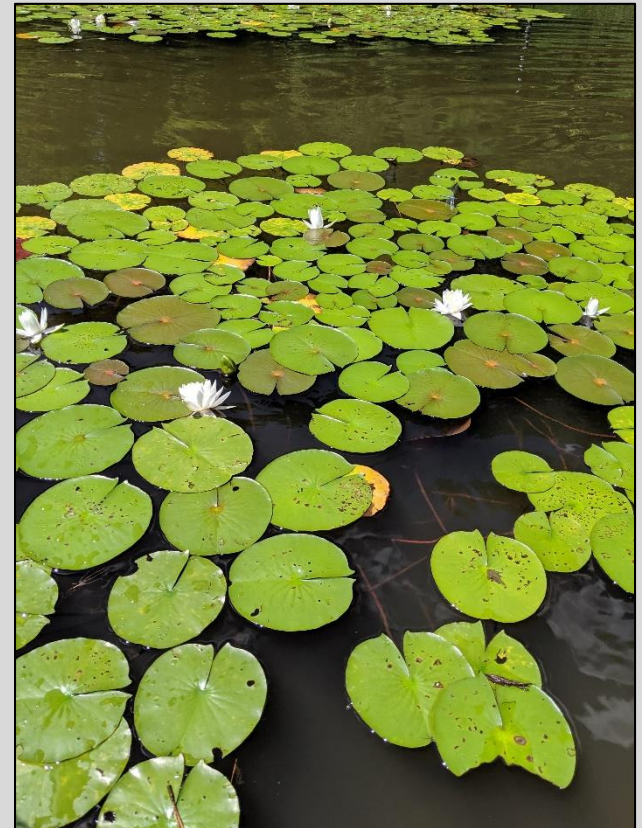
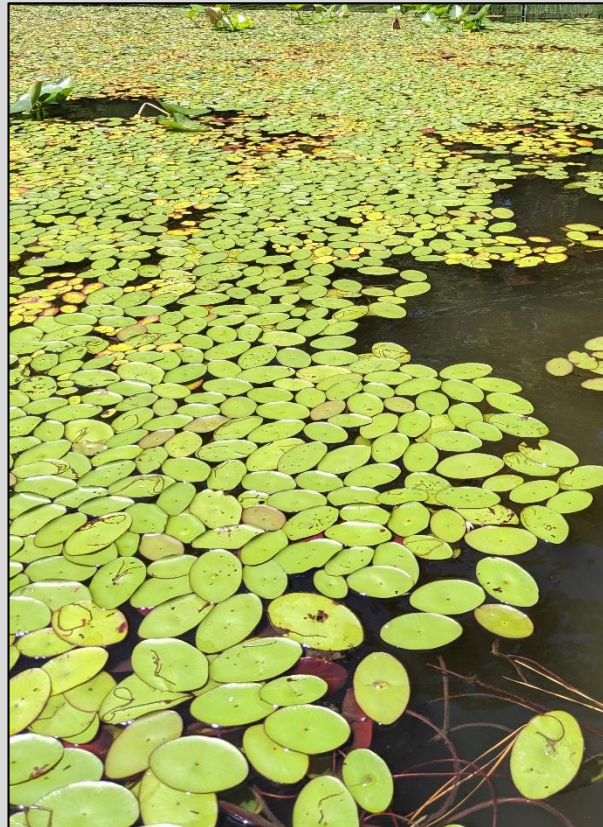


Plants

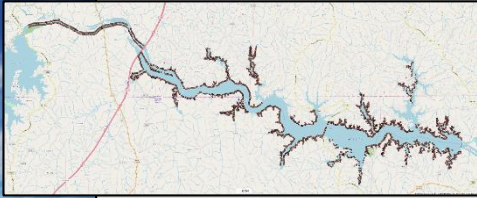
Floating Leaf

Floating Leaf

Pondweed



Questions?



AquaticPlants@ncsu.edu