



# Georgia's State Water Plan

Middle Ocmulgee Water Planning Council  
April 13, 2021

[www.georgiawaterplanning.org](http://www.georgiawaterplanning.org)



## Middle Ocmulgee Regional Water Council Meeting DRAFT Agenda – April 13, 2021

### Objectives:

- 1) Update Council on forecasting process and results
- 2) Hear updates from EPD
- 3) Coordinate with Metro District
- 4) Seed grant update

9:45 – 10:00	Online Check-in and Roll Call	Michelle Vincent, Jacobs
10:00 – 10:10	Welcome and Council Business <ul style="list-style-type: none"><li>• Approve Meeting Summary and Meeting Agenda</li></ul>	Chairman Richardson
10:10 – 10:35	EPD Updates <ul style="list-style-type: none"><li>• BEAM modeling updates</li><li>• Appointments</li><li>• Other EPD Updates</li></ul>	Dr. Wei Zeng, EPD Veronica Craw, EPD
10:35 – 10:45	Metro District Update <ul style="list-style-type: none"><li>• Plan and schedule updates</li></ul>	Danny Johnson, ARC
10:45 – 11:15	Seed Grant Updates <ul style="list-style-type: none"><li>• Update on microplastic grant project</li><li>• Seed Grant/Section 319(h) grant general info</li></ul>	Krista Capps, UGA Veronica Craw, EPD
11:15 – 11:20	Break	
11:20 – 12:05	Forecasting Updates <ul style="list-style-type: none"><li>• Municipal Forecasting results</li><li>• Industrial and Energy Forecasts</li><li>• Agricultural forecast update</li></ul>	Brian Skeens, Jacobs Ashley Reid, CDM Mark Masters, GWPCC
12:05 – 12:20	Wrap Up and Next Steps	Chairman Richardson and Michelle Vincent, Jacobs
12:20 – 12:25	Public Comments/Local Elected Official Comments	
12:25	Adjourn	

- Welcome and Introductions
- Approve Meeting Summary from last meeting
- Approve Draft Agenda

# Middle Ocmulgee Region Council Meeting

## EPD Updates

- EPD Updates – Veronica Craw, EPD
- BEAM Modeling Updates – Dr. Wei Zeng, EPD



# Updates from EPD

Veronica Craw, Georgia EPD

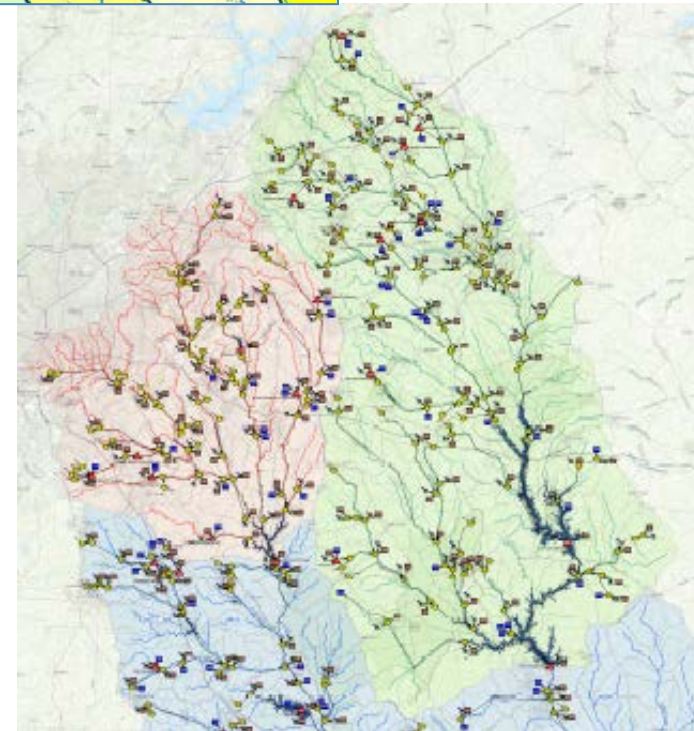


# Updates from EPD

- Council appointments process
- Regional Water Plan Updates
  - Plan Updates with Metro District's process
  - Draft updated Plans by September 2022 for public notice
- Technical work in process that underlies the Regional Water Plans:
  - Forecasting
    - Municipal, Industrial & Energy Forecasts completed
    - Agricultural forecast – later this spring
  - Resource Assessments

# Resource Assessments

- Updates to Modeling Tools used for:
  - Surface Water Availability
    - New modeling tool that provides analysis at more nodes
  - Groundwater Availability
    - Refined groundwater model with smaller grid spacing and transient pumping
  - Water Quality Resource Assessment
    - Updated information & model recalibration







## OOA BEAM Model Development

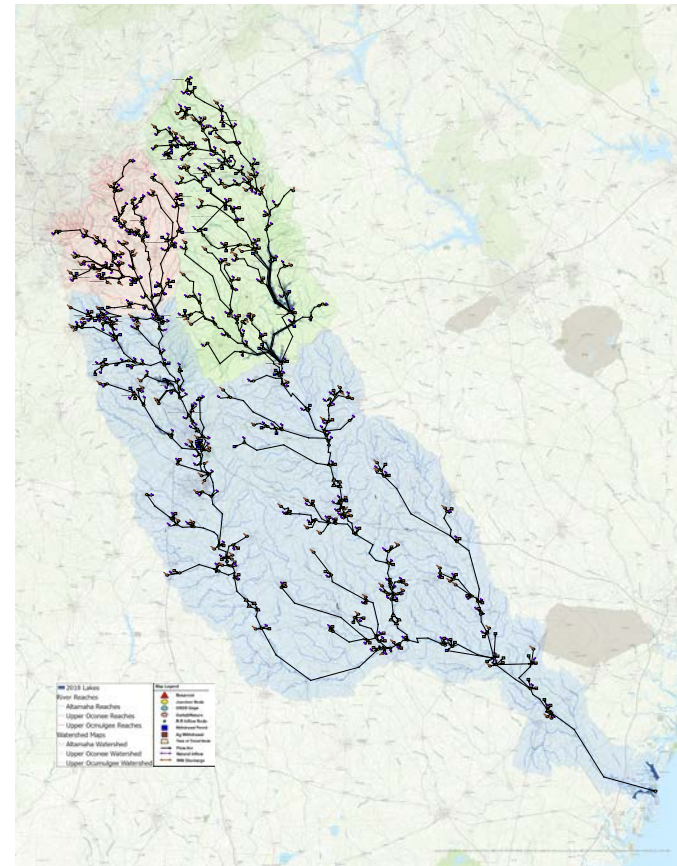
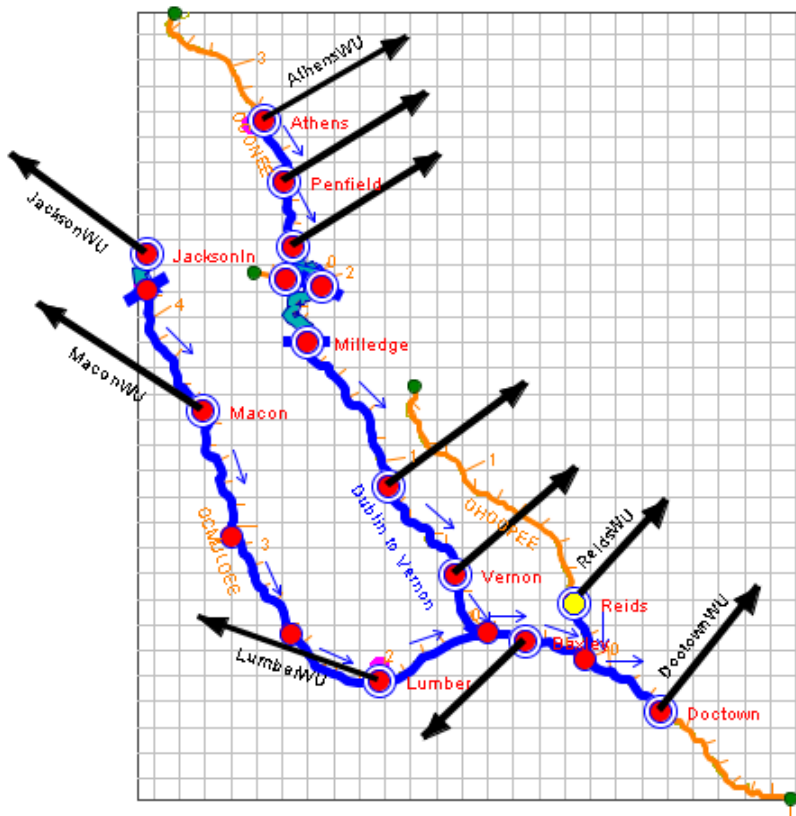
**Surface Water Availability Resource Assessment:  
Pilot Development for Oconee-Ocmulgee-Altamaha Basin**

# Outline

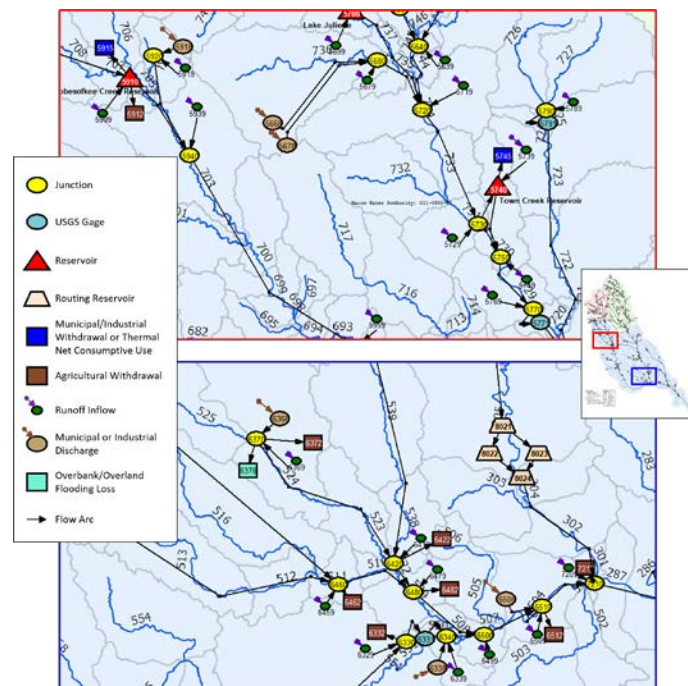
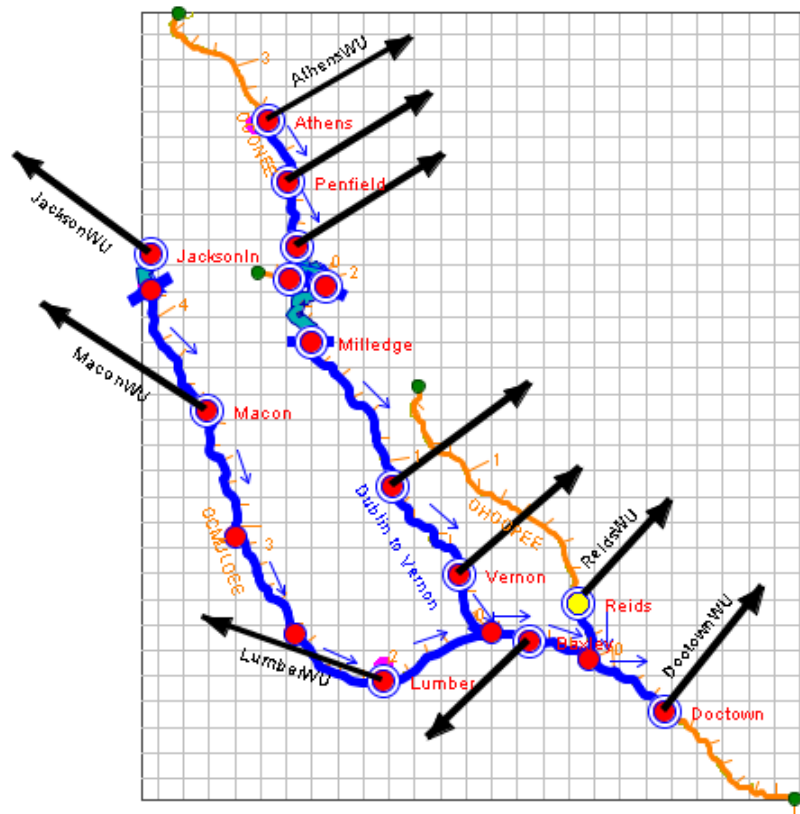
- **Basin Environmental Assessment Model (BEAM)**
  - **Model configuration**
  - **Features**
  - **Unimpaired Flow (UIF) development**
- Performance measure (performance metrics) and a hypothetical scenario
- How this affects planning and permitting



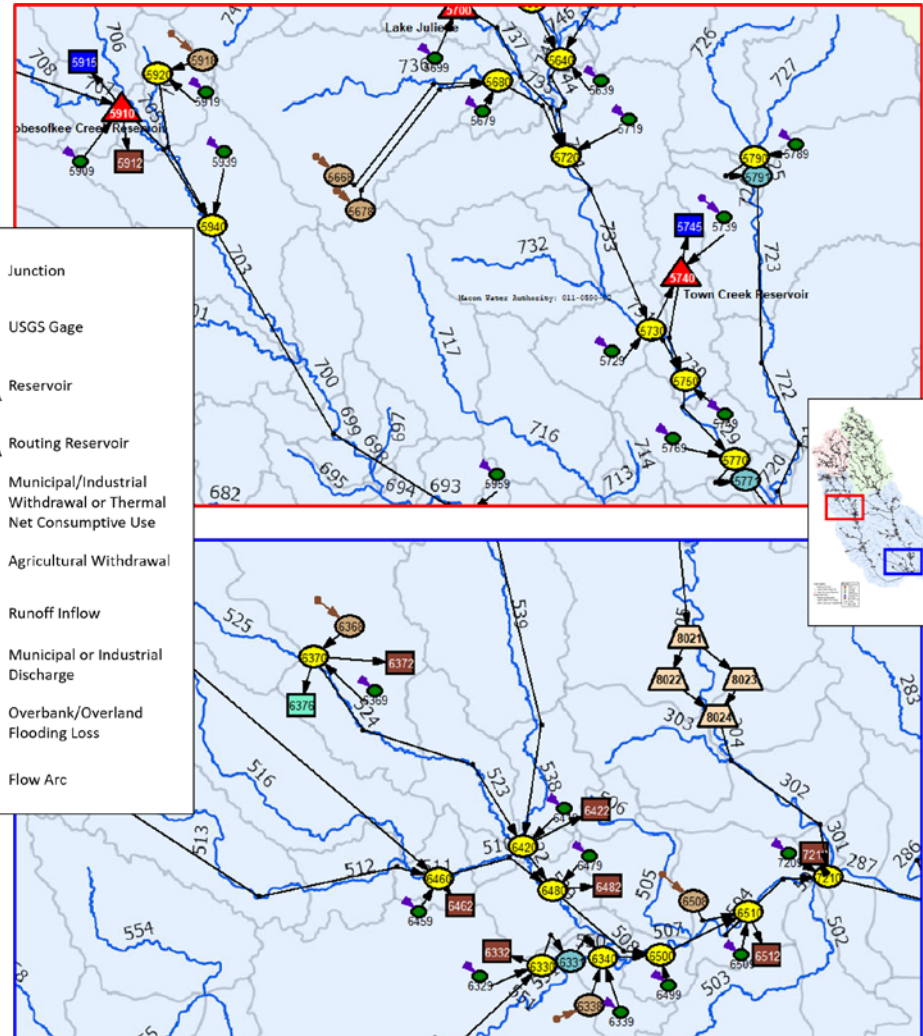
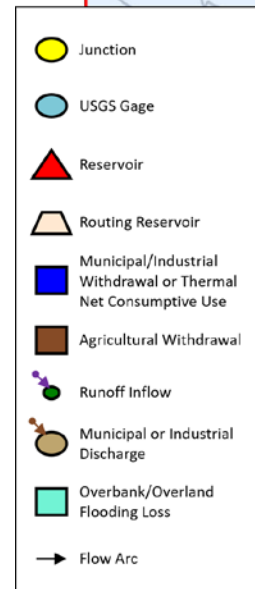
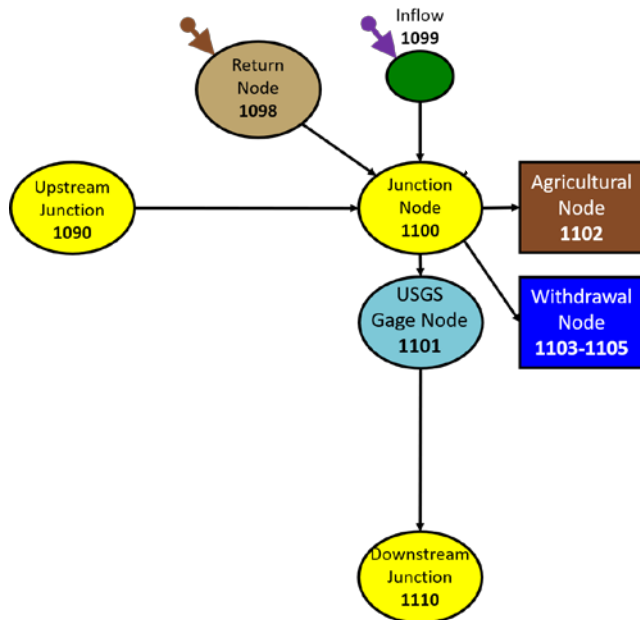
# ResSim (Prior Model) and BEAM Schematics



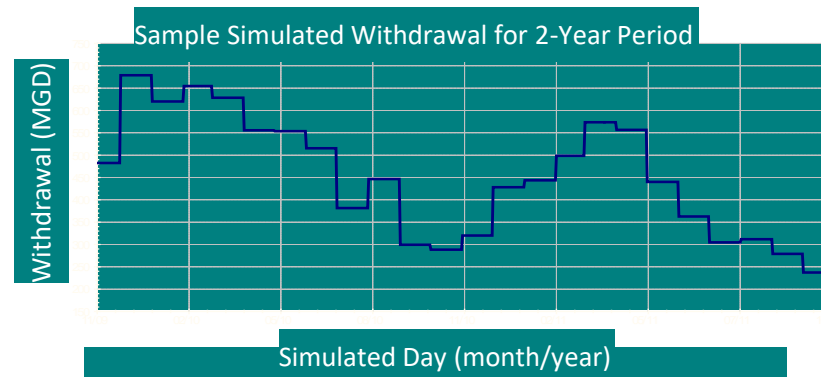
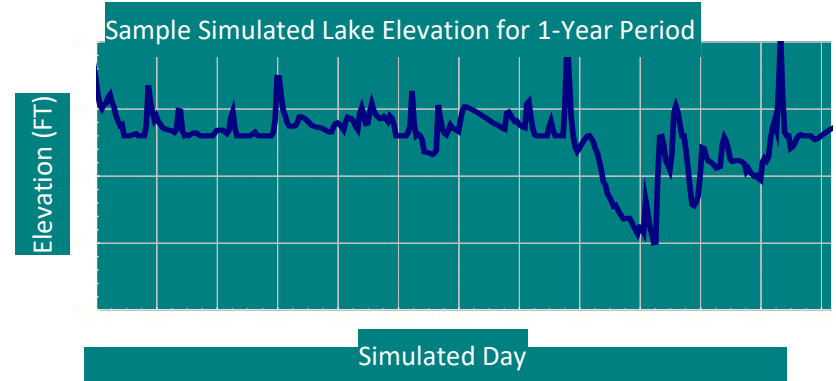
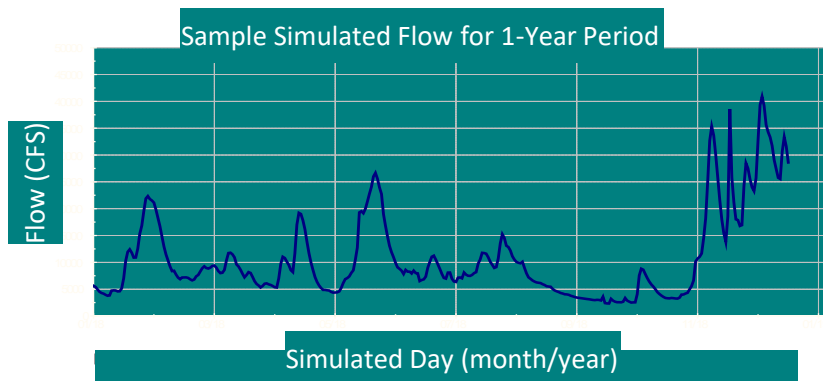
# ResSim (Prior Model) and BEAM (Zoomed In) Schematics



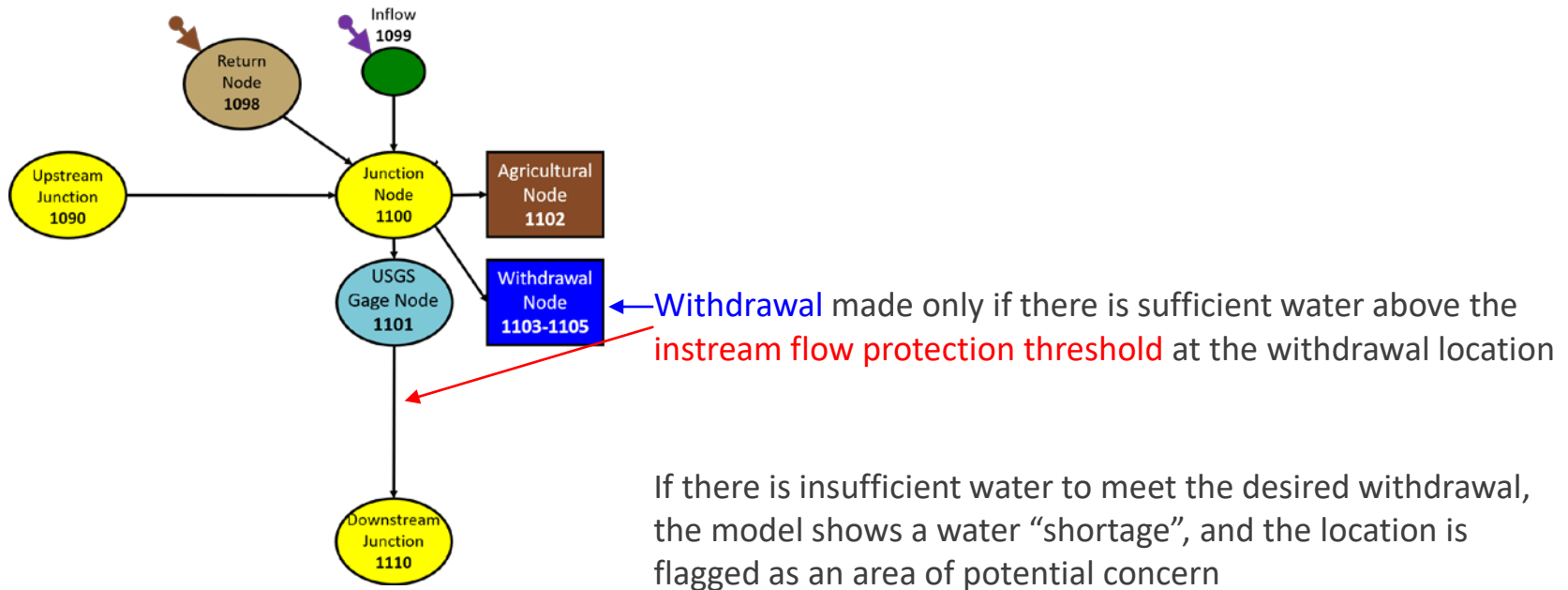
# BEAM Node Types



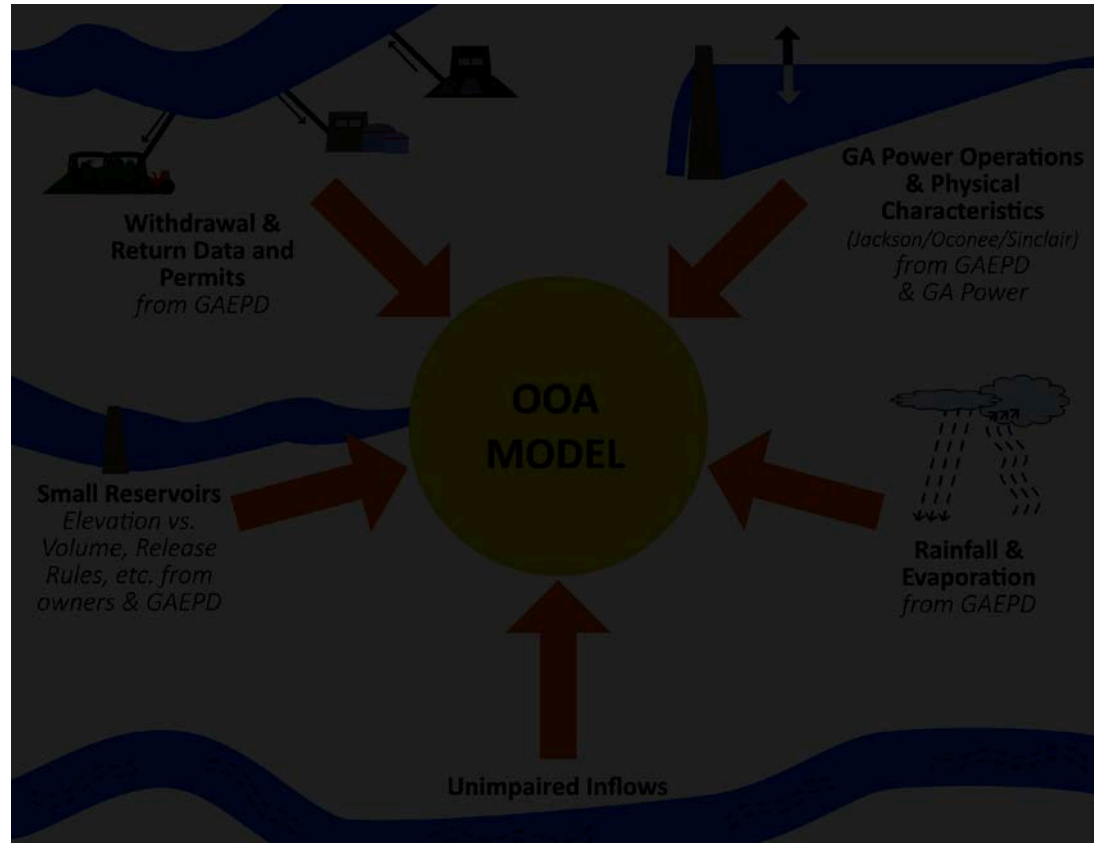
# Sample Model Output



## Instream Flow Protection Thresholds are Met *Before* Withdrawals are Made



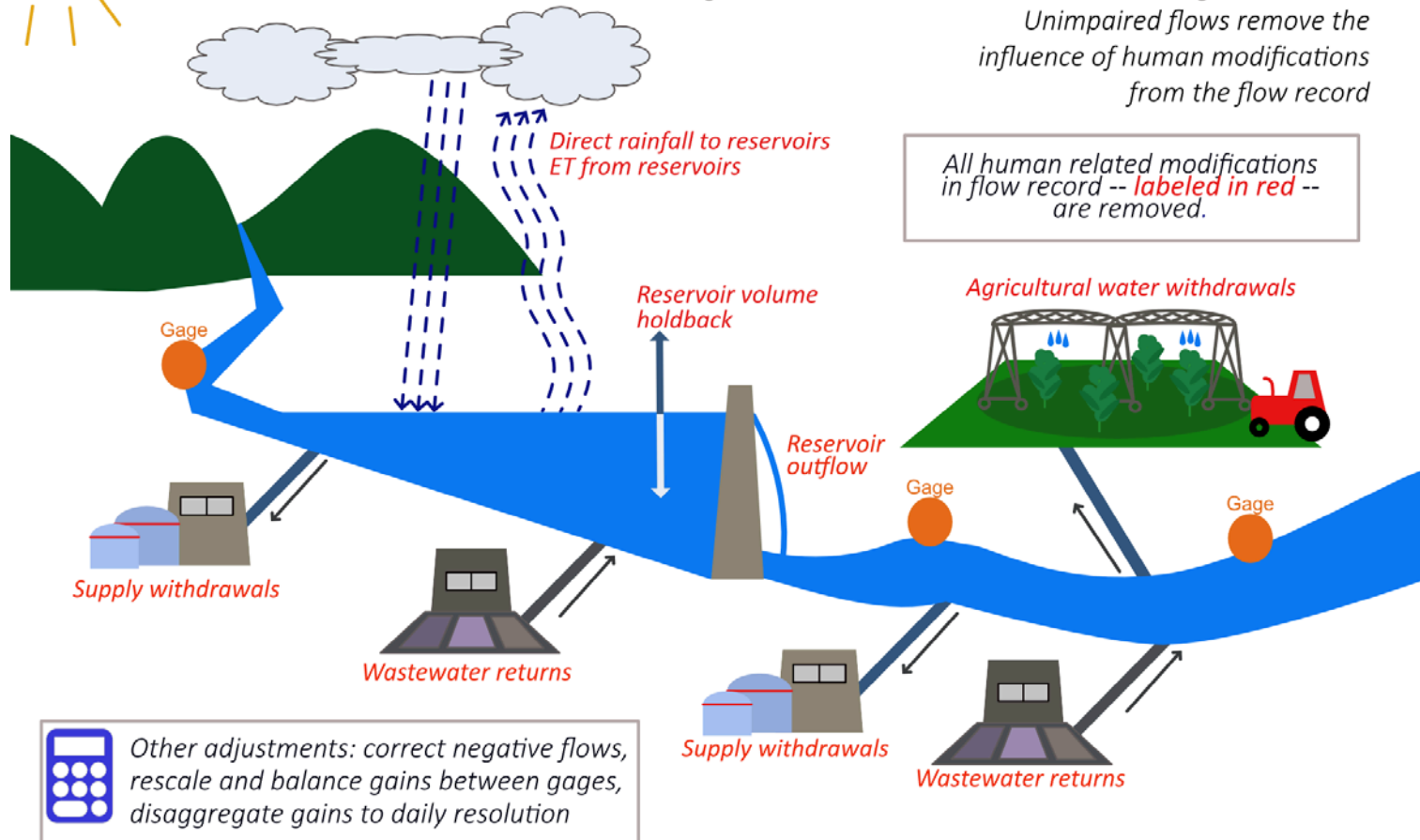
## Input Data Sources





# Unimpaired Flows Development

Unimpaired flows remove the influence of human modifications from the flow record





# Outline

- Basin Environmental Assessment Model (BEAM)
  - Model configuration
  - Features
  - Unimpaired Flow (UIF) development
- **Performance measure (performance metrics) and a hypothetical scenario**
- How this affects planning and permitting

# Performance Metrics for Today's Demonstration

- **Water Supply**

- Number of days per year that flow falls below the regulatory flow requirement at a wastewater discharge location
- Daily volume of desired withdrawal that cannot be taken from the river because of low flows
- Daily reservoir elevation (reservoir drawdown)
- Percent of months with minimum elevation below a threshold

- **Ecological**

- Average monthly area of available habitat suitable for specific species of fish
- Percent of years with sufficient floodplain inundation during spawning season

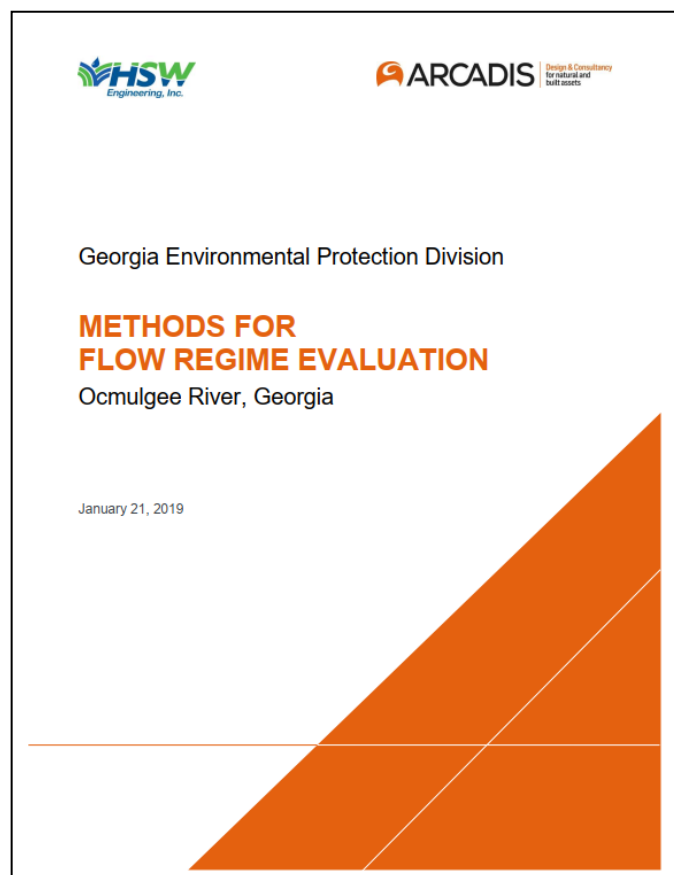
- **Recreation**

- Number of days per year with sufficient river water level for boating
- Percent of days with elevation below a recreational threshold

- **Hydropower**

- Average annual peak generation (energy generated during “peak” hours)

# Pilot Study on Ocmulgee River Identified Potential Metrics

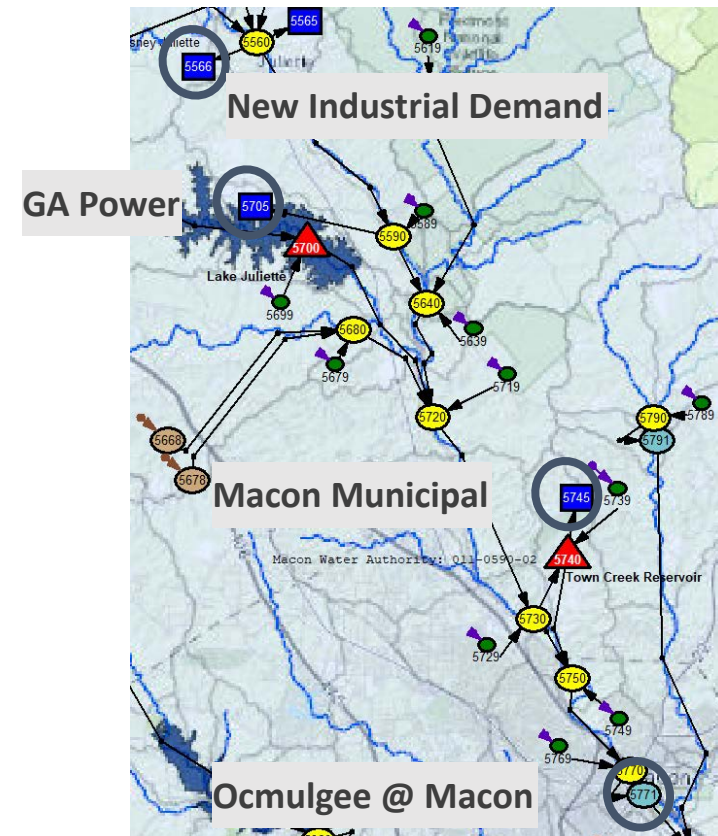


River service	Service metric
Recreation (Paddling)	Paddling during low water conditions (Stage < 6 feet)
Recreation (Boating)	Paddling during low water conditions (Stage < 7.5 feet)
Instream aquatic habitat	AWS index (Shallow Fast, Shallow Slow, Deep Fast)
	Macon site habitat area (Bhattacharjee, 2017)
Instream bottom and channel-side habitat	Frequency of exceeding wetted perimeter threshold Wetted perimeter (feet)
Floodplain wetland habitat	Wetland inundation area (square miles)
	Frequency of exceeding floodplain inundation threshold

# Ocmulgee Scenario: New Industrial Demand

For Informational Purposes Only

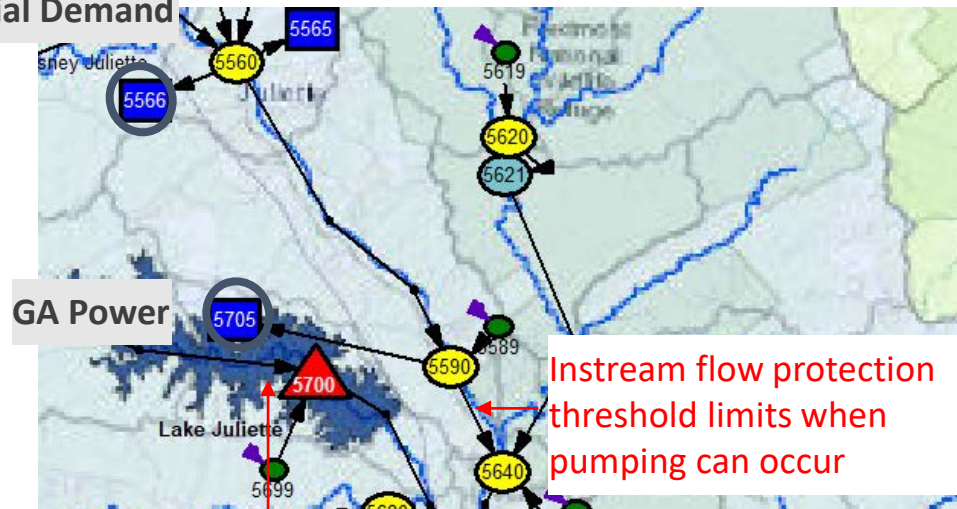
- What would happen if a large (50 mgd) new industrial demand was added at Juliette, GA?
- Performance Metrics for downstream impacts
  - Impacts to downstream withdrawals
    - Volume of desired pumping that cannot be pumped from the river because of low flows
    - Daily reservoir levels at Town Creek Reservoir
  - Ocmulgee River at Macon PMs
    - Number of days per year with sufficient river level for boating
    - Instream Aquatic Habitat
    - Boating/Paddling



# Pumping to Lake Juliette May Be Impacted By New Demand

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New Industrial Demand



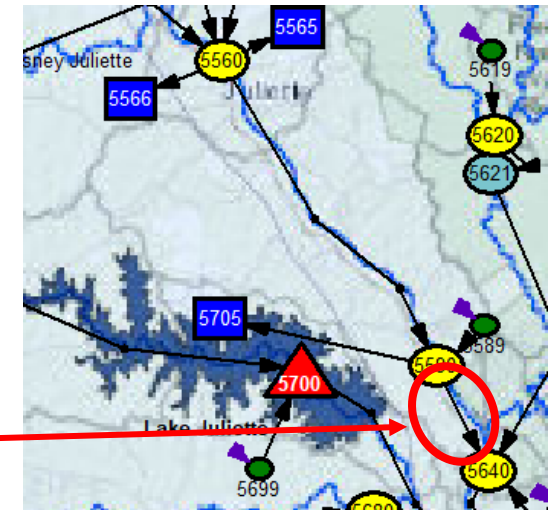
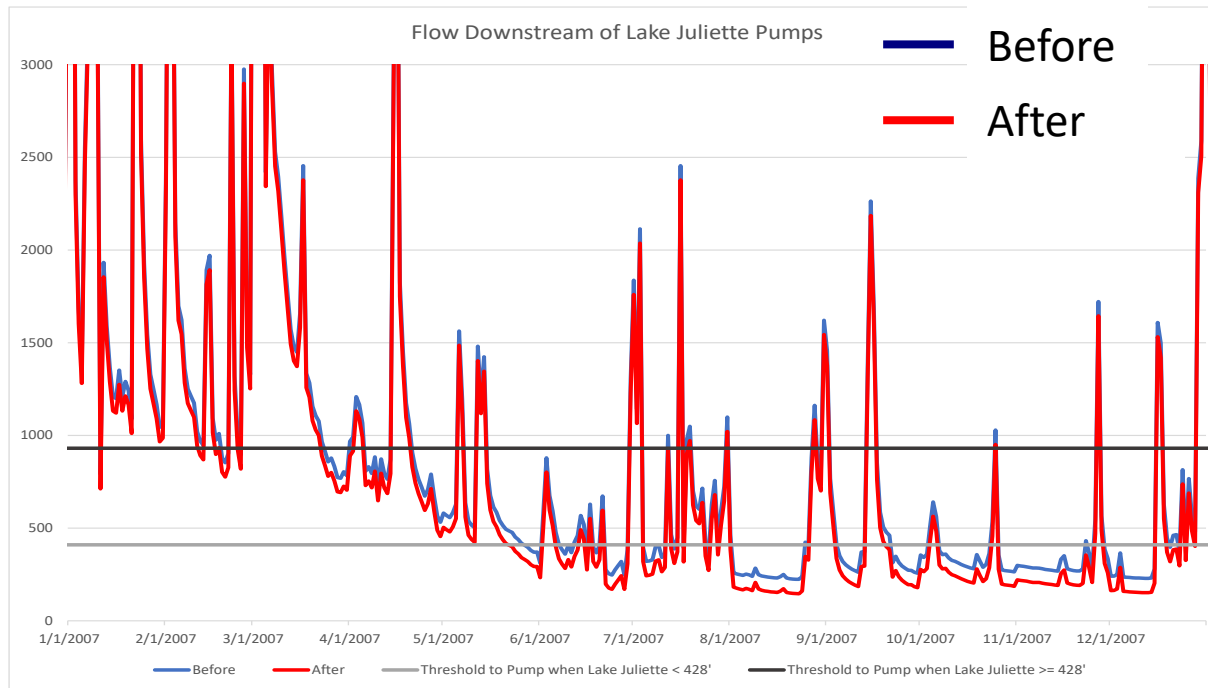
When the elevation at Lake Juliette falls below 428', the instream flow protection threshold is reduced (from 931 cfs to 410 cfs)

# Outline

- Basin Environmental Assessment Model (BEAM)
  - Model configuration
  - Features
  - Unimpaired Flow (UIF) development
- Performance measure (performance metrics) and a hypothetical scenario
- **How this affects planning and permitting**

# Ocmulgee River Flow Downstream of Pumps to Lake Juliette

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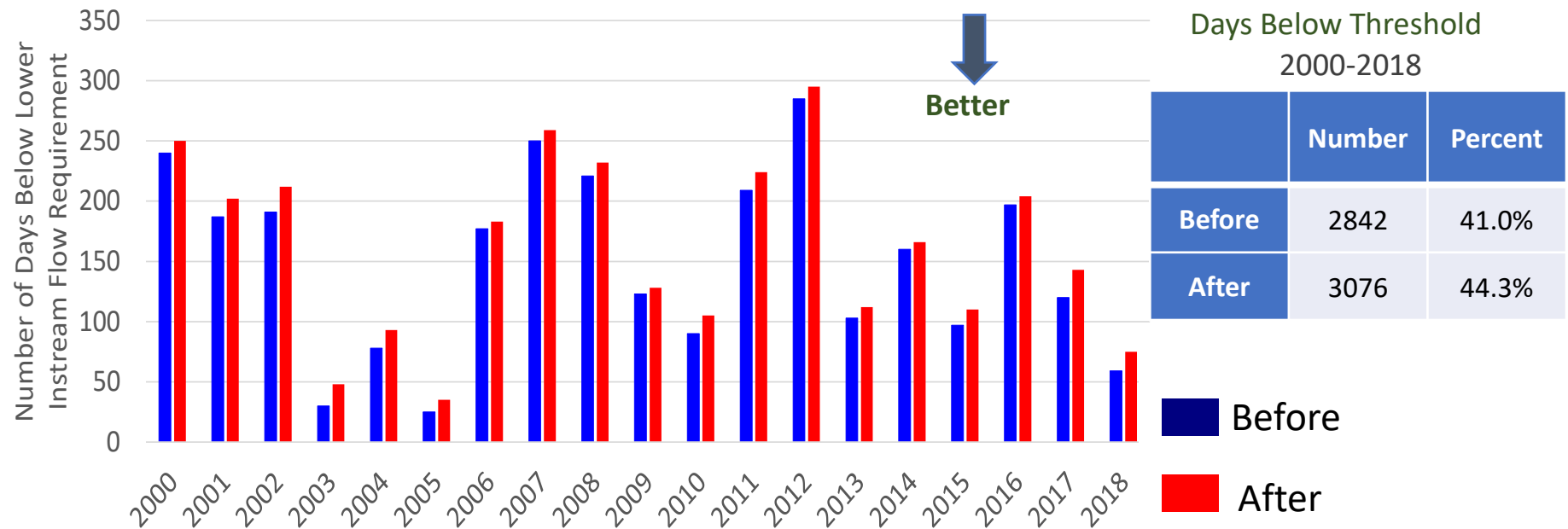
Streamflow threshold to pump when Lake Juliette  $\geq 428'$

Streamflow threshold to pump when Lake Juliette < 428'



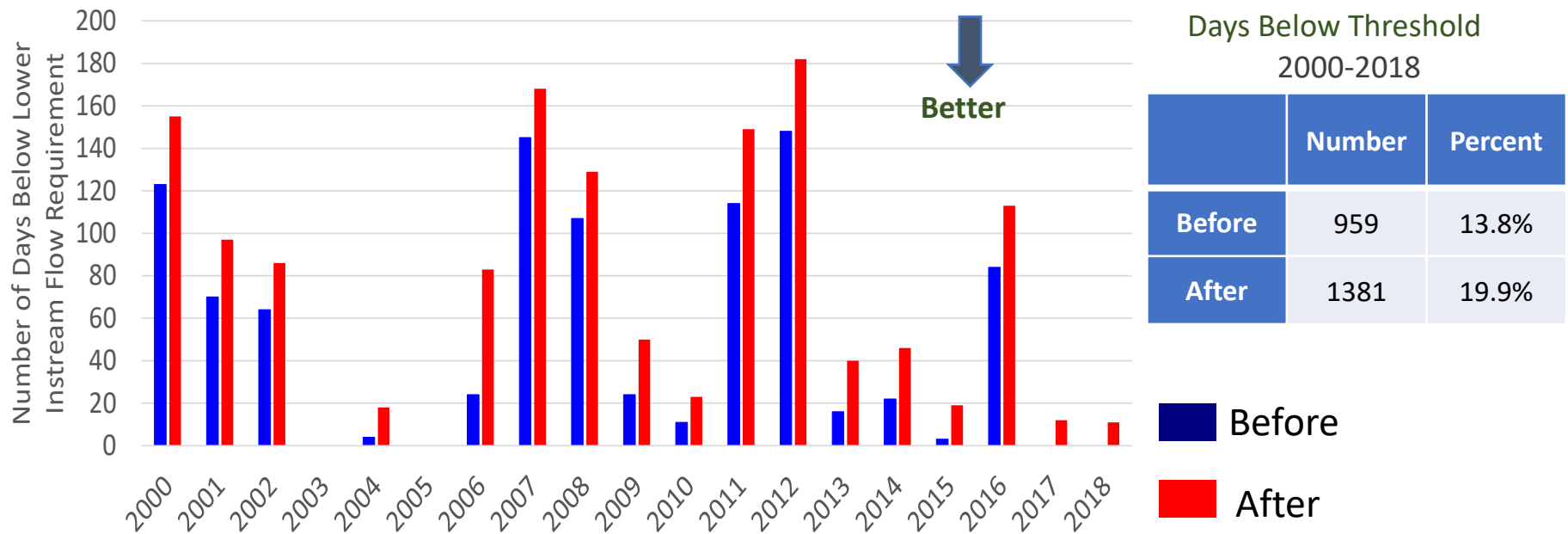
# Number of Days Each Year Ocmulgee River Flow Downstream of Pumps is Less than 931 CFS

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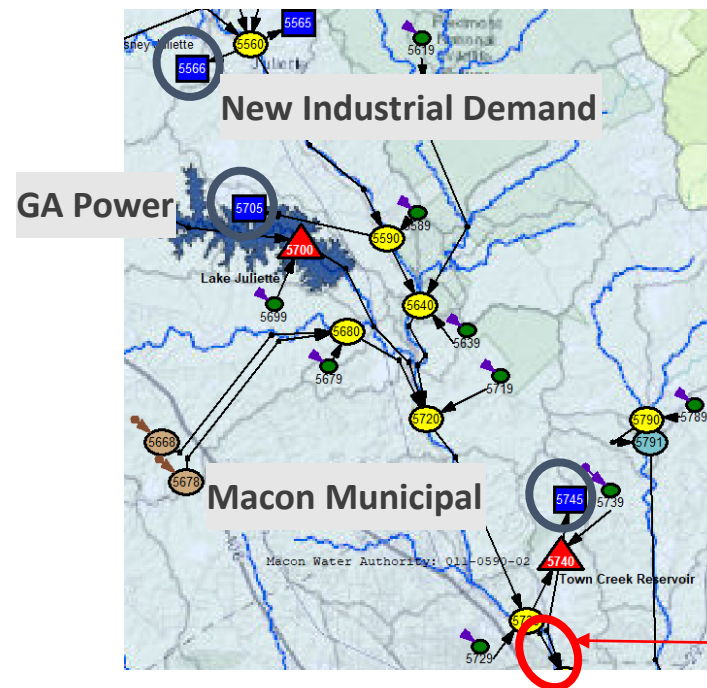
# Number of Days Each Year Ocmulgee River Flow Downstream of Pumps is Less than 410 CFS

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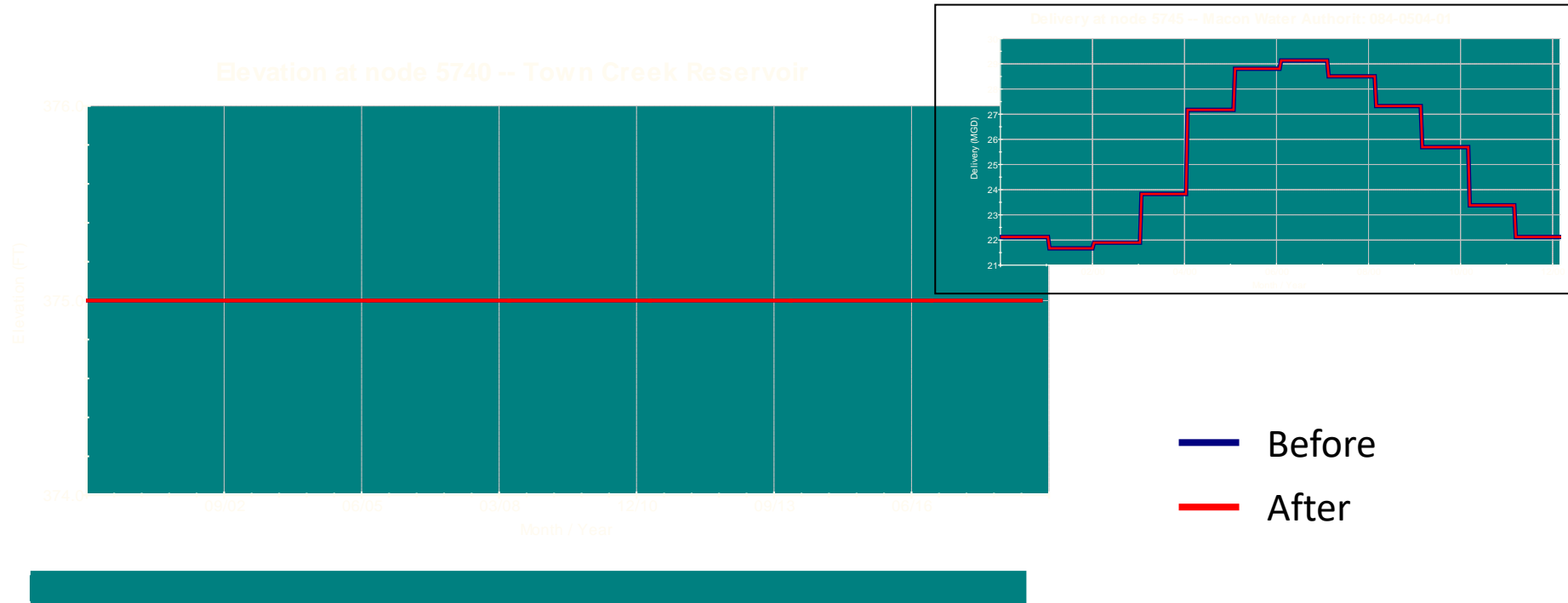
## Pumping to Town Creek Reservoir May Be Impacted By New Demand



Instream flow protection permit allows up to 35 MGD to be pumped any day (regardless of flows)

# Ocmulgee Scenario: No Impacts to Town Creek Reservoir

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- Pumping to reservoir is exempt from instream flow protection threshold if pumping is below 35 mgd

# Using Flow to Create Boating/Paddling Performance Metric

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- Convert stream flow to stage

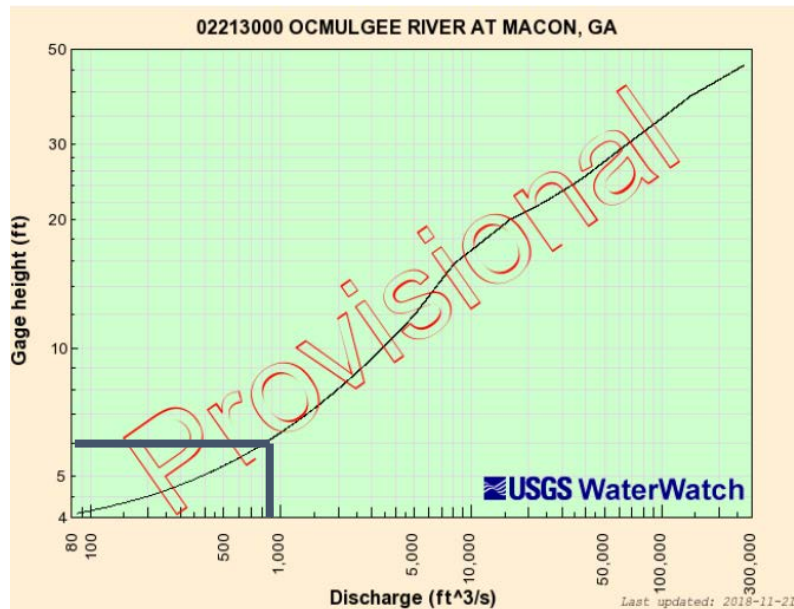
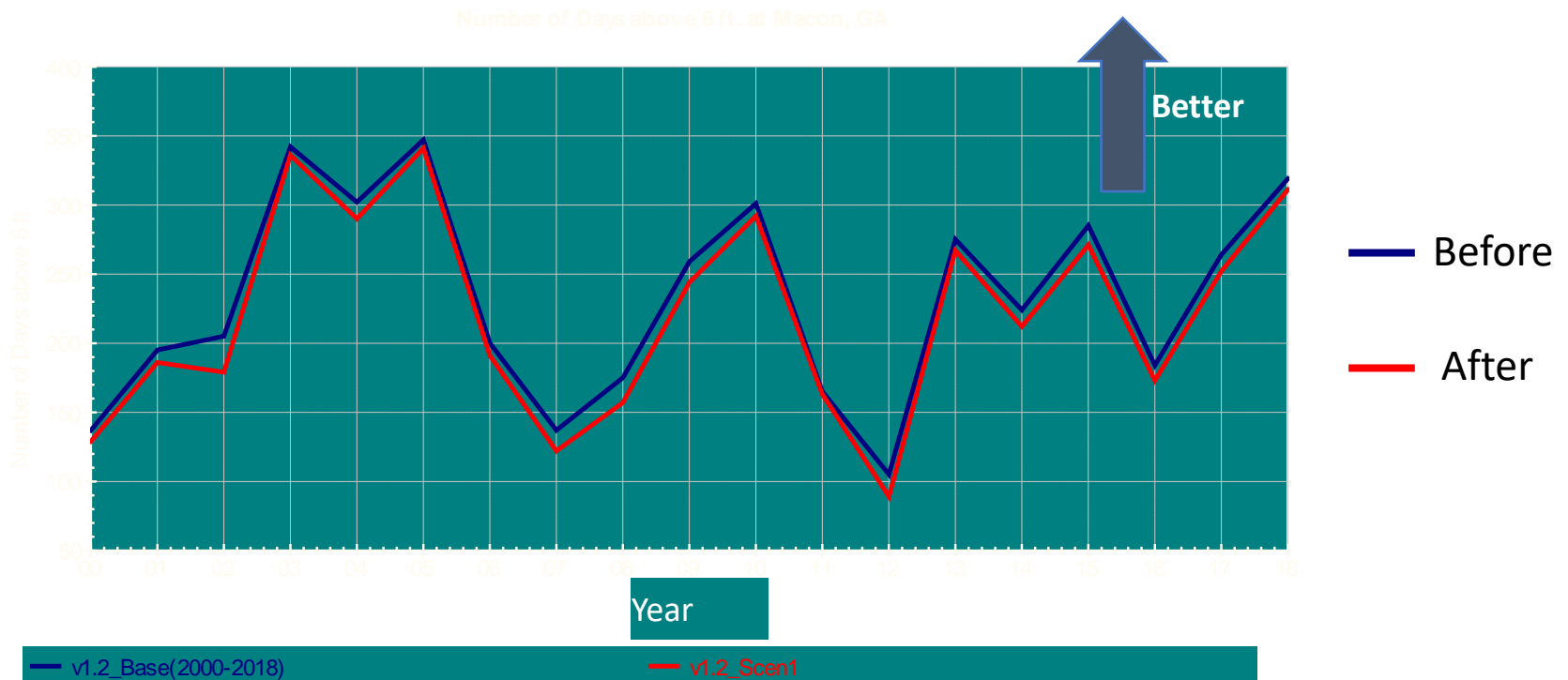


Table 11. Low-flow metrics for Ocmulgee River recreational boating

River Service	Metric	Source
Kayaking/canoeing	Amount of time that kayaking or canoeing is not ideal (i.e., gage height $\leq 6.0$ feet) due to low water conditions	Personal communication with Kathleen O' Neal (Ocmulgee Outdoor Expeditions)
Boating	Amount of time that boating is not ideal (i.e., gage height $\leq 7.5$ feet) due to low water conditions	Viable stage for kayaking/canoeing + 1.5 feet (average shaft length of short- and long-shaft small engines); (Iboats, 2009)

# Performance Metric at Macon, GA for Boating

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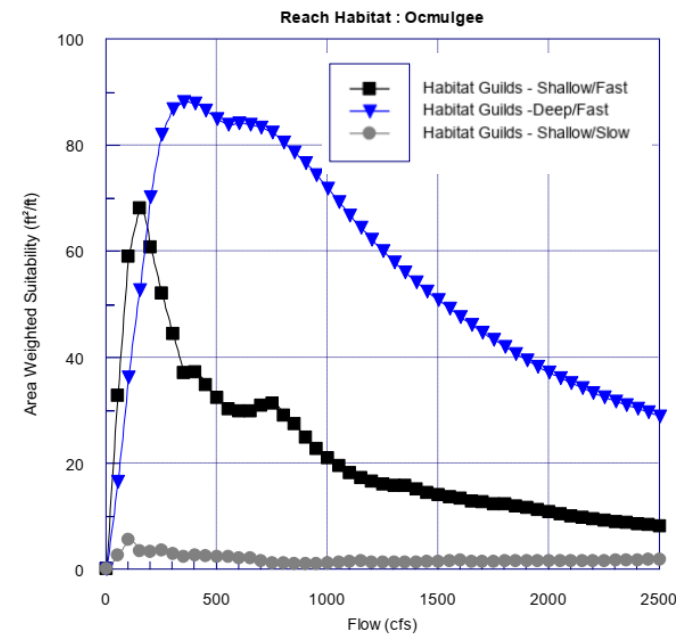


## Reach Habitat

- Shallow/Fast
  - Species: Spottail Shiner and Bluehead Chub



- Deep/Fast
  - Species: Largemouth Bass



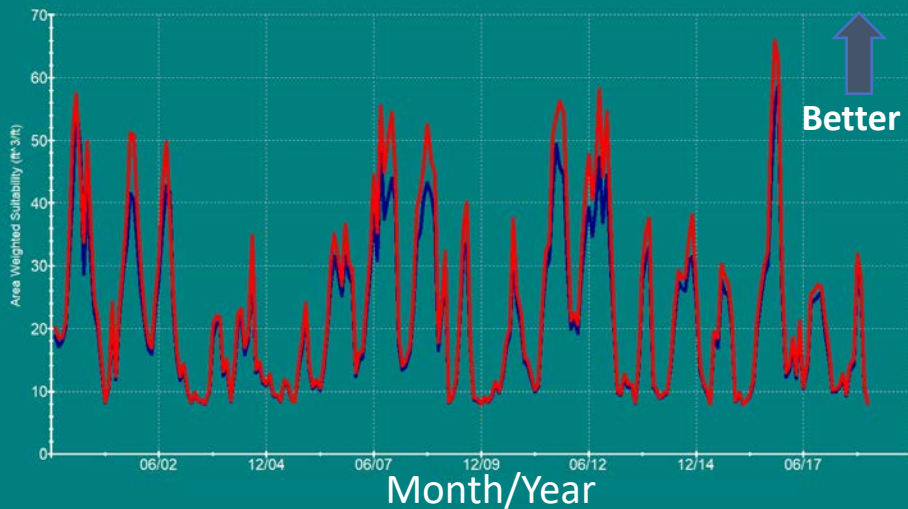


# Ocmulgee Scenario: Performance Metrics at Macon, GA

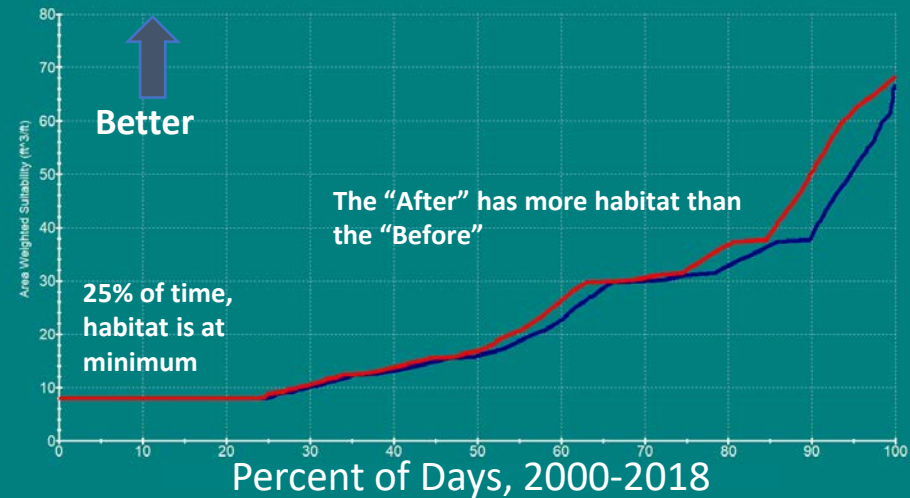
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Shallow/Fast Habitat Guild Area Weighted Suitability - Monthly Average



Shallow/Fast Habitat Guild Area Weighted Suitability - Probability at Macon, GA



— Before

— After

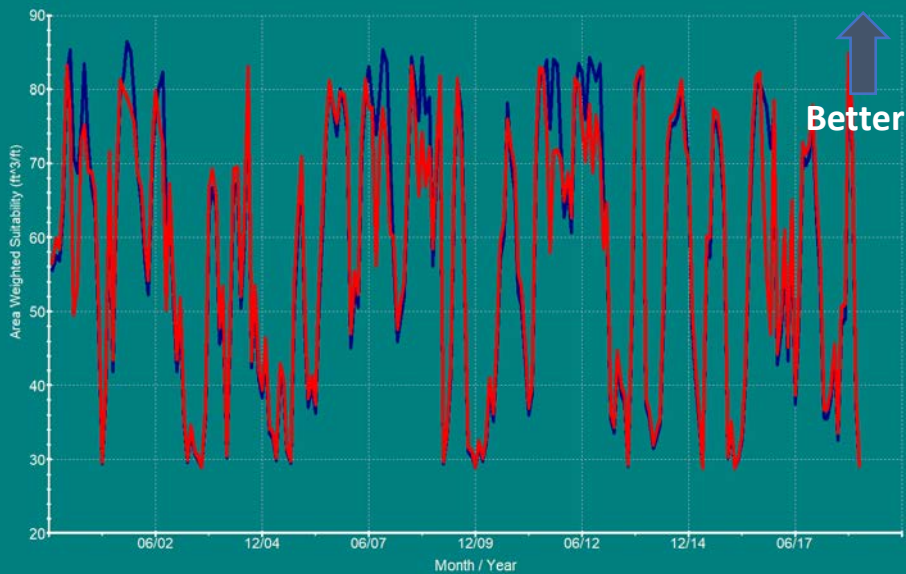
[https://en.wikipedia.org/wiki/Spottail\\_shiner#/media/File:Notropis\\_hudsonius.jpg](https://en.wikipedia.org/wiki/Spottail_shiner#/media/File:Notropis_hudsonius.jpg)  
[https://www.inaturalist.org/guide\\_taxa/490641](https://www.inaturalist.org/guide_taxa/490641)

# Ocmulgee Scenario: Performance Metrics at Macon, GA

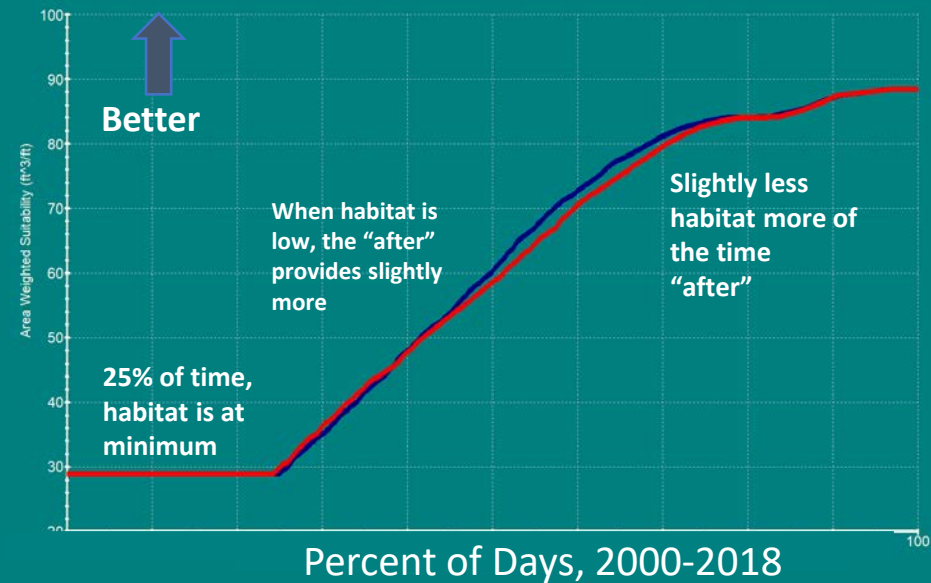
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Deep/Fast Habitat Guild Area Weighted Suitability - Monthly Average



Deep/Fast Habitat Guild Area Weighted Suitability - Probability at Macon, GA



— Before

— After

[https://www.fws.gov/fisheries/freshwater-fish-of-america/largemouth\\_bass.html](https://www.fws.gov/fisheries/freshwater-fish-of-america/largemouth_bass.html)

# Questions?

Georgia Environmental Protection Division

Watershed Protection Branch

Water Supply Program

[Wei.Zeng@dnr.ga.gov](mailto:Wei.Zeng@dnr.ga.gov)

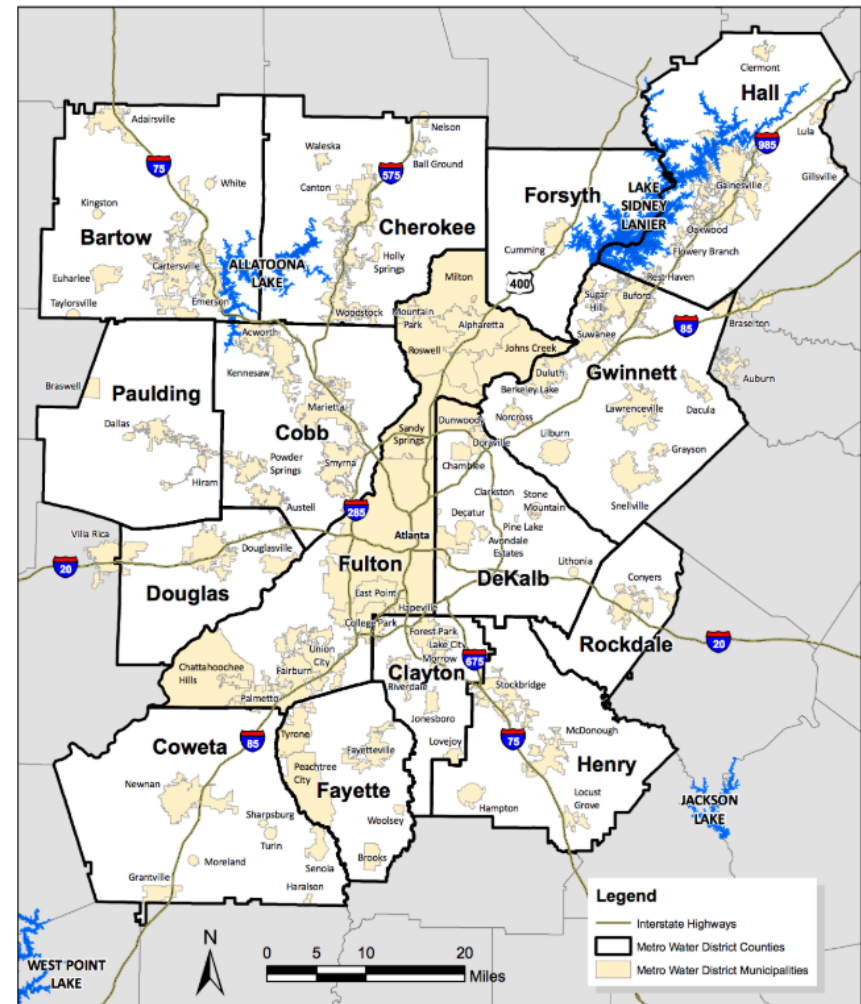
404-463-2883

Acknowledging Hazen and Sawyer team for developing BEAM model  
and for developing material for this presentation

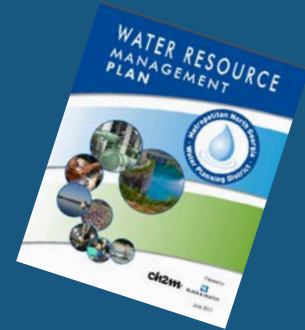
# Middle Ocmulgee Region Council Meeting

# Metro District Update

- **Plan and Schedule Updates**
  - Danny Johnson, ARC



# 2022 Plan Update Schedule



	Sep-20	Dec-20	Mar-21	Jun-21	Sep-21	Dec-21	Mar-22	Jun-22	Sep-22	Dec-22
Data Collection/Resource Forecasting		◆	◆							
Action Items Review and Update		◆	◆	◆	◆	◆	◆			
Appendix A - River Basin Profiles			◆	◆	◆	◆				
Appendix B - Facility Planning				◆	◆	◆				
Stormwater Forecasting			◆	◆	◆	◆				
Supporting Efforts										
Localized Demands										
Drought Response Options Menu		◆	◆	◆	◆	◆				
Watershed Resilience										
Full Draft Plan for Review								◆	◆	
Public Comment									◆	◆
EPD/Board Approval										◆

# Moving Forward on Conservation Action Items

Improve our region's drought resilience and maintain our national leadership on water conservation by:

- Reducing long-term per capita demands by requiring use of proven water efficiency technology (Nov 2020 TCC)
- Preparing a menu of optional programs utilities can use to implement EPD's drought rule (Feb 2021 TCC)
- Promoting the voluntary, early adoption of new water efficiency technologies (Feb 2021 TCC)



# Concepts for Potential Action Item Updates - Efficient Technologies and Water Waste

Codes for New / Renovated Buildings to require More Efficient Technologies

- Plumbing Fixtures
- Landscape Irrigation System Design
- Water-Efficient Appliances
- HVAC Cooling Towers

Adjust Premise Plumbing Sizing Requirements to Account for Efficiency

Update Water Waste Model Ordinance





# Concepts for Potential Action Item Updates- Beyond Mandatory Codes

Rebate Programs to promote leading efficient technologies

- Smart Irrigation Controller rebate program
- Smart Leak Detector rebate program

Promoting whole home water efficiency

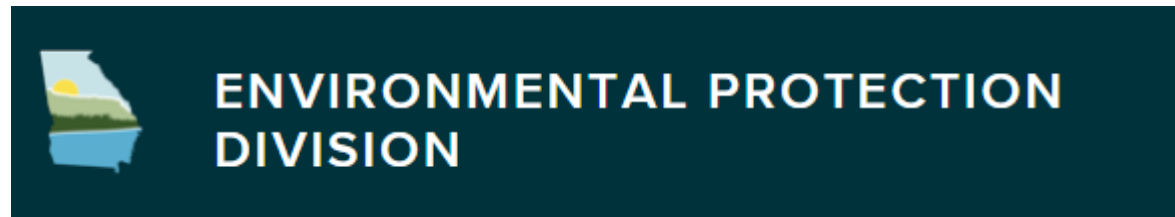
- HERS H2O Whole House Water Efficiency Rating



# Middle Ocmulgee Region Council Meeting

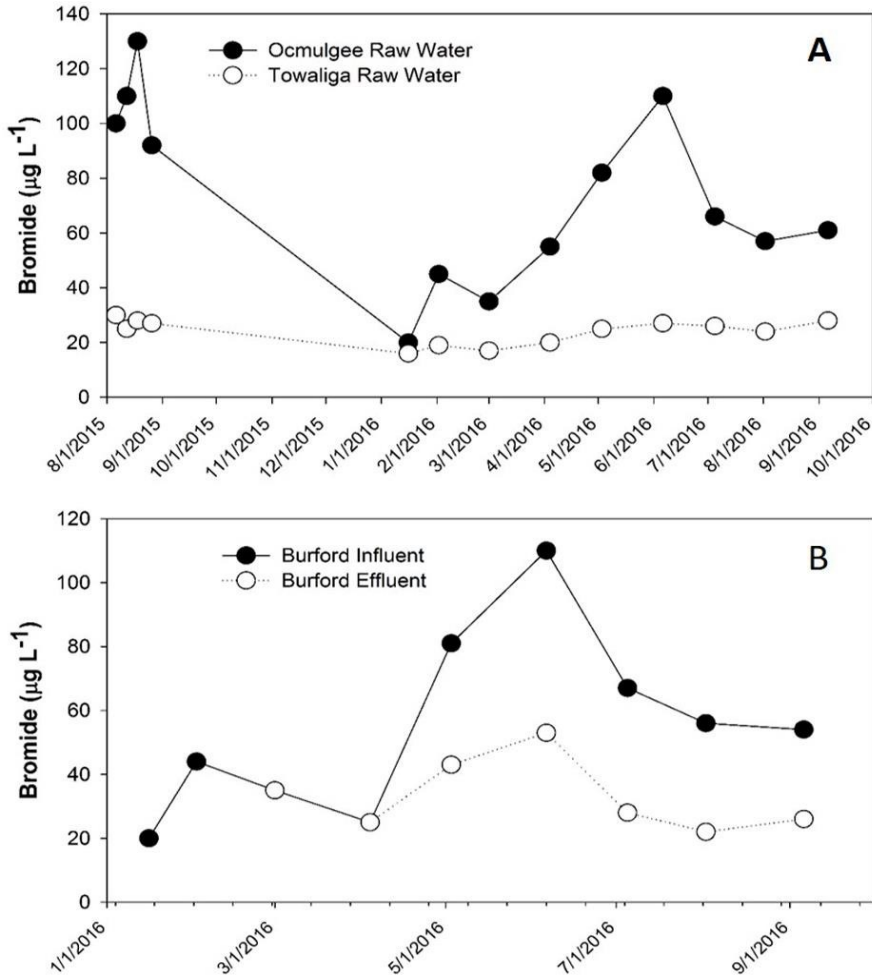
- **Seed Grant Updates**

- Microplastic seed grant – Dr. Krista Capps, UGA
- Seed Grant/ Section 319(h) Grants – Veronica Craw, EPD



**Investigating increasing bromide concentrations in the Butts County drinking water supply to support activities outlined in the Middle Ocmulgee Regional Water Plan.**

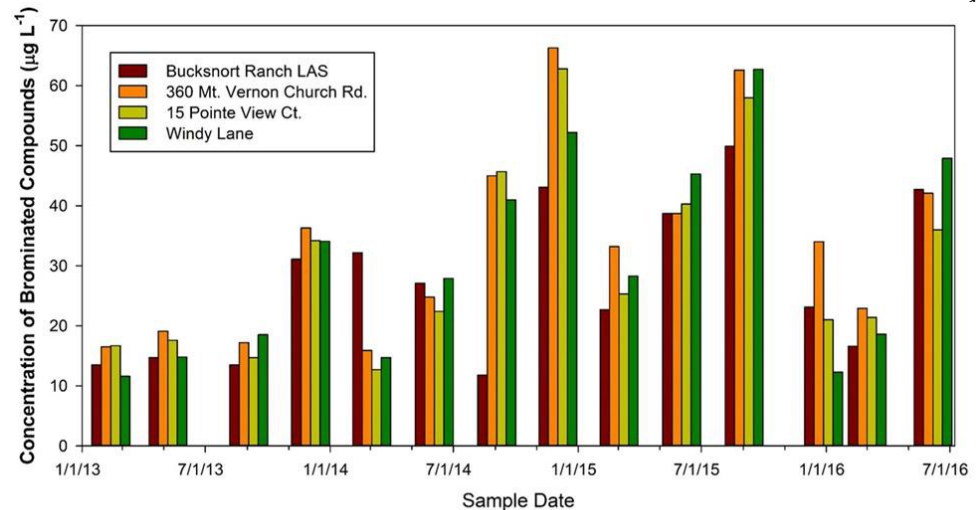
Summary Report



**Figure 2: (A) Bromide concentrations in raw water from the Ocmulgee and the Towaliga; (B) Bromide concentrations in the influent and effluent in Burford**

## Background and Past Findings

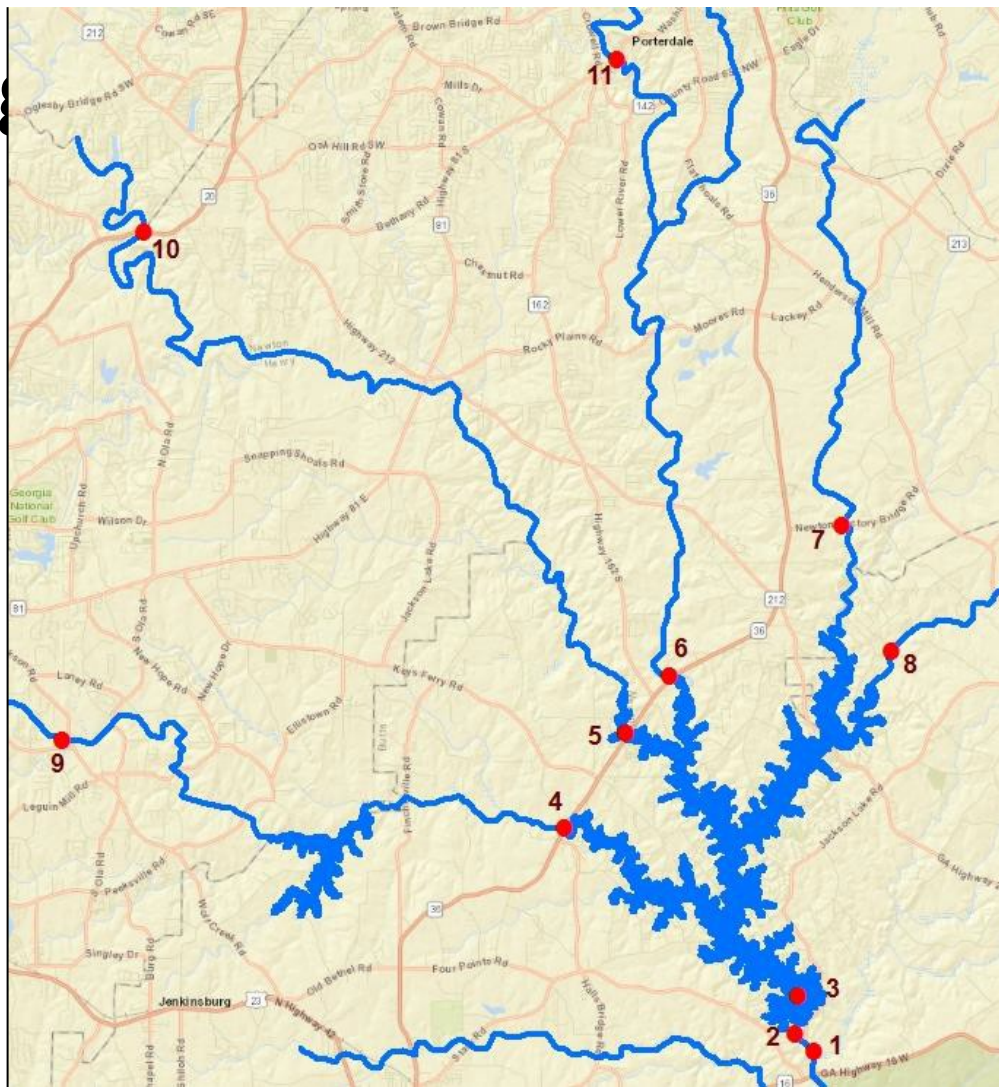
- Staff at the Butts County Water and Sewer Authority first documented brominated compounds in treated water in December 2013.
- Raw water in Ocmulgee River tested positive for bromide from August 2015 to September 2016 (Figure 3).
- Bromide in Ocmulgee have been shown to be higher than those in the nearby Towaliga River (Figure 2).



**Figure 3: Concentration of brominated compounds collected at four sites through time.**

# Sampling

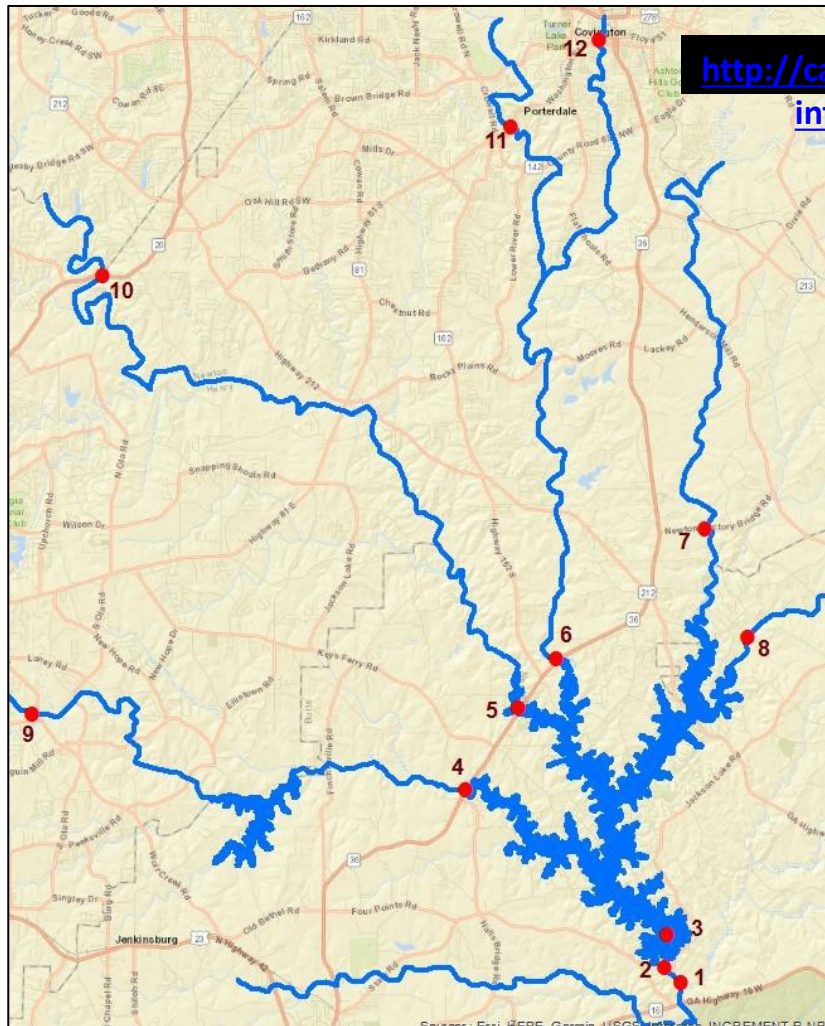
Site #	Site Description
1	Ocmulgee River – Butts County Intake
2	Ocmulgee River – Immediately Below Dam
3	Jackson Lake – Center Pool
4	Jackson Lake – Tussahaw Creek Influent
5	Jackson Lake – South River Influent
6	Jackson Lake – Yellow River Influent
7	Jackson Lake – Alcovy River Influent
8	Jackson Lake – Rocky Creek Influent
9	Tussahaw Creek – Old Jackson Road
10	South River – GA Hwy 20
11	Yellow River – GA Hwy 81
12	Alcovy River – GA Hwy 278



## Project Goals:

- Enhance local and regional water quality monitoring programs through an intensive pilot program monitoring of bromide concentrations in 12 sites in the Middle Ocmulgee River Watershed (Management Practice WQ2: Adopt and Coordinate Statewide, Regional, and Local Water Quality Monitoring Programs)
- Inform the update of the local water master plan for Butts County by generating technical products for the water council (Management Practice WS1)
- Examine how upstream wastewater treatment practices may alter bromide concentrations in receiving waters (Goal: Promote properly managed wastewater discharges and beneficial reuse)
- Support progress on a Recommendation to the State (in Section 7.4 of the RWP) regarding the collection of “Additional Data (Water Quality)”
- Investigate the impacts of metro area discharge on bromide concentrations in the Middle Ocmulgee River (Management Practice WS2: Investigate Impacts of Metro Area Discharges)





<http://cappslab.ecology.uga.edu/additional-info/bromide-in-surface-water/>

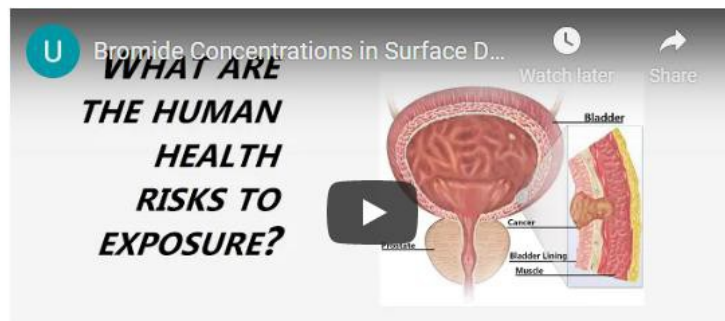
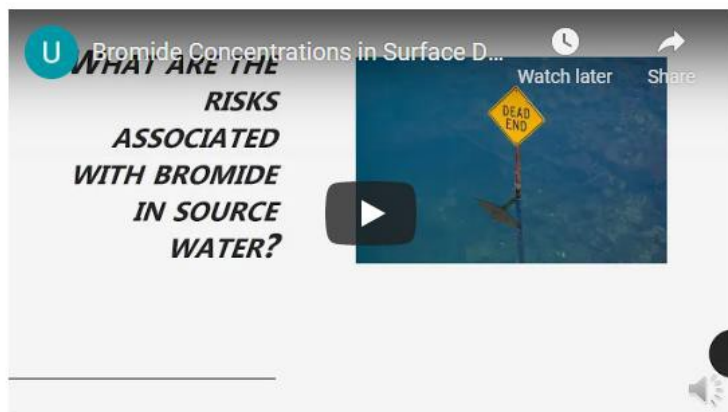
## BROMIDE CONCENTRATIONS IN SURFACE DRINKING WATER SOURCES

This information was prepared by faculty and students from the University of Georgia as part of a research program funded by the SFY2017 Regional Water Plan Seed Grant, "Bromide Concentrations in Surface Drinking Water Sources for Butts County" funded through the Georgia Environmental Protection Division.

## PowerPoint Files

<http://cappslab.ecology.uga.edu/additional-info/bromide-in-surface-water/>

- Summary
- Natural Sources and Chemical Interactions
- Anthropogenic Sources of Bromide
- Disinfection Byproducts
- Managing Bromide and Brominated Compounds
- Regulations Governing Brominated Compounds





<http://cappslab.ecology.uga.edu/resources-to-support-microplastics-research/>

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## Resources to Support Microplastics Research

EDIT

### Microplastics in the Environment

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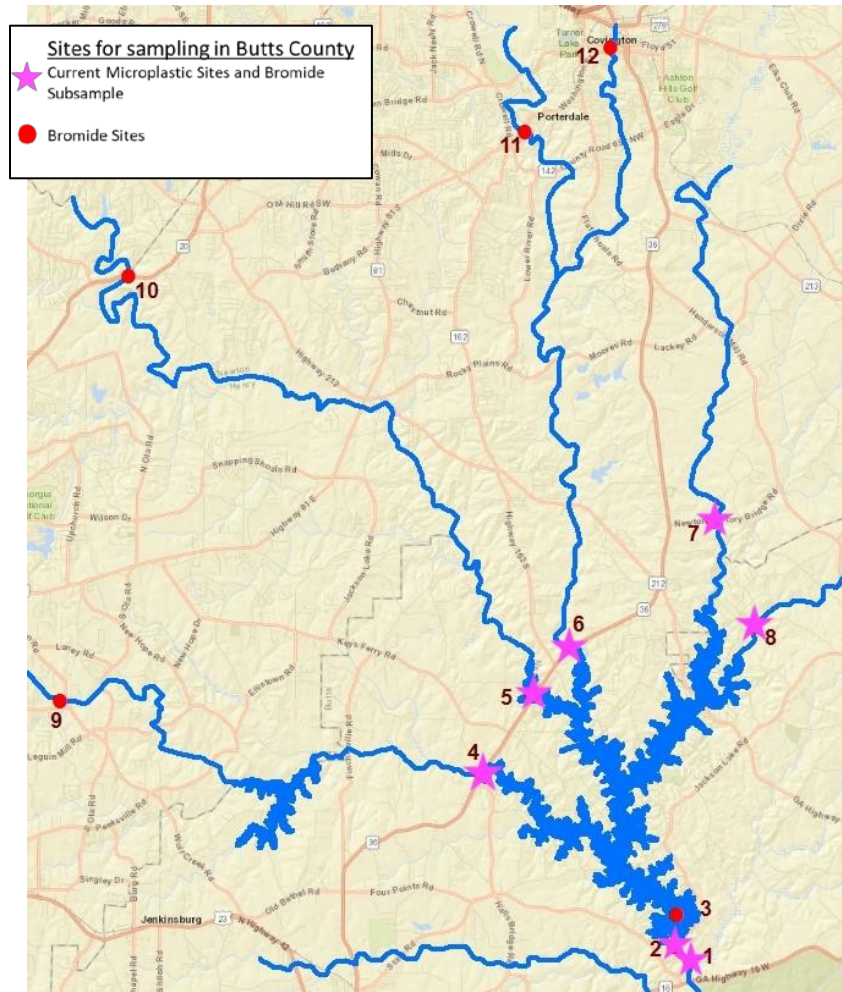
Big questions, local data

Christine Fallon participates in the Directorate Fellowship Program through the U.S Fish and Wildlife Service

Biology at Tonto National Monument

Reflecting on an Internship with UGA Marine Extension

Visit to The Jones Center at Ichauway



## Research

One of the great challenges in microplastics research is a lack of accepted, standardized methods. These two resources represent recent efforts to address this challenge:

- Reporting Guidelines to Increase the Reproducibility and Comparability of Research on Microplastics
- Critical Assessment of Analytical Methods for the Harmonized and Cost-Efficient Analysis of Microplastics

## Current State of Microplastics Research and Considerations about Quality Control

If you are interested in learning more about an amazing project to assess microplastic pollution in a river system in the southeastern US, an overview of microplastics research, sampling and study design concerns, and considerations about quality control, please consider viewing this [video](#). The content was created as part of a Microplastics Workshop that was organized by the Tennessee Aquarium, the River Basin Center at UGA, and the Capps Lab. Learn more about the workshop [here](#). Brief biographies for the plenary speakers (Drs. Andreas Fath, Jeremy Conkle, and Rae McNeish) can be found [here](#).



<http://capps-lab.ecology.uga.edu/resources-to-support-microplastics-research/>



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Studying freshwater ecosystems in a changing world



<http://cappslab.ecology.uga.edu/>

# Seed Grant/Section 319(h) Grant Updates

Veronica Craw, Georgia EPD



# Grant Updates

- Timelines
  - 319(h) application deadline April 30, 2021
  - Seed Grant announcement July 2021
    - No anticipated changes
- Process Changes!
  - Zengine™ by WizeHive

Veronica Craw  
Georgia Environmental Protection Division

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[veronica.craw@dnr.ga.gov](mailto:veronica.craw@dnr.ga.gov)



# Middle Ocmulgee Region Council Meeting

## Five Minute Break



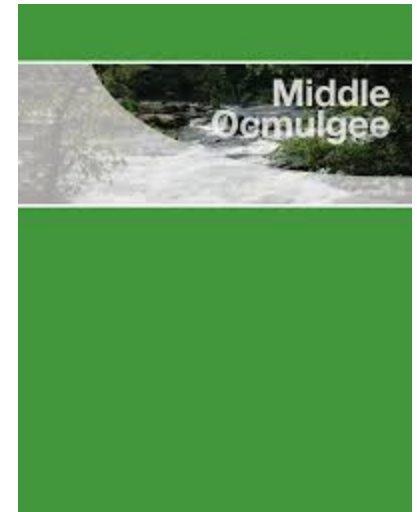
*Paddle Georgia –  
Ocmulgee River*



# Middle Ocmulgee Region Council Meeting

## Forecasting Updates

- **Municipal Forecasting Results**
  - Brian Skeens, Jacobs
- **Industrial and Energy Forecasting**
  - Ashley Reid, CDM
- **Agricultural Forecast Updates**
  - Mark Masters, GWPCC





# Middle Ocmulgee Region Council Meeting

- **Wrap Up and Next Steps**
  - Next Council meeting?
    - General date range
    - Any topics or ideas you would like to see on agenda?
    - Contact Michelle or Laura with input or ideas



# Georgia's State Water Plan

## Public Comment Period

- Please limit comments to 3 minutes total
- Council encourages written submission of comments as well

[www.georgiawaterplanning.org](http://www.georgiawaterplanning.org)

# Thank You!

Questions? Comments? Need  
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