Upper Oconee Regional Water Planning Council Meeting

April 14, 2022

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Welcome & Council Business

Pat Graham, UOC Vice-Chair

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Welcome & Council Business

- Welcome and Introductions
- Approve Draft Meeting Summary from December 8, 2021, Council Meeting
- Approve Today's Draft Meeting Agenda

Council Meeting Agenda

Georgia's State Water Plan

Upper Oconee Regional Water Planning Council Meeting

DRAFT Agenda – April 14, 2022

The Lake Club at Reynolds Lake Oconee

1100 Lake Club Drive, Greensboro, GA 30642

Zoom link: https://us06web.zoom.us/j/86899842389

Phone: 1-646-558-8656, Meeting ID: 868 9984 2389

9:00-9:30 am	In Person Coffee Meet and Greet/Online Check-in/Roll Call	Laura Hartt, Jacobs Brian Skeens, Jacobs Michelle Vincent, Jacobs
9:30-9:35 am	Welcome and Council Business • Approve Draft Meeting Summary (12/8/21) • Approve Draft Meeting Agenda (TBD)	Vice-Chair Pat Graham
9:30-9:40 am	EPD Updates	Anna Truszczynski, EPD
9:40-10:00 am	Plan Section 1.3 Upper Oconee Water Planning Region Vision and Goals • Review/Update	Laura Hartt, Jacobs
10:00-10:15 am	Metro North Georgia Water Planning District Update	Brian Skeens, Jacobs
10:15-10:35 am	Flow-Dependent Benefits and Values of Water Resources in the Upper Oconee Region • BEAM/metrics discussion	Gail Cowie, GWPPC Wei Zeng, EPD (virtual)
10:35-11:15 am	Surface Water Resource Assessment (BEAM Model) • Baseline Results	Wei Zeng, EPD (virtual)
11:15-11:25 am	Break	
11:25-11:40 am	Seed Grant Highlight • GIS Mapping – City of Madison	Bryce Jaeck, City of Madison
11:40am-12:30 pm	Water Quality (Assimilative Capacity) Resource Assessment • Overview and Water Quality Updates • Modeling Results	Liz Booth, EPD (virtual) Anna Truszczynski, EPD
12:30-1:00 pm	Lunch	
1:00-1:30 pm	Plan Section 4 Forecasting Future Water Resource Needs • Review Update	Brian Skeens, Jacobs
1:30-1:40 pm	Wrap Up • Public Comments/Local Elected Official Comments • Adjourn	Vice-Chair Pat Graham

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EPD Updates

Ania Truszczynski, EPD

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Regional Water Planning Review & Revision Process

5-Year Review Process will focus on:

- Updated Water Demands and Wastewater Forecasts
- Updated Surface Water and Ground Water Availability Resource Assessments (Quantity)
- Updated Surface Water Quality / Assimilative Capacity Resource Assessment
- Refinement of Management Practices, if needed, to address potential water resource gaps

Regional Water Planning Overview & Schedule

Regional Water Plan Review and Revision Schedule

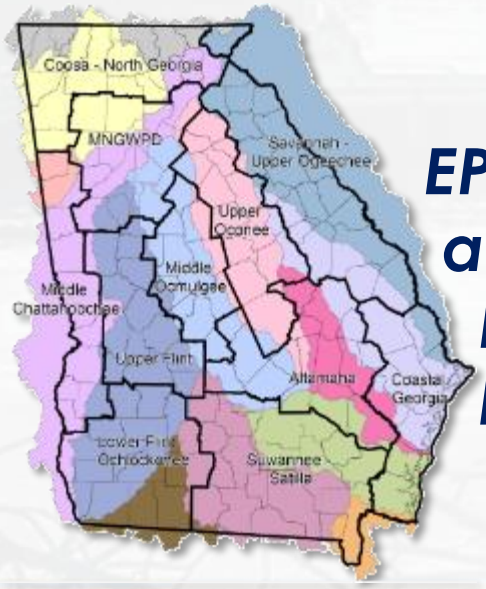
Meeting One
4th Quarter 2021

Meeting Two
1st Quarter 2022

Meeting Three
2nd Quarter 2022

Meeting Four
3rd Quarter 2022
Draft Plan

Meeting Five (Final)
4th Quarter 2022
Incorporate Comments



EPD targeted date of adoption of revised Regional Water Plan by December 2022

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Regional Water Planning Review & Revision Process

With support of Planning Contractor, the UOC will:

- Evaluate updated municipal, industrial, energy and agricultural water demand forecasts
  - Corresponding updates to Plan Section 4 – to be presented today ☑
- Evaluate updated water resource assessments – to be presented today & during next quarterly meeting
  - Corresponding updates to Plan Sections 3 & 5 – to be presented at next quarterly meeting
- Re-evaluate management practices
  - Corresponding updates to Plan Sections 6 & 7 – to be presented at next 2 quarterly meetings
- Prepare Draft Plan Update for Public Notice by September 30, 2022

Vision & Goals (Section 1.3)

Laura Hartt, Jacobs

Vision & Goals (Section 1.3)

- During Planning Round 1, the Upper Oconee Council went through an extensive visioning process to develop its Vision and supporting Goals
- UOC's Vision guides and frames the selection of management practices
- UOC's Vision and Goals reflect how we aspire to see water resources managed to meet regional needs
- Vision and Goals were re-visited during Planning Round 2, with no major changes

Do we need to update UOC's 2017 Vision & Goals for 2022?

- Have any major water issues arisen in the region over the past 5 years?
- Have priorities (i.e., Goals) for water resource management changed over the past 5 years?
- Is there anything on the horizon that may influence the Vision for the region?
- If answers are substantively "no," then revisions to Vision and Goals may not be needed.

Vision (2017)

Create a regional plan that focuses on managing water as a critical resource vital to our health, economic, social and environmental wellbeing. Build trusting partnerships with neighboring regions and develop an educated and engaged citizenry that embraces sound water management.

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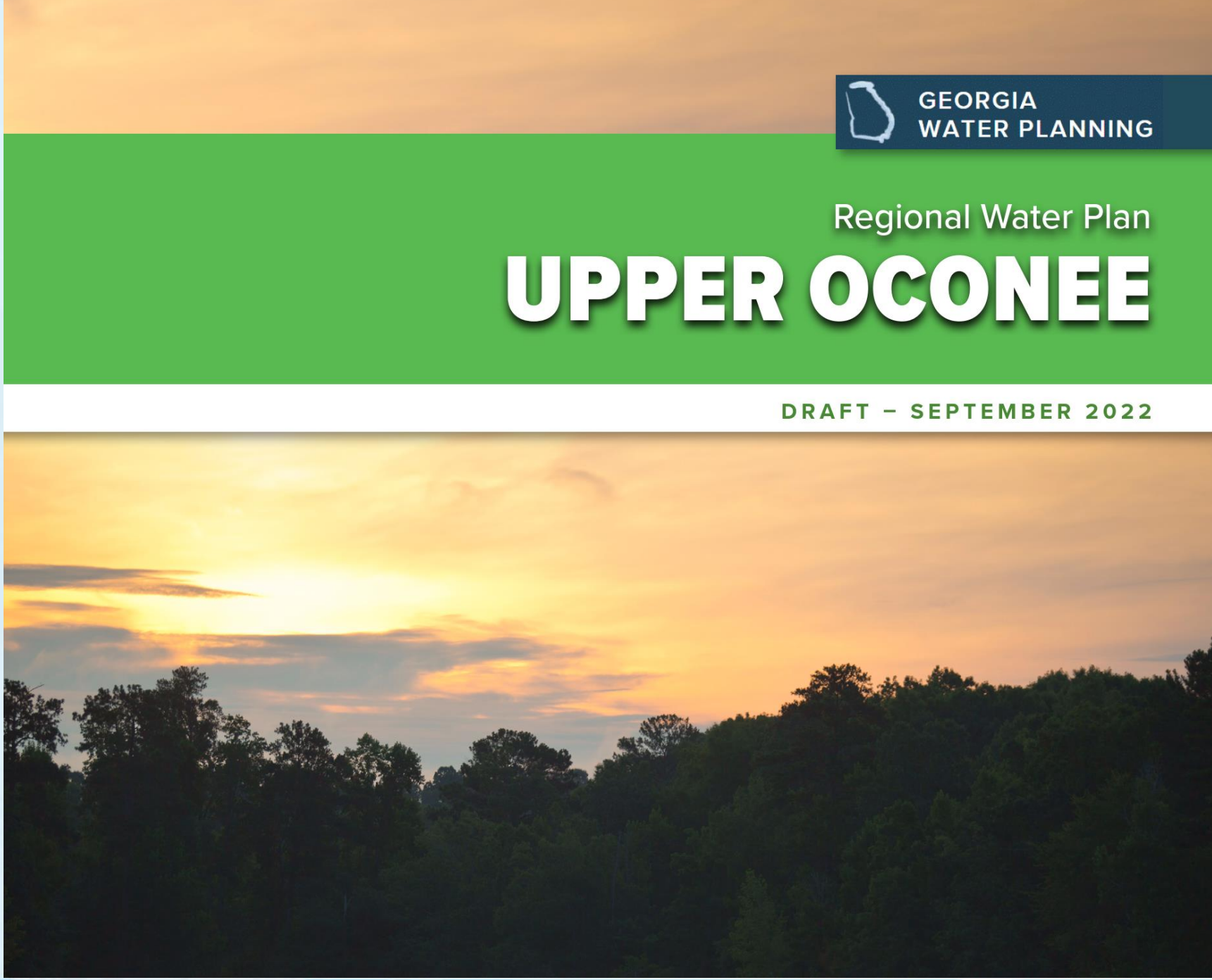


Goals (2017)

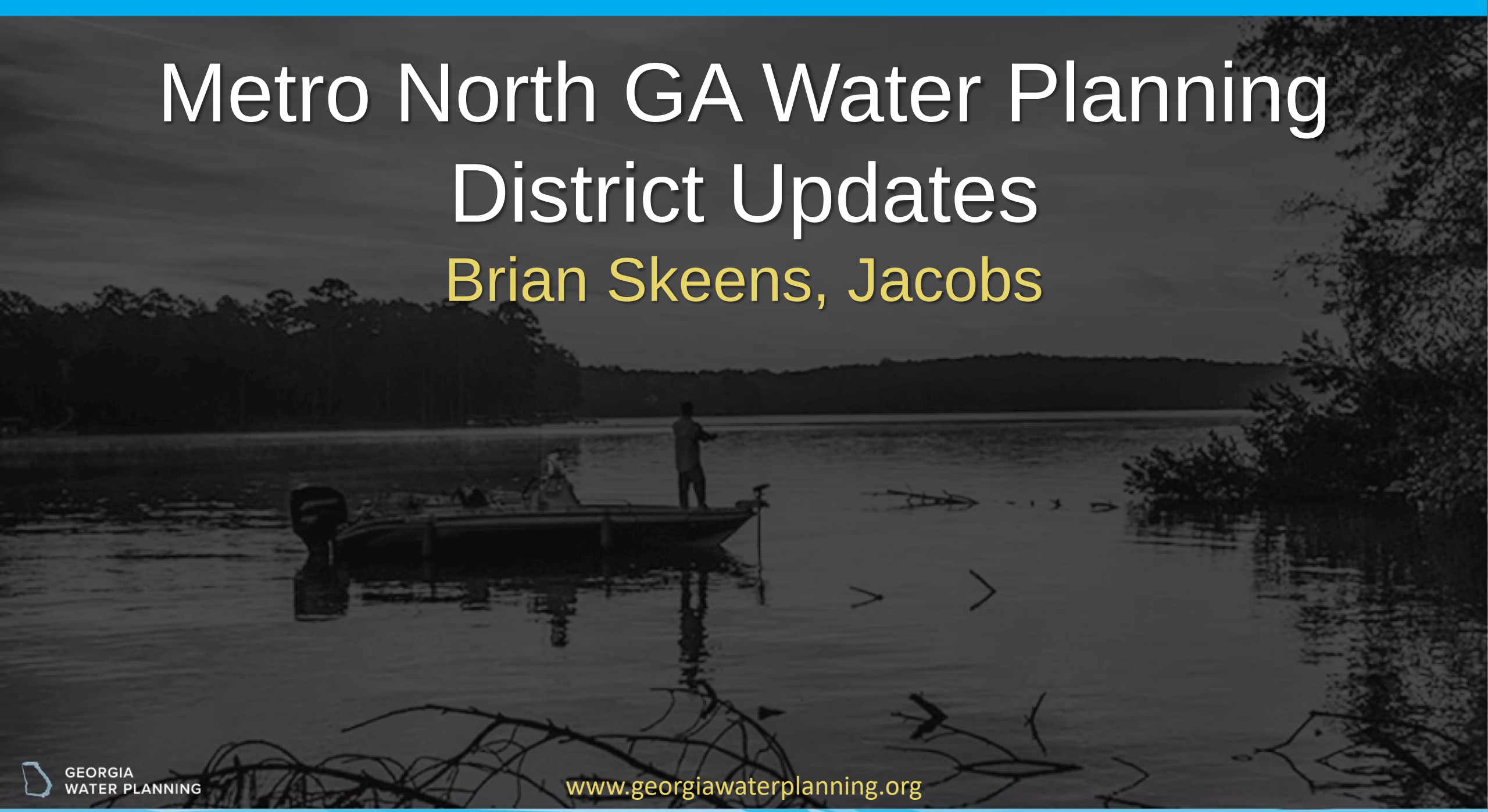
- Promote alternatives and technologies that conserve, reuse, return, and recycle water within the Upper Oconee region.
- Ensure that management practices balance economic development, recreation, and environmental interests.
- Educate stakeholders in the region on the importance of water quality and managing water as a resource including practices such as water conservation and increased water efficiency.
- Encourage the development of and accessibility to data and information to guide management decisions.

Goals (2017) Continued

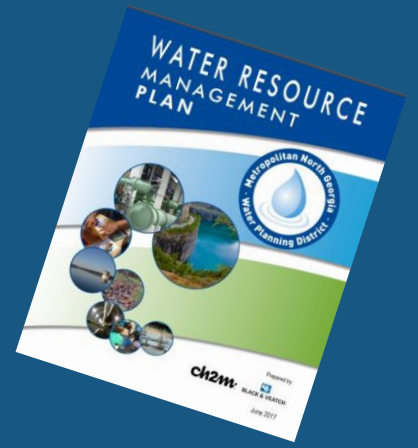
- Identify programs, projects, and educational messages to reduce non-point source pollution to protect water quality in lakes and streams.
- Recommend innovative strategies (water, sewer, and/or stormwater) that provide sufficient revenues to maintain a high level of service while promoting water conservation and efficiency.
- Identify and plan measures to ensure sustainable, adequate water supply to meet current and predicted long-term population, environmental, and economic needs.

Metro North GA Water Planning District Updates

Brian Skeens, Jacobs



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										

Summary of Proposed Action Item Changes For the 2022 District Plan

For the integrated, wastewater, and watershed sections, no major new or expanded action items are proposed

Five new and expanded water conservation (WSWC) action items, which replace action items from 2017

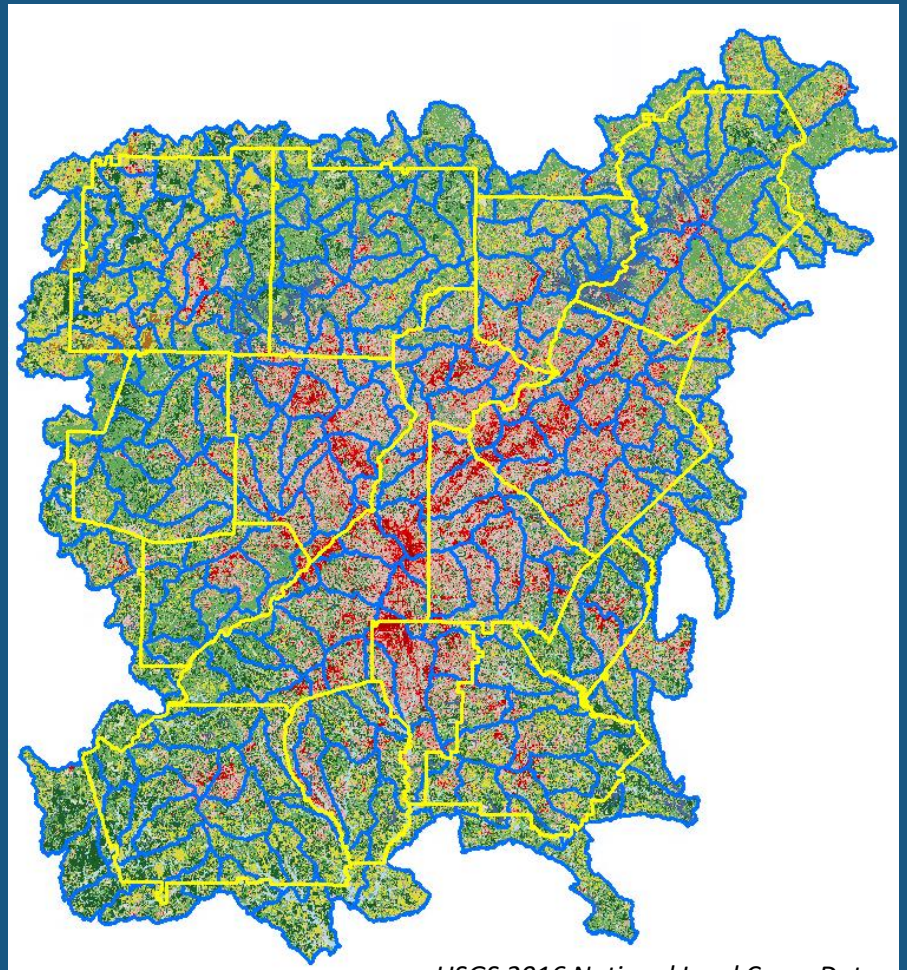
Changes are being proposed in all action item sections to address items that are out-of-date, have been completed, or that are duplicative of state requirements

Proposal for 5 New / Updated WSWC Action Items

1. New Residential Customer Leak Reduction Programs (WSWC-5)
2. New Plumbing Code Efficiency Requirements (WSWC-8)
3. Updated Landscape Irrigation System Efficiency Requirements (WSWC-10)
4. Updated Drought Response Ordinance Requirement (WSWC-13)
5. Updated Water Loss Control Program (WSWC-15)

Stormwater Forecast Update

- Planning-level estimate of the total potential runoff management volume from development
- Calculated at a Basin Scale
- Using three Post-Construction SW Management Standards
  - Water Quality Volume
  - Channel Protection Volume
  - Overbank Flood Volume
- Four Planning Scenarios
  - predevelopment, 2019, 2030, & 2040



USGS 2016 National Land Cover Data

Next Steps

April/May 2022 – Regional Water Council review

- Webinar presentation on April 19, 2022, 5:00 p.m.
- Comments Due by May 11, 2022

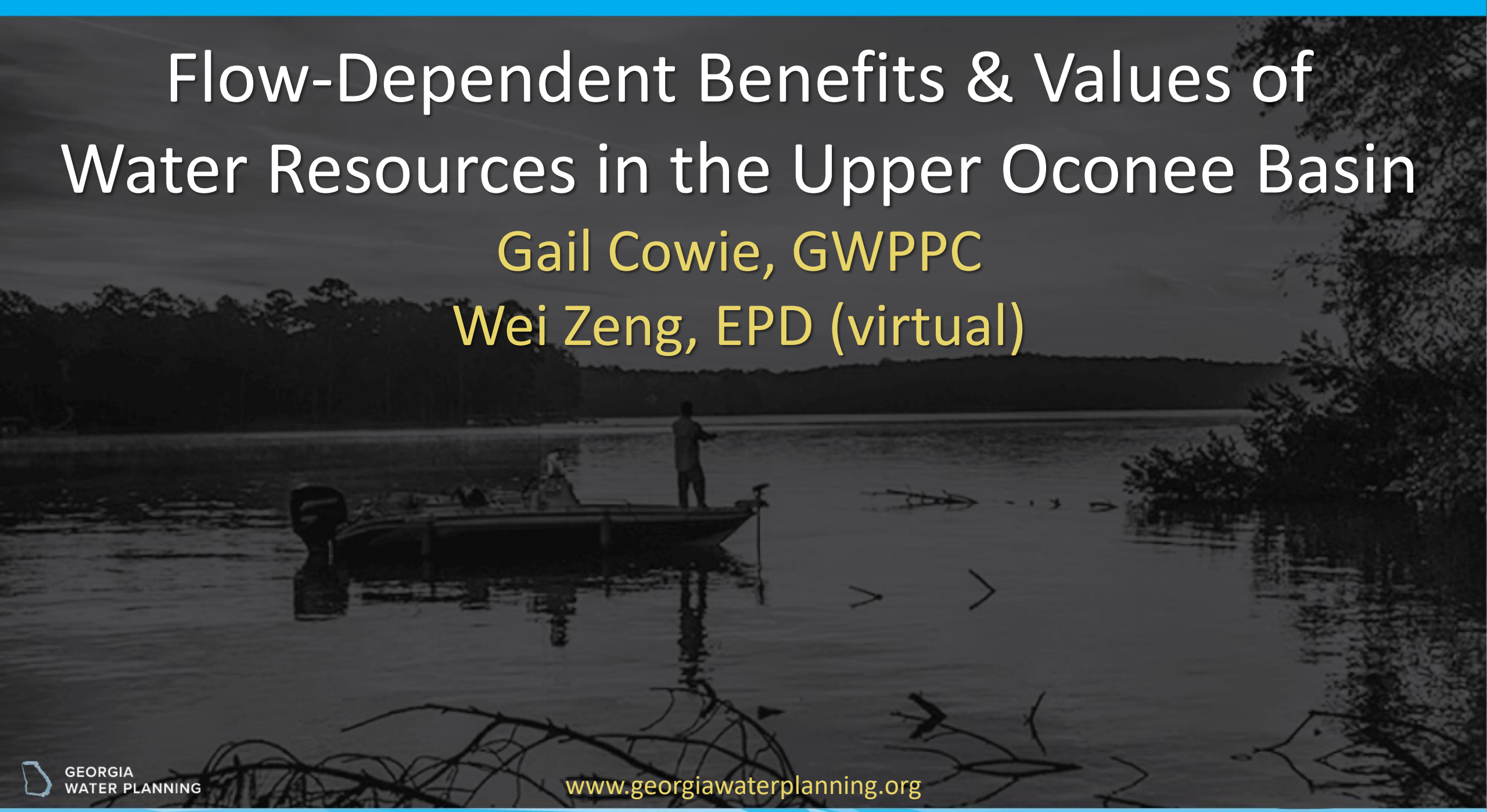
June 2022 – Board authorization for public comment

Third Quarter 2022 – Plan released for public comment

Fourth Quarter 2022 – EPD concurrence, Board approval

Flow-Dependent Benefits & Values of Water Resources in the Upper Oconee Basin

Gail Cowie, GWPPC
Wei Zeng, EPD (virtual)



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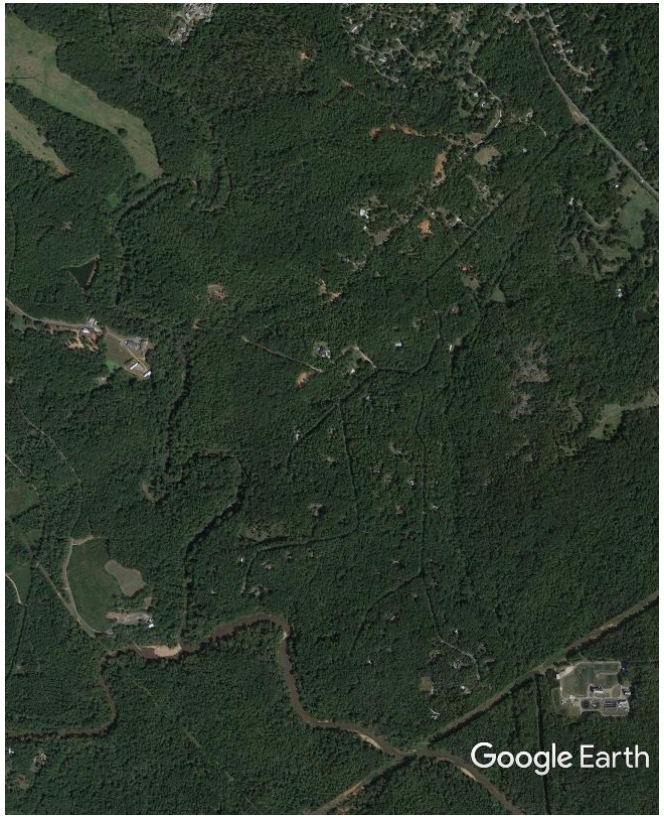
Flow-dependent benefits and values of waters in the Upper Oconee Region

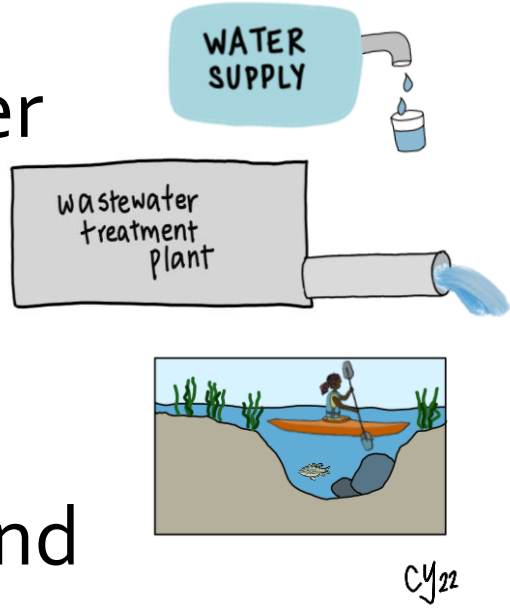
Gail Cowie

4/14/22



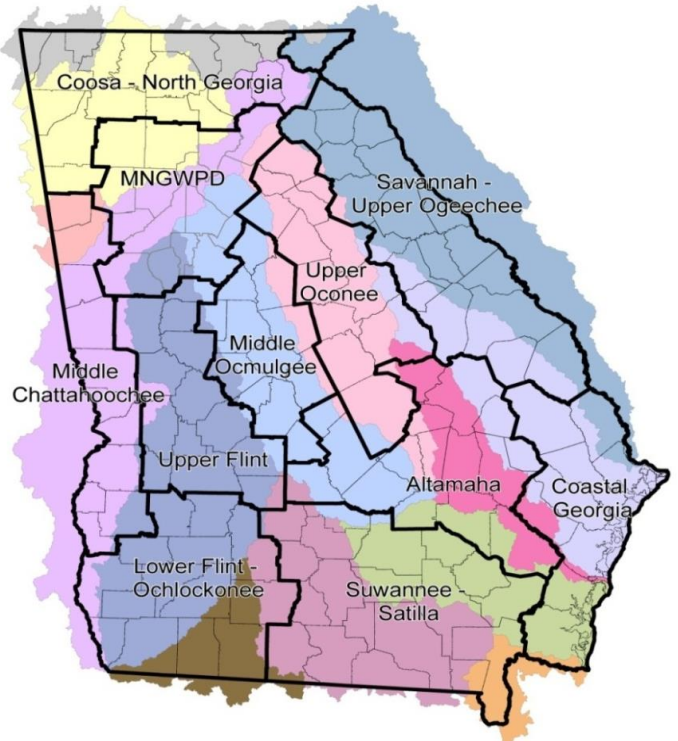
Purpose

- Regional Water Plan recognizes a wide range of uses and benefits from the region's waters
- Basin-specific information on water supply, water quality, and wastewater assimilation included
- This project adds basin-specific information on other uses
- Results can be used in revision of regional plan and modeling of surface water availability



Approach to Project

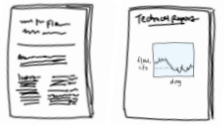
- Answer two questions
  - Uses and benefits identified by people in the basin as important
  - How do uses and benefits vary with streamflow or lake levels
- Focus on the Oconee River basin
  - Large rivers and major tributaries
- Two sources of information
  - Water users across the basin
  - Scientific and technical studies



Where did we get information?

- 140 people invited to participate
- 48 people contributed information
  - Interviews, meetings, surveys, and an interactive map

- Input from water users combined with review of scientific and technical studies of basin resources



- Draft products to be reviewed by project participants, Water Council, and EPD

Products

- Map – Stakeholder Input on Important Uses and Benefits
- Map – Performance Metrics for Surface Water Assessments
- Supplemental Maps
- Supporting Documents
- Report – Review of Scientific and Technical Literature
- Project Summary

Products

- Map – Stakeholder Input on Important Uses and Benefits
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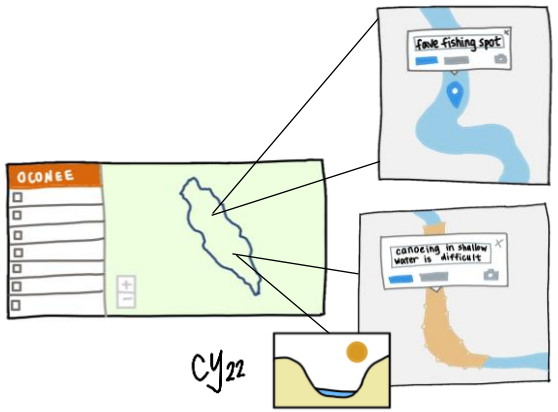
Stakeholder Input on Important Uses and Benefits

Uses and Benefits Highlighted by Water Users

- Water supply
- Water quality and wastewater assimilation
- Direct economic value



- Recreation on rivers and lakes
- Aquatic habitat and species
- Recreation and habitat on adjacent lands
- Environmental and historical education

REVIEW MAP - Oconee Ba...

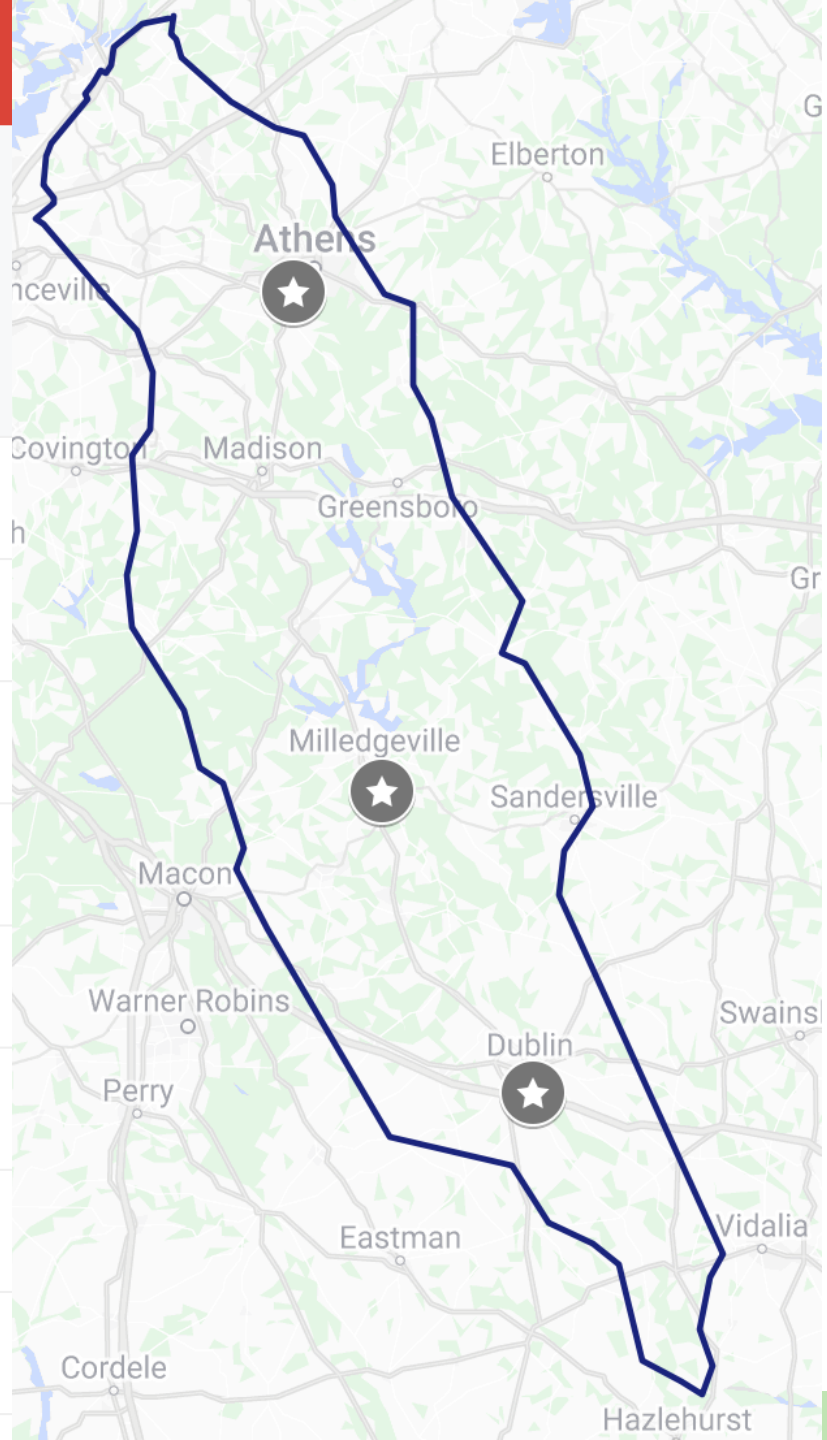
This map presents information on the water uses and values that water users in the Oconee River Basin have identified as important. For

64 views

Published yesterday at 9:41 PM

SHARE

- [ ] Water Supply
- [ ] Water Quality and Wastewater Processing
- [ ] Direct Economic Value
- [ ] Recreation on Rivers and Lakes
- [ ] Aquatic Habitat and Species
- [ ] Recreation and Habitat on Adjacent Lands
- [ ] Environmental and Historical Education
- [ ] Basin Boundary



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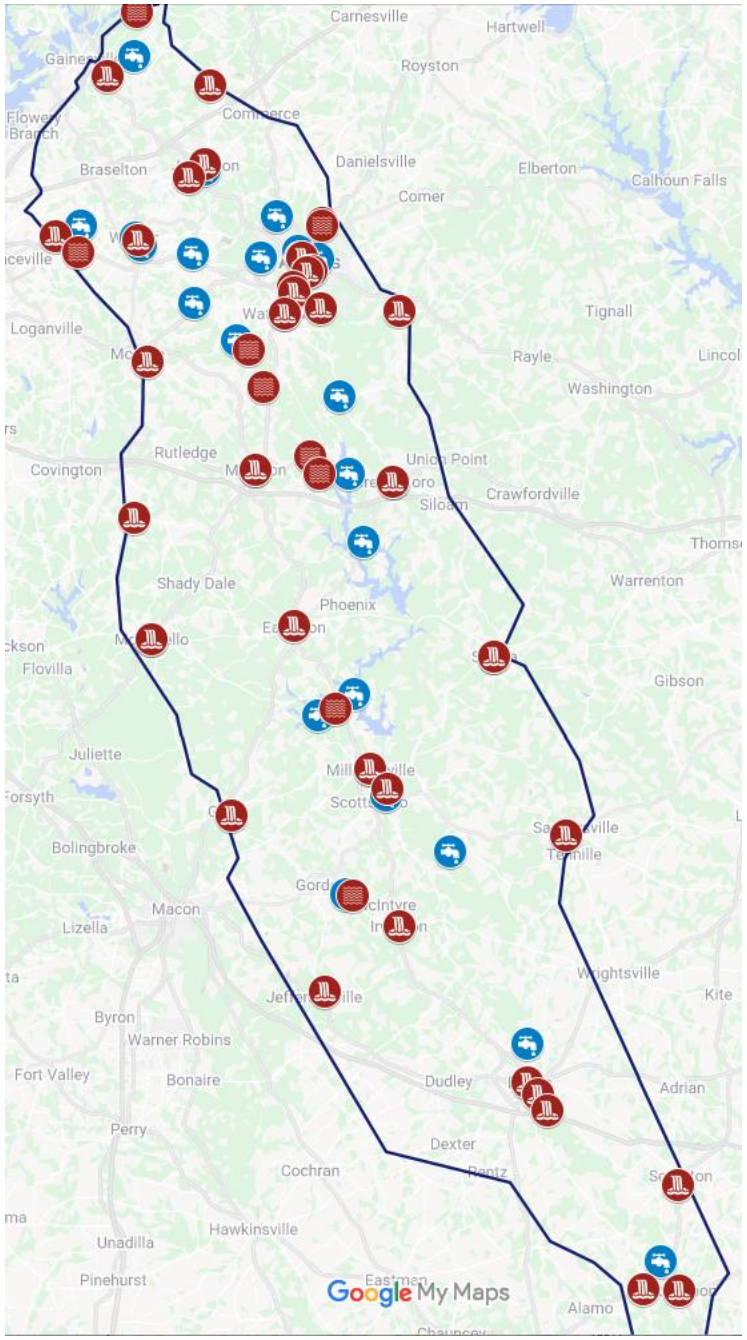

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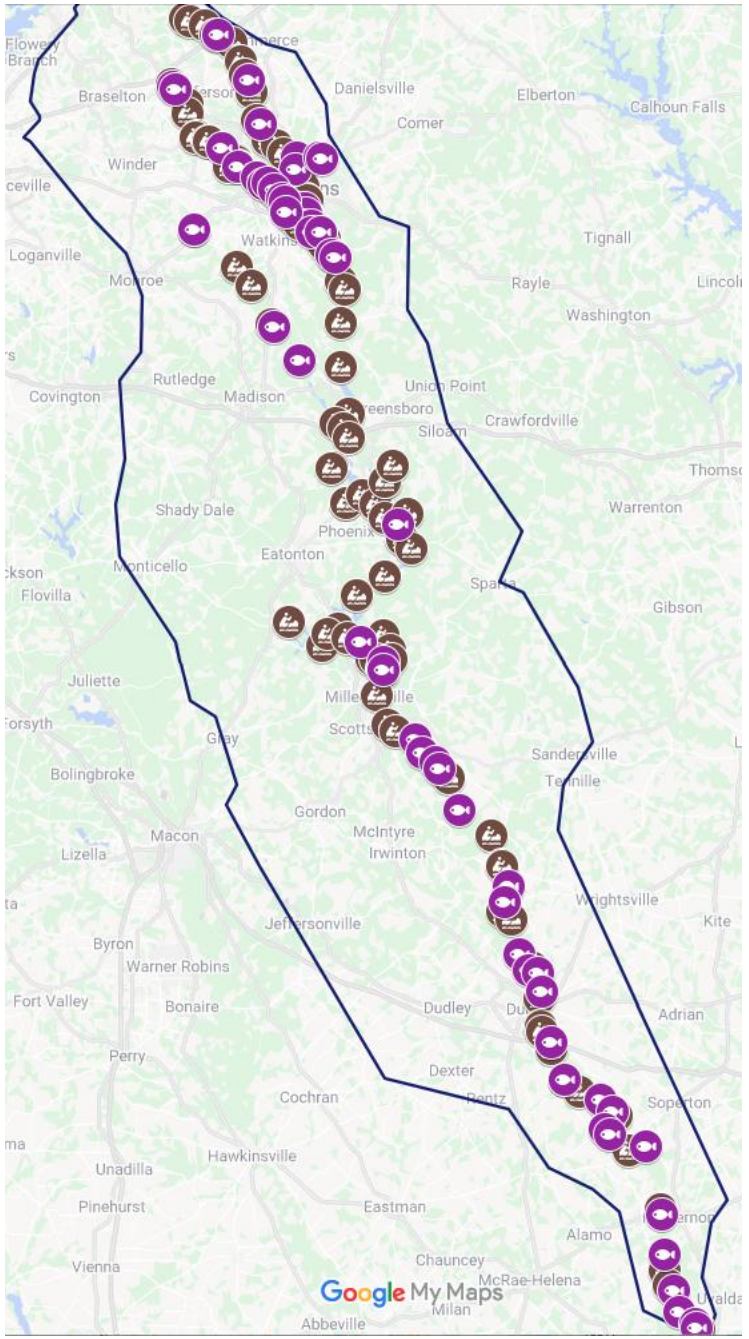

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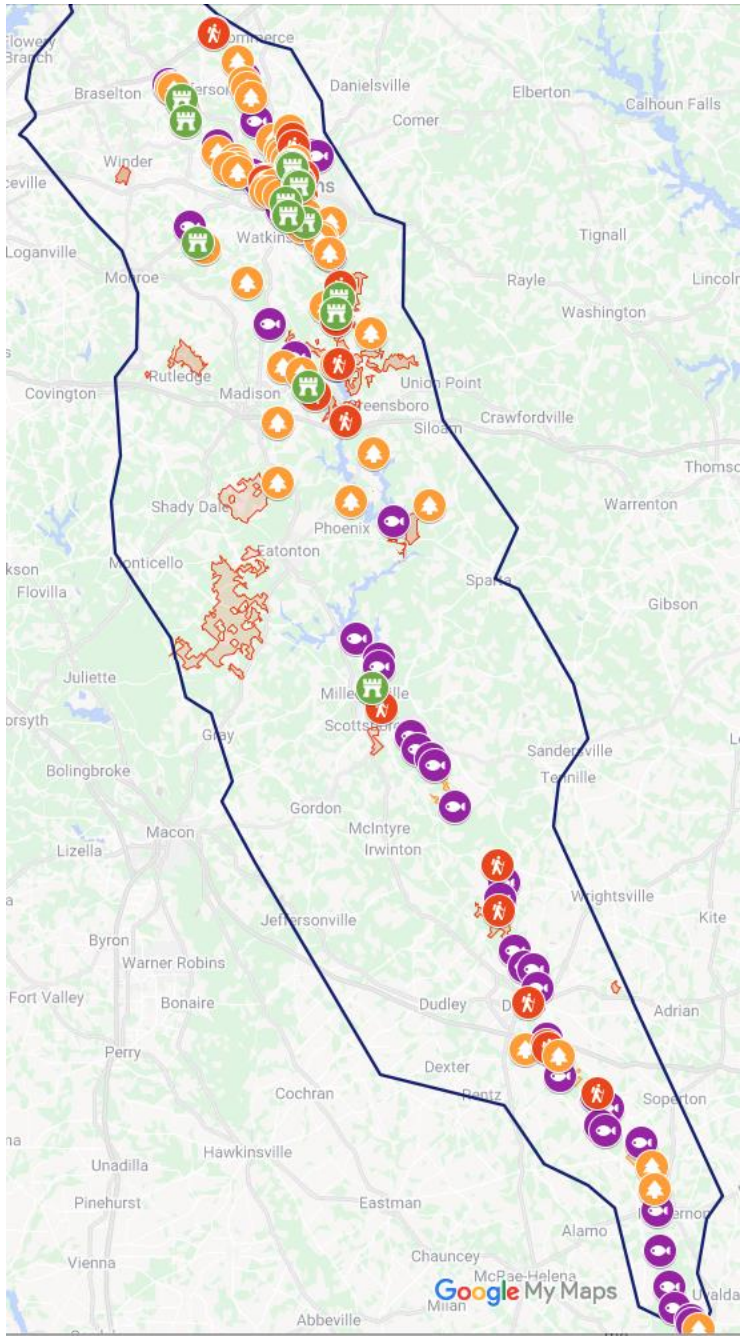

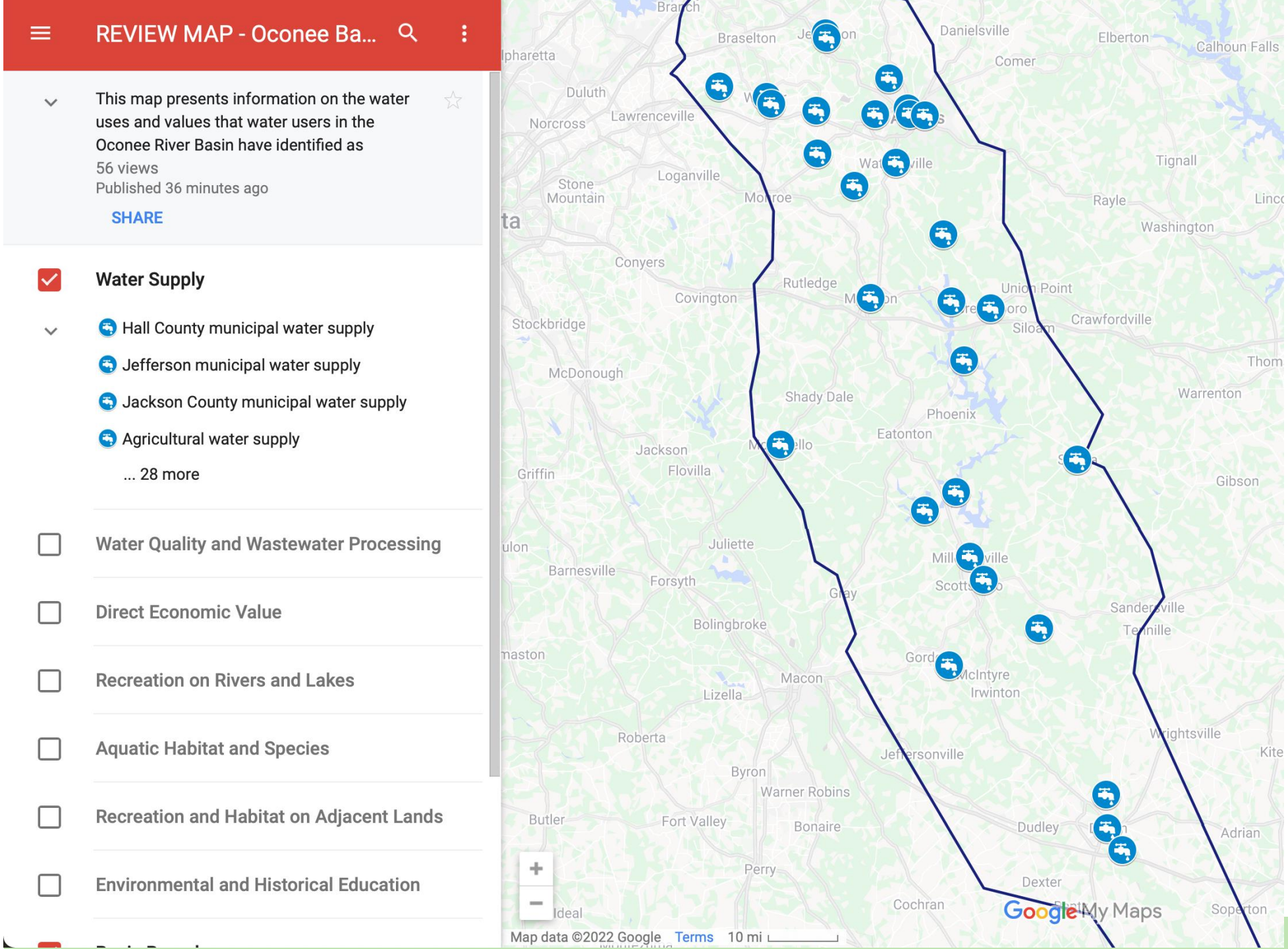
REVIEW MAP - Oconee Ba...
This map presents information on the water uses and values that water users in the Oconee River Basin have identified as
56 views
Published 36 minutes ago
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Water Supply
Hall County municipal water supply
Jefferson municipal water supply
Jackson County municipal water supply
Agricultural water supply
... 28 more
Water Quality and Wastewater Processing
Direct Economic Value
Recreation on Rivers and Lakes
Aquatic Habitat and Species
Recreation and Habitat on Adjacent Lands
Environmental and Historical Education
Braselton
Danielsville
Elberton
Calhoun Falls
Comer
Duluth
Norcross
Lawrenceville
Loganville
Stone Mountain
Monroe
Tignall
Rayle
Washington
Conyers
Rutledge
Covington
Union Point
Crawfordville
Stockbridge
McDonough
Shady Dale
Phoenix
Eatonton
Warrenton
Jackson
Flovilla
Griffin
Gibson
Juliette
Barnesville
Forsyth
Gray
Bolingbroke
Macon
Lizella
Irwinton
Roberta
Jeffersonville
Wrightsville
Byron
Warner Robins
Butler
Fort Valley
Bonaire
Dudley
Adrian
Perry
Dexter
Cochran
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Madison municipal water supply

Location Name

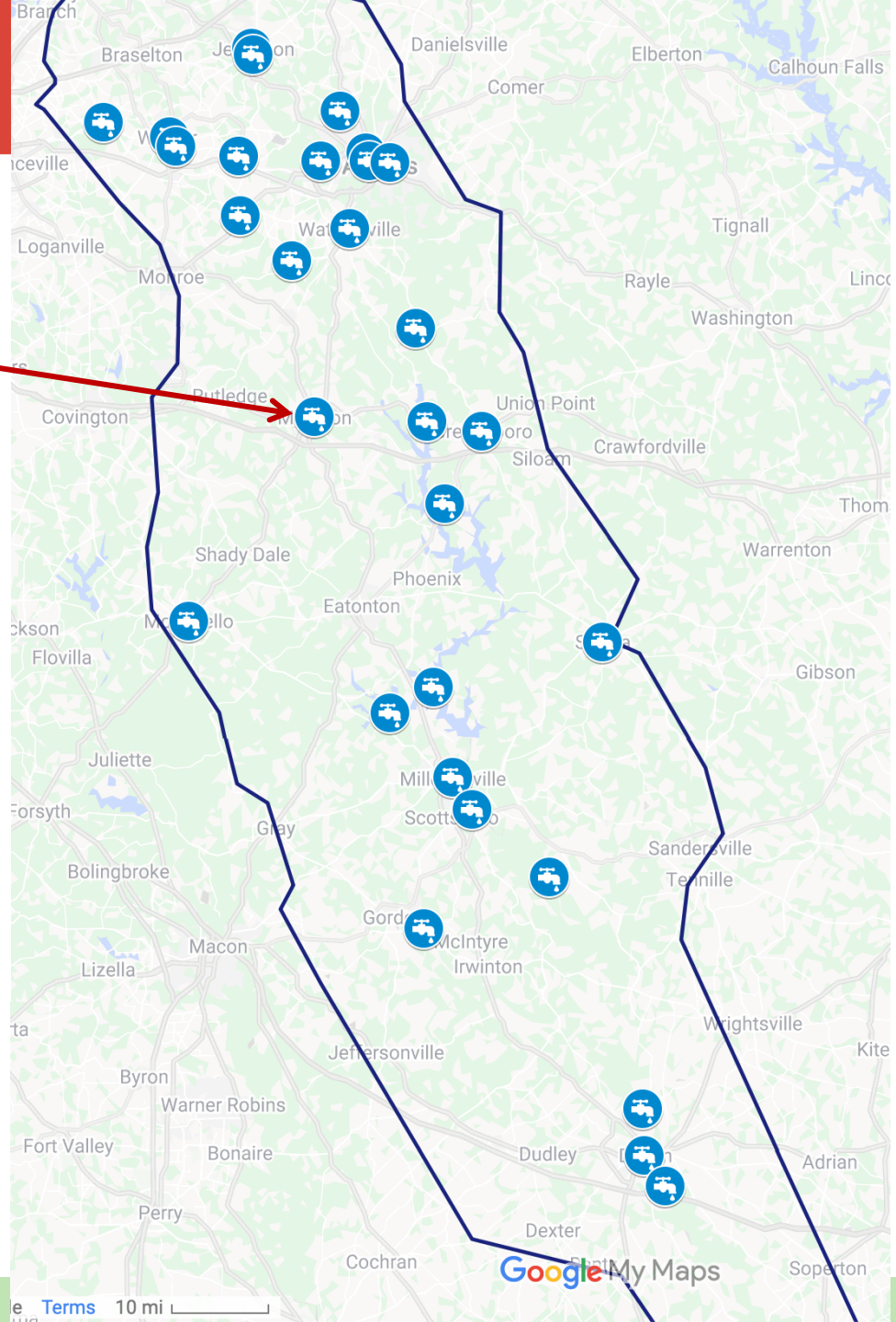
Madison municipal water supply

Details

The City of Madison has active permits to withdraw water from Lake Oconee and from Hard Labor Creek, a tributary of the Apalachee River, to meet its demand for municipal water supply.

Layer

Water supply



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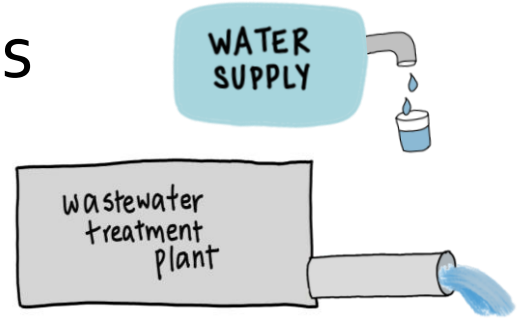
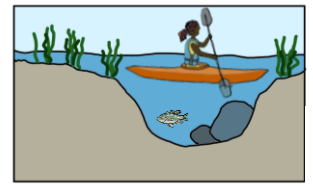
Metrics for Surface Water Resource Assessment

What are metrics?

- Numeric thresholds for beneficial or undesirable conditions related to a specific use or benefit
- Use in modeling of surface water availability to flag concerns
- Standard metrics for all Water Planning Regions
  - Water supply
  - Wastewater assimilations



- This project identified two kinds of metrics that can be added
  - Recreation (boating)
  - Species and natural habitat



Metrics - Recreation; Spec...

This map provides new information that can be applied in assessment of surface water availability and regional water planning for the

10 views

Published seconds ago

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Flow Measurement Locations

Recreation on Rivers and Lakes

- North Oconee River from Deadwyler Road to...
- North Oconee River from Dudley Park to Whi...
- North Oconee River from Whitehall Road to ...
- Middle Oconee River from Old Pendergrass ...

... 23 more

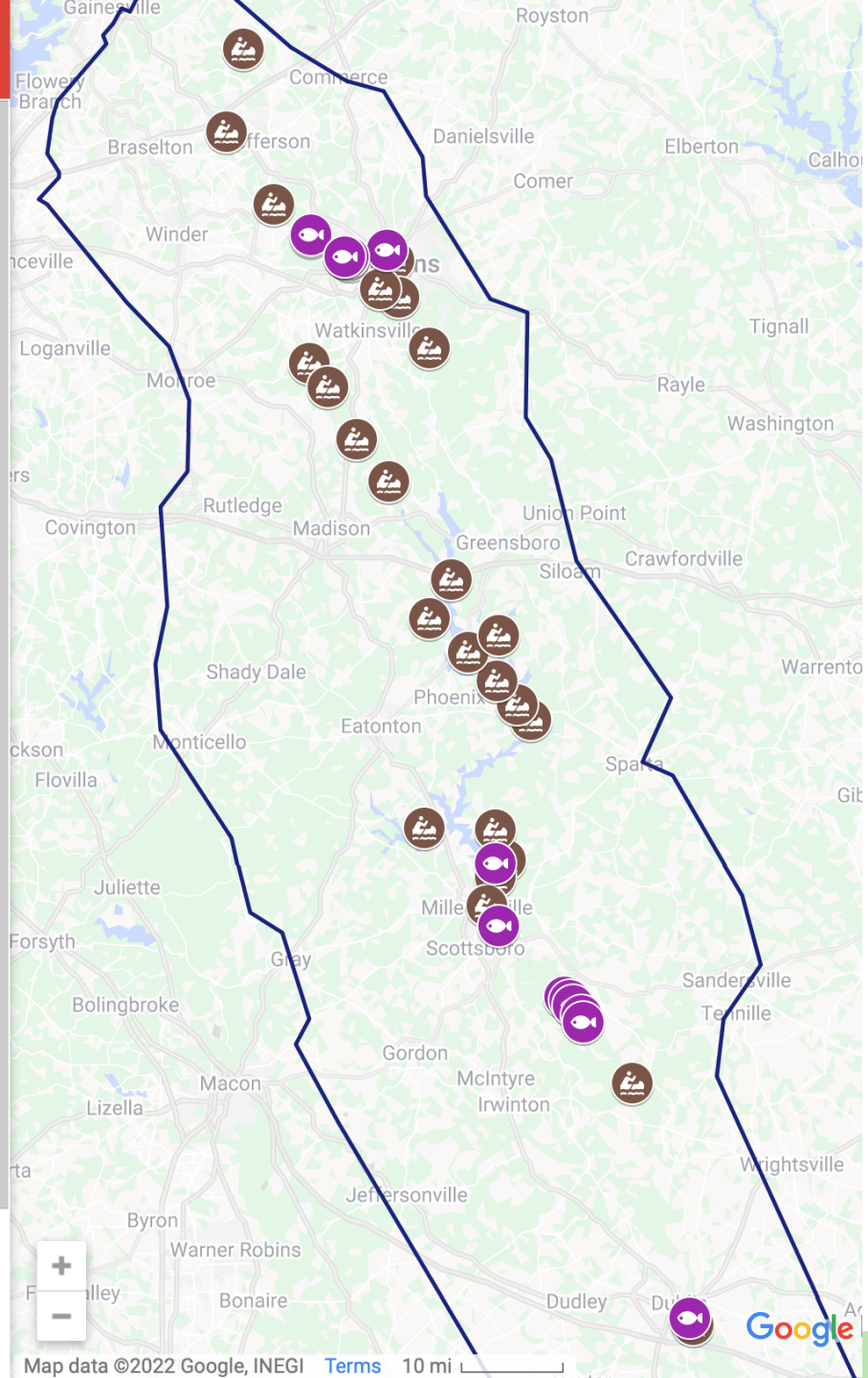
Species and Natural Habitats

- North Oconee R at Athens
- Middle Oconee River at Tallassee Dam
- Middle Oconee R at Athens
- Middle Oconee R at Athens

... 11 more

Basin Boundary

- Oconee River Basin Boundary Line

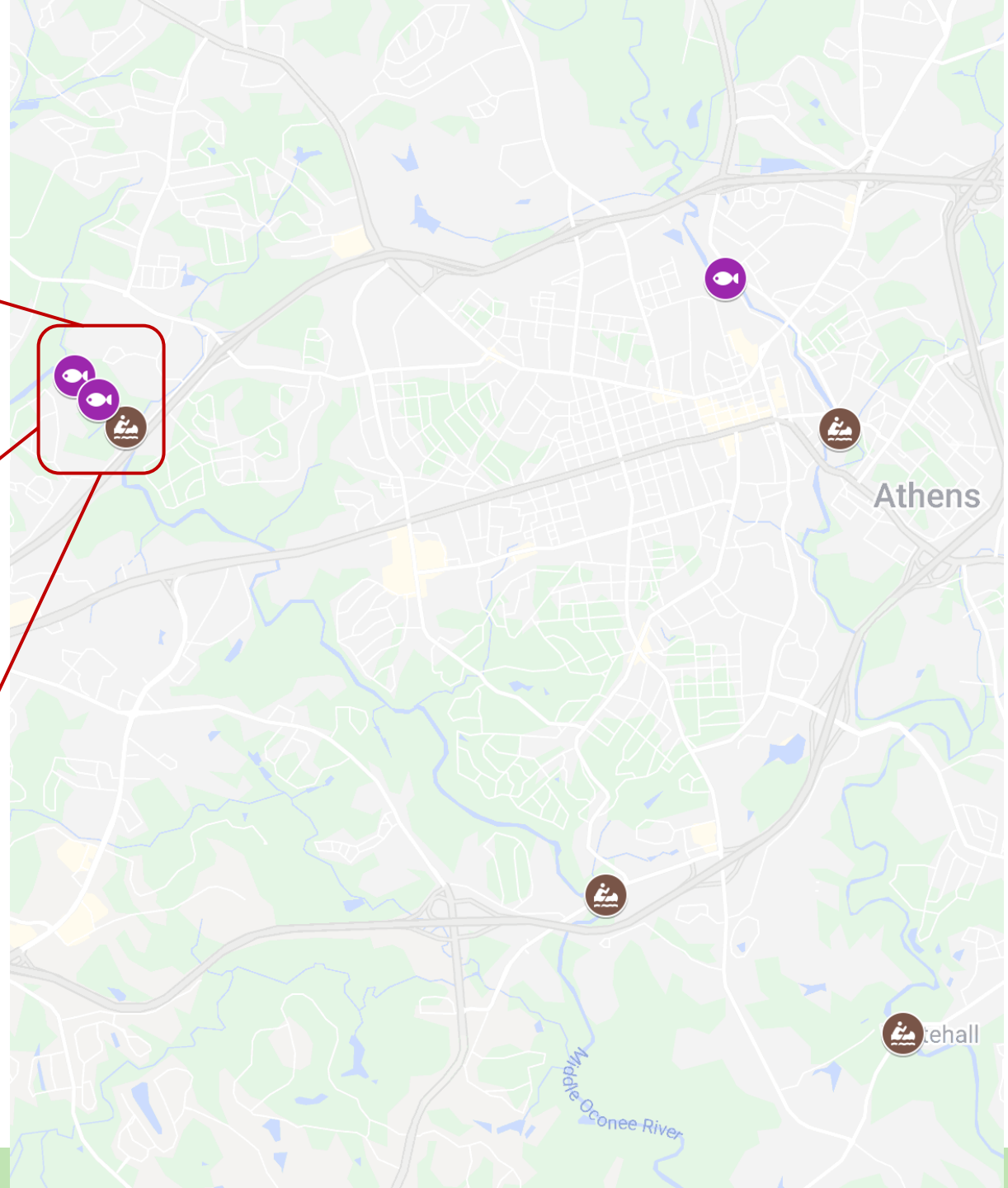


Middle Oconee R at Athens

Use or Benefit	Species and natural habitats
Indicator	Aquatic habitat in dry season - loss of habitat
Metric	# days with flow <265 cfs, June-October
Use or Benefit	Species and natural habitats
Indicator	Aquatic habitat in dry season - loss of species
Metric	# days with flow <100 cfs, June-October

Middle Oconee River from Ben Burton Park to Macon Hwy

Use or Benefit	Recreation (canoe/kayak)
Indicator	Runnable for paddling
Metric	# days with gage heights between 1.3 and 4 feet

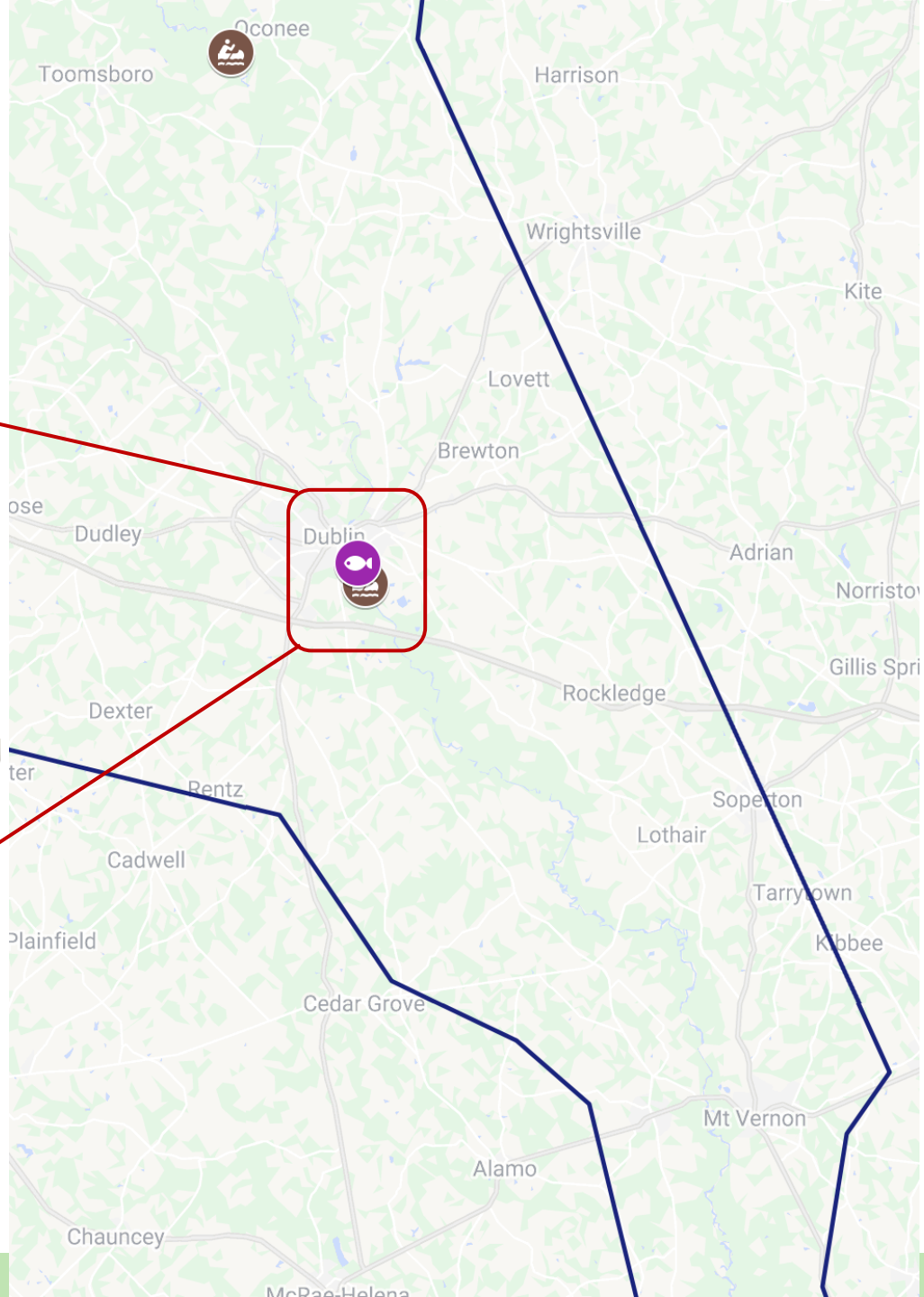


Oconee River near Dublin

Use or Benefit	Species and natural habitats
Indicator	Connection to floodplain habitat
Metric	# of days with flow above 15,000 cubic feet per second (cfs), November to March

Oconee River from Dublin to the confluence with the Ocmulgee

Use or Benefit	Recreation (jonboats)
Indicator	Passable for jonboats
Metric	# days with gage height above 2 feet



Next Steps

- Review by contributors, Water Council, EPD
- To use map products:
  - What locations interest you? Zoom into those.
  - What uses and benefits interest you? Select in the sidebar to show entries.
  - What entries interest you? Click on the icon or the sidebar entry to see details.
  - Should any additional metrics be applied in surface water modeling? Which one(s)?

To see map with full stakeholder input

To see map with metrics

Questions and Comments?

Gail Cowie

gcowie@h2opolicycenter.org

706-338-0805

Thanks to Laura Rack (metrics), Carol Yang (graphics), and Regina Nasrallah (mapping)

Surface Water Availability Resource Assessment (BEAM Model) Baseline Results

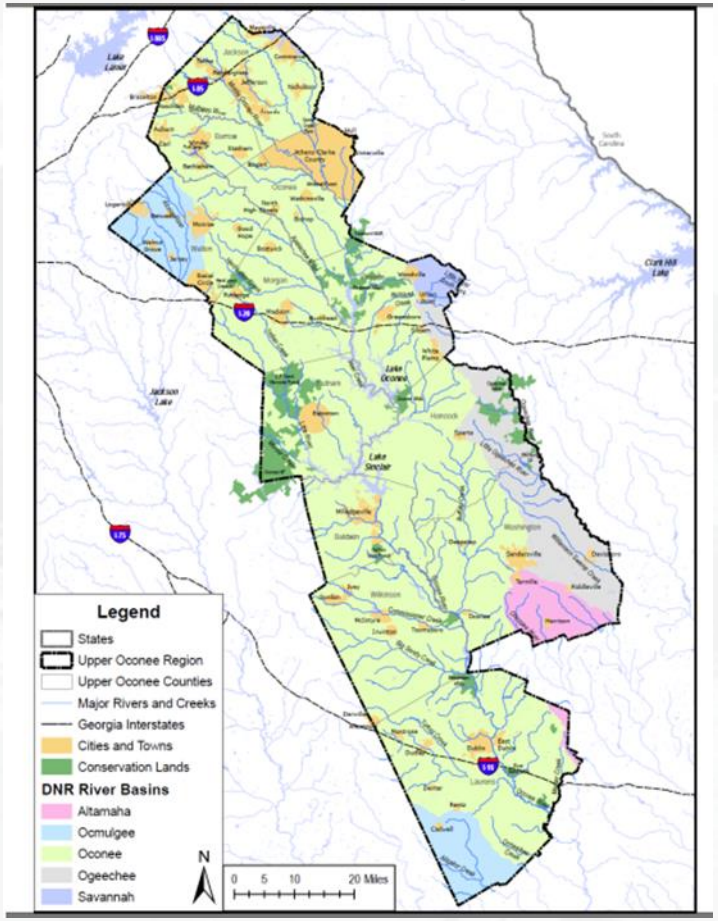
Wei Zeng, EPD (virtual)

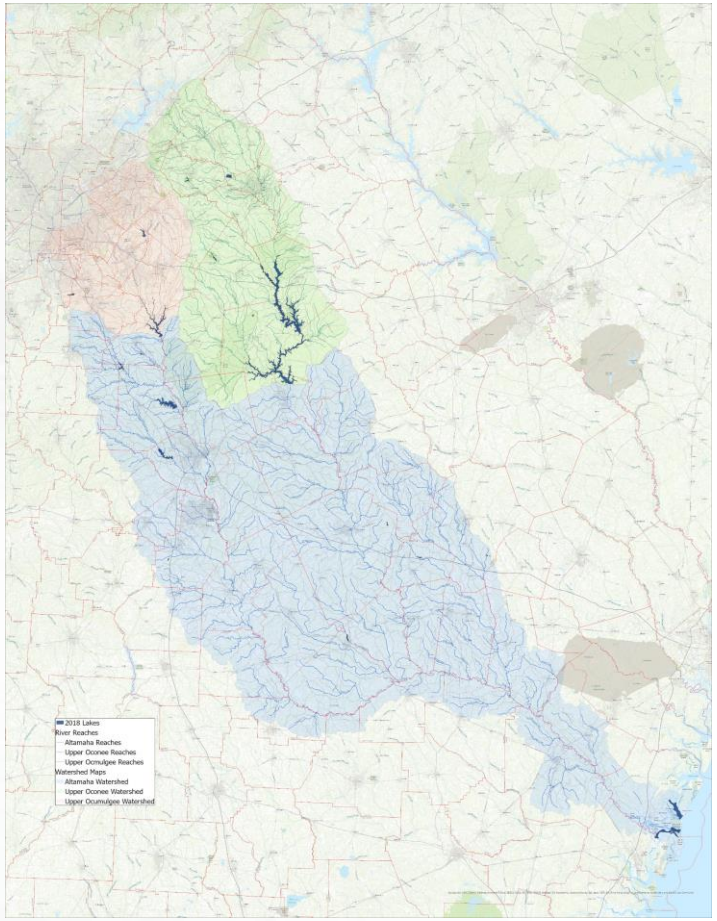
Presentation Outline

- Introduction and BEAM (i.e., Basin Environmental Assessment Model) Settings
- Model Results Baseline Scenario
  - Water Supply Challenges, Examples (water supply PMs)
  - Wastewater Assimilation Challenges, Examples (wastewater assimilation PMs)
  - Performance Metric at Athens and Dublin for Recreation & Habitats (recreational PMs and Habitats PMs)
- Additional Performance Measures to consider?

Upper Oconee Region & OOA BEAM Model Domain

(OOA = Ocmulgee-Oconee-Altamaha)





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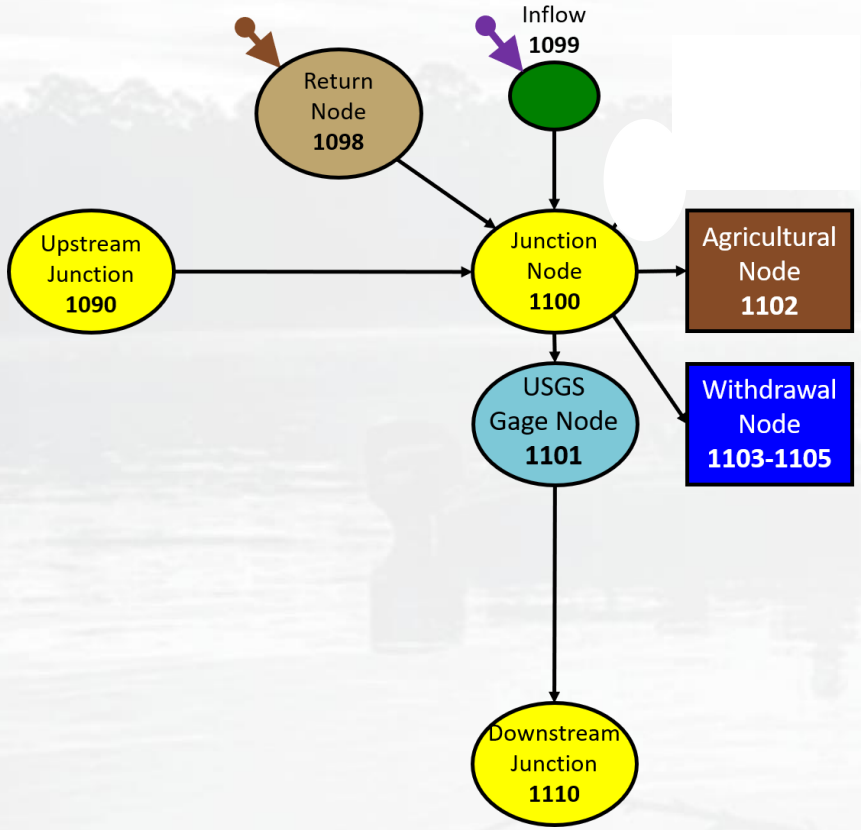
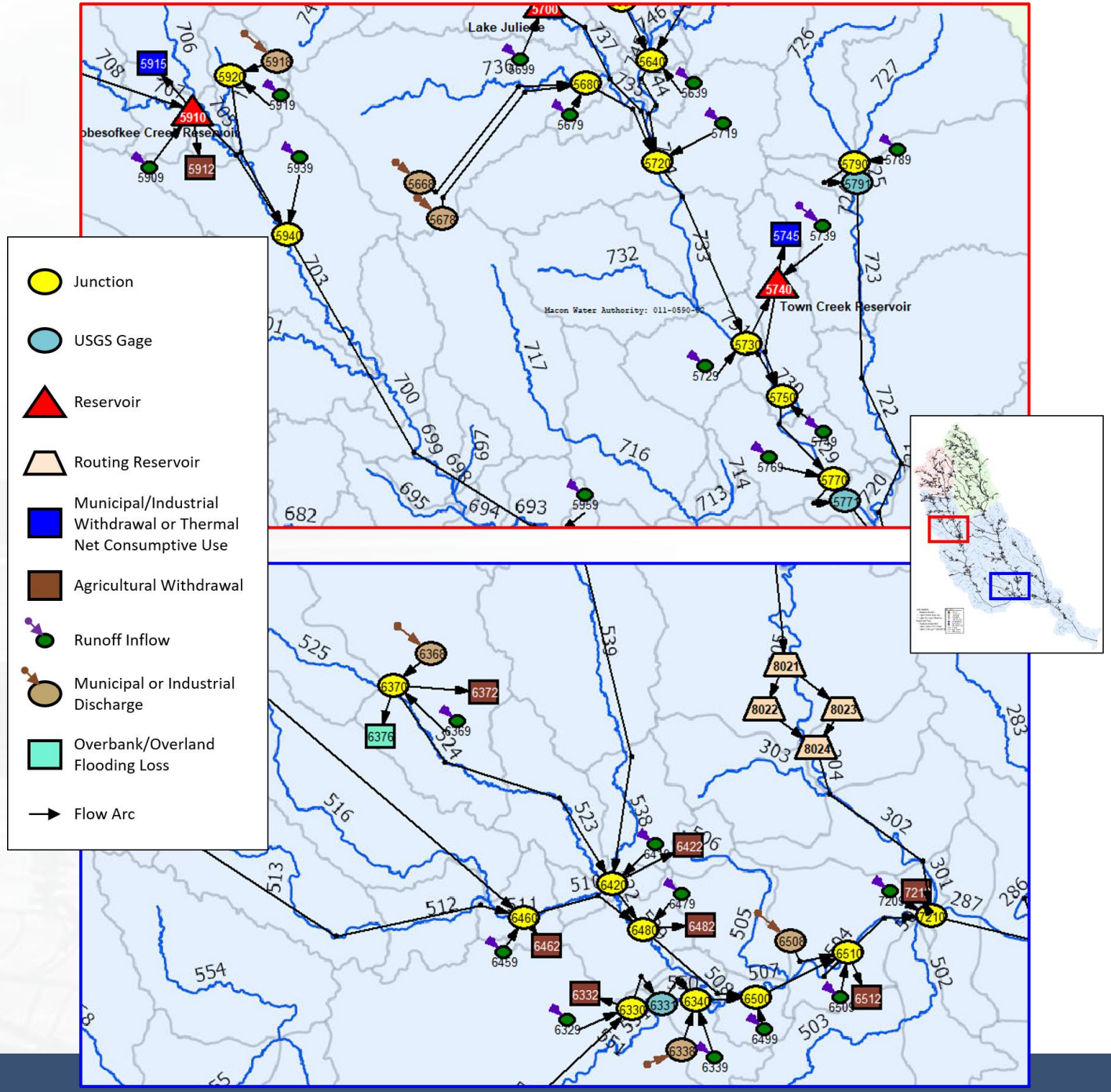
OOA BEAM Node Types

(OOA = Ocmulgee – Oconee – Altamaha)
(BEAM = Basin Environmental Assessment Model)





OOA BEAM Model Baseline Settings

(OOA = Ocmulgee-Oconee-Altamaha) (BEAM = Basin Environmental Assessment Model)

- Simulation Period (Hydrologic Conditions): 1939-2018
- Withdrawal and Discharge amount: average of period 2010-2018 (i.e., marginally dry conditions)
- Instream Flow Protection Thresholds: per permit conditions
- Reservoir physical and operational data: from reservoir owner or EPD

Water Supply Settings: Facilities Analyzed in BEAM Model for Upper Oconee Region

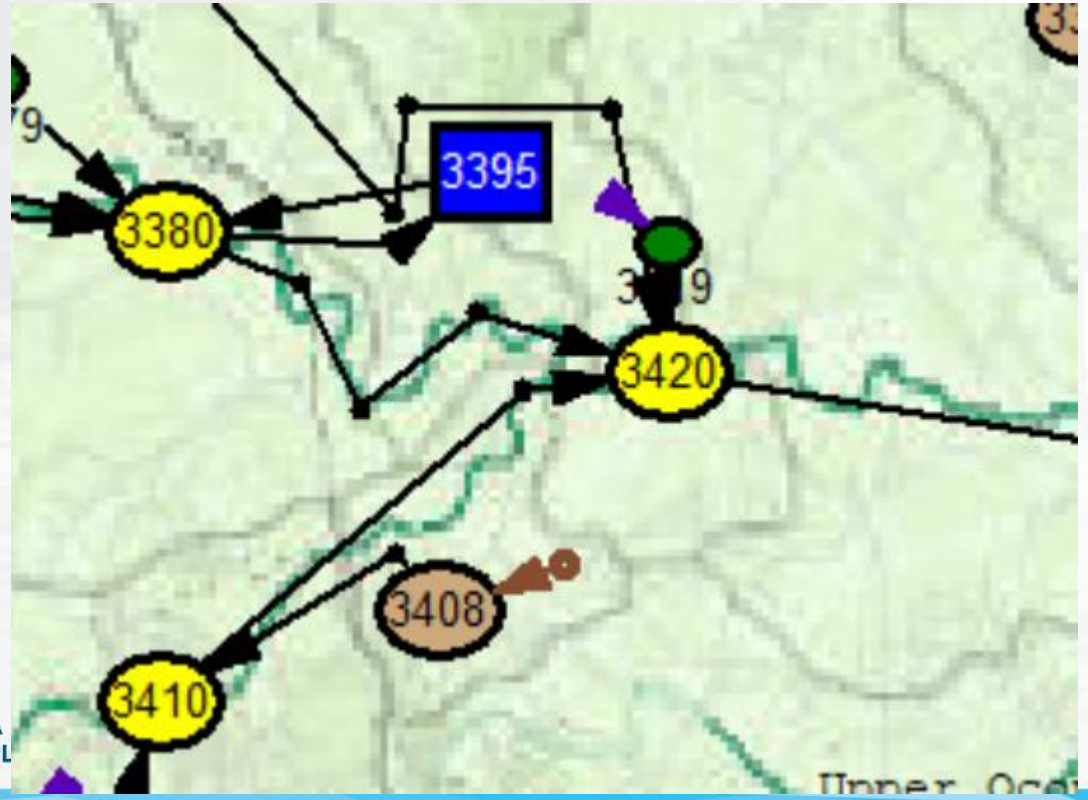
Facility	Total number
Municipal Withdrawal	22
Municipal Discharge	30
Industrial Withdrawal	6
Industrial Discharge	6
Energy Withdrawal/Discharge	2

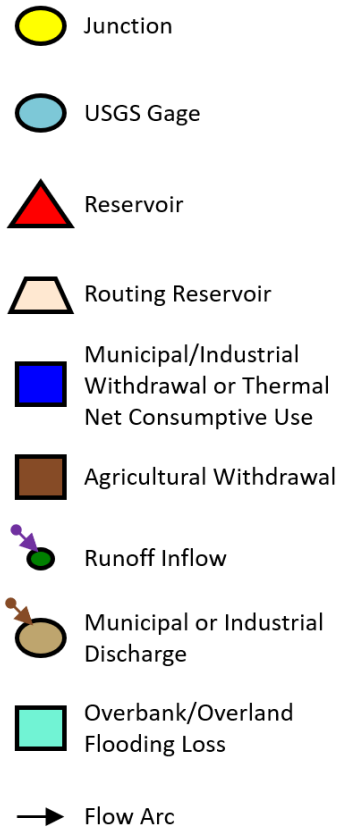
Draft Resource Assessment Results

- Water Supply Challenges, Examples
  - City of Winder
  - Upper Oconee Basin Water Authority
  - City of Statham
- Wastewater Assimilation Challenges, Examples
  - Athens-Clarke County (Cedar Creek WPCP)
- Performance Metric at Athens for Recreation and Habitats
- Performance Metric at Dublin for Habitats

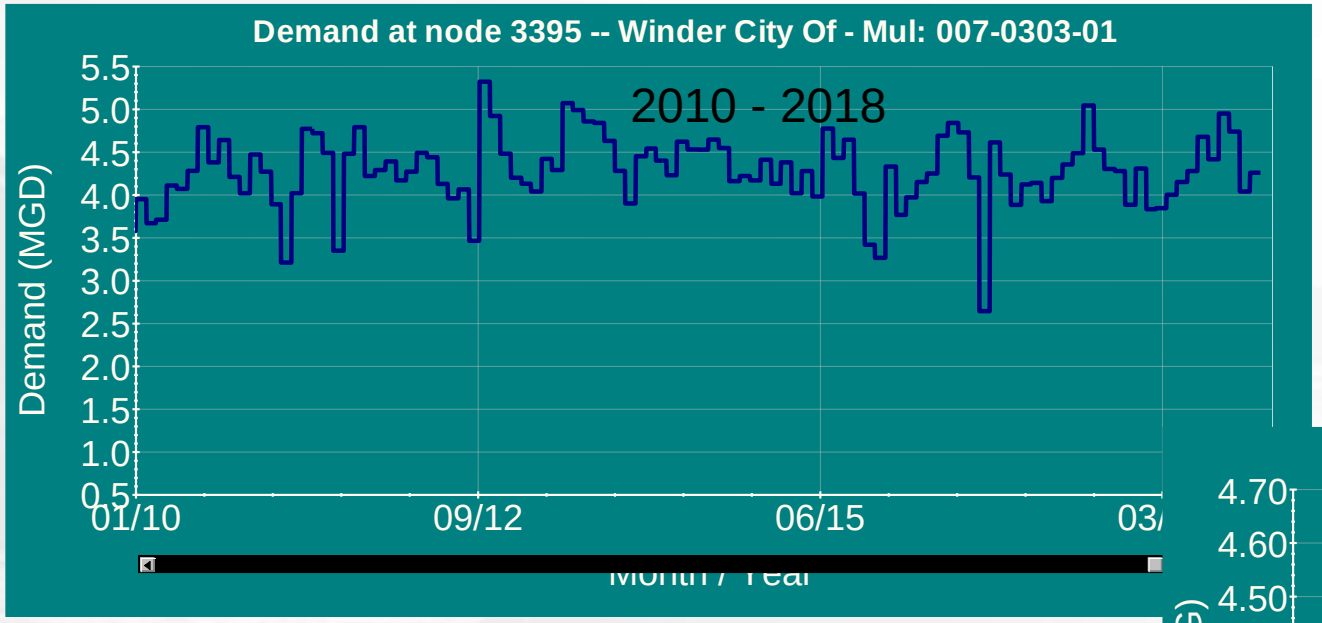
Example 1: Permit 007-0303-01 (BEAM Node 3395)

- Permit holder: City of Winder
- Withdrawal limits: 6.7/5.1 mgd (daily/monthly)

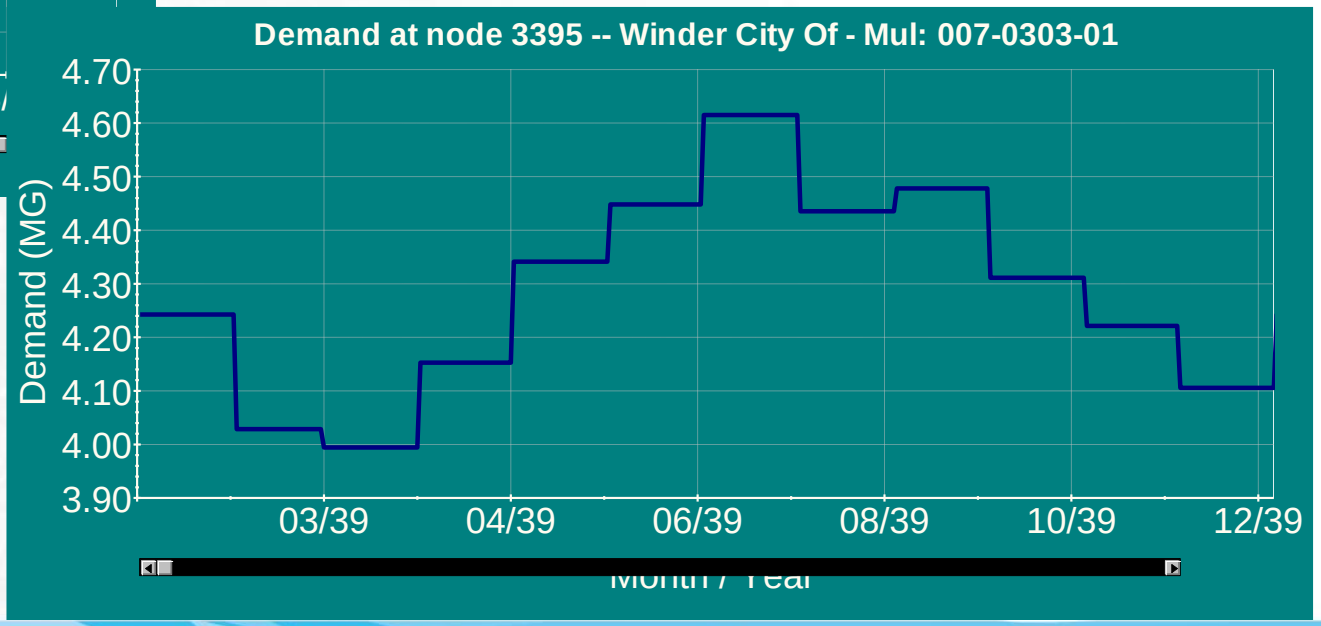




Permit 007-0303-01 Withdrawal Amount Setting-average of 2010-2018

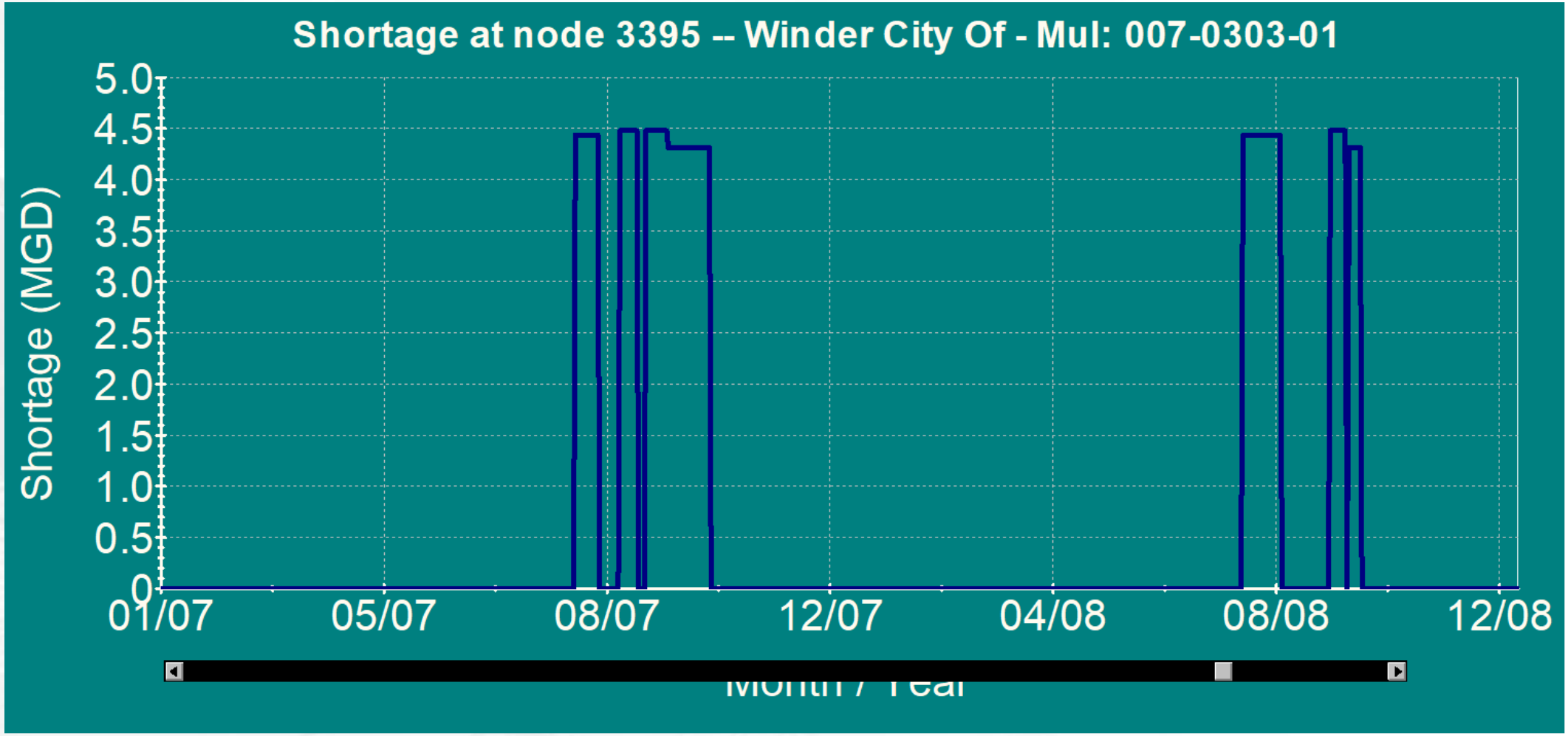


Baseline

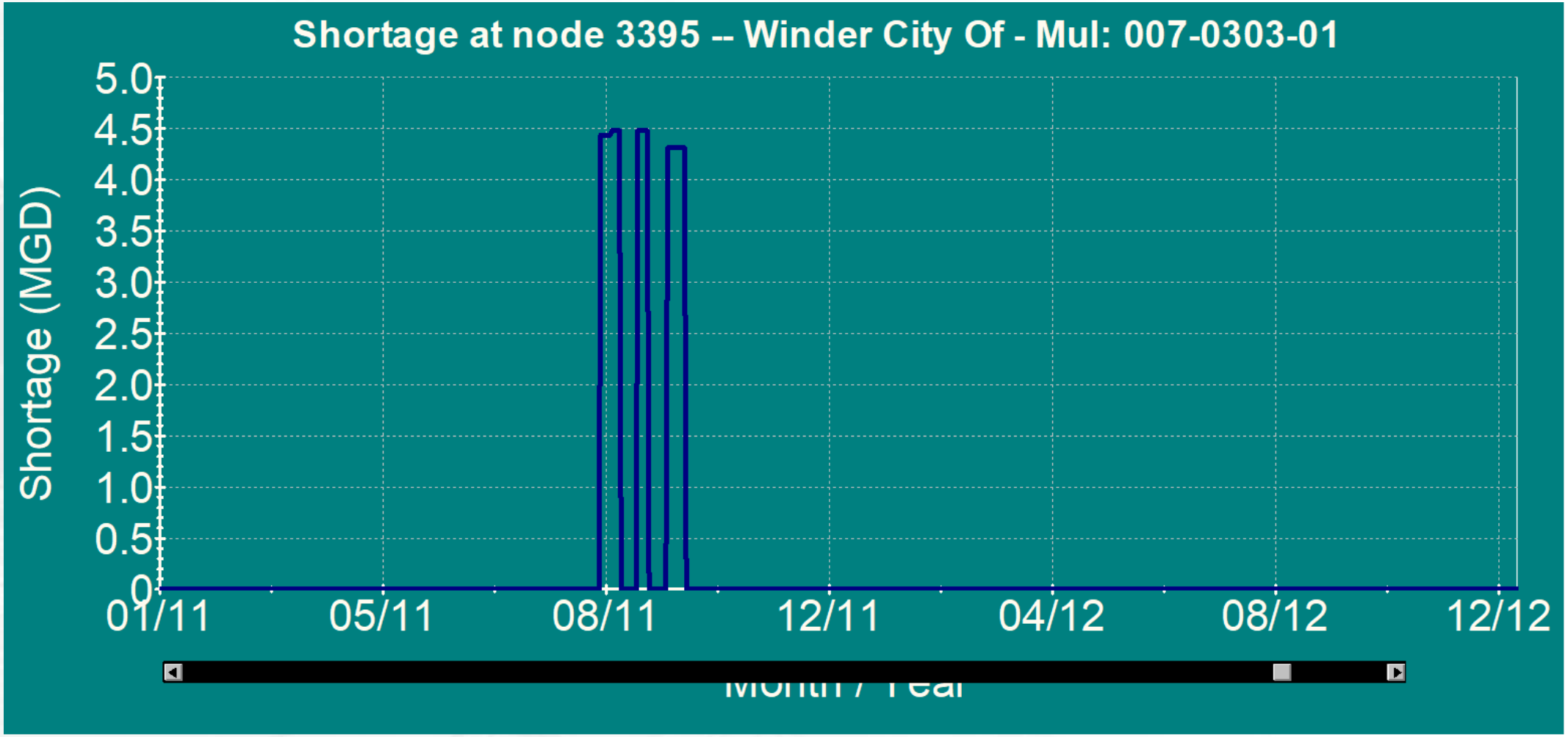


GEORGIA WATER PLANNING

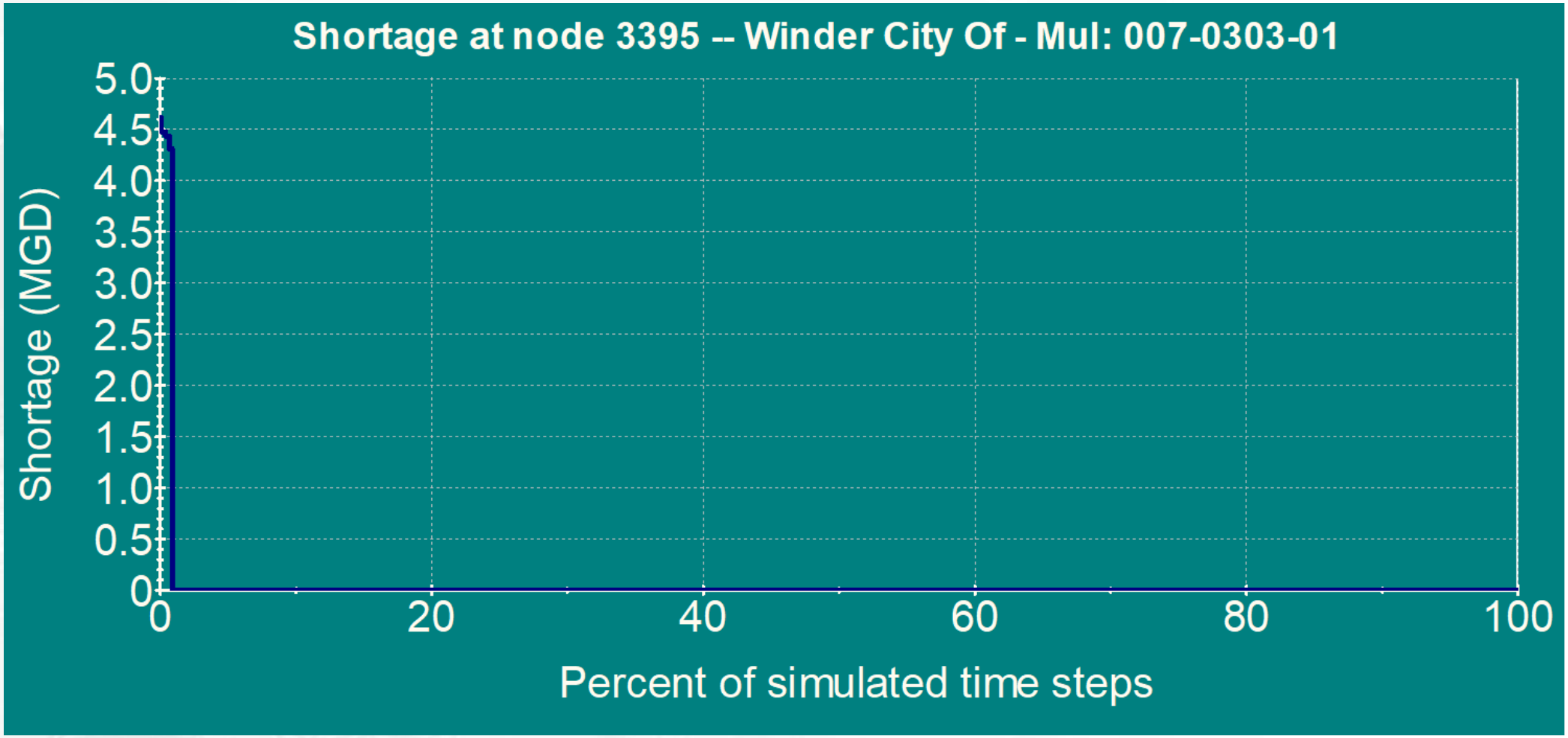
Water Supply Challenge in 2007-2008



Water Supply Challenge in 2011-2012



Water Supply Shortage Frequency in 1939-2018

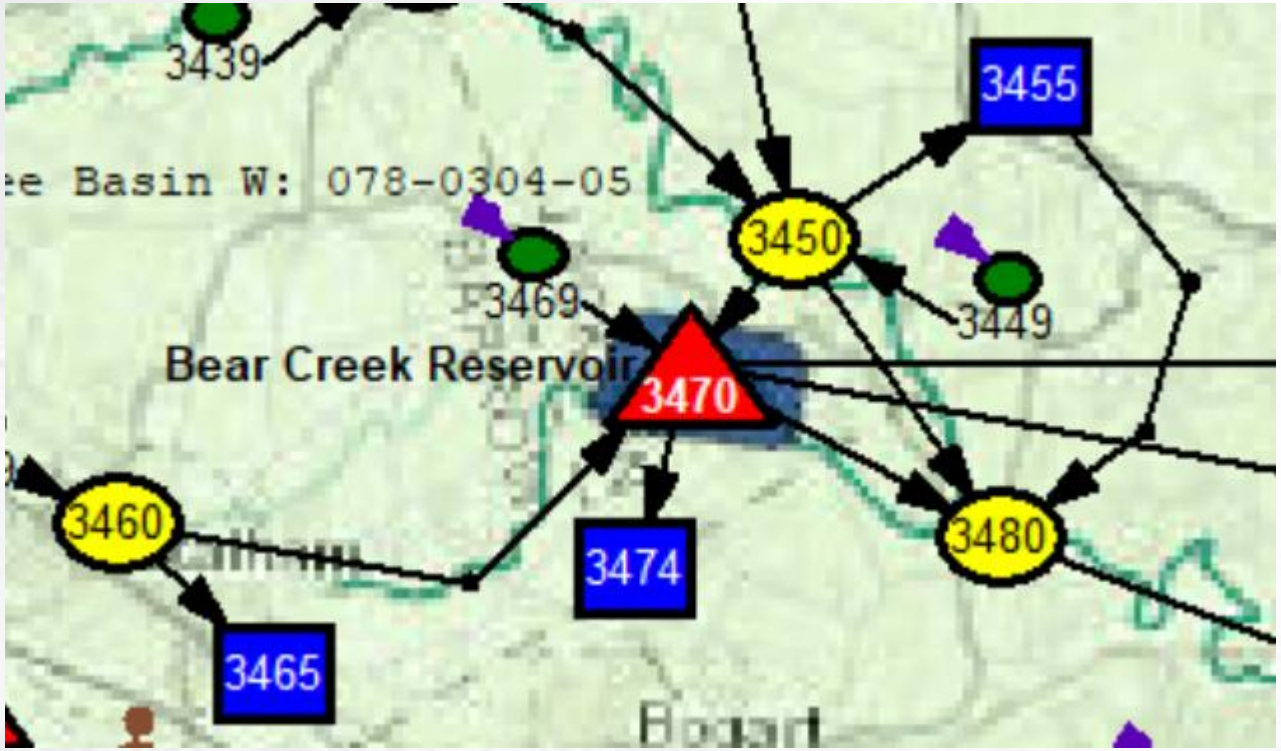


Water Supply Challenge Summary

Year	Total Days of Challenge	Total Volume of Shortage (acfe-ft)
1954	32	429.45
1955	5	68.19
1956	10	137.27
1957	11	150.88
1986	21	290.89
1988	18	250.74
1999	7	95.66
2000	4	56.64
2002	25	341.15
2007	58	783.46
2008	37	502.05
2011	27	365.08
Total	255	3471.48

Example 2: Permit 078-0304-06 (BEAM Node 3474)

- Permit holder: Upper Oconee Basin Water Authority
- Withdrawal limits: 79/58 mgd (daily/monthly)



Junction

USGS Gage

Reservoir

Routing Reservoir

Municipal/Industrial Withdrawal or Thermal Net Consumptive Use

Agricultural Withdrawal

Runoff Inflow

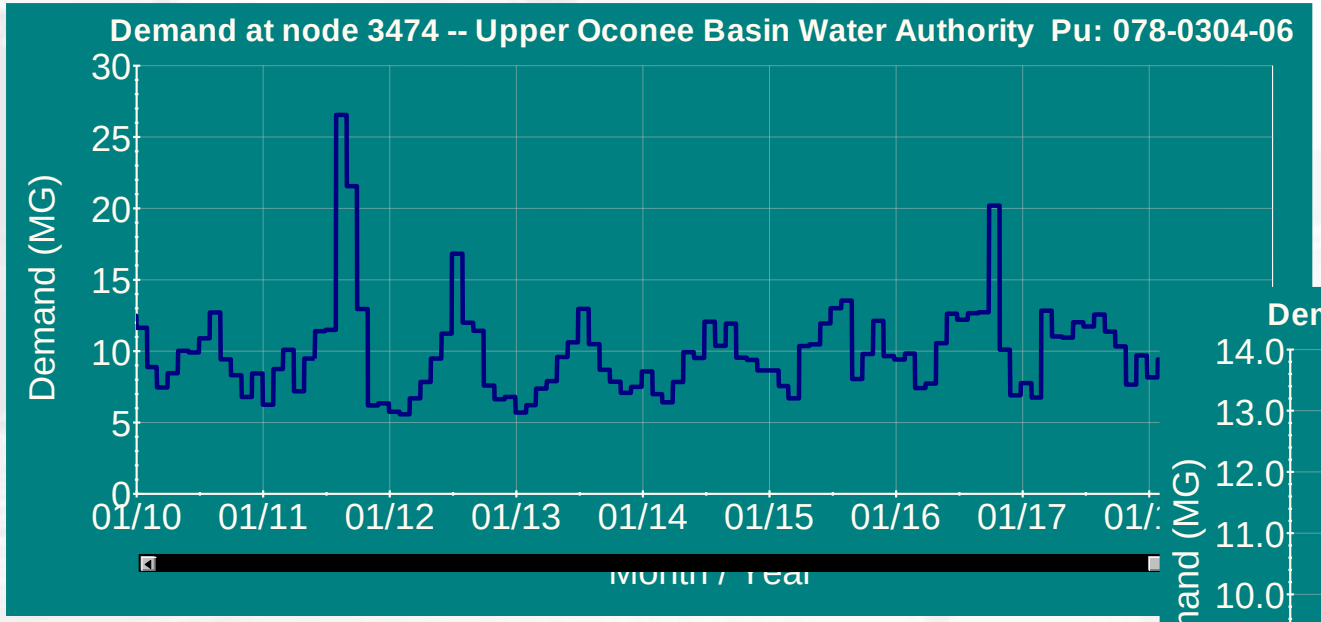
Municipal or Industrial Discharge

Overbank/Overland Flooding Loss

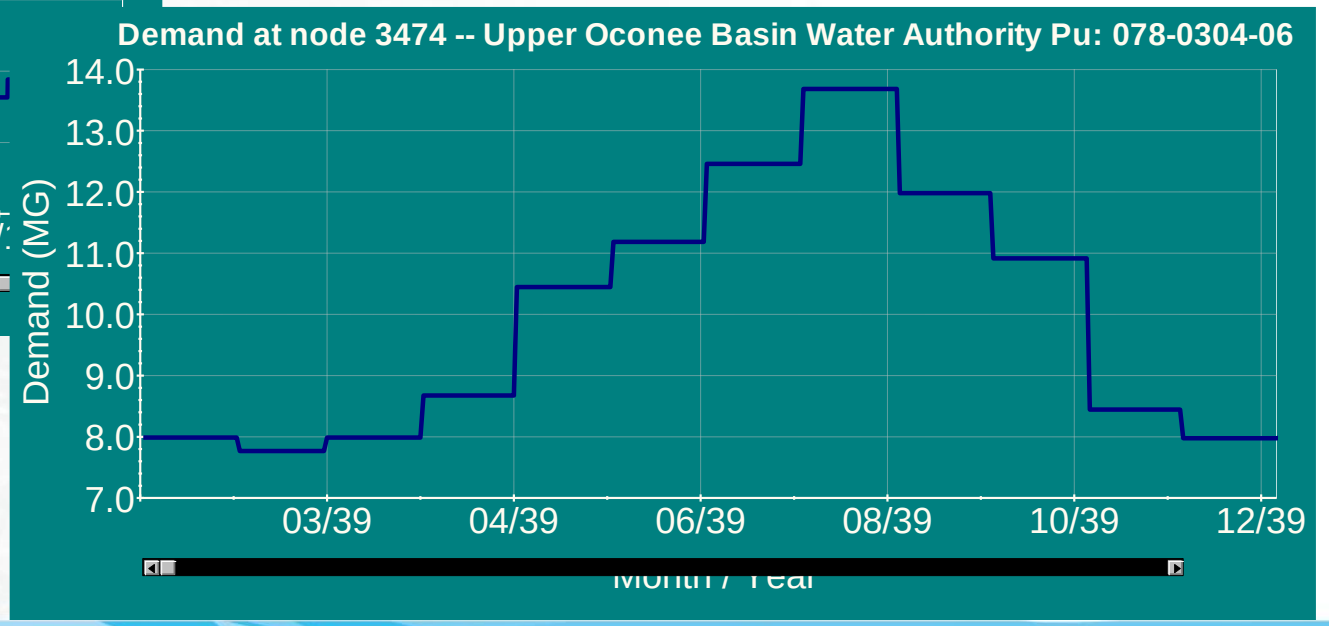
Flow Arc

Permit 078-0304-06 Withdrawal Amount Setting-average of 2010-2018

2010 - 2018

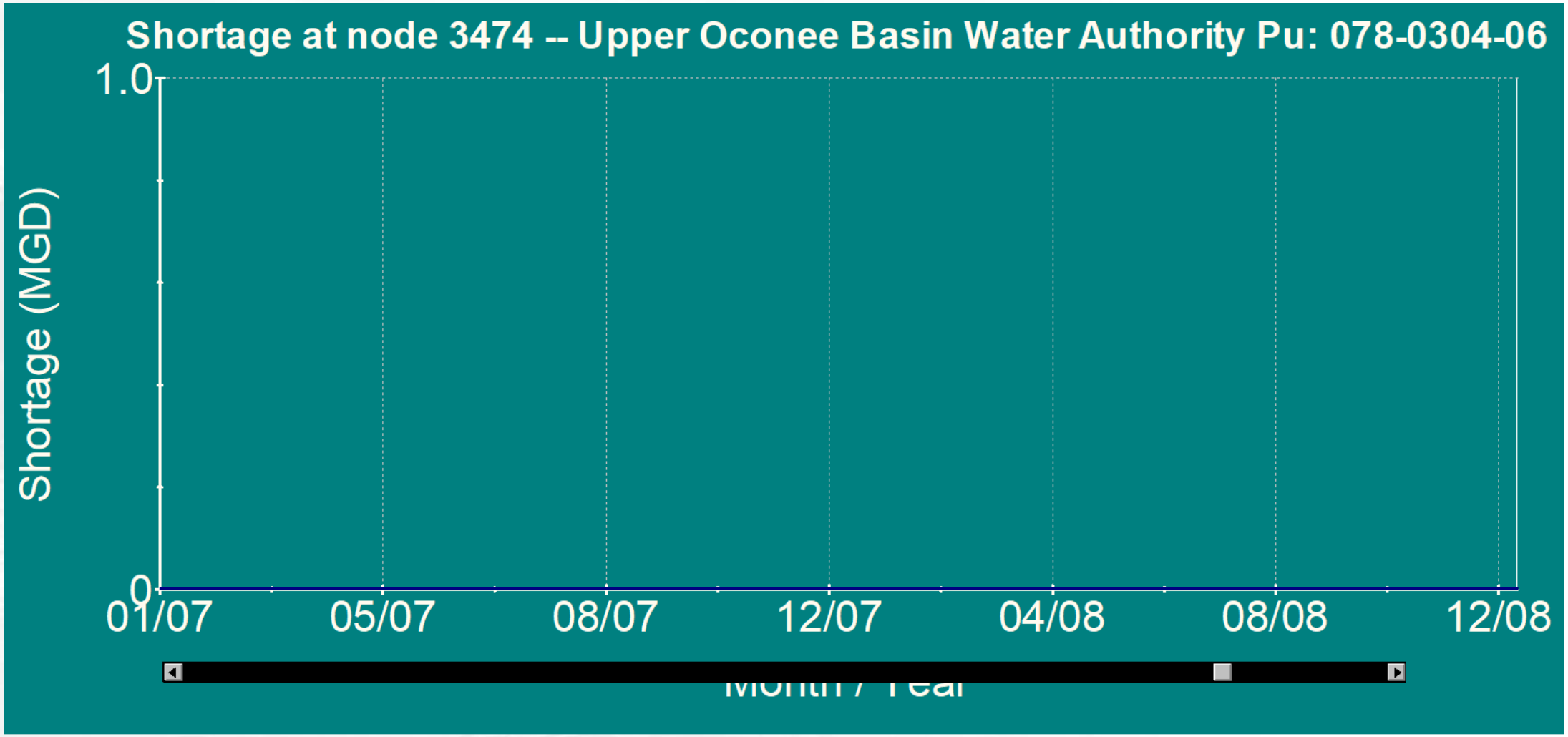


Baseline

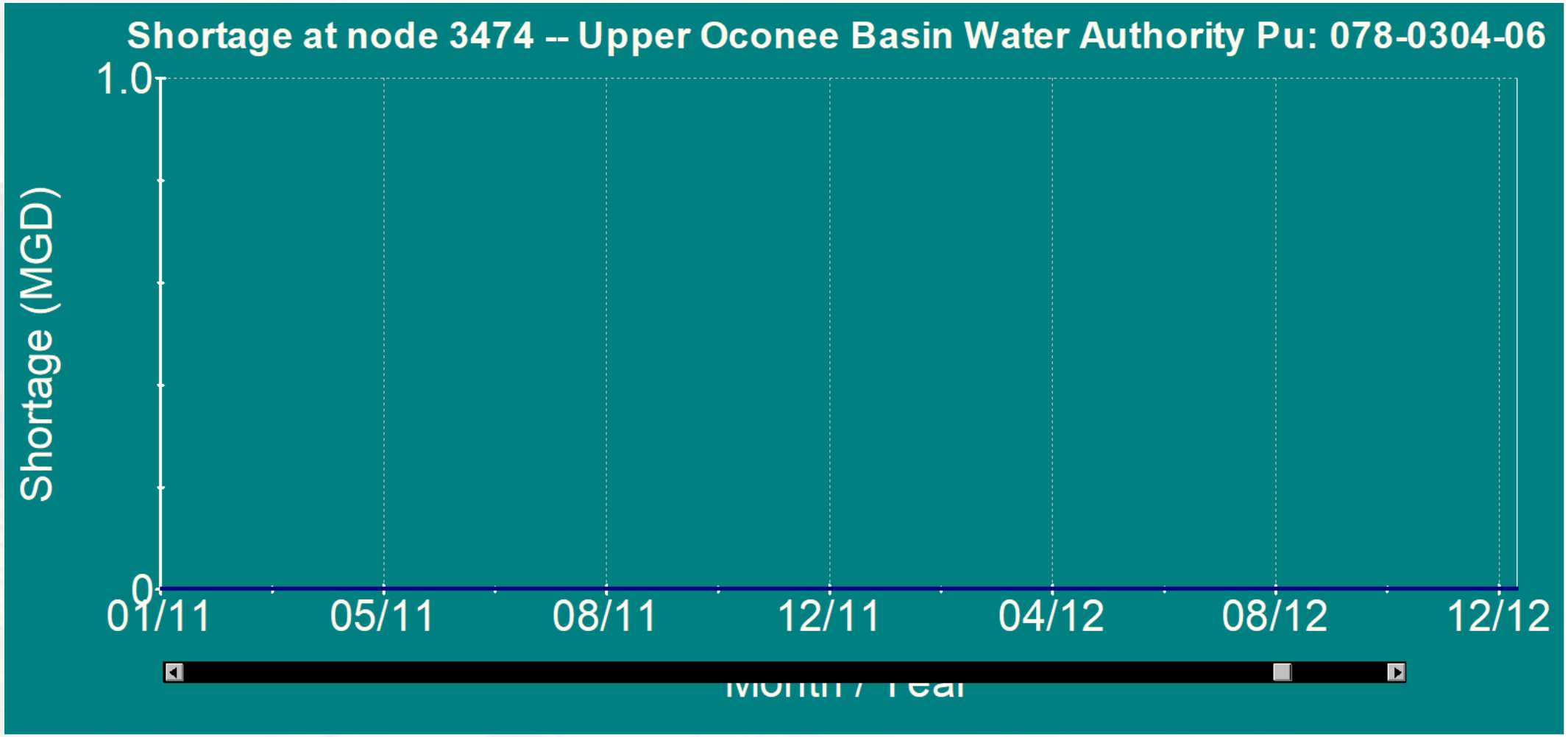


GEORGIA WATER PLANNING

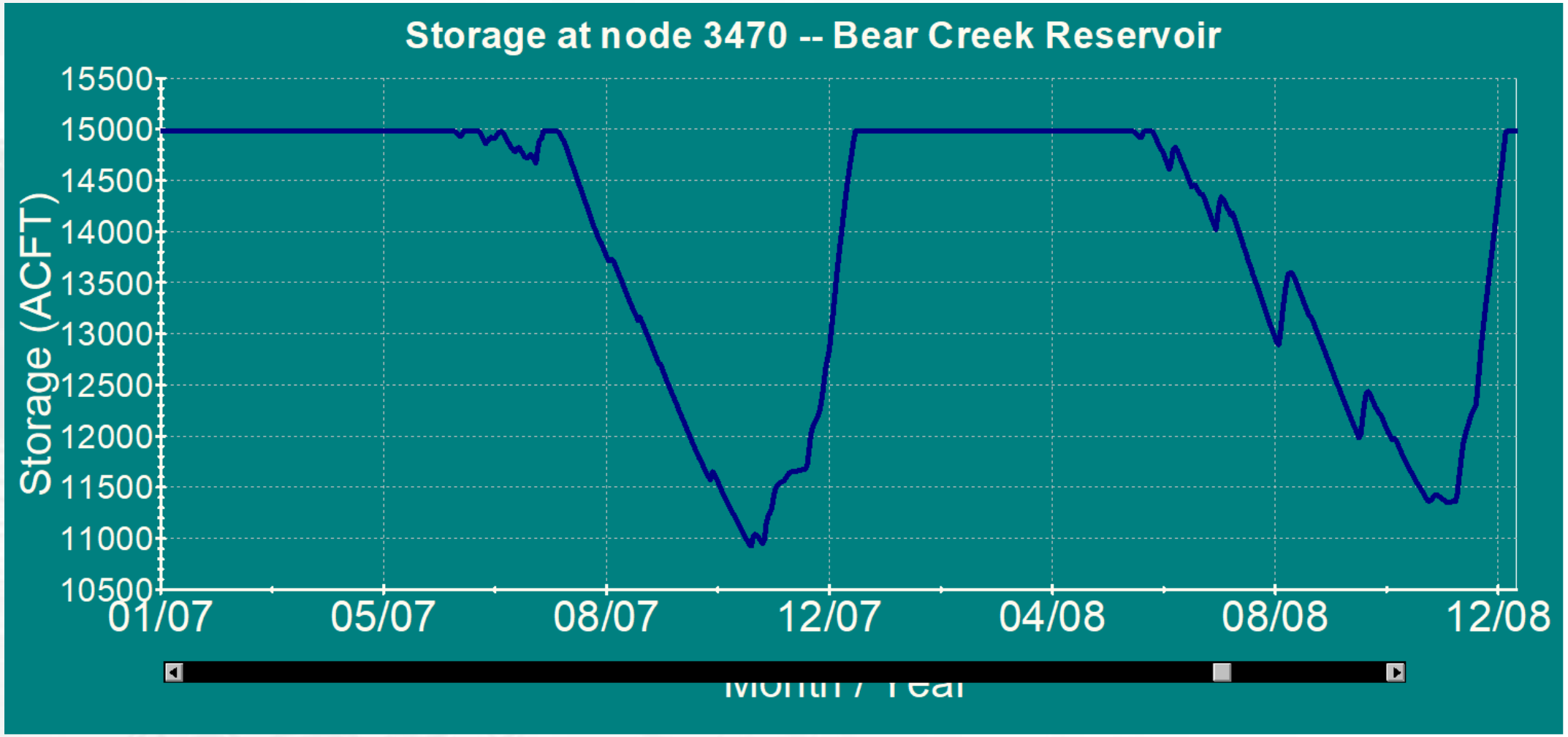
Water Supply Challenge in 2007-2008



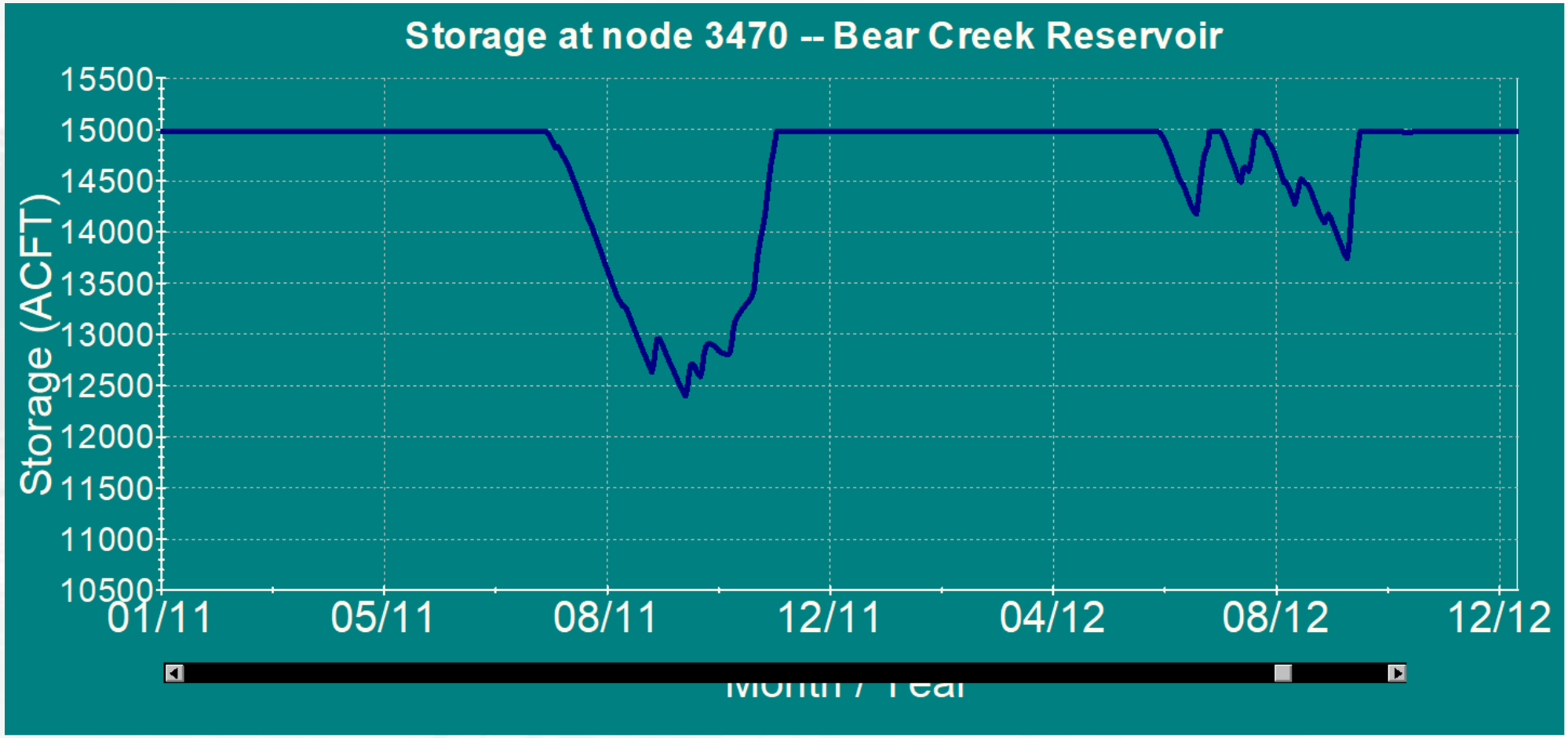
Water Supply Challenge in 2011-2012



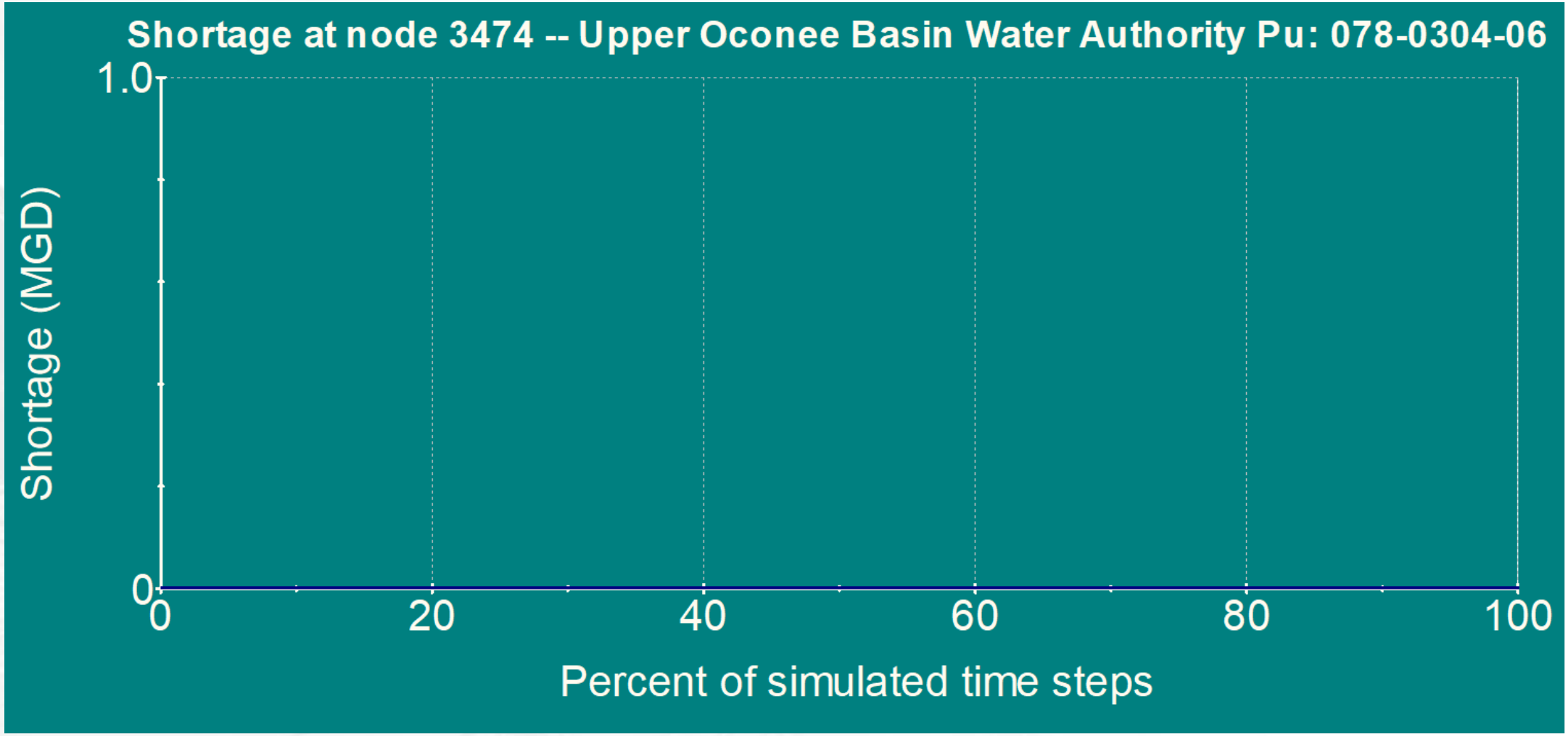
Simulated Useable Storage in 2007-2008



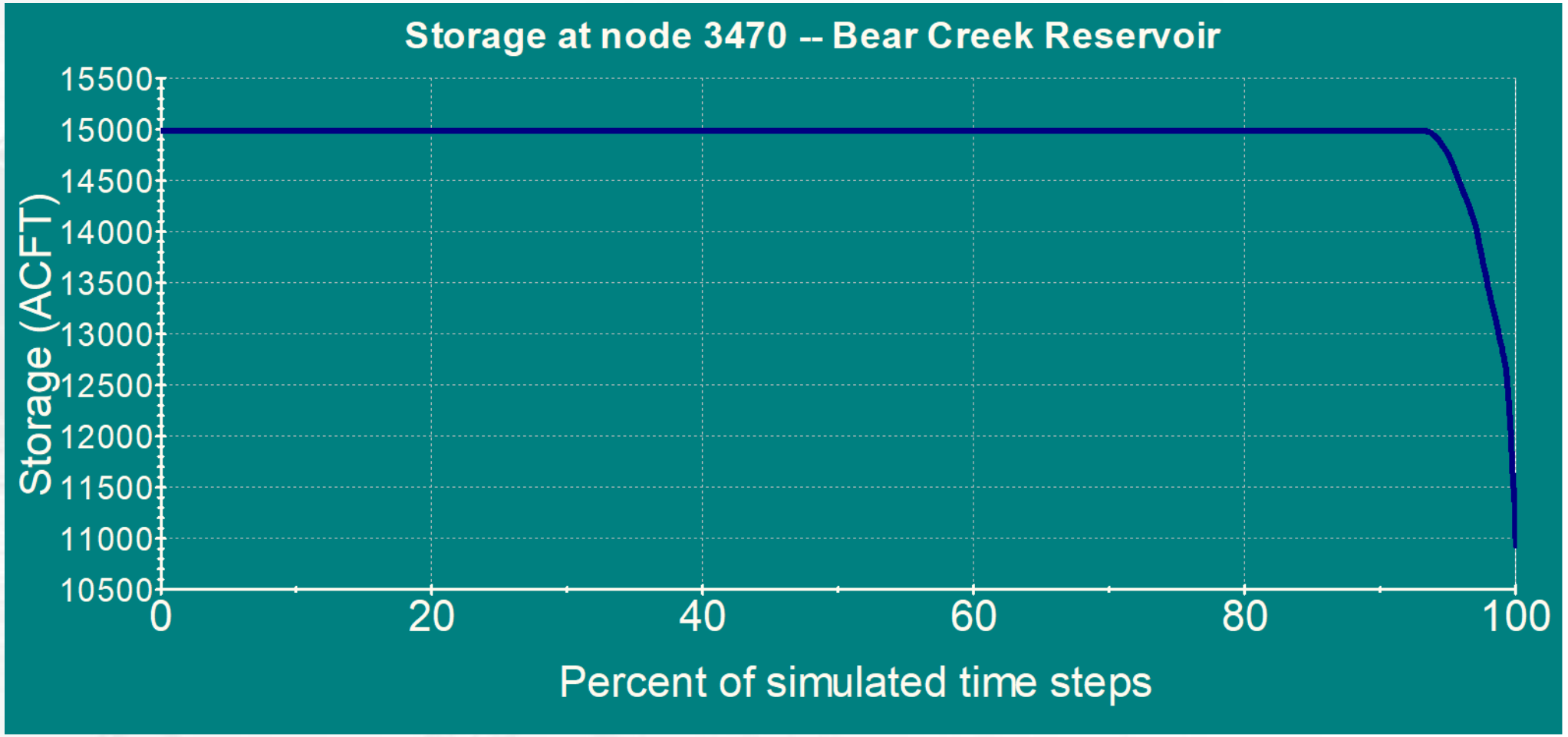
Simulated Useable Storage in 2011-2012



Water Supply Challenge in 1939-2018

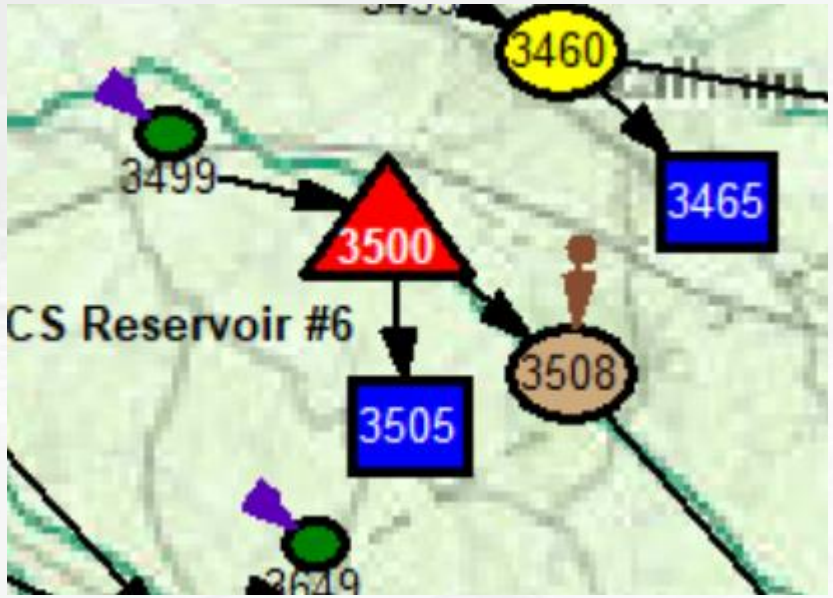


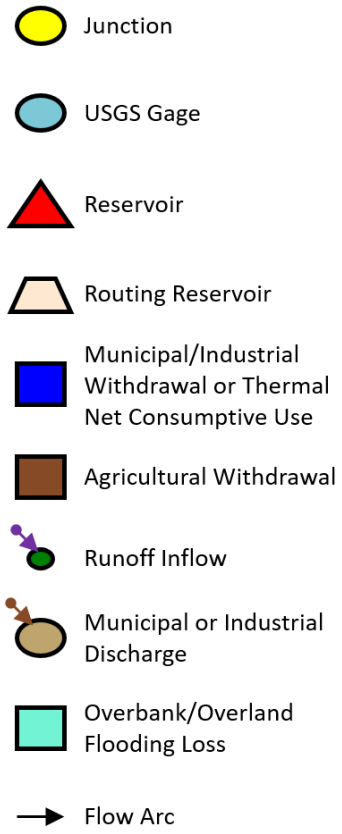
Simulated Useable Storage Frequency



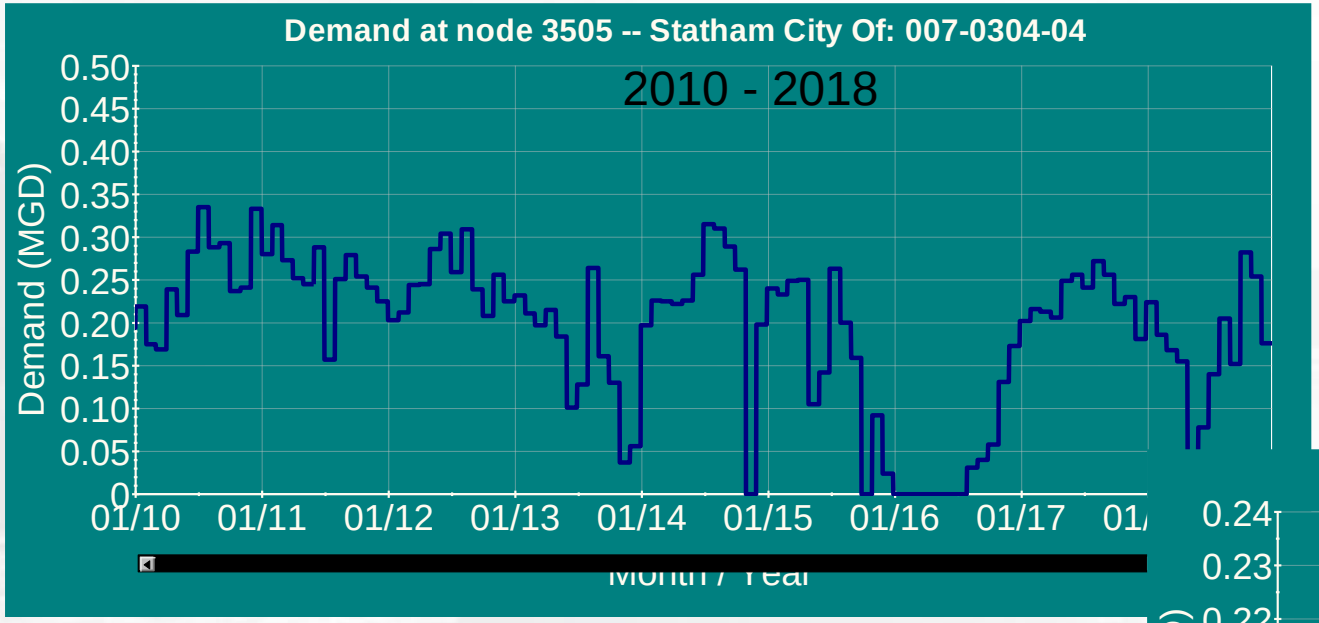
Example 3: Permit 007-0304-04 (BEAM Node 3505)

- Permit holder: City of Statham
- Withdrawal limits: 1.0/0.8 mgd (daily/monthly)

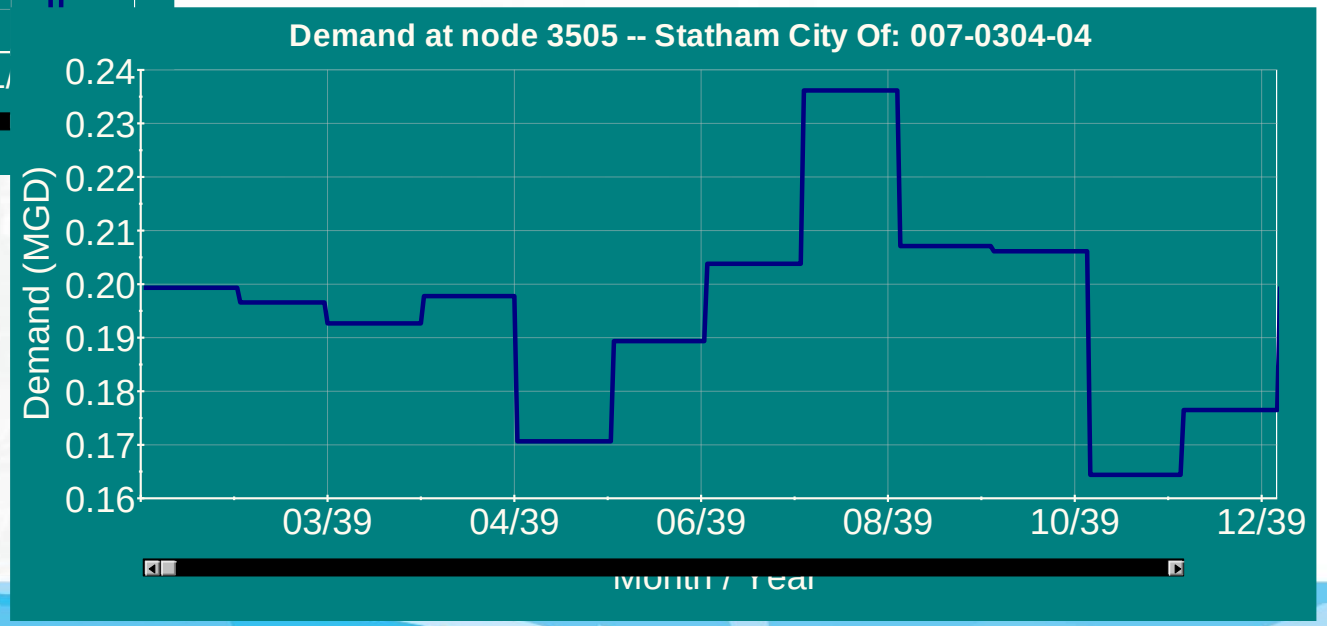




Permit 007-0304-04 Withdrawal Amount Setting-average of 2010-2018

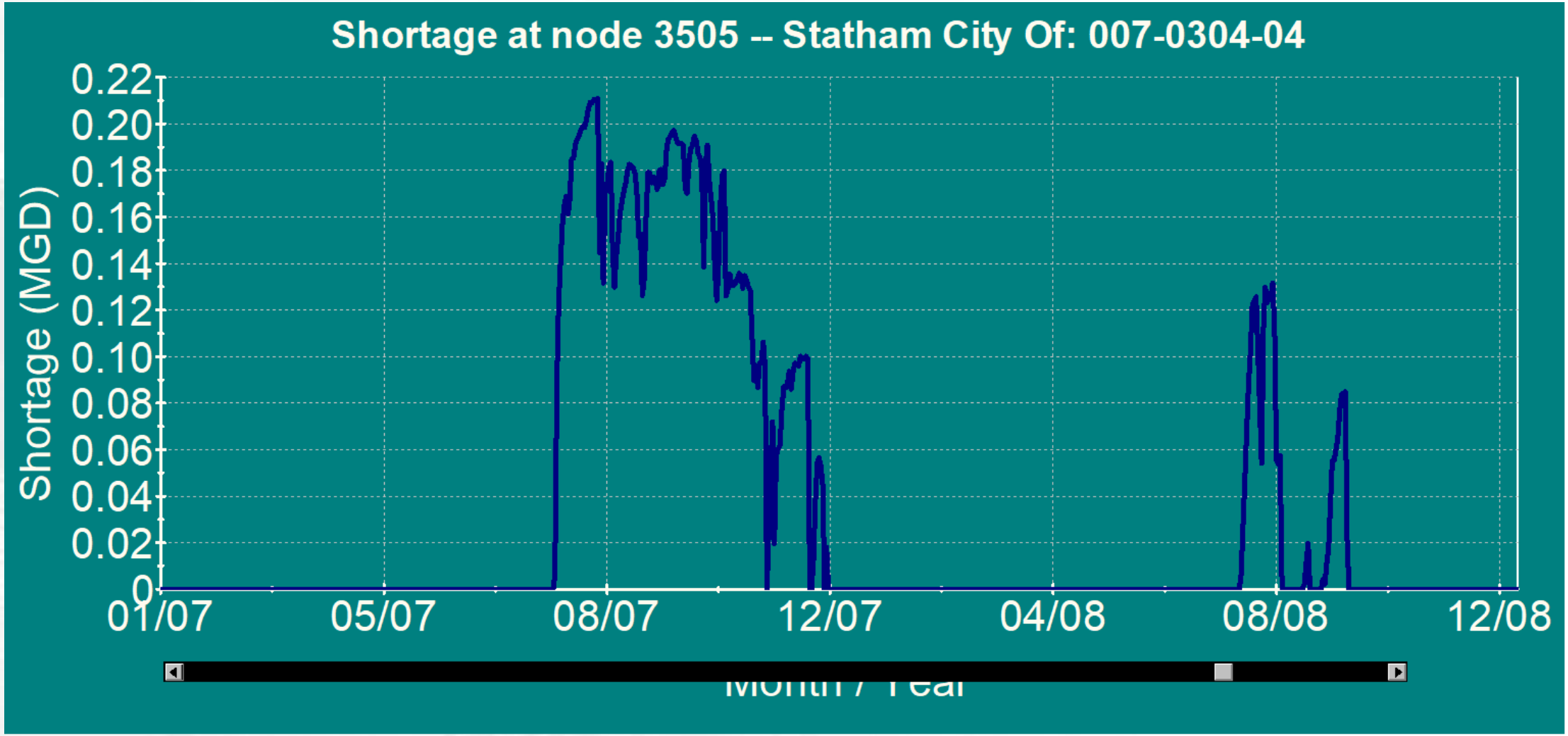


Baseline

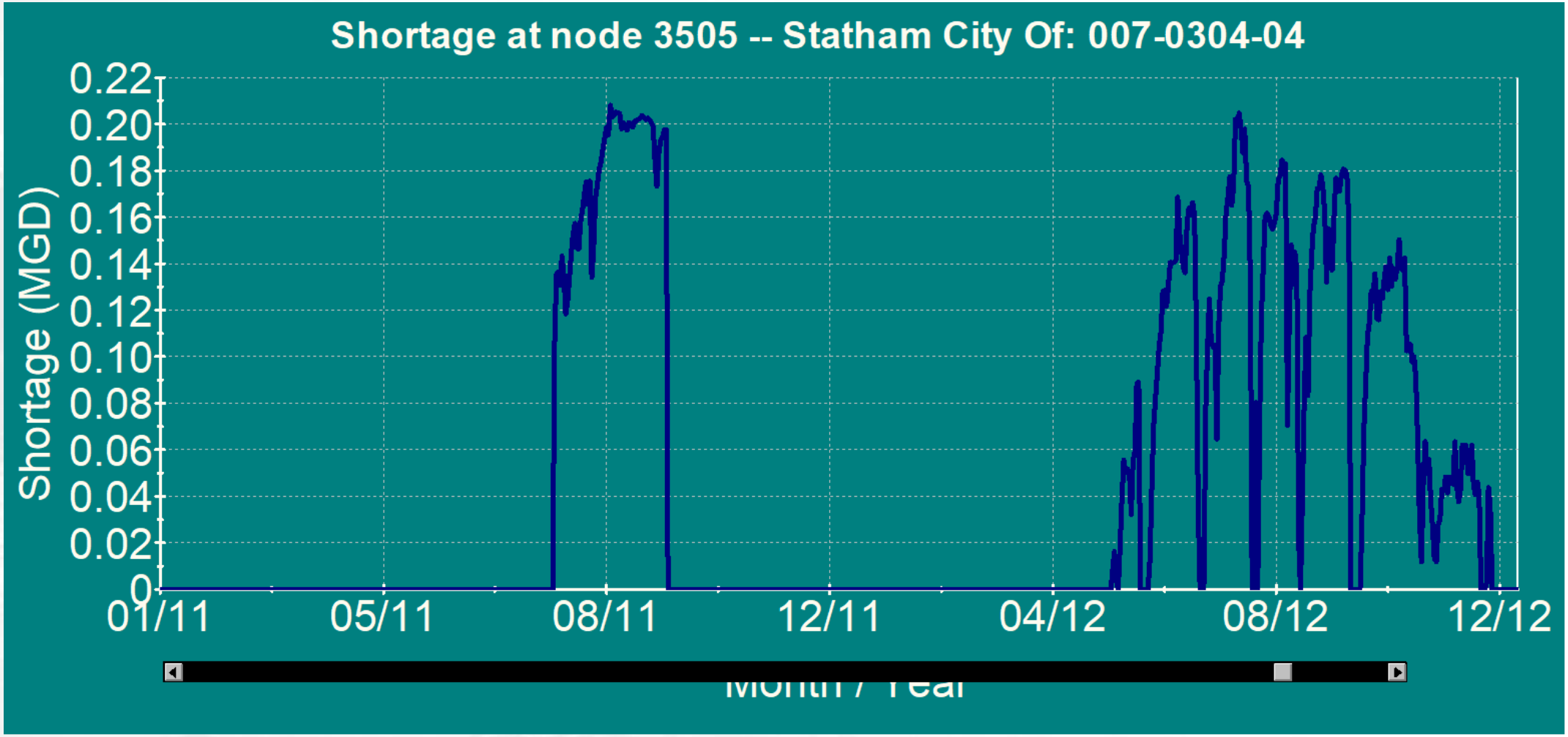


GEORGIA WATER PLANNING

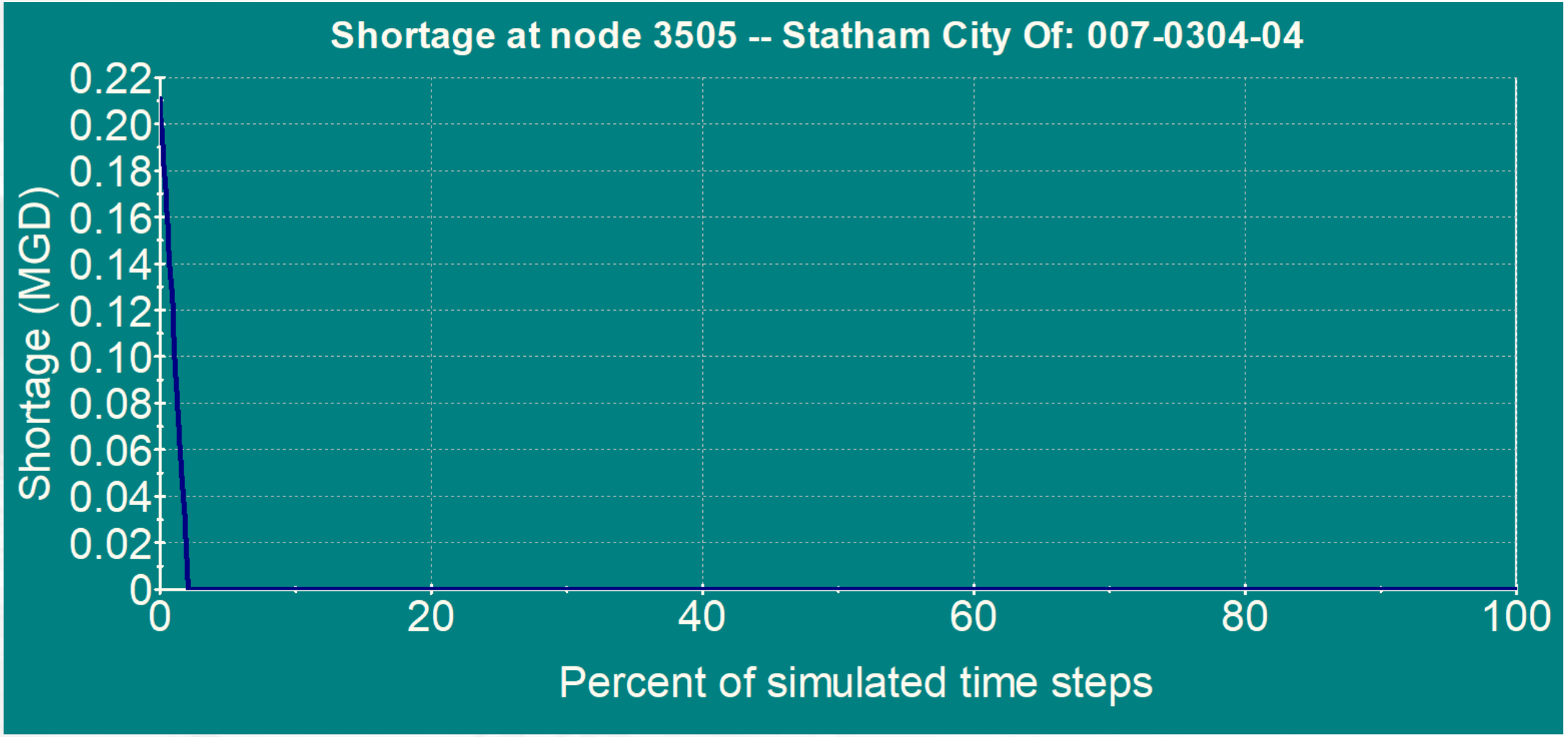
Water Supply Challenge in 2007-2008



Water Supply Challenge in 2011-2012



Water Supply Challenge in 1939-2018



Discussion

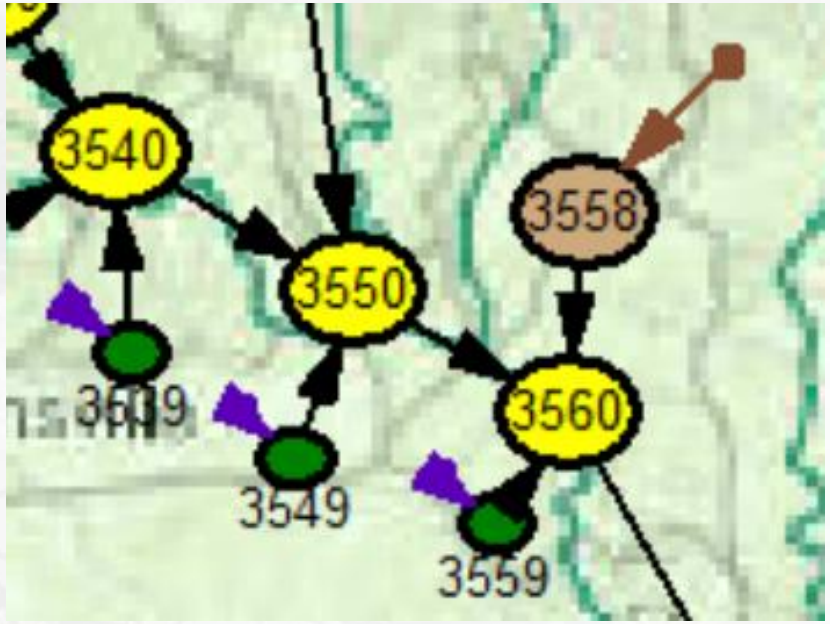
- Do you want to adopt this performance metric as part of your plan?
- Future conditions will be included in the next update in Resource Assessment for comparison with the baseline.
- What additional performance measures would you like to see in assessing water supply?

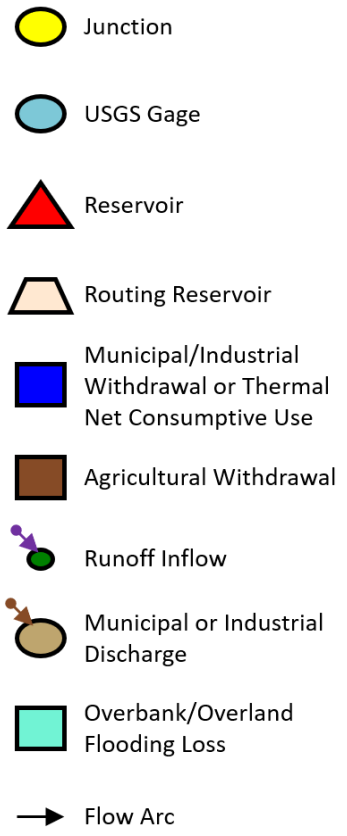
Wastewater Assimilation Challenge

- Wastewater increases with population growth, which may also bring challenge to water resource management.
- 7Q10 flow is usually used as low flow threshold for wastewater assimilation.

Wastewater Assimilation Challenge Example: Permit GA0034584 (BEAM Node 3558)

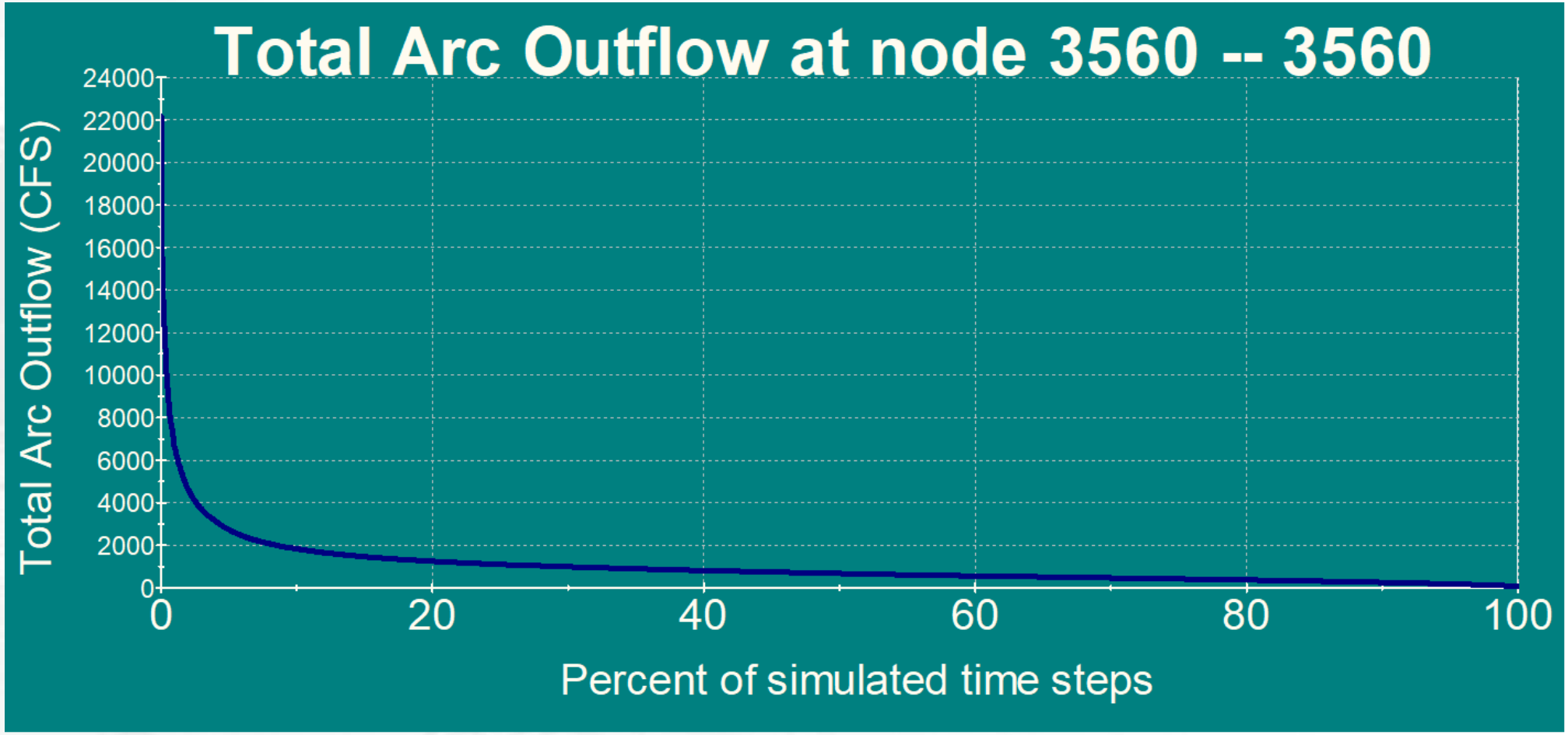
- Permit holder: Athens-Clarke County (Cedar Creek WPCP)
- Permitted monthly discharge flow: 4 mgd
- 7Q10 Flow at discharge location: 91.82 cfs



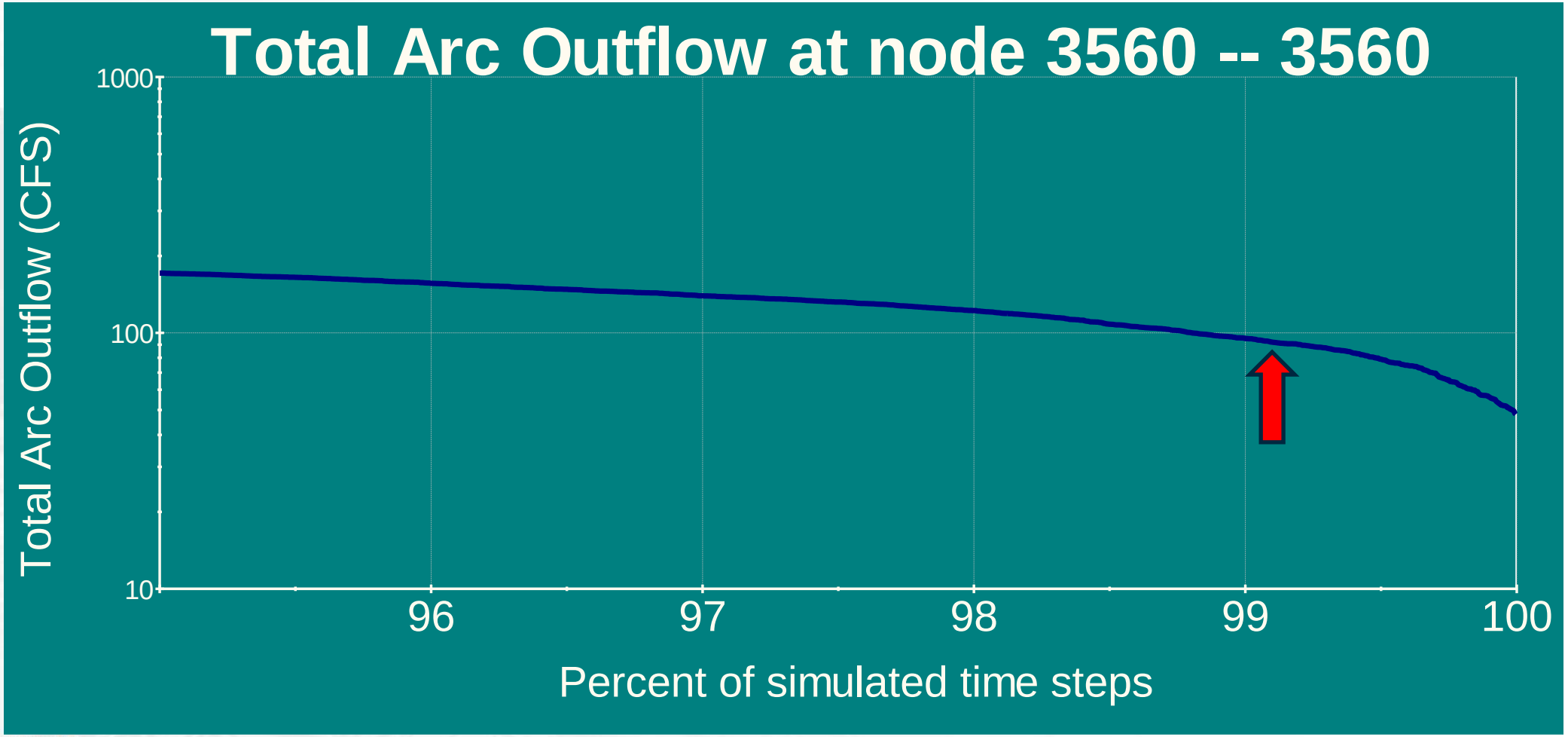


GEORGIA WATER PLANNING

Simulation Results at GA 0034584 Location Flow Frequency

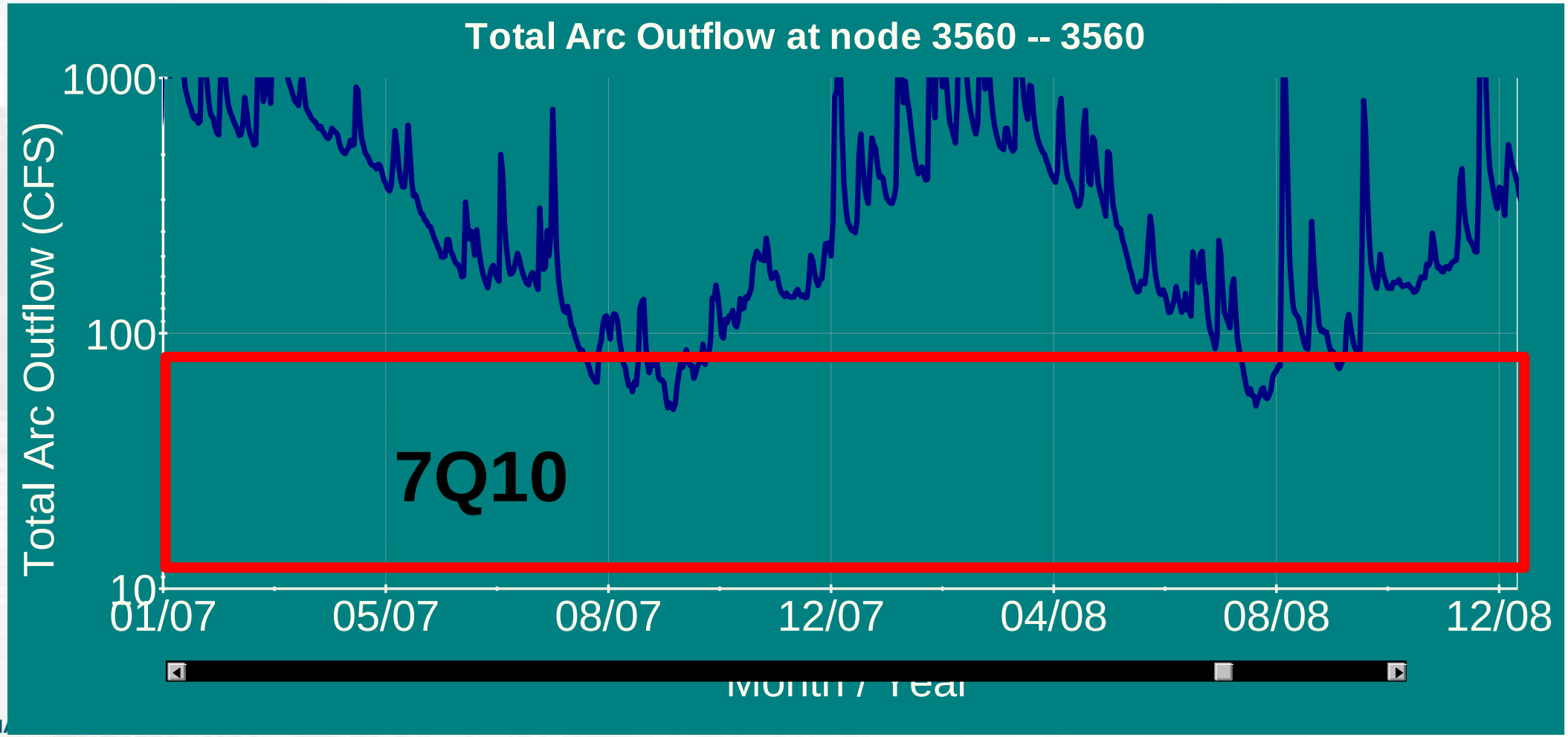


Simulation Results at GA 0034584 Location Flow Frequency (low end) (7Q10 = 91.82 cfs)

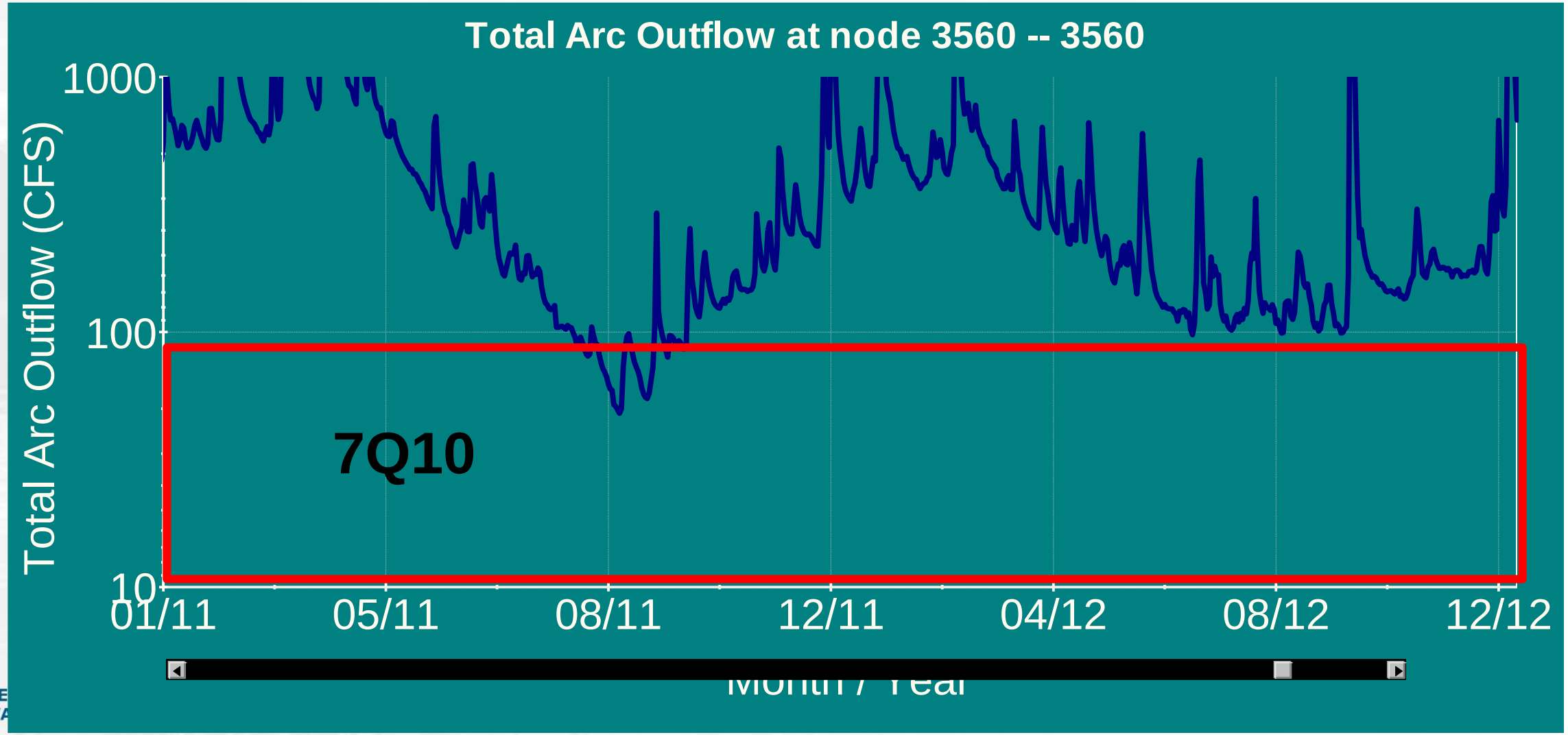


GEORGIA WATER PLANNING

Simulation Results at GA 0034584 Location Flow in 2007



Simulation Results at GA 0034584 Location Flow in 2011



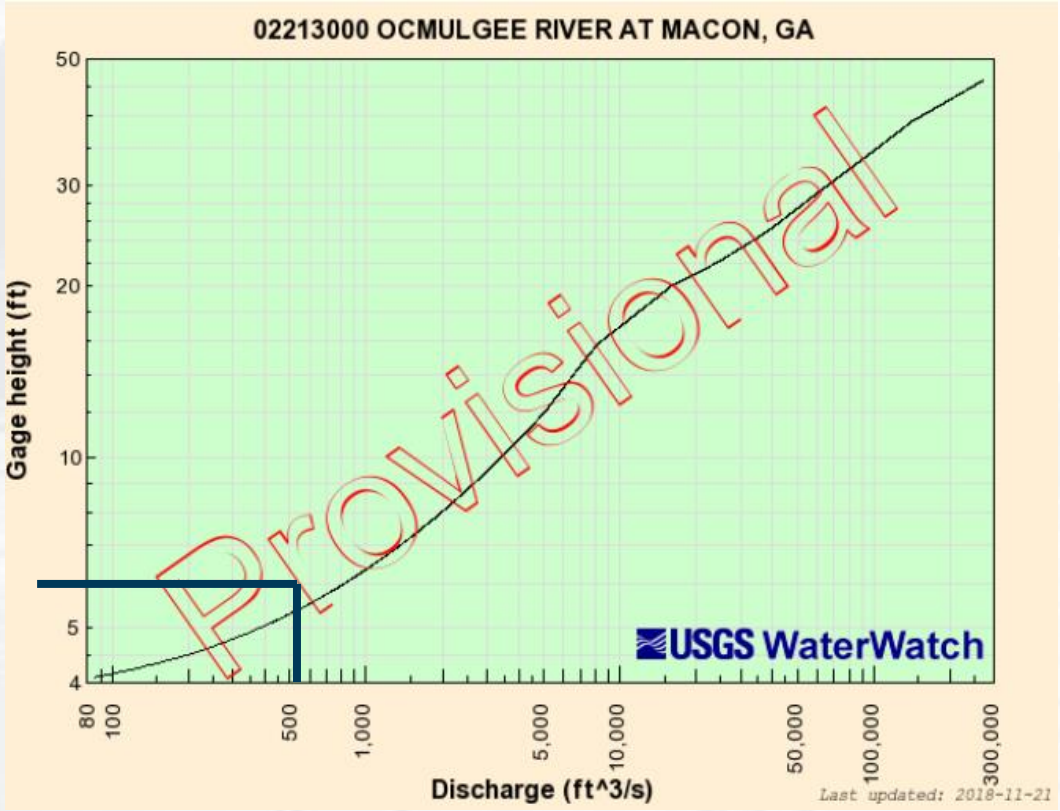
Wastewater Assimilation Challenge Summary

Year	Total Days of Challenge	Total volume of Shortage (acre-ft)
1954	23	258.83
1956	3	11.37
1986	20	599.09
1988	13	378.25
2000	6	214.75
2002	38	1967.76
2007	56	2247.84
2008	40	1566.23
2011	45	1622.69
2016	17	90.55
Total	261	8957.35

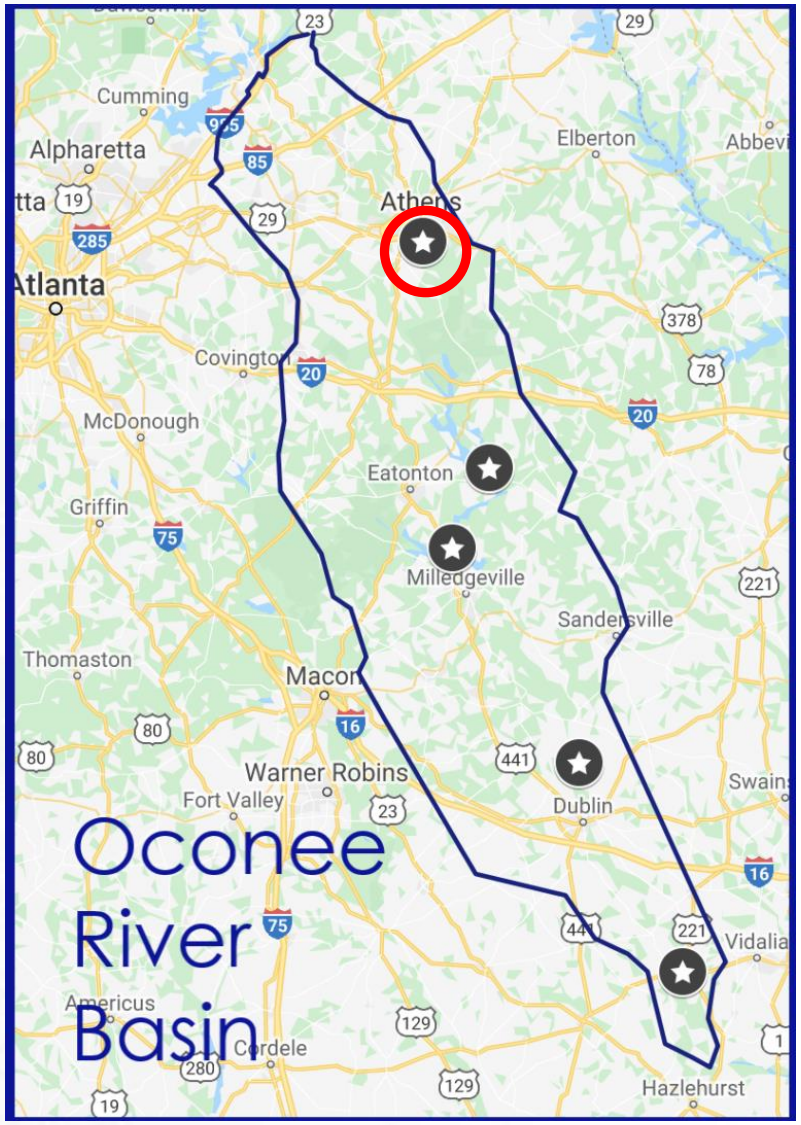
Using Flow to Create Boating/Paddling Performance Metric

For Informational Purposes Only

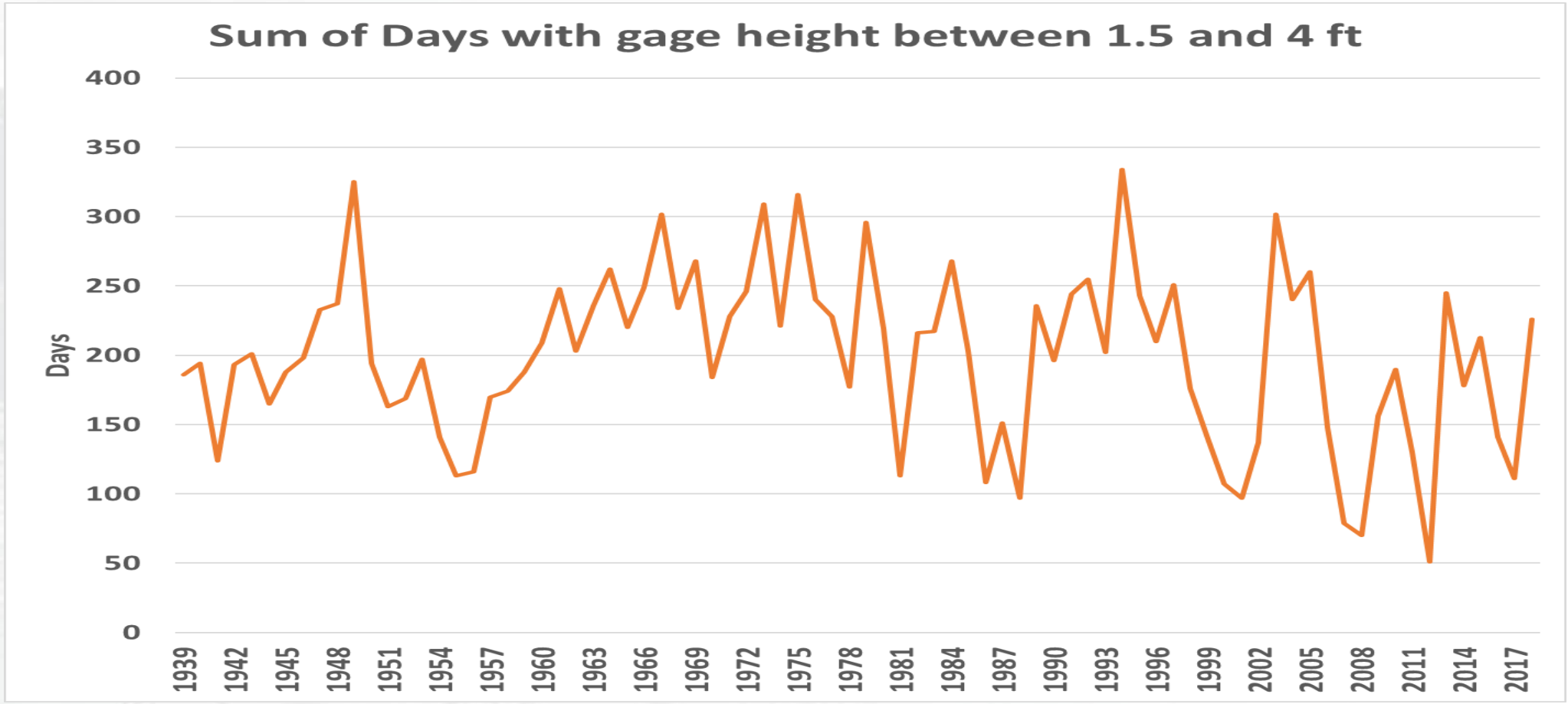
- Convert stream flow to stage



Locations of Recreational & Habitats Interests– Stakeholder Input

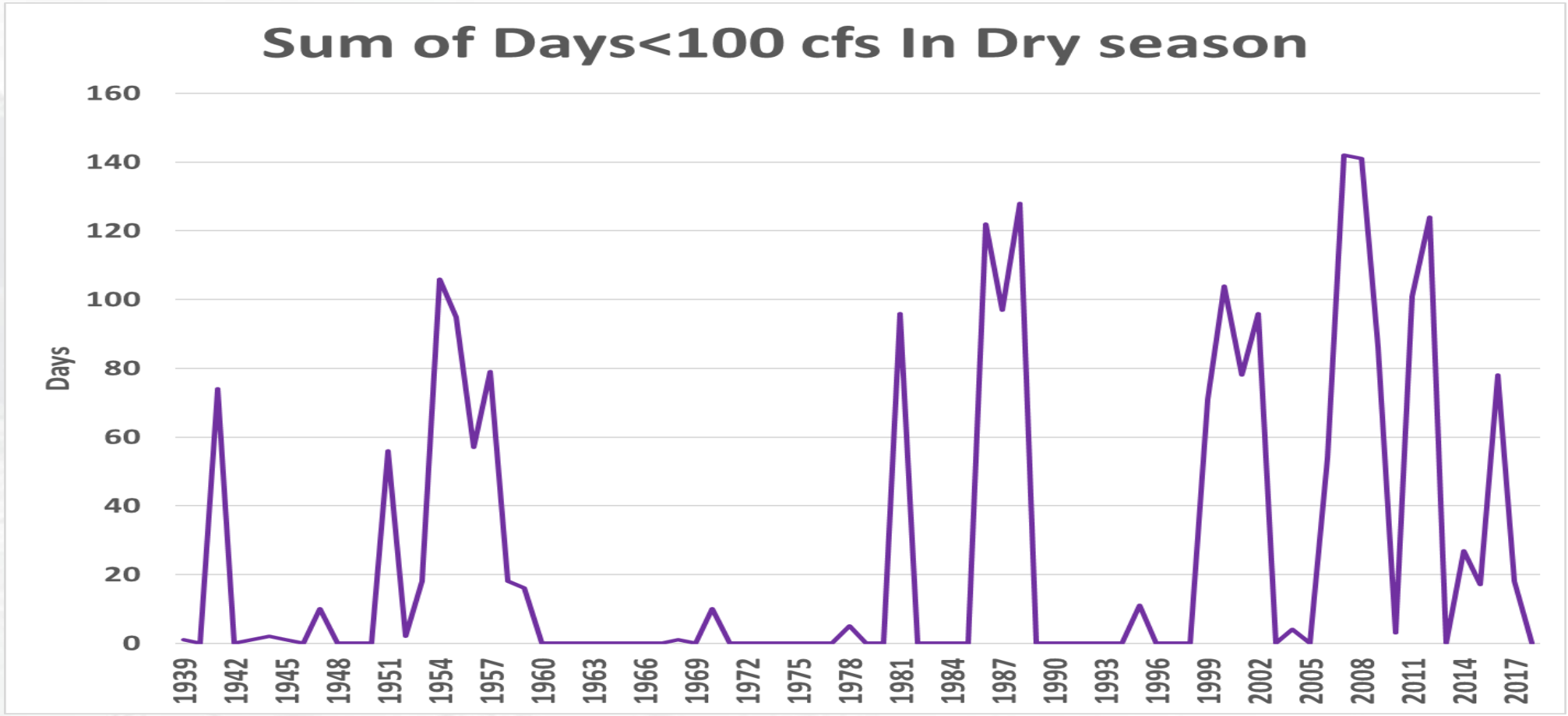


Performance Metric Example 1: Athens, GA for Kayaks & Canoes



Better

Performance Metric Example 2: Athens, GA for loss of riverweed & caddisflies in shoal habitats



Better

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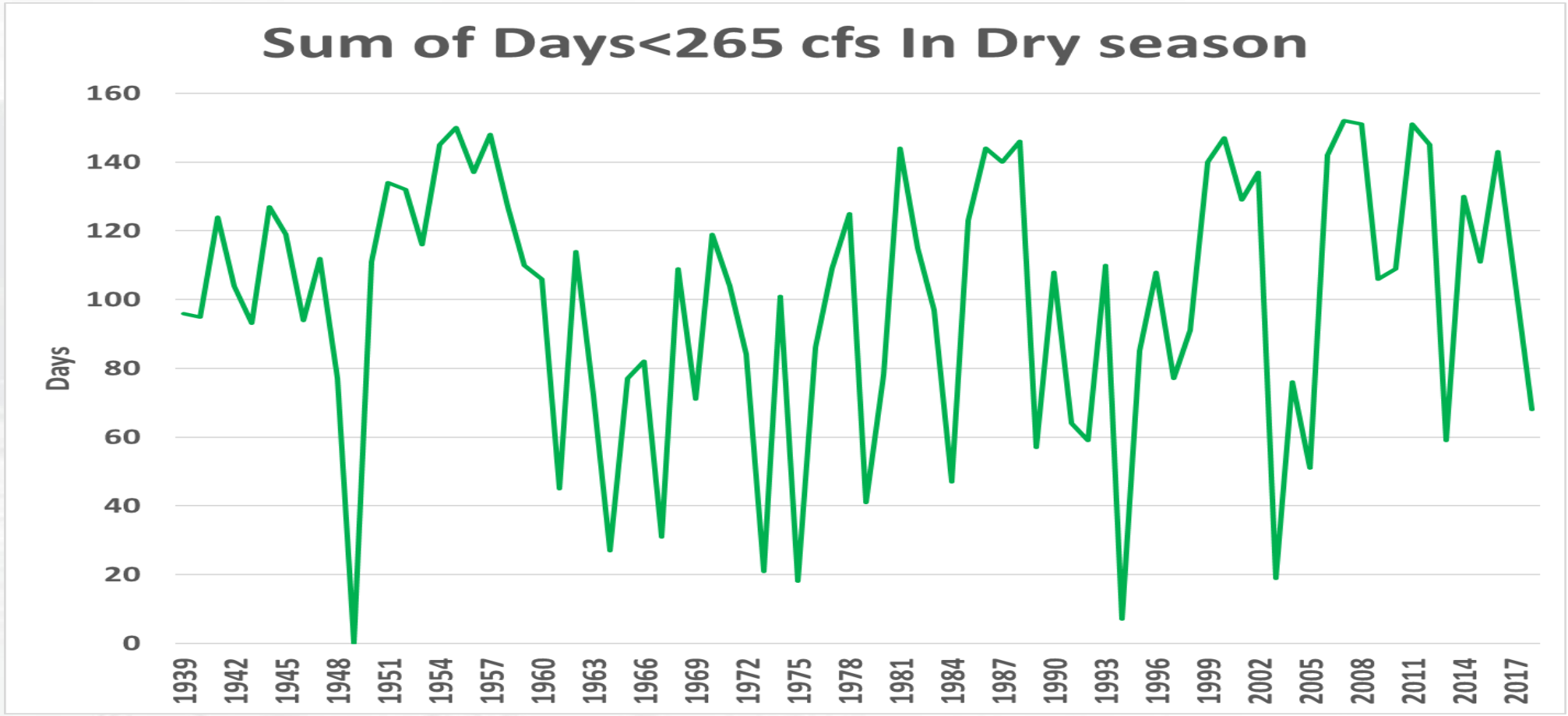
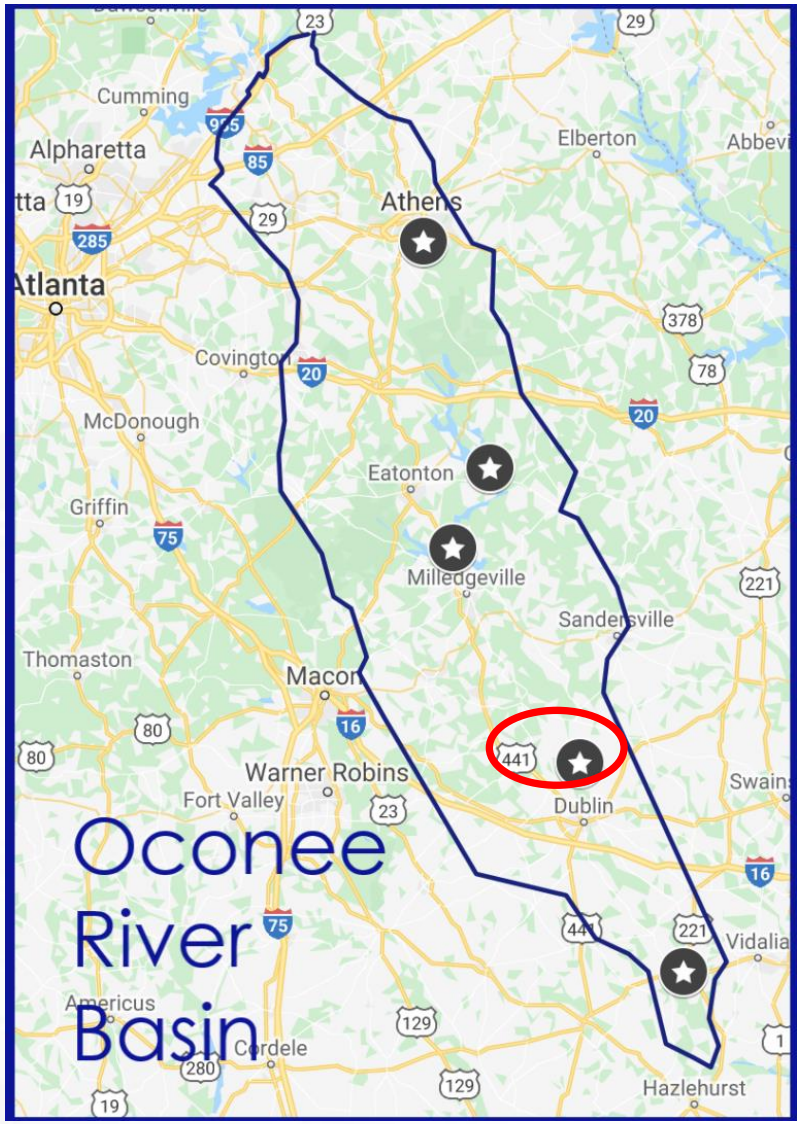
Performance Metric Example 3:Athens, GA for almost complete loss of swift water habitat in river

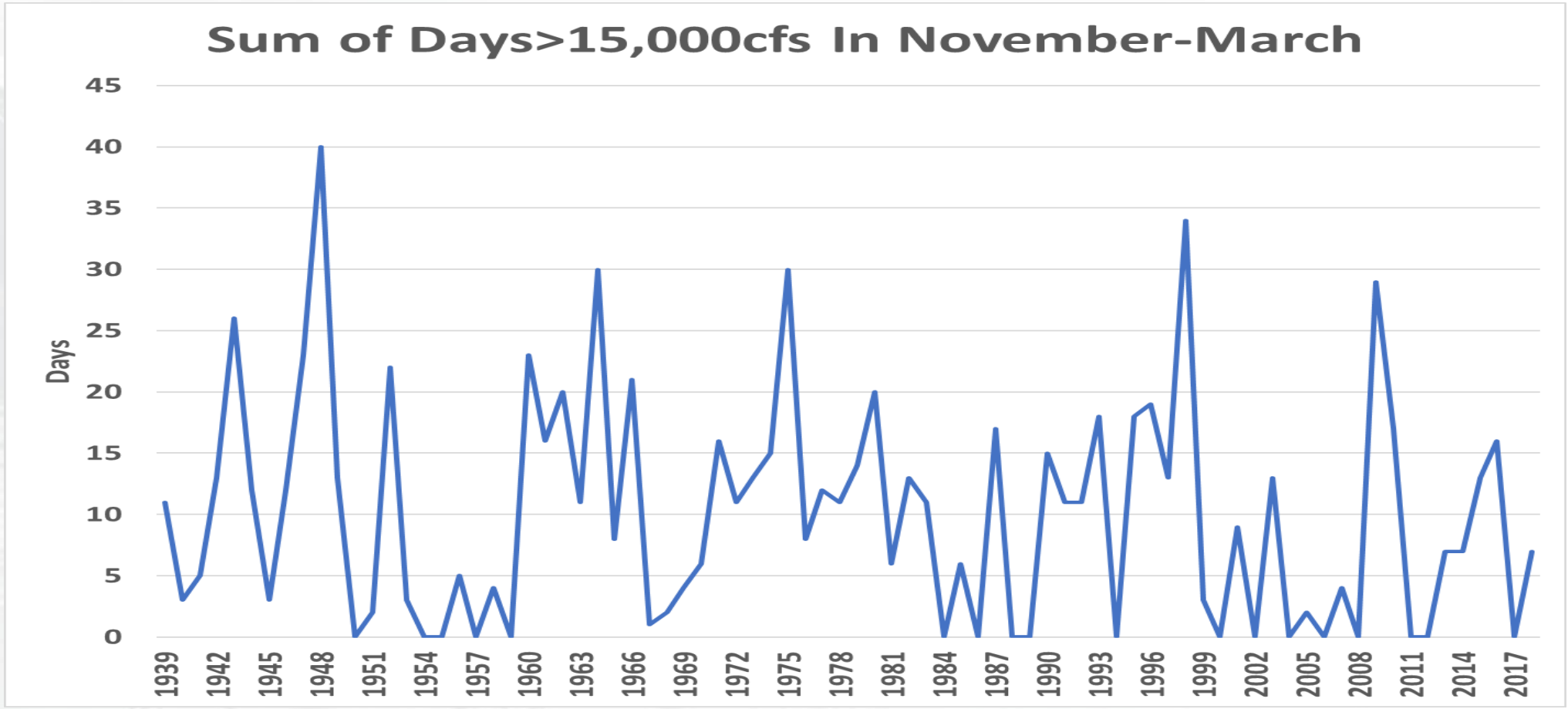


Better

Locations of Habitats Interests – Stakeholder Input



Performance Metric Example 4: Dublin, GA for Oxbows and entire floodplain inundated



Better

Discussion

- Do you want to adopt similar performance metric as part of your plan?
- Future conditions will be included in the next update in Resource Assessment for comparison with the baseline.
- What additional performance measure would you like to see in assessing river recreation or river habitats?

Questions?

Contact Information:

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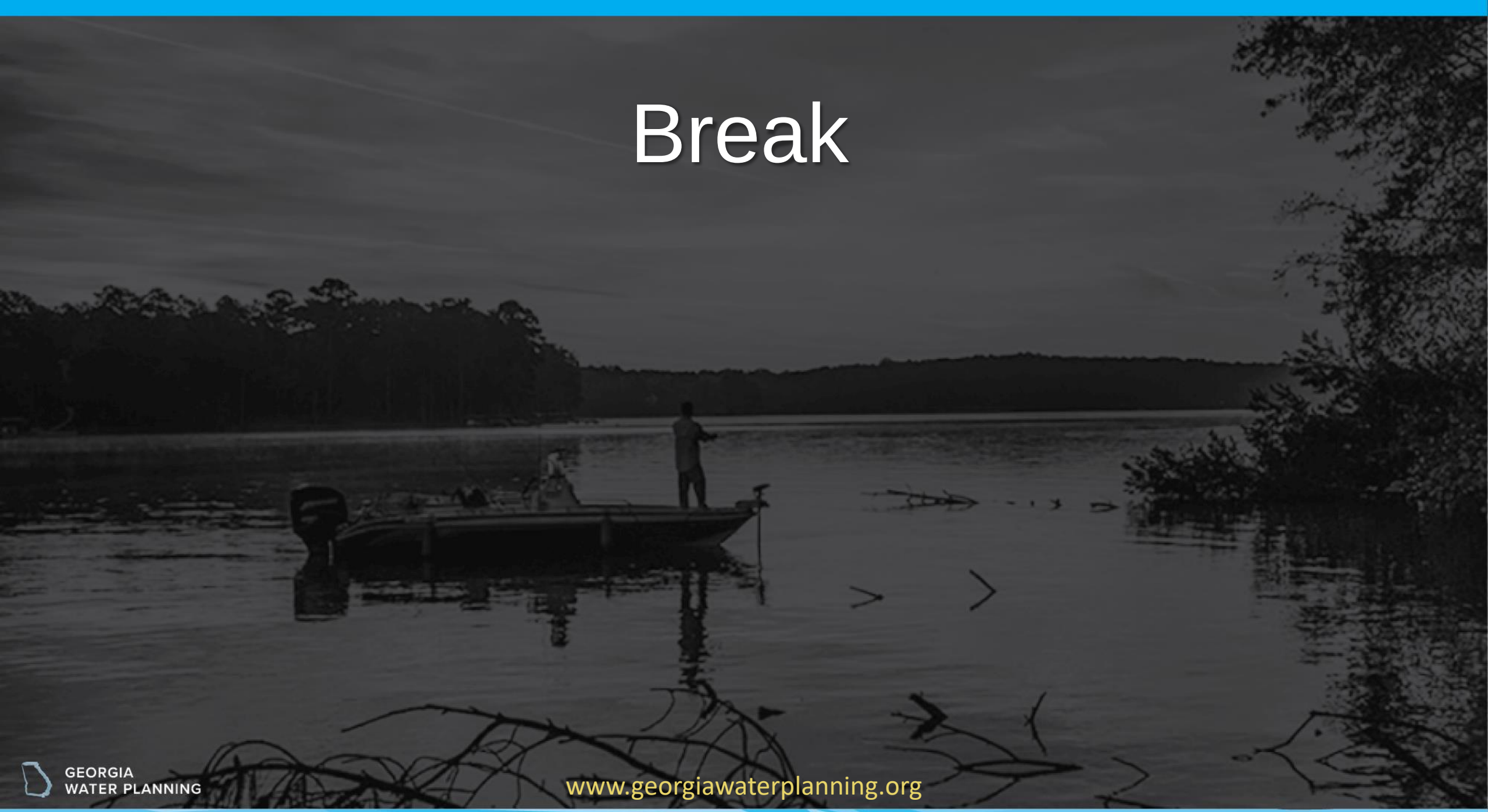
Manager, Water Supply Program
Watershed Protection Branch, Georgia EPD
470-251-4897 (Zoom Phone) New!
470-898-3891 (Cell)

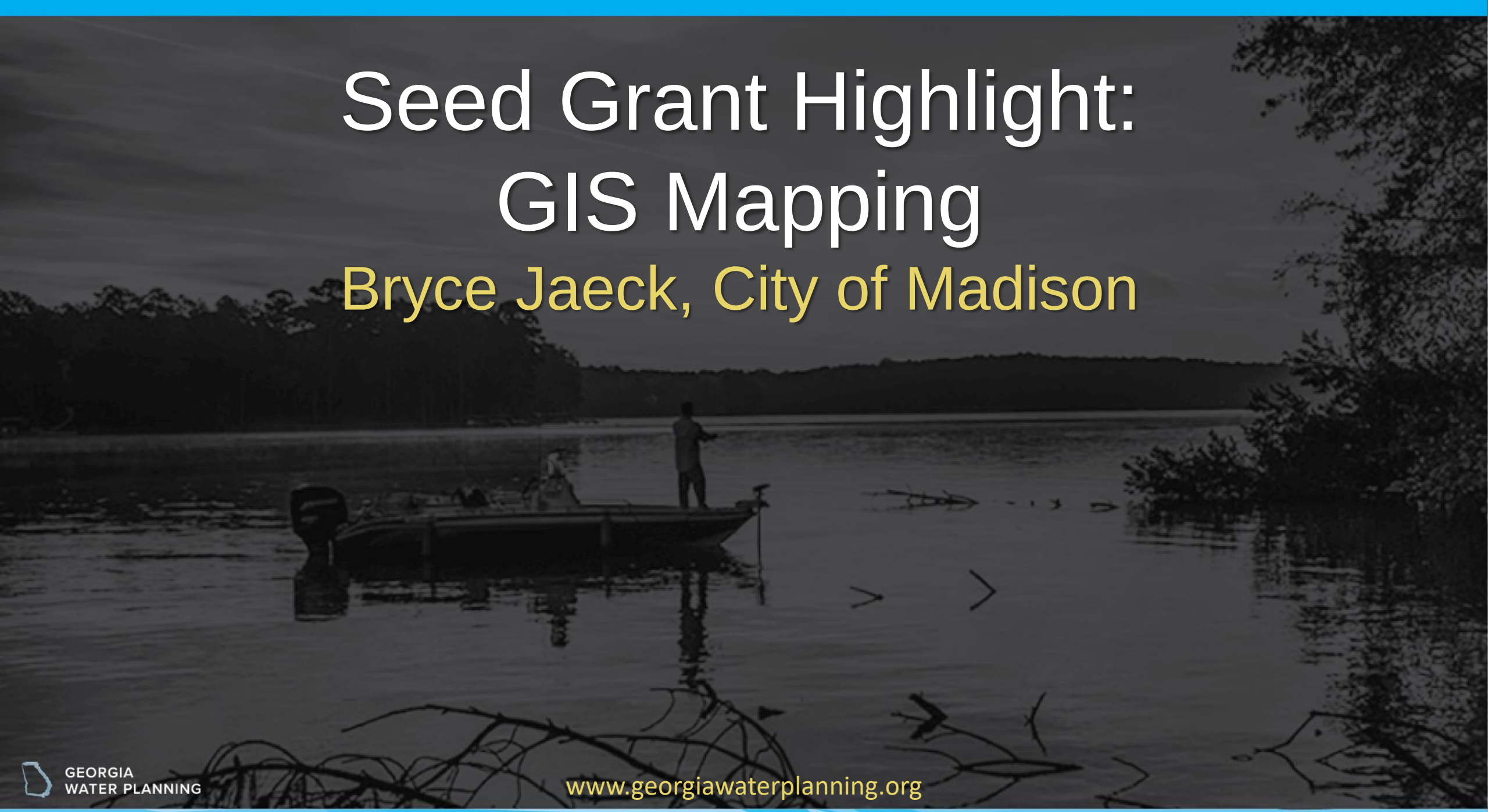
Wei.Zeng@dnr.ga.gov

Break



Seed Grant Highlight: GIS Mapping

Bryce Jaeck, City of Madison



Water Quality (Assimilative Capacity) Overview & Water Quality Updates

Liz Booth, EPD (video)

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Water Quality (Assimilative Capacity) Resource Assessment Results

Liz Booth, EPD (virtual)
Ania Truszczynski, EPD

Water Quality Resource Assessment

- Language from Plan Section 3.2.1:
  - “The Assimilative Capacity Resource Assessment evaluated the capacity of surface waters to process pollutants without violating water quality standards. The assimilative capacity results for the existing conditions focus on
    - dissolved oxygen (DO),
    - nutrients (specifically nitrogen and phosphorus), and
    - chlorophyll a (the green pigment found in algae, which serves as an indicator of lake water quality).”

Modeling completed/will review today.

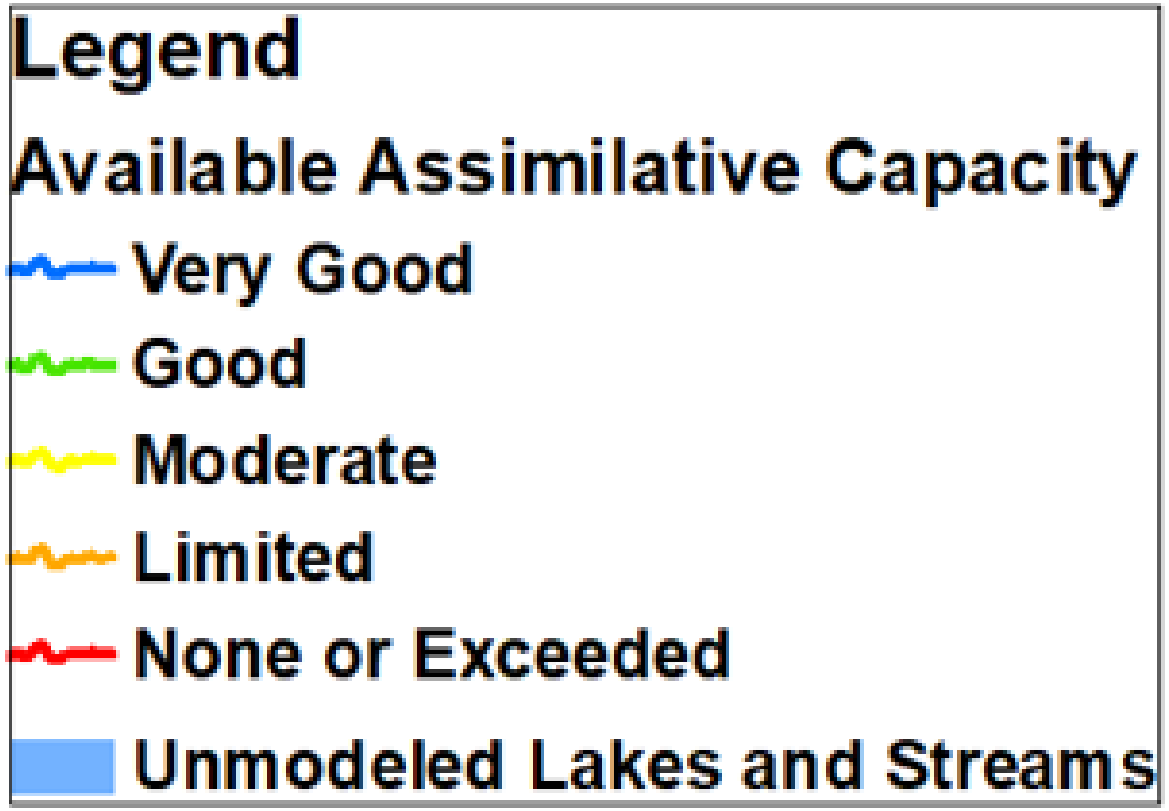
Updated watershed & lake models are in process, but results are not yet available.

Dissolved Oxygen Results

- Plan Section 3.2.1 – Current Conditions
  - The majority of the modeled stream segments in the Upper Oconee basin appear to have “good” to “very good” available assimilative capacity for DO under critical conditions.
  - Table 3-1 and **Figure 3-5** show the results of the modeling. (Current condition results are also repeated in Figure 5-3.)
- Plan Section 5.3.1 – Future Conditions
  - In order to address areas of limited or no assimilative capacity for DO, GAEPD incorporated some assumptions regarding future permitted flows and modifications to permit effluent limits.
  - **Figure 5-4** shows the assimilative capacity at assumed future permitted flows and effluent limits.

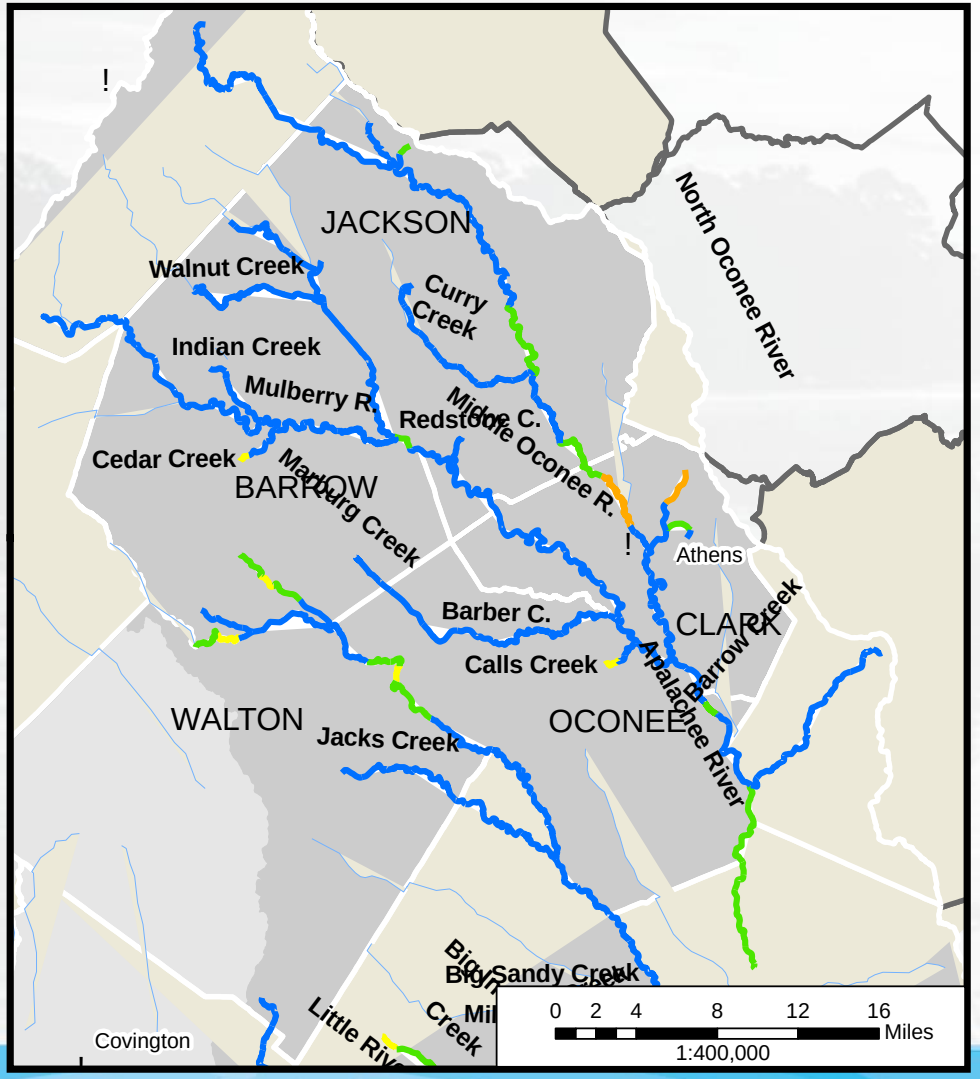
Dissolved Oxygen (DOSAG Models)

- Current Conditions
  - 2019 Permit Limits
- Future Conditions
  - 2060 Assumed Permit Limits
- DOSAG Models:
  - Dischargers at permit limits
  - High temp, low flow conditions
- Assimilative Capacity
  - Evaluating how DO levels compare to WQ standard of 5.0 mg/L (or natural conditions)

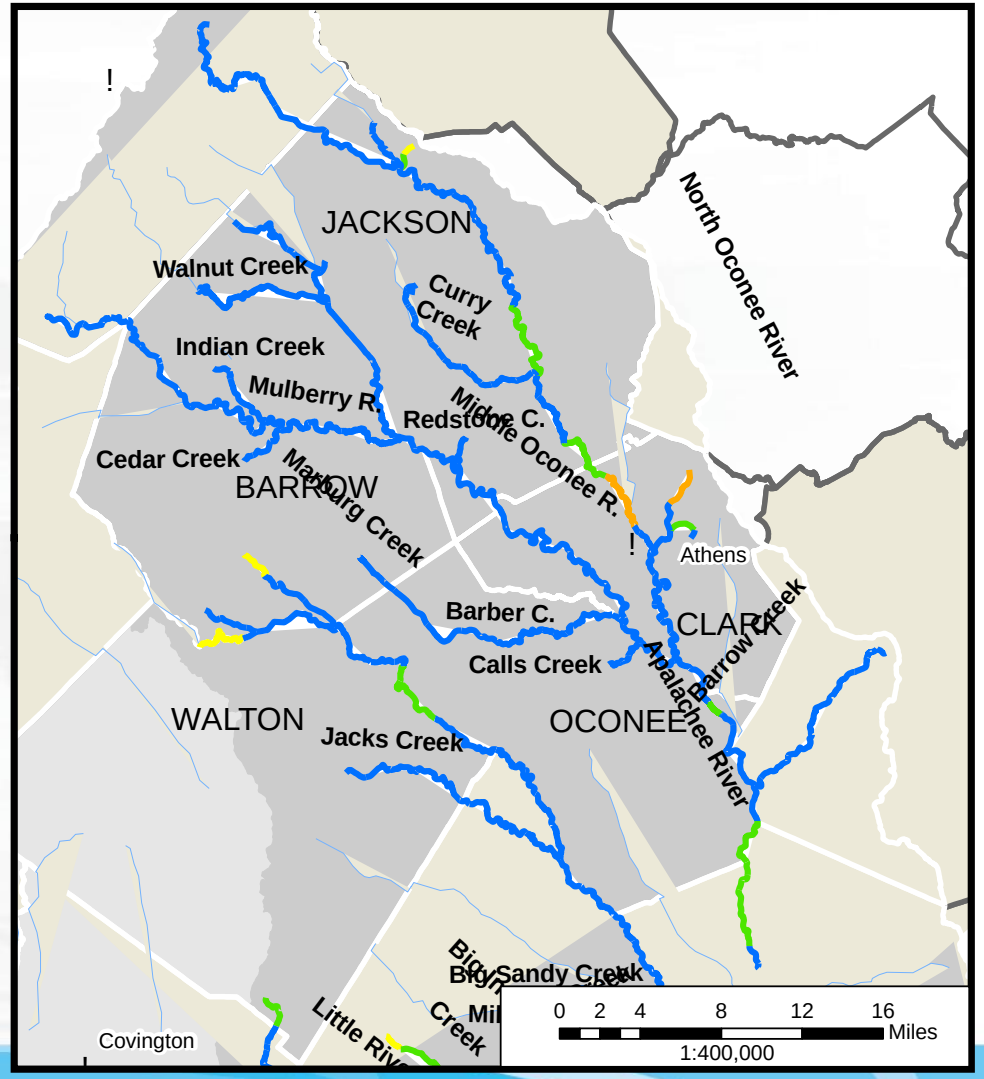


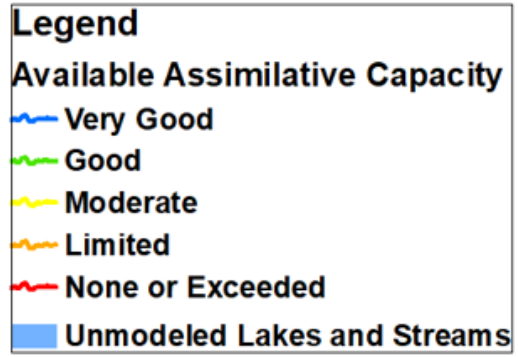
Dissolved Oxygen Results: Upper Oconee Basin

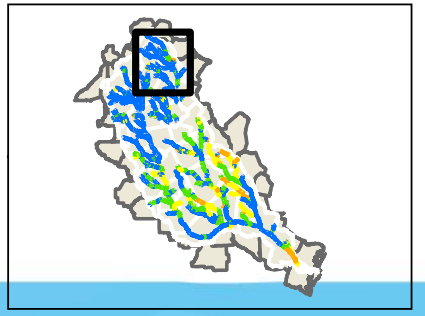
Current Conditions



Future Conditions



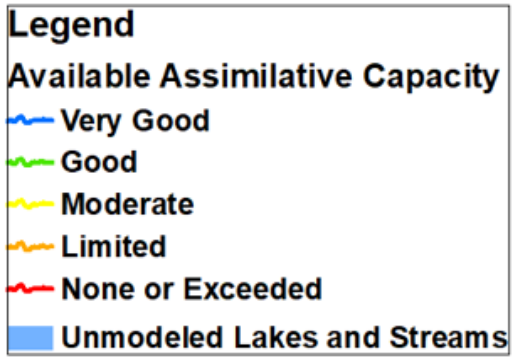




Dissolved Oxygen Results: Walton Co./Ocmulgee Basin

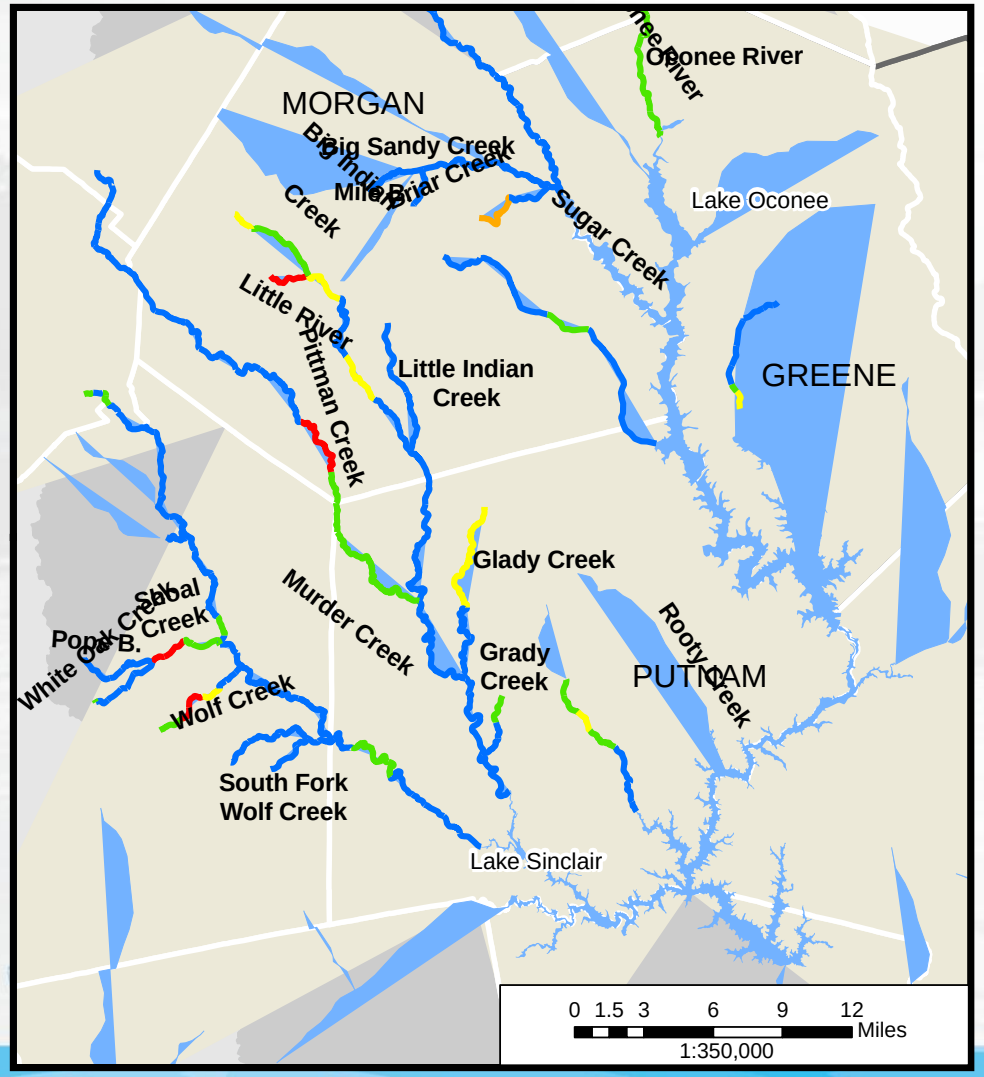
Current Conditions

Future Conditions

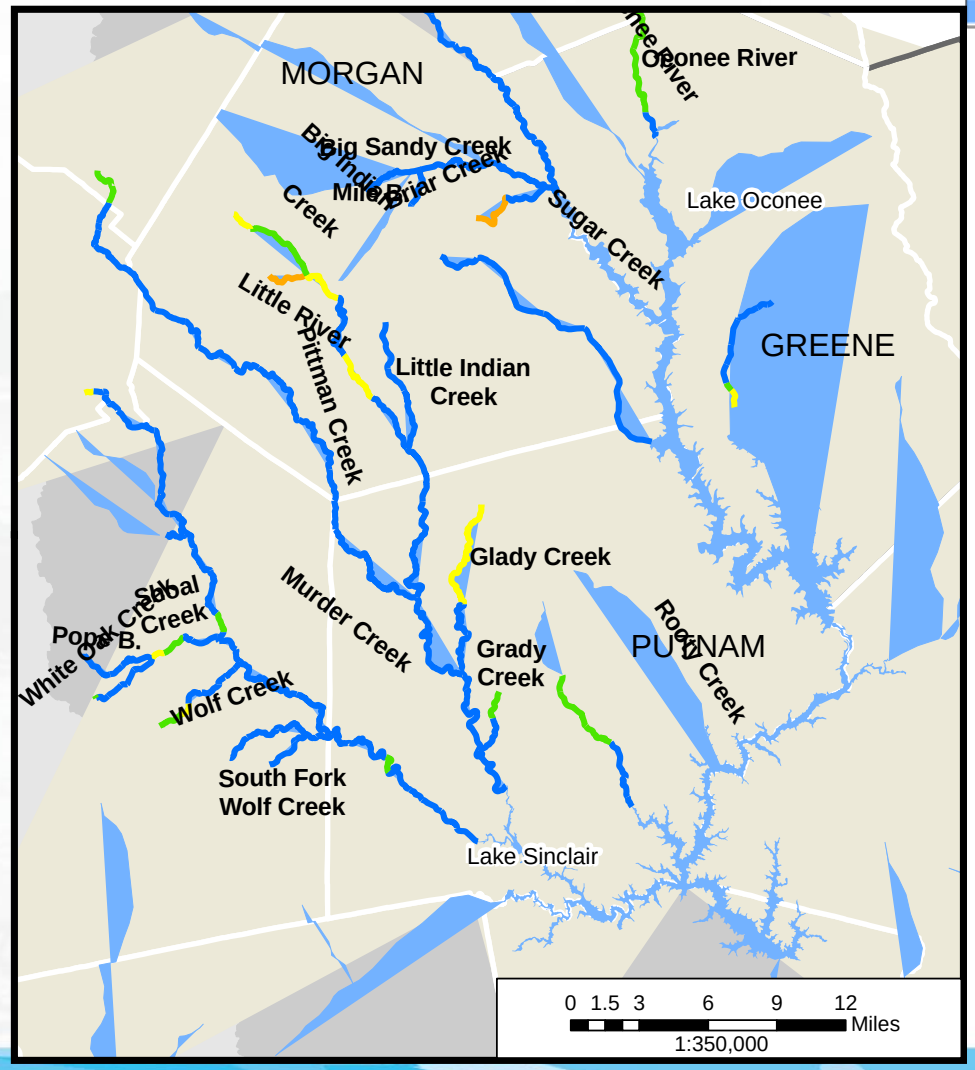


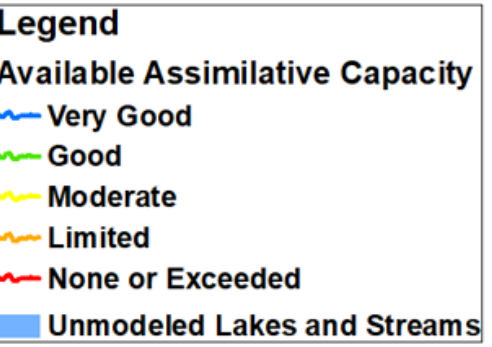
Dissolved Oxygen Results: Middle Oconee Basin

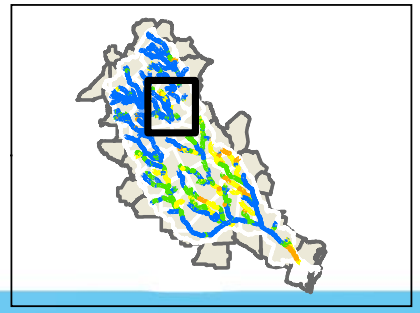
Current Conditions



Future Conditions

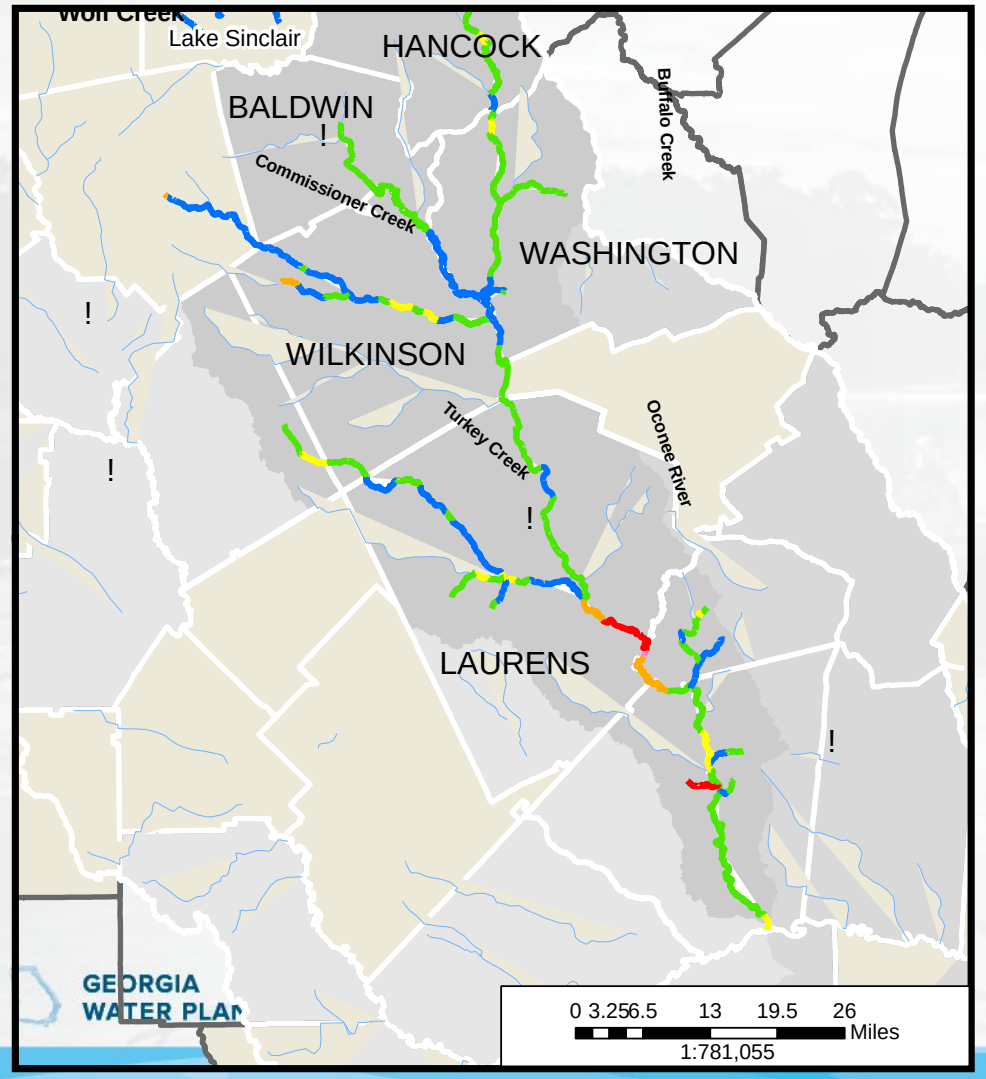




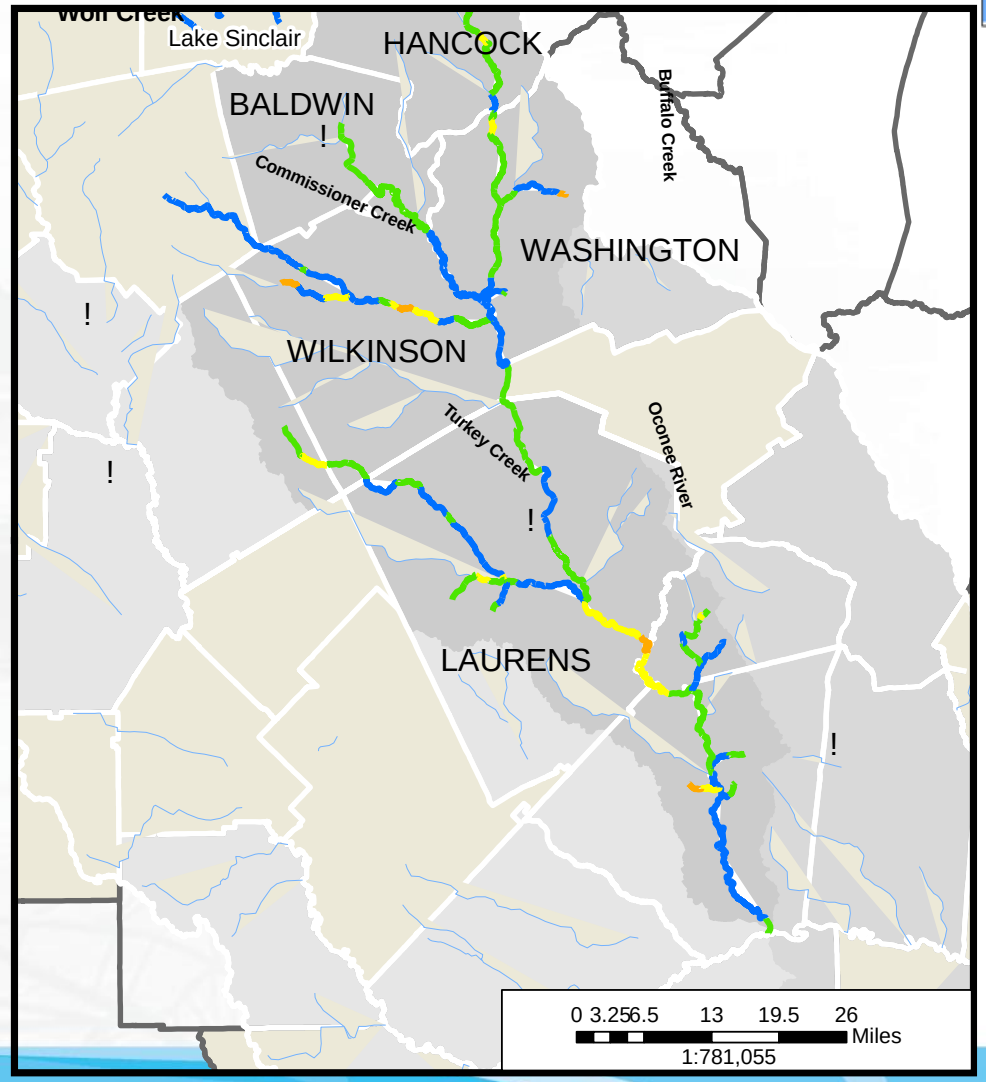


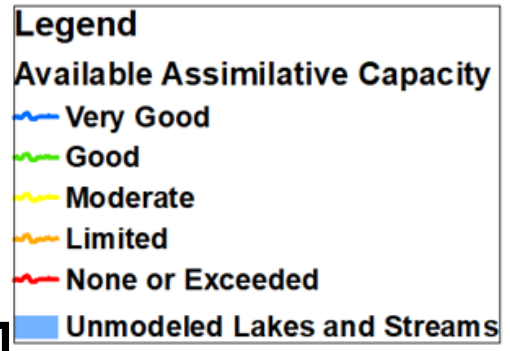
Dissolved Oxygen Results: Lower Oconee Basin

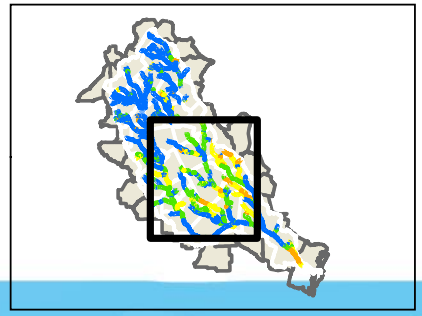
Current Conditions



Future Conditions

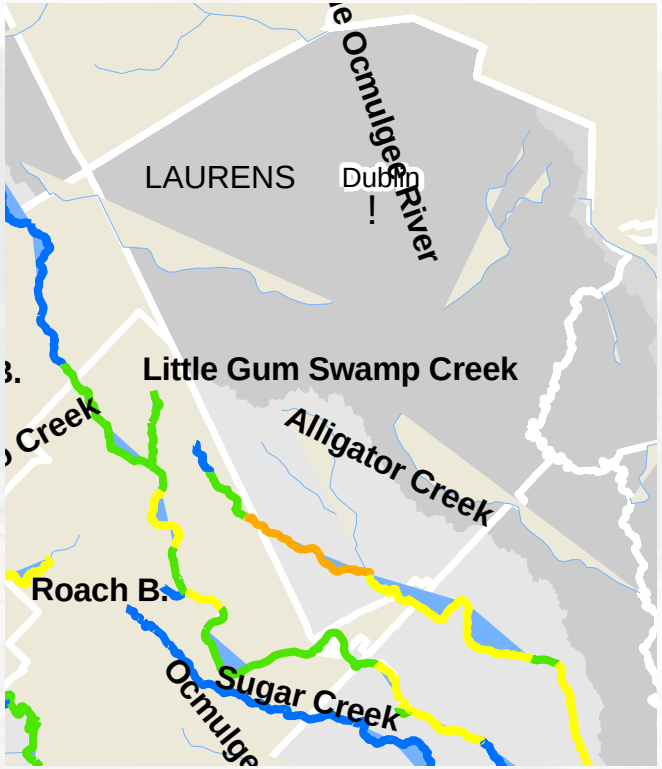




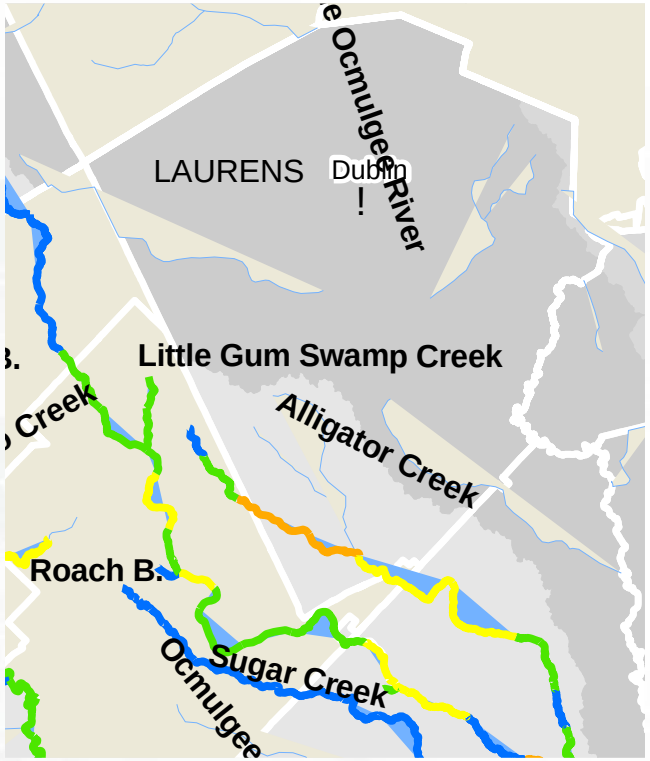


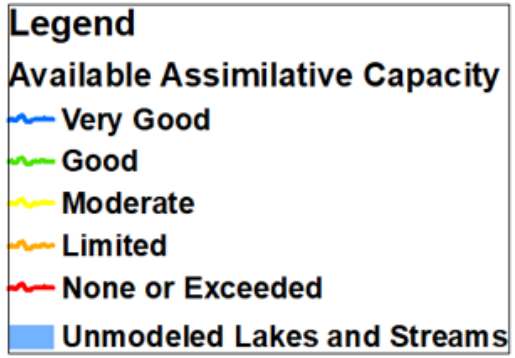
Dissolved Oxygen Results: Laurens Co./Ocmulgee Basin

Current Conditions



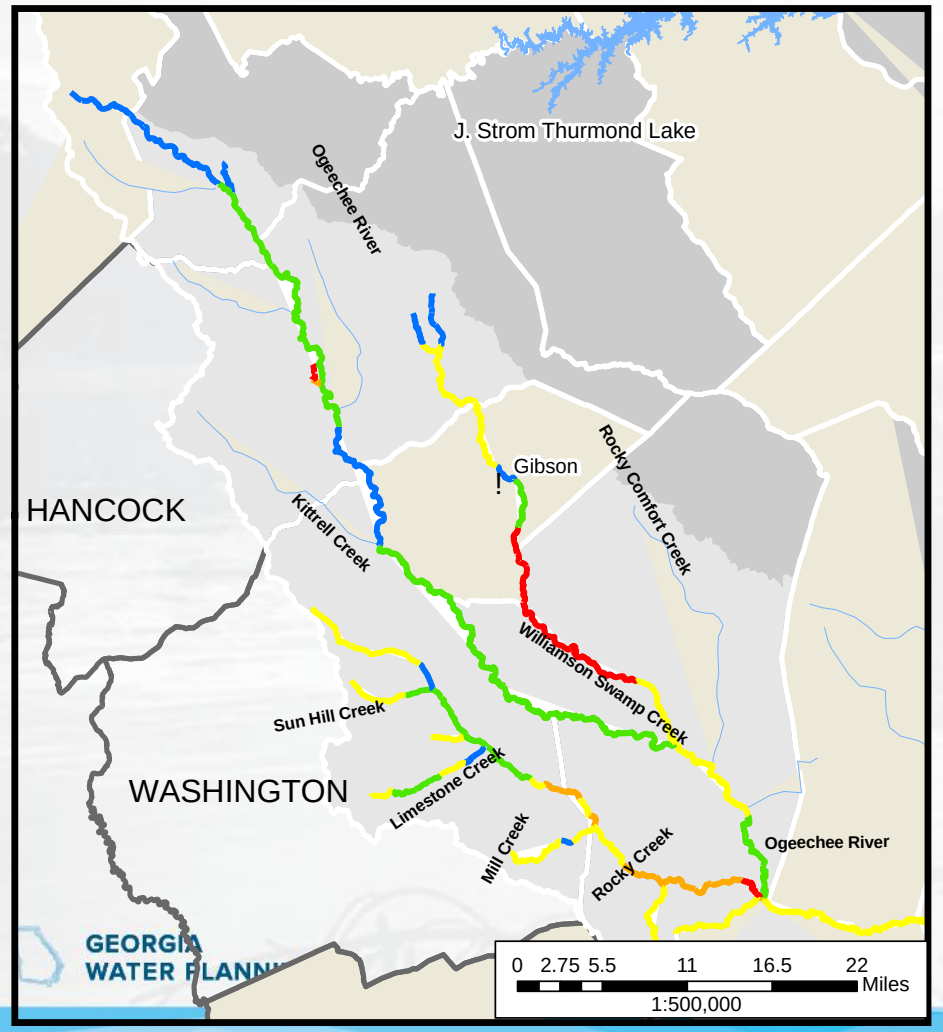
Future Conditions



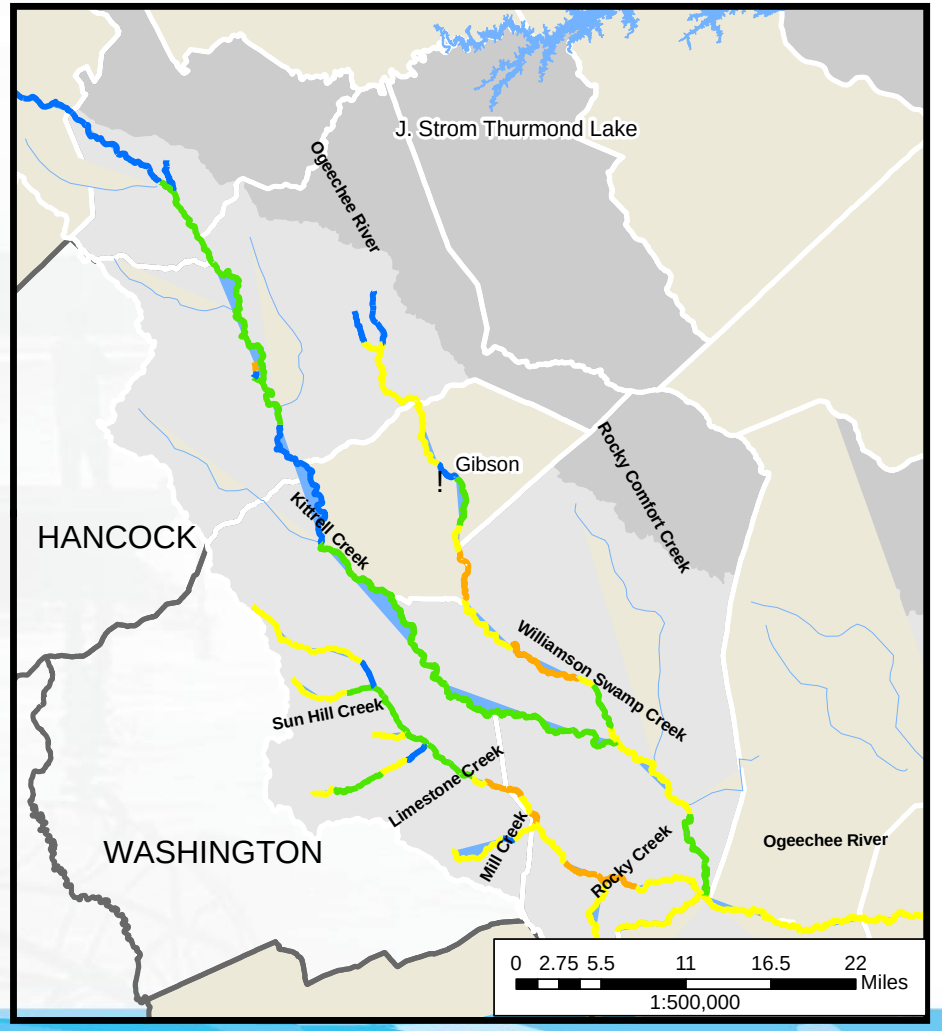


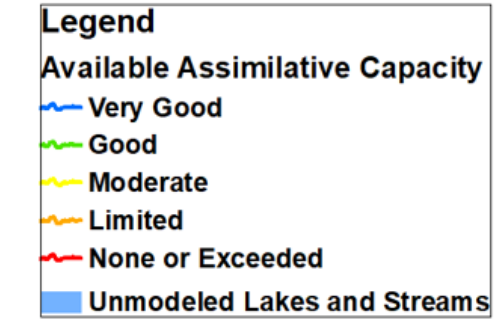
Dissolved Oxygen Results: Hancock & Washington Co./ Ogeechee Basin

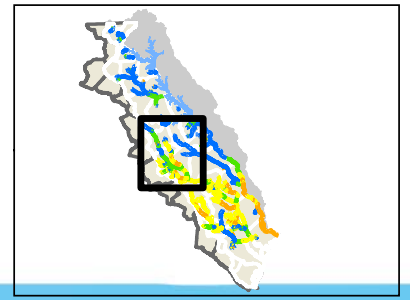
Current Conditions



Future Conditions

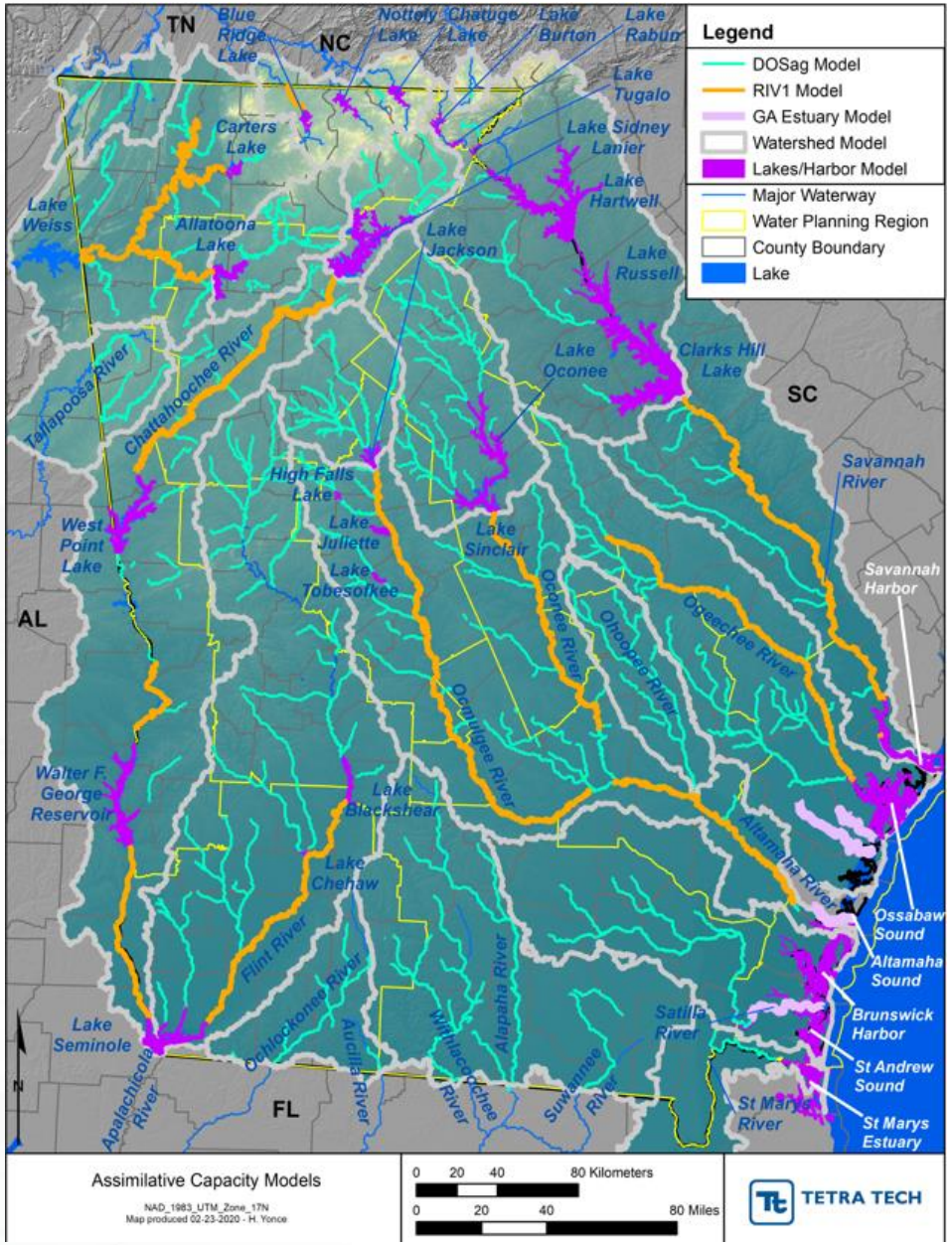






Watershed & Lake Models

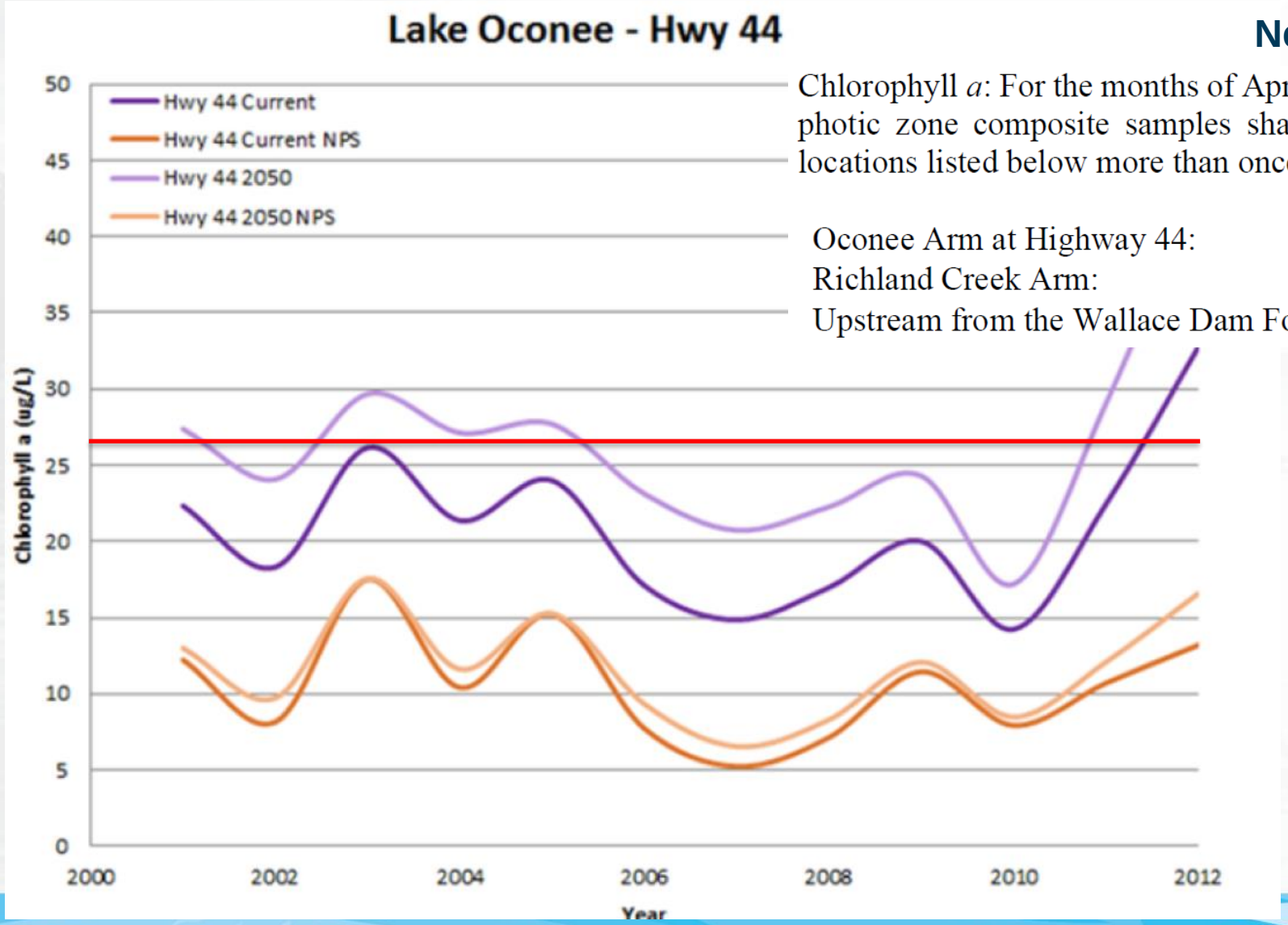
- Models incorporate:
  - Land use & runoff
  - Meteorological information
  - Dischargers at permit limits
- Watershed Models evaluated:
  - Loadings – by subbasin – under wet and dry conditions
    - Total Nitrogen
    - Total Phosphorus
- Lake Models evaluated Chlorophyll *a* response in lakes



Watershed & Lake Models

- Current Conditions – Plan Section 3.2.1
  - Noted lack of nutrient or chlorophyll *a* criteria for Lakes Oconee and Sinclair, and made comparisons of lake model results to chlorophyll *a* criteria for Lake Jackson
    - **EPD has since established chlorophyll *a* criteria for Lakes Oconee and Sinclair**
  - Noted that modeled chlorophyll a levels in Lake Oconee during drought conditions were likely elevated due to point source nutrient loadings from the Athens and eastern metro Atlanta areas as well as loadings from agricultural sources
- Future Conditions – Plan Section 5.3.2
  - Modeling assumed future total P limits for all dischargers that don't currently have limits
  - Future conditions resulted in increases in lake chlorophyll a levels (Figures 5-5 & 5-6)
  - "Management practices for nutrient reductions from both point and nonpoint sources will be needed in order for waters to meet these new standards and to maintain conditions in Lakes Oconee and Sinclair."

Lake Oconee Model Results

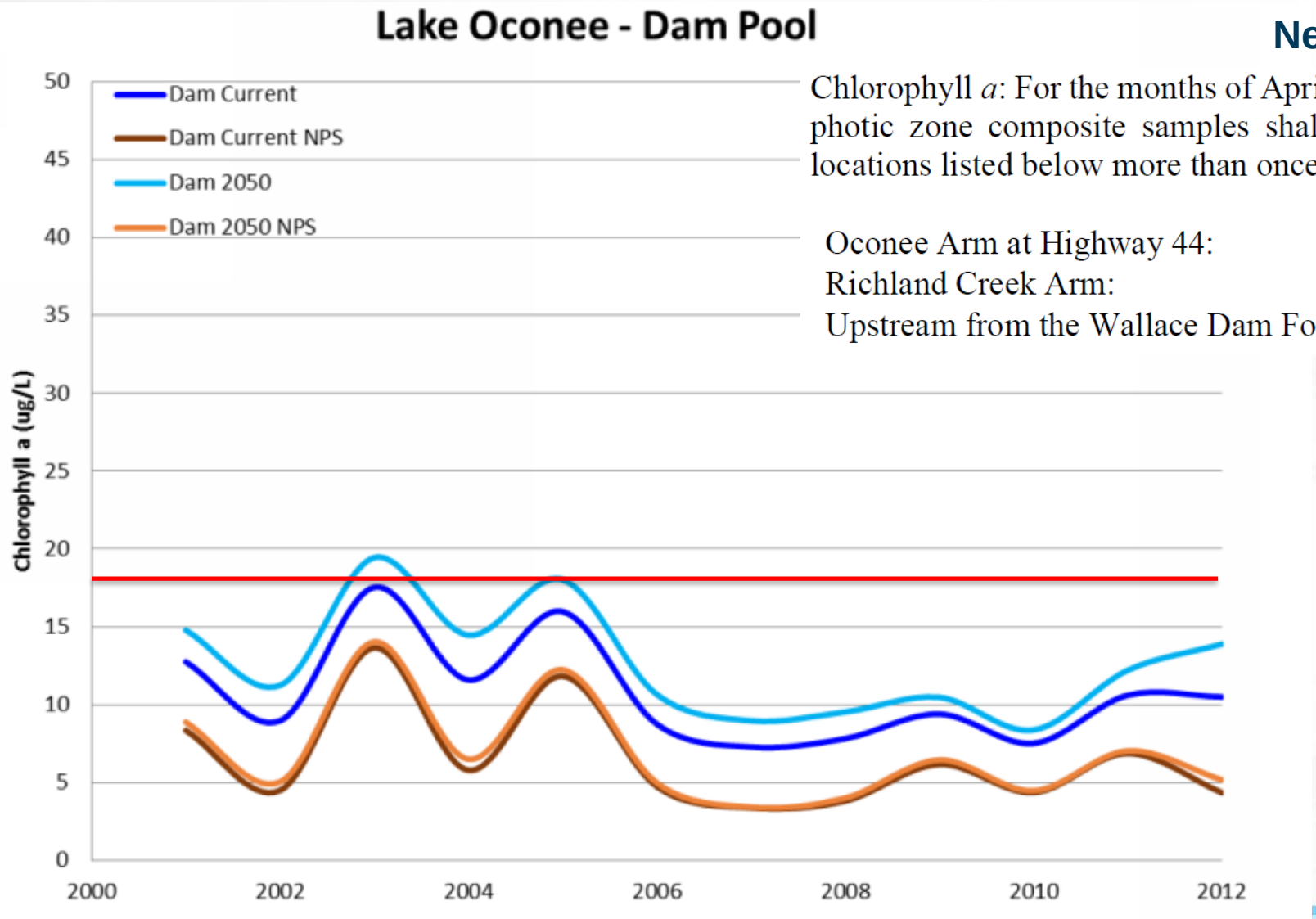


New Chlorophyll a Criteria

Chlorophyll *a*: For the months of April through October, the average of monthly mid-channel photic zone composite samples shall not exceed the chlorophyll *a* concentrations at the locations listed below more than once in a five-year period:

Oconee Arm at Highway 44:	26 µg/L
Richland Creek Arm:	15 µg/L
Upstream from the Wallace Dam Forebay:	18 µg/L

Lake Oconee Model Results



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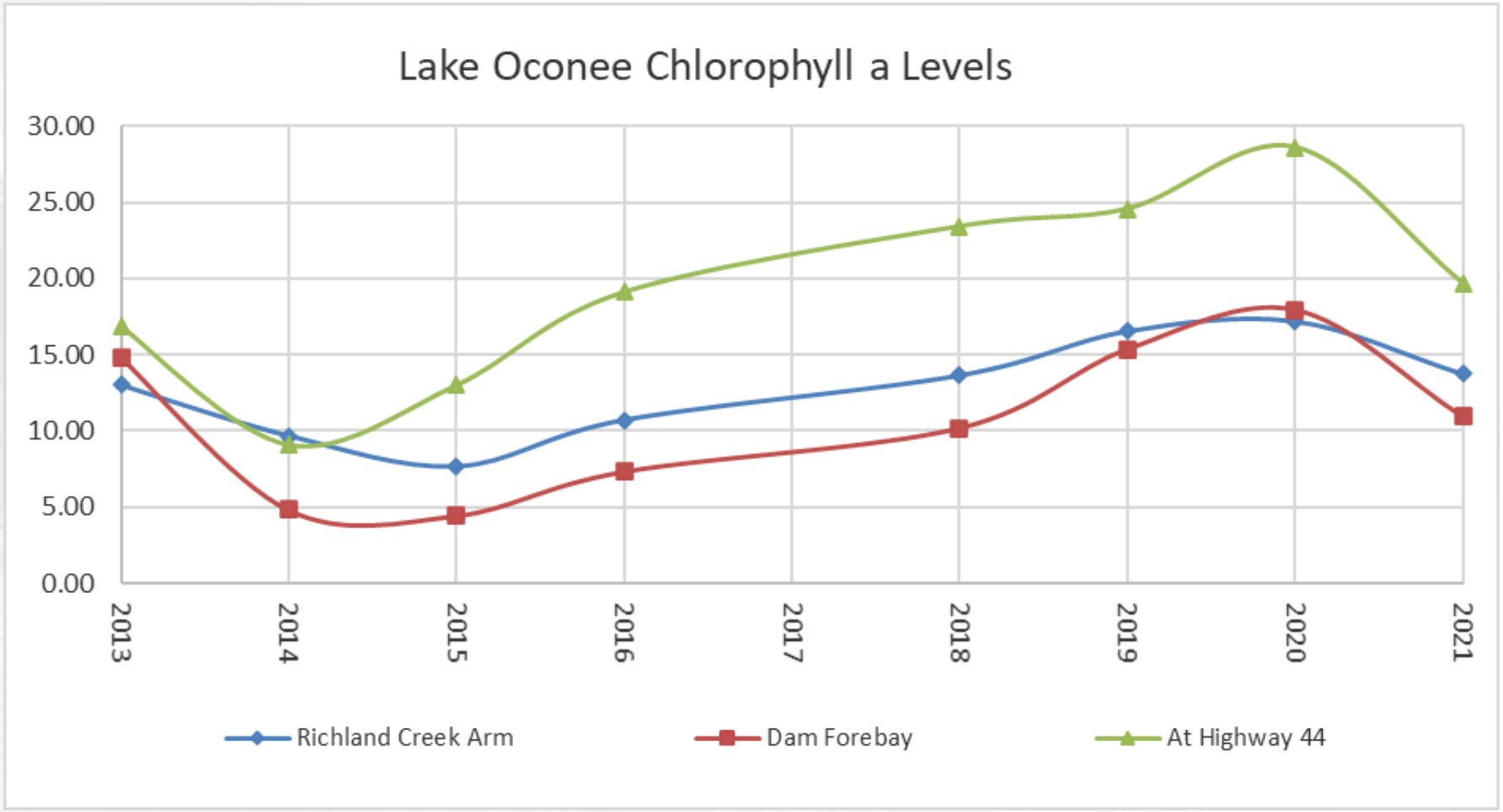
Upstream from the Wallace Dam Forebay:	18 µg/L

Lake Oconee: Measured Chlorophyll *a*



Chlorophyll *a* criteria:

26 µg/L

18 µg/L

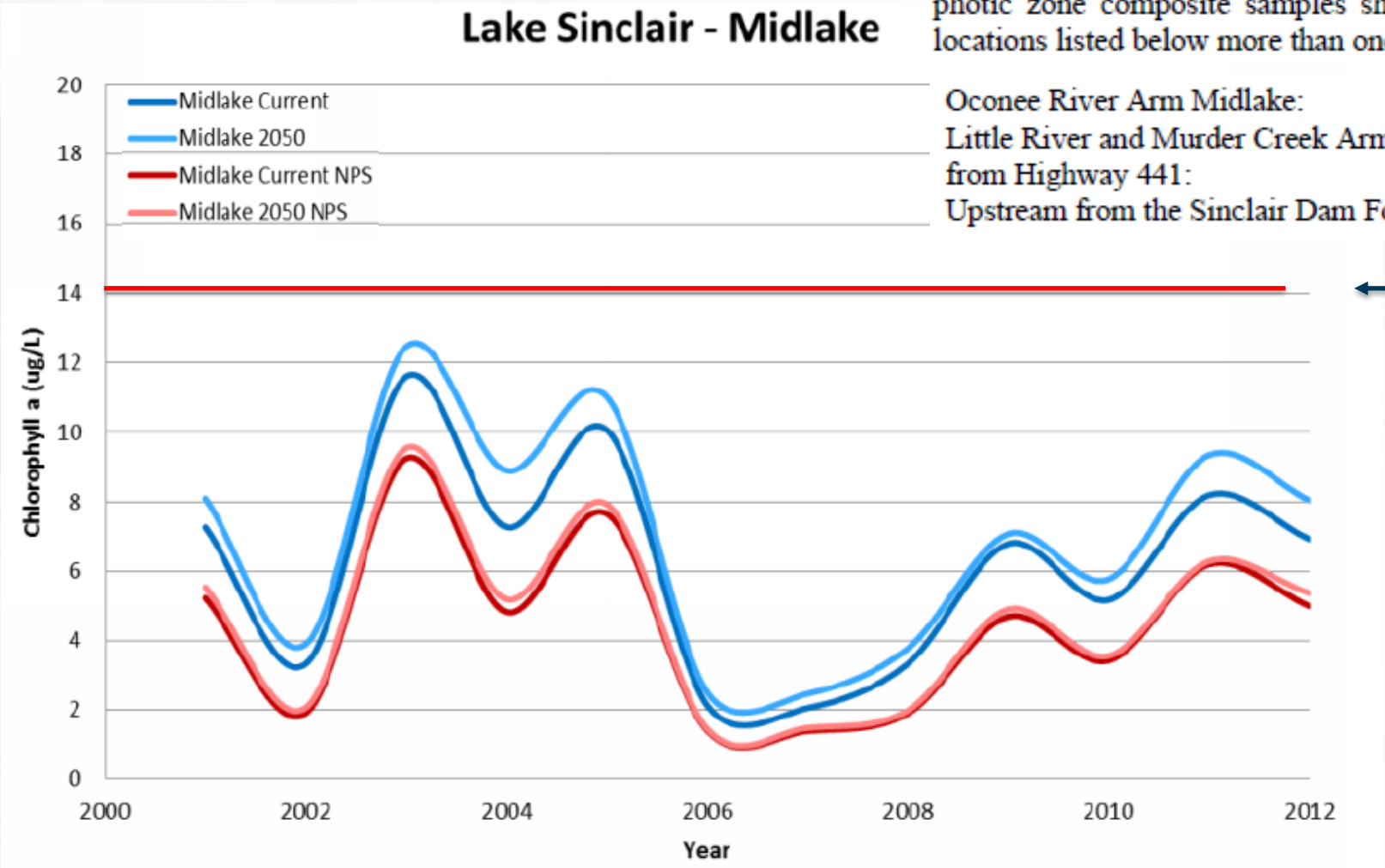
15 µg/L

Lake Sinclair Model Results

New Chlorophyll a Criteria

Chlorophyll *a*: For the months of April through October, the average of monthly mid-channel photic zone composite samples shall not exceed the chlorophyll *a* concentrations at the locations listed below more than once in a five-year period:

Oconee River Arm Midlake:	14 µg/L
Little River and Murder Creek Arm Upstream from Highway 441:	14 µg/L
Upstream from the Sinclair Dam Forebay:	10 µg/L



Lake Sinclair Model Results

New Chlorophyll a Criteria

Chlorophyll *a*: For the months of April through October, the average of monthly mid-channel photic zone composite samples shall not exceed the chlorophyll *a* concentrations at the locations listed below more than once in a five-year period:

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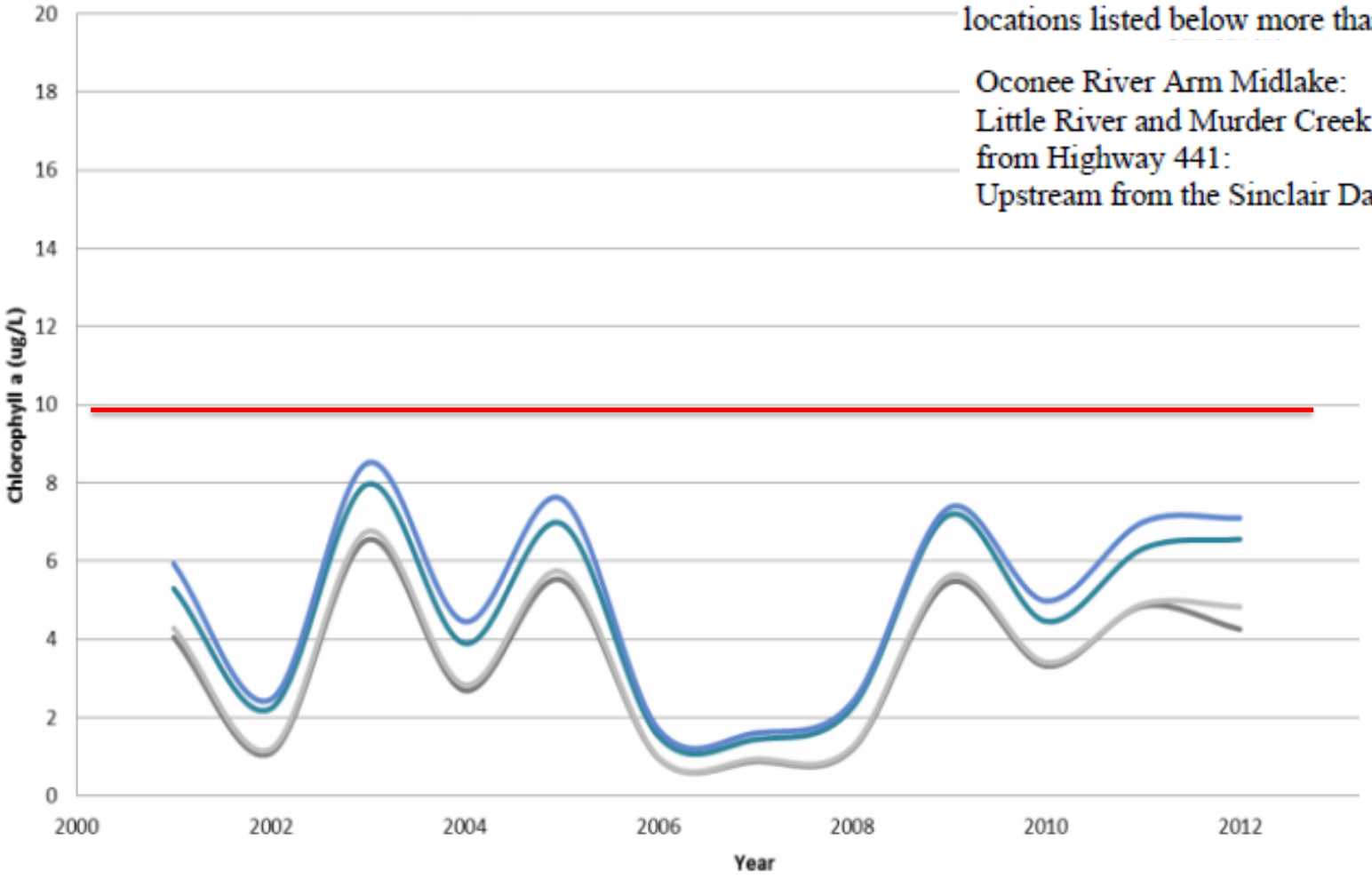
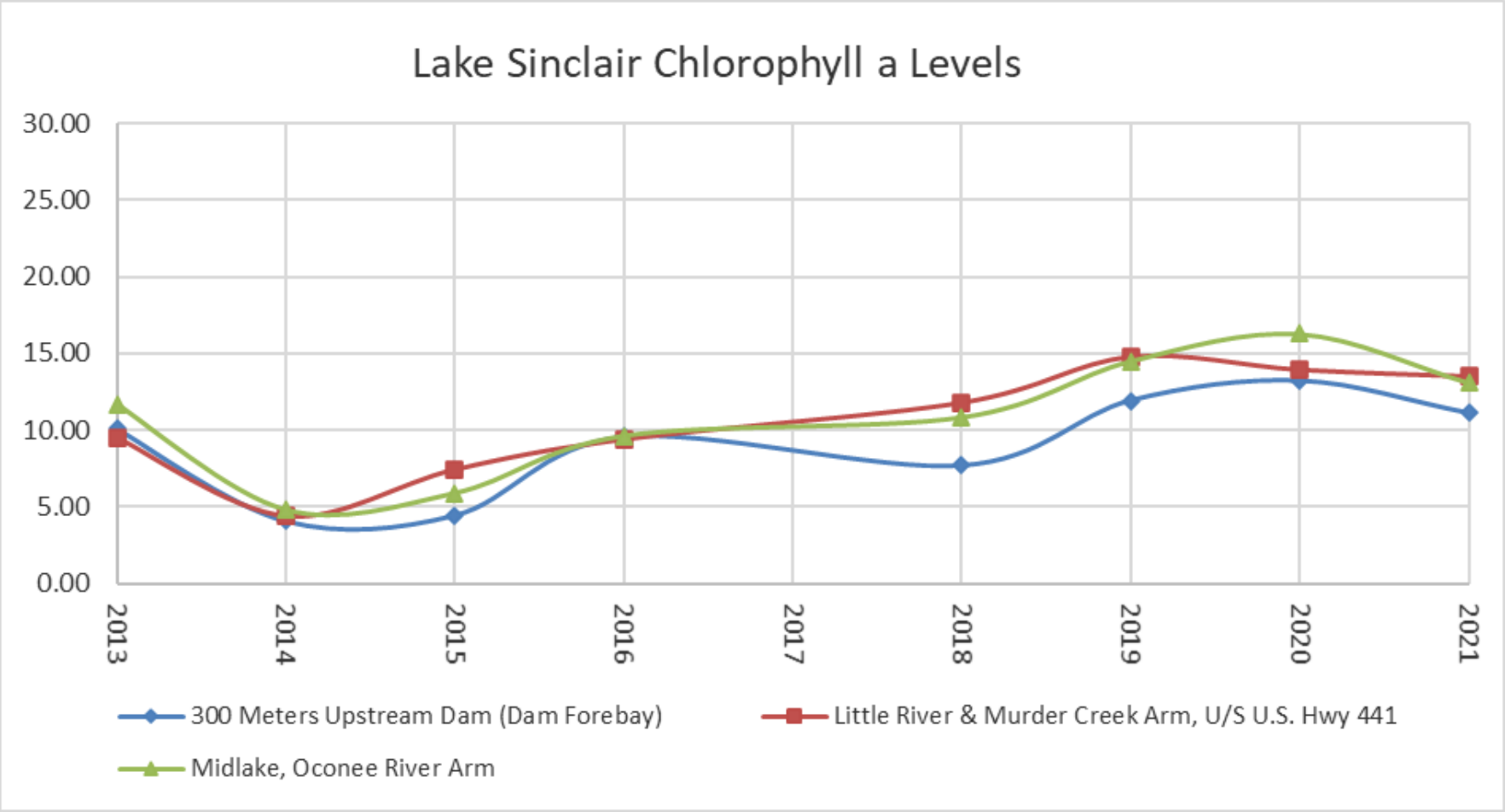


Lake Sinclair: Measured Chlorophyll *a*



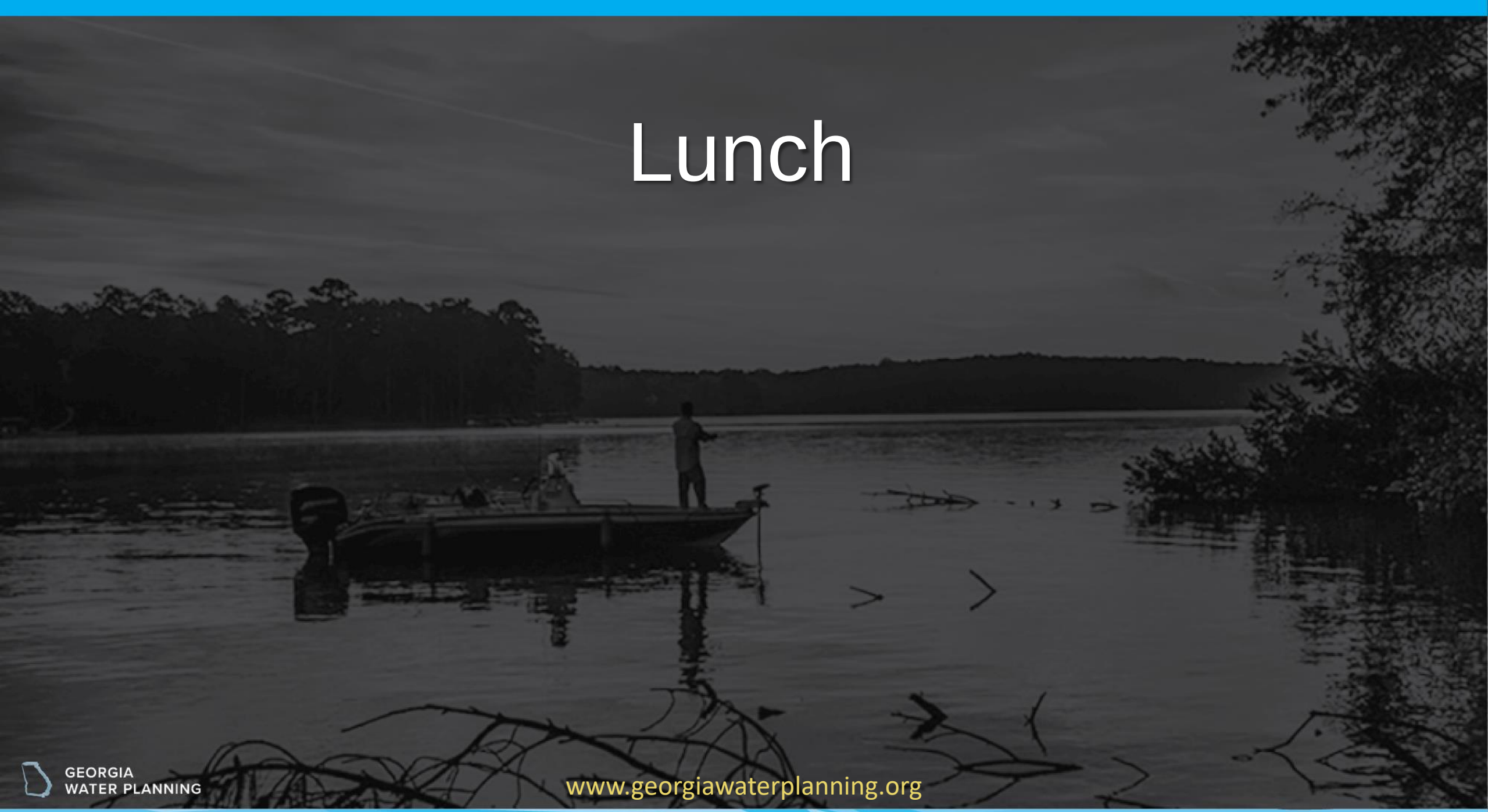
Chlorophyll *a* criteria:

14 µg/L

14 µg/L

10 µg/L

Lunch

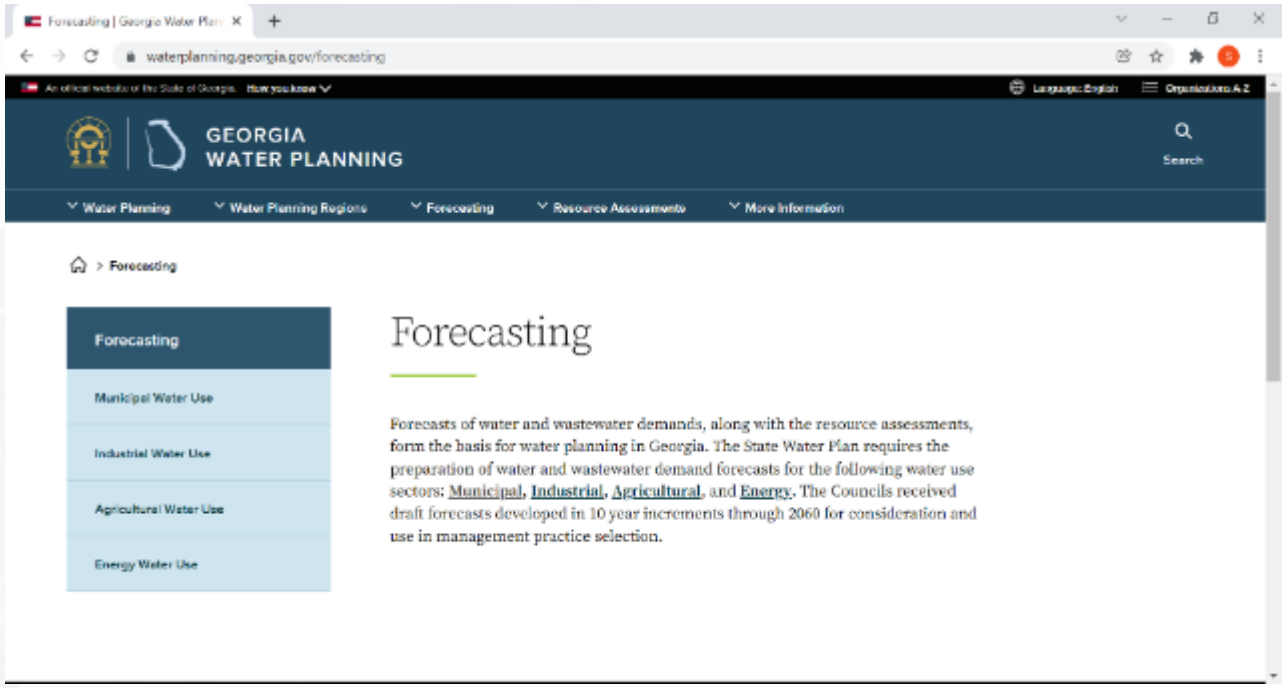


Water &Wastewater Demand Forecasting Draft Plan Update (Section 4)

Brian Skeens, Jacobs

Water & Wastewater Demand Forecasting

- Results previously shared with Council during April 2021 virtual meeting.
- Updates to Water and Wastewater Demand Forecasts for various sectors are available on the website.
- Water & Wastewater Demand Forecasting Technical Memorandum & Section 4 of the Regional Water Plan have been drafted.



https://waterplanning.georgia.gov/forecasting

Population Projections By County

County	2020	2030	2040	2050	2060	Difference (2020 to 2060)	% Increase (2020 – 2060)
Baldwin	44,428	43,637	41,221	38,125	35,806	-8,622	-19%
Barrow	86,383	116,916	149,706	189,385	239,941	153,558	178%
Clarke	129,779	146,104	158,840	168,872	181,071	51,292	40%
Greene	18,717	22,546	24,505	27,014	30,982	12,265	66%
Hancock	8,193	7,637	7,004	6,557	6,482	-1,711	-21%
Jackson	74,700	95,493	115,088	136,627	160,808	86,108	115%
Laurens	47,296	47,405	46,964	45,989	45,193	-2,103	-4%
Morgan	19,138	20,757	22,438	24,206	26,328	7,190	38%
Oconee	41,737	52,926	63,566	75,060	87,460	45,723	110%
Putnam	21,885	22,308	22,341	22,478	23,209	1,324	6%
Walton	95,814	109,179	124,621	141,993	162,652	66,838	70%
Washington	20,302	20,009	19,452	18,595	18,066	-2,236	-11%
Wilkinson	8,919	8,361	7,791	7,095	6,665	-2,254	-25%
TOTAL	**617,291**	**713,278**	**803,537**	**901,996**	**1,024,663**	**407,372**	**66%**

Source: Georgia Governor's Office of Planning and Budget, 2019.

Municipal Water Demand Forecasts by County (AAD-MGD)

Table 4-2 Municipal Water Demand Forecasts by County (AAD-MGD)

County	2020	2030	2040	2050	2060
Baldwin	6.41	6.19	5.74	5.21	4.81
Barrow	8.68	11.60	14.57	18.04	22.34
Athens-Clarke	11.59	12.86	13.83	14.42	15.05
Greene	2.69	3.20	3.42	3.72	4.20
Hancock	1.53	1.40	1.27	1.17	1.14
Jackson	9.12	11.47	13.61	15.91	18.42
Laurens	5.84	5.73	5.56	5.32	5.11
Morgan	2.69	2.87	3.06	3.24	3.47
Oconee	4.63	5.78	6.82	7.91	9.06
Putnam	2.08	2.08	2.04	2.01	2.03
Walton	9.66	10.82	12.14	13.59	15.28
Washington	3.28	3.18	3.04	2.85	2.72
Wilkinson	1.01	0.95	0.90	0.83	0.79
TOTAL	**69.22**	**78.14**	**85.99**	**94.23**	**104.42**

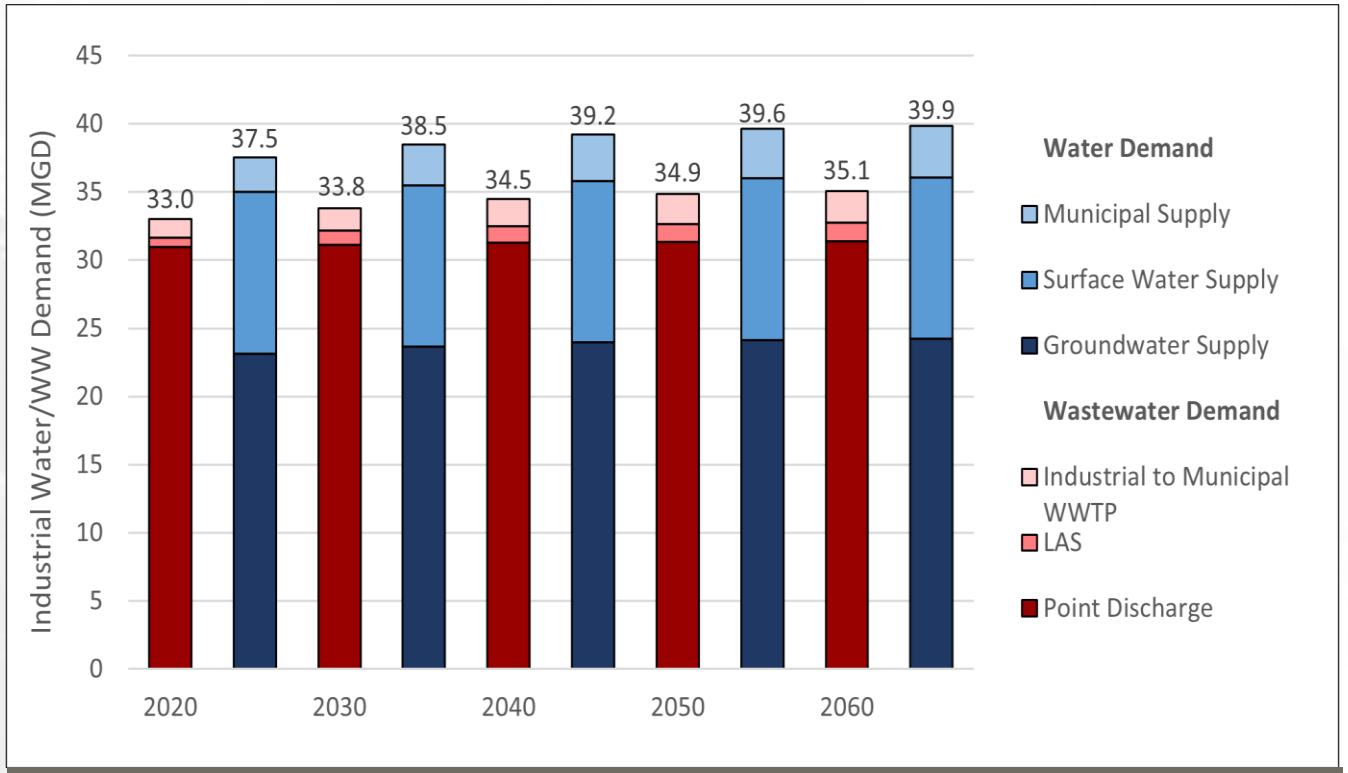
Source: Upper Oconee Water and Wastewater Forecasting Technical Memorandum (2022).

Notes:

Municipal water demand forecasts include publicly supplied and self-supplied demands from surface water and groundwater sources.

Values represent forecasted annual average demand (AAD) in million gallons per day (MGD)

Industrial Water & Wastewater Flow Forecast (AAD-MGD)



Source: Upper Oconee Water and Wastewater Forecasting Technical Memorandum (2022).
Notes: Values represent forecasted annual average Demand (AAD) in million gallons per day (MGD).

Figure 4-3 Total Industrial Water and Wastewater Flow Forecast (in AAD-MGD)

https://waterplanning.georgia.gov/forecasting

Agricultural Water Demand Forecasts by County (AAD-MGD)

Table 4-4 Agricultural Water Demand Forecasts by County (AAD-MGD)

County	2020	2030	2040	2050	2060	% Increase (2020 to 2060)
Baldwin	0.18	0.18	0.18	0.18	0.18	0%
Barrow	0.18	0.18	0.18	0.18	0.18	0%
Athens-Clarke	0.68	0.68	0.68	0.72	0.68	0%
Greene	0.57	0.57	0.57	0.58	0.57	0%
Hancock	0.19	0.19	0.19	0.19	0.19	1%
Jackson	1.02	1.02	1.02	1.02	1.02	0%
Laurens	12.60	12.91	13.41	14.22	14.61	16%
Morgan	3.06	3.10	3.16	3.23	3.31	8%
Oconee	2.89	2.89	2.89	2.90	2.89	0%
Putnam	2.01	2.01	2.02	2.04	2.05	2%
Walton	2.17	2.17	2.17	2.16	2.17	0%
Washington	15.40	16.42	17.91	19.82	21.71	41%
Wilkinson	0.24	0.25	0.25	0.26	0.27	12%
Total	**41.2**	**42.6**	**44.6**	**47.5**	**49.8**	**21%**

Source: Upper Oconee Water and Wastewater Forecasting Technical Memorandum (2022).
Notes:
Crop demands represent dry year conditions, in which 75% of years had more rainfall and 25% of years had less.
Agricultural withdrawals (crop and non-crop) are supplied by groundwater and surface water.
Values represent forecasted annual average demand (AAD) in million gallons per day (MGD).

https://waterplanning.georgia.gov/forecasting

Energy Water Demand Forecasts (AAD-MGD)

- Six (6) energy facilities
- Jackson, Walton, & Washington counties

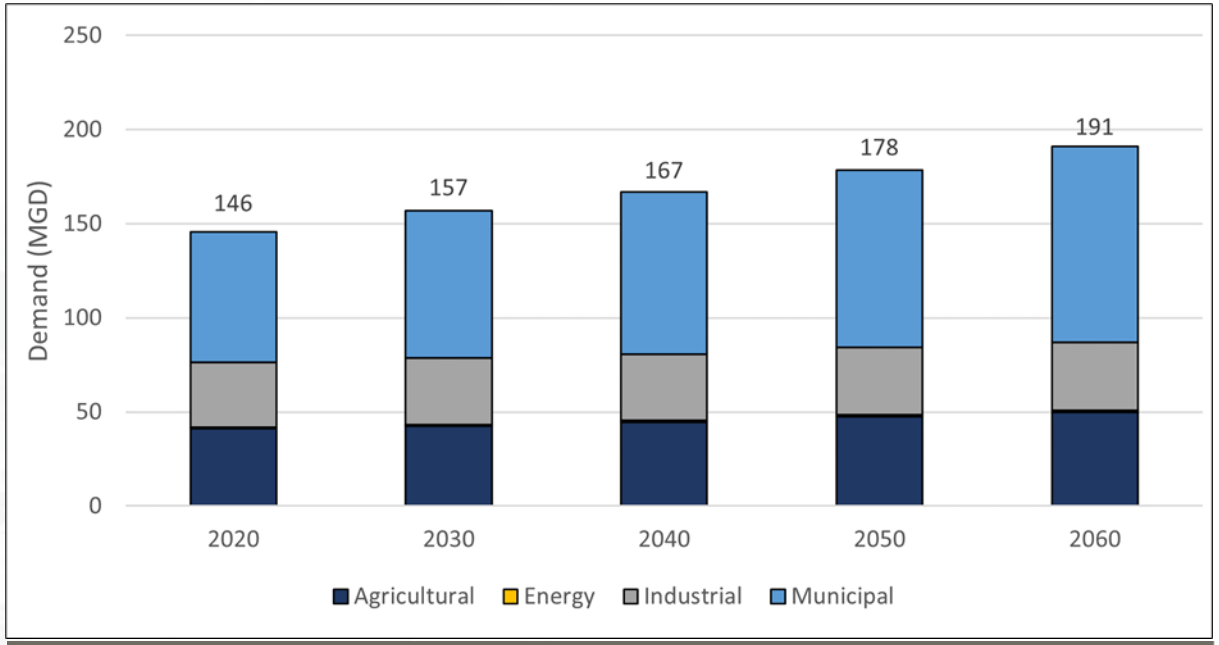
Table 4-5 Energy Sector Water Demand Forecast (AAD-MGD)

Demand Type	2020	2030	2040	2050	2060
Withdrawals	0.72	0.72	0.94	1.05	1.15
Consumption	0.63	0.63	0.83	0.92	1.01

Source: Upper Oconee Water and Wastewater Forecasting Technical Memorandum (2022).
Notes: Values represent forecasted annual average demand (AAD) in million gallons per day (MGD).

Updated Water Demand Forecast by Sector (AAD-MGD)

- Municipal water demand for the municipal sector is forecasted to increase from 69.2 MGD in 2020 to 104.4 MGD in 2060.
- 75% of municipal demand will be met by surface water sources; 25% by groundwater sources.
- Total demand increases 31% from 2020 to 2060.



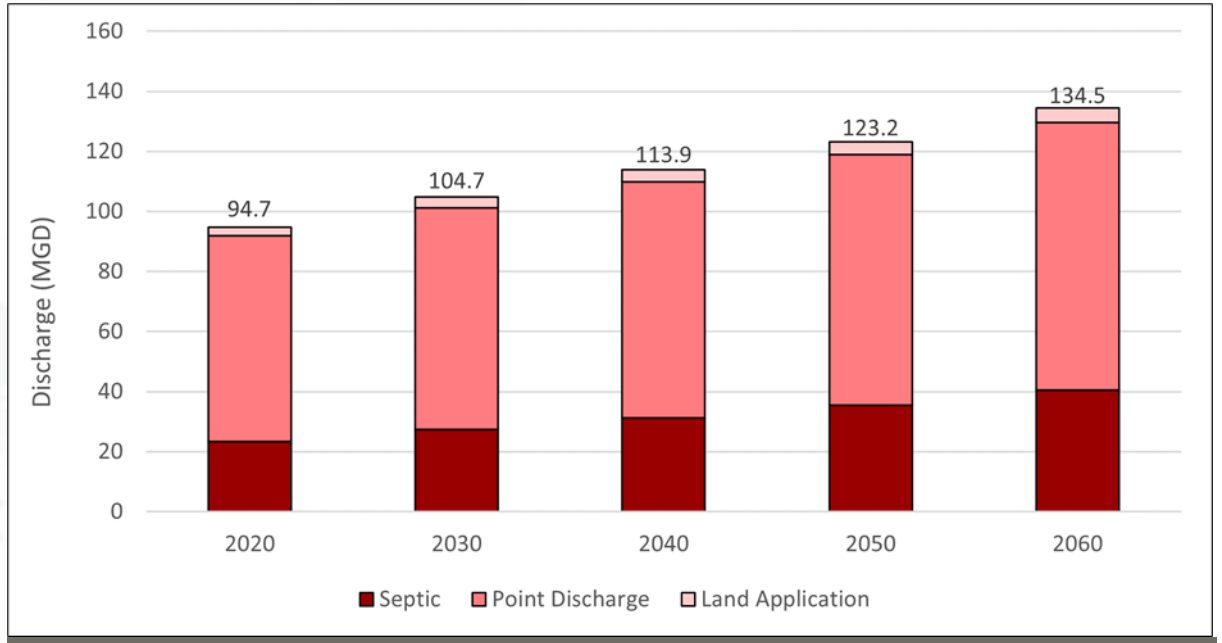
Source: Upper Oconee Water and Wastewater Forecasting Technical Memorandum (2022).
Notes: Values represent forecasted annual average demand (AAD) in million gallons per day (MGD).

2022 Figure 4-4 Water Demand Forecast by Sector (AAD-MGD)

https://waterplanning.georgia.gov/forecasting

Updated Wastewater Demand Forecast

- Municipal wastewater demand is forecasted to increase from 62 MGD in 2020 to 99 MGD in 2060.
- Percentage of municipal. wastewater treated by septic has declined compared to 2017 update but remains relatively steady in counties with low density.



Source: Upper Oconee Water and Wastewater Forecasting Technical Memorandum (2022).
Notes: Values represent forecasted annual average Demand (AAD) in million gallons per day (MGD).

Figure 4-5 Total Wastewater Flow Forecast (AAD-MGD)

https://waterplanning.georgia.gov/forecasting

Public Comments/Local Elected Official Comments

Pat Graham, UOC Vice-Chair

Wrap Up / Next Meeting / Adjourn

Pat Graham, UOC Vice-Chair