Middle Chattahoochee Council Meeting

March 15, 2022

GEORGIA
WATER PLANNING
waterplanning.georgia.gov

Agenda

OBJECTIVES

Check in with new members

Review and discuss water resource assessments

Discuss and consider adoption of revised vision statement and goals

10:00	Welcome, Agenda Review, Check-In with New Members
10:15	Chair's Report
10:20	American Rescue Plan Act: Water & Infrastructure Awards
10:25	Vision & Goals Revisions
10:50	Next Steps in Plan Development
11:00	Overview of Resource Assessments
11:10	Surface Water Availability Assessment
12:00	LUNCH
12:45	Groundwater Availability Assessment
1:20	Surface Water Quality Assessment
2:15	Break
2:25	Small Group Discussions: Incorporating Resource Assessments into Regional Water Plan
2:55	Resource Assessments Wrap-Up
3:00	EPD Report
3:10	Public Comment
3:20	Next Steps
3:25	ADJOURN

Introductions

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Middle Chattahoochee Council Members

Name	City	County
Hannah V. Anderson	Fort Gaines	Clay
John M. Asbell	LaGrange	Troup
Victoria Barrett	Richland	Stewart
Laura Lee Bernstein	Columbus	Muscogee
Patrick Bowie	LaGrange	Troup
Jimmy Bradley	Cuthbert	Randolph
Barbie Crockett	Centralhatchee	Heard
Steve Davis, Chair	Columbus	Muscogee
Philip Eidson	Tallapoosa	Haralson
Tony Ellis	Tallapoosa	Haralson
James Emery	LaGrange	Troup
Gardiner Garrard	Columbus	Muscogee
Dan Gilbert	Columbus	Muscogee
Joseph Griffith	Buchanan	Haralson
Tim Grizzard	Franklin	Heard
Jimmie L. Hayes	Morris	Quitman
Senator Jason Anavitarte (Ex-Officio)		

Name	City	County
Kevin Hayes	Franklin	Heard
Bill Heath	Breman	Haralson
Ken Johnson	Fort Gaines	Clay
Harry Lange	Cataula	Harris
Carvel Lewis	Georgetown	Quitman
Adolph McLendon	Richland	Stewart
George E. Moon III	West Point	Harris
Mac Moye	Lumpkin	Stewart
Denney Rogers	Ephesus	Heard
Randy Simpkins	Carrollton	Carroll
Jim Thornton	LaGrange	Troup
Kenneth M. Van Horn	Cusseta	Chattahoochee
Jason Weeks	Georgetown	Quitman
Don Watson (Alternate)	LaGrange	Troup
Matt Windom	Bowdon	Carroll
Robert York	Bremen	Carroll
Representative Randy Nix (Ex-Officio)		

Chair's Report

Presented by Chairman Davis

ARPA: Water and Infrastructure Awards

Presented by Kristin Rowles

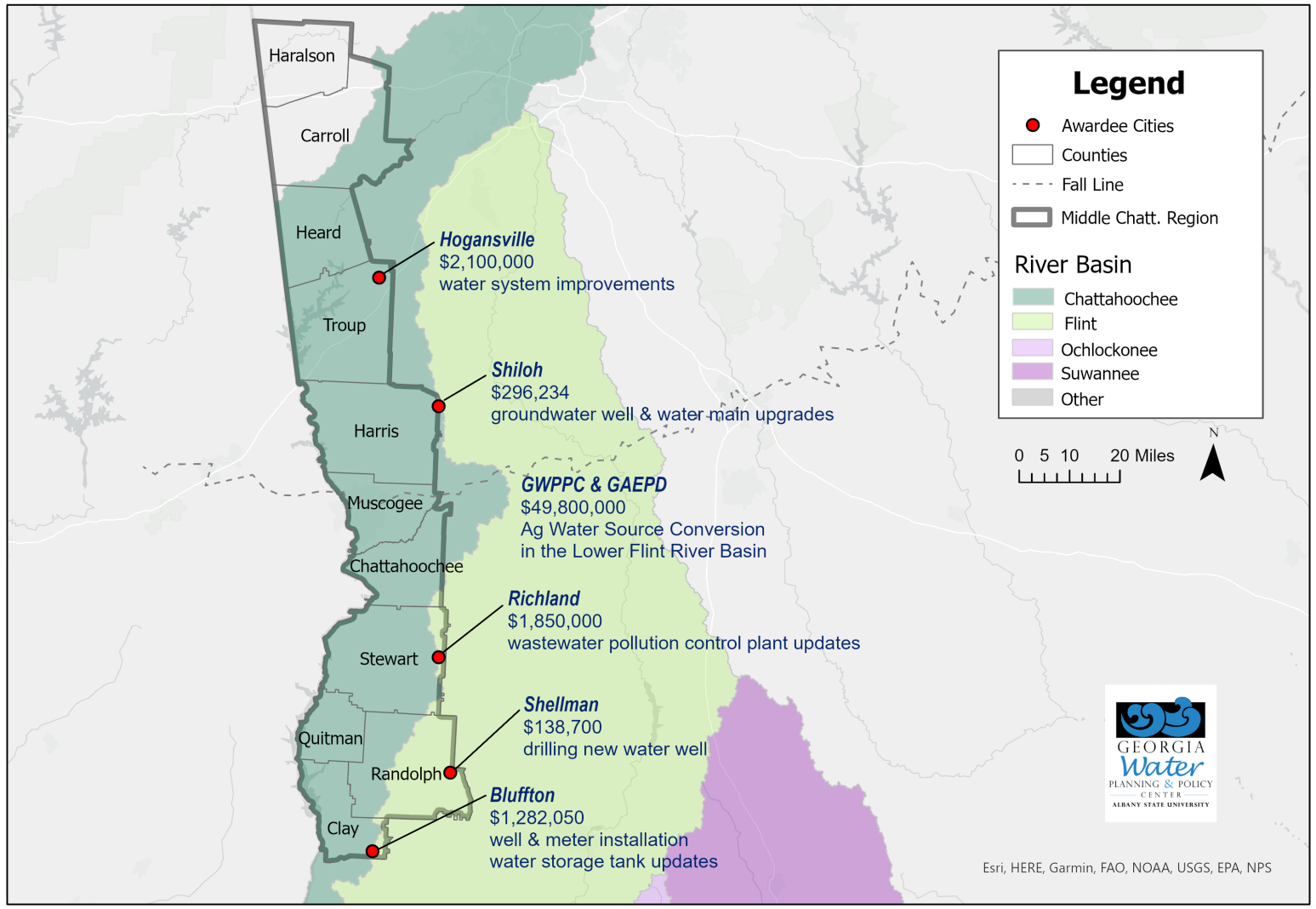
American Rescue Plan Water & Infrastructure Awards

Governor Kemp announced more than $422M in awards to reinforce water and sewer infrastructure in communities across the state (Feb 22, 2022)

These investments are aimed toward:

- Improving drinking water treatment
- Extending drinking water to high-need areas
- Improving drinking water infrastructure
- Improving wastewater treatment
- Improving biosolids management
- Improving sewer systems
- Securing water for future generations

Middle Chattahoochee Water Planning Region: Preliminary Awards
American Rescue Plan Act — Water & Sewer Infrastructure Grants



Agricultural Water Source Conversion for Streamflow Resilience

- $49.8 million preliminary award
- Primary Objective: Conversion of surface water withdrawals in the Lower Flint River Basin to deep groundwater sources
- Partnership:
  - Georgia Water Planning & Policy Center
  - Georgia Environmental Protection Division
  - Golden Triangle Resource Conservation & Development Council

GEORGIA Water
PLANNING & POLICY CENTER
ALBANY STATE UNIVERSITY

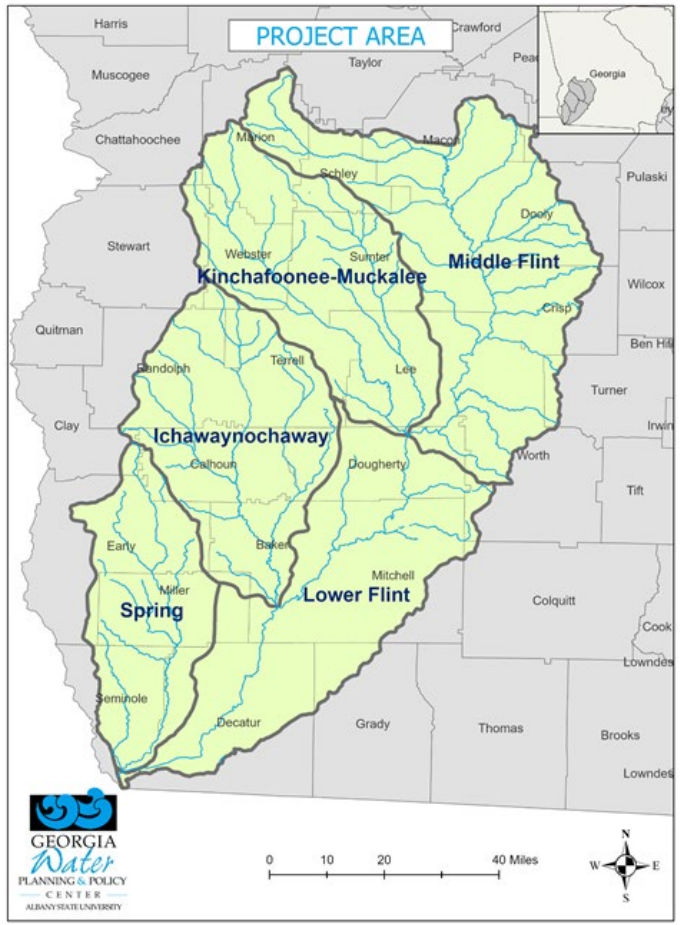
GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

Golden Triangle RC&D
Resource Conservation and Development Council
Southwest Georgia

Project Activities

- Installation of 242 deep groundwater wells at sites of existing agricultural surface water withdrawals
- Conservation planning at each participating farm
- Environmental monitoring and assessment of groundwater aquifers and aquatic ecosystems
- Flow augmentation system improvements
- Stakeholder-driven water resources and endangered species management planning

How the Project Relates to Regional Water Planning



- Project directly implements recommendations for source water conversion of surface water withdrawals in the plans of the region's three Councils: **Middle Chattahoochee, Lower Flint-Ochlockonee, Upper Flint**
- Project implements several other recommendations in these three regional water plans addressing water conservation, endangered species, data collection, and other water resource management objectives
- Project was developed based on results of a Regional Water Management Plan Implementation Seed Grant on source water conversion feasibility in Ichawaynochaway Creek Basin by the GA Water Planning and Policy Center (2017).

Vision and Goals

Committee Report

Middle Chattahoochee Council Plan Review Committee

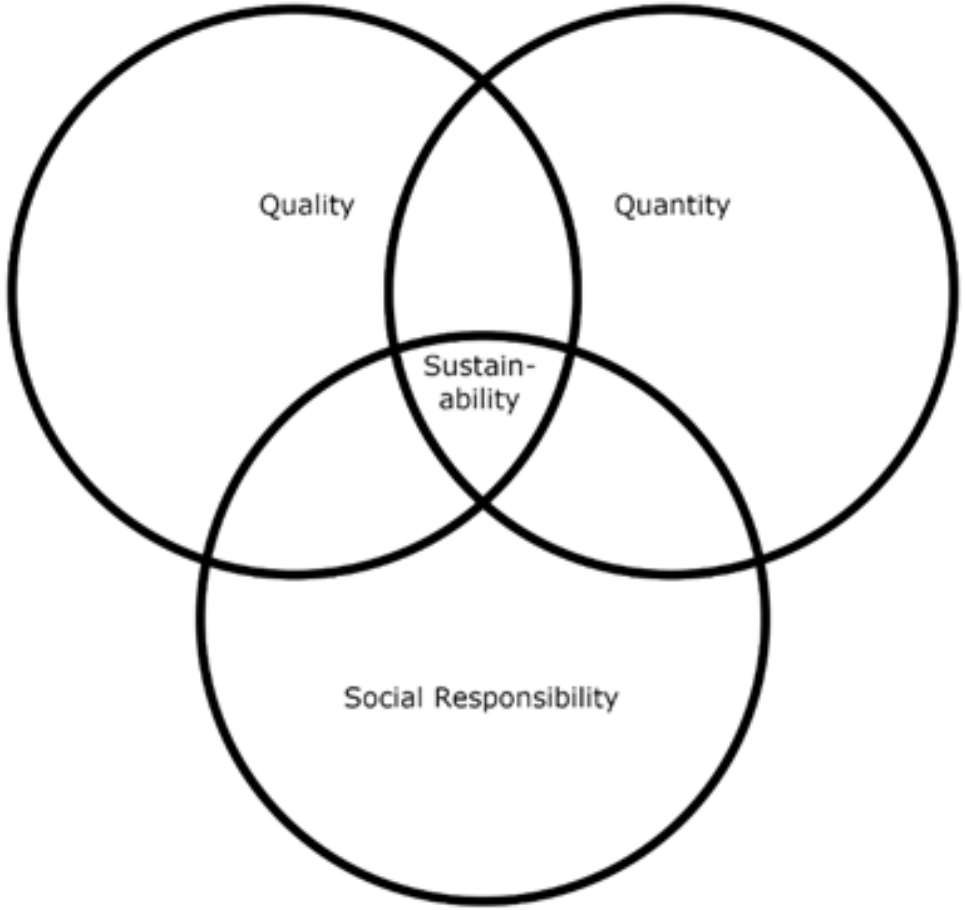
MEMBERS

- John Asbell
- Steve Davis
- Victoria Barrett
- Dan Gilbert
- Harry Lange
- Mac Moye
- Ken VanHorn
- Matt Windom

Plan Review Meetings

Areas of Discussion

- Ideas suggested by Council members at Nov 10 Council Meeting
- Economic opportunity and equity
- Restructuring, condensing & readability
- Importance of recreation



Vision Statement Revisions

Council's 2017 Vision

Our vision is that our descendants have safe, clean, and abundant water to meet their needs in the Middle Chattahoochee Region; seeking to accomplish that through reasonable efforts in cooperation, education, scientific research, best available data, and preservation.

Recommended Council's 2022 Vision

Our vision is that our descendants have safe, clean, abundant, and sustainable water in the Middle Chattahoochee Region through cooperation, education, scientific research, best available data, conservation, and stewardship.

Goals from 2017 Plan

1. **Political**
   - Provide the technical basis to help resolve the issues pertaining to water resources management and competing interests.
2. **Uncertainties**
   - Provide guidance for effective policies and appropriate actions during drought, economic uncertainty, regulatory or political influences, and effects of climate variability.
3. **River System**
   - The Apalachicola-Chattahoochee-Flint (ACF) River System is a unique asset of this region. The management of the rivers and their uses (hydropower, navigation, water quality, water supply, flood control, fish and wildlife conservation, recreation, and cooling water for nuclear and coal fired power plants) are vital to the region. The Plan will recommend adjustments to the management directives and uses of the river system in order to achieve a balance in meeting future water requirements in the region.
4. **Land Use Changes**
   - Acknowledge the increasing tax value of land and resulting trends: increasing urbanization, fewer natural forests, and decreasing agricultural land. However, the Plan will seek to encourage agricultural land and forest land conservation by providing for their water requirements.

Goals from 2017 Plan (cont.)

5. Water Balance

- Provide a better understanding of water balance and consumptive use and clearly define returns to surface water and the need for storage and provide guidance for the increasing trend in groundwater usage.

6. Population

- Address the water needs for an increasing resident population as well as the increased transient population at such locations as Fort Benning.

7. Quantity and Quality

- Establish the necessary goals to achieve water quality and quantity throughout the Middle Chattahoochee Basin.

8. Conservation / Green

- Encourage forest, agriculture and open land and habitat preservation. It will also encourage cost effective alternative energy sources, water conservation, and sustained protection of habitat and natural resources.

9. Inter-state Water Planning

- Recognize the importance of inter-state coordination in water planning to provide for sustainable management of shared water resources.

Recommended Goals

1. **Maintain collaboration** that acknowledges the significant differences of geography, population, economic conditions, and biodiversity in the region to build consensus around how to provide for the needs of this region sustainably and for the foreseeable future.
2. **Plan to protect the quality of the water** in the rivers, streams, and reservoirs in our region for the purposes of enhancing the quality of life for the people in our region, conserving fish and wildlife, promoting recreation, supporting our economy, and protecting public health, with due consideration of environmental and economic sustainability.
3. **Plan the use of water** in the rivers, streams, and reservoirs within our region to provide sufficient flow and lake levels for public and private uses, including transportation, commerce, energy production, agriculture, public water supply, flood control, recreation, industry, and economic development, with due consideration of environmental and economic sustainability.

Parking Lot

Material that was not incorporated into the goals that the Committee would like to consider how it is addressed elsewhere in the plan

- Develop a better understanding of water balance and consumptive use of water in the region, clearly define returns to surface water, assess the need for water storage, and provide guidance for groundwater management.
- Plan for sufficient water storage to meet demands in periods of drought.
- Consider the diverse economic and water needs of our region in our planning in order to enhance prosperity for all.
- Apply a lens of equity of opportunity to our collaborative planning efforts in the region.
- Consider in our planning the increasing tax value of land and resulting trends: increasing urbanization, fewer natural forests, and decreasing and agricultural land.

Parking Lot (cont.)

- Encourage agriculture, forest land conservation, and open land and habitat preservation by providing for their water requirements. Our plan will also encourage cost effective alternative energy sources, water conservation, and sustained protection of habitat and natural resources.
- Recognize the importance of inter-state coordination in water planning to provide for sustainable management of shared water resources.
- Provide the technical basis to help resolve the issues pertaining to water resources management and competing interests.
- Provide guidance for effective policies and appropriate actions to address drought, economic uncertainty, regulatory or policy changes, and the effects of climate variability.
- Guide the management and uses of the river systems in our region to achieve a balance in meeting future water requirements.

Next Steps in Plan Development

Corinne Valentine, Black & Veatch

Regional Water Plan Update

Regional Water Plan Review and Revision Schedule

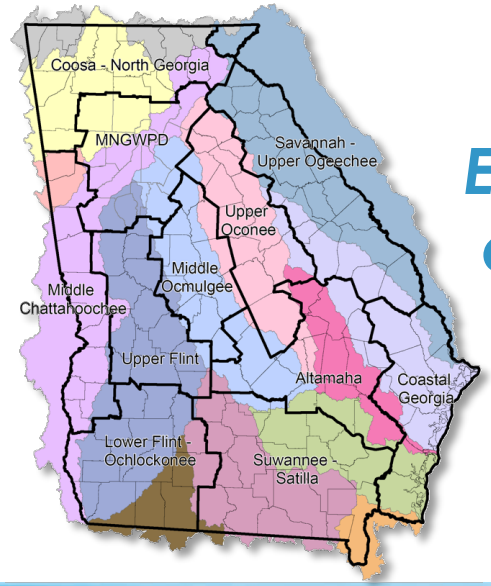
Meeting One
4th Quarter 2021

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

Regional Water Plan Update

Regional Water Plan Review and Re

Meeting One
4th Quarter 2021

Meeting Two
1st Quarter 2022

Meeting Three
2nd Quarter 202

(Final)
2022
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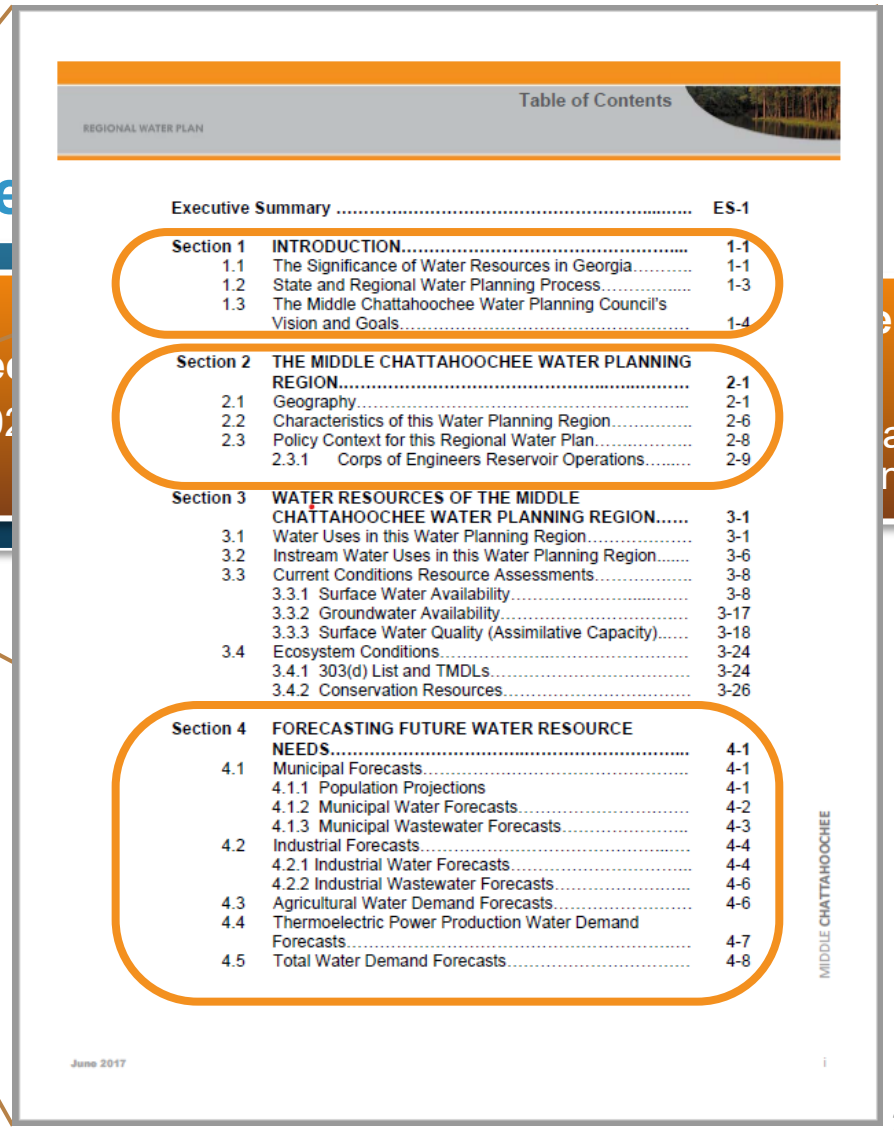

Table of Contents

REGIONAL WATER PLAN

MIDDLE CHATTAHOOCHEE

June 2017

i

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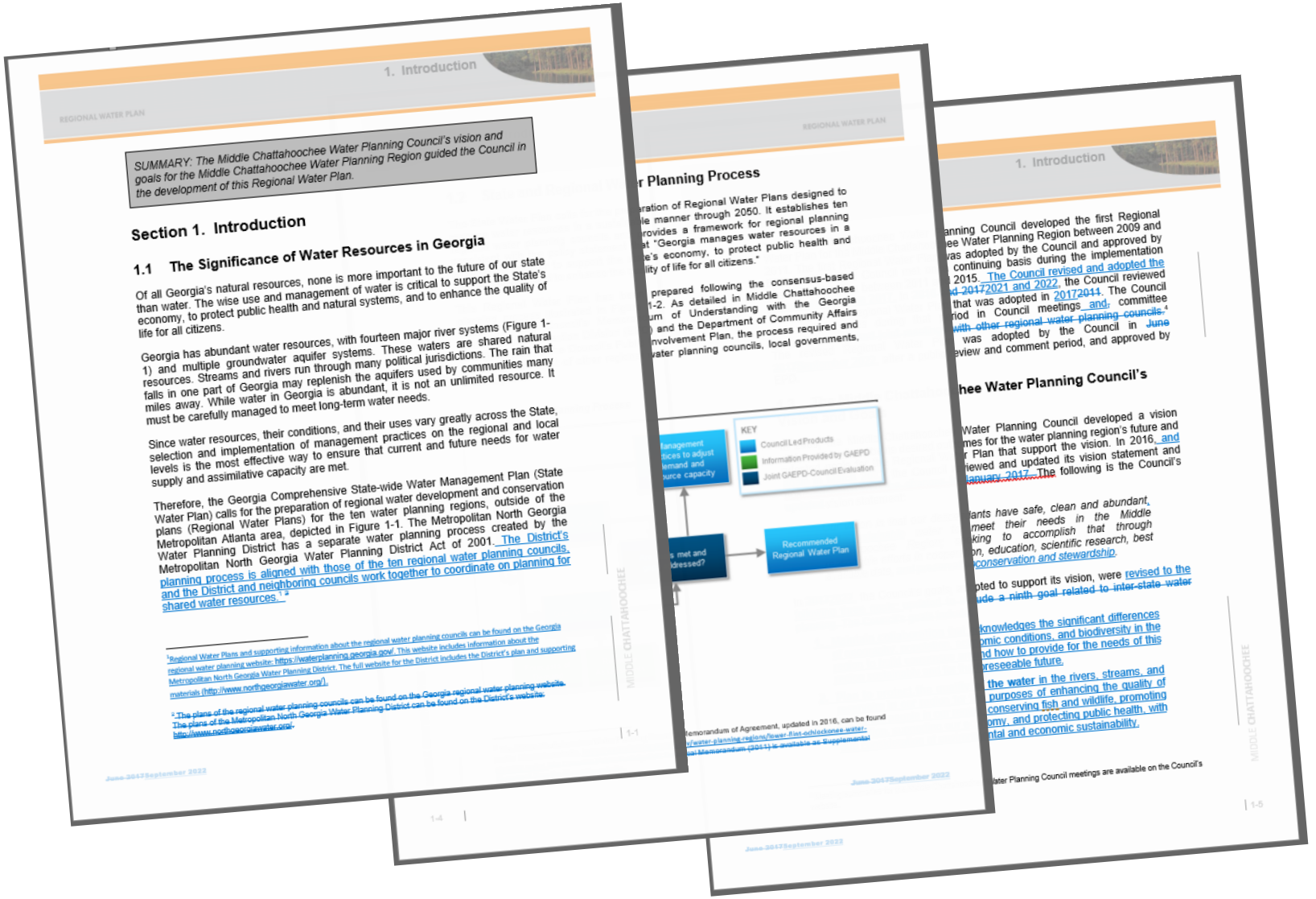
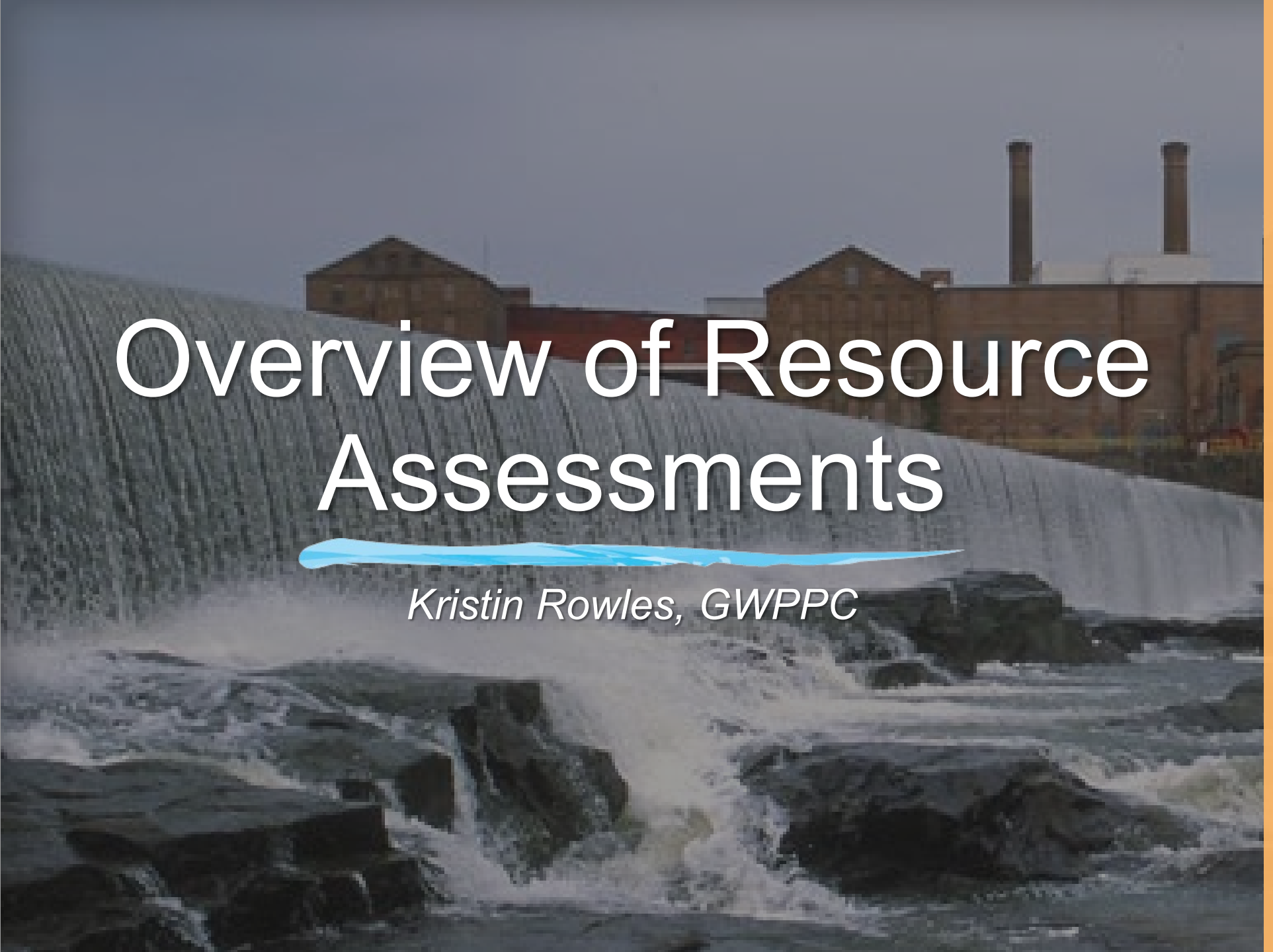
WATER PLANNING

Regional Water Plan Update





Overview of Resource Assessments

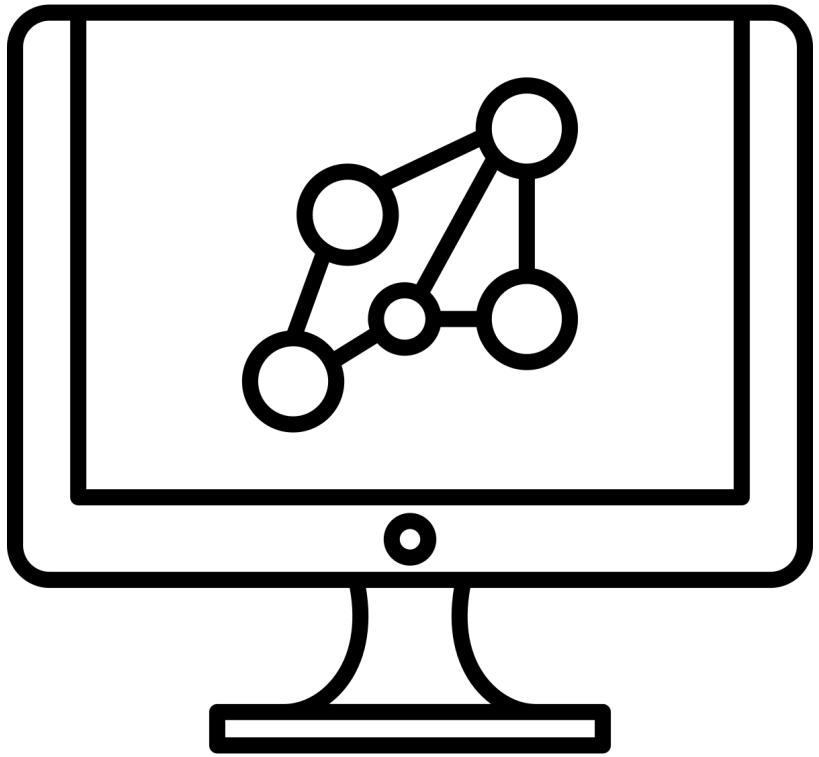
Kristin Rowles, GWPPC

Regional Water Planning Models

1. Groundwater Availability
2. Surface Water Availability
3. Surface Water Quality

We Use Models to Understand and Predict

- Model development builds on theory and data to **represent** a system.
- Model **calibration** adjusts a model to better represent the system (fit with observations).
- Model **validation** tests whether a model makes good predictions.
- Model **simulations** provide results that illustrate and predict how a system works.



Regional Water Planning Model Results

***Metrics** are used to evaluate the results relative to outcomes of interest.*

Surface Water Availability

Do we have enough water to…

- meet demands?
- assimilate wastewater?
- support recreation?

Groundwater Availability

How does groundwater use affect our aquifers?

Does groundwater use cause adverse impacts?
(to users, aquifers, instream flows)

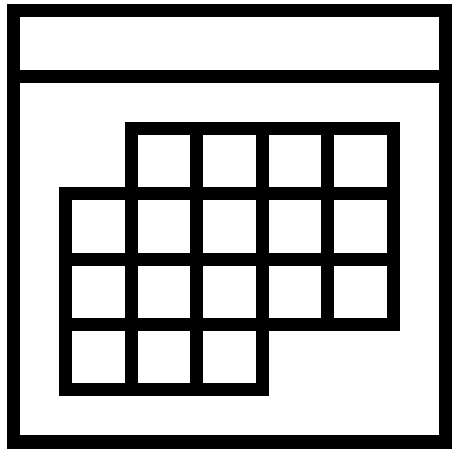
Sustainable Yield

Surface Water Quality

Is water quality adequate to support uses?
(drinking water, recreation, fishing)

How do wastewater discharges affect water quality (dissolved oxygen)?

Regional Water Planning Models



Groundwater Availability

- Results are ready and will be presented today

Surface Water Availability

- Results will be shared at next meeting
- Today's focus is on how the model works and how we measure results (***metrics***)

Surface Water Quality

- Some model results will be shared today and some at the next meeting

Using the Resource Assessment Models

- How do the results explain the capacity of the region's water resources to meet demands (forecasts) and the Council's vision and goals?
- Do the results point to any concerns? How can the regional water plan address those concerns?
- What metrics do you find useful? Are there other metrics you would like to see?
- What other information do you need to understand the condition of the region's water resources?

ASK QUESTIONS

Surface Water Availability Assessment

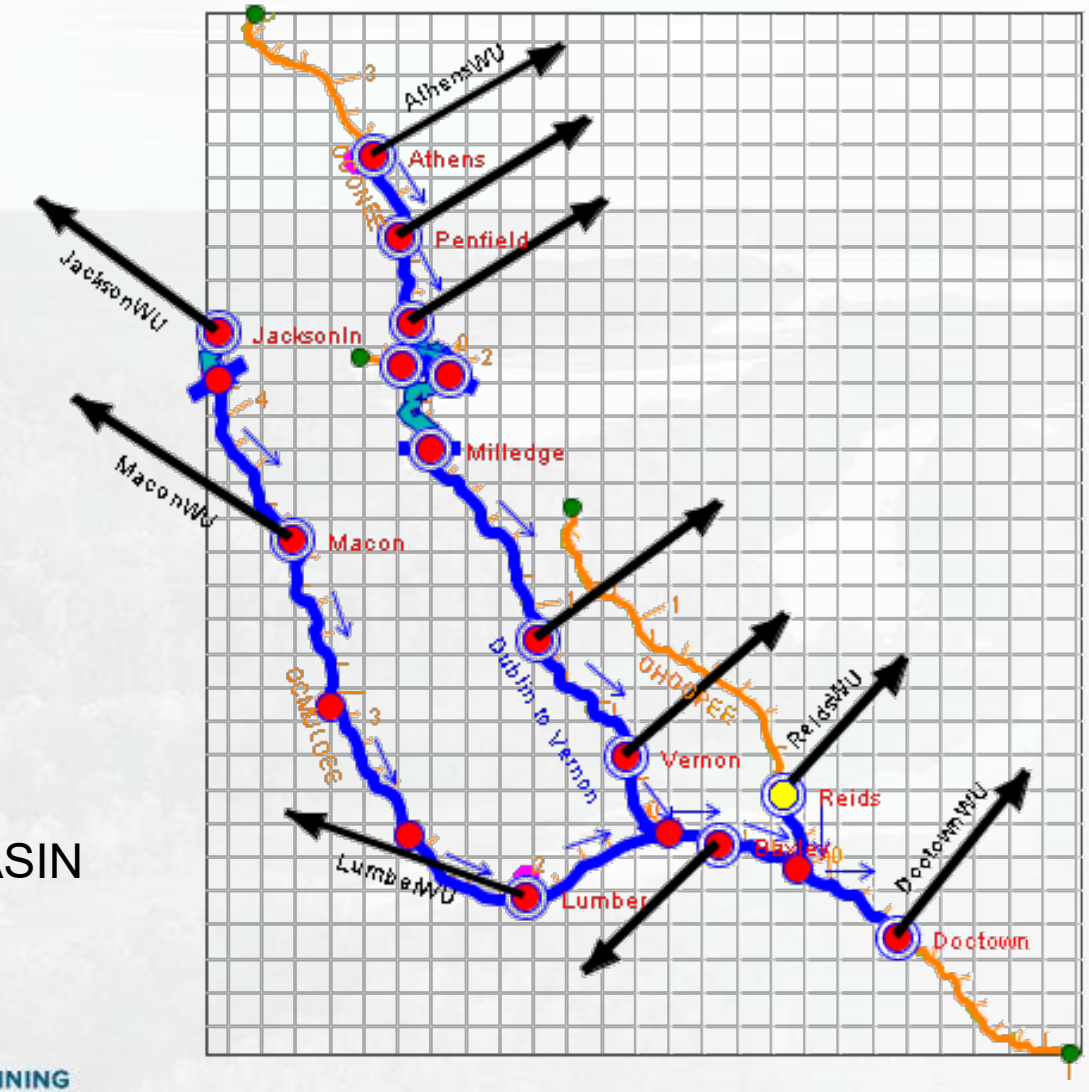
Wei Zeng and Jennifer Welte, GA EPD

Kristin Rowles, GWPPC

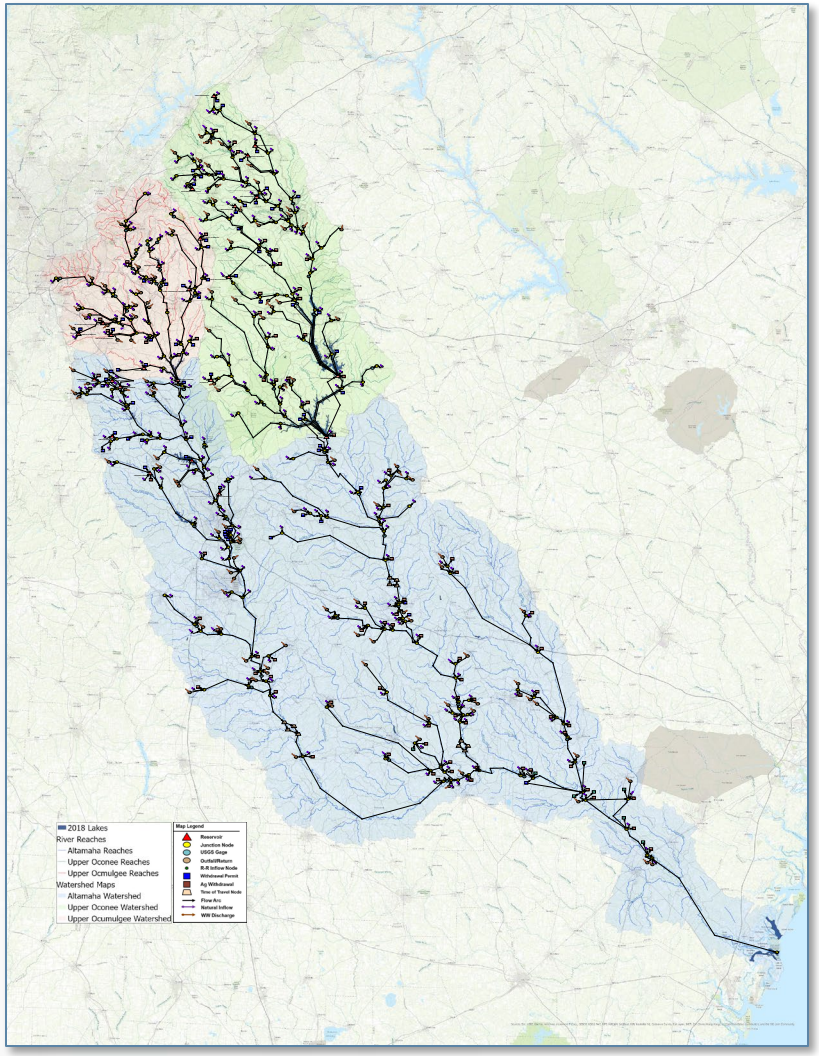
Outline

- What is BEAM? (Basin Environmental Assessment Model)
- Model Metrics & Results
- Today's Examples – Oconee-Ocmulgee-Altamaha Basin (OOA)
- Apalachicola-Chattahoochee-Flint Basin (ACF) Results – Next Council Meeting

ResSim (Prior Model) and BEAM Schematics



OOA BASIN



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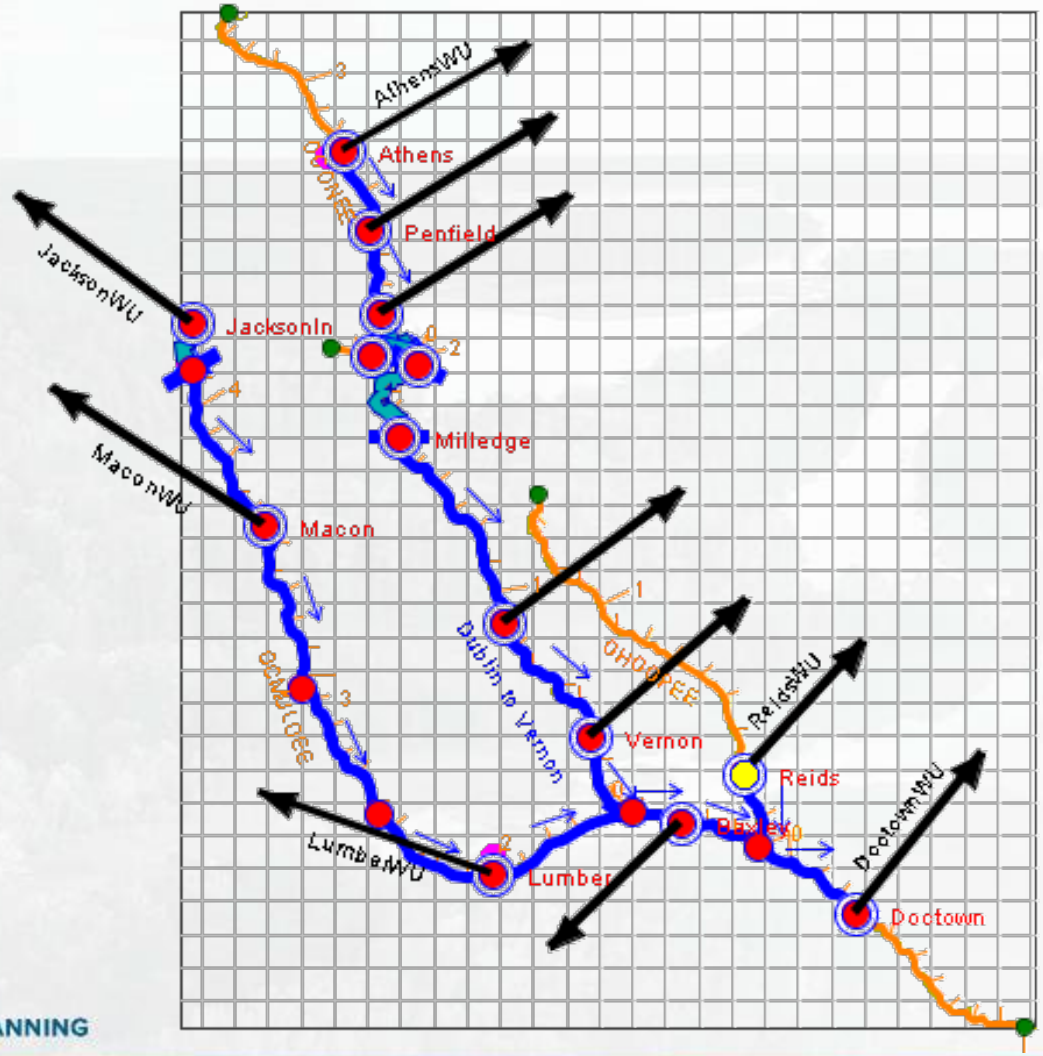
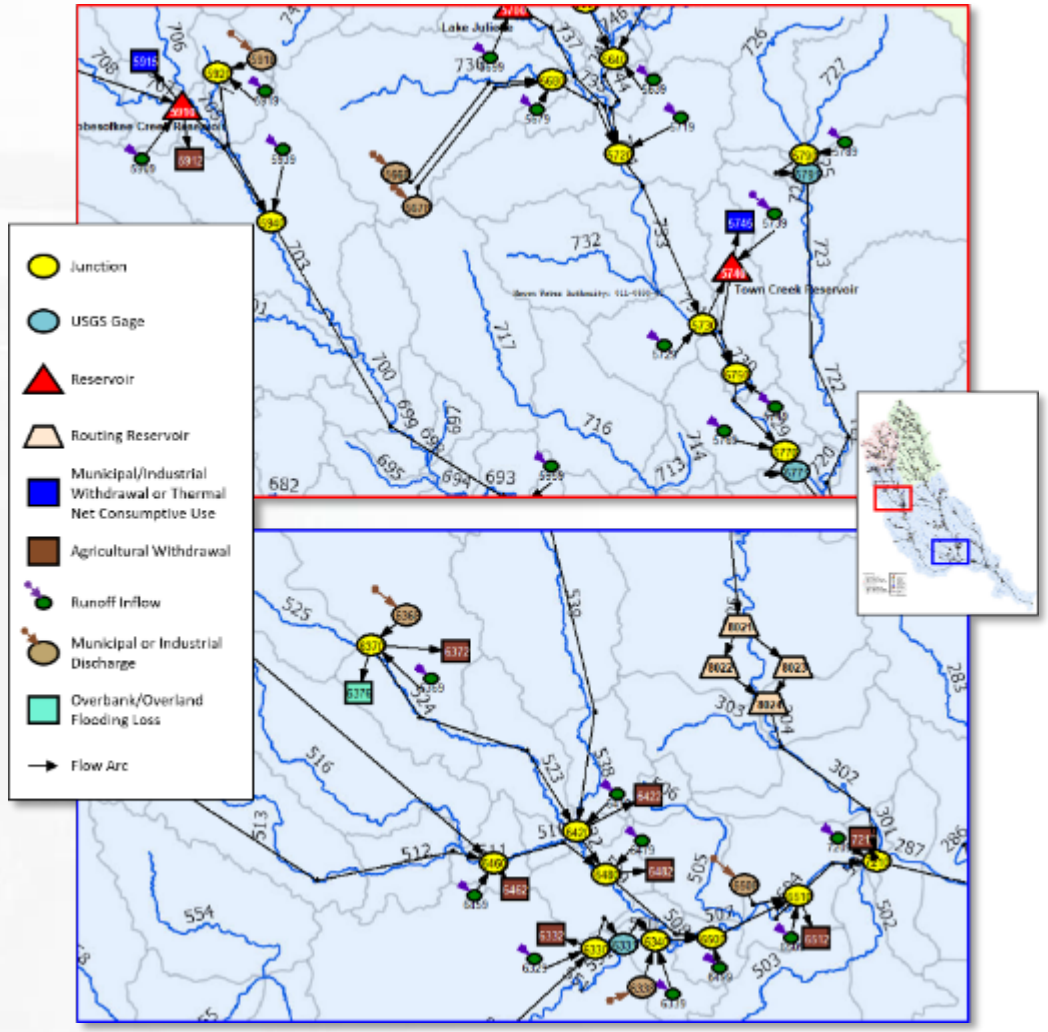
ResSim (Prior Model) and BEAM (Zoomed In) Schematics





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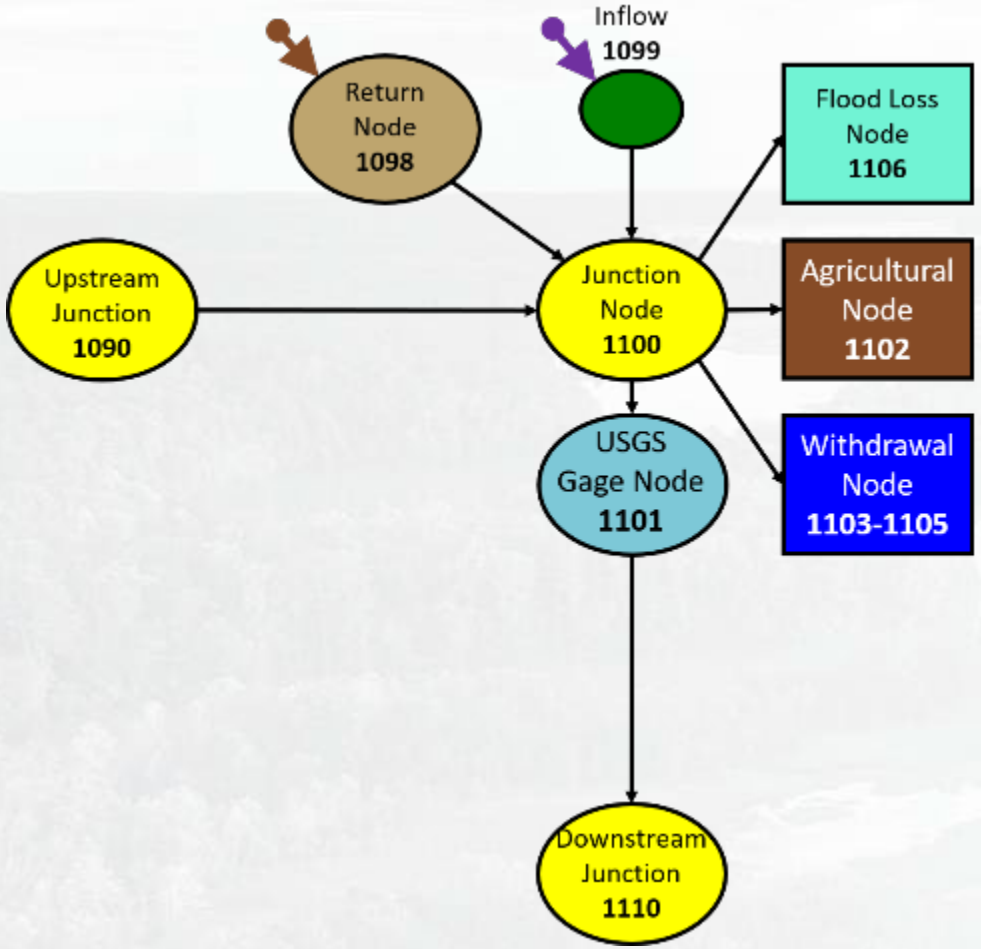
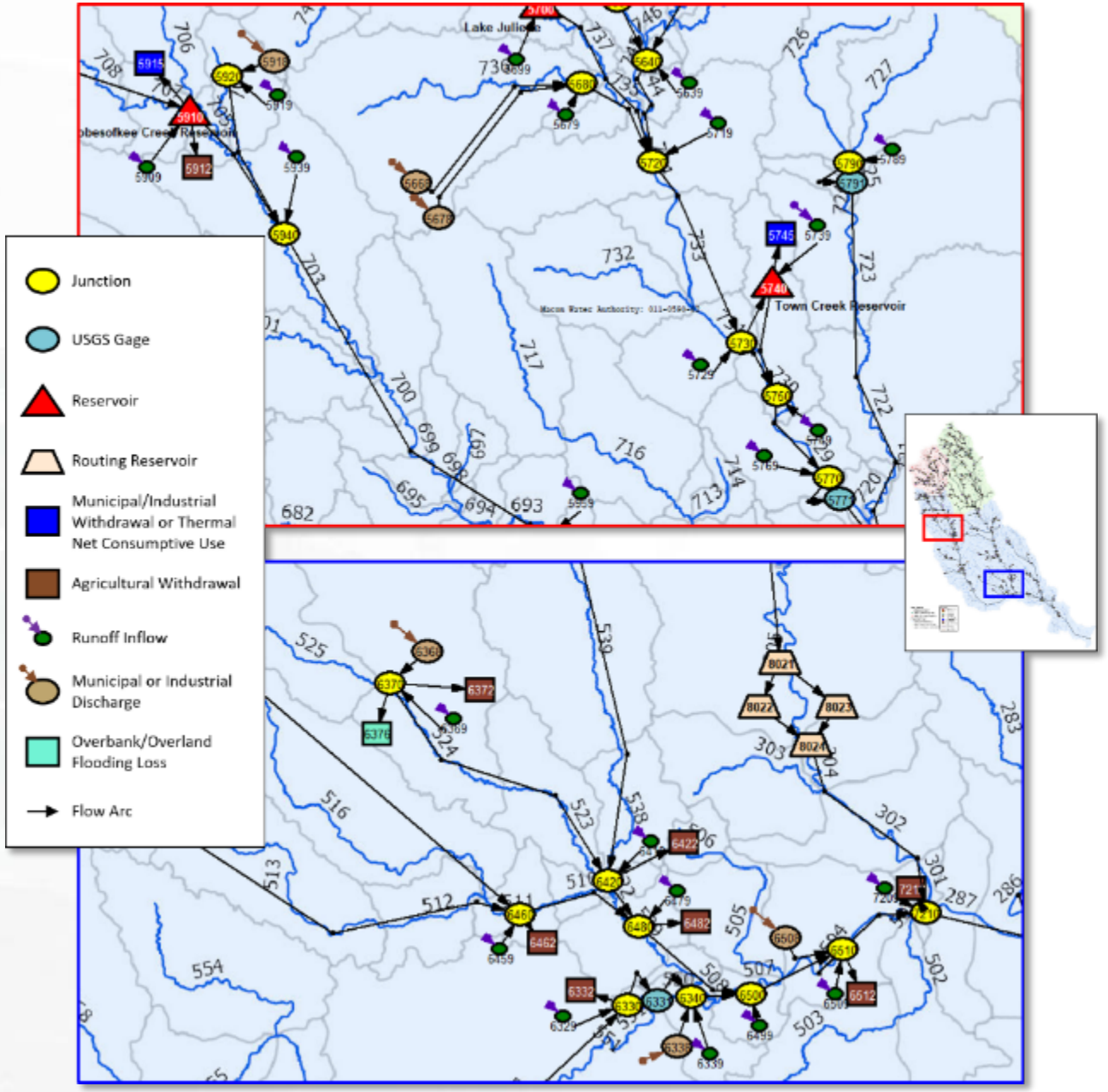
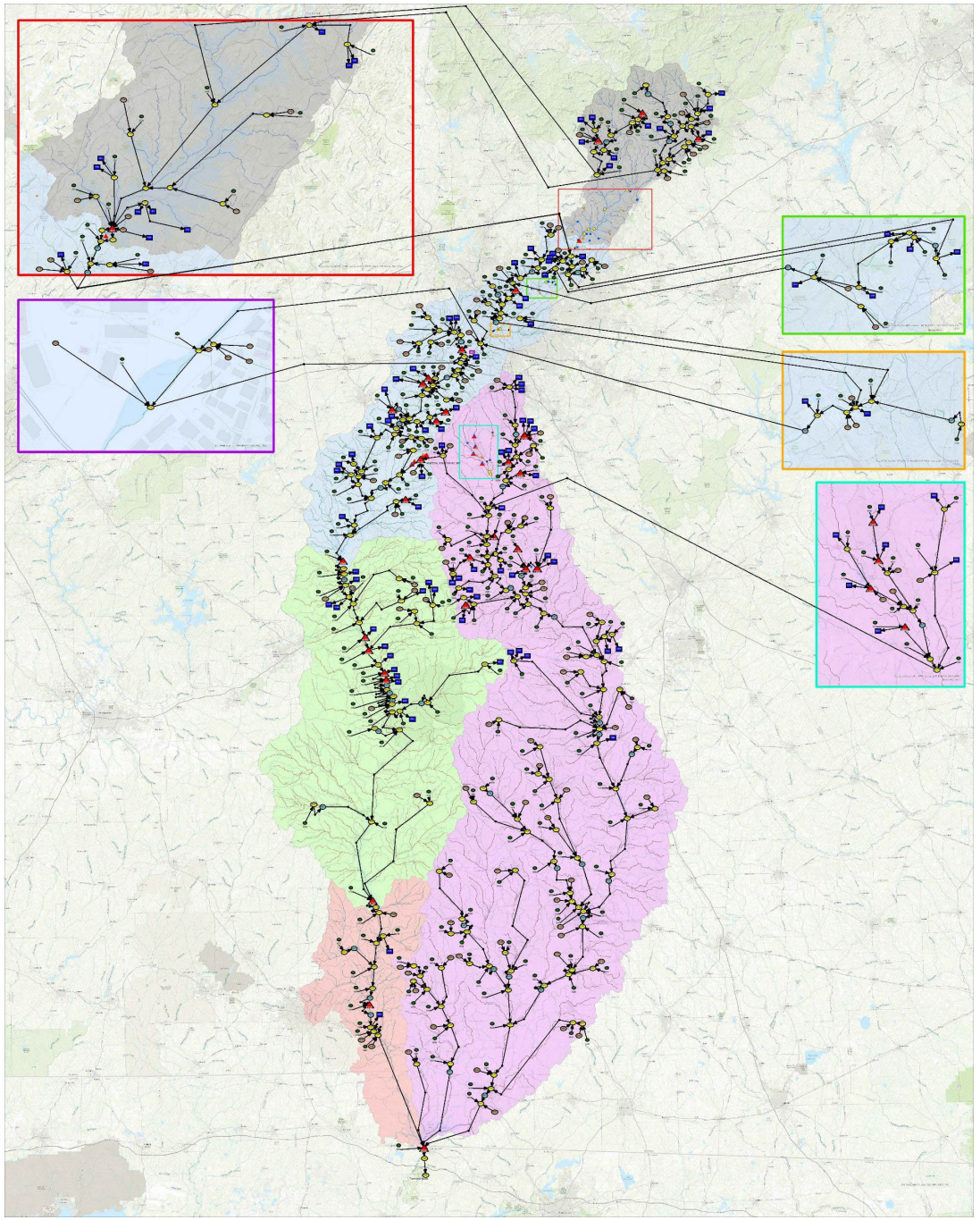
BEAM Node Types





BEAM Schematic for the ACF



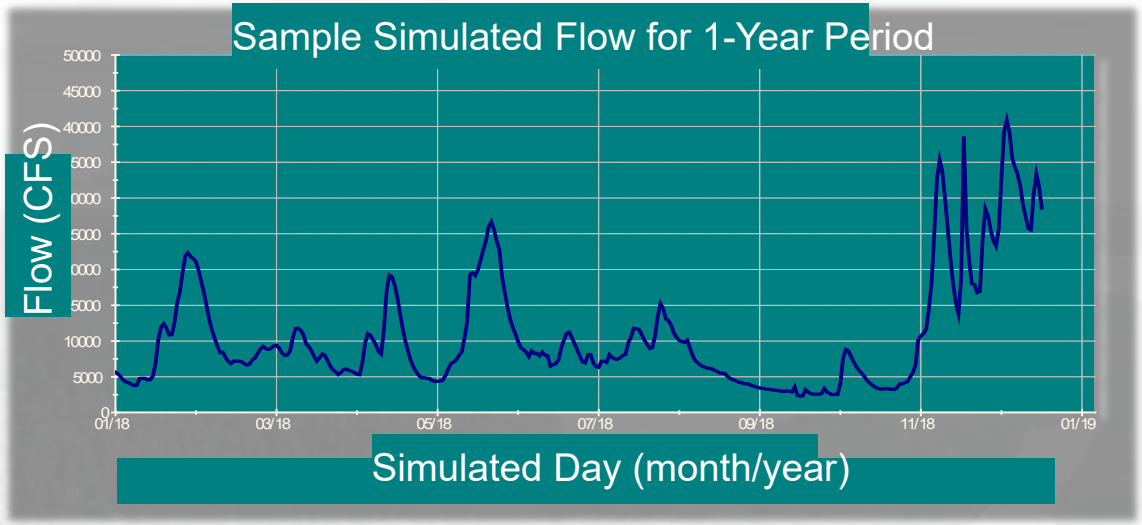
Baseline Conditions

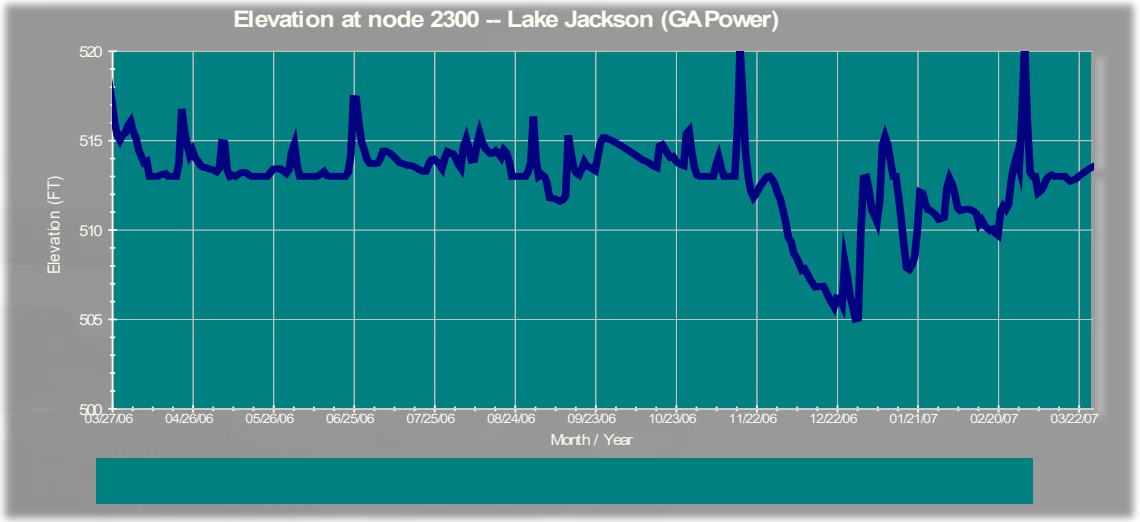
- Simulation Period (Hydrologic Conditions): 1939-2018
- Withdrawal and Discharge amount: average of period 2010-2018 (i.e., marginally dry conditions)
- Instream Flow Protection Thresholds: per permit conditions

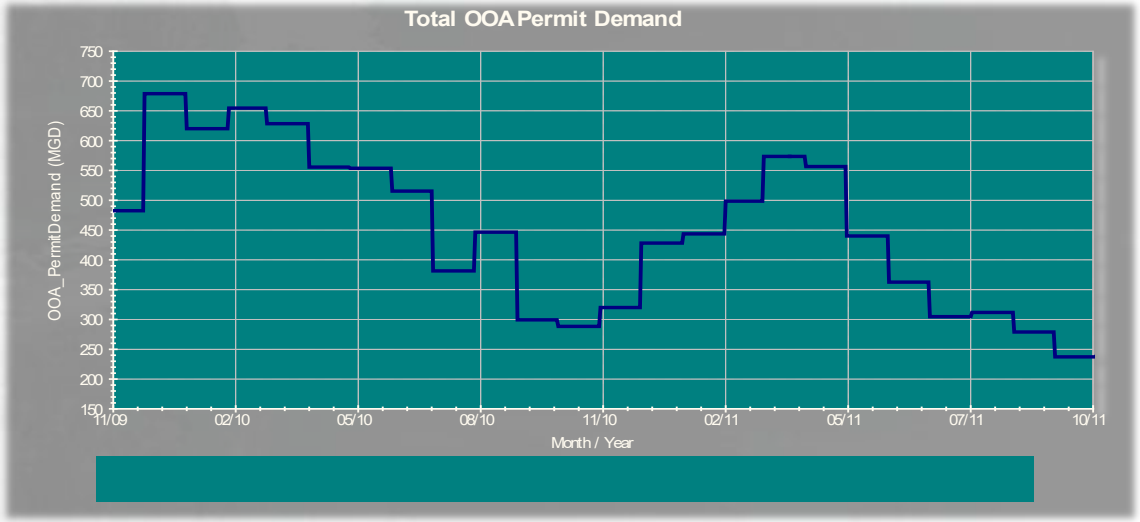
BASELINE model results will tell us how things are **now**.

They will give us a **basis for comparison** with future conditions or hypothetical conditions.

Sample Model Output







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Approximate Schedule for BEAM by BASIN

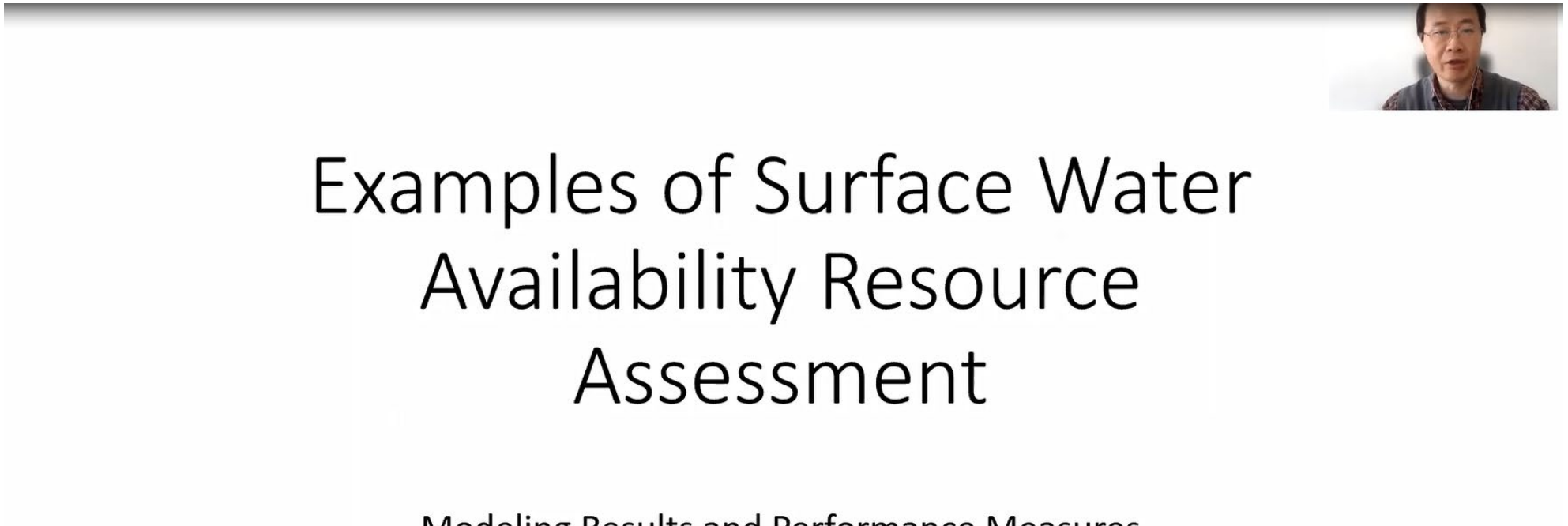
Basin	Abbreviation	Results Ready
Oconee-Ocmulgee-Altamaha	OOA	Now
Ochlockonee-Suwannee-Satilla-St. Mary's	OSSS	March
Savannah-Ogeechee	SO	April
Apalachicola-Chattahoochee-Flint	ACF	May
Alabama-Coosa-Tallapoosa	ACT	May

Video Overview

- **Metrics to Evaluate Surface Water Availability with the BEAM Model**
  - Water Supply
  - Wastewater Assimilation
  - Recreation
  - Fish Habitat

Examples in the video are in the OOA BASIN

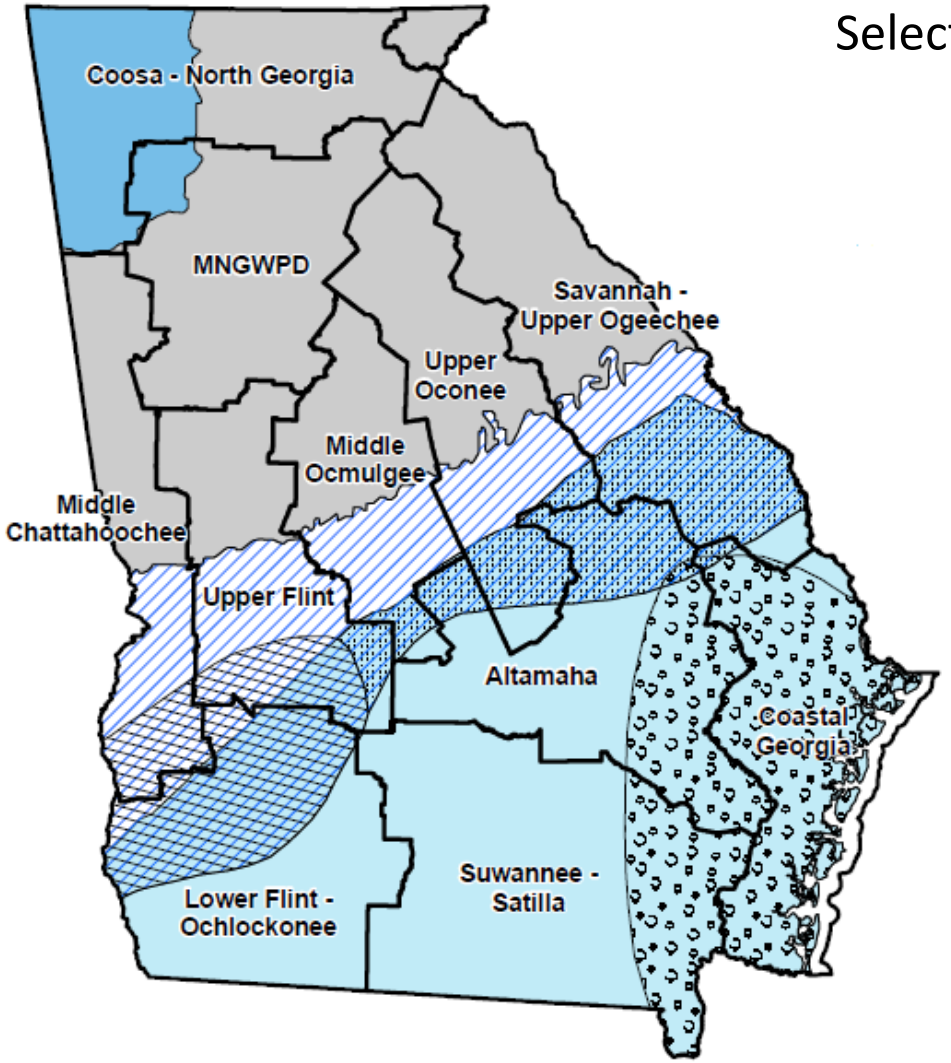
Surface Water Availability Assessment



Groundwater Availability Assessment

Christine Voudy, GA EPD

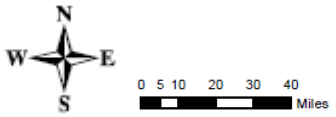
Water Planning Regions and Georgia's Aquifers



Select aquifers were prioritized for assessment.

Legend

- Water Planning Regions
- Brunswick Aquifer System
- Claiborne and Clayton Aquifers
- Cretaceous Aquifer System
- Crystalline-rock Aquifers
- Gordon Aquifer System
- Paleozoic-rock Aquifers
- Upper and Lower Floridan Aquifers



Georgia®

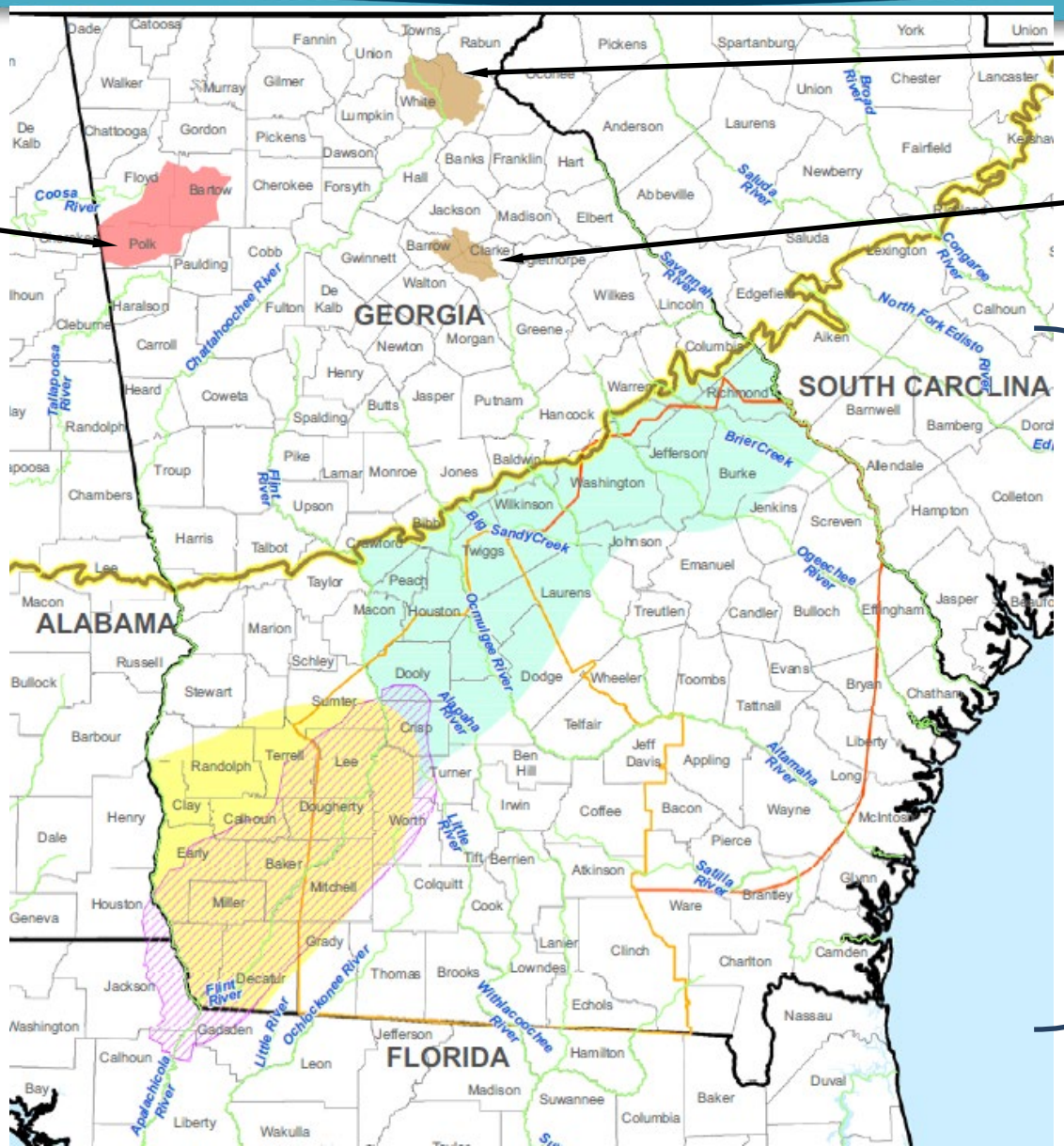
Sustainable Yield

- Amount of groundwater that can be withdrawn without causing unwanted results.
- Metrics were established
  - Drawdown between pumping wells not to exceed 30 ft.
  - Reduction in aquifer storage does not go beyond a new base level.
  - Groundwater recovers between periods of higher pumping.
  - No more than 40% reduction in stream baseflow
  - Groundwater levels do not go below top of confining layer.

Prioritized Aquifers Selected for Groundwater Resource Assessment

Ridge & Valley Region:

Paleozoic-rock Aquifer Study Basin



Blue Ridge & Piedmont Regions:

Crystalline-rock Aquifer Study Basins

Coastal Plain Region Aquifer Study Basins:

- ***Upper Floridan: Eastern Coastal Plain***
- ***Upper Floridan: South Central GA***
- ***Upper Floridan: Dougherty Plain***
- ***Cretaceous***
- ***Claiborne***

Crystalline Rock Aquifer – 2011 Plan

Water Budget Approach

- Most appropriate way to provide a planning level assessment of groundwater resource sustainability this region of the State.

- Is an accounting of water movement within the hydrologic cycle, both natural and artificial.
  - Net gw consumption = gw withdrawals – gw recharge

- By comparing net groundwater consumption to the sustainable yield criteria, estimates of net groundwater availability were developed.

Crystalline Rock Aquifer Study Basins

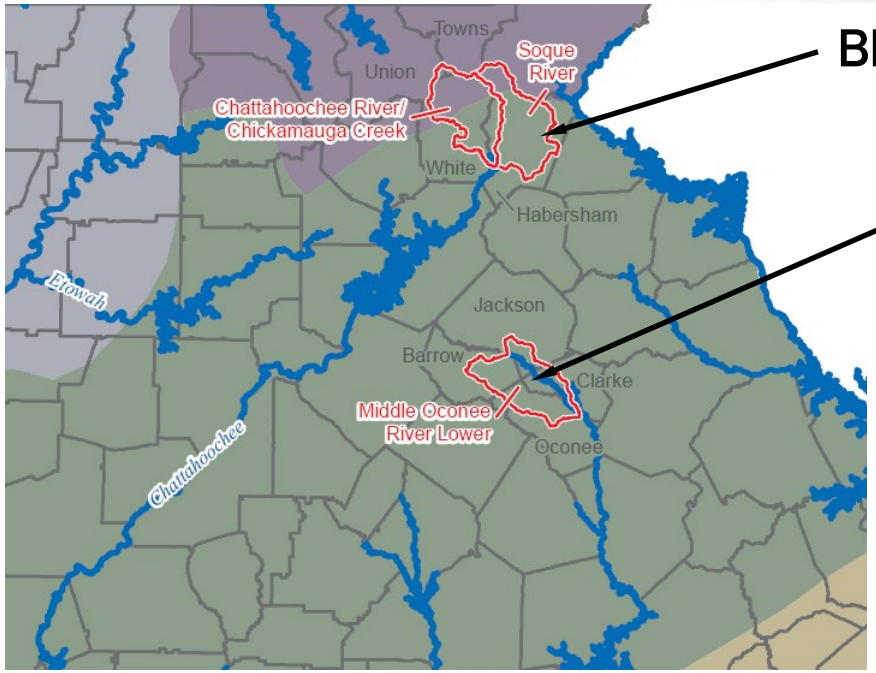
Estimated Range of Sustainable Yield

- Because the water budget focuses on streamflow as the primary estimator of recharge and groundwater availability a variant of the Tennant Method was used to estimate sustainable yield.

- Daily streamflow data from the period 1989 – 2008 were used to calculate the mean annual streamflow and baseflow and a range of streamflow and baseflow reduction amounts (40% to 60%) were evaluated.

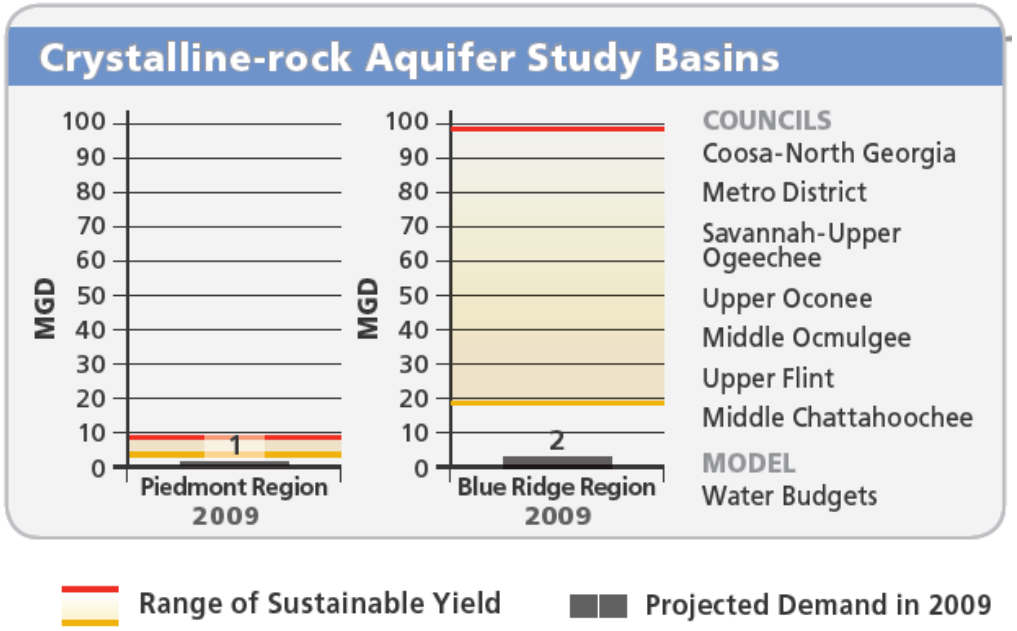
- The 50% mid-level streamflow was chosen as the criterion to estimate the net amount of groundwater available for use.

Crystalline Rock Aquifer
Water Budget Modeling Approach



Blue Ridge Region

Piedmont Region



Forecasted Demands Crystalline Rock Aquifer (Carroll, Haralson, Harris, Heard, and Troup Counties):

2020 – 3.05 MGD
2060 – 2.91 MGD

Regional Coastal Plain Model and Select Sub-Regional Model Domains – 2011 Plan

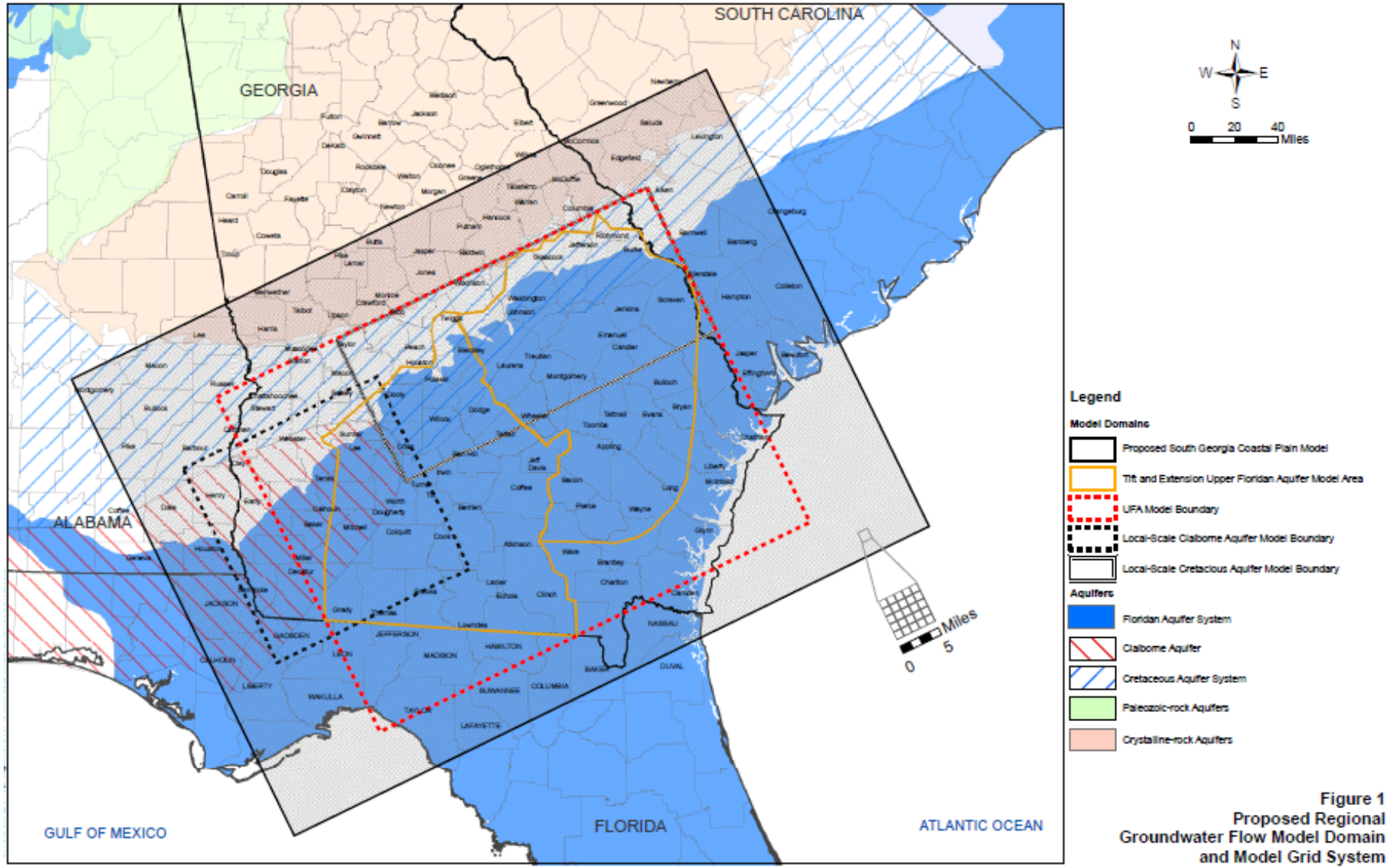


Figure 1
Proposed Regional Groundwater Flow Model Domain and Model Grid System

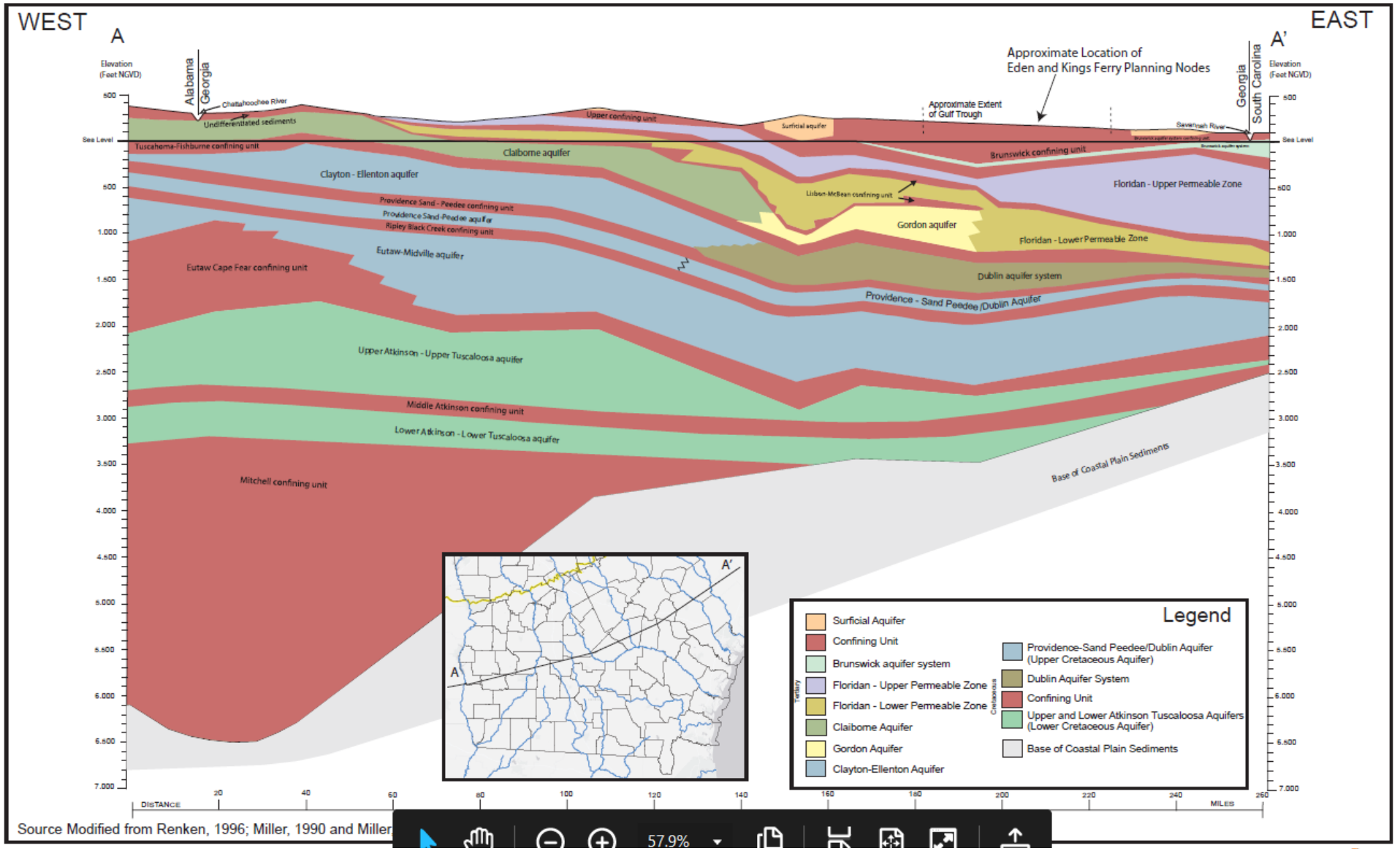
Regional Coastal Plain Model

- MODFLOW three-dimensional finite difference model.
- Seven model layers depict prioritized aquifers
  - Layer 1 - Surficial
  - Layer 2 – Floridan
  - Layer 3 – Claiborne
  - Layer 4 – Clayton
  - Layers 5-7 - Cretaceous Sand
    - Providence
    - Eutaw-Midville
    - Upper/Lower Atkinson
- Confining units between aquifer layers is represented as vertical leakance (negligible horizontal flow and vertical flow is calculated by the model)
- Grid spacing of model is 1-mile by 1-mile and all properties are centered.

Regional Coastal Plain Model

- Model was run in steady-state mode.
- Model depicts all permitted well locations and pumping rates within the Georgia Coastal Plain.
- Baseline withdrawals
  - Municipal and Industrial pumping rates were provided by EPD.
  - No pumping data available on Ag wells, so pumping rates were estimated based on USGS water use data from 2000 to 2005. These were estimated by County.
  - Included withdrawals from portions of aquifers in AL, FL, and SC within model domain.

Cross-Section of Hydrogeologic Units – Regional Coastal Plain Model



Source Modified from Renken, 1996; Miller, 1990 and Miller

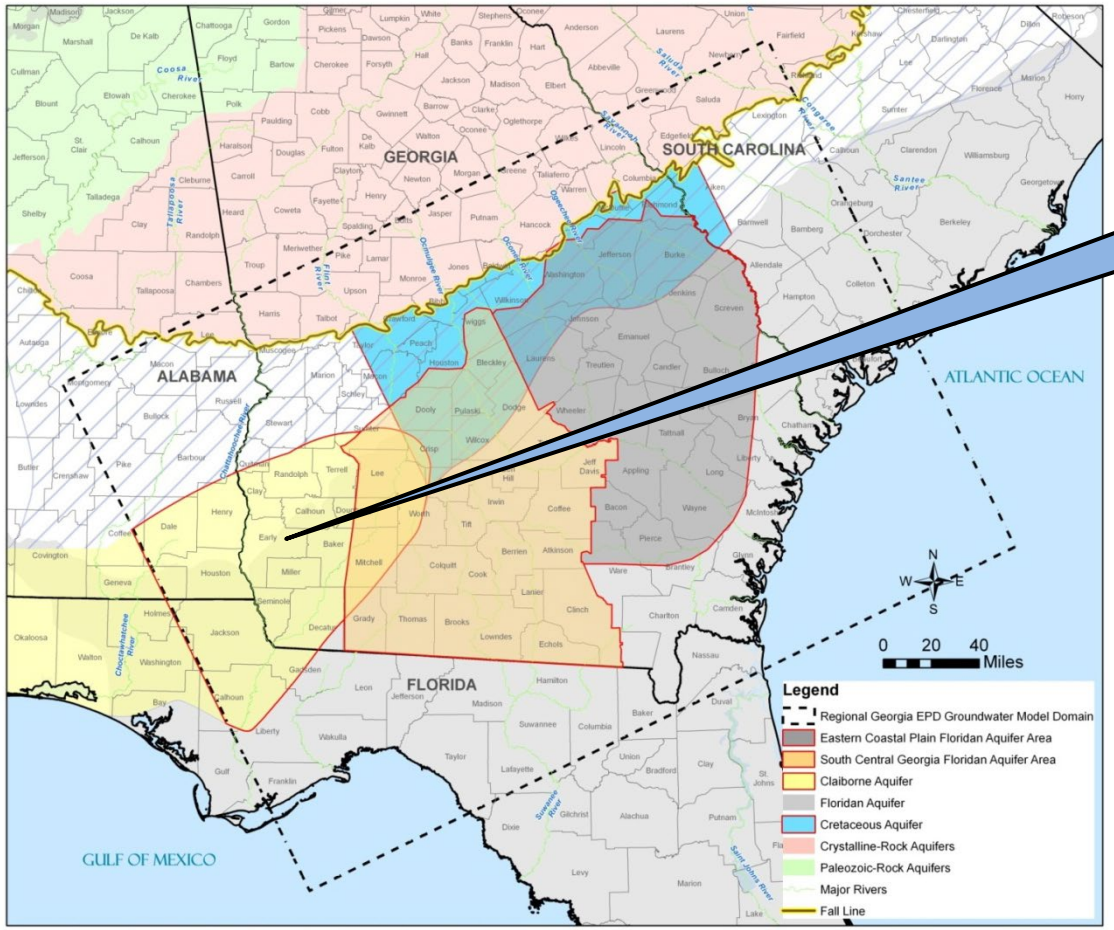
Round 1 - Sustainable Yield Estimates

- Low end – Uniformly increase simulated withdrawals from existing well locations until criteria is met.

- High end – Non-uniformly increase simulated withdrawals from existing and hypothetical wells until criteria is met.

- Sustainable yield assumes withdrawals from aquifer are increased while withdrawals from other aquifers held constant.

Claiborne Aquifer – Georgia Coastal Plain



Claiborne Aquifer in Georgia's Coastal Plain

Low End of SY = 140 mgd
High End of SY = 635 mgd

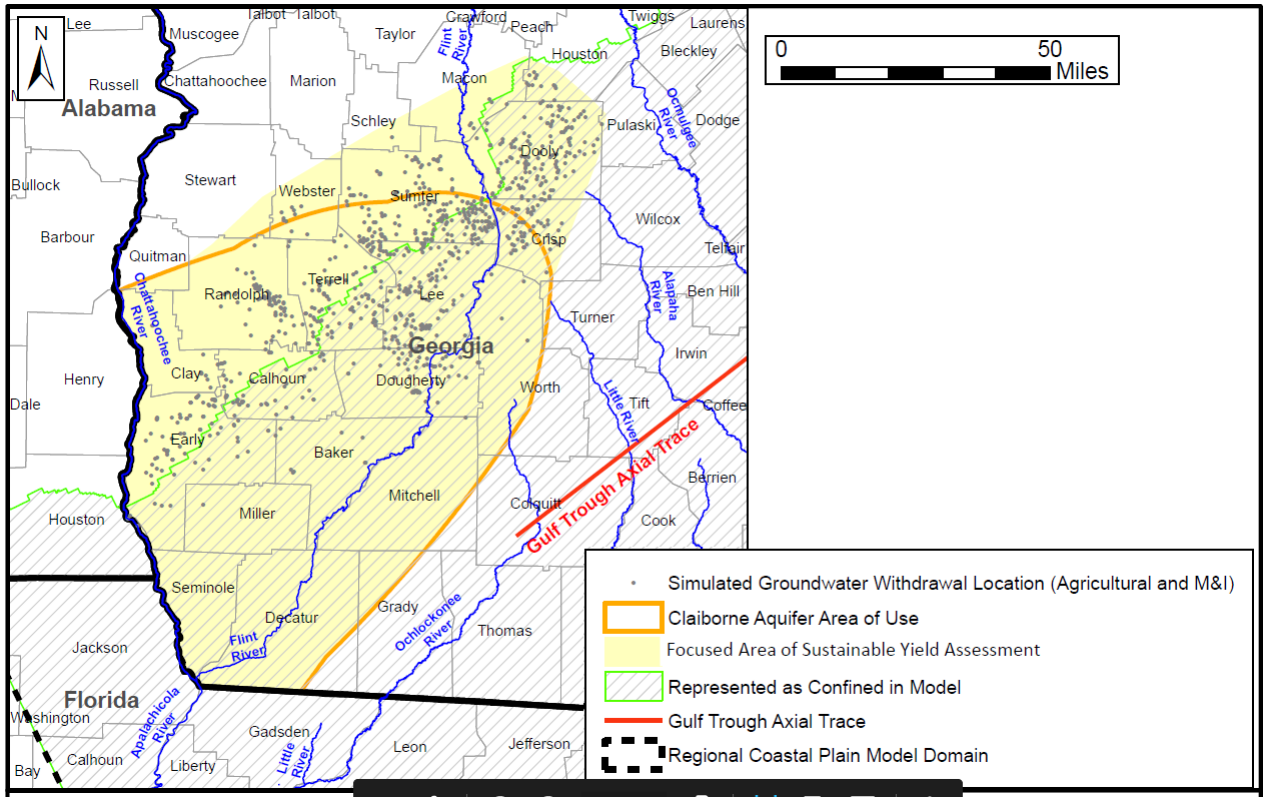
Middle Chattahoochee current use and forecasted demands :
2020 – 4 mgd
2060 – 5 mgd

Aquifer-wide Demands:
2020 – 71 mgd
2060 – 94 mgd

Groundwater Resource Assessment Updates for 2017 Plan

- Between 2016-2017:
  - Reduce finite difference grid cell size
    - From 1 mile^2 to 2,000 ft^2 for SW GA Subregional Model
    - From 1 mile^2 to 1,760 ft^2 for Regional Coastal Plain Model
  - Transmissivity values of Claiborne Aquifer were revised based on data collected during 2017 GEFA study.
    - Leakance of Claiborne Aquifer was adjusted as part of model calibration.
    - Leakance and transmissivity of Clayton Aquifer and Providence Sand were adjusted as part of the model calibration.
  - Expanded representation of river-groundwater interactions.
    - Expanded number of tributary streams represented in models.
  - Transient model inputs were developed with model calibration.
    - Represent hydrologic groundwater conditions for period from 2009-2012.
    - Metered Ag data were available for these years.

Claiborne Aquifer Updates



- New Area of Use defined for the Claiborne Aquifer.
  - Includes parts of Crisp, Dooly, Macon and Houston Counties.
- Refined model reassessed Sustainable Yield of Claiborne Aquifer.

Claiborne Aquifer Updated Sustainable Yields

Condition	Pumping from Claiborne Aquifer	Increased Pumping		Modeling Results			
				Max Drawdown	Reduced GW Contribution to River Baseflow		
	(mgd)	(mgd)	(%)	(ft)	Model-wide	Focused Area of SY Assessment	Flint River
Baseline	120						
Uniformly increased existing well pumping (low end of SY)	141	20	17%	30	< 1 %	< 2 %	< 1 %
Existing and new well pumping (high end of SY)	803	682	564%	30	7.5%	5.4%	24%

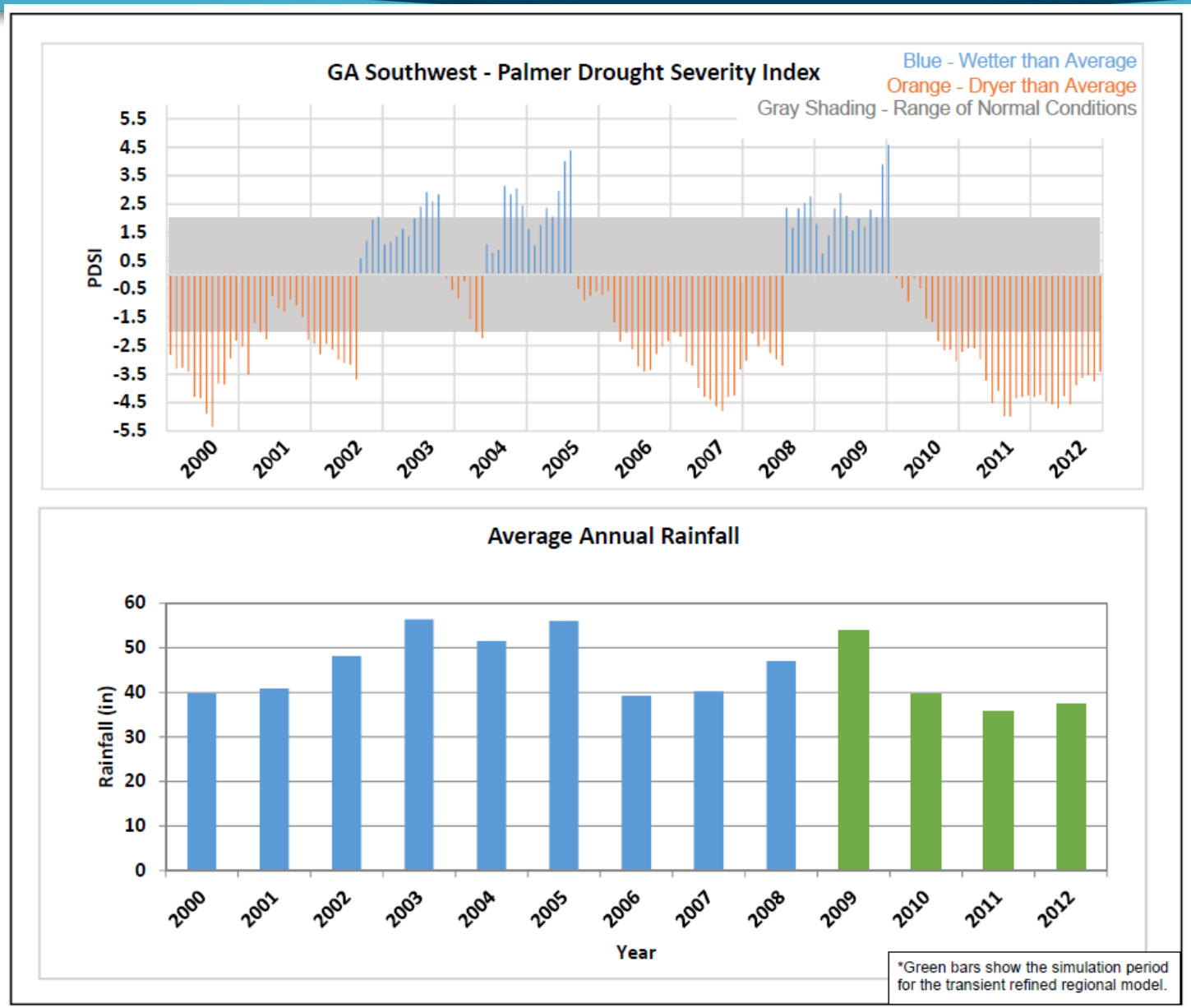
Claiborne Aquifer – High End Sustainable Yield

County	Simulated Baseline Groundwater Withdrawal Rate (mgd)	Simulated High End Groundwater Withdrawal Rate (mgd)	County	Simulated Baseline Groundwater Withdrawal Rate (mgd)	Simulated High End Groundwater Withdrawal Rate (mgd)
Baker	1.0	11.3	Miller	0.1	21.2
Calhoun	4.3	44.5	Mitchell	0.01	3.8
Clay	1.1	28.8	Pulaski	0	2.7
Colquitt	0	0.4	Quitman	0	4.2
Crisp	9.4	37.4	Randolph	9.1	87.4
Decatur	0	4.6	Schley	0.3	16.6
Dooly	15.6	83.1	Seminole	0	3.7
Dougherty	8.3	22.7	Stewart	0	11.4
Early	6.5	67.1	Sumter	32.3	116.5
Grady	0	1.2	Terrell	11.0	80.8
Houston	4.5	18.9	Turner	0	0.5
Lee	14.1	49.7	Webster	1.2	41.1
Macon	1.1	34.7	Worth	0.3	7.2
Marion	0	1.2			

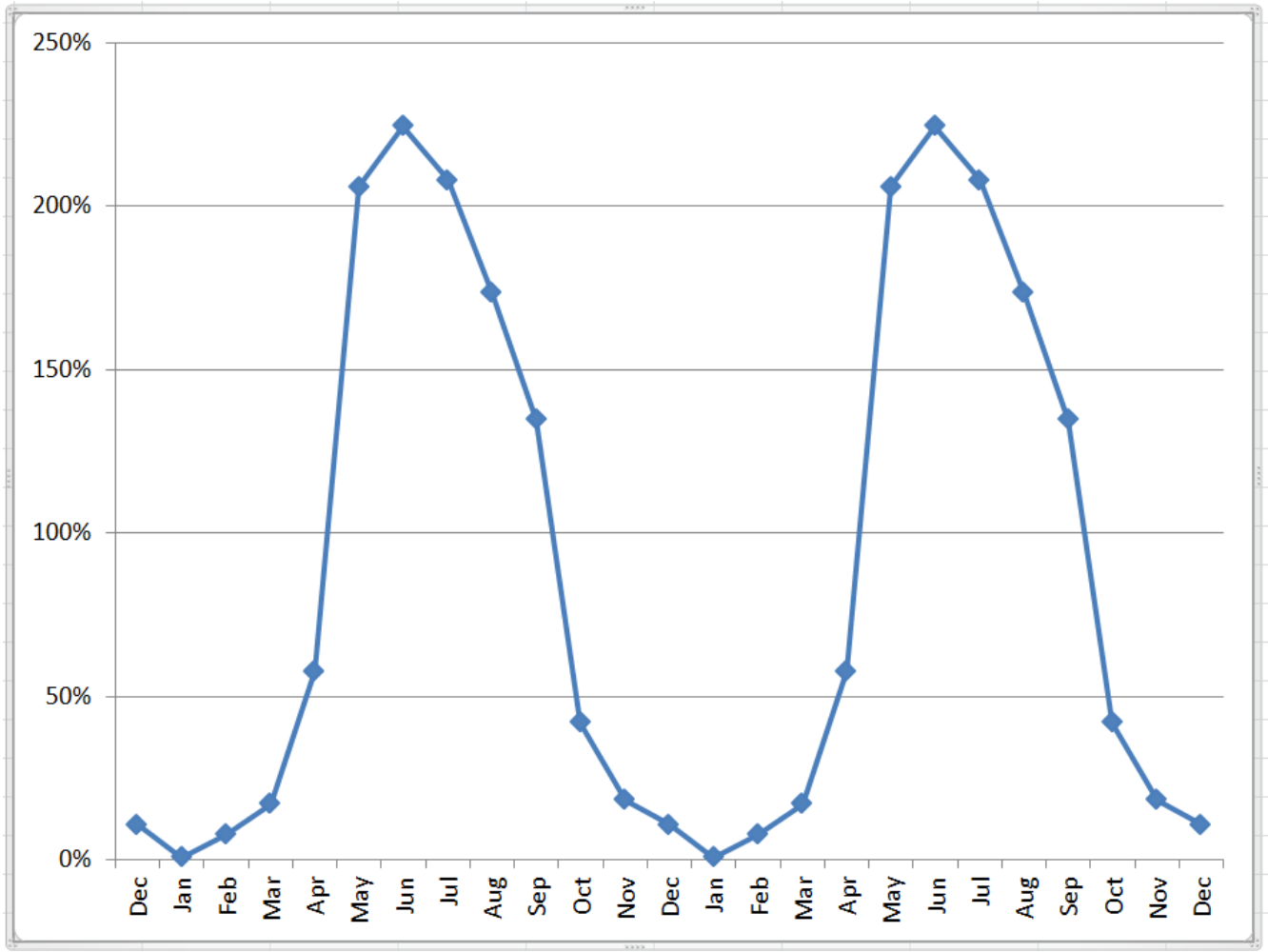
Additional Assessment of Cretaceous Sand Aquifer

- Focused assessment of Cretaceous Sand Aquifer system in Middle Chattahoochee Council area.
- Modeling was done of increased groundwater withdrawals where additional drawdowns from the withdrawals would not extend to rivers and drains in the aquifer outcrop areas.
- Model run in transient mode.
- Model simulations represent hydrologic groundwater conditions for period from 2009-2012.

Annual precipitation of the four years chosen for the transient simulations



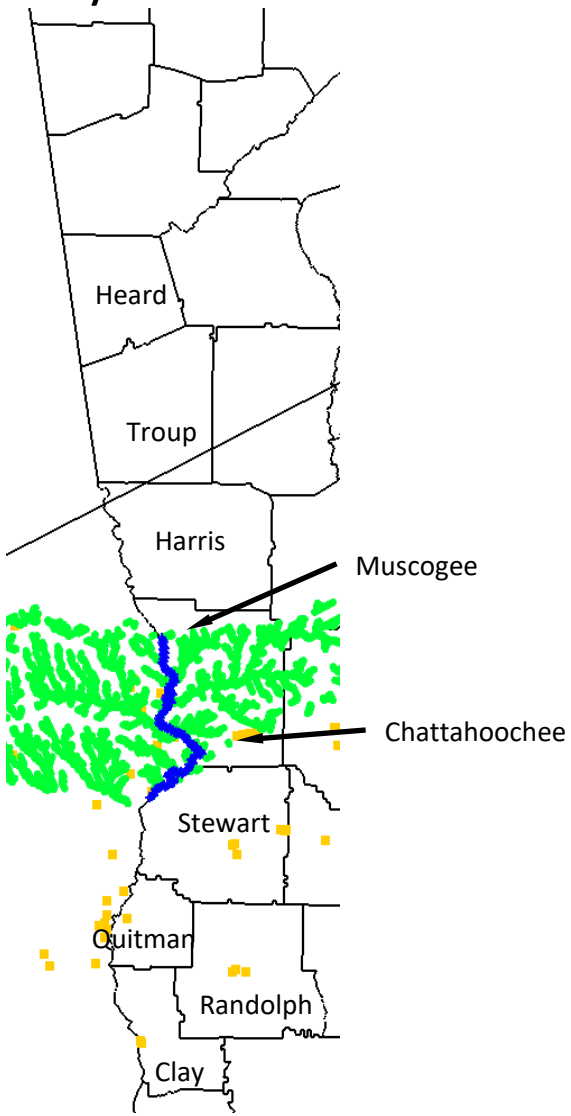
Transient Well pumping irrigation rates



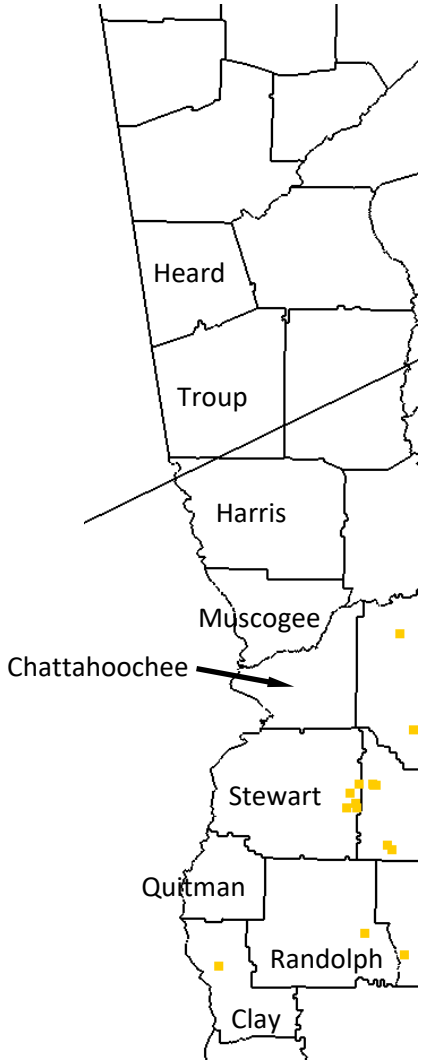
- Transient monthly pumping rate as a percentage of the 100% steady state pumping rate.

Cretaceous Aquifer rivers and drains

Layer 5 wells

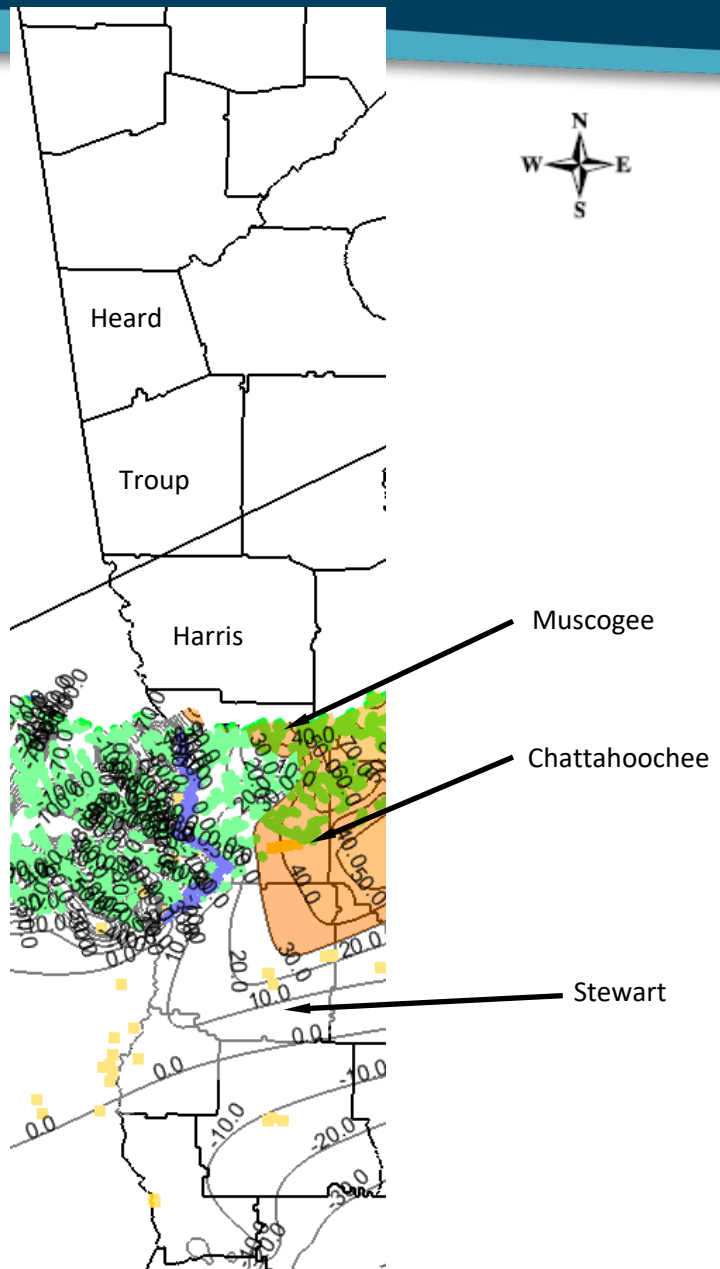


Layer 6 wells



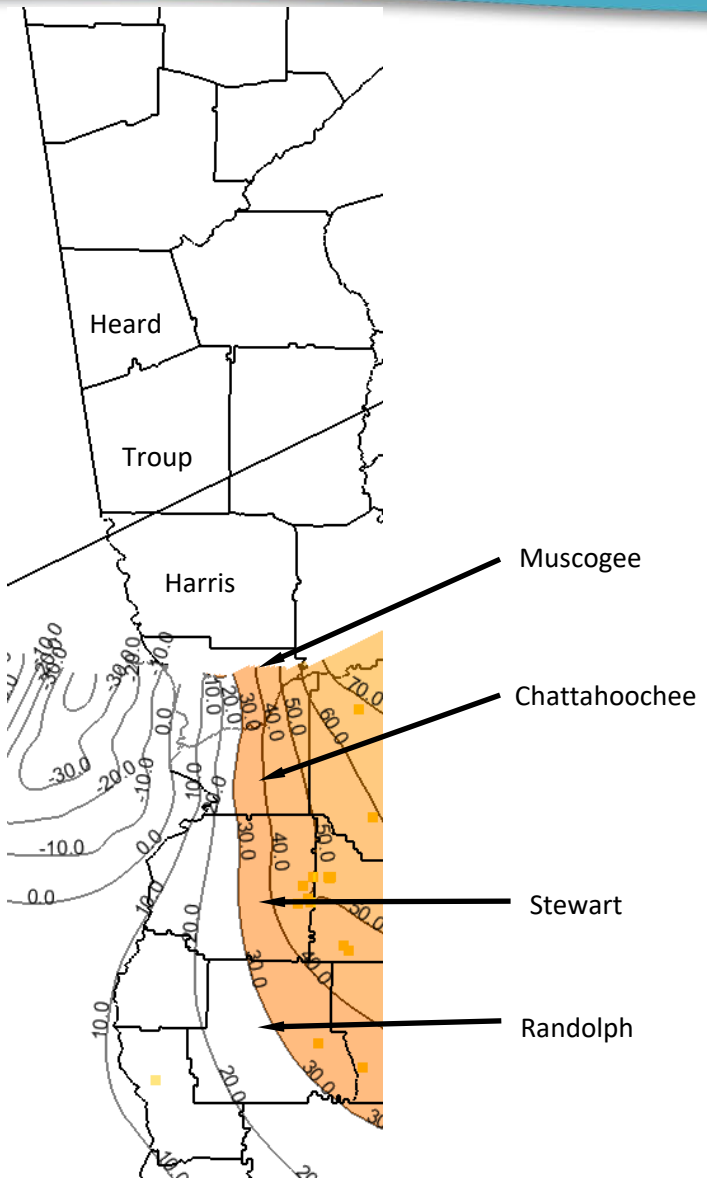
- Layer 5 wells in Chattahoochee and Muscogee Counties in aquifer outcrop area.
- Layer 6 wells were not near the rivers and drains in outcrop area.

Layer 5 Cretaceous Aquifer drawdown - Baseline



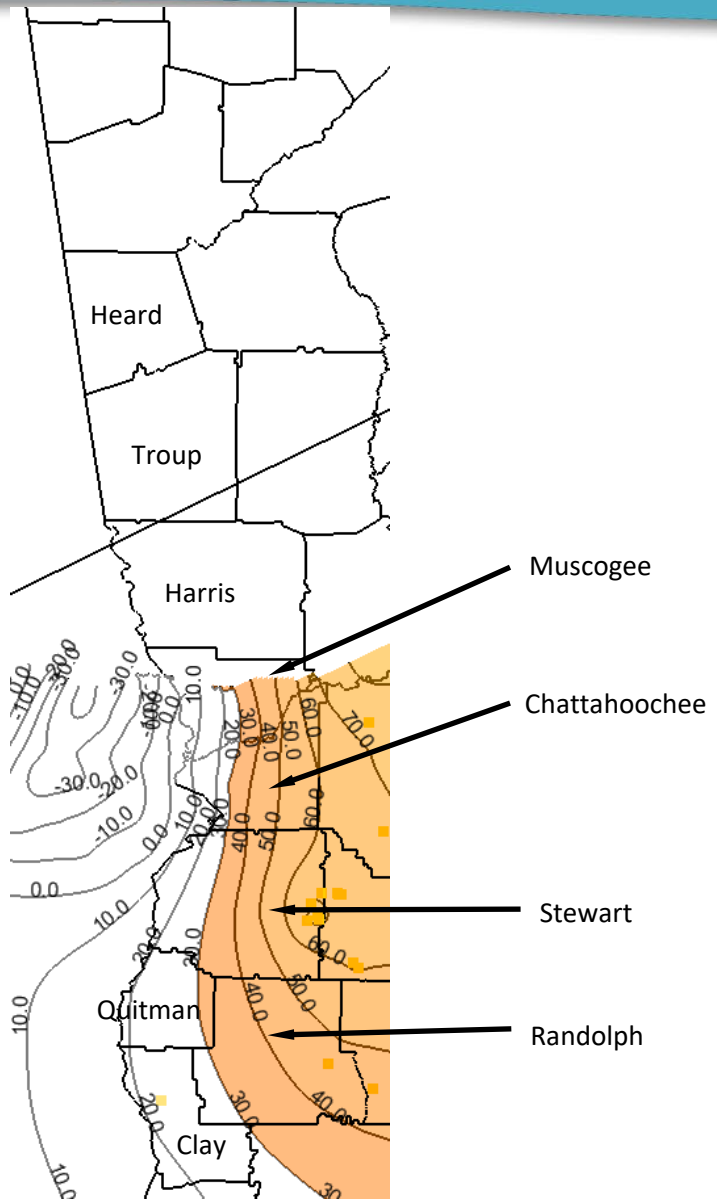
- There is >30 feet of drawdown caused by baseline pumping (during peak growing season).
- The >30 feet of drawdown occurs in northeastern Stewart County and eastern Chattahoochee and Muscogee Counties.
- Wells in Chattahoochee County, where >30 feet drawdown occurs, is in the outcrop area.
- Did not simulate increased groundwater withdrawal from any well from Layer 5 due to more than 30 feet of drawdown in outcrop areas.

Layer 6 Cretaceous Aquifer Drawdown 2x Baseline Pumping Rates (+8 MGD)



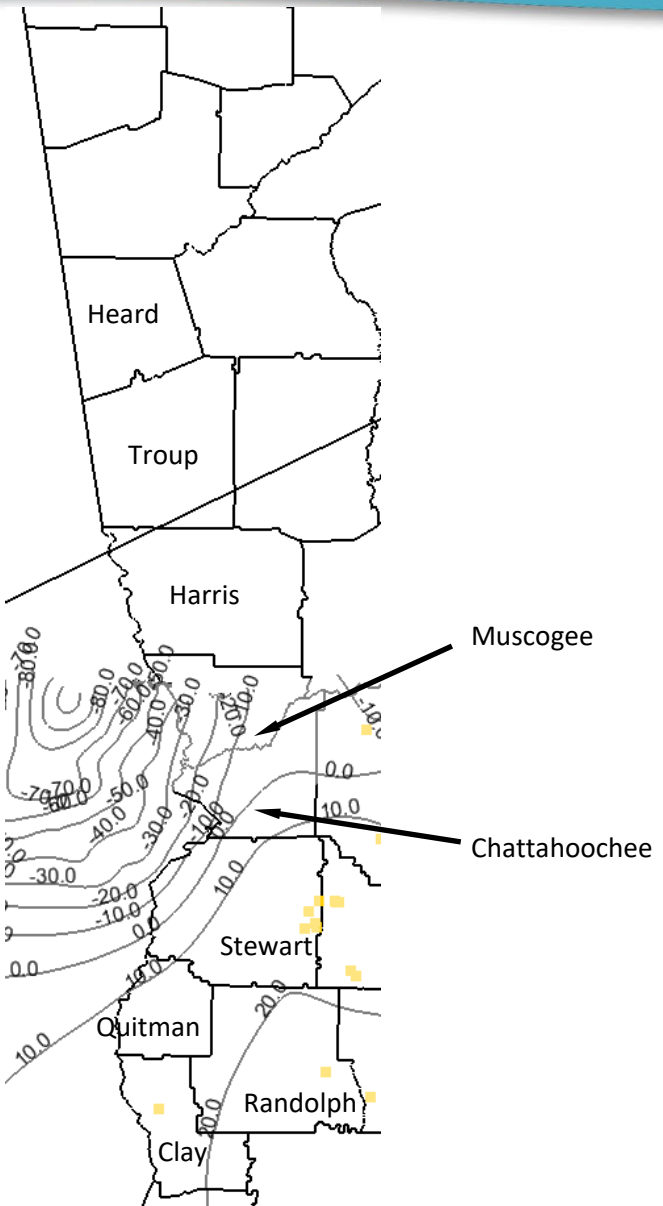
- Baseline pumping is approximately 4 mgd.
- There is >30 feet of drawdown caused by 2x baseline pumping during peak growing season.
- The >30 feet of drawdown occurs in eastern Randolph, Stewart, Chattahoochee, and Muscogee Counties.
- The 30 feet of simulated drawdown could cause well pumps which are set within 30 feet of the static water level to go dry.

Layer 6 Cretaceous Aquifer Drawdown 5x Baseline Pumping Rates (+20 MGD)



- There is >30 feet of drawdown caused by 5x baseline pumping during peak growing season.
- The >30 feet of drawdown occurs in almost all of Randolph County, part of Quitman County, and eastern Stewart, Chattahoochee, and Muscogee Counties .
- The 30 feet of simulated drawdown could cause well pumps which are set within 30 feet of the static water level to go dry.

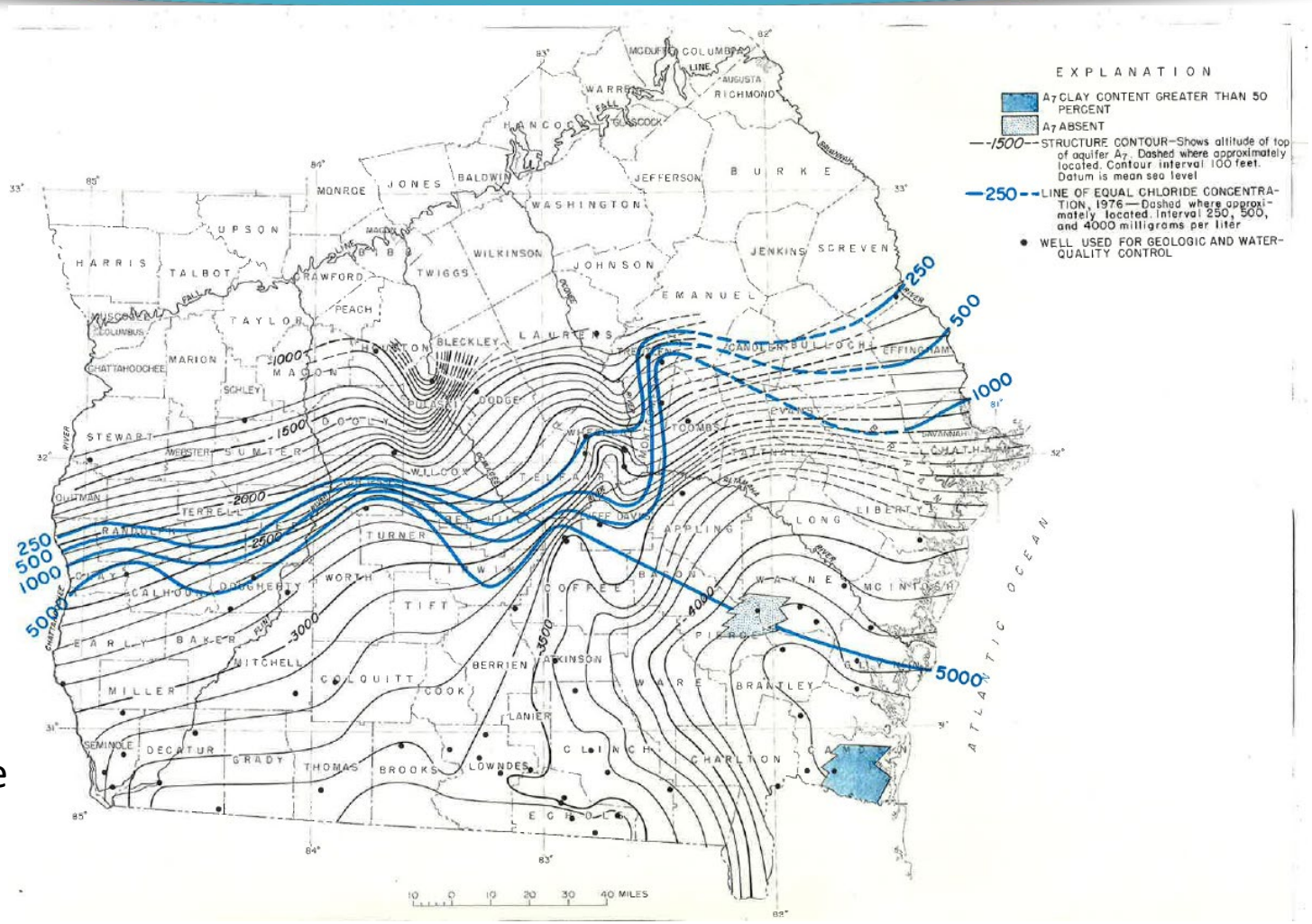
Layer 6 Cretaceous Aquifer Drawdown 5x Baseline Pumping Rates



- Represents transient pumping during winter months (0% of steady state pumping rates).
- Groundwater levels in Layer 6 do not fully recover.
- Metric threshold exceeded - Groundwater recovers between periods of higher pumping.

Brackish groundwater in the lower unit of Cretaceous Aquifer (Layer 7)

- Layer 7 of the Cretaceous Aq. has been mapped to have some brackish groundwater
- USGS defines brackish as Total Dissolved Solids (TDS) = 1,000 to 10,000 mg/L.
- Clay and Randolph Counties, TDS range from 250 mg/L-5,000 mg/L



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Surface Water Quality Assessment

Elizabeth Booth, GA EPD

Stephen Simpson, Black & Veatch

Outline

- How We Use Water Quality Information
  - Impaired Waters List
  - Modeling
- State Water Quality Criteria (Metrics) and Assessment
- Surface Water Quality Assessment Results

Water Quality Goals and Objectives

- Ensure that water protects biota and human health and provides for recreation
- Standards are the way that EPD meets these goals
- Designated uses (drinking water, recreation) determine specific standards
- If water quality does not meet established standards:
  - Listing as an impaired water (305(b)/303(d) list)
  - Development of Total Maximum Daily Loads and Implementation Plans
  - Affects issuance of National Pollutant Discharge Elimination System permits
- Ongoing updating

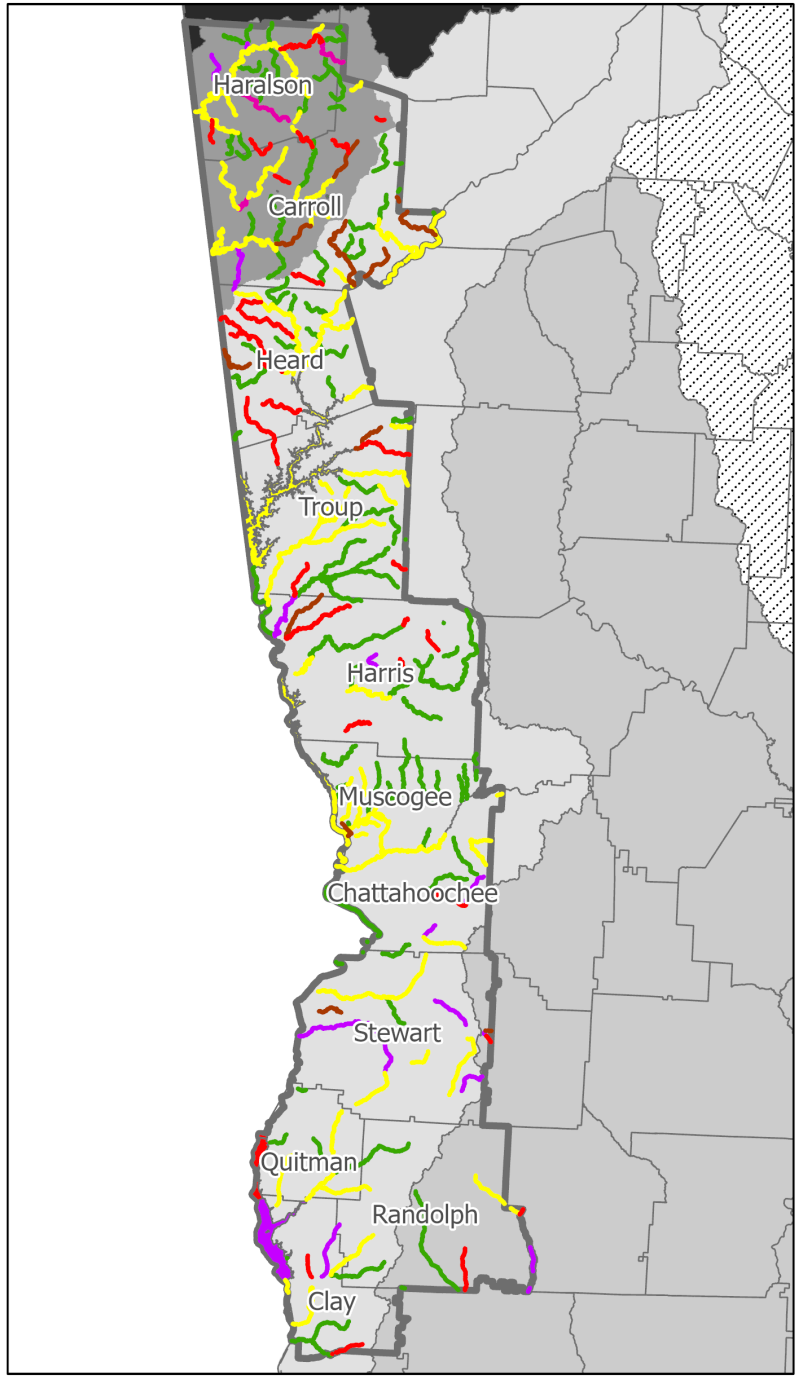
Improving Water Quality

- Georgia is required to conduct a Triennial Review of Water Quality Standards
  - Additional criteria
    - Biocides
    - Lakes Oconee and Sinclair Chlorophyll a
  - Revised criteria
    - Metals
    - Bacteria (Change from fecal coliform to E. coli)
  - Change in designated uses
    - Some nominated waterbodies approved; others to be reconsidered
- Water Quality Standard Approval process

Water Quality Planning

- Emerging issues
  - Harmful algal blooms
- Assessment of waterbodies statewide
  - Impairments
  - TMDL Implementation Plans
- State Water Planning
  - Water Quality Resource Assessment
    - Existing conditions
    - Future conditions
- Future issues
  - Per- and Polyfluoroalkyl Substances (PFAS)

Surface Water Quality Assessment in the Middle Chattahoochee Water Planning Region 305(b) Report 2020



Legend

Water Planning Region Boundary

County Boundary

Water Quality Category

- 1
- 2
- 3
- 4a
- 4a, 5
- 4b
- 5

River Basin

- Chattahoochee
- Coosa
- Flint
- Ocmulgee
- Tallapoosa

0 10 20 30 Miles

N

Category Definitions:

1. Data indicate that waters are supporting their designated use(s).

2. A waterbody has more than one designated use and data indicate that at least one designated use is being met, but there is insufficient evidence to determine whether all uses are being met.

3. There is insufficient data or other information to make a determination as to whether or not the designated use(s) is being supported.

4a. Data indicate that at least one designated use is not being supported, but TMDL(s) have been completed for the parameter(s) that are causing a water not to meet its use(s)

4b. Data indicate that at least one designated use is not being supported, but there are actions in place (other than a TMDL) that are predicted to lead to compliance with water quality standards

4c. Data indicate that at least one designated use is not being supported, but the impairment is not caused by a pollutant

5. Data indicate that at least one designated use is not being supported and TMDL(s) need to be completed for one or more pollutants. Waters in Category 5 make up the 303(d) list.

Water Quality Resource Assessment

Results under Current Conditions

Dissolved Oxygen Modeling

- **Current Conditions addressed in Plan Section 3.3.3**

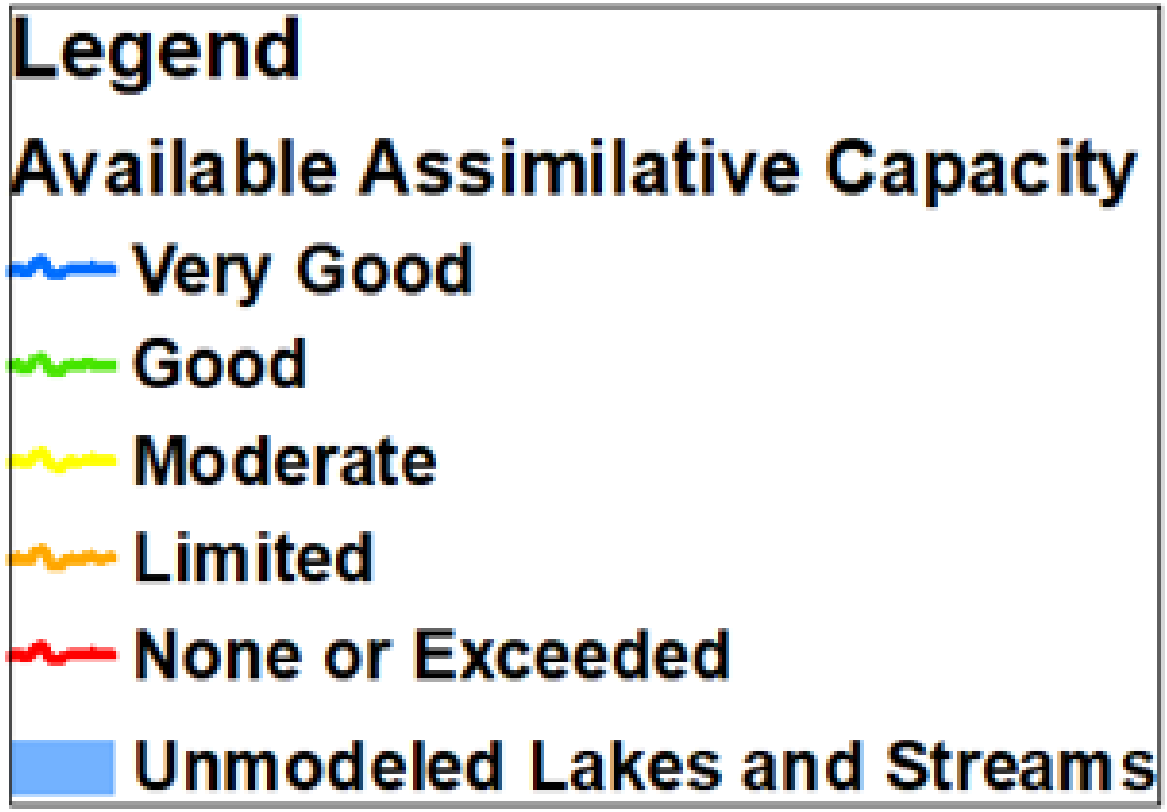
  Dissolved Oxygen Modeling

  Figures 3-5 and 3-6 show the in-stream dissolved oxygen model results with existing discharges during critical low flow, high temperature conditions. The current conditions assimilative capacity analysis incorporated municipal and industrial wastewater facilities operating at their full permitted discharge levels (flow and effluent discharge limits as of ~~2014~~2019). Stream segments where the model results showed available assimilative capacity as exceeded are red; segments predicted to have no available assimilative capacity under critical low flow (7Q10) and high temperature conditions are pink. Those predicted to have very good DO levels relative to state water quality standards are blue.

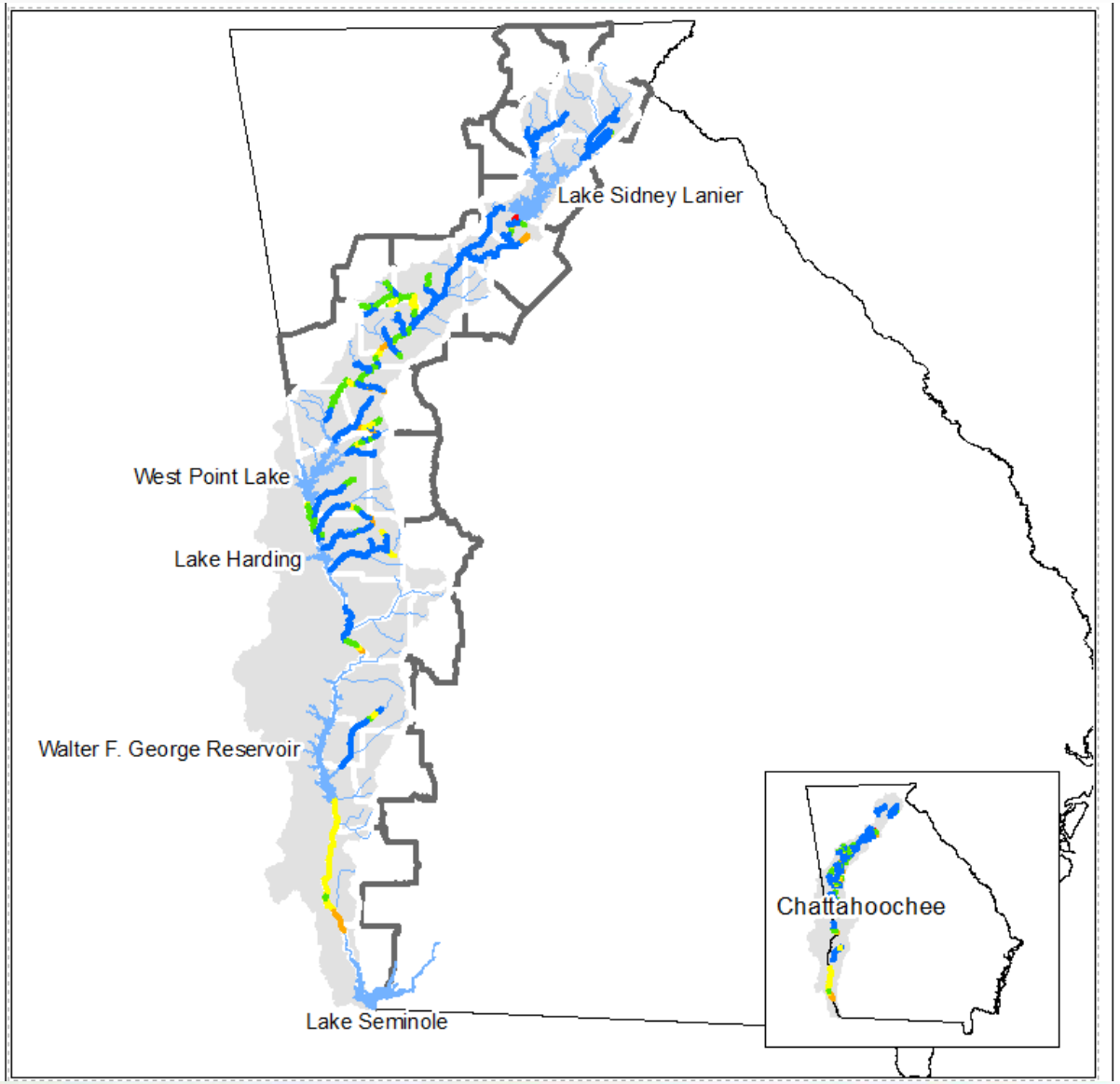
- **Future Conditions addressed in Plan Section 5.3**
  - **Results at next meeting**

Dissolved Oxygen Modeling

- Current Conditions
  - 2019 Permit Limits
- DOSAG and Riv-1 Models:
  - Dischargers at permit limits
  - High temp, low flow conditions
- Assimilative Capacity
  - How DO levels compare to water quality standard of 5.0 mg/L (or natural conditions)



Current DO Conditions: Chattahoochee Basin



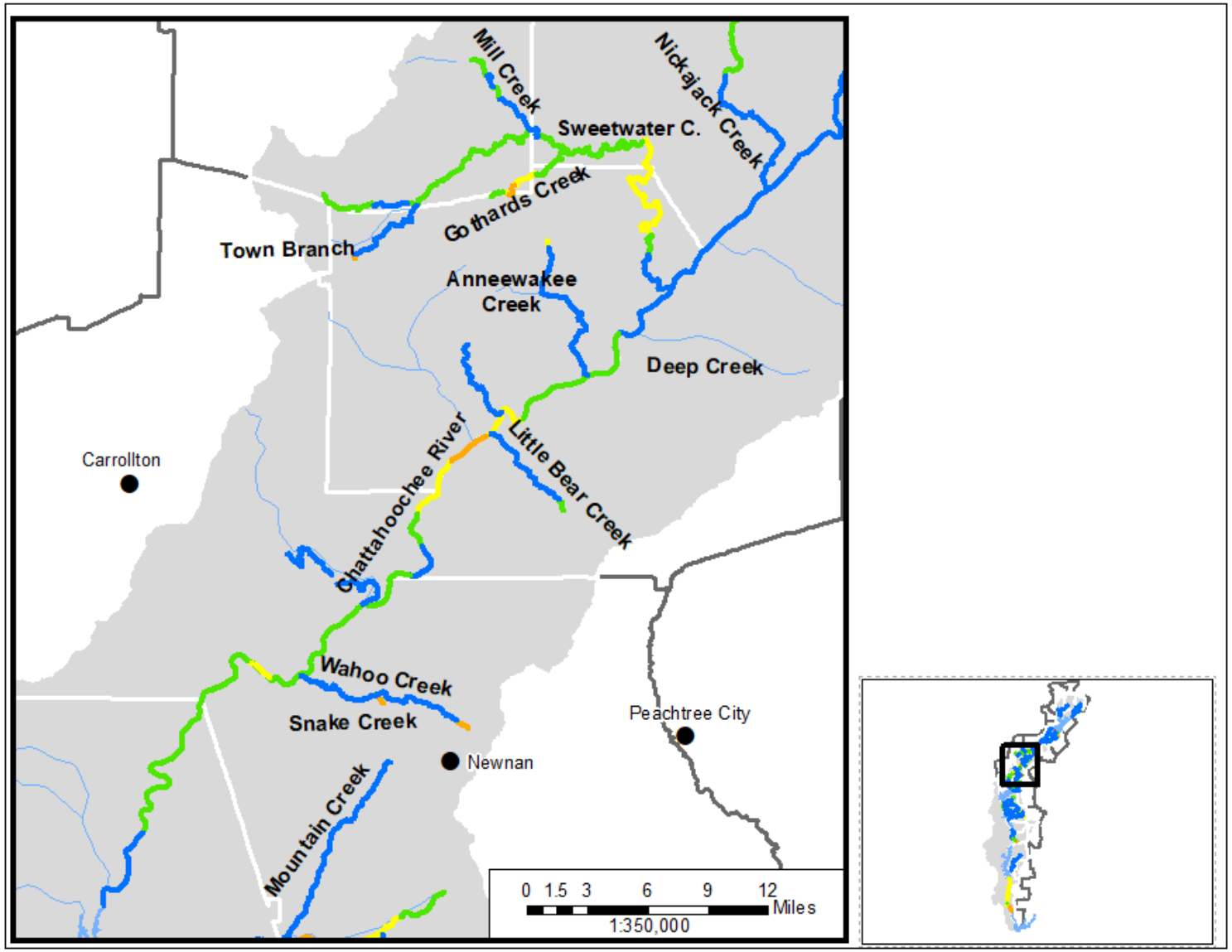
Legend

Available Assimilative Capacity

- **Very Good**
- **Good**
- **Moderate**
- **Limited**
- **None or Exceeded**
- **Unmodeled Lakes and Streams**

GEORGIA
WATER PLANNING

Current DO Conditions: Above West Point Lake



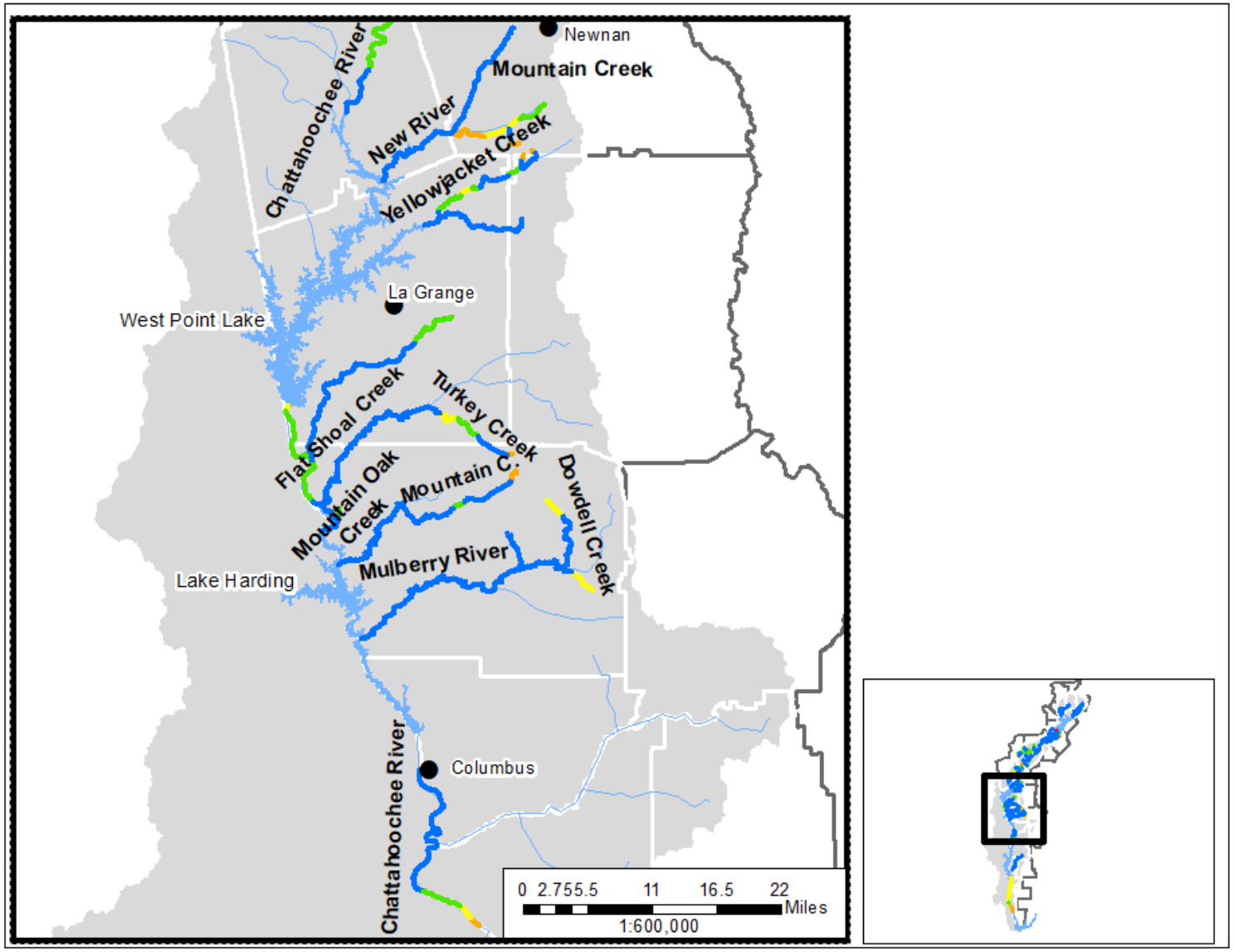
Legend

Available Assimilative Capacity

- Very Good
- Good
- Moderate
- Limited
- None or Exceeded
- Unmodeled Lakes and Streams

GEORGIA WATER PLANNING

Current DO Conditions: West Point to Columbus



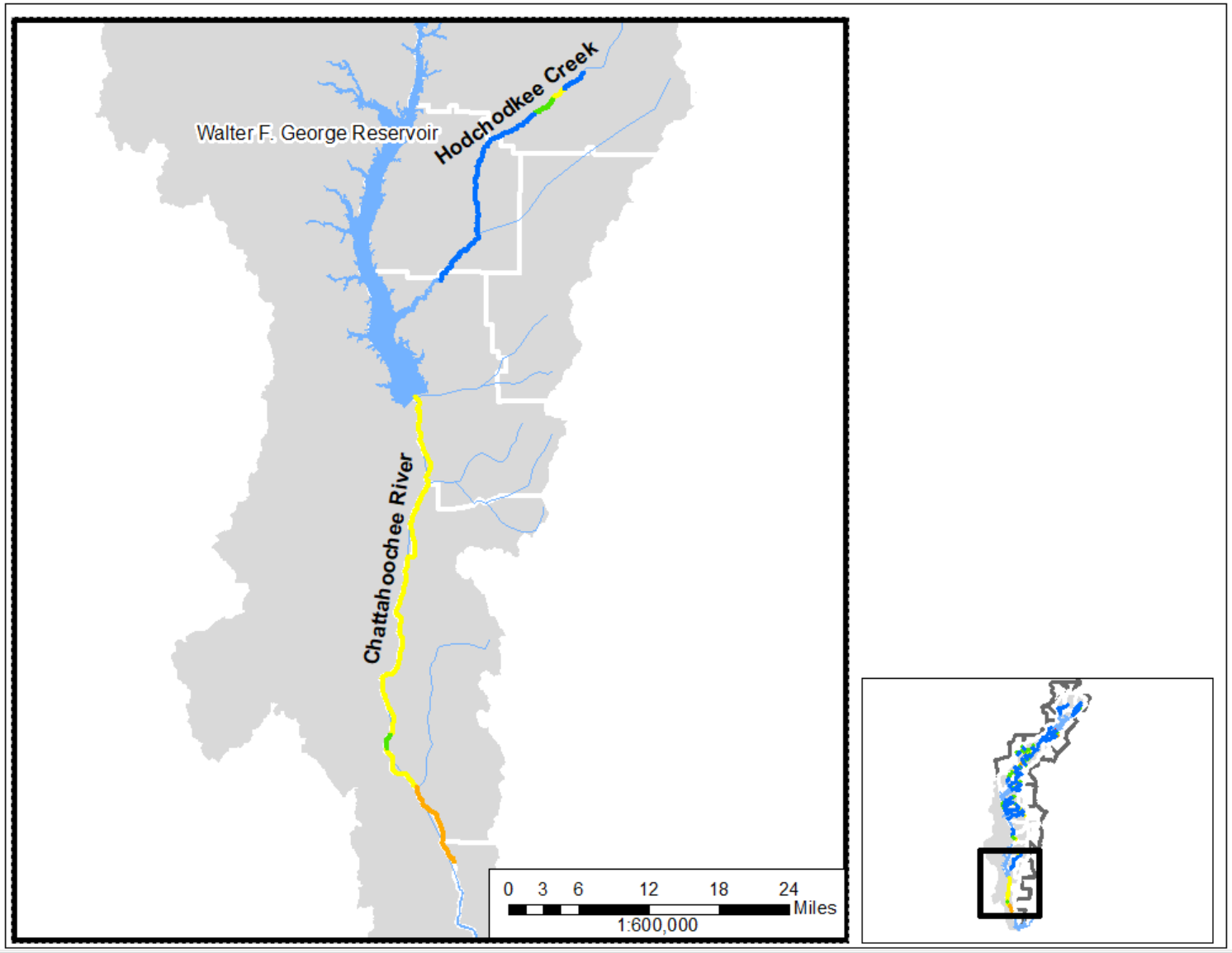
Legend

Available Assimilative Capacity

- Very Good
- Good
- Moderate
- Limited
- None or Exceeded
- Unmodeled Lakes and Streams

GEORGIA
WATER PLANNING

Current DO Conditions: Below Columbus



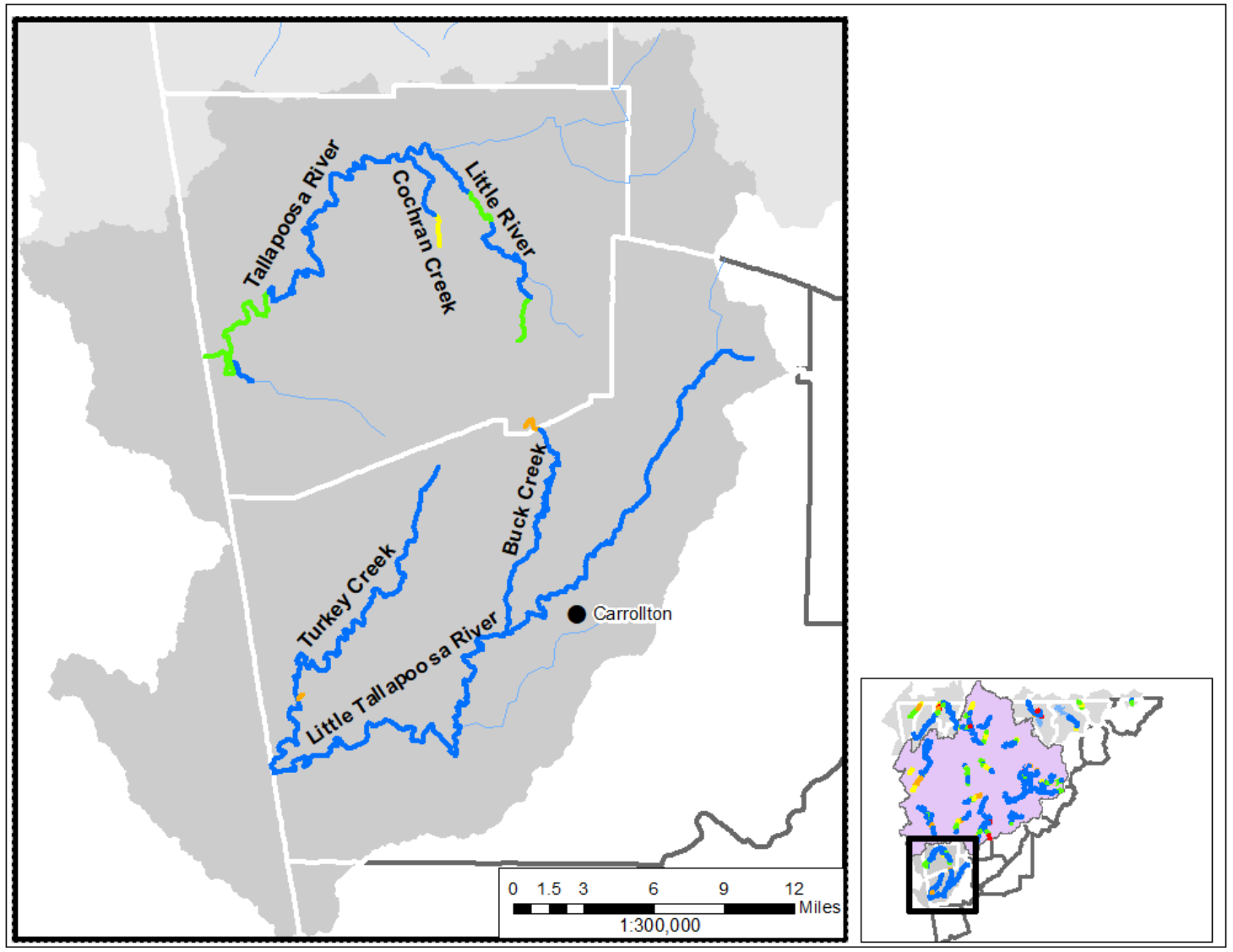
Legend

Available Assimilative Capacity

- Very Good
- Good
- Moderate
- Limited
- None or Exceeded
- Unmodeled Lakes and Streams

GEORGIA
WATER PLANNING

Current DO Conditions: Tallapoosa Basin



Legend

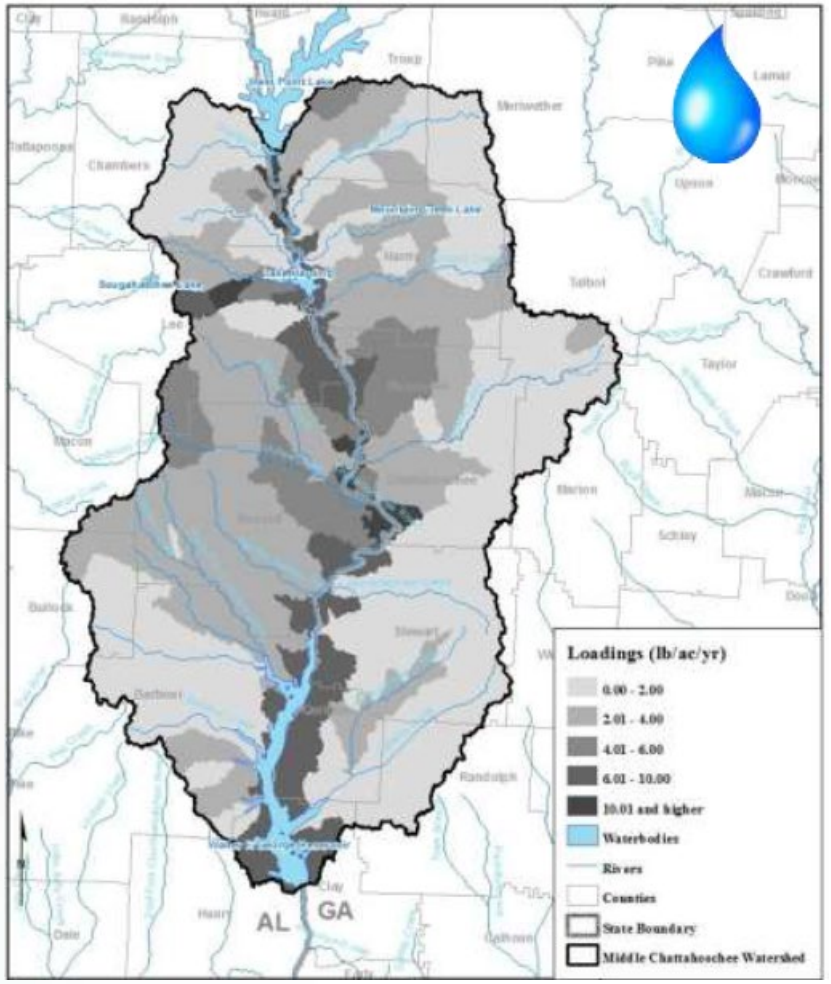
Available Assimilative Capacity

- Very Good
- Good
- Moderate
- Limited
- None or Exceeded
- Unmodeled Lakes and Streams

GEORGIA
WATER PLANNING

Watershed Modeling: Nutrients

- Current (2008) and future (2050) landuse
- Meteorological information (2001-2012)
- Heat maps
  - Loadings – by subbasin – under representative wet and dry years
  - Total Nitrogen
  - Total Phosphorus
- Increases under dry year conditions
  - Point source-driven
- Increases under wet year conditions
  - Nonpoint source-driven



Watershed Modeling: Nutrients

- **Current Conditions addressed in Plan Section 3.3.3**

Nutrients

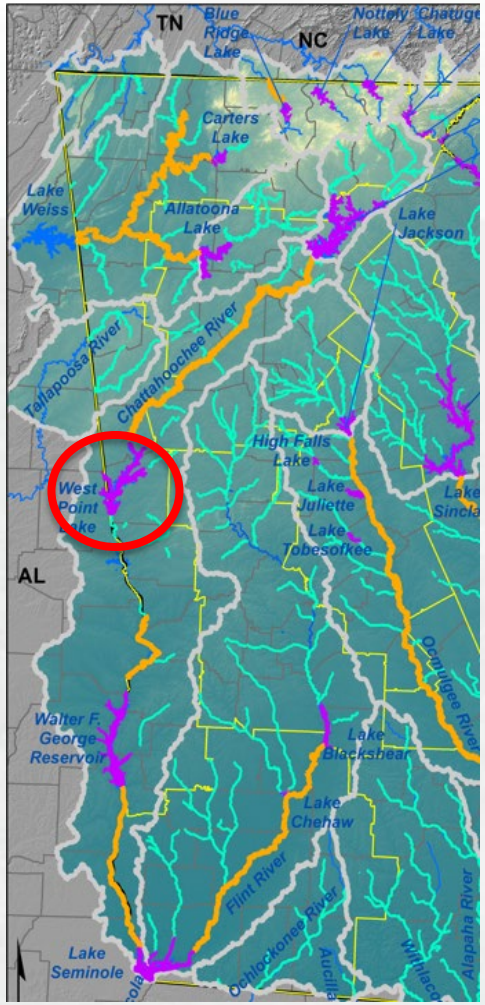
Watershed and lake models were run assuming current levels of water use and wastewater disposal and current land use profiles as inputs. These inputs accounted for nutrient loading from the contributing watershed over twelve years of recently observed hydrology. Watershed model results are summarized as follows:

- Lake Lanier Watershed: Nitrogen and phosphorous loads are primarily nonpoint source related.
- Chattahoochee Watershed: Point sources are the primary contributors of nitrogen and phosphorous loading in the watershed.
- Tallapoosa Watershed: In this smaller watershed, nitrogen and phosphorus loads are impacted by both point and nonpoint sources.

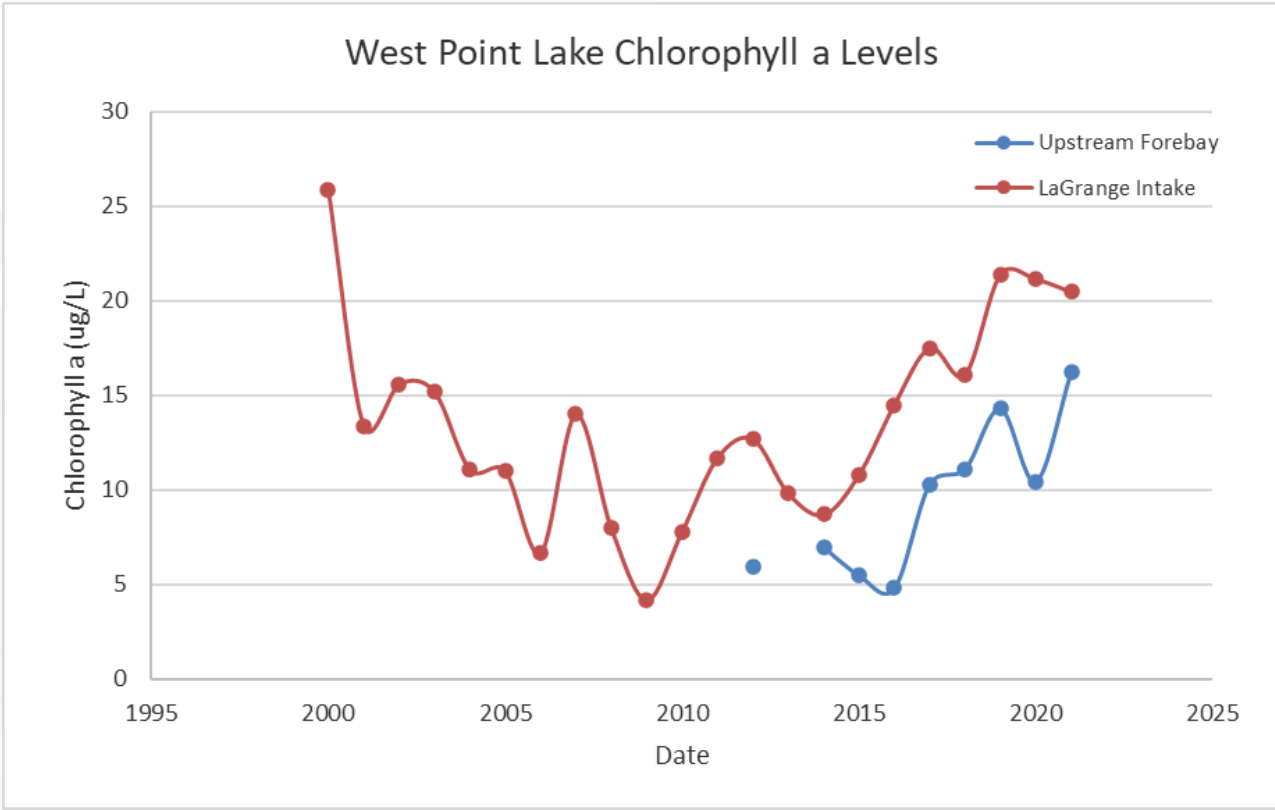
Lake Modeling: Chlorophyll a

- **Plan Sections 3.3.3 and 5.3**
- **Lake models predict the algal response (chlorophyll a) to nutrient loads from the watershed models**
- **Modeled chlorophyll a levels were compared with existing chlorophyll a lake standards**

Chlorophyll a: West Point Lake

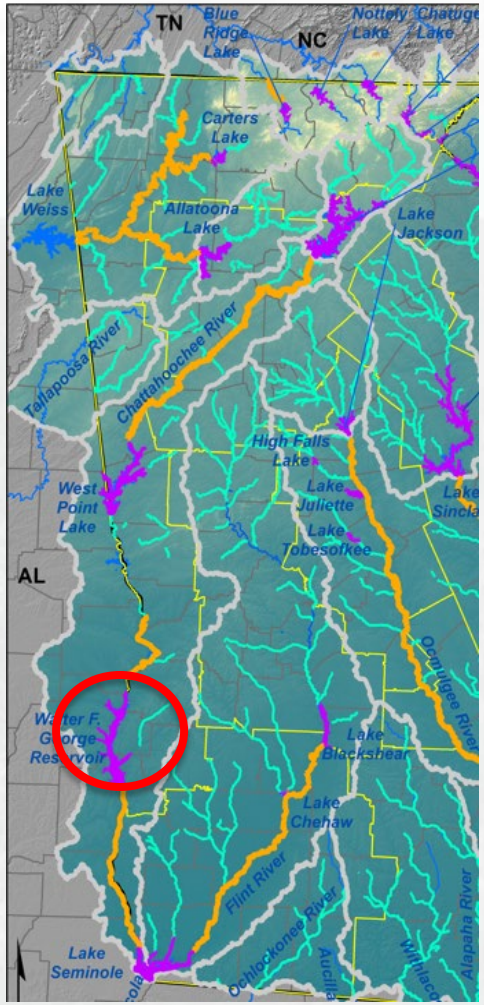


- **From 2017 Plan:**
  - **Chlorophyll-a standards are projected to be met under future conditions**
  - **Increases in total N projected in 2050**
  - **Future total P loadings are projected to decrease due to point source controls (Figure 5-5)**

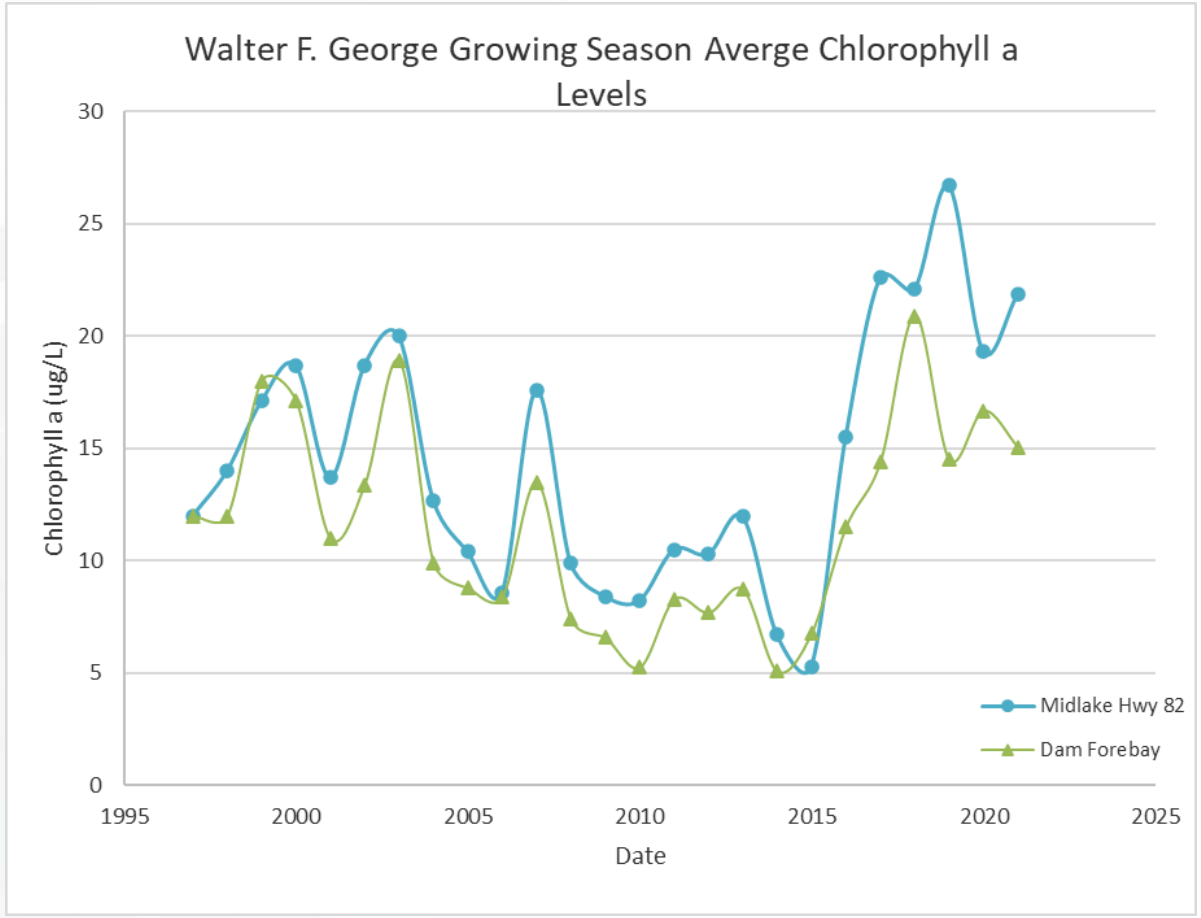


Chlorophyll a standards are:
22 µg/L (U/S Forebay)
24 µg/L (LaGrange Intake)

Chlorophyll a: Lake Walter F. George



- **From 2017 Plan:**
  - **Chlorophyll-a exceedances were projected under current and future conditions**
  - **Current total P loading is primarily from point sources (~67%)**
  - **Future projected increases in nutrient loadings will be primarily point source related**



Chlorophyll a standards are:
18 μg/L (Midlake)
15 μg/L (Dam Forebay)

GEORGIA WATER PLANNING

Small Group Discussions:

Incorporating Resource Assessments into Regional Water Plan

Using the Resource Assessments in the Regional Water Plan

- Understanding today's presentations

  Do you have questions? Need something explained a little more? What other information do you need to understand the region's water resource conditions?

- Assessment results

  Is there something in the results that you would like to discuss in relation to the Council's regional water plan? A concern? A recommendation? An information need?

- Metrics

  What metrics do you find useful? Are there other metrics you would like to see?

Resource Assessments Wrap-Up

Kristin Rowles, GWPPC

EPD Report

Christine Voudy, GA EPD

Public Comment

Next Steps

Next Steps

- **Next Meeting: May 11**
- **Plan Review Committee to review Sections 1, 2, and 4**
- **Inter-Regional Coordination**
- .
- .
- .

Thank You

Middle Chattahoochee

https://waterplanning.georgia.gov/water-planning-regions/middle-chattahoochee-water-planning-region