Lower Flint-Ochlockonee Council Meeting

April 14, 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
10:10	Chair's Report
10:15	American Rescue Plan Act: Water & Infrastructure Awards
10:30	GAEPD Report
10:40	Next Steps in Plan Development
10:55	Overview of Resource Assessments
11:10	Groundwater Availability Assessment
12:00	Lunch
12:45	Surface Water Quality Assessment
1:35	Surface Water Availability Assessment
2:25	Break
2:35	Discussion: Incorporating Resource Assessments into Regional Water Plan
3:05	Resource Assessments Wrap-Up
3:15	Public Comment
3:25	Next Steps
3:30	ADJOURN

Introductions

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Lower Flint-Ochlockonee Council Members

Name	City	County
Chris Addleton	Cairo	Grady
J. Steve Bailey	Donalsonville	Seminole
C. LaDon Calhoun	Colquitt	Miller
Murray Campbell	Camilla	Mitchell
Casey M. Cox	Camilla	Mitchell
Marc E. DeMott	Moultrie	Colquitt
Frederick Dent	Sylvester	Worth
David Dixon	Leesburg	Lee
Hugh Dollar	Bainbridge	Decatur
Vincent Falcione	Albany	Lee
John A. Heath	Dawson	Terrell
Jack Henderson	Newton	Baker
Connie C. Hobbs	Newton	Baker
Sen. Dean Burke		

Name	City	County
Greg Hobbs	Thomasville	Thomas
Phil Long	Bainbridge	Decatur
Michael A. McCoy		Dougherty
George C. McIntosh	Dawson	Terrell
Mike Newberry III	Arlington	Early
Calvin D. Perry	Moultrie	Colquitt
Walt Pierce	Edison	Calhoun
A. Richard Royal	Camilla	Mitchell
J. Stephen Singletary	Blakely	Early
Jay Smith	Albany	Dougherty
Mark Spooner	Donalsonville	Seminole
Steve Sykes	Camilla	Mitchell
Cory Thomas	Colquitt	Miller
James L. Webb	Leary	Calhoun
Rep. Gerald Greene		

Chair's Report

Presented by Chairman Royal

ARPA: Water and Infrastructure Awards

Mark Masters, GWPPC

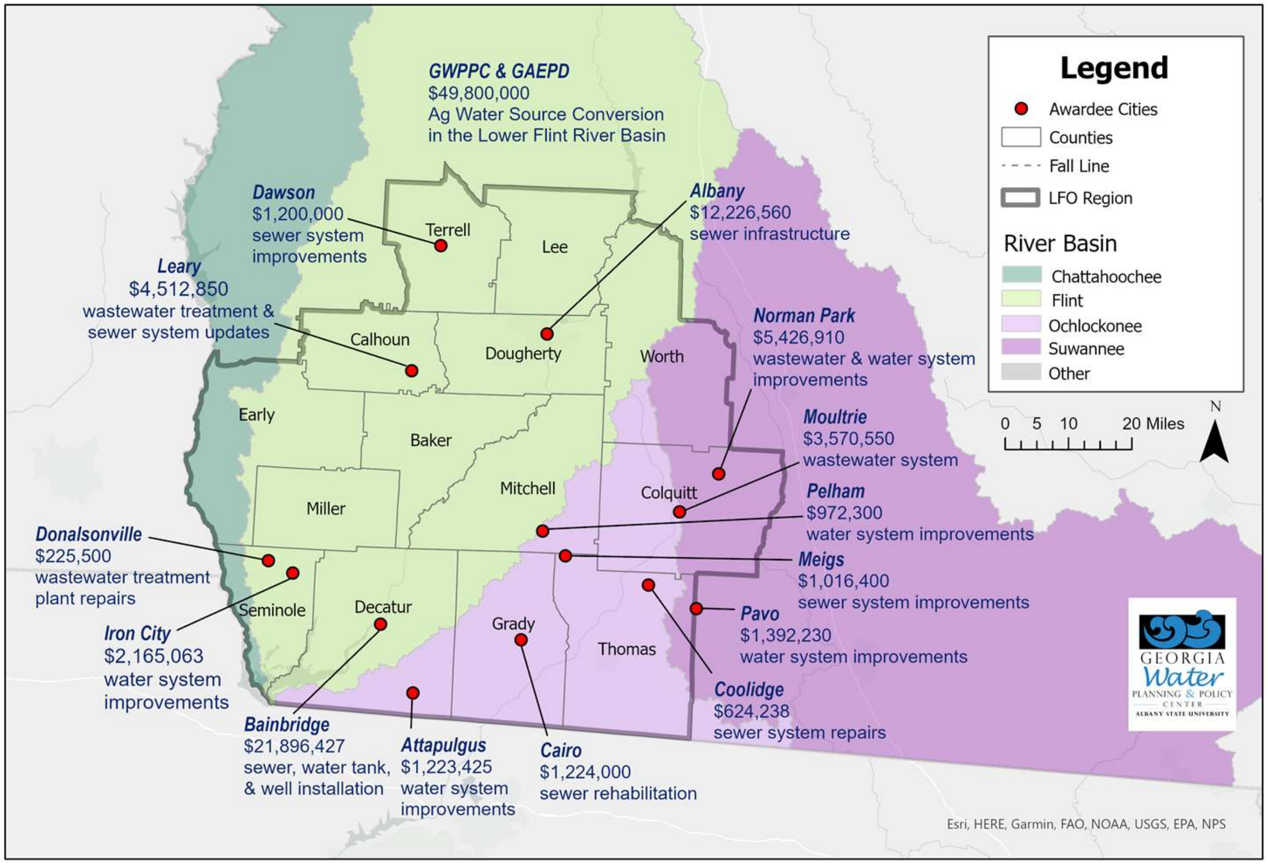
American Rescue Plan Water & Infrastructure Awards

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

Lower Flint-Ochlockonee 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

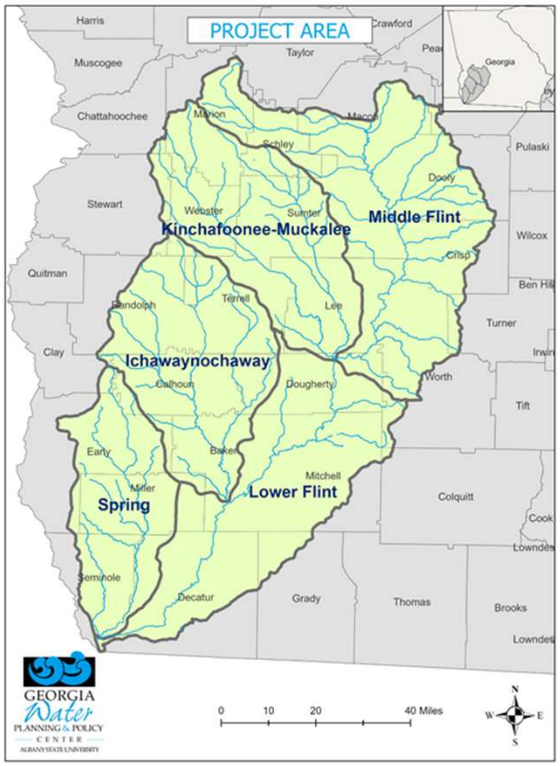
GEORGIA Water PLANNING & POLICY CENTER ALBANY STATE UNIVERSITY

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: **Lower Flint-Ochlockonee, Upper Flint, Middle Chattahoochee**

- 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)

GAFIT
GEORGIA FLOW INCENTIVE TRUST
Sustaining Farmers And Streams

OBJECTIVES

- Test **innovative approaches** in water management and identify new paths forward to water security for agriculture and natural systems in Southwest Georgia
- Provide **field-tested data** on producer preferences with respect to irrigation suspension via an auction format to inform policy
- Add to the **toolbox** of drought management policies and incentives
- Work **collaboratively** to reflect the needs and interests of stakeholders and make policy and management recommendations together (as appropriate)

GEORGIA Water PLANNING & POLICY CENTER
ALBANY STATE UNIVERSITY

The Nature Conservancy
Protecting nature. Preserving life.

2022 Incentives Auction

Total Bids: 721 bids on 306 fields from 87 bidders

	A **Full Season Suspension**	**B** **Volumetric Limit (6" for Season)**	**C** **Standby Option** **(Suspend Only if Flows Drop below Drought Threshold)**
Bids Received	254	246	221
Acres	15,686	15,627	13,845
Bids	$100 to $2,500 per acre	$75 to $2,100 per acre	$50 to $2,500 per acre
Contracts			*ongoing*

GEORGIA FLOW INCENTIVE TRUST
Sustaining Farmers And Streams

EPD Report

Jennifer Welte, GA EPD

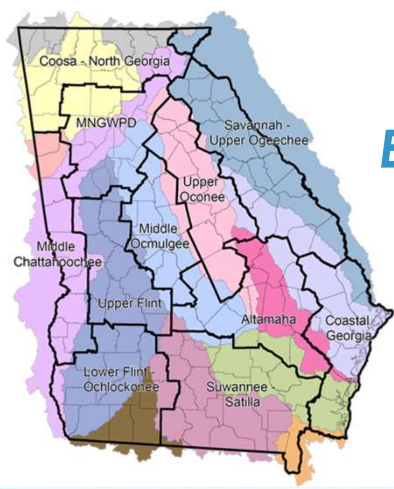
Next Steps in Plan Development

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

TABLES

FIGURES

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

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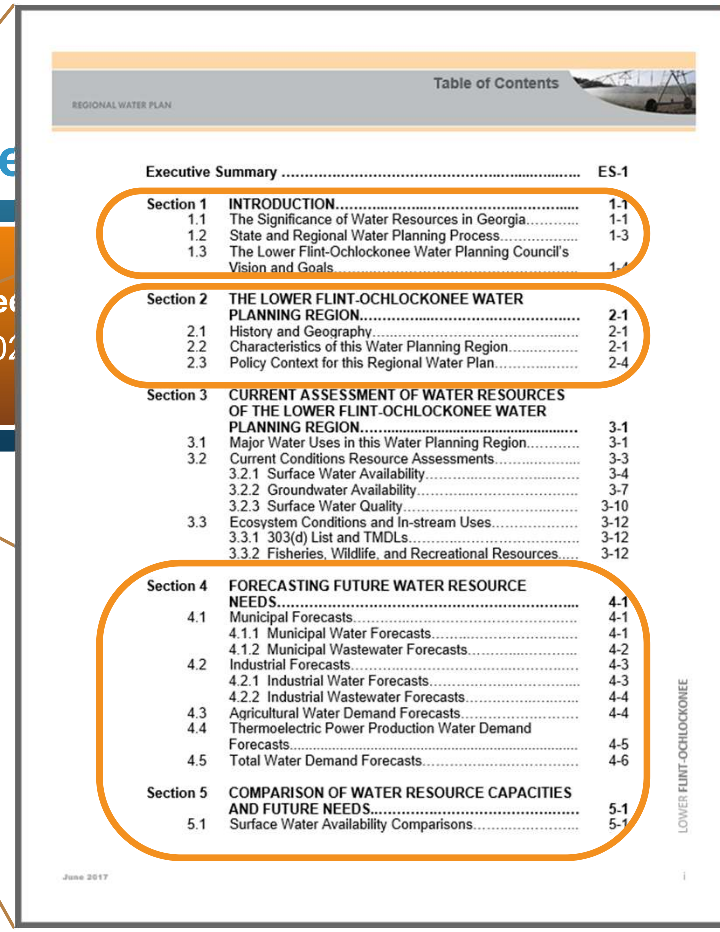

REGIONAL WATER PLAN

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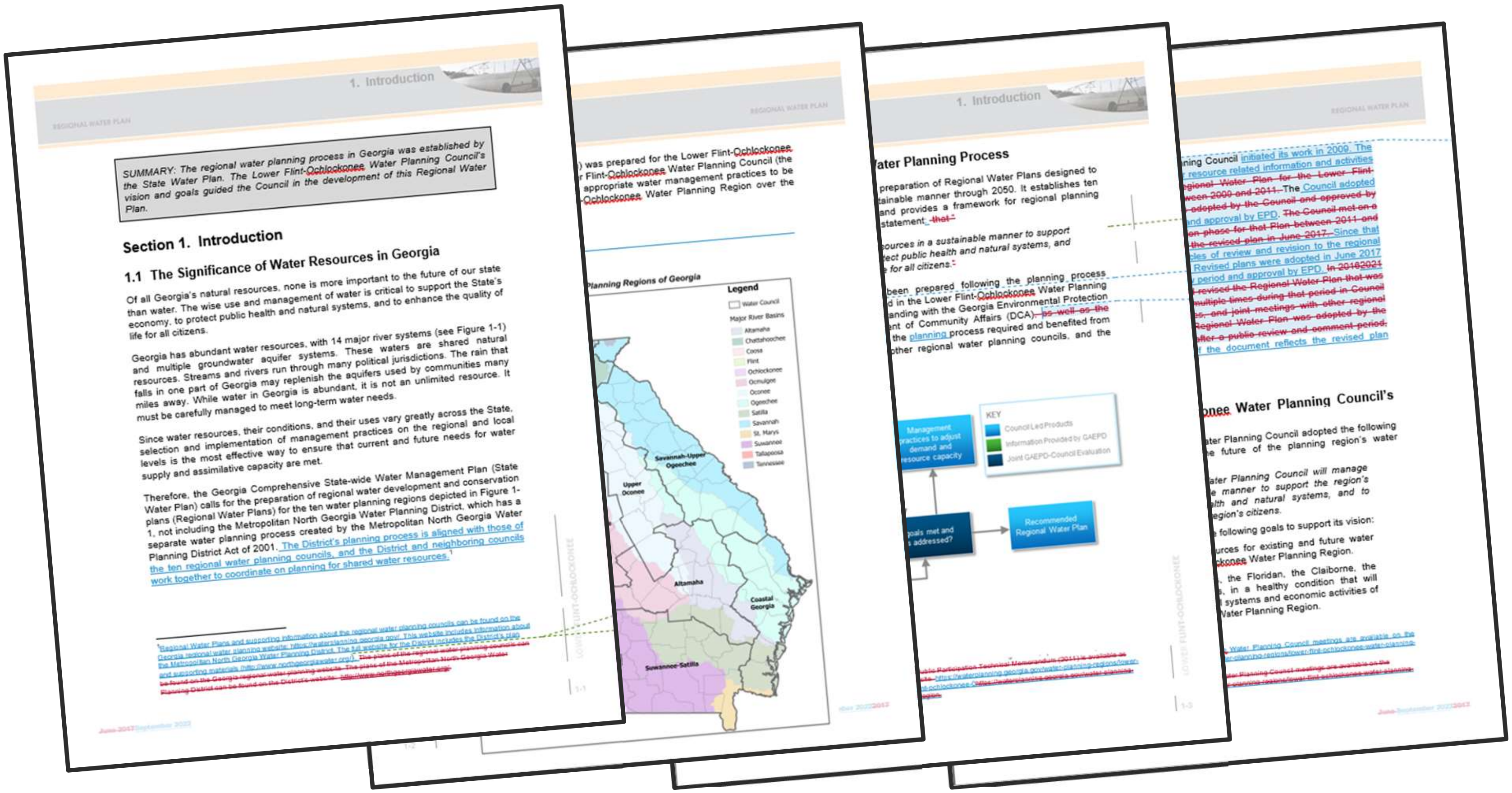
LOWER FLINT-OCHLOCKONEE

June 2017 i

GEORGIA
WATER PLANNING

Regional Water Plan Update



Committee Work on Plan Updates

Convening Now:

- Plan Review Committee
- Inter-Council Coordination Committee

Convening Later:

- Water Quality
- Water Quantity
- Other?

Overview of Resource Assessments

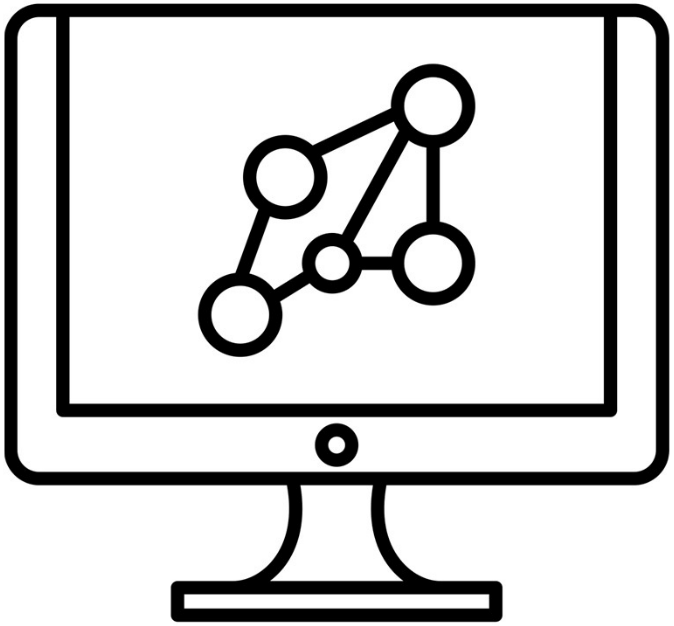
Mark Masters, GWPPC

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

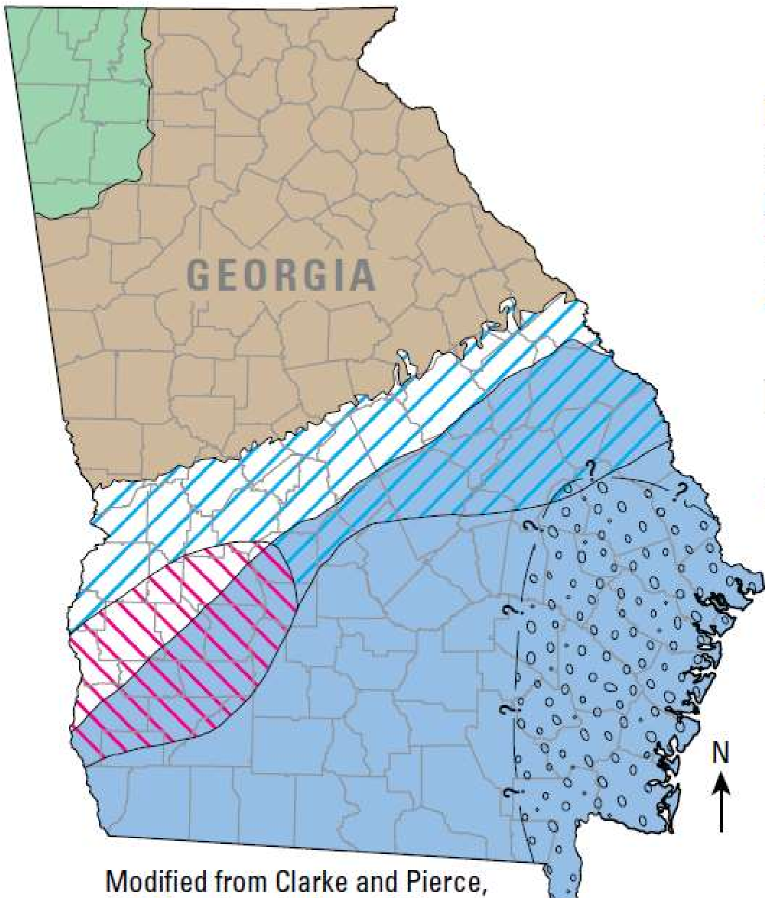
- How do the results explain the capacity of the region’s water resources to meet demands (forecasts) and the Council's vision and goals?
- Do the results point to any concerns? How can the regional water plan address those concerns?
- What metrics do you find useful? Are there other metrics you would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

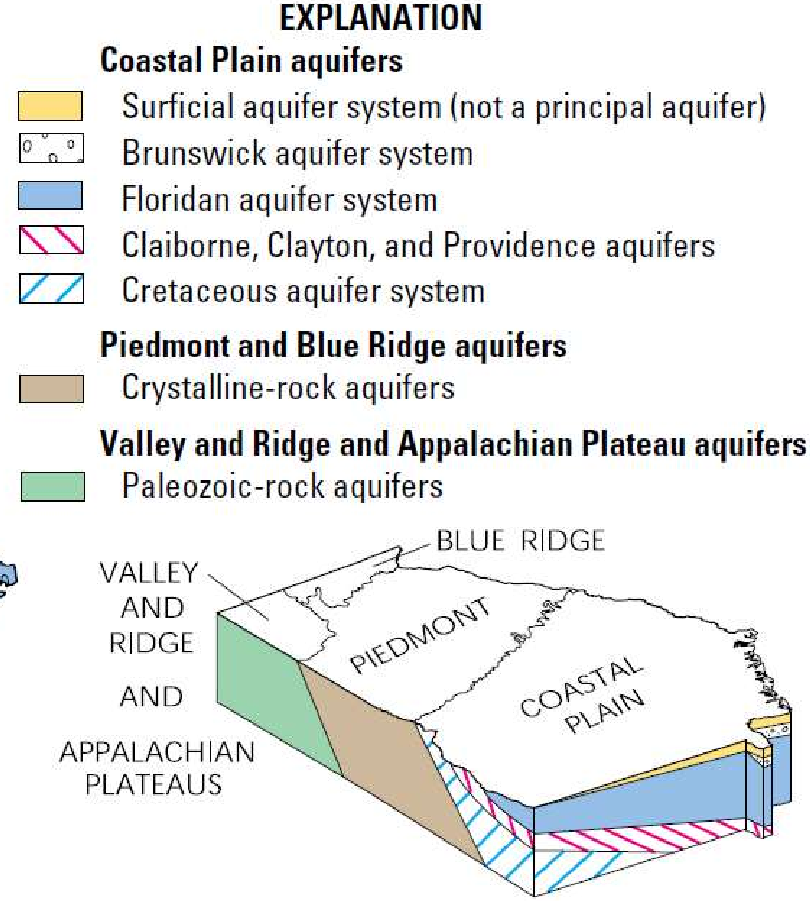
ASK QUESTIONS

Groundwater Availability Assessment

Christine Voudy, GA EPD

Water Planning Regions and Georgia's Aquifers





Modified from Clarke and Pierce, 1984; Leeth and others, 2005

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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.

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

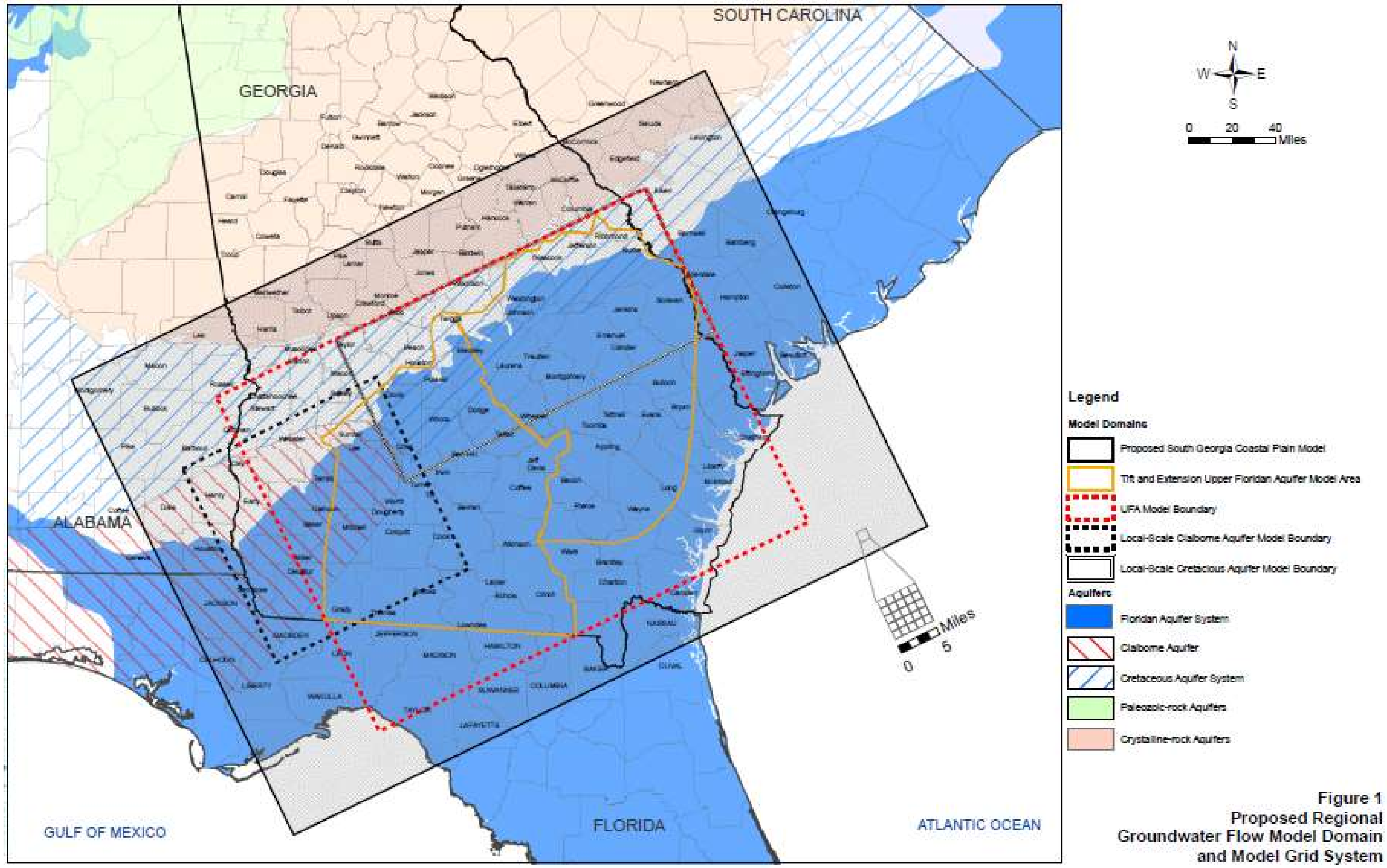

Figure 1
Proposed Regional
Groundwater Flow Model Domain
and Model Grid System

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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.

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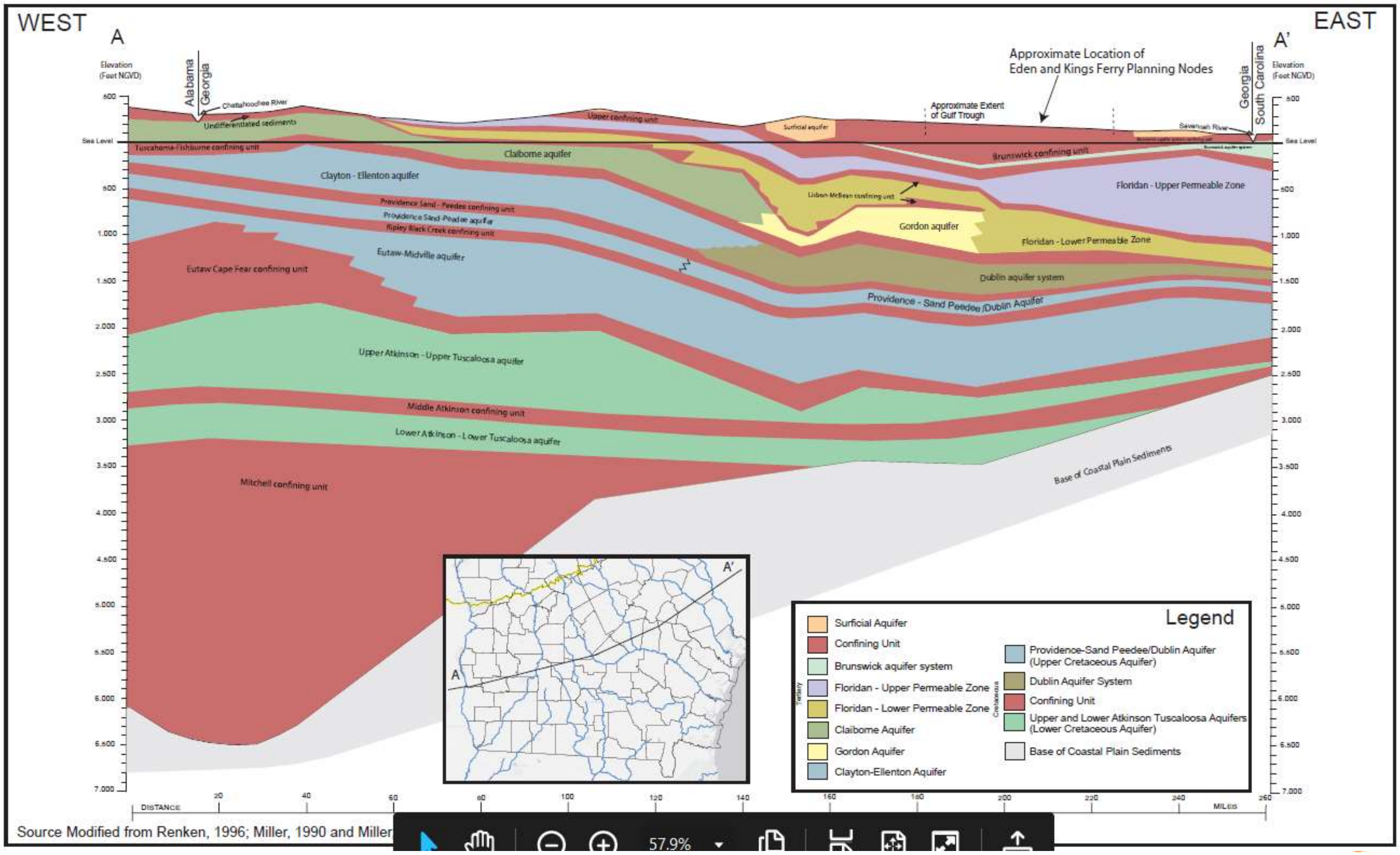
Cross-Section of Hydrogeologic Units – Regional Coastal Plain Model



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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.

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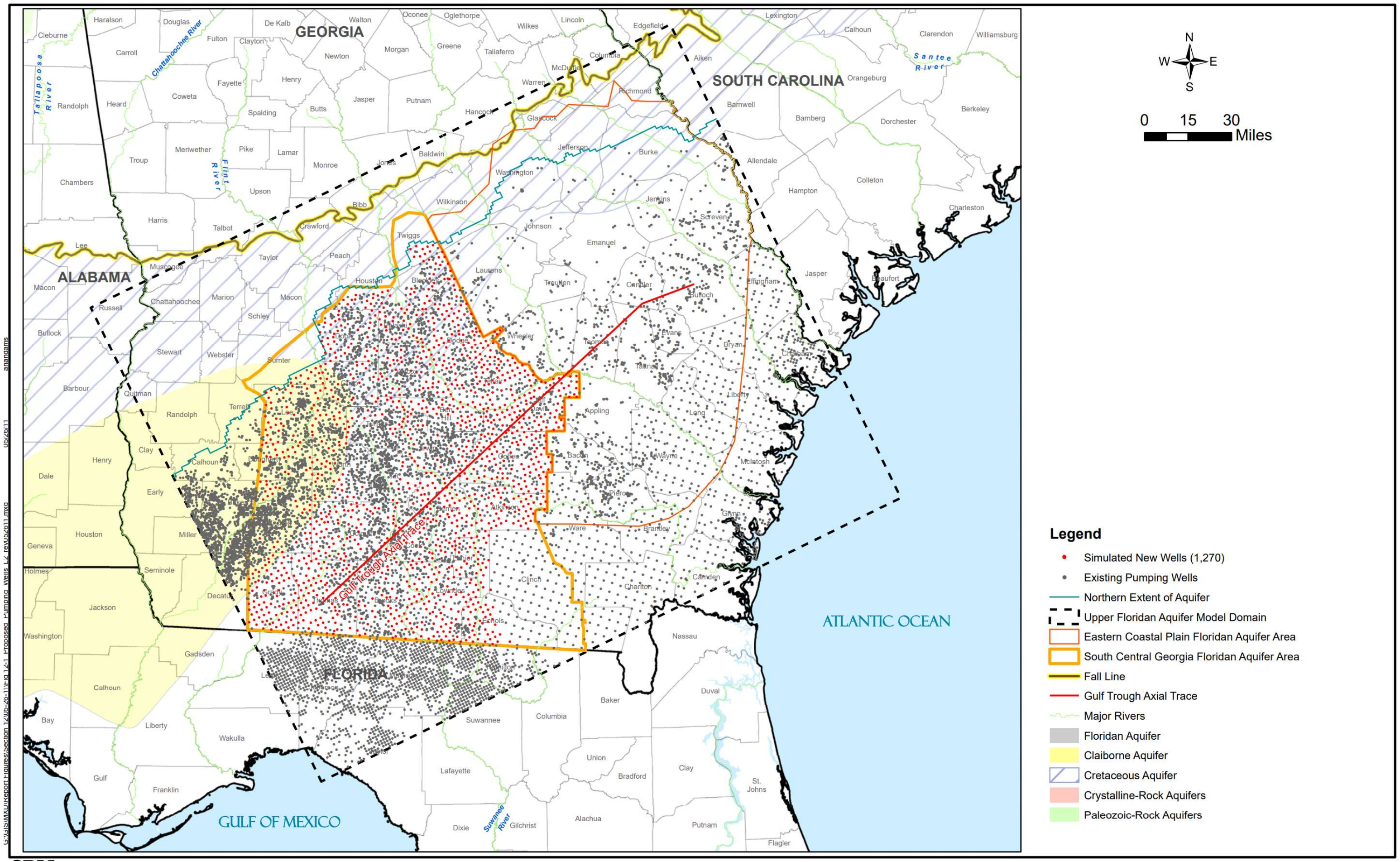
Round 1 - Sustainable Yield Estimates

- 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.

Floridan Aquifer (South Central) – High End Sustainable Yield Scenario



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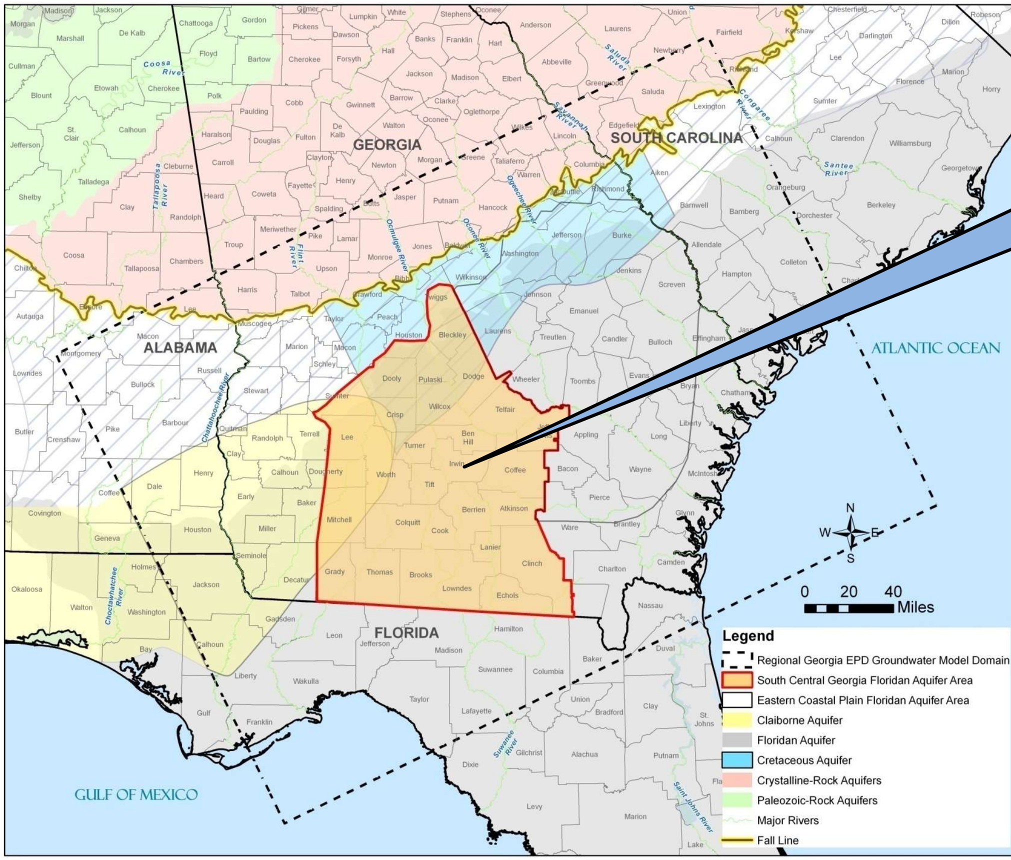
Upper Floridan Aquifer - South Central Georgia



Low End of SY = 622 mgd
High End of SY = 836 mgd

Lower Flint Current use and forecasted demands :

2020 – 421 mgd

2060 – 557 mgd

Aquifer-wide demand:

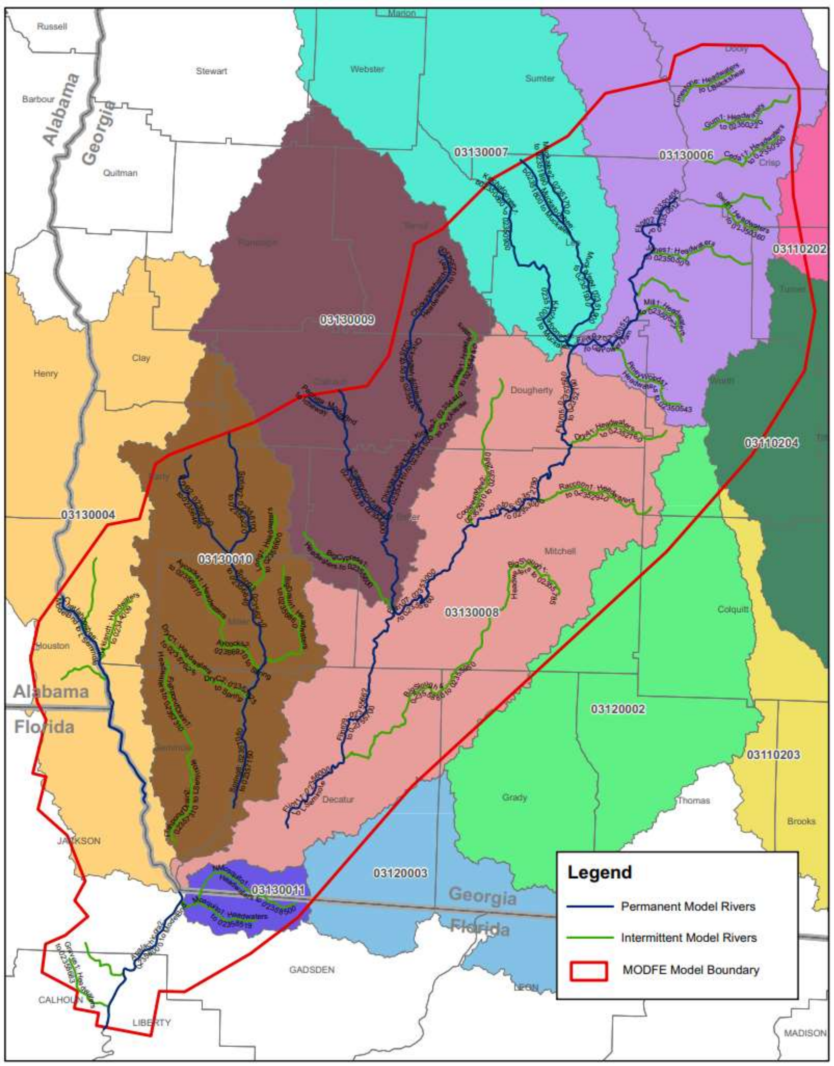
2020 – 488 mgd

2060 – 658 mgd

Upper Floridan Dougherty Plain

- Used an existing USGS MODFE model.
  - Two versions were provided by USGS – Transient and Steady State
  - Model calibrated to October 1999 conditions, which is time of lowest stream baseflow
  - Provides conservative estimate of potential impacts
- There are a number of tributary basins and river systems within the model domain
  - Each tributary basin is represented by a unique hydrologic unit code (HUC)
- Concern in this area is the potential impact to base flows.
  - Significant degree of connection between the Upper Floridan and the rivers in southwest Georgia
  - Determined withdrawal rate multiplier for each HUC
    - Incrementally increasing withdrawals in a specific HUC while keeping withdrawals in the other HUC at the original rate.
    - Increased withdrawals until streamflow metric was met.

Hydrologic Unit Codes in SW Georgia Model



- Sustainable Yield:
  - Low End sustainable yield
    - Ran simulations in which groundwater withdrawals were increased in all HUCs by their unique multiplier.
    - Lowered unique multipliers until streamflow metric no longer violated.
  - High End sustainable yield:
    - Used March 2001 data – highest river stage within USGS model.
    - Input March 2001 groundwater withdrawals and other time-specific parameters.

1 in equals 12 miles

Groundwater Withdrawal Increase Factors

HUC	Baseline October 1999 Withdrawals (mgd)	Revised Withdrawals without HUC 03130004		Revised Withdrawals with HUC 03130004	
		Multiplier	Withdrawal (mgd)	Multiplier	Withdrawal (mgd)
03130007	3.97	1.73	6.88	1.73	6.88
03130006 03110202 03110204	11.39	1.87	21.34	1.87	21.34
03130009	9.86	4.22	41.62	4.22	41.62
03130010	39.91	1.21	48.33	1.21	48.33
03130008 03120002 03120003	77.64	1.33	102.95	1.33	102.95
03130004	11.21	1.00	11.21	9.17	102.80
03130011	2.99	1.51	4.53	1.51	4.53
Totals	**157**		**237**		**328**

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Upper Floridan Aquifer – Dougherty Plain

Upper Floridan Aquifer in the Dougherty Plain

Low End of SY = 237 mgd
High End of SY = 328 mgd

Lower Flint Current use and forecasted demands:
2020 – 392 mgd
2060 – 518 mgd

Aquifer-wide demand:
2020 – 441 mgd
2060 – 576 mgd

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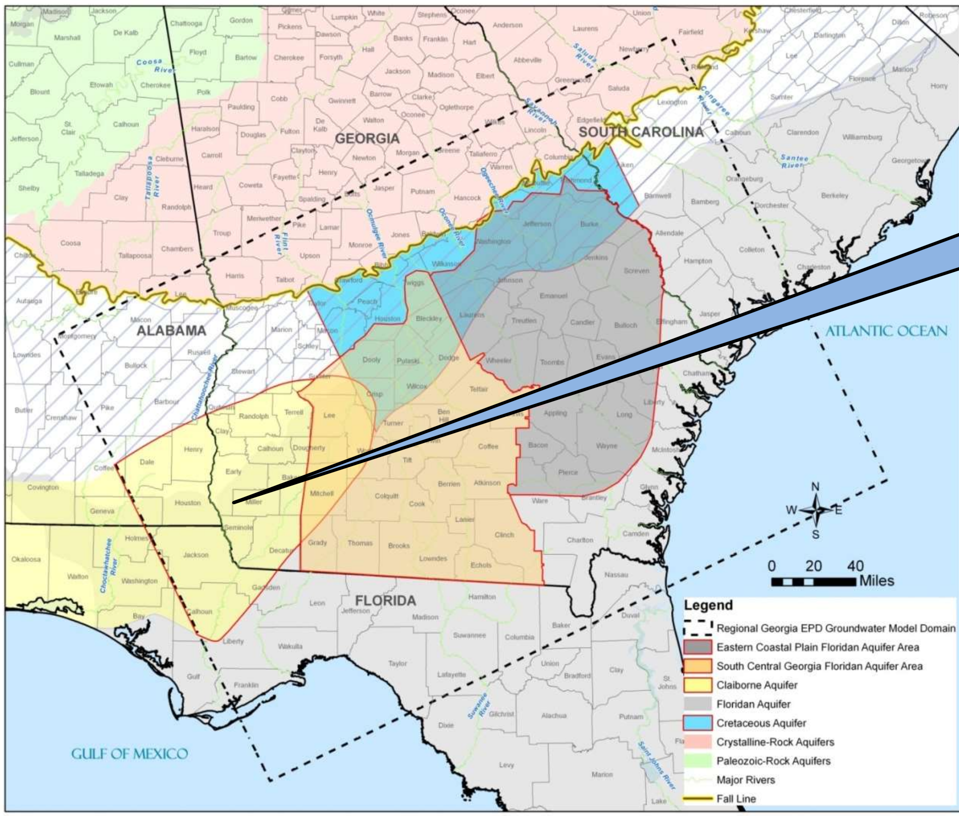
Claiborne Aquifer – Georgia Coastal Plain



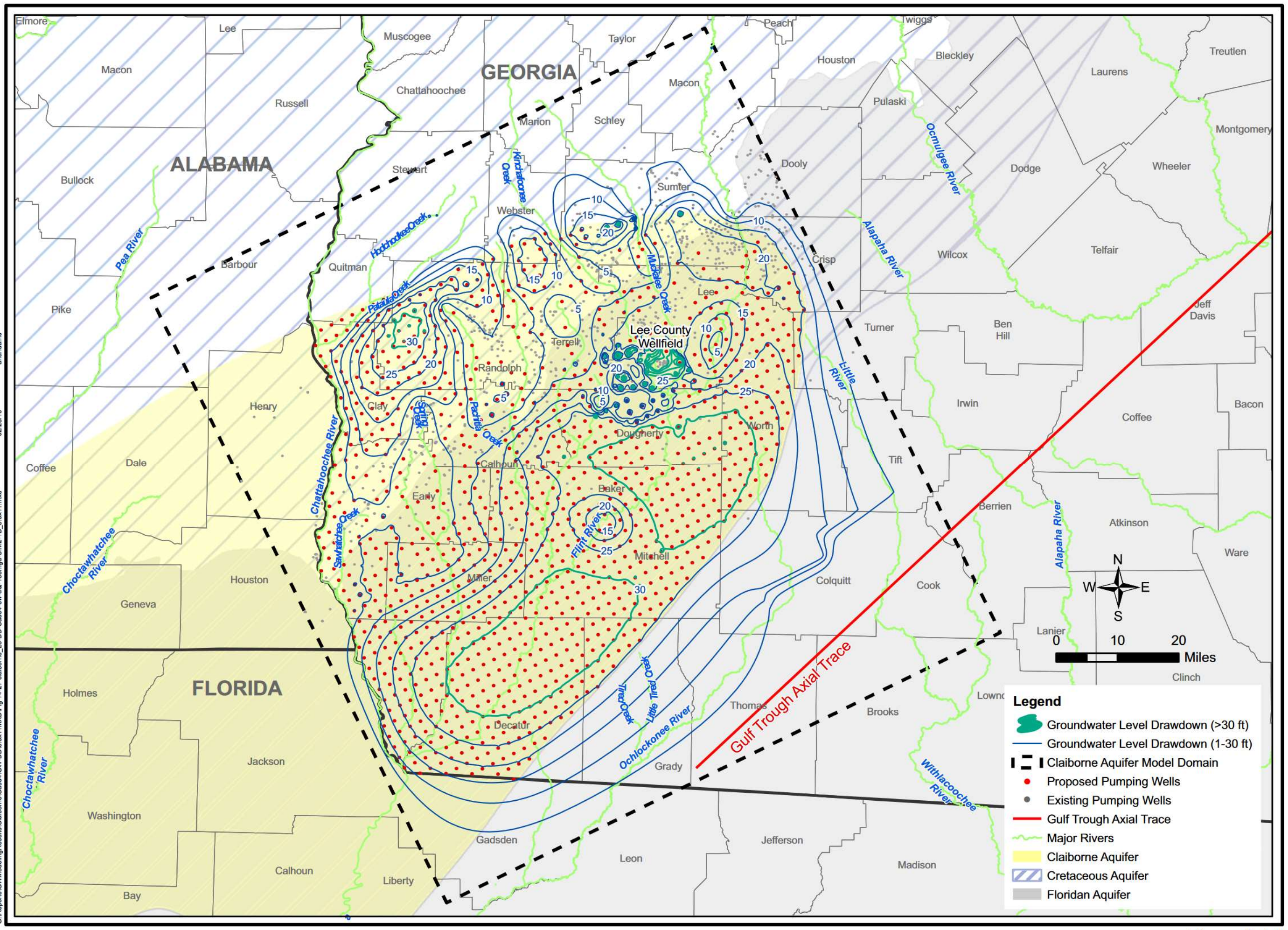
Low End of SY = 140 mgd
High End of SY = 635 mgd

Lower Flint Current use and forecasted demands:
2020 – 41 mgd
2060 – 52 mgd

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

Claiborne Aquifer in Georgia's Coastal Plain

Claiborne Aquifer High End Sustainable Yield Scenario



Claiborne Aquifer Simulations for Sustainable Yield – 2011 Plan

Simulation	Condition	Pumping in Claiborne Aquifer	Increased Pumping		Modeling Results	
					Max Drawdown	Reduced GW Contribution to River Baseflow [1]
		(mgd)	(mgd)	(%)	(ft)	
SIM 1	Baseline	93			-	-
SIM 2	Uniformly increased existing well pumping (low end of SY)	140	47	51%	30	2%
SIM 3	Non-uniformly increased existing well pumping	439	346	372%	30	12%
SIM 4	Uniformly increased simulated new well pumping with baseline pumping in existing wells (93 mgd)	149	56	60%	30	2%
SIM 5	Non-uniformly increased simulated new well pumping with baseline pumping in existing wells (93 mgd)	444	351	377%	30	12%
SIM 6	Non-uniformly increased existing and simulated new well pumping (high end of SY)	635	542	583%	30	18%

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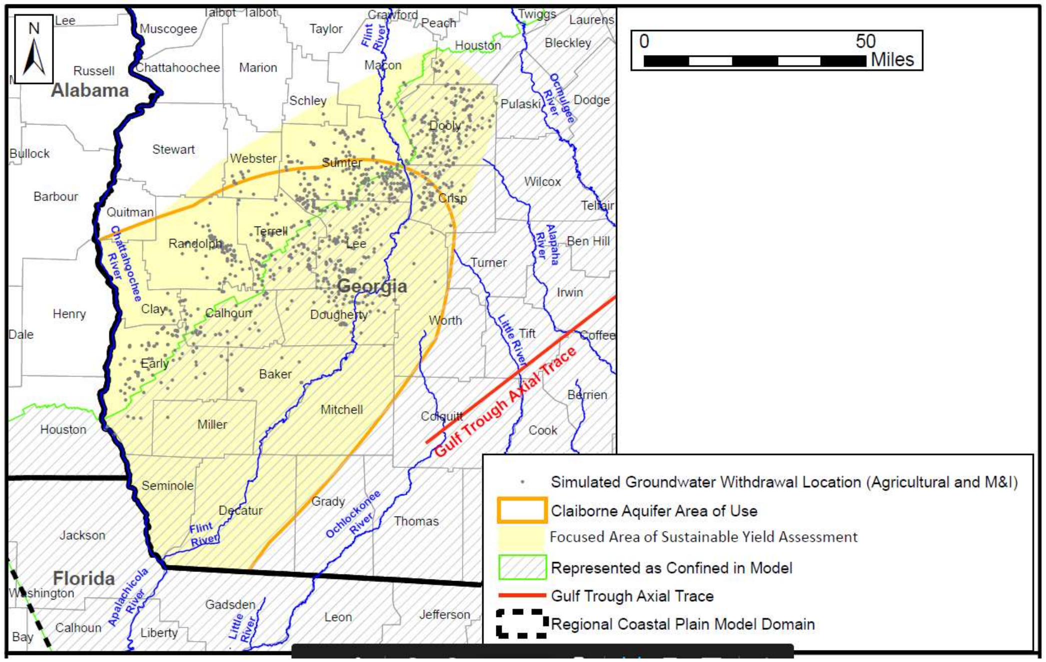
Groundwater Resource Assessment Updates for 2017 Plan

- Between 2016-2017:
  - Reduce finite difference grid cell size
    - 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.
- Reassessed Sustainable Yield of Claiborne Aquifer.

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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			

Lower Flint Council Request – 2017 Plan

- Address Lower Flint Council request to:
  - Evaluate whether the sustainable yield of the Claiborne Aquifer is affected by specific location and timing of groundwater withdrawals.

- Use transient model to evaluate how Claiborne Aquifer may respond to time-varying withdrawals during and between crop growing seasons in localized areas.

- Investigate replacing aqricultural surface water withdrawals in Ichawaynochaway and Spring Creek watersheds with groundwater withdrawals:
  - In areas where Claiborne is confined, apply withdrawals to Claiborne Aquifer.
  - In areas where the Claiborne is unconfined, apply withdrawals to next deepest aquifer (Cretaceous Sand).

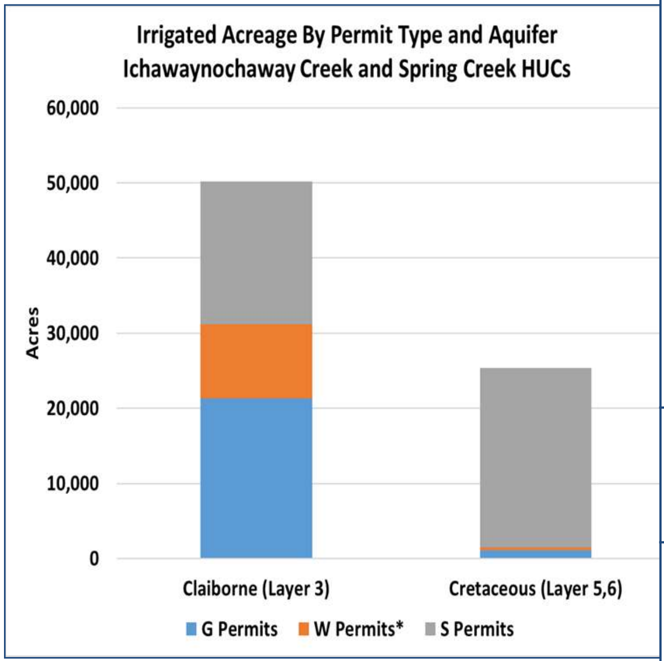
Southwest Georgia Subregional Model Domain

- Ag withdrawals in Ichawaynochaway and Spring Creek watersheds simulated as groundwater withdrawals.
- Transient simulations representing different hydrologic conditions:
  - 4-Year simulation
    - Year 1 (wet)
    - Year 2 (Normal/dry)
    - Year 3 (dry)
    - Year 4 (dry)
  - 8-Year simulation – repeats 4-year sequence.

Scenario	Duration	Additional GW Withdrawals in Ichawaynochaway Creek	Additional GW Withdrawals in Spring Creek
Baseline	8 years	-	-
Scenario 1	4 years	Yes	-
Scenario 2	4 years	-	Yes
Scenario 3	8 years	Yes	-
Scenario 4	8 years	-	Yes
Scenario 5	8 years	Yes	Yes

Focus of Presentation

Ichawaynochaway and Spring Creek Watersheds – Irrigated Acreage

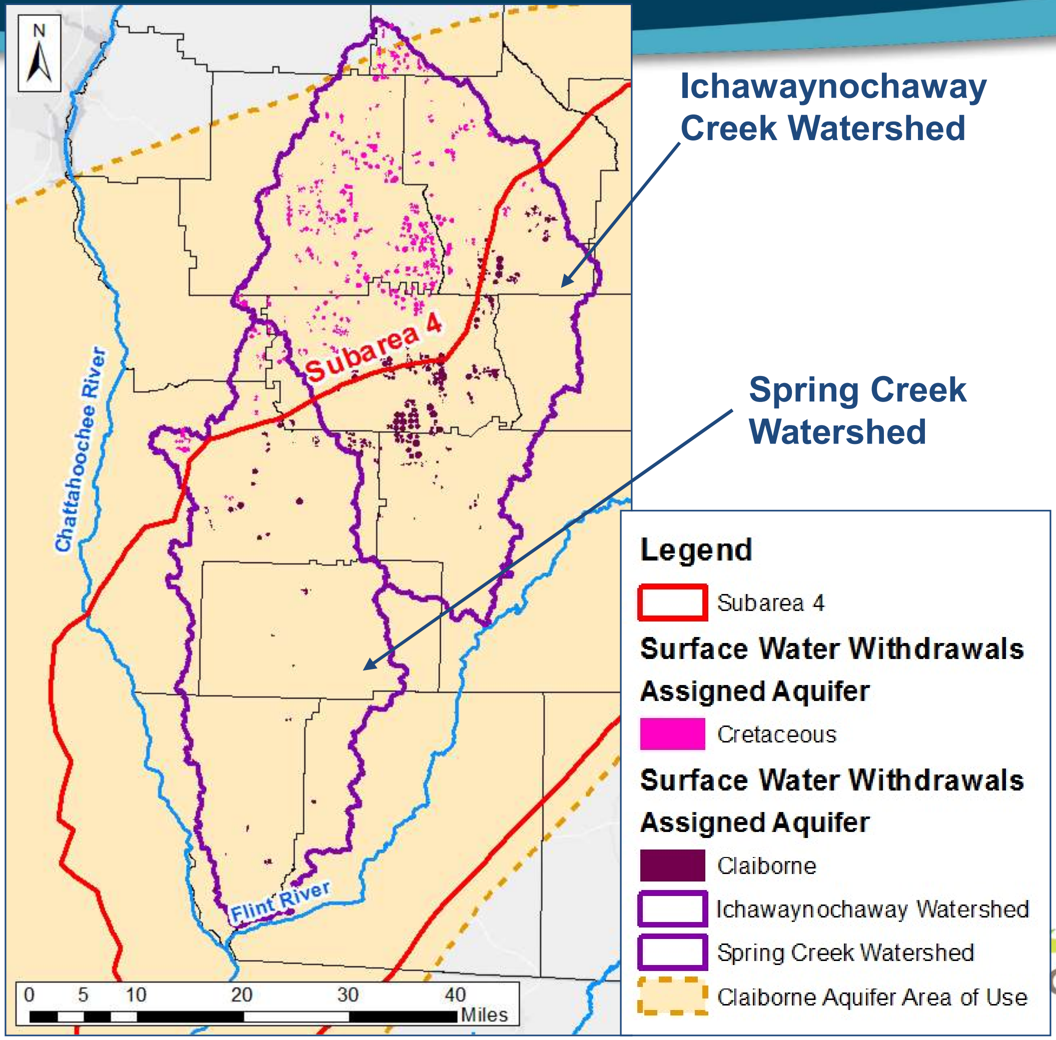


Aquifer	Groundwater (acres) (Baseline)		Additional Converted Surface Water (acres) (Scenario 5)
	G Permits (Groundwater)	W Permits* (Groundwater to Pond)	S Permits (Surface Water)
Claiborne (Layer 3)	21,306	9,923	18,997
Cretaceous (Layer 5,6)	1,107	367	23,904

* W area is actual irrigated acreage x 70%

Study Area

- In areas where simulated Claiborne aquifer is confined, apply withdrawals to Claiborne Aquifer.
  - In areas where Claiborne aquifer is unconfined, apply withdrawals to next deepest aquifer
    - Cretaceous Aquifer (model layers 5 & 6) in Ichawaynochaway
    - Cretaceous Aquifer (model layer 6) in Spring Creek.
  - Simulated groundwater withdrawals assigned to centroid location of agricultural parcel.



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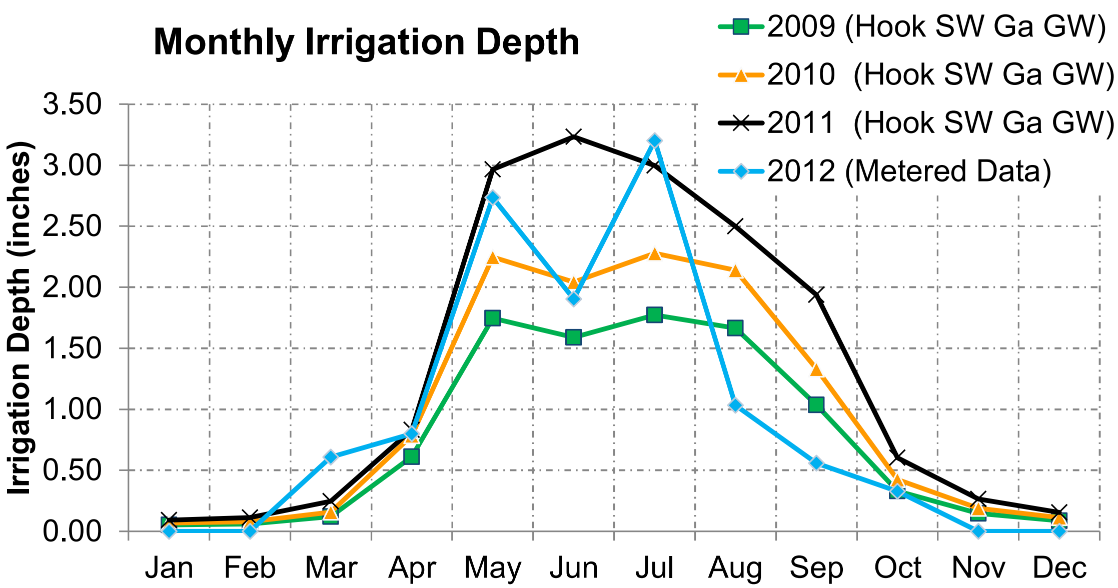
Simulation (Scenario 5) Development

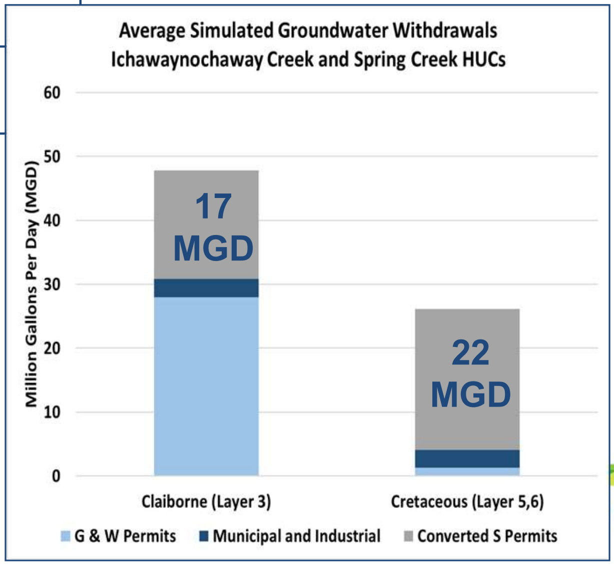
- Irrigated acreage data from Georgia EPD.
  - Baseline agricultural withdrawals calculated for G (Groundwater) and W (Well to pond).
  - Scenario 5 new withdrawals calculated for S (surface water) permits in Ichawaynochaway and Spring Creek watersheds.
- Monthly groundwater withdrawals computed from annual irrigated depths and monthly patterns:
  - Annual irrigation groundwater use based on metered data (2009-2012).
  - Monthly patterns for 2009, 2010, 2011 from Hook for Southwest Georgia Groundwater.
  - Monthly patterns for 2012 from EPD metered data.



Scenario 5 – Simulated Groundwater Withdrawals

Assigned Aquifer	Claiborne	Cretaceous
Model Layer	3	5, 6
Surface water converted to groundwater for Scenario		
Average, S Permits (MGD)	17	22
Monthly Max., S Permits (MGD)	55	70
Monthly Min., S Permits (MGD)	0*	0*
Baseline Ag., G & W Permits (MGD)	28	1.3
Baseline Municipal and Industrial (MGD)	2.8	2.8

- Scenario 5 – Increase withdrawals in both Ichawaynochaway and Spring Creek watersheds.
- "0" irrigation for time period November - February



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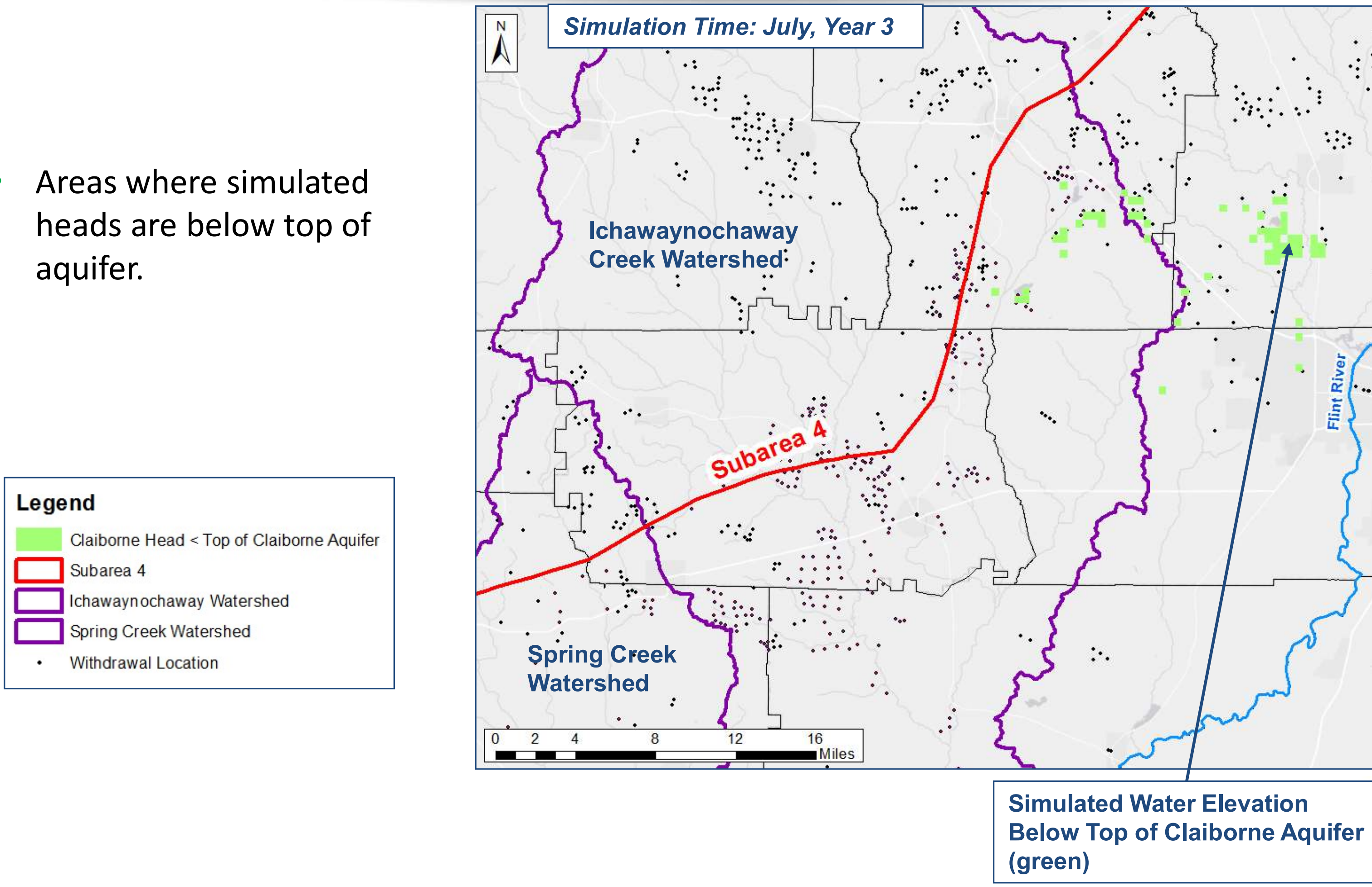
Simulated Claiborne Aquifer Heads Relative to Top of Claiborne – Scenario 5

- Areas where simulated heads are below top of aquifer.



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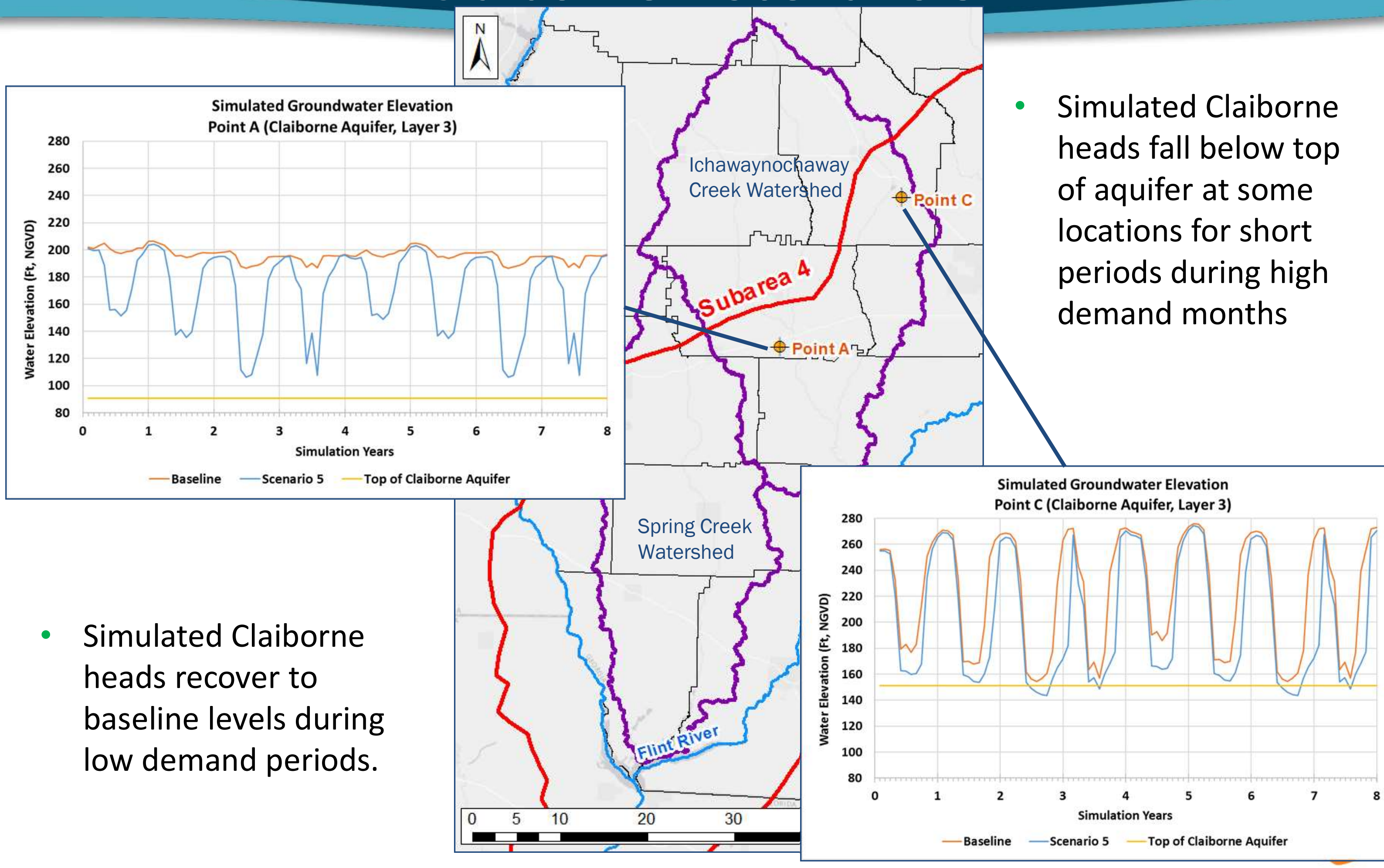
Simulated Claiborne Aquifer Heads Relative to Top of Claiborne – Scenario 5



- Simulated Claiborne heads fall below top of aquifer at some locations for short periods during high demand months

- Simulated Claiborne heads recover to baseline levels during low demand periods.

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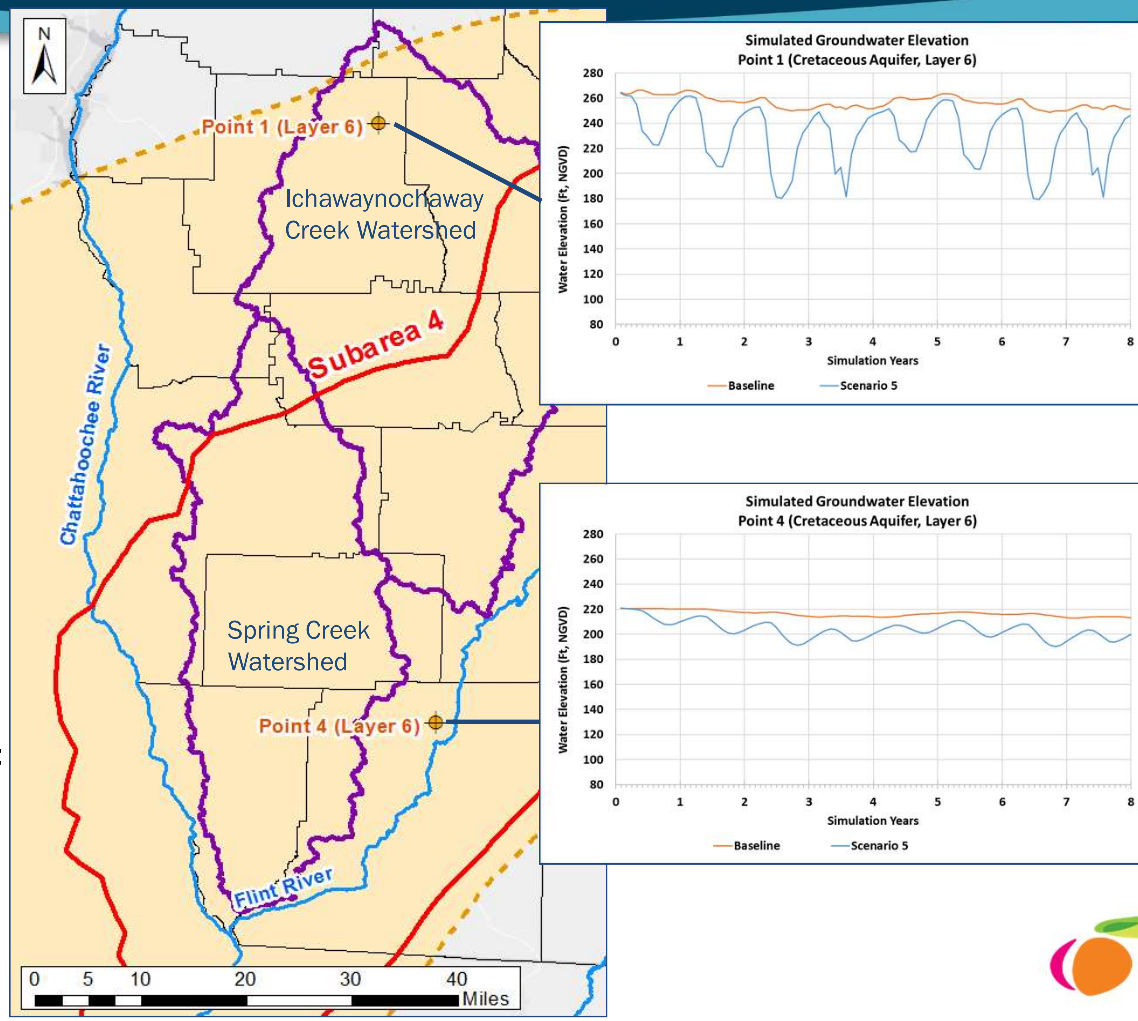
Simulated Cretaceous Aquifer Heads – Scenario 5

- Layer 5 (Providence Sand) could not support substantial pumping due to low transmissivity.
- Simulated Cretaceous heads do no always recover to baseline levels during low demand periods.
- Decrease in baseline water levels over simulation period is related to relatively wet initial condition.
- Top of Cretaceous aquifer:
  - Point 1 = -250 ft elevation.
  - Point 4 = -1,700 ft elevation.



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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, ie Federal Clean Water Act "fishable" and "swimmable"

- Standards are the way that EPD meets these goals
- Designated uses determine specific standards
- If water quality does not meet established standards:
  - Listing as an impaired water ie (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 to improve
- State Water Planning
  - Water Quality Resource Assessment
    - Existing conditions
    - Future conditions
- Future issues
  - Per- and Polyfluoroalkyl Substances (PFAS)

Water Quality Resource Assessment

Elizabeth A. Booth, Ph.D., P.E.

Watershed Planning and Monitoring Program Manager

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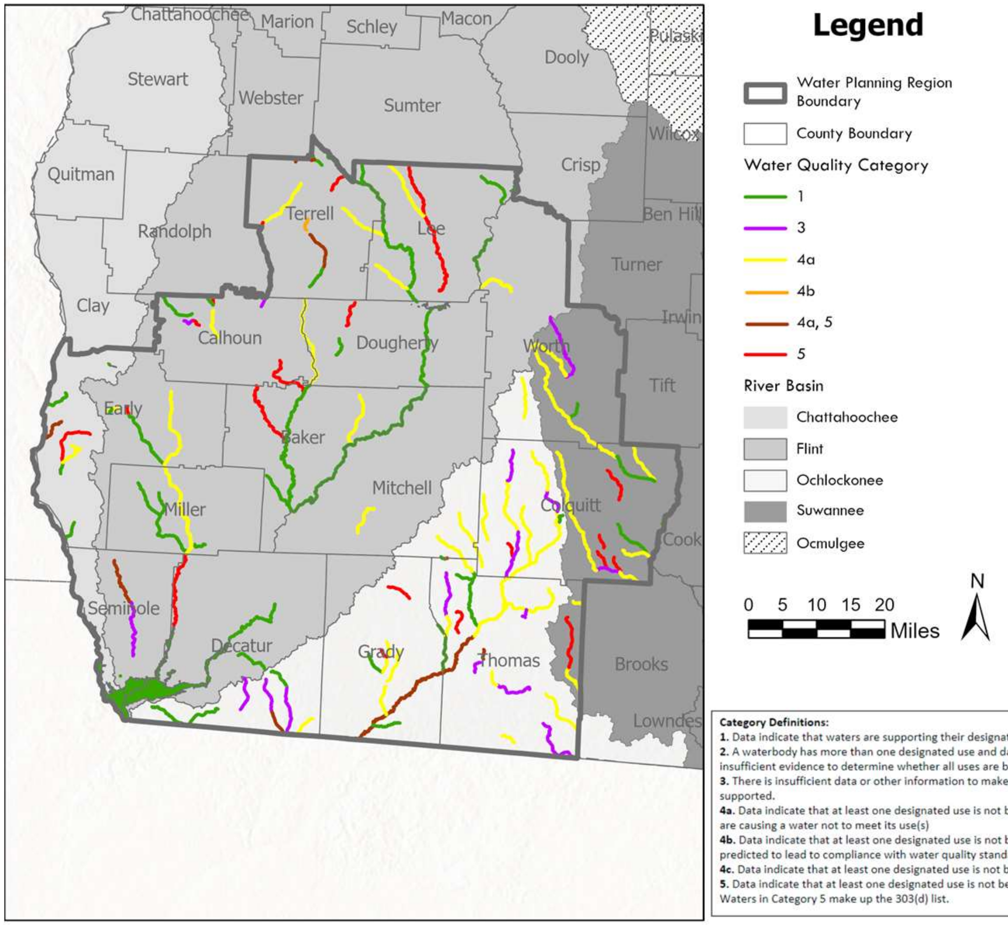
ENVIRONMENTAL PROTECTION DIVISION

Surface Water Quality Assessment in the Lower Flint-Ochlockonee Water Region 305(b) Report 2020



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

Water Quality Resource Assessment

- Plan Section 3.2.1:
  - Two water quality model evaluations were performed:

1. River Model (Dissolved Oxygen Modeling) → Modeling completed/will review today.
2. Lake and Watershed Models (Nutrient Modeling) → Updates to these models have not been conducted for this round of planning.

- Current Conditions (Section 3) & Future Conditions (Section 5)

Nutrient Modeling Findings

- Nutrient concentrations were evaluated in the Flint basin watersheds
  - Total nitrogen (N)
  - Total phosphorus (P)
- Lake models estimated the algal response (chlorophyll *a* levels) from the nutrient loadings in Lakes Blackshear, Chehaw and Seminole
- Findings:
  - **Nonpoint sources** currently contribute more total N, but future increases in total N will come more from point sources
  - **Point sources** currently contribute more total P
  - Future increases in loadings to Lake Seminole will be primarily point source related
  - There are currently no nutrient or chlorophyll *a* standards for the rivers or lakes

Dissolved Oxygen Modeling

- **Current Conditions addressed in Plan Section 3.2.3**

Dissolved Oxygen Modeling

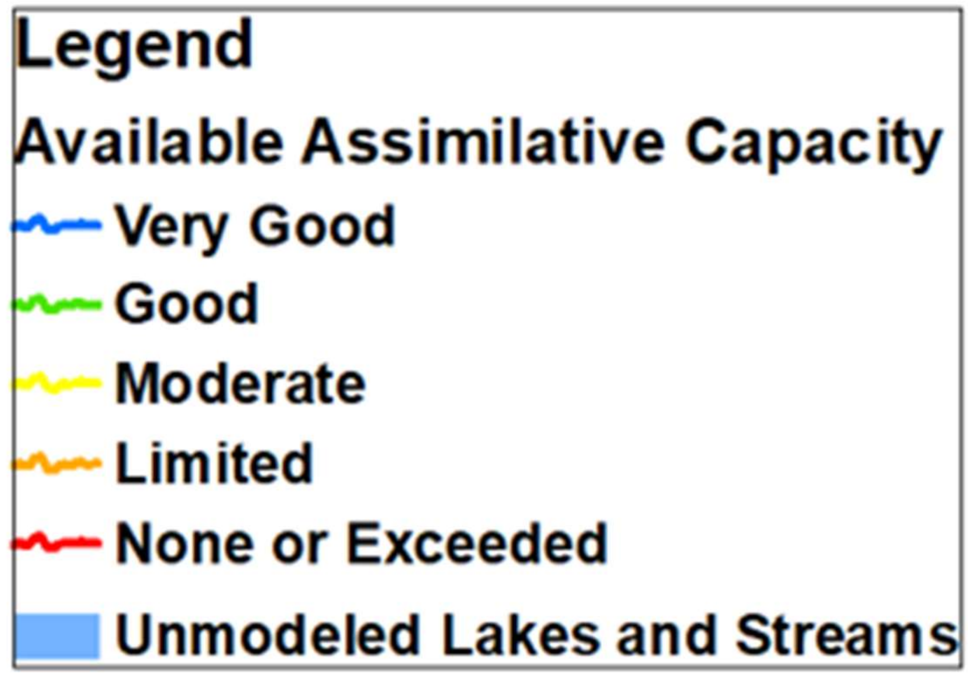
Figure 3-5 shows the in-stream dissolved oxygen model results for current discharges given critical low flow (7Q10), high temperature conditions. The current conditions assimilative capacity analysis incorporated municipal and industrial wastewater facilities operating at their full permitted discharge levels (flow and effluent discharge limits as of ~~2014~~2019).

- **Future Conditions addressed in Plan Section 5.3**

Figure 5-1 shows the modeled assimilative capacity at assumed future (~~2050~~2060) permitted flow and effluent limits.

Dissolved Oxygen Modeling

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



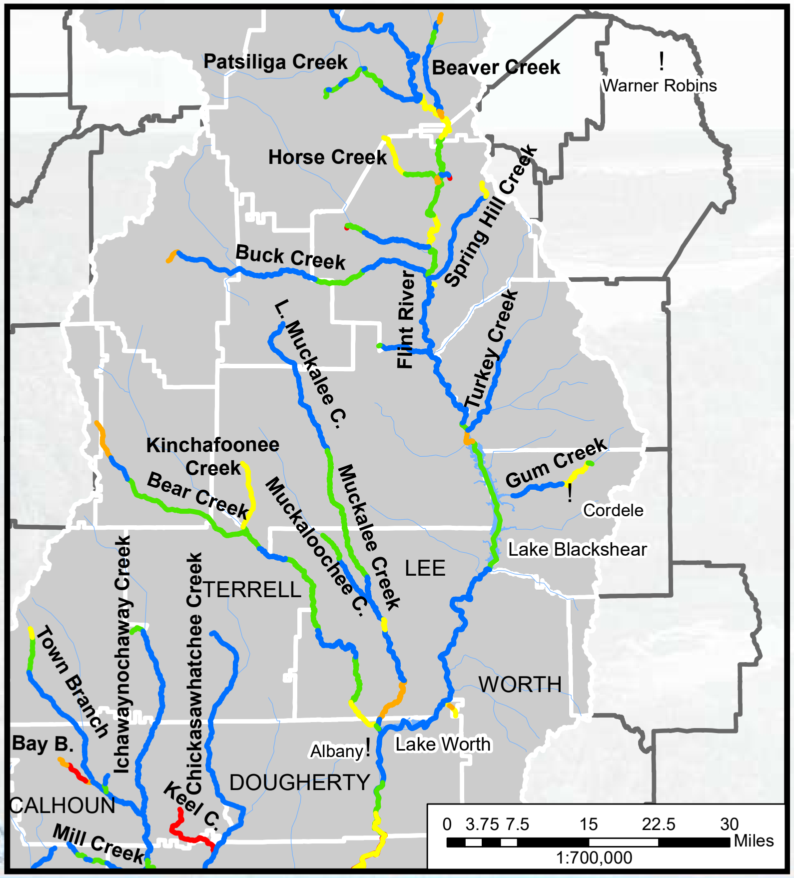
Dissolved Oxygen Results: Middle Flint Basin

Legend

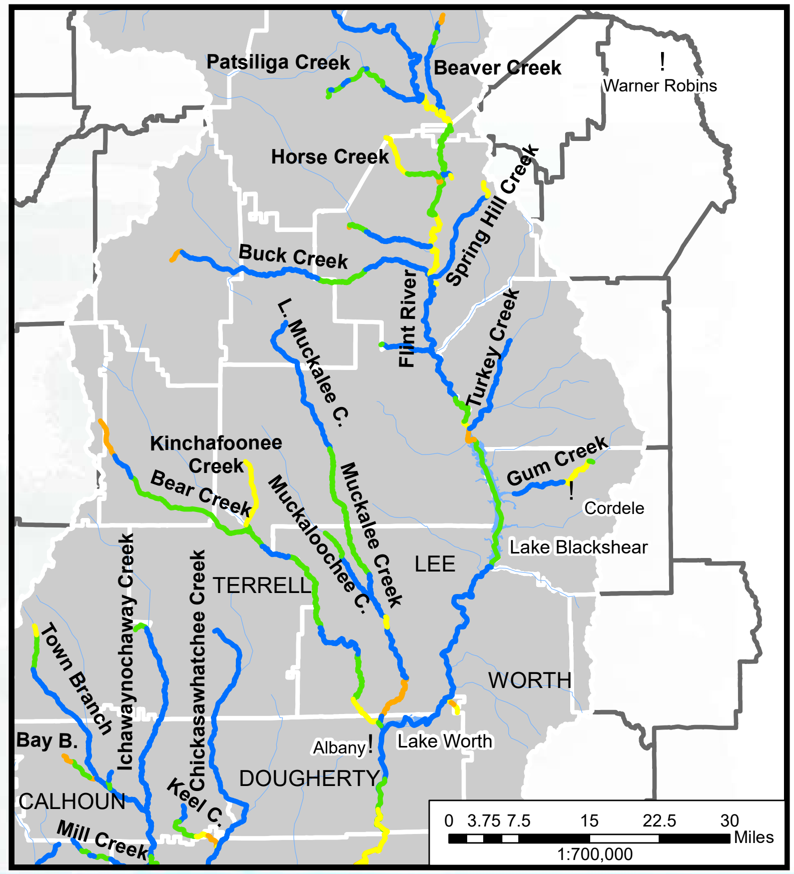
Available Assimilative Capacity

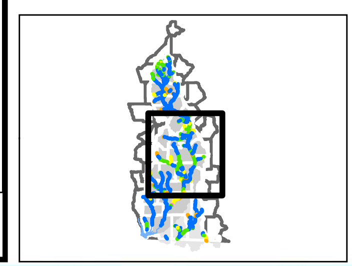
- Very Good
- Good
- Moderate
- Limited
- None or Exceeded
- Unmodeled Lakes and Streams

Current Conditions



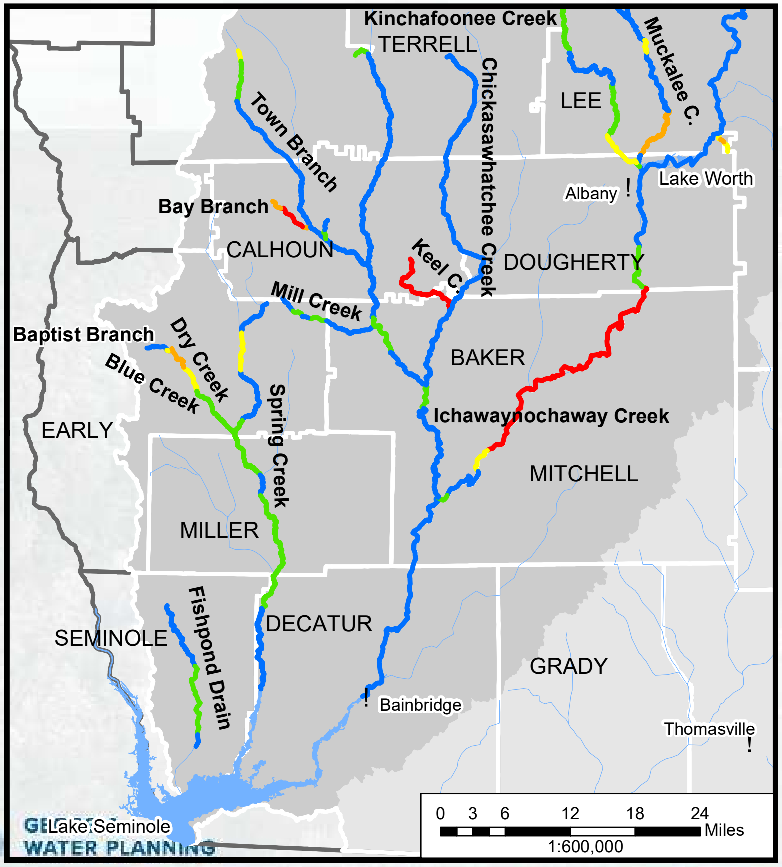
Future Conditions



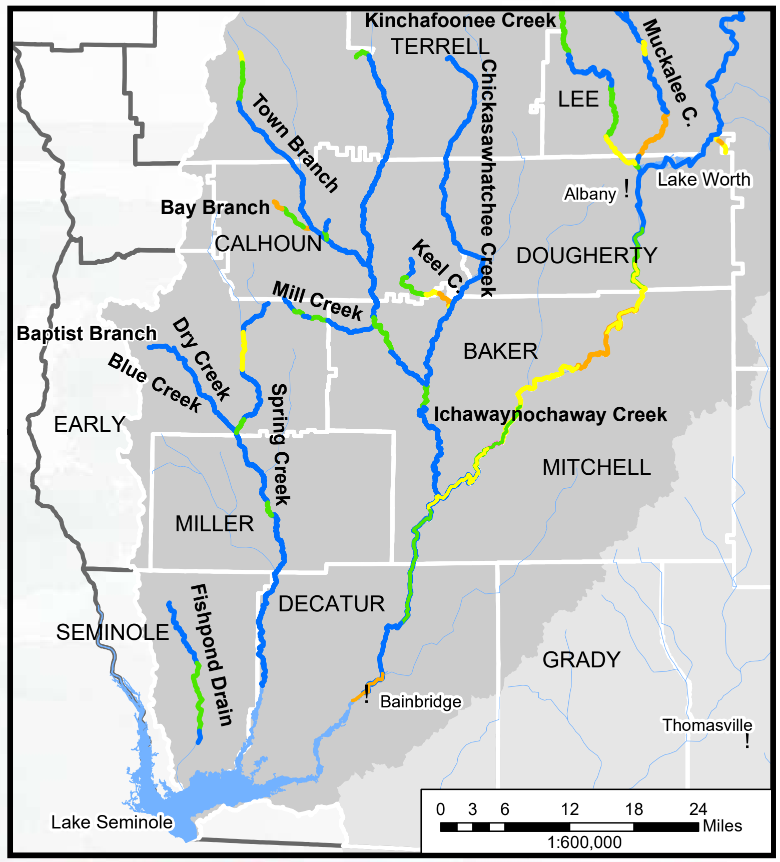


Dissolved Oxygen Results: Lower Flint Basin

Current Conditions



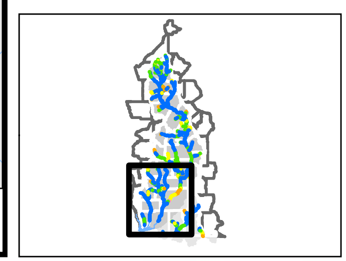
Future Conditions



Legend

Available Assimilative Capacity

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



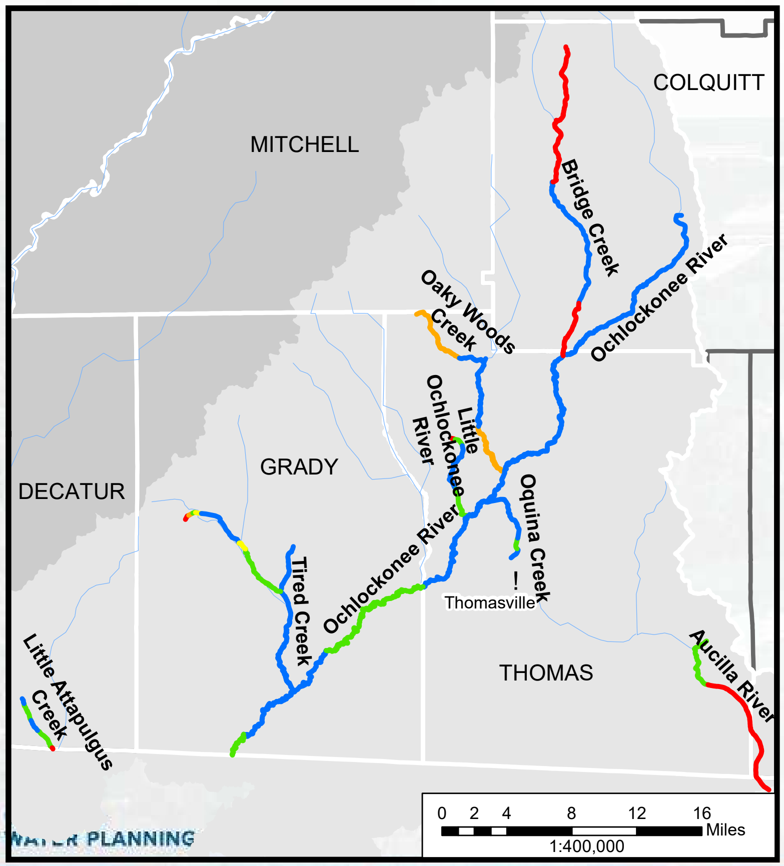
Dissolved Oxygen Results: Ochlockonee Basin

Legend

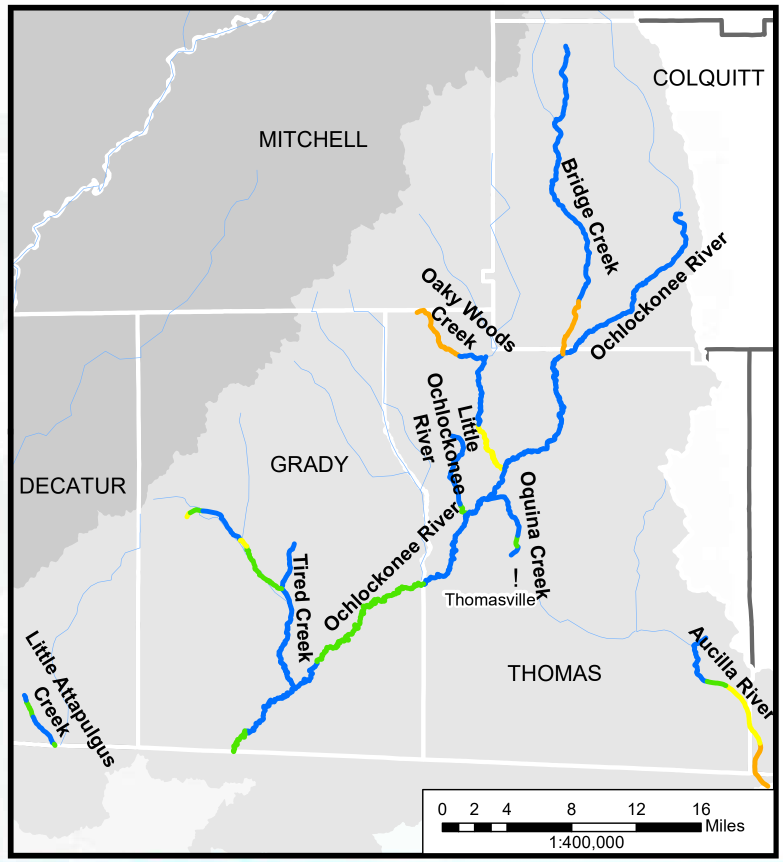
Available Assimilative Capacity

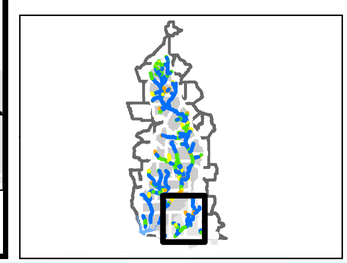
- Very Good
- Good
- Moderate
- Limited
- None or Exceeded
- Unmodeled Lakes and Streams

Current Conditions



Future Conditions





Surface Water Availability Assessment

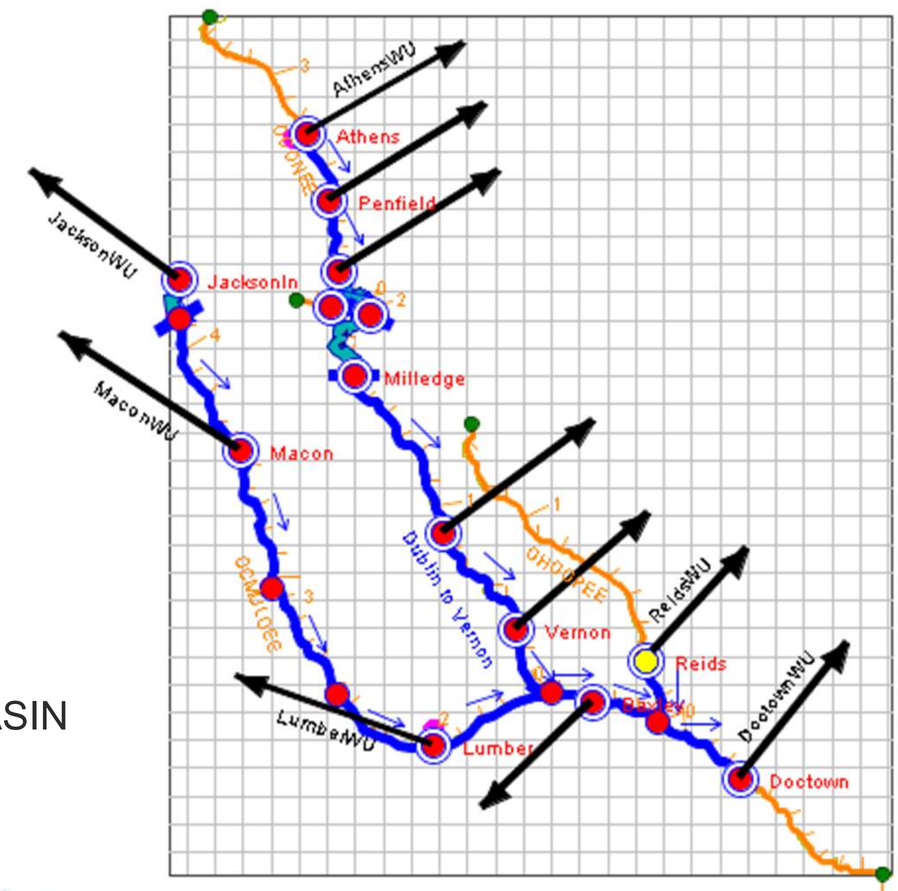
Wei Zeng, GA EPD

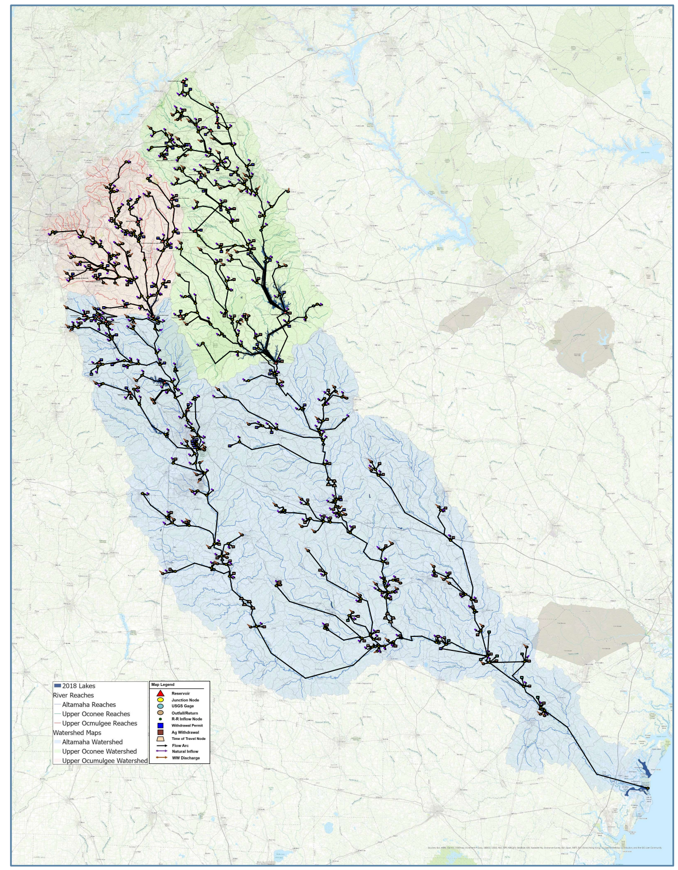
Mark Masters, GWPPC

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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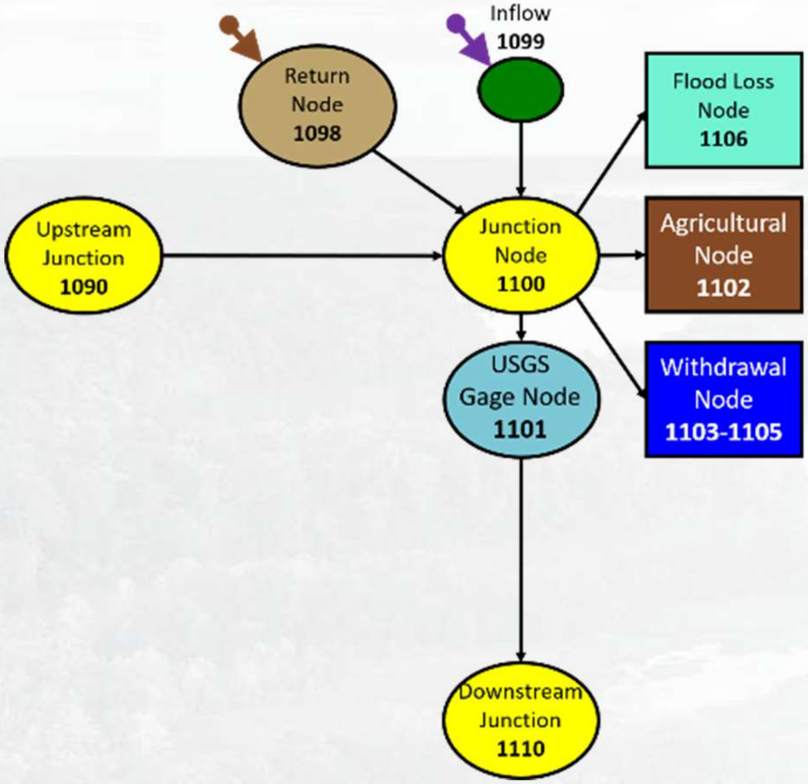
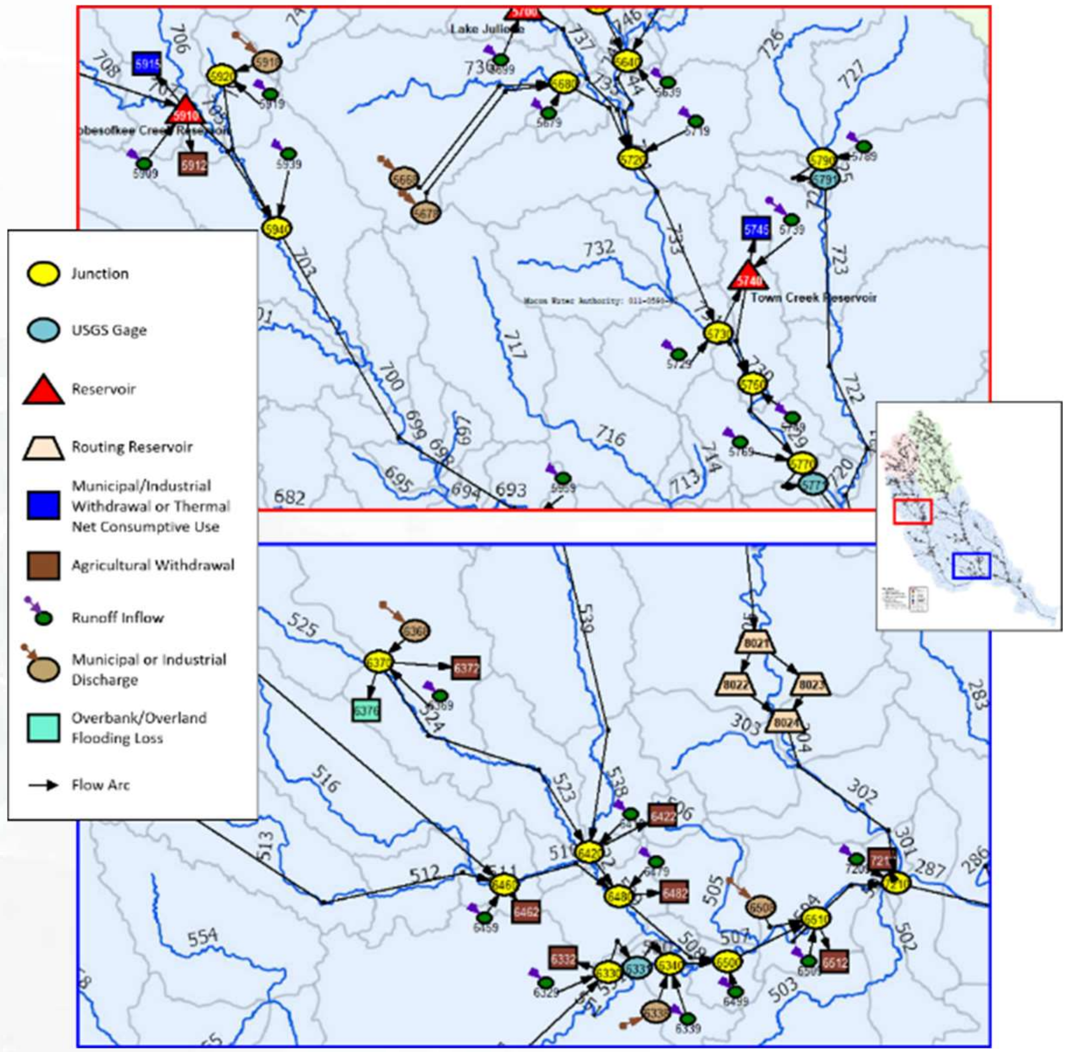
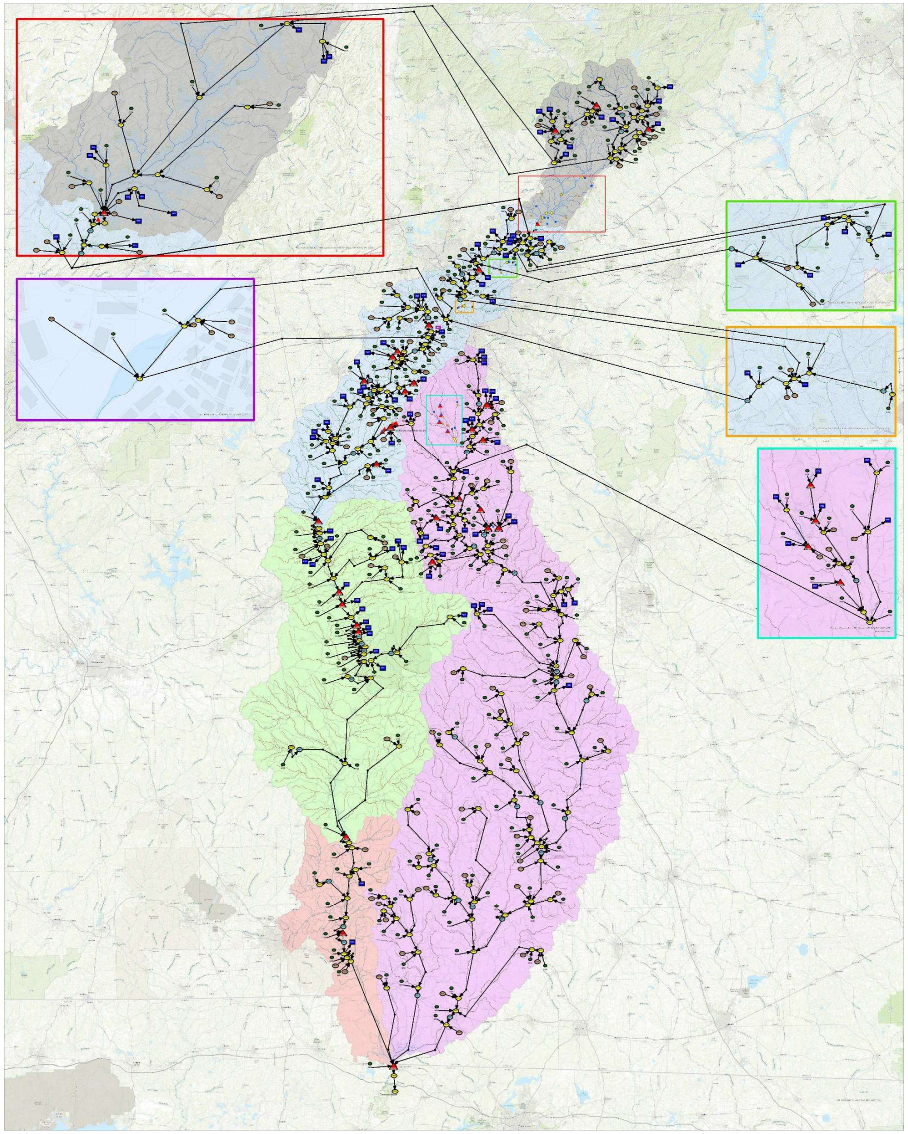
BEAM Node Types





BEAM Schematic for the ACF



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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.

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

Examples of Surface Water Availability Resource Assessment

Modeling Results and Performance Measures

Discussion: Incorporating Resource Assessments into Regional Water Plan

Corinne Valentine, Black & Veatch

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

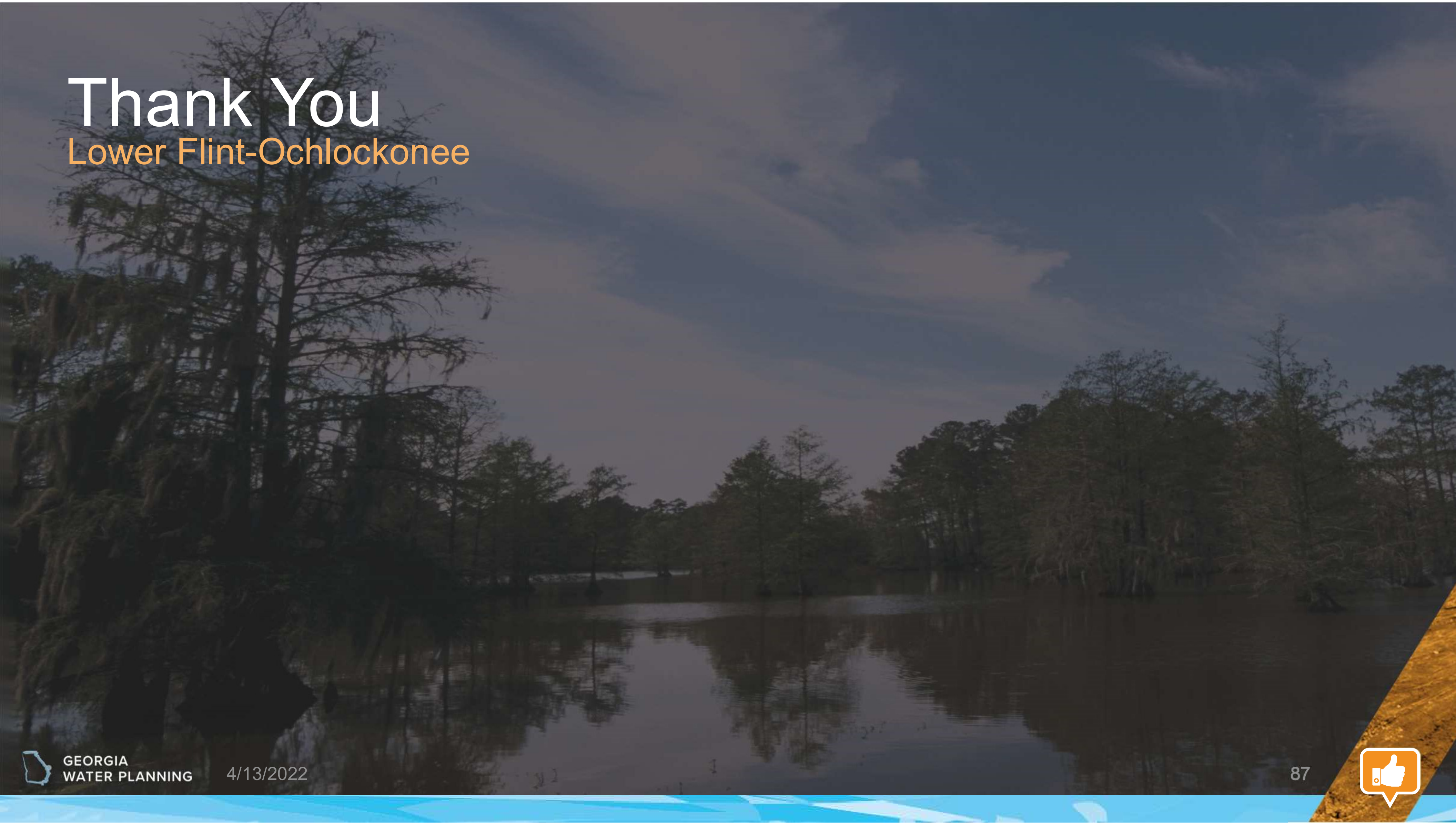
  What metrics do you find useful? Are there other metrics you would like to see?

Public Comment

Next Steps

Next Steps

- **Next Meeting: May 12**
- **Plan Review Committee to review Sections 1, 2, and 4**
- **Inter-Regional Coordination Committee:**
  - **Metro Water District draft plan**
    - Virtual Meeting on April 19th
    - Draft plan materials available now for Council review
    - Comments due on May 11


Thank You
Lower Flint-Ochlockonee
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