Georgia's State Water Plan

Coastal Georgia Regional Water Planning Council Meeting
October 10, 2019

Council Meeting Agenda

Georgia's State Water Plan

Coastal Georgia Regional Water Council Meeting
Agenda – October 10, 2019

Objectives:

1) Receive updates from Army Corps of Engineers on On-Going Projects and Studies of Regional Significance
2) Review background on up-coming technical work that will support the 2020-2021 Water Plan Update Cycle
3) Discuss Industrial and Municipal Water Demand Forecast Methodologies and Discuss Subcommittee
4) Review 2019 Seed Grant Opportunities and Timelines

10:00 – 10:30	Registration
10:30 – 10:45	Welcome and Introductions - Benjy Thompson
	Approve meeting minutes from November 8, 2018 Council Meeting
	Approve meeting agenda
10:45 – 11:30	Updates from the U.S. Army Corps of Engineers
	- South Atlantic Coastal Study (SACS)
	- Savannah Harbor Expansion Project (SHEP)
	- Savannah River Basin Comprehensive Study, Interim Study 2
11:30 – 12:00	Lunch
12:00 – 12:45	Background and Overview of Up-Coming Technical Work that will support the up-coming 2020-2022 Regional Water Plan Update Cycle
	- Population Projections
	- Water Demand Forecasts
	- Resource Assessments
12:45 – 1:40	Water Demand Forecast Methodology Overview
	- Industrial Water Demand
	- Municipal Water Demand and County Specific GPCDs
	- Demand Forecast Subcommittee(s)
1:40 – 1:50	Review 2019 Seed Grant Opportunities and Timelines
1:50 – 2:00	Public Comments/Local Elected Official Comments
	Next Steps / Wrap Up
2:00	Adjourn

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Council Business

Welcome and Introductions / Council Business

- Welcome and Introductions
- Approve meeting agenda
- Approve meeting summary from November 8, 2018 Joint Council Meeting

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Updates from the U.S. Army Corps of Engineers - Savannah District

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Lunch

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Background and Overview of Upcoming Technical Work for 2020-2022 Regional Water Plan Update Cycle

Background

Next plan update cycle projected to kick off in 2020

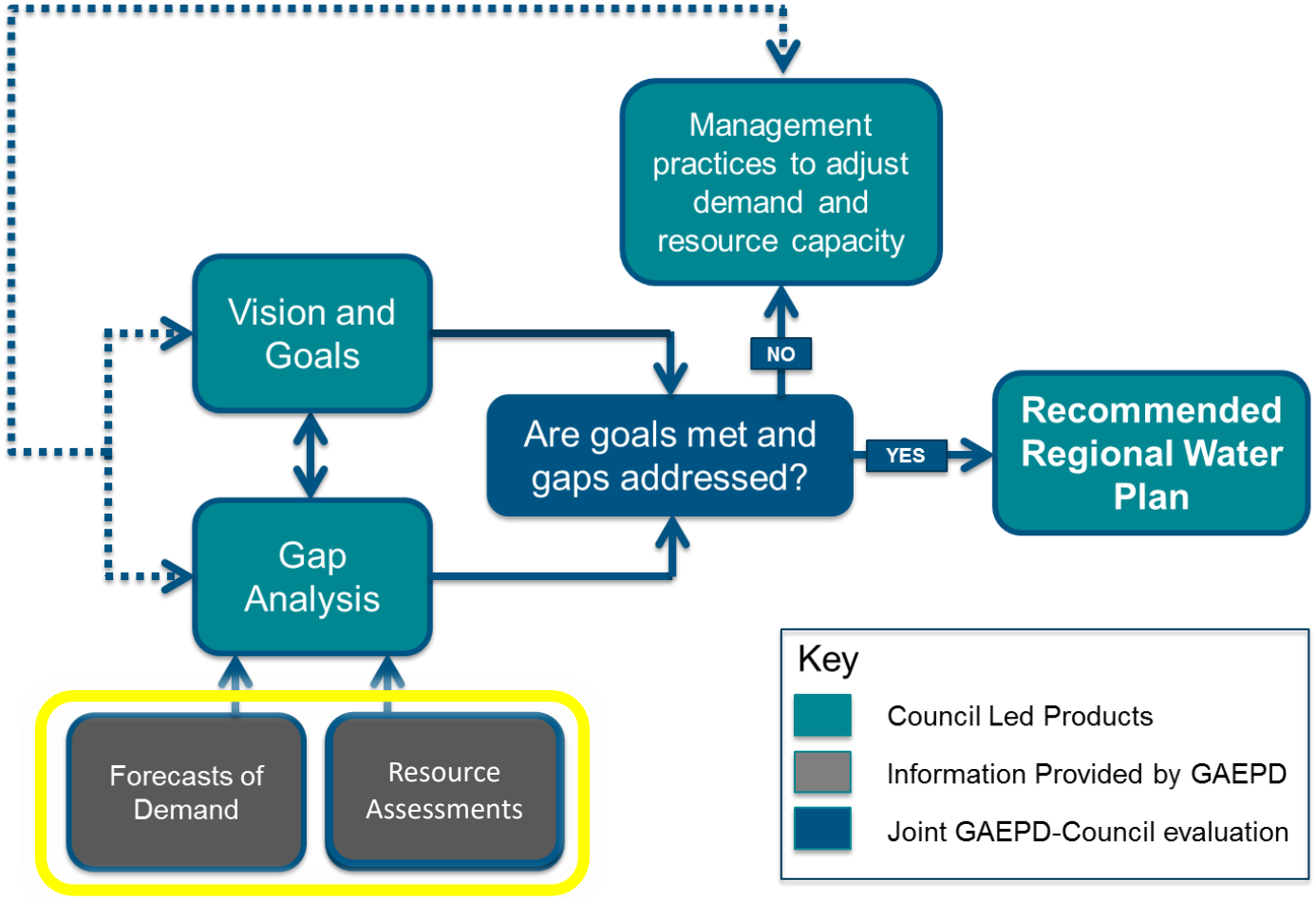
Initial focus areas will include:

- Updated population projections
- Updated water demand and wastewater forecasts
  - Including a revised industrial demand estimate
  - Updated energy sector estimates
- Updated Surface Water and Ground Water Availability Resource Assessments (Quantity)
- Updated Surface Water Quality / Assimilative Capacity Resource Assessment

Purpose

- Re-familiarize council with the key technical products that inform the water plan update
  - What analysis is performed?
  - How is the information used?
  - Why is it done like that?
  - How does it all fit together?
- Provide baseline for more refined discussions on items of interest or potential changes during the next cycle.

Coastal Georgia Regional Water Planning Process



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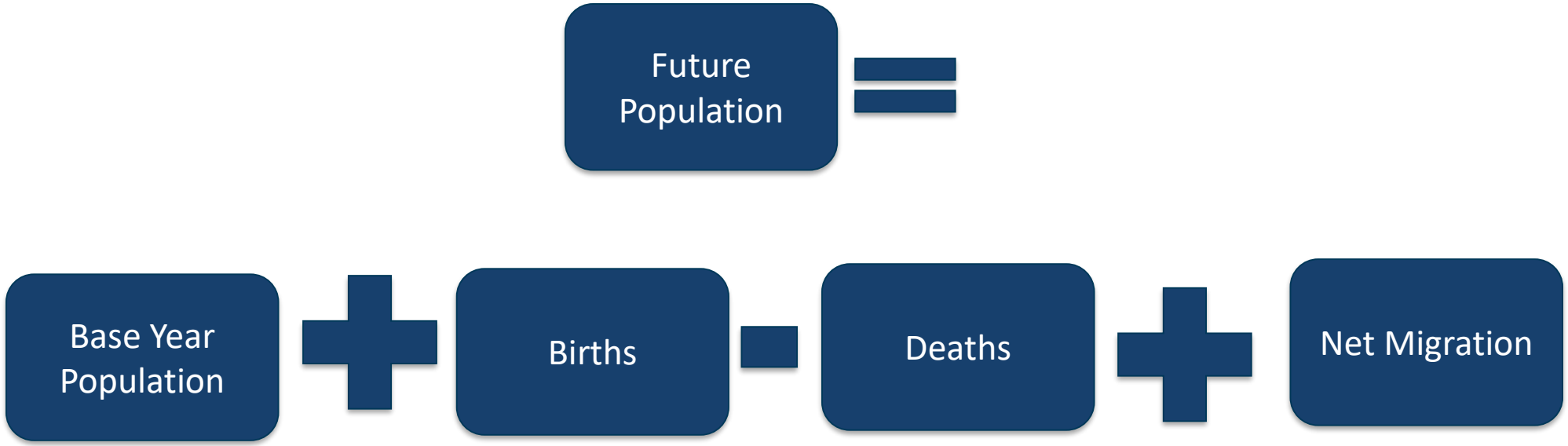
Population Projections

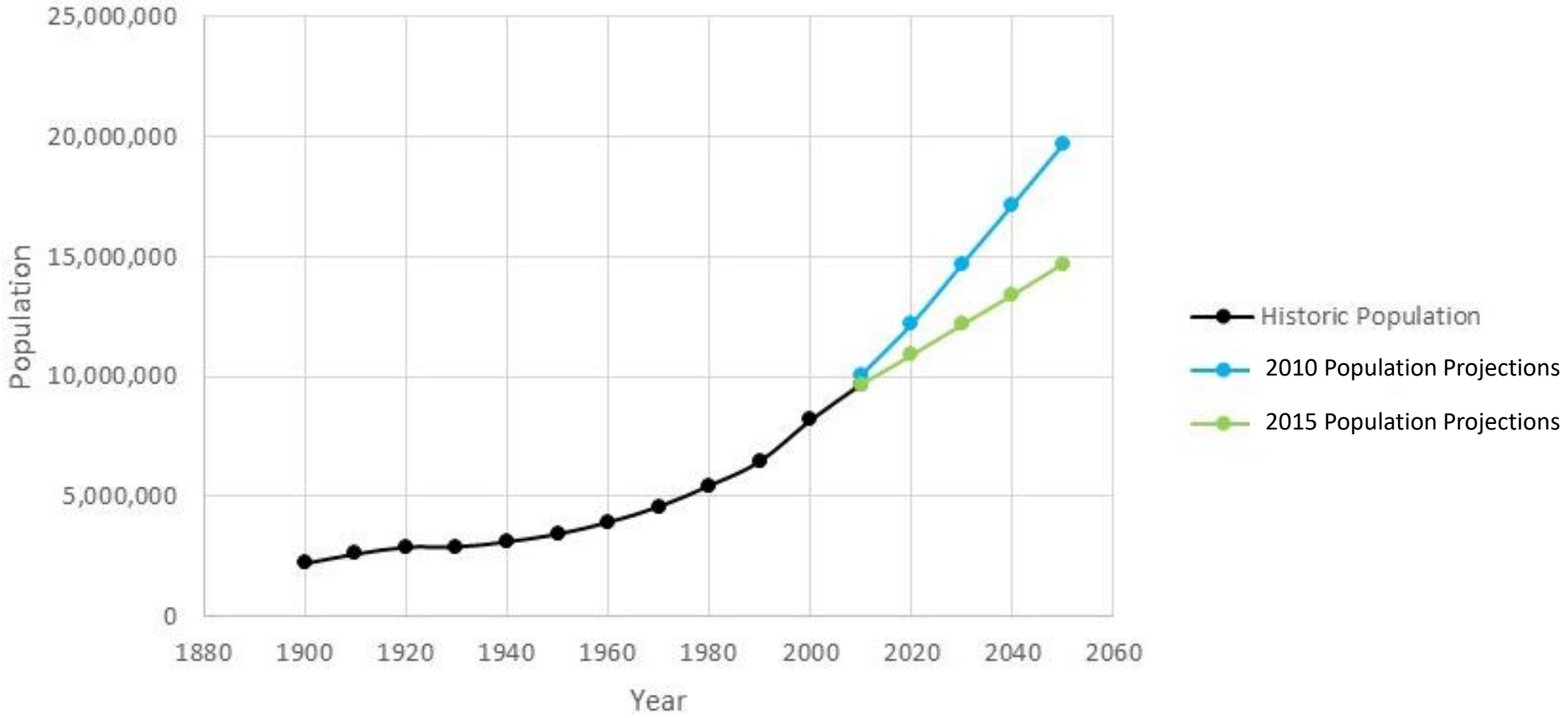
Updated Population Projections

- State and County population projections are prepared by the Governor's Office of Planning and Budget (OPB) https://opb.georgia.gov/
- Used consistently by all state agencies for multiple purposes
- Updated population projections will be used in the Review and Revision process
- Population is dynamic and is an important input to planning

Basic Approach to Population Projections (The Cohort-Component Method)

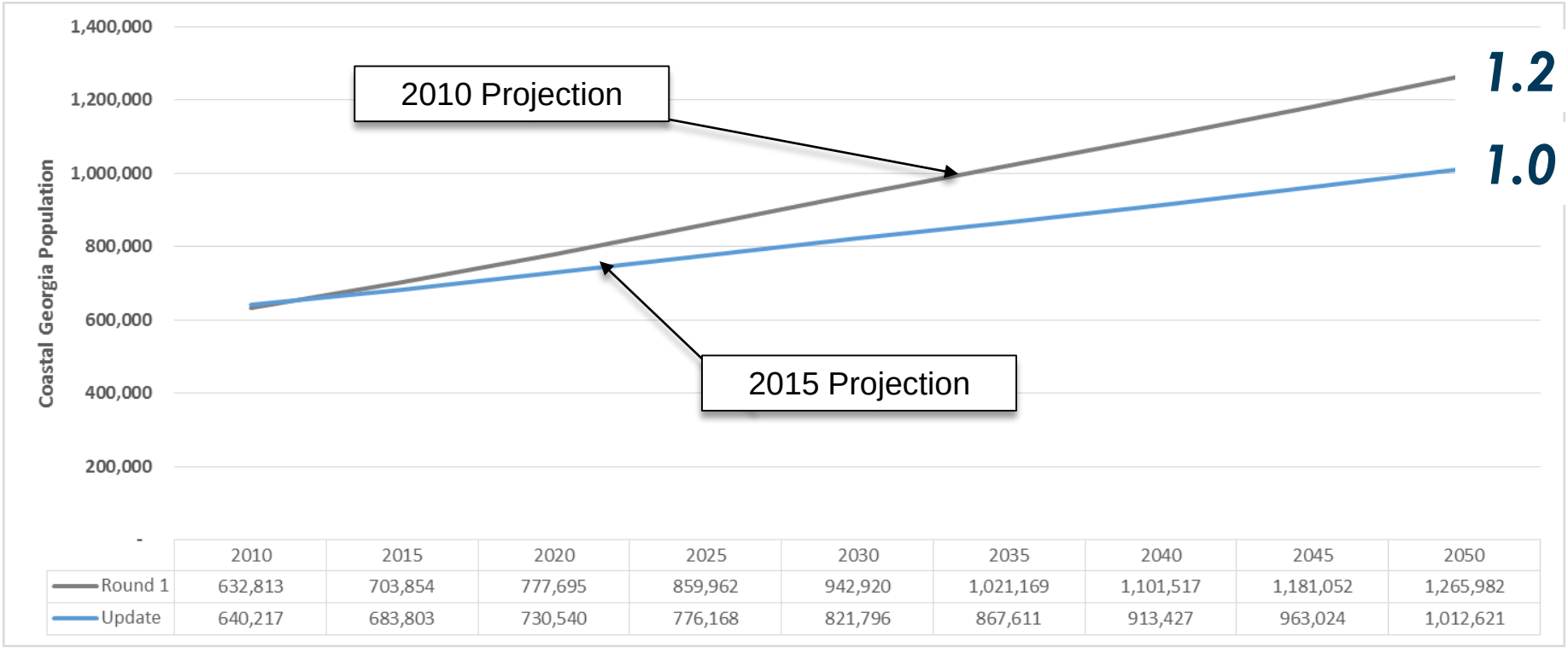


Population Growth Revision 2017 Regional Water Plan Update - Statewide



Population Growth Revision 2017 Regional Water Plan Update - Coastal Council

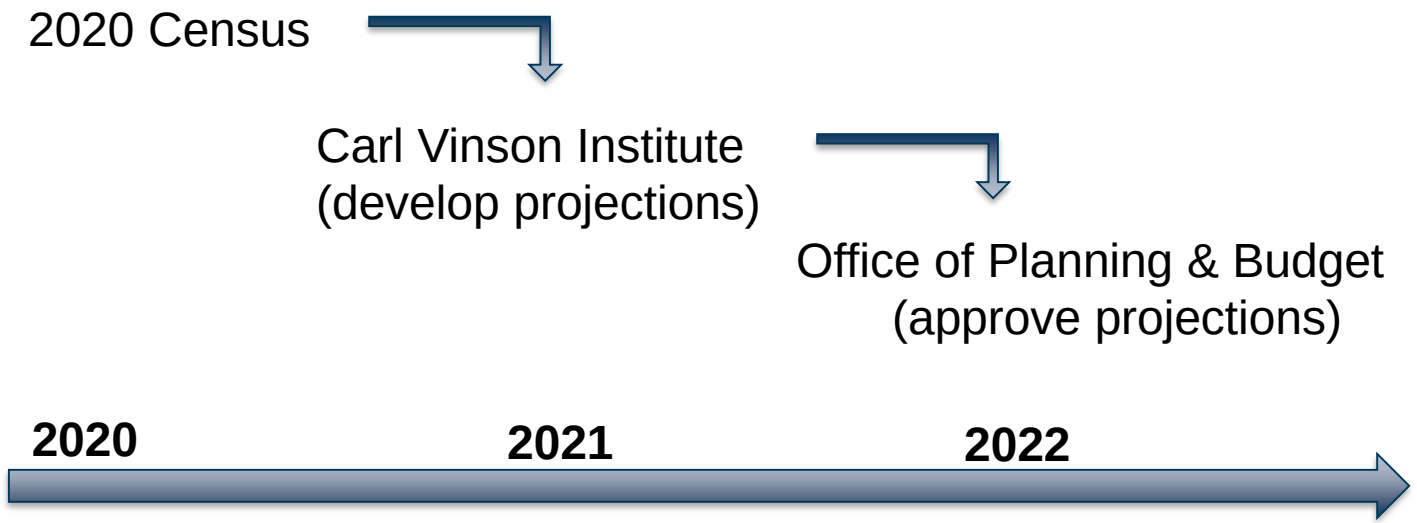
- Population growth was refined during the last update showing 20% less projected population by 2050.



	2010	2015	2020	2025	2030	2035	2040	2045	2050
Round 1	632,813	703,854	777,695	859,962	942,920	1,021,169	1,101,517	1,181,052	1,265,982
Update	640,217	683,803	730,540	776,168	821,796	867,611	913,427	963,024	1,012,621

Incorporating the 2020 Census

The 2020 Census timeline will not allow for incorporation into the population projections for the next update



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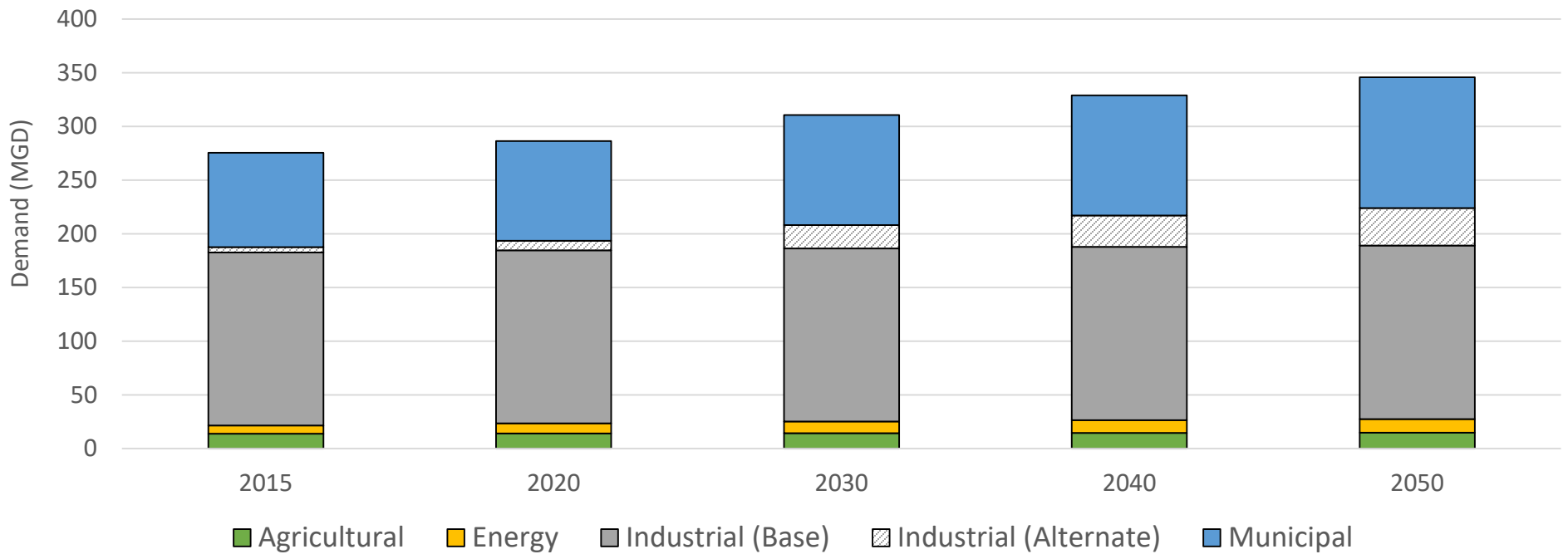
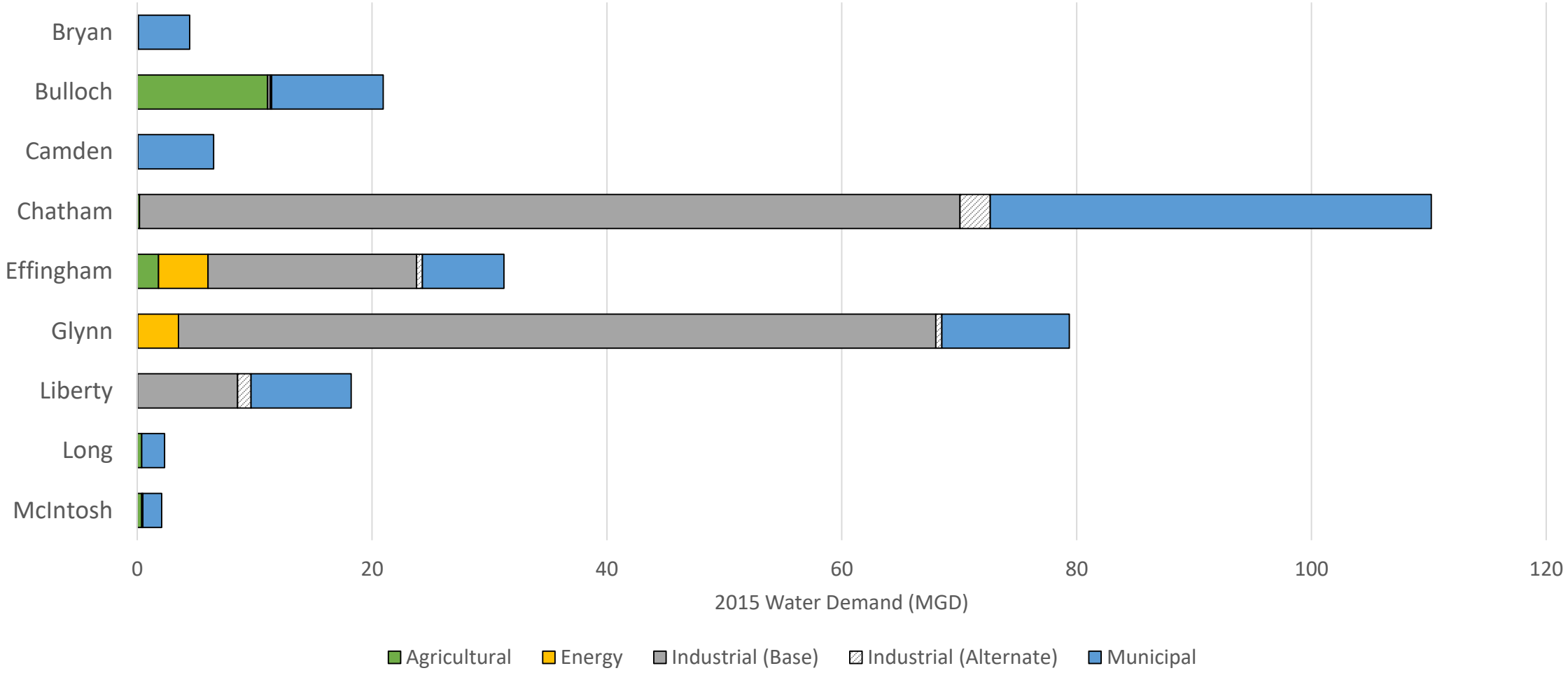
Water Demand Forecasts

Water Demand for Coastal Georgia Region

- Water Demand Forecasts are developed for 4 sectors:
  - Municipal
  - Industrial
  - Energy
  - Agricultural



Coastal Georgia Water Demands by County



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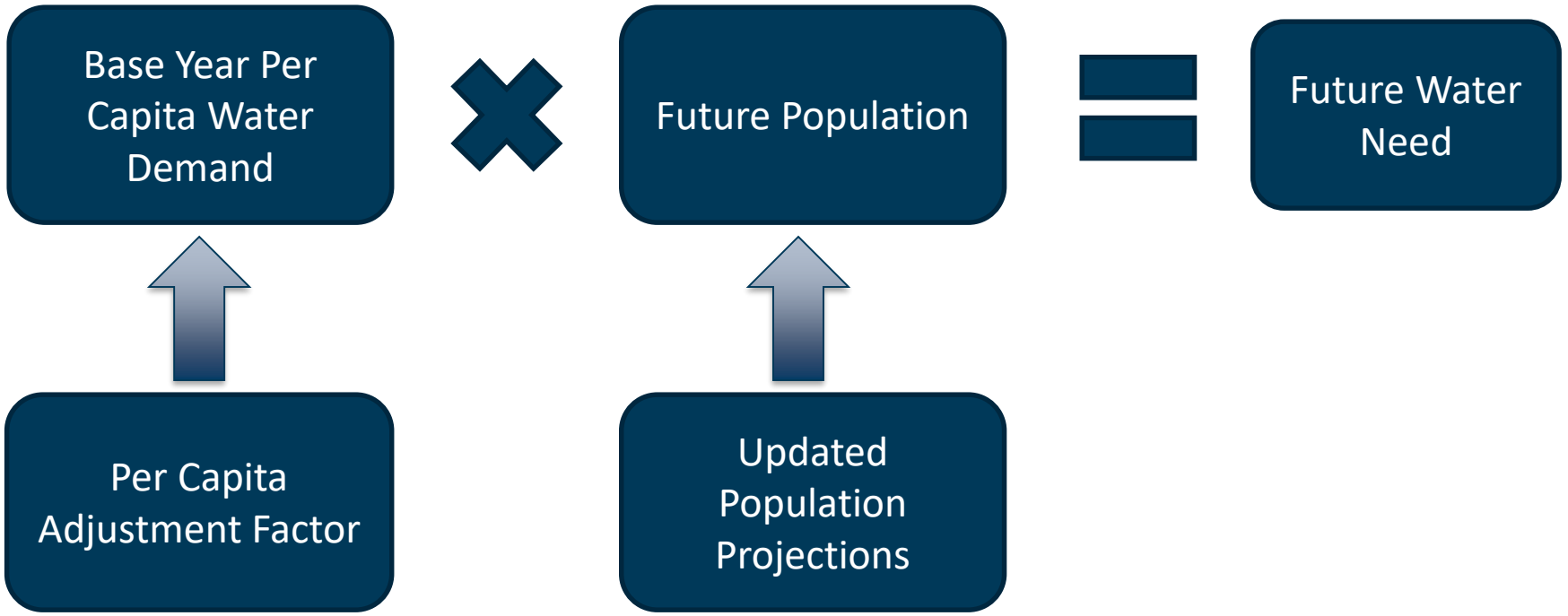
Municipal Water Demand Forecast

Projecting Municipal Water Demand

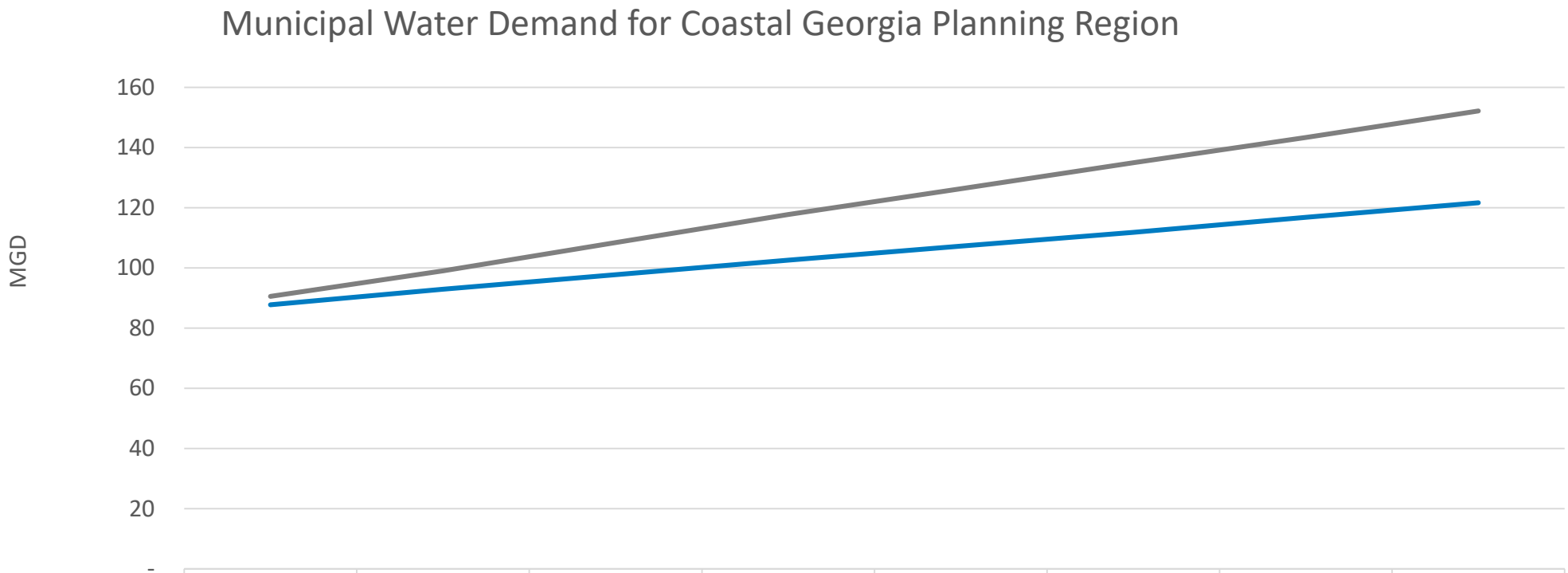
2011 Future Water Need:

Projecting Municipal Water Demand

2017 Update with Adjustment Factor:



Change in Municipal Water Demand



	2015	2020	2025	2030	2035	2040	2045	2050
Round 1	90.55	99.06	108.45	117.74	126.30	134.94	143.32	152.19
Update	87.74	92.88	97.77	102.55	107.25	111.85	116.79	121.63

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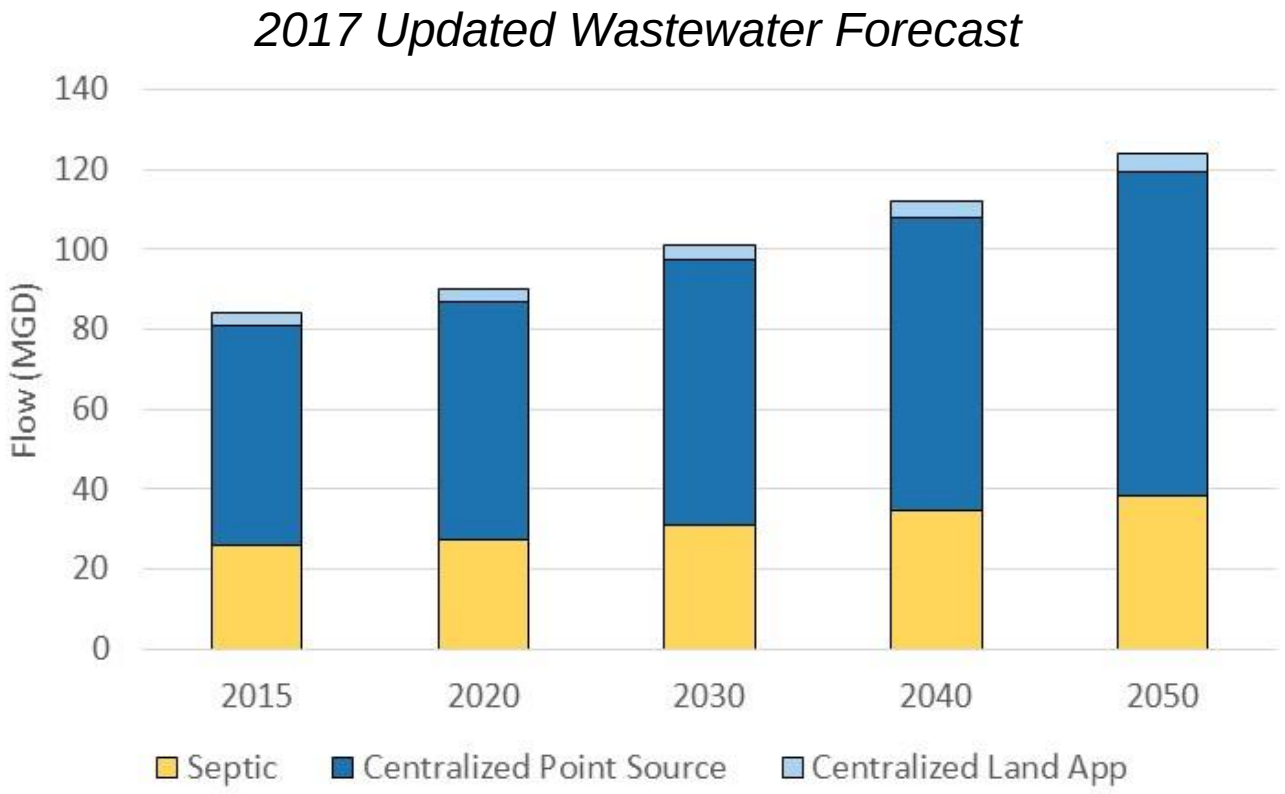
Municipal Wastewater Forecast

Municipal Wastewater Forecast Update

- For the 2011 RWP, the municipal water demand served as the basis for estimating the municipal wastewater (WW) flows for each county



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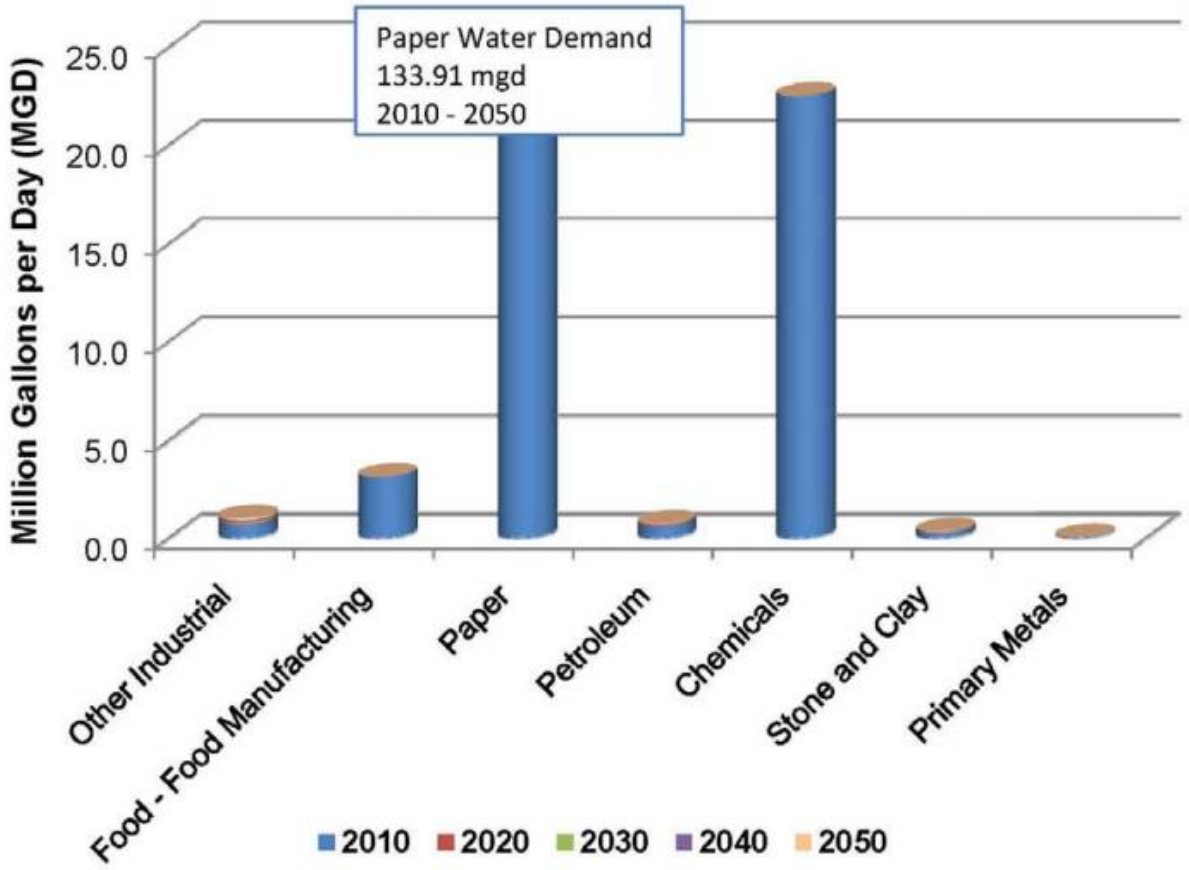
Industrial Water Demand Forecast

Industrial Water Demand Forecasts

- The Coastal Council previously elected to have a base and alternate industrial forecast which incorporated 35 MGD of additional industrial growth.
- Industrial demands were not updated during the 2017 RWP update due to updated employment data not being available
- Industrial wastewater flows are identified by discharge method
- More on projecting industrial demands will be covered in the next section

Industrial Water Demand for Coastal Georgia

- Industrial water use in the Coastal Region is dominated by the paper industry



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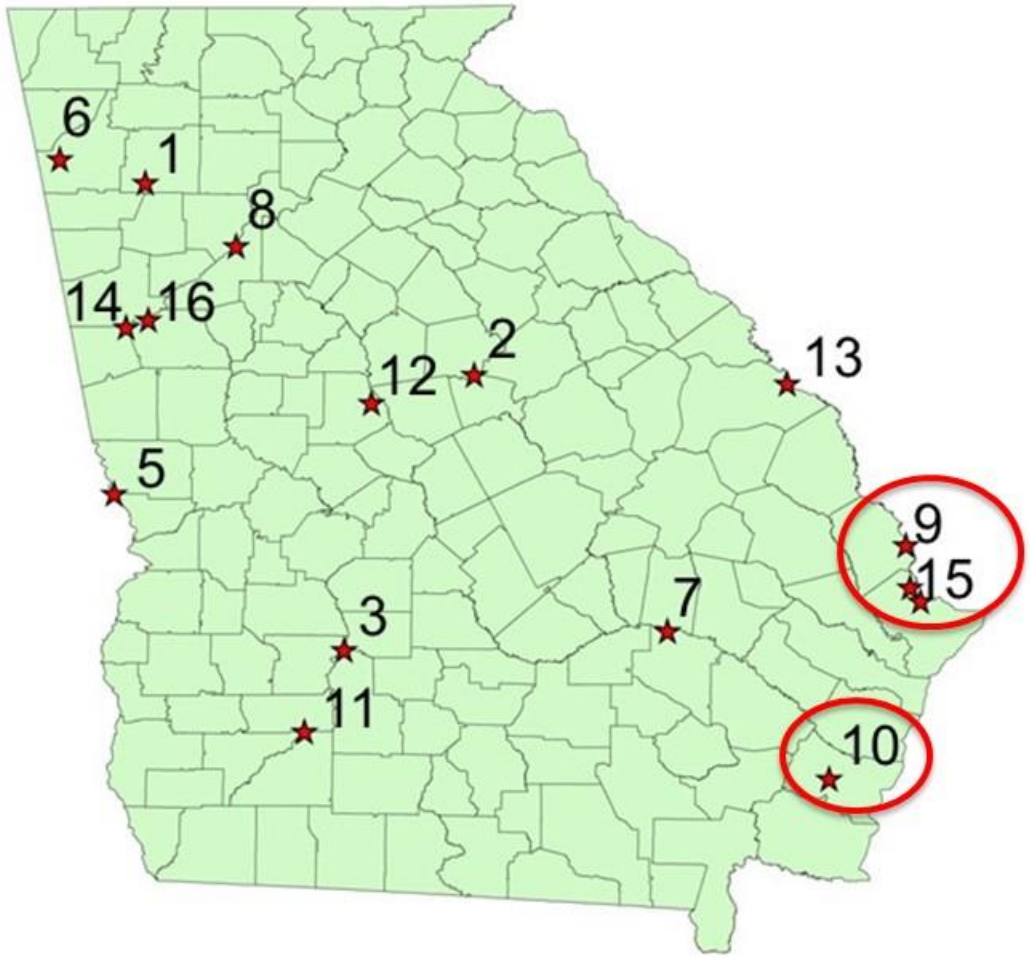
Energy Water Demand Forecast

2011 RWP - Thermoelectric Power Facilities in Georgia with Water Withdrawal Permits



Facility Name	County
1. Plant Bowen	Bartow
2. Plant Branch	Putnam
3. Crisp County Power Comm-Steam	Worth
4. Gum Power Plant LLC	Mitchell
5. H Allen Franklin[1]	Lee (Alabama)
6. Plant Hammond	Floyd
7. Plant Hatch	Appling
8. Plant Jack McDonough	Cobb
9. Plant McIntosh	**Effingham**
10. Plant McManus	**Glynn**
11. Plant Mitchell	Dougherty
12. Plant Scherer	Monroe
13. Voglte	Burke
14. Plant Wansley	Heard
15. Plant Wentworth (Kraft)	**Chatham**
16. Plant Yates	Coweta

[1] Plant is physically located in Alabama; water withdrawal permit from Georgia EPD

Energy Forecasting Methodology

- Each power facility has a unique water-to –power-to-production signature
- Statewide, each facility contributes a unique portion to the entire power portfolio
- The relative contribution of each facility can change over time as facilities retire or are brought on-line
- This information is used along with total power production (est. from population projections) to determine statewide & regional water needs out to 2050

Coastal Georgia Energy Forecast Review

Demand Type	2015	2020	2030	2040	2050
Withdrawals (MGD)	344	75	86	94	97
Consumption (MGD)	7.7	9.3	10.7	11.9	12.7

**Plant Wentworth is assumed retired in the forecasts following 2015*

***2019 IRP recommends the retirement of Plant McIntosh Unit 1*

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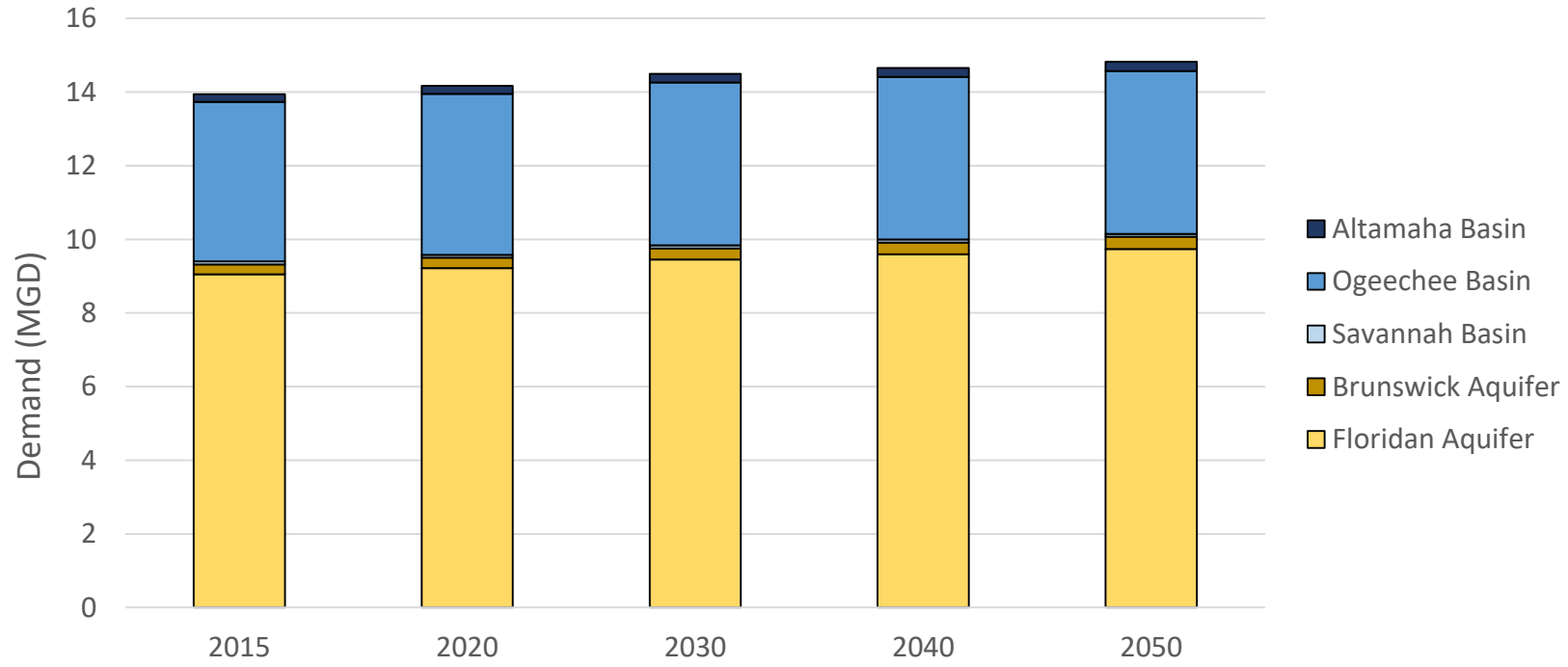
Agricultural Water Demand Forecast

Agricultural Water Demand Forecast

- Approach: Look to past trends and consider foreseeable changes
- Acreage
  - Baseline – USDA Census of Agriculture (2012); linked to 2015 irrigated acres
- Crop water needs
  - Wet, normal and dry year estimates by crop/soil/county
  - Aggregated spatially to 2015 irrigated acreage
- Crop projections through 2050 - modeled based on multiple data sources:
  - Average of: USDA Projections, Southeast Model, Georgia Model

Coastal Georgia Agricultural Water Demand

- Agricultural water demand is focused in Bulloch and Effingham counties
- Demand is met through surface water (i.e. river basins) and groundwater



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Resource Assessment

Coastal Georgia Region Resource Assessments

Current & Future Conditions

- Groundwater availability
- Surface water availability
- Surface water quality

Gaps

- Compare resource to demands to determine if there are potential gaps in current or future water availability or water quality

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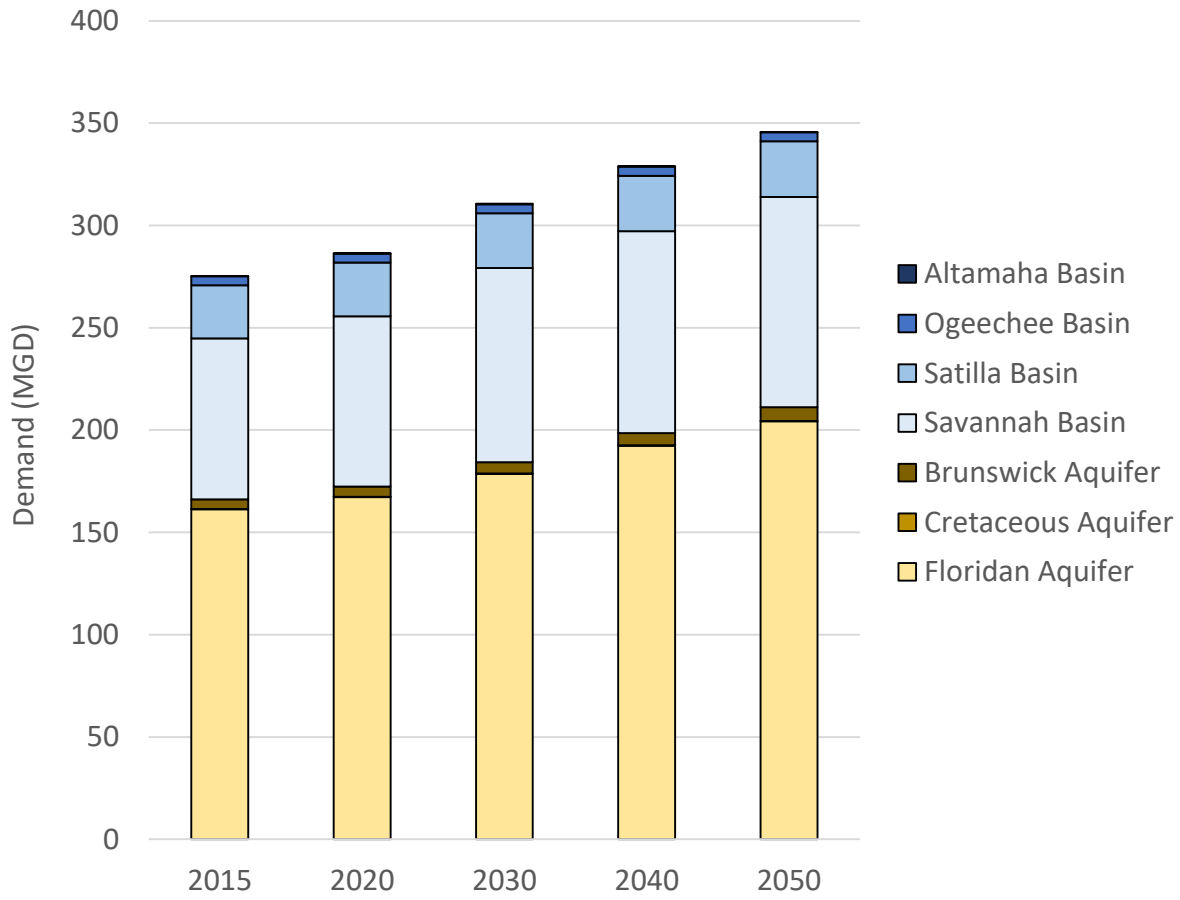
Groundwater Availability

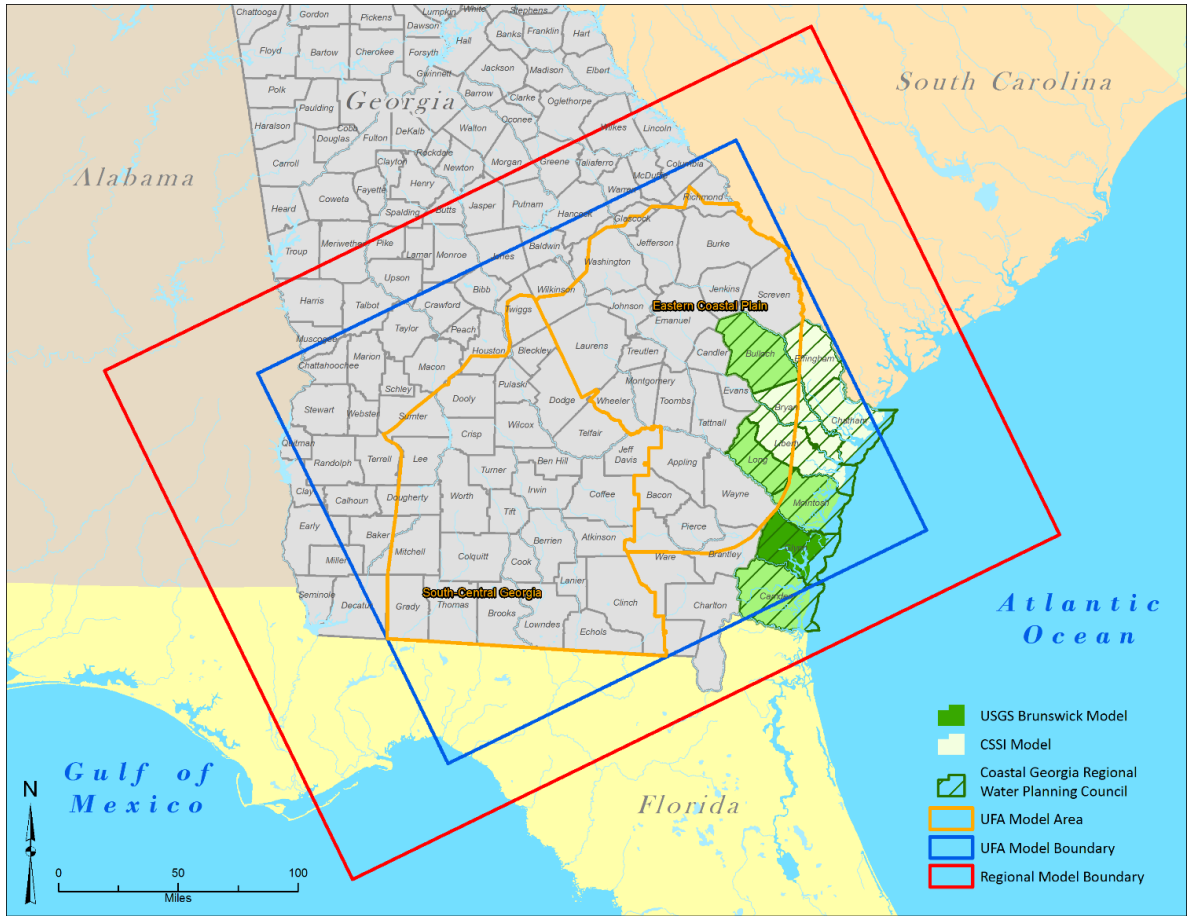
Coastal Georgia Region Groundwater Availability Assessment

- Groundwater supplies ~60% of the regional water demand
- Coastal Georgia groundwater usage comes largely from the Floridan aquifer
- Demand is also met through surface water (i.e. river basins)



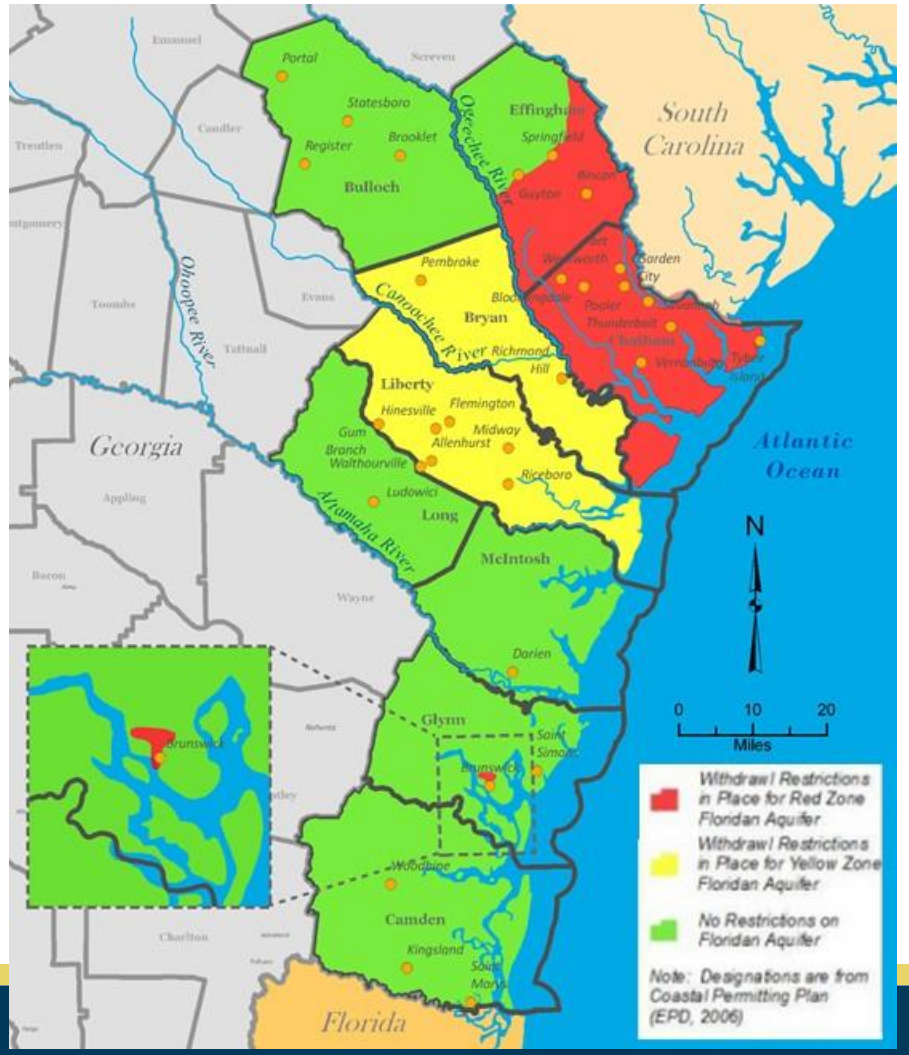
Groundwater Modeling of the Floridan Aquifer

- Floridan Aquifer model boundaries used in the Groundwater Resource Assessment for determining sustainable yield
- CSSI Model used for evaluating Salt Water Intrusion
- Regionally, there is sufficient groundwater to meet current needs; pumping restrictions have been implemented locally in response to salt water intrusion

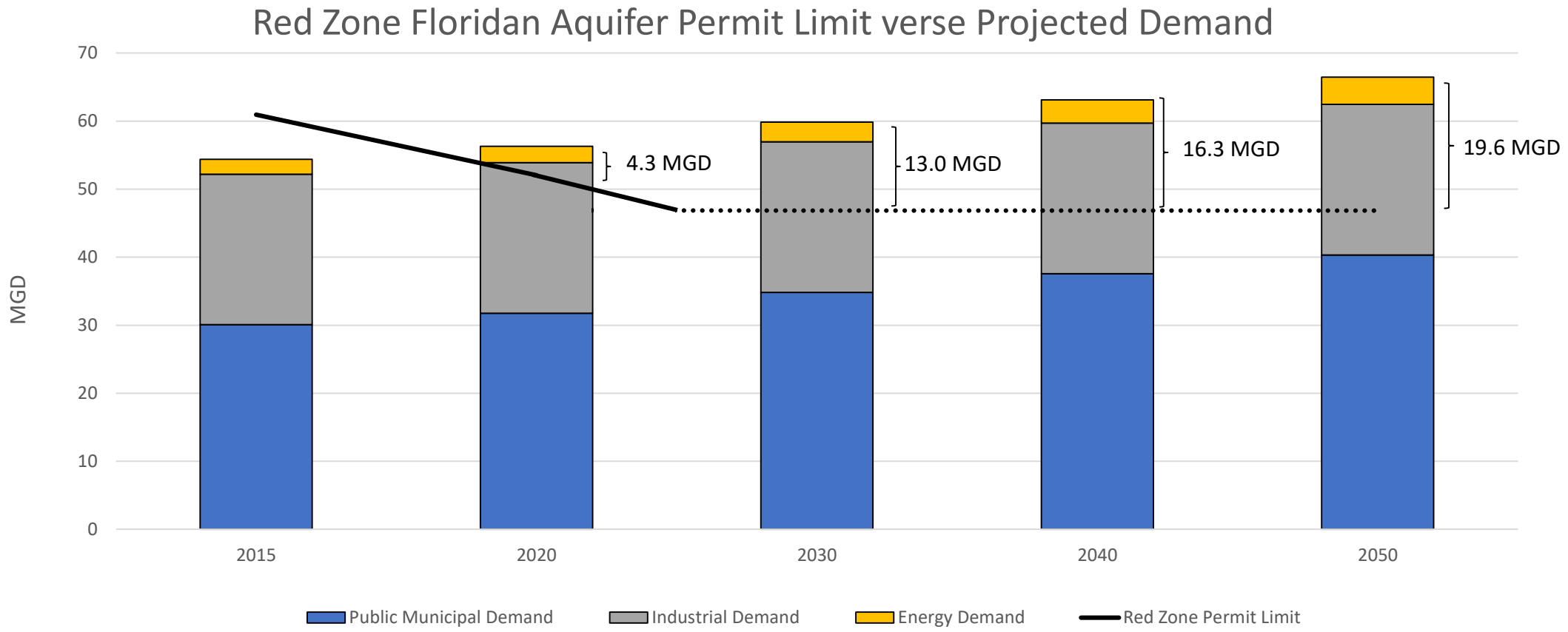


Coastal Georgia Region Gap Summary (cont.)

- The Red and Yellow Zones are subject to a moratorium on future withdrawals and municipal, industrial, and energy permit holders have had reductions to their permit limits
  - A second Red Zone was designated for a small portion of Glynn County in Brunswick.
  - Additional pumping in this area should also be avoided.

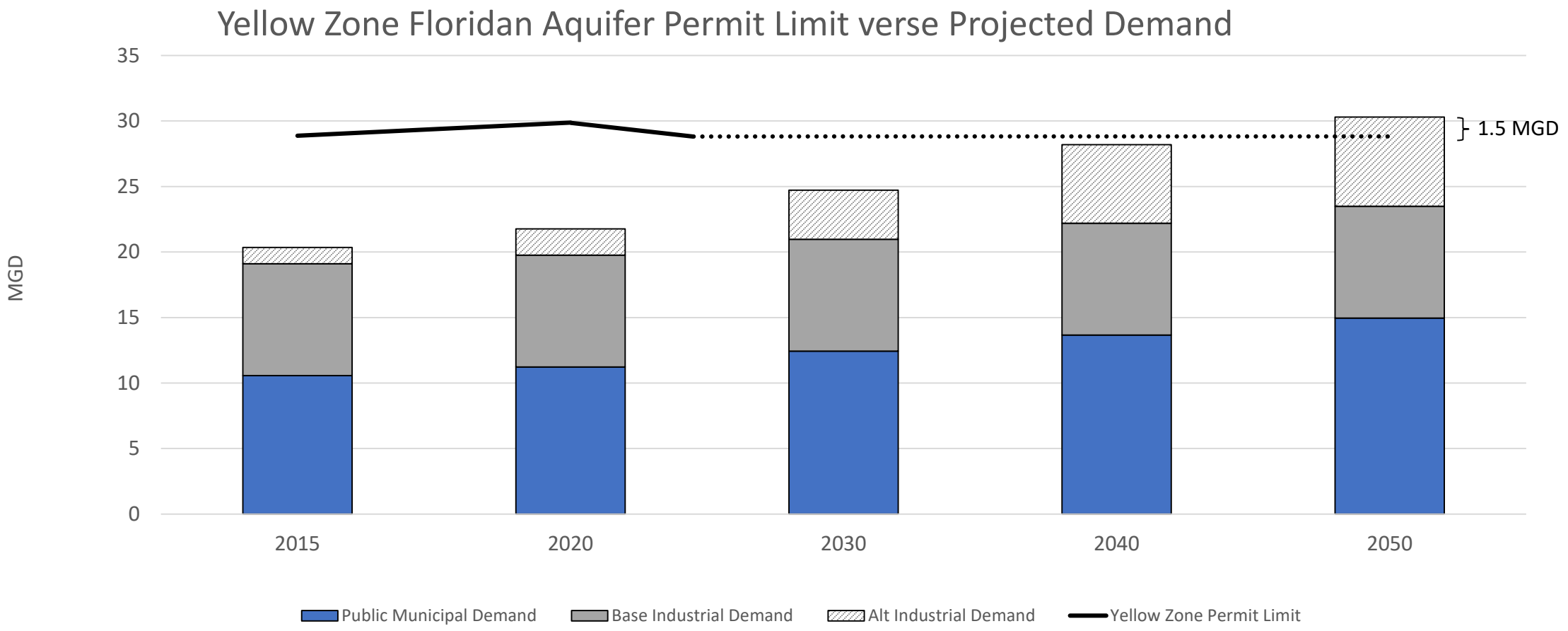


Aquifer Permit Limits vs. Projected Demand



Notes:
Fifty percent of the Effingham County municipal and industrial demands are assumed to come from the Red Zone.
Demand assumed to be supplied from the Brunswick aquifer has not been included (0.44 MGD in 2015; 0.53 MGD in 2050)

Aquifer Permit Limits vs. Projected Demand



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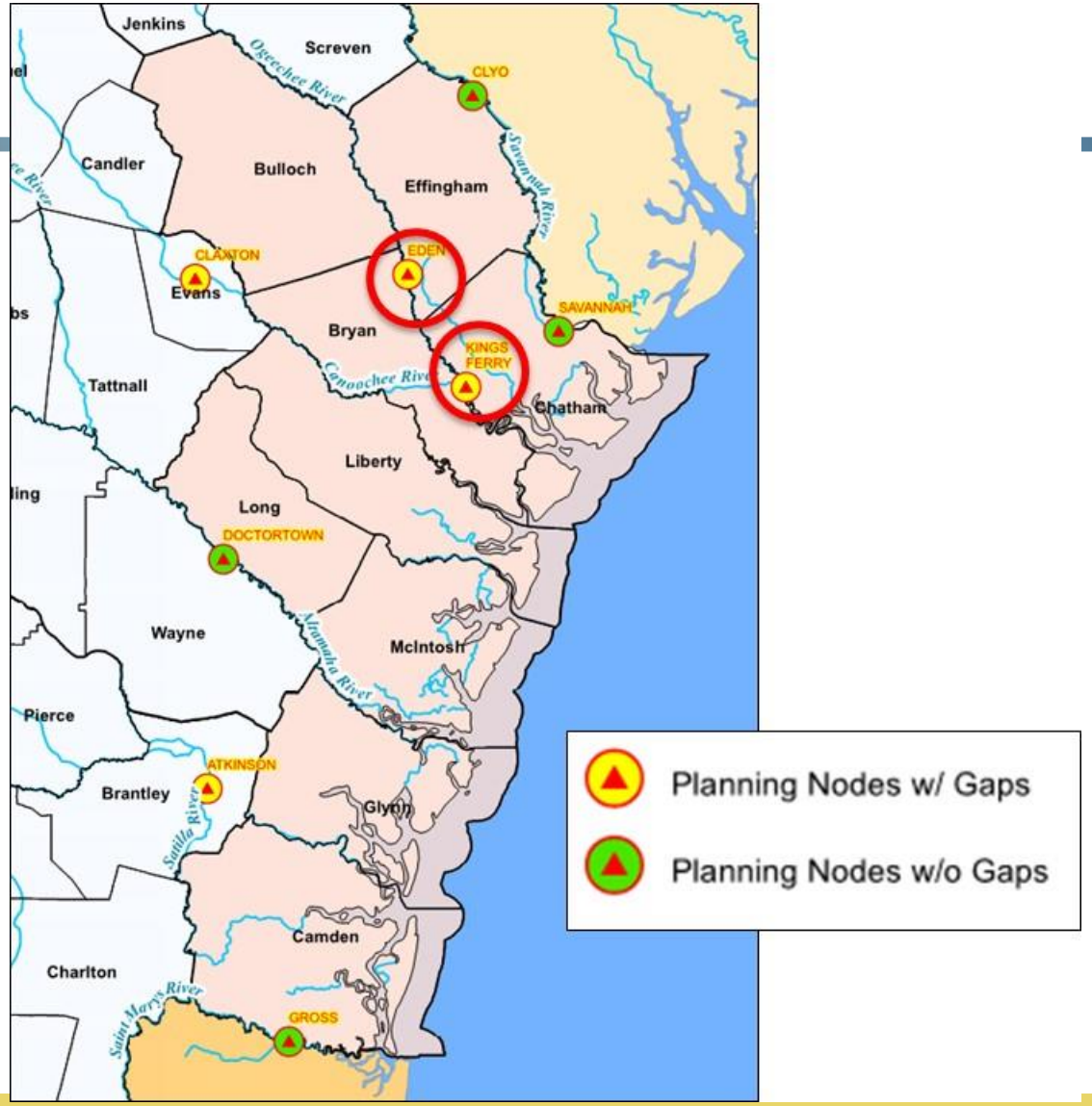
Surface Water Availability

Surface Withdrawals by County and Region

- Acreages of each County within the local drainage area (LDA) by planning node were determined
- Areas irrigated with surface water by County within the LDA assigned to planning node were determined
- 2050 forecasted surface water withdrawals for portion of County assigned (drains to) planning node within LDA were available from GWPPC and EPD's surface water availability resource assessment work

Coastal Georgia Region Surface Water Availability Assessment

- Surface water availability was assessed at locations with long-term records of measurements, with streamflows modeled under current and future conditions
- A potential gap occurs when streamflow is projected to fall below targets for instream uses
- Potential gaps in streamflow identified on the Ogeechee River near Eden and at Kings Ferry



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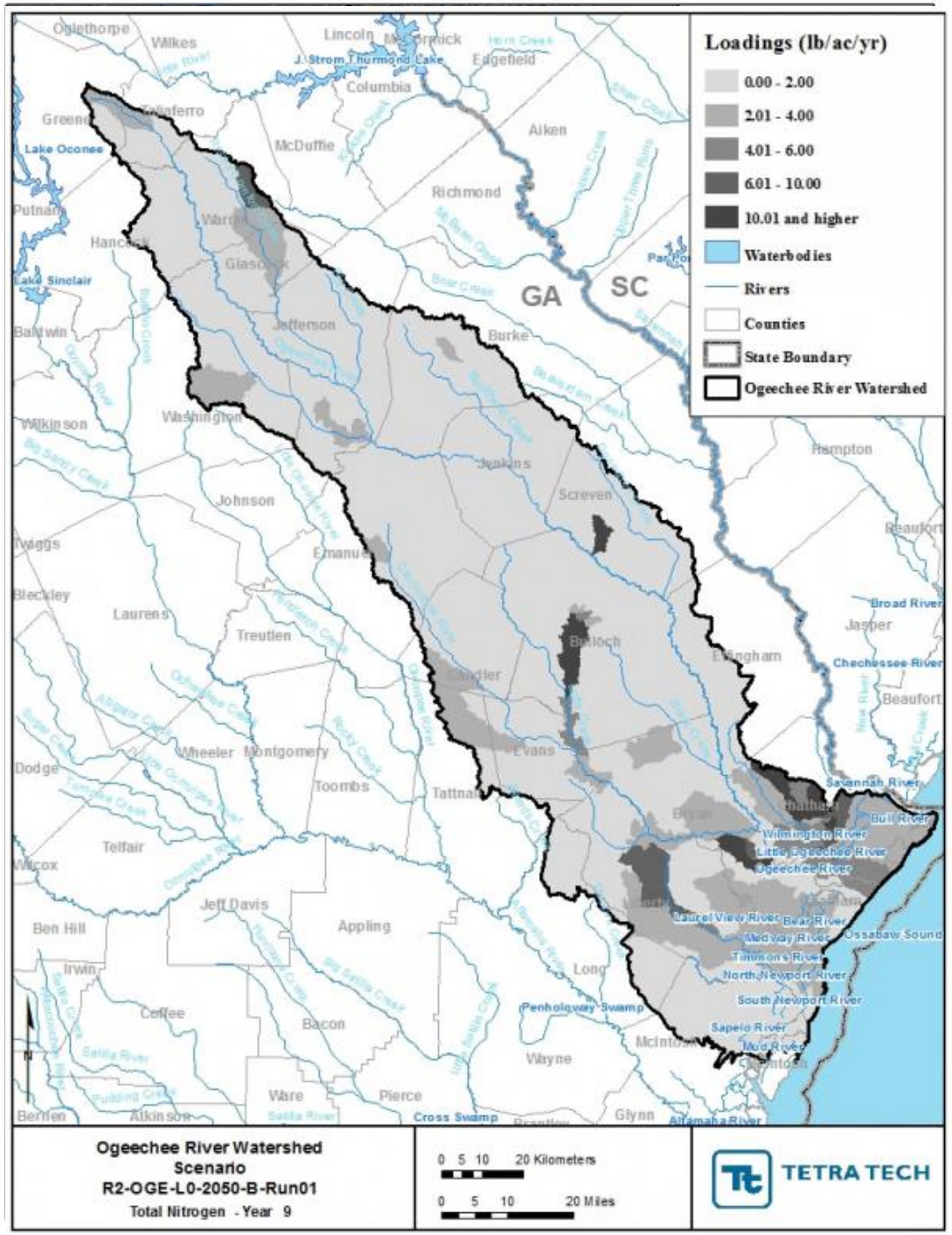
Water Quality

Current Assimilative Capacity Assessment

- Develop Models
- Use available data & conservative assumptions
- Calibrate models to existing conditions
- Evaluate models using current permits
- Determine available assimilative capacity
- Determine areas of concern

Round 2 of the State Water Plan



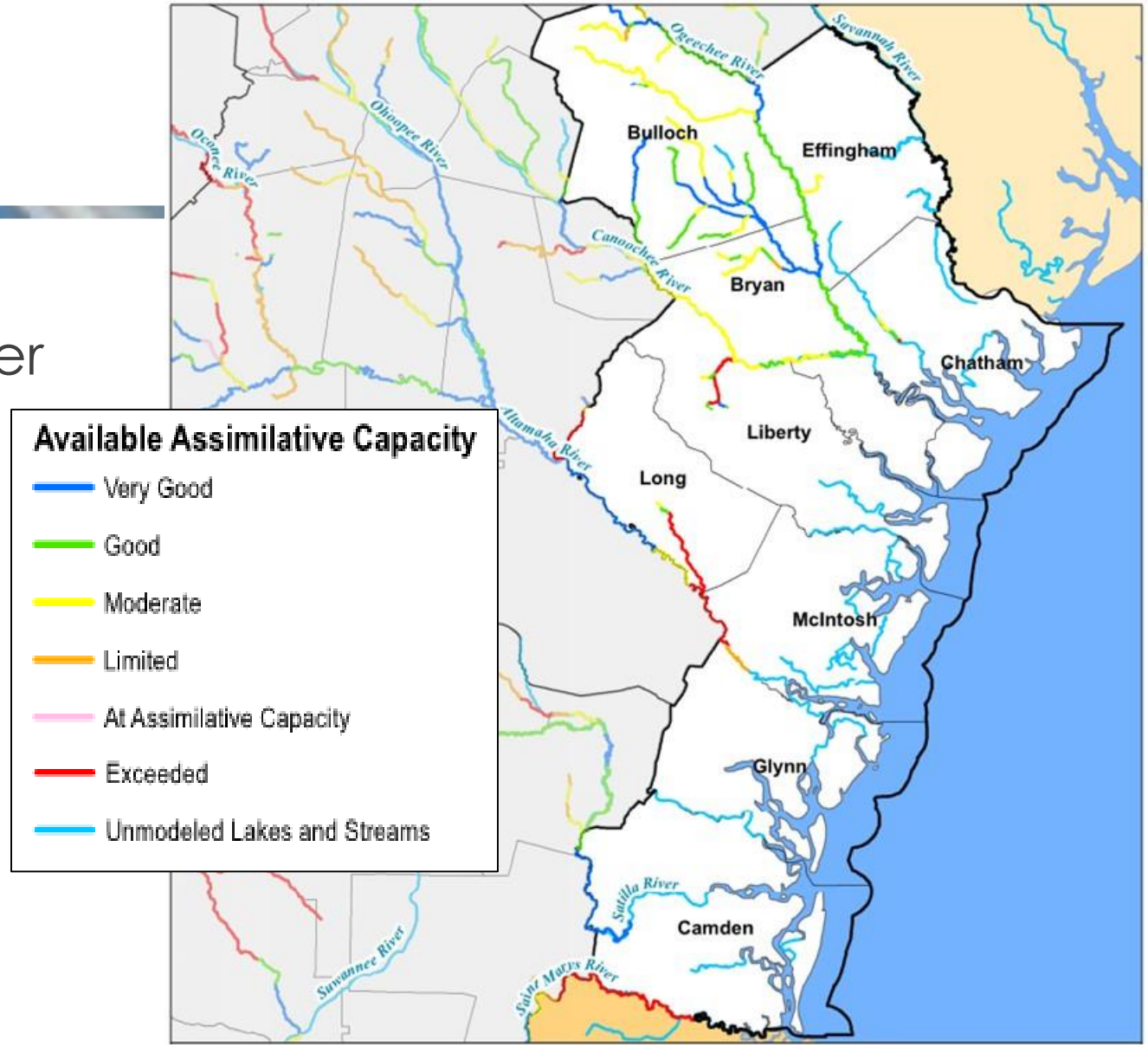
- Multiple models used including:
- DOSAG (streams)
- RIV1 (Rivers)
- GA ESTUARY (Estuaries)
- Lakes/Estuaries (EFDC/LSPC)
- Nutrient Loading

Future Assimilative Capacity Assessment

- Evaluate models using future permitted flow
  - Increased Flows (Q)
- Incorporate model assumptions regarding future permits limits designed to meet water quality standards
  - Tighter BOD Limits (maintain load, Q x Concentration)
  - New or Tighter Ammonia (NH3) Limits
  - New or Tighter Dissolved Oxygen Limits
- Land use changes

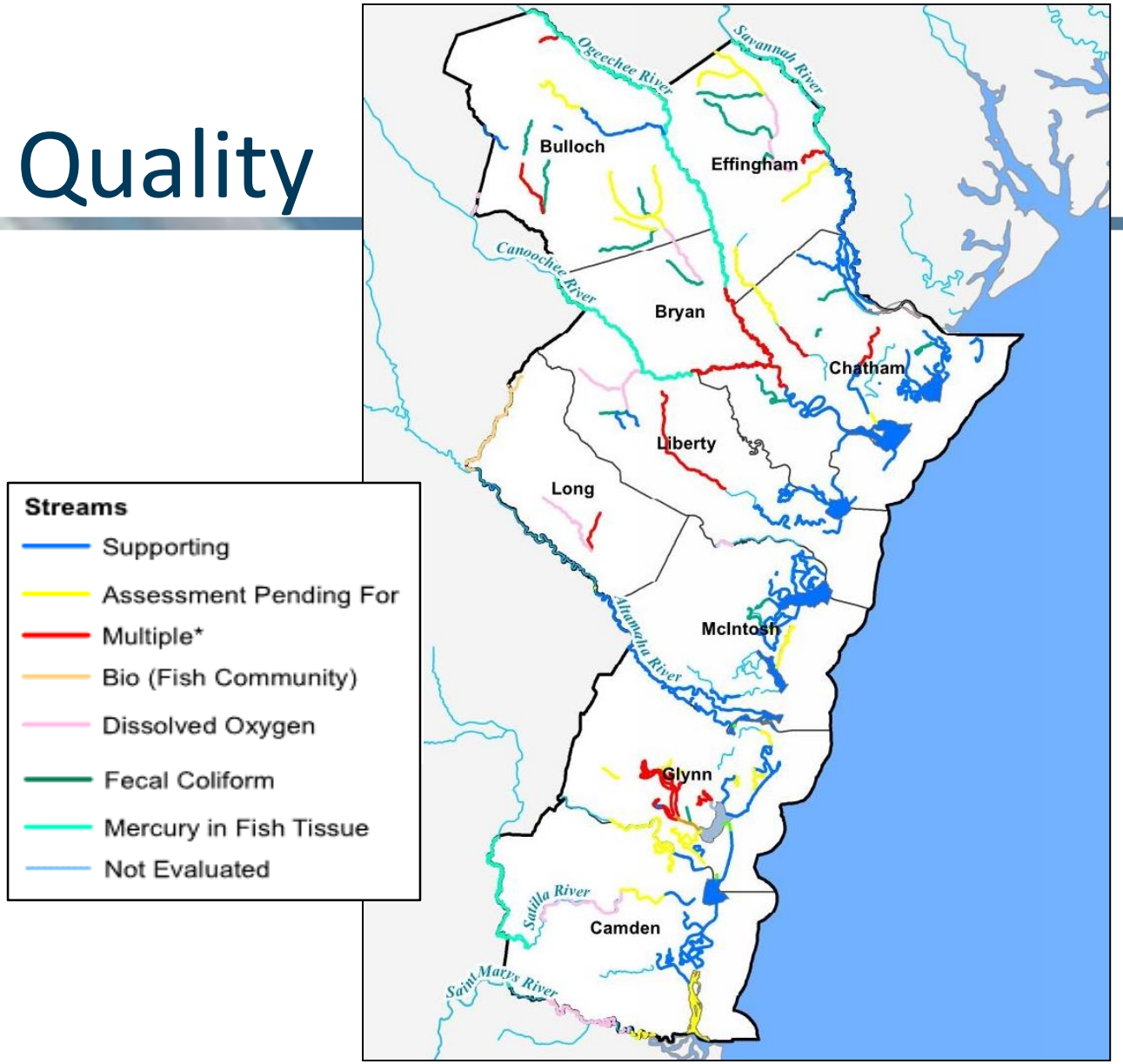
Assimilative Capacity Assessment

- Modeled dissolved oxygen under current permitted conditions



Coastal Georgia Region Impaired Surface Water Quality

- The Coastal Georgia Region has 51 impaired stream reaches with a total length of 413 miles
- The region also has 2 impaired sounds



Resource Assessment Discussion

- Feedback on items of interest
- Potential changes during next cycle
  - Groundwater
  - Surface Water Quantity
  - Surface Water Quality

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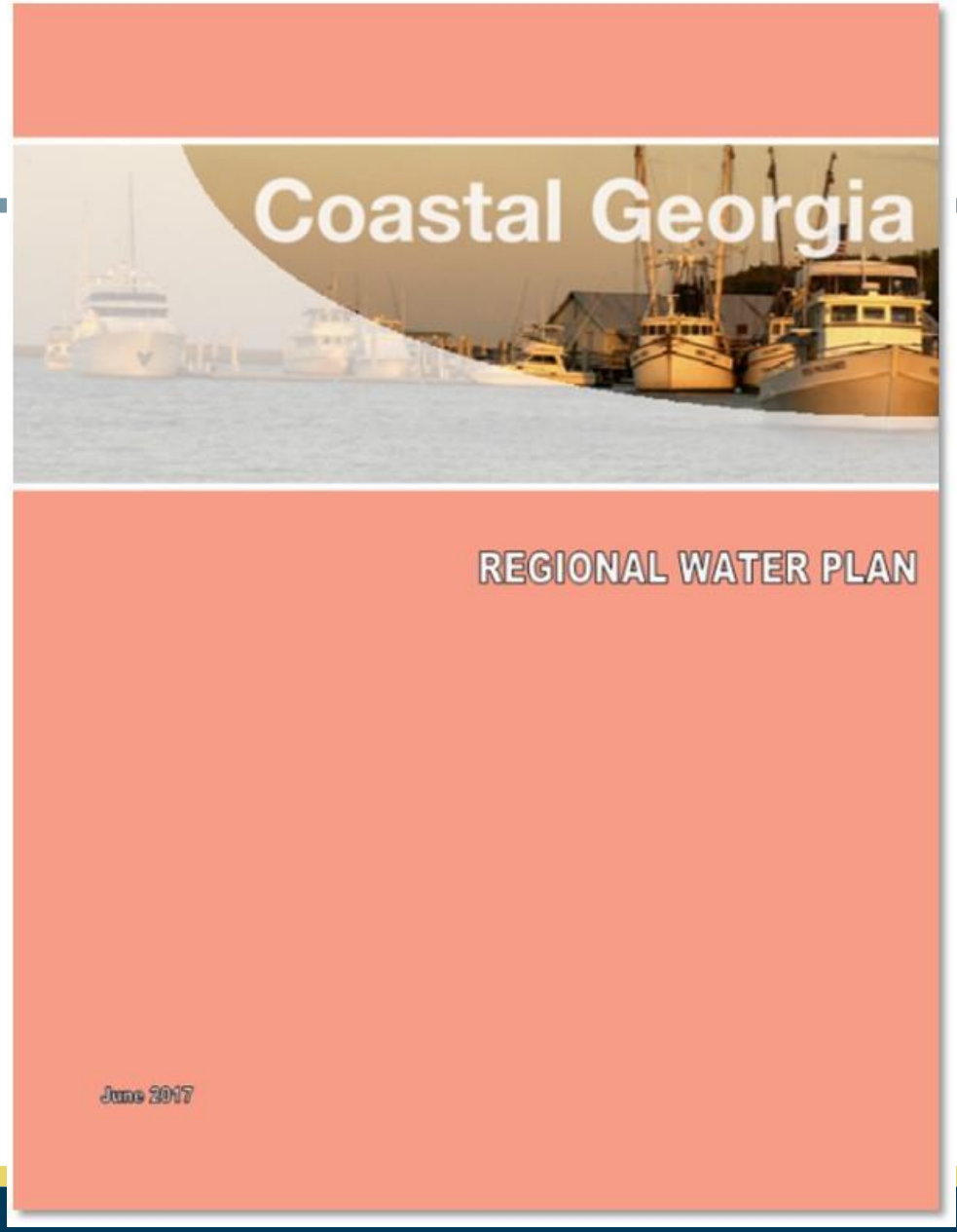
Water Demand Forecast Methodology Overview

Water Demand Forecast Methodology Overview

- Industrial Water Demand
  - Review of GA Methodology
  - Overview of other State Plans
  - Efficiency Considerations
- Municipal Water Demand and County Specific GPCDs
- Demand Forecast Subcommittee(s)



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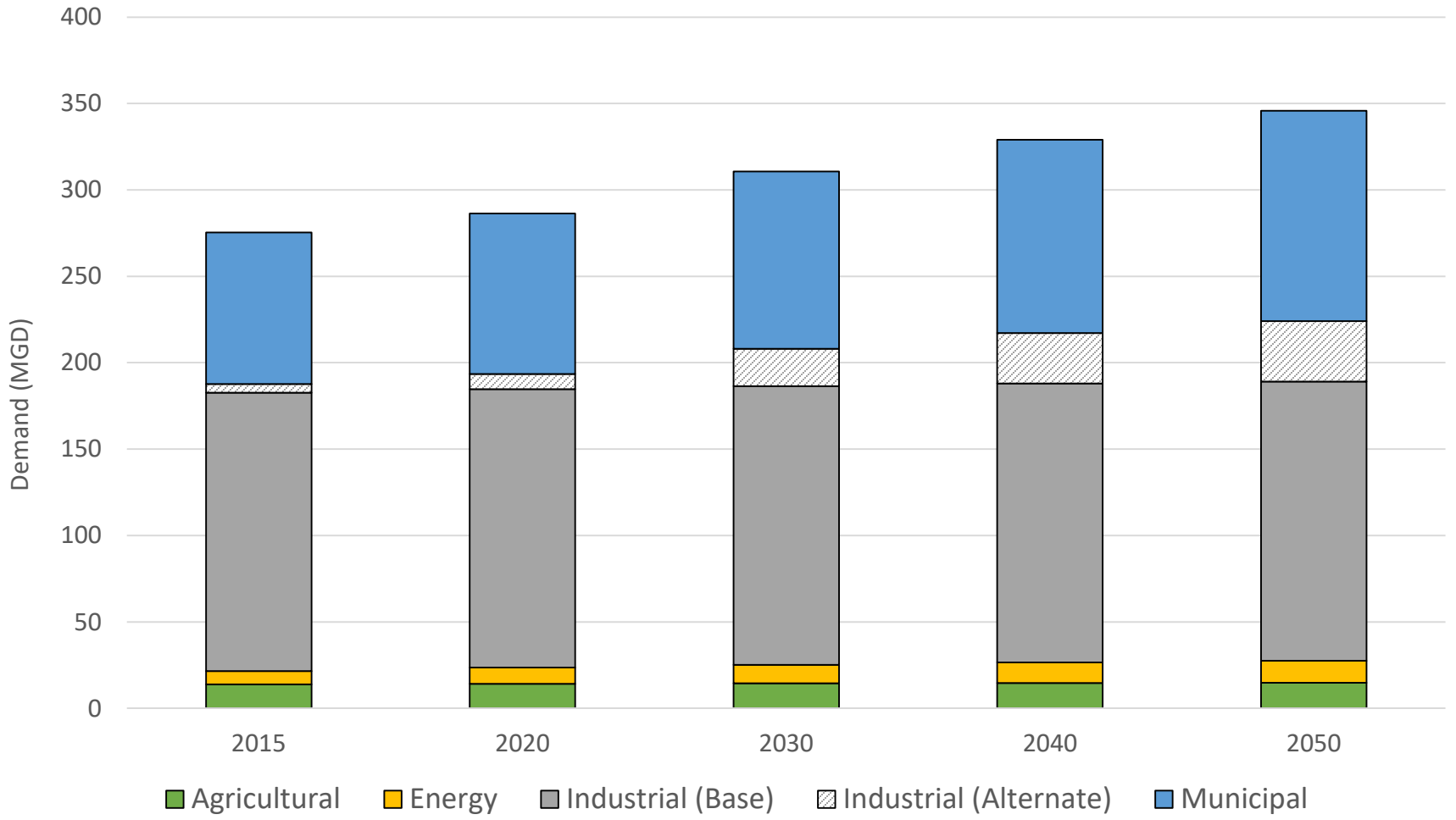
Industrial Water Demand Forecast Discussion

Industrial Water Needs

- Water is needed for industrial processes, sanitation, cooling, and some domestic (employee) use
- Water need is linked to production
- Employment is linked to production*
- Industrial demands were not updated during the 2017 RWP Update due to updated employment data not being available

Projecting Industrial Water Demand

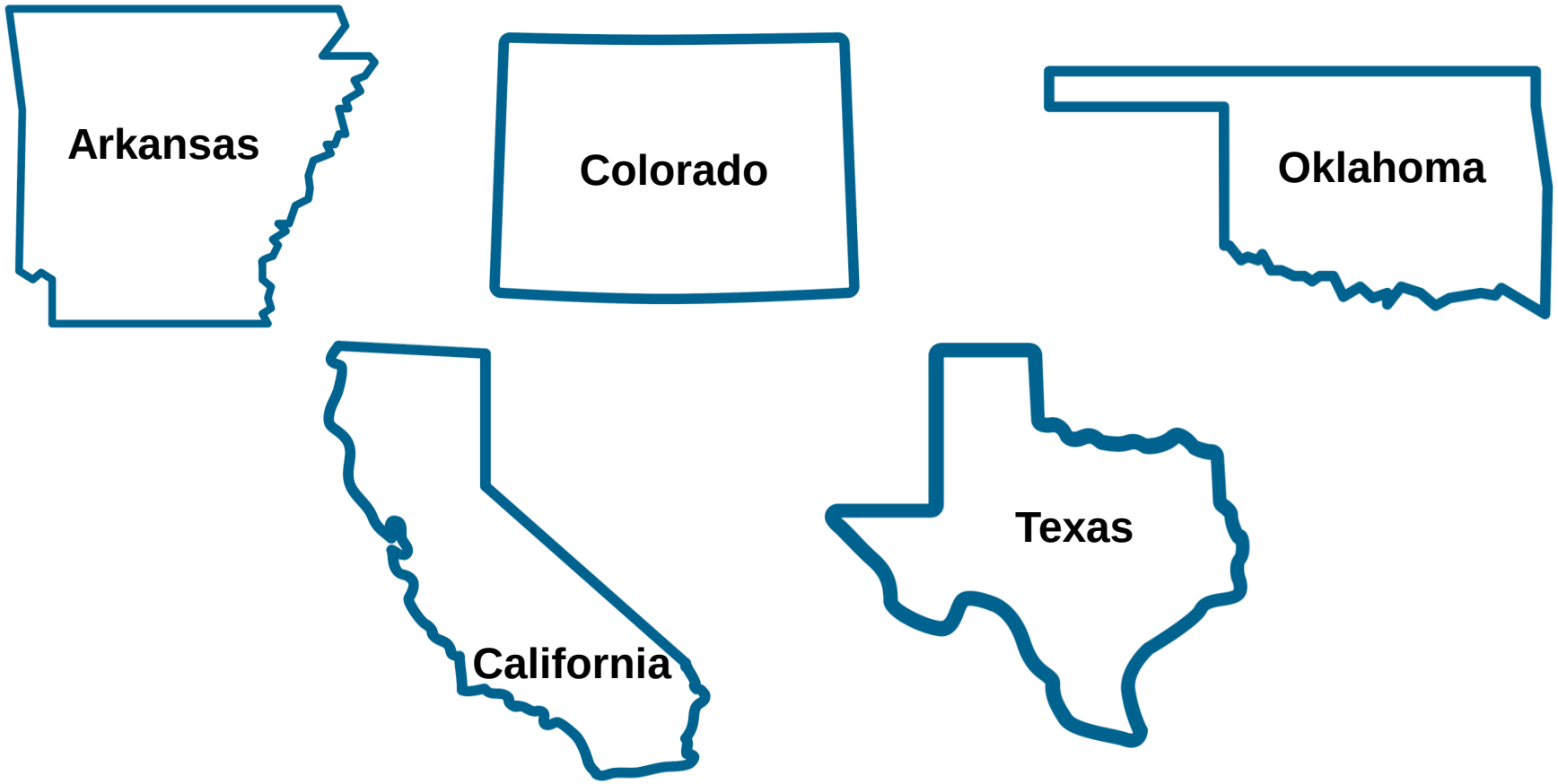
Sector Based Demand Forecast – Coastal Georgia



Additional Industrial Demand

County	Distribution of Additional 2050 Demand (MGD)	Source of Supply
Bryan	2.0	Groundwater
Bulloch	2.0	Groundwater
Camden	2.0	Groundwater
Chatham and Effingham	19.0	Surface Water
Glynn	5.0	Groundwater
Liberty	4.8	Groundwater
Long	0.0	Groundwater
McIntosh	0.2	Groundwater
Total	**35.0**	-

Review of Alternative Methodologies



Arkansas Water Plan

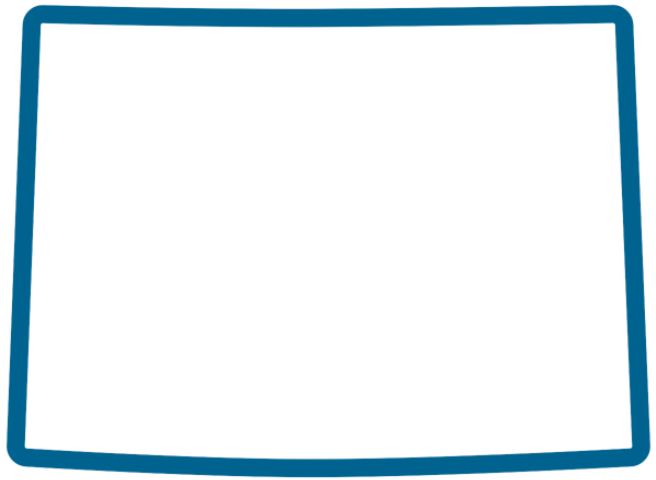
- Used state reporting database to determine baseline use by NAICS
- Projected future industrial water use by county based upon rate of growth of the county employment by NAICS

California Water Plan

- All industrial water use is summed for large hydrologic areas & divided by area industrial employment
- Future industrial employment derived from linear projection from historical data
- Future water use as base period water use per employee times future industrial employment

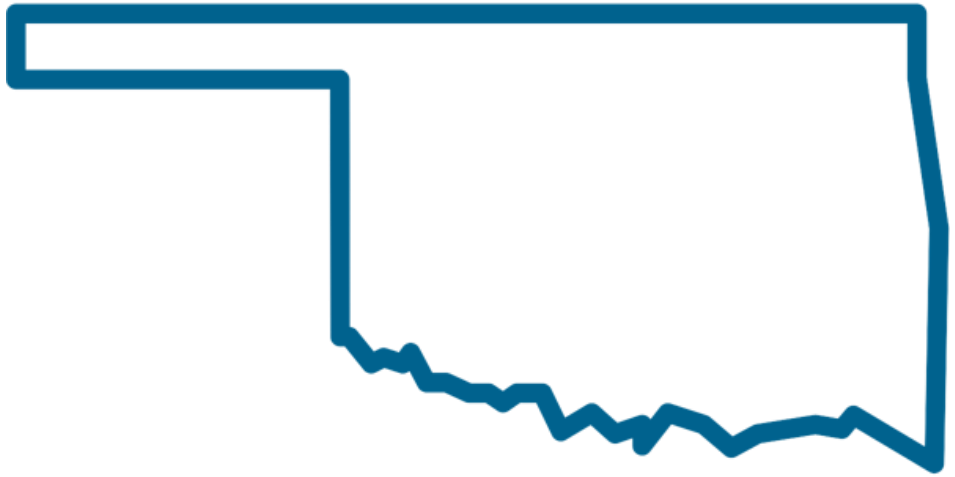
Colorado Statewide Water Supply Initiative

- Self-supplied large industrial use identified by specific user in each county
- Self-supplied water use by county either held constant or increased based upon local assumptions



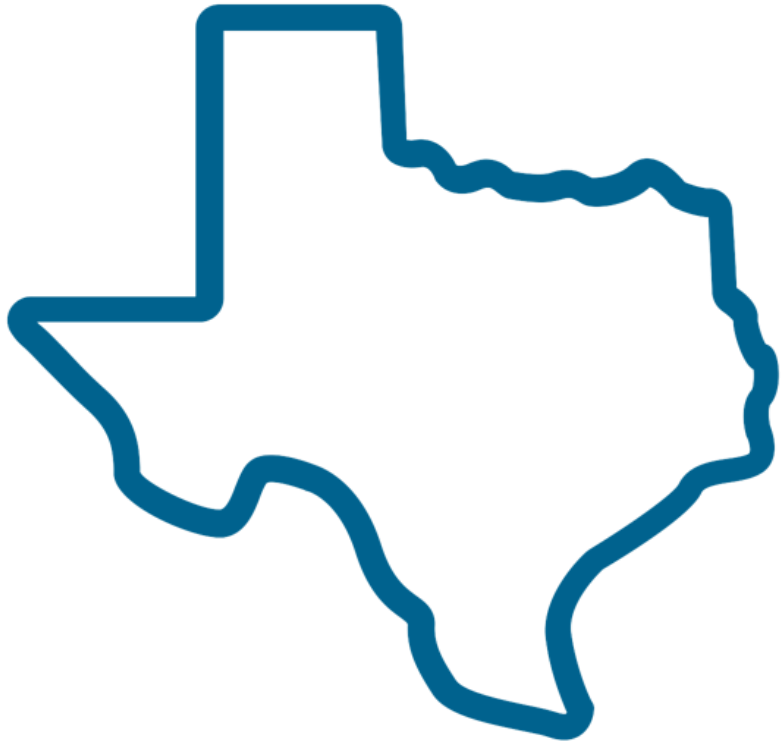
Oklahoma Comprehensive Water Plan

- Self-supplied industrial water use based on facility level reported withdrawals
- Industrial water use aggregated into 13 categories by county
- Increases in future based on industrial employment growth by category and county



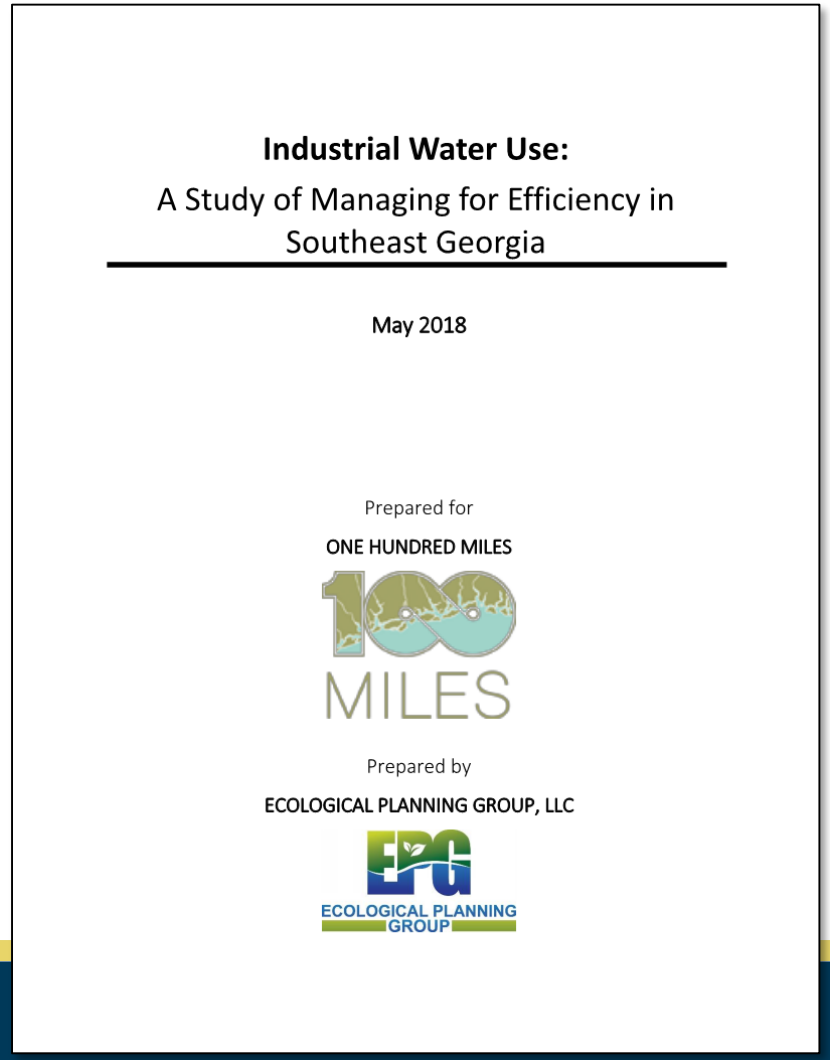
Texas Water Development Board

- Industrial water use aggregated by category per county
- Ratio of industrial water use to industrial gross product by county calculated
- Regional future gross product projected by consultant
- Base year water use per gross product multiplied by future gross product
- Additional factor for future water use efficiency incorporated



One Hundred Miles (OHM) Study

- Compares Regional Water Plan industrial forecast with the reported withdrawals
- Provides an updated industrial forecast
- Study used 2015 withdrawals as the baseline and results show lower projected industrial water demand in the future
- Highlights industrial sector successes in improving water efficiency



Industrial Water Use:

A Study of Managing for Efficiency in Southeast Georgia

May 2018

Prepared for

ONE HUNDRED MILES

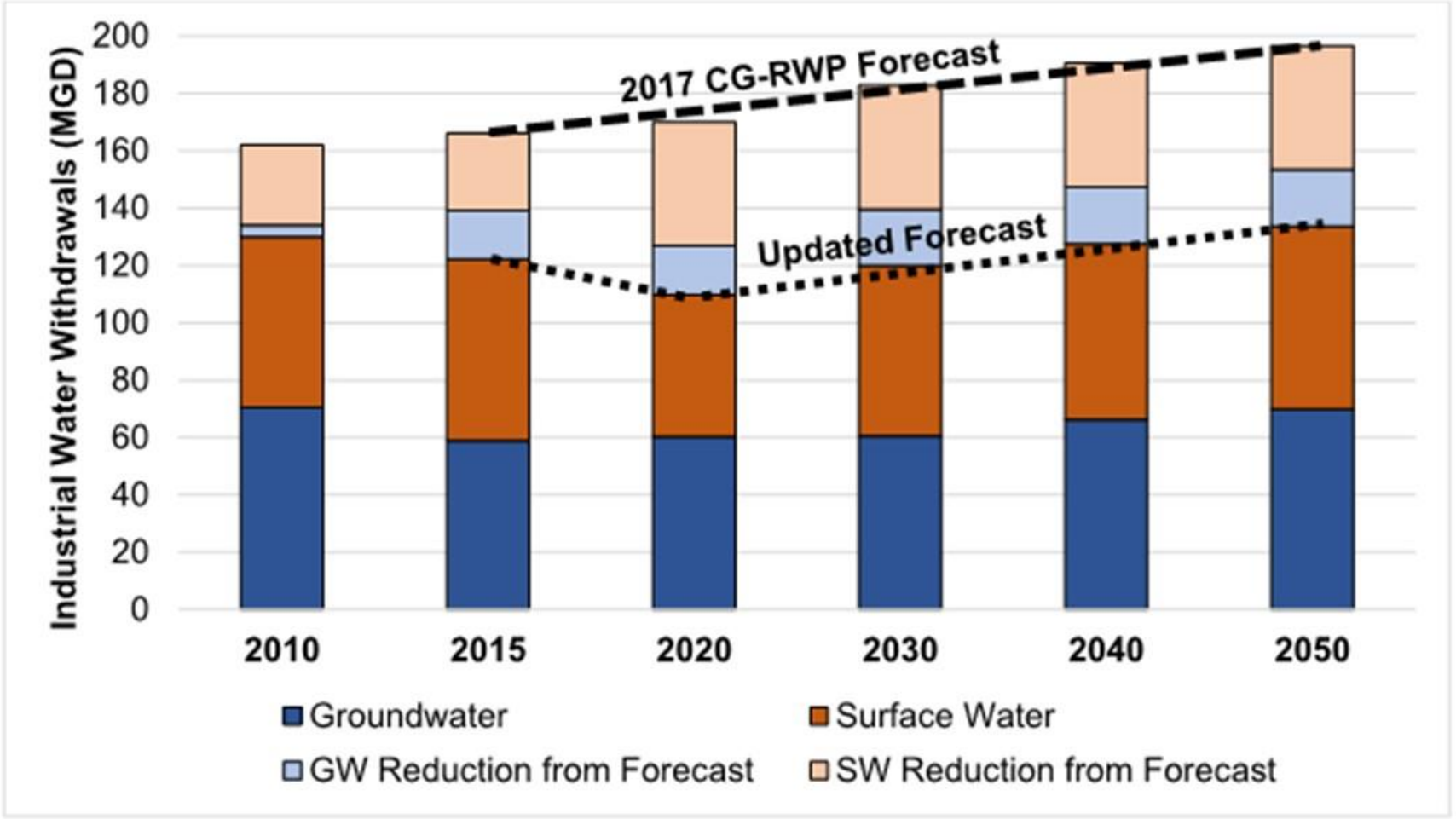
100 MILES

Prepared by

ECOLOGICAL PLANNING GROUP, LLC

EPG ECOLOGICAL PLANNING GROUP

OHM Industrial Study:
Results of Coastal Forecast Comparison



Graphic source: OHM Study

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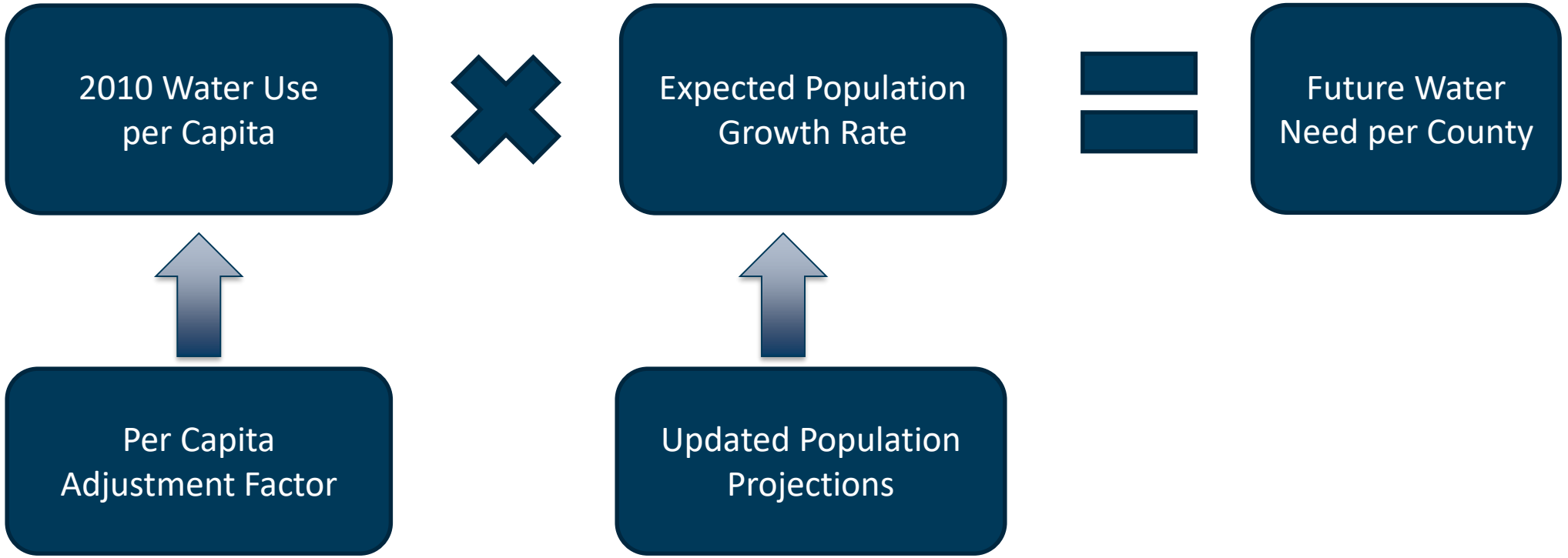
Municipal Water Demand Forecast Discussion

Projecting Municipal Water Demand

For 2017 Update, the 2011 Municipal Water Need was updated with an Adjustment Factor by County:



Municipal GPCD Adjustment Results by County

County	2005 GPCD	2011 Plan	2017 Plan			Red Zone
			%Change	2015	2050	2015
Bryan	110	138	-0.2%	138	132	
Bulloch	108	138	-0.3%	138	130	
Camden	130	138	-3.5%	133	127	
Chatham	136	138	-1.6%	136	127	97
Effingham	119	138	1.7%	140	134	95
Glynn	157	138	-2.3%	135	126	
Liberty	109	138	-1.2%	136	129	
Long	116	138	-0.7%	137	131	
McIntosh	136	138	-4.1%	132	125	

County Level GPCD vs. Regional GPCD

- County level GPCD offers:
  - More detailed representation of current conditions
  - Greater flexibility in planning
  - Facilitates periodic updates
  - Captures variation in local water use patterns
  - Reflects local water conservation programs

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Updating Per Capita Estimates

Using Water Audits to Calculate Per Capita

- Annual water audits are required by all water systems serving 3,300 people or more in Georgia since 2011/2012
- Water audits show the breakdown of water use from entering distribution system to customer meter
- Accounts for imported and exported water
- Quantifies water loss volumes

Per Capita Calculation

- Water supplied from water audit divided by population served from the State's Safe Drinking Water Information System (SDWIS) database
- Per capita values are calculated for each system (2011-2018)
- Weighted averages are calculated for each county with water systems serving population of 3,300 or more

Preliminary Per Capita Estimates

- Not all Coastal counties have systems serving >3,300 people

County	2011 Weighted Average	2012 Weighted Average	2013 Weighted Average	2014 Weighted Average	2015 Weighted Average	2016 Weighted Average	2017 Weighted Average	2018 Weighted Average	8-year Average
Bryan		112	110	102	107	116	131	114	113
Bulloch	130	137	117	86	86	91	88	87	103
Camden	97	91	106	66	62	66	85	81	82
Chatham	113	112	113	220	225	247	217	106	169
Effingham		311	242	130	160	148	296	153	206
Glynn	108	96	78	99	107	115	137	121	108
Liberty	119	113	67	93	90	87	88	84	93

Georgia's State Water Plan

Water Forecast Subcommittee(s)

Water Forecast Subcommittee

- Subcommittees ideally have 6-8 members to have more detailed discussions on forecast methodology
- Subcommittees would bring any recommendations back to the full council
- Last update there were subcommittees on:
  - Water Plan Update Editing Subcommittee
  - Outreach Subcommittee

Water Forecast Subcommittee

- Should there be a single water forecast subcommittee or more refined groups (i.e., industrial vs municipal)?
- When to start meeting? How often?
- Who wants to volunteer?

Georgia's
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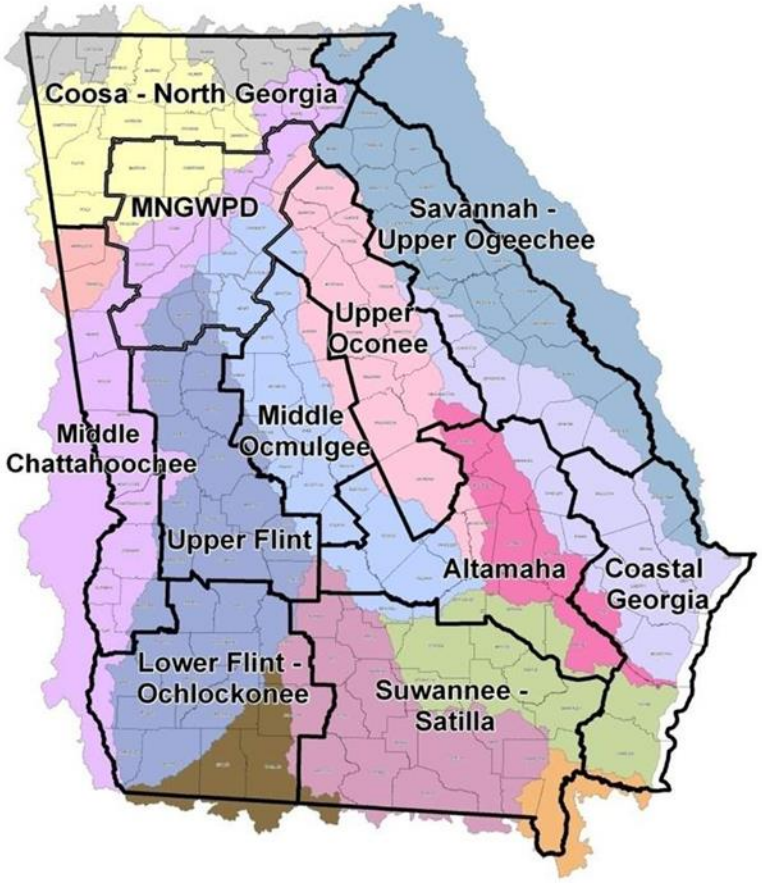
Review 2019 Seed Grant Opportunities

Regional Water Plan Seed Funds

- Cost-Share: 60%/40% (with 10% cash match)
- $75,000 State limit
- Must include letter of endorsement
- 2020: $300,000 available
- Enhancing water supply or water quality improvements that also provide water availability benefits
- Implementation activities identified in the Regional Water Plans



Regional Water Plan Seed Grant (State)

Regional Water Plan Seed Grant Web Site:

https://epd.georgia.gov/regional-water-plan-seed-grant-funds

- Grant Call **NOW OPEN**
- Pre-application meeting deadline **10/17/2019**
- Application Deadline **10/31/2019**

Current Seed Grant Proposal Initiatives

- "State of the Hydrology" portal/dashboard for Coastal Georgia
- Will provide access to readily available hydrologic data through the Council's website
- Ongoing discussions with Georgia Southern University who will champion the proposal
- Other ideas?

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Public Comments/Local Elected Official Comments

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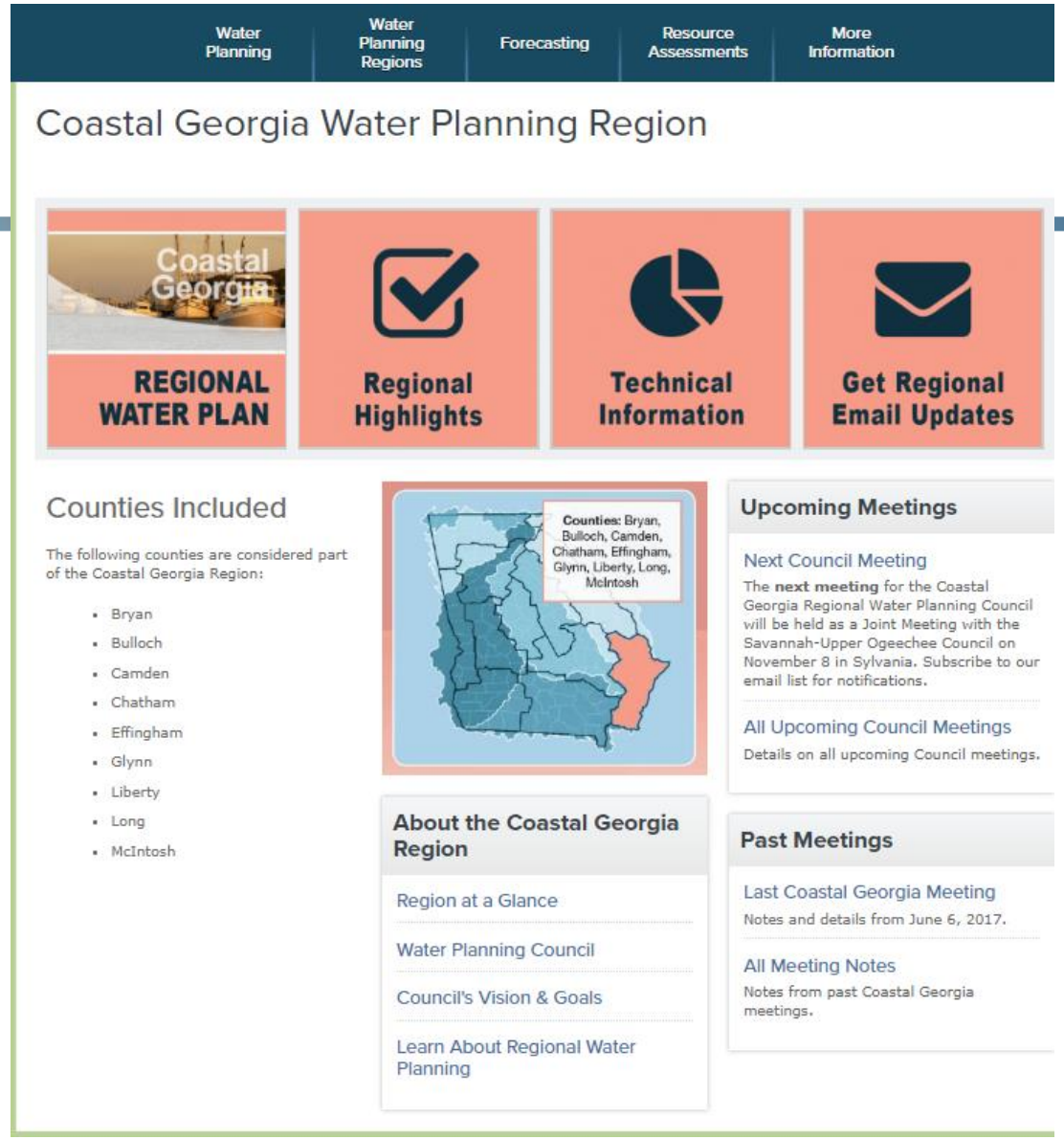
Next Steps /Wrap Up

Continuing Support to RWP Councils

- Regional Council Website Updates
- Survey for Potential Topics of Interest
- Regional Water Plan Video

Regional Council Website Updates

https://waterplanning.georgia.gov/coastal-georgia-water-planning-region

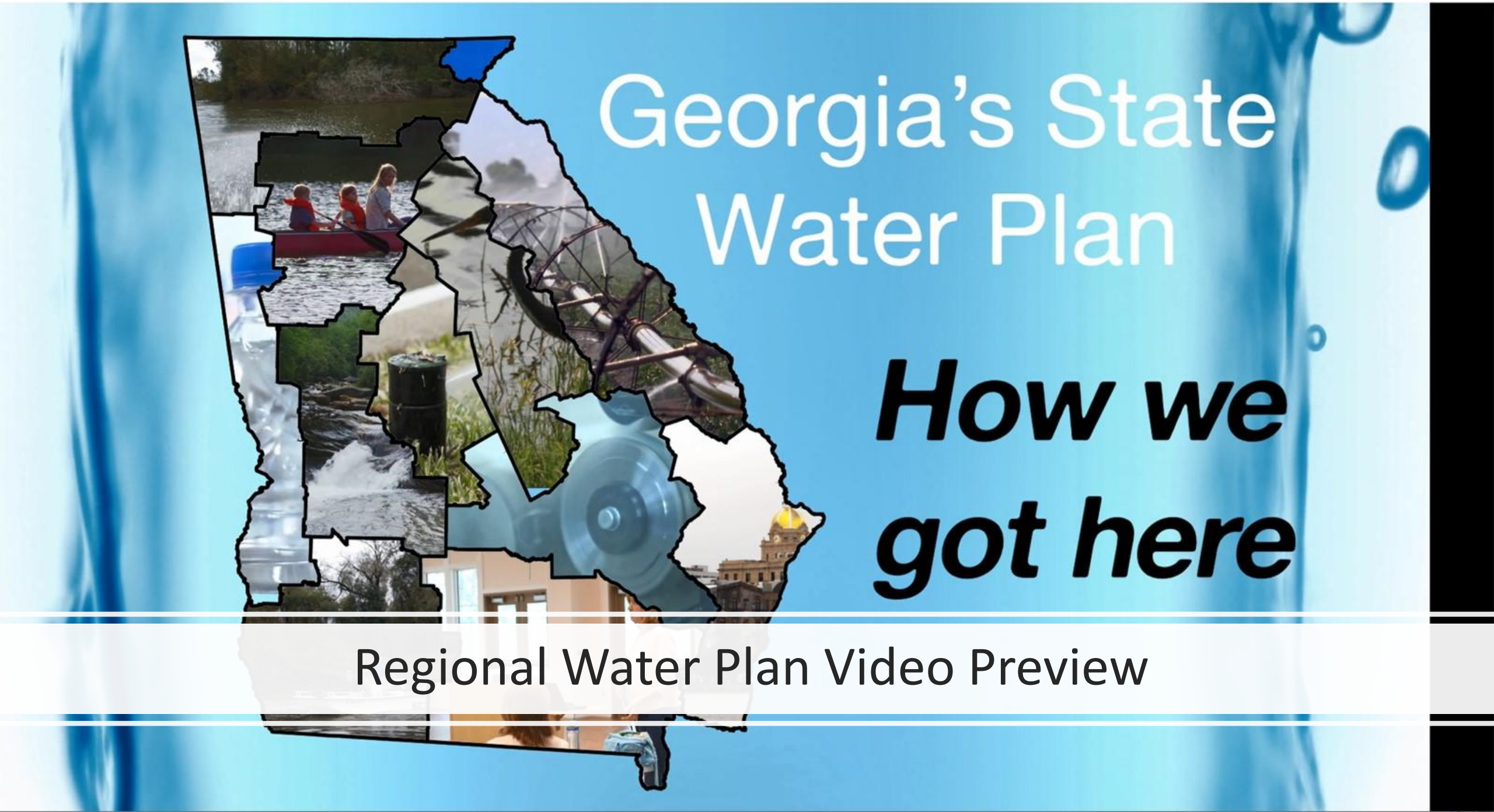


Survey – Potential Topics of Interest

- Helps guide future agenda planning
- Survey Monkey link to be sent out to Council Members at a future date

Water Management Strategies
Drought Response Planning
Population Projections
Agricultural Water Demand Forecasting
Interaction of Groundwater and Surface Water
Federal & State agency initiatives
Recreational uses and opportunities
Suggested topic

https://www.surveymonkey.com/r/9NDWV6H



Regional Water Plan Video Preview

Thank You!

Questions? Comments? Need More Information?

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