



Georgia's  
**State Water Plan**

**Regional Water Development and  
Conservation Plan Review and Revision  
Coastal Georgia Water Planning Council  
Meeting 1, March 10, 2016**

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

# Registration

9:00 AM – 9:30 AM

# Welcome and Introductions / Approve Agenda

9:30 AM – 9:45 AM

# Introduction

- Welcome from Benjy Thompson
- Council Introductions
- Review and Approve Agenda



# Georgia's State Water Plan

## Coastal Georgia Regional Water Council Meeting: Agenda - Thursday March 10, 2016

### Meeting Objectives:

- 1) Plan Review and Revision Overview and Schedule
- 2) Review Updated Population Projections
- 3) Review Municipal Water & Wastewater Forecast Updates
- 4) Discuss Industrial Water and Wastewater Forecasts
- 5) Review Current Agricultural Demand Estimate and Method for Updates

8:30 – 9:00 a.m.	[New Council Member Training and Orientation - Optional/ As-Needed]
9:00 – 9:30	Registration
9:30 – 9:45	Welcome and Introductions / Approve Agenda
9:45 – 10:00	Comment Period for Local Elected Officials in Attendance
10:00 – 10:15	Overview/Schedule
10:15 – 10:30	Vision and Goals / Memorandum of Agreement
10:30 – 11:00	Plan Elements for Review and Revision <ul style="list-style-type: none"><li>• <i>Status/summary of plan review and revision document completed by Council;</i></li><li>• <i>Recommendations for engaging key implementation actors;</i></li><li>• <i>Implementation status</i></li></ul>
11:00 – 11:15	Break
11:15 – 12:15 p.m.	Review Updated Population Projections and Municipal Water/Wastewater Forecast
12:15 – 12:45	Lunch <ul style="list-style-type: none"><li>○ Army Corps of Engineers Savannah River Basin Update</li><li>○ Jeff Larson - Georgia/South Carolina Update</li></ul>
12:45 - 1:15	Industrial Water and Wastewater Forecasts
1:15 – 1:30	Energy Water Use Forecast Updates
1:30 – 2:15	Current Agricultural Water Demand Estimate and Method for Updates
2:15 – 2:30	Break
2:30 – 2:45	Appointment of Technical Subcommittees by Council [other Council specific needs]
2:45 – 3:15	<u>Special Topic:</u> Section 319(h) NPS Grant/Special Award - Cliff Lewis (EPD)
3:15 – 3:30	Public Comments
3:30 – 3:45	Wrap Up/Council Meeting 2 Preview
3:45 – 4:00	Council Meeting 1 Evaluation
4:00 – 4:30	[New Council Member Debrief - Discuss Additional Training Needs, etc.]

# Elected Official Comments and Public Comments

- Sign up for public comments during morning registration period (to ensure enough time is allotted)
- Please limit comments to 3 minutes total
- Council encourages written submission of comments as well, to ensure meeting summaries accurately reflect comments

# Regional WDCP Review and Revision Process

## Review and Revision Process

### Georgia EPD Contacts

- Jennifer Welte – EPD's Project Manager for Review & Revision Process
- Jeff Larson – EPD's Lead for Coastal Georgia Planning Council
- Dr. Elizabeth Booth – Surface Water Quality Resource Assessment
- Dr. Wei Zeng - Surface Water Availability Resource Assessment
- Dr. Jim Kennedy – Groundwater Availability Resource Assessment

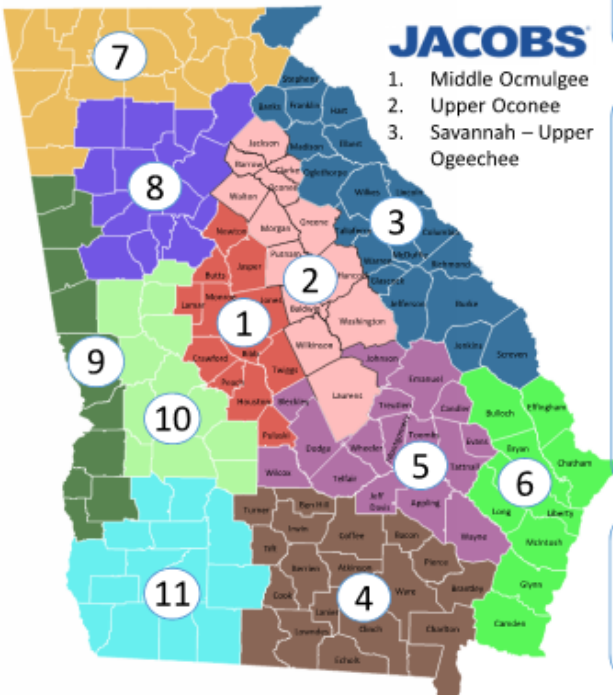
# Regional WDCP Review and Revision Process

## Planning Contractor – CDM Smith-Jacobs Team

- Primary Council Support – Shayne Wood
  - Project Manager - Shayne Wood
  - Technical Director – Sue Morea
  - Technical Advisor - Rick Brown
- 
- Demand Forecasting – Bill Davis
  - Water Availability Resource Assessments (Groundwater and Surface Water) – Lee Wiseman
  - Management Practices – Dale Jones



# Georgia's Water Planning Regions



**JACOBS**

1. Middle Ocmulgee
2. Upper Oconee
3. Savannah – Upper Ogeechee

**CDM  
Smith**

4. Suwannee – Satilla
5. Altamaha
6. Coastal

2016 - 2017  
Plan Review  
and Revision

## 1 Middle Ocmulgee



Chair **Elmo A. Richardson**

- Email:
- Phone: (478) 747-9476
- Title: Owner, Elmo A. Richardson, Jr., PE, LLC

EPD Lead **Ted Hendrickx**

- Email: [ted.hendrickx@dnr.ga.gov](mailto:ted.hendrickx@dnr.ga.gov)
- Phone: (404) 463-4952

JACOBS Lead **Michelle Vincent**

- Email: [Michelle.Vincent@jacobs.com](mailto:Michelle.Vincent@jacobs.com)
- Phone: (404) 751-2160

## 2 Upper Oconee



Chair **Melvin Davis**

- Email: [mdavis@oconee.ga.us](mailto:mdavis@oconee.ga.us)
- Phone: (706) 769-5120
- Title: Chairman, Oconee County Board of Commissioners

EPD Lead **Lebone Moeti**

- Email: [lebone.moeti@dnr.ga.gov](mailto:lebone.moeti@dnr.ga.gov)
- Phone: (404) 232-7834

JACOBS Lead **Dale Jones (Interim)**

- Email: [Dale.Jones@jacobs.com](mailto:Dale.Jones@jacobs.com)
- Phone: (678) 520-6944

## 3 Savannah-Upper Ogeechee



Chair **Ron C. Cross**

- Email: [rcross@columbiacountyga.gov](mailto:rcross@columbiacountyga.gov)
- Phone: (706) 868-3379
- Title: Chairman, Columbia County Board of Commissioners

EPD Lead **Jeff Larson**

- Email: [jeff.larson@dnr.ga.gov](mailto:jeff.larson@dnr.ga.gov)
- Phone: (404) 308-8062

JACOBS Lead **Katherine Atteberry**

- Email: [Katherine.Atteberry@jacobs.com](mailto:Katherine.Atteberry@jacobs.com)
- Phone: (404) 978-7430

## 4 Suwannee- Satilla



Chair **Scott Downing**

- Email: [sdi1@windstream.net](mailto:sdi1@windstream.net)
- Phone:
- Title: Chairman, Ben Hill County Commission

EPD Lead **Cliff Lewis**

- Email: [cliff.lewis@dnr.ga.gov](mailto:cliff.lewis@dnr.ga.gov)
- Phone: (229) 894-2554

CDM Lead **Shayne Wood**

- Email: [woodsh@cdmsmith.com](mailto:woodsh@cdmsmith.com)
- Phone: (904) 993-5568

## 5 Altamaha



Chair **Edward S. Jeffords**

- Email: [ed.jeffords@rayonieram.com](mailto:ed.jeffords@rayonieram.com)
- Phone: (912) 427-5155
- Title: Sr. Engineer, Rayonier Advanced Materials

EPD Lead **Jennifer Welte**

- Email: [jennifer.welte@dnr.ga.gov](mailto:jennifer.welte@dnr.ga.gov)
- Phone: (404) 463-1694

CDM Lead **Danielle Honour**

- Email: [honourdm@cdmsmith.com](mailto:honourdm@cdmsmith.com)
- Phone: (407) 660-2552

## 6 Coastal



Chair **Benjamin Thompson**

- Email: [benjy.thompson@advantagebulloch.com](mailto:benjy.thompson@advantagebulloch.com)
- Phone: (912) 489-9115
- Title: CEO Development Authority of Bulloch County

EPD Lead **Jeff Larson**

- Email: [jeff.larson@dnr.ga.gov](mailto:jeff.larson@dnr.ga.gov)
- Phone: (404) 463-1694

CDM Lead **Shayne Wood**

- Email: [woodsh@cdmsmith.com](mailto:woodsh@cdmsmith.com)
- Phone: (904) 527-6703

## 7 Coosa-N. Georgia

EPD Lead **Becky Champion**

Planning Contractor **CH2M**

## 8 MNGWPD

Lead **ARC**

Planning Contractor **Black & Veatch/CH2M**

## 9 Middle Chatahoochee

EPD Lead **Christine Voudy**

Planning Contractor **Black & Veatch**

## 10 Upper Flint

EPD Lead **Glen Behrend**

Planning Contractor **GWPPC**

## 11 Lower Flint- Ochlockonee

EPD Lead **Gail Cowie**

Planning Contractor **GWPPC**

# Regional WDCP Review and Revision Process

## Interim WDCP Support

- Carl Vinson Institute of Government, University of Georgia (Leigh Elkins)
  - Altamaha; Coastal; Savannah-Upper Ogeechee; Suwanee-Satilla
- Middle Georgia Regional Commission
  - Upper Oconee; Middle Ocmulgee
- North Georgia Regional Commission
  - Coosa – North Georgia
- Georgia Water Planning and Policy Center
  - Middle Chattahoochee; Lower Flint-Ochlockonee; Upper Flint

***Review and Revision Process will incorporate, as needed, the findings and conclusions that Council arrived at during the interim planning period***

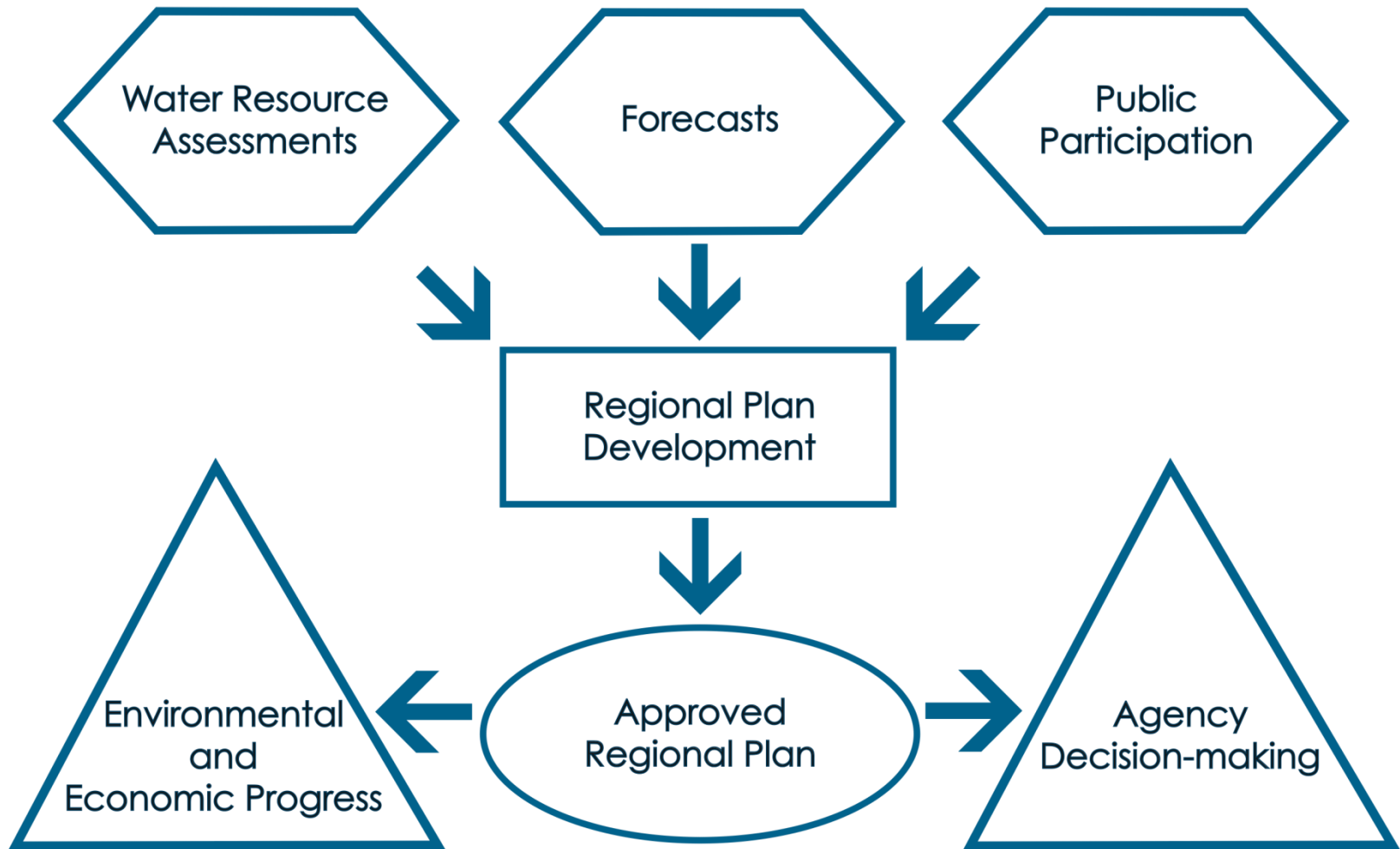
# Comment Period for Local Elected Officials

9:45AM – 10:00 AM

# Overview/Schedule

10:00 AM – 10:15 AM

# Water Planning Process



# Purpose and Use of 2011 Regional Water Plans

- Used by EPD to Inform Permitting Decisions
- Used by EPD and GEFA to inform funding decisions
- Facilitate improvement to Resource Assessment Methods
- Facilitated additional research and data gathering for agricultural water use
- Example Projects/Activities Related to Water Planning
  - Priority 319 funding in every planning region
  - Aquifer Storage and Recovery pilot project in Flint River Basin
  - Ground water to surface water pilot project in Flint River Basin
  - Cretaceous well feasibility study to address Salt Water Intrusion

# Schedule

		FY 2016									FY 2017								
					CY 2016									CY 2017					
		Oct	Nov	Dec	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
<b>Regional Water Planning Council Activities (FY2016 - FY2017)</b>																			
Forecasting	Present Updated OPB Population Forecasts																		
	Evaluate Updates to M&I Water and Wastewater Demand Forecasts																		
	Evaluate Updates to Agricultural Water Demand Forecasts																		
	Evaluate Updates to Energy Water Demand Forecasts																		
Gap Analysis	Revised Surface Water Availability vs. Revised Forecasts (Gap Analysis)																		
	Revised Ground Water Availability vs. Revised Forecasts (Gap Analysis)																		
	Revised Surface Water Quality Availability vs. Revised Forecasts (Gap Analysis)																		
Mgt. Practices	Review & Revise Management Practices and Initial Future Assessment Modeling																		
	Further Refinement of Management Practices and Additional Future Assessment Modeling																		
	Final Selection of Management Practices																		
Plan Approval	Recommended Draft Regional Plans to EPD																		
	EPD Review																		
	Public Comment																		
	Councils Revise Recommended Plans in Response to Public Comment and EPD Adopts Revised WDCP																		
	Project Close-out																		
Meetings	<b>Meeting 1 - Demand Forecasting Updates</b>																		
	<b>Meeting 2 (Joint) - Agriculture Demands and updates to Resource Assessment and Gap Analysis</b>																		
	<b>Meeting 3 - Review Management Practices and Select Future Scenarios to Address Gaps</b>																		
	<b>Meeting 4 - Refining / Selecting Management Practices and Provide Draft Plan to EPD</b>																		
	<b>Meeting 5 - Adopt Revisions to the recommended draft Plan</b>																		



# Vision and Goals, Memorandum of Agreement (MOA)

10:15 AM – 10:30 AM





Georgia's  
**State Water Plan**

**Vision and Goals**

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

# Vision and Goals

## Vision and Goals

- In Round 1, each Council went through an extensive visioning process to develop Vision and subsequent supporting Goals
- Council Vision will guide and frame the selection of management practices
- Our Region's vision and goals reflect how we see resources managed to meet regional needs

## Vision and Goals can carry forward into the 5-year update process

- Have any major water issues surfaced in the region?
- Has what you wish to see for this region regarding water resources changed substantially over the last 5 years?
- Are there any things on the horizon that may influence the vision for the region?
- If answers are substantively no, revisions to Vision and Goals are not necessary.

# Vision and Goals

## Coastal Georgia Adopted Vision

*as adopted by the Council 9.24.09*

**“The Coastal Georgia Regional Water Planning Council seeks to conserve and manage our water resources in order to sustain and enhance our unique coastal environment and economy of Coastal Georgia.”**



# Vision and Goals

## Coastal Georgia Adopted Goals

*as adopted by the Council 11.17.09*

- Manage and develop high quality water resources to sustainably and reliably meet domestic, commercial, industrial and agricultural water needs.
- Identify fiscally responsible and implementable opportunities to maximize existing and future supplies including promoting water conservation and reuse.
- Optimize existing water and wastewater infrastructure, including identifying opportunities to implement regional water and wastewater facilities.
- Protect and maintain regional recreation, ecosystems, and cultural and historic resources that are water dependent to enhance the quality of life of our current and future citizens, and help support tourism and commercial activities.

# Vision and Goals

## Coastal Georgia Adopted Goals

*as adopted by the Council 11.17.09*

- Identify and utilize best available science and data and apply principles of various scientific disciplines when making water resource management decisions.
- Identify opportunities to manage stormwater to improve water quantity and quality, while providing for wise land management, wetland protection, and wildlife sustainability.



Georgia's  
**State Water Plan**

**Memorandum of Agreement  
Operating Procedures  
Meeting Rules  
Public Involvement Plan**

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

# Memorandum of Agreement

## What are We Responsible for and How Will We Operate?

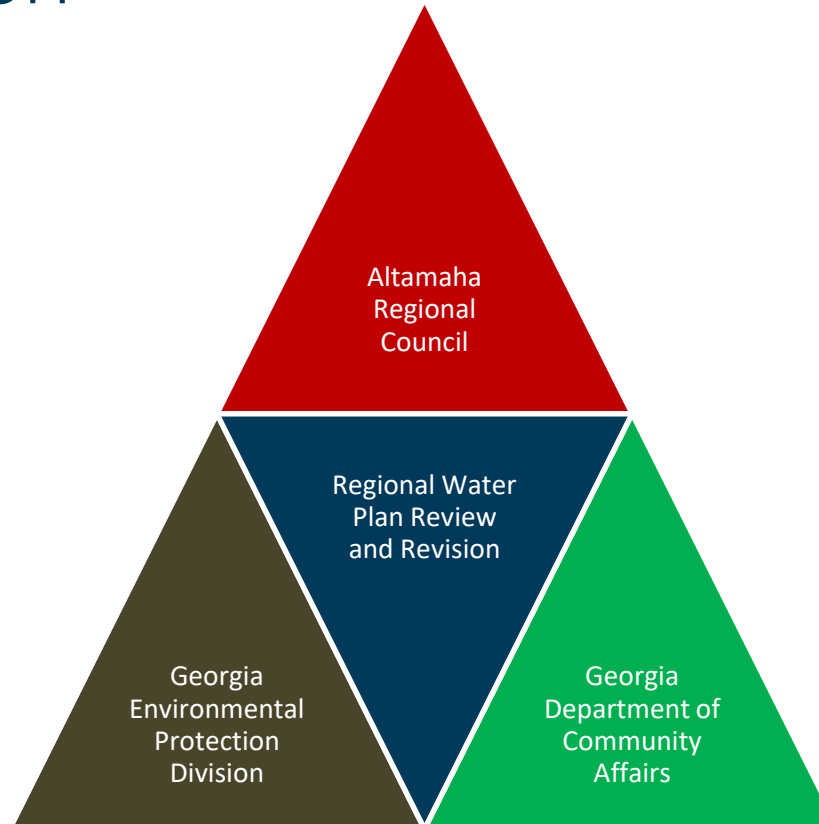
Existing documents define responsibilities, operations, and relationships:

1. Memorandum of Agreement (MOA)
  - a. Operating Procedures
  - b. Rules for Meetings
2. Public Involvement Plan



# Memorandum of Agreement

- MOA outlines roles for Regional Water Plan Preparation



# Memorandum of Agreement

- Establishes operating procedures, goals and objectives to govern actions and decisions for the Council
- Has a minimum of a 3-year term & can be renewed and amended upon written approval of all parties
- Defines Council, EPD and DCA responsibilities

# Memorandum of Agreement

Georgia's

State Water Plan

Altamaha Regional Water  
Planning Council

## Council Responsibilities:

- Submit drafts and final recommended plan to Director
- Identify management practices for the plan using provided data
- Adopt and follow operating procedures and rules for meetings
- Provide regional forum for local governments (inside and outside region) and coordinate with other Regional Councils
- Conduct open meetings and receive public comments in accordance with adopted Public Involvement Plan

# Memorandum of Agreement



## EPD Responsibilities:

- Provide a Planning Contractor to assist the Regional Council
- Provide technical and planning guidance
- Provide information on water quantity capacity and assimilative capacity, water use and forecasts, and status of the region's waters
- Coordinate planning across regions
- Provide public notice on the draft plan
- Review drafts of the plan and provide feedback
- Adopt final complete and consistent plan

# Memorandum of Agreement



## DCA Responsibilities:

- Provide information to identify inconsistencies between draft Plans and local and regional comprehensive plans
- Assist in developing a timeline for resolving inconsistencies
- Provide for Regional Council review and comment on local or regional comprehensive plans as they become due

# Operating Procedures and Rules for Meetings

## Documents to guide Council deliberations

- Includes practices shown to be effective and workable
- Designed to provide common approaches across councils
- Designed to support Council development of adoptable and implementable plan

# Memorandum of Agreement

## Proposed update to MOA

- Reinforce responsibilities of Council and agencies
- Extension of MOA, past the 2011 Plan adoption process and into the Review and Revision period
- Signatures by Council Chair, EPD Director and DCA Commissioner

# Operating Procedures

## Proposed updates to Operating Procedures

- Can be amended by Council, after EPD review and comment
- Housekeeping updates to address quorum and voting during Review and Revision process
- 3 changes to consider (see handout)
- Input at today's meeting; notice to all members to follow, then action at next meeting



# Public Involvement Plan

## Public Involvement Plan (PIP)

- Maintains transparency of the planning process
- Seeks input from key stakeholders
- Establishes communications with neighboring councils
- Includes mechanisms for public comments



# Public Involvement Plan

## Procedural criteria

- All regional water planning council meetings will be open meetings
- Comments should pertain to topic(s) of meeting
- 3 minutes per speaker will be provided at the end of our meetings
- Provisions for written comments will be made available



## Meeting Announcements

- Posted on Gov Delivery system
- Meeting agendas and meeting summaries will be distributed



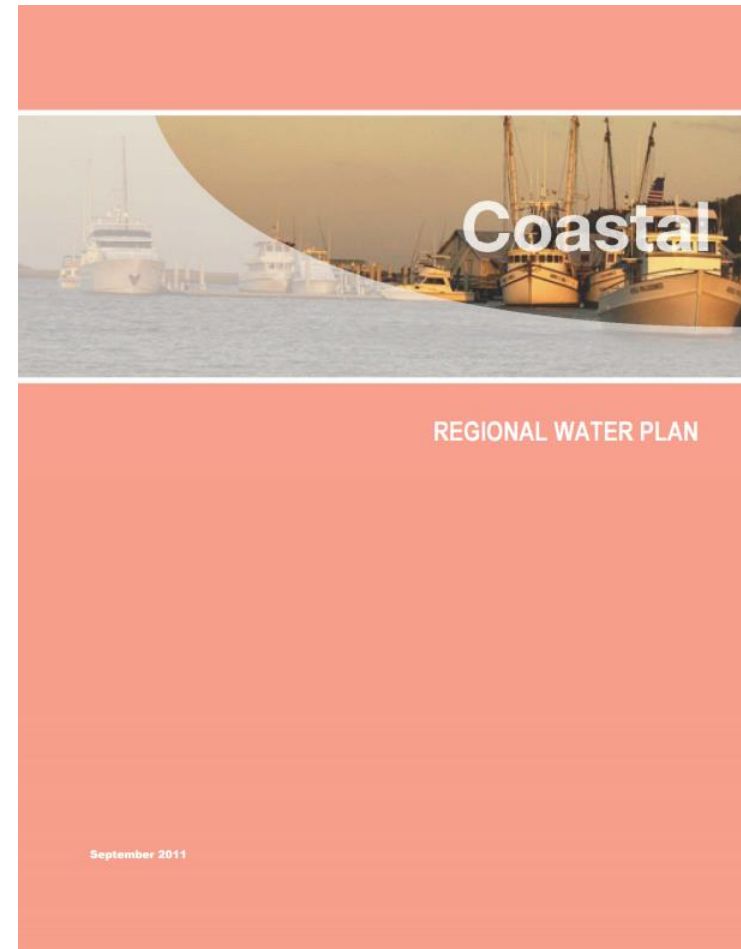
# Plan Review & Revision

10:30 AM – 11:00 AM

# Regional WDCP Review and Revision Process

Initial 5-Year Review Process will focus on:

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



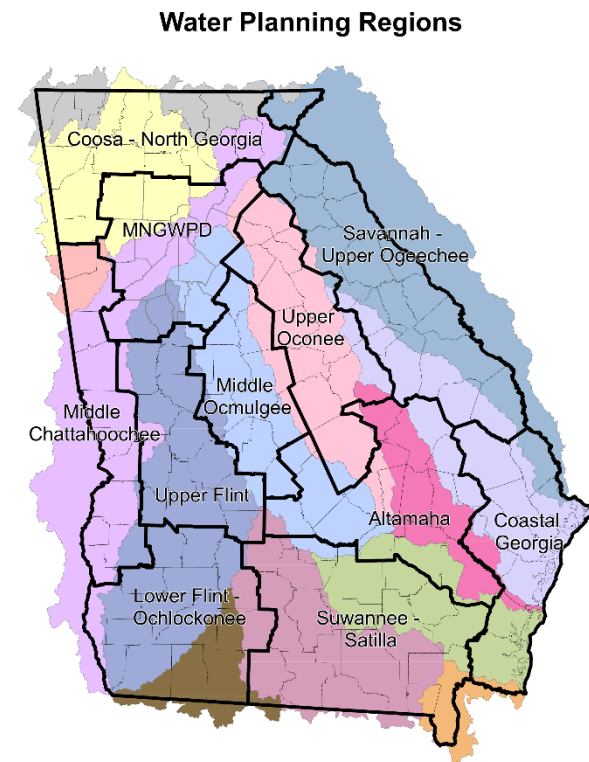
# Review and Revision Process (*cont.*)

With the support of the Planning Contractor (PC), the Council will:

- Evaluate updated municipal & industrial water and wastewater demand forecasts
- Evaluate updated energy water demand forecasts
- Evaluate updated agricultural water demand forecasts
- Evaluate updated water resource assessments
- Re-evaluate updated “gaps”
- Re-evaluate management practices

# Review and Revision Process (*cont.*)

- EPD adoption of revised Regional Water Plan by March 31, 2017
- Anticipate Council will meet quarterly for a total of 5 meetings
- 2<sup>nd</sup> quarterly meeting (June 2016) will be a Joint Council Meeting
  - Savannah-Upper Ogeechee
  - Upper Oconee
  - Middle Ocmulgee
  - Altamaha
  - Suwannee-Satilla
  - Delegates (Upper Flint, LFO)
- Joint Council Meeting for western councils also to be held in June 2016



# Review and Revision Process (*cont.*)

## Revisions to Regional Water Plans

- 1<sup>st</sup> Draft –Updates to M&I and Energy Forecasting (April 2016)
- 2<sup>nd</sup> Draft –Updates to Agricultural Forecasting and Resource Assessment (July 2016)
- 3<sup>rd</sup> Draft –Updates to Forecasts/Gap Information and Management Practices (October 2016)

# Review and Revision Process (*cont.*)

## Revisions to Regional Water Plans

- Final Draft (December 2016)
  - EPD will public notice a 45-day comment period and conduct concurrent review
  - Council will review comments and incorporate changes during February 2017
  - Council will submit final recommended plan by February 28, 2017
- Plan will be adopted by EPD no later than March 31, 2017



# Break

11:00 AM – 11:15 AM

# Updated Population Projections and Municipal Water/Wastewater Forecast

11:15 AM – 12:15 PM



Georgia's  
**State Water Plan**

Updated Population Projections

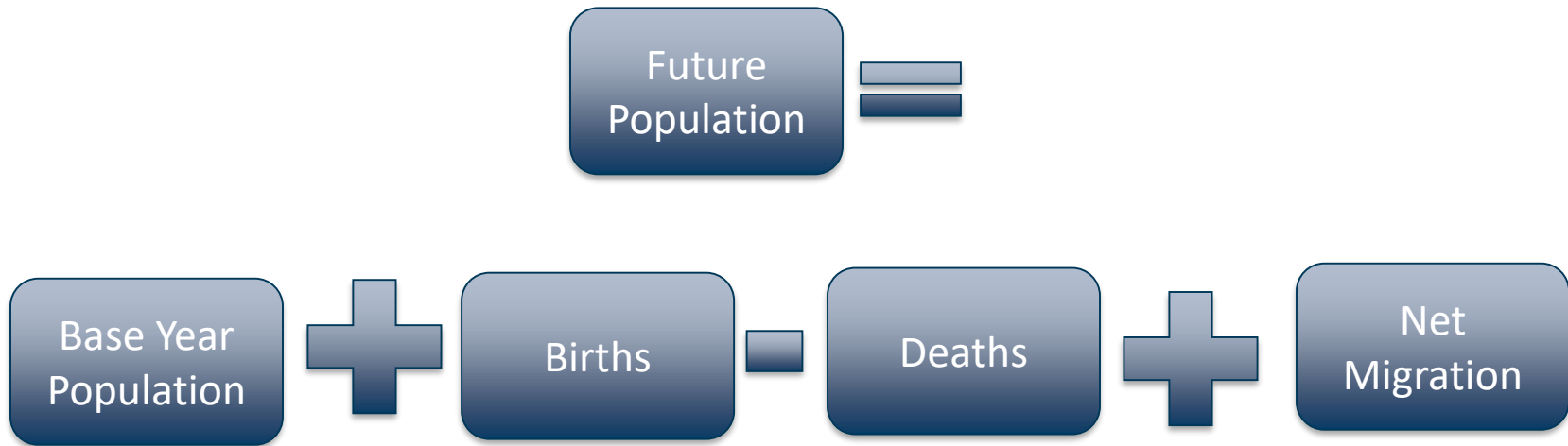
[www.georgiawaterplanning.org](http://www.georgiawaterplanning.org)

# Updated Population Projections

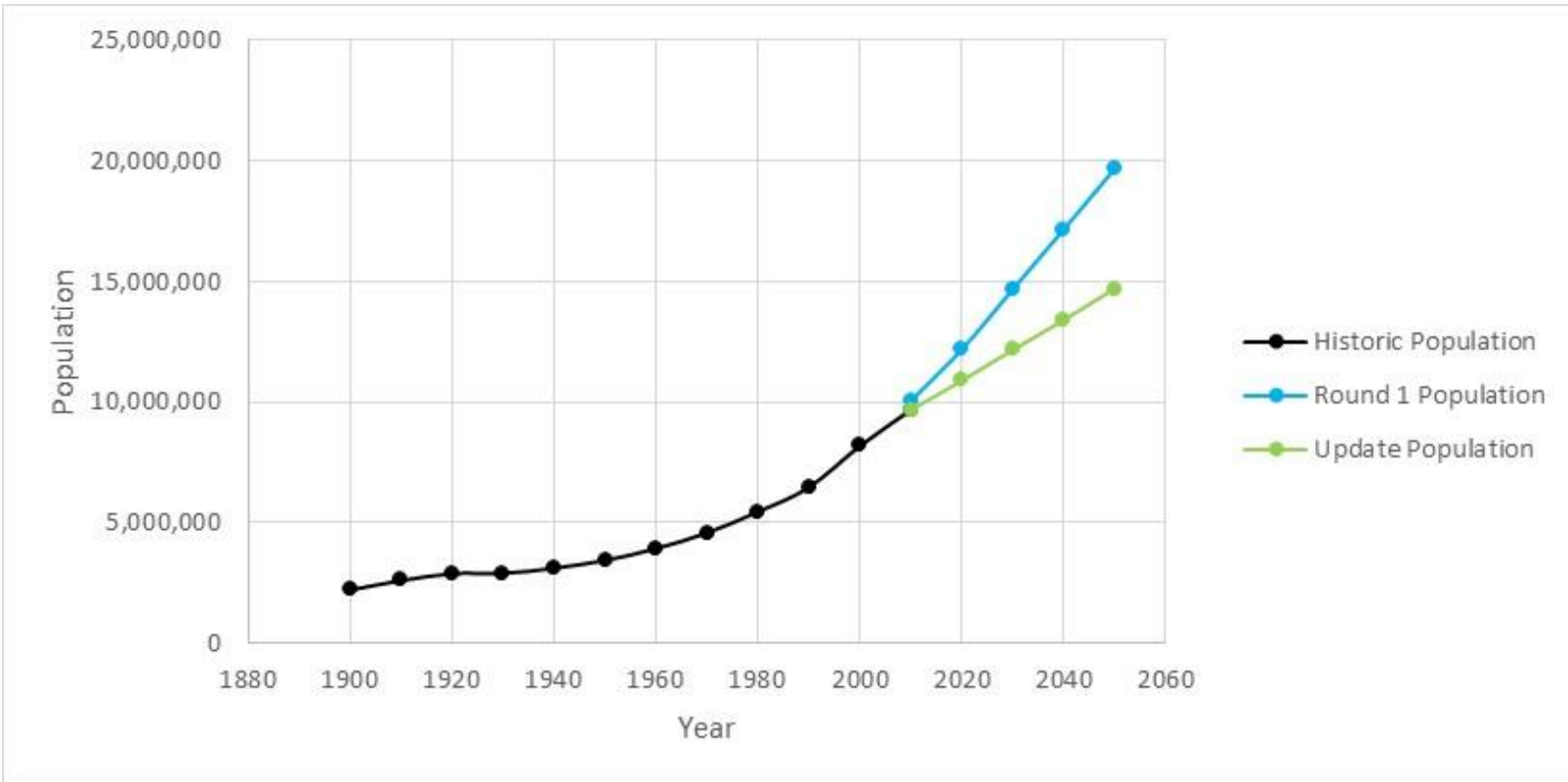
- State and County population projections are prepared by the Governor's Office of Planning and Budget (OPB)  
<https://opb.georgia.gov/>
- Used consistently by all state agencies for multiple purposes
- Updated population projections will be used in the Review and Revision process
- Population is dynamic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

# Updated Population Projections

## Basic Approach to Population Projections



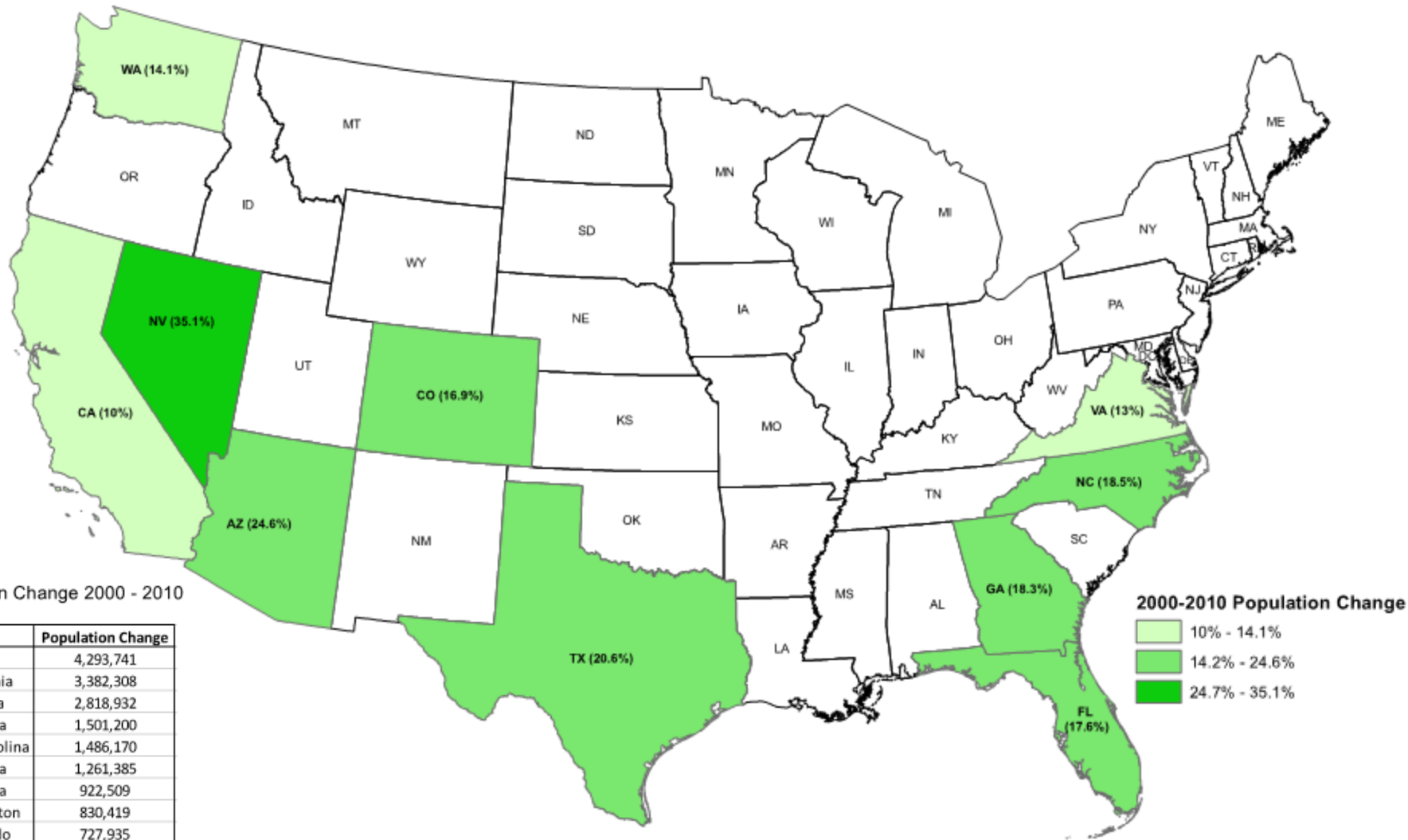
# Georgia's Population Growth Over Time



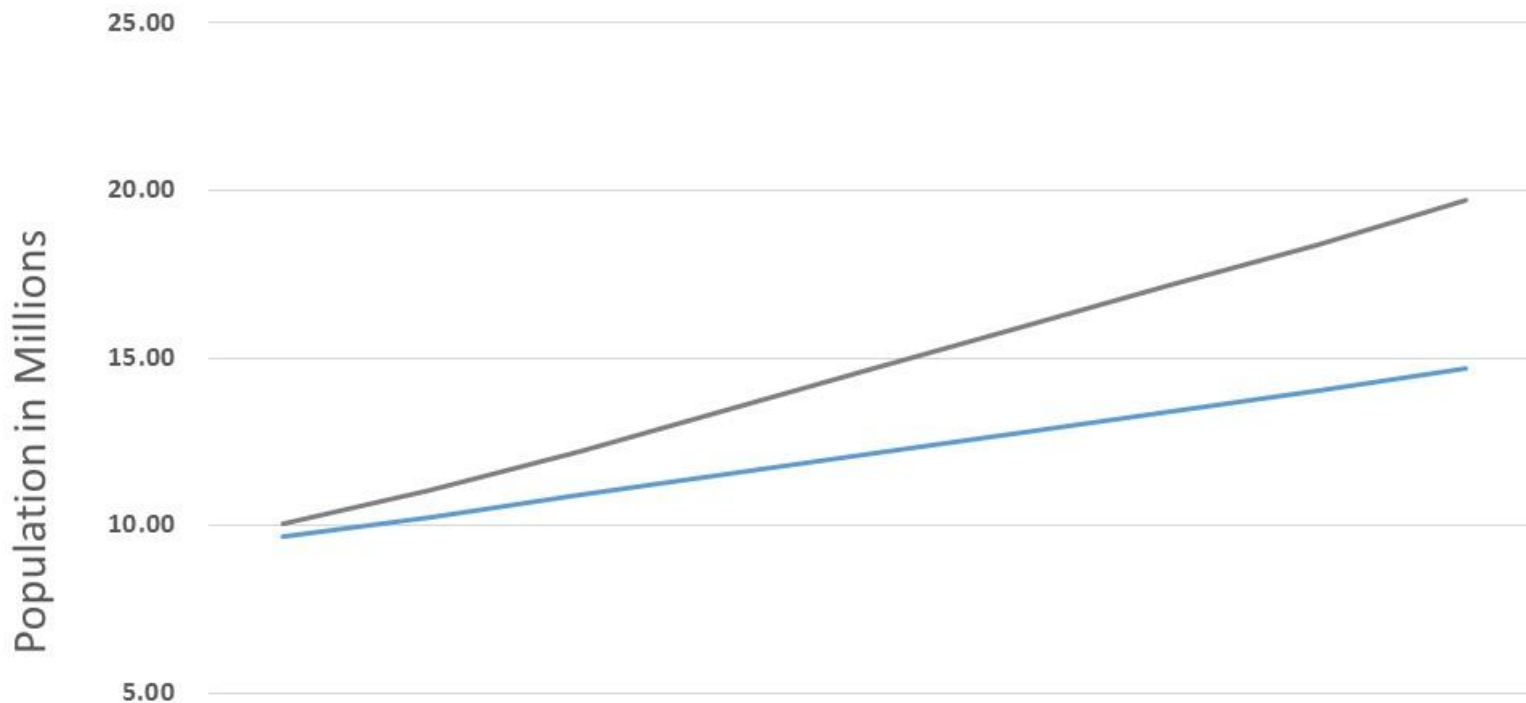
Georgia's Historic Population Growth and Projections



# Top 10 States with Highest Population Growth



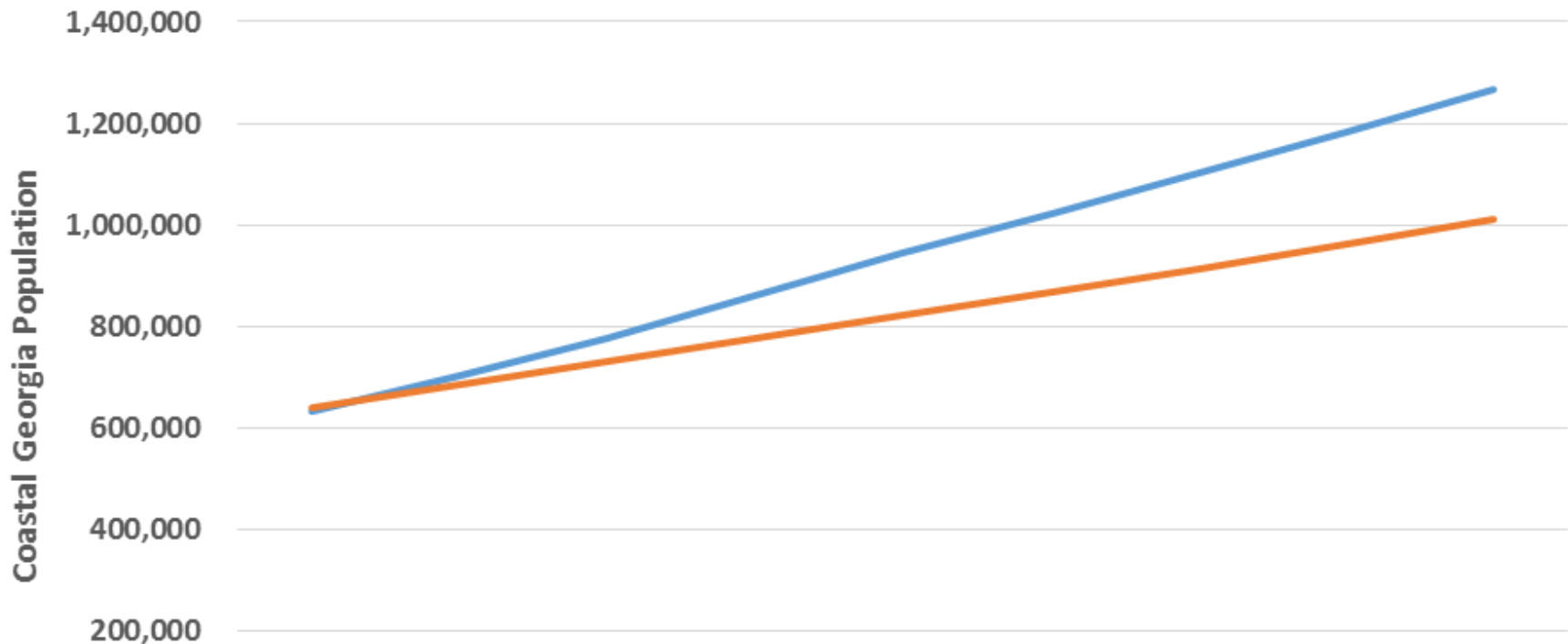
# State Population Projections



	2010	2015	2020	2025	2030	2035	2040	2045	2050
— Round 1	10.07	11.08	12.19	13.43	14.69	15.91	17.17	18.37	19.69
— Update	9.69	10.25	10.90	11.54	12.17	12.80	13.41	14.04	14.71



# Coastal Georgia Region Population Projections



	2010	2015	2020	2025	2030	2035	2040	2045	2050
— Round 1	632,813	703,854	777,695	859,962	942,920	1,021,1	1,101,5	1,181,0	1,265,9
— Update	640,217	683,803	730,540	776,168	821,796	867,611	913,427	963,024	1,012,6

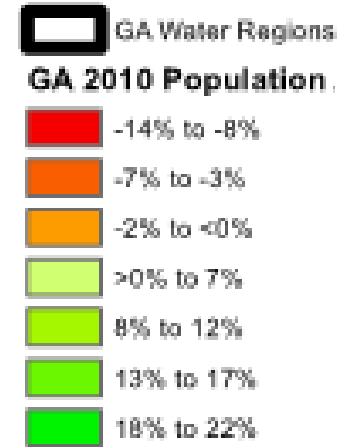
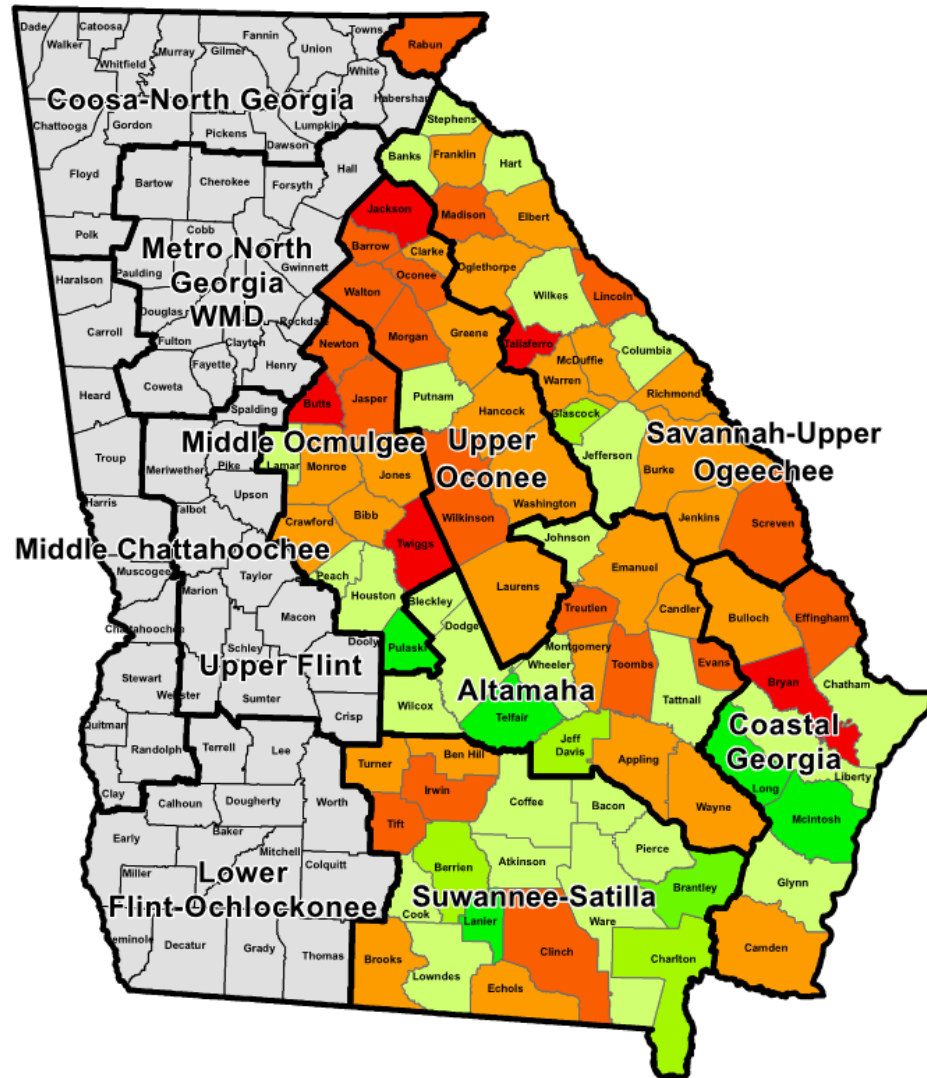
# Updated Population Projections

- A Cohort-Component model was used for both the Round 1 and updated population projections – but data inputs have changed based on new/updated information
- Age specific fertility and death rates are updated using 2008-2012 data
- Migration rates are also updated using a series of approaches including:
  - use of U.S. Census Bureau's annual population estimates and components of change for 1990-2014
  - the 2006-2014 period was used to calculate net migration for each county in Georgia
  - data from the U.S. Census Bureau's 2006-2010 American Community Survey was also utilized

# Updated Population Projections

- The current population projections are more in line with historic trends
- The projections used for Round 1 were strongly influenced by historical levels of in migration and relatively high birth rates among some cohorts
- Georgia continues to grow but growth is trending toward fewer counties – 50% of Georgia's population growth from 2010-2013 occurred in Fulton, Gwinnett, and Cobb
- Between 2010 and 2013, census data showed that about half of Georgia's counties have experienced population declines
- The majority of counties with declining population are considered rural counties

# Georgia 2010 Population Projection Change



- Represents change between Round 1 2010 projection and 2010 Census

# Municipal Water/Wastewater Forecast Updates



Georgia's  
**State Water Plan**

Municipal Water Demand Forecast  
Update

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

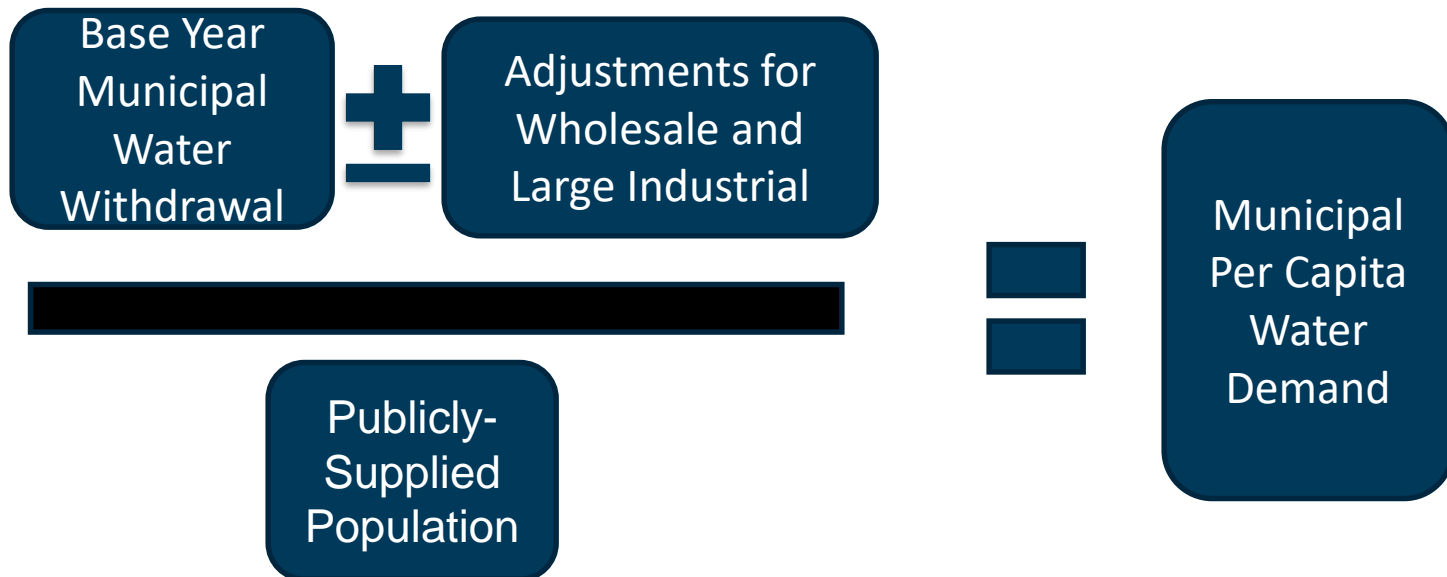
# Projecting Municipal Water Demand

Future Water Need:



# Calculating Per Capita Demand

- Municipal
  - public/private water systems
  - adjustment for wholesale and large industrial
  - Council feedback for region specific adjustment
- Self-Supply (provided by users)
  - 100 gpcd demand regional specific value
  - Council feedback for region specific adjustment



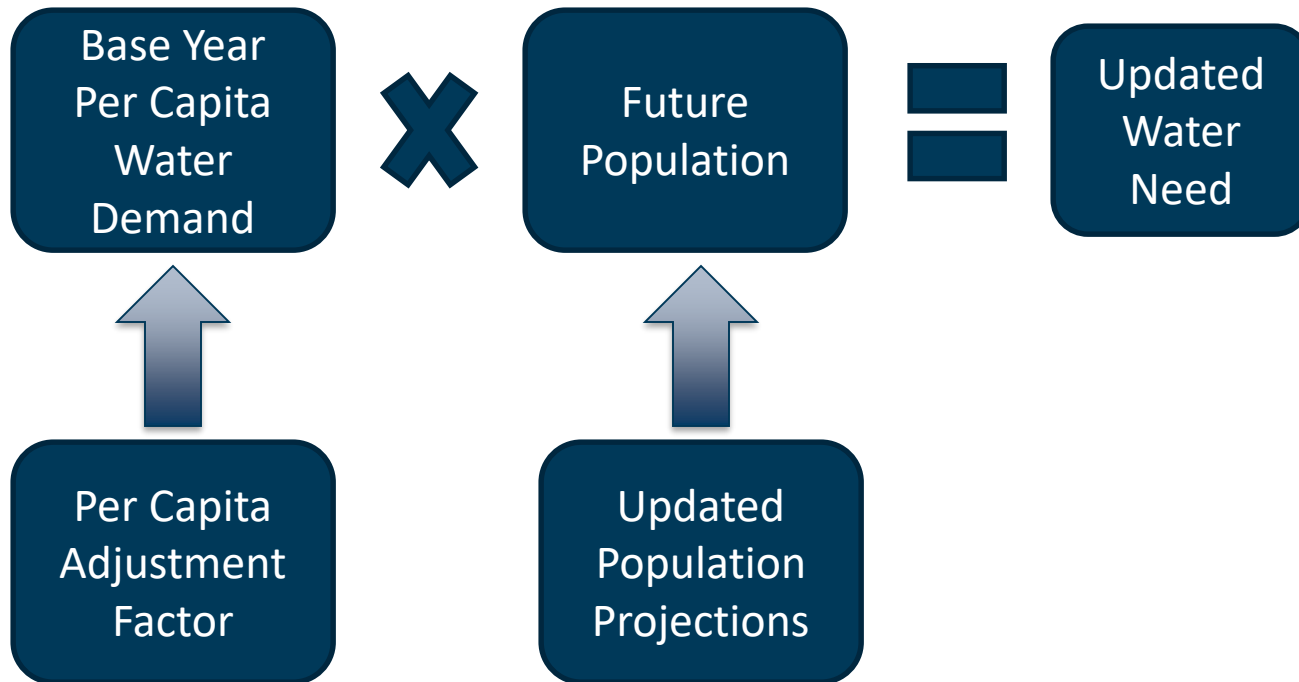


# Round 1 Methodology

- Development of the WCDP used an extensive process of:
  - estimating water use and population served by municipalities in each county
  - calculating a weighted average (weighted by population served) for each county
  - reconciling the county average USGS estimates
  - refining the county gpcd values given comments from regional councils

# Projecting Municipal Water Demand

Updated Municipal Water Need with Adjustment Factor:



# WDCP Updated Adjustment to GPCD

- EPD collected municipal water use and population served by municipalities and water systems from 2010 to 2014 (5 years)
- The % rate of change was calculated for each year interval (2010 to 2011, 2011 to 2012, 2012 to 2013, and 2013 to 2014), and the average of those was calculated as the ***per capita water use adjustment factor***
- The adjustment factor was applied to the Round 1 gpcd values

# Update Methodology

- New population projections
- Each county has the “municipal” water demand split between publicly-supplied (i.e., water provider) and self-supplied (i.e., private wells).
- The ratio of public-supplied to self-supplied water use in each county for Round 1 were maintained for update

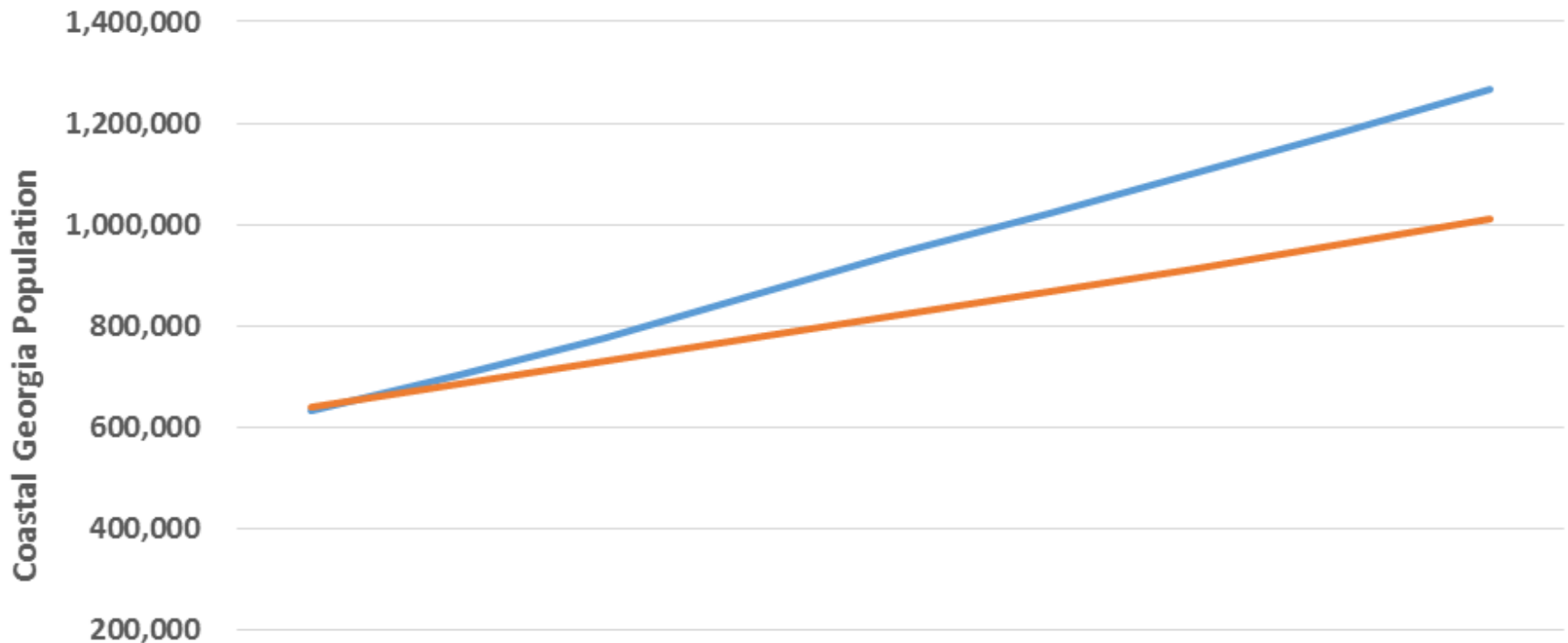
# Municipal GPCD Adjustment Results - Coastal

- Small relative change
- Less than 5% change across all counties
- 7 out of 9 counties have less than 3 gpcd change
- Round 1 Regional Average GPCD: 138
- Updated Regional Average GPCD: 136
- Average change across region is -1.3%

# Municipal GPCD Adjustment Results by County

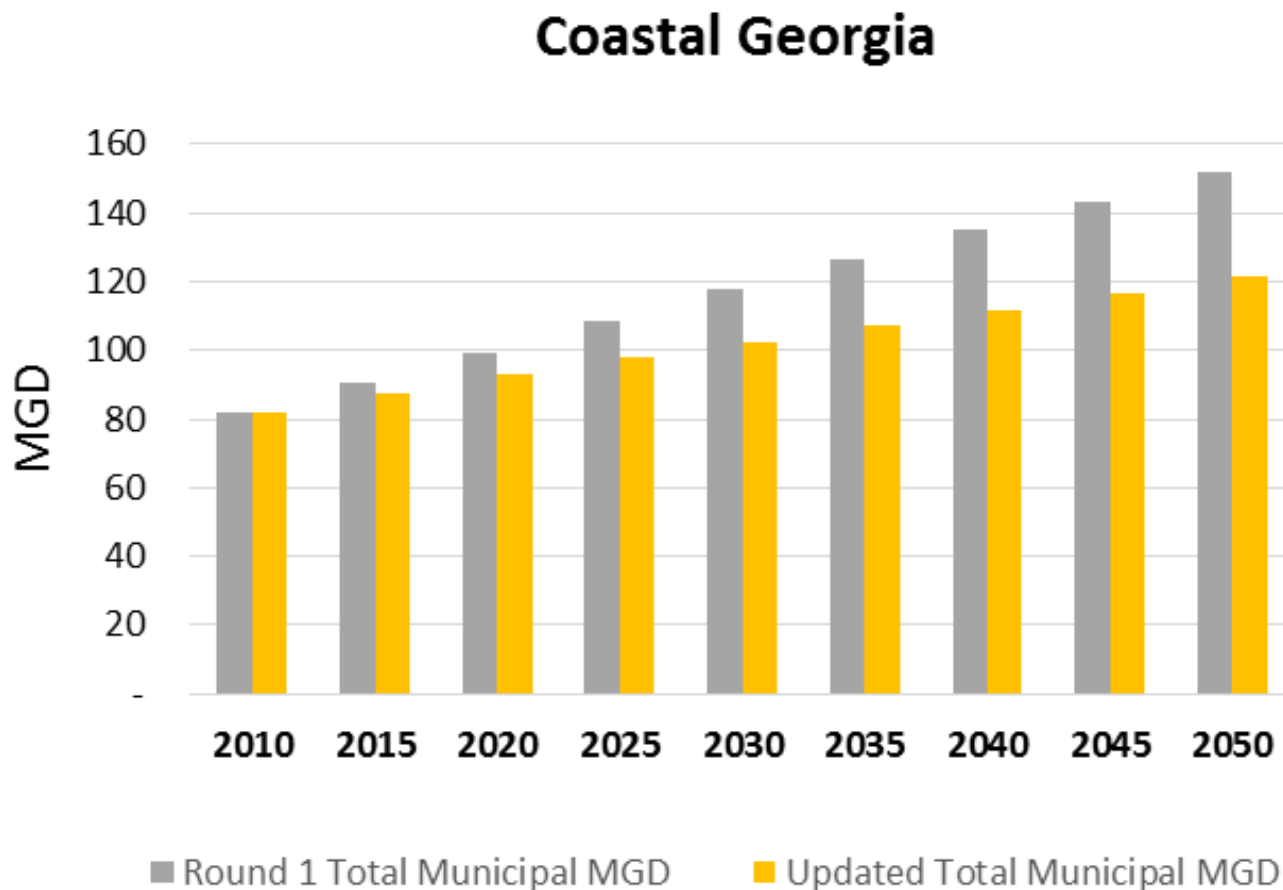
County	Round 1 GPCD	Updated GPCD	GPCD $\Delta$	% GPCD Change
Bryan	138.0	137.7	-0.3	-0.2%
Bulloch	138.0	137.6	-0.4	-0.3%
Camden	138.0	133.2	-4.8	-3.4%
Chatham	138.0	135.8	-2.2	-1.6%
Effingham	138.0	140.3	2.3	1.7%
Glynn	138.0	134.8	-3.2	-2.3%
Liberty	138.0	136.3	-1.7	-1.2%
Long	138.0	137.1	-0.9	-0.6%
McIntosh	138.0	132.3	-5.7	-4.1%

# Coastal Georgia Region Population Projections



	2010	2015	2020	2025	2030	2035	2040	2045	2050
— Round 1	632,813	703,854	777,695	859,962	942,920	1,021,1	1,101,5	1,181,0	1,265,9
— Update	640,217	683,803	730,540	776,168	821,796	867,611	913,427	963,024	1,012,6

# Coastal Georgia Region Updated Water Demand





# Additional GPCD Analysis by EPD

- EPD will continue to evaluate and refine the additional source of information
- Planning Considerations:
  - Regional and statewide planning are conducted at a different scale than that used in facility planning and permitting
  - Data requirements, local and site specific conditions are unique
- We will keep Council engaged and informed as this work progresses

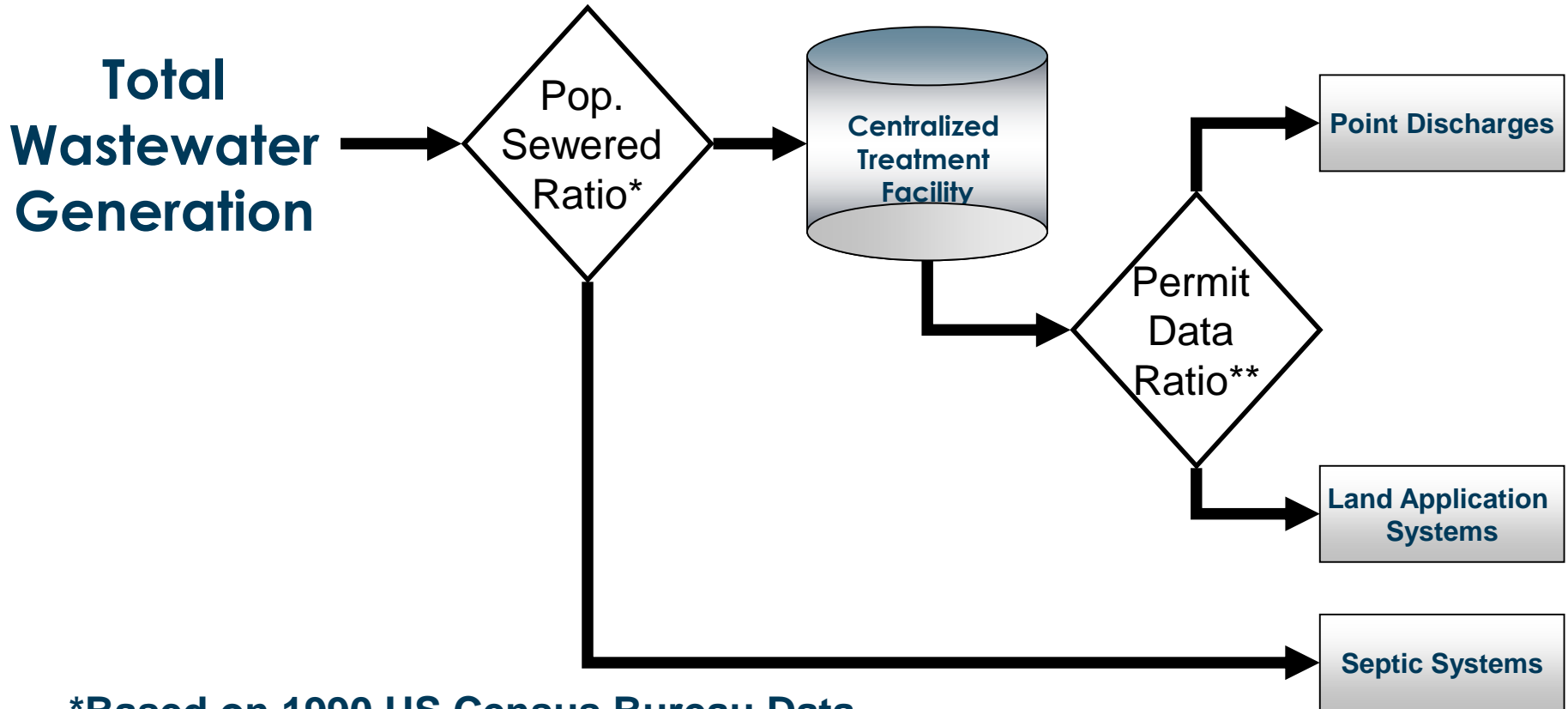


Georgia's  
**State Water Plan**

Municipal Wastewater Demand  
Forecast Update

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

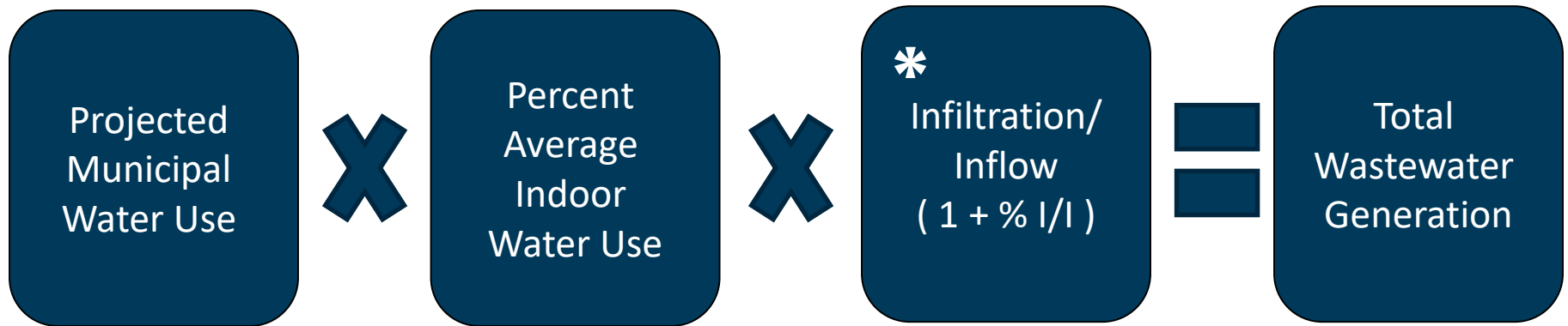
# Municipal Wastewater Discharges



\*Based on 1990 US Census Bureau Data

\*\*Based on Existing GA EPD Permit Data

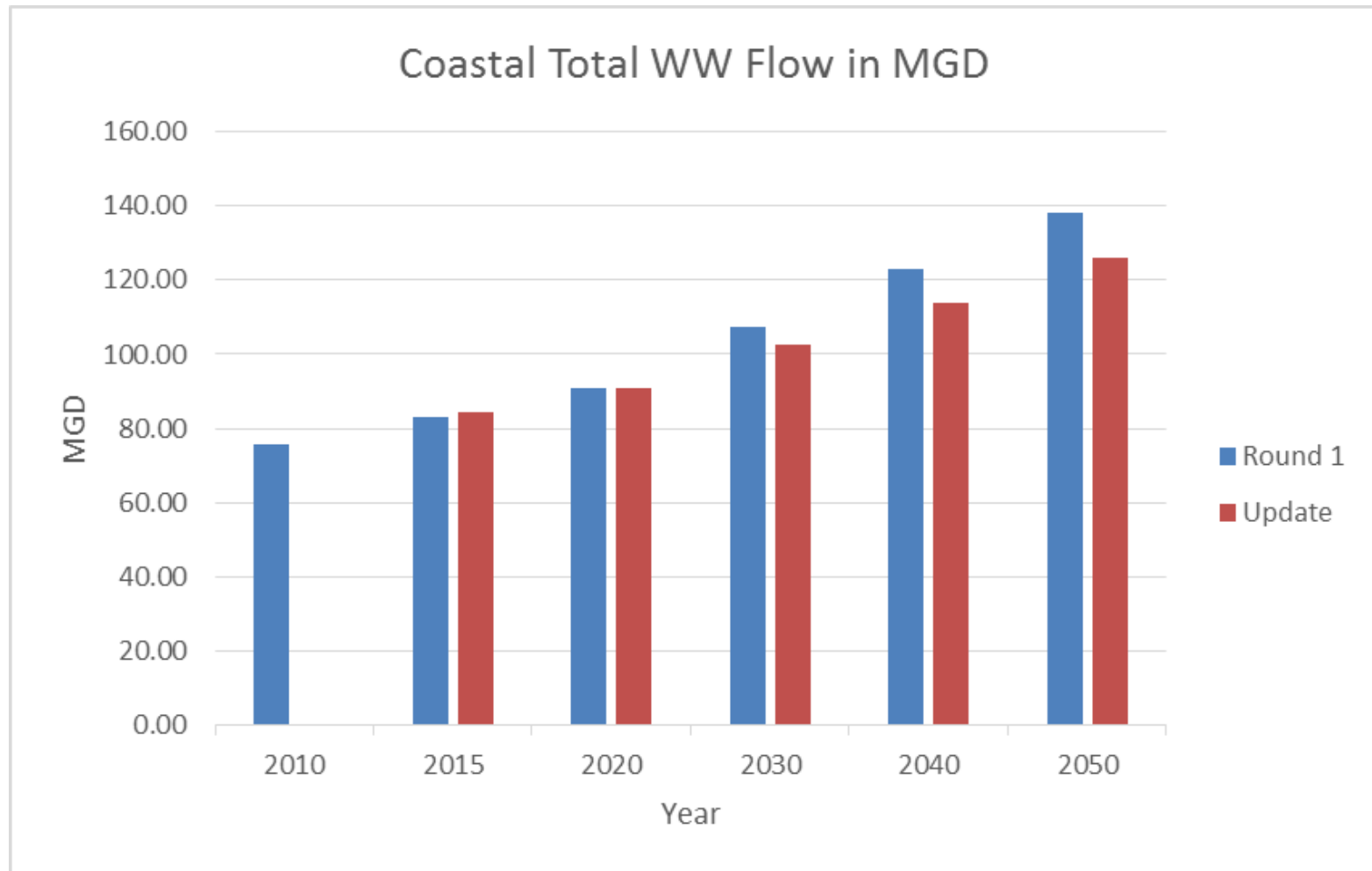
# Round 1 Municipal Wastewater Calculation



# Municipal Wastewater Forecast Update

- In Round 1 the municipal water demand served as the basis for estimating the municipal wastewater (WW) flows for each county
- **New** methodology based on:
  - 2014 discharges by county
  - % increase in population
  - Future wastewater changes at the rate of population change
  - Incorporates the trend in ratio of centralized/septic to determine the predicted change in centralized flows by county

# Municipal Wastewater Forecast Update Results



# Lunch Time

12:15 PM – 12:45 PM



# Industrial Water Forecast Updates

12:45 PM – 1:15 PM



# Industrial Water Needs

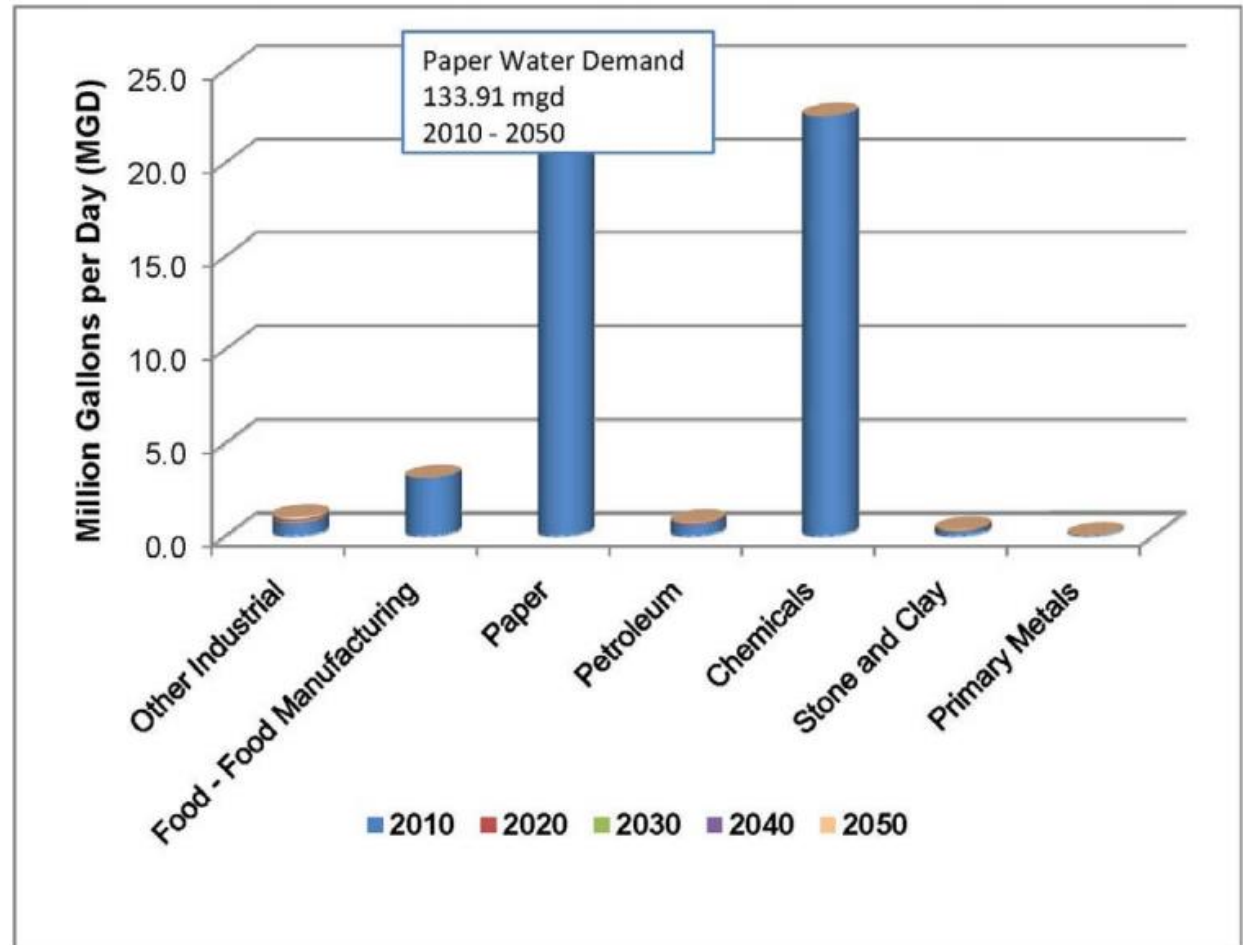
- Water is needed for industrial processes, sanitation, cooling and some domestic (employee) use
- Water need is linked to production
- Employment is linked to production
- Updates of employment data are not available, therefore industrial forecasts are not being updated at this time

# Industrial Water & Wastewater Demand

- EPD recommends maintaining Round 1 estimates of industrial water & wastewater forecasts
- Regional Councils are encouraged to review Round 1 projections and identify any significant changes that may have occurred

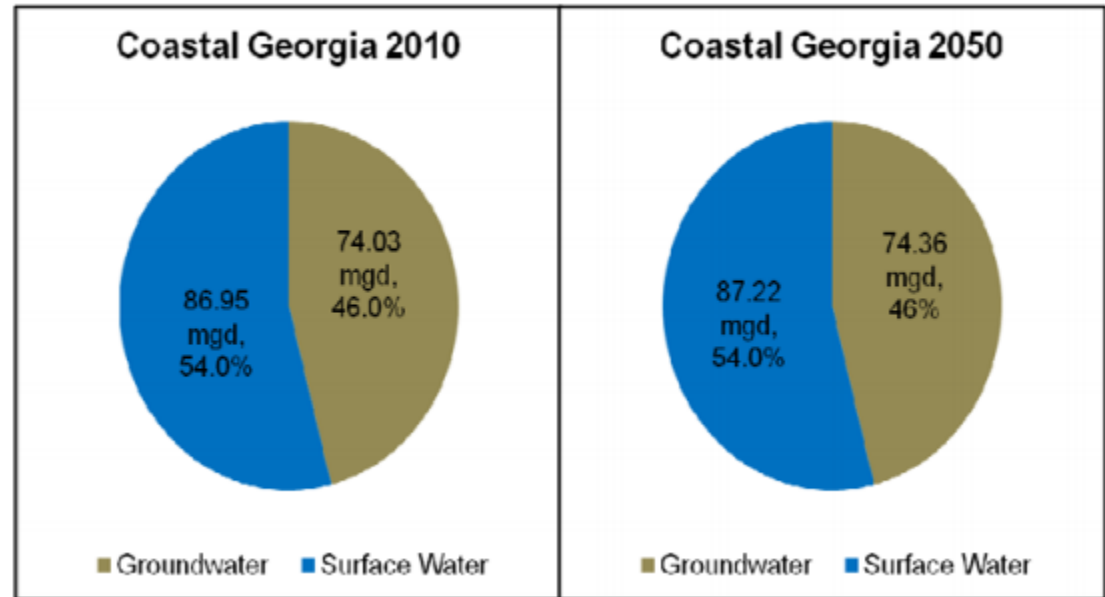
# Industrial Water Demand

## Round 1 – Coastal Georgia Industrial Water Demand by Category



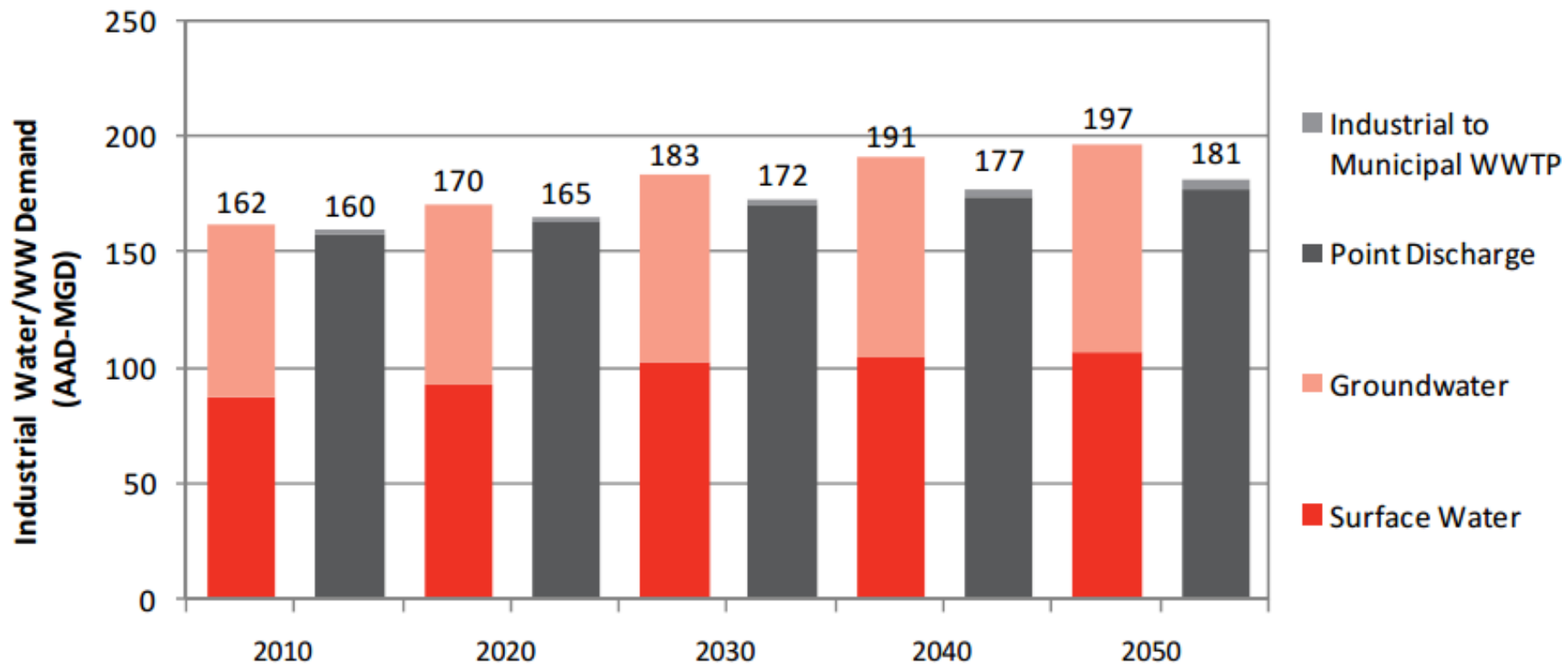
# Industrial Water Demand

## Round 1 – Coastal Georgia Industrial Water Demand by Source



# Industrial Wastewater Flow

## Round 1 – Coastal Georgia Industrial Wastewater Flow by Discharge Method



# Energy Forecast Updates

1:15 PM – 1:30 PM

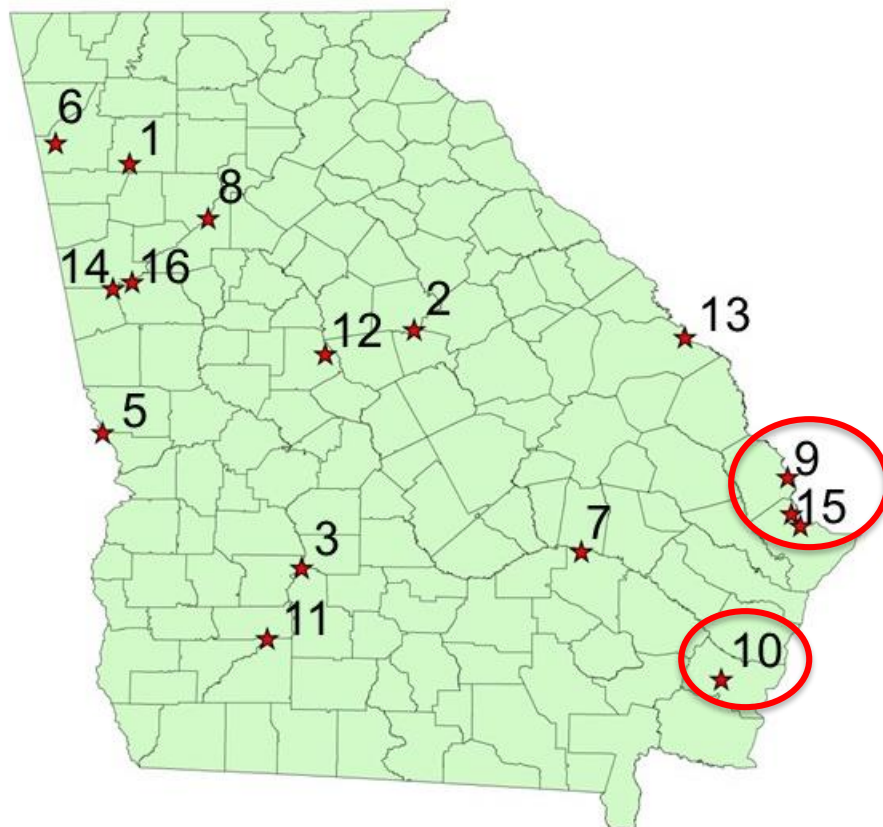


Georgia's  
**State Water Plan**

**Energy Forecast Updates**

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

# Round 1 - Thermoelectric Power Facilities in Georgia with Water Withdrawal Permits



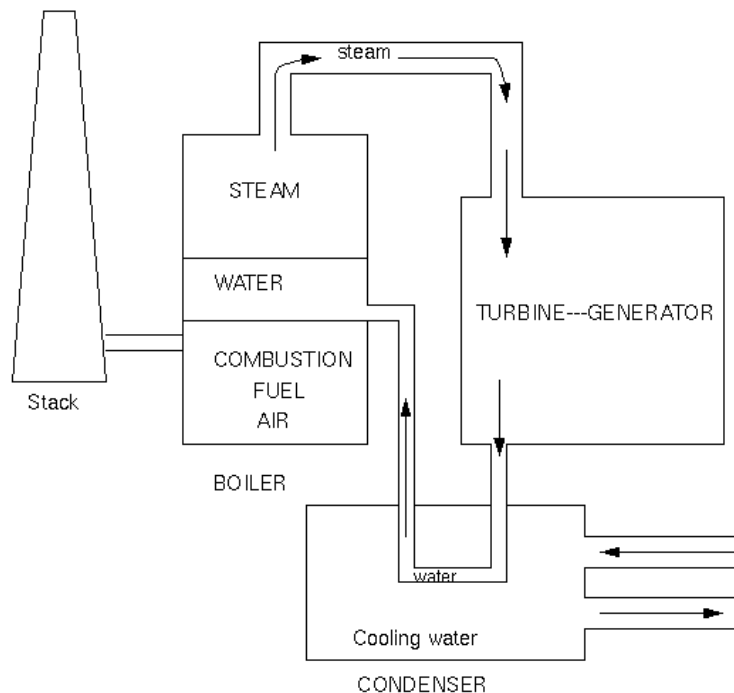
Facility Name	County
1. Plant Bowen	Bartow
2. Plant Branch	Putnam
3. Crisp County Power Comm- Steam	Worth
4. Gum Power Plant LLC	Mitchell
5. H Allen Franklin <sup>1</sup>	Lee (Alabama)
6. Plant Hammond	Floyd
7. Plant Hatch	Appling
8. Plant Jack McDonough	Cobb
<b>9. Plant McIntosh</b>	<b>Effingham</b>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

<sup>1</sup> Plant is physically located in Alabama; water withdrawal permit from Georgia EPD



# Energy Forecast Updates

- Variables for calculations
  - Fuel type (coal, natural gas, nuclear)
  - Prime Mover (thermal energy into mechanical energy)
  - Cooling type (single pass vs. evaporative)



# 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

# Water Use Factors by Generating Combination

<b>WATER WITHDRAWALS</b>	
<b>Power Generation Combination</b>	<b>Gal/MWh</b>
Fossil Fuel/Biomass, Steam Turbine, Once-Through Cooling	41,005
Fossil Fuel/Biomass, Steam Turbine, Cooling Tower	1,153
Fossil Fuel/Biomass, Gas (Combustion) Turbine	0
Natural Gas, Combined-Cycle, Cooling Tower	225
Nuclear, Steam Turbine, Cooling Tower	1,372
<b>WATER CONSUMPTION</b>	
<b>Power Generation Combination</b>	<b>Gal/MWh</b>
Fossil Fuel/Biomass, Steam Turbine, Once-Through Cooling	0
Fossil Fuel/Biomass, Steam Turbine, Cooling Tower	567
Fossil Fuel/Biomass, Gas (Combustion) Turbine	0
Natural Gas, Combined-Cycle, Cooling Tower	198
Nuclear, Steam Turbine, Cooling Tower	880

# Update Methodology - Water Demands for Thermo-Electric Power Generation

- Updated energy needs are estimated from new population projections and the relationship between population and energy needs as previously estimated
- A baseline and high demand scenario are estimated
  - Baseline is the expected energy need based on regression analysis & population projection
  - The standard error from the regression analysis is used to estimate the 95% upper limit (high demand)

# Update Methodology - Water Demands for Thermo-Electric Power Generation (*cont.*)

- Water withdrawal requirements and water consumption rates (in gallons per MWh) are multiplied by the power generation (MWh) of each power generating configuration to estimate the withdrawal and consumptive use.
- The locations of power generating facilities are known by region, watershed and node. Thus, the estimated water withdrawals and consumptive use can be allocated among the regions, watersheds and nodes

# Update Methodology - Water Demands for Thermo-Electric Power Generation (*cont.*)

- Water and power results are not yet complete
- Round 1 assumption was 1% of the energy need will be met through renewable (wind & solar) energy. Plan update (2016/2017) assume MW capacity from renewable (being developed with Ad Hoc Group Input)
- Hydropower generation is constant

# Update Results - Water Demands for Thermo-Electric Power Generation

- Energy forecast still under development with input from the Energy Ad Hoc group
- Three major power generating facilities in the Coastal Georgia region
  - Plant McIntosh - Effingham County
  - Plant McManus - Glynn County
  - Plant Wentworth (Kraft) – Chatham County

# Current Agricultural Demand Estimate and Method for Updates

1:30 PM – 2:15 PM





Georgia's  
**State Water Plan**

**Current Agricultural Demand Estimate and  
Method for Updates**

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

# Current Agricultural Demand Estimate and Method for Updates

Mark Masters

# Break

2:15 PM – 2:30 PM

# Appointment of Technical Subcommittee

2:30 PM – 2:45 PM

# Technical Subcommittees

- If needed, technical subcommittees may be appointed to continue to review key topics
- Input needed by April 15, 2016 to EPD

# Section 319(h) Georgia's Nonpoint Source Implementation Grant Funding

2:45 AM – 3:15 AM



Georgia's  
**State Water Plan**

Section 319(h) Georgia's Nonpoint  
Source Implementation Grant  
Funding

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

# Public Comments

3:15 PM – 3:30 PM



# Public Comments

- Sign up for public comments during registration period (to ensure enough time is allotted)
- Please limit comments to 3 minutes total
- Council encourages written submission of comments as well, to ensure meeting summaries accurately reflect comments

# Wrap-Up, What to Expect Next Meeting

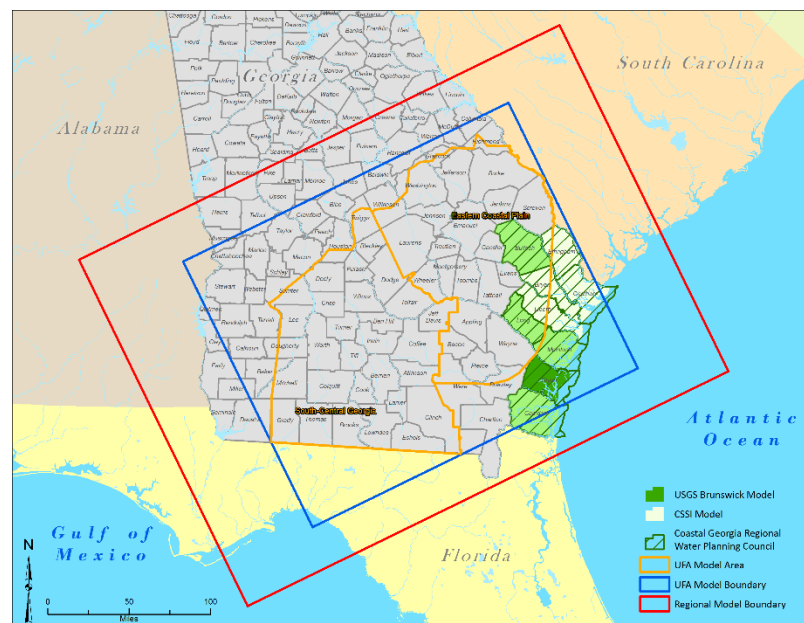
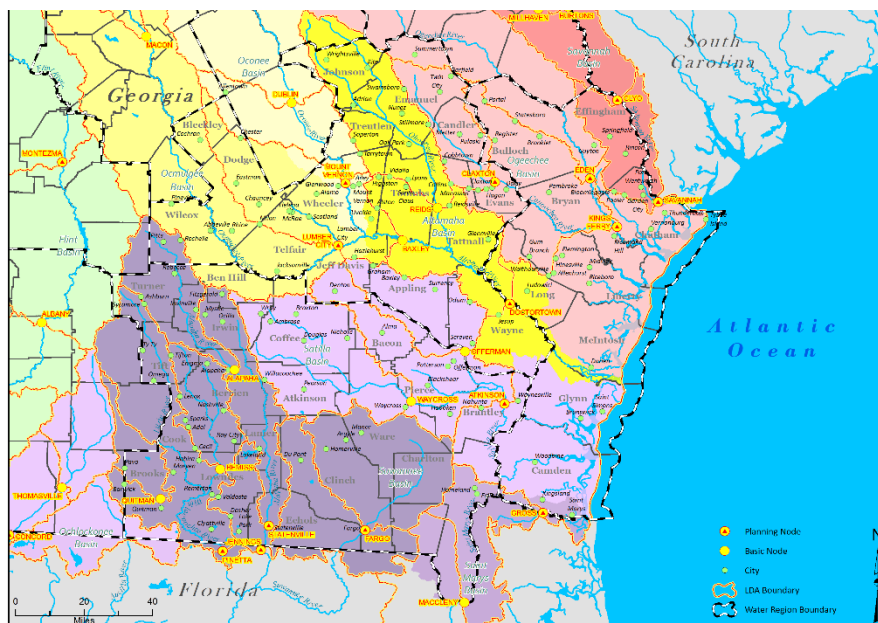
3:30 PM – 3:45 PM

# Next Meeting

- 2<sup>nd</sup> quarterly meeting (June 2016 timeframe) will be a Joint Council Meeting
  - Members can be delegates to attend the afternoon breakout session to neighboring councils

# Council Meeting 2

- Updates to Resource Assessments will focus on both surface water and groundwater and changes, if any, to the Gap Analysis conducted in Round 1



# Council Meeting 1 Evaluation

3:45 PM – 4:00 PM

# Thank You!

Questions? Comments? Need  
More Information?

[Woodsh@cdmsmith.com](mailto:Woodsh@cdmsmith.com)

[Jeff.Larson@dnr.ga.gov](mailto:Jeff.Larson@dnr.ga.gov)

Council Meeting Evaluation: Please let us know what went well at this meeting, and any suggestions for next meeting.

# Detailed Slides

# Population & Municipal water demand forecast

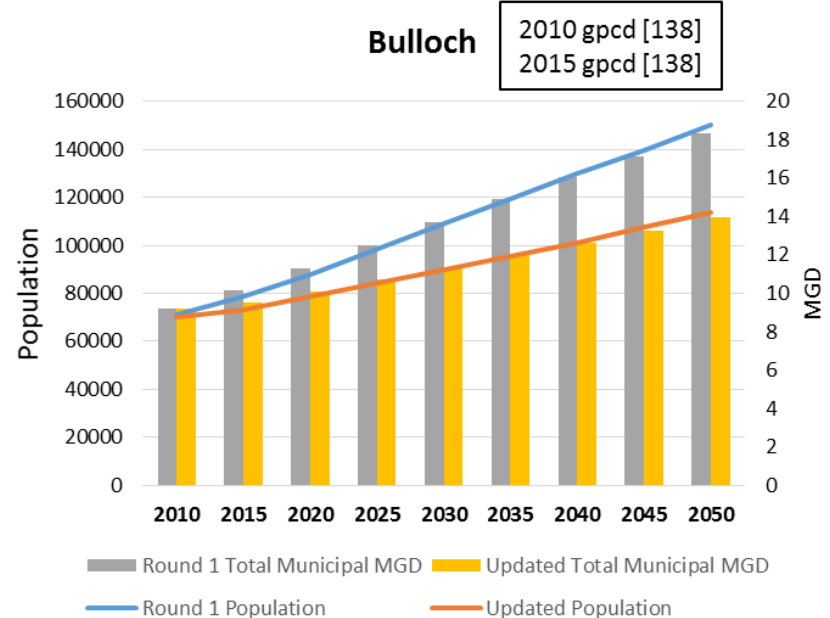
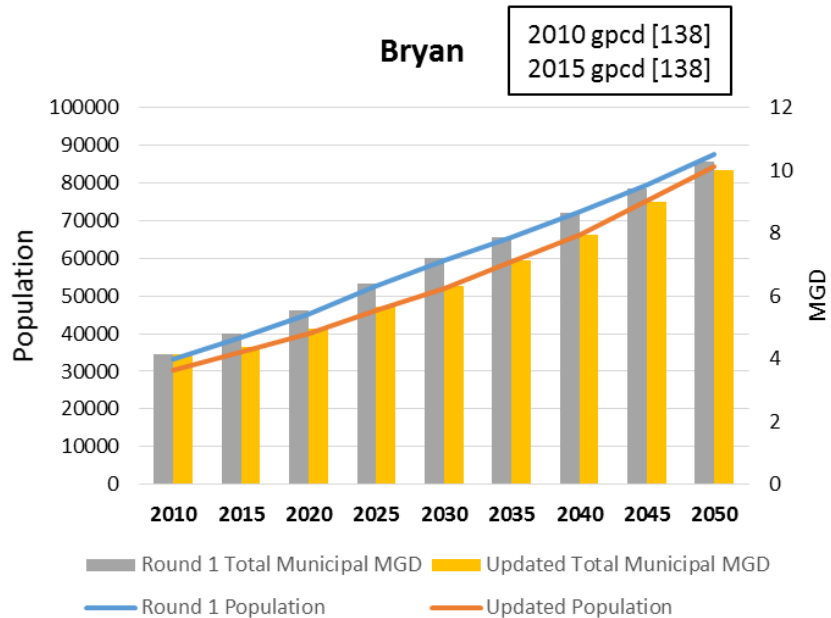
		Population	change							
		2010	2015	2020	2025	2030	2035	2040	2045	2050
CGA - Coastal Georgia	Bryan	(3,093)	(3,877)	(5,107)	(6,422)	(7,610)	(6,492)	(5,968)	(4,126)	(2,968)
	Bulloch	(655)	(5,680)	(9,429)	(14,152)	(19,206)	(23,840)	(28,584)	(32,211)	(36,498)
	Camden	(2)	(7,186)	(15,318)	(25,977)	(37,064)	(47,706)	(59,095)	(70,770)	(83,727)
	Chatham	7,726	12,202	13,867	14,211	14,994	15,609	16,766	18,471	19,985
	Effingham	(3,927)	(10,645)	(17,574)	(26,440)	(35,742)	(43,301)	(51,009)	(55,772)	(61,724)
	Glynn	999	(2,535)	(5,540)	(9,147)	(13,104)	(17,335)	(21,885)	(26,189)	(31,055)
	Liberty	1,513	(6,643)	(10,934)	(17,100)	(22,931)	(28,626)	(34,770)	(42,330)	(50,376)
	Long	2,571	4,358	5,214	6,365	7,447	8,757	9,926	11,277	12,477
	McIntosh	2,272	(45)	(2,333)	(5,133)	(7,908)	(10,624)	(13,471)	(16,379)	(19,475)
		7,404	(20,051)	(47,155)	(83,794)	(121,124)	(153,558)	(188,090)	(218,028)	(253,361)



# Population & Municipal water demand forecast

Council	County	Adjusted 2005 Per Capita	2014	Adjusted 2014 Per Capita	gpcd difference
			gpcd % change		
CGA - Coastal Georgia	Bryan	138	-0.2%	138	-0.3
	Bulloch	138	-0.3%	138	-0.4
	Camden	138	-3.4%	133	-4.8
	Chatham	138	-1.6%	136	-2.2
	Effingham	138	1.7%	140	2.3
	Glynn	138	-2.3%	135	-3.2
	Liberty	138	-1.2%	136	-1.7
	Long	138	-0.6%	137	-0.9
	McIntosh	138	-4.1%	132	-5.7

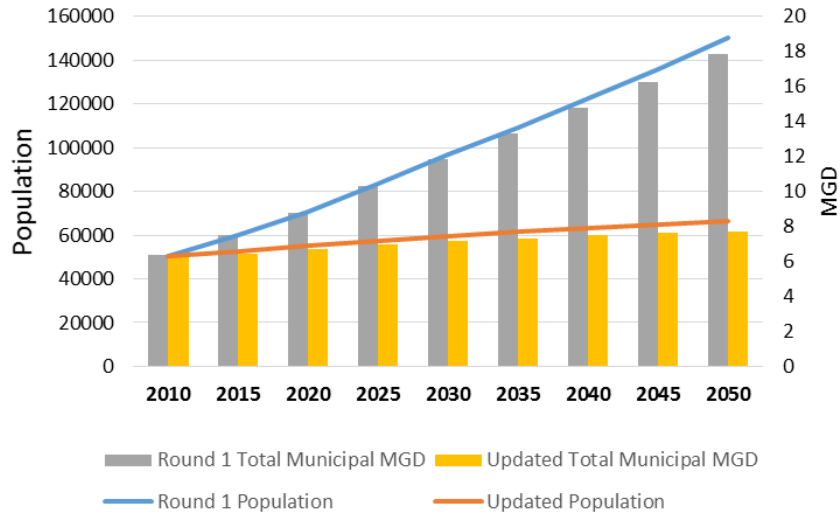
# Population & Municipal water demand forecast



# Population & Municipal water demand forecast

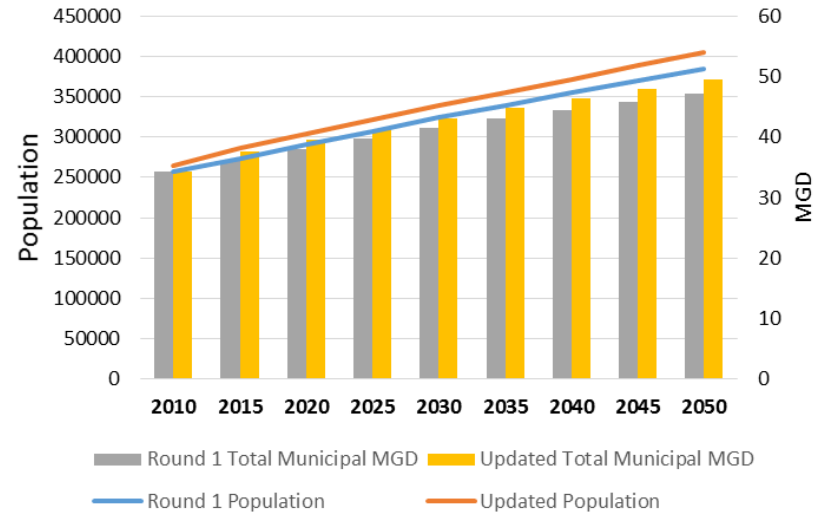
## Camden

2010 gpcd [138]  
2015 gpcd [133]

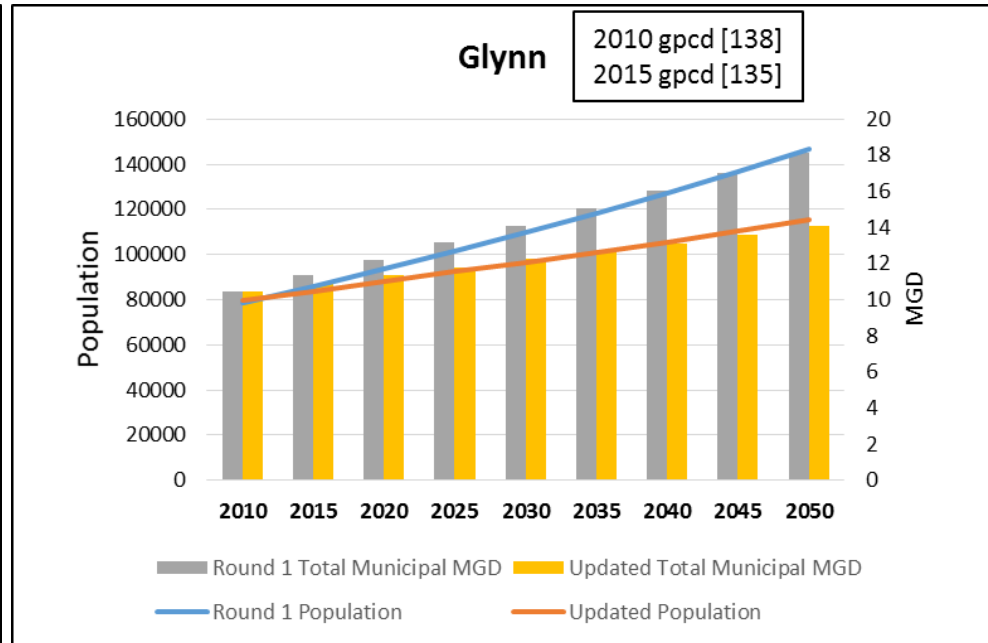
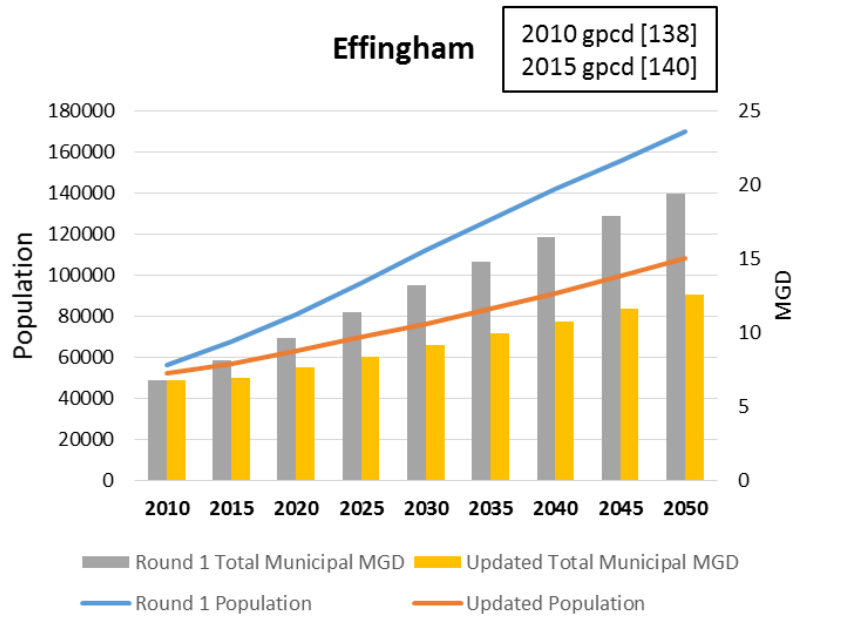


## Chatham

2010 gpcd [138]  
2015 gpcd [136]



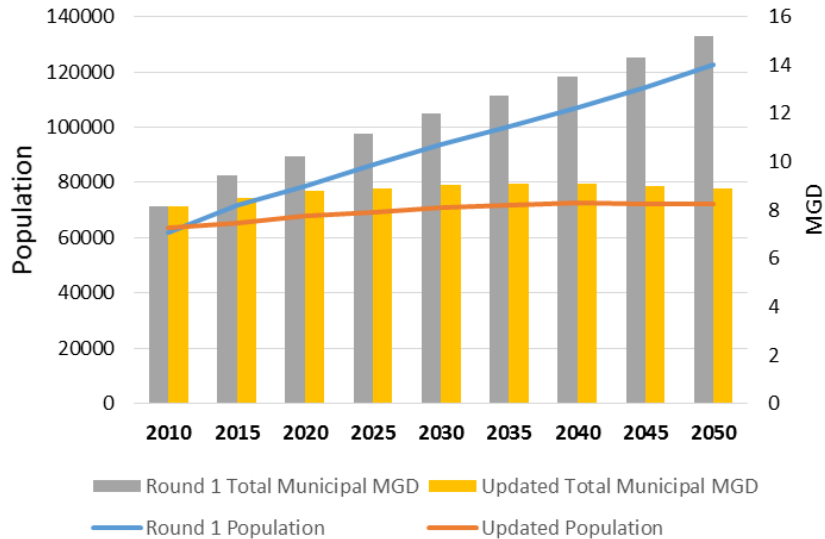
# Population & Municipal water demand forecast



# Population & Municipal water demand forecast

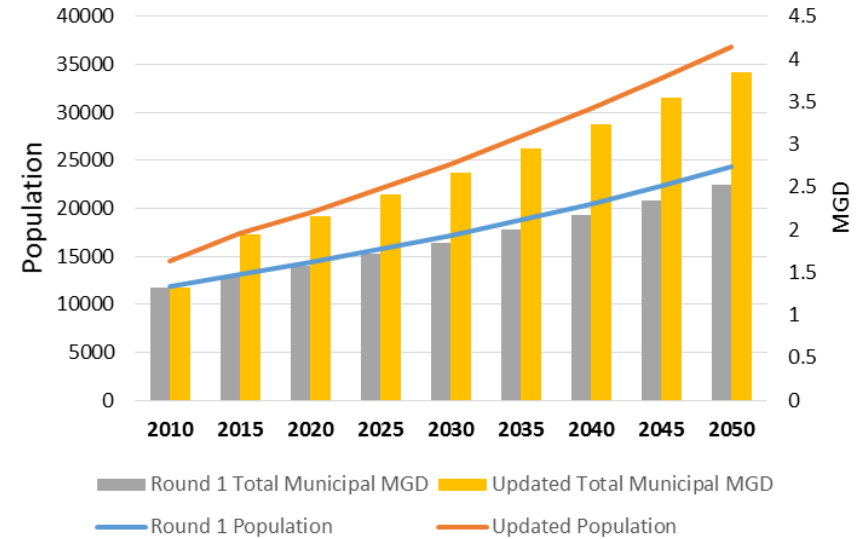
## Liberty

2010 gpcd [138]  
2015 gpcd [136]

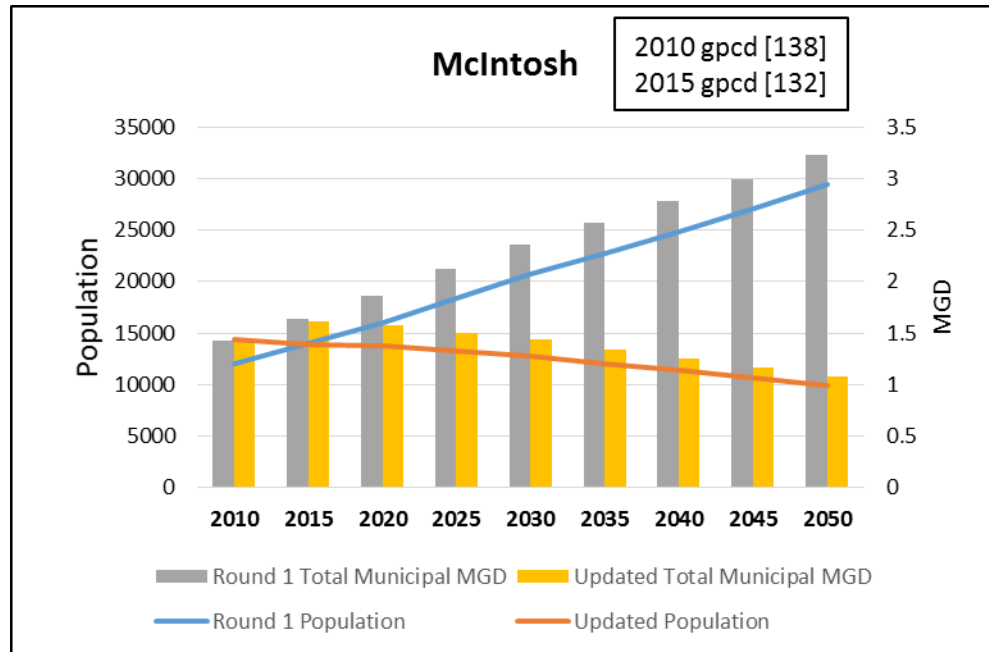


## Long

2010 gpcd [138]  
2015 gpcd [137]



# Population & Municipal water demand forecast



# Municipal Wastewater Forecast Update Results

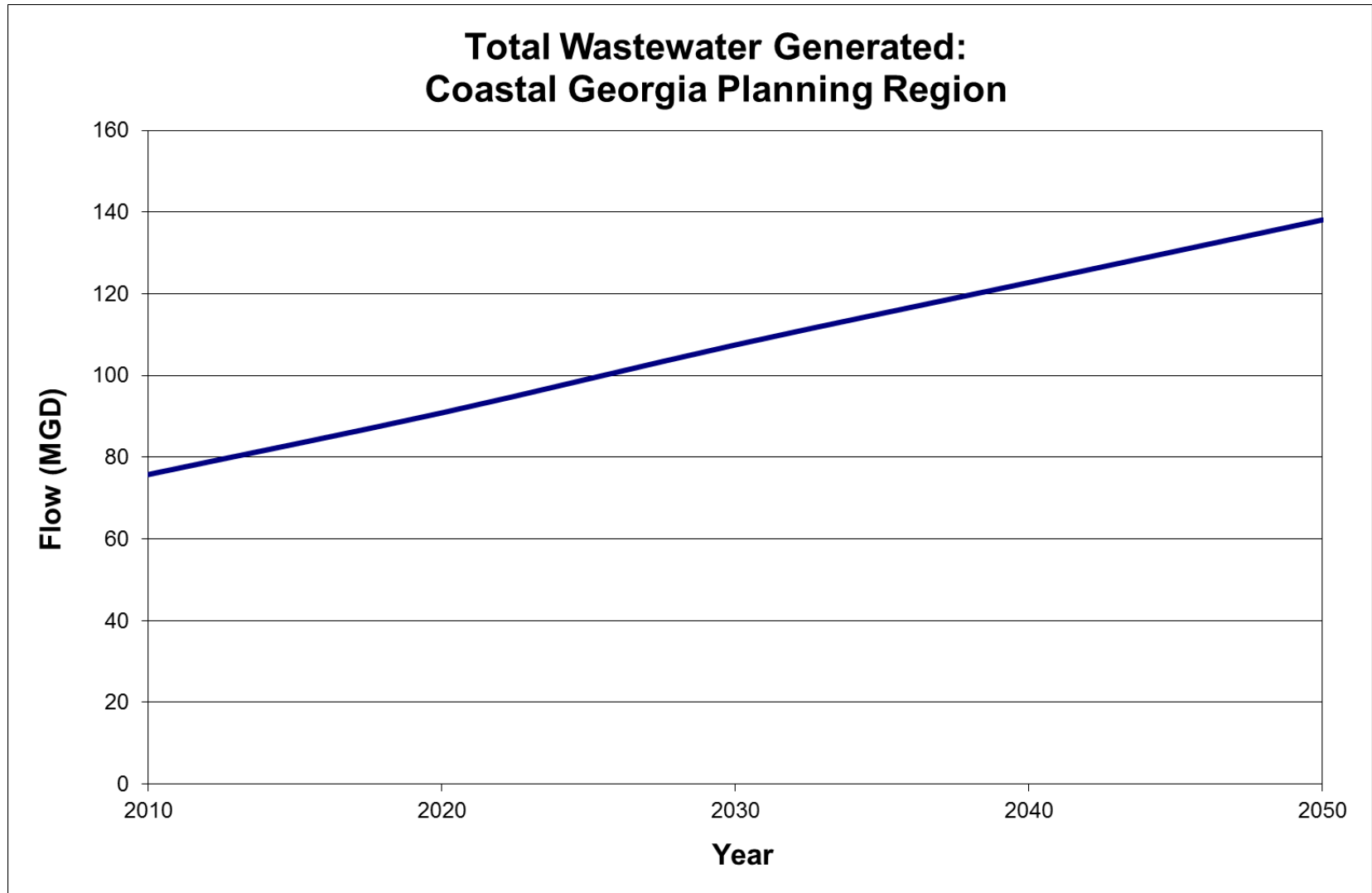
County	2015 Wastewater Flow	% of Total 2015 Wastewater Flow
Bryan	4.74	5.6%
Bulloch	9.90	11.7%
Camden	6.45	7.6%
Chatham	35.30	41.7%
Effingham	6.20	7.3%
Glynn	14.09	16.7%
Liberty	4.65	5.5%
Long	1.48	1.7%
McIntosh	1.79	2.1%
<b>Grand Total</b>	<b>84.60</b>	<b>100.0%</b>

# Municipal Wastewater Forecast Round 1 Results

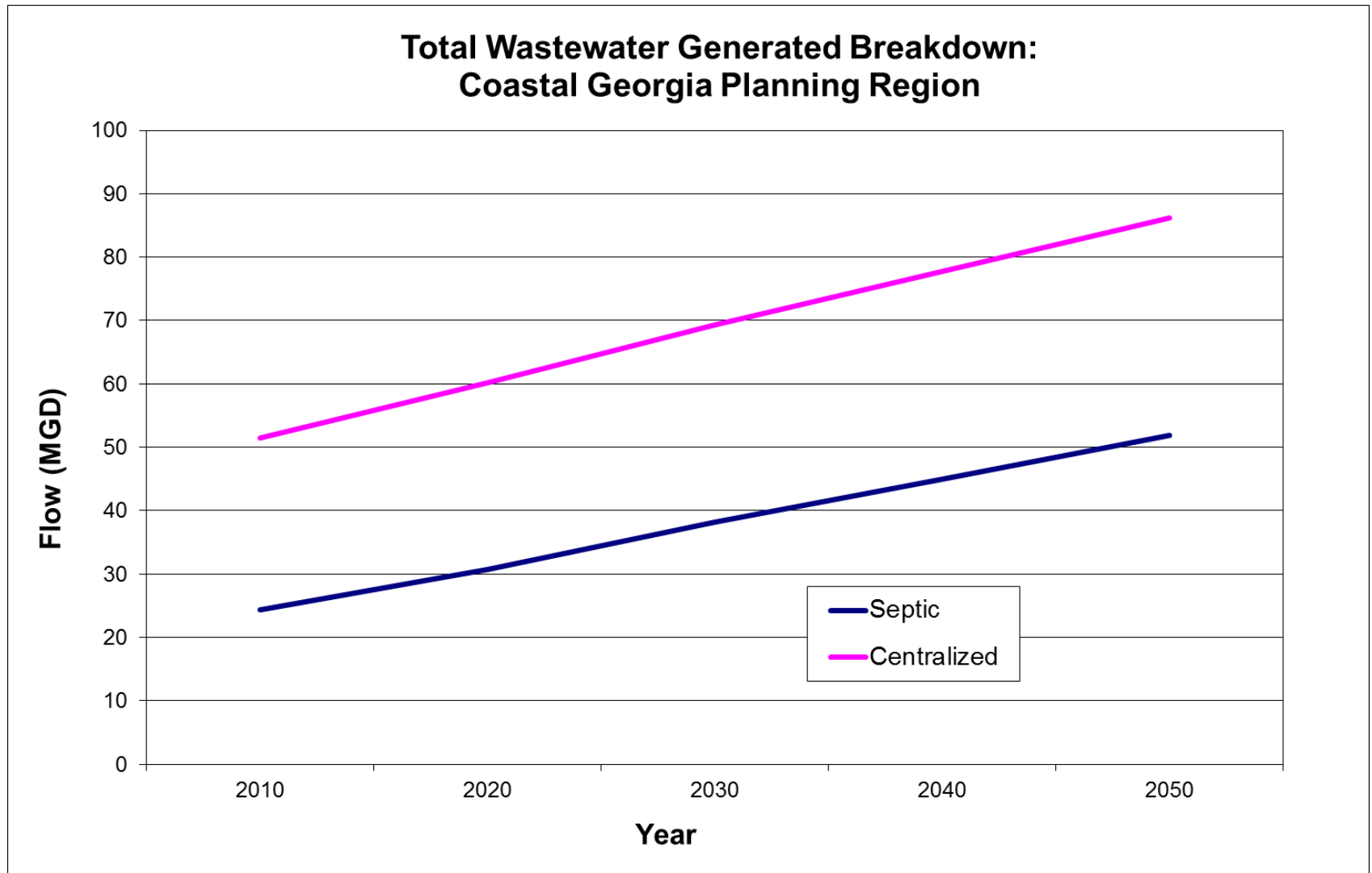
County	2015 Wastewater Flow	% of Total 2015 Wastewater Flow
Bryan	3.34	4.4%
Bulloch	7.53	9.9%
Camden	6.15	8.1%
Chatham	33.18	43.8%
Effingham	5.35	7.1%
Glynn	9.62	12.7%
Liberty	8.17	10.8%
Long	1.15	1.5%
McIntosh	1.26	1.7%
<b>Grand Total</b>	<b>75.76</b>	<b>100.0%</b>



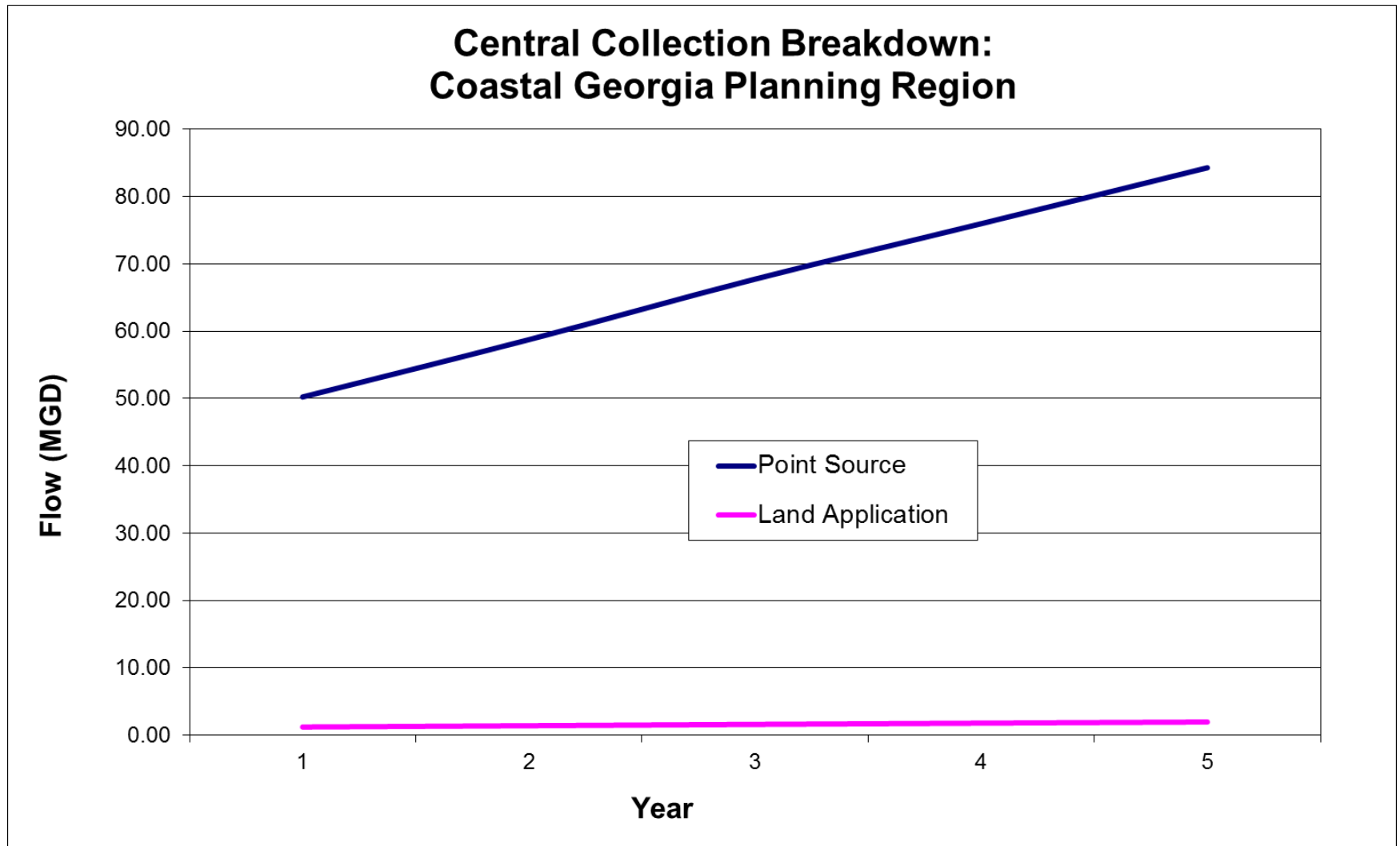
# Municipal Wastewater Forecast Round 1 Results



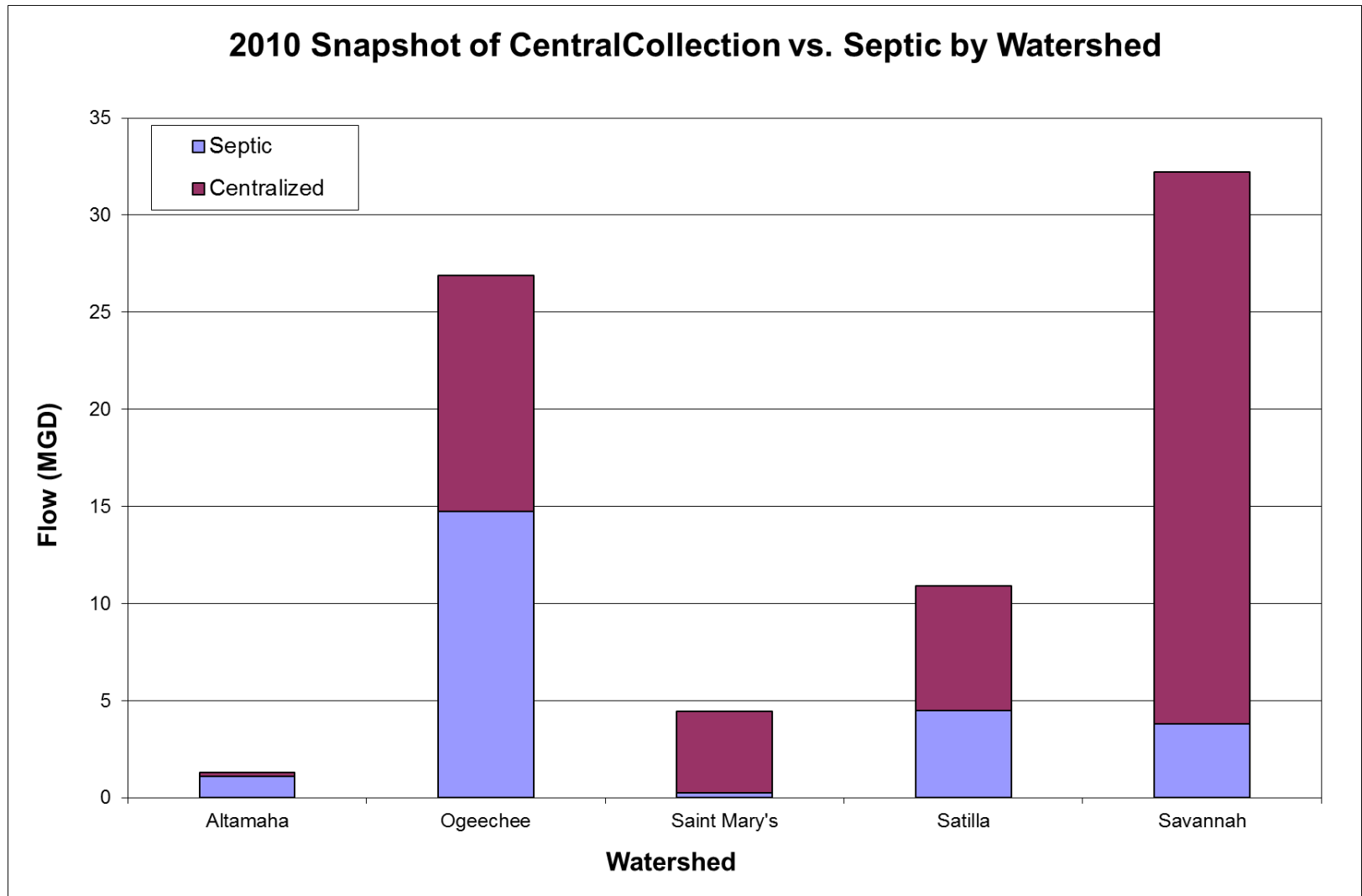
# Municipal Wastewater Forecast Round 1 Results



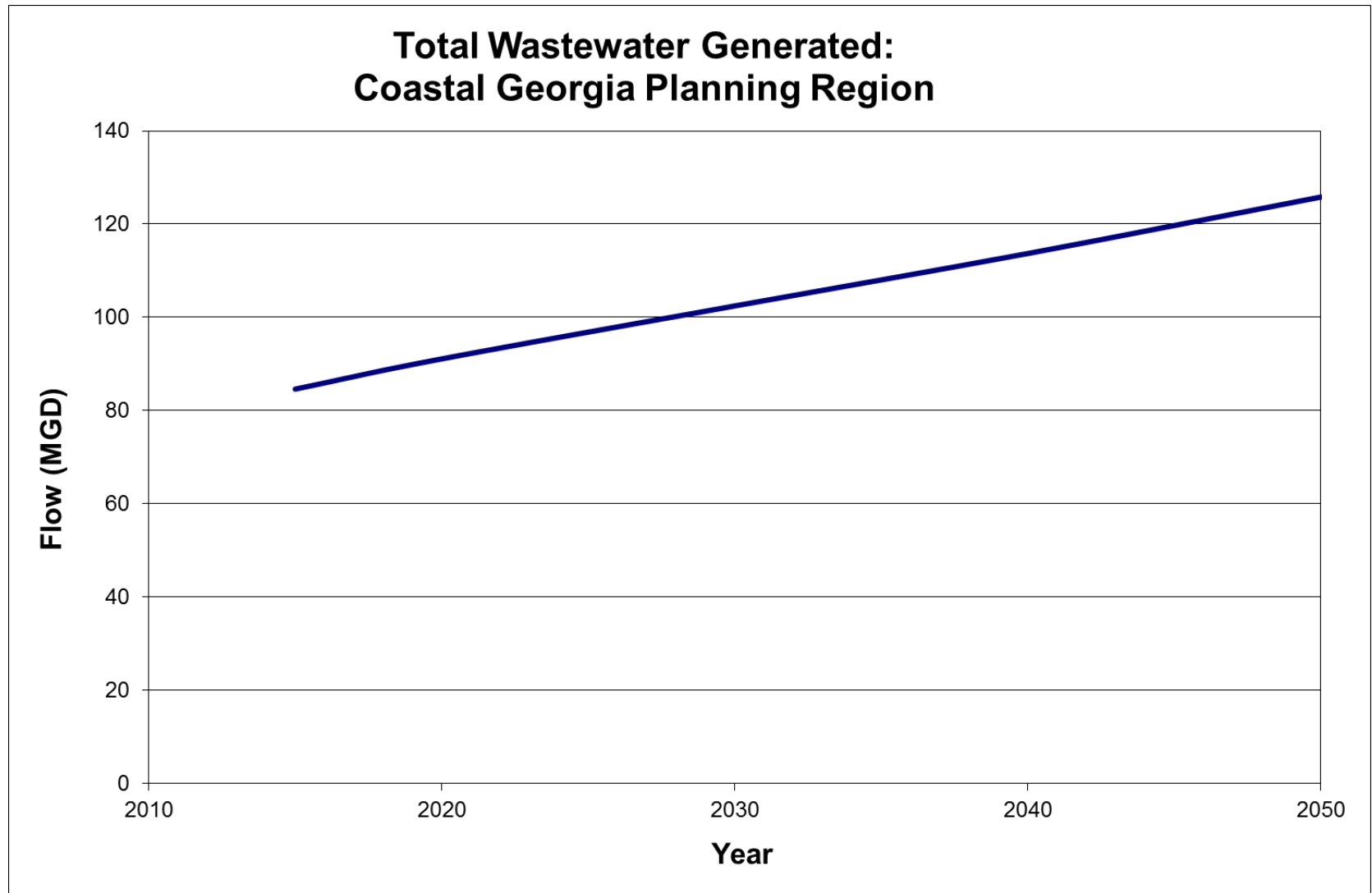
# Municipal Wastewater Forecast Round 1 Results



# Municipal Wastewater Forecast Round 1 Results

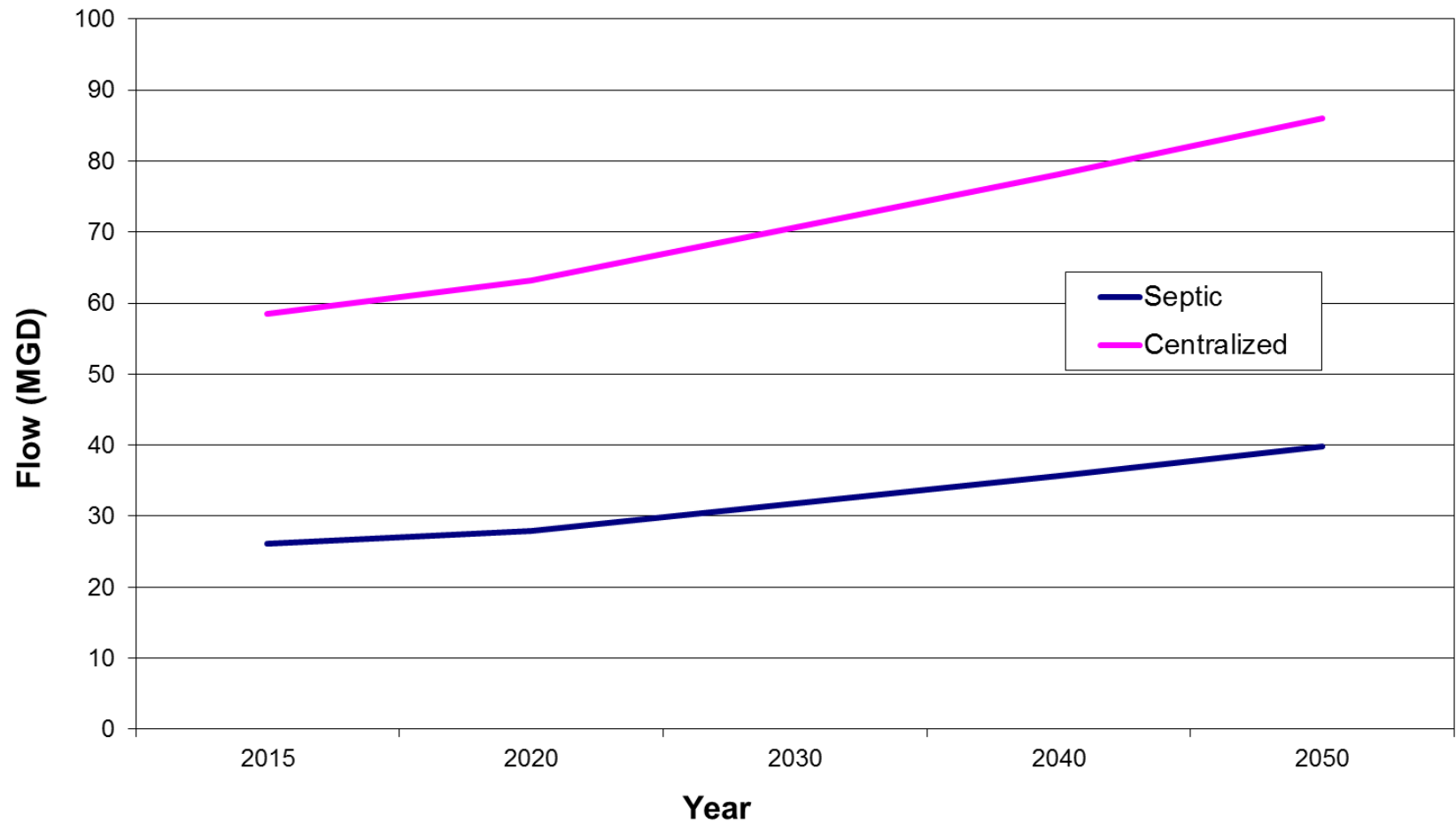


# Municipal Wastewater Forecast Update Results



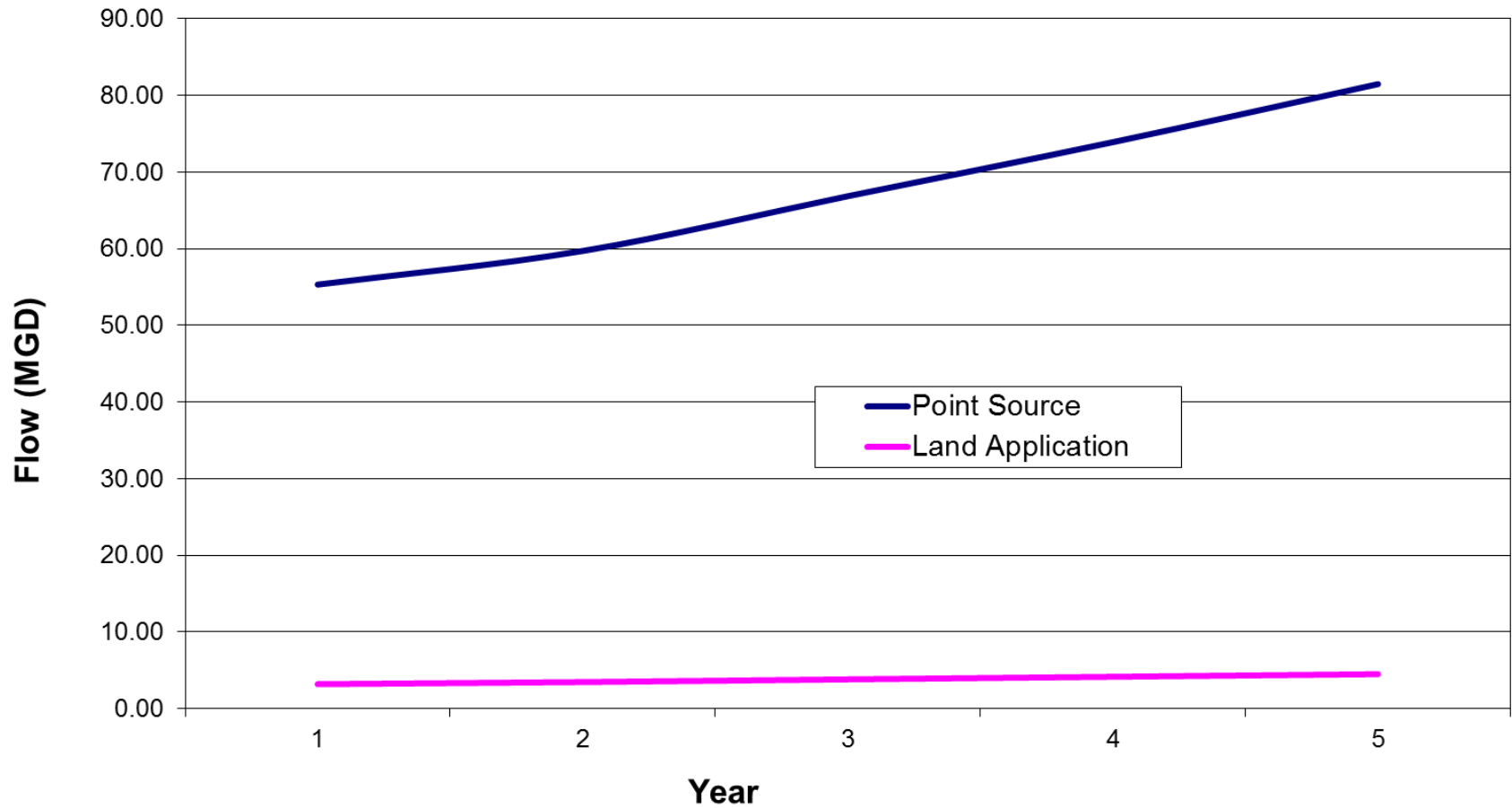
# Municipal Wastewater Forecast Update Results

## Total Wastewater Generated Breakdown: Coastal Georgia Planning Region

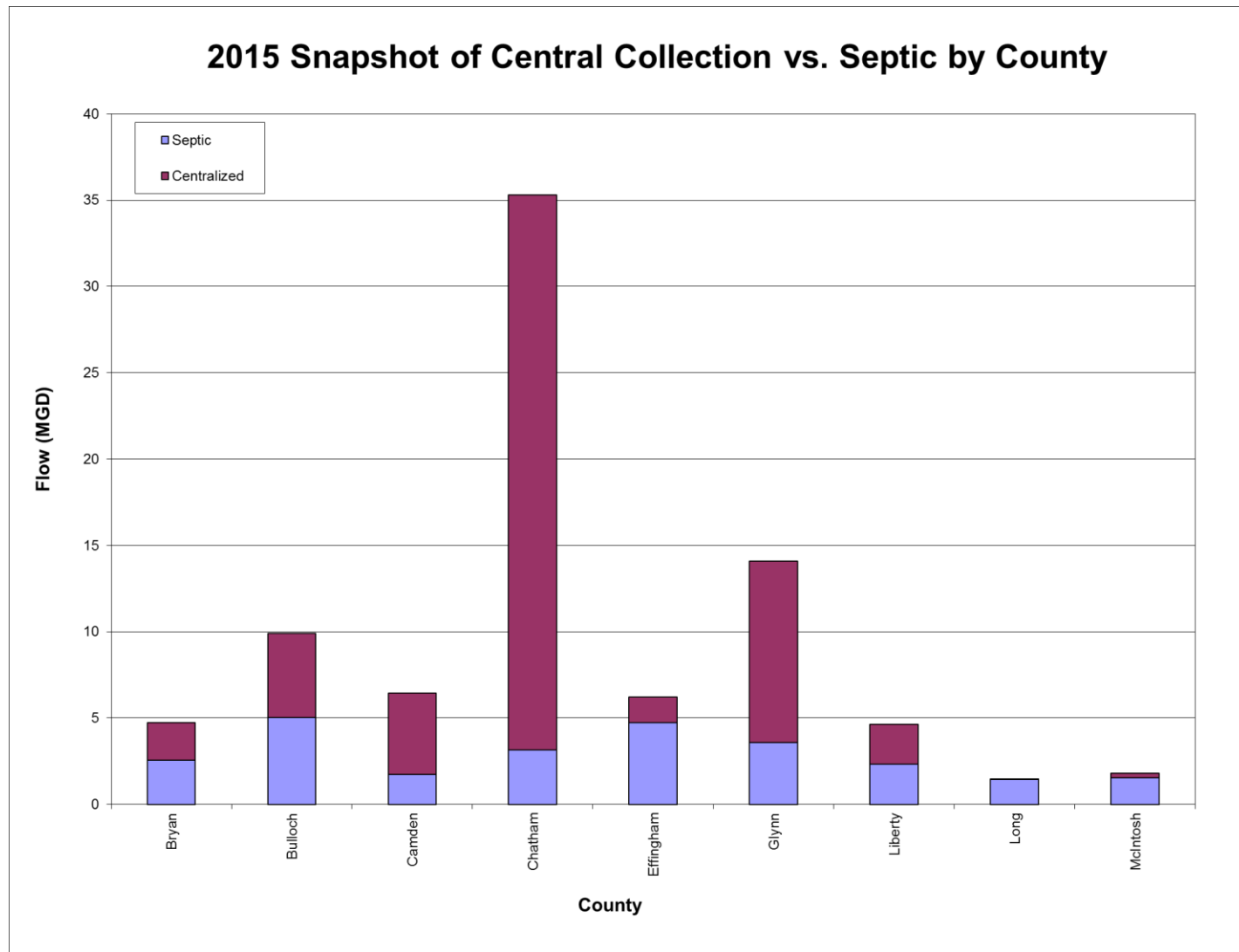


# Municipal Wastewater Forecast Update Results

## Central Collection Breakdown: Coastal Georgia Planning Region

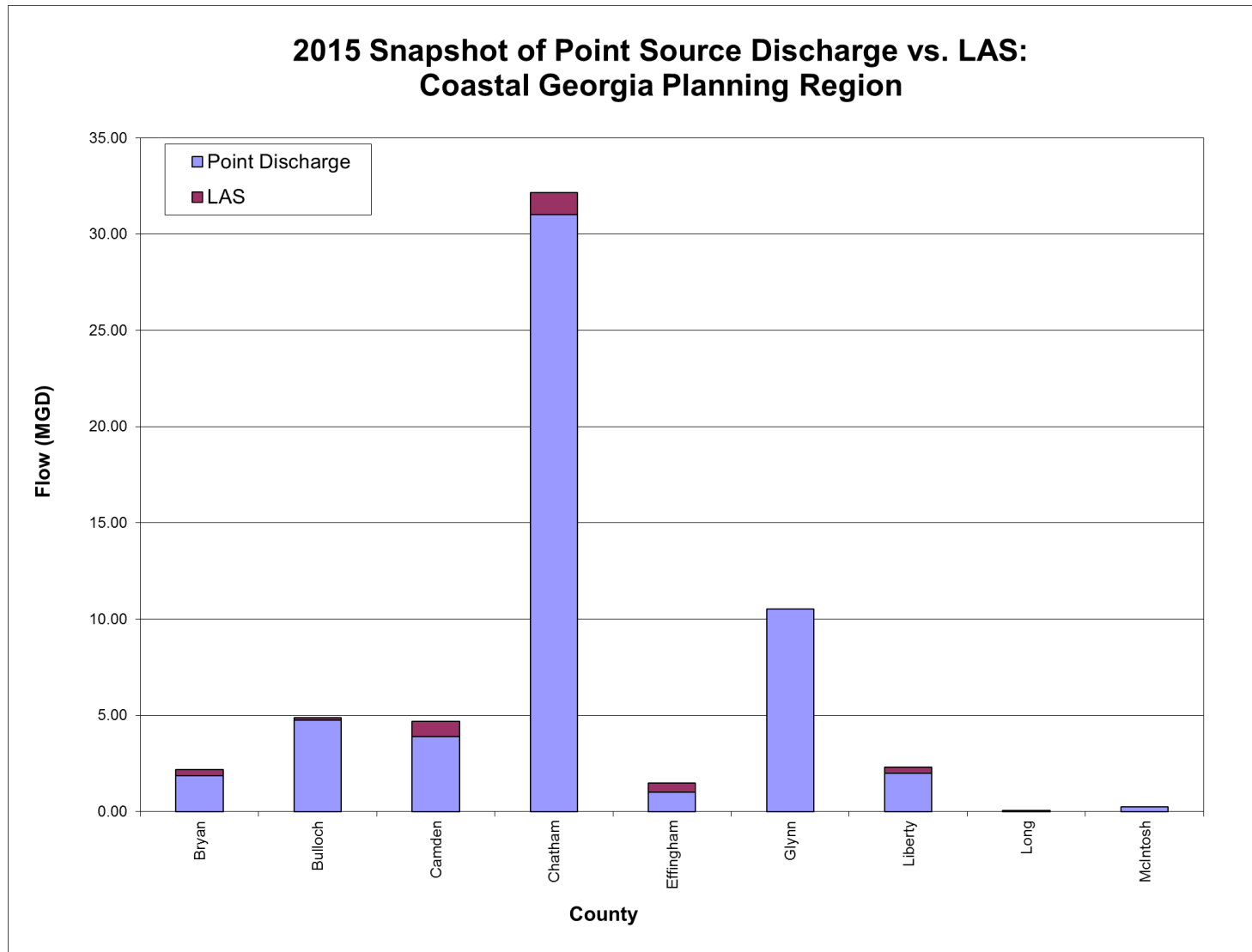


# Municipal Wastewater Forecast Update Results



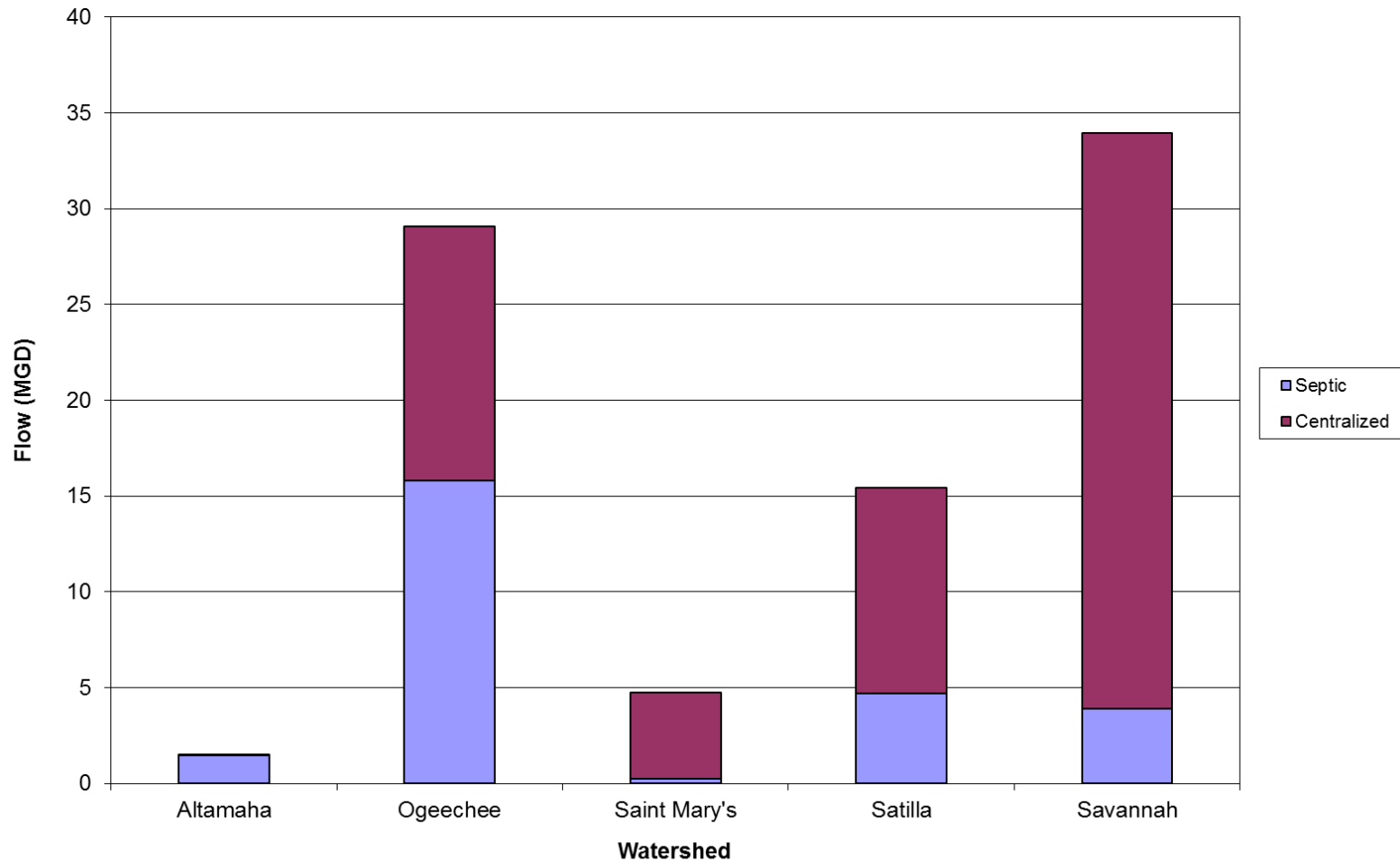


# Municipal Wastewater Forecast Update Results



# Municipal Wastewater Forecast Update Results

2015 Snapshot of CentralCollection vs. Septic by Watershed



# Major Water-Using Industries in Georgia

<b>Industry</b>	<b>SIC Code</b>	<b>NAICS Code</b>	<b>Industry</b>	<b>SIC Code</b>	<b>NAICS Code</b>
<b>Mining</b>	<b>14</b>	<b>212</b>	<b>Petroleum</b>	<b>29</b>	<b>324</b>
<b>Food</b>	<b>20</b>	<b>311</b> <b>312</b>	<b>Rubber</b>	<b>30</b>	<b>326</b>
<b>Textiles</b>	<b>22</b>	<b>313</b> <b>314</b>	<b>Stone and Clay</b>	<b>32</b>	<b>327</b>
<b>Apparel</b>	<b>23</b>	<b>315</b>	<b>Primary Metals</b>	<b>33</b>	<b>331</b>
<b>Paper</b>	<b>26</b>	<b>322</b>	<b>Fabricated Metal Products</b>	<b>34</b>	<b>332</b>
<b>Chemicals</b>	<b>28</b>	<b>325</b>	<b>Electric Machinery</b>	<b>36</b>	<b>335</b>