Georgia's

State Water Plan

Regional Water Development and Conservation Plan Review and Revision
Altamaha Water Planning Council
Meeting 1, March 3, 2016

www.georgiawaterplanning.org

Registration

9:00 AM – 9:30 AM

Georgia™

Welcome and Introductions / Approve Agenda

9:30 AM – 9:45 AM

Georgia™

Introduction

- Welcome from Chair Jeffords
- Council Introductions
- Review and Approve Agenda

Georgia's
State Water Plan

Altamaha Regional Water Council Meeting 1
Agenda – March 3, 2016

Objectives:

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

8:30–9:00 a.m.	[New Member Training and Orientation - Optional/If Needed]
9:00–9:30 a.m.	Registration
9:30–9:45	Welcome and Introductions / Approve Agenda
9:45-10:00	Regional Water Planning Overview/Schedule
10:00-10:15	Review Plan Vision and Goals
	Discuss Updates to Memorandum of Agreement
10:15–10:30	Section 319(h) Georgia's Nonpoint Source Implementation Grant Funding
10:30-11:15	Current Agricultural Demand Estimate and Method for Updates
11:15 - 11:30	Break
11:30- 12:00 p.m.	Updated Population Projections
12:00-12:45	Lunch
12:45 - 1:30	Municipal Water / Wastewater Forecast Updates
1:30-2:00	Industrial Water / Wastewater Forecast Updates
2:00-2:15	Break
2:15-2:45	Energy Forecast Updates
2:45-3:00	Appointment of Subcommittee [or other Council-Specific agenda needs]
3:00–3:15	Public Comments/Local Elected Official Comments
3:15–3:30	Wrap Up/Council Meeting 2 Preview/ Council Meeting 1 Evaluation

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

Review and Revision Process
Georgia EPD Contacts

- Jennifer Welte – Point of Contact, Project Manager for Review & Revision Process
- 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

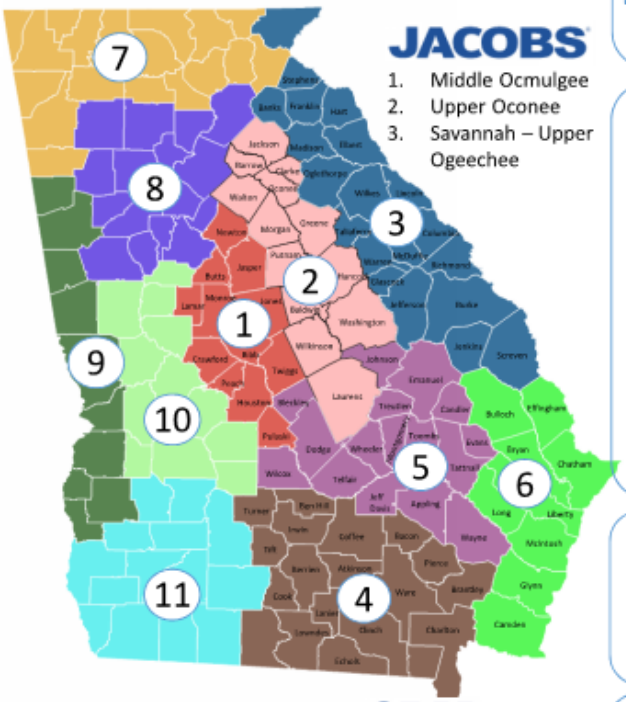
- Primary Council Support - Danielle Honour
- Project Manager - Shayne Wood
- Technical Director – Sue Morea
- Technical Advisor - Rick Brown

- Demand Forecasting – Bill Davis
- Water Availability Resource Assessments (Groundwater and Surface Water) – Lee Wiseman
- Management Practices – Dale Jones

Georgia

Georgia's
State Water Plan
Regional Water Planning

Georgia's Water Planning Regions



JACOBS

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

2016 - 2017 Plan Review and Revision

CDM Smith

4. Suwannee – Satilla
5. Altamaha
6. Coastal

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
- Phone: (404) 463-4952

Jacobs Lead: Michelle Vincent
- Email: Michelle.Vincent@jacobs.com
- Phone: (404) 751-2160

2 Upper Oconee

Chair: Melvin Davis
- Email: 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
- Phone: (404) 232-7834

Jacobs Lead: Dale Jones (Interim)
- Email: Dale.Jones@jacobs.com
- Phone: (678) 520-6944

3 Savannah-Upper Ogeechee

Chair: Ron C. Cross
- Email: rcross@columbiacountyga.gov
- Phone: (706) 868-3379
- Title: Chairman, Columbia County Board of Commissioners

EPD Lead: Jeff Larson
- Email: jeff.larson@dnr.ga.gov
- Phone: (404) 308-8062

Jacobs Lead: Katherine Atteberry
- Email: Katherine.Atteberry@jacobs.com
- Phone: (404) 978-7430

4 Suwannee- Satilla

Chair: Scott Downing
- Email: sdi1@windstream.net
- Phone:
- Title: Chairman, Ben Hill County Commission

EPD Lead: Cliff Lewis
- Email: cliff.lewis@dnr.ga.gov
- Phone: (229) 894-2554

CDM Lead: Shayne Wood
- Email: woodsh@cdmsmith.com
- Phone: (904) 993-5568

5 Altamaha

Chair: Edward S. Jeffords
- Email: ed.jeffords@rayonieram.com
- Phone: (912) 427-5155
- Title: Sr. Engineer, Rayonier Advanced Materials

EPD Lead: Jennifer Welte
- Email: jennifer.welte@dnr.ga.gov
- Phone: (404) 463-1694

CDM Lead: Danielle Honour
- Email: honourdm@cdmsmith.com
- Phone: (407) 660-2552

6 Coastal

Chair: Benjamin Thompson
- Email: 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
- Phone: (404) 463-1694

CDM Lead: Shayne Wood
- Email: 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

Georgia

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

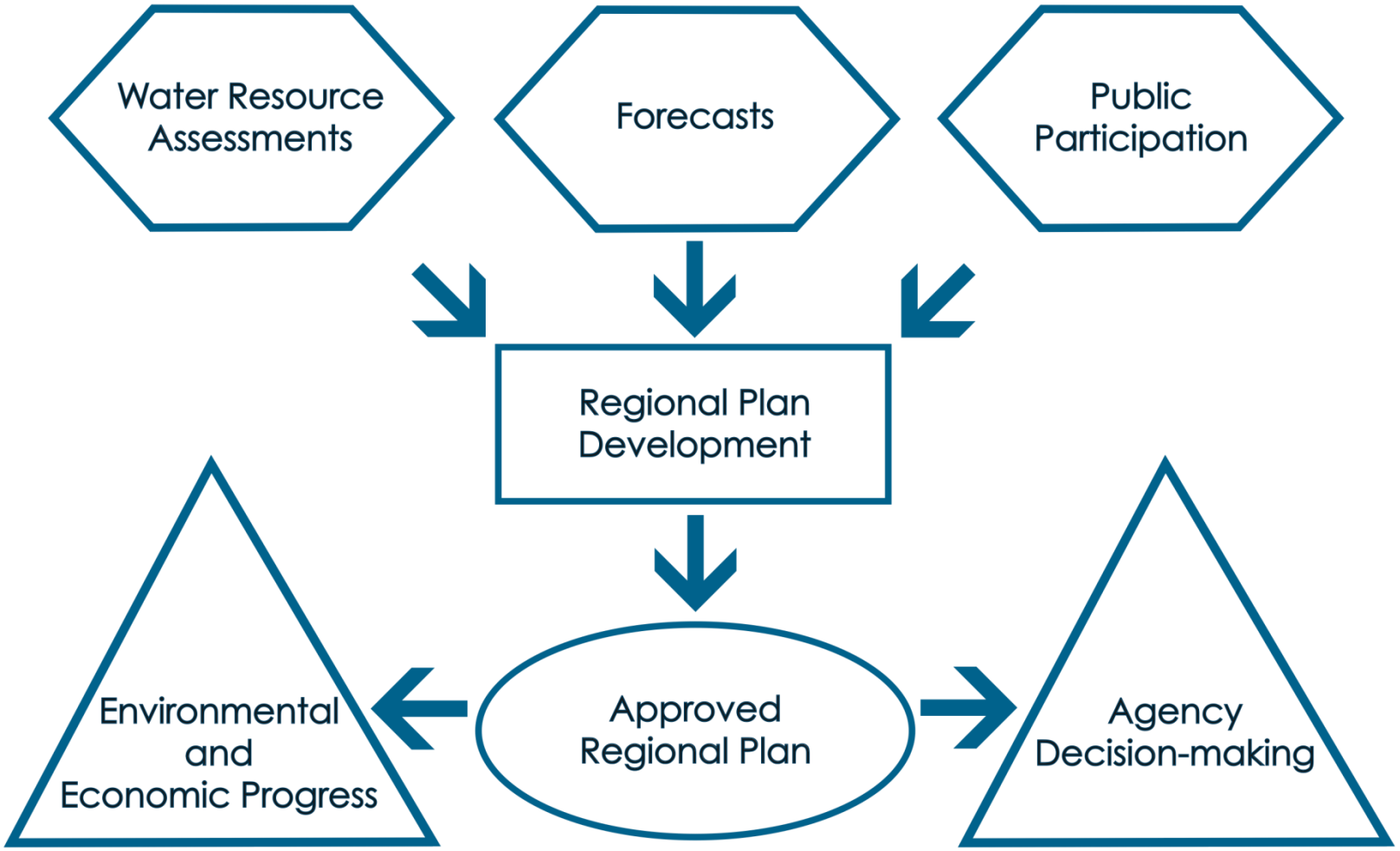
Georgia™

Plan Review & Revision Overview/Schedule

9:45 AM – 10:00 AM

Georgia

Water Planning Process



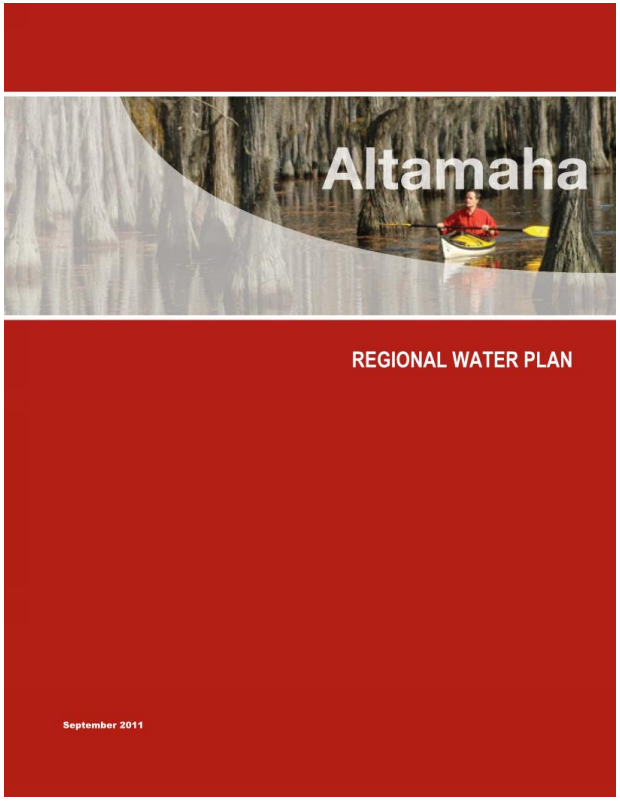
Purpose and Use of 2011 Regional Water Plans

- 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

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



Georgia

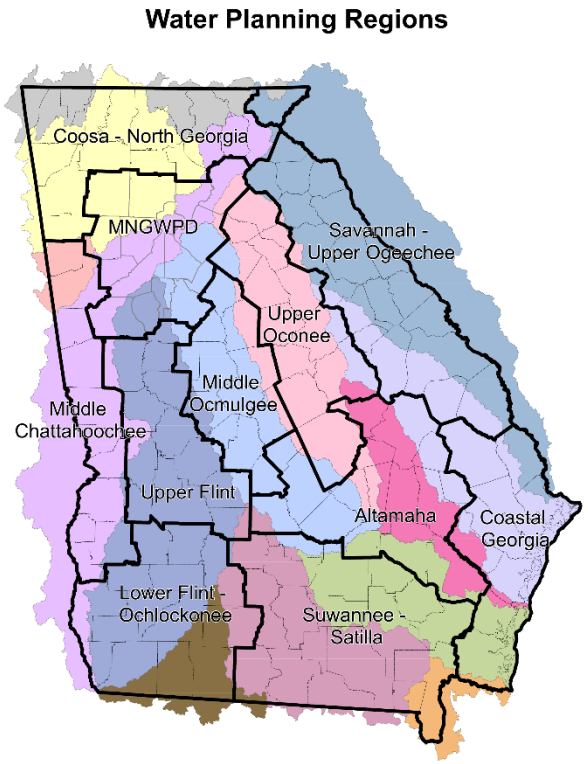
Review and Revision Process (*cont.*)

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
- 2nd quarterly meeting (June 2016) will be a Joint Council Meeting
  - Savannah-Upper Ogeechee
  - Upper Oconee
  - Middle Ocmulgee
  - Coastal Georgia
  - Suwannee-Satilla
  - Delegates (Upper Flint, LFO)
- Joint Council Meeting for western councils also to be held in June 2016



Review and Revision Process (*cont.*)

	Regional Water Planning Council Activities (FY2016 - FY2017)	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
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	**Meeting 1** - Demand Forecasting Updates																		
	Meeting 2 (Joint) - Agriculture Demands and updates to Resource Assessment and Gap Analysis																		
	Meeting 3 - Review Management Practices and Select Future Scenarios to Address Gaps																		
	Meeting 4 - Refining / Selecting Management Practices and Provide Draft Plan to EPD																		
	Meeting 5 - Adopt Revisions to the recommended draft Plan																		

Georgia

Review and Revision Process (*cont.*)

Revisions to Regional Water Plans

- 1st Draft –Updates to M&I and Energy Forecasting (April 2016)
- 2nd Draft –Updates to Agricultural Forecasting and Resource Assessment (July 2016)
- 3rd 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

Georgia

Vision and Goals, Memorandum of Agreement (MOA)

10:00 AM – 10:15 AM

Georgia™

Georgia's

State Water Plan

Vision and Goals

www.georgiawaterplanning.org

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

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

Altamaha Adopted Vision

as adopted by the Council 10.28.10

"The vision of the Altamaha Regional Water Planning Council is to wisely manage, develop, and protect the region's water resources for current and future generations by ensuring that the Altamaha basin's water resources are sustainably managed to enhance quality of life and public health, protect natural systems including fishing, wildlife and wildlife utilization activities, and support the basin's economy."

Vision and Goals

Altamaha Adopted Goals

as adopted by the Council 11.19.10

- Protection of recharge areas
- Optimize existing & future supplies
- Promote water conservation
- Prepare for climate & water supply variability
- Implement cost effective management strategies
- Manage resources sustainably to meet needs including economic and population growth
- Identify opportunities to minimize excessive regulations
- Ensure an adequate water supply of suitable quality
- Optimize existing water and wastewater infrastructure
- Identify opportunities to manage water, wastewater, and stormwater to improve water quantity and quality to protect natural resources
- Work collaboratively with other regions

Georgia

Georgia's

State Water Plan

Memorandum of Agreement
Operating Procedures
Meeting Rules
Public Involvement Plan

www.georgiawaterplanning.org

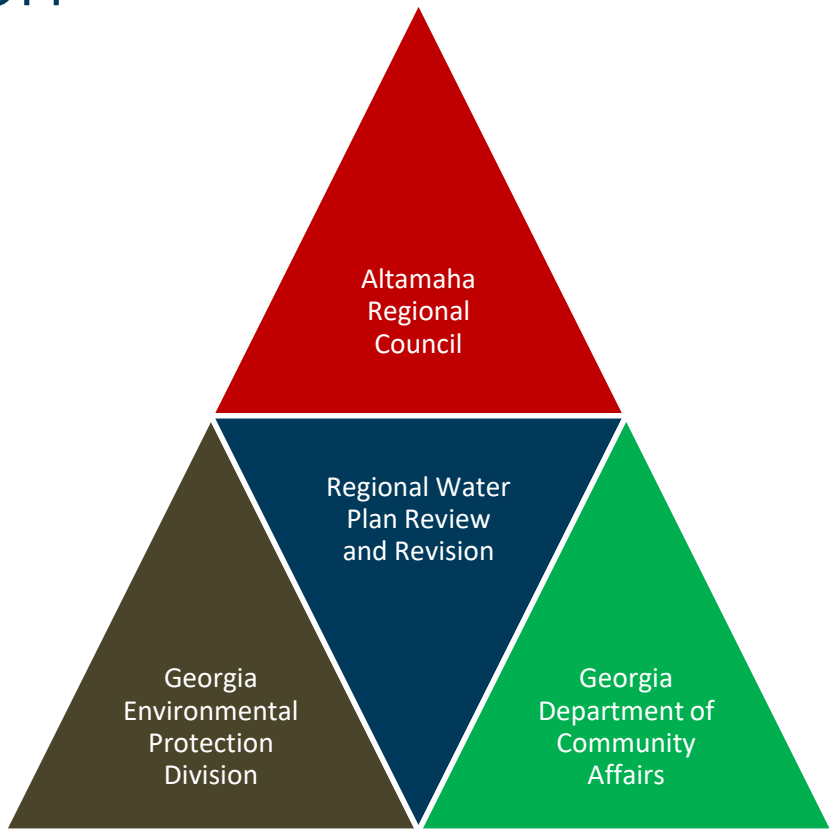
What are We Responsible for and How Will We Operate?

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

Georgia

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

Georgia

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

Georgia™

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

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 (PIP)

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

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

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

10:15 AM – 10:30 AM

Georgia

Georgia's

State Water Plan

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

www.georgiawaterplanning.org

Current Agricultural Demand Estimate and Method for Updates

10:30 PM – 11:15 PM

Georgia

Georgia's

State Water Plan

Current Agricultural Demand Estimate and Method for Updates

www.georgiawaterplanning.org

Current Agricultural Demand Estimate and Method for Updates

Mark Masters

Georgia

Break

11:15 AM – 11:30 AM

Georgia™

Updated Population Projections

11:30 AM – 12:00 PM

Georgia™

Georgia's

State Water Plan

Updated Population Projections

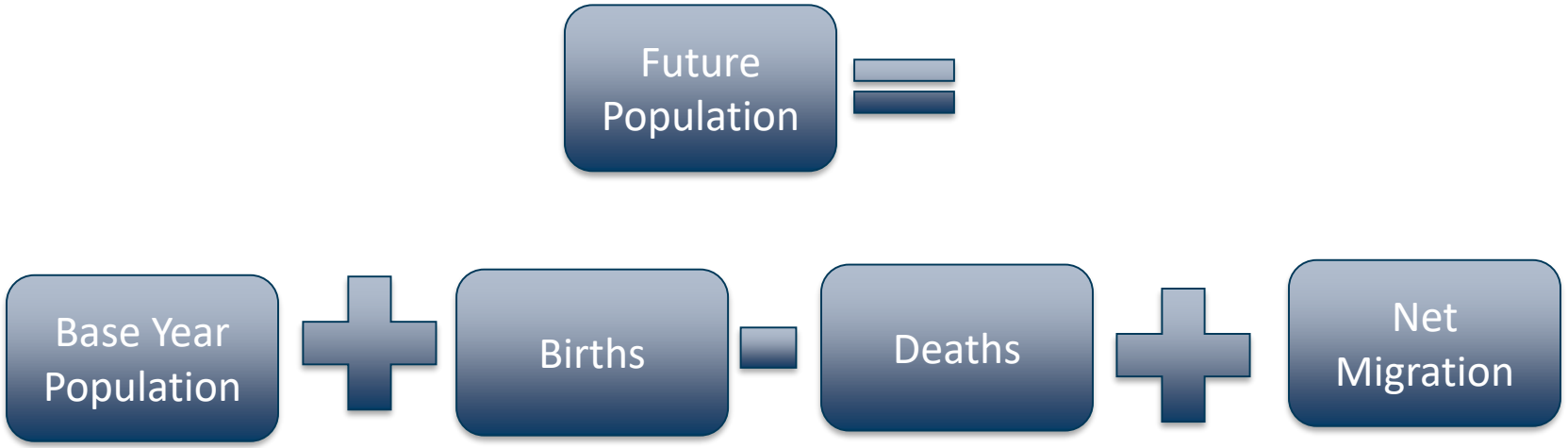
www.georgiawaterplanning.org

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

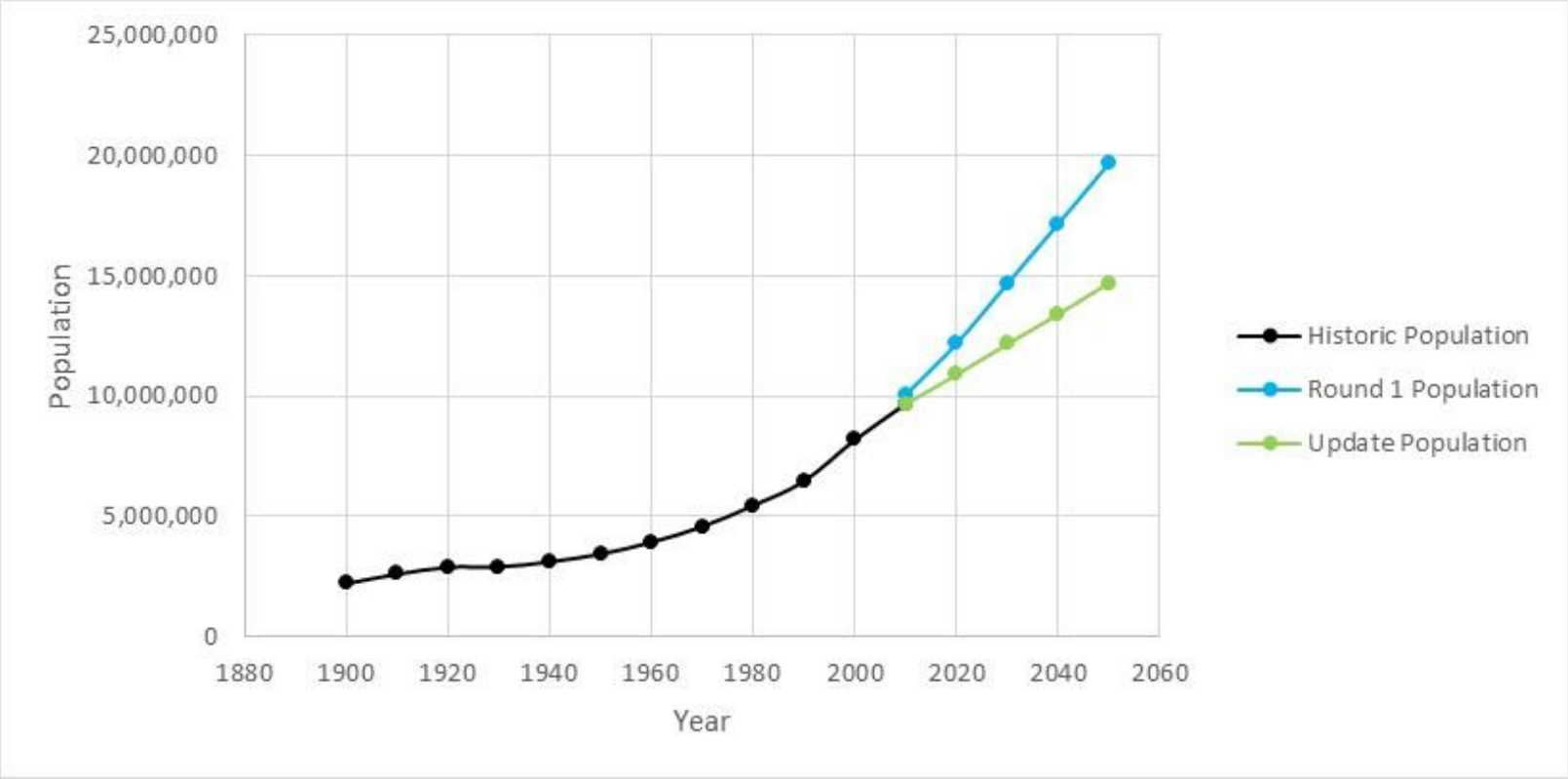
Updated Population Projections

Basic Approach to Population Projections



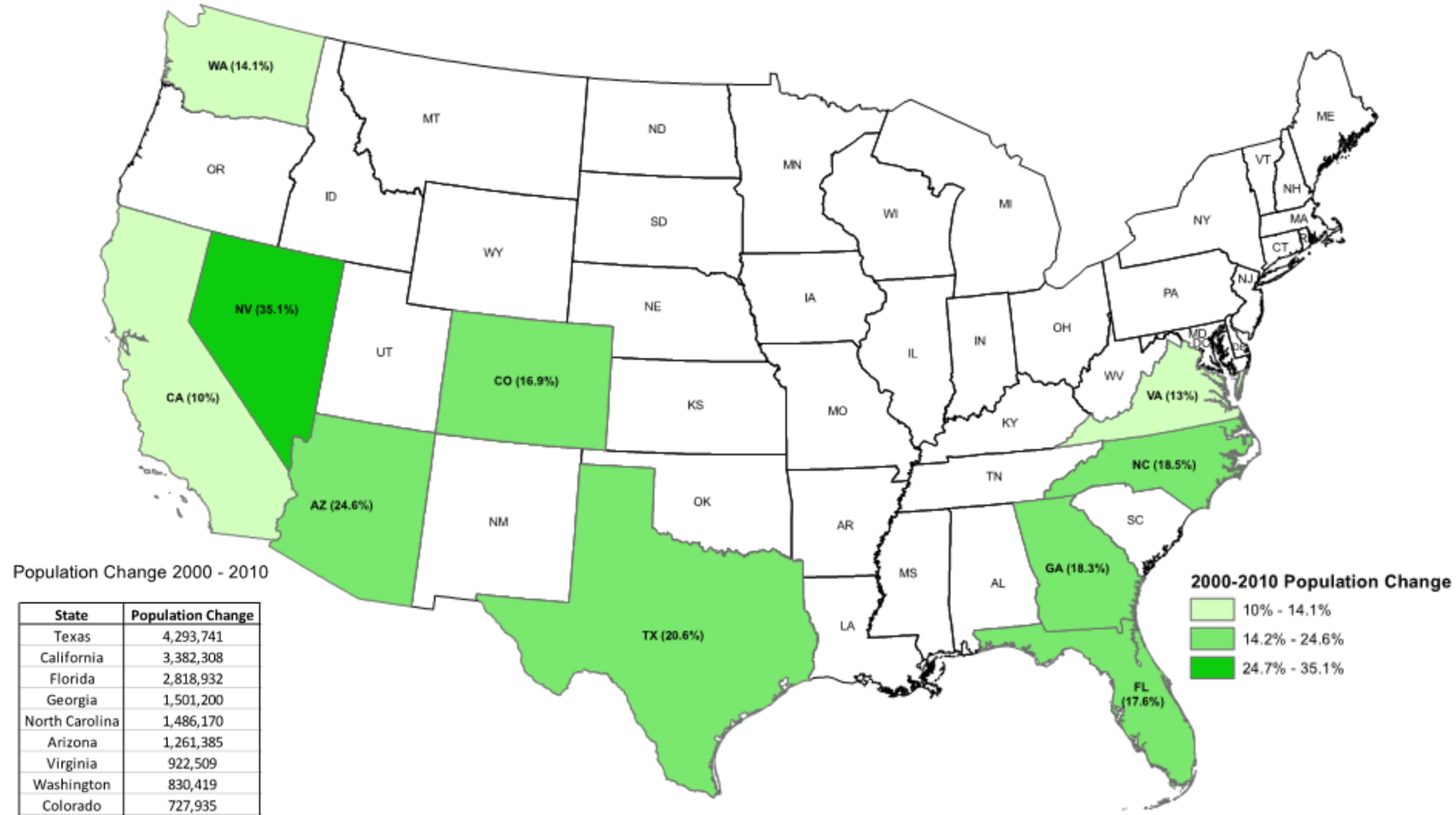
Georgia™

Georgia's Population Growth Over Time



Georgia's Historic Population Growth and Projections

Top 10 States with Highest Population Growth

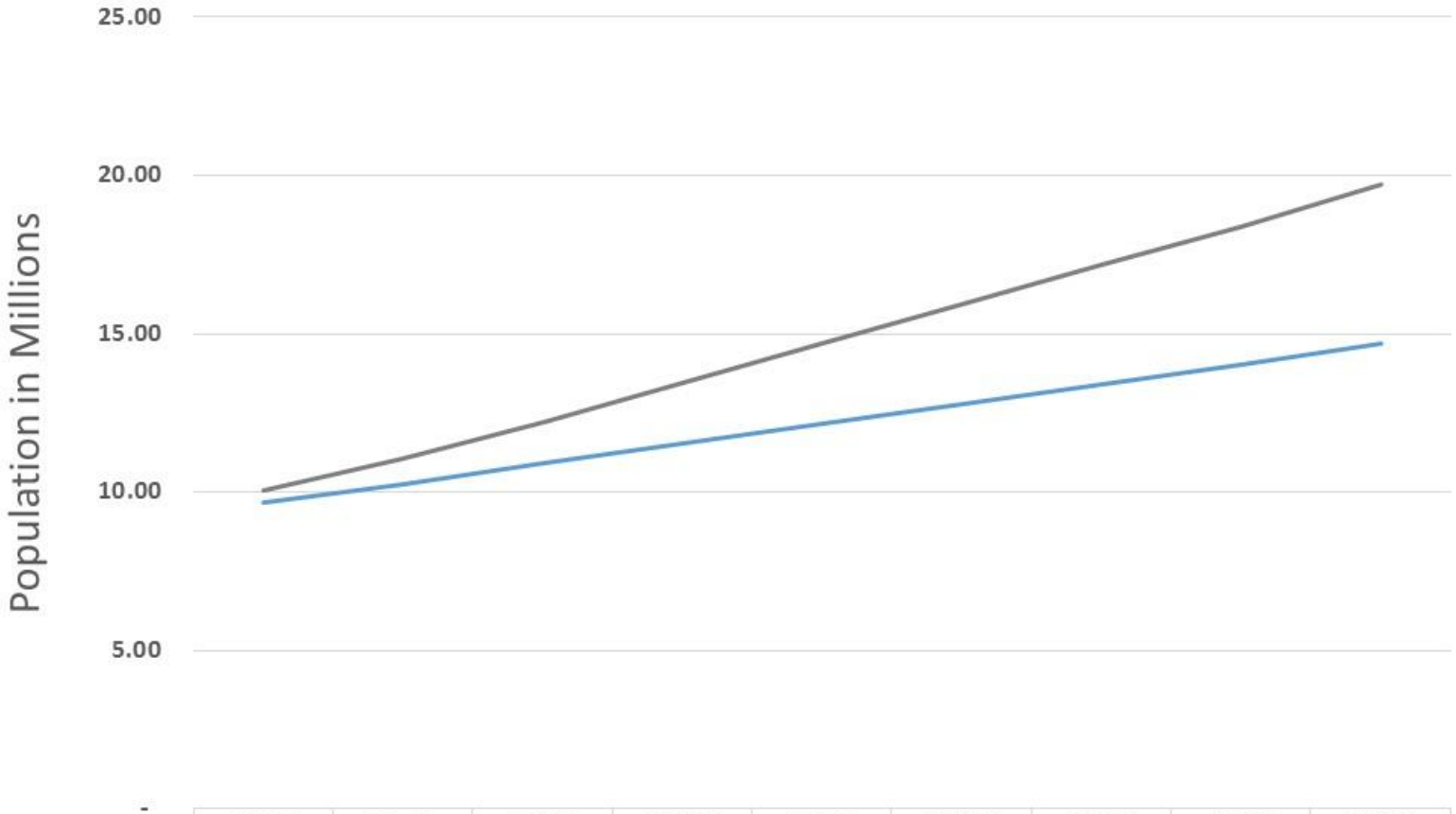


Population Change 2000 - 2010

State	Population Change
Texas	4,293,741
California	3,382,308
Florida	2,818,932
Georgia	1,501,200
North Carolina	1,486,170
Arizona	1,261,385
Virginia	922,509
Washington	830,419
Colorado	727,935
Nevada	702,294

Georgia™

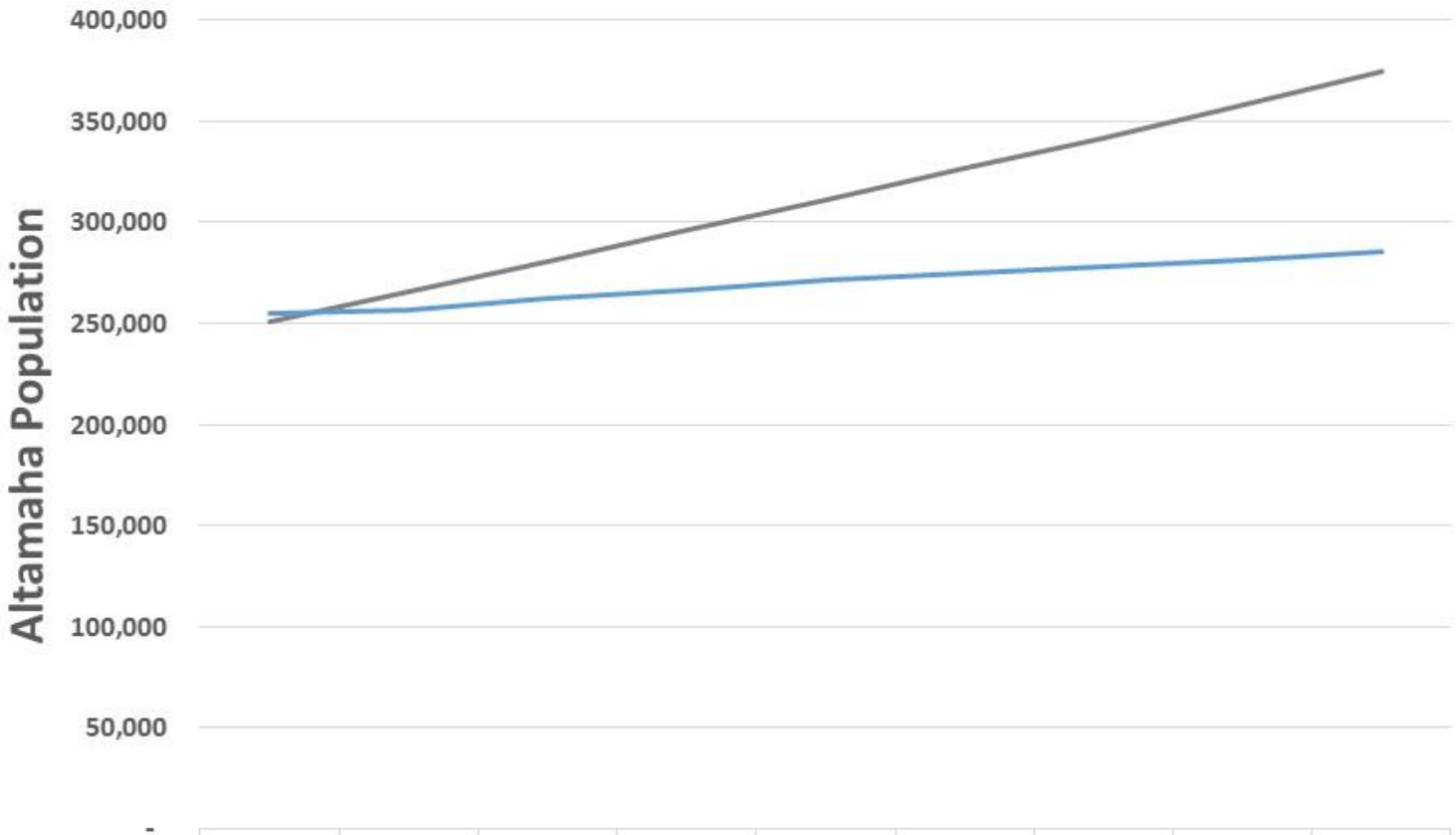
State Population Projections



	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

Georgia

Atlamaha Region Population Projections



	2010	2015	2020	2025	2030	2035	2040	2045	2050
Round 1	250,659	265,670	280,643	295,994	311,418	326,524	341,872	357,879	374,565
Update	254,765	256,305	262,028	266,757	271,485	274,776	278,067	281,658	285,248

Georgia

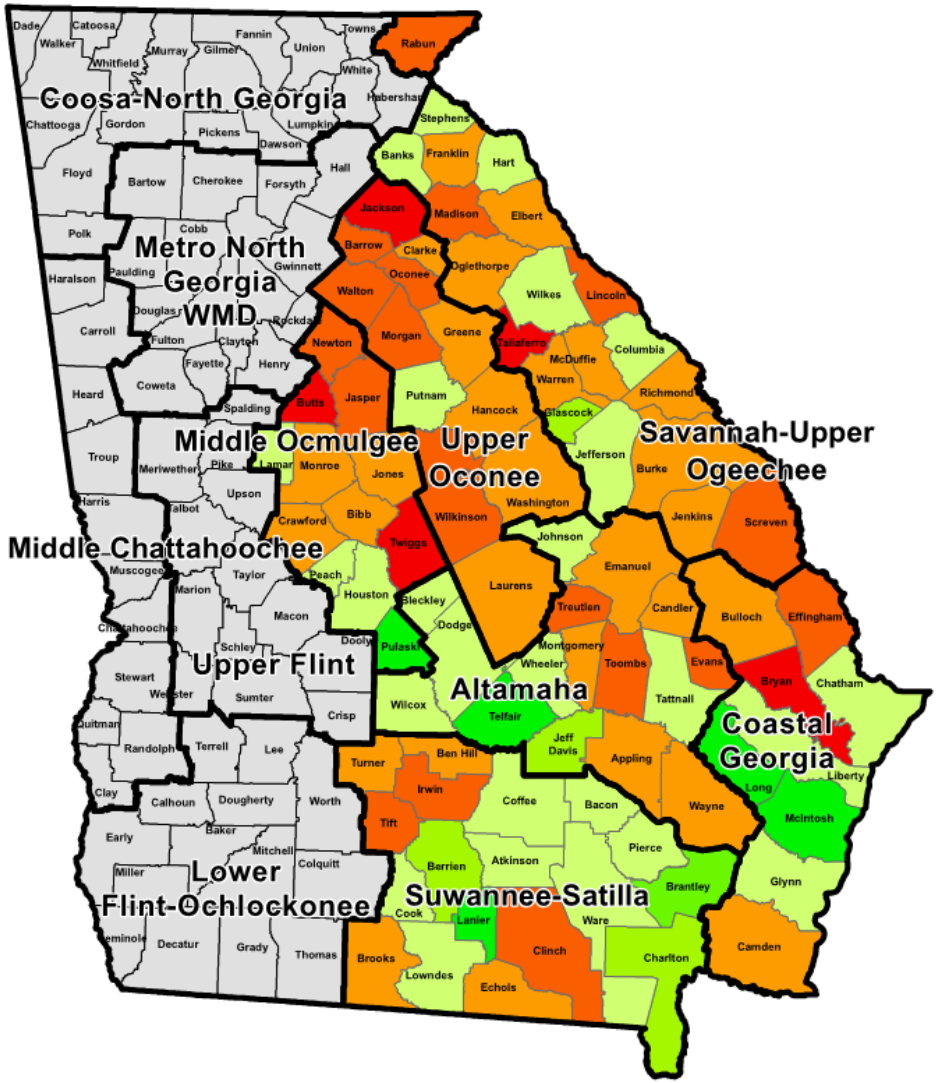
Updated Population Projections

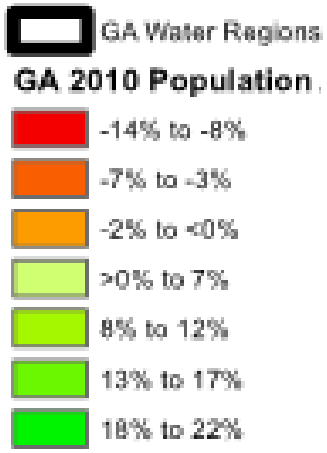
- A Cohort-Component model was used for both the Round 1 and updated population projections – but data inputs have changed based on new/updated information
- Age specific fertility and death rates are updated using 2008-2012 data
- Migration rates are also updated using a series of approaches including:
  - 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

Georgia

Lunch Time
12:00 PM – 12:45 PM

Municipal Water/Wastewater Forecast Updates

12:45 AM – 1:30 PM

Georgia

Georgia's

State Water Plan

Municipal Water Demand Forecast Update

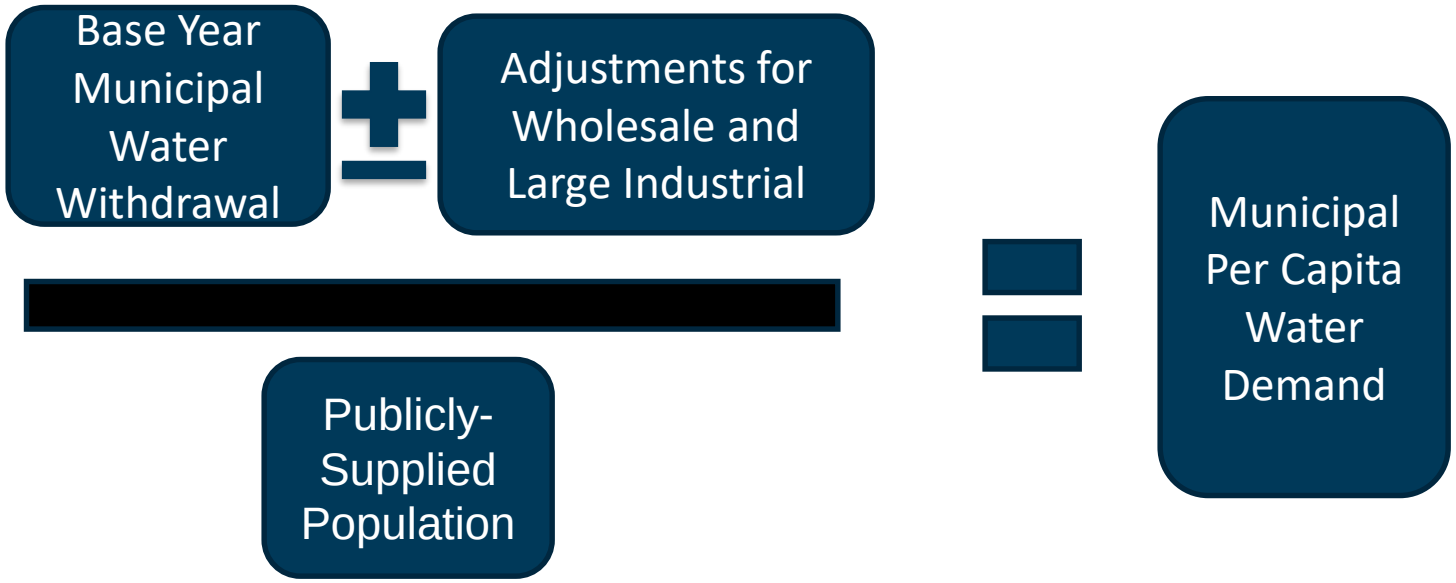
www.georgiawaterplanning.org

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)
  - 75 gpcd demand (USGS)
  - Council feedback for region specific adjustment



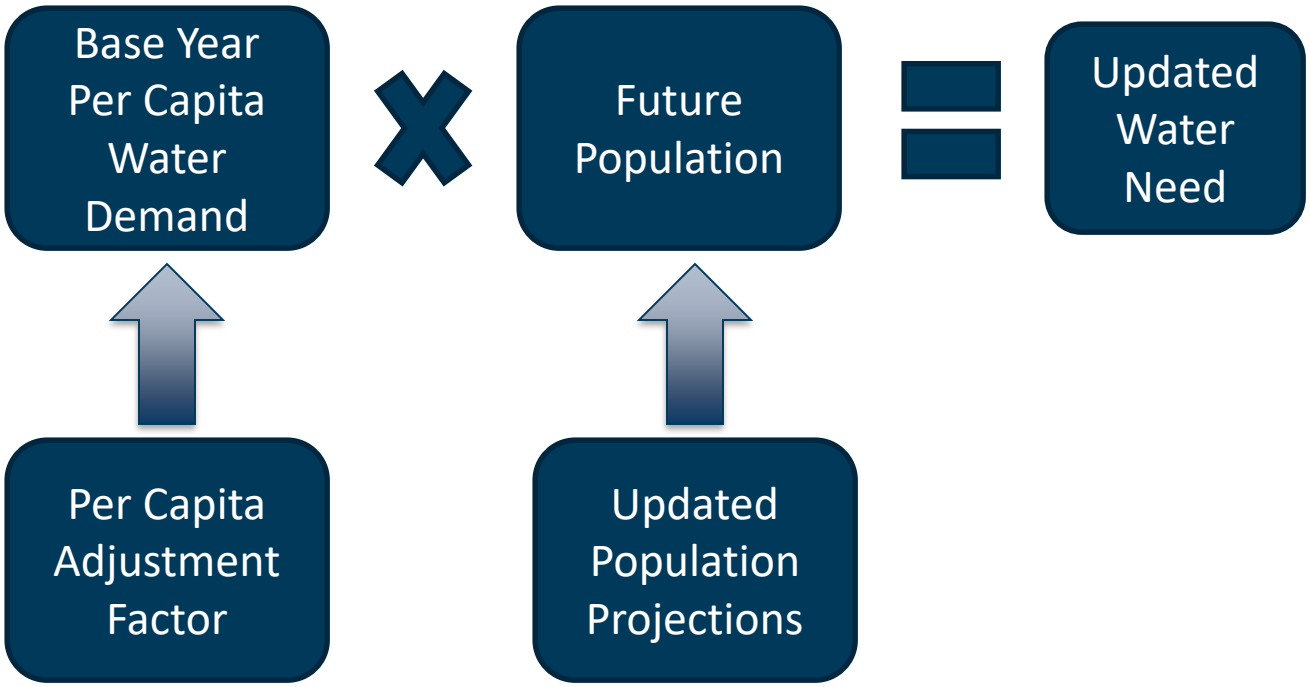
Georgia

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

Georgia

Municipal GPCD Adjustment Results - Altamaha Region

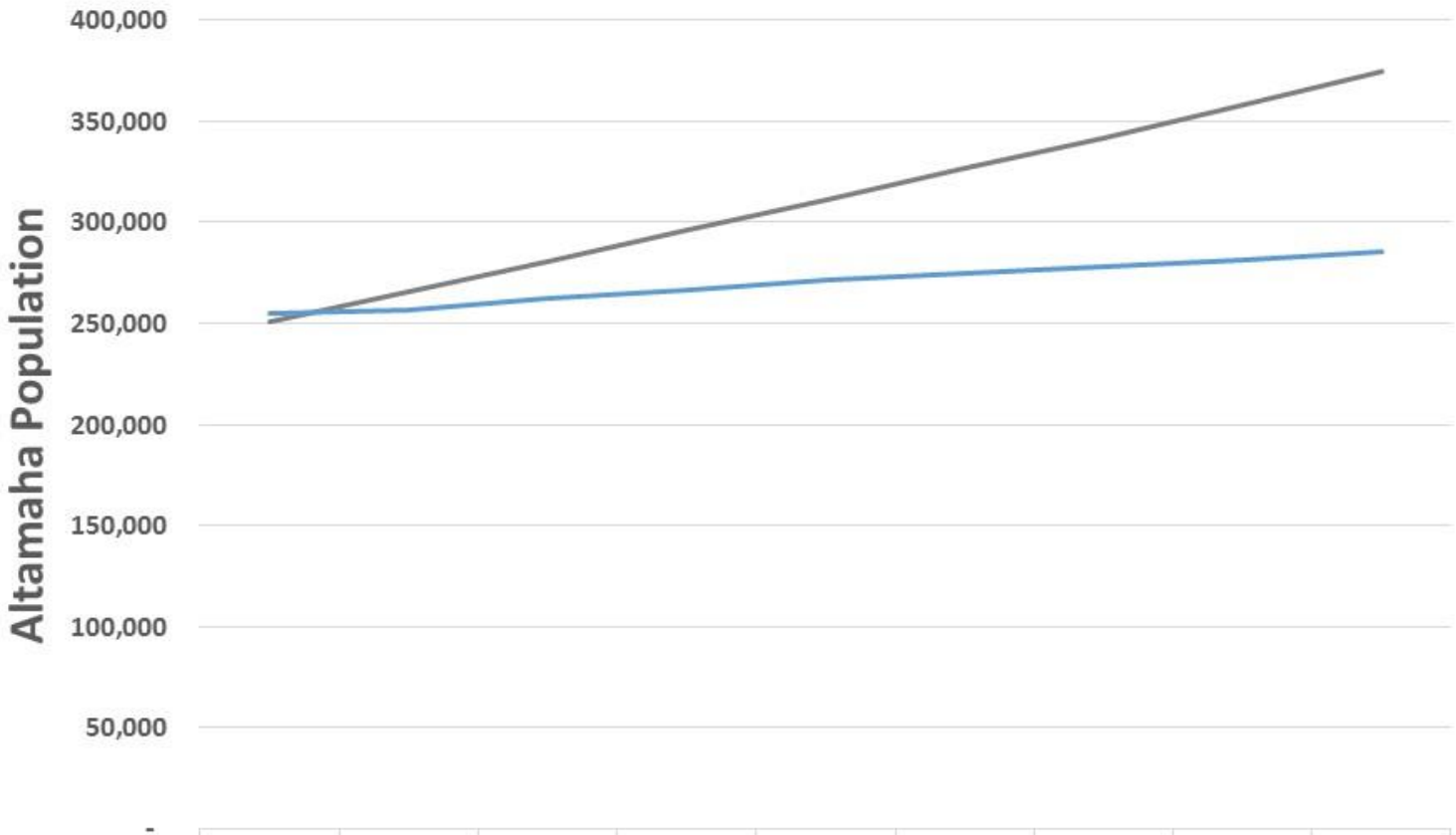
- Small relative change
- Less than 6% change across all counties
- 10 out of 16 counties have less than 3 gpcd change
- Round 1 Regional Average GPCD: 138
- Updated Regional Average GPCD: 136
- Average change across region is 1.7%

Municipal GPCD Adjustment Results by County

County	Round 1 GPCD	Updated GPCD	GPCD Δ	% GPCD Change
Appling	140	133	-7.0	-4.5%
Bleckley	115	113	-2.0	-1.3%
Candler	105	99	-6.0	-5.3%
Dodge	174	176	2.0	1.6%
Emanuel	169	161	-8.0	-4.7%
Evans	95	92	-3.0	-3.5%
Jeff Davis	195	193	-2.0	-1.1%
Johnson	121	122	1.0	1.1%
Montgomery	112	112	0.0	0.0%
Tattnall	121	118	-3.0	-2.0%
Telfair	140	141	1.0	0.4%
Toombs	147	146	-1.0	-0.6%
Treutlen	128	128	0.0	0.3%
Wayne	171	164	-7.0	-4.3%
Wheeler	141	143	2.0	1.4%
Wilcox	139	133	-6.0	-4.8%

Georgia

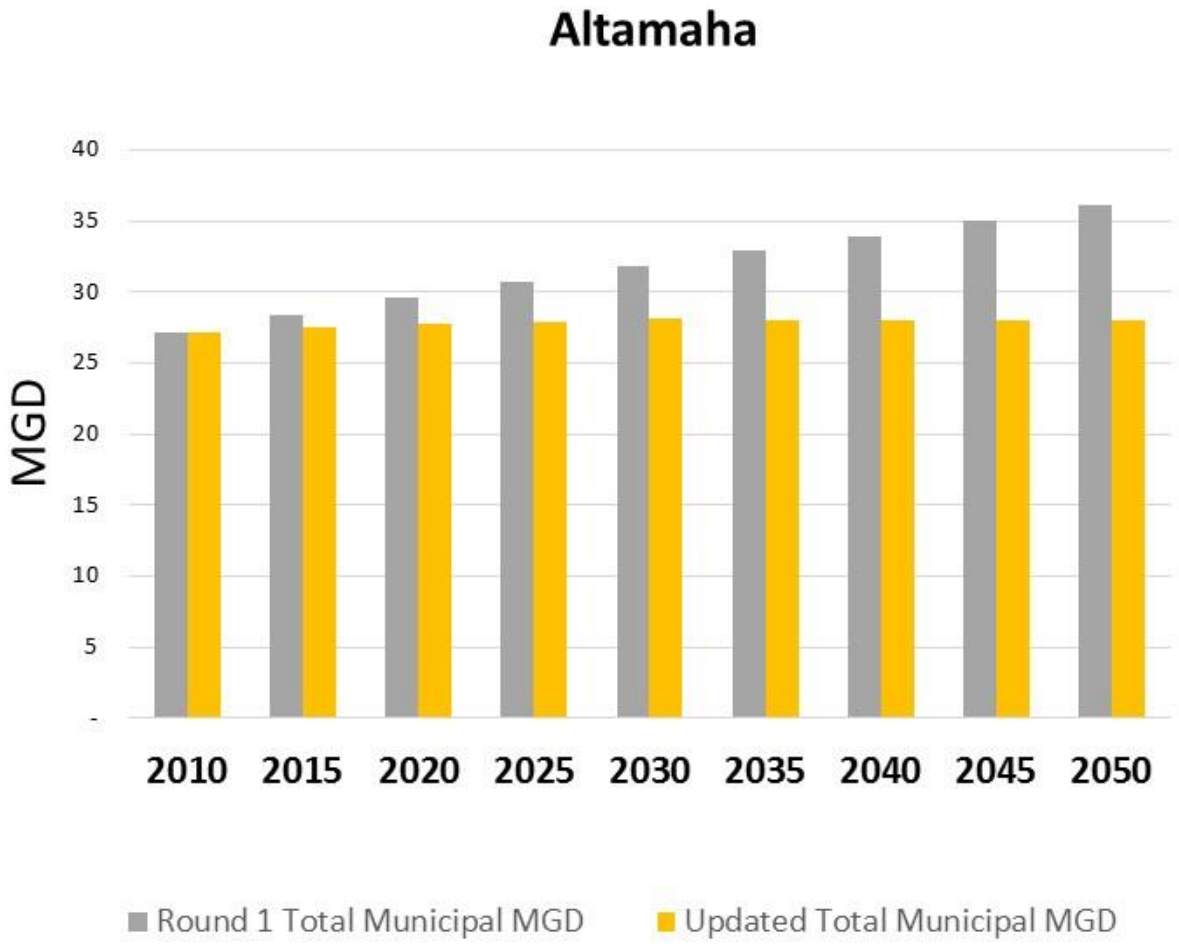
Atlamaha Region Population Projections



	2010	2015	2020	2025	2030	2035	2040	2045	2050
Round 1	250,659	265,670	280,643	295,994	311,418	326,524	341,872	357,879	374,565
Update	254,765	256,305	262,028	266,757	271,485	274,776	278,067	281,658	285,248

Georgia

Atlamaha 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

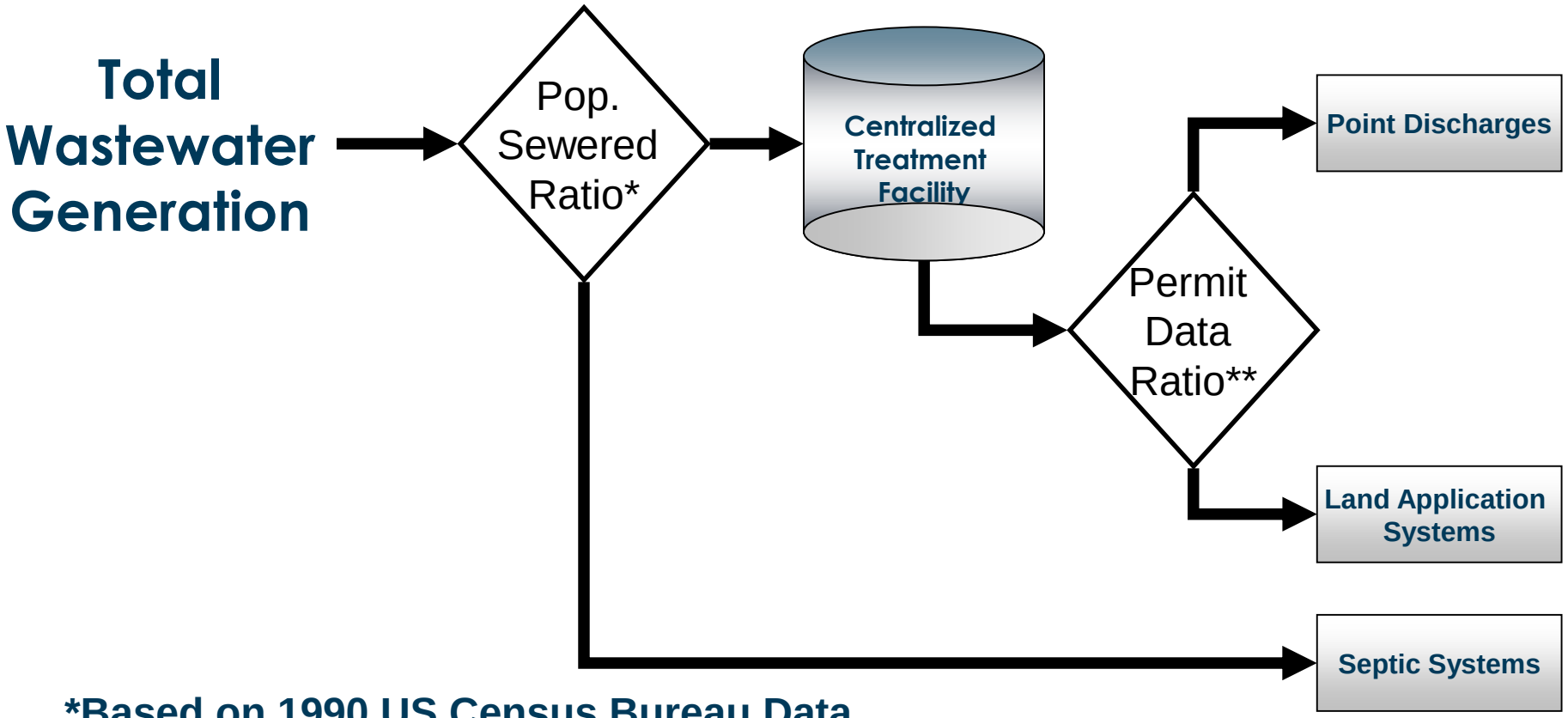
Georgia

Georgia's
State Water Plan

Municipal Wastewater Demand Forecast Update

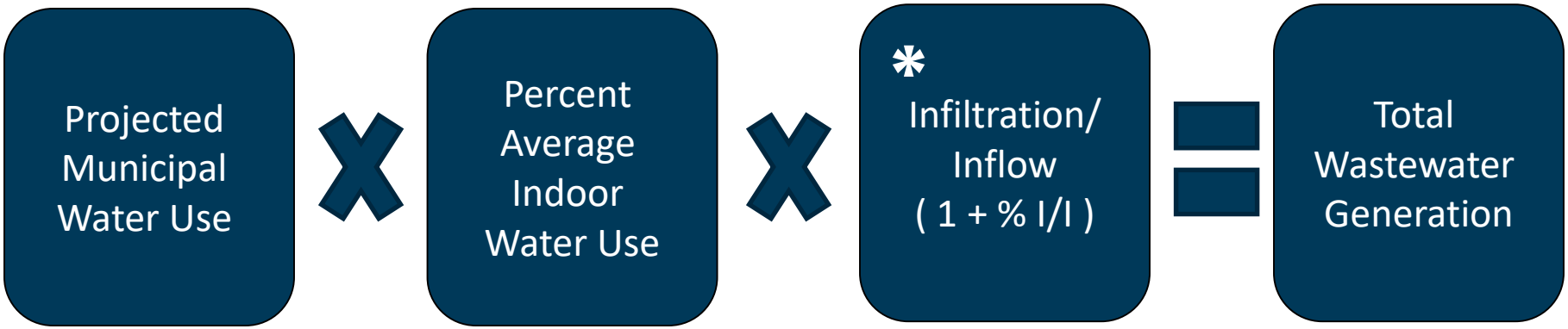
www.georgiawaterplanning.org

Municipal Wastewater Discharges



*Based on 1990 US Census Bureau Data
**Based on Existing GA EPD Permit Data

Round 1 Municipal Wastewater Calculation

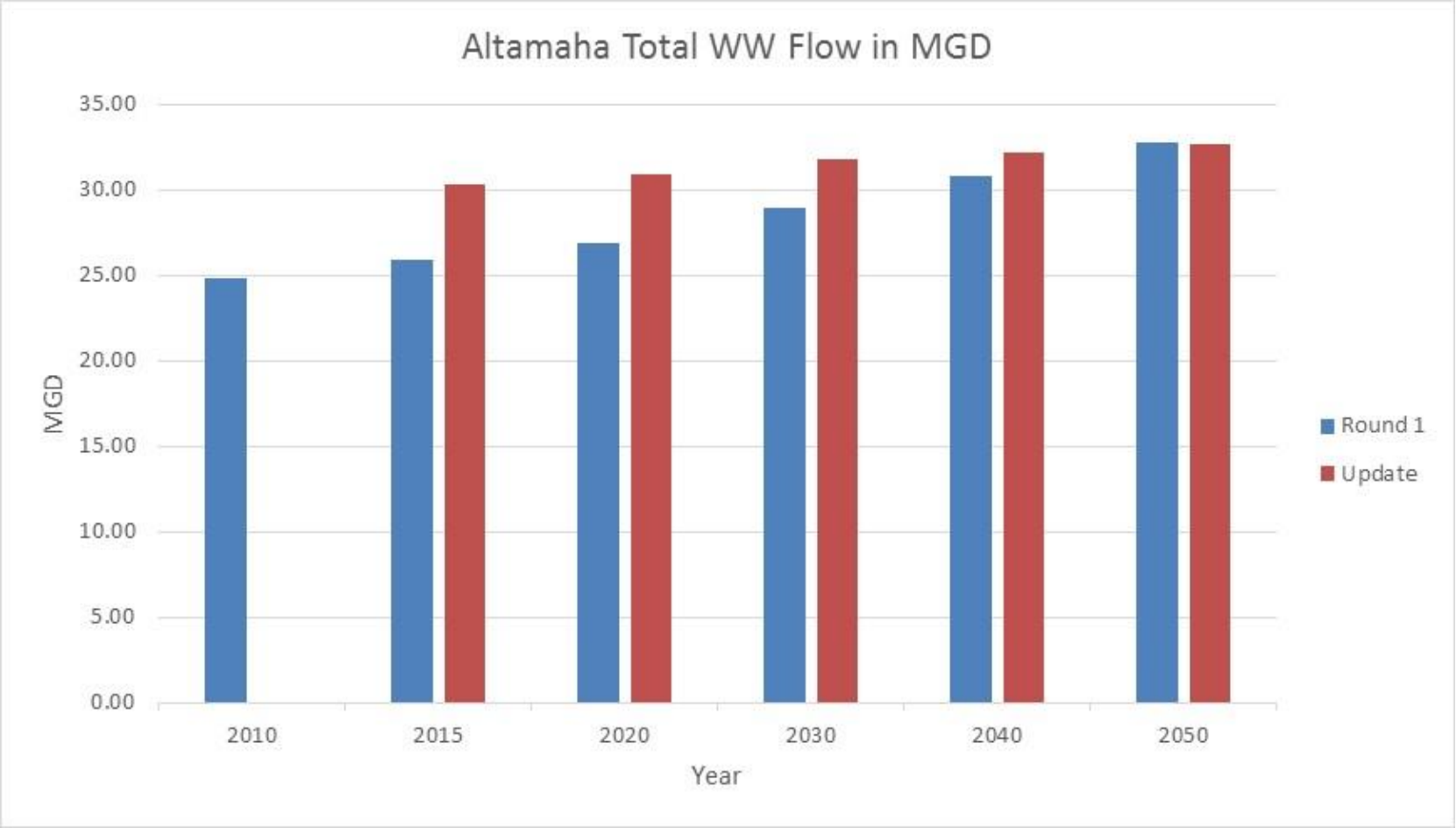


Municipal Wastewater Forecast Update

- 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

Georgia

Municipal Wastewater Forecast Update Results



Industrial Water Forecast Updates

1:30 PM – 2:00 PM

Georgia

Industrial Water Needs

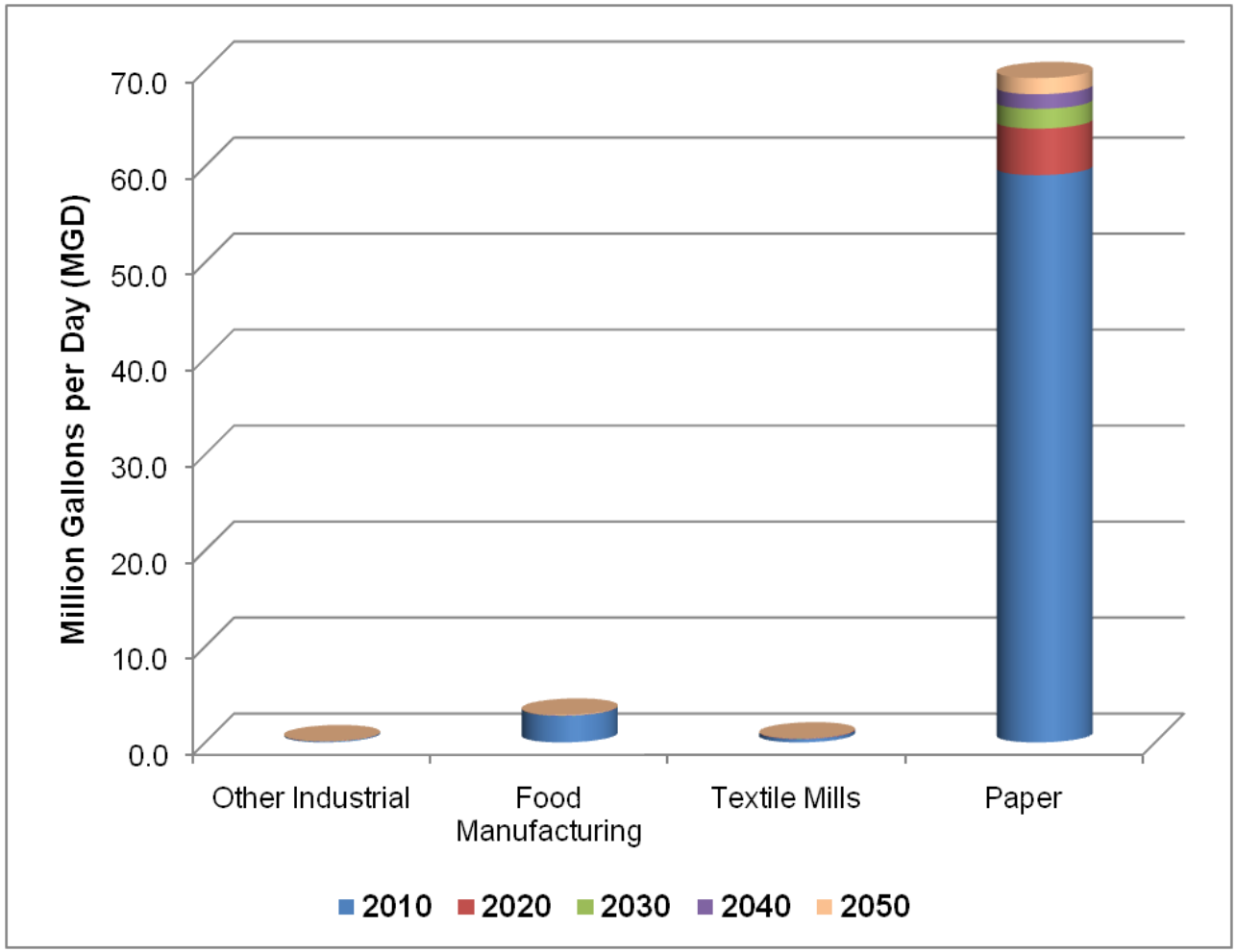
- Water is needed for industrial processes, sanitation, cooling and some domestic (employee) use
- Water need is linked to production
- Employment is linked to production
- Updates of employment data are not available, therefore industrial forecasts are not being updated at this time

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

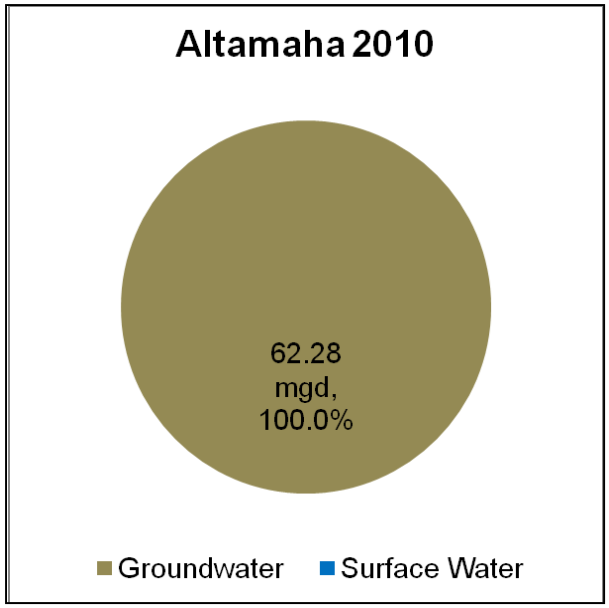
Industrial Water Demand

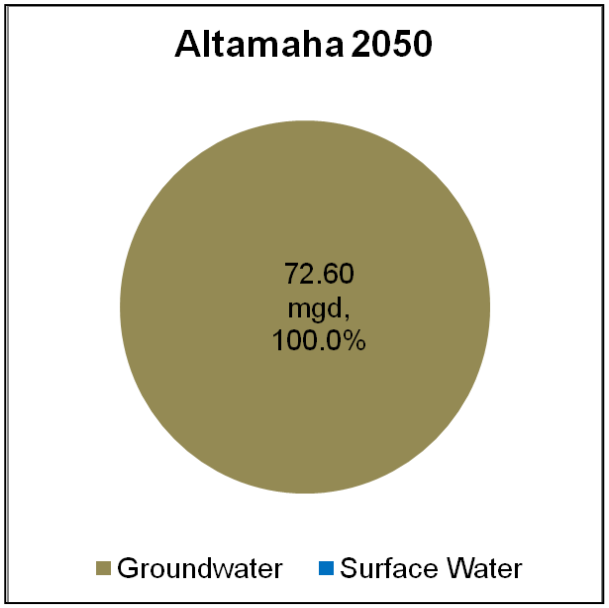
Round 1 - Altamaha Industrial Water Demand by Category



Industrial Water Demand

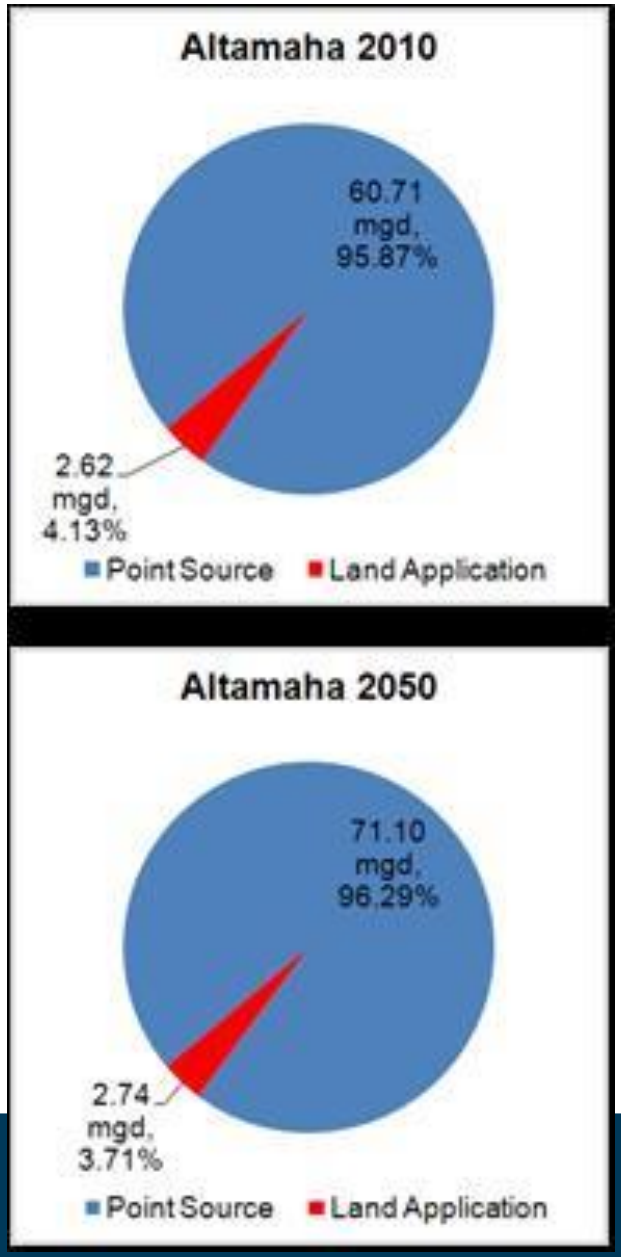
Round 1 - Altamaha Industrial Water Demand by Source





Industrial Wastewater Flow

Round 1 - Altamaha Industrial Wastewater Flow by Discharge Method



Break

2:00 PM – 2:15 PM

Georgia™

Energy Forecast Updates

2:15 PM – 2:45 PM

Georgia™

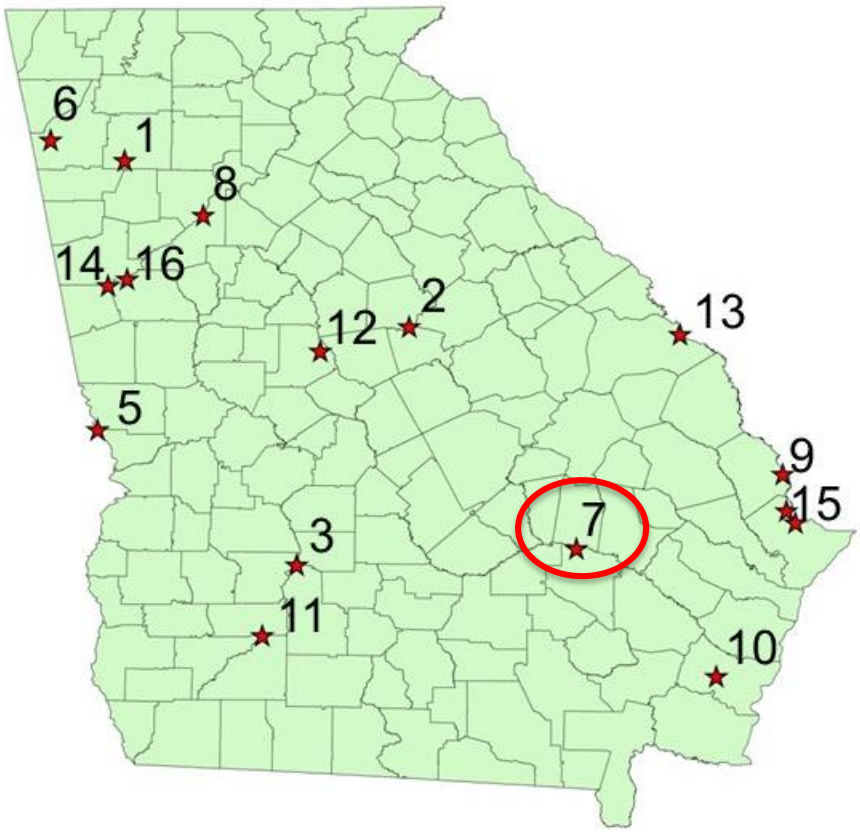
Georgia's

State Water Plan

Energy Forecast Updates

www.georgiawaterplanning.org

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



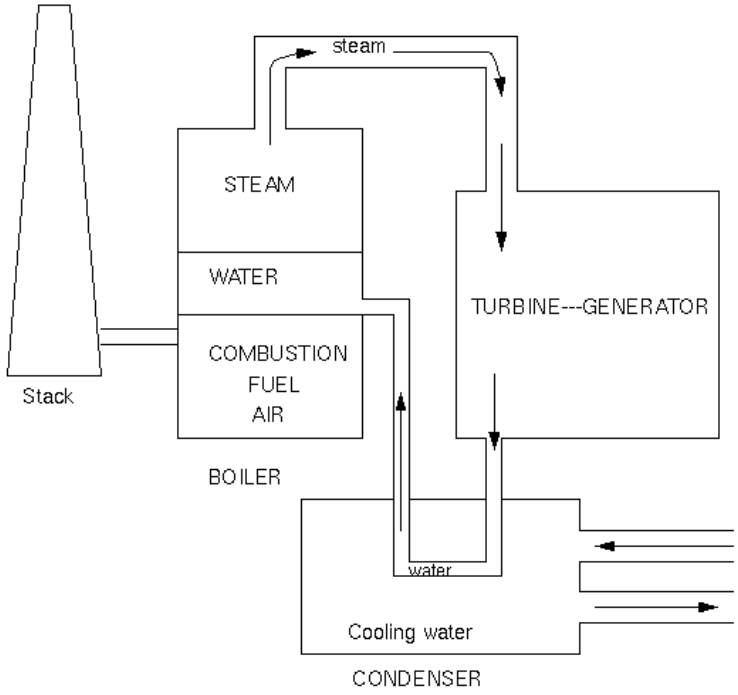
Facility Name	County
1. Plant Bowen	Bartow
2. Plant Branch	Putnam
3. Crisp County Power Comm-Steam	Worth
4. Gum Power Plant LLC	Mitchell
5. H Allen Franklin[1]	Lee (Alabama)
6. Plant Hammond	Floyd
7. Plant Hatch	Appling
8. Plant Jack McDonough	Cobb
9. Plant McIntosh	Effingham
10. Plant McManus	Glynn
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

Georgia

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

WATER WITHDRAWALS	
Power Generation Combination	**Gal/MWh**
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
WATER CONSUMPTION	
Power Generation Combination	**Gal/MWh**
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
- Assumes 1% of the energy need will be met through renewable (wind & solar) energy
- 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
- One major power generating facility in the Altamaha region (Plant Hatch in Appling County)
  - No changes at this facility so the energy water forecast for Altamaha is expected to be similar to the Round 1 (2010) forecast: **51.0** mgd (withdrawal) and **32.7** mgd (consumption)

Appointment of Technical Subcommittee

2:45 PM – 3:00 PM

Georgia™

Technical Subcommittees

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

Georgia

Public Comments / Local Elected Official Comments

3:00 PM – 3:15 PM

Georgia

Elected Official Comments and 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

3:15 PM – 3:30 PM

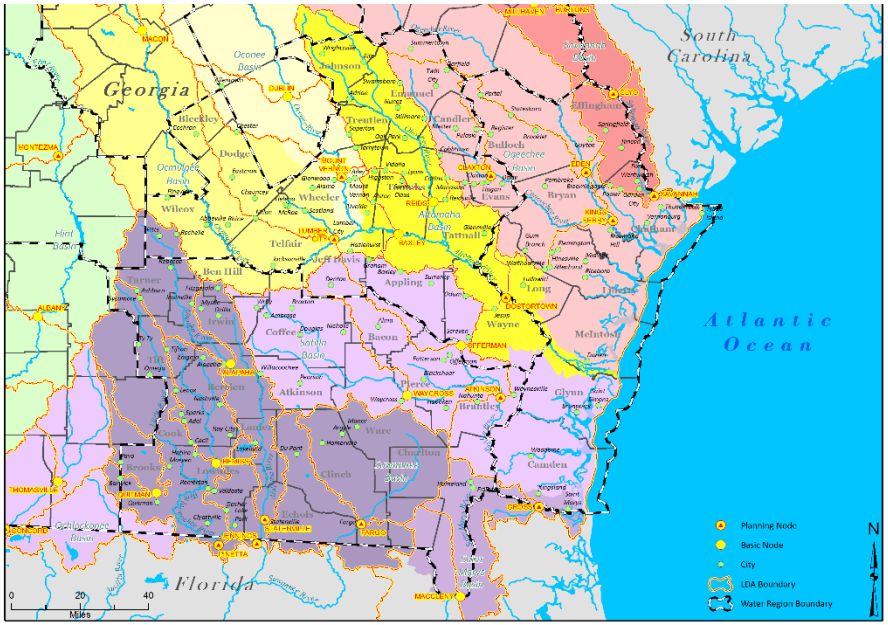
Georgia

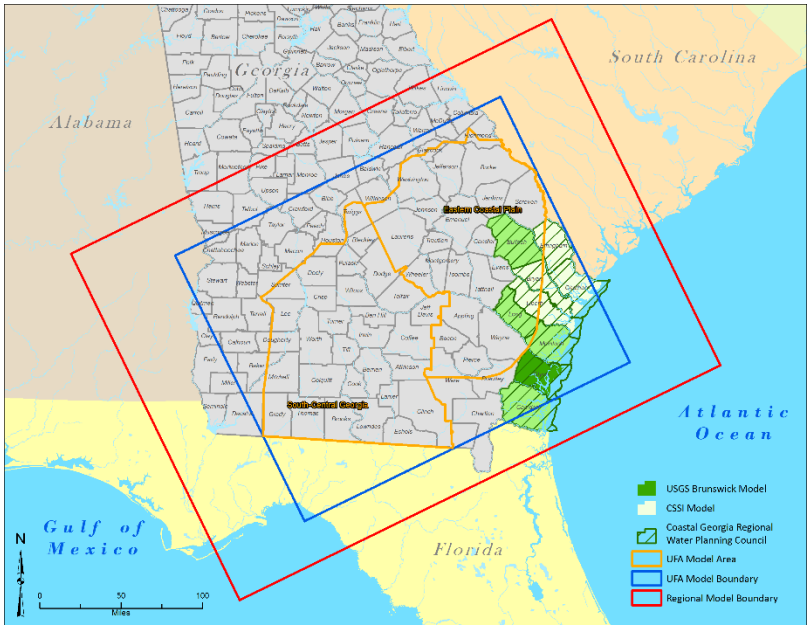
Next Meeting

- 2nd quarterly meeting (June 2016 timeframe) will be a Joint Council Meeting
  - Members can be delegates to attend the afternoon breakout session (Suwannee-Satilla and Coastal)
- Altamaha Council can elect to send delegates to attend the western Joint Council meeting

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

3:15 PM – 3:30 PM

Georgia™

Thank You!

Questions? Comments? Need More Information?

Honourdm@cdmsmith.com
Jennifer.Welte@dnr.ga.gov

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

Georgia

Detailed Slides

Population & Municipal water demand forecast

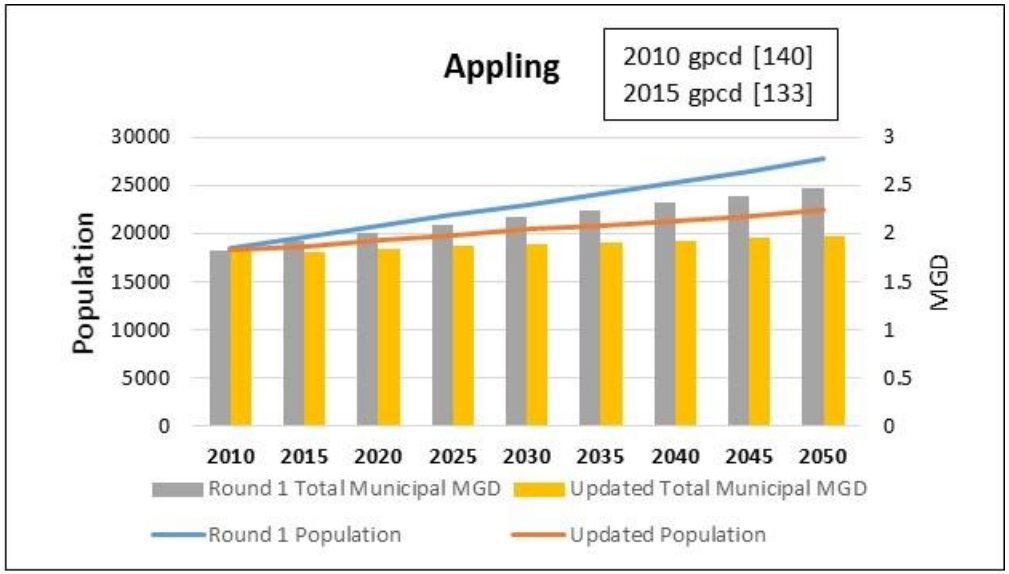
Population	change							
2010	2015	2020	2025	2030	2035	2040	2045	2050
(201)	(947)	(1,455)	(2,026)	(2,614)	(3,299)	(3,994)	(4,648)	(5,377)
62	(943)	(1,607)	(2,198)	(2,747)	(3,195)	(3,642)	(4,083)	(4,499)
(76)	(1,522)	(2,926)	(4,612)	(6,531)	(8,816)	(11,337)	(14,180)	(17,375)
1,338	(149)	(1,064)	(2,175)	(3,081)	(3,636)	(4,187)	(4,622)	(5,045)
(543)	(613)	(470)	(558)	(708)	(1,024)	(1,347)	(1,750)	(2,240)
(1,004)	(2,115)	(2,886)	(3,679)	(4,476)	(5,289)	(6,085)	(6,833)	(7,589)
1,392	1,141	1,253	1,294	1,366	1,316	1,299	1,241	1,188
282	(231)	(562)	(900)	(1,249)	(1,701)	(2,126)	(2,500)	(2,876)
(49)	(887)	(1,592)	(2,335)	(2,988)	(3,504)	(4,013)	(4,483)	(4,963)
1,290	(522)	(1,919)	(3,573)	(5,355)	(7,230)	(9,202)	(11,100)	(13,160)
2,971	2,572	1,895	1,167	454	(282)	(983)	(1,613)	(2,265)
(1,635)	(2,905)	(3,387)	(3,898)	(4,504)	(5,643)	(6,946)	(8,832)	(10,698)
(304)	(830)	(1,211)	(1,662)	(2,032)	(2,350)	(2,602)	(2,764)	(2,925)
(176)	(1,655)	(2,418)	(3,373)	(4,357)	(5,626)	(6,858)	(8,148)	(9,470)
382	596	545	527	530	544	571	707	852
377	(355)	(813)	(1,238)	(1,638)	(2,012)	(2,353)	(2,613)	(2,876)
4,106	(9,365)	(18,615)	(29,237)	(39,933)	(51,748)	(63,805)	(76,221)	(89,317)

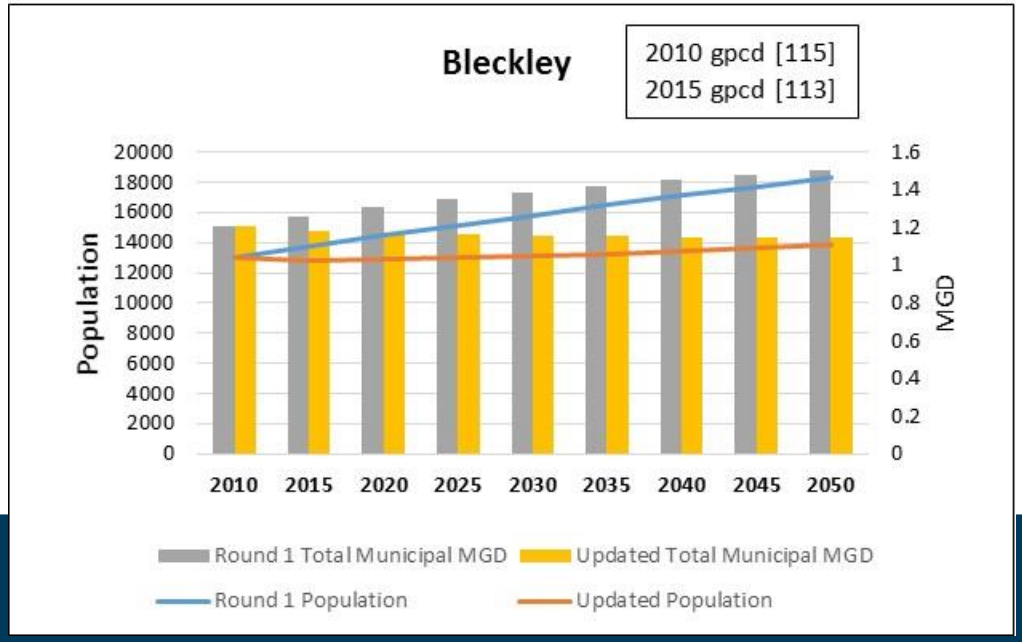
Georgia

Population & Municipal water demand forecast

Council	County	Adjusted 2010 Per Capita	2015 gpcd % change	Adjusted 2015 Per Capita	gpcd difference
ALT - Altamaha	Appling	140	-4.5%	133	-6.2
	Bleckley	115	-1.3%	113	-1.5
	Candler	105	-5.3%	99	-5.5
	Dodge	174	1.6%	176	2.7
	Emanuel	169	-4.7%	161	-8.0
	Evans	95	-3.5%	92	-3.3
	Jeff Davis	195	-1.1%	193	-2.1
	Johnson	121	1.1%	122	1.3
	Montgomery	112	0.0%	112	0.0
	Tattnall	121	-2.0%	118	-2.4
	Telfair	140	0.4%	141	0.5
	Toombs	147	-0.6%	146	-0.9
	Treutlen	128	0.3%	128	0.4
	Wayne	171	-4.3%	164	-7.4
	Wheeler	141	1.4%	143	1.9
	Wilcox	139	-4.8%	133	-6.7

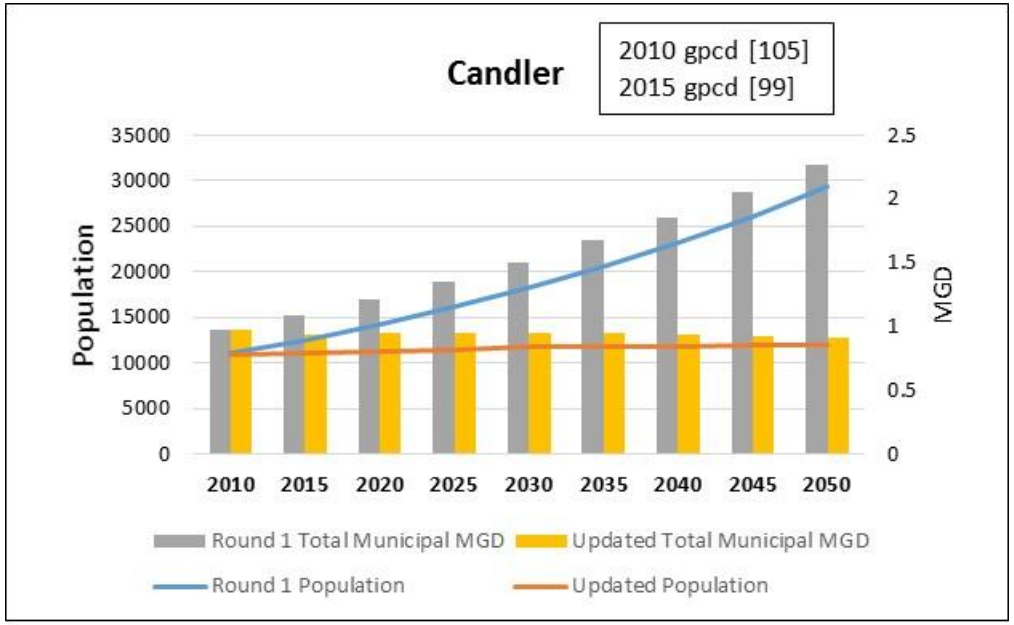
Population & Municipal water demand forecast

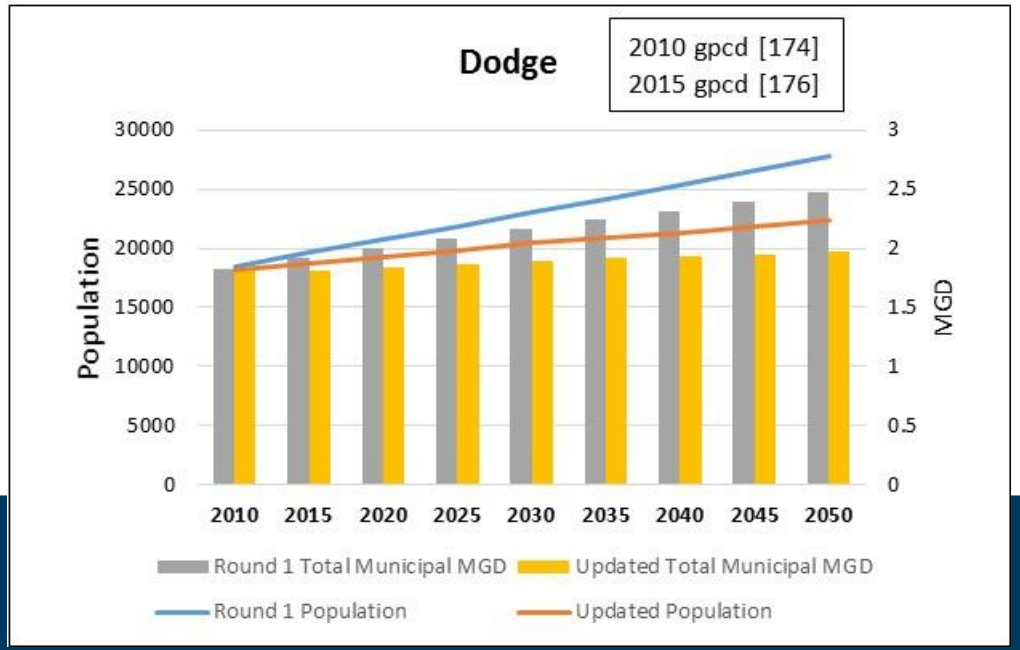




Georgia

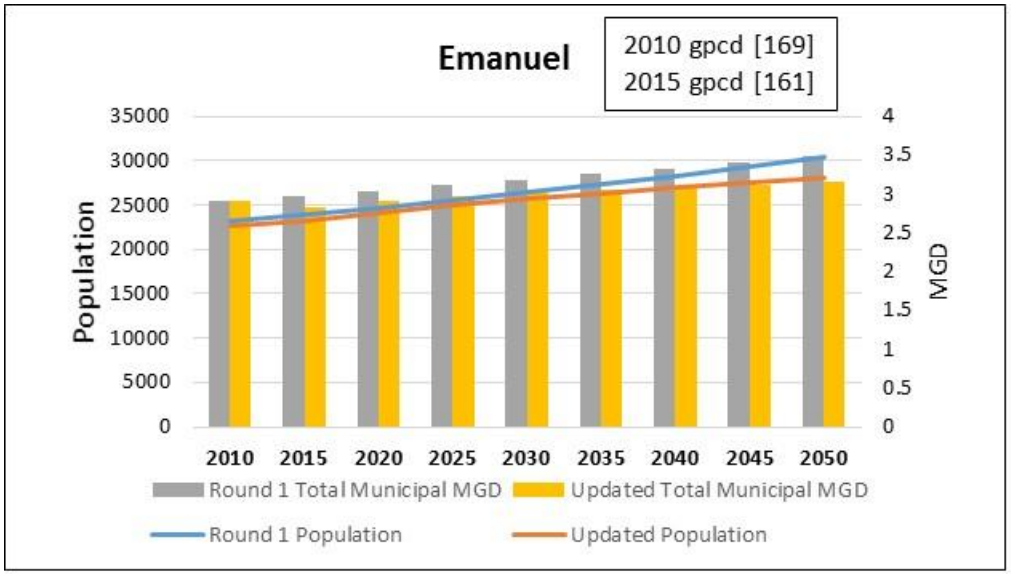
Population & Municipal water demand forecast

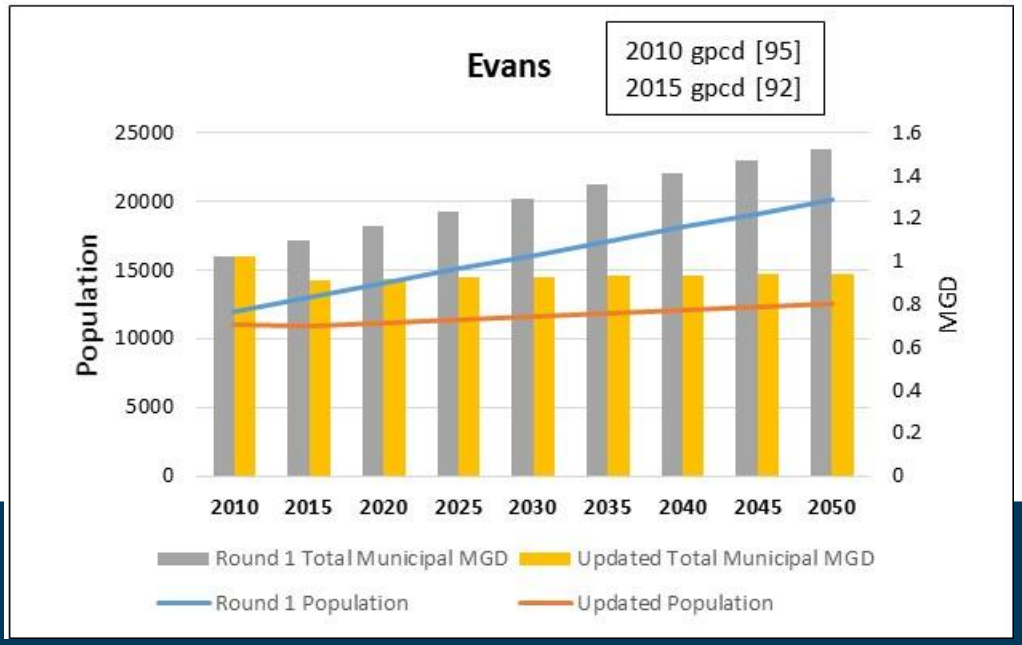




Georgia

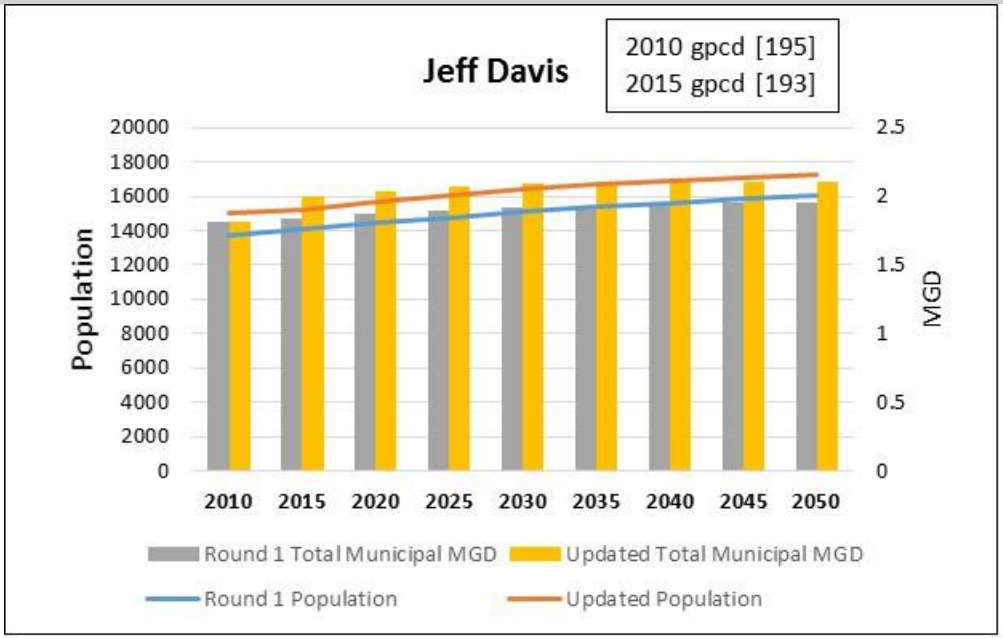
Population & Municipal water demand forecast

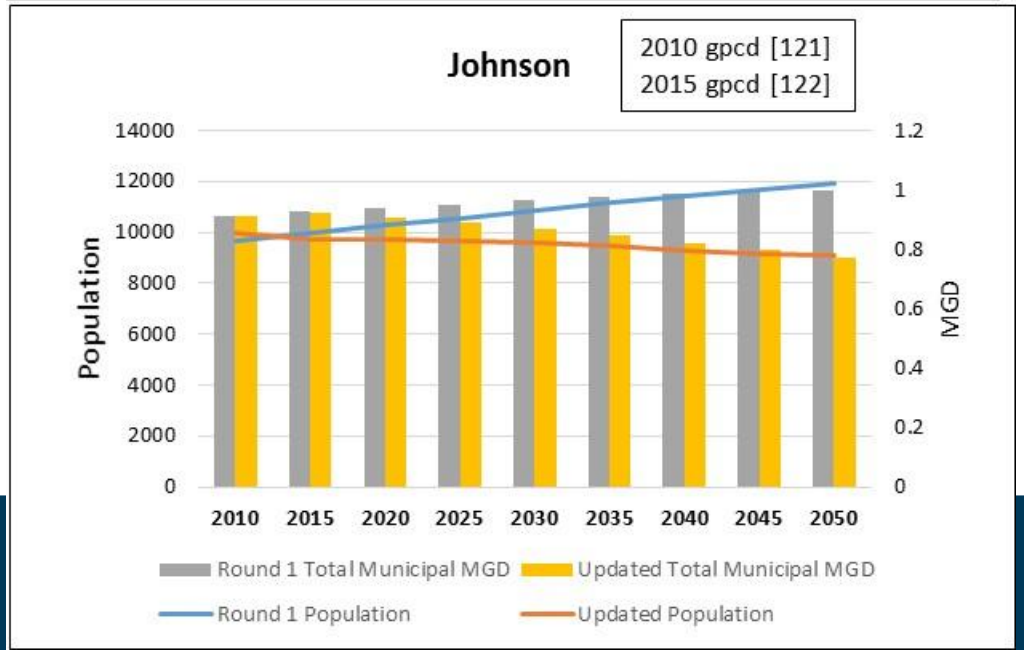




Georgia

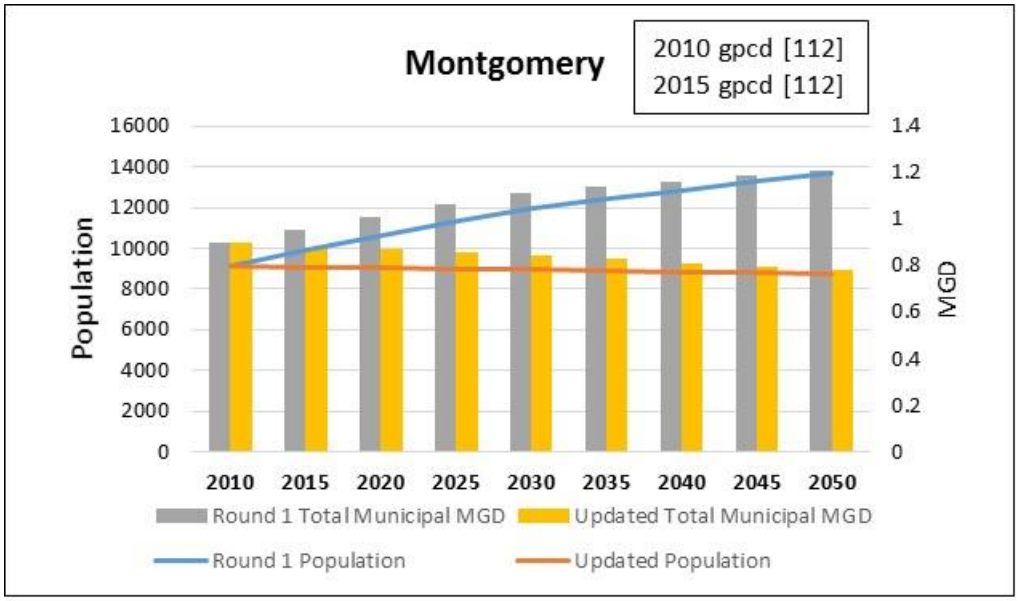
Population & Municipal water demand forecast

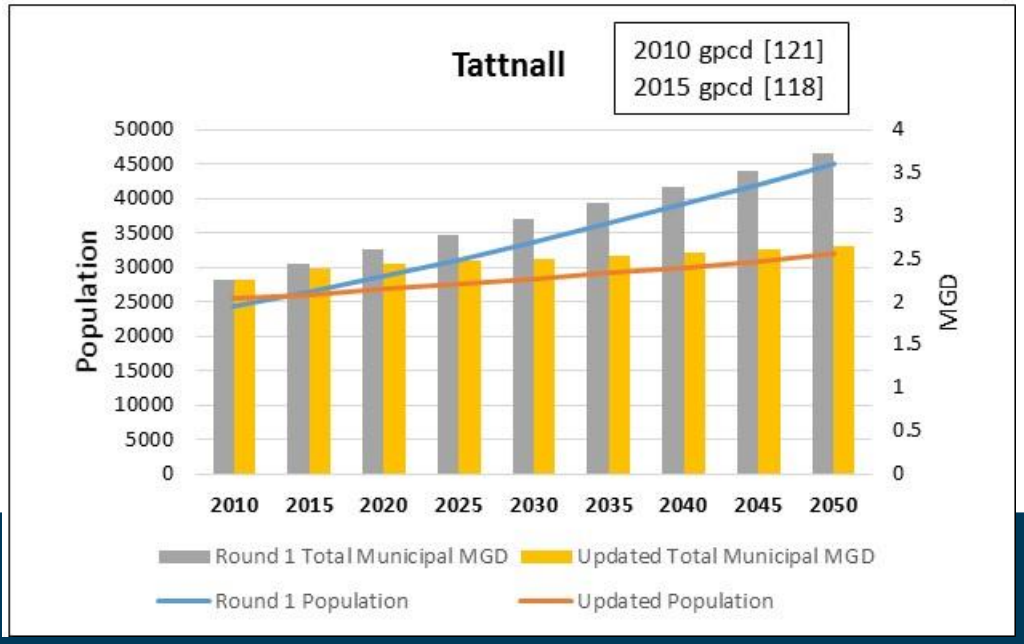




Georgia

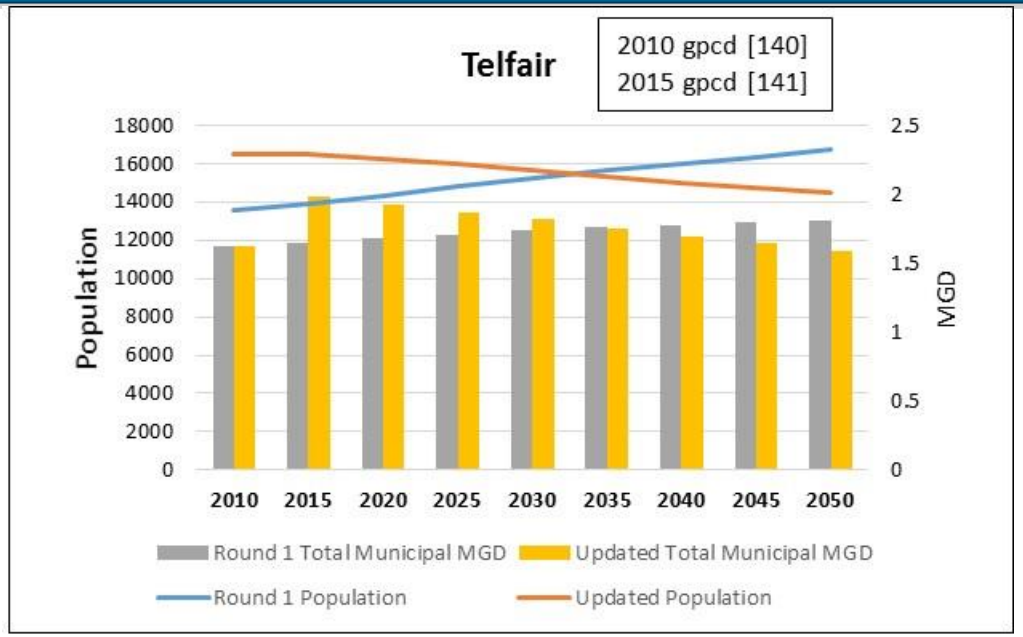
Population & Municipal water demand forecast

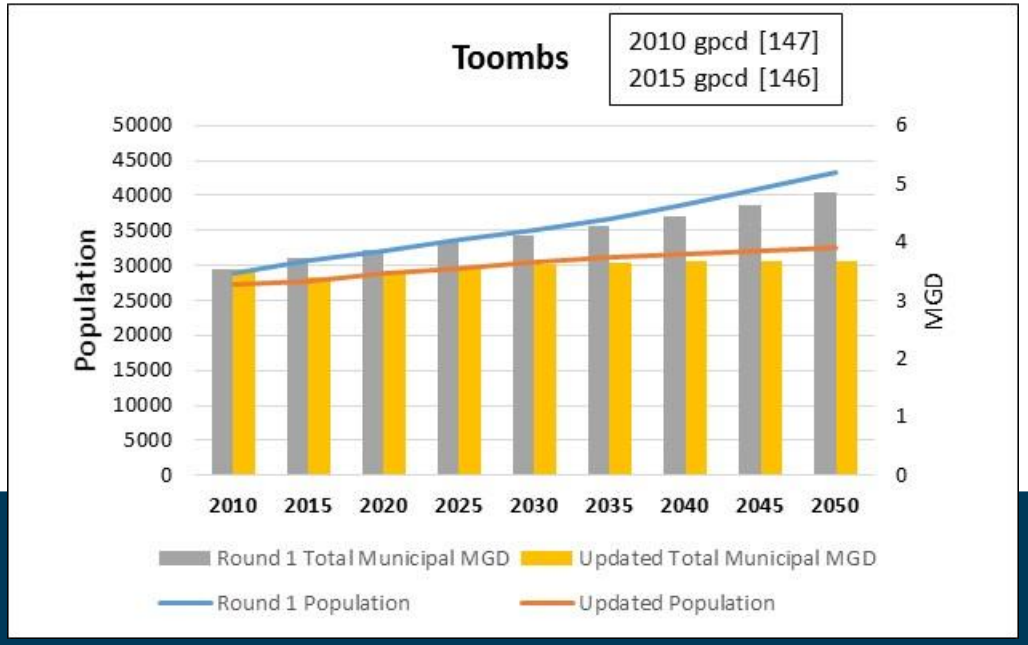




Georgia

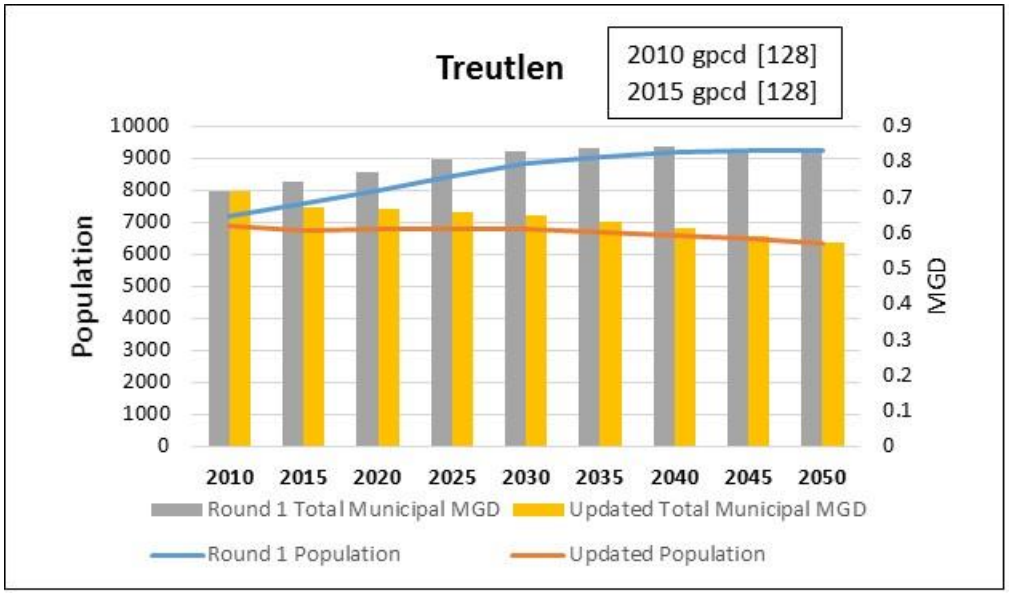
Population & Municipal water demand forecast

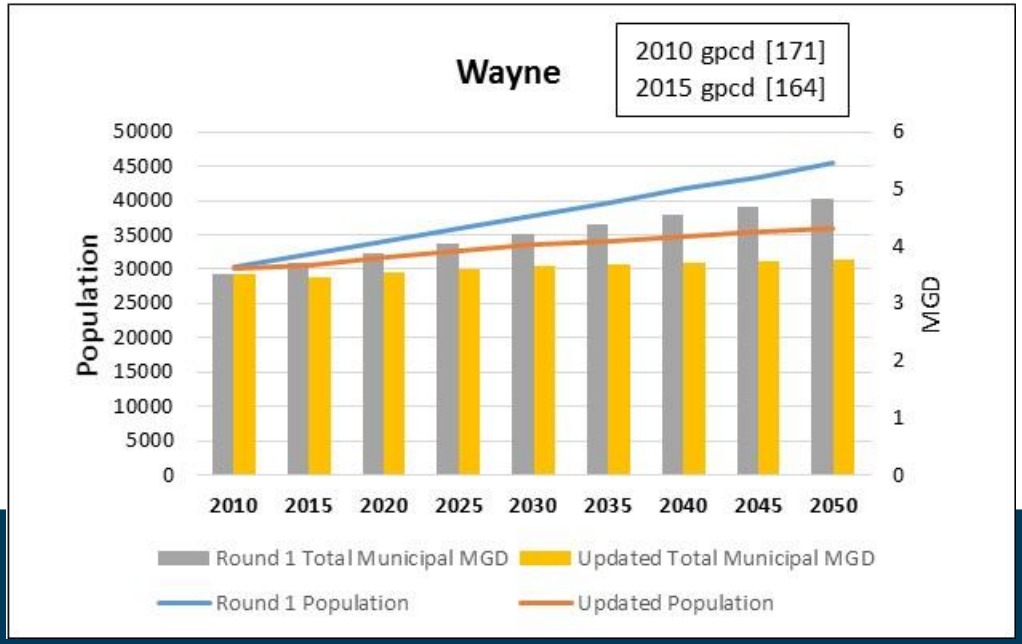




Georgia

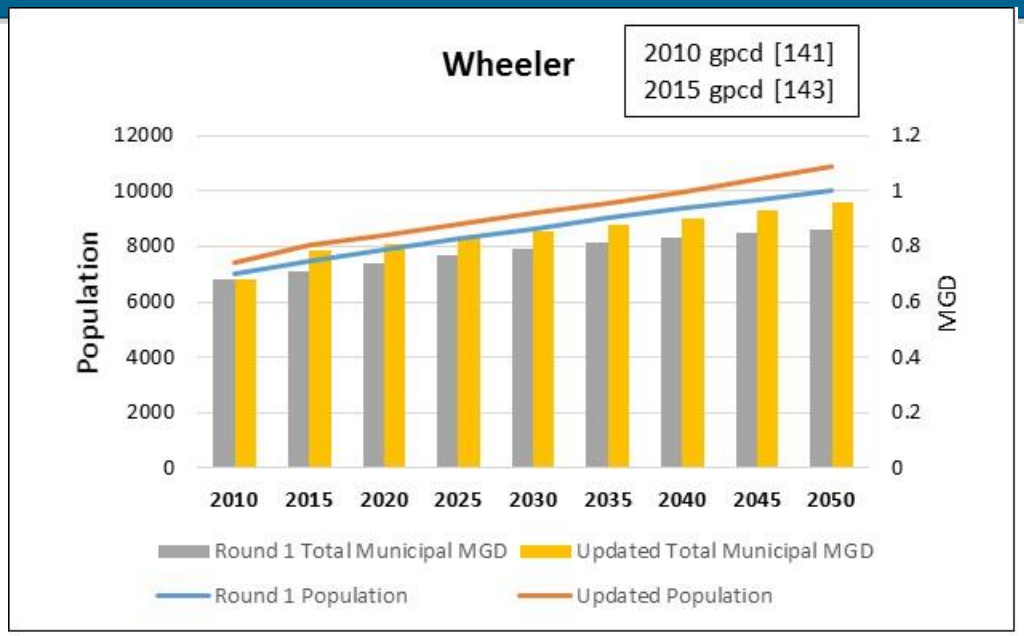
Population & Municipal water demand forecast

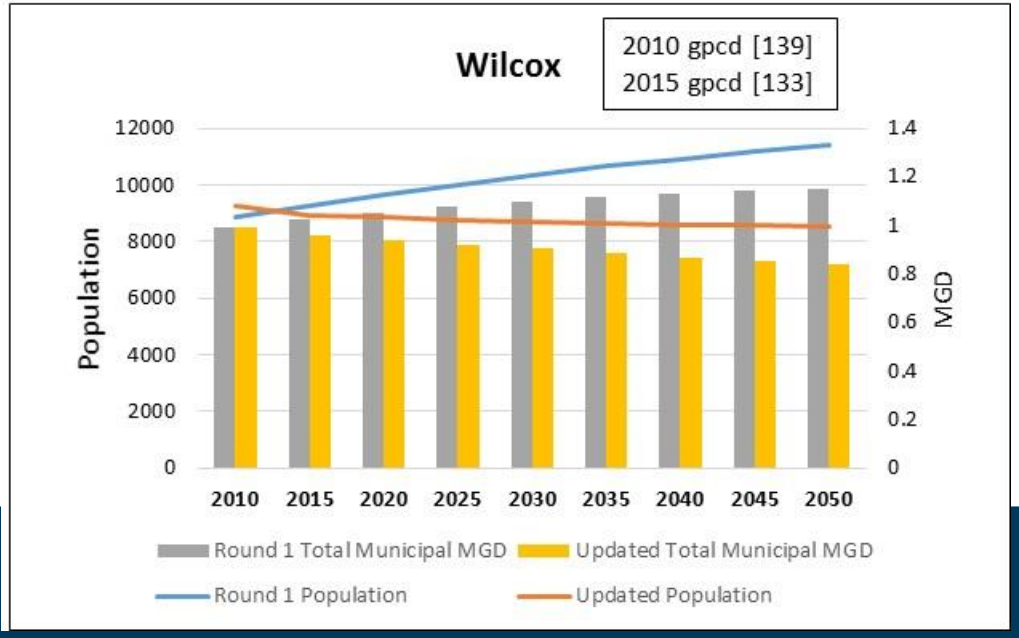




Georgia

Population & Municipal water demand forecast





Georgia

Municipal Wastewater Forecast Update Results

County	2015 Wastewater Flow	% of Total 2015 Wastewater Flow
Appling	1.99	7%
Bleckley	0.96	3%
Candler	1.13	4%
Dodge	2.36	8%
Emanuel	4.00	13%
Evans	0.52	2%
Jeff Davis	1.60	5%
Johnson	1.21	4%
Montgomery	0.86	3%
Tattnall	3.09	10%
Telfair	2.28	8%
Toombs	3.66	12%
Treutlen	0.77	3%
Wayne	4.12	14%
Wheeler	1.02	3%
Wilcox	0.71	2%
Total	**30.29**	**100%**

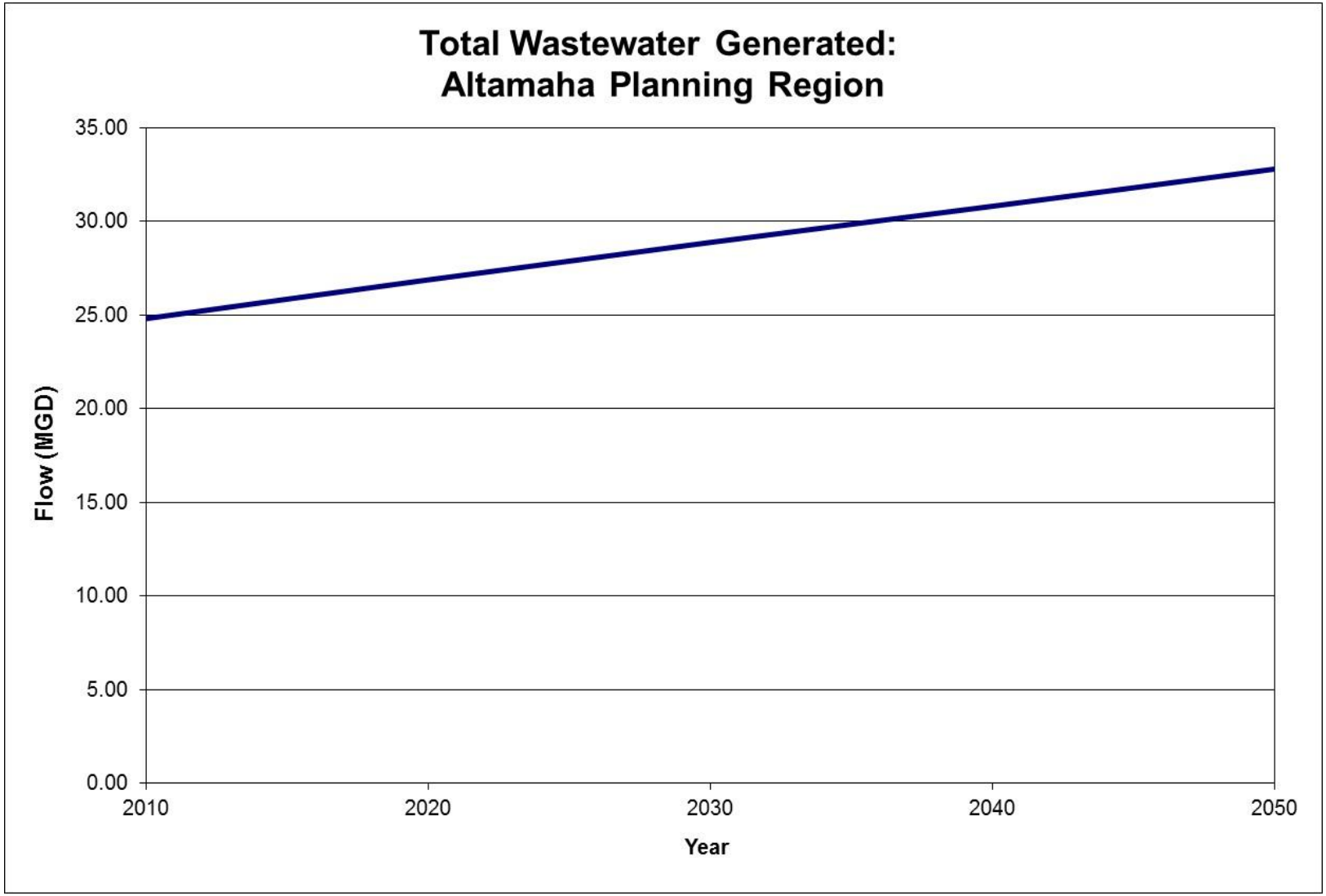
Georgia

Municipal Wastewater Forecast Round 1 Results

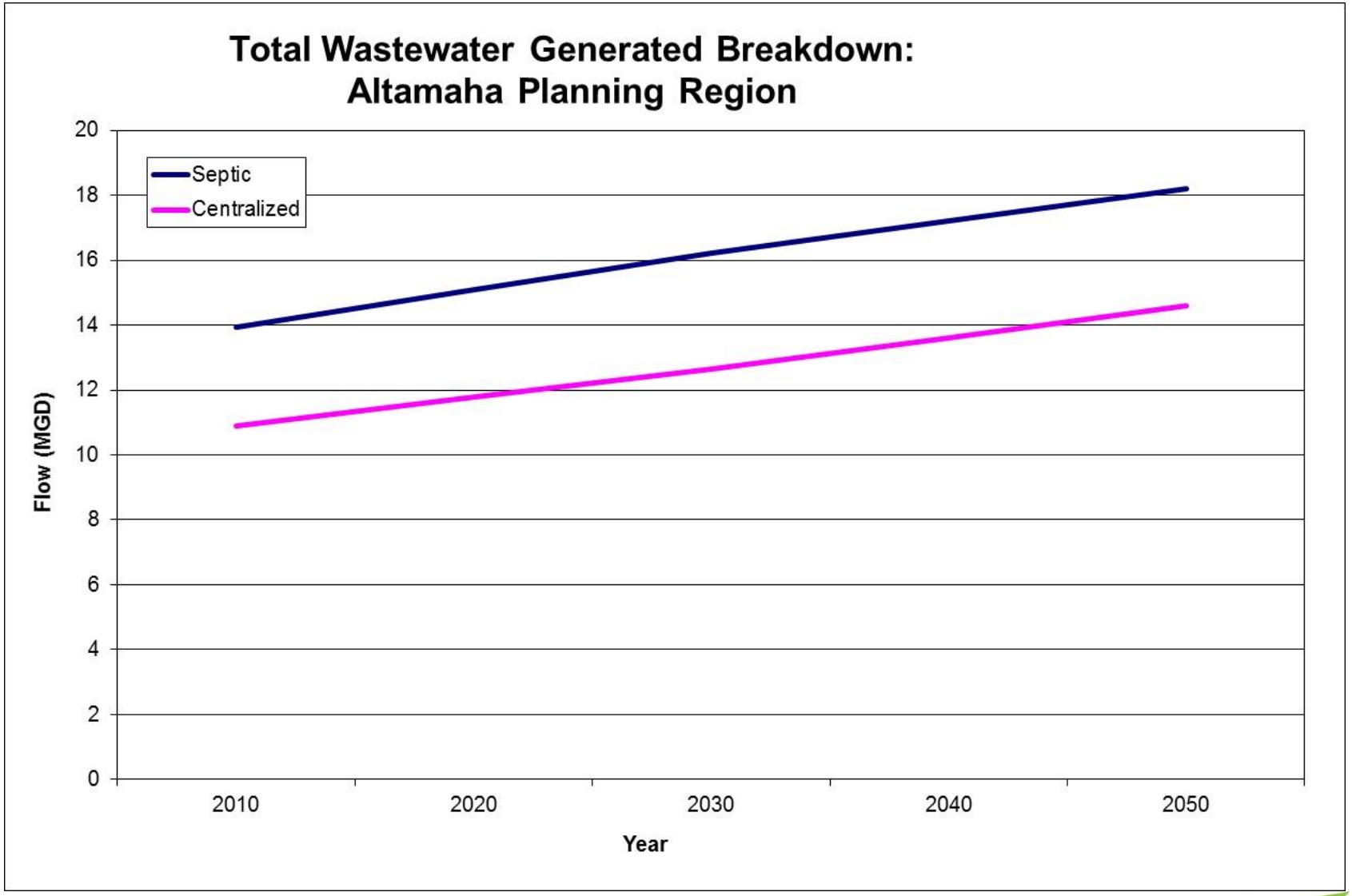
County	2010 Wastewater Flow	% of Total 2010 Wastewater Flow
Appling	1.60	6%
Bleckley	1.01	4%
Candler	1.08	4%
Dodge	2.14	9%
Emanuel	2.57	10%
Evans	0.85	3%
Jeff Davis	1.51	6%
Johnson	0.80	3%
Montgomery	0.80	3%
Tattnall	2.15	9%
Telfair	1.54	6%
Toombs	3.25	13%
Treutlen	0.68	3%
Wayne	3.30	13%
Wheeler	0.60	2%
Wilcox	0.93	4%
Total	24.82	**100%**

Georgia

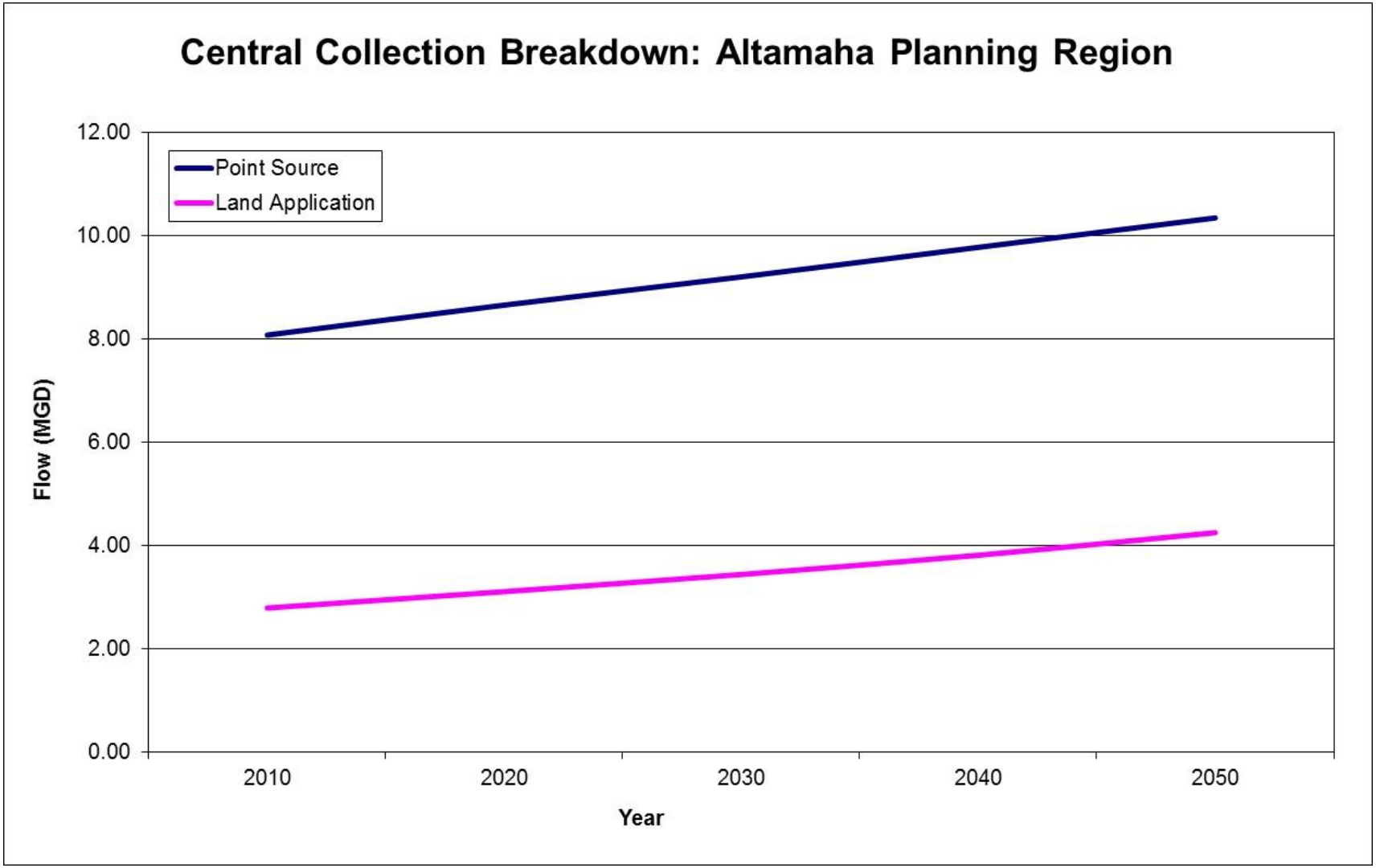
Municipal Wastewater Forecast Round 1 Results



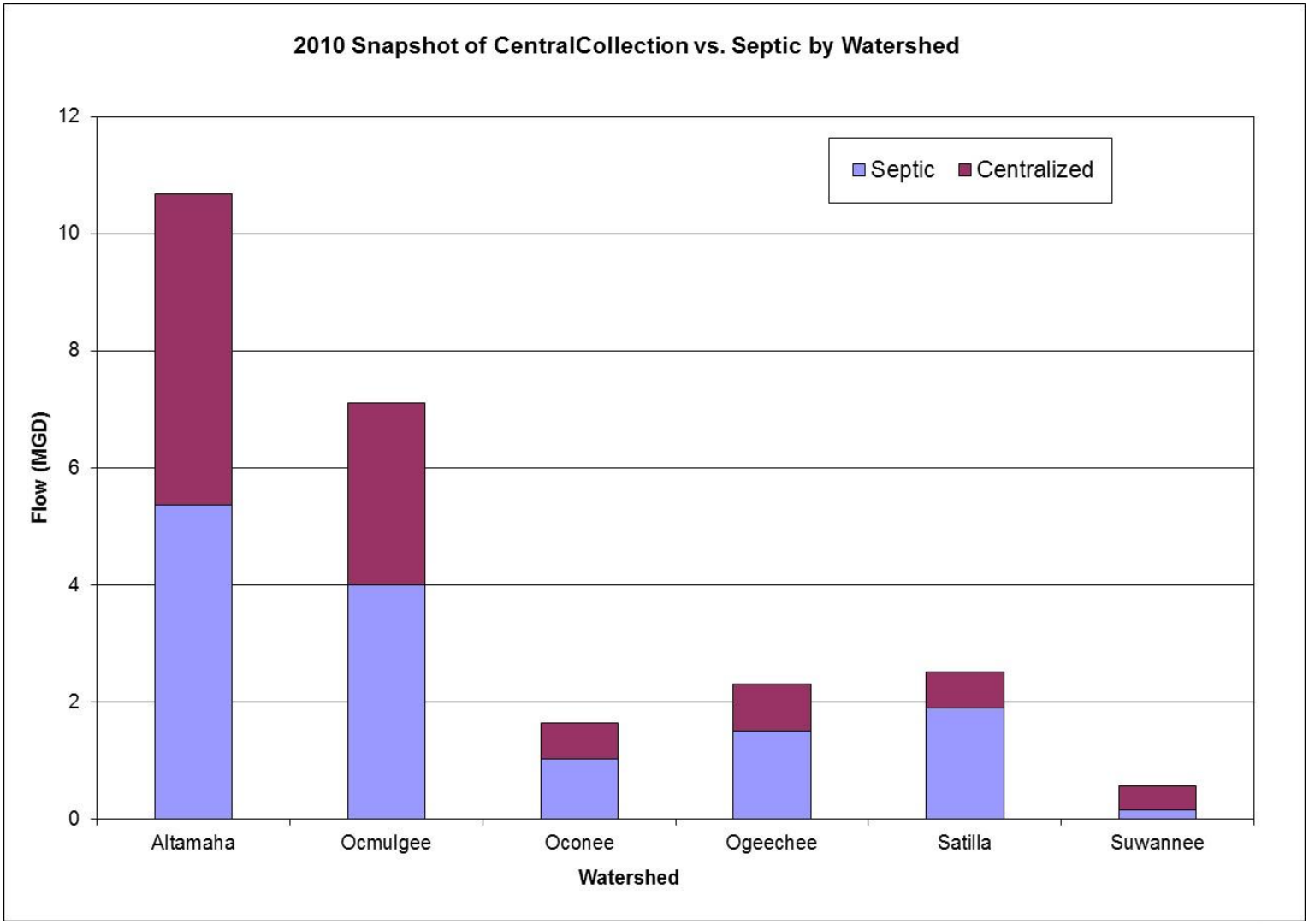
Municipal Wastewater Forecast Round 1 Results



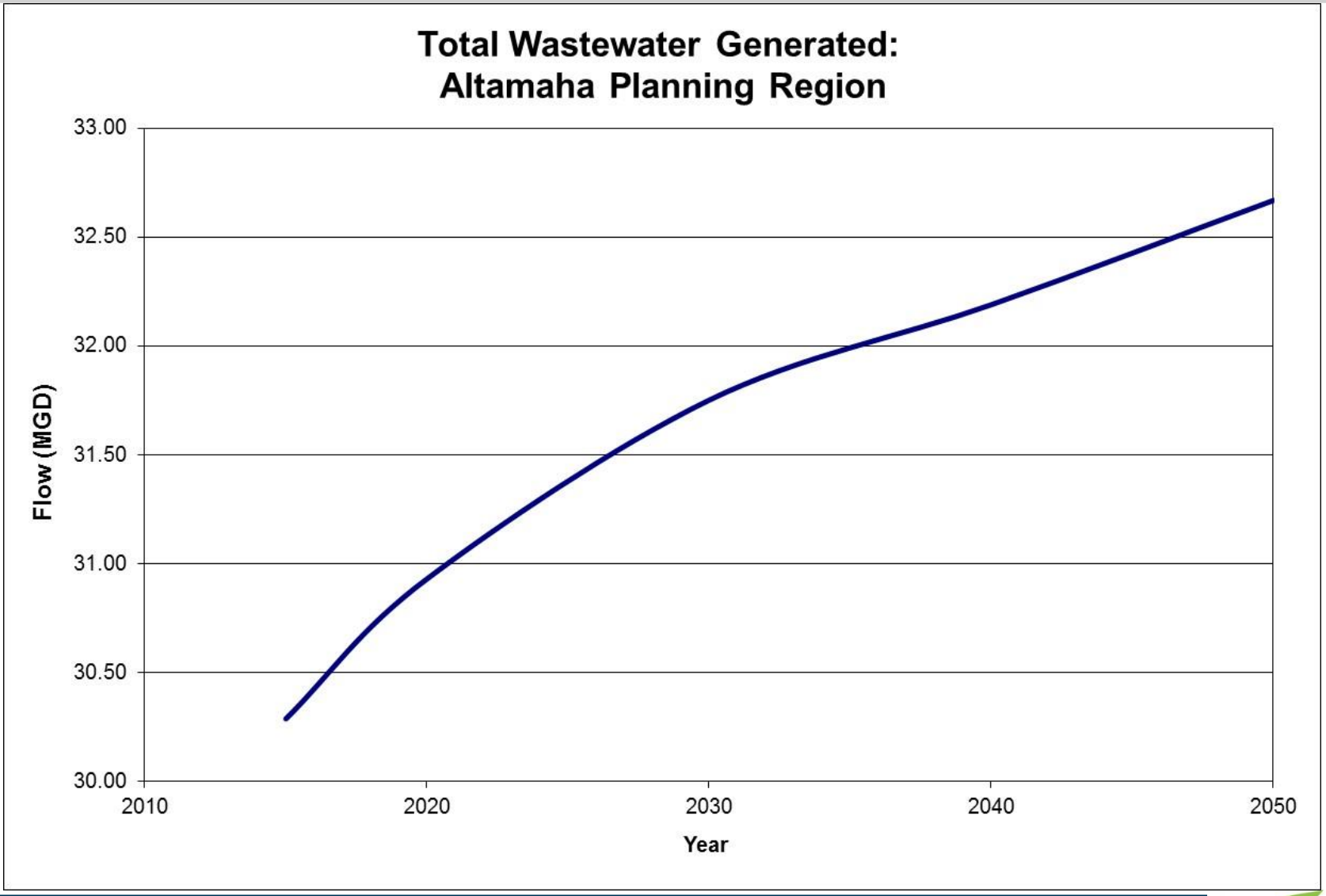
Municipal Wastewater Forecast Round 1 Results



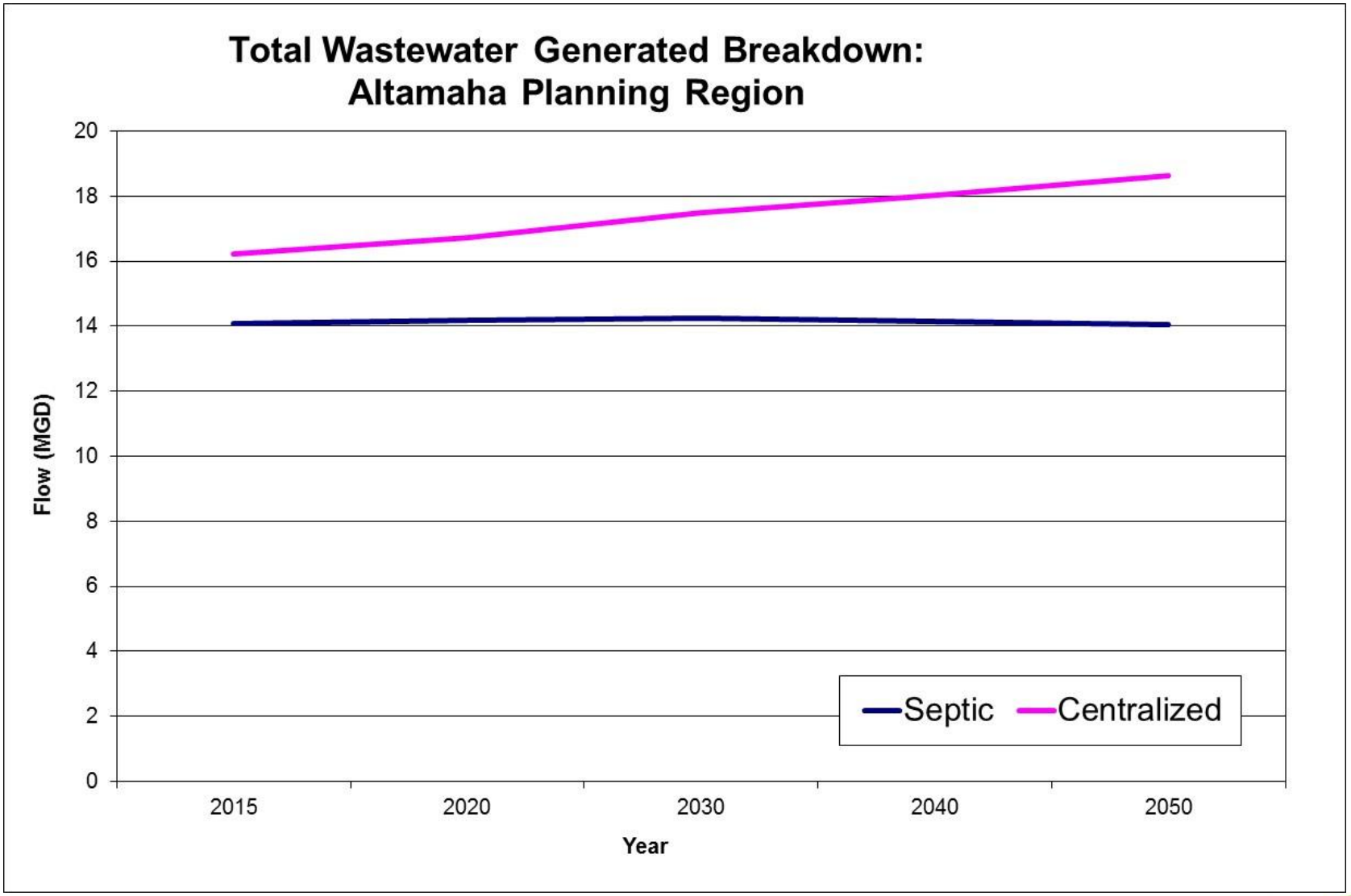
Municipal Wastewater Forecast Round 1 Results



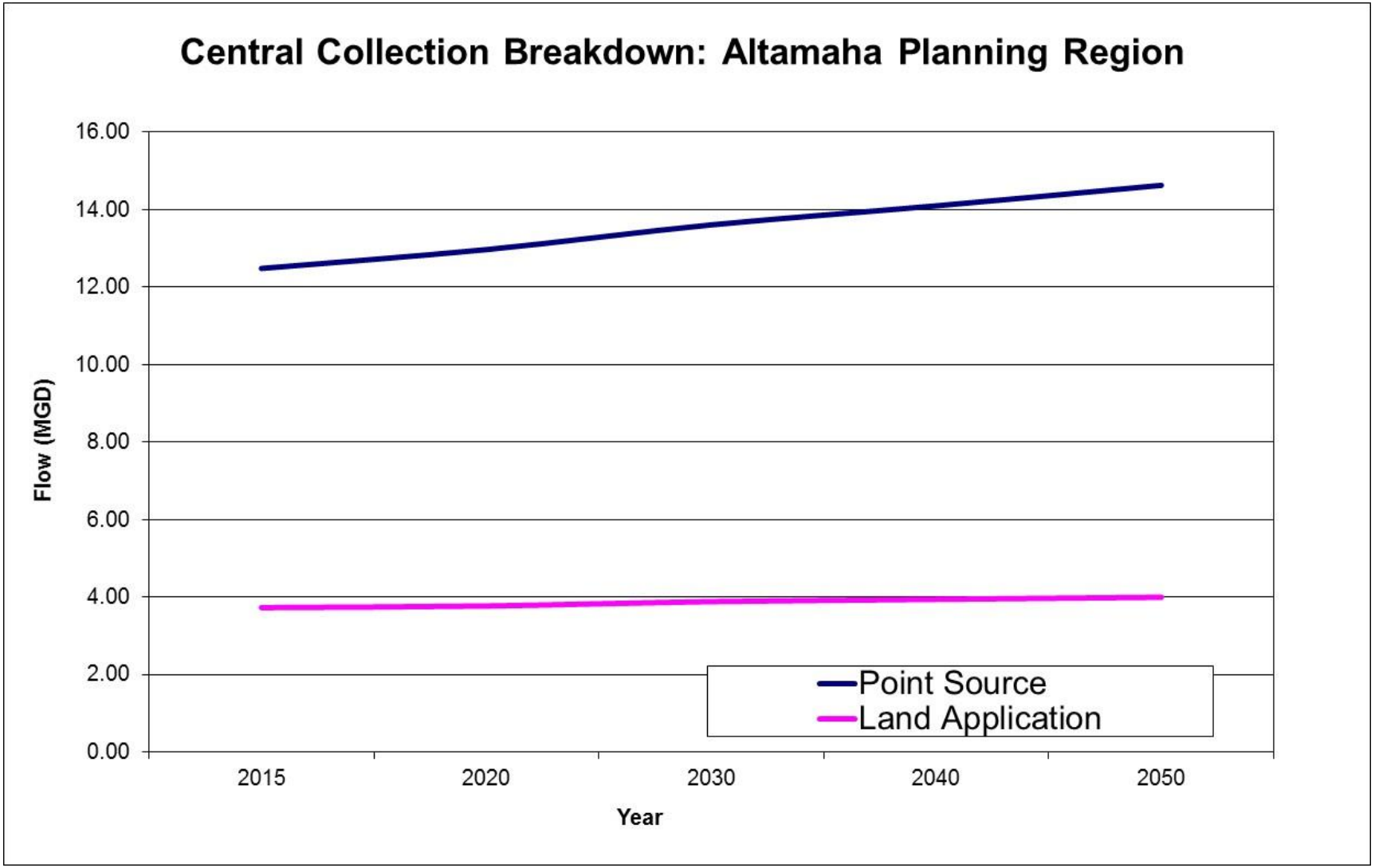
Municipal Wastewater Forecast Update Results



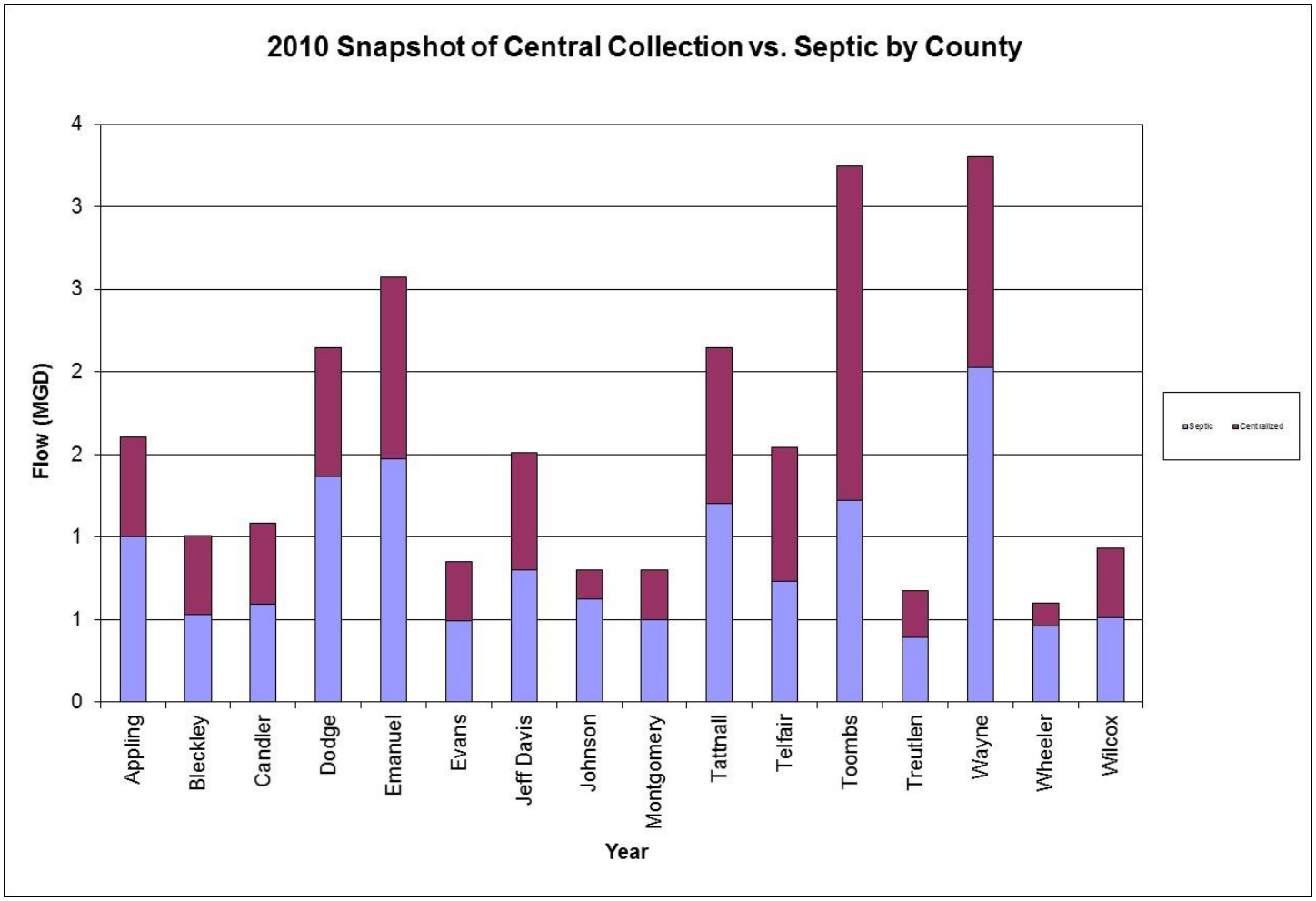
Municipal Wastewater Forecast Update Results



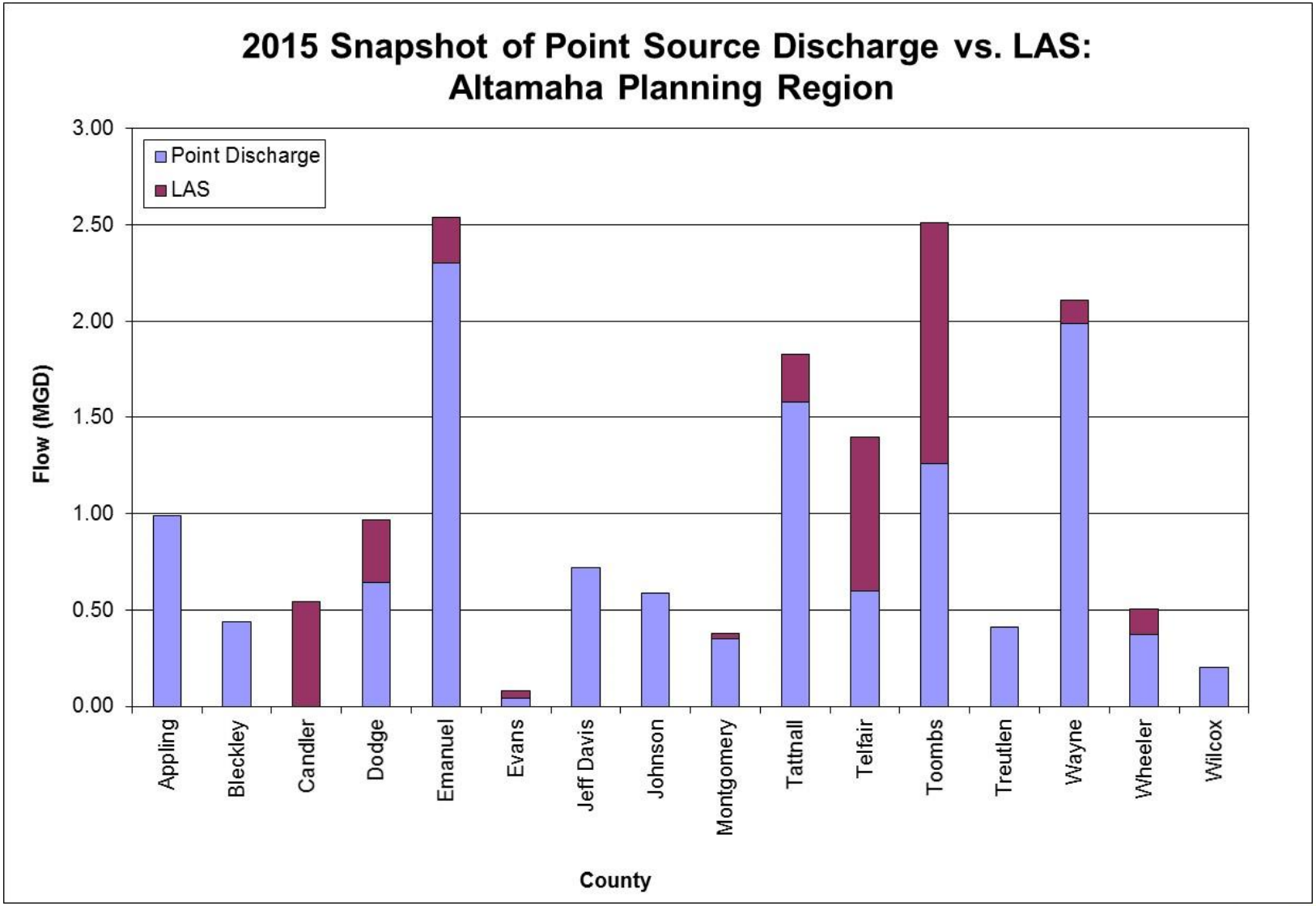
Municipal Wastewater Forecast Update Results



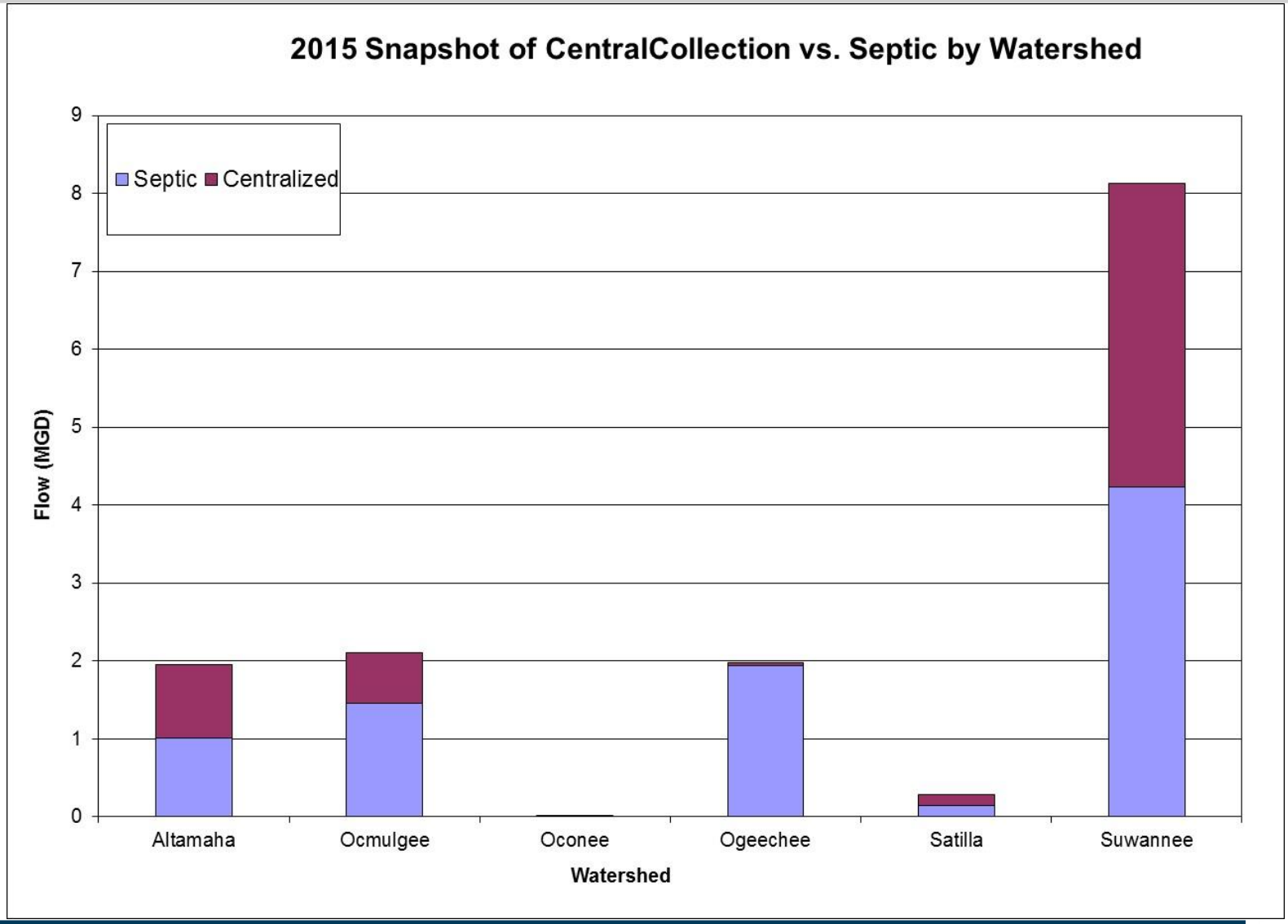
Municipal Wastewater Forecast Update Results



Municipal Wastewater Forecast Update Results



Municipal Wastewater Forecast Update Results



Major Water-Using Industries in Georgia

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

Georgia