Georgia's
State Water Plan

Council Meeting # 4

Coastal Georgia Regional Water Planning Council
February 24, 2017
Richmond Hill City Center, Richmond Hill, Georgia

Georgia's
State Water Plan

Welcome/Introductions/Approve Agenda/Meeting Objectives

Council Meeting Agenda

Georgia's State Water Plan

Coastal Georgia Regional Water Council Meeting 4
Agenda – February 24, 2017

Objectives:

1) Review Demand Forecasts, Resource Assessment Results and Initial Plan Updates (Sections 3, 4 & 5)
2) Discuss Format and Initial Revisions to Regional Water Plan (RWP) Update Documents
3) Review, Discussion and Revision of Management Practices including decision making
4) Discuss Approach and Timelines for Remaining RWP Updates

9:00–9:30	Registration
9:30–9:45	Welcome and Introductions Approve meeting minutes from November 17, 2016 Individual Council Meeting Approve meeting agenda
9:45-10:45	Regional Water Plan Deliverables • Review Demand Forecast Technical Memorandum • Format and Initial Revisions of RWP Updates • Review Updates to Sections 3, 4 and 5 of the RWP
10:45-11:00	Break
11:00 -11:45	Report out on January 2017 Shared Resources Sub-Committee Meetings
11:45-12:30 pm	Lunch (*30-minute SHEP update from U. S. Army Corps of Engineers - Spencer Davis*)
12:30 - 1:00	Review 2011 Decision Process
1:00 - 2:30	Review and Discuss Management Practices
2:30 - 3:00	Next steps, Subcommittee Discussion and Schedule for Remaining RWP updates
3:00 - 3:15	Public Comments/Local Elected Official Comments Wrap Up
3:15	Adjourn

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Council Meeting 4

- Meeting Summary from Nov 17, 2016 Council Meeting (CM3)
- Approve Meeting Agenda for CM4

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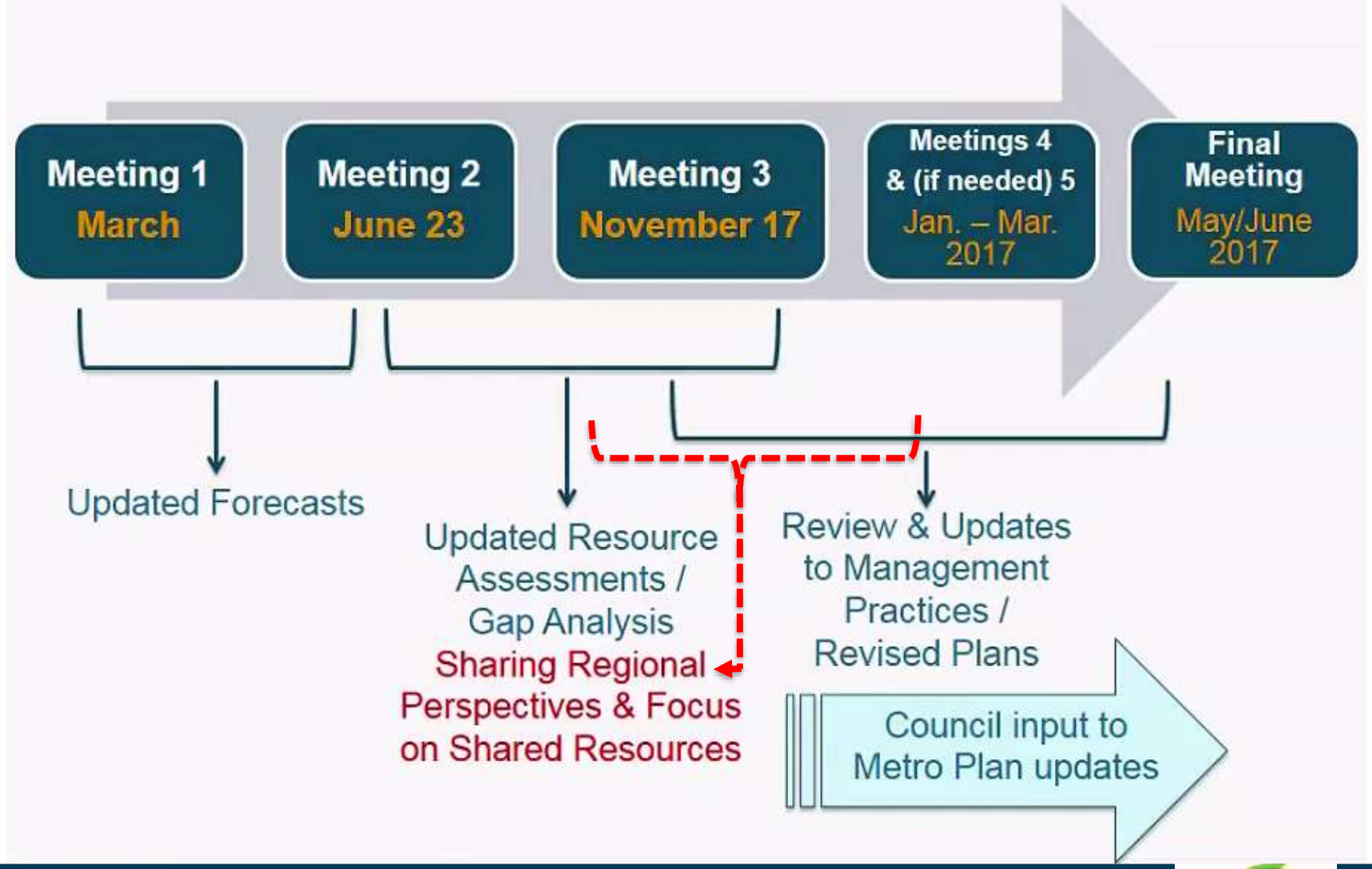
Regional Water Development and Conservation Plan 5-year Review and Revision – Review of Deliverables

www.georgiawaterplanning.org

2016 – 2017 Regional Water Plan Review and Revision Schedule



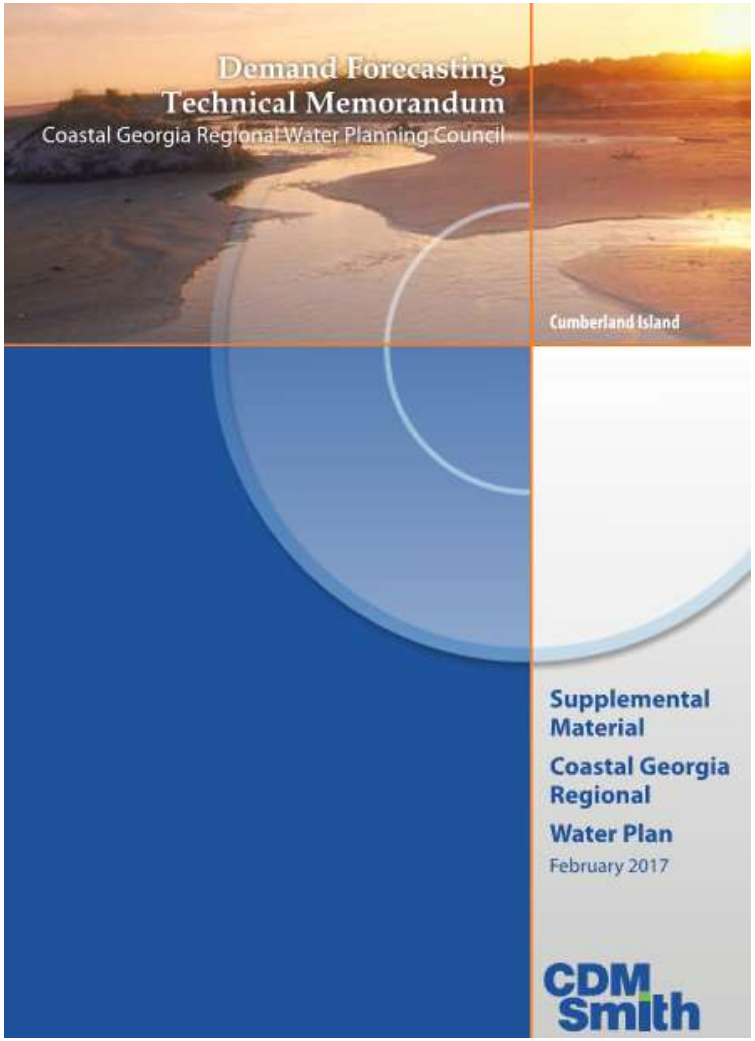
Completing Draft Plan Update

- Final Demand Forecast Technical Memorandum
- Draft Section 3 - Water Resources of the Coastal Georgia Region
- Draft Section 4 - Forecasting Future Water Resource Needs
- Draft Section 5 - Comparison of Available Resource Capacity and Future Needs

Georgia

Demand Forecast Technical Memorandum (TM)

- Items addressed from council input
  - Regional gpcd value vs. county specific
  - Industrial forecast not being updated but methodology will be considered for update next plan update round
  - County demands presented in tabular format
  - County specific Agricultural demands updated by Mark Masters and documented in the TM
- Seeking Council Approval



Overview of Plan Content

September 2011

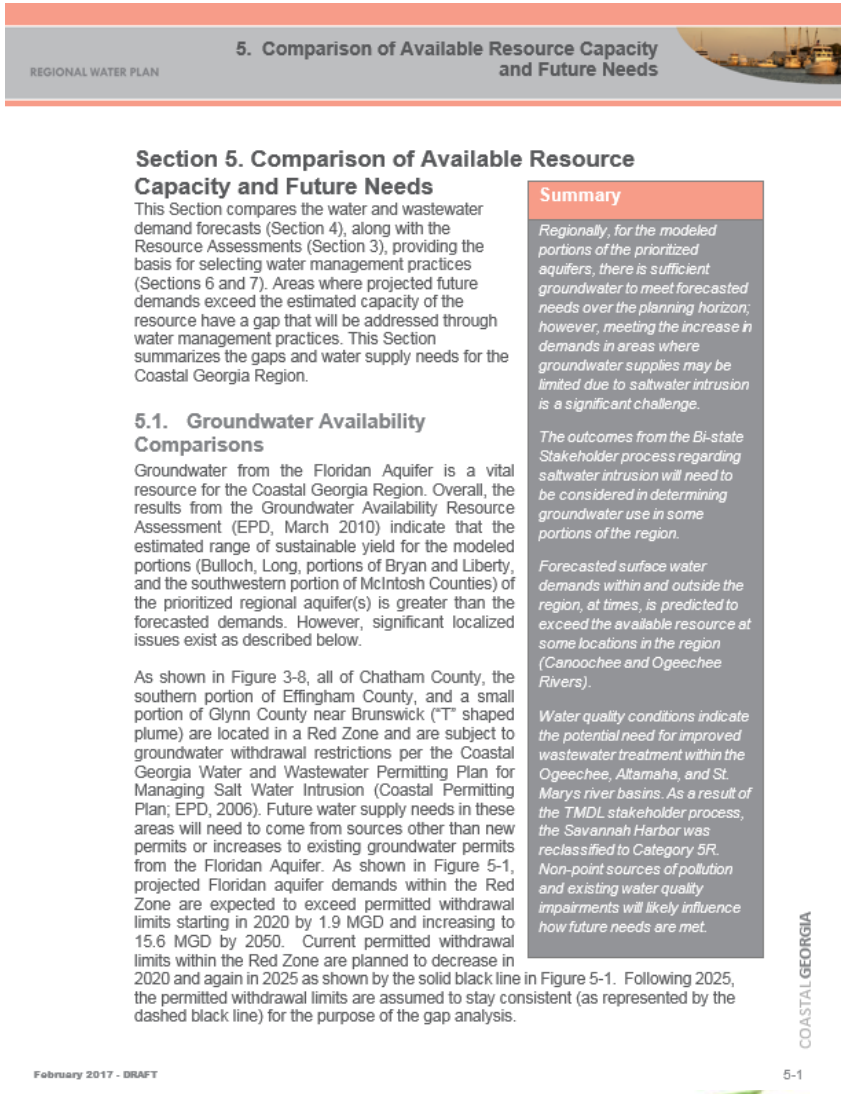
COASTAL GEORGIA

Georgia

Report Sections 3, 4 & 5 – Review by Editing Committee

- Section 3 - Water Resources of the Coastal Georgia Region
- Section 4 - Forecasting Future Water Resource Needs
- Section 5 - Comparison of Available Resource Capacity and Future Needs

Editing Committee Assignments



REGIONAL WATER PLAN

5. Comparison of Available Resource Capacity and Future Needs

Section 5. Comparison of Available Resource Capacity and Future Needs

This Section compares the water and wastewater demand forecasts (Section 4), along with the Resource Assessments (Section 3), providing the basis for selecting water management practices (Sections 6 and 7). Areas where projected future demands exceed the estimated capacity of the resource have a gap that will be addressed through water management practices. This Section summarizes the gaps and water supply needs for the Coastal Georgia Region.

Summary

Regionally, for the modeled portions of the prioritized aquifers, there is sufficient groundwater to meet forecasted needs over the planning horizon; however, meeting the increase in demands in areas where groundwater supplies may be limited due to saltwater intrusion is a significant challenge.

The outcomes from the Bi-state Stakeholder process regarding saltwater intrusion will need to be considered in determining groundwater use in some portions of the region.

Forecasted surface water demands within and outside the region, at times, is predicted to exceed the available resource at some locations in the region (Canoochee and Ogeechee Rivers).

Water quality conditions indicate the potential need for improved wastewater treatment within the Ogeechee, Altamaha, and St. Marys river basins. As a result of the TMDL stakeholder process, the Savannah Harbor was reclassified to Category 5R. Non-point sources of pollution and existing water quality impairments will likely influence how future needs are met.

5.1. Groundwater Availability Comparisons

Groundwater from the Floridan Aquifer is a vital resource for the Coastal Georgia Region. Overall, the results from the Groundwater Availability Resource Assessment (EPD, March 2010) indicate that the estimated range of sustainable yield for the modeled portions (Bulloch, Long, portions of Bryan and Liberty, and the southwestern portion of McIntosh Counties) of the prioritized regional aquifer(s) is greater than the forecasted demands. However, significant localized issues exist as described below.

As shown in Figure 3-8, all of Chatham County, the southern portion of Effingham County, and a small portion of Glynn County near Brunswick ("T" shaped plume) are located in a Red Zone and are subject to groundwater withdrawal restrictions per the Coastal Georgia Water and Wastewater Permitting Plan for Managing Salt Water Intrusion (Coastal Permitting Plan; EPD, 2006). Future water supply needs in these areas will need to come from sources other than new permits or increases to existing groundwater permits from the Floridan Aquifer. As shown in Figure 5-1, projected Floridan aquifer demands within the Red Zone are expected to exceed permitted withdrawal limits starting in 2020 by 1.9 MGD and increasing to 15.6 MGD by 2050. Current permitted withdrawal limits within the Red Zone are planned to decrease in 2020 and again in 2025 as shown by the solid black line in Figure 5-1. Following 2025, the permitted withdrawal limits are assumed to stay consistent (as represented by the dashed black line) for the purpose of the gap analysis.

COASTAL GEORGIA

February 2017 - DRAFT

5-1

BREAK

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Report Out Shared Resources Subcommittee Meetings on Groundwater and Surface Water

www.georgiawaterplanning.org

Groundwater Subcommittee Invited Participants

Name	Affiliation	County
James Vaughn Coastal Georgia Council	james.vaughn@gmcnetwork.com	Chatham
Ed Jeffords, Altamaha Council Chair	ed.jeffords@rayonieram.com	
Gerald DeWitt, Altamaha Council	gadewitt@hotmail.com	
Tom Wiedmeier, Savannah Upper Ogeechee Council	Director, Augusta Utilities TWiedmeier@augustaga.gov	
Jeff Larson, Georgia EPD	Georgia EPD Jeff.Larson@dnr.ga.gov	
Jim Kennedy, Georgia EPD	Georgia EPD Jim.Kennedy@dnr.state.ga.us	
Bill Frechette, Georgia EPD	Georgia EPD Bill.Frechette@dnr.ga.gov	
Jennifer Welte, Georgia EPD	Georgia EPD Jennifer.Welte@dnr.ga.gov	
Rick Brown, CDM Smith	CDM Smith brownrl1959@gmail.com	
Shayne Wood, CDM Smith	CDM Smith WoodSH@cdmsmith.com	
Danielle Honour, CDM Smith	CDM Smith HonourDM@cdmsmith.com	

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Groundwater Subcommittee Meeting Objectives

Georgia's State Water Plan

Floridian Aquifer Groundwater Use Shared Resources Subcommittee Meeting Agenda

Monday, January 23, 2017

World Trade Center, 131 Hutchinson Island Rd, Savannah, GA 31421

Altamaha, Coastal Georgia, Savannah-Upper Ogeechee Regional Water Planning Councils

Meeting Objectives:

The meeting will focus on the Red (Chatham and Southeast Effingham Counties) and Yellow Zones (Bryan and Liberty Counties)

1) Review and discuss Updated Regional Floridan Aquifer Water Demand Forecasts
2) Review and discuss changes to the 2011 Regional Water Planning assumptions for Floridan Aquifer Groundwater Availability for the Red and Yellow Zones and revised "Gap" quantification
3) Begin discussion of Planned Activities and Potential Management Practices that could be utilized to meet future water needs considering updated forecasts and Floridan Aquifer permit limit reductions in the Red and Yellow Zones
4) Provide participants a more complete understanding of the Regional Water Planning process and local planning challenges and opportunities

Georgia

Surface Water Subcommittee Invited Participants

Name	Affiliation/Contact	Planning Region/County
Mark Masters	Georgia Water Planning and Policy Center, Agricultural Water Forecast Lead mmasters@h2opolicycenter.org	
Danielle Honour	CDM Smith, Planning Contractor HonourDM@cdmsmith.com	
Rick Brown	CDM Smith, Planning Contractor Brownrl1959@gmail.com 720-737-4453	
Shayne Wood	CDM Smith, Planning Contractor WoodSH@cdmsmith.com	

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Surface Water Subcommittee Meeting Objectives

Georgia's State Water Plan

Surface Water Use Shared Resources Subcommittee
Meeting Agenda
Wednesday, January 25, 2017,
Ogeechee Technical College, Oak Room, 1 Joe Kennedy Blvd, Statesboro, GA 30458
Altamaha, Coastal Georgia, Savannah-Upper Ogeechee, Suwannee-Satilla, and Upper Oconee Regional Water Planning Councils

Meeting Objectives:

1) Develop a deeper understanding of Surface Water Use within and between Regional Councils
2) Discuss Surface Water Flow Conditions and Potential Gaps in light of Updated Forecast and Resource Assessment Results
3) Learn more about the Agricultural Water Permitting Program
4) Begin discussion of Planned Activities and Potential Management Practices, within and between Regional Councils, which might affect Shared Resources and/or be considered to help address potential Surface Water Gaps

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LUNCH BREAK

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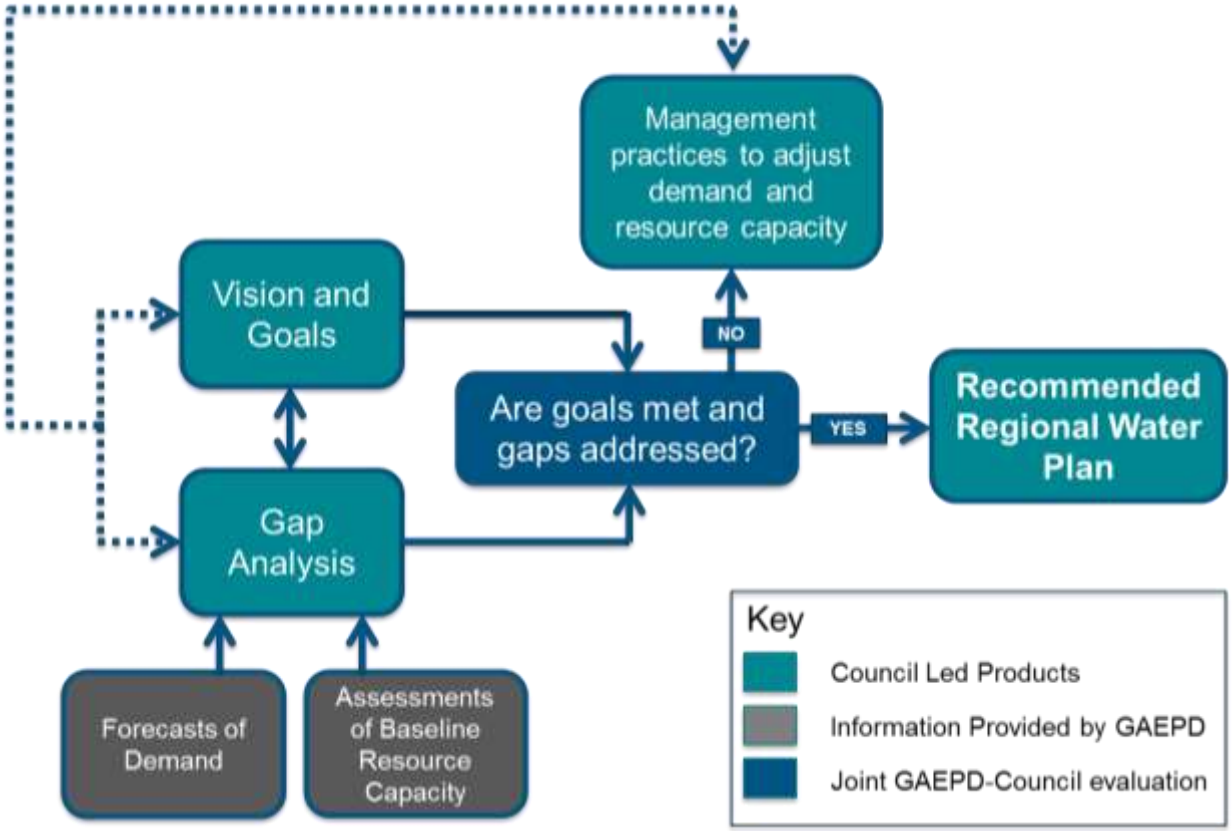
Review 2011 Decision Process

www.georgiawaterplanning.org

Coastal Georgia RWPC Vision

Conserve and manage our water resources in order to sustain and enhance our unique coastal environment and economy of Coastal Georgia.



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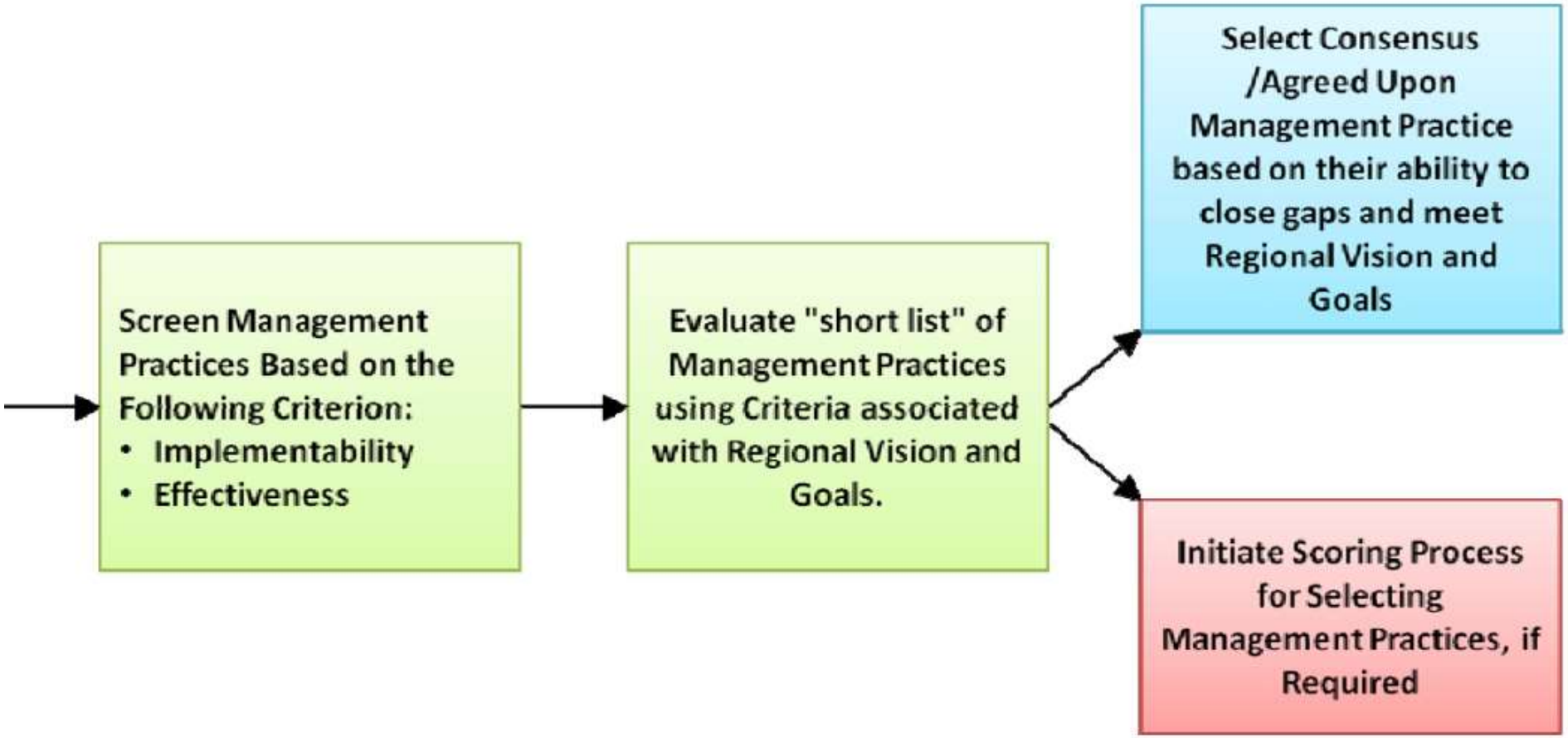
Management Practices Definition

- Any program or activity that:
  - Helps meet the regional vision and goals
  - Can be employed to ensure that there is sufficient water (surface and groundwater quantity) and assimilative capacity (surface water quality) to sustainably meet future needs

- Management practices can increase resource capacity and/or adjusts forecasted demands (i.e., water efficiency measures)

Management Practice Selection Process



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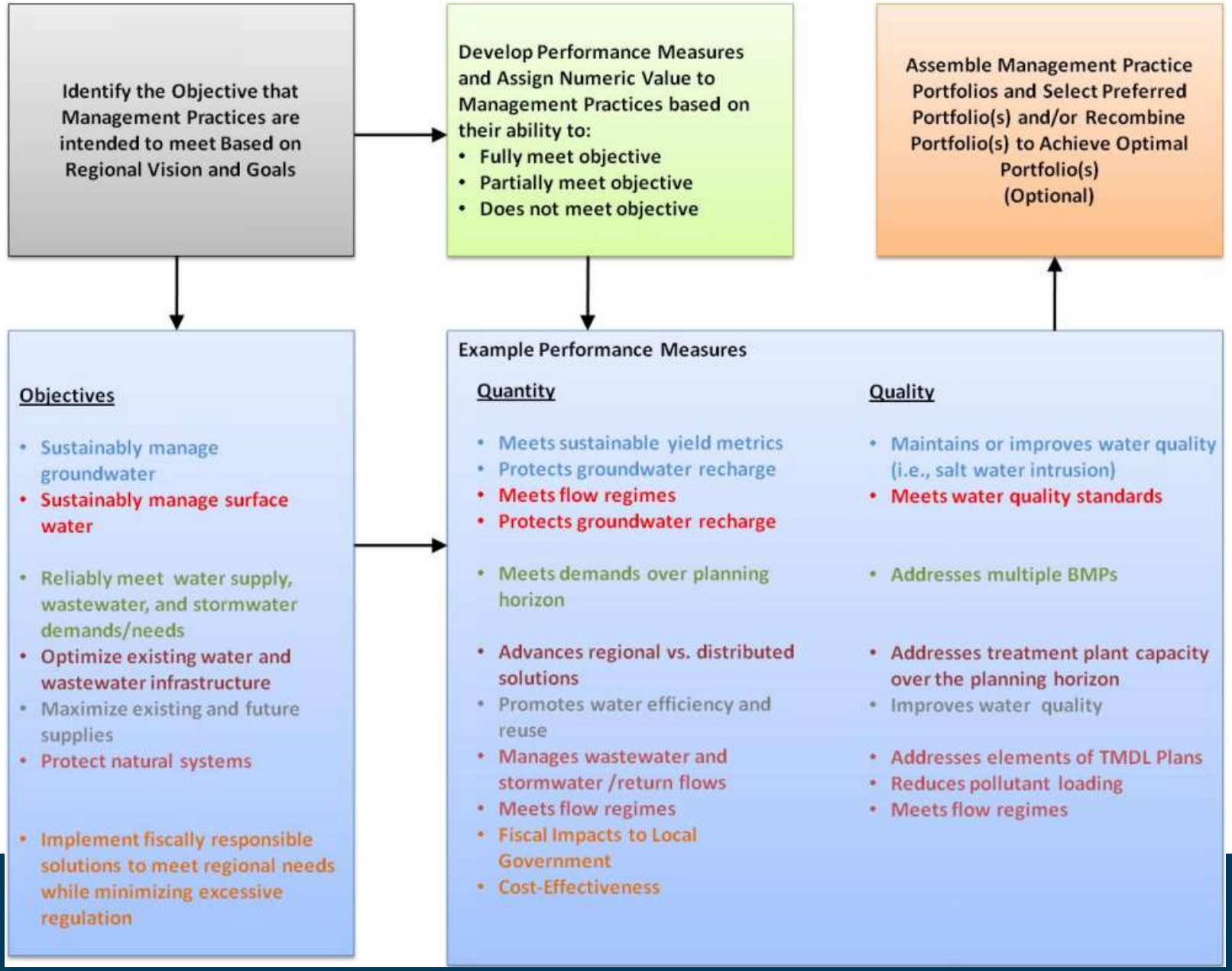
Management Practice Selection Process



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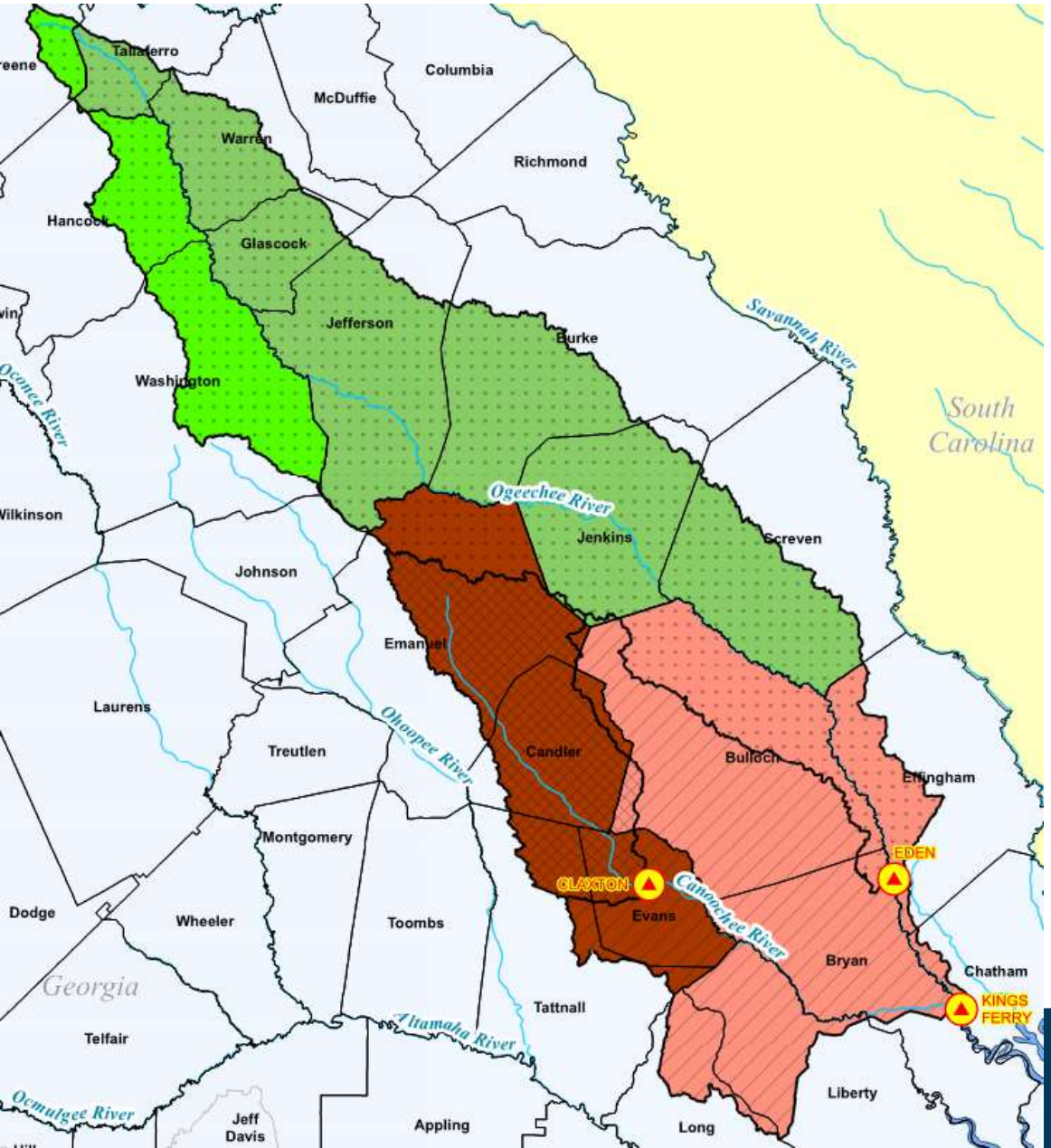
Review and Discuss Management Practices

www.georgiawaterplanning.org

Management Practices

- The Coastal Council identified 86 Management Practices (MPs) in 2011 RWP
  - Water Conservation
  - Water Supply and Management
  - Wastewater and Water Quality
  - Information Needs
- Step Back and Highlight Primary Drivers for MPs

Potential Surface Water Gaps



- Regional Council and Local Drainage Area (LDA) Boundaries – Claxton, Eden and Kings Ferry Planning Nodes

Georgia

2050 Withdrawals by County and Region

Kings Ferry Planning Node Surface Water Forecast by Region and County

	Councils That Are Within the Local Drainage Area with Potential Gaps	Counties That Are Located (whole or in part) Within the Local Drainage Area	Acreage of County Area Within the LDA That Drains to Planning Node	% of County Land Area Within the LDA That Drains to Planning Node	Acreage of SW Irrigated Land Area Within the LDA That Drains to Planning Node[1]	2050 Forecasted Surface Water Withdrawals for Portion of County That Drains to Planning Node[2, 3] (MGD)
Ogeechee River	Altamaha	Candler	11,225	7.0%	105	0.04
		Emanuel	2,258	0.5%	148	0.08
		Evans	88,106	73.6%	3,789	2.45
		Tattnall	22,355	6.4%	616	0.52
	Coastal Georgia	Bryan	184,718	63.4%	--	--
		Bulloch	269,498	61.1%	5,449	2.72
		Chatham	9,412	2.9%	--	--
		Effingham	5,369	1.7%	--	--
		Liberty	116,784	33.2%	31	0.02
		Long	47,550	18.4%	263	0.12
	Savannah-Upper Ogeechee	Jenkins	1,750	0.8%	194	0.11

1 – Acres irrigated with surface water by County and planning node were obtained from the Irrigated Acreage GIS layer (Georgia Water Planning & Policy Center, 2016)
2 – Surface water withdrawals by County were obtained from 2050_Final_Yearly_Withdrawals_MGD_Atlantic GIS layer (Georgia Water Planning & Policy Center, 2016)
3 – MGD represents average annual day demands
-- No surface water irrigated acres reported for County within LDA

Surface Water Management Practice Categories

- Data Collection/Additional Research (DCAR)
- Water Conservation (WC)
- Additional/Alternate to Existing Surface Water Supply Sources (ASWS)
- Current and Future Surface Water Needs (SW)
- Agricultural Best Management Practices for Crop and Pasture Lands (NPSA)

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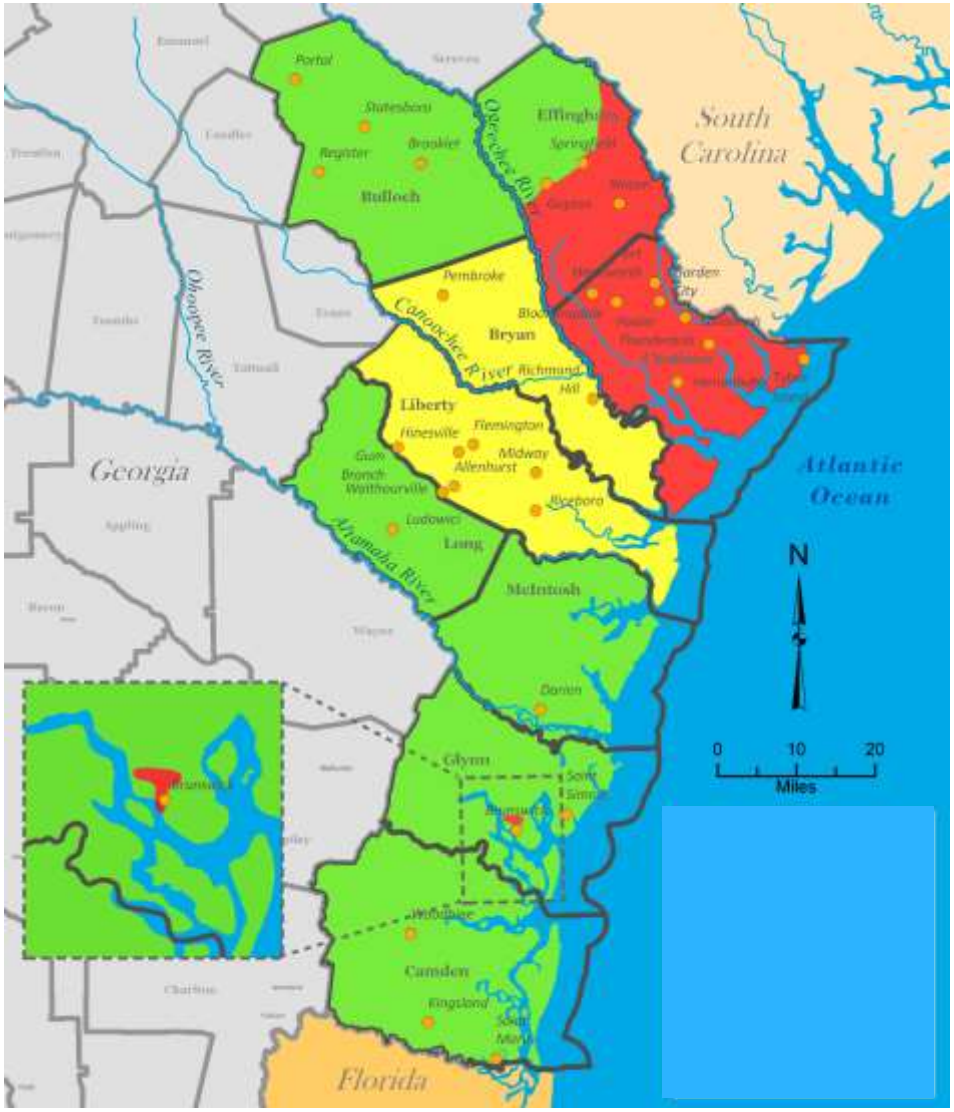
Groundwater Gaps



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Changes Since Completion of 2011 Water Plan

- Developing alternate water supply strategies is vital to meet future needs

Red and Yellow Zone Forecasted Water Needs

Implement Proactive Local and Regional Planning

Reduction in Groundwater Use to Improve Management of the Floridan Aquifer

Implement Reduction Strategy

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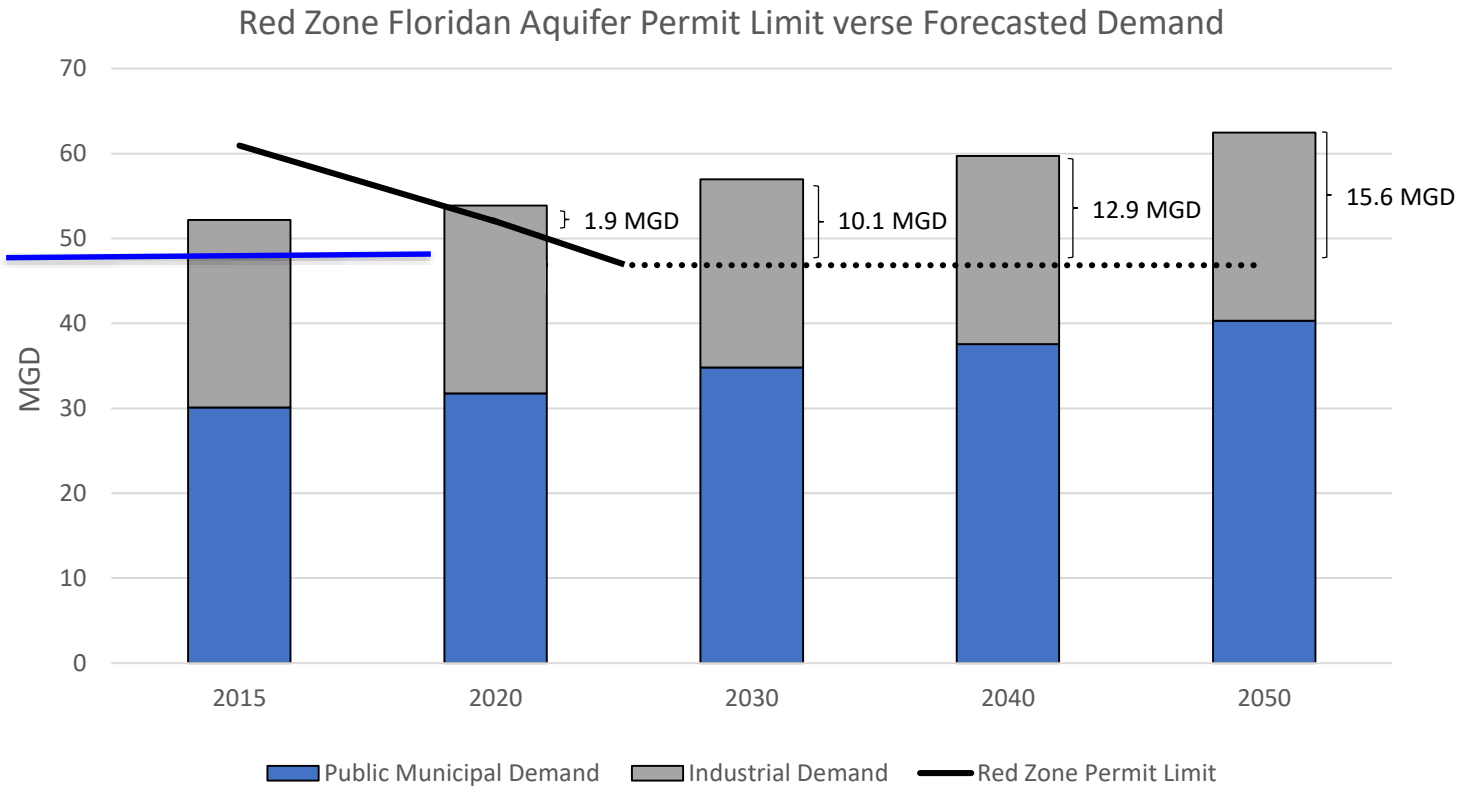
Aquifer Permit Limits vs. Forecasted Demand

2015 Actual = 48 MGD



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)

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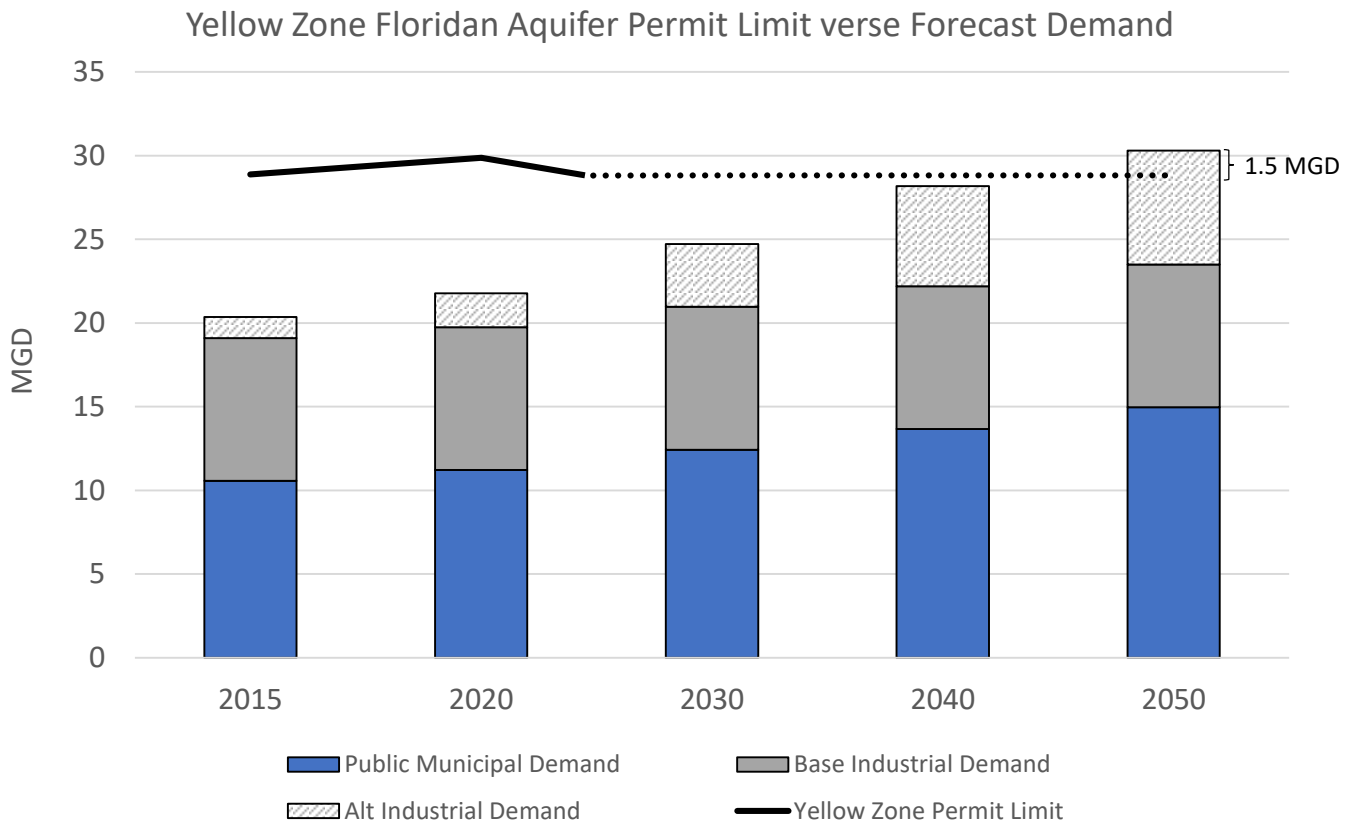
Aquifer Permit Limits vs. Forecasted Demand



Groundwater Water Management Practice Categories

- Data Collection/Additional Research (DCAR)
- Water Conservation (WC)
- Additional/Alternate to Existing Surface Water Supply Sources (ASWS)
- Current and Future Groundwater Needs (GW)
- Municipal Groundwater Permit Capacity (MGWPC)
- Future Educational Needs (EDU)
- Industrial Groundwater Permit Capacity (IGWPC)

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Surface Water Quality Resource Assessment Follow-U

- Identification of gaps within the region
  - Dissolved Oxygen Assimilative Capacity
  - Identification of specific reaches not meeting assimilative capacity

- Category 5R on the 2014 305(b)/303(d) list, the EPA withdrew the dissolved oxygen TMDL for the Savannah Harbor in favor of the alternative restoration approach outlined

It is important to note that exceedance of assimilative capacity on a reach could be the result of a point source discharge, non-point source loading

Assimilative Capacity Results (November 2016 Meeting)

Coastal Region – Results of DO Assimilative Capacity

Reaches within the Coastal Georgia Planning Council that have exceeded their full assimilative capacity under the current conditions assessment include:

- Taylors Creek, Canoochee Creek, and Little Ogeechee River in the Ogeechee Basin
- Beards Creek, Doctors Creek, Jones Creek and the lower portion of the Altamaha River main stem in the Altamaha Basin; and
- The main stem of the Saint Marys River in the St. Marys Basin.

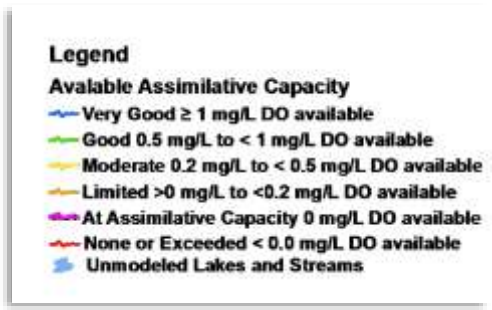
It is important to note that exceedance of assimilative capacity on a reach could be the result of a point source discharge, non-point source loading, or a naturally low DO condition.

Assimilative Capacity Results (November 2016 Meeting)

- Coastal Region – Results of DO Assimilative Capacity

Current Conditions

Updated Future Condition (2050)



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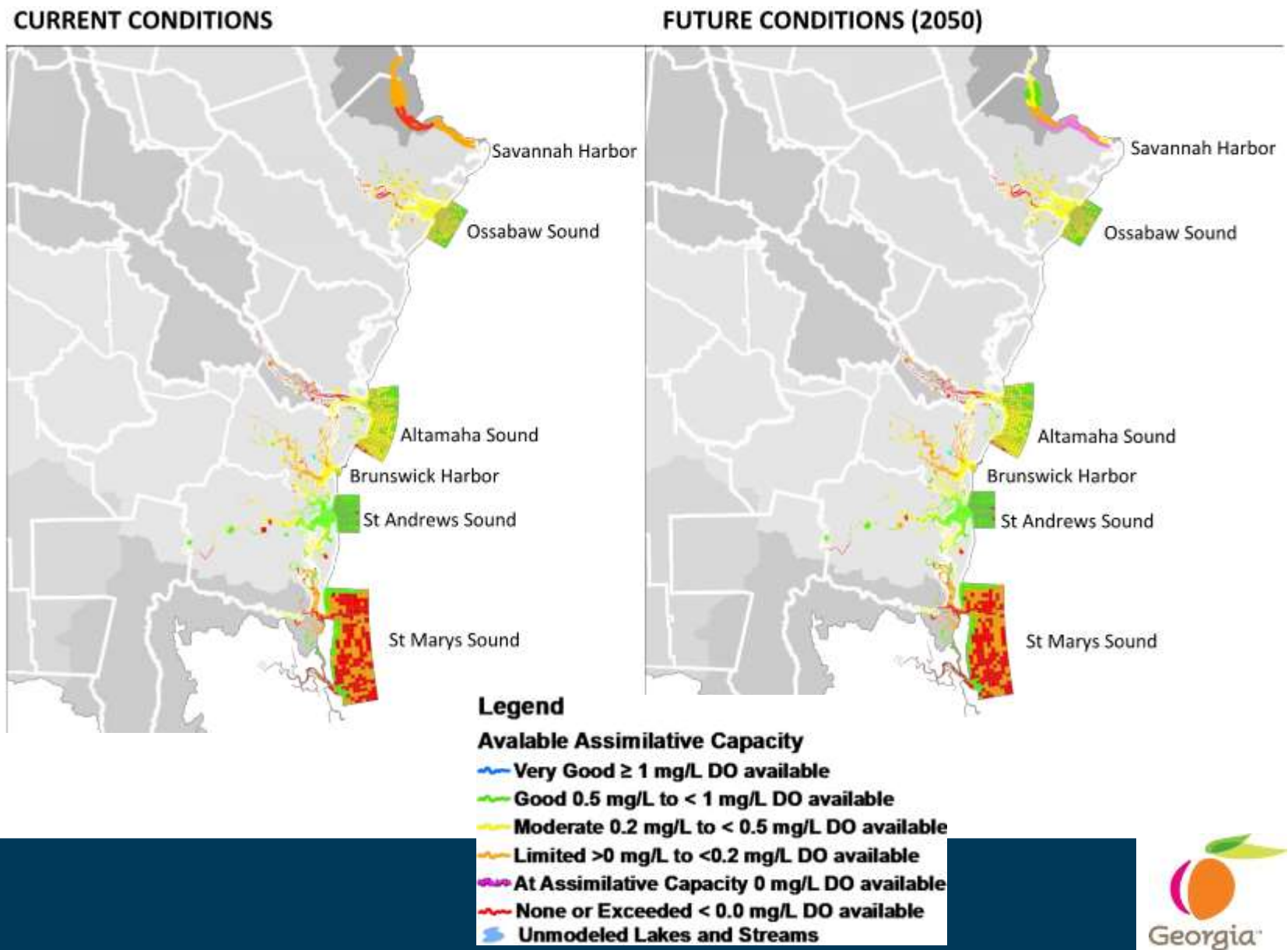
Environmental Fluid Dynamics Code (EFDC) Model Results



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Water Quality Management Practice Categories

- Existing Impairments and Total Maximum Daily Load Listed Streams (TMDL)
- Point Sources – Dissolved Oxygen (PSDO)
- Current and Future Surface Water Needs (SW)
- Water Quality Nonpoint Source Needs (NPS)
- Future Educational Needs (EDU)
- Best Management Practices (NPSU, NPSR, NPSF, NPSA)

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Detailed Discussion of Management Practices

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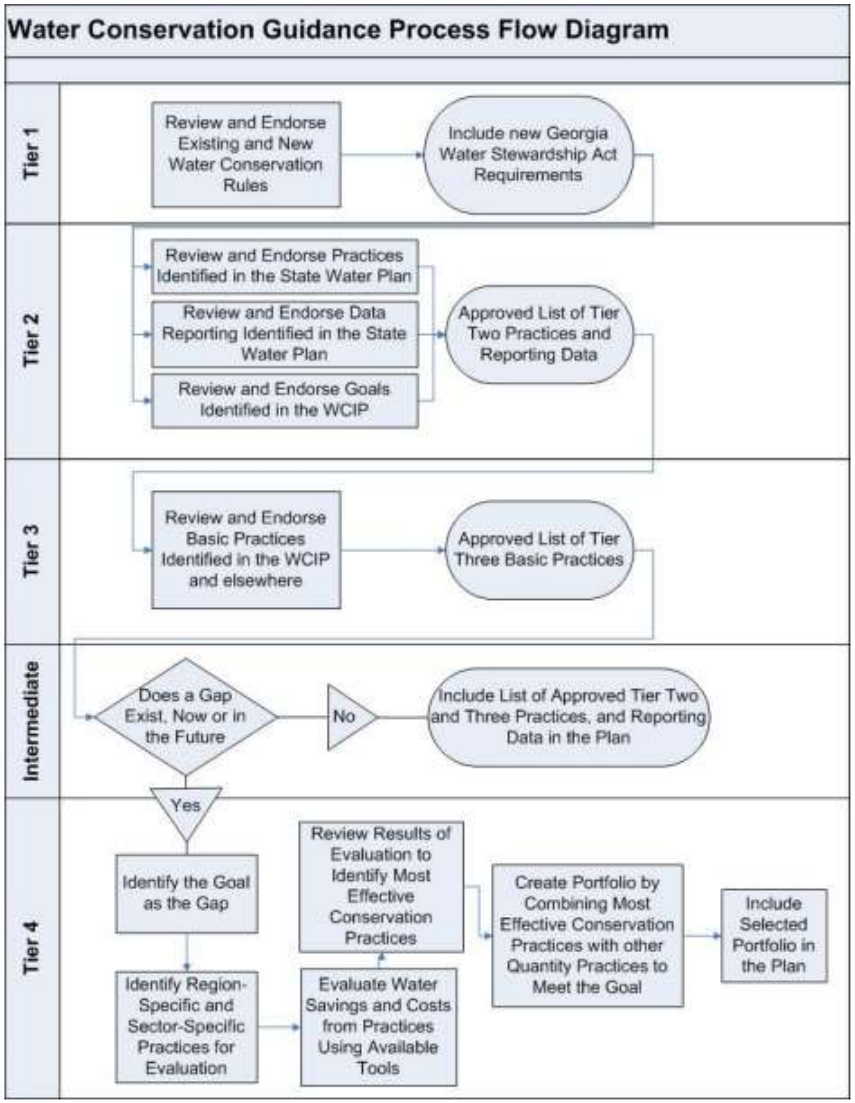
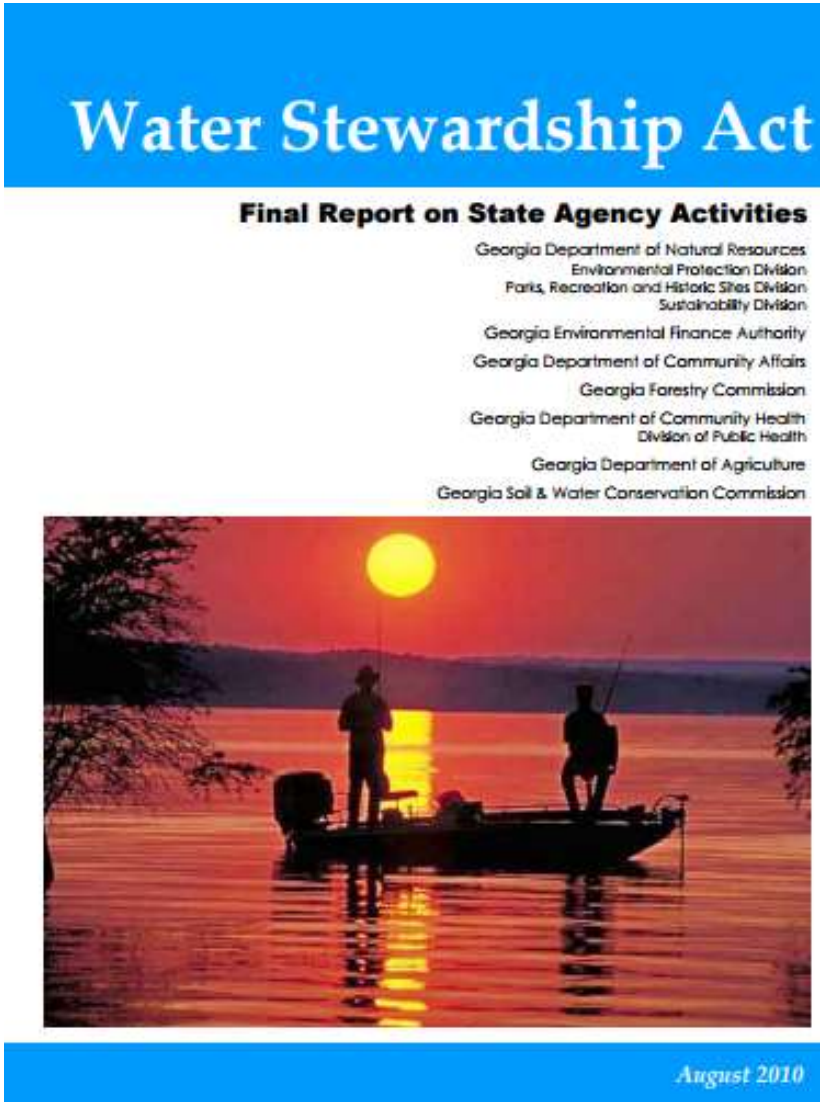
Water Conservation is a Priority Management Practice





http://www.georgiawaterplanning.org/documents/DetailedGuidance
https://epd.georgia.gov/sites/epd.georgia.gov/GWSA

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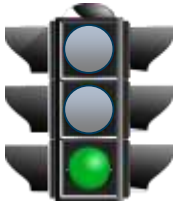
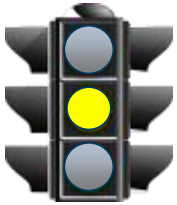
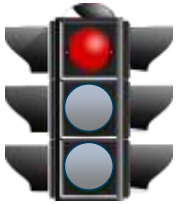
2011 RWP Recommended Management Practices



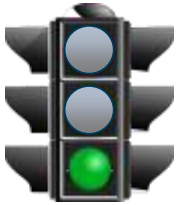
No Revision Needed **(NRN)**



Additional Discussion Required **(ADR)**



Revise or Eliminate **(ROE)**



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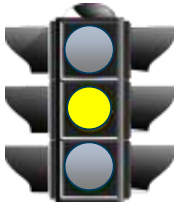
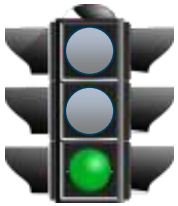
2011 RWP Recommended Management Practices

Table 6-1: Management Practices Selected for the Coastal Georgia Region			
Management Practice Number	**Issue(s) to be Addressed by Action(s)**	**Description/Definition of Action**	**Relationship of Action or Issue to Vision and Goals (Section 1.4)**
WC-2 Tier 3 and Tier 4 Measures for Municipal and Industrial Users in the Red and Yellow Zones	Help meet current and forecasted municipal and industrial groundwater water supply needs/gaps in the Red and Yellow Zones	Municipal and Industrial groundwater uses -The following Tier 3 and 4 municipal and industrial water conservation practices, established in the Coastal Permitting Plan, June 2006, and are supported by Council. - Maximize use of recycled or reclaimed water - Adopt water conservation education programs - For Golf Courses: 1) conduct reclaimed water feasibility study and 2) comply with Best Management Practices MOA by Georgia Golf Course Superintendents Assoc./EPD, May 2004. Council also recommends that local governments consider requiring rain/ moisture sensor shut-off devices for irrigation systems in new construction.	1-3



2011 RWP Recommended Management Practices

Table 6-1: Management Practices Selected for the Coastal Georgia Region			
Management Practice Number	**Issue(s) to be Addressed by Action(s)**	**Description/Definition of Action**	**Relationship of Action or Issue to Vision and Goals (Section 1.4)**
Action Needed - Water Conservation (WC) Continued - Address current and future gaps and needs by efficient water use – Agricultural Tier 3 Conservation Practices[2]			
WC-3 Audits	- Help meet current and future agricultural ground and surface water supply gaps/needs throughout the region - Help meet current and forecasted agricultural groundwater use in the Red and Yellow Zones - Help address surface water gap on Ogeechee River at Kings Ferry and Eden and Canoochee River at Claxton	Conduct irrigation audits	1,2,4
WC-4 Metering		Meter irrigation systems	1,2,4
WC-5 Inspections		Inspect pipes and plumbing to control water loss	1,2,4
WC-6 Minimize High-Pressure Systems		Minimize or eliminate the use of high-pressure spray guns on fixed and traveler systems where feasible	1,2,4
WC-7 Efficient Planting Methods		Utilize cropping and crop rotation methods that promote efficiency	1,2,4,5



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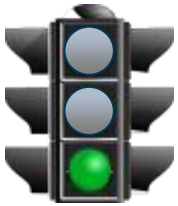
2011 RWP Recommended Management Practices

Table 6-1: Management Practices Selected for the Coastal Georgia Region			
Management Practice Number	**Issue(s) to be Addressed by Action(s)**	**Description/Definition of Action**	**Relationship of Action or Issue to Vision and Goals (Section 1.4)**
Action Needed - Water Conservation (WC) Continued - Address current and future gaps and needs by efficient water use – Agricultural Tier 4 Conservation Practices[2]			
WC-8 Conservation Tillage	- Help meet current and future agricultural ground and surface water supply gaps/needs throughout the region - Help meet current and forecasted agricultural groundwater use in the Red and Yellow zones - Help address surface water gap on Ogeechee River at Kings Ferry and Eden and Canoochee River at Claxton	Practice conservation tillage	1,2,4
WC-9 Control Loss		Control water loss	1,2,4
WC-10 End-Gun Shutoffs		Install end-gun shutoff with pivots	1,2,4
WC-11 Low Pressure Systems		Install low pressure irrigation systems where feasible (soil-specific)	1,2,4
WC-12 Application Efficiency Technologies		Encourage and improve use of soil moisture sensors, evapotranspiration sensors, or crop water use model(s) to time cycles	1,2,5



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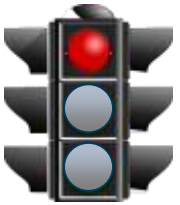
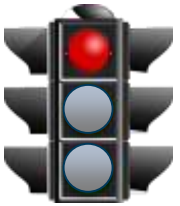
2011 RWP Recommended Management Practices

Table 6-1: Management Practices Selected for the Coastal Georgia Region

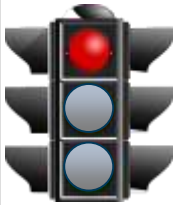
Management Practice Number	Issue(s) to be Addressed by Action(s)	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
Action Needed - Additional/Alternate Sources to Present Groundwater Source(s) in Gap Areas (AAGS)[1]. Note – future groundwater use in Glynn County near Brunswick can be met by drilling groundwater wells outside the hydrologic boundaries that induce upward movement of salt water from a deeper geologic unit in the area of the "T" shaped salt water plume.			
AAGS-1 Cross-Jurisdictional Collaboration	Help meet current and forecasted municipal and industrial groundwater use in the Red and Yellow Zones	Multi-jurisdictional groundwater development and/or management in multi-county areas outside Red and Yellow zones	1-3
AAGS-2 Increase Surface Water Supplies		Develop/utilize additional surface water supplies to meet multi-sector uses (i.e., City of Savannah Industrial and Domestic Plant or other sources)	1-5
AAGS-3 Additional Reservoir Storage		Increase surface water storage (reservoirs)	1-5
AAGS-4 Study Aquifer Storage and Recovery in Addressing Gaps		Conduct research to determine the feasibility (technical, financial, legal, political), role, and potential benefits and limitations of aquifer storage and recovery (ASR) in critical gap areas and/or recharge of surficial and other aquifers	1,5

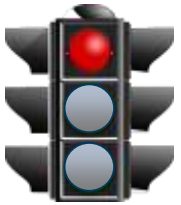




2011 RWP Recommended Management Practices

Table 6-1: Management Practices Selected for the Coastal Georgia Region			
Management Practice Number	**Issue(s) to be Addressed by Action(s)**	**Description/Definition of Action**	**Relationship of Action or Issue to Vision and Goals (Section 1.4)**
AAGS-5 Surface Water Storage in Aquifers		Increase surface water storage (ASR); feasibility based on outcome of AAGS-4	1-3,5
AAGS-6 Additional Aquifer Use		Optimize the use of additional regional and local aquifers	1-3
AAGS-7 Reuse		Implement water reuse	1-5
AAGS-8 Determine Desalination Feasibility	Help meet current and forecasted municipal and industrial groundwater use in the Red and Yellow Zones (Note: This option is pending feasibility of other options)	Desalination - consider feasibility of removal of salt from ocean water and distribution of water to help meet water needs in gap areas	1,5





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2011 RWP Recommended Management Practices

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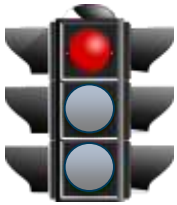
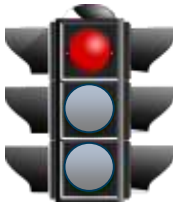
Management Practice Number	**Issue(s) to be Addressed by Action(s)**	**Description/Definition of Action**	**Relationship of Action or Issue to Vision and Goals (Section 1.4)**
AAGS-9 Determine Reverse Osmosis Feasibility	Help meet current and forecasted municipal and industrial groundwater use in the Red and Yellow Zones (Note: These options are pending feasibility of other options)	Reverse Osmosis treatment of brackish water - consider feasibility of additional treatment at source of supply through treatment of brackish surface water and distribution of water to help meet water needs in gap areas	1,5
AAGS-10 Inter-basin Transfers		Inter-basin transfers from within the region or collaborating regions to meet regional water needs and benefit both the areas from which the transferred water is withdrawn and the area receiving the water	1, 3, 4
Action Needed - Institutional (I) Practice(s)[1] to Help Meet Water Needs in Groundwater Gap Areas			
I-1 Cross-Jurisdictional Groundwater Coordination Group	Coordinate and optimize water development and distribution for both groundwater and surface water municipal and industrial uses	Formation of a multi-jurisdictional groundwater use and development "Group" to coordinate groundwater development, infrastructure development/use, and optimize yield and sustainability	1-3,5





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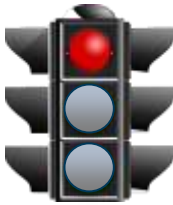
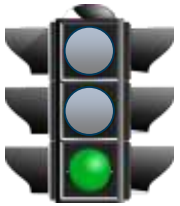
2011 RWP Recommended Management Practices

Table 6-1: Management Practices Selected for the Coastal Georgia Region			
Management Practice Number	**Issue(s) to be Addressed by Action(s)**	**Description/Definition of Action**	**Relationship of Action or Issue to Vision and Goals (Section 1.4)**
Action Needed - Engineered Solution(s) to Address Salt Water Intrusion (ES)[1] and Help Meet Water Needs in Gap Areas			
ES-1 Engineered Solution	Meet current and forecasted needs in Red and Yellow Zones and address salt water intrusion in the Floridan Aquifer	Pending outcome of Bi-state salt water intrusion stakeholder process - Options could range from well head treatment to hydrologic barrier(s), etc.	1,4
Action Needed - Address Current and Future Surface Water Use in Gap Areas **Data Collection/Additional Research (DCAR)** to confirm frequency, duration, and severity of agriculturally-driven shortages to 7Q10 low flow conditions			
DCAR-1 Agricultural Consumption Data	Improve understanding and quantification of agricultural water use and the projected surface water gaps on the Ogeechee River at Eden and Kings Ferry	Acquire additional data/information on agricultural consumptive use to confirm or refine if agricultural consumption is less than 100% consumptive. Conduct "modeling scenario analysis to bracket a reasonable range of consumption" with Resource Assessment models with "new" information on consumptive use to assess effect on surface water gap.	5





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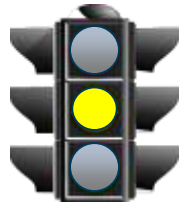
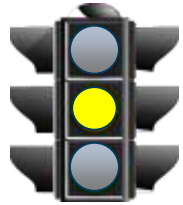
2011 RWP Recommended Management Practices

Table 6-1: Management Practices Selected for the Coastal Georgia Region			
Management Practice Number	**Issue(s) to be Addressed by Action(s)**	**Description/Definition of Action**	**Relationship of Action or Issue to Vision and Goals (Section 1.4)**
DCAR-2 Source of Supply Data to Refine Forecasts	Improve understanding and quantification of agricultural water use and the projected surface water gaps on the Ogeechee River at Eden and Kings Ferry	Refine surface water agricultural forecasts and Resource Assessment models to improve data on source of supply and timing/operation of farm ponds	5
DCAR-3 Better Understand Demand and Impacts on Projected Gaps	Improve understanding and quantification of agricultural water use and the projected surface water gaps on the Ogeechee River at Eden and Kings Ferry	Refine and improve surface water Resource Assessment and agricultural forecasts to address spatial and temporal hydrologic variations in relationship to forecasts, climate conditions, and other non-water use variables	5
DCAR-4 Improve Data Quality and Analysis	Obtain additional data and improved understanding of actual versus forecasted water use	Continue to fund, improve, and incorporate agricultural water use metering data and use this information in Regional Water Plan updates	5





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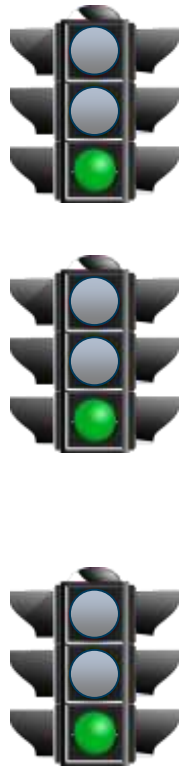
2011 RWP Recommended Management Practices

Table 6-1: Management Practices Selected for the Coastal Georgia Region			
Management Practice Number	**Issue(s) to be Addressed by Action(s)**	**Description/Definition of Action**	**Relationship of Action or Issue to Vision and Goals (Section 1.4)**
DCAR-5 Irrigation Efficiency Education and Research	Improvement of surface water flows (Ogeechee River at Eden and Kings Ferry) via reduced surface water use while maintaining/improving crop yields	Collaborate/support research (University, State and Corporate) on improved irrigation efficiency measures and development of lower water use crops	5
DCAR-6 Understand Optimum Application Methods	Improvement of surface water flows (Ogeechee River at Eden and Kings Ferry) via reduced surface water use while maintaining/improving crop yields	Improve education and research on when and how much water is needed to maximize crop yield with efficient irrigation	5
DCAR-7 Minimize Groundwater Use Impacts to Surface Water	Improvement of surface water flows (Ogeechee River at Eden and Kings Ferry) in areas where ground and surface water are hydrologically connected and groundwater use impacts surface water flows	Promote management practices and educate stakeholders to minimize impacts to surface water associated with excessive pumping/use of aquifers that may impact surface water flows and estuary health	2,4



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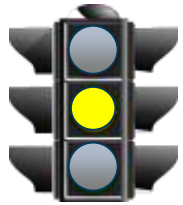
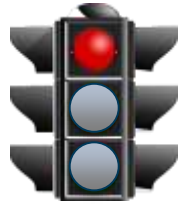
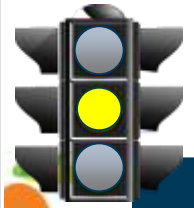
Management Practice Number	Issue(s) to be Addressed by Action(s)	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
DCAR-8 Analyze Addressing Extreme Conditions	Cost effectively address surface water low flow conditions (Ogeechee River at Eden and Kings Ferry) while avoiding undue adverse impacts on water users and uses in the planning area	Conduct analysis of the socioeconomic benefits and cost in comparison to ecological benefits of addressing surface water gaps that are larger in magnitude, but occur infrequently	5
DCAR-9 Study Potential Use of Aquifers to Address Gaps	Examine potential role and feasibility of storage of surface water to help meet municipal and industrial needs; especially in Red and Yellow Zones (possible alternate supply) and/or for use in improving surface water flows (in gap areas).	Conduct research to determine the feasibility and potential benefits and limitations of aquifer storage and recovery for confined aquifers; and determine the feasibility and potential benefits to recharge surficial aquifers to increase stream baseflow to address gaps	5
DCAR-10 Restoration Impact on Low Flow Conditions Analysis	Examine potential role of wetlands restoration and implementation considerations in addressing surface water low flow conditions	Conduct research and identify incentives to restore wetlands and other areas to determine if this practice can improve river flows during shortages to 7Q10 low flows	2,4,6







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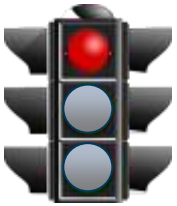
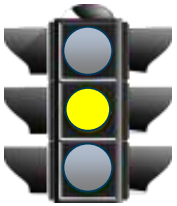
2011 RWP Recommended Management Practices

Management Practice Number	Issue(s) to be Addressed by Action(s)	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
Action Needed - Address Current and Future Surface Water Use in Gap Areas Additional/Alternate to Existing Surface Water Supply Sources (ASWS)			
ASWS-1 Consider Low Flow Conditions in Future Surface Water Permitting	Help ensure that future surface water use does not contribute to frequency and severity of low flow conditions within the Local Drainage Areas that contribute flow to the Eden and Kings Ferry gauges	Future surface water uses - If surface water (ponds and withdrawals) is sought for future water supply (new permits), the Applicant, GSWCC, and EPD should work collaboratively to demonstrate that future surface water uses will not contribute to frequency or magnitude of gaps[2]	1,2,4
ASWS-2 Incentives for Dry-Year Releases from Ponds	Help improve surface water flow on the Ogeechee River at Eden and Kings Ferry during low flow conditions	Future surface water uses - Utilizing incentives and collaborative partnerships, examine opportunities to optimize farm and other pond operations to obtain releases during gap periods[2]	1,2,4,5





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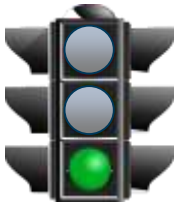
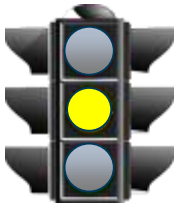
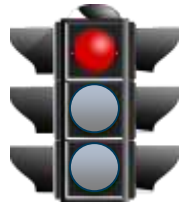
Management Practice Number	Issue(s) to be Addressed by Action(s)	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)	
ASWS-3 Substitute Future Surface Water Use with Groundwater in Dry Years	Help improve surface water flow on the Ogeechee River at Eden and Kings Ferry during low flow conditions	Future surface water uses - Encourage use of groundwater within the sustainable yield of the groundwater aquifer (outside) as an alternate source to surface water use during 7Q10 low flow conditions[2]	1,2,4	
ASWS-4 Substitute Existing Surface Water Use with Groundwater in Dry Years		Existing surface water uses - Replace portion of existing surface water use with groundwater, within the sustainable yield of the groundwater aquifer (outside Red and Yellow Zones) in times of shortage to 7Q10 low flow conditions, so long as use of groundwater sources does not impact surface water flow in other areas	1,2,4	
ASWS-5 Opportunities and Incentives for Dry-Year Releases from Ponds		Existing surface water uses - Utilizing incentives and collaborative partnerships, identify opportunities to allow use of agricultural pond storage to augment river flows in times of shortage to 7Q10 low flow periods	1-4	

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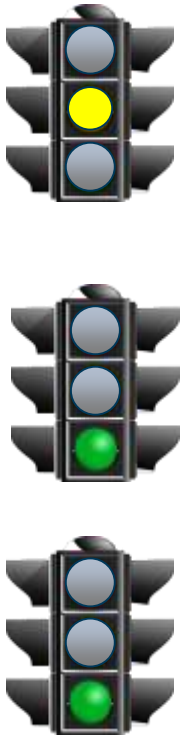
2011 RWP Recommended Management Practices

Management Practice Number	Issue(s) to be Addressed by Action(s)	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
ASWS-6 Ecological Restoration Incentive Program		Based on the outcome of research (DCAR-10 above), consider incentive based programs to restore wetlands and other areas if this practice can improve river flows during shortages to 7Q10 low flow periods	2,4,6
ASWS-7 Land Management Incentives		Incentive-based land use practices to help promote infiltration and aquifer recharge	2,6
ASWS-8 Incentives for Greater Wastewater Return Flows		Evaluate incentive-based programs to increase wastewater returns; modify land application systems, septic systems, and manage stormwater to improve return flows while maintaining water quality	1-3,6
ASWS-9 Multi-Region Reservoir		Possible joint non-main stem reservoir to serve multiple regions/regional council boundaries with Savannah-Upper Ogeechee and Oconee Councils	1-5



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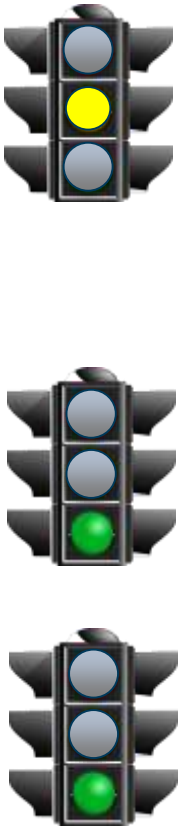
Management Practice Number	Issue(s) to be Addressed by Action(s)	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
ASWS-10 Inter-Basin Transfers	Help improve surface water flow on the Ogeechee River at Eden and Kings Ferry during low flow conditions	Inter-basin transfers from within the region or collaborating regions that can address regional water needs and benefit both the areas from which the transferred water is withdrawn and the area receiving the water	1-3
Action Needed - Address Water Quality (Dissolved Oxygen Levels)			
Point Sources – Dissolved Oxygen (PSDO)			
PSDO-1 Collect Water Quality Data	Verification of Water Quality Resource Assessment Data and Assumptions to determine dissolved oxygen conditions (see Figure 5-3 for more information)	Data collection to confirm loading and/or receiving stream chemistry	5
PSDO-2 Point Discharge Relocation	Improve dissolved oxygen levels in receiving streams (see Figure 5-3 for more information)	Modification of wastewater discharge location. In areas without shortages to 7Q10 low flow conditions, identify feasibility to move discharge location to higher flow streams with greater assimilative capacity.	3,4



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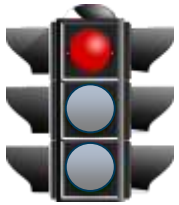
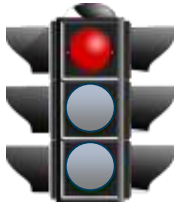
Management Practice Number	Issue(s) to be Addressed by Action(s)	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)	
PSDO-3 Enhance Point Source Treatment		Upgrade/improve treatment to address low dissolved oxygen conditions in receiving streams	3,4	
Action Needed - Address Wastewater Permit Capacity Needs/Gaps				
Municipal Wastewater Permit Capacity (MWWPC)				
MWWPC-1 Increase Wastewater Permit Capacity	Additional municipal wastewater treatment capacity may be needed in Bryan, Camden, Liberty and Long Counties	Expand or construct new facilities and/or obtain additional wastewater permit capacity to meet forecasted needs.[3] Planned municipal projects in Bryan, Camden, Effingham, and Liberty Counties.	3,4	
Industrial Wastewater Permit Capacity (IWWPC)				
IWWPC-1 Collect Additional Industrial Permit Data	Collect additional data where needed on industrial flow volumes and permit conditions to verify permitted versus forecasted needs	Obtain additional permit data regarding flow volumes and permit conditions for industrial wastewater facilities forecasted needs[4]	5	

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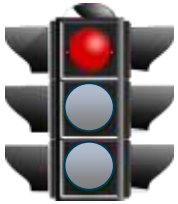
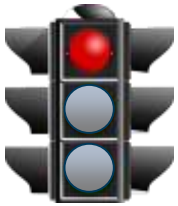
Management Practice Number	Issue(s) to be Addressed by Action(s)	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
Action Needed - Address Water Withdrawal Permit Capacity Needs/Gaps			
Municipal Groundwater Withdrawal Permit Capacity (MGWPC)			
MGWPC-1 Increase Municipal Groundwater Permit Capacity	2050 municipal groundwater forecast exceeds existing permit capacity in all counties except Glynn	For Green Zone, obtain groundwater permit capacity and construct new or expanded facilities to meet forecasted need. For Red and Yellow Zones, consider alternate source of supply[5].	3,4
Industrial Groundwater Permit Capacity (IGWPC)			
IGWPC-1 Increase Industrial Groundwater Permit Capacity	2050 industrial groundwater forecast exceeds existing permit capacity in Bryan, Bulloch, Effingham, Liberty, and McIntosh Counties	For Green Zone, obtain groundwater permit capacity. For Red and Yellow Zones, consider alternate source of supply[6]. Construct new or expanded facilities to meet forecasted need.	3,4





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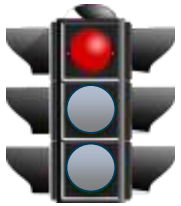
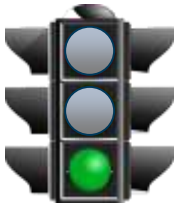
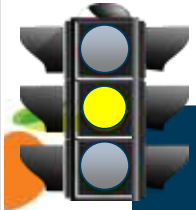
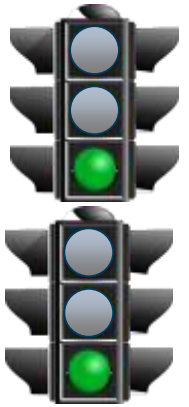
2011 RWP Recommended Management Practices

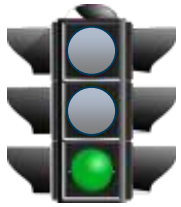
Management Practice Number	Issue(s) to be Addressed by Action(s)	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
The following Coastal Council management practices are programmatic in nature and are therefore described in general terms.			
Action Needed – Utilize Groundwater (GW) to meet Current and Future Needs			
GW-1 Develop and Practice Sustainable Groundwater Use		• For cities, counties, and utilities outside the Red and Yellow Zones, continue to sustainably provide and manage water from the Upper Floridan Aquifer and other significant aquifers in areas not impacting salt water intrusion, following EPD permitting protocol regarding leakage between aquifers (especially the Upper and Lower Floridan aquifers) • Construct new or expanded facilities to meet forecasted need	1-3,5
GW-2 Promote Aquifer-Friendly Land Use Practices		• Encourage land use practices that sustain and protect aquifer recharge areas (both inside and outside the region) for the aquifers present in the region • Counties and local governments should consider practices to promote infiltration and aquifer recharge	2,6
GW-3 Research and Analyze Sustainable Groundwater Management		• Continue to monitor and improve understanding of historic, current, and future trends in groundwater levels; use best available science when evaluating potential value and/or impact associated with aquifer storage and/or recovery of surface water • Utilize sound science and continue to improve data and sustainably manage groundwater resources	5

2011 RWP Recommended Management Practices

Management Practice Number	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
Management Practices to Address Current and Future Surface Water (SW) Needs		
SW-1 Surface Water Use Within Available Capacity	• Continue to apply for permits to use surface water within the available surface water resource capacity	1,3-5
SW-2 Monitor and Evaluate Estuaries	• Monitor Atlantic slope river flow conditions to sustain estuary conditions	5
Management Practices to Address Water Quality Point Source Needs - Ammonia and Nutrients (PSAN)		
PSAN-1 Ammonia Limits	• Implementation of ammonia limits, where applicable (see Figure 5-4 for more information)	1,4,5
PSAN-2 Enhance Nutrient Treatment	• Improve/upgrade treatment for nutrients (phosphorus and/or nitrogen) (see Figure 5-4 for more information) https://rivercenter.uga.edu/project/coastal-wastewater-planning-and-management/	1,4
PSAN-3 Eliminate Illicit Discharges	• Identify and eliminate illicit discharges to surface waters (as found in Glynn County, City of Darien, City of Pooler, Bryan County, and City of Savannah Watershed Protection Plans)	1,4





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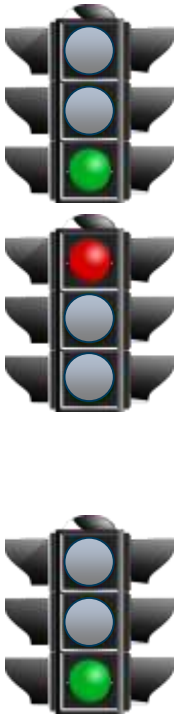
2011 RWP Recommended Management Practices

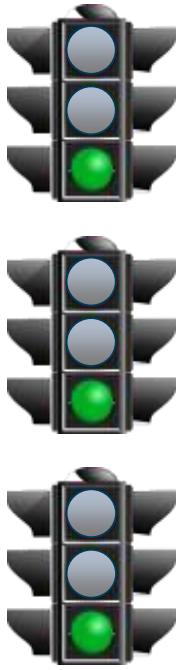
Management Practice Number	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
Management Practices to Address Water Quality Non-Point Source (NPS) Needs		
(Dissolved oxygen, fecal coliform, nutrients, and other impairments)		
NPS-1 Study Human Impacts on Water Quality	• Data collection/analysis to confirm if dissolved oxygen and/or fecal coliform is human induced	4,5
NPS-2 Monitor and Address NPS Nutrient Loading	• Support efforts to monitor and determine sources of nutrient loading and other NPS impairments to waters of the State, and upon confirmation of source, develop specific management programs to address these needs	1,4-6 Septic?
The following practices are selected by the Costal Council to encourage implementation by the applicable local or State program(s).		
Urban/Suburban Best Management Practices (NPSU)		
NPSU-1 Control Erosion	• Use soil erosion and sediment control measures	4,6



Georgia

2011 RWP Recommended Management Practices

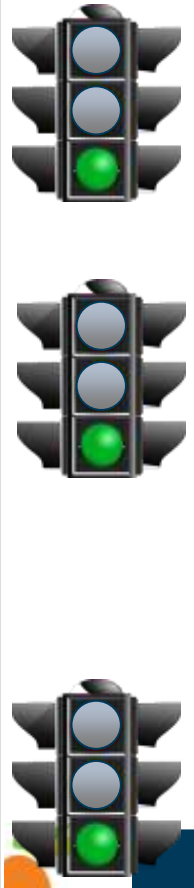
Management Practice Number	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
NPSU-2 Manage Stormwater Runoff	• Stormwater retention ponds, wetlands, swales, filter strips, and bank stabilization to manage runoff and help support river flows (as found in City of Pooler, City of Richmond Hill, and City of Savannah Watershed Protection Plans)	2,4,6
NPSU-3 Increase Stormwater Infiltration	• Consider measures to promote increased infiltration of stormwater to reduce nutrient and other pollutant runoff	2,4,6
NPSU-4 Riparian Buffers	• Protect and maintain riparian buffers along urban streams	4,6
Rural Best Management Practices (NPSR)		
NPSR-1 Advocate Implementing Road Runoff BMPs	• Implement BMPs to control runoff from dirt roads by encouraging County implementation of BMPs indentified in Georgia Resource Conservation and Development Council, "Georgia Better Back Roads – Field Manual"	4,6



Georgia

2011 RWP Recommended Management Practices

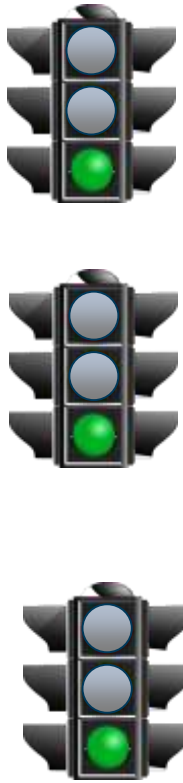
Management Practice Number	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
Forestry Best Management Practices (NPSF)		
NPSF-1 Support Forestry Commission Water Quality Program	• Support Georgia Forestry Commission's (GFC) water quality program consisting of BMP development, education/outreach, implementation/compliance monitoring, and complaint resolution process	4,6
NPSF-2 Improve BMP Compliance	• Improve BMP compliance through State-wide biennial BMP surveys and BMP assurance exams, Master Timber Harvester workshops, and continuing logger education	4-6
NPSF-3 Wetland and Forest Restoration Incentives and Support	• Incentives to restore wetlands and historically drained hardwood and other areas. Where applicable, support United States Department of Agriculture (USDA) incentive programs through the Farm Service Agency and NRCS to restore converted wetlands back to forested conditions.	4,6
Agricultural Best Management Practices for Crop and Pasture Lands (NPSA) - Support and encourage implementation of Georgia Soil and Water Conservation Commission (GSWCC) BMP and Education Programs		
NPSA-1 Soil Erosion Reduction Measures	• Conservation tillage and cover crop	4,6



Georgia

2011 RWP Recommended Management Practices

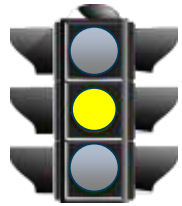
Management Practice Number	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
NPSA-2 Utilize Buffers	• Field buffers, riparian forested buffers, and strip cropping to control run-off and reduce erosion	4,6
NPSA-3 Livestock Management	• Livestock exclusions from direct contact with streams and rivers and vegetation buffers	4,6
NPSA-4 Manure Control	• Responsible manure storage and handling	4,6
NPSA-5 Wetland and Forest Restoration Incentives	• Incentives to restore wetlands and historically drained hardwood and other areas	4,6
Existing Impairments and Total Maximum Daily Load Listed Streams (TMDL)		
TMDL-1 Evaluate Impairment Sources	• Data collection and confirmation of sources to remove streams listed due to "natural sources"	4,5



Georgia

2011 RWP Recommended Management Practices

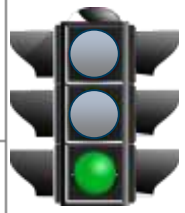
Management Practice Number	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
TMDL-2 Analyze Impaired Segments and Sources	• Data collection to refine river/stream reach length for impaired waters; focus on longest reaches to refine location and potential sources of impairments	4,5
TMDL-3 Stormwater Management BMPs	• Stormwater Management: - Agricultural, Forestry, Rural, and Urban/Suburban Best Management Practices (BMPs) *See Above Non-Point Source for Details*	4,6
Nutrients – Satilla and Savannah River Nutrient (Phosphorus and Nitrogen) Watershed Models (NUT)		
NUT-1 Link Nutrient Loading With Current Land Use	• Align current land use with phosphorus and nitrogen loading data to help optimize effectiveness of management practice based on consideration of land uses and actual nutrient loading contribution to surface water resources (i.e., predominant land use is not necessarily the predominant source of nutrients) - Agricultural, Forestry, Rural, and Urban BMPs *See Above Non-Point Source for Details*	4,5

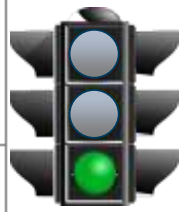


Georgia

2011 RWP Recommended Management Practices

Management Practice Number	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
Management Practices to Address Future Educational Needs (EDU)		
EDU-1 Promote Conservation Programs	• Support Water Conservation Programs	2,5
EDU-2 Stormwater Education	• Support Stormwater Educational Programs	2,6
EDU-3 Septic System Maintenance Education	• Support Septic System Maintenance Programs	2,3
EDU-4 Forestry BMP Education	• Support GFC Forestry BMP and UGA-SFI Logger Education Programs	2,6





Georgia

2011 RWP Recommended Management Practices

Management Practice Number	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
Management Practices to Address Future Ordinance and Code Policy Needs (OCP)		
OCP-1 Engage Local Governments in Stormwater Issues	• Encourage local government to develop ordinances and standards to implement and/or update stormwater regulations (as found in Glynn County, City of Darien, City of St. Marys, City of Port Wentworth, Town of Portal, City of Rincon, and City of Hinesville Watershed Protection Plans). Possible resource documents include: Georgia Stormwater Management Manual, Coastal Stormwater Supplement, and Metro North Georgia Water Planning District Model Ordinance.	4,6
OCP-2 Green Space Opportunities and Incentives	• Identify opportunities for green space on incentive and voluntary basis	2,4
OCP-3 Promote Integrated Planning	• Encourage coordinated environmental planning (land use, water supply, stormwater, wastewater and compliance with the *Environmental Planning Criteria* developed pursuant to Part V of the Georgia Planning Act and in the Mountain and River Corridors Protection Act	1-6
OCP-4 Local Government Erosion Control Measures	• Encourage local governments to implement, inspect, and enforce Erosion and Sedimentation Control Measures (as found in City of Darien, City of Pooler, Bryan County, City of Rincon, and City of Hinesville Watershed Protection Plans)	2,6

2011 RWP Recommended Management Practices

Summary of Management Practices for Shared Resources – The Coastal Georgia Region will combine its management practices with the following Councils to address shared resource gaps. The management practices that address gaps at Claxton and Eden will also help address the gap at Kings Ferry.

Surface Water Quantity – Ogeechee River (Eden and Kings Ferry) and Canoochee River (Claxton)

Coastal Georgia – The Coastal Georgia Regional Council has identified management practices in the above table to address approximately 11% of the cumulative gap at Eden, 9% of the cumulative gap at Kings Ferry, and 8% of the cumulative gap at Claxton.

Altamaha – The Altamaha Regional Council has identified water conservation, replacement of surface water use with groundwater use, refinement of forecasting and modeling data, and potential use of incentives, among others to address the majority of the cumulative gap at Claxton and a portion of the cumulative gap at Kings Ferry.

Savannah-Upper Ogeechee – The Savannah-Upper Ogeechee Regional Council has identified water conservation, replacement of surface water use with groundwater, and agricultural water use monitoring program to address a portion of the cumulative gap at Kings Ferry and the majority of the cumulative gap at Eden.

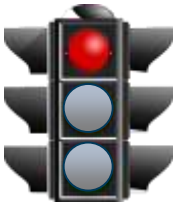
Upper Oconee – The Upper Oconee Regional Council has identified the use of variable rate irrigation, development of new groundwater wells, and encouraging centralized sewer in developing areas to address a small portion of the cumulative gap at Eden and a small portion of the cumulative gap at Kings Ferry.

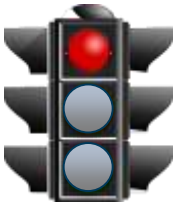
Surface Water Quality:

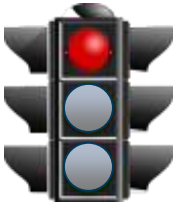
Satilla River Watershed Model – The Suwannee-Satilla Regional Council has identified the same Best Management Practices for reducing nutrient loading as are summarized in the above table for the Coastal Council.

Savannah River Watershed Model – The Savannah-Upper Ogeechee Regional Council is awaiting more information on nutrient standards.

Suwannee-Satilla – There is one reach with exceeded dissolved oxygen assimilative capacity in the St. Marys basin that is shared with the Suwannee-Satilla Region. Both Councils recommend monitoring and data collection.



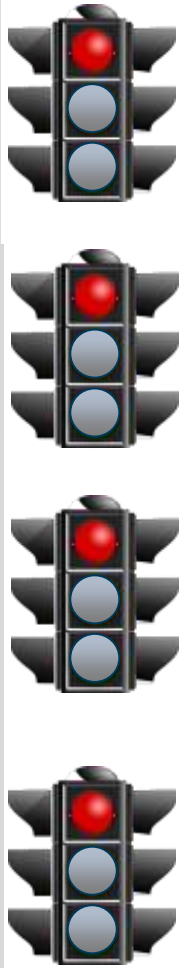




Georgia

2011 RWP Recommended Management Practices

Surface Water Quality: Support TMDL Stakeholder Group for the Savannah River Harbor.
Groundwater Quantity/Quality: Support Bi-State Salt Water Intrusion Stakeholder Process in the Savannah/Hilton Head Regions.
Ongoing Planning: Research and incorporate South Carolina and Florida water planning data and issues for future modeling and refine modeling, if warranted. Track potential issues/proposed uses that may affect Surface Water Quality and Quantity on the St. Marys River in South Georgia and Florida.



Notes:

[1] The role/selection of specified practice in addressing current gaps and future forecasted needs in the gap areas requires additional data from the Bi-State Salt Water Intrusion Stakeholder Process between Georgia and South Carolina.

[2] For agricultural water users in the Coastal Region, focus management practice on surface water permit holders and new surface water permit requests in Bulloch, Bryan, Effingham, Chatham, and Long Counties; Kings Ferry and Eden nodes (Ogeechee and Canoochee Rivers).

[3] Wastewater utilities should coordinate with EPD to obtain needed capacity. Regionally sufficient capacity exists; however, localized gaps may occur in Bryan, Camden, Effingham, and Liberty Counties.

[4] Additional industrial wastewater capacity may be needed. EPD to update and refine discharge limit databases.

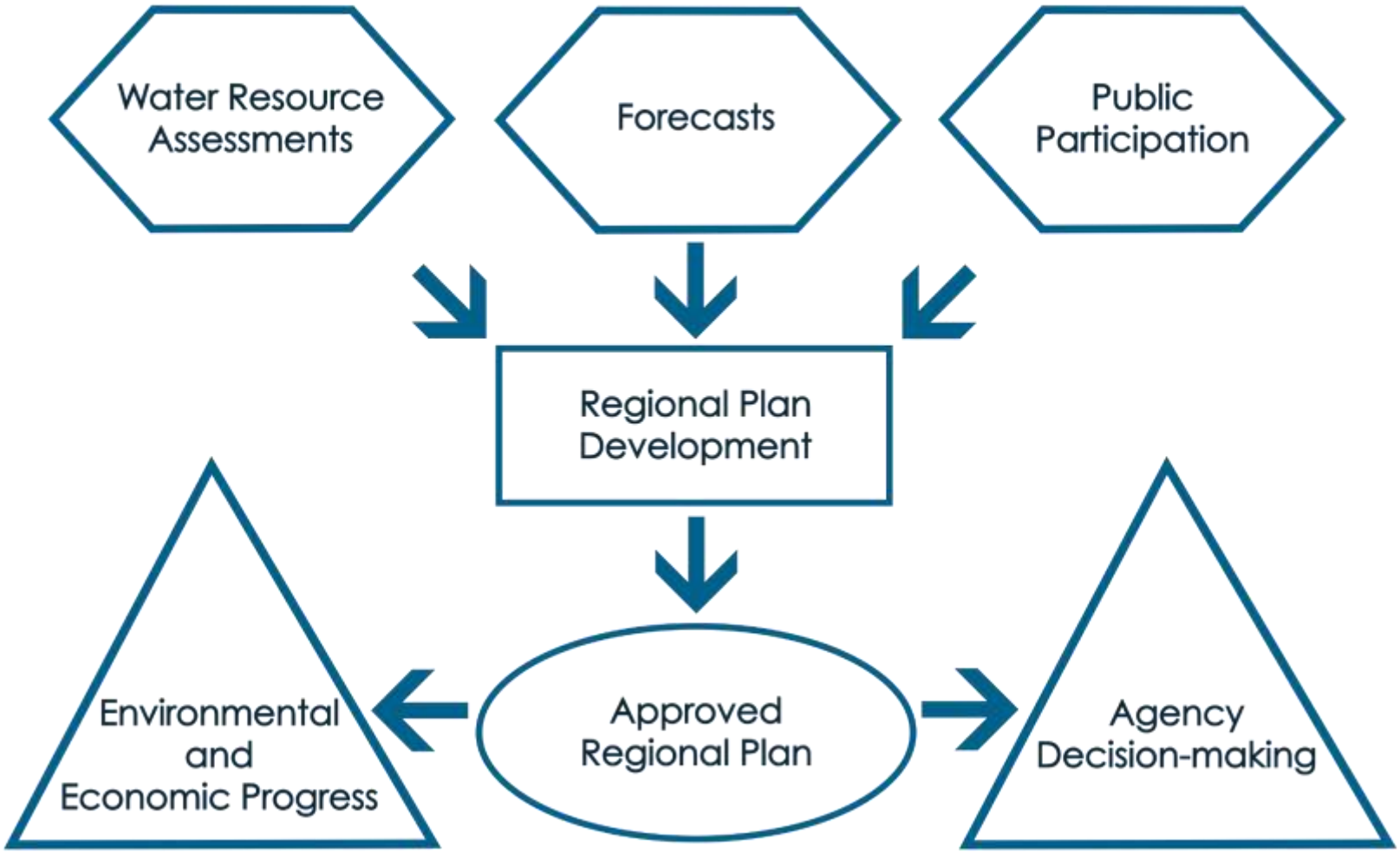
[5] Additional municipal groundwater permit capacity may be needed in Bulloch, Camden, Long, and McIntosh Counties. Utilities in regions should evaluate long-term needs and, if needed, work with EPD to obtain additional permit capacity. Municipal groundwater forecast above existing permitted capacities in Bryan, Chatham, Effingham and Liberty Counties should be evaluated for alternate source of supply in light of possible outcomes from the Bi-State Salt Water Intrusion Stakeholder Process between Georgia and South Carolina.

[6] Additional industrial groundwater permit capacity may be needed in Bulloch and McIntosh Counties. Industrial groundwater forecast above existing permitted capacities in Bryan, Effingham and Liberty Counties should be evaluated for alternate source of supply in light of possible outcomes from the Bi-State Salt Water Intrusion Stakeholder Process between Georgia and South Carolina.

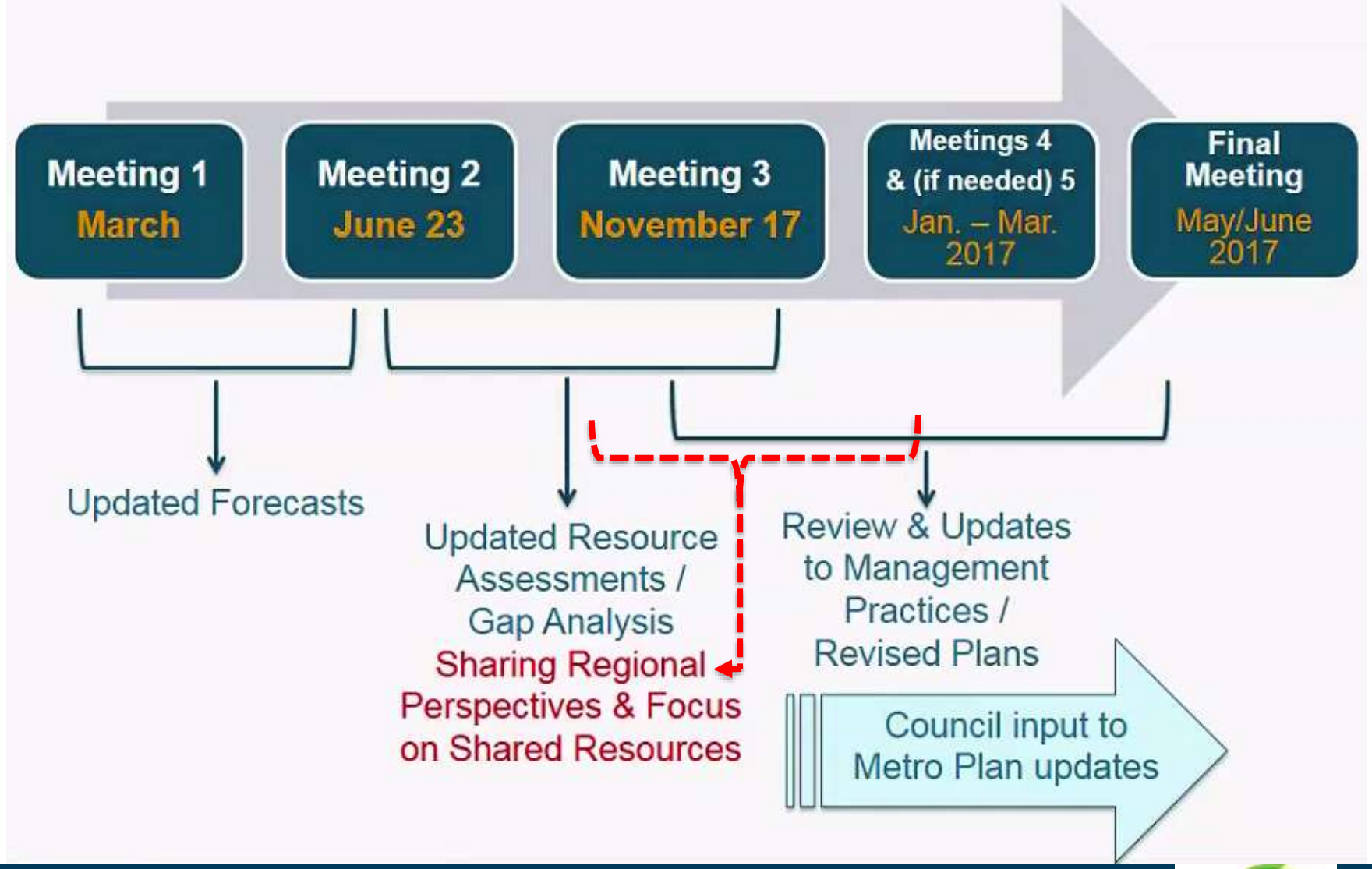
Georgia's
State Water Plan

Next Steps, Subcommittee Discussion, and Schedule for Revising/Updating the Regional Water Plan

Water Planning and the Importance of Plans



2016 – 2017 Regional Water Plan Review and Revision Schedule



Subcommittee and Schedule for Completion

- Editing Subcommittee Assignment
  - Sections 3, 4 and 5 (Under Review By Council)
  - Sections **6**, 7 and 8 (Next up for Drafting)
  - Section 1 and 2 + ES
- Schedule for Completion
  - Tentative Final Editing Subcommittee meeting for Fri. March 10th
  - Need to have final draft by Fri. March 17th
  - EPD Review Comments by Fri. March 24th
  - Publish Draft for 45-Day Public Review March 31st
  - May 15th to June 1st – Respond to Comments
  - Month of June – Final + Council Vote + EPD

Georgia

Public Comments / Elected Official Comments

- Public Comments
- Elected Official Comments
- Wrap Up

Thank You!

Questions? Comments? Need More Information?

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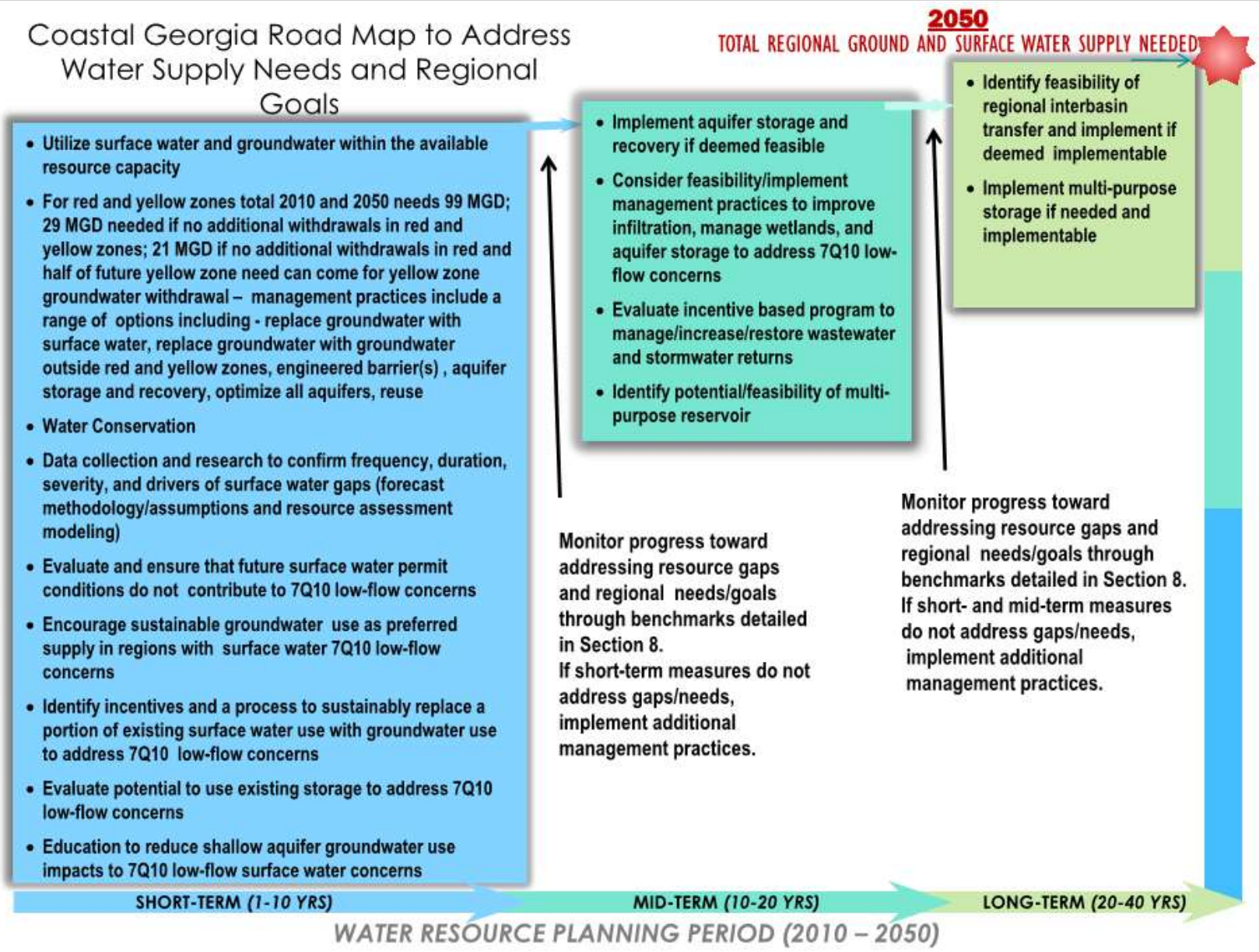
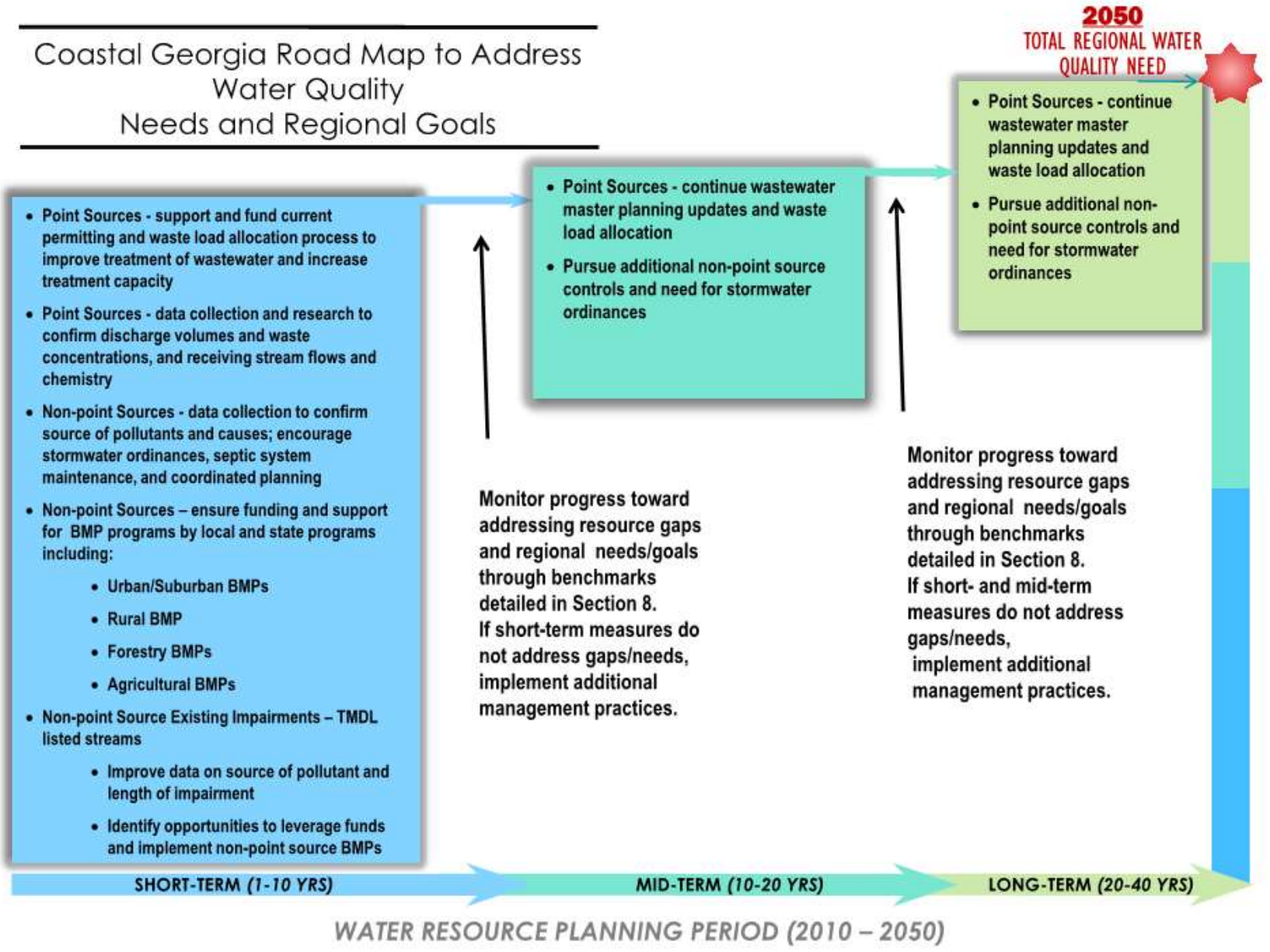
brownrl1959@gmail.com

2011 RWP Recommended Management Practices

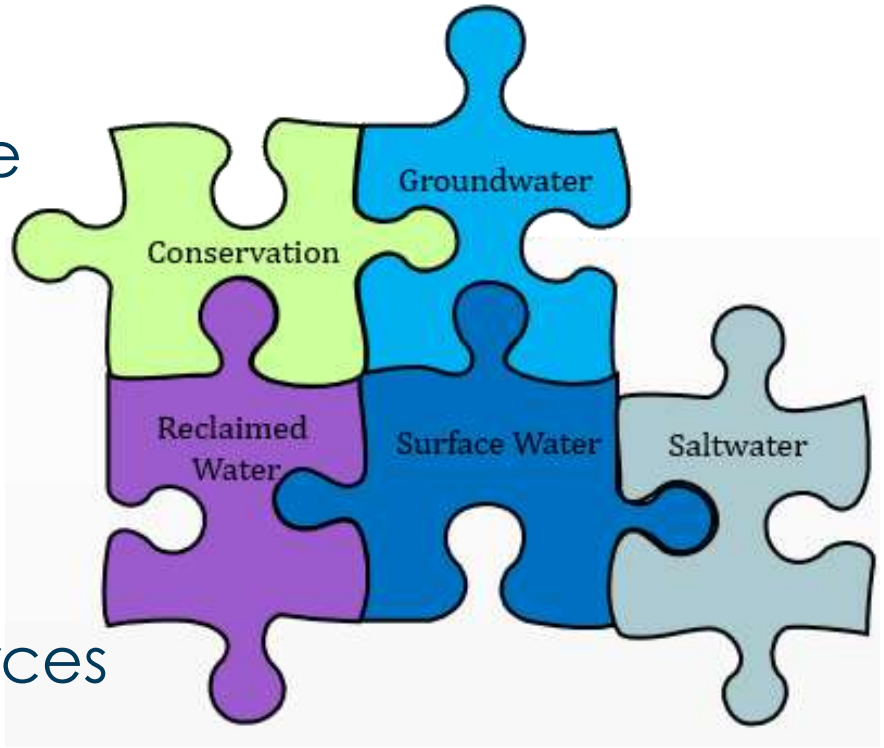


2011 RWP Recommended Management Practices



Broad Categories of Management Practices

- Water Conservation
- Additional Surface Water Use
  - Savannah River
  - Ogeechee River
- Groundwater
  - From the Green Zone
  - From other Aquifers
- Brackish or Saline Water Sources
- Institutional Considerations



Georgia

Broad Management Practice Categories

NON-STRUCTURAL

STRUCTURAL

Data Collection/Sound Science

Water Conservation (WC)

Additional Surface Water Existing Facilities

Additional Groundwater

Institutional Options for Regional Cooperation/ Water System Optimization Green Zone

Additional Surface Water New Sources

Floridan Aquifer in Green Zone

Reuse

Reuse

Institutional Options for Regional Cooperation/ Water System Operation Red and Yellow Zones

Reverse Osmosis Desalination

Additional/ Alternative Aquifers in Red and Yellow Zones

Aquifer Storage and Recovery

Georgia

2050 Withdrawals by County and Region

Claxton Planning Node Surface Water Forecast by Region and County

	Councils That Are Within the Local Drainage Area with Potential Gaps	Counties That Are Located (whole or in part) Within the Local Drainage Area	Acreage of County Area Within the LDA That Drains to Planning Node	% of County Land Area Within the LDA That Drains to Planning Node	Acreage of SW Irrigated Land Area Within the LDA That Drains to Planning Node[1]	2050 Forecasted Surface Water Withdrawals for Portion of County That Drains to Planning Node[2, 3] (MGD)
Canoochee River	Altamaha	Candler	133,561	83.8%	3,695	2.75
		Emanuel	143,497	32.5%	757	0.50
		Evans	31,606	26.4%	864	0.47
		Tattnall	37,832	10.8%	1,859	1.26
	Coastal Georgia	Bulloch	11,120	2.5%	564	0.27
	Savannah-Upper Ogeechee	Jenkins	1,594	0.7%	29	0.02

1 – Acres irrigated with surface water by County and planning node were obtained from the Irrigated Acreage GIS layer (Georgia Water Planning & Policy Center, 2016)
2 – Surface water withdrawals by County were obtained from 2050_Final_Yearly_Withdrawals_MGD_Atlantic GIS layer (Georgia Water Planning & Policy Center, 2016)
3 – MGD represents average annual day demands

Georgia

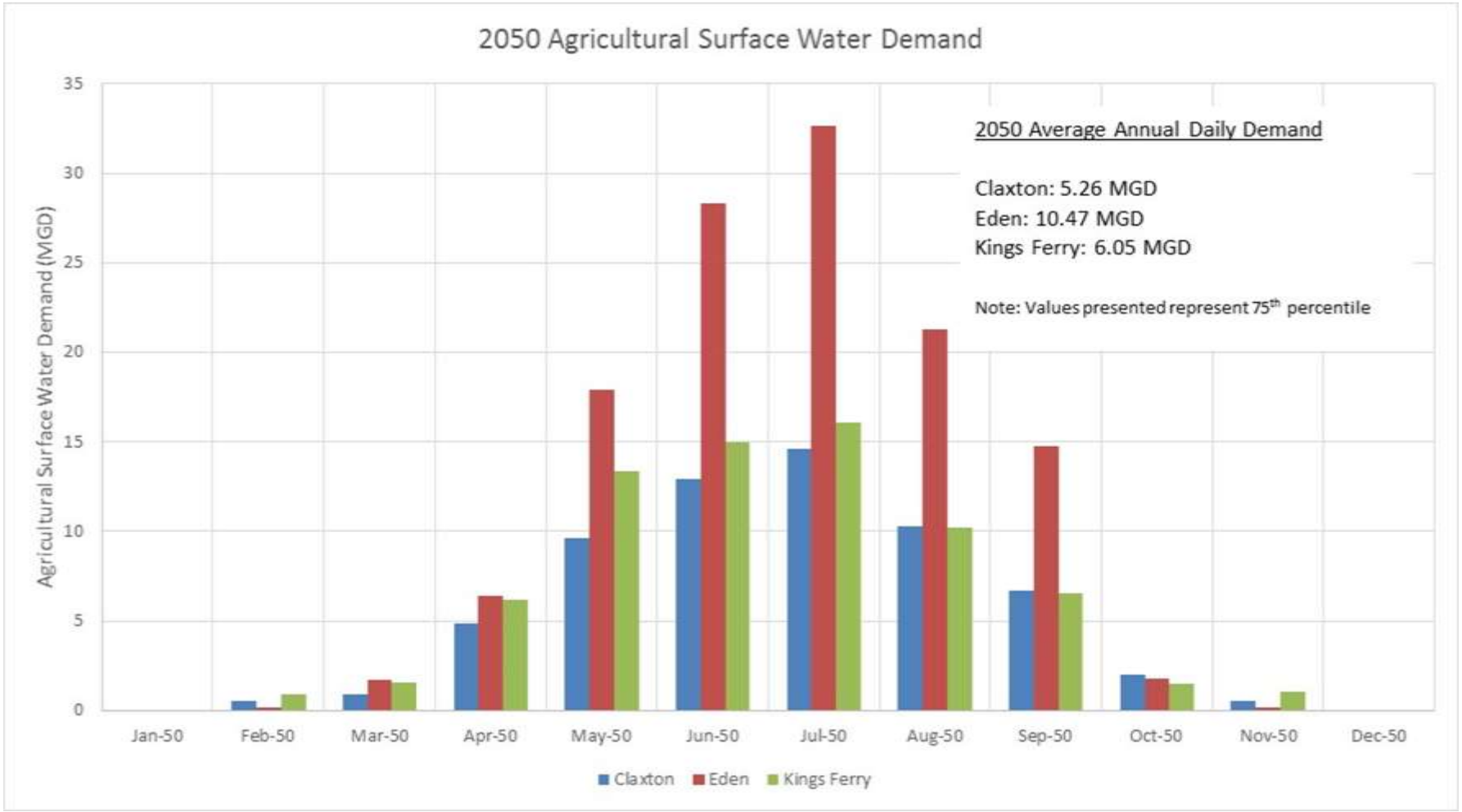
2050 Withdrawals by County and Region

Eden Planning Node Surface Water Forecast by Region and County

	Councils That Are Within the Local Drainage Area with Potential Gaps	Counties That Are Located (whole or in part) Within the Local Drainage Area	Acreage of County Area Within the LDA That Drains to Planning Node	% of County Land Area Within the LDA That Drains to Planning Node	Acreage of SW Irrigated Land Area Within the LDA That Drains to Planning Node[1]	2050 Forecasted Surface Water Withdrawals for Portion of County That Drains to Planning Node[3, 4] (MGD)
Ogeechee River	Altamaha	Emanuel	85,902	19.4%	67	0.05
	Coastal Georgia	Bryan	8,566	2.9%	--	--
		Bulloch	160,722	36.4%	2,609	1.28
		Effingham	75,983	24.6%	23	0.01
	Savannah-Upper Ogeechee	Burke	201,286	37.6%	3,771	2.24
		Glascock	85,063	92.0%	143	0.05
		Jefferson	275,388	81.2%	4,149	1.95
		Jenkins	210,099	93.1%	3,194	1.94
		Screven	179,344	42.7%	2,443	1.46
		Taliaferro	45,087	36.0%	33	0.01
		Warren[2]	101,551	55.3%	95	0.22
	Upper Oconee	Greene	23,158	8.9%	--	--
		Hancock	86,595	28.3%	14	0.02
		Washington	168,745	38.5%	1,159	1.4

1 – Acres irrigated with surface water by County and planning node were obtained from the Irrigated Acreage GIS layer (Georgia Water Planning & Policy Center, 2016)
2 - Warren County has municipal surface water withdrawals (0.17 MGD) in addition to agricultural surface water withdrawals (Source: Round 2 Statewide Aggregation spreadsheet, Arcadis, 2016)
3 – Surface water withdrawals by County were obtained from 2050_Final_Yearly_Withdrawals_MGD_Atlantic GIS layer (Georgia Water Planning & Policy Center, 2016)
4 – MGD represents average annual day demands
-- No surface water irrigated acres reported for County within LDA

Surface Water Resource Forecast and Potential Gaps



Georgia

Surface Water Resource Forecast and Potential Gaps

Claxton Planning Node - Surface Water Forecast and Summary of Potential Gaps by Region

	Councils and Associated Counties That Are Within in the Local Drainage Area with Potential Gaps	Total 2050 Forecasted Surface Water Demand at Planning Node Summarized by Sector (MGD)[1]	2050 Potential Gap Information: Average Daily Flow Deficit per Gap Event Summarized by Planning Node[2]		2050 Forecasted Surface Water Withdrawals Summarized by Planning Council[3] (MGD)
			1-7 Day Duration	8 - 14 Day Duration	
Canoochee River	Altamaha – Candler, Emanuel, Evans, Tattnall	Agriculture: 4.98	2 MGD (3 cfs) 51% of all potential gap events	3 MGD (5 cfs) 20.4% of all potential gap events	4.98
	Coastal Georgia - Bulloch	Agriculture: 0.27			0.27
	Savannah Upper Ogeechee - Jenkins	Agriculture: 0.02			0.02
				TOTAL:	**5.26**

1 – Represents average annual demand
2- Source: Surface Water Availability Resource Assessment Updates: Current and Future Conditions, November 17, 2016 Council Member Handout, Savannah and Ogeechee Basins
3 - Surface water withdrawals by County were obtained from 2050_Final_Yearly_Withdrawals_MGD_Atlantic GIS layer (Georgia Water Planning & Policy Center, 2016)

Georgia

Surface Water Resource Forecast and Potential Gaps

Eden Planning Node - Surface Water Forecast and Summary of Potential Gaps by Region

	Councils and Associated Counties That Are Within in the Local Drainage Area with Potential Gaps	Total 2050 Forecasted Surface Water Demand at Planning Node Summarized by Sector (MGD)[1]	2050 Potential Gap Information: Average Daily Flow Deficit per Gap Event Summarized by Planning Node[2]		2050 Forecasted Surface Water Withdrawals Summarized by Planning Council[3] (MGD)
			1-7 Day Duration	8 - 14 Day Duration	
Ogeechee River	Altamaha - Emanuel	Agriculture: 0.05	7 MGD (11 cfs) 61.1% of all potential gap events	10 MGD (15 cfs) 16.7% of all potential gap events	0.05
	Coastal Georgia – Bryan, Bulloch, Effingham	Agriculture: 1.29			1.29
	Savannah-Upper Ogeechee – Burke, Glascock, Jefferson, Jenkins, Screven, Taliaferro, Warren	Agriculture: 7.7 Municipal Water: 0.17			7.87
	Upper Oconee – Greene, Hancock, Washington	Agriculture: 1.42			1.42
				TOTAL:	**10.64**

1 – Represents average annual demand
2- Source: Surface Water Availability Resource Assessment Updates: Current and Future Conditions, November 17, 2016 Council Member Handout, Savannah and Ogeechee Basins
3 - Surface water withdrawals by County were obtained from 2050_Final_Yearly_Withdrawals_MGD_Atlantic GIS layer (Georgia Water Planning & Policy Center, 2016)

Georgia

Surface Water Resource Forecast and Potential Gaps

Kings Ferry Planning Node - Surface Water Forecast and Summary of Potential Gaps by Region

	Councils and Associated Counties That Are Within in the Local Drainage Area with Potential Gaps	Total 2050 Forecasted Surface Water Demand at Planning Node Summarized by Sector (MGD)[1]	2050 Potential Gap Information: Average Daily Flow Deficit per Gap Event Summarized by Planning Node[2]		2050 Forecasted Surface Water Withdrawals Summarized by Planning Council[3] (MGD)
			1-7 Day Duration	8 - 14 Day Duration	
Ogeechee River	Altamaha – Candler, Emanuel, Evans, Tattnall	Agriculture: 3.09	13 MGD (20 cfs) 58.0% of all potential gap events	27 MGD (41 cfs) 13.0% of all potential gap events	3.09
	Coastal Georgia – Bryan, Bulloch, Chatham, Effingham, Liberty, Long	Agriculture: 2.86			2.86
	Savannah-Upper Ogeechee – Jenkins	Agriculture: 0.11			0.11
				TOTAL:	**6.05**

1 – Represents average annual demand
2 – Source: Surface Water Availability Resource Assessment Updates: Current and Future Conditions, November 17, 2016 Council Member Handout, Savannah and Ogeechee Basins
3 – Surface water withdrawals by County were obtained from 2050_Final_Yearly_Withdrawals_MGD_Atlantic GIS layer (Georgia Water Planning & Policy Center, 2016)

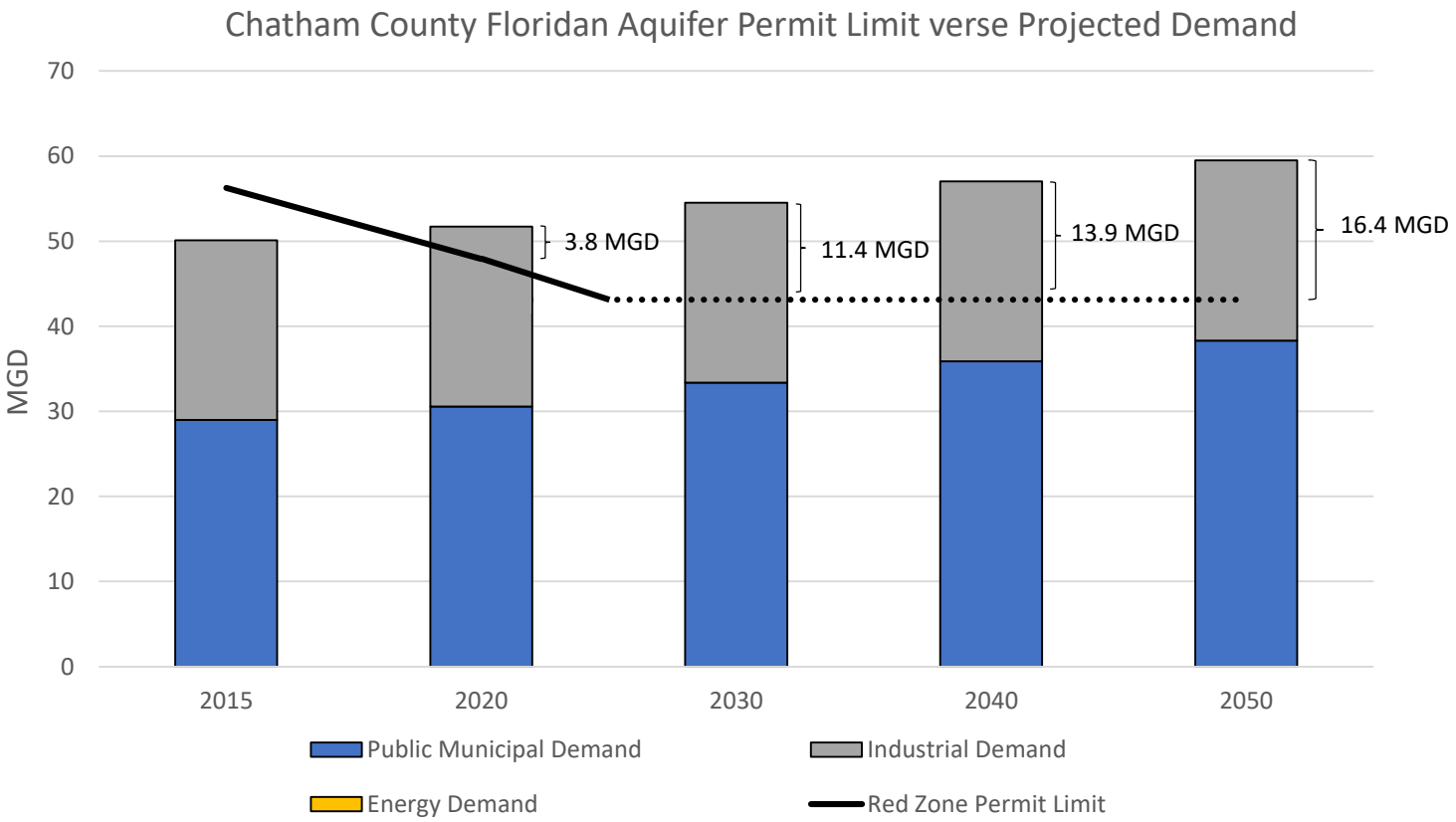
Georgia

Developing Information for Regional Water Planning Councils

- Did you find the meeting information useful in helping improve your understanding of the planning process?
- Do you have any suggestions or observations that you think would benefit the Regional Water Planning Councils?
- Do you have any additional thoughts for enhancing communications with agricultural water users or other public or private entities?

Georgia

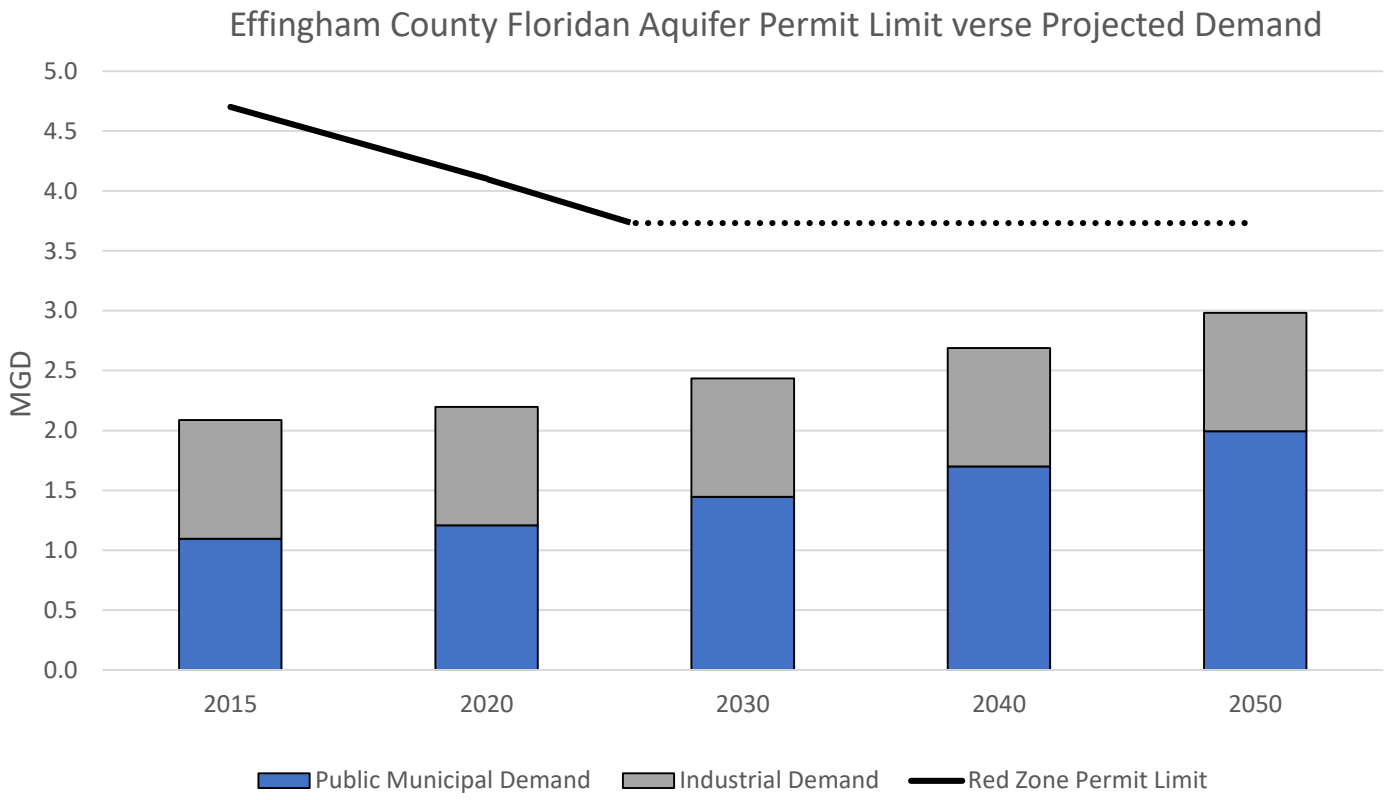
Aquifer Permit Limits vs. Projected Demand



Notes:
Demand assumed to be supplied from the Brunswick aquifer has not been included (0.44 MGD in 2015; 0.53 MGD in 2050)

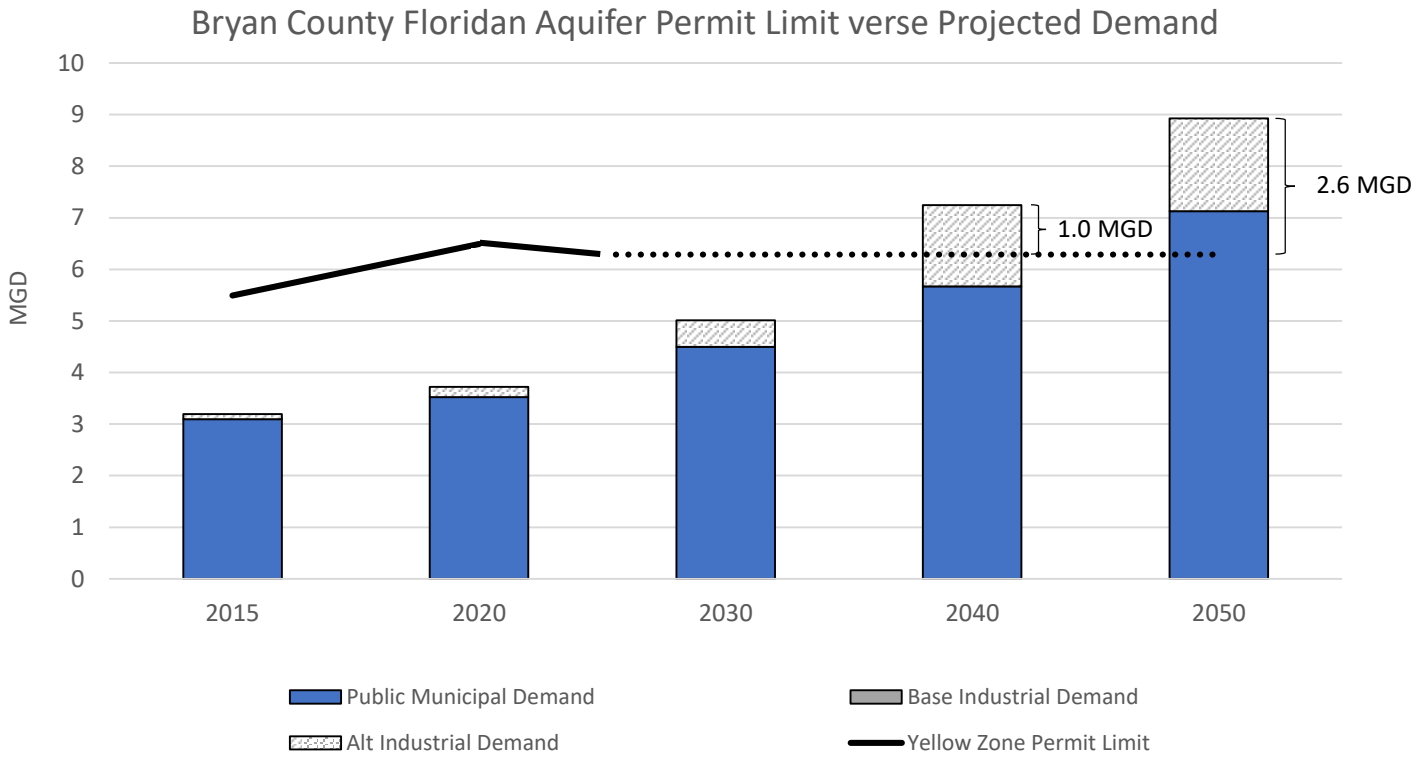
Georgia

Aquifer Permit Limits vs. Projected Demand

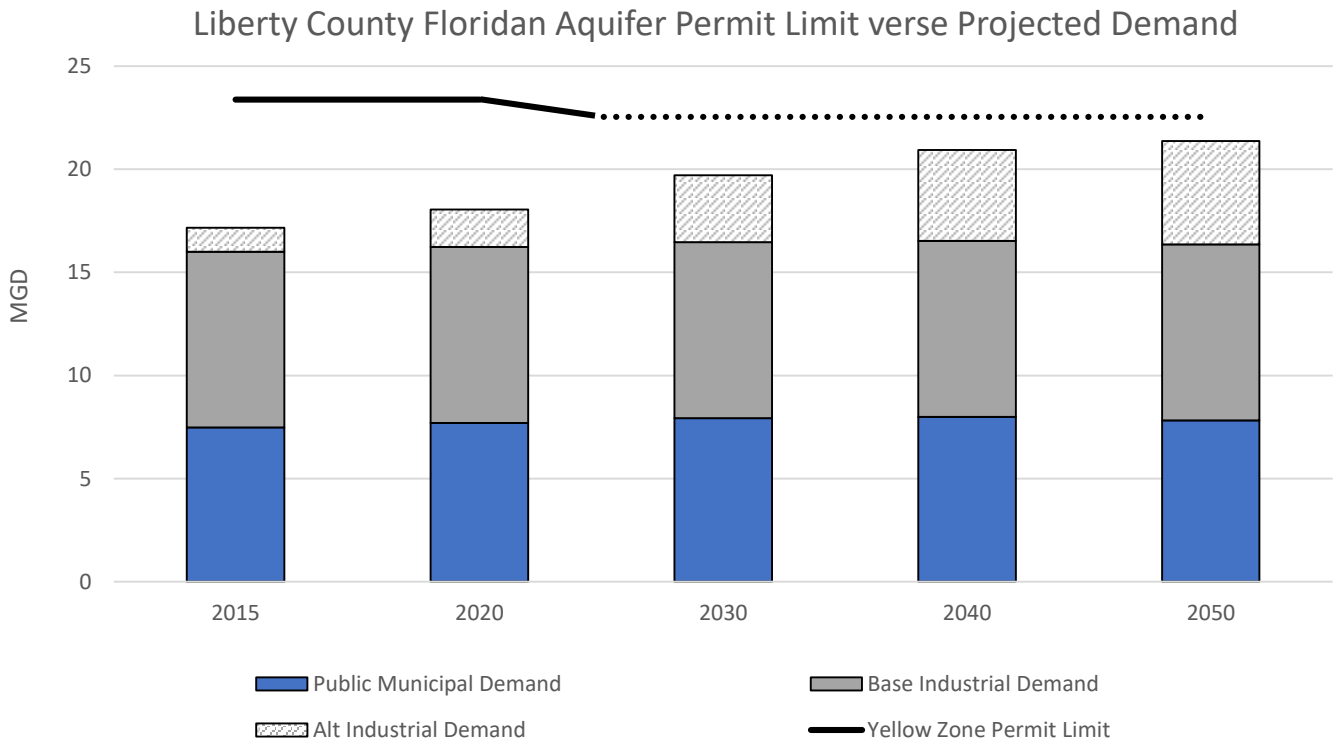


Notes:
Fifty percent of the Effingham County municipal and industrial demands are assumed to come from the Red Zone.

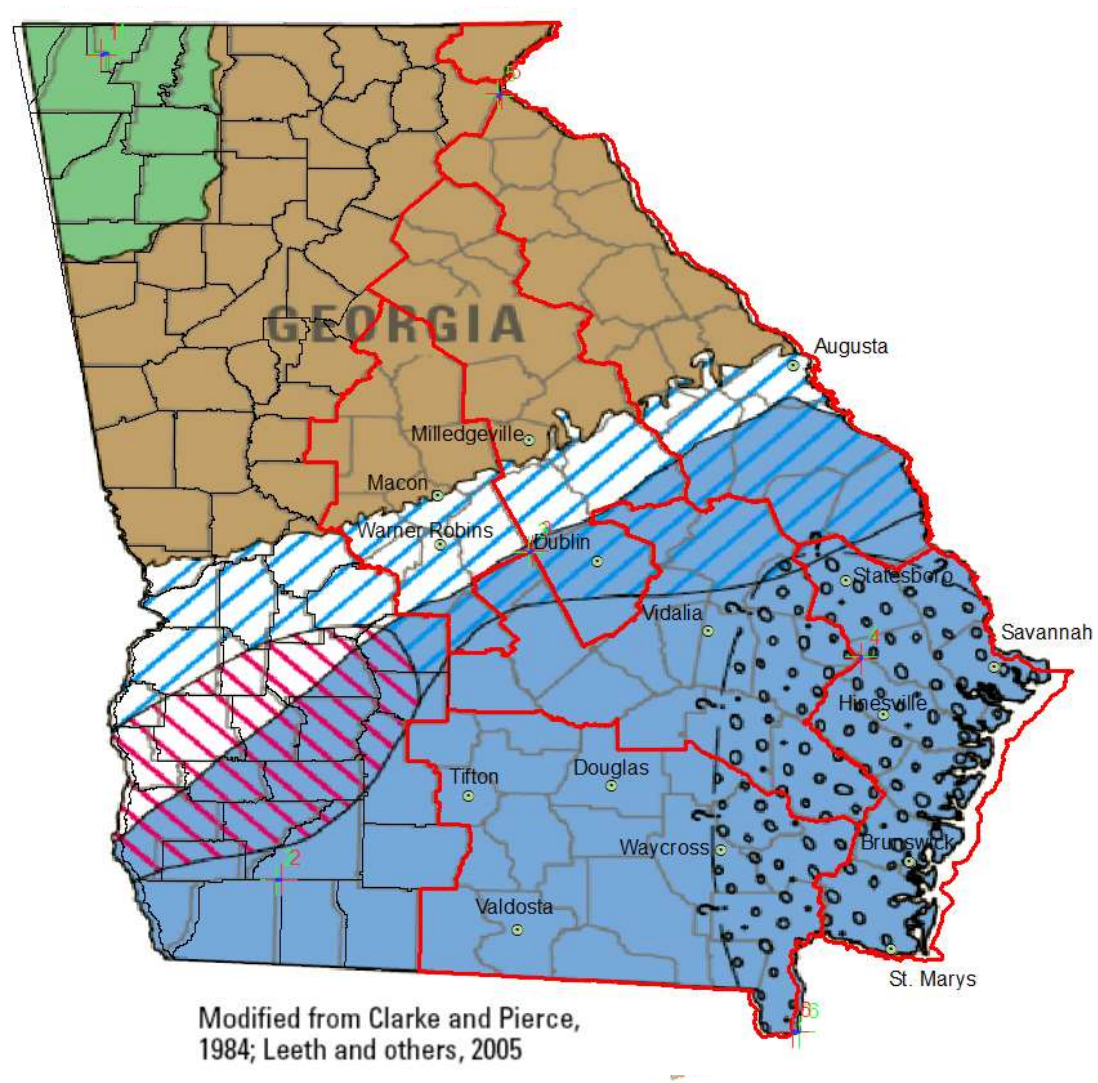
Aquifer Permit Limits vs. Projected Demand

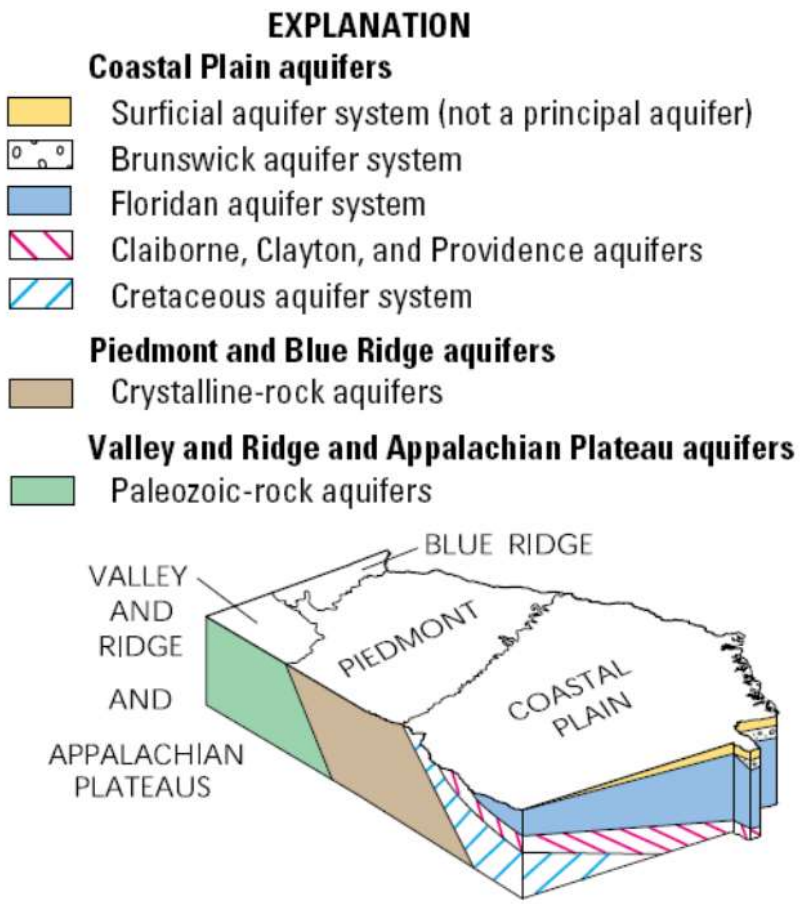


Aquifer Permit Limits vs. Projected Demand

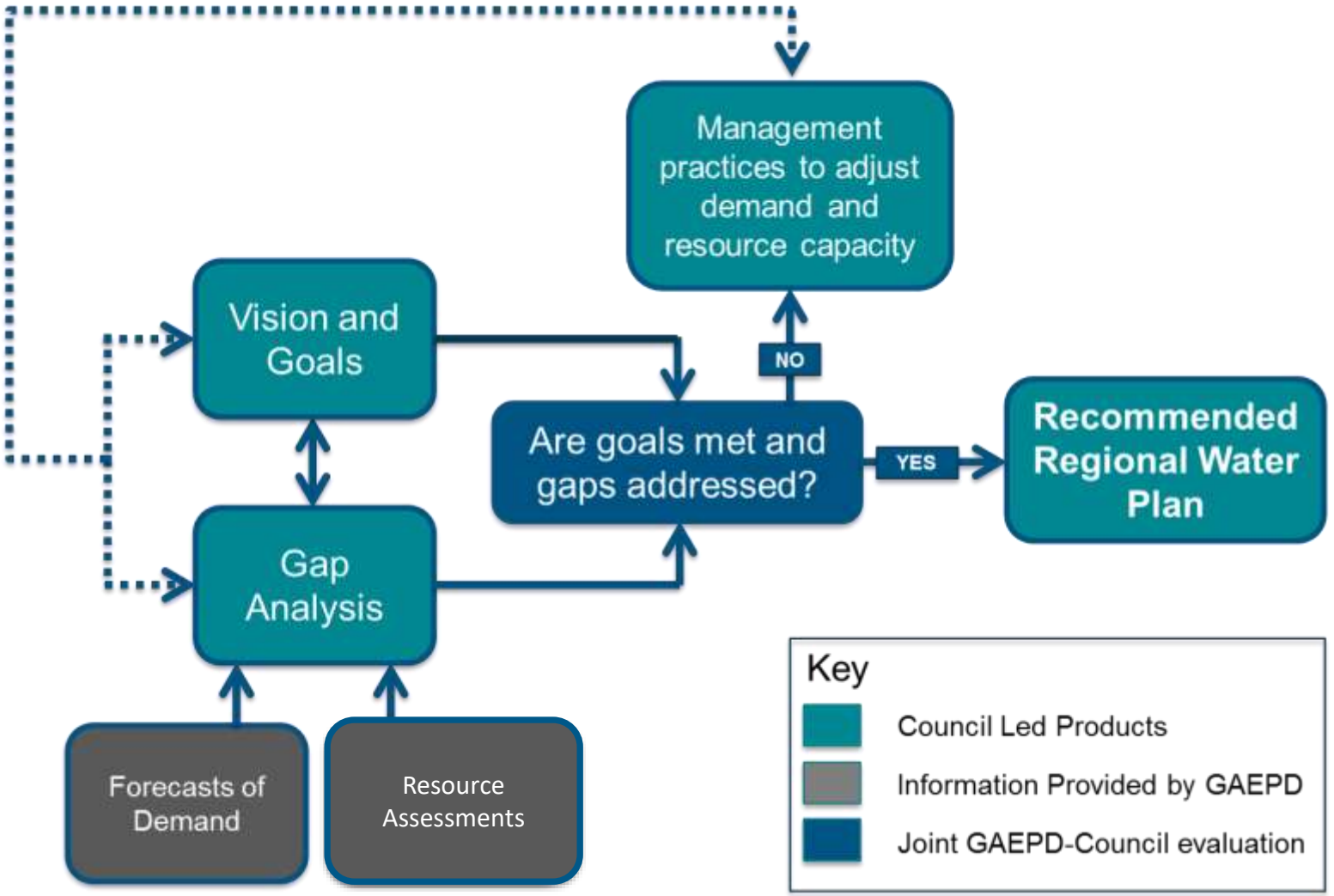


Regional Water Planning Councils



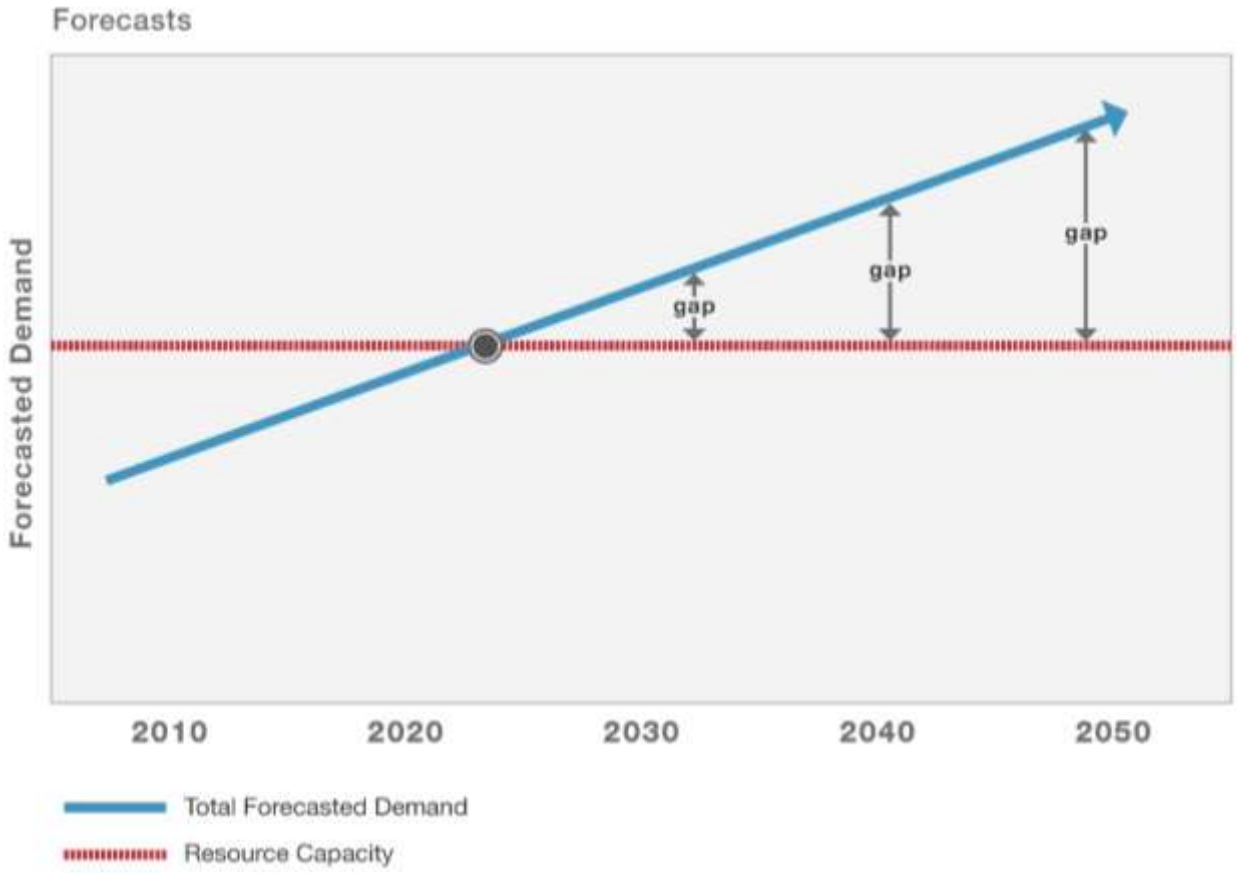


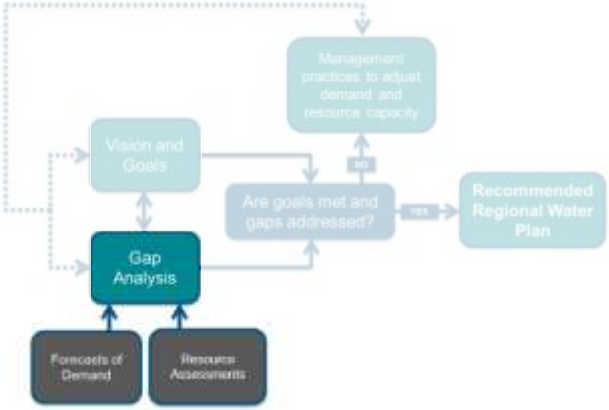
Steps in the Development of the Regional Water Plan



Georgia

Identification of Gaps

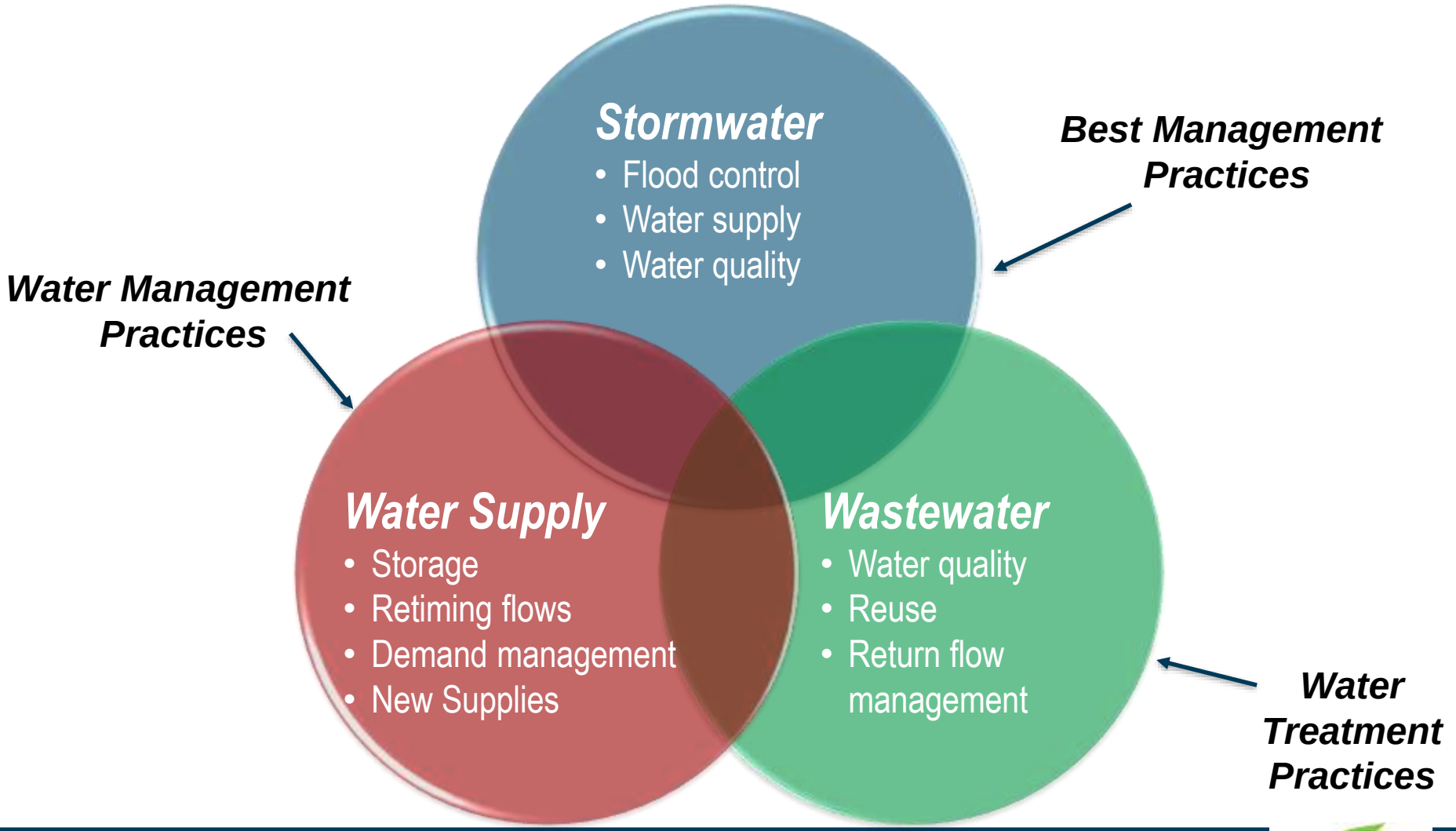




Coastal Georgia Region Gap Summary (cont.)

- Groundwater Resource
  - Consistent with Round 1, there are no gaps in the modeled portions of the Floridan Aquifer (outside Red and Yellow Zones)
  - The 4 County 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
    - Potential gaps in groundwater in this portion of the region
    - Consider increased coordination & discussion within the region and between Councils

Developing a Water Plan Decision Framework



Management Practices are not Self Implementing