Georgia's
State Water Plan

Council Meeting # 4

Suwannee-Satilla Regional Water Planning Council
March 1, 2017
Wiregrass Technical College, Valdosta, Georgia

www.georgiawaterplanning.org

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Welcome/Introductions/Approve Agenda/Meeting Objectives

Council Meeting Agenda

Georgia's State Water Plan

Suwannee – Satilla Regional Water Council Meeting 4
Agenda – March 1, 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
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

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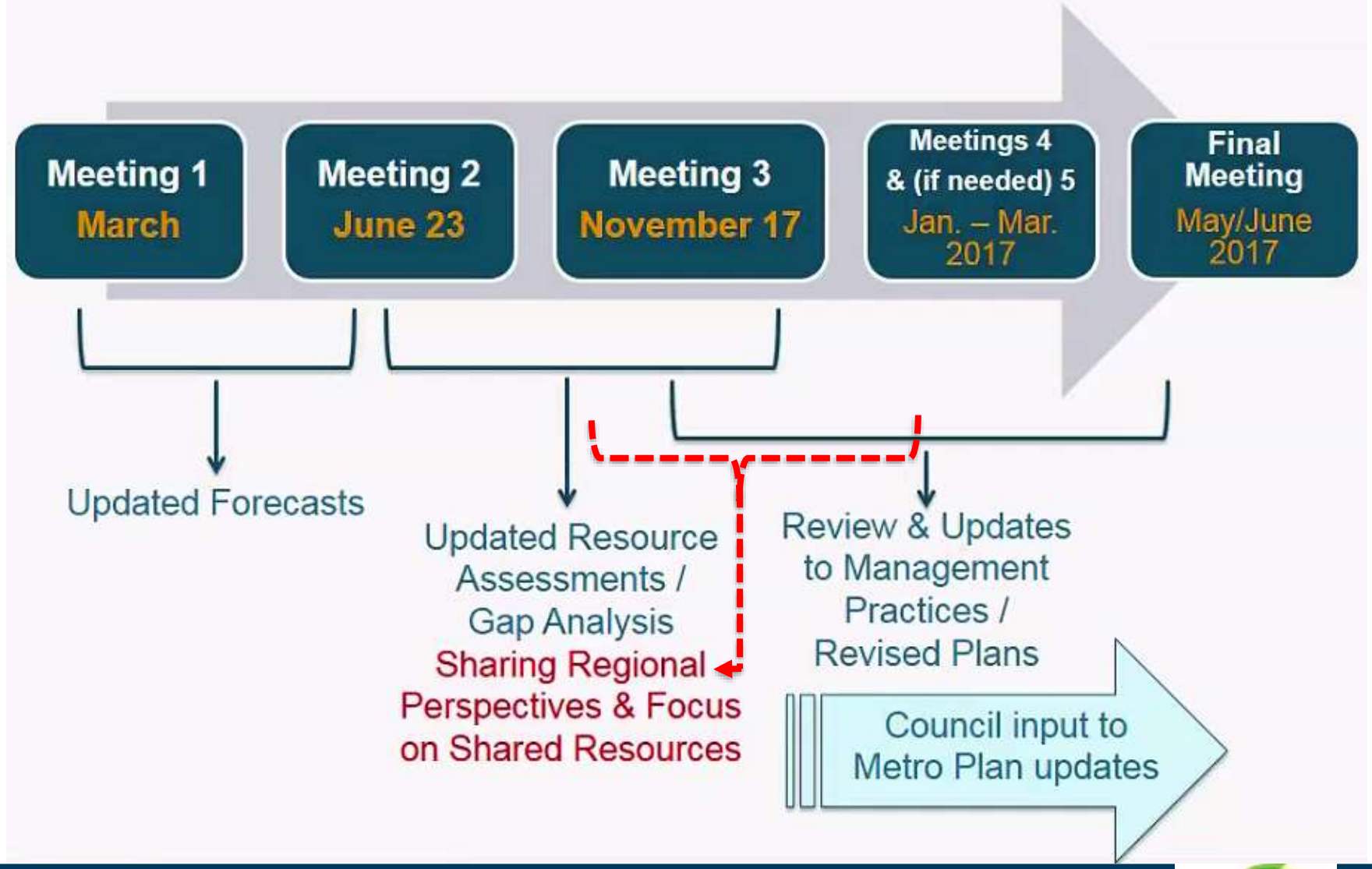
2016 – 2017 Regional Water Plan Review and Revision Schedule

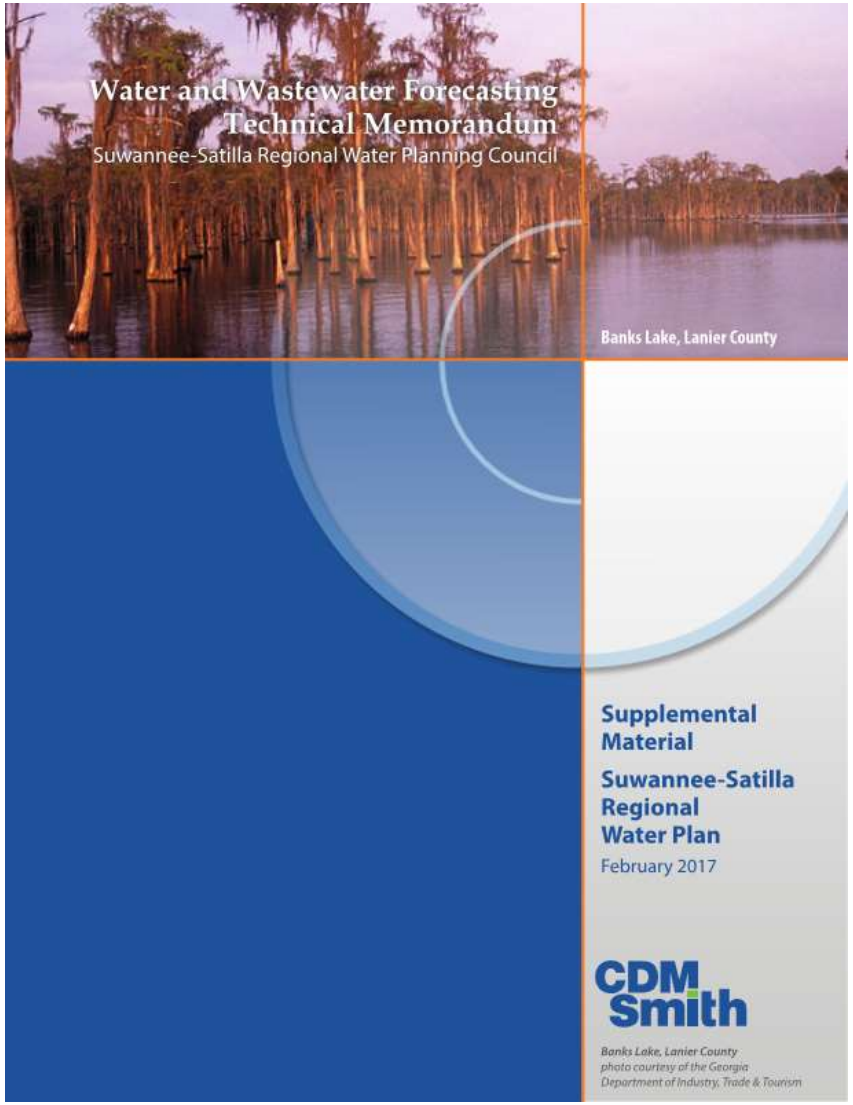


Completing Draft Plan Update

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

Demand Forecast Technical Memorandum (TM)

- Items addressed from council input
  - County demands presented in tabular format
  - County specific Agricultural demands updated by Mark Masters and documented in the TM
- Seeking Council Approval

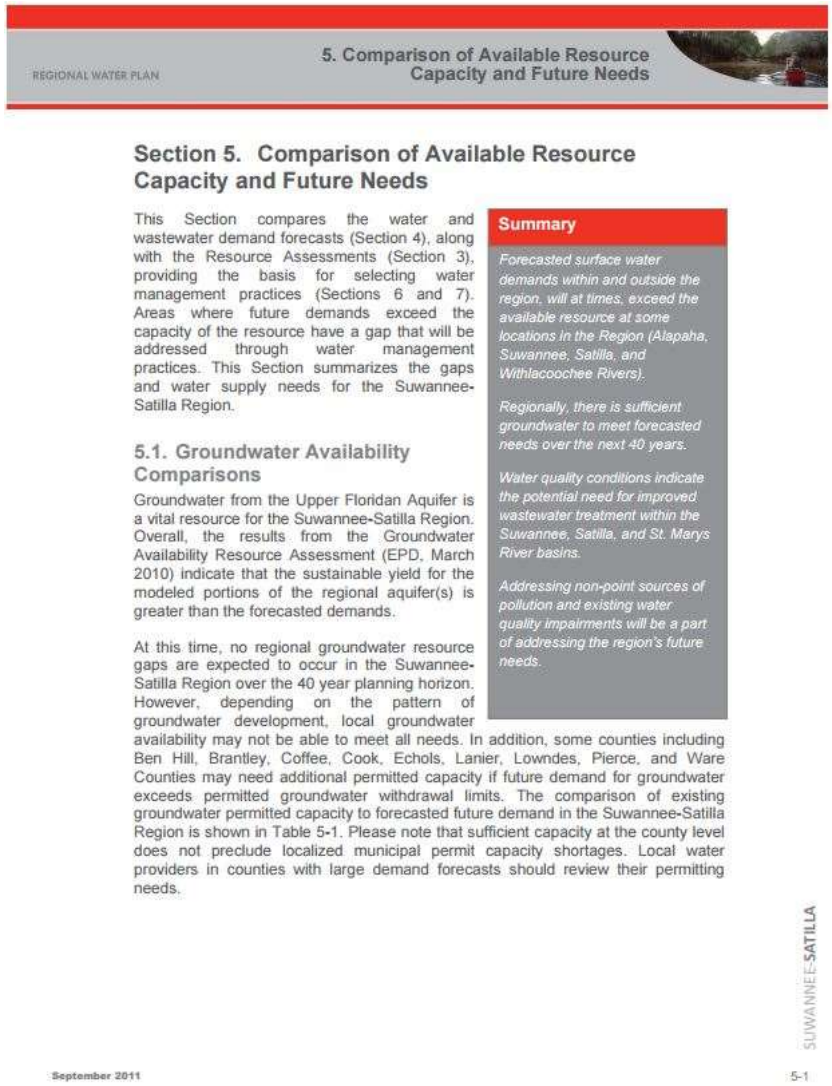


Overview of Plan Content

Georgia

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

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



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 future demands exceed the 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 Suwannee-Satilla Region.

Summary

Forecasted surface water demands within and outside the region, will at times, exceed the available resource at some locations in the Region (Alapaha, Suwannee, Satilla, and Withlacoochee Rivers).

Regionally, there is sufficient groundwater to meet forecasted needs over the next 40 years.

Water quality conditions indicate the potential need for improved wastewater treatment within the Suwannee, Satilla, and St. Marys River basins.

Addressing non-point sources of pollution and existing water quality impairments will be a part of addressing the region's future needs.

5.1. Groundwater Availability Comparisons

Groundwater from the Upper Floridan Aquifer is a vital resource for the Suwannee-Satilla Region. Overall, the results from the Groundwater Availability Resource Assessment (EPD, March 2010) indicate that the sustainable yield for the modeled portions of the regional aquifer(s) is greater than the forecasted demands.

At this time, no regional groundwater resource gaps are expected to occur in the Suwannee-Satilla Region over the 40 year planning horizon. However, depending on the pattern of groundwater development, local groundwater availability may not be able to meet all needs. In addition, some counties including Ben Hill, Brantley, Coffee, Cook, Echols, Lanier, Lowndes, Pierce, and Ware Counties may need additional permitted capacity if future demand for groundwater exceeds permitted groundwater withdrawal limits. The comparison of existing groundwater permitted capacity to forecasted future demand in the Suwannee-Satilla Region is shown in Table 5-1. Please note that sufficient capacity at the county level does not preclude localized municipal permit capacity shortages. Local water providers in counties with large demand forecasts should review their permitting needs.

SUWANNEE-SATILLA

September 2011

5-1

Editing Committee Assignments

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

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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

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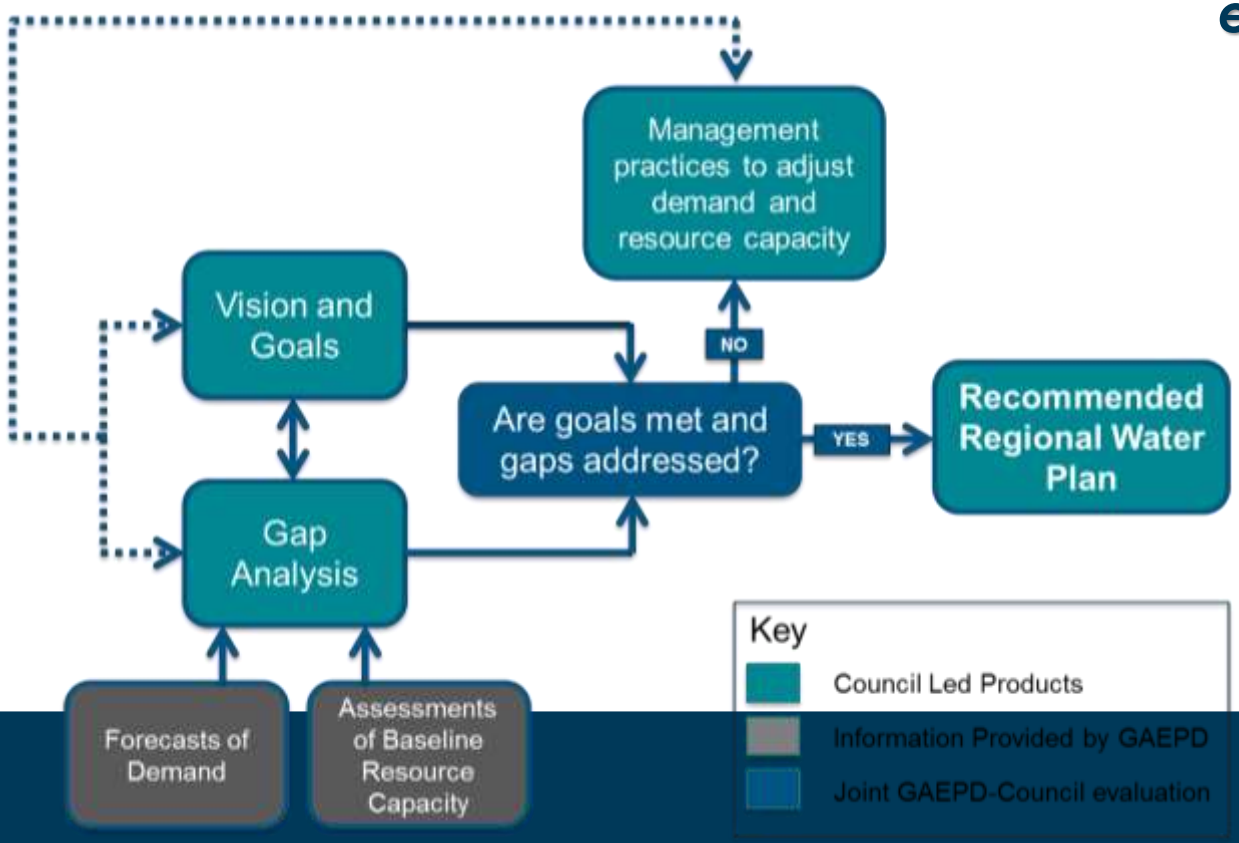
Suwannee - Satilla RWPC Vision

Manage water resources in a sustainable manner under Georgia's regulated riparian and regulated reasonable use laws to support the state's and region's economy, to protect public health and natural resources, and to enhance the quality of life for all citizens; while preserving the private property rights of Georgia's landowners, and in consideration of the need to enhance resource augmentation and efficiency opportunities.



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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)

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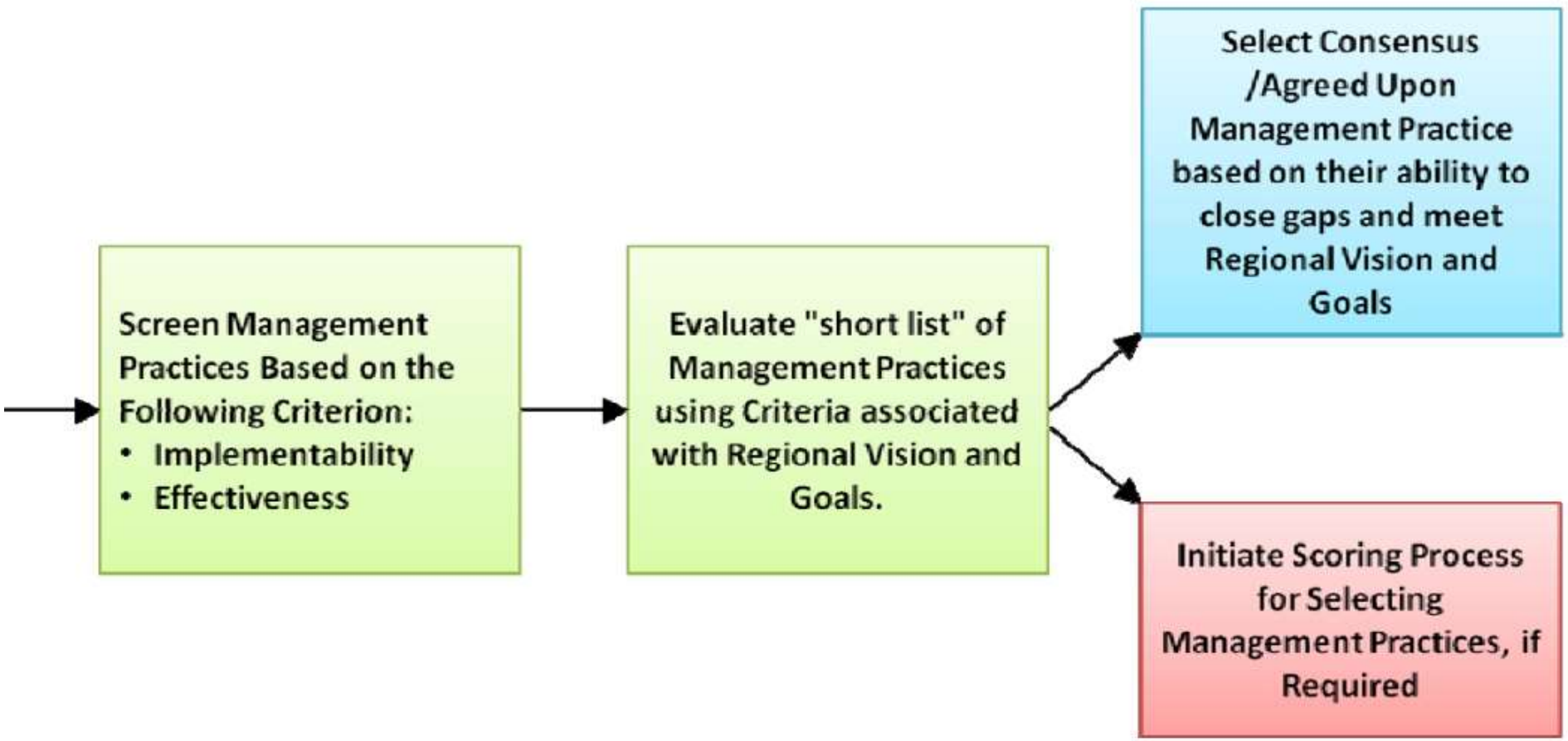
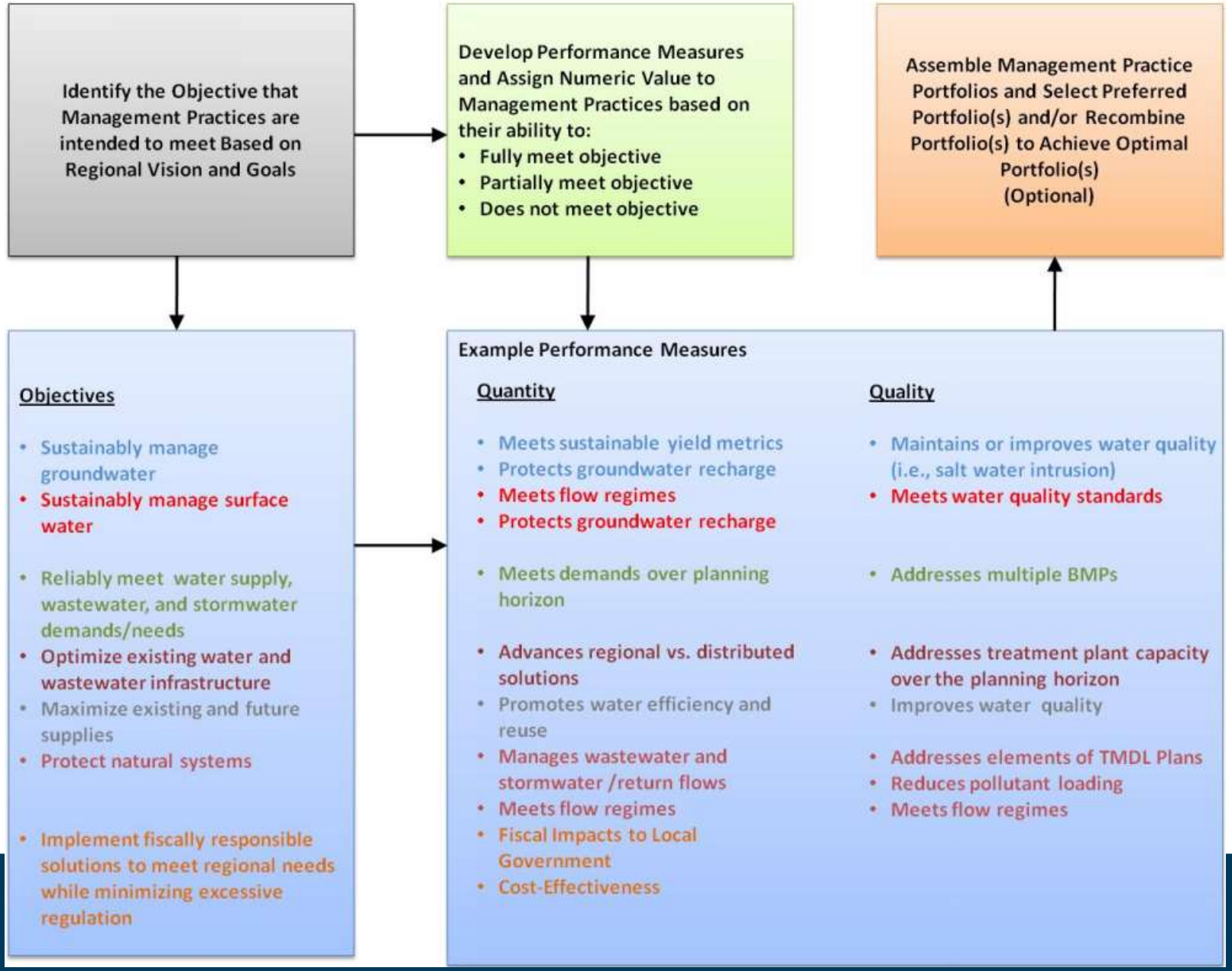
Management Practice Selection Process



Management Practice Selection Process



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Review and Discuss Management Practices

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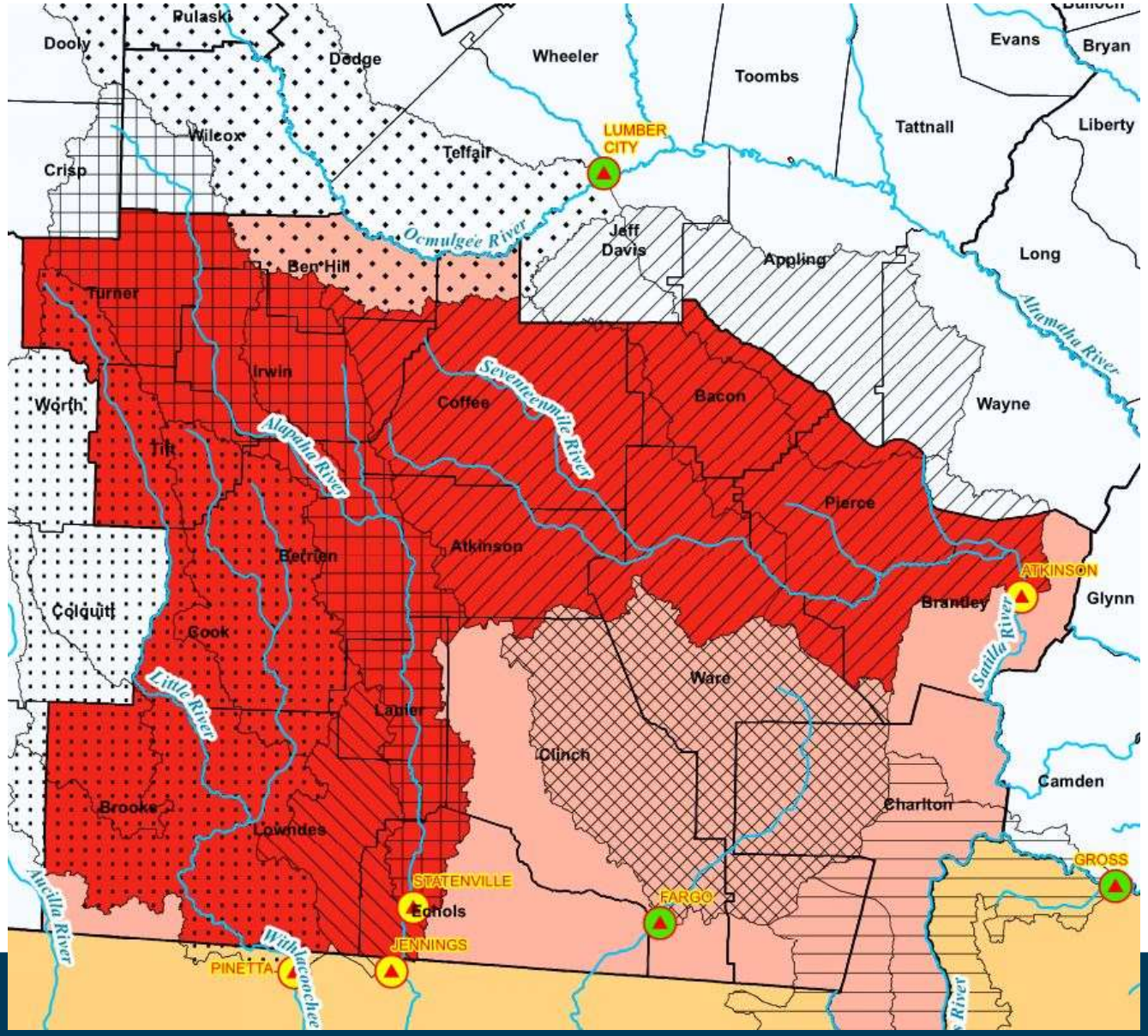
Management Practices

- Suwannee - Satilla identified 76 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 – Pinetta, Statenville, Jennings, Fargo, Lumber City and Atkinson Planning Nodes

Georgia

2050 Withdrawals by County and Region

Table 1a Pinetta 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]	% of County SW Irrigated Land Area Within the LDA That Drains to Planning Node	2050 Forecasted Surface Water Withdrawals for Portion of County That Drains to Planning Node[2, 3] (MGD)
Lower Flint-Ochlockonee	Colquitt	201,242	56.5%	13,411	6.66%	7.77
	Thomas	38,296	10.8%	670	1.75%	0.27
	Worth	152,858	41.6%	10,118	6.62%	4.84
Suwannee-Satilla	Berrien	156,518	53.4%	5,678	3.63%	--
	Brooks	270,998	85.1%	1,178	0.43%	0.75
	Cook	149,252	100%	4,381	2.94%	0.91
	Lanier	5,788	4.5%	84	1.45%	--
	Lowndes	195,845	59.9%	823	0.42%	0.51
	Tift	139,923	81.3%	10,969	7.84%	4.70
	Turner	45,189	24.4%	5,057	11.19%	3.10

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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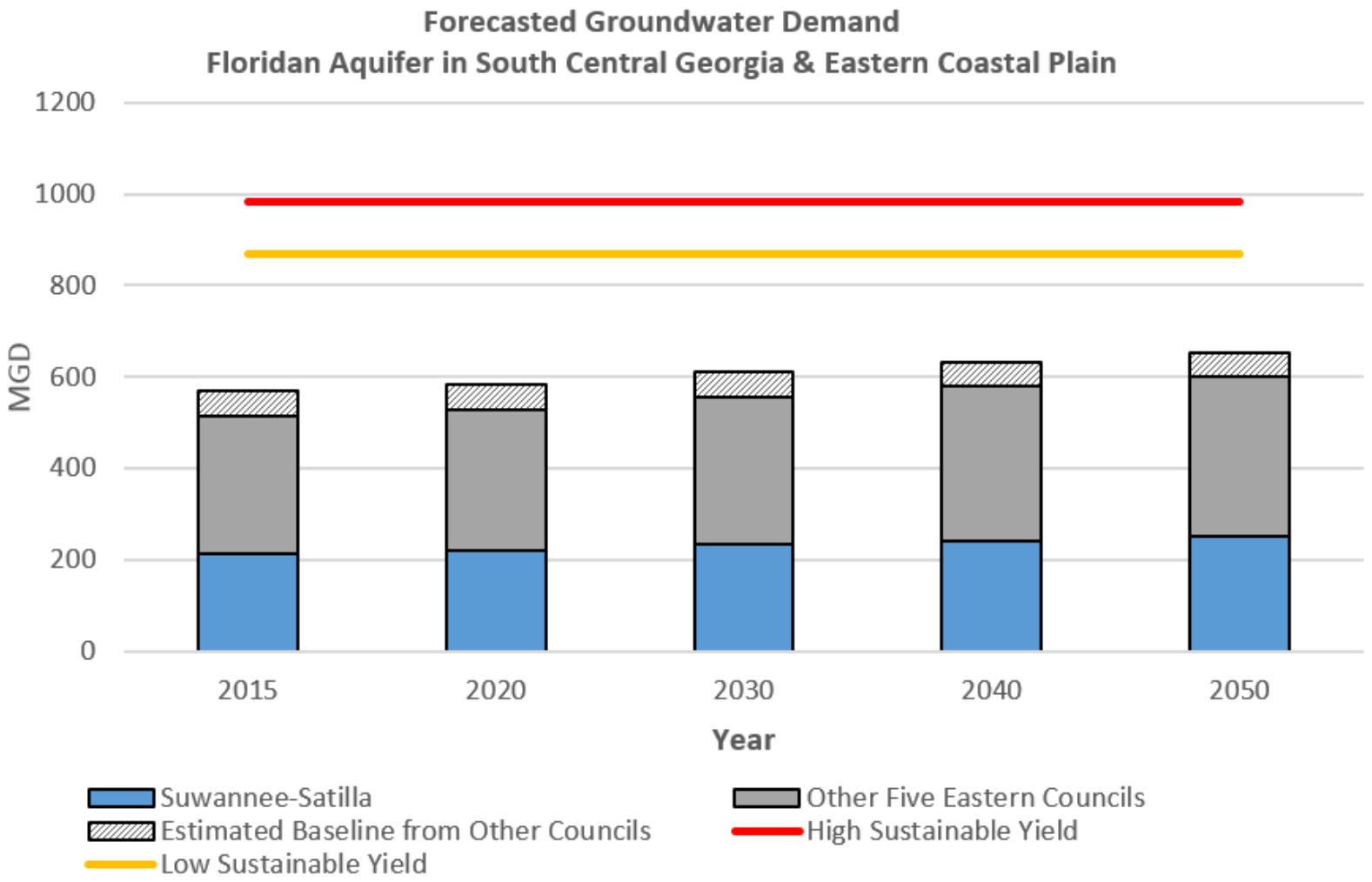
Groundwater Gaps – None for Suwannee-Satilla Basin



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
  - Future treatment capacity needs by 2050 identified potential gaps for WWTPs and/or LAS for Bacon, Echols and Pierce counties
  - Dissolved Oxygen Assimilative Capacity
  - Identification of specific reaches not meeting assimilative capacity
  - St. Marys Sound
- Non point source "Heat Maps" – align BMPs with Vision and Goals "*to protect public health and natural resources, and to enhance the quality of life for all citizens*"

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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)

Suwannee – Satilla Reaches that have exceeded their DO assimilative capacity under current conditions:

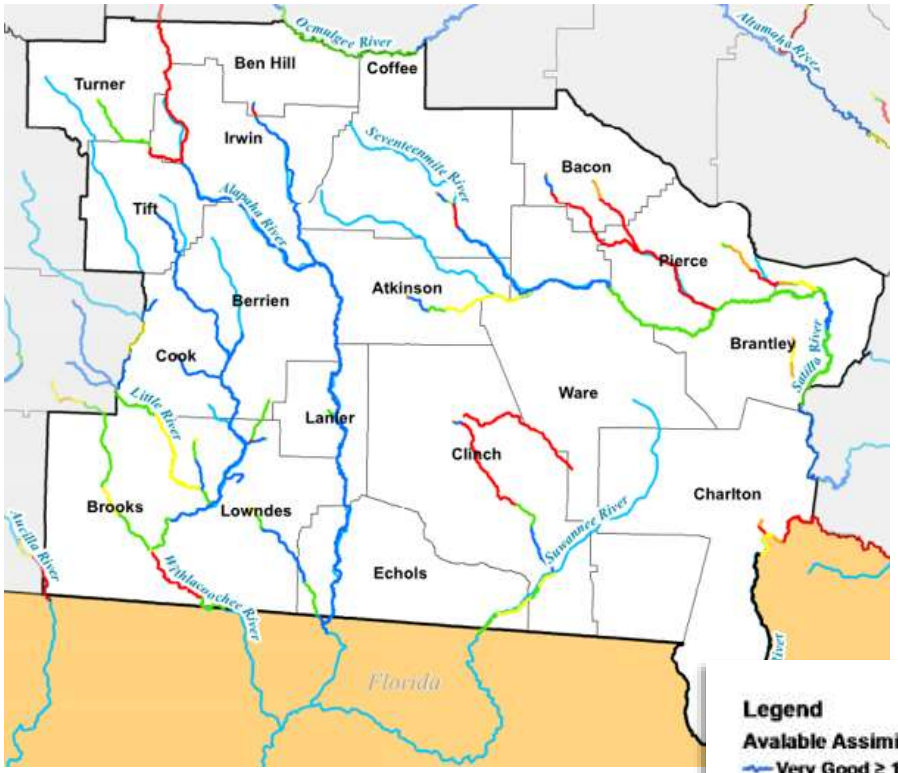
- Suwannee Basin:
  - Alapaha River, Hat Creek, Withlacoochee River, Woodyard Creek, Tatum Creek, Cat Creek, Cane Creek, and a small portion of the Willacoochee River
- Satilla Basin
  - Seventeen Mile River, Little Hurricane Creek, Hurricane Creek, Alabaha River, and Little Satilla River
- St. Marys Basin
  - Spanish Creek and the main stem of the Saint Marys River
  - The main stem of the Saint Marys River in the St. Marys Basin
- Aucilla River in the Ochlockonee 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)

Suwannee – Satilla Region – Results of DO Assimilative Capacity

Current Conditions



Updated Future Condition (2050)

Legend

Available Assimilative Capacity

- Very Good ≥ 1 mg/L DO available
- Good 0.5 mg/L to < 1 mg/L DO available
- Moderate 0.2 mg/L to < 0.5 mg/L DO available
- Limited >0 mg/L to <0.2 mg/L DO available
- At Assimilative Capacity 0 mg/L DO available
- None or Exceeded < 0.0 mg/L DO available
- Unmodeled Lakes and Streams

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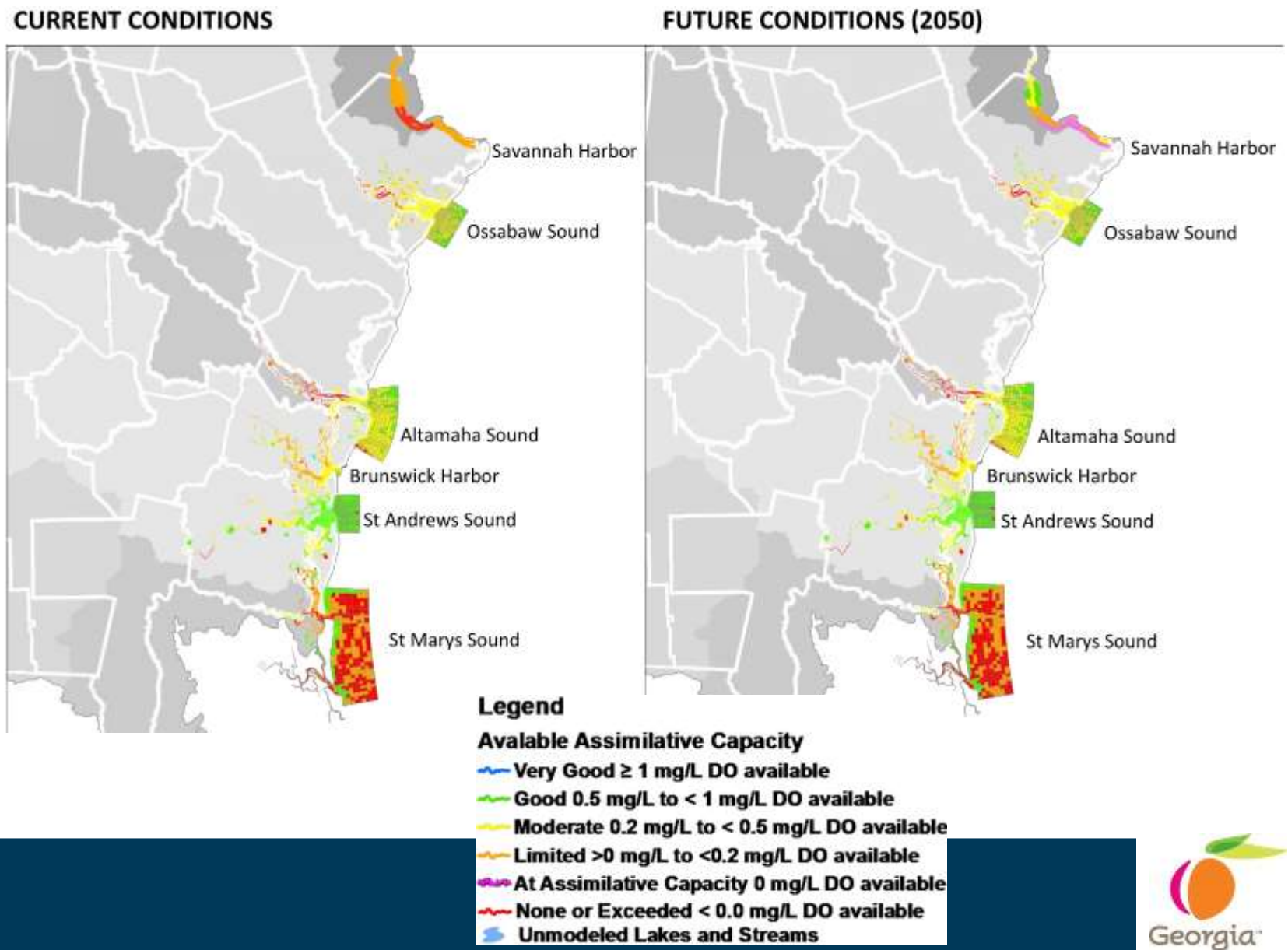
Environmental Fluid Dynamics Code (EFDC) Model Results



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Heat Maps – **Add**

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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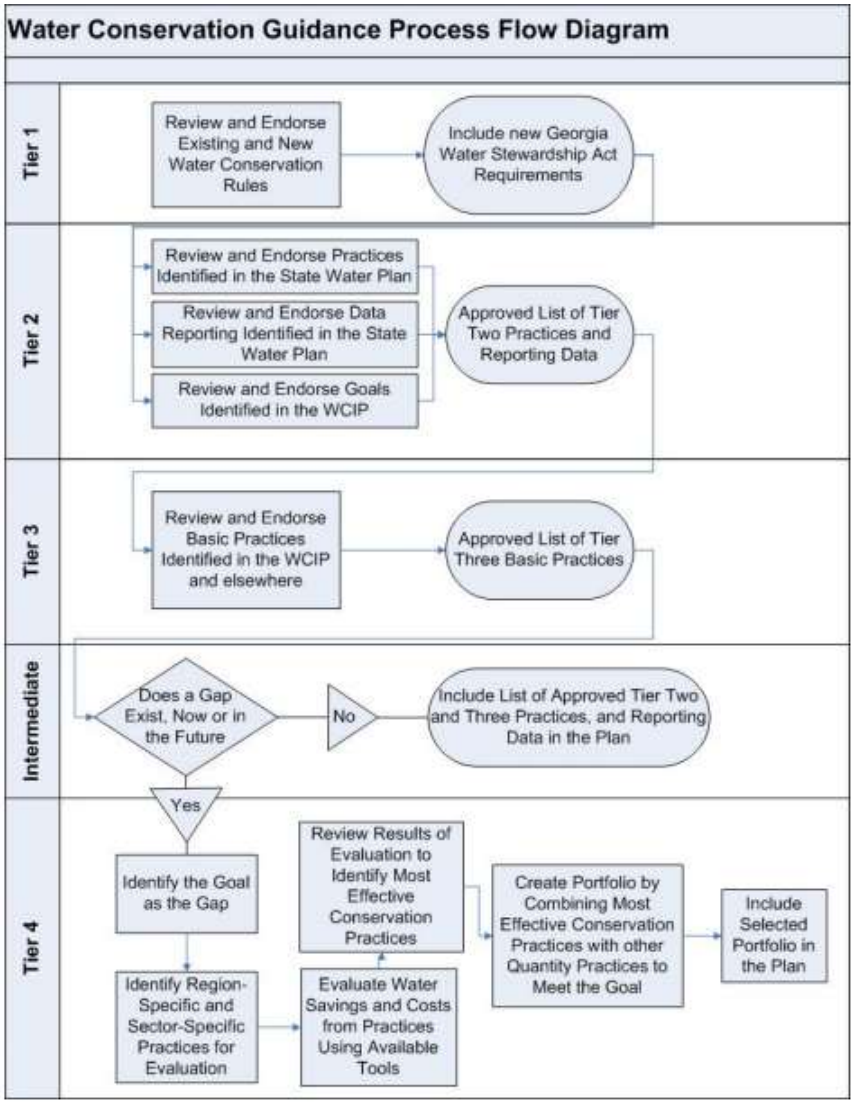
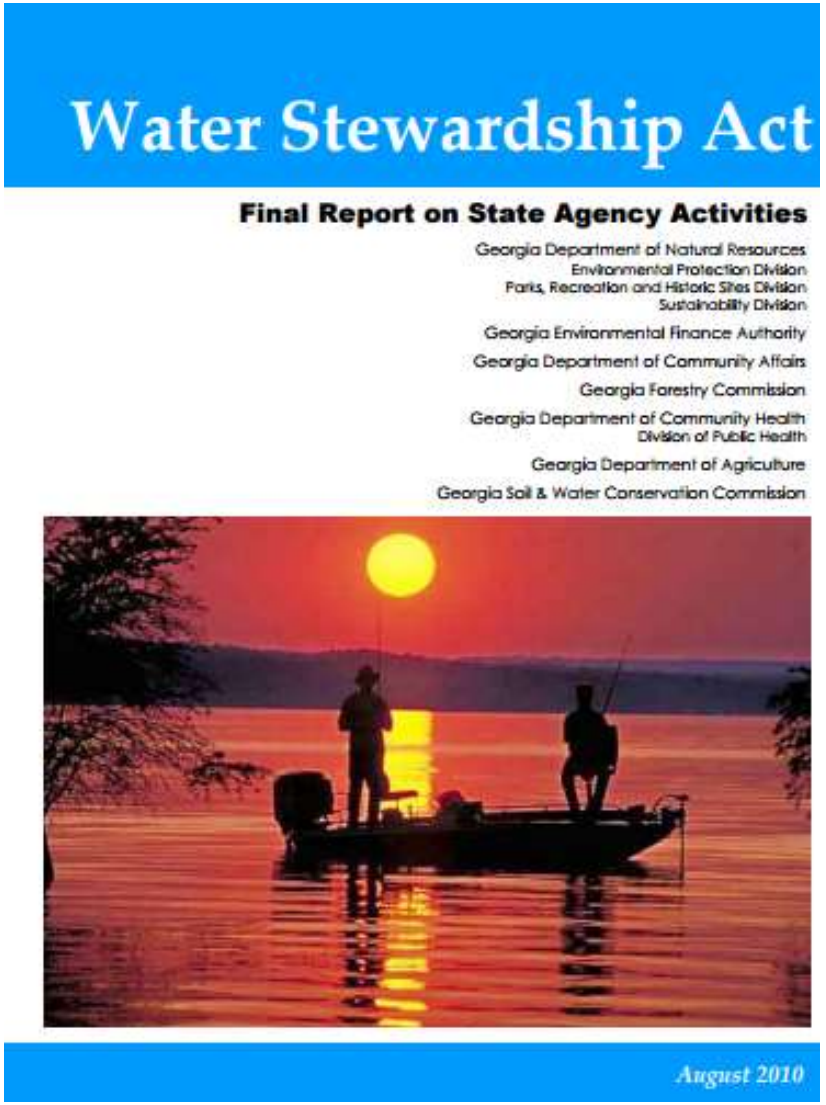
Water Conservation is a Priority Management Practice





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

Georgia

Drought Management Rules Updated in August 2015

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Rules and Regulations of the State of Georgia

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Route : GA R&R » Department 391 » Chapter 391-3 » Subject 391-3-30

Subject 391-3-30 DROUGHT MANAGEMENT

Rule 391-3-30-.01 Purpose of Rule

To establish rules and regulations relating to drought management, including: provisions for a drought response committee; drought indicators and triggers; a drought declaration process; and state and local predrought mitigation strategies and drought response strategies. Predrought mitigation strategies are designed to minimize the potential effects of drought. Drought response strategies include measures or actions to be implemented during various stages of drought.

Rule 391-3-30-.02 Definitions

When used in this Chapter:

(1) "Affected drought area" means any area subject to a drought declaration made in accordance with Rule 391-3-30-.05.

(2) "Director" means the director, or his/her designee, of the Environmental Protection Division of the Department of Natural Resources.

(3) "Division" means the Environmental Protection Division of the Department of Natural Resources.

State regulations address the following water conservation practices:

- Submittal of water conservation plans by withdrawal permittees and demonstration by water withdrawal permittees of progress toward water conservation goals or water efficiency standards (Ga. Comp. R. & Regs R. 391-3-6-.07(4) and 391-3-2-.04(11))
- Landscape irrigation limits based on Drought Response Level and as required by Ga. Comp. R. & Regs R. 391-3-30-.03 (with exemptions)
- Even-odd watering restrictions for non-irrigation outdoor water uses during Drought Response Level 2 and 3 (Ga. Comp. R. & Regs R. 391-3-30)
- Car wash facility best management practices and certification requirements (Ga. Comp. R. & Regs R. 391-31-.03)
- Water loss auditing requirements for public water systems (serving more than 3,300 individuals), according to IWA/AWWA Water Audit Method[1] (Ga. Comp. R. & Regs R. 391-3-33, OCGA §12-5-4.1)
- Installation of submeters in multiunit residential buildings and certain retail and light industrial buildings granted a permit for construction after July 1, 2012 (OCGA 12-5-180.1)
- Building code standards for high efficiency plumbing fixtures in new construction after July 1, 2012 (OCGA 8-2-3)
- Building code standards for high efficiency cooling towers in new construction permitted after July 1, 2012 (OCGA 8-2-23)

Additionally, the Council supports and encourages the adoption of voluntary water conservation measures. Utilize existing incentive programs to support the use of these practices.

http://rules.sos.ga.gov/nllxml/georgiacodesGetcv.aspx?urlRedirected=yes&data=admin&lookingfor=391-3-30

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2011 RWP Recommended Management Practices

Table 6-1: Management Practices Selected for the Suwannee-Satilla 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 - Address Current and Future Surface Water Use in Gap Areas **Data Collection/Additional Research (DCAR)** to confirm frequency, duration, severity, and drivers of surface water gaps and identify significant causes (climate, timing, water use, land cover, etc.) of 7Q10 low flow conditions and advance research/feasibility of potential solutions			
DCAR-1[1] Collect Agricultural Consumption Data; Refine Resource Assessment	Improve understanding and quantification of agricultural water use and the projected surface water gaps on the Satilla River at Atkinson, the Alapaha River at Statenville and Jennings, and the Withlacoochee River at Pinetta (hereafter referred to as “surface water gaps”)	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	1,4,5,13

2011 RWP Recommended Management Practices

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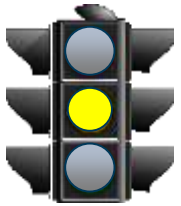
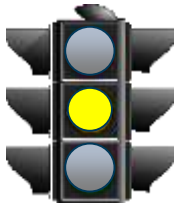
DCAR-2[1] Source of Supply Data to Refine Forecasts		Refine surface water agricultural forecasts and Resource Assessment models to improve data on source of supply and timing/operation of farm ponds and dual-source irrigation systems	1,4,5,13
DCAR-3[1] Improve Forecast and Resource Data; Analyze Storage Impacts on Gaps		Refine and improve surface water Resource Assessment and agricultural forecasts to address spatial and temporal hydrologic variations (i.e., including but not limited to evapotranspiration, infiltration, runoff, and groundwater/surface water interconnections) in relationship to forecasts, climate conditions, and other non-water use variables. This includes developing a better understanding of agricultural and residential water storage systems (ponds) and their effect on low flow conditions.	1,4,5,13





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2011 RWP Recommended Management Practices

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DCAR-4[1] Improve Data Quality and Analysis Capabilities	Obtain additional data and improved understanding of actual versus forecasted water use	Continue to fund, improve, and incorporate metering data regarding agricultural water use; Collect and use this information in Water Plan updates, including expanding the number of GSWCC continuously monitored real-time meter sites in surface water gap areas	5,6,13
DCAR-5[1] Irrigation Efficiency Education and Research	Improvement of surface water flows via reduced surface water use while maintaining/improving crop yields	Collaborate/support research (In-State University, State, and Corporate) on improved irrigation efficiency measures and development of lower water use crops and lower water use plant strains for existing and future crop types	5,6,13
DCAR-6[1] Understand Optimum Application Methods		Improve education and research on when and how much water is needed to maximize crop yield with efficient irrigation	5,6,13

Georgia

2011 RWP Recommended Management Practices

Table 6-1: Management Practices Selected for the Suwannee-Satilla 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 - Address Current and Future Surface Water Use in Gap Areas **Data Collection/Additional Research (DCAR)** to confirm frequency, duration, severity, and drivers of surface water gaps and identify significant causes (climate, timing, water use, land cover, etc.) of 7Q10 low flow conditions and advance research/feasibility of potential solutions			
DCAR-7 Minimize Groundwater Impacts to Surface Water	Improvement of surface water flows in areas where groundwater and surface water are hydraulically connected and groundwater use impacts surface water flows	Promote management practices and educate water users to minimize impacts to surface water associated with excessive pumping/use of shallow/surficial aquifers that may impact surface water flows	1,5,6,13
DCAR-8 Analyze Addressing Extreme Conditions	Evaluate the cost versus benefit of closing the largest, most infrequent surface water gaps	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	1,5,11
DCAR-9 Study Potential Use of Aquifers to Address Gaps	Improvement of surface water flows (in gaps 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	4,5,6,7

Georgia

2011 RWP Recommended Management Practices

Table 6-1: Management Practices Selected for the Suwannee-Satilla 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 - Address Current and Future Surface Water Use in Gap Areas **Data Collection/Additional Research (DCAR)** to confirm frequency, duration, severity, and drivers of surface water gaps and identify significant causes (climate, timing, water use, land cover, etc.) of 7Q10 low flow conditions and advance research/feasibility of potential solutions			
DCAR-10 Restoration Impact on Low Flow Conditions Analysis	Examine potential role of wetlands restoration and water retention structures in addressing surface water low flow conditions. Evaluate implementation considerations for each option.	Develop plan of study and research opportunities and limitations associated with improving river flow conditions via creation/restoration of wetlands and potential water retention structures including streams. If feasible, identify potential location(s) and estimate improvements to stream flow conditions. Identify incentives to make this a viable water supply option and develop a cost-benefit analysis of these incentives.	4,8

2011 RWP Recommended Management Practices

Table 6-1: Management Practices Selected for the Suwannee-Satilla 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) - Address current and future gaps and meet water needs by efficient water use. The Suwannee-Satilla Council supports the 25 water conservation goals contained in the March 2010 Water Conservation Implementation Plan (WCIP).			
WC-1 Tier 1 and Tier 2 Measures for Municipal and Industrial Users	Help meet current and forecasted municipal and industrial surface water and groundwater supply needs throughout the region	Municipal and Industrial water uses - encourage implementation and adherence to Tier 1 and Tier 2 water conservation measures established in existing rulemaking processes and plans [WCIP, Coastal Permitting Plan (including applicable Tier 3 and Tier 4 practices), and Water Stewardship Act of 2010] and encourage active participation of local governments/utilities in future rulemaking to improve water use efficiency	6
WC-2 Tier 1 and Tier 2 Measures for Agricultural Users	Help meet current and forecasted agricultural surface water and groundwater supply needs throughout the region	Encourage implementation of Tier 1 and Tier 2 conservation measures and adherence to WCIP by agricultural and surface water groundwater users	6

2011 RWP Recommended Management Practices

Table 6-1: Management Practices Selected for the Suwannee-Satilla 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 - Meet current and future gaps and needs by efficient agricultural water use - Tier 3 Conservation Practices[1]			
WC-3 Audits	- Help meet current and forecasted agricultural ground and surface water supply needs - Help address surface water gaps on the Satilla River at Atkinson, the Alapaha River at Statenville and Jennings, and the Withlacoochee River at Pinetta	Conduct irrigation audits	6,13
WC-4 Metering		Meter irrigation systems	
WC-5 Inspections		Inspect pipes and plumbing to control water loss	

Georgia

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)**
Action Needed - Water Conservation (WC) Continued - Meet current and future gaps and needs by efficient agricultural water use - Tier 3 Conservation Practices[1]			
WC-6 Minimize High-Pressure Systems	- Help meet current and forecasted agricultural ground and surface water supply needs - Help address surface water gaps on the Satilla River at Atkinson, the Alapaha River at Statenville and Jennings, and the Withlacoochee River at Pinetta	Minimize or eliminate the use of high-pressure spray guns on fixed and traveler systems where feasible	6,13
WC-7 Efficient Planting Methods		Utilize cropping and crop rotation methods that promote efficiency	

2011 RWP Recommended Management Practices

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Action Needed - Water Conservation (WC) Continued - Meet current and future gaps and needs by efficient agricultural water use - Tier 4 Conservation Practices[1]			
WC-8 Conservation Tillage	See issues addressed by WC-3 through WC-7	Practice conservation tillage	6,13
WC-9 Control Loss		Control water loss	
WC-10 End-Gun Shutoffs		Install end-gun shutoff with pivots	
WC-11 Low Pressure Systems		Install low pressure irrigation systems where feasible (soil specific)	
WC-12 Application Efficiency Technologies		Encourage and improve use of soil moisture sensors, evapotranspiration sensors, or crop water use model(s) to time cycles	

2011 RWP Recommended Management Practices

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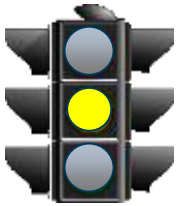
Management Practice Number	**Issue(s) to be Addressed by Action(s)**	**Description/Definition of Action**	**Relationship of Action or Issue to Vision and Goals (Section 1.4)**
Additional/Alternate to Existing Surface Water Supply Sources (ASWS)[1]			
ASWS-1 Consider Low Flow Conditions in Future Surface 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 Atkinson, Statenville, Jennings, or Pinetta gauges	Future surface water uses - If surface water (ponds and withdrawals) is sought for future water supply (new permits), Applicant, GSWCC, and EPD should work collaboratively to demonstrate that future surface water uses will not contribute to frequency or magnitude of gaps	1,4,5



2011 RWP Recommended Management Practices

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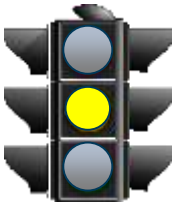
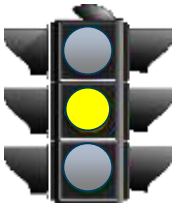
Management Practice Number	**Issue(s) to be Addressed by Action(s)**	**Description/Definition of Action**	**Relationship of Action or Issue to Vision and Goals (Section 1.4)**
Additional/Alternate to Existing Surface Water Supply Sources (ASWS)[1]			
ASWS-2 Incentives for Dry-Year Releases from Ponds	Help improve surface water flow on the Satilla River at Atkinson, the Alapaha River at Statenville and Jennings, and the Withlacoochee River at Pinetta 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 in dry/gap years	1,3,4,5
ASWS-3 Substitute Future Surface Water Use with Groundwater in Gap Areas		Future surface water uses - Encourage additional groundwater development as a preferred source of supply for future demand in surface water gap areas	1,2,5,11
ASWS-4 Substitute Existing Agricultural Surface Water Use with Groundwater in Dry Years		Existing surface water uses - Encourage replacement of a portion of existing agricultural surface water irrigation use with groundwater in times of shortage to 7Q10 dry periods; so long as use of the groundwater source does not impact surface water flow in other areas	1,4,5





Georgia

2011 RWP Recommended Management Practices

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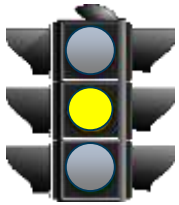
Management Practice Number	**Issue(s) to be Addressed by Action(s)**	**Description/Definition of Action**	**Relationship of Action or Issue to Vision and Goals (Section 1.4)**
Additional/Alternate to Existing Surface Water Supply Sources (ASWS)[1]			
ASWS-5 Opportunities and Incentives for Dry-Year Releases from Ponds	Help improve surface water flow on the Satilla River at Atkinson, the Alapaha River at Statenville and Jennings, and the Withlacoochee River at Pinetta during low flow conditions	Existing surface water uses- Utilizing incentives and collaborative partnerships, identify opportunities that allow for use of agricultural pond storage to augment river flows in times of shortage to 7Q10 dry periods	1,3,4,5
ASWS-6 Consider Phased Seasonal Agricultural Permit Conditions		Existing surface water uses - Identify need for, and feasibility of, seasonal surface water permit conditions for existing agricultural uses to address times of shortage to 7Q10 dry periods; Phase implementation as follows: Phase 1 (Direct stream withdrawals); Phase 2 (Consider pond storage effects based on outcome of research from DCAR-2 and DCAR-3)	1,4,5



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)**
Additional/Alternate to Existing Surface Water Supply Sources (ASWS)[1]			
ASWS-7 Ecological Restoration Incentive Program	Help improve surface water flow on the Satilla River at Atkinson, the Alapaha River at Statenville and Jennings, and the Withlacoochee River at Pinetta during low flow conditions	Based on 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 dry periods	1,4,5,8
ASWS-8 Land Management Incentives		Evaluate incentive-based land use practices to help promote infiltration and aquifer recharge	1,4,5,7

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)
Additional/Alternate to Existing Surface Water Supply Sources (ASWS)[1]			
ASWS-9 Incentives for Greater Wastewater Return Flows; Coordinated Management	Help improve surface water flow on the Satilla River at Atkinson, the Alapaha River at Statenville and Jennings, and the Withlacoochee River at Pinetta during low flow conditions	Evaluate incentive-based programs to increase wastewater returns; modify land application system, septic systems, and manage stormwater to improve return flows while maintaining water quality Evaluate feasibility, and encourage use of, regional storm water management, and if feasible, implement coordinated stormwater management to attenuate high flows and help augment low flows and improve water quality for the Withlacoochee River above the Pinetta Node	1,4,5,10
ASWS-10 Multi-Region Reservoir		Possible joint non-main stem reservoir to serve multiple regions/regional council boundaries with Upper Flint and/or Lower Flint-Ochlockonee Councils	1,4,5,9
ASWS-11 Inter-Basin Transfers		Regional inter-basin transfers (i.e., Ocmulgee to Alapaha and Altamaha to Little Satilla); Collaborating between regions to meet regional water needs and benefit both the areas from which the transferred water is withdrawn and the area receiving the water	1,4,5

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2011 RWP Recommended Management Practices

Table 6-1: Management Practices Selected for the Suwannee-Satilla Region

WASTEWATER MANAGEMENT IN COASTAL GEORGIA

A Menu of Options

Katie Hill, J.D.
River Basin Center
University of Georgia

January 2017

Local and Regional Planning
- Interdepartmental communication and cooperation
- Intergovernmental communication and cooperation
- Local wastewater planning

Wastewater Treatment Plants
- Design
- Plant operations
- Collection systems
- Education and outreach

Community Systems
- Inventories
- Oversight or prohibitions
- Uses, siting, and land use planning
- Management programs

Funding
- Permit and funding eligibility and incentive programs
- Infrastructure selection and management
- Local rates and funding programs

Onsite Systems
- Inventories and mapping
- Siting, design, and installation
- Operation and maintenance
- Failing and nonconforming systems
- Enforcement

https://researchweb8.wpengine.com/rivercenter/wp-content/uploads/sites/17/2015/08/WEB_wastewater_mgmt_in_coastal_ga_jan2017.pdf

2011 RWP Recommended Management Practices

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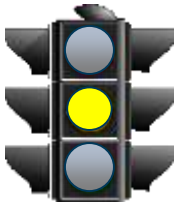
Management Practice Number	**Issue(s) to be Addressed by Action(s)**	**Description/Definition of Action**	**Relationship of Action or Issue to Vision and Goals (Section 1.4)**
Action Needed - Address Wastewater Permit Capacity Needs/Gaps			
Available Municipal Wastewater Permit Capacity (MWWPC)			
MWWPC-1 Increase Wastewater Permit Capacity	Additional municipal wastewater treatment capacity may be needed in Bacon, Cook, Lowndes, and Pierce Counties	Obtain additional wastewater permit capacity to meet forecasted needs	5
Available Industrial Wastewater Permit Capacity (IWWPC)			
IWWPC-1[2] 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	5



2011 RWP Recommended Management Practices

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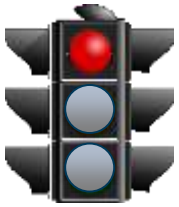
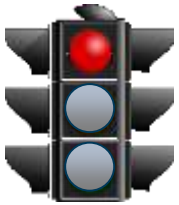
Management Practice Number	**Issue(s) to be Addressed by Action(s)**	**Description/Definition of Action**	**Relationship of Action or Issue to Vision and Goals (Section 1.4)**
Action Needed - Address Water Withdrawal Permit Capacity Needs			
Municipal Groundwater Permit Capacity (MGWPC)			
MGWPC-1 Increase Municipal Groundwater Permit Capacity	Additional municipal groundwater permit capacity may be needed in Brantley, Coffee, Echols, Lanier, Lowndes, Pierce, and Ware Counties	Obtain groundwater permit capacity	1,4,5
Industrial Groundwater Permit Capacity (IGWPC)			
IGWPC-1 Increase Industrial Groundwater Permit Capacity	Additional industrial groundwater permit capacity may be needed in Ben Hill, Cook, and Ware Counties	Obtain groundwater permit capacity	1,4,5





Georgia

2011 RWP Recommended Management Practices

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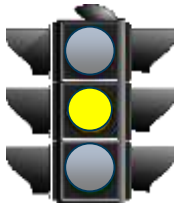
Management Practice Number	**Description/Definition of Action**	**Relationship of Action or Issue to Vision and Goals (Section 1.4)**
Action Needed - Address Current and Future Groundwater (GW) Needs		
GW-1 Sustainable Groundwater Development	Continue to sustainably drill wells, use, and develop water from the Upper Floridan and other significant aquifers	1,4,5
GW-2 Promote Aquifer-Friendly Land Uses	Encourage land use practices that sustain and protect aquifer recharge areas (both inside and outside the region) for the aquifers that are present in the region	4,5,7



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Management Practice Number	**Description/Definition of Action**	**Relationship of Action or Issue to Vision and Goals (Section 1.4)**
Action Needed - Address Current and Future Groundwater (GW) Needs		
GW-3 Research Groundwater Sustainability	Continue to refine sustainable yield metrics, monitor and improve understanding of historic, current, and future trends in groundwater levels; Continue to refine modeling and other tools	1,4,5,13
GW-4 Inter-State Resource Planning	Collaborate with Florida regarding shared resource issues and water planning	1,4,5,13

2011 RWP Recommended Management Practices

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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 and use surface water within the available surface water resource capacity	1,4,5
SW-2 Monitor and Evaluate Estuaries	Monitor Satilla River flow conditions to help determine flow conditions that sustain estuary conditions	4,8,9,13

2011 RWP Recommended Management Practices

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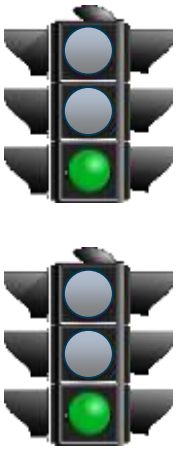
Management Practice Number	**Description/Definition of Action**	**Relationship of Action or Issue to Vision and Goals (Section 1.4)**
Management Practices to Address Water Quality Non-Point Source (NPS) Needs		
(Dissolved oxygen, fecal coliform, nutrients, and other impairments)		
NPS-1 Study Human Impacts on Water Quality	Data collection/analysis to confirm if dissolved oxygen and/or fecal coliform is human induced	4,8,13
NPS-2 Monitor and Address NPS Nutrient Loading	Support efforts to monitor and determine the sources of nutrient loading and other NPS impairments to rivers, lakes, and streams, and upon confirmation of source, develop specific management programs to address water quality needs	4,8,10,13



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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		
The following practices are selected by the Suwannee-Satilla Council to encourage implementation by the applicable local or state program(s).		
Urban Best Management Practices (NPSU)		
NPSU-1 Control Erosion	Use soil erosion and sediment control measures	4,8,10
NPSU-2 Manage Stormwater Runoff	Stormwater retention ponds, wetlands, and bioretention areas to manage runoff quality and flow rate and help support river flows (as found in City of Valdosta Watershed Protection Plan, 2009)	4,8,10

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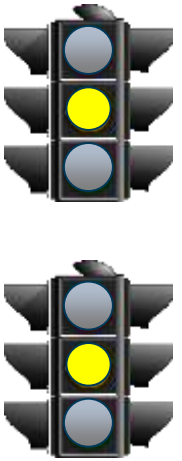
Management Practices to Address Water Quality Non-Point Source (NPS) Needs		
The following practices are selected by the Suwannee-Satilla Council to encourage implementation by the applicable local or state program(s).		
Urban Best Management Practices (NPSU)		
NPSU-3 Increase Stormwater Infiltration	Consider measures to reduce directly-connected impervious area and promote increased infiltration of stormwater to help reduce nutrient and other pollutant runoff (as found in City of Baxley Watershed Protection Plan, 2007)	4,8,10
NPSU-4 Riparian Buffers	Protect and maintain riparian buffers along urban streams	4,8,10
NPSU-5 Street Sweeping	Implement street sweeping program (as found in City of Pearson Watershed Protection Plan, 2008)	4,8,10



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Management Practices to Address Water Quality Non-Point Source (NPS) Needs		
The following practices are selected by the Suwannee-Satilla Council to encourage implementation by the applicable local or state program(s).		
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 the BMPs identified in Georgia Resource Conservation and Development Council, "Georgia Better Back Roads – Field Manual"	4,8,10

2011 RWP Recommended Management Practices

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Management Practices to Address Water Quality Non-Point Source (NPS) Needs		
The following practices are selected by the Suwannee-Satilla Council to encourage implementation by the applicable local or state program(s).		
Forestry Best Management Practices (NPSF)		
NPSF-1 Support Forestry Commission Water Quality Program	Support Georgia Forestry Commission water quality program consisting of BMP development, education/outreach, implementation/compliance monitoring, and complaint resolution process	4,8,10,13
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	4,8,10,13
NPSF-3 Conservation Land Use Planning	Seek long-term conservation easements or purchase development rights by willing landowners and conservation groups	4,8,10
NPSF-4 Forest Restoration Incentives and Support	Where applicable, support United States Department of Agriculture incentive programs through the Farm Service Agency and NRCS to restore converted wetlands back to forested conditions	4,8

Georgia

2011 RWP Recommended Management Practices

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Management Practices to Address Water Quality Non-Point Source (NPS) Needs		
The following practices are selected by the Suwannee-Satilla Council to encourage implementation by the applicable local or state program(s).		
Agricultural Best Management Practices for Crop and Pasture Lands (NPSA) - Support and encourage implementation of GSWCC BMP and Education Programs		
NPSA-1 Soil Erosion Reduction Measures	Conservation tillage and cover crop	4,6,8,10
NPSA-2 Utilize Buffers	Field buffers, riparian forested buffers, and strip cropping to control runoff and reduce erosion	4,6,8,10
NPSA-3 Livestock Management	Livestock exclusions from direct contact with streams and rivers and vegetation buffers	4,8,10
NPSA-4 Manure Control	Responsible manure storage and handling	4,8,10
NPSA-5 Wetland and Forest Restoration Incentives	Incentives to restore wetlands and historically drained hardwood and other areas	4,8

Georgia

2011 RWP Recommended Management Practices

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Management Practices to Address Water Quality Non-Point Source (NPS) Needs		
The following practices are selected by the Suwannee-Satilla Council to encourage implementation by the applicable local or state program(s).		
Existing Impairments and Total Maximum Daily Load Listed Streams (TMDL)		
TMDL-1 Evaluate Impairment Sources	Data collection and confirmation of sources to support modify stream standards to reflect "natural sources" and/or to reflect naturally low dissolved oxygen streams	4,13
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	4,13
TMDL-3 Stormwater Management BMPs	Stormwater Management: -Agricultural BMPs -Forestry BMPs -Rural BMPs -Urban BMPs *See Above Non-Point Source for Details*	4,8,10,13

2011 RWP Recommended Management Practices

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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		
The following practices are selected by the Suwannee-Satilla Council to encourage implementation by the applicable local or state program(s).		
Nutrients – Satilla River Watershed Model (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 practices 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 nutrient load) - Agricultural, Forestry, Rural, and Urban BMPs *See Above Non-Point Source for Details*	4,8,10,13

2011 RWP Recommended Management Practices

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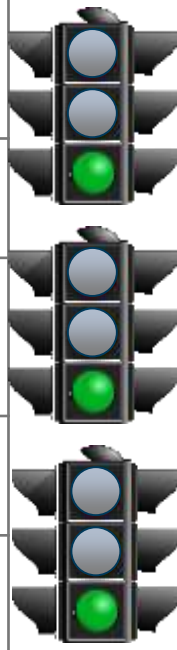
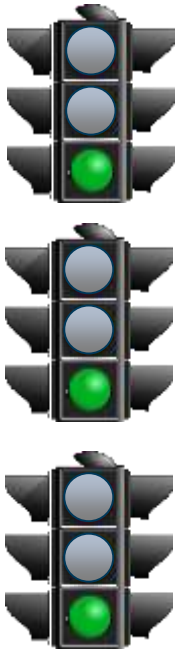
Management Practice Number	**Description/Definition of Action**	**Relationship of Action or Issue to Vision and Goals (Section 1.4)**
Management Practices to Address Future Educational Needs (EDU)		
EDU-1 Promote Conservation Programs	Support Water Conservation Programs	1,4,5,6,13
EDU-2 Stormwater Education	Support Stormwater Educational Programs	4,5,8,11
EDU-3 Septic System Maintenance Education	Support Septic System Maintenance Programs	4,5,8
EDU-4 Forestry BMP Education	Support Georgia Forestry Commission Forestry BMP and UGA-SFI Logger Education Programs	4,8,10
EDU-5 Funding and Support for BMP Education	Prioritize funding and support for existing and future education, awareness, and BMP programs on non-point source pollution, including but not limited to: Agricultural BMPs, Forestry BMPs, Rural BMPs, Urban BMPs, Georgia Adopt-a-Stream, UGA Extension Service, and Georgia Forestry Commission	4,5,8,10



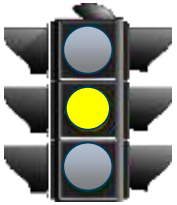
2011 RWP Recommended Management Practices

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	Encourage local government to develop ordinances and standards to implement and/or update stormwater and land development regulations. Possible resource documents include: Georgia Stormwater Management Manual, Coastal Stormwater Supplement, and Metro North Georgia Water Planning District Model Ordinances	4,8,10
OCP-2 Green Space Opportunities and Incentives	Identify opportunities for green space on incentive and voluntary basis	1,4,5
OCP-3 Promote Integrated Planning	Encourage coordinated environmental planning, land use, stormwater, and wastewater	1,2,4,5,10,13
OCP-4 Local Government Erosion Control Measures	Encourage local governments to enforce Erosion and Sedimentation Control Ordinance (as found in Cities of Pearson and Valdosta Watershed Protection Plans, 2008 and 2009)	4,8,10



2011 RWP Recommended Management Practices

Table 6-1: Management Practices Selected for the Suwannee-Satilla Region		
The following Suwannee-Satilla Council Management Practices are programmatic in nature and are therefore described in general terms.		
Management Practice Number	**Description/Definition of Action**	**Relationship of Action or Issue to Vision and Goals (Section 1.4)**
Summary of Management Practices for Shared Resources – The Suwannee-Satilla Region will implement management practices summarized in this table and collaborate with the following Councils to address shared resource gaps. Note: As summarized below, each Council has identified a series of management practices intended to address the contributing portion of the surface water flow gap within their boundaries.		
Surface Water Quantity – Satilla River (Atkinson), Alapaha River (Statenville and Jennings), and Withlacoochee River (Pinetta) Suwannee-Satilla – The Suwannee-Satilla Council has identified the management practices in the above table to address the majority of the cumulative gap at Atkinson, Statenville, and Jennings, and a portion of the cumulative gap at Pinetta. Altamaha – The Altamaha Council has identified water conservation, replacement of surface water use with groundwater use, refinement of forecasting and modeling data, and potential use of incentives and new permit conditions among others to address a portion of the cumulative gap at Atkinson, and a small portion of the cumulative gaps at Statenville and Jennings. Lower Flint-Ochlockonee – The Lower Flint-Ochlockonee Council has identified conservation, investigation of replacement of surface water with groundwater, greater utilization of farm ponds, and consideration of new storage and Aquifer Storage and Recovery (ASR) to address a portion of the cumulative gap at Pinetta. Upper Flint – The Upper Flint Council has identified conservation, investigation of replacement of surface water with groundwater, greater utilization of farm ponds, and consideration of new storage and ASR to address a portion of the cumulative gap at Statenville and Jennings.		



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Surface Water Quality: Satilla River Watershed Model – The Altamaha Council has identified the same BMPs for nutrient loading as are summarized in the above table for the Suwannee-Satilla Council. Altamaha – There is one reach with exceeded assimilative capacity in the Suwannee River basin that is shared with the Altamaha Region. The Altamaha Council recommends improved level of wastewater treatment to improve in-stream dissolved oxygen, implementation of ammonia limits, and improvement of wastewater treatment for nutrients (nitrogen and phosphorus). Coastal Georgia – There is one reach with exceeded DO assimilative capacity in the St. Marys River basin that is shared with the Coastal Georgia Region. Both Councils recommend monitoring and data collection to assess whether impairment is caused by non-point source discharges or naturally low DO concentrations in the reach.		

[1]Seek to reduce frequency and severity of human impacts to 7Q10 low flow conditions in the region associated with agricultural water use. Focus on surface water permit holders and new surface water permit requests in Satilla Watershed [(Atkinson, Bacon, Brantley, Coffee, Irwin, Pierce, and Ware Counties (Atkinson Gap)], Alapaha Watershed [Atkinson, Ben Hill, Berrien, Echols, Irwin, Lanier, Lowndes, Tift, and Turner Counties (Statenville and Jennings Gaps)], and Withlacoochee Watershed [(Berrien, Brooks, Cook, Lowndes, Tift, and Turner Counties (Pinetta Gap)].
[2]Additional industrial wastewater capacity may be needed. EPD to update and refine discharge limit databases.

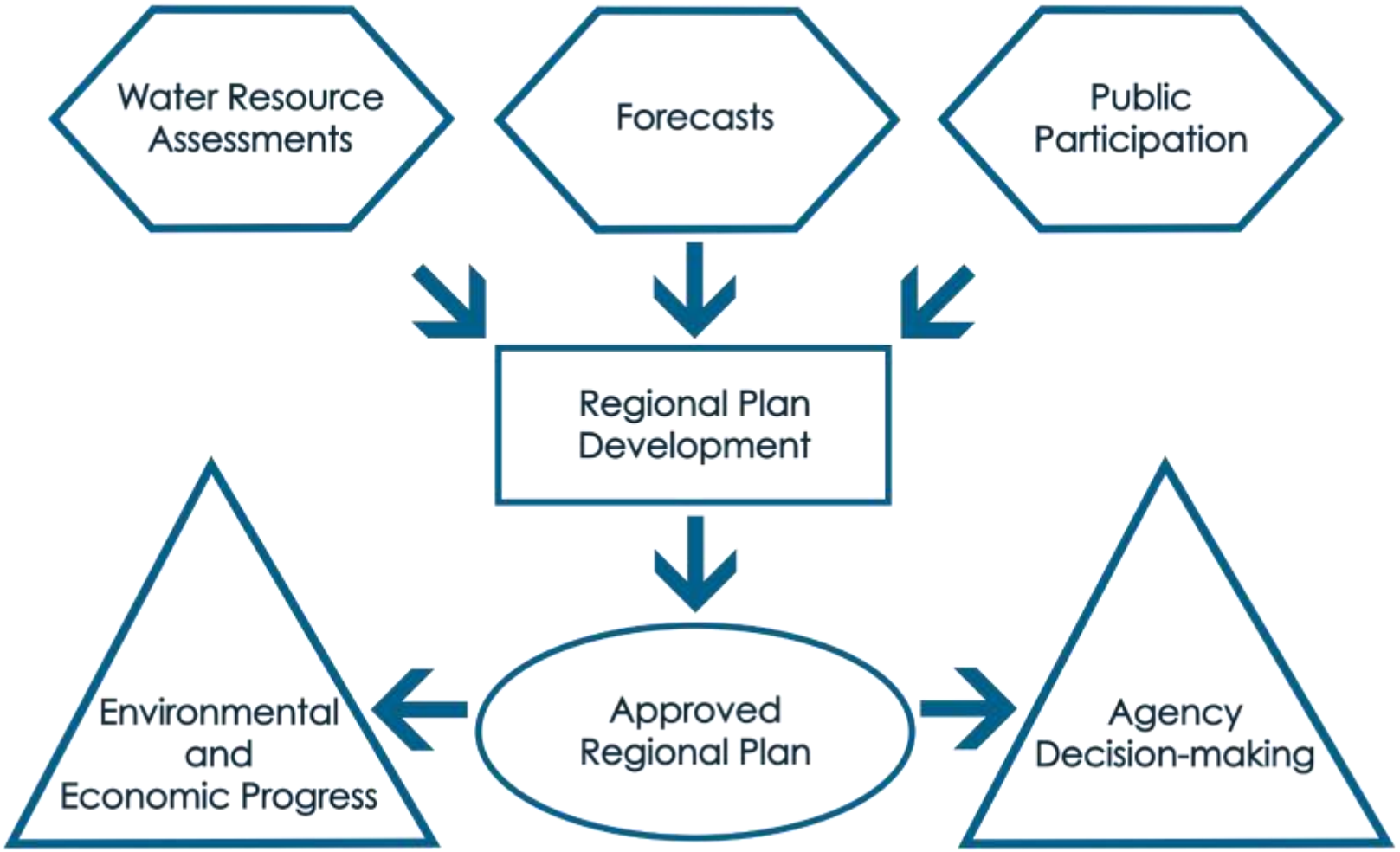
Georgia

Georgia's
State Water Plan

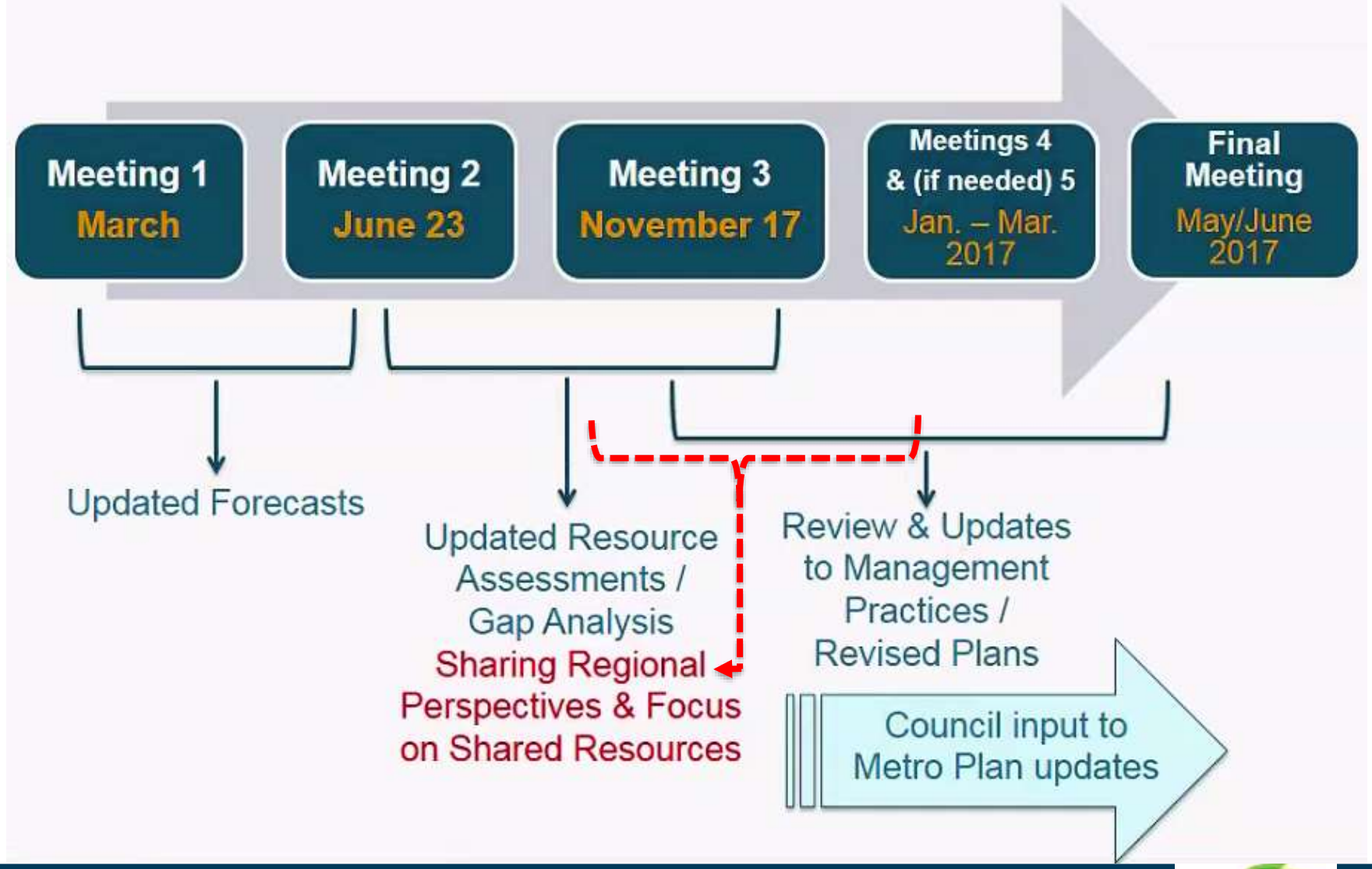
Next Steps, Subcommittee Discussion, and Schedule for Revising/Updating the Regional Water Plan

www.georgiawaterplanning.org

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 teleconference to be scheduled week of March 13th
  - Need to have final draft by Fri. March 20th
  - EPD Review Comments by Fri. March 27th
  - 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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Georgia