



Section 6. Addressing Water Needs and Regional Goals

This Section presents the Coastal Georgia Council's water management practices selected to address resource shortfalls or gaps identified and described in Section 5, and/or to meet the Council's Vision and Goals described in Section 1.

6.1. Identifying Water Management Practices

The comparison of Resource Assessments and forecasted needs presented in Section 5 identifies the Region's likely resource shortfalls or gaps and demonstrates the need for region and resource specific water management practices. In the cases where shortfalls or gaps appear to be unlikely based on the comparison of the Region's Resource Assessments and forecasted needs, the management practices described in this section have been selected to also meet those needs specified by the Council (e.g., facility/infrastructure needs and practices, programmatic practices, etc) that are aligned with the Region's vision and goals and in selecting the actions needed (i.e., water management practices) the Council considered practices identified in existing plans, the region vision and goals, and coordinated with local governments and water providers as well as neighboring Councils who share these water resources.

Summary

Insert text regarding the summary of this section.

Review of Existing Plans and Practices

The Council conducted a comprehensive review of existing local and regional water management plans and relevant related documents to frame the selection of management practices. The types of plans/studies that were reviewed to support identification and selection of management practices for the Coastal Region consisted of the following:

- Comprehensive Work Plans (local and regional scale)
- Regional infrastructure and permitting plans
- EPD databases (permitted withdrawals, planned projects, and proposed reservoirs)
- State-wide guidance documents (conservation, cost, and water planning)

- Best Management Practices (forestry, agriculture, and stormwater management)
- Water quality studies (basin, watershed, and local scale)
- TMDL evaluations

When possible, successful management practices already planned for and/or in use in the Coastal Region formed the basis for the water management practices selected by the Council.

6.2. Selected Water Management Practices for the Coastal Georgia Region

Table 6-1 summarizes the Coastal Georgia Council's selected management practices by source of supply for the relevant demand sector(s), permitted municipal and industrial water and wastewater capacity, water quality assimilative capacity (dissolved oxygen) challenges, current water quality impairments, and nutrient considerations for the Satilla and Savannah River watersheds. Information on shared resources is provided to identify where management practices in other regional Councils are also needed to address identified gaps. The table summarizes general information regarding management practices needed to meet forecasted needs, and more detailed information on management practices needed to address gaps between available resources and forecasted needs.

In the Coastal Georgia region, there are both surface water flow regime and demand gaps. A flow regime gap occurs when surface water consumption results in low flow conditions more severe than those occurring without consumption, so there is not sufficient flow to meet both offstream and instream needs. The low flow condition used was the lower of the unimpaired 1 in 10 year 7-day low flow for each month of the year or the cumulative unimpaired daily flow. A demand gap occurs when there is insufficient flow to meet the current or forecasted water supply need for the specified demand sector. There are also localized groundwater resource gaps in the Coastal Georgia region (Red and Yellow Zones) associated with limited supply availability and increase in multi-sector water demands.

The selected management practices will over time address identified gaps when combined with practices for all shared resource regions. The Coastal Georgia region addresses closure of gaps by: identification and implementation of specific actions to add/improve infrastructure and improve flow and water quality conditions; confirming the presence and magnitude of gaps; and assessing the impact of infrequent surface water gaps and the associated costs and benefits associated with these gaps.

Note to EPD reviewers: Additional language may be needed on coordinating closure of gaps related to stakeholder group process.

**Table 6-1: Management Practices Selected for the Coastal Water Planning Region**

No.	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
Management Practices to Address Current and Future Groundwater Use in Gap Areas: Bryan and Liberty Counties (Yellow Zone); Southeastern Effingham and Chatham Counties (Red Zone)		
Water Conservation (WC)		
Tiers 1 and 2 Conservation Practices (Municipal and Industrial)		
WC-1	<ul style="list-style-type: none"> Encourage implementation and adherence to water conservation measures established in existing and future rulemaking processes and plans [Water Conservation Implementation Plan (WCIP) procedures, Coastal Georgia Water and Wastewater Permitting Plan to Control Salt Water Intrusion, June 2006] by local governments/utilities 	1-3
Tiers 3 and 4 Conservation Practices		
WC-2	<ul style="list-style-type: none"> The following Tiers 3 and 4 municipal and industrial water conservation practices were established during the Coastal Georgia Water and Wastewater Permitting Plan to Control Salt Water Intrusion, June 2006 and are supported by the Coastal Council. <ul style="list-style-type: none"> - Maximize use of recycled or reclaimed water - Adopt water conservation education program - For Golf Courses: 1) conduct reclaimed water feasibility study and 2) comply with Best Management Practices MOA by Georgia Golf Course Superintendents Association/EPD, May 2004 	1-3
WC-3 through WC-12	<ul style="list-style-type: none"> See description of Tiers 3 and 4 agricultural practices under Surface Water Conservation 	1,2
Additional/Alternate to Present Groundwater Source(s) (AAGS)¹		
AAGS-1	<ul style="list-style-type: none"> Regional groundwater development and/or management in multi-county areas outside red and yellow zones 	1-3
AAGS-2	<ul style="list-style-type: none"> Develop/utilize additional surface water supplies to meet multi-sector uses 	1-5
AAGS-3	<ul style="list-style-type: none"> Increase surface water storage (reservoirs) 	1-5
AAGS-4	<ul style="list-style-type: none"> Conduct research to determine the feasibility, role, and potential benefits and limitations of aquifer storage and recovery in critical gap areas and/or recharge of surficial and other aquifers 	5
AAGS-5	<ul style="list-style-type: none"> Increase surface water storage (aquifer storage and recovery (ASR) well fields); feasibility based on outcome of information obtained from AAGS-4 	1-3,5

6. Addressing Water Needs and Regional Goals

No.	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
AAGS-6	<ul style="list-style-type: none"> Optimize additional aquifer use 	1-3
AAGS-7	<ul style="list-style-type: none"> Implement water reuse 	1-5
Institutional (I) Practices¹		
I-1	<ul style="list-style-type: none"> Formation of a regional groundwater use and development "Group" to coordinate groundwater development, infrastructure development/use, and optimize yield and sustainability 	1-3,5
Engineered Solution(s) to Address Salt Water Intrusion (ES)¹		
ES-1	<ul style="list-style-type: none"> Place Holder Pending Outcome of Bi-State salt water intrusion stakeholder process 	1,4
Management Practices to 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	<ul style="list-style-type: none"> 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
DCAR-2	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Continue to fund, improve, and incorporate agricultural water use metering data and use this information in Water Plan updates 	5
DCAR-5	<ul style="list-style-type: none"> Collaborate/support research (University, State and Corporate) on improved irrigation efficiency measures and development of lower water use crops 	5
DCAR-6	<ul style="list-style-type: none"> Improve education and research on when and how much water is needed to maximize crop yield with efficient irrigation 	5



No.	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
DCAR-7	<ul style="list-style-type: none"> 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
DCAR-8	<ul style="list-style-type: none"> 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. Results from gap analysis indicate that approximately 85-90% of the gap at Kings Ferry can be addressed with 20% of the water supply that is needed to address the largest gap. 	5
DCAR-9	<ul style="list-style-type: none"> Conduct research to determine the feasibility and potential benefits and limitations of aquifer storage and recovery and/or recharge of surficial and other aquifers to help retune flows to gap periods 	5
<p>Water Conservation (WC) – Encourage the development and use of higher efficiency agricultural irrigation practices including consideration of the following Tiers 3 & 4 agricultural practices from the WCIP</p> <p>*Not all practices are needed to realize conservation savings as practices are not additive.</p>		
Tier 3 Conservation Practices²		
WC-3	<ul style="list-style-type: none"> Conduct irrigation audits 	1,2,4
WC-4	<ul style="list-style-type: none"> Meter irrigation systems 	1,2,4
WC-5	<ul style="list-style-type: none"> Inspect pipes and plumbing to control water loss 	1,2,4
WC-6	<ul style="list-style-type: none"> Minimize or eliminate the use of high-pressure spray guns on fixed and traveler systems where feasible 	1,2,4
WC-7	<ul style="list-style-type: none"> Utilize cropping and crop rotation methods that promote efficiency 	1,2,4,5
WC-8	<ul style="list-style-type: none"> Practice conservation tillage 	1,2,4
Tier 4 Conservation Practices²		
WC-9	<ul style="list-style-type: none"> Control water loss 	1,2,4
WC-10	<ul style="list-style-type: none"> Install end-gun shutoff with pivots 	1,2,4
WC-11	<ul style="list-style-type: none"> Install low pressure irrigation systems where feasible (soil-specific) 	1,2,4
WC-12	<ul style="list-style-type: none"> Encourage and improve use of soil moisture sensors, ET sensors or crop water use model (s) to time cycles 	1,2,5

6. Addressing Water Needs and Regional Goals

No.	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)		
ASWS-1	<ul style="list-style-type: none"> 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 gaps² 	1,2,4
ASWS-2	<ul style="list-style-type: none"> Future surface water uses - Utilizing incentives and collaborative partnerships, examine opportunities to optimize farm and other pond operations to obtain releases in dry/gap years² 	1,2,4,5
ASWS-3	<ul style="list-style-type: none"> Future surface water uses - Encourage use of groundwater within the sustainable yield of the groundwater aquifer (outside yellow and red zones) as an alternate source to surface water use during 7Q10 low-flow conditions² 	1,2,4
ASWS-4	<ul style="list-style-type: none"> Existing surface water uses - Replace a portion of existing surface water use with groundwater, within the sustainable yield of the groundwater aquifer (outside yellow and red zones) in times of shortage to 7Q10 low-flow conditions, so long as the use of the groundwater sources does not impact surface water flow in other areas 	1,2,4
ASWS-5	<ul style="list-style-type: none"> Existing 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 dry periods 	1-4
ASWS-6	<ul style="list-style-type: none"> Conduct research and identify incentives to restore wetlands and other areas to determine if this practice can improve river flows during shortages to 7Q10 dry periods 	2,4,6
ASWS-7	<ul style="list-style-type: none"> Incentive-based land use practices to help promote infiltration and aquifer recharge 	2,6
ASWS-8	<ul style="list-style-type: none"> Evaluate incentive-based programs to increase wastewater returns; modify land application systems, septic systems, and manage stormwater to improve return flows 	1-3
ASWS-9	<ul style="list-style-type: none"> Possible joint non-main stem reservoir with Savannah-Upper Ogeechee and Oconee Councils 	1-5
ASWS-10	<ul style="list-style-type: none"> 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



No.	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
Management Practices to Address Water Quality Gaps		
Point Sources – Dissolved Oxygen (PSDO)		
PSDO-1	<ul style="list-style-type: none"> Data collection to confirm loading and/or receiving stream chemistry 	5
PSDO-2	<ul style="list-style-type: none"> Modification of wastewater discharge location. In areas with no shortages to 7Q10 low-flow conditions, identify feasibility to move discharge location to higher flow streams with greater assimilative capacity. 	3,4
PSDO-3	<ul style="list-style-type: none"> Upgrade/improve treatment to address low dissolved oxygen conditions in receiving streams 	3,4
Management Practices to Address Permit Capacity Gaps		
Available Municipal Wastewater Permit Capacity (MWWPC)		
MWWPC-1	<ul style="list-style-type: none"> Expand or construct new facilities and/or obtain additional wastewater permit capacity to meet forecasted needs³ 	3,4
Available Industrial Wastewater Permit Capacity (IWWPC)		
IWWPC-1	<ul style="list-style-type: none"> Obtain additional permit data regarding flow volumes and permit conditions for industrial wastewater facilities forecasted needs⁴ 	5
Municipal Groundwater Permit Capacity (MGPC)		
MGPC-1	<ul style="list-style-type: none"> Obtain groundwater permit capacity⁵ 	3,4
Industrial Groundwater Permit Capacity (IGWPC)		
IGWPC-1	<ul style="list-style-type: none"> Obtain groundwater permit capacity⁶ 	3,4
Management Practices to Address Current and Future Groundwater (GW) Needs Outside Gap Areas		
GW-1	<ul style="list-style-type: none"> For cities, counties, and utilities outside the yellow and red 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) 	1-3,5
GW-2	<ul style="list-style-type: none"> Encourage land use practices that sustain and protect aquifer recharge areas (both inside and outside the region) for the aquifers present in the region 	2,6

6. Addressing Water Needs and Regional Goals

No.	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
GW-3	<ul style="list-style-type: none"> 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 	5
Water Conservation (WC)		
WC-13	<ul style="list-style-type: none"> Encourage implementation and adherence to WCIP by local governments/utilities for Tiers 1 and 2 conservation measures for municipal and industrial uses 	1-3
WC-14	<ul style="list-style-type: none"> Encourage implementation and adherence to WCIP by agricultural groundwater users of Tiers 3 and 4 conservation measures 	1,2
Management Practices to Address Current and Future Surface Water (SW) Needs Outside Gap Areas		
SW-1	<ul style="list-style-type: none"> Continue to apply for permits to use surface water in non-gap areas within the available surface water resource capacity 	1,4,5
SW-2	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Implementation of ammonia limits, where applicable 	1,4
PSAN-2	<ul style="list-style-type: none"> Improve/upgrade treatment for nutrients (phosphorus and/or nitrogen) 	1,4
PSAN-3	<ul style="list-style-type: none"> Identify and eliminate illicit discharges to surface waters (Glynn County, City of Darien, City of Pooler, Bryan County, and City of Savannah Watershed Protection Plans) 	1,4
Management Practices to Address Water Quality Non-Point Source (NPS) Needs (Dissolved oxygen, fecal coliform, nutrients, and other impairments)		
NPS-1	<ul style="list-style-type: none"> Data collection/analysis to confirm if dissolved oxygen and/or fecal coliform is human induced 	4,5
NPS-2	<ul style="list-style-type: none"> 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




No.	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
<i>The following practices are selected by the Coastal Georgia Council to encourage implementation by the applicable local or state program(s).</i>		
Urban Best Management Practices (NPSU)		
NPSU-1	<ul style="list-style-type: none"> Use soil erosion and sediment control measures 	4,6
NPSU-2	<ul style="list-style-type: none"> Stormwater retention ponds, wetlands, swales, filter strips, and bank stabilization to manage runoff and help support river flows (City of Pooler, City of Richmond Hill, and City of Savannah Watershed Protection Plans) 	2,4,6
NPSU-3	<ul style="list-style-type: none"> Consider measures to promote increased infiltration of stormwater to reduce nutrient and other pollutant runoff 	2,4,6
NPSU-4	<ul style="list-style-type: none"> Protect and maintain riparian buffers along urban streams 	4,6
Rural Best Management Practices (NPSR)		
NPSR-1	<ul style="list-style-type: none"> Implement BMPs to control runoff from dirt roads by encouraging County implementation of BMPs identified in Georgia Resource Conservation and Development Council, "Georgia Better Back Roads – Field Manual" 	4,6
Forestry Best Management Practices (NPSF)		
NPSF-1	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Conservation tillage and cover crop 	4,6
NPSA-2	<ul style="list-style-type: none"> Field buffers, riparian forested buffers, and strip cropping to control run-off and reduce erosion 	4,6

6. Addressing Water Needs and Regional Goals

No.	Description/Definition of Action	Relationship of Action or Issue to Vision and Goals (Section 1.4)
NPSA-3	<ul style="list-style-type: none"> Livestock stock exclusions from direct contact with streams and rivers and vegetation buffers 	4,6
NPSA-4	<ul style="list-style-type: none"> Responsible manure storage and handling 	4,6
NPSA-5	<ul style="list-style-type: none"> Incentives to restore wetlands and historically drained hardwood and other areas 	4,6
Existing Impairments – Total Maximum Daily Load Listed Streams (TMDL)		
TMDL-1	<ul style="list-style-type: none"> Data collection and confirmation of sources to remove streams listed due to “natural sources” 	4,5
TMDL-2	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Stormwater Management: <ul style="list-style-type: none"> -Urban Best Management Practices -Forestry Best Management Practices -Agricultural Best Management Practices <i>See Above Non-Point Source for Details</i> 	4,6
Nutrients – Satilla and Savannah River Nutrient (Phosphorus and Nitrogen) Watershed Models (NUT)		
NUT-1	<ul style="list-style-type: none"> 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 (i.e., predominant land use is not necessarily the predominant source of nutrients) <ul style="list-style-type: none"> -Urban Best Management Practices -Forestry Best Management Practices -Agricultural Best Management Practices <i>See Above Non-Point Source for Details</i> 	4,5
Management Practices to Address Future Educational Needs (EDU)		
EDU-1	<ul style="list-style-type: none"> Support Water Conservation Programs 	2,5
EDU-2	<ul style="list-style-type: none"> Support Stormwater Educational Programs 	2,6
EDU-3	<ul style="list-style-type: none"> Support Septic System Maintenance Programs 	2,3
EDU-4	<ul style="list-style-type: none"> Support GFC Forestry BMP and UGA-SFI Logger Education Programs 	2,6



No.	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	<ul style="list-style-type: none"> Encourage local government to develop ordinances and standards to implement and/or update stormwater regulations (Glynn County, City of Darien, City of St. Mary's, 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	<ul style="list-style-type: none"> Identify opportunities for green space on incentive and voluntary basis 	2,4
OCP-3	<ul style="list-style-type: none"> Encourage coordinated environmental planning, land use, stormwater, wastewater and Compliance with the Environmental Part V Criteria from DCA?? 	1-6
OCP-4	<ul style="list-style-type: none"> Encourage local governments to implement, inspect, and enforce Erosion and Sedimentation Control Measures (City of Darien, City of Pooler, Bryan County, City of Rincon, and City of Hinesville Watershed Protection Plans) 	2,6
Shared Resources		
To Be Determined from other Councils (Altamaha, Savannah-Upper Ogeechee, Upper Oconee, Suwannee-Satilla)		
Surface Water Quality: Support TMDL Stakeholder Group for the Savannah River Harbor		
Groundwater Quality: Support Bi-State Salt Water Intrusion Stakeholder Process in the Savannah/Hilton Head Regions		
Surface Water Quality and Quantity: Saint Marys River in South Georgia		
On-Going Planning: Research and incorporate South Carolina and Florida water planning data and issues for future modeling and refine modeling if warranted Surface Water Quality and Quantity Saint Marys River South Georgia (surface water and groundwater)		
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 Saltwater Intrusion Stakeholder Process between Georgia and South Carolina.		
² For agricultural water users in the Coastal Georgia 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.		



6. Addressing Water Needs and Regional Goals

Notes Continued:

⁵ Additional groundwater permit capacity may be needed in Bryan, Bulloch, Camden, Effingham, Liberty, and Long Counties. Utilities in regions should evaluate long-term needs and, if needed, work with EPD to obtain additional permit capacity.

⁶ Additional groundwater permit capacity may be needed in Bryan, Bulloch, Effingham, Liberty, and McIntosh Counties. Industries in regions should evaluate long-term needs and, if needed, work with EPD to obtain additional permit capacity.



Section 7. Implementing Water Management Practices

This section presents the Coastal Georgia Council's roadmap for the implementation of the water management practices identified in Section 6. Schedules for implementation, in addition to the early step(s) required to initiate implementation of a given practice, are presented for both short and long-term actions. The Coastal Georgia Council has defined short term as years 2010 to 2020 and long term as 2020 to 2050. As the State Water Plan provides, this plan will be primarily implemented by the various water users in the region, therefore the Coastal Georgia Council has described the roles and responsibilities of the implementing parties as well as the fiscal implications of the practices.

Council also emphasizes that the implementation of recommended management practices are predicated on a number of planning assumptions related to: projected growth of population, industry, agricultural and energy needs; data sets and assumptions related to water use, water withdrawals and returns; data regarding water quality and watershed models; and resource assessment tools for surface water availability, surface water quality and groundwater availability. Consequently, significant changes or departures from these planning assumptions, forecasts, and resource assessment tools may require a modification of the recommended management practices, the implementation schedule, and/or the implementing entities/affected stakeholders. Future planning efforts should confirm current assumptions and make necessary revisions and/or improvements to the conclusions reached during this round of planning.

Summary

Insert text regarding the summary of this section.

7.1. Implementation Schedule and Roles of Responsible Parties

Table 7-1 ties the resource shortfalls and the needs specified by the Council and the corresponding management practices detailed in Table 6-1 to the parties who will implement those practices. This table also describes the timeframe for implementation and the specific steps required for implementation.

7. Implementing Water Management Practices

WATER DEVELOPMENT & CONSERVATION PLAN

Table 7-1: Implementation Schedule

Action Needed (Management Practice)	Issue to be Addressed and Resource(s) Affected	Permittee Category of Responsible Parties (if applicable)	For All Actions: Initial Implementation Step(s) and Associated Date(s)	For Short-term Actions: Further Action to Complete Implementation and Associated Date(s)	For Long-term Actions: Further Action to Complete Implementation and Associated Date(s)	Responsible Parties
Surface Water Management Practices (Altamaha, Canoochee, Ogeechee, Satilla, Savannah, and St. Marys Rivers)						
Analysis of water availability to prevent impact to gap periods	Forecasted agricultural withdrawals at Claxton	Agricultural Surface Withdrawal	EPD to develop Data Needs and Guidance for Analysis Requirements Applicants to submit analysis from 2010-2015	EPD from 2010-2015 revise and expedite application process based on refined resources assessment tools	Determine if expedited or revised permitting process is warranted to allow for use of the resource and protection of critical low flows	EPD Applicant for Agricultural Surface water permit
Issuance of new surface water permits	Forecasted municipal and industrial withdrawals at Savannah	Industrial, and Municipal Surface Withdrawal	Present though first update of Water Plan	Issue additional surface water permits by 01/2020	Verify flow conditions and gaps	EPD
Refine agricultural education and data collection practices	Gaps: education, data, and flow regime	NA	Jun-Dec 2011 Develop scope of work and key partnering agencies January 2012-2015	Complete data collection and evaluation by 01/2015 Incorporate data/findings in next water plan revision	NA	EPD in partnership with UGA, GSWCC, GDA Other key institutions
Water conservation practices (T3-T4)	Programmatic practices	NA	Jun-Dec 2011 confirm and verify status of selected conservation practices Conduct outreach/education/incentives to encourage implementation of conservation measures	Implement water conservation practices thorough 01/2020	Verify Conservation savings estimates	EPD, GSWCC others? EPD, GSWCC, GDA others for support Individual agricultural users for implementation

7. Implementing Water Management Practices



Groundwater Management Practices

(Majority of 2010 pumping from Floridan Aquifer (99%), remainder from Brunswick Aquifer)

Sustainable withdrawals to satisfy multi-sector uses	Regional pumping	Agricultural , Industrial, and Municipal Groundwater Withdrawal	Present through first update of Water Plan 2015 verify sustainable yield metrics consider any relevant localized impacts	Provide guidance and implement sustainable groundwater withdrawal rates through 01/2020	Modify resources assessments and sustainable yield criteria	Applicant for permits EPD for other actions specified
Potential facility/ infrastructure needs at County scale	2050 municipal gap in Bulloch, Camden, Effingham, and Long Counties 2050 industrial gap in Bryan, Bulloch, Effingham, Liberty, and McIntosh Counties	Public Water System	June 2012 to first update of Water Plan	Will refine based on County level infrastructure graphics and determine timing between short and long-term projects		Cities and Utilities to review water plan information and assumptions address possible gaps and/or assist by providing updated data for next water plan
Water conservation practices (T1-T4)	Program-matic practices, Water supply gaps	NA	Present through 2020 Update in next Water Plan	Implement water conservation practices by 01/2020 Estimate and verify conservation savings	2020-2050 Continue implementation of practices and estimate/verify conservation savings	Cities and Utilities WCIP state agencies

7. Implementing Water Management Practices

Regional groundwater management	Water supply gaps (Red Zone and Yellow Zone)	Municipal Groundwater Withdrawal, Public Water System	January – June 2011 Conduct discussions with multi-county, city and key utilities. Incorporate any significant outcomes. Present – December 2012 Track and incorporated major findings from the Bi-state stakeholder group on saltwater intrusion			Multiple jurisdictions within and surrounding red and yellow zones EPD given timing no proposed role for Council
Develop/ utilization of additional surface water supplies to meet multi-sector uses	Water supply gaps (Red Zone and Yellow Zone)	Agricultural, Industrial, and Municipal Surface Withdrawal	January – June 2011 Conduct discussion with multi-county, city and key utilities. Incorporate any significant outcomes. Present – December 2012 Track and incorporated major findings from the Bi-state stakeholder group on saltwater intrusion			Multiple jurisdictions within and surrounding red and yellow zones EPD given timing no proposed role for Council
Incentive-based land use practices to promote infiltration and aquifer recharge	Maintain sustainable yield of prioritized aquifers	NA				
Aquifer recharge to manage saltwater intrusion	Water supply gaps (Red Zone and Yellow Zone)	Underground Injection Control				

7. Implementing Water Management Practices



Increase surface water storage (reservoirs)	Water supply gaps (Red Zone and Yellow Zone)	Public Water System, Municipal Surface Water Withdrawal				
Increase surface water storage (ASR)	Water supply gaps (Red Zone and Yellow Zone)	Public Water System, Underground Injection Control				
Optimize other aquifer use	Water supply gaps (Red Zone and Yellow Zone)	Municipal Groundwater Withdrawal	<p>Jan–Jun 2011 Conduct discussions with multi-county, city and key utilities. Incorporate any significant outcomes.</p> <p>Present – December 2012 Track and incorporated major findings from the Bi-state stakeholder group on saltwater intrusion</p>			<p>Multiple jurisdictions within and surrounding red and yellow zones</p> <p>EPD given timing no proposed role for Council</p>
Formation of a regional groundwater development and use coordination group	Programmatic practices	NA	<p>Jan-Jun 2011 Conduct discussions with multi-county, city and key utilities. Incorporate any significant outcomes.</p> <p>Present – December 2012 Track and incorporated major findings from the Bi-state stakeholder group on saltwater intrusion</p>			<p>Multiple jurisdictions within and surrounding red and yellow zones</p> <p>EPD given timing no proposed role for Council</p>
Implement water reuse	Programmatic practices	NA				

7. Implementing Water Management Practices

Wastewater Management Practices						
Increase water returns by decreasing LASs	Gaps: flow regime	General Wastewater	Site specific need direction this is facility level			
Increase water returns by decreasing OSSMSs	Gaps: flow regime	General Wastewater	Site specific or County specific			Counties
Potential facility/ infrastructure needs at County scale	2050 municipal facility/ infrastructure gap (Bryan, Camden, Liberty, and Long Counties). 2050 industrial facility/ infrastructure gap (Bryan, Camden, Chatham, Effingham, Glynn, and Liberty Counties)	General Wastewater	Site specific need direction this is facility level			
Water Quality (Dissolved Oxygen) Management Practices						
Utility system upgrades and replacements	Facility/ infrastructure needs	General Wastewater	Site specific need direction this is facility level			
Investigate reaches with limited assimilative capacity identified through DO modeling	Surface water quality gaps identified through DO modeling	NA				

7. Implementing Water Management Practices



Non-point source pollution reduction	Programmatic practices	Municipal/ Industrial/ Construction Stormwater				City, county, for urban Silva culture for forestry Individual and corporate for agriculture
Water Quality Impairment Management Practices						
Non-point source pollution reduction	Programmatic practices	Municipal/ Industrial/ Construction Stormwater				City, county, for urban Silva culture for forestry Individual and corporate for agriculture
Identify opportunities to restore historically drained wetlands	Help address quality and quantity nexus	Need EPD guidance on selection of permit				
Water Quality (Nutrients) - Satilla and Savannah River Watershed Models						
Non-point source pollution reduction	Programmatic practices	Municipal/ Industrial/ Construction Stormwater				City, county, for urban Silva culture for forestry Individual and corporate for agriculture
Education/Ordinances						
Water Conservation Education/Out reach Programs	Help promote sustainable use of surface and groundwater resources	NA				WCIP agencies

7. Implementing Water Management Practices

Non-point source pollution issues associated with septic tanks/ systems, stormwater, and non-point source pollution from urban, forested, and agricultural lands	<p>Improve awareness of water quality and land use practices.</p> <p>Improve water quality in watershed and Local Drainage Area</p>	Municipal/ Industrial/ Construction Stormwater				Cities, Counties, GSWCC, GFC
Shared Resources Coordination						
Resource coordination with Savannah-Upper Ogeechee, Upper Oconee and Altamaha Councils	Flow regime gap (Eden and Kings Ferry)	NA	Need to identify selected practices for all regions first			
Resource coordination with Altamaha Council	Flow regime gap (Claxton)	NA	Need to identify selected practices for all regions first			
Resource coordination with Savannah River TMDL Stakeholder Group	Surface water quality gap (Savannah River)	NA	Present through January 2012 Support and Monitor stakeholder process for the identification of management practices	January 2012-2020 implement stakeholder selected process or alternative measures if needed		EPD Stakeholder group and other affected utilities



Resource coordination with South Carolina Water Planning Process	Surface water quantity and quality (Savannah River)	NA	Present-January 2012 Continue outreach and coordination with South Carolina to incorporated and refine demand, resource assessment information, and management practices			EPD USACE South Carolina DNR and DHEC
Resource coordination with Saltwater Intrusion Stakeholder Group	Groundwater quality gap (Upper Floridan Aquifer)	NA	Present-December 2011 Support and Monitor stakeholder process for the identification of management practices			EPD, South Carolina DNR and DHEC, stakeholder group

7.2 Fiscal Implications of Selected Water Management Practices

{Planning Contractors will describe the planning level cost of the water management practices as well as funding sources and options (14.7.c.xiv).

The Planning Contractor may want to outline potential mechanisms (e.g. GEFA loan and grant programs) that could be used to support the local government implementation of the selected water management practices.

The costs in Table 7-2 may be dollars based on calculations or may be rough estimates based on the cost guidance. The sources for costs is to be detailed in the “Notes and Sources For Costs” column.}



Table 7-2: Cost Estimates for the Implementation Responsibilities

Action Needed (Management Practice)	Issue to Be Addressed	Capital/ Programmatic Cost	O&M costs	Non-monetary Costs	Funding Sources and Options	Notes and Sources for Costs
{NOTE: ACTIONS carried over from Table 6-1}	{NOTE: ISSUES carried over from Table 6-1}					

7.3. Alignment with Other Plans

{Note here consistencies and differences between the Regional Water Plan and other regional and local plans (14.7.c.x), specifically addressing alignments and/or inconsistencies associated with timing, budgeting, or responsibilities. Explanations for inconsistencies should be provided, and recommendations to promote future compatibility between plans should be made}.

7.4. Recommendations to the State

The Coastal Georgia Council supports the concept of regional water resource planning with a focus on planning Councils composed of local governments, water users, water providers, industry, business and affected stakeholders. Local representatives are typically most familiar with local water resource issues and needs. The State has a vital role providing technical support, guidance and funding to support locally focused water resource planning.


The Coastal Georgia Council is sensitive to unintended consequences if plan recommendations become mandates. The State must help balance plan recommendations with assessing measurable progress toward plan implementation. If additional rules or other administrative or regulatory actions are deemed necessary, the State should work with Councils to help ensure workable solutions.

The following specific recommendations to the State are provided to help aid in the successful implementation of the plan.



Georgia EPD

- Consider “institutionalizing” planning. This would entail a long-term commitment of staff and funding to: monitor and support plan recommendations; coordinate improved data collection, management and analysis; continue to develop and improve resource assessment tools; and help provide funding, permitting and technical support to address gaps and water resource needs.
- Support and facilitate the Savannah River Total Maximum Daily Load Stakeholder process (EPD Reviewers please provide the official name for this process). Allowing stakeholders from both Georgia and South Carolina to identify possible solutions to pollutant loading will help ensure implementable solutions. EPD’s assistance in coordinating, facilitating, and providing technical support to this process is essential. The Coastal Regional Council supports this process and has indicated that a successful conclusion of this process is identification and implementation of pollutant loading strategies (management practices) which can improve dissolved oxygen conditions in the lower Savannah River.
- Provide leadership, coordination and technical support to the Upper Floridan Aquifer Salt Water Intrusion Stakeholder Process (EPD Reviewers please provide official name). This bi-state process between Georgia and South Carolina is charged with developing potential comprehensive management strategies to address salt water intrusion in the Savannah/Hilton Head region. The Coastal Council regional plan provides recommended management practices based on preliminary assumptions on the amounts of groundwater withdrawals that may be allowed to meet current and future demands. The outcome of this stakeholder process could significantly change some of these assumptions and the Council’s recommended management practices. Consequently, EPD will also need to continue to serve as a “bridge” between the State water planning process and this stakeholder process.
- Work with Georgia Soil and Water Conservation Commission, Georgia Department of Agriculture, University of Georgia and other relevant institutions to improve agricultural water use data collection and management. This effort would focus on refining source(s) of supply for multiple irrigation sources, continuing to assess data on crop water requirements, evaluating the effects of farm ponds on direct irrigation withdrawals and the hydrologic cycle, and further research on crop consumptive use. This data in turn should be coordinated with Resource Assessment tools to ensure accurate simulation of any gaps and assumptions.



7. Implementing Water Management Practices

- Focus funding support and permitting assistance to projects and programs aimed at addressing gap areas. Where possible, leverage federal funds to help support and expedite project implementation.
- Consider collaborative approaches to collecting more standardized water use data and improving data on water demands. This would include continued improvement and updating databases used in the planning process. It would also involve working with the Georgia Municipal Association and other relevant stakeholders to improve water use information.
- Working with Georgia Environmental Finance Authority, examine opportunities to improve coordination among water providers and users and create incentives to maximize existing infrastructure and coordinated operations.
- Track, support, and participate in South Carolina water planning efforts. Successful planning in the Coastal Region and Savannah-Upper Ogeechee Region will benefit from constructive and collaborative engagement of South Carolina on issues associated with the current and future use of the Savannah River for both water supply and wastewater assimilation. Sustainable use and management of the Savannah River is critical to the social and economic future of both Georgia and South Carolina.
- Continue to engage in dialogue and data-sharing with the State of Florida regarding current and forecasted groundwater use. South Georgia and North Florida rely heavily on the Upper Floridan aquifer to meet water supply needs and it is in EPD's best interest to include the most accurate available information on growth and groundwater use in both states in our resource assessment modeling. (EPD reviewers should we include anything here regarding nutrient standards in Florida?)

Georgia Environmental Finance Authority

- Meeting forecasted water supply needs will require stable and flexible funding sources to assist water users and water and wastewater utilities in meeting forecasted needs. A stable GEFA financing source(s) should be provided for necessary water supply, water and wastewater plant construction and plant upgrades to address current and future gaps.

Georgia Forestry Commission (GFC)

- Continue to support and fund the GFC Forestry Best Management Practices Program. Providing education and incentives to control erosion and segmentation will help the region prevent/address TMDL listed segments, reduce nutrient loadings, and support wetland areas. This will have the benefit of helping sustaining baseflow conditions of streams and water quality.



Georgia Soil and Water Conservation Commission (GSWCC)

GSWCC should continue to provide leadership and locally focused efforts in the following programs:

- Continue education and outreach associated with *Urban Erosion and Sediment Control* program including certification of individuals involved in land disturbing activities and on-site implementation of erosion, sedimentation, and pollution control plans. This will help address the water quality needs of the region.
- Continue education and outreach efforts to agricultural interests through annual Irrigation Meetings and other avenues to inform farmers of available technologies and funding sources to make more efficient use of water resources without incurring hardship.
- Support completion, maintenance and improvement of the *Agricultural Water Use Measurement Program*, which is aimed at cost effectively collecting agricultural water use data across the state, and integrating cooperative arrangements with the private sector and partnerships with other State agencies. This program is a vital component to helping the State and regions effectively manage and utilize water resources.
- Support *Georgia Agricultural Conservation Incentive* program, which provides funding support to help implement conservation practices. Funding for this program is essential to help implement conservation measures, especially in the regional watersheds where there are surface water gaps.

Plan Coordination with Agencies Identified in the Water Conservation Implementation Plan and Identification of other key state agencies – CDM would like your input on this topic during our Review Meeting. Inclusion of the Coastal Regional Commission may be desirable but not sure if it fits here.



Section 8. Monitoring and Reporting Progress

The selected water management practices identified in Section 6 will be primarily implemented (as described in Section 7) by the various water users in the region, including local governments and others with the capacity to develop water infrastructure and apply for the required permits, grants, and loans.

The benchmarks prepared by the Coastal Georgia Council and listed in Table 8-1 below will be used to assess the effectiveness of this plan's implementation and identify any required revisions. As detailed below, the Council selected both qualitative and quantitative benchmarks that will be used to assess whether the water management practices are closing gaps over time and allowing the water planning region to meet its vision and goals. The benchmarks will be used to evaluate the Regional Water Plan effectiveness at the next 5-year plan review.

Summary

Insert text regarding the summary of this section.

8.1. Benchmarks

{Benchmarks should be specific, measurable, achievable, realistic, and time-phased. In the text below the table the Council should outline how to collect and analyze the data necessary to evaluate implementation progress. The time period is intended to show the timeframe between evaluations to provide meaningful results – some benchmarks may be long-term and not measured well on a short timeframe.}

Table 8-1: Benchmarks for Water Management Plans

Action Needed (Management Practice)	Benchmark	Measurement Tools	Time Period
{NOTE: ACTIONS carried over from Table 6-1}	{Identify quantitative and qualitative benchmarks that can be used to evaluate the region's progress toward achieving their regional vision and the guiding policy of the State Water Plan}	{TBD by Council}	{TBD by Council}

8.2. Plan Updates

Meeting current and future water needs will require periodic review and revision of Regional Water Plans. The State Water Plan and associated rules provide that each Regional Water Plan will be subject to review by the appropriate Regional Water Planning Council every five years and in accordance with this guidance provided by the Director, unless otherwise required by the Director for earlier review. These reviews and updates will allow an opportunity to adapt the Regional Water Plan based on changed circumstances and new information arising in the five years after EPD's adoption of these plans. These benchmarks will guide EPD in the review of the Regional Water Plan.

8.3. Plan Amendments

{Language TBD -- Councils may provide recommend language here e.g. "triggering events" to the degree the Council has discussed and has opinions on this topic.}



Bibliography

Coastal Regional Commission of Georgia, June 9, 2010. The Regional Plan of Coastal Georgia. June 9, 2010.

www.crc.ga.gov/planning/Pages/planning_regional.aspx

Coastal Georgia Regional Development Center, Coastal Georgia Comprehensive Plan Agenda. November 12, 2008.

www.crc.ga.gov/planning/Pages/planning_regional.aspx

Coastal Regional Commission of Georgia website. Retrieved August 3, 2010.

www.crc.ga.gov/

Coastal Regional Commission's Coastal Georgia Economic Development website. Retrieved on July 20, 2010, www.thegeorgiacoast.crc.ga.gov/index.html

Cowie, G. and Davis, D. Georgia's State Water Plan. Retrieved on March 2, 2009.

www.robinson.gsu.edu/ethics_pub/2009/cowie.pdf

Georgia Comprehensive State-wide Water Management Plan. Georgia Water Council. January 8, 2008.

Georgia Department of Community Affairs Georgia County Snapshots website.

Retrieved on July 21, 2010, www.dca.state.ga.us/CountySnapshotsNet/default.aspx

Georgia Department of Community Affairs, Regional Planning Rules "Standards and Procedures for Regional Planning." Chapter 110-12-6, et seq.

www.dca.ga.gov/development/PlanningQualityGrowth/PAGES/Legal.asp#RegionalRules

Georgia Department of Corrections website Facility Search. Retrieved on July 21, 2010, www.dcor.state.ga.us/GDC/FacilityMap/jsp/FacQrybyCounty.jsp

Georgia Department of Economic Development. GeorgiaFacts website. Retrieved on July 21, 2010, www.georgiafacts.net

Georgia Department of Labor. LaborMarket Explorer and Local Area Profiles.

Retrieved on July 21, 2010, www.explorer.dol.state.ga.us/mis/profiles.htm

Georgia Department of Natural Resources. Environmental Protection Division. Coastal Georgia Water and Wastewater Permitting Plan for Managing Salt Water Intrusion. June 2006.

Georgia Department of Natural Resources. Environmental Protection Division. Draft August 2003. Altamaha River Basin Management Plan 2003.

Georgia Department of Natural Resources. Environmental Protection Division. Georgia's State Water Plan. Regional Water Planning Guidance. July 2009.

Georgia Department of Natural Resources. Environmental Protection Division. Georgia's Water Resources. A Blueprint for the Future. Draft Submission to the Water Council. June 28, 2007.

Georgia Department of Natural Resources. Environmental Protection Division. The State of Georgia's Environment, 2009.

Georgia Department of Natural Resources. Wildlife Resources Division. A Comprehensive Wildlife Conservation Strategy for Georgia. August 31, 2005.

Georgia Department of Natural Resources. Wildlife Resources Division. Fisheries Section Annual Report. 2006.

Southeast Regional Climate Center. Climate summaries obtained for the following stations: Brooklet (ID 091266), Savannah Airport (ID 097847), Brunswick Airport (ID 091345), Fort Stewart (ID 093538), and Sapelo Island (ID 097808).

The New Georgia Encyclopedia, Land Resources
www.georgiaencyclopedia.org/nge/Article.jsp?id=h-2123

University System of Georgia, Map of USG Institutions. Retrieved on July 21, 2010,
www.usg.edu/inst/map/