

Suwannee-Satilla Regional Water Planning Council – Preliminary Selected Management Practices to Address Resource Gaps and Vision and Goals				
Affected Resource/Preliminary Management Practices	Gap	Water Resource Need - Vision and Goals	Implementation Considerations/Outreach Recommendations	Cost Range ¹
Surface Water (SW) Current and Future Use in Gap Areas	Yes	Yes	Agricultural (Ag) Water Users in Regions with Gaps and State and Federal Agencies	
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 shortages to 7Q10 low-flow conditions.			Short-term 1-10 years; EPD, GSWCC, Universities, GA Department of Ag GA Department of Ag identify funding sources and seek legislative authorization and funding through the legislative process	
DCAR-1. 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 SW gap.				
DCAR-2. Refine SW Ag forecasts and Resource Assessment Model methods and assumptions to improve data on source of supply and timing/operation of farm ponds.				
DCAR-3. Refine and improve SW resource assessment and Ag forecasts to address spatial and temporal hydrologic variations (i.e., including but not limited to evapotranspiration, infiltration, runoff) 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.				
DCAR-4. Continue to fund, improve, and incorporate metering data regarding Ag water use and collect and use this information in Water Plan updates.				
DCAR-5. Collaborate/support research (University, State and Corporate) on improved irrigation efficiency measures and development of lower water use crops and lower water use plant strains.				
DCAR-6. Improve education and research on when and how much water is needed to maximize crop yield with efficient irrigation.				

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Data Collection/Additional Research (DCAR) - continued	Yes	Yes		
DCAR-7. Promote management practices and educate stakeholders to minimize impacts to shallow/surficial aquifers that may impact surface water flows.			Short-term 1-10 years; EPD, GSWCC, Universities, GA Department of Ag. Develop fact sheets and conduct landowner outreach and work with applicable trade groups.	Low
DCAR-8. Conduct analysis of the socioeconomic benefits and cost in comparison to ecological benefits of addressing SW gaps that are larger in magnitude but occur infrequently. Results from gap analysis indicate that approximately 80-90% of the gaps in the region can be addressed with 15- 20% of the water supply that is needed to address the largest gap.			Short-Term 1-10 years; EPD	
DCAR-9. 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 retime flows to gap periods.			Short-term 1-10 years; EPD, GSWCC, Universities, GA Department of Ag	
DCAR-10. Development of plan of study and conduct research to evaluate the opportunities and limitations associated with improving river flow conditions via creation/restoration of wetlands, and if deemed potentially feasible, identify potential location(s) and estimates of potential improvements to stream flow conditions. This effort should include the identification of the incentives that could be used to make this a viable water supply option.			Short-term 1-10 years; EPD and other research agencies/entities USDA and other agencies for funding and incentives	

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Water Conservation (WC) – Encourage the development and use of higher efficiency Ag irrigation practices, where and when economically viable, including consideration of the following Tiers 3 & 4 for Ag conservation practices from the Water Conservation Implementation Plan (WCIP). Not all practices are needed to realize conservation savings; practices are not additive.			Short-term 1-10 years; EPD, GSWCC, GA Department of Ag, NRCS - Leverage funds and create incentives Ag water users in the Suwannee-Satilla Region focus on SW permit holders and new SW permit requests;	
Tier 3 Conservation Practices				
WC-3. Conduct irrigation Audits				Low
WC-4. Meter Irrigation Systems			<u>Alapha Watershed</u> - within region Atkinson, Ben Hill, Berrien, Clinch, Echols, Irwin, Lanier, Lowndes Counties.	Low
WC-5. Inspect Pipes and plumbing to control water loss				Low
WC-6. Minimize/reduce the use of high-pressure spray guns on fixed and traveler systems where feasible			<u>Withlacoochee Watershed</u> - Brooks, Crook, Lowndes, Tift, Turner Counties.	Low
WC-7. Cropping and crop rotation that promote efficiency				Low
WC-8. Practice conservation tillage				Low
Tier 4 Conservation Practices			<u>Satilla Watershed</u> - Bacon, Brantley, Pierce, Ware Counties.	
WC-9. Control water loss			<u>Suwannee Watershed</u> - Brantley, Charlton, Clinch. and Ware Counties	Low
WC-10. Encourage use of end-gun shutoff with pivots				Low
WC-11. Encourage use of low pressure irrigation systems where feasible soil specific				Low
WC-12. Encourage and improve use of soil moisture sensors, ET sensors or crop water use model (s) to time cycles				Low

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Additional and Alternatives to Existing Surface Water Supply Sources (ASWS)	Yes	Yes	Short-term 1-10 years; GSWCC to collaborate with EPD, Natural Resources Conservation Service (NRCS), GA Department of Ag, and current/future SW users to develop application process and data needs to allow streamlined application and review process. Coordinate pond permitting and irrigation permitting processes. EPD, GSWCC and GA Department of Ag to develop strategy.	
ASWS-1. Future SW 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.			Ag water users in the Suwannee-Satilla region. Focus on SW permit holders and new SW permit requests;	
ASWS-2. Future SW Uses - utilizing incentives and collaborative partnerships, examine opportunities to optimize farm and other pond operations to obtain releases in dry/gap years.			<u>Alpha Watershed</u> - Atkinson, Ben Hill, Berrien, Clinch, Echols, Irwin, Lanier, Lowndes Counties. <u>Withlacoochee Watershed</u> - Brooks, Crook, Lowndes, Tift, Turner Counties.	
ASWS-3. Future SW Uses - encourage additional groundwater development as a preferred source of supply for future demand in SW gap areas.			<u>Satilla Watershed</u> - Bacon, Brantley, Pierce, Ware Counties. Coordinate gap closure with Altamaha (Wilcox County), Lower Flint-Ochlockonee (Colquitt, Worth Counties), Lower Flint (Crisp County)	Medium
ASWS-4. Existing SW Uses - Encourage replacement of a portion of existing SW irrigation use with groundwater in times of shortage to 7Q10 dry periods; so long as use of the groundwater source does not impact SW flow in other areas.			Short-term 1-10 years; EPD, GSWCC and GA Department of Ag to develop strategy and work with potential participants/impacted users to increase support for and implementation of strategy and ensure the long-term sustainability of regional ground water supplies.	Medium
ASWS-5. Existing SW uses - utilizing incentives and collaborative partnerships identify opportunities allow for use of Ag Pond storage to augment river flows in times of shortage to 7Q10 dry periods.			Short/Mid-term 1-20 years; EPD, GSWCC and GA Department of Ag to develop strategy and work with potential participants/impacted users to increase support for and implementation of strategy	

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Additional and Alternatives to Existing Surface Water Supply Sources (ASWS) - continued	Yes	Yes		
ASWS-6. Existing SW uses - identify need for, and feasibility of, seasonal surface water permit conditions for existing uses to address times of shortage to 7Q10 dry periods; Phase implementation Phase 1 - Direct stream withdrawals; Phase 2 - Consider pond storage effects based on outcome of research from DCAR-2 and DCAR-3			Short/Mid-term 1-20 years; EPD, GSWCC and GA Department of Ag to develop strategy and work with potential participants/impacted users to increase support for and implementation of strategy	
ASWS-7. 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			Short/Mid-term 1-20 years; Encourage research to determine effectiveness and feasibility and implement if outcome of research warrants if practice is deemed effective.	
ASWS-8. Incentive based land use practices to help promote infiltration and aquifer recharge			Mid-term 10-20 years;	
ASWS-9. Evaluate incentive based programs to increase wastewater returns; modify LAS, septic systems, and manage stormwater to improve return flows			If deemed effective and feasible identify implementation needs based on status of gap closure	Medium to High
ASWS-10. Possible joint non-mainstem reservoir with Upper-Flint and/or Lower Flint-Ochlockonee			Short/Mid-term 1-20 years; Monitor gap closure and based on rate of gap closure consider reservoir reconnaissance/feasibility study	High
ASWS-11. 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			Mid/Long-term 10-40 years; Monitor gap closure and based on rate of gap closure consider inter-basin transfer reconnaissance/feasibility study	High

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Water Quality (WQ) Gaps	Yes	Yes	Municipal and Industrial Dischargers	
Point Sources – dissolved oxygen (PSDO)			Municipalities and/or utilities within the region Under development/to be determined	
PSDO-1. Data collection to confirm loading and/or receiving stream chemistry				
PSDO-2. Modification of Discharge Location				Medium
PSDO-3. Upgrade or replacement of treatment facilities				Medium to High
Available Municipal Wastewater Permit Capacity (MWWPC)	Yes/No	Yes		
MWWPC-1. Obtain additional waste water permit capacity to meet forecasted needs			Short-term 1-10 years; Wastewater utilities should coordinate with EPD to obtain needed capacity. Regionally sufficient capacity exist however localized gaps may occur, in Bacon, Cook, Lowndes, and Pierce Counties	Medium to High
Available Industrial Wastewater Permit Capacity (IWWPC)				
IWWPC-1. Obtain additional permit data regarding flow volumes and permit conditions for industrial wastewater facilities forecasted needs			Short-term 1-10 years; Additional industrial wastewater capacity may be needed. EPD to update and refine discharge limit data bases	Low

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Municipal Ground Water Permit Capacity (MGPC)				
MGPC-1. Obtain GW Permit Capacity			Short-term/Long-term 1-40 years; Additional GW permit capacity may be needed in Brantley, Coffee, Echols, Lanier, Lowndes, Pierce and Ware Counties. Utilities in regions should evaluate long-term needs and if needed work with EPD to obtain needed permit capacity.	Medium
Industrial Ground Water Permit Capacity (IGWPC)				
IGWPC-1. Obtain GW Permit Capacity			Short-term/Long-term 1-40 years; Additional permit capacity may be needed in Ben Hill, Cook, and Ware Counties. Industries in regions should evaluate long-term needs and, if needed, work with EPD to obtain needed permit capacity.	Medium
Shared Resources	Yes	Yes		
To Be Determined from other Councils			Altamaha, Upper Flint, Lower Flint-Ochlockonee	

¹Cost Range classified as either low, medium, or high by management practice type. Corresponding 2010 cost ranges associated with each category are shown below.

Type of Management Practice (cost unit)	Cost Range ²		
	Low	Medium	High
Water Conservation or Water Supply (\$/MG)	\$1 - \$5,000	\$5,000 - \$100,000	\$100,000 - \$1M
Water or Wastewater Treatment Infrastructure (\$/MGD)	<\$1M	\$1M - \$5M	\$5M - \$11M
Education or Ordinance/Policy Changes (\$/capita)	\$0 - \$2.50	\$2.50 - \$8	

² Cost data from "Supplemental Guidance for Regional Planning Contractors: Water Management Practice Cost Comparison" dated April 2010

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Groundwater (GW) Current and Future Use to Meet Forecasts	No	Yes	Municipal, Industrial (M&I), Agricultural, Water Users, State Agencies	
GW-1. Continue to sustainably drill wells, use, and develop water from the Upper Floridan and other significant aquifers.			Short-term 1-10 years; EPD, Cities, Counties, and Utilities in the region	Medium
GW-2. 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.			Short-term 1-10 years; Cities and Counties in aquifer recharge areas for implementation. State agencies for research and data transfer to local governments	
GW-3. Continue to refine sustainable yield metrics, monitor and improve our understanding of historic, current and future trends in groundwater levels. Continue to refine and update modeling and other tools.			Short-term 1-10 years; EPD	
GW-4. Research and incorporate Florida water forecasting information for future modeling and refine modeling if warranted.			Short-term 1-10 years; EPD	
Water Conservation (WC)	No	Yes		
WC-1. Encourage implementation and adherence to WCIP by local governments/utilities for Tier 1 and 2 conservation measure for M&I			Short-term 1-10 years; Encourage/recommend collaborative process with EPD, Georgia Municipal Association, Georgia Association of County Commissioners, and Water Providers in the region in developing and implementing existing and upcoming water conservation rules	Low
WC-2. Encourage implementation and adherence to WCIP by Agricultural groundwater users of Tier 3 and 4 conservation measures			Short-term 1-10 years; Encourage/recommend collaborative process with GSWCC, EPD, Georgia Department of Ag, and Ag ground water users to develop implementation process	Low

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Surface Water (SW) Current and Future Use Outside Gap Areas	No	Yes	Surface Water Users in Regions without Gaps and State and Federal Agencies	
SW-1. Continue to issue permits and use surface water in non-gap areas within the available SW resource capacity.			Short-term 1-10 years; EPD and applicable Federal agencies	Low
SW-2. Monitor Satilla River flow conditions to sustain estuary conditions.			Short-term 1-10 years; EPD and Coastal Resources Division	
Water Quality Non-Point Sources (NPS)	No	Yes	Agricultural, Forestry, Urban, and Rural Land Use Area	
Non-Point Source (NPS) – dissolved oxygen, fecal coliform, nutrients, and other impairments			Short-term 1-10 years; EPD and ?	
NPS-1. Data Collection/Analysis to confirm if dissolved oxygen and/or fecal coliform is human induced.				
NPS-2. Support efforts to monitor and determine the sources of nutrient loading and other NPS impairments to waters of the state, and upon confirmation of source, develop specific management programs to address.				
Non-Point Source (NPS) - continued The following practices are selected by the Suwannee-Satilla Council to encourage implementation by the applicable local or state program(s) including incorporation of relevant BMP updates.	No	Yes		
Urban Best Management Practices (NPSU)	No	Yes	Short-term 1-10 years; Cities, Utilities and Utilities in Region	
NPSU-1. Use soil erosion and sediment control measures.				Low
NPSU-2. Stormwater retention ponds, wetlands, and bioretention to manage runoff quality and flow rate and help support river flows (City of Valdosta Watershed Protection Plan, 2009).				
NPSU-3. Consider measures to reduce directly-connected impervious area and promote increased infiltration of stormwater to help reduce nutrient and other pollutant runoff (City of Baxley Watershed Protection Plan, 2007).				
NPSU-4. Protect and maintain riparian buffers along urban streams.				Low
NPSU-5. Implement street sweeping program (City of Pearson Watershed Protection Plan, 2008).				

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Rural Best Management Practices (NPSR)	No	Yes	Short-term 1-10 years; County Government Public Works/Road and Bridge	
NPSR-1. 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".				Low
Forestry Best Management Practices (NPSF)	No	Yes	Short-term 1-10 years; GFC, Georgia Forestry Association, the Georgia State Forestry Registration Board, Georgia Sustainable Forest Initiative, University of Georgia, Southern Wood Producers Association.	
NPSF-1. Support Georgia Forestry Commission (GFC) water quality program consisting of BMP development, education/outreach, implementation/compliance monitoring, and complaint resolution process.				Low
NPSF-2. Improve BMP compliance through Statewide biennial BMP surveys and BMP assurance exams; master timer harvester workshops and continuing logger education; and if necessary seek enforcement actions against registered foresters that operate out of compliance with BMPs.				
NPSF-3. Seek long-term conservation easements or purchase development rights by willing landowners and conservation groups.				
NPSF-4. 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.			USDA, NRCS, Non-profits, Non-governmental organizations.	

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Non-Point Source (NPS) - continued The following practices are selected by the Suwannee-Satilla Council to encourage implementation by the applicable local or state program(s)	No	Yes		
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; example practices are summarized below.	No	Yes	Short-term 1-10 years; GSWCC other entities? NRCS, Adopt a stream?? GFC??	
NPSA-1. Conservation tillage and cover crop.			Short-term 1-10 years; GSWCC other entities? NRCS, Adopt a stream? GFC?	Low
NPSA-2. Field buffers, riparian forested buffers, and strip cropping to control run-off and reduce erosion.				Low
NPSA-3. Livestock stock exclusions from direct contact with streams and rivers and vegetation buffers.				Low
NPSA-4. Responsible manure storage and handling				Low
NPSA-5. Incentives to restore wetlands and historically drained hardwood and other areas.				
Existing Impairments – Total Maximum Daily Load Listed Streams (TMDL)	No	Yes		
TMDL-1. Data collection and confirmation of sources to remove streams listed due to “natural sources”.			Short-term 1-10 years; EPD	
TMDL-2. Data Collection to refine river/stream reach length for impaired waters; focus on longest reaches to refine location and potential sources of impairments.			Short-term 1-10 years; EPD and ?	
TMDL-3. Stormwater Management: TMDL-3a. Urban Best Management Practices TMDL-3b. Forestry Best Management Practices TMDL-3c. Agricultural Best Management Practices <i>See Above Non-Point Source for Details</i>				

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Nutrients – Satilla and Savannah River Nutrient (Phosphorous and Nitrogen) Watershed Models (NUTR)	No	Yes	Short-term 1-10 years;	
<p>NUTR-1. Align current land use with phosphorous 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).</p> <p>NUTR-1a. Urban Best Management Practices NUTR-1b. Forestry Best Management Practices NUTR-1c. Agricultural Best Management Practices <i>See Above Non-Point Source for Details</i></p>			Short-term 1-10 years; Support research and development of tools such as the Southern Group of State Foresters and USFS Sediment Prediction modeling tool being developed by Auburn University. EPD and GFC City and County Governments GFC and? GSWCC and?	
Educational Practices (EDU)	NA	Yes		
EDU-1. Support Water Conservation Programs			State Agencies with WCIP responsibilities, Cities, and Utilities	Low
EDU-2. Support Stormwater Educational Programs			EPD, Cities, Counties, and Utilities	Low
EDU-3. Support Septic System Maintenance Programs			EPD, Cities, and Counties	Low
EDU-4. Support GFC Forestry BMP and UGA-SFI Logger Education Programs			GFC and UGA	Low

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Ordinance and Code Policy Practices (OCP)	NA	Yes		
OCP-1. Encourage local government to develop ordinances and standards to implement and/or update stormwater regulations and land development regulations. Possible resource documents include: Georgia Stormwater Management Manual, Coastal Stormwater Supplement and Metro North Georgia Water Planning District Model Ordinances.			Short-term 1-10 years; EPD and Regional Commissions	Low
OCP-2. Identify opportunities for green space on incentive and voluntary basis.			Short-term 1-10 years; Regional Commissions, County and City Government	Low
OCP-3. Encourage coordinated environmental planning, land use, stormwater, and wastewater.			Short-term 1-10 years Regional Commissions, County and City Government	Low
OCP-4. Encourage local government to enforce Erosion and Sedimentation Control Ordinance (Cities of Pearson and Valdosta Watershed Protection Plans, 2008 & 2009).			Short-term 1-10 years Regional Commissions, County and City Government	Low
Shared Resources	Yes	Yes		
To Be Determined from other Councils			Altamaha, Upper Flint, Lower Flint-Ochlockonee	

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