EXECUTIVE SUMMARY

LOWER SAVANNAH-SALKEHATCHIE RIVER BASIN PLAN 2025 DRAFT

CONTENTS

Savannah River cover photo courtesy Beaufort-Jasper Water & Sewer Authority (BJWSA) and Coosawhatchie cover photo courtesy Courtney Kimmel.

Savannah River at Augusta

FOREWORD

The Lower Savannah-Salkehatchie River Basin Plan is the result of years of preparation, work, and contributions from numerous stakeholders with a vested interest in water management. The State of South Carolina began implementing its vision for a comprehensive and actionable water plan in 2014 with the development of surface water quantity models for each of the eight major river basins in the state. An updated groundwater model of the Coastal Plain Aquifer System and the development of methodologies for projecting water demands for all water use sectors followed. This voluminous preparatory work, grounded firmly in science, provides River Basin Councils (RBCs) in all eight basins with the technical information they need to understand water availability, propose and test alternative management strategies, and make concerted recommendations to water users, regulatory agencies, and state legislators on future management practices and policies to manage and protect the resource.

This report constitutes one of the eight river basin plans, and it is organized and supported by the work of the State Water Planning Process Advisory Committee (PPAC). The PPAC participated in a facilitated process to formulate a thorough, practical, and consistent planning approach that is being applied in the different river basins in South Carolina. Published in 2019, the South Carolina State Water Planning Framework now serves as a comprehensive, uniform guide for the RBCs, each charged with developing an understanding of the water resources in their respective basins; identifying the gaps or risks related to current and future water uses; and developing recommended policies, management practices, and legislative considerations "**designed to ensure the surface water and groundwater resources of a river basin will be available for all uses for years to come, even under drought conditions.**"

The river basin plans are the fourth of a five-step process to update the South Carolina State Water Plan with actionable recommendations and priorities. All eight plans will inform the updated State Water Plan, which is why consistency in the planning process and types of recommendations made is important. The updated State Water Plan will help guide decisions to preserve water for all uses throughout the state. The process of incorporating RBC findings and recommendations into the South Carolina State Water Plan was initiated in September 2024 with Governor's Executive Order # 2024-22, which also established a new advisory group to the South Carolina Department of Environmental Services (SCDES) called WaterSC, composed of stakeholders from many water interest categories, similar to the RBCs. WaterSC will help summarize and prioritize the collective recommendations from the RBCs for consideration by SCDES. SCDES is leading the development of the State Water Plan, incorporating advice from the newly formed WaterSC Water Resources Working Group, the RBCs, and the pre-existing Catawba Wateree Water Management Group, which fulfills the RBC obligations for the Catawba Basin.

Coosaw Farms (courtesy Brad O'Neal)

Acknowledgements

The Lower Savannah-Salkehatchie RBC consists of the following volunteer stakeholders representing eight different water interest categories. These individuals spent nearly two years sharing their diverse perspectives and offering their expertise, culminating in the development of this River Basin Plan.

Name	Organization	Interest Category
Danny Black	Southern Carolina Regional Alliance	Industry and Economic Development
Taylor Brewer	Beaufort County Stormwater Manager	Local Government
Kenneth Caldwell	Alliant Insurance Services/Tree Farmer	Agriculture, Forestry, and Irrigation
John Carman	City of Aiken Energy and Environmental Committee	Local Governments
Brian Chemsak	Beaufort Jasper Water and Sewer Authority	Water and Sewer Utilities
Austin Connelly	Farmers Grain & Supply Inc.	Agriculture, Forestry, and Irrigation
Leslie Dickerson	Savannah Riverkeeper	Environmental
Kari Foy	Lowcountry Regional Water System (LRWS)	Water and Sewer Utilities
Samuel Grubbs	Samuel L Grubbs Farm LLC	Agriculture, Forestry, and Irrigation
Lawrence Hayden	Self Employed - Previously USDA Forest Service	Environmental
Heyward Horton*	SC Rural Water Association Colleton County Economic Alliance, Inc.	Industry and Economic Development
Jeff Hynds	Department of Energy – Savannah River Field Office	Industry and Economic Development
Courtney Kimmel	Port Royal Sound Foundation	Environmental
Lynn McEwen	City of New Ellenton	Water and Sewer Utilities
Dean Moss	Retired	At-Large
Pete Nardi	Hilton Head Public Service District	Water and Sewer Utilities
Sara O'Connor	Coppage Law Firm/Seaside Sustainability	Environmental
Brad O'Neal	Coosaw Farms	Agriculture, Forestry, and Irrigation
Joseph Oswald III	JCO Farms & AIS LLC	Agriculture, Forestry, and Irrigation
Tommy Paradise	City of North Augusta	Local Government
Reid Pollard	Retired	Water-based recreational
Brandon Stutts	Dominion Energy	Electric Power Utilities
Bill Wabbersen	Retired	Water-based recreational
Will Williams	Western SC Economic Development Partnership	Industry and Economic Development
Brad Young	Hilton Head National Golf Club	Agriculture, Forestry, and Irrigation

** RBC member who participated during the process but was not an active member at the time this Plan was prepared.*

Several RBC member alternates, Kathy Rhoad and Angel Brabham were also integral to the planning process.

The Lower Savannah-Salkehatchie RBC would like to thank the following individuals and organizations who contributed to the development of this River Basin Plan by providing technical presentations and information, meeting coordination, modeling, administration, and other support services.

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Lauren Dwyre
Matthew Hall
Grace Houghton
Dr. Nicholas Rogers
Dr. Amy Shaw
Camren Shea
Kirk Westphal

Little Hell Landing on Savannah River (courtesy Bill Wabbersen)

What to Know About this Plan

This plan is one of eight river basin plans to be developed for South Carolina. The Lower Savannah-Salkehatchie RBC, comprising stakeholders representing various water interests, collaborated with South Carolina Department of Natural Resources (SCDNR) and SCDES, and met monthly for almost 2 years. They followed a carefully designed process to establish goals and actions throughout the basin. Through facilitated dialogue and a **clear commitment to help improve the balance of water uses between societal and environmental needs**, they discussed issues, increased their understanding of various perspectives, agreed on recommended actions or policies for improved water management where possible, and offered viewpoints to aid decision-makers in realizing progress throughout the basin. This plan is a direct result of their efforts to improve the sustainability of water resources in the Lower Savannah-Salkehatchie River basin, and to improve the balance between all water uses.

Unlike the other RBCs, this RBC was charged with planning for two river basins, adjacent but not hydrologically connected by surface streams; the lower portion of the Savannah River basin below Lake Thurmond and the Stevens Creek confluence (which is shared with Georgia and which does not include large mainstem reservoirs as does the Upper Savannah basin), and the Salkehatchie River basin (which is contained entirely within the South Carolina Coastal Plain). The two basins are grouped together into a single basin for planning purposes, recognizing that each has unique hydrology, but that they share similar geologic, land use, and water use characteristics.

While water users in the Georgia portion of the Lower Savannah River basin are simulated in the surface water availability model, the statistics of shortages and impacts of management measures are only reported for South Carolina water users in this report.

Some of the most important findings of and recommendations from the RBC include:

- **Current Water Use:** Surface water availability modeling suggests a low risk of water supply shortages based on current water demands, assuming that droughts will not be more severe than those that have occurred over the previous 71 years in the Salkehatchie River basin and the previous 82 years in the Lower Savannah River basin. The only potential shortages under current use patterns suggested by the analysis would be for five agricultural water users on tributary streams and the Coosawhatchie River, which can likely be alleviated by existing, on-site storage (farm ponds) that were not included in the model.

- **Growth Projection Impacts:** Modeling indicates the potential for water shortages for a limited number of agricultural water users (all in the Salkehatchie basin) under moderate economic growth assumptions through 2070. These water users all exhibit equal or slightly greater shortages under the high economic growth assumptions, in addition to a few additional agricultural users in the Salkehatchie River basin and one municipal water user in the Lower Savannah basin. Agricultural uses are typically supplemented with farm ponds that can provide buffers against short-term, low streamflow conditions.
- **Overallocation:** Certain headwater reaches of tributaries in the Lower Savannah and Salkehatchie River basins are overallocated, though neither mainstem river is overallocated. If all surface water users withdrew at their fully permitted and registered (P&R) amount (a very unlikely scenario), there would not be enough water for all users; two of the tributaries in the Lower Savannah would be unsustainably stressed near their headwaters, and three of the tributaries in the Salkehatchie would be similarly stressed near their headwaters.
- **Ecological Flow Metrics:** Based on the model simulations, the moderate and high economic growth scenarios result in low risk for ecological integrity at the one location assessed (Horse Creek at Clearwater) in the Lower Savannah River basin. However, if all users were to withdraw water at their fully P&R volumes, the reduction in streamflow could reduce the number of fish species in Horse Creek. These findings do not rule out all potential risks to ecological integrity or aquatic biodiversity related to other metrics or flow alterations, and the methodology employed is limited to wadeable streams, which are most vulnerable to substantial flow alterations. Analysis of the relationship between ecologic health and flow characteristics was not performed in the Salkehatchie River basin because of data limitations.
- **If Future Droughts Worsen:** Without assigning probability or associating future droughts with specific climate projections, the RBC examined the potential impacts of future droughts that might be more severe than historical droughts. Three types of synthetic droughts were tested with the models, focusing on impacts of water management in the Upper Savannah River basin on flows in the Lower Savannah River basin (the analysis did not include the Salkehatchie basin):
  - **Scenario 1** – A repeating 5-year drought constructed by splicing together the five driest water years in the baseline simulation period (2001, 2008, 1981, 1988, and 2017), with respect to mainstem total annual flow.
  - **Scenario 2** – A repeating single-year drought corresponding to the second driest water year (2008) and identified as the critical single-year drought with respect to Lake Thurmond water supply availability during critical summer months.
  - **Scenario 3** – A repeating synthetic drought year constructed by splicing together the 12 driest calendar month flows in the baseline simulation period.

  The reduction in water availability in, and releases from, Lake Thurmond (in the Upper Savannah basin) under these extended drought scenarios would impact the flow entering the Lower Savannah River. In general, the simulations performed here highlight significant water supply vulnerabilities if historical observed drought conditions were to occur in the future with greater frequency and/or duration. Acceptable instream and environmental flow levels are a key driver of the vulnerability of water supplies to potential future extreme drought conditions.
- **Recommended Water Management Strategies:**
  - **Demand Side Management:** The RBC identified and recommended a toolbox of demand-side water management strategies for municipal, industrial, and agricultural water users that, if implemented, could help reduce the potential for shortages and help maintain adequate streamflows for environmental needs.
  - **Supply Side Management:** Due to the very low risk of surface water shortages or ecological degradation, the RBC

Coosawhatchie River (courtesy Courtney Kimmel)

did not recommend any new supply-side strategies beyond those currently employed. Strategies that are already being used effectively, including the conjuctive use of surface and groundwater, use of recycled water (also known as water reclamation or water reuse. See expanded discussion in Chapter 6 of the Plan.) for golf course irrigation, interbasin transfers from the Lower Savannah to the Salkehatchie River Basin, aquifer storage and recovery (ASR), and small impoundments can be expanded to meet growing demands. The RBC recognized, however, that changing conditions beyond those examined could require additional supply-side strategies be implemented to reduce or eliminate potential surface water shortages.

- **Policy, Regulatory, and Legislative Recommendations:** In addition to proposing numerous planning process and technical recommendations, the RBC reached consensus on several important policy, regulatory, and legislative recommendations, including:
  - Improve the current laws that allow for regulation of water use so that they are effective and enforceable.
  - The South Carolina Surface Water Withdrawal, Permitting, Use, and Reporting Act should allow for reasonable use criteria to be applied to all surface water withdrawals (with some caveats), like those that currently exist for groundwater withdrawals.
  - The South Carolina Legislature should approve and adopt the State Water Plan and subsequent updates.
  - The South Carolina Legislature should establish a grant program to help water users implement the actions and strategies identified in the legislatively approved State Water Plan.
  - The water withdrawal permitting process should specifically assess the permit application's alignment with the legislatively approved State Water Plan.
  - Recognizing that the resources of the Savannah River basin are finite and shared between the states, the Governor of South Carolina should communicate with the Governor of Georgia to establish a coordinated, state-level planning and water management process for the Savannah River basin and their shared groundwater aquifers.
  - The SC Legislature should support matching or incentivizing County Green Space Sales and Use Tax programs to establish balance among water and land uses (e.g., agricultural, residential, industrial, recreational, instream requirements).
  - Local governments and land managers should coordinate to reduce sediment loading to waterways.
  - Towns and counties should develop stormwater design manuals that promote responsible development, protect water resources, and prioritize redevelopment over new development.

ES-1

Banded Pelican landing on Port Royal Sound, Hilton Head Island

Introduction: Purpose and Utility of the Plan

This Lower Savannah-Salkehatchie River Basin Plan is one of eight plans that will be developed for the planning river basins in South Carolina (Figure ES-1). Numerous and diverse stakeholders throughout the basin worked with SCDNR, SCDES, and others during its development. The plan was prepared in response to the South Carolina Water Resources Planning and Coordination Act, and continues the work that began in 1998 with the South Carolina Water Plan.

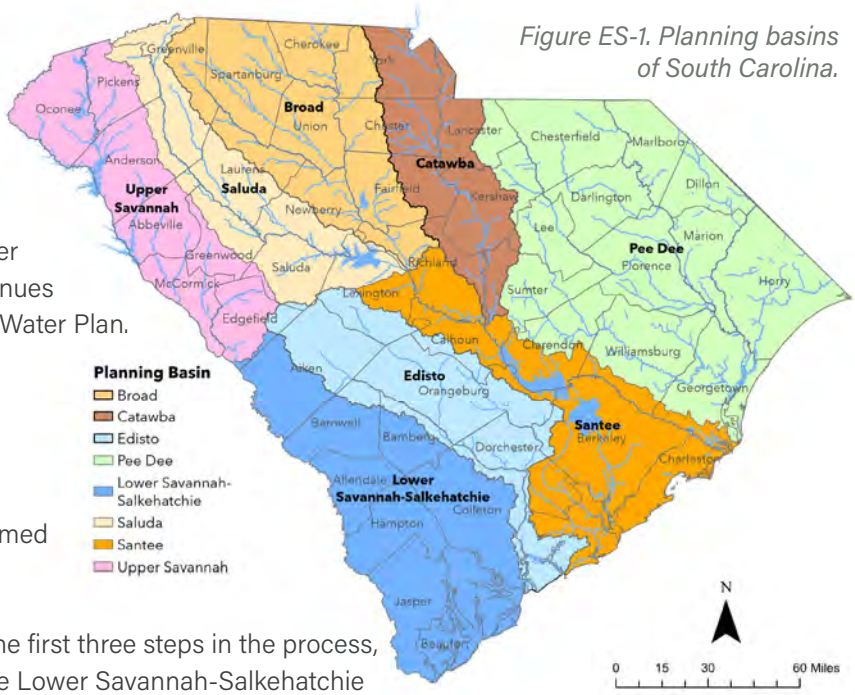


Figure ES-1. Planning basins of South Carolina.

In 2014, a five-step process was initiated to update and actualize the South Carolina Water Plan (Figure ES-2). The process was conceived and organized to provide the necessary scientific and water use information to stakeholders so they could make informed recommendations on water management actions, policies, and potential legislation in response to the needs of each basin. The first three steps in the process, now complete for the Lower Savannah-Salkehatchie basin, provide tools and data on surface water and groundwater resources, as well as historical water use, current water demand, and estimates of future demand for the basin. The Lower Savannah-Salkehatchie River Basin Plan is the culmination of Step 4 of the process for the Lower Savannah-Salkehatchie River basin. The plan assesses water availability in the basin over a 50-year planning horizon and presents the recommendations of the Lower Savannah-Salkehatchie RBC—a diverse group of volunteer stakeholders representing eight different water-interest categories.

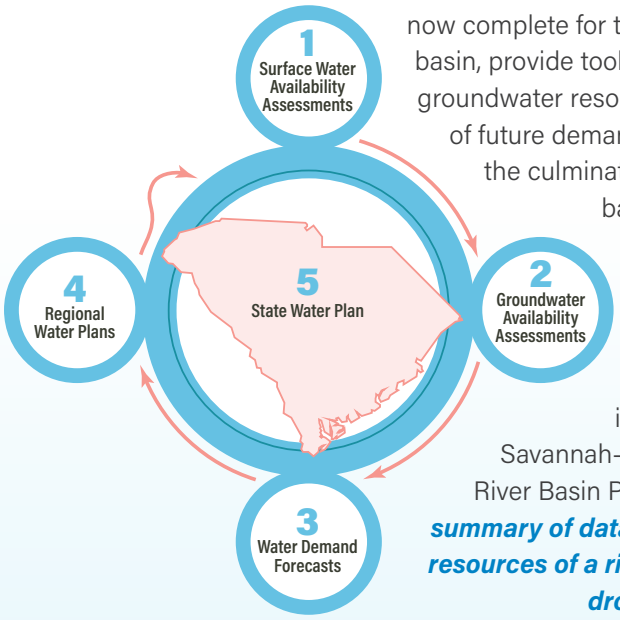


Figure ES-2. South Carolina's five-step process to update the State Water Plan.

Section ES-2 describes the planning process in more detail. As prescribed in the South Carolina State Water Planning Framework, the Lower Savannah-Salkehatchie RBC was charged with supporting the development of this River Basin Plan as "***a collection of water management strategies supported by a summary of data and analyses designed to ensure the surface water and groundwater resources of a river basin will be available for all uses for years to come, even under drought conditions.***" This same planning process has been or will be applied in all eight South Carolina river basins.

Savannah River at Augusta

Specifically, each River Basin Plan will include data, analysis, and water management strategies to guide water resource development in the basin for a planning horizon of 50 years by answering four principal questions:

1. What is the basin's current available water supply and demand?
2. What are the current permitted and registered water uses within the basin?
3. What will be the water demand in the basin throughout the planning horizon, and will the available water supply be adequate to meet that demand?
4. What water management strategies will be used in the basin to ensure the available supply meets or exceeds the projected demand throughout the planning horizon?

River Basin Plans will focus principally on the quantity and availability of surface water and groundwater for all designated uses: drinking water, agricultural and other irrigation, forestry, industry and economic development, power generation, nonconsumptive uses such as aquatic habitat suitability and environmental needs, and water-based recreation. Plans will not focus directly on flood management or water quality (these important issues are considered in other plans); however, the RBCs are encouraged to consider water management strategies that have secondary benefits with respect to flood management and water quality.

All eight River Basin Plans will be used to inform and update the South Carolina State Water Plan. While these plans do not prescribe regulatory, policy, or legislative decisions, they represent consensus-based recommendations from diverse and vested stakeholders on prudent actions and policies to be considered by citizens, water managers, state agencies, and elected officials to help ensure future water availability for all uses.

Coosawhatchie River at Highway 60 (courtesy Low Country Regional Water System)

ES-2 Overview of the Planning Process

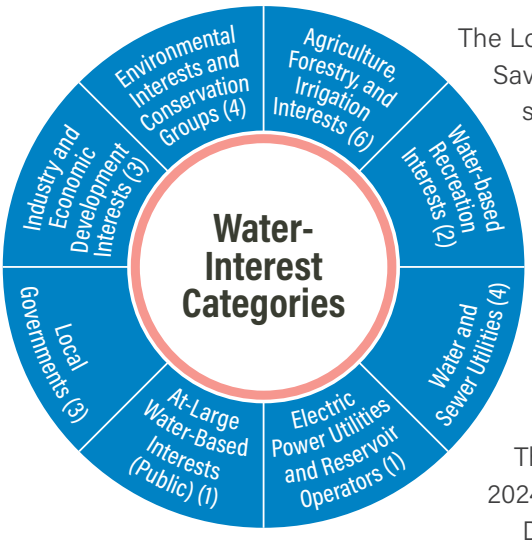


Figure ES-3. Water-interest categories represented in the RBC. Numbers in parentheses indicate RBC member representation.

The Lower Savannah-Salkehatchie River Basin Plan was formulated by the Lower Savannah-Salkehatchie RBC, a group of more than 20 individual volunteer stakeholders representing local governments, agriculture and forestry, environmental interests, water-based recreation, utilities (water, sewer, electric power), and industry/economic development (Figure ES-3).

The Lower Savannah-Salkehatchie RBC met monthly for nearly 2 years to follow the systematic planning process prescribed in the 2019 South Carolina State Water Planning Framework. SCDNR and the PPAC (a 19-person group composed principally of the same interest groups as each individual RBC but with academic representation) collaboratively developed the Planning Framework.

The series of meetings of the RBC involved two field trips within the basin. In May 2024, the RBC visited Hilton Head Island to learn about Hilton Head Public Service District's (HHPSD) ASR program, reverse osmosis treatment plant, and recycled water program. The RBC also toured the Waddell Mariculture Center in Bluffton. In April 2025, the RBC toured the US Department of Energy's (USDOE) Savannah River Site (SRS). These helped connect each RBC member to the physical setting of the river basin and the multiple needs the water serves. This holistic perspective of the basin helped foster consensus-building. The RBC also had a joint meeting with the Upper Savannah RBC to learn about the United States Army Corps of Engineers (USACE) operations, projects, and initiatives in the Savannah River basin.

The planning process is divided into four phases, discussed below and in greater detail in the Planning Framework. Each phase spanned approximately 6 months, equally representing one quarter of the entire process.

PHASE 1

Orientation, Administrative Tasks, and Background Information

During this phase, RBC members reviewed bylaws, protocols, expectations, and the planning process. They selected a chair and vice-chair and reviewed technical information to aid them in the planning process for the Lower Savannah-Salkehatchie River basin. The RBC also developed a vision statement and a set of supporting goals (see next page).

PHASE 2

Comparison of Water Resource Availability and Demand

In this phase, the RBC reviewed the methods, tools, and results from the first three steps of the overall State Water Plan formulation, including surface water and groundwater availability analysis and water demand projections. This provided a consistent and scientific perspective on the overall balance of supply and demand throughout the basin, as well as current and future risks. Results were derived from the surface water model developed in earlier steps and analysis of groundwater conditions, trends, and projections.

PHASE 3

Evaluation of Water Management Strategies

This was an interactive phase that involved the RBC and technical team identifying and evaluating surface water and groundwater management strategies to address water shortages or water supply issues identified in Phase 2. Results were reported back to the RBC and evaluated against established performance measures. This interchange allowed the RBC to recognize common benefits and agree on recommended strategies and their relative priorities.

PHASE 4

River Basin Plan Preparation

This final phase involved the development of a draft version of the plan, including recommendations for water management strategies, policies, legislation, and regulatory actions. It also included the formulation of recommendations for drought response initiatives and recommendations for improving the planning process. It included a period for public review and appropriate incorporation of public comments before finalizing the plan.

During Phase 1, the Lower Savannah-Salkehatchie RBC developed the following vision statement and goals specifically for the Lower Savannah-Salkehatchie River basin.

VISION STATEMENT

Shared water resources are managed to sustainably meet the needs of all stakeholders in the Lower Savannah and Salkehatchie basins now and into the future.

GOALS

1) Develop water use strategies, policies, and legislative recommendations so that the Lower Savannah-Salkehatchie River basins are resilient and:
   a. Provide for an accurate accounting of current and future water availability.
   b. Promote stability of water allocations to support long-term planning.
   c. Promote balance between development, industry, and economic growth in areas with adequate water resources.
   d. Allow for growth.
   e. Prevent saltwater intrusion and loss of freshwater resources.
   f. Maintain adequate flows to support instream needs of aquatic organisms and recreation.
2) Enhance collaboration between all stakeholders and water interest groups, including Georgia and the Upper Savannah RBC.
3) Educate and inform local governments on how land use decisions impact water availability.
4) Develop and implement an education and communication plan to promote the strategies, policies, and recommendations developed for the Lower Savannah-Salkehatchie River basins.

The planning process included outreach to the public to educate and augment the RBC with important information and perspectives. Two initial informational meetings were held to explain the planning process and solicit participation in the RBC. An additional meeting was reserved for presentation of the draft plan and solicitation of verbal and written comments.

Wetlands on Hilton Head Island

Overview of the Lower Savannah-Salkehatchie River Basin

The combined Lower Savannah-Salkehatchie River basin covers nearly 4,500 square miles (sq mi) across the states of South Carolina and Georgia. The Lower Savannah River part of the basin extends for approximately 125 miles from the southern part of Edgefield County along the South Carolina-Georgia border to the coast in Jasper County's southernmost point, while the Salkehatchie River part of the basin extends 95 miles from eastern Barnwell County to the coast of Beaufort and Colleton Counties (SCDNR 2023a). In South Carolina, the river basin consists of significant portions of Aiken, Allendale, Bamberg, Barnwell, Beaufort, Colleton, Hampton, and Jasper Counties. Allendale, Beaufort, Hampton, and Jasper Counties lie entirely within the basin. A small portion of Edgefield County is also present in the river basin. Five major subbasins divide the Lower Savannah-Salkehatchie River planning basin: the Lower Savannah, Calibogue-Wright River, and most of the Middle Savannah subbasins (which collectively form the Lower Savannah portion of the basin), and the Salkehatchie, Broad-St. Helena, and St. Helena Island subbasins (which collectively form the Salkehatchie portion of the basin). These are shown in Figure ES-4.

Figure ES-4. The Lower Savannah-Salkehatchie River basin in South Carolina.

Land use and land cover in the Lower Savannah-Salkehatchie River basin primarily includes wetlands and forested areas, but also small- and moderate-sized urban areas. The basin is predominantly rural. However, the basin contains the moderately-sized cities and towns of North Augusta, Hilton Head Island, Bluffton, and parts of Aiken, and numerous smaller cities and towns such as Beaufort, Barnwell, Walterboro, Hampton, Allendale, Bamberg, Denmark, Laurel Bay, and Hardeeville. Wetlands and woodlands are the dominant landcover types in the basin, as shown in Figure ES-5.

Salkehatchie River Redbreast Sunfish (courtesy Chris Thomason)

Approximately 23 percent (1,050 sq mi), of the Lower Savannah-Salkehatchie River basin is conserved land (The Nature Conservancy 2024). Land within the basin is primarily conserved through private and state government entities; however, 310 sq mi of land is managed by the USDOE at the Savannah River Site in the upper part of the Lower Savannah River basin. There are 11 natural preserves designated by the South Carolina Heritage Trust program, four state parks, and seven cultural preserves within the Lower Savannah-Salkehatchie River basin (SCDNR 2019b and South Carolina State Parks 2024).

The annual average precipitation for the entire planning basin ranges from 45 to 51 inches (in.). Generally, the upper part of the basin receives less precipitation than the lower part. Precipitation varies throughout the year based on location. June is generally the wettest month in the upper part of the basin, as measured at the Blackville weather station in Barnwell County (averaging 5.35 in.), while August is generally the wettest month in the lower part of the basin, as measured at the Beaufort Marine Corps Air Station (MCAS) station in Beaufort County (averaging 7.03 in.). The driest month at both locations is November (averaging 2.45 in. at Blackville and 2.22 in. at Beaufort MCAS).

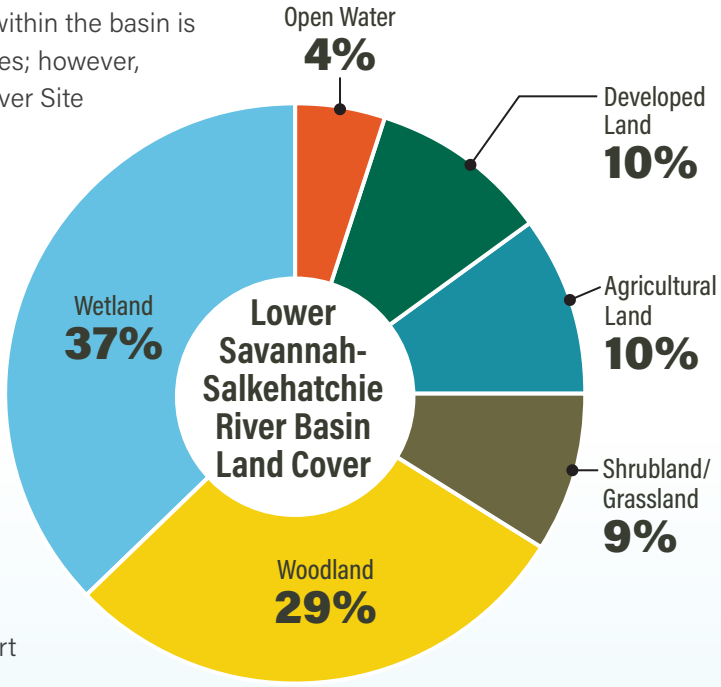


Figure ES-5. 2023 Lower Savannah-Salkehatchie River basin land cover (Multi-Resolution Land Characteristics Consortium [MRLC] 2024).

The lowest annual amount of precipitation occurred in 1986 at the Blackville station (approximately 33 in.) and in 2004 at the Beaufort MCAS station (approximately 31 in.). Because of the nature of drought, one type of indicator cannot fully encapsulate the intensity of drought impacts or capture the variation in impacts among sectors and location within a river basin. While 1986 and 2004 were the driest years on record at the

Blackville and Beaufort MCAS weather stations, respectively, stream gages on the Savannah River near Clyo, Georgia and on the Salkehatchie River near Miley experienced their lowest annual average flows in 2012 and 2011, respectively. The most recent year of drought conditions (defined by a Standard Precipitation Index of less than -1) was in 2011 at the Bamberg and Savannah/Hilton Head International Airport (Georgia) weather stations.

The Lower Savannah-Salkehatchie River basin is home to an exceptionally diverse array of freshwater fishes, including 85 native species and 14 introduced species (Thomason 2024). The combined Upper and Lower Savannah River basins are home to a total of 118 native fish species, which is more than the total richness of some states (Marcy et al. 2005). Some common sportfish in the planning basin are the redbreast, bluegill, redear sunfish (shellcracker), and spotted sunfish (stumpknocker). Some examples of non-game fish include the taillight shiner, the Savannah darter, and the dollar sunfish. Additionally, the Savannah and Salkehatchie Rivers are important habitats for diadromous fish, or those that migrate from freshwater to saltwater (catadromous) and from saltwater to freshwater (anadromous) for the purpose of spawning. For example, striped bass and Atlantic sturgeon can be found in various reaches of the Savannah River depending on the season. Striped bass migrate from winter habitat in the lower river reaches near the ocean up through the landward freshwater reaches in the summer for spawning (SCDNR 2015). Other species important to recreational and conservation efforts such as the American shad and shortnose sturgeon spawn within the basin.

Oysters are also a valuable commercial and recreational resource in South Carolina. Some of the highest mortality rates for oysters have been observed in the Calibogue Sound and may be attributed in part to the high rate of urbanization in the area (Ballenger 2024). Conversely, the mortality rates of oysters have been among the lowest in the Port Royal Sound and lower St. Helena Sound, because of the limited freshwater flow into these sounds.

Despite its high diversity and importance for species conservation in the southeast, the Savannah River is listed as one of the most polluted rivers in the United States, with several 303(d) impaired sites for issues pertaining to pH, zinc, mercury, and fecal coliform in the lower part of the river (South Carolina Department of Health and Environmental Control [SCDHEC] 2023). The Salkehatchie River basin possesses an even greater number of impaired sites, which concentrate around the coastal area and pertain primarily to fecal coliform, mercury, turbidity, and copper (SCDHEC 2023).

Figure ES-6. Representative aquatic species within the Lower Savannah-Salkehatchie River basin.

Little Salkehatchie River

Water Availability: Supply and Demand

SURFACE WATER SUMMARY

The Lower Savannah River portion of the basin, as defined for South Carolina's river basin planning process, extends 125 miles along the South Carolina-Georgia state line (SCDNR 2009). The lower part of the Savannah River runs from the confluence of the Upper Savannah River and Stevens Creek near the Fall Line to the Atlantic Ocean. The largest tributaries that drain to the Lower Savannah River include Horse Creek, Upper Three Runs Creek, and Lower Three Runs Creek, all of which are in the upper Coastal Plain region. Smaller tributaries in the middle and lower Coastal Plain region are generally associated with swamplands. To the northeast, the Salkehatchie River portion of the basin extends 95 miles inland from the Atlantic Ocean (SCDNR 2009). The major streams draining the Salkehatchie portion of the basin are the Salkehatchie, Coosawhatchie, and Ashepoo Rivers. The Salkehatchie River and the Little Salkehatchie River combine to form the tidally influenced Combahee River. The Coosawhatchie drains into the Broad River, a tidal saltwater river. Coastal water bodies in the basin include St. Helena Sound, Port Royal Sound, and numerous tidal creeks and rivers.

Savannah River flows have been regulated since 1951 through controlled releases from Lake Thurmond (SCDNR 2009), resulting in flows in the Savannah River at Augusta nearly always being above 3,600 cubic feet per second (cfs). Flows are variable in the upper part of the Savannah River because of these releases, and more uniform downstream because of the tributary stream inflows and stabilization by the wetlands. Streamflow in the Salkehatchie River is relatively steady and well-sustained because of groundwater storage and water supplied from headwater streams in the upper Coastal Plain (SCDNR 2009). Coosawhatchie River flows are more variable, as it depends on rainfall and runoff from low lying, permeable terrain. Freshwater availability in the Salkehatchie River basin can be limited, and the Coosawhatchie River and Great Swamp can run dry during the summer and fall.

The Lower Savannah-Salkehatchie River basin has been developed with numerous navigation projects and limited flood-control projects located solely in the Salkehatchie basin. Most development in the Lower Savannah basin has been for navigation projects, and there are no completed flood-control projects in this part of the basin. The largest lakes in the Lower Savannah basin are Par Pond on Lower Three Runs Creek (surface area of 2,700 acres) and Langley Pond on Horse Creek (surface area of 250 acres) (SCDNR 2009).

USGS stream gage on the Coosawhatchie River (courtesy Low Country Regional Water System)

There are no large reservoirs in the Salkehatchie part of the basin, where the largest lake is a pond near the Ashepoo River which has a surface area of 800 acres (SCDNR 2009). USACE navigation projects are concentrated near the coast and include channels through Port Royal Sound and the Beaufort River. They also maintain the Atlantic Intracoastal Waterway.

Additionally, 182 regulated dams and numerous unregulated small dams create small impoundments on the tributaries to the Savannah River and in the Salkehatchie basin. Most of the regulated dams, particularly those designated as High Hazard dams, are in the upper reaches of the combined planning basin.

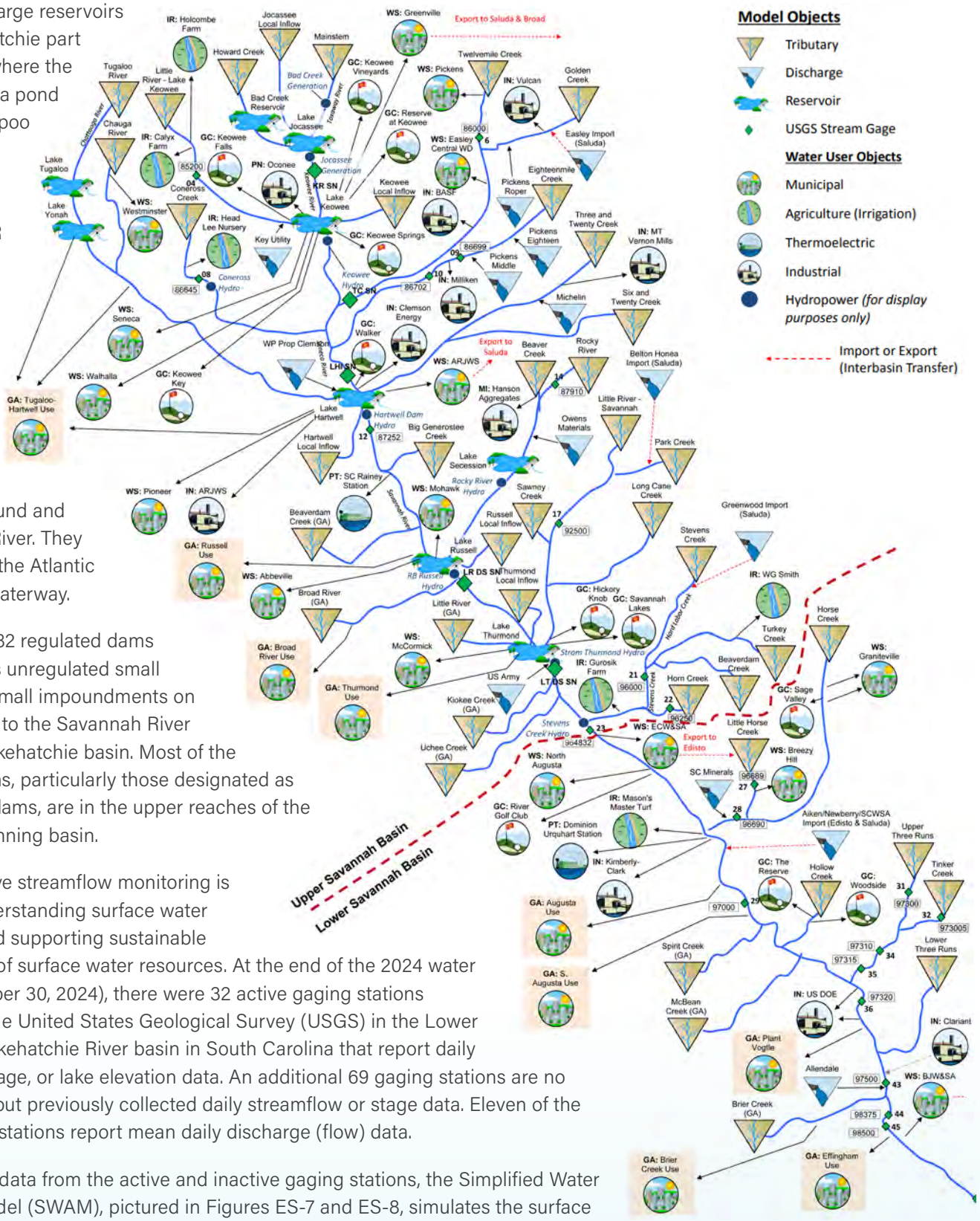


Figure ES-7. Simplified Water Allocation Model framework of the Savannah River basin.

Comprehensive streamflow monitoring is critical to understanding surface water availability and supporting sustainable management of surface water resources. At the end of the 2024 water year (September 30, 2024), there were 32 active gaging stations operated by the United States Geological Survey (USGS) in the Lower Savannah-Salkehatchie River basin in South Carolina that report daily streamflow, stage, or lake elevation data. An additional 69 gaging stations are no longer active but previously collected daily streamflow or stage data. Eleven of the active gaging stations report mean daily discharge (flow) data.

Supported by data from the active and inactive gaging stations, the Simplified Water Allocation Model (SWAM), pictured in Figures ES-7 and ES-8, simulates the surface water stream network of the Savannah River system, including the Lower Savannah River, and the Salkehatchie River basin. The model quantifies current and future surface water availability based on natural hydrology and current and projected water demand. It also simulates future water management strategies to identify risks and reliability of surface water utilization. It is used throughout this analysis to help characterize surface water availability under different scenarios.

Coosaw Farms (courtesy Brad O'Neal)

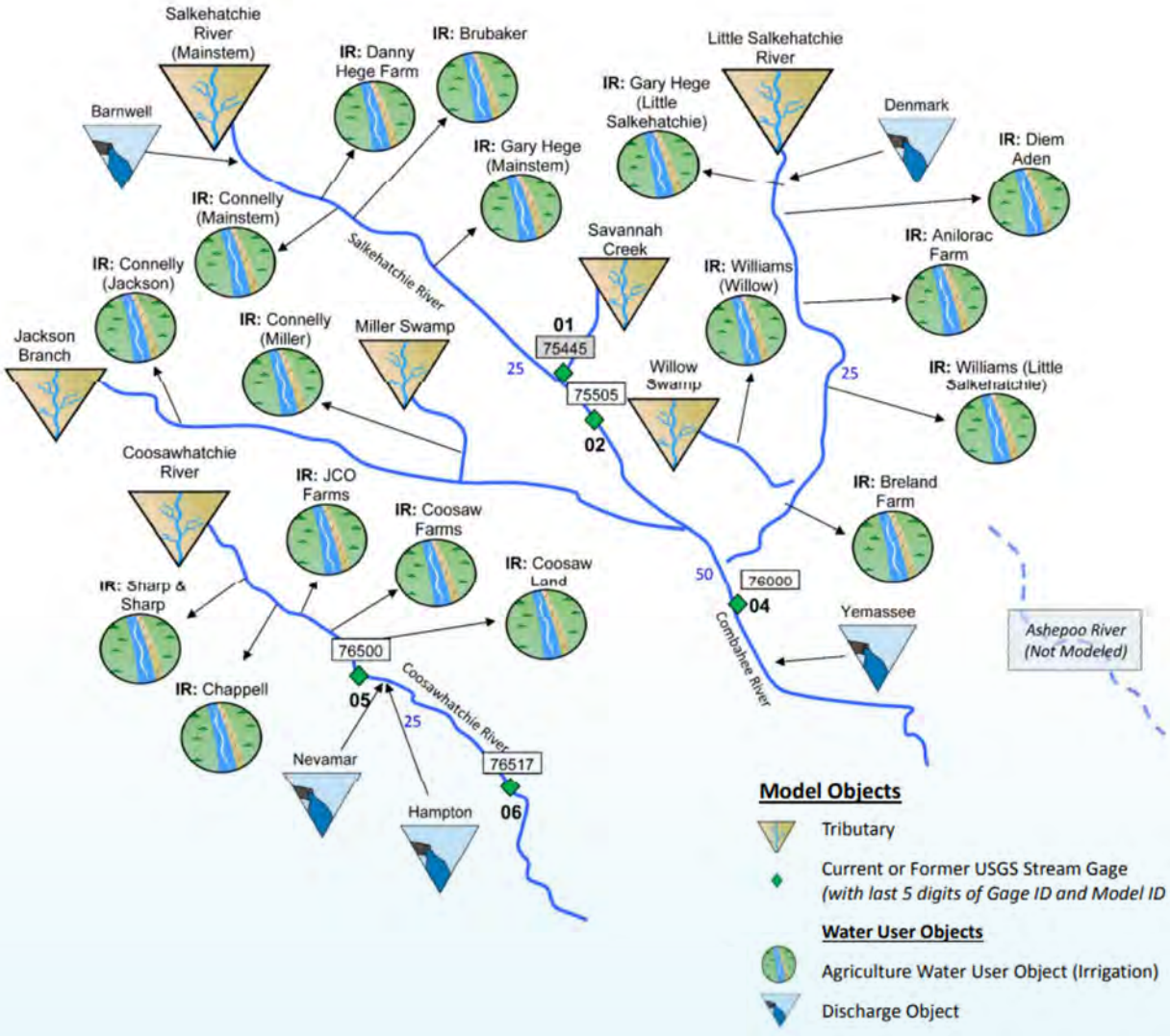


Figure ES-8. Simplified Water Allocation Model framework of the Salkehatchie River basin.

GROUNDWATER SUMMARY

The Lower Savannah-Salkehatchie River basin is underlain by the Coastal Plain aquifer system, a wedge of layered aquifers and confining units that begins at the Fall Line and thickens toward the coast (Figure ES-9). Aquifers in the Coastal Plain are composed of permeable sand or limestone units.

The lowermost aquifers in the basin are the Gramling and Charleston aquifers, which are rarely accessed by wells. The overlying McQueen Branch aquifer reaches depths of almost 1,500 feet in southern Hampton County, where the aquifer reaches a thickness of about 300 feet. McQueen Branch wells in the central part of the basin can produce more than 2,000 gallons per minute (gpm) (SCDNR 2009), while the McQueen Branch aquifer is generally not used for water supply in coastal areas because of its depth, its relatively poor ability to yield water, and more readily available water in shallower aquifers.

Overlying the McQueen Branch aquifer are the Crouch Branch, Gordon, Middle and Upper Floridan, and surficial aquifers. Wells in the Crouch Branch aquifer are an important supply source, with well yields as high as 1,000 gpm (SCDNR 2009). The Gordon aquifer underlies the Floridan system across most of the basin and is an important source of water for domestic supply, public supply, light irrigation, and industry. The Floridan aquifer system is one of the most productive aquifer systems in the United States and has substantial volume pumped from it in southern South Carolina and coastal Georgia. The Floridan aquifer system is the primary groundwater source in all but the upper part of the basin (SCDNR 2009). The top of the Floridan aquifer usually occurs within 50 to 100 feet of land surface, while the base of the aquifer is at its deepest in southern Beaufort County, where it occurs at about 600 feet. The limestone of the Floridan aquifer is more transmissive than other sand aquifers in South Carolina, allowing for well yields that can exceed 2,000 gpm.

The surficial aquifer is shallow, unconfined, and hydraulically connected to surface water, and is often referred to as the water-table aquifer. Groundwater levels in the surficial aquifer show more seasonal fluctuation and have more limited available drawdowns compared to those of the deeper confined aquifers. Surficial aquifer wells generally yield less than 75 gpm and are typically used for domestic and light commercial purposes (SCDNR 2009). Near the coast, where water in the Floridan aquifer is brackish, the surficial aquifer is used for domestic water supplies.

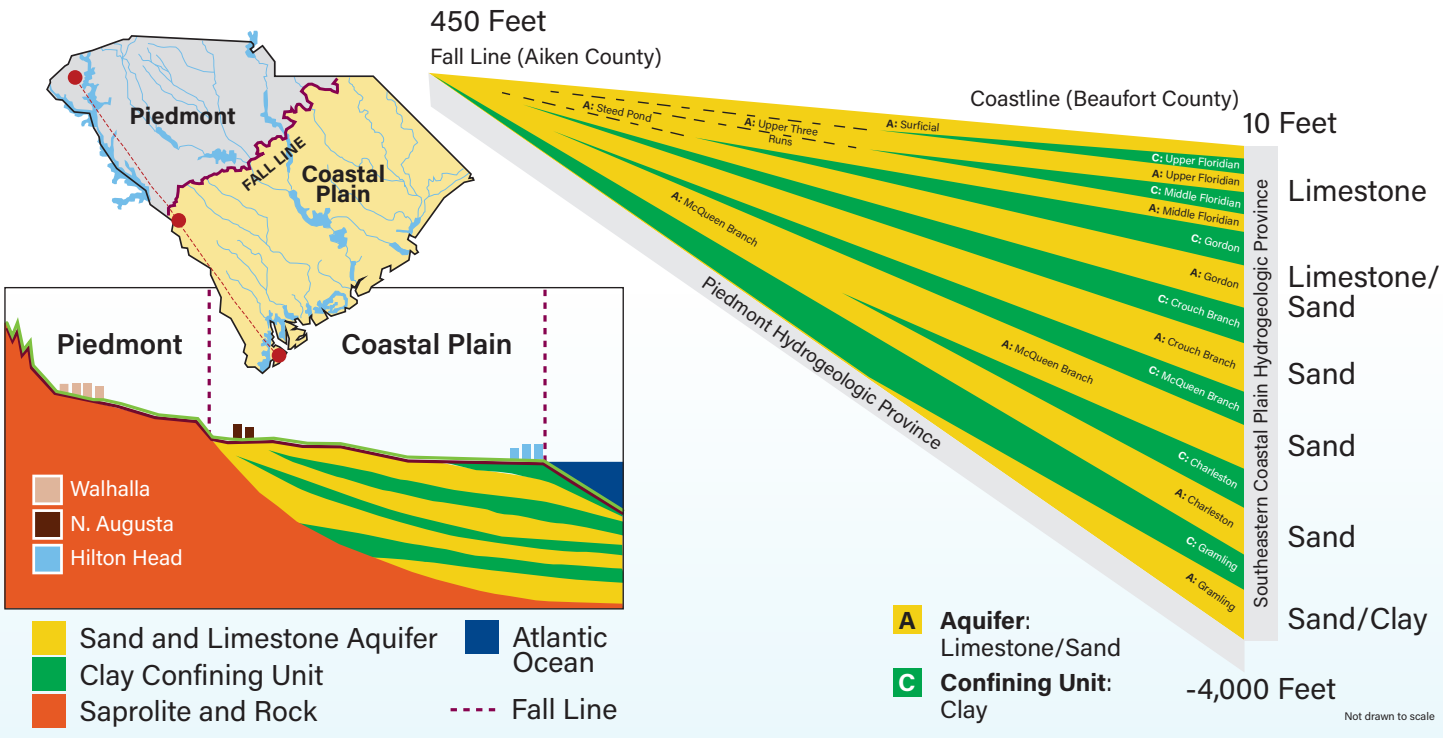


Figure ES-9. Coastal Plain aquifer system schematic cross section adapted from SCDNR 2023b.

Waddell Mariculture Center Field Trip

Under South Carolina's Groundwater Use and Reporting Act (Chapter 5, Section 49-5-60), a Capacity Use Area (CUA) is designated where excessive groundwater withdrawals present potential adverse effects to natural resources, public health, safety, or economic welfare. SCDES then coordinates with affected governing bodies and groundwater withdrawers to develop a groundwater management plan for the CUA. The basin includes parts of two CUAs: the Western CUA in the upper Coastal Plain and the Lowcountry CUA in the western lower Coastal Plain. Although there are no major cones of depression in this area, groundwater monitoring wells illustrate long-term water-level declines of up to 15 feet in the Floridan/Gordon, Crouch Branch, and McQueen Branch aquifers (Foxworth and Hughes 2019). The Lowcountry CUA was established due to concerns of saltwater intrusion from water-level declines observed in the Upper Floridan aquifer near Savannah, Georgia, and at Hilton Head Island (Berezowska and Monroe 2017). Much of the updip area of the Upper Floridan aquifer is unaffected by this pumping, and groundwater levels are close to predevelopment conditions (USGS 2010). There has been a decline in groundwater use since 2004 that has resulted in a rebound in groundwater levels (Berezowska and Monroe 2017). Regulatory groundwater permit limits enacted on Upper Floridan aquifer withdrawals at Hilton Head combined with alternative surface water and groundwater from deeper aquifers have caused a leveling off of the Upper Floridan aquifer at Hilton Head.

Many small towns and communities in the Lower Savannah-Salkehatchie River basin are solely dependent on groundwater supplies. Most larger water providers, for example the City of Aiken and the Beaufort-Jasper Water and Sewer Authority, use groundwater but also have access to surface water supplies. The public water supply and agriculture sectors are by far the largest users of groundwater.

Near the coast, some municipal water providers have implemented ASR programs to store treated water in aquifers when water demand is low and extract the stored water when demand is high. Beaufort-Jasper Water and Sewer Authority injects and stores approximately 300 million gallons of water from the Savannah River in the Middle Floridan aquifer each year (Chemsak 2025). The HHPSD extracts brackish water from the Middle Floridan aquifer, removes the salt using reverse osmosis, and returns it to the same aquifer for storage, storing about 260 million gallons each year (Nardi 2025).

WATER DEMAND SUMMARY

Figures ES-10 through ES-14 summarize the current and projected water demands in the Lower Savannah-Salkehatchie River basin. Total current water use in the South Carolina portion of the basin is approximately 246.4 MGD, 42.5 MGD of which is from the Salkehatchie basin and 203.9 MGD of which is from the Lower Savannah basin. Approximately 76 MGD of this total demand is withdrawn from groundwater, with the rest coming from surface water. Current withdrawals in the Lower Savannah basin are dominated by thermoelectric water use, which represents 50.5 percent of the basin's total withdrawal; however, only 2.5 percent of water withdrawn for thermoelectric use is used consumptively with the remaining 97.5 percent being returned to streams and rivers downstream. In the Salkehatchie basin, agriculture dominates current withdrawals. In both basins, public supply is the second largest use category (35.3 and 18.4 percent of total basin withdrawals in the Lower Savannah and Salkehatchie basins, respectively). Current total water use by category for the Lower Savannah and Salkehatchie River basins are shown in Figure ES-10.

Of the 170.4 MGD of total basin surface water withdrawal from South Carolina water users, an estimated 22 percent (37 MGD) of the water is consumptively used and 78 percent (134 MGD) is returned to streams and rivers after use. Consumptive use was not calculated for groundwater users. Because of the type and age of collection systems, discharge data suggests there may be substantial inflow and infiltration which hinders the calculation of consumptive use. Additionally, approximately 171 MGD of surface water is withdrawn from Georgia-side water users in the basin.

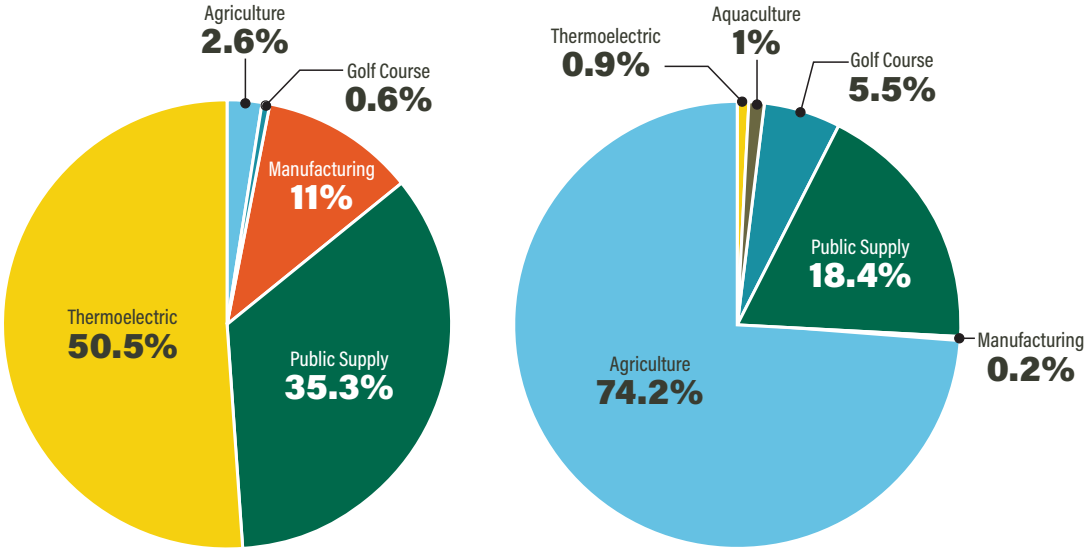
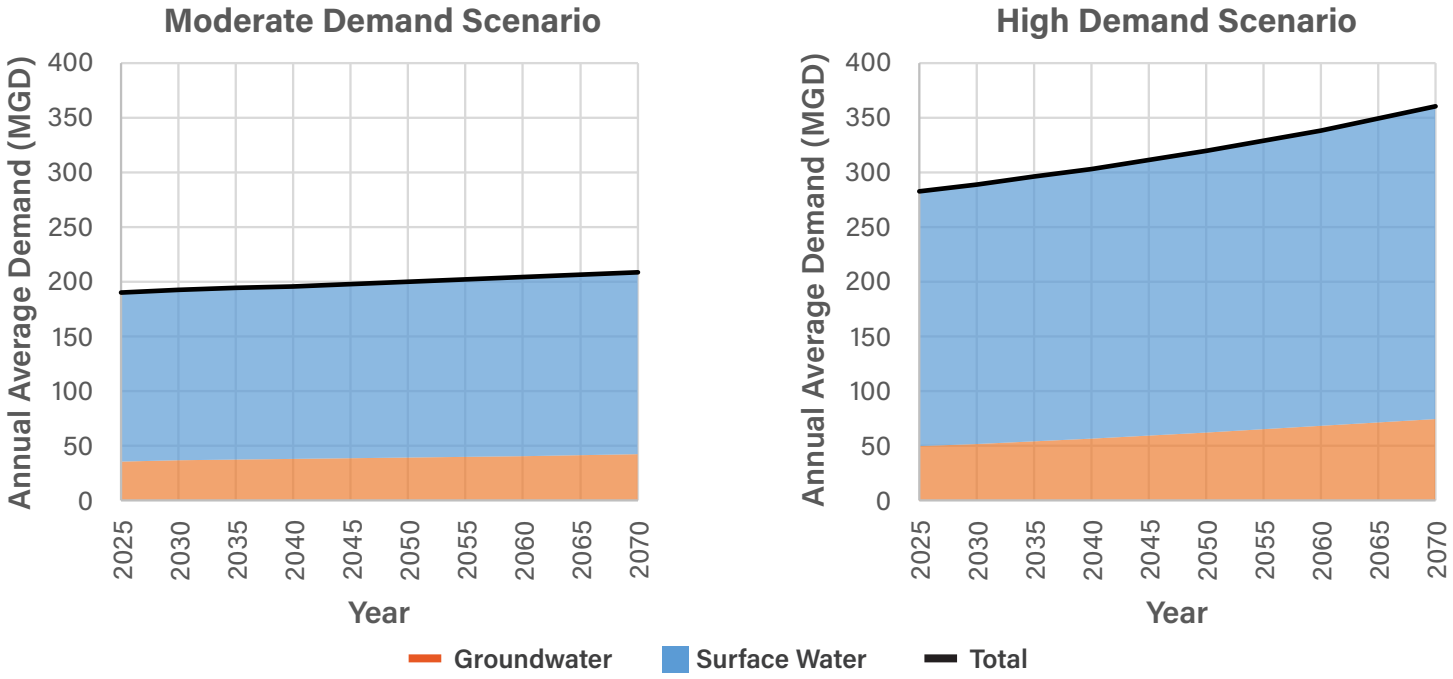


Figure ES-10. Current total water use category percentages of total demand for Lower Savannah (left) and Salkehatchie (right) basins.

For this planning effort, two future demand scenarios were developed: the Moderate Demand Scenario, which is based on median rates of water use in recent reporting and moderate growth projections, and the High Demand Scenario, which is based on the maximum monthly rates of water use in recent reporting and high growth projections. From 2025 to 2070, total water demand in the Lower Savannah River basin is projected to increase by 10 percent from 190 MGD to 209 MGD for the Moderate Demand Scenario, and by 28 percent from 282 MGD to 360 MGD for the High Demand Scenario (Figure ES-11). Over the same time period in the Salkehatchie River basin, total water demand is projected to increase by 24 percent from 42 MGD to 52 MGD for the Moderate Demand Scenario, and by 36 percent from 73 MGD to 99 MGD for the High Demand Scenario (Figure ES-12). The Moderate and High Demand Scenarios have different starting points from one another and differ from the current use because the Moderate Demand Scenario is based on each user's median recent use, the High Demand Scenario is based on each user's maximum recent use, and the Current Use Scenario is based on each user's average recent use.

Most of the water demand growth in both the Lower Savannah and Salkehatchie River basins is expected to come from increasing demand for public water supply, as shown in Figures ES-13 and ES-14. In the Moderate Demand Scenario for the Salkehatchie River basin, public supply demands are projected to initially decrease with decreasing population, then rise, returning to approximately starting 2025 demands. All of the public supply comes from groundwater in the Salkehatchie River basin. Thermoelectric, golf course, and aquaculture demands in both basins were held constant across the planning horizon.

Projected water demands in the Lower Savannah River basin are well below the total permitted and registered surface and groundwater amount of 1,506.9 MGD in the basin. In the Salkehatchie River basin, projected 2070 demands reach 84 percent of total permitted and registered amounts for the High Demand Scenario and 44 percent for the Moderate Demand Scenario. Permitted and registered withdrawals are not, however, proxies for water availability in the basin, because sufficient flows to satisfy such withdrawals rates cannot be guaranteed into the future.



*This total demand includes thermoelectric demand, almost all of which is returned downstream.

Figure ES-11. Lower Savannah River basin total water demand projections by water source.

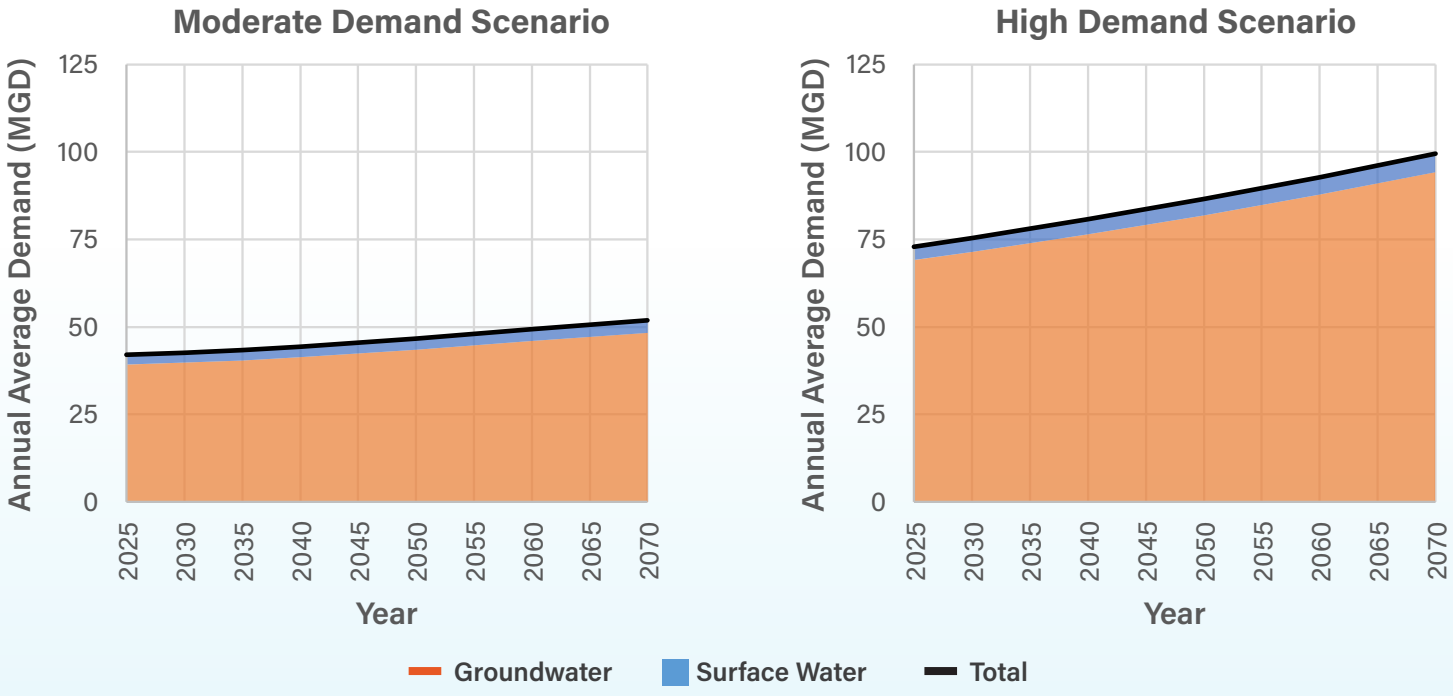


Figure ES-12. Salkehatchie River basin total water demand projections by water source.

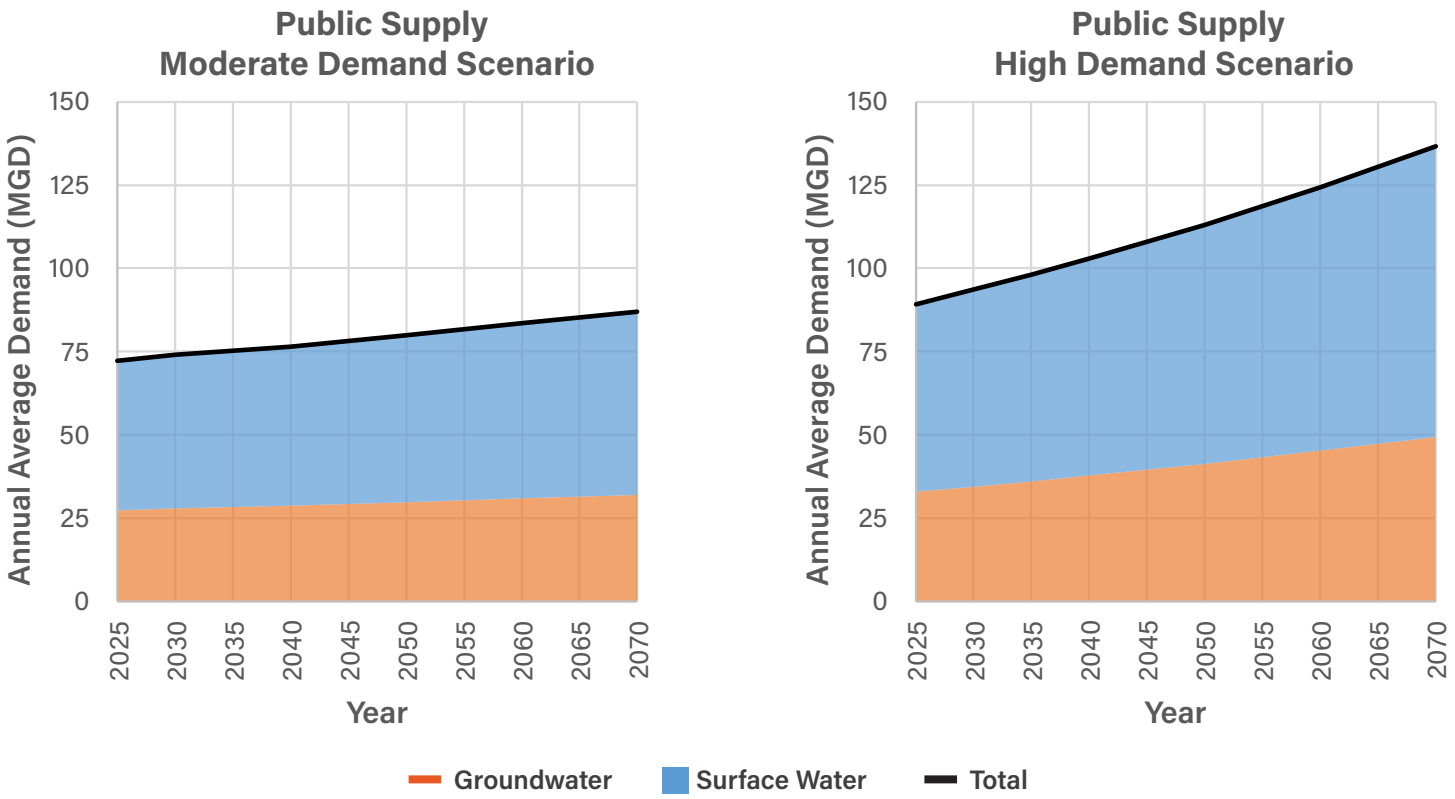


Figure ES-13. Lower Savannah River basin projected public supply water demands.

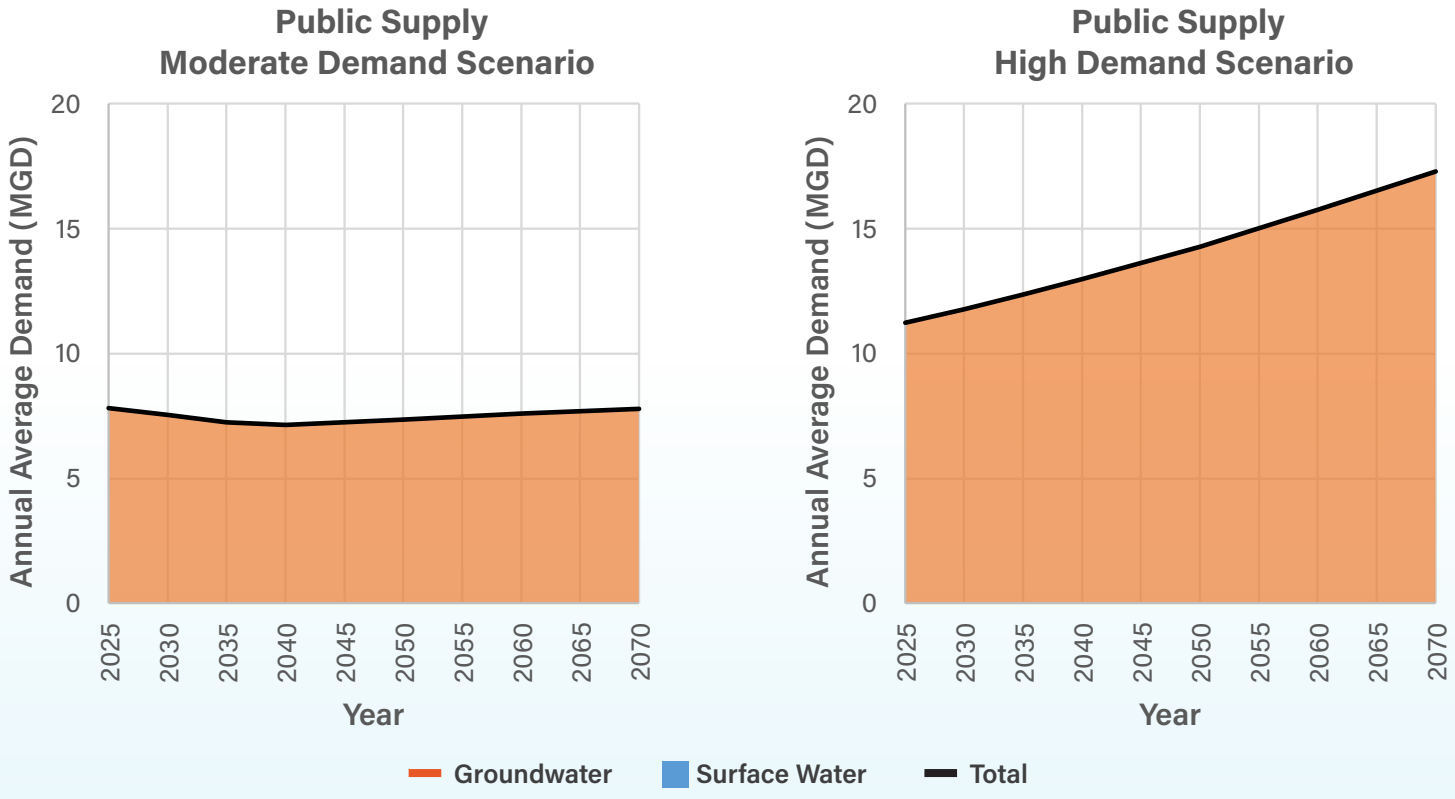


Figure ES-14. Salkehatchie River basin projected public supply water demands.

Tidal Flats at Mitchelville Beach and Port Royal Sound Near Palmetto Hall, Hilton Head Island, South Carolina

WATER AVAILABILITY SUMMARY

Surface water quantity models were used to evaluate surface water availability using current and projected water demands. No calibrated groundwater model was available for the Lower Savannah-Salkehatchie basin during this initial planning period; however, groundwater resources were evaluated by considering historical trends in aquifer levels and accounting for past, present, and projected future groundwater pumping. The results of surface water modeling helped the RBC identify several key observations and conclusions about the availability of surface water resources in the Lower Savannah-Salkehatchie River basin. These key conclusions, presented in the subsection below, led to the RBC evaluating and selecting a suite of water management strategies to promote the sustainable use of the resource and maintain adequate river flows during low flow conditions. Section ES-5 summarizes the evaluation and selection of water management strategies.

In accordance with the Framework, multiple planning scenarios were conducted to evaluate different levels of water demands. The demand scenarios were superimposed on historical hydrology, reflecting conditions over the 82-year period from 1939 through 2021 for the Lower Savannah River basin and the 71-year period from 1951 through 2021 for the Salkehatchie River basin. The following scenarios were evaluated in this analysis:

- **Current Scenario.** A snapshot in time of current demands.
- **Moderate Demand Scenario.** Projected moderate increase in demands through 2070.
- **High Demand Scenario.** Aggressive assumptions of water demand based on maximum monthly rates of water use in recent reporting and high population and demand growth through 2070. This scenario represents an unlikely maximum for total water demand because it is very unlikely these demands would occur month after month and year after year for all water users; however, this scenario provided the RBC with information on which to base conservative management strategies.
- **Permitted and Registered (P&R) Scenario.** A hypothetical scenario in which all existing permitted and registered water users withdraw water at their fully permitted or registered amount. This scenario also represents an unlikely maximum for total water demand because most water users are not expected to need to withdraw their fully permitted or registered amount even 50 years from now, nor would they need to withdrawal at that level month after month and year after year.
- **Unimpaired Flow (UIF) Scenario.** The RBC requested a fifth scenario be run to understand naturally occurring water in the absence of any human impacts (no withdrawals or returns and no reservoirs).

Cherry Point Water Reclamation Facility (photo courtesy BJWSA)

Following are the specific observations and conclusions relative to each planning scenario.

- **Current Use Scenario.** Surface water availability modeling suggests a low risk of water supply shortages under the Current Use Scenario. Shortages are projected for five agricultural water users on tributary streams and the Coosawhatchie River. These withdrawals are mostly located either on or adjacent to impoundments that are not included in the model, which may provide enough water to prevent the projected physical shortages at times when low flows are simulated.

- **P&R Scenario.** Results of this hypothetical and unlikely scenario, which include projected shortages for 10 agricultural operations, two public water suppliers, and one golf course, demonstrate that the surface water resources of the basin are overallocated based on existing permits and registrations. The public water suppliers and golf course with shortages are all permitted to withdraw amounts much larger than their current average annual demands.

- **Moderate Demand Scenario.** Given current climate conditions and existing basin management and regulatory structure, basin surface water supplies are predicted to be adequate to meet increased demands through the 2070 planning horizon, resulting from moderate economic and population growth. Shortages are projected for five existing agricultural water users plus two projected future agricultural water users, all in the Salkehatchie basin. Agricultural uses are typically supplemented with farm ponds that can provide buffers against short-term low-streamflow conditions. River flows are predicted to decrease modestly in the Lower Savannah basin and more substantially at some locations in the Salkehatchie basin, based on overall higher withdrawal rates. Mean and median flows on the Lower Savannah River at the USACE Dock at Savannah, Georgia are predicted to decrease 1 and 3 percent, respectively, based on 2070 demands.

- **High Demand Scenario.** In the Lower Savannah basin, one municipal water user experiences shortages under the High Demand Scenario through the 2070 planning horizon. All the Salkehatchie basin agricultural water users with shortages in the Moderate Demand Scenario exhibit equal or slightly greater shortages under the High Demand Scenario, and two additional agricultural water users and one additional projected future agricultural water user also experience shortages through the 2070 planning horizon. Agricultural withdrawals are often located either on or adjacent to farm ponds that are not included in the model. River flows are predicted to decrease modestly in the Lower Savannah basin and more substantially at most locations in the Salkehatchie basin. Modeled reductions are most pronounced during low-flow periods. Mean and median flows on the Lower Savannah River at the USACE Dock at Savannah, Georgia are predicted to decrease 2 and 4 percent, respectively, based on 2070 demands.

Hilton Head ASR Well

- **UIF Scenario.** Simulated flows under natural conditions (referred to in the planning framework as "Unimpaired Flows, or UIFs") without surface water users, discharges, or water imports are generally higher than simulated Current Use Scenario flows, as expected; however, on Upper Three Runs on the USDOE's SRS, Current Use Scenario mean flows are approximately 2 percent greater than UIF Scenario mean flows because of the USDOE industrial wastewater discharge upstream. At most locations assessed in the Lower Savannah basin, the Current Use Scenario minimum flows are greater than UIF Scenario flows because of upstream discharges originating from outside of the basin. An exception to this is on Horse Creek at Clearwater, where the Current Use Scenario minimum flow is less than the UIF Scenario minimum flow. At most locations assessed in the Salkehatchie basin, Current Use Scenario minimum flows are less than UIF Scenario minimum flows, which is a contrast from the Lower Savannah basin. It is important to note that under these simulated conditions, the natural rivers on their own would not be able to support the state's targets for minimum instream flow for environmental purposes under all conditions which are computed as percentages of typical (median) conditions, but do not necessarily represent lowest possible flow levels.

To assess potential ecological risk associated with increasing water use in the Lower Savannah basin, biological response metrics developed by Bower et al. (2022) were correlated to model-simulated flows from the various planning scenarios. Based on the model simulations, the Moderate and High Demand Scenarios result in low risk for ecological integrity at the one location assessed (Horse Creek at Clearwater) (The Nature Conservancy et al. 2025). There, the mean daily flow metric for the P&R Scenario results in a moderate risk in terms of fish species richness because of streamflow reductions. Changes in mean daily flow for the P&R Scenario are predicted to substantially reduce the number of fish species, with Horse Creek predicted to lose 27 percent of fish species. Low-risk outcomes in terms of duration of low flow were identified for all scenarios assessed at the Horse Creek location. These findings do not rule out all potential risks to ecological integrity or aquatic biodiversity related to other metrics or flow alterations. Analysis of the relationship between ecologic health and flow characteristics was not performed in the Salkehatchie River basin because of data limitations.

Results and conclusions are based on modeling that assumed historical climate patterns from the past 82 or 71 years, for the Lower Savannah and Salkehatchie River basins, respectively. In subsequent phases of river basin planning, the RBC has identified the need to evaluate potential impacts to water supply availability, resulting from more severe droughts and changing climate, such as increasing temperatures and more variable precipitation.

Groundwater conditions in the Lower Savannah-Salkehatchie River basin were evaluated based on available groundwater monitoring data, potentiometric aquifer surface contours, current groundwater demand, and estimates of future water demand. Water levels are relatively stable basin-wide across all aquifers in response to groundwater development. For a majority of the basin, there have been no significant long-term declines in aquifer levels. The greatest concern in the basin exists in the Upper Floridan aquifer where pumping has created a cone of depression at Savannah, Georgia and Hilton Head Island has been impacted by saltwater intrusion. The aquifers that underly the basin are capable of transmitting large volumes of groundwater to support projected water demand over the planning horizon, but in the absence of testing the demand scenarios with a calibrated groundwater model, this evaluation is only an informed estimate and it is difficult to predict if groundwater supply shortages will exist under reasonable future demand scenarios.

Specific observations and conclusions relative to the groundwater assessment include:

- Water level trends in the Crouch Branch and McQueen Branch aquifers have remained stable over time despite groundwater pumping, demonstrating a pattern of consistent and sufficient recharge to both aquifers.
- Agricultural irrigation is common in the basin, especially in the middle portion of the basin. Irrigation in these areas is projected to continue or increase over the planning horizon. More monitoring wells are needed in this area to understand how future pumping may impact aquifer levels.
- Long term pumping of the Upper Floridan aquifer has caused a reversal of historic groundwater gradients allowing saltwater to intrude into the aquifer on Hilton Head Island. Pumping reductions have stabilized both the cone and water levels. Even with reductions, saltwater plumes continue to move inland across Hilton Head Island. Even if all groundwater withdrawals were eliminated, the plumes would continue to exist well into the future.
- Public water supply demand is expected to increase in Beaufort and Jasper Counties over the next decade. Permit limit regulations enforced on the Upper Floridan aquifer in South Carolina have allowed water levels to stabilize, therefore additional demand must be met using multiple groundwater sources and surface water.

This water availability analysis answered three of the four questions posed on page 7 of this Executive Summary:

1. **What is the basin's current available supply and demand?** Current demands are 203.9 MGD from the Lower Savannah River basin (82 percent from surface water and 18 percent from groundwater) and 42.5 MGD from the Salkehatchie River basin (6 percent from surface water and 94 percent from groundwater). While the available supply varies by location and time, surface water modeling indicated current surface water supplies are generally sufficient to meet current demands. A calibrated groundwater model was not available at the time of this analysis. However, the stability of groundwater levels suggests sufficient supply to meet current demands aside from in the Upper Floridan aquifer where there is a cone of depression near Savannah, Georgia and saltwater intrusion near Hilton Head.
2. **What are the current permitted and registered water uses with the basin?** In the Lower Savannah-Salkehatchie River basin, 1,625 MGD is currently permitted or registered for the following uses: thermoelectric (13 percent of total), public supply (24 percent), manufacturing (55 percent), golf course (1 percent), agriculture (7 percent) and aquaculture (<1 percent).
3. **What will be water demand in the basin throughout the planning horizon, and will the available water supply be adequate to meet that demand?** By 2070, demands for water for the High Demand Scenario, which assumes hot and dry conditions (high irrigation) and high population and economic growth, are projected to reach 360 MGD in the Lower Savannah River basin and 99 MGD in the Salkehatchie River basin. Surface water modeling indicates a low risk of shortages in the High Demand Scenario, and some of the projected shortages may be alleviated by farm ponds not included in the model. Without a groundwater model it is difficult to predict the capacity of the basin's aquifers and whether there is sufficient supply to meet future demand. The RBC recommends the groundwater availability analysis and Plan be updated when a calibrated groundwater model is available.

The answer to question 4, **what water management strategies will be used in the basin to ensure the available supply meets or exceeds the projected demand throughout the planning horizon**, is included in ES-6.

Lower Savannah-Salkehatchie RBC Meeting

Water Management Strategies Evaluated

The Planning Framework identifies a two-step process to evaluate water management strategies. As a first step, proposed management strategies may be simulated using models to assess their effectiveness in eliminating or reducing identified shortages or in increasing water supply. For strategies deemed potentially effective, their feasibility for implementation is addressed considering cost and benefits, consistency with state regulations, reliability, environmental and socioeconomic impacts, and potential interstate or interbasin impacts.

The RBC identified and considered a suite of water management strategies to recommend as part of this River Basin Plan. Demand-side strategies were considered which focus on conserving water, using it more efficiently, and reducing demands by recycling or reusing water for the agriculture, golf, municipal (public water supply), and industrial sectors. Some examples of the municipal demand-side strategies considered include incentives and requirements for low flow fixtures and appliances, conservation-based water rate pricing structures, public education of water conservation, landscape irrigation programs and codes, and water efficiency standards for new construction. For agriculture and/or golf course irrigation, strategies considered include irrigation equipment changes, water audits and nozzle retrofits, and the use of wetting agents on turf grasses.

The RBC did not focus on identifying new supply-side strategies (strategies that increase the amount of surface water or groundwater available for withdrawal) because modeling results of the High Demand Scenario did not indicate any significant Surface Water Shortages and analysis suggests that groundwater resources are likely sufficient to meet future demands through the 2070 planning horizon. Instead, the RBC considered the continuation of existing supply-side management strategies and the implementation of future supply-strategies, should conditions change. Supply-side strategies already being used include recycled water (which could be considered both a demand-side and supply-side strategy) for irrigation; onsite retention of stormwater via impoundments for irrigation; conjunctive use of surface water and groundwater; interconnections and regionalization of public water supply systems; interbasin transfers (e.g., from the Lower Savannah River basin to the Salkehatchie River basin); and ASR.

Lower Savannah-Salkehatchie RBC Meeting

ES-6

Savannah River Canal (photo courtesy BJWSA)

Recommendations

RECOMMENDED WATER MANAGEMENT STRATEGIES

The RBC's water management strategy recommendations align with their vision and goal statements developed for the Lower Savannah-Salkehatchie River basin. By assessing and recommending these specific strategies, the stakeholders who make up the RBC are recommending actions that help achieve their vision statement: "***Shared water resources are managed to sustainably meet the needs of all stakeholders in the Lower Savannah and Salkehatchie basins now and into the future.***" The recommended strategies support the RBC's goals to ***develop water use strategies, policies, and legislative recommendations so that the Lower Savannah-Salkehatchie River basins are resilient, to enhance collaboration between all stakeholders, including those in Georgia and the Upper Savannah Basin, and to educate and inform local governments and others***.

Supply-side Strategies: Due to the very low risk of surface water shortages or ecological degradation throughout the basin, the RBC did not recommend any additional supply-side strategies beyond those currently employed. The RBC recognized, however, that changing conditions beyond those examined could require supply-side strategies be implemented to reduce or eliminate potential surface water shortages. To help prepare for such uncertainties, the RBC recommended the following for future consideration:

- Potential expansion of recycled water programs for new golf courses, agriculture, construction, and industry.
- A study on the potential for ASR throughout the basin to encourage the expansion of this strategy.
- Creation of a groundwater barrier via injection of reclaimed water to help prevent saltwater intrusion. This could help protect the integrity of coastal groundwater as a potable water source, but would require a change to existing state law and regulations.

Adaptive Management: Though the simulation of historic conditions revealed low risks for the Lower Savannah-Salkehatchie Basin with respect to water availability and ecological flow needs, the RBC emphasized that future uncertainties should not be ignored. In keeping with a predominant trend throughout the United States, an adaptive approach, in which water users and the RBC continually monitor and evaluate emerging risks and respond accordingly, is recommended. This avoids over-investment now, and can ward off under-investment if risks are recognized in time. Specific risks or conditions that the RBC recommends monitoring and planning for as needed include:

- Climate change
- Population growth
- Irrigation demand
- Infrastructure maintenance
- Industrial growth and types of industry in the basin
- Cyberwarfare
- Future land use patterns
- Extreme flood events
- Modeling and data gaps
- Georgia water use
- Energy uncertainty and loss of power
- Per- and polyfluoroalkyl substances (PFAS, also known as "forever chemicals"), other emerging contaminants, and other water quality impacts

Demand-side Strategies: To help guard against unforeseen water shortages and ecological impacts, and to promote stewardship of the water resources in the basin, the RBC recommended a suite of municipal, industrial, and agricultural demand-side water management strategies. The RBC did not prioritize these recommendations, as they recognized that their applicability varies between users. Recommended strategies are summarized in Table ES-1:

Table ES-1. Recommended demand-side water management strategies

Municipal Conservation and Efficiency Practices	Agricultural Conservation and Efficiency Practices	Industrial Conservation and Efficiency Practices
Public Education of Water Conservation	Water Audits and Nozzle Retrofits	Water Audits
Conservation Pricing Structures	Irrigation Scheduling and Smart Irrigation	Rebates on Energy-Efficient Appliances
Leak Detection and Water Loss Control Programs	Soil Management and Cover Copping	Water Recycling and Reuse
Water Waste Ordinance	Crop Variety, Crop Type, and Crop Conversion[1]	Water-Saving Equipment and Efficient Water Systems
Advanced Metering Infrastructure (AMI) and Automated Meter Reading (AMR)	Irrigation Equipment Changes	Water-Saving Fixtures and Toilets
Landscape Irrigation Program and Codes/ Time-of-Day Watering Limit	Future Technologies	Educating Employees about Water Conservation
Recycled Water Programs Using Utility-Provided Reclaimed Water for Irrigation and Other Uses	Wetting Agents (golf courses)	
	Recycled Water Programs, Including Use of Utility-Provided Reclaimed Water for Irrigation[2]	

[1] Not all agriculture, forestry, and irrigation water interest category representatives on the RBC support this strategy. Crop types cannot be easily changed without major expenditures on equipment. Furthermore, the type of crop grown is often market driven.

[2] Utility-provided reclaimed water is already used for irrigation of golf courses in the basin and it may be an option for some agricultural operations, but the RBC recognizes that there are limitations and it should not be considered a universal recommendation for agricultural irrigation.

DROUGHT RESPONSE RECOMMENDATIONS

Ongoing drought management in South Carolina occurs at the state, regional, and local levels. At the state level, SCDNR/ SCDES develops, coordinates, and executes a statewide drought mitigation plan. The state also created the South Carolina Drought Response Committee (DRC) to be the major drought decision-making entity in the state. The DRC is a statewide committee chaired and supported by SCDES, SCDNR, and the State Climatology Office (SCO), with representatives from local interests. Because the severity and impact of drought conditions can vary across the state, SCDNR delineated four Drought Management Areas (DMAs) that generally follow the major basin divides within the state (recognizing that some of the eight basins with RBCs flow into other basins downstream). The Lower Savannah-Salkehatchie River basin is partly within the West DMA (shared with the Upper Savannah, Saluda, and Edisto Basins) and partly within the Southern DMA (shared with the Edisto and Santee Basins).

Coordination and Communication:

Under the Planning Framework, the RBC will support drought response, collect drought information, and coordinate drought response activities. With the support of SCDES, the RBC will:

- Collect and evaluate local hydrologic information for drought assessment
- Provide local drought information and recommendations to the DRC regarding drought declarations
- Communicate drought conditions and declarations to the rest of the RBC, stakeholders, and the public
- Advocate for a coordinated, basinwide response by entities with drought management responsibilities (e.g., water utilities, reservoir operators, large water users)
- Coordinate with other drought management groups in the basin as needed

Hilton Head Reverse Osmosis Water Treatment Plant

Drought Recommendations:

- The RBC recommends that water utilities review their drought management plan and response ordinance every 5 years and review and update every 10 years or more frequently if conditions change.
- The RBC recommends that state funding be made available to water utilities to support the review and update of drought management plans.
- The RBC encourages water utilities in the basin to consider drought surcharges on water use during severe and/or extreme drought phases.
- The RBC encourages water users and those with water interests to submit drought impact observations through the Condition Monitoring Observer Reports (CMOR).
- The RBC recommends that each RBC have representation on the DRC. The Lower Savannah-Salkehatchie RBC will communicate drought conditions and responses within the basin to the DRC through this representative.

POLICY, LEGISLATIVE, REGULATORY, TECHNICAL, AND PLANNING PROCESS RECOMMENDATIONS

During the final phase of the planning process, the Lower Savannah-Salkehatchie RBC developed, considered, and agreed on various policy, legislative, and regulatory recommendations. The RBC also offered technical recommendations and suggestions for improving the planning process in other river basins throughout the state. The following subsections summarize these recommendations.

Policy, Legislative, and Regulatory Recommendations

The Lower Savannah-Salkehatchie RBC engaged in discussion about issues and concerns with existing policies, laws, and regulations governing water withdrawals and water use. The following recommendations in Table ES-2 are intended to guide SCDES and the Legislature when considering changes to existing policies, laws, and regulations that govern water withdrawals and assist local government efforts to protect water resources.

Table ES-2. Lower Savannah-Salkehatchie RBC policy, legislative, and regulatory recommendations.

Policy, Legislation, and Regulatory Recommendations	▪ Improve the current laws that allow for regulation of water use so that they are effective and enforceable. ▪ The South Carolina Surface Water Withdrawal, Permitting, Use, and Reporting Act should allow for reasonable use criteria to be applied to all surface water withdrawals (with some caveats), like those that currently exist for groundwater withdrawals. ▪ The Legislature should approve and adopt the State Water Plan and subsequent updates. ▪ The South Carolina Legislature should establish a grant program to help water users implement the actions and strategies identified in the legislatively approved State Water Plan. ▪ The water withdrawal permitting process should specifically assess the permit application's alignment with the legislatively approved State Water Plan. ▪ Recognizing that the resources of the Savannah River Basin are finite and shared between the states, the Governor of South Carolina should communicate with the Governor of Georgia to establish a coordinated, state-level planning and water management process for the Savannah River Basin and their shared groundwater aquifers. ▪ The SC Legislature should support matching or incentivizing County Green Space Sales and Use Tax programs to establish balance among water and land uses (e.g., agricultural, residential, industrial, recreational, and instream requirements).
Local Government Recommendations to Protect Water Resources	▪ Local governments and land managers should coordinate to reduce sediment loading to waterways. ▪ Towns and counties should develop stormwater design manuals that promote responsible development, protect water resources, and prioritize redevelopment over new development.

Technical and Program Recommendations

The RBC may make technical and program recommendations to address any data gaps or information needs identified during the river basin planning process. The following recommendations in Table ES-3 should be taken as considerations for future phases of the river basin planning process. To implement these recommendations, the Lower Savannah-Salkehatchie RBC will need support from SCDNR, SCDES, and other technical experts.

Table ES-3. Lower Savannah-Salkehatchie RBC technical and program recommendations.

Groundwater Analysis Recommendations	▪ SCDES should continue to work with the USGS to develop a groundwater model covering the Lower Savannah-Salkehatchie basin and use the model to better understand the capacity of each aquifer and its ability to sustain future demands. ▪ A groundwater model should be used to analyze and predict chloride levels in the Upper Floridan and Middle Floridan aquifers in Beaufort County. ▪ Funding should be provided to SCDES to add monitoring wells in the central part of the basin, such as Colleton, Bamberg, and Hampton counties, in deeper aquifers. ▪ The RBC also noted the need to coordinate with Georgia on the use and impacts to the shared groundwater resources.
Modeling and Data-Related Recommendations	▪ Future surface water modeling should incorporate scenarios that further examine future uncertainties, such as changes in rainfall and hydrology, alternative population growth scenarios, and potential impacts of future development on runoff. ▪ Fund and establish a mesoscale network of weather and climate monitoring stations. ▪ The RBC will support continued efforts to maintain and expand streamflow gages.
Technical Study Recommendations	▪ Future planning efforts should include evaluation of surface water quality. ▪ The state should request for and cost-share in the completion of Phase 2 of the USACE Comprehensive Study and Drought Plan Update. ▪ SCDES should study the use of indirect potable reuse.
Water Resource Protection Recommendations	▪ Encourage the building permitting process where applicable to require developers work with water/wastewater utilities to ensure adequate availability/capacity.

Recommendations to Improve the River Basin Planning Process

Table ES-4 lists the recommendations that should be considered for development of future river basin plans.

Table ES-4. Lower Savannah-Salkehatchie RBC recommendations to improve the river basin planning process.

Recommendations to Promote Findings and Coordinate Implementation	▪ WaterSC should consider recommendations from the RBCs. ▪ RBC members should communicate with legislative delegations throughout the river basin planning process to promote their familiarity with the process and its goals and to generate buy-in on its recommendations. ▪ The RBC will support and promote outreach and education to increase awareness with the general public around watershed-based planning.
Recommendations to Improve Communication Among RBCs and Other Groups	▪ SCDES, the RBC Planning Teams, and the RBCs should conduct regular reviews of the RBC membership to sustain and make sure all interest categories are adequately represented and attendance across all interest categories meets the requirements of the RBC Bylaws. ▪ SCDES should organize an annual state-wide meeting of RBCs and State agencies. ▪ As part of future water planning efforts, the RBC should attempt to increase engagement with USACE Planning Division and the USDOE. ▪ The RBC, with the support of SCDES, should communicate with the Georgia Environmental Protection Division (GAEPD) to coordinate and communicate with the Coastal Georgia Regional Council.
Funding Recommendations	▪ The South Carolina Legislature should continue to fund state water planning activities, including river basin planning. ▪ SCDES should designate staff to continue to coordinate and support ongoing RBC activities.

Artesian Well at Little Hell Landing on Savannah River (courtesy Bill Wabbersen)

Lower Savannah-Salkehatchie River Basin Plan Implementation

The Lower Savannah-Salkehatchie RBC identified seven implementation objectives for its River Basin Plan. These seven objectives were developed based on themes that emerged from the recommendations made in previous chapters. The Planning Framework provides the RBC the opportunity to prioritize these objectives. The Lower Savannah-Salkehatchie RBC implementation objectives are listed below, and discussed further in Table ES-5, which lists some of the short-term strategies and actions for these objectives.

Objective 1. Improve water use efficiency to conserve water resources

Objective 2. Engage Georgia in Water Planning

Objective 3. Communicate, coordinate, and promote findings and recommendations from the River Basin Plan

Objective 4. Promote engagement in the water planning process

Objective 5. Enhance understanding of groundwater resources

Objective 6. Improve technical data and understanding of water resource management issues

Objective 7. Improve drought management

Table ES-5. Implementation objectives and representative short-term strategies and actions.

Objective	Representative Short-Term (5-Year) Strategies and Actions[1]
Objective 1. Improve water use efficiency to conserve water resources	**MUNICIPAL** ▪ RBC and SCDES identify funding opportunities and technical assistance ▪ RBC encourages water utilities to conduct a water loss/leak detection audit using AWWA M36 Method, establish a baseline, and continue to measure every 2-3 years ▪ RBC implements outreach and education program about recommended water management practices and funding opportunities ▪ RBC develops survey of practices implemented, funding issues, and funding sources utilized **AGRICULTURAL** ▪ RBC and SCDES identify funding opportunities ▪ RBC implements outreach and education program about recommended water management practices and funding opportunities **INDUSTRIAL** ▪ RBC develops and implements outreach and education programs about recommended water management practices ▪ RBC reviews and analyzes water usage to improve understanding of water savings of strategies

Table ES-5. Implementation objectives and representative short-term strategies and actions. (continued)

Objective	Representative Short-Term (5-Year) Strategies and Actions[1]
Objective 2. Engage Georgia in Water Planning	▪ RBC communicates with SCDES, the Governor's Office, and legislative representatives to resume a coordinated, on-going, interstate-level planning process ▪ SCDES and RBCs work with GAEPD and their Regional Water Councils to have an annual meeting, and/or otherwise participate in each other's meetings
Objective 3. Communicate, coordinate, and promote findings and recommendations from the River Basin Plan	▪ RBC advocates that the Legislature adopt the State Water Plan ▪ RBC develops talking points/script to provide consistent messaging ▪ RBC tracks which representatives have been spoken to and by whom from the RBC ▪ RBC develops communication plan to coordinate with WaterSC and promote RBC-developed recommendations ▪ WaterSC considers recommendations developed by all RBCs in planning activities
Objective 4. Promote engagement in the water planning process	▪ SCDES and RBC conduct outreach to promote membership for under-represented groups as necessary ▪ SCDES executes annual meeting ▪ SCDES and RBCs work with USACE and USDOE to have annual meetings, and/or otherwise participate in each other's meetings ▪ RBC coordinates with the Upper Savannah RBC where possible ▪ RBC members present at local and state conferences or to local organizations regarding the River Basin Plan and process ▪ Counties and municipalities consider amendments to permitting process
Objective 5. Enhance understanding of groundwater resources	▪ USGS completes updates to the South Atlantic Coastal Plain Groundwater model and subregional models of the Lower Savannah-Salkehatchie River basins ▪ USGS simulates current and future conditions in the Lower Savannah-Salkehatchie River basins and shares findings with RBC ▪ SCDES seeks funding and drills new monitoring wells in groundwater areas of concern, as needed ▪ Use a groundwater model to simulate chloride levels under various future conditions
Objective 6. Improve technical data and understanding of water resource management issues	▪ RBC conducts outreach to USGS and current funding entities on the importance of streamflow data to the river basin planning process. RBC supports the search for additional funding sources as needed ▪ RBC identifies specific water quality issues and concerns in the basin ▪ SCDES develops scope of study based on input from the WateReuseSC and RBCs and examples from other states ▪ RBC coordinates with the SCO and other RBCs on how to best support appropriation of funding and establishment of network ▪ RBC works with local governments and land managers to incorporate best management practices into land use, planning, zoning, and permitting processes
Objective 7. Improve drought management	▪ Public suppliers on the RBC review and update their drought management plans and send them to the SCO ▪ Public suppliers on the RBC consider ways to incorporate RBC drought management recommendations into their drought plans ▪ SCDES and SCDNR communicates funding needs to Legislature ▪ RBC executes outreach strategy and updates materials as necessary ▪ RBC develops approach to track updates to drought management plans in the basin ▪ RBC conducts outreach to State and USACE to communicate recommendations

[1]*These examples are representative and do not reflect the complete list developed by the RBC, which are in Table 10-2 of the Lower Savannah-Salkehatchie River Basin Plan.*

Little Salkehatchie River

FUNDING OPPORTUNITIES

Existing external funding sources may be leveraged to promote implementation of the objectives outlined in Chapter 10.1.1. For example, EPA's Water Infrastructure Finance and Information Act program offers funding to support eligible water and wastewater infrastructure projects including those related to drought prevention, reduction, and mitigation. Other funding to support drought mitigation efforts may be available through the Federal Emergency Management Agency's (FEMA's) Hazard Mitigation Grant Program (HMGP). Table 10-3 of the River Basin Plan summarizes federal funding sources for public suppliers that were available at the time this Plan was prepared in May 2025.

The United States Department of Agriculture (USDA) offers numerous programs for farmers and ranchers to reduce risk from drought or to restore land impacted by drought. The Farm Bill has authorized several programs to provide relief to farms and ranches experiencing drought, including the Federal Crop Insurance Program; the Emergency Conservation Program; the Pasture, Rangeland, and Forage Program; and the Livestock Forage Disaster Program. In addition, the Environmental Quality Incentives Program (EQIP) provides assistance to farm operations to conserve water and for other conservation measures. Some EQIP assistance is targeted toward water-conserving efforts in drought-prone regions through the WaterSMART Initiative, a collaboration between the USDA and the U.S. Department of the Interior's Bureau of Reclamation. Table 10-4 of the River Basin Plan summarizes these and other existing USDA funding sources that were available at the time this Plan was prepared in May 2025.

In 2022 Congress passed the Inflation Reduction Act (IRA), which may provide additional funding to programs related to agricultural conservation for fiscal years 2023 through 2026. For example, of the $20 billion allotted to the USDA, Section 21001 of the IRA assigned $8.5 billion in addition to amounts otherwise available to an existing USDA program, EQIP. On January 20, 2025, an Executive Order was issued requiring all agencies to immediately pause the disbursement of funds appropriated through the IRA and for agency heads to review the IRA to enhance their alignment with the administration's new policies. On February 20, 2025, $20 million in contracts for the EQIP, Conservation Stewardship Program, and Agricultural Conservation Easement Programs was released. At the time this Plan was prepared in May 2025, it is unknown if the IRA funding described above will be continued or eliminated.

(courtesy Brad O'Neal)

(courtesy Low Country Regional Water System)

IMPLEMENTATION CONSIDERATIONS

Funding: Water withdrawers may have limited financial capacity to pursue the recommended water management strategies. Agricultural water withdrawers may have limited financial resources to invest in new and potentially expensive water conservation or augmentation strategies. Although some outside funding sources exist, applications for such programs may present a technical or resource barrier to many water withdrawers. Any new funding sources pursued by the RBC with SCDES support may take time to develop, leading to delays in implementation.

Stakeholder Acceptance: The RBC itself has no authority to enforce recommendations in the basin. Therefore, implementation of these strategies is dependent upon effective communication of RBC findings and recommendations to stakeholders. To gain acceptance, water withdrawers must understand and communicate the goals and the recommended strategies as well as have assurance that they are viable and effective in improving balanced access to the basin's water resources.

Agency Cooperation: Some recommended actions require collaboration with SCDES, USGS, the state Legislature, USACE, Governors, and Georgia planning bodies, with the RBC playing a role in recommending and supporting the strategy. Outreach may include direct communication or the development of print or online materials to describe the recommendation, benefits, funding sources, and how these strategies relate to findings from the planning process. Recognizing the importance of support of decision makers, the RBC has included a recommendation to communicate with the legislative delegation throughout the planning process to promote buy-in.

RBC Momentum: To effectively implement the recommended strategies of the River Basin Plan, the RBC must continue to meet as a planning body. The Planning Framework states that the River Basin Plan should not be perceived as a static document and the RBC should not be a stagnant planning body between successive updates. Rather, the RBC is to be "actively engaged in promoting the implementation of the recommendations proposed" and "will continue to meet on a periodic basis to pursue River Basin Plan implementation activities as needed" (SCDNR 2019a). The Lower Savannah-Salkehatchie RBC may also promote coordination with other RBCs, Georgia planning bodies, and between Governors directly.

Consensus-Building: As it did during the development of this plan, the RBC should aim to build consensus where possible during implementation and consider documenting alternative points of view when consensus is not possible. Documenting alternative points of view can be equally valuable to officials who have a role implementing water management strategies and/or recommendations made by a portion of the RBC.

SUMMARY

The Lower Savannah-Salkehatchie RBC, one of eight statewide RBCs to convene, has successfully followed the Planning Framework to develop a River Basin Plan for the Lower Savannah-Salkehatchie River basin. The plan includes recommendations on which the RBC felt they had reached reasonable consensus. In the coming years, the policy and technical recommendations made by the RBC will help inform and support further water planning efforts in the basin.

In addition, the Lower Savannah-Salkehatchie RBC plans to continue sharing information and decisions with the Upper Savannah RBC so that actions and decisions throughout the entire Savannah River basin can be coordinated.

Coosaw Farms (courtesy Brad O'Neal)

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(courtesy Chris Thomason)

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Savannah River at Augusta