EXECUTIVE SUMMARY

PEE DEE RIVER BASIN PLAN 2025

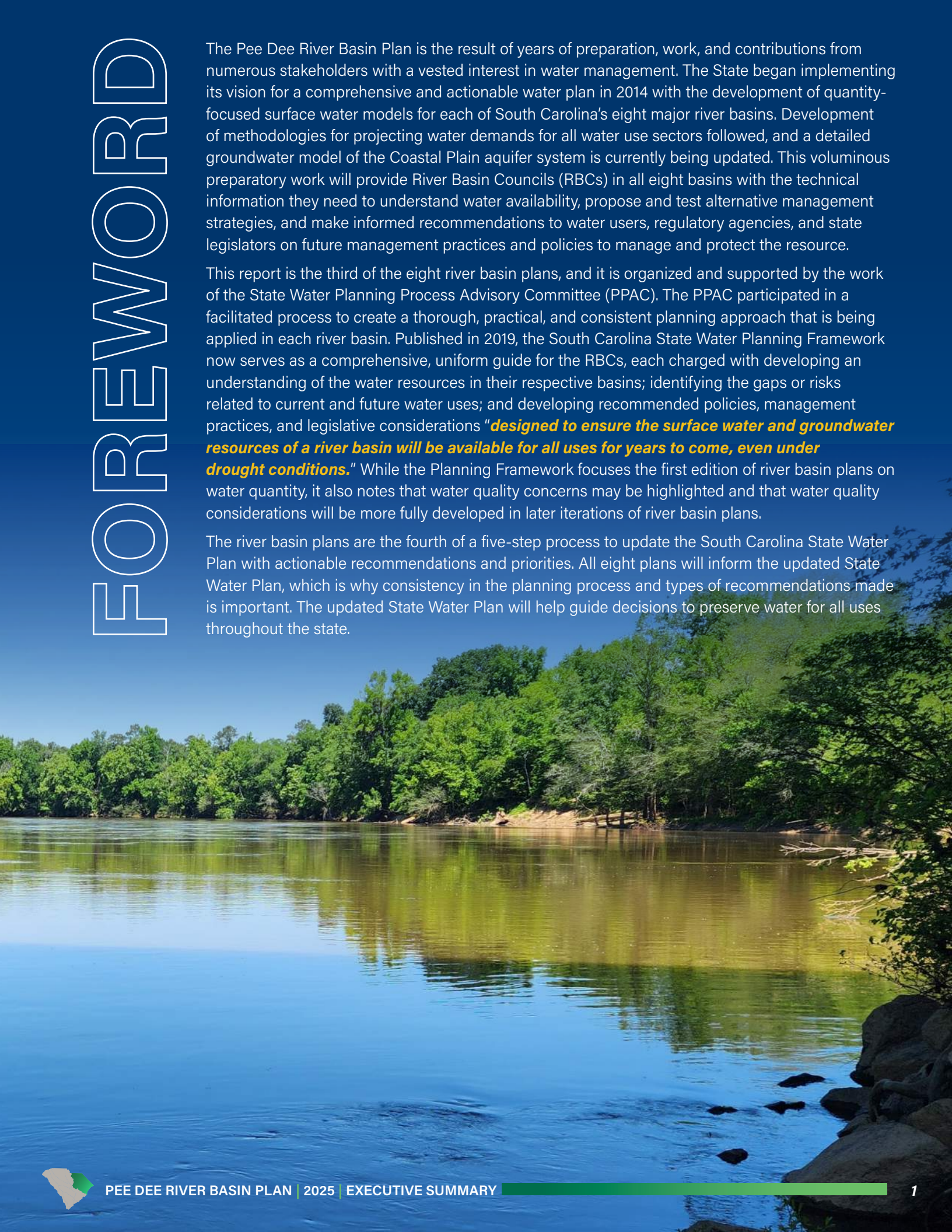
CONTENTS

FOREWORD

The Pee Dee 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 began implementing its vision for a comprehensive and actionable water plan in 2014 with the development of quantity-focused surface water models for each of South Carolina's eight major river basins. Development of methodologies for projecting water demands for all water use sectors followed, and a detailed groundwater model of the Coastal Plain aquifer system is currently being updated. This voluminous preparatory work will provide 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 informed recommendations to water users, regulatory agencies, and state legislators on future management practices and policies to manage and protect the resource.

This report is the third 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 create a thorough, practical, and consistent planning approach that is being applied in each river basin. 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.***" While the Planning Framework focuses the first edition of river basin plans on water quantity, it also notes that water quality concerns may be highlighted and that water quality considerations will be more fully developed in later iterations of river basin plans.

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.



Acknowledgments

The Pee Dee River Basin Council (RBC) consists of the following volunteer stakeholders representing eight different water interest categories. These individuals spent over two-and-a-half years sharing their diverse perspectives and offering their expertise, culminating in the development of this River Basin Plan.

Name	Organization	Interest Category
Everett Allen	Keep It Green/Inlet Bay & Stewards	At-Large
Michael Bankert	Legends Golf Course	Agriculture, Forestry, and Irrigation
Tim Brown	Grand Strand Sewer and Water	Water and Sewer Utilities
Cliff Chamblee	Sonoco Products Company - Hartsville	Industry and Economic Development
John Crutchfield	Duke Energy	Electric-Power Utilities
Jason Gamble	Gamble Family Farms	Agriculture, Forestry, and Irrigation
Michael Hemingway	City of Florence	Local Government
Megan Hyman	International Paper	Industry and Economic Development
Eric Krueger	The Nature Conservancy	Environmental Interests
Frances McClary	Williamsburg Soil and Water Conservation	Water-Based Recreation
Douglas Newton	Newton Farms	Agriculture, Forestry, and Irrigation
Hughes Page	Pee Dee Land Trust	Environmental Interests
Bob Perry	Water & Land Solutions	Environmental Interests
Lindsay Privette (Vice Chair)	Pee Dee Regional Council of Governments	Industry and Economic Development
Buddy Richardson II (Chair)	USDA-Farm Service Agency	At-Large
John Rivers	Riverdale Farms, Inc.	Agriculture, Forestry, and Irrigation
Debra Buffkin	Winyah Rivers Alliance	Environmental Interests
Dr. Jeff Steinmetz	Francis Marion University	At-Large
Cynthia Walters	Santee Cooper	Electric-Power Utilities

The Pee Dee 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.

South Carolina Dept. of Environmental Services
Brooke Czwartacki
Scott Harder
Hannah Hartley
Courtney Kemmer
Joe Koon
Leigh Anne Monroe
Priyanka More
Alex Pellett
Andy Wachob

South Carolina Dept. of Natural Resources
Dr. Joseph Ballenger
Bill Marshall
Jason Marsik
Hope Mizzell
Dr. Elliot Wickham

South Carolina Office of Resilience
Alex Butler

The Nature Conservancy
Eric Krueger

Clemson University
Dr. Luke Bower
Dr. Kendall Kirk
Dr. Joe Mruzek
Dr. Brandon Peoples
Dr. Nathan Smith
Dr. Thomas Walker III
Chikezie Isiguzo, PhD candidate

United States Geological Survey
Toby Feaster
Andrea Hughes

Duke Energy
John Crutchfield
Jeff Lineberger

Waccamaw Regional Council of Governments
Leigh Kane

City of Florence
Michael Hemingway

Grand Strand Water and Sewer Authority
Tim Brown

Georgetown Water and Sewer District
Michael Yip

North Carolina Dept. of Environmental Quality
Linwood Peale

Yadkin-Pee Dee Water Management Group
Aubrey Lofton

CDM Smith
John Boyer

Brown and Caldwell
Beth Albrecht
Stephanie Alimena
Jane McDonough
Matt Lindburg
JD Solomon *(JD Solomon Solutions)*

Pee Dee River Basin Council Meeting

What to Know About this Plan

The Pee Dee RBC, with stakeholders representing various water interests, collaborated with South Carolina Department of Environmental Services (SCDES)[1] and South Carolina Department of Natural Resources (SCDNR) and met monthly for over two-and-a-half years. They followed a carefully designed process to establish goals and actions throughout the basin. Through facilitated dialogue, they discussed issues, increased their understanding of various perspectives, and agreed on recommended actions or policies for improved water management. This Plan is a direct result of their efforts to improve the sustainability of water resources in the Pee Dee River basin and to improve the balance between societal and environmental water uses.

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

- **Surface water supplies are generally adequate to meet all uses within the planning horizon of 2070.**
  - The surface water availability modeling suggests a low risk of water supply shortages under reasonable future demand scenarios. Modeling indicates that current net withdrawals and discharges are not appreciably altering the current flow regime, compared to naturalized conditions.
  - Projected water uses are a low risk to stream biodiversity. However, high water withdrawals associated with water use scenarios that reflect fully permitted and registered allocation water withdrawals could pose a medium to high risk to fish species and could result in large losses in the number of fish species in the unlikely event that withdrawals reach their permitted or registered levels.
- **A high-level evaluation of groundwater supplies indicates that sustainability issues in the Crouch Branch and McQueen Branch aquifers have occurred in Georgetown, Horry, and Florence counties while groundwater levels in areas closer to zones of recharge have remained relatively stable.**
  - Aquifer water levels should continue being monitored to identify potential future issues as uses of groundwater increase.
  - Once complete, the updated groundwater model of the Coastal Plain Aquifer System should be used to more precisely identify areas of groundwater concern and explore water management strategies to mitigate groundwater risks.

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[1] *"Under state law, the South Carolina Department of Health and Environmental Control (DHEC) became two separate agencies on July 1, 2024. The two new agencies are the South Carolina Department of Environmental Services (SCDES) and South Carolina Department of Public Health (DPH)" (DHEC Restructuring. | SCDES). Activities carried out by the aforementioned DHEC, now SCDES, will be described under the new organizational structure of SCDES.*

- **Tried-and-true as well as innovative water management strategies are available to sustain supplies.**
  - The RBC prioritized several water management strategies, with many focusing on reducing water use and improving water use efficiency to conserve and sustain water supplies. Other important strategies include conjunctively using surface water and groundwater supplies, reducing water losses, updating drought management plans, and considering innovative approaches that utilize all sources of available supply to meet future water needs (e.g., reuse of wastewater discharges or capture of stormwater).
  - The RBC stressed that not all water management strategies are appropriate for every situation and geography. Implementation of strategies should be approached thoughtfully.
- **Good data and technical information are needed to better inform water management decisions**
  - The RBC identified a wide range of data needs and technical studies that will be useful for informing water management decisions now and in the next update of this River Basin Plan.
- **Policy, regulatory, and legislative changes could help better understand and manage available supplies as well as continue collaborative water planning processes into the future.**
  - When considering permit applications, reasonable use criteria should be applied to surface water withdrawals, as is currently done for groundwater withdrawals.
  - The South Carolina legislature should provide ongoing funding for Plan implementation, including administration, technical evaluations, data collection and research, and providing grants to stakeholders for water projects. Funds should accommodate adequate State staff to provide dedicated, ongoing support for Plan implementation.

The Pee Dee River Basin Plan was developed collaboratively using the best available science

ES-1 Introduction: Purpose and Utility of the Plan

The Pee Dee River Basin Plan is the third of eight plans that will be developed for the primary 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 pursuant to the South Carolina Water Resources Planning and Coordination Act and continues the work that began in 1998 with the South Carolina Water Plan.

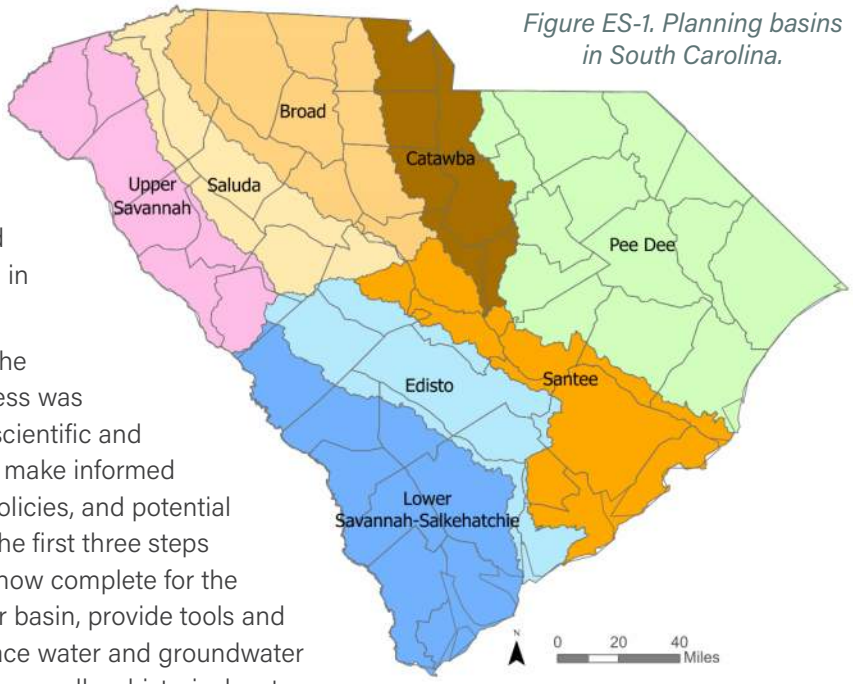


Figure ES-1. Planning basins in South Carolina.

In 2014, a five-step process was initiated to update 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 Pee Dee River 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 Pee Dee River Basin Plan is the culmination of Step 4 of the process. The Plan assesses current and future water availability in the basin and presents the recommendations of the Pee Dee RBC—a group of volunteer stakeholders representing each of the eight broadly defined stakeholder interest categories.

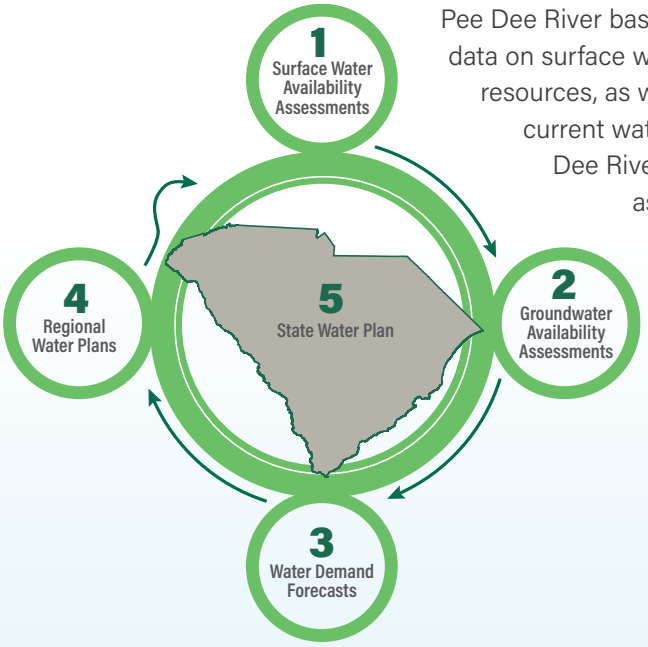


Figure ES-2. South Carolina's five-step process to update the State Water Plan.

Section ES-2 describes the planning process in more detail. As prescribed in the South Carolina State Water Planning Framework, the 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.**"

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. River Basin Plans focus primarily on the quantity and availability of surface water and groundwater for all designated uses: drinking water, agricultural and other irrigation (including golf courses), forestry, industry and economic development, power generation, nonconsumptive uses such as aquatic habitat suitability and environmental needs, and water-based recreation. While these plans do not focus directly on flood management or water quality (these important issues are considered in other plans), 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.

A RIVER BASIN PLAN ANSWERS FOUR 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 employed in the basin to ensure the available supply meets or exceeds the projected demand throughout the planning horizon?

Clemson Pee Dee Research and Education Center

ES-2 Overview of the Planning Process

The Pee Dee River Basin Plan was developed by the Pee Dee RBC, which is a group of 19 volunteer stakeholders representing local government, agriculture, forestry, environmental interests, water-based recreation, utilities, and more (**see Figure ES-3**). The RBC met monthly over a period of two-and-a-half years starting in 2022, following the systematic planning process prescribed in the 2019 South Carolina State Water Planning Framework.

Originally scheduled for two years, the timeline for completing the Pee Dee River Basin Plan evolved due to difficulties in updating the groundwater model for this river basin. To expedite the process for completing the Plan, the RBC used existing groundwater data to assess trends in groundwater supply and areas where groundwater supply challenges are known to exist. They then considered successful groundwater management practices in these areas as they identified recommended strategies for minimizing future risk.

The RBC had 30 meetings, including three field trips to the Sumter Water Plant, Woodard Farms, and Sonoco to better understand the river and how water is withdrawn and used to support agricultural, public water supply, and industrial needs. These field trips helped connect the RBC members to the physical river basin and foster a holistic perspective to support consensus-building.

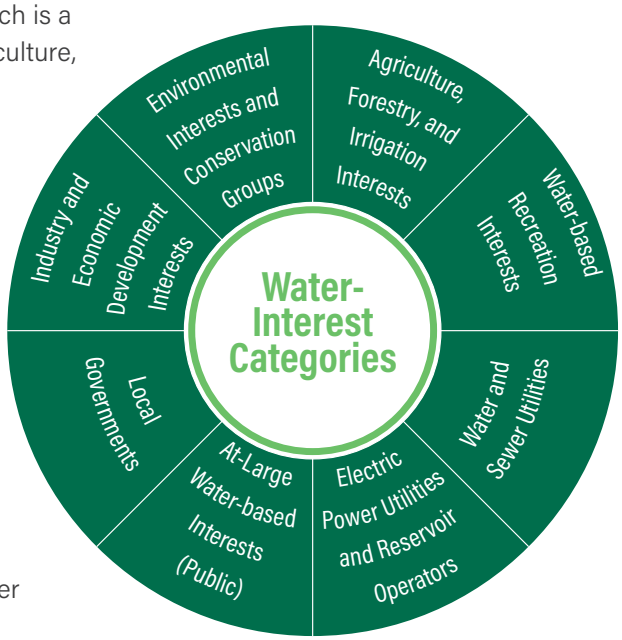


Figure ES-3. RBC water-interest categories.

RBC tour of Woodard Farms agricultural facility in May 2023

The four phases of the Planning Framework are described below. These four phases did not occur in isolated time steps; for example, Phases 2 and 3 overlapped so that the RBC could more easily foster strategic thinking around the demand for and availability of water resources and subsequent solutions to mitigate potential supply risks.

PHASE 1

Orientation, Administrative Tasks, and Background information

During this phase, RBC members reviewed bylaws, protocols, expectations, and the planning process. The RBC selected a chair and vice-chair, reviewed technical information to aid in the planning process, and developed a vision statement and set of supporting goals

PHASE 2

Comparison of Water Resource Availability and Demand

During Phase 2, the RBC reviewed the methods, tools, and results from the first three steps of the overall State Water Plan process, including surface water and groundwater availability analyses and water demand projections. This provided a consistent and scientific perspective on the balance of supply and demand throughout the basin, as well as current and future risks. The RBC used the surface water model and groundwater data to assess the ability of supplies to meet current and future water demands.

PHASE 3

Evaluation of Water Management Strategies

In this interactive phase, the RBC and technical team identified and evaluated surface water and groundwater management strategies to address water shortages or water supply risks identified in Phase 2. Modeling and evaluation results were reported back to the RBC. This process allowed the RBC to recognize common benefits and agree on recommended strategies and their relative priorities.

PHASE 4

River Basin Plan Preparation

The final phase involved the development of a draft version of the Plan, including recommendations for water management strategies focusing on supplies and demands, as well as policy and technical recommendations. It also included 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 Pee Dee RBC developed mission and vision statements as well as actionable goals supporting their vision for the Pee Dee River basin.

MISSION STATEMENT

To develop, implement, monitor, and periodically revise a River Basin Plan for the surface and groundwater resources in the Pee Dee River basin.

VISION STATEMENT

To make sure water is available for all in the Pee Dee River basin.

GOALS

1. Develop and approve the River Basin Plan by June 1, 2024.
2. Review and update the River Basin Plan at least once every five years or amend it as needed.
3. Regularly communicate with stakeholders throughout the river basin.
4. Recommend policy, legislative, regulatory, or process changes.

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. Two additional meetings were reserved for presentation of the draft Plan and solicitation of verbal and written comments from the public.

ES-3 Overview of the Pee Dee River Basin

The Pee Dee River basin covers approximately 7,855 square miles making up 25 percent of the state's total land area. The river originates in North Carolina and receives most of its flow from drainage in North Carolina (SCDNR 2009). The other major rivers that flow into the Pee Dee River include the Little Pee Dee River, Lynches River, Black River, and Waccamaw River. While the Black River originates in South Carolina, the other major rivers (the Lynches, Pee Dee, Little Pee Dee, and Waccamaw) all originate in North Carolina. About 42 percent of the basin is located within South Carolina, and the rest of the basin is in North Carolina with a small portion in Virginia. The mainstem of the river runs over 400 miles and traverses many different geographies. The basin overlays fourteen counties in South Carolina, fully encompassing seven.

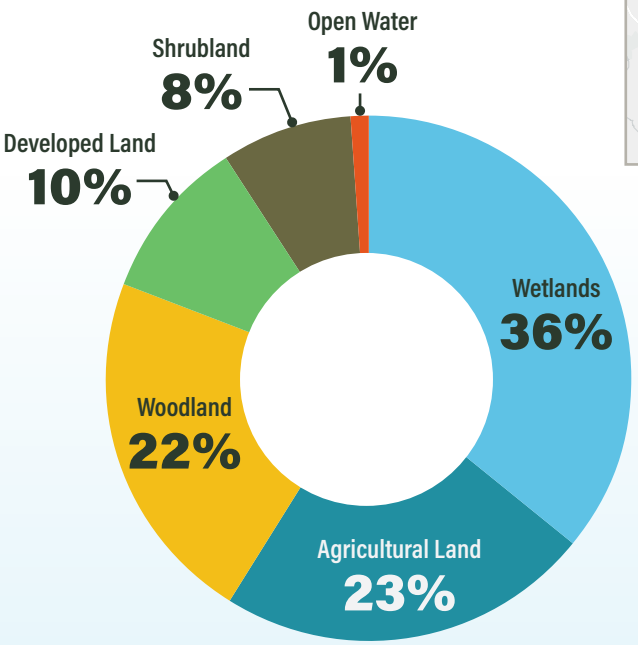


Figure ES-5. Pee Dee River basin land cover.

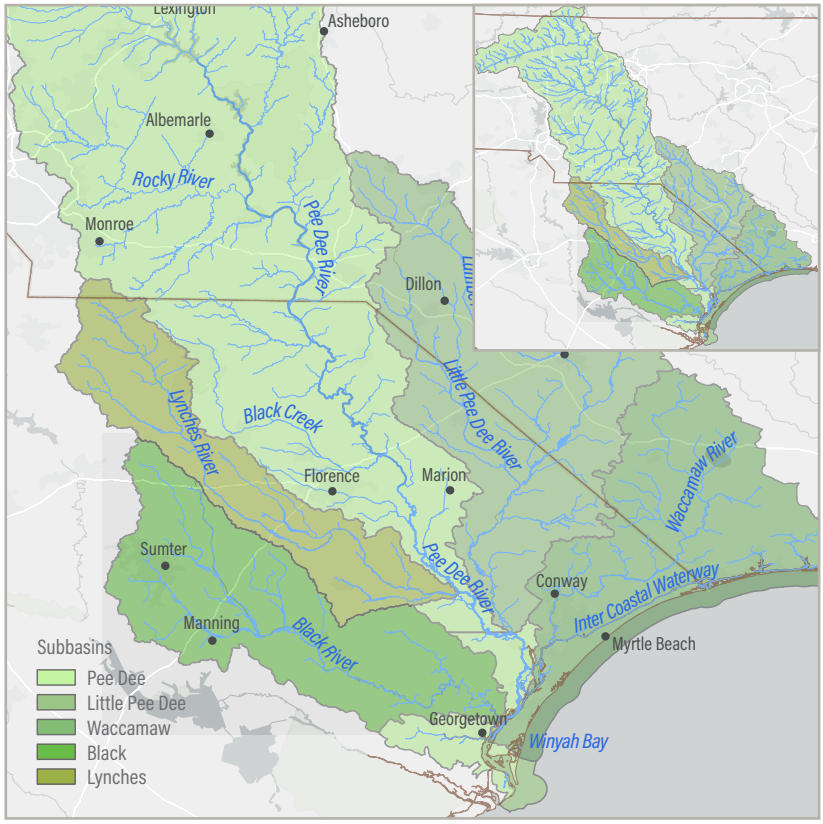


Figure ES-4. Pee Dee River basin and subwatersheds.

The Pee Dee River basin is largely made up of wetland, agricultural and wooded areas. Woodland and agricultural lands have decreased in the watershed since 2001, while developed land and shrublands have increased over this time.

Average annual precipitation throughout the basin ranges from 42 to 63 inches, with higher totals in the upper portions of the basin and along the coast, while the middle of the basin receives less precipitation. Generally, July and August are the wettest months in the basin, and the driest month tends to be November.

The Pee Dee River basin supports 102 native fish species as well as 10 introduced non-native species. In the counties with at least a portion of their areas in the Pee Dee River basin, there are 9 federally endangered species, 8 federally threatened species, and 18 at-risk species. Additionally, 46 bird species are protected by the Migratory Bird Treaty Act.

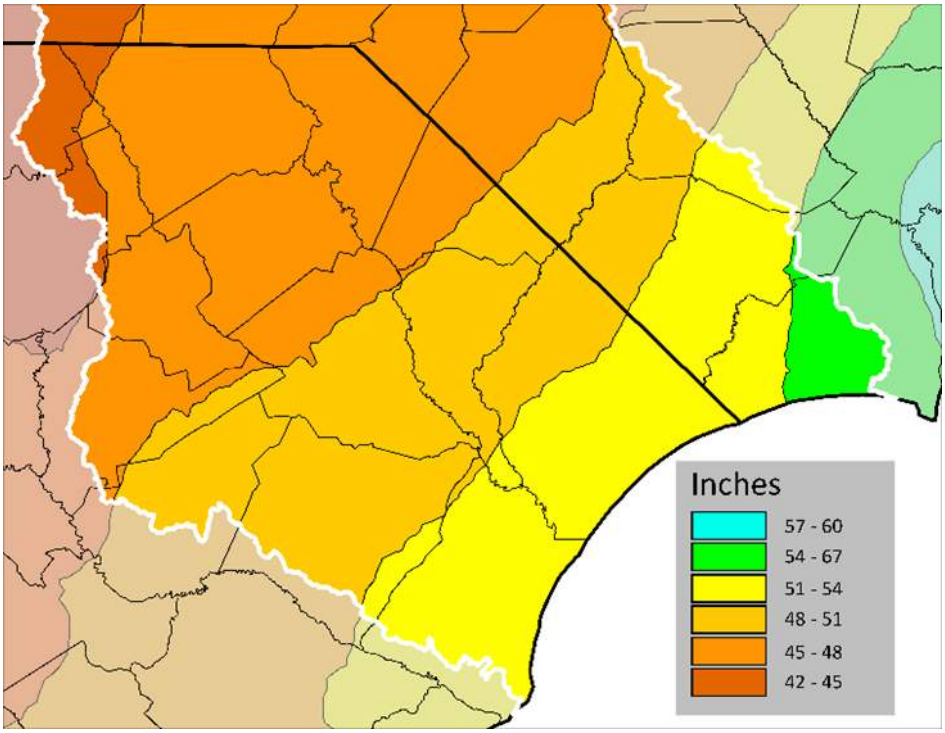


Figure ES-6. Average annual precipitation in the Pee Dee River basin (1991-2020).

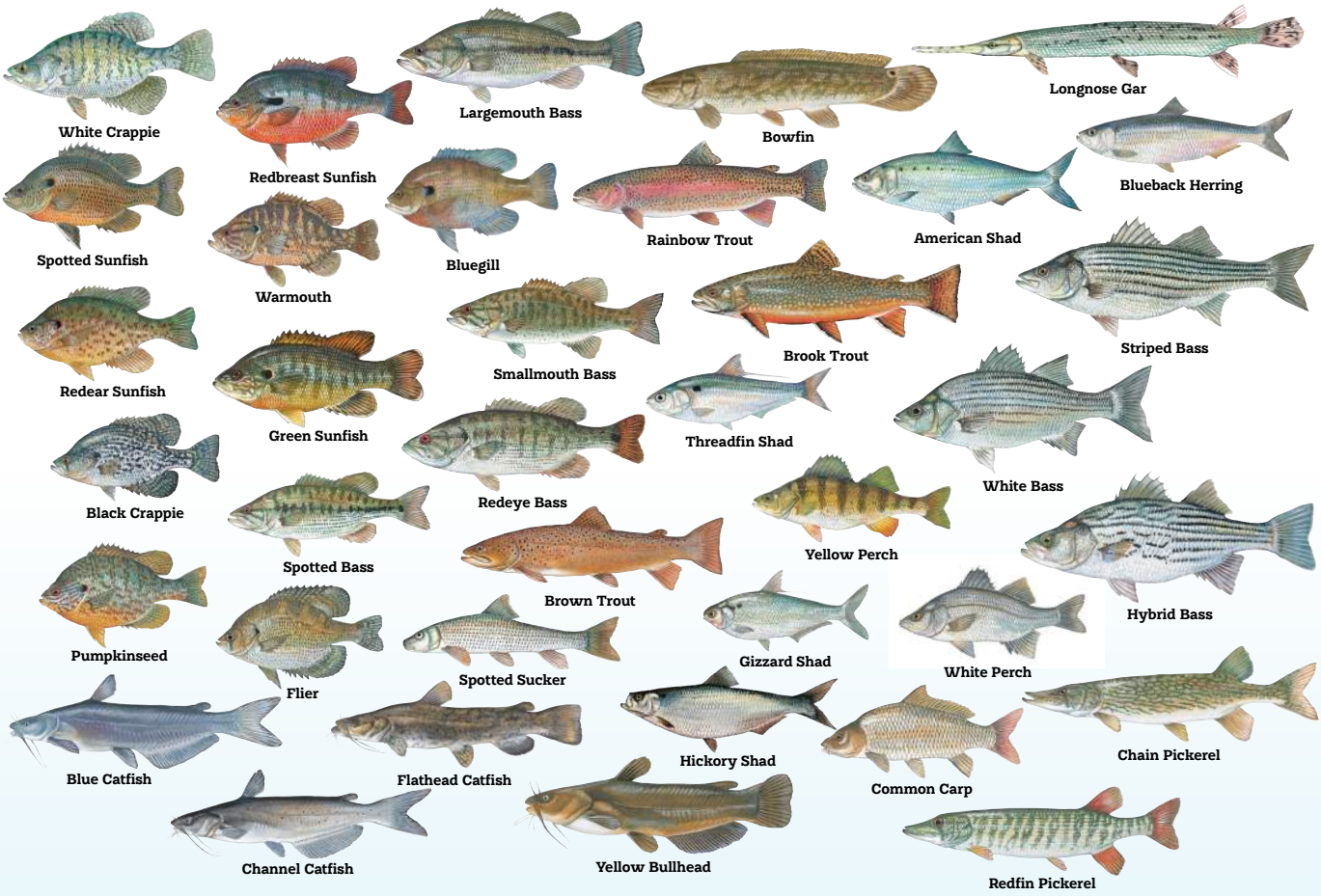


Figure ES-7. Subset of freshwater fish sought by anglers (Freshwater Fish Identification (dnr.sc.gov)).

ES-4 Water Availability: Supply and Demand

SURFACE WATER SUMMARY

The mainstem of the Great Pee Dee River (Pee Dee River) is the dominant hydrologic feature of the basin. Although the Pee Dee River in South Carolina is free-flowing, **it is regulated in North Carolina by a series of six large reservoirs.** The reservoirs, operated primarily for hydroelectric power generation, strongly influence flows in the Pee Dee River in South Carolina, particularly during low-flow periods (SCDNR 2009). **Limited surface-water development has occurred in South Carolina.**

Streams in the upper part of the basin originate in or traverse the upper Coastal Plain. These streams, such as Black Creek and Cedar Creek, exhibit steady flows that are maintained by discharge from groundwater storage, particularly during periods of low rainfall. Most streams in this basin are associated with extensive swamp areas and follow indistinct channels that often divide and recombine. Lower Coastal Plain streams, such as Catfish Canal, exhibit more variable flow and typically are more dependent on rainfall and runoff than on groundwater discharge to support flows (SCDNR 2009).

The RBC identified surface water concerns and challenges related to both water quality and quantity-based surface water assessments and modeling. Water quality is becoming a bigger concern, and the Pee Dee RBC needs to understand its impacts to environment and recreation, both at high and low flows.

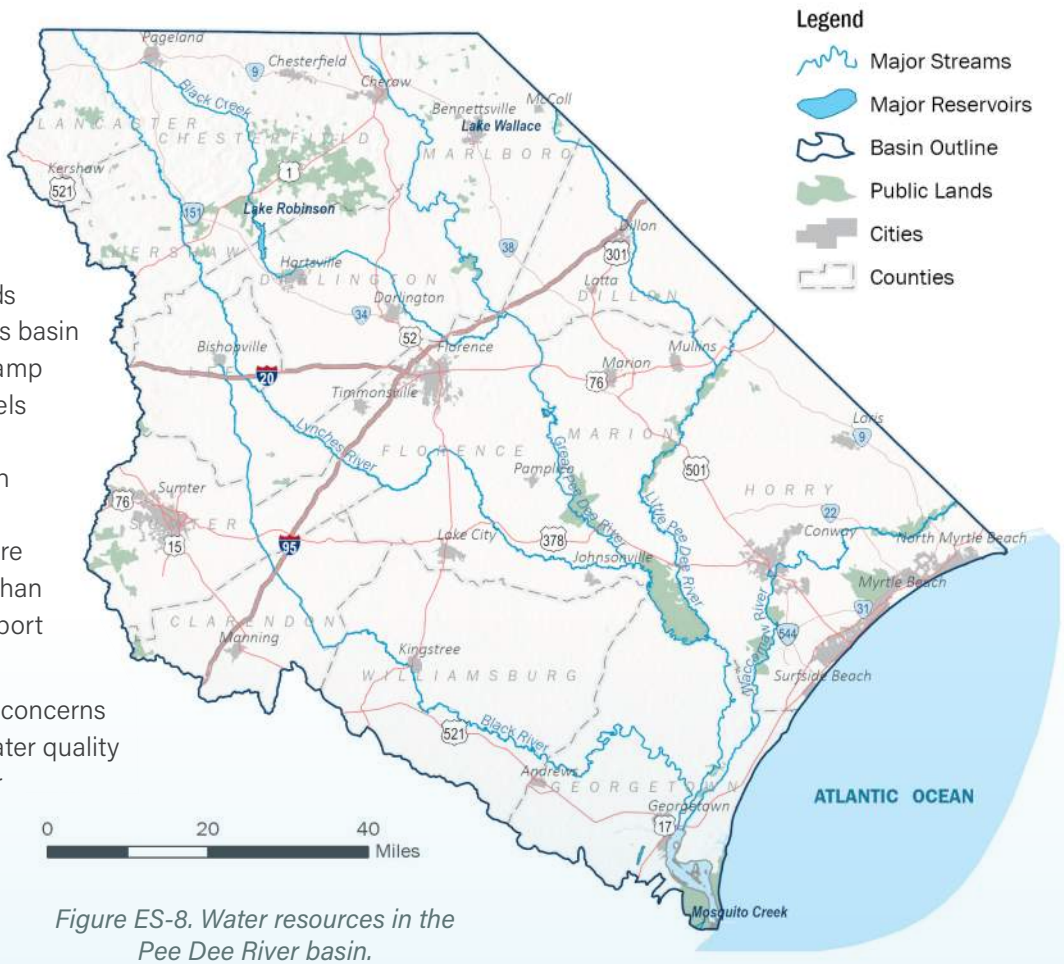


Figure ES-8. Water resources in the Pee Dee River basin.

The Simplified Water Allocation Model (SWAM), pictured in **Figure ES-9**, was used to assess current and future surface water availability and to evaluate the effectiveness of proposed water management strategies. SWAM uses a framework composed of a network of river reaches, impoundments, withdrawals, and returns, in which water is routed hydrologically between nodes.

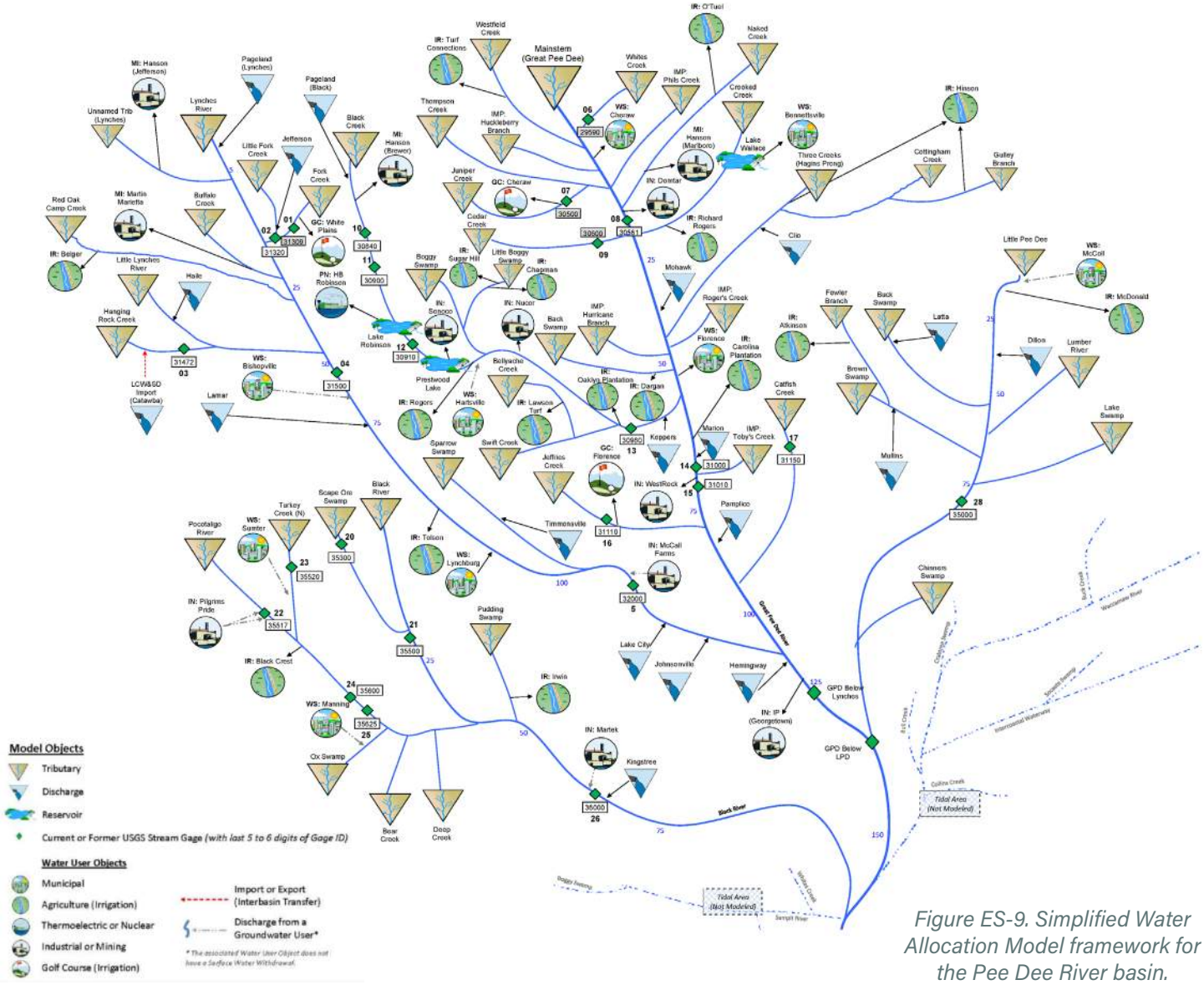


Figure ES-9. Simplified Water Allocation Model framework for the Pee Dee River basin.

City of Sumter's Pocotaligo Wastewater Treatment Plant

GROUNDWATER SUMMARY

The basin is predominately underlain by the Coastal Plain aquifer system with a small portion of the Piedmont crystalline rock aquifer present in Chesterfield County (SCDNR 2022). The Coastal Plain aquifers are composed of permeable sands or limestone separated by clay confining units arranged in a wedge that begins at the Fall Line and thickens towards the coast. **The most important aquifers in the Pee Dee River basin are the surficial, Crouch Branch, and McQueen aquifers.**

Groundwater in South Carolina is regulated by SCDES in areas designated as Capacity Use Areas (CUA). Under South Carolina's Groundwater Use and Reporting Act (Chapter 5, Section 49-5-60), CUAs are designated where excessive groundwater withdrawals present potential adverse effects to natural resources, public health, safety, or economic welfare. When these conditions occur, SCDES coordinates with affected governing bodies and groundwater withdrawers to develop a groundwater management plan for the CUA. The Pee Dee River basin encompasses three CUAs: the Waccamaw, Pee Dee, and Santee-Lynches. Within these areas, groundwater withdrawal permits are required to withdraw and use groundwater if use is equal to or greater than 3 million gallons in any month (SCDES 2023).

Three cones of depression are in the Pee Dee River basin, as shown as blue dots in **Figure ES-10**. The severity of the cones is more prominent in the coastal region. These areas formed from years of groundwater pumping in the Pee Dee as well as neighboring basins.

The RBC identified the following threats to groundwater sources in the basin:

- **Groundwater supplies are generally adequate, but cones of depression have developed in some areas**, and drought conditions compound water supply risks. Planning for drought and managing limited water resources is important.
- **Agriculture**, which often relies on groundwater, **is vulnerable to drought**.
- **Coastal regions continue to develop even though groundwater levels are declining.**

Current and future risks to groundwater supplies were assessed using existing monitoring well data, potentiometric maps, and current and future groundwater demand data. In the future, a three-dimensional numerical groundwater flow model of the Coastal Plain aquifers and confining units will be used to evaluate groundwater risk and management strategies to mitigate risk. The USGS is currently working on an update to the groundwater model.

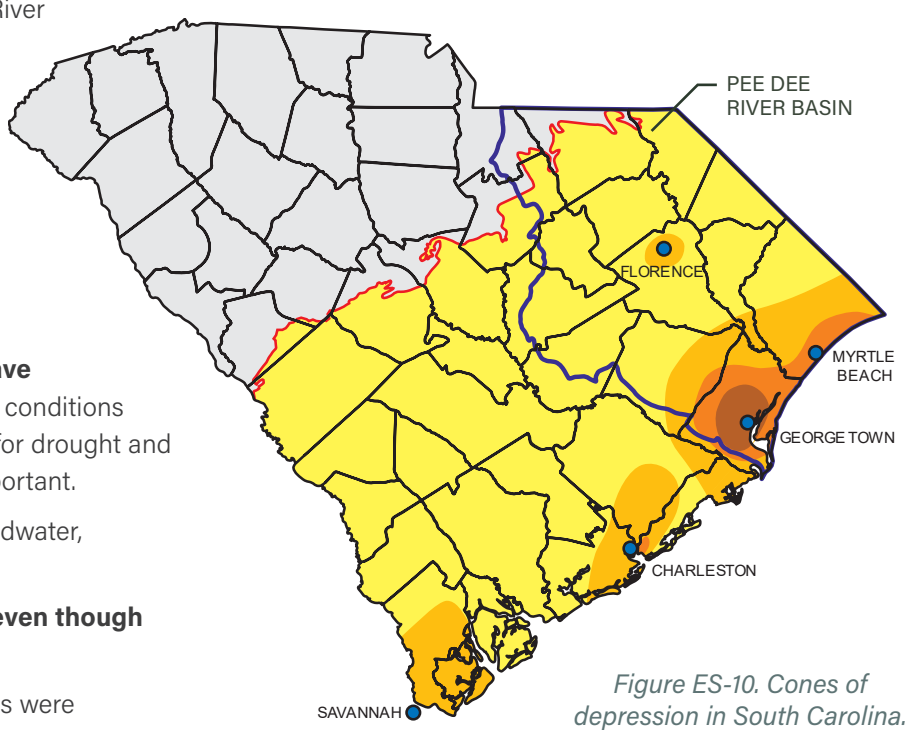


Figure ES-10. Cones of depression in South Carolina.

WATER DEMAND SUMMARY

The total current water demands in the Pee Dee River basin are approximately 1,028.8 million gallons per day (MGD) on average. Of this withdrawal, 111.9 MGD is from groundwater and 916.9 MGD is from surface water. About 217 MGD (21 percent) of the water is consumptively used, and 811.8 MGD (79 percent) is returned to the river after its use.

Two future demand projections were developed for this Plan: (1) the Moderate Water Demand Scenario (Moderate Scenario) and (2) the High Water Demand Scenario (High Demand Scenario). The Moderate Scenario is based on median rates of water use and moderate growth projections, while the High Demand Scenario is based on the maximum monthly rates of water use in recent reporting and high growth projections. While it is unlikely that the conditions of the High Demand Scenario would occur for an extended time or universally across the basin, the scenario is useful for establishing an upper bound for the projected demand.

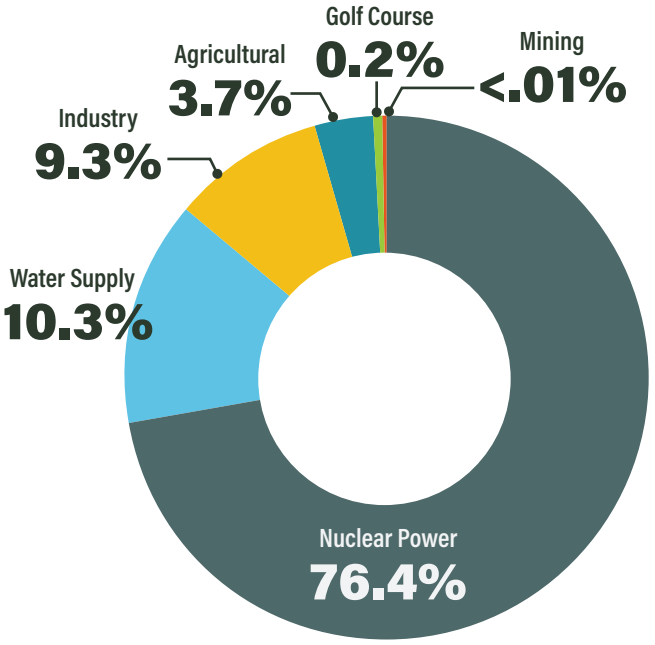
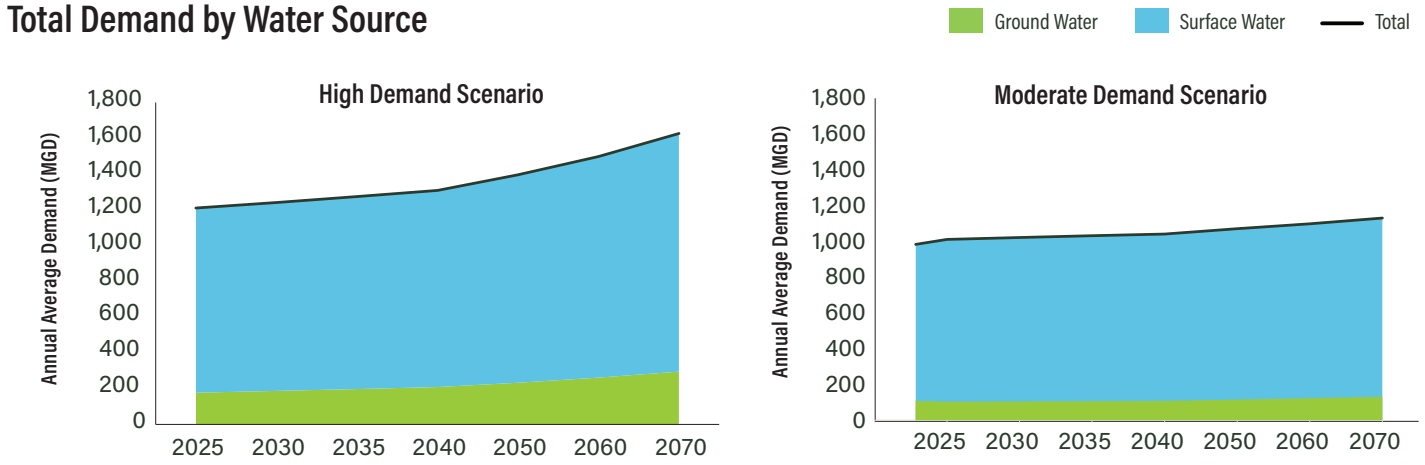


Figure ES-11. Breakdown of current water use in the Pee Dee River basin.



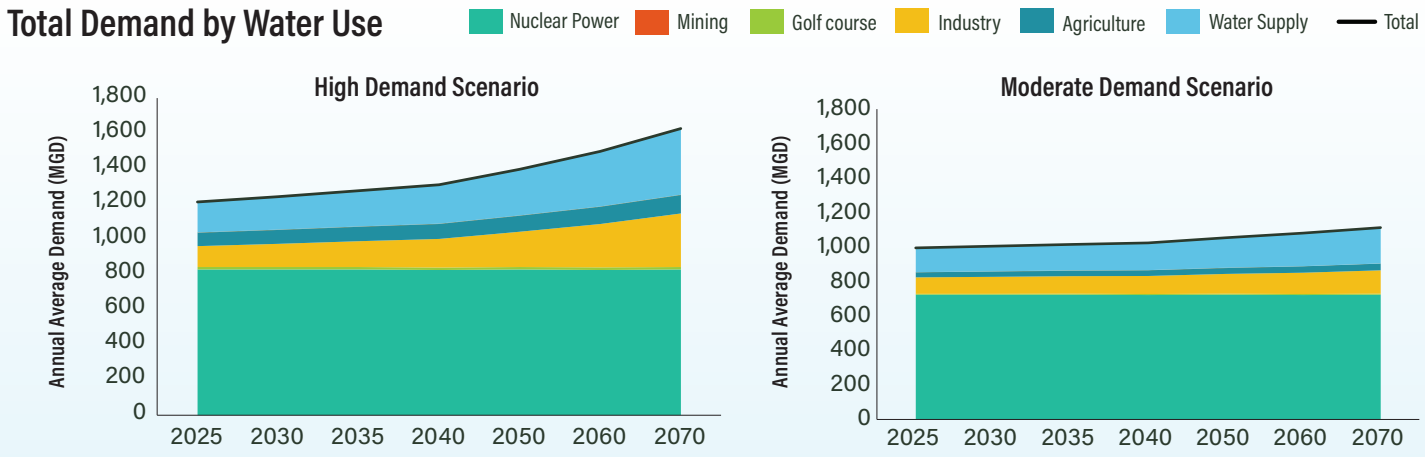


Figure ES-12. Total water demand projection by water source (above), water demand projections by water use category (below).

WATER AVAILABILITY SUMMARY

In accordance with the Planning Framework, multiple planning scenarios were developed to evaluate varying levels of water demand and available water supplies to meet demands. The demand scenarios were superimposed on historical hydrology, reflecting conditions over the 89-year period of river flow data from 1929 to 2018.

- **Current Surface Water Use Scenario (Current):** Current operations, infrastructure, and water use in the Pee Dee River basin.
- **Permitted and Registered Surface Water Use Scenario (P&R):** Modeled demands are set to permitted or registered values for all water users. In other words, this simulation explored the question of, "what if all water users used the full volume of water allocated through permits and registrations?" The scenario provides information to determine whether surface water is currently over-allocated in the basin.
- **Moderate Water Demand Scenario (Moderate):** Modeled demands were set to projected 2070 levels based on an assumption of moderate population and economic growth.
- **High Water Demand Scenario (High Demand):** Modeled demands are set to the 90th percentile of variability in reported withdrawals for each user, and the projections are based on aggressive growth within the range of uncertainty of the referenced driver variable projections.
- **Unimpaired Flow Scenario (UIF):** All water demands and discharges in the model were set to zero to represent "naturalized" surface water conditions in the basin.

Key Surface Water Observations and Conclusions

Surface water modeling was conducted using current and projected rates of water withdrawals. The modeling results led to several key observations and conclusions about the availability of surface water resources in the Pee Dee River basin. The key conclusions, presented below, informed the RBC's identification of multiple water management strategies to sustain surface water supplies, promote the efficient 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.

The following observations and conclusions were identified for each planning scenario:

- **Current Surface Water Use Scenario (Current):** Physical surface water shortages were identified in the Current Scenario for 2 agricultural water users, 2 golf courses, and a mining operation in the SWAM model, ranging in frequency from less than 1 percent to 7 percent of months of the 89-year simulation period. **Many if not all the simulated shortages in this scenario are likely to be significantly tempered or avoided because of the on-site water storage available from existing ponds which were not included in the model.** The ponds provide much-needed storage during low flow conditions that occur during a drought.
- **Permitted and Registered Surface Water Use Scenario (P&R):** River flows are predicted to decrease compared to the Current Scenario resulting in surface water shortages for just over one-third of the surface water users. The total permitted and registered amount of surface water (in the non-tidally influenced, modeled portion of the Pee Dee River basin) is 1,324 MGD, or more than twice the Current Scenario surface water demands of 576 MGD. **While the P&R Scenario represents unrealistic conditions, it demonstrates that the surface water resources of the basin are over-allocated based on existing permit and registration amounts.**

- **Moderate Water Demand Scenario (Moderate):** River flows are predicted to decrease only slightly, compared to the Current Scenario throughout the basin. Modeled reductions are most pronounced during low flow periods. Calculated water shortages remain essentially unchanged, relative to the Current Scenario. **Surface water supplies are predicted to be adequate to meet increased demands resulting from moderate economic and population growth.**
- **High Water Demand Scenario (High Demand):** River flows are also predicted to decrease modestly throughout the basin, compared to the Current Scenario. Modeled reductions are most pronounced during low flow periods. Median flows in the Pee Dee River at the USGS gaging station below Pee Dee are predicted to decrease by 7 percent and minimum flows by up to 16 percent by 2070, compared to the Current Scenario flows if population and economic growth are high and given a hotter and drier climate. **Calculated water shortages increase only slightly, in terms of both duration and intensity, from the Moderate and Current Scenarios.**
- **Unimpaired Flow Scenario (UIF):** The UIF Scenario is only slightly different in performance compared to the Current Scenario, indicating that **current net withdrawals and discharges are not appreciably altering the current flow regime, compared to naturalized conditions.** Current Scenario flows are larger than the UIF Scenario flows on the Lynches, Little Pee Dee, and Black Rivers because of water users that withdraw from groundwater and discharge to surface water.

Biological response metrics were developed and combined with hydrologic metrics to identify statistically significant correlations between flow characteristics and ecological suitability for fish and macroinvertebrates. Select flow-ecology metrics (hydrologic metrics found to be most correlated to biological diversity) were then used as performance measures to help guide RBC discussions and recommendations for the Pee Dee River basin. The analysis focused on two biological response metrics (species richness, tolerant species) and four hydrologic statistics (mean daily flow, base flow, frequency of low flow, timing of lowest observed flow) to characterize the integrity of the subbasins. A representative result figure showing the combinations of hydrologic and biological response metrics on the four major tributaries is presented in **Figure ES-13**.

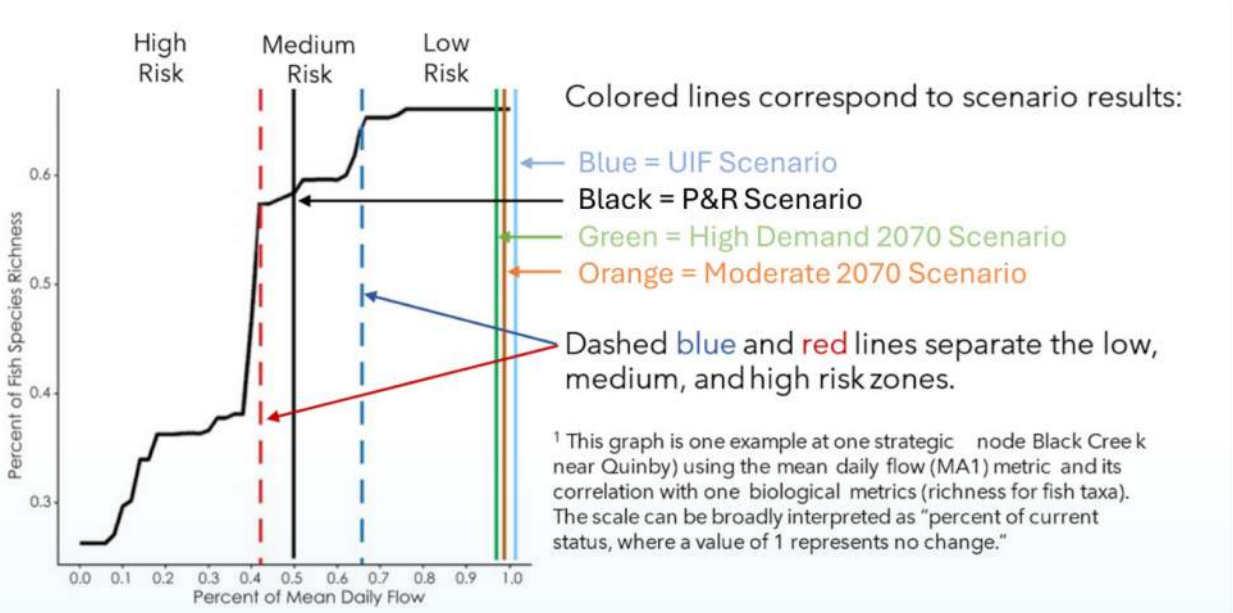


Figure ES-13. Biological response metrics example.

In general, surface water modeling results suggest that projected water use scenarios are a low risk to stream biodiversity. If water is withdrawn at high rates reflecting fully permitted and registered allocations, a medium to high risk to fish species could occur and could result in large losses in the number of fish species. The findings do not rule out all potential risks to ecological integrity or aquatic biodiversity related to other metrics or flow alterations.

Key Groundwater Observations and Conclusions

Groundwater conditions in the Pee Dee River basin were evaluated based on available data from groundwater monitoring data, potentiometric mapping, and estimates of future water demand. The groundwater evaluation demonstrates that both the Crouch Branch and McQueen Branch aquifers can transmit large volumes of groundwater to support water withdrawals in most regions of the Pee Dee River basin. In the absence of testing the demand scenarios with a calibrated groundwater model, 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 are presented below.

- **Water level trends in wells near the recharge areas of the Crouch Branch and McQueen Branch aquifers have remained stable over time despite groundwater pumping.** This demonstrates a pattern of consistent and sufficient recharge to both aquifers. It is likely that no groundwater supply shortages will occur in these areas under the Current Scenario.
- **Groundwater levels decline moving farther toward the coast from the recharge zone, which is consistent in both the Crouch Branch and McQueen Branch aquifers.** In most cases water levels are declining approximately 1 foot per year. The declines in the Crouch Branch aquifer observed near Georgetown are about 2 feet per year.
- **Groundwater gradients in both aquifers are influenced by pumping at the coast.** It is possible that recharge is not reaching the coast because it is withdrawn up dip (or further inland).
- **The continued growth and expansion of a cone of depression in the potentiometric surfaces of groundwater in the Crouch Branch and McQueen Branch aquifers in Georgetown and Horry counties has been monitored for years.** While groundwater pumping is a driver, the specific reasons for the degree and nature of the decline are not fully understood and may include under or unreported withdrawals and geologic factors.
- At current rates of groundwater use, by 2070, groundwater levels in Williamsburg and Horry counties may decline an additional 50 feet, and in parts of Georgetown County, as much as 100 feet, **bringing water levels in the Crouch Branch aquifer to critically low levels.**
- The updated Coastal Plain groundwater model is needed to more precisely evaluate current and future groundwater supply risks in the Pee Dee River basin and strategies to mitigate risk.
- **While conjunctive water management strategies have been very beneficial** for slowing and reversing declining groundwater levels associated with the cone of depression in Florence County, **groundwater levels should continue to be monitored** to evaluate potential groundwater supply risks that may occur if future uses increase.
- **Groundwater levels should be monitored routinely basinwide**, particularly in the lower Coastal Plain and coastal counties. In addition to measuring static water levels, water levels in actively pumping wells should occasionally be measured.

The Pee Dee River near Florence

ES-5 Water Management Strategies Evaluated

The Planning Framework identifies a two-step process to evaluate water management strategies. As a first step, proposed management strategies are 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. Section ES-6 discusses recommendations based on this information. The RBC identified and evaluated a wide variety of water management strategies, which are grouped into demand-side strategies in Table ES-1 and supply-side strategies in Table ES-2.

Table ES-1. Demand-side water management strategies evaluated by the Pee Dee RBC.

Municipal Conservation Practices	Industrial and Thermoelectric Efficiency Practices	Agricultural and Golf Conservation Practices
Development, Update, and Implementation of Drought Management Plans	Water Reuse and Recycling	Water Audits and Nozzle Retrofits
Conservation Pricing Structures	Water Efficient Processes	Irrigation Scheduling and Smart Irrigation
Public Education on Water Conservation	Drought Management Best Practice Collaboration	Cover Cropping, Conservation Tillage, Mulch
Leak Detection and Water Loss Control Program	Leak Detection and Water Loss Control Program	Crop Variety, Crop Type, and Crop Conversions
Low Flow Fixtures, Toilets, and Appliances	Low Flow Fixtures, Toilets, and Appliances	Irrigation Equipment Changes
Water Efficiency Standards for New Construction	Reclaimed Water	Drip/Trickle Irrigation (for select crops)
Residential Water Audits	Switch to Combined-Cycle Natural Gas	Wetting Agents to Reduce Water Use
Reclaimed Water Programs	Energy Saving Appliances	Water Loss Control and Regular Maintenance
Car Wash Recycling Programs		Time of Day Watering Practices
Time of Day Watering Limits		Soil Moisture Monitoring
Landscape Irrigation Programs and Codes		Low-Water Use Landscaping
Xeriscaping		

Table ES-2. Supply-side water management strategies evaluated by the Pee Dee RBC.

Supply-Side Strategies and Practices	
New or Increased Storage (new impoundments, reservoirs, and tanks; dredging to deepen impoundments; raising dam heights to expand impoundments; aquifer storage and recovery)	**Conveyance** (interconnections with neighboring utilities, regional water systems, and interbasin transfers)
Water Reclamation (non-potable water reuse systems and stormwater capture and treatment)	**Desalination** (desalination of seawater)
Conjunctive Use (using groundwater to augment or replace surface water, especially during low flow periods)	

Forested area in the Pee Dee watershed

ES-6 Recommendations

RECOMMENDED WATER MANAGEMENT STRATEGIES

The recommended water management strategies reflect the Pee Dee RBC's collaborative prioritization process as well as the overall River Basin Plan vision developed by the RBC at the beginning of this planning process. The vision of the Pee Dee RBC is "To make sure water is available for all in the Pee Dee River basin". Implementing the recommended water management strategies will help realize this vision.

The strategies presented in the previous section were evaluated by the RBC in a two-step process:

1. First, the technical team scored the strategies using a series of criteria (benefits, costs, implementability, time) to identify the most impactful strategies and provide guidance on focus areas for the RBC.
2. Then, the RBC participated in a voting process and ranked the strategies according to their preference. Strategies were ranked using a "Forced Ranking" approach that compared multiple consensus methodologies to holistically prioritize the strategies based on RBC feedback (see Chapter 7 for more details).

The forced ranking results are shown in Figures ES-14 through ES-16 along with key takeaways.

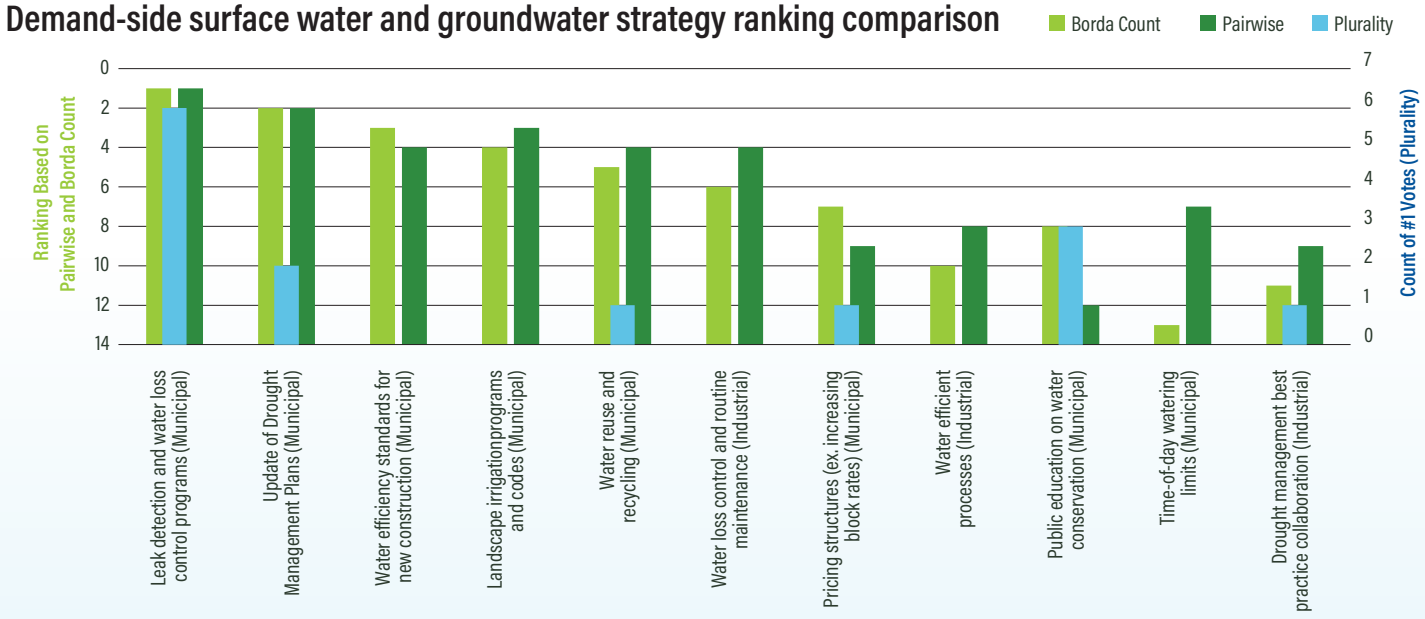


Figure ES-14. Demand-side surface water and groundwater strategy ranking comparison.

Key Takeaways:

- Leak detection and water loss control programs were ranked by the RBC as the highest priority demand-side water management strategies.
- Public education on water conservation is an important strategy and is a high priority.
- Many of the municipal water management strategies focus on the efficient use of water supplies.
- Reducing water use is a recurring theme in the prioritized municipal water management strategies.
- Industrial water management strategies focus on efficient water use and reducing water demands.
- While agricultural water management strategies did not rank in the top eleven, they are important, because they can increase crop yields while reducing water use and cost.

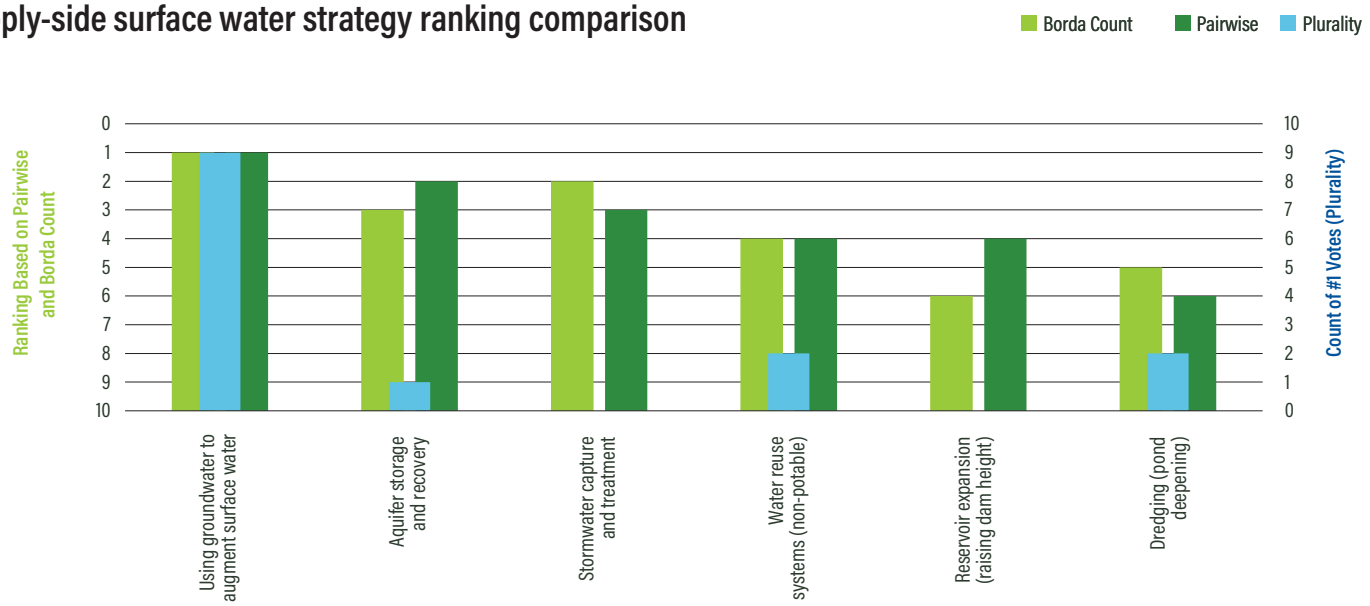


Figure ES-15. Supply-side surface water strategy ranking comparison.

Key Takeaways:

- Using groundwater to supplement surface water supplies was highly ranked.
- Priorities reflect a combination of strategies focused on conjunctively using surface and groundwater supplies, utilizing supplies that have historically not been beneficially used, and increasing storage.
- The RBC expressed a willingness to consider innovative approaches to supply-side challenges.

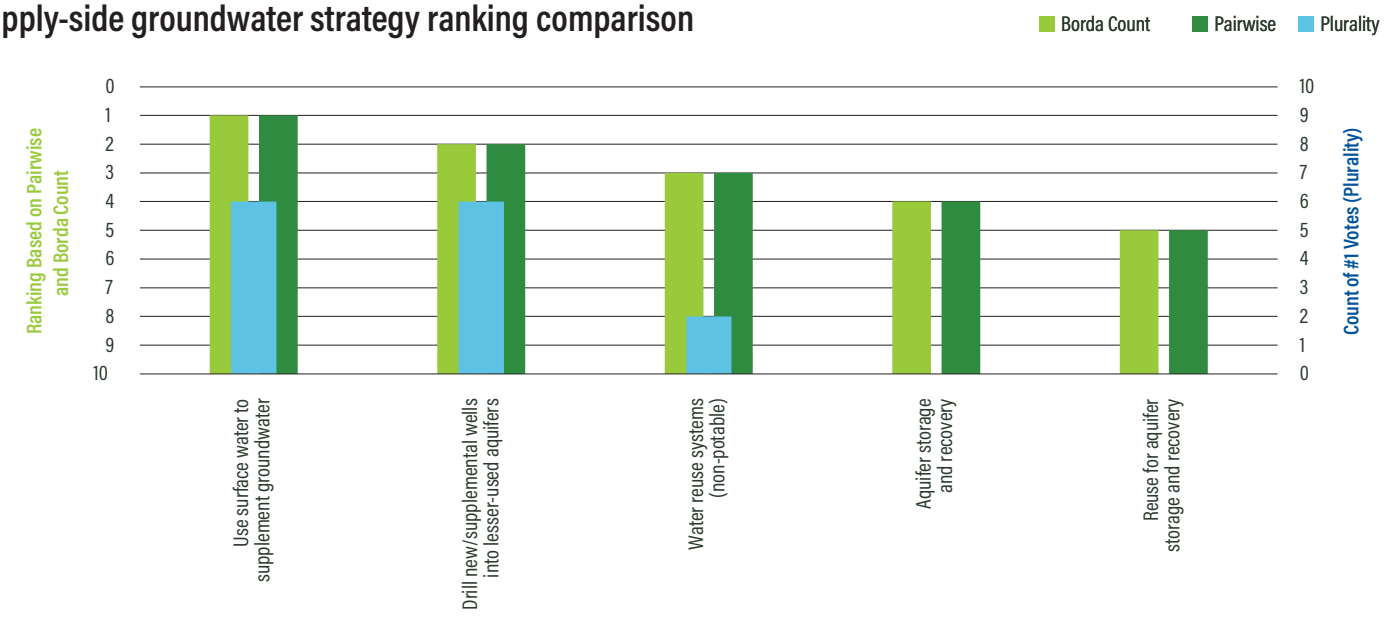


Figure ES-16. Supply-side groundwater strategy ranking comparison.

Key Takeaways:

- Three supply side groundwater strategies – using surface water to supplement groundwater supplies, drilling new wells, and reusing supplies to meet non-potable needs - were clearly prioritized by the RBC.
- Drilling new or supplemental groundwater wells into lesser-used aquifers is a strategy with strong support from the RBC.
- Two prioritized strategies are focused on aquifer storage and recovery and are closely related.

The RBC noted that some surface water and groundwater supply-side strategies may not be useful or appropriate in certain geographic areas due to hydrologic characteristics or regulations.

DROUGHT RESPONSE RECOMMENDATIONS

Drought management in South Carolina occurs at the state, regional, and local levels. At the state level, utilities are required to respond to drought conditions based on the requirements in the South Carolina Drought Response Act (Code of Laws of South Carolina, 1976, Section 49-23-10, et seq., as amended) (SCDNR 2009). SCDNR developed four drought management areas (DMAs) within the state to both enable geographically specific drought mitigation measures and to prevent overly-broad drought responses that ignore local conditions and challenges. The Pee Dee River basin spans the Northeast DMA and extends into part of the Central DMA.

Pee Dee RBC Drought Management Recommendations: The Pee Dee RBC developed the following recommendations related to drought planning, response, and drought policies:

1. The RBC recommends that water utilities review and update their drought management plan and response ordinance every 5 years, or more frequently if conditions change.
2. When droughts occur, the RBC encourages water users and those with water interests to submit their drought impact observations through the Condition Monitoring Observer Reports.
3. The RBC recommends that industries continue and enhance information sharing on best practices for drought management.
4. The RBC recommends that a Drought Management Advisory function be created within the RBC.
5. The RBC recommends that water utilities, when updating their drought management plan and response ordinance, look for opportunities to develop response actions that are consistent with those of neighboring utilities.
6. The RBC recommends that water utilities coordinate, to the extent practical, their drought response messaging.
7. The RBC recommends that value-added collaboration be conducted among members and stakeholders to investigate additional ways to mitigate drought-related risks.

Under the Planning Framework, the Pee Dee RBC has assumed additional responsibilities to help monitor and coordinate drought response effectively in the Pee Dee River basin. Two broad categories summarize these responsibilities:

Roles and Responsibilities

- Collect and evaluate local hydrologic information for drought assessment.
- Provide local drought information and recommendations to the Drought Response Committee (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.

Communication

- The Pee Dee RBC will communicate drought conditions and responses within the basin through the RBC's elected Chair (or Vice Chair, if the need arises).
- If a member of the Pee Dee RBC also serves on the DRC, this member may work with the RBC Chair (or Vice Chair) to directly communicate between the Pee Dee RBC and the DRC.
- The Pee Dee RBC will communicate and/or coordinate on drought response with water management groups that include a focus on the North Carolina portion of basin.

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

During the final phase of the planning process, the Pee Dee RBC developed, considered, and prioritized various policy, legislative, and regulatory recommendations. The RBC also offered technical recommendations and suggestions for improving the planning process. The ranked and prioritized policy and technical recommendations are shown in **Figure ES-17** and **Figure ES-18**.

While Pee Dee RBC priorities for policy, legislative, regulatory, technical, and planning process recommendations are described here, Chapter 7 of the Pee Dee River Basin Plan provides a comprehensive list of all the recommendations identified by the Pee Dee RBC

Policy recommendation ranking comparison

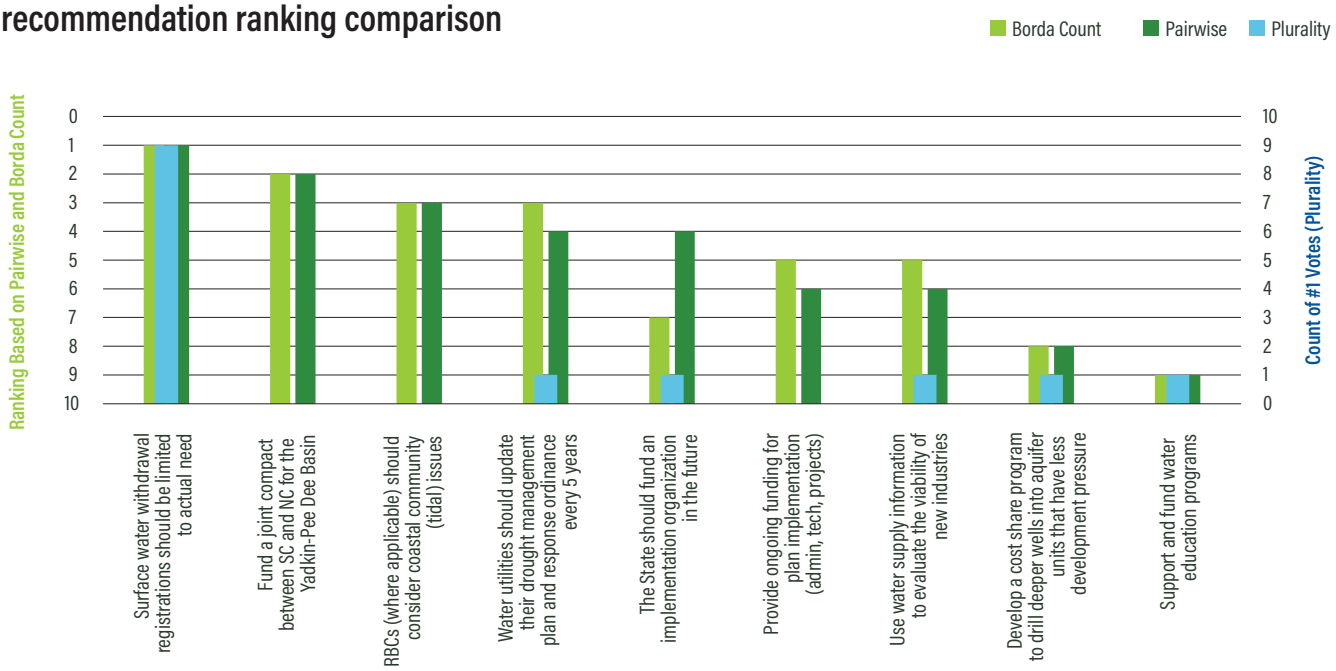


Figure ES-17. Policy recommendation ranking comparison.

Key Takeaways:

- The policy recommendation with the highest priority was that surface water withdrawal registrations should be limited to actual need.
- Several policy recommendations were generally supported by the RBC and also received a #1 vote by five of the RBC members. These recommendations focus on updating drought management plans, state funding of an implementation organization, using water supply information to evaluate viability of new industry, funding for drilling wells into aquifers with less water use, and funding water education programs.
- The Pee Dee RBC prioritized and highly supported several recommendations that focus on the continuation and implementation of the basin planning process.

Technical recommendation ranking comparison

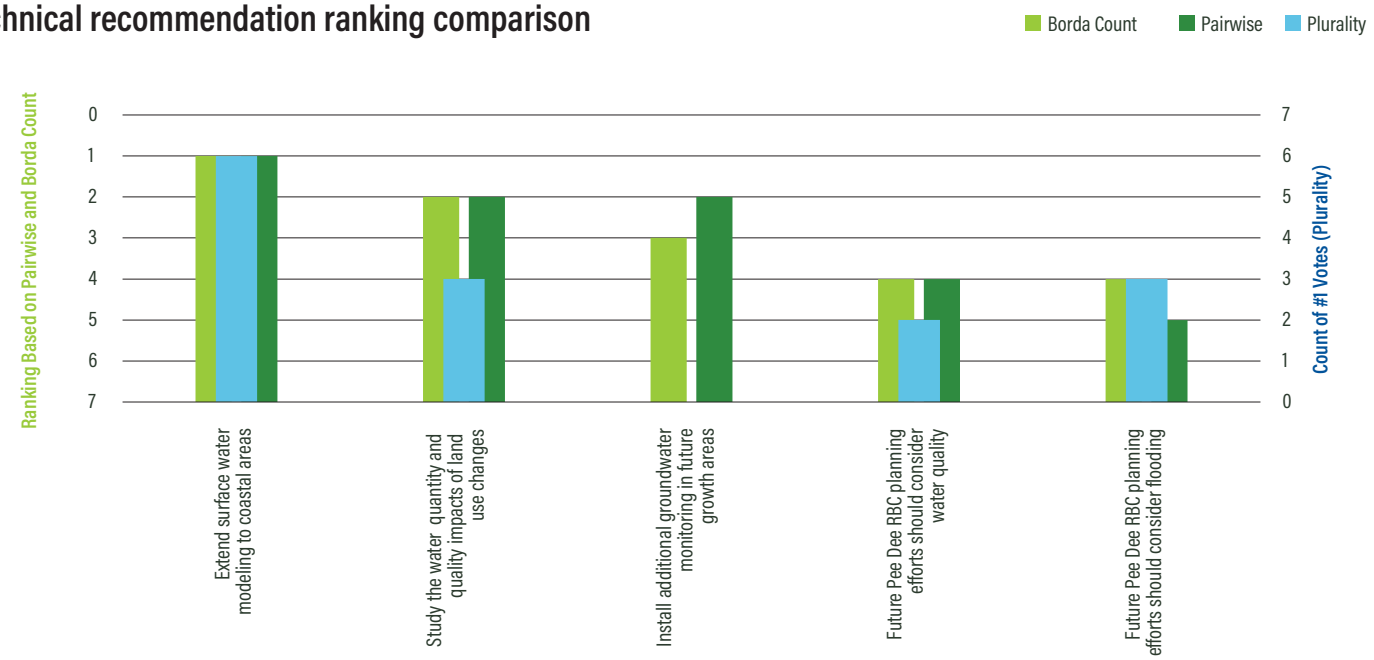


Figure ES-18. Technical recommendation ranking comparison.

Key Takeaways:

- Additional studies and extending technical analysis tools to consider coastal areas are highly supported by the RBC. This is especially important due to high projected population growth along the coast, the need for additional supplies to meet future demands in these communities, and declining local groundwater levels.
- Evaluating the water quantity and quality impacts of land use changes is another high priority for the Pee Dee RBC.
- The Pee Dee RBC strongly favored considering water quality and flooding impacts in future updates to the River Basin Plan.
- Additional discussions by the Pee Dee RBC, which occurred after the prioritization process, centered on the need for good data and the importance of good data for making sound water management decisions.
- The Pee Dee RBC also discussed the importance of completing the groundwater model to help inform their understanding of current and potential future groundwater-related risks and water management strategies to reduce risks

Recommendations to Improve the River Basin Planning Process

The following planning process recommendations should be taken into consideration for future planning process phases.

- The RBC (in conjunction with SCDES) should develop guidance and guidelines for processes to replace RBC members if current members resign, and to adjust member terms if necessary. They should develop best practices for recruiting new members.
- SCDES should organize an annual state-wide meeting of RBCs and State agencies.
- Public relations and communication strategies should be developed to educate the public on who the RBC is, what it does, and the benefits of participation. Strategies should focus on both the role of the RBC in planning and in implementation.
- Meetings could be held at differing locations and include more field trips, if possible.
- The South Carolina Legislature should continue to fund state water planning activities, including river basin planning. Currently, nearly all the funding for the river basin planning process has come from the legislature.

ES-7 Pee Dee River Basin Plan Implementation

The Pee Dee RBC identified five implementation objectives as outlined in Table ES-3. The objectives were developed based on RBC input throughout the river basin planning process and the themes that emerged from the recommendations made in previous chapters. These objectives were prioritized in accordance with the Planning Framework guidance, and justifications for their priorities are provided in the table.

Table ES-3. Implementation objectives and prioritization.

Objective	Priority	Prioritization Justification
Objective 1: Improve water use efficiency to conserve and sustain water supplies	High	While significant shortages were not projected in the Pee Dee Basin, efficient water use helps create resilience for unforeseen challenges. Many efficiency improvements can lower costs to homeowners, industry, and agriculture; can sustain supplies; and can be pursued immediately.
Objective 2: Implement one-water approaches to optimize sources of supply	High	Where water supplies are stressed, conjunctive use of surface and groundwater can help meet demands more reliably and sustainably. Actions should be implemented proactively in areas of water stress.
Objective 3: Improve drought management	Medium	Maintaining up-to-date drought plans and effective communication are important for public water supplier response and to coordinate actions at a basin- and state-level.
Objective 4: Broaden technical understanding of water resource issues	Medium	The RBC identified a wide variety of technical issues that need additional investigation to better understand current or potential future issues and to inform strategies to mitigate water supply risks.
Objective 5: Effectively communicate RBC findings and recommendations	High	Support and participation from basin stakeholders is critical to achieve the vision of the Pee Dee River Basin Plan.

Table ES-4. Implementation objectives and representative short-term strategies and actions.

Objective	Representative Short-Term (5-Year) Strategies and Actions
Objective 1: Improve water use efficiency to conserve and sustain water supplies	▪ Identify funding opportunities ▪ To the extent practicable, establish a baseline of residential per capita water use ▪ Implement an outreach and education program ▪ Individual water users to implement conservation practices
Objective 2: Implement one-water approaches to optimize sources of supply	▪ Identify funding opportunities ▪ Implement an outreach and education program ▪ Individual water users proactively implement new water supply practices
Objective 3: Improve drought management	▪ Public water providers on RBC to update drought management plans ▪ Communicate best practices for drought management by industry ▪ Foster drought communications among stakeholders
Objective 4: Broaden technical understanding of water resource issues	▪ Complete groundwater model ▪ Evaluate data gaps and needs ▪ Extend surface water modeling to coastal areas ▪ Study water quantity and quality impacts of land use changes ▪ Install additional groundwater monitoring in growth areas ▪ Consider water quality and flooding in future planning efforts
Objective 5: Effectively communicate RBC findings and recommendations	▪ Conduct Pee Dee RBC meetings to review, initiate, and support implementation actions ▪ Develop a communication plan early in the implementation process and conduct education and outreach

FUNDING OPPORTUNITIES

Existing external funding sources may be leveraged to promote implementation of the objectives. For example, EPA's Water Infrastructure Finance and Information Act (WIFIA) 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 Hazard Mitigation Grant Program (HMGP) or Building Resilient Infrastructure and Communities (BRIC) programs. Federal and other funding opportunities, such as USDA funding opportunities, are listed in Chapter 10 of the Plan.

IMPLEMENTATION CONSIDERATIONS

The Pee Dee RBC may encounter challenges with respect to implementation of the identified strategies. Potential challenges are listed and described below:

- **Funding:** Procuring sufficient funding to implement strategies was identified by the RBC as a significant challenge. Withdrawers may have limited financial resources to implement the strategies recommended under Objectives 1 and 2.
- **Stakeholder Acceptance:** The RBC has no authority to enforce recommendations in the basin, and implementation of many of the recommended strategies therefore require cooperation and acceptance from stakeholders. To address this, the RBC will develop and execute an outreach plan, including data to justify recommendations and strategies.
- **Support for the River Basin Planning Process:** Success of the River Basin Plan is dependent upon continued support for the South Carolina river basin planning process. Knowing this, the RBC developed and prioritized policy recommendations (see Chapter 9) that focus on the need for the State to fund an implementation organization in the future and to fund implementation of the River Basin Plan.
- **Staff and Resource Capacity:** Implementation will need to be supported by South Carolina, but the Pee Dee RBC anticipates that the State will need additional staff capacity and resources focused and dedicated to implementation of River Basin Plans across the basins.
- **External Communications:** Guidance is needed to help direct how communications with outside groups should be conducted, what should be said, and who should be involved.
- **Continued RBC Meetings:** The Plan's success hinges on continued activity from the RBC to foster implementation of the strategies developed in this Plan. The Pee Dee RBC has identified quarterly meetings as desirable in the first year after publication of the River Basin Plan to pursue funding and implementation. After the first year, meetings may be held less frequently as needed.
- **Consensus Framework:** As the RBC makes decisions related to implementation, the RBC should build consensus where possible and document alternative points of view when consensus is not possible.
- **Clarity of Responsibilities:** The implementation plan identifies responsible entities for each short-term action, but as implementation is carried out, clear responsibilities should be established and communicated.

SUMMARY

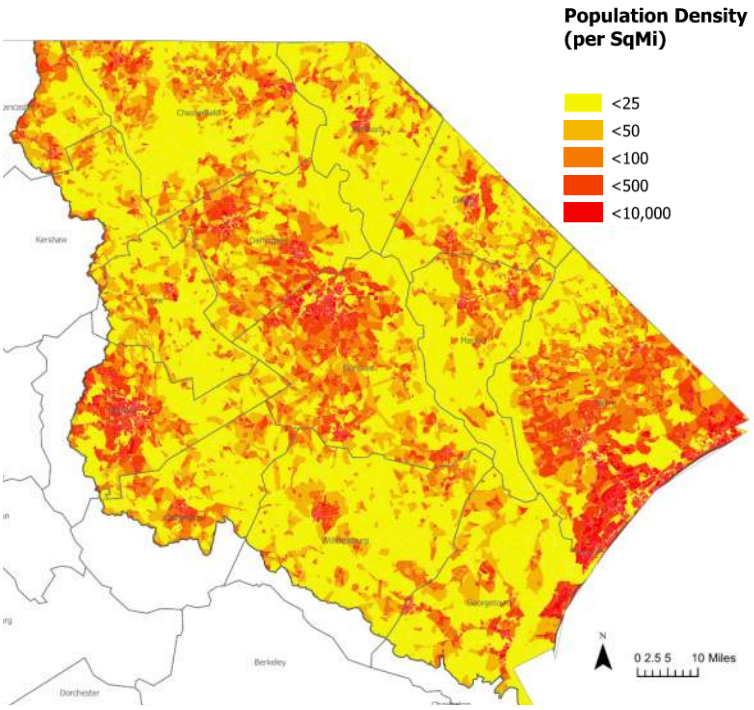
The Pee Dee RBC, the third of eight statewide RBCs to convene, has successfully followed the Planning Framework to develop a consensus-based River Basin Plan for the Pee Dee River basin. **While surface water shortages were not projected to have a large impact in the Pee Dee River basin, the RBC prioritized water use strategies that focus on efficient use of water resources to create resilience for unforeseen future challenges. Current and potential future groundwater supply challenges were identified in certain areas of the basin (especially along the coast), and groundwater modeling is needed to fully characterize the issues and solutions.** Other important objectives of the Pee Dee RBC are implementing one-water approaches aimed at addressing stressed water supplies and developing ways to meet water demands more reliably and sustainably. Through timely drought management communication, continued technical exploration, and active engagement with RBC stakeholders, the Plan aims to chart a course of action over the short and long term for the basin.

Springtime in the Pee Dee River Basin

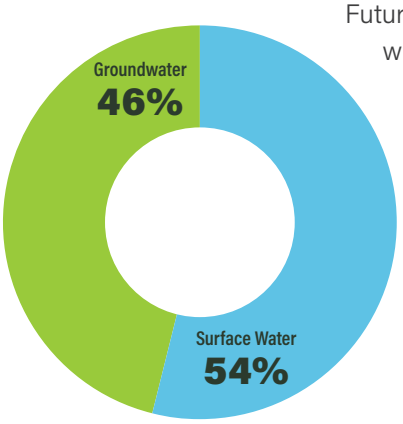
Municipal Summary

The Pee Dee River basin contains a mix of rural and urban areas. Large portions of the basin are rural in nature, and cities like Florence, Sumter, and Myrtle Beach contain more highly developed, urban, and population-dense areas. Horry County is the most populous in the basin followed by Florence and Lancaster counties. Of the counties in the Pee Dee River basin, Horry and Georgetown counties along the coast have seen the highest increases in population since 2010.

Municipal water providers in the Pee Dee River basin currently use around 143 million gallons per day (MGD) on average. Aside from power generation, the municipal water sector has the highest use in the basin at 14 percent (if water demands for nuclear power are ignored, municipal uses are 58 percent of basinwide demand).



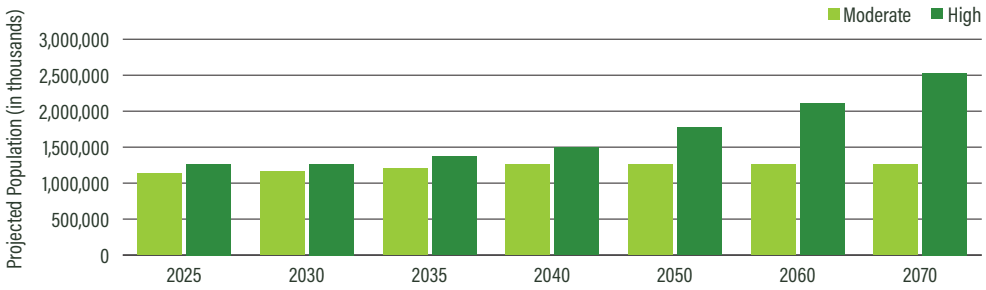
Population density in the Pee Dee River basin is greatest along the coast



Surface water provides most of the current municipal supply in the Pee Dee River basin

Future population increases will drive the need for additional water to meet municipal demands.

Basinwide, population is anticipated to increase by 45 and 117 percent in the Moderate and High Demand scenarios, respectively. Horry and Lancaster counties are projected to see the highest population increases.



	Moderate Demand Scenario (MGD)			High Demand Scenario (MGD)		
Year	Surface Water	Groundwater	Total	Surface Water	Groundwater	Total
2025	79.5	61.2	**140.7**	90.0	82.6	**172.6**
2070	139.4	68.2	**207.6**	231.3	144.5	**375.8**
% Change 2025-2070	**75%**	**11%**	**47%**	**157%**	**75%**	**118%**

Water demands basinwide are anticipated to increase from 47 to 118 percent in the Moderate and High Demand scenarios, respectively. Groundwater use is anticipated to increase more than surface water.

Modeling conducted for the Pee Dee River basin did not suggest that municipalities will experience future surface water shortages, but groundwater supply risks may increase.

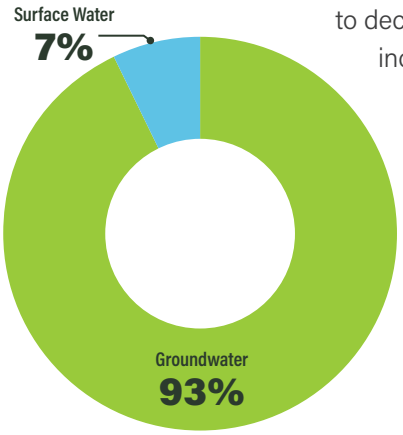
The RBC prioritized several water management strategies for municipalities, including:

- Leak detection and water loss control
- Increasing water use efficiency
- Conjunctively using surface water and groundwater supplies

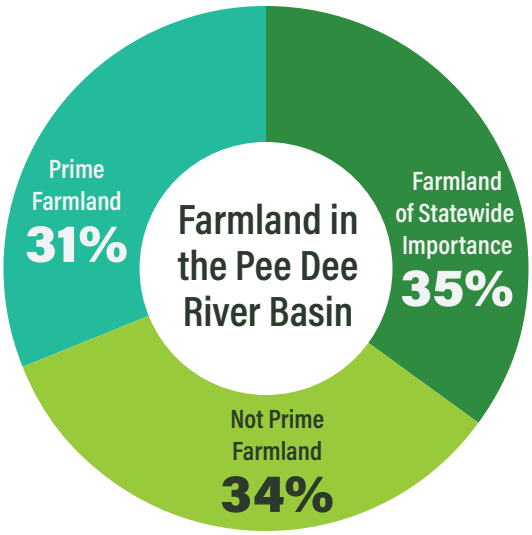
Agricultural Summary

Farmland makes up a significant portion of the Pee Dee River basin, and agricultural production is integral to the basin's economy. The Pee Dee River basin also has a significant number of livestock operations.

The number of farms in the South Carolina has generally increased since 1992, but growth has slowed and tapered since 2007. While the growth of farms has been variable and begun to decline slightly, irrigation has steadily increased. Irrigation has grown in South Carolina and is a critical tool for sustaining crop production during dry times. Overall, farmers irrigate efficiently in the Pee Dee River basin, with 95 percent using sprinkler and drip systems.



Groundwater provides most of the current irrigation supply in the Pee Dee River basin



A wide variety of crops are grown in the Pee Dee River basin including grains, fruits, vegetables, beans, greens, and cotton.

Irrigated agriculture currently uses 36 million gallons per day (MGD) on average, which is about 4 percent of the overall water demand in the Pee Dee River basin (if water demands for nuclear power are ignored, irrigated agriculture is 15 percent of basinwide demand).

By 2070, irrigated area and irrigation water use are expected to grow 34 to 38 percent in the Pee Dee River basin.

	Moderate Demand Scenario (MGD)			High Demand Scenario (MGD)		
Year	Surface Water	Groundwater	Total	Surface Water	Groundwater	Total
2025	1.9	27.3	**29.2**	5.0	71.0	**76.0**
2070	2.6	36.5	**39.1**	6.5	98.4	**104.9**
% Change 2025-2070	**31%**	**34%**	**34%**	**30%**	**39%**	**38%**

The RBC prioritized three water management strategies for agriculture:

- Conservation tillage/cover cropping
- Water audits and center pivot sprinkler retrofits
- Irrigation scheduling programs

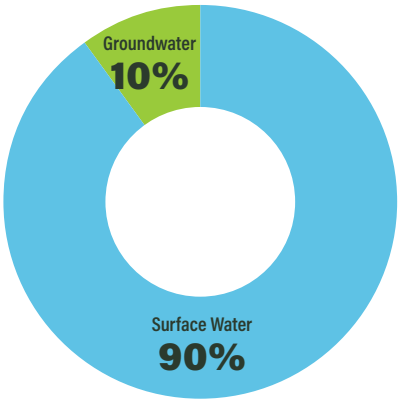
Modeling conducted for the Pee Dee River basin did not suggest that agriculture will experience significant future water shortages. However, the Pee Dee RBC recommends that agriculture continues to build efficiencies into its water use to increase crop production and sustain water supplies.

Industrial Summary

Both surface water and groundwater are used for industry in the Pee Dee River basin. Surface water is used to produce paper, packaging, and other paper-related products (Domtar, West Rock Co., and International Paper); manufacture and recycle steel (Nucor); and manufacture packaging solutions (Sonoco).

Pee Dee River basin industries currently use 97 million gallons per day (MGD) on average, which is about 9 percent of the overall water demand in the Basin (if water demands for nuclear power are ignored, industrial use is 39 percent of basinwide demand).

Industrial water demands are projected to increase by 43 percent from 2025 to 2070 in the Moderate Demand Scenario. In the High Demand Scenario, industrial water demands are projected to increase by 155 percent from 2025 to 2070. While manufacturing has variable production day-to-day, the High Demand Scenario assumes maximum production and potential for new industries or facilities to develop. Surface water is anticipated to remain the primary source of supply for industry, but groundwater use is projected to increase as well.



Surface water provides most of the current supply used by industry in the Pee Dee River Basin

	Moderate Demand Scenario (MGD)			High Demand Scenario (MGD)		
Year	Surface Water	Groundwater	Total	Surface Water	Groundwater	Total
2025	83.5	11.3	**94.8**	100.8	18.5	**119.3**
2070	114.1	21.6	**135.7**	256.7	47.1	**303.8**
% Change 2025-2070	**37%**	**91%**	**43%**	**155%**	**155%**	**155%**

The RBC recognizes that industry is an efficient user of water and minimizes costs associated with water use. Industry can continuously strive to build on past success and be more efficient. RBC recommended water management strategies for industry focus on using water efficiently and reducing water demands, especially during drought.

The RBC prioritized three water management strategies for industry:

- Water loss control and routine maintenance
- Using water efficient processes
- Water reuse and recycling


Brown AND
Caldwell