SC DEPARTMENT *of* ENVIRONMENTAL SERVICES

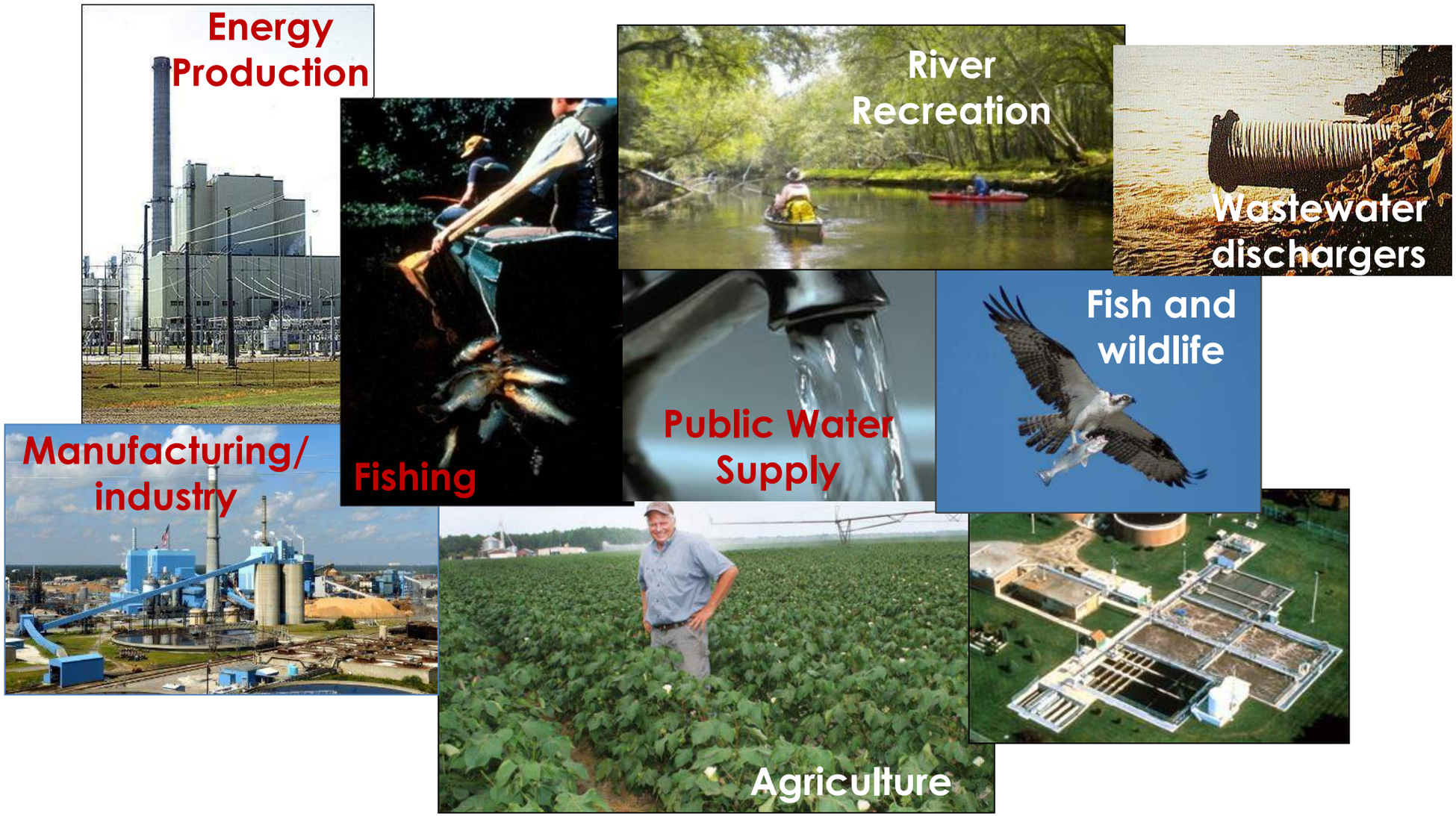
South Carolina State and River Basin Planning

Scott Harder, Hydrology Section Manager
Division of Water Resources/Bureau of Water
SC Department of Environmental Services

Santee RBC Meeting #1, December 19, 2024
Old Santee Canal Park
Moncks Corner, SC

Agenda Item 5

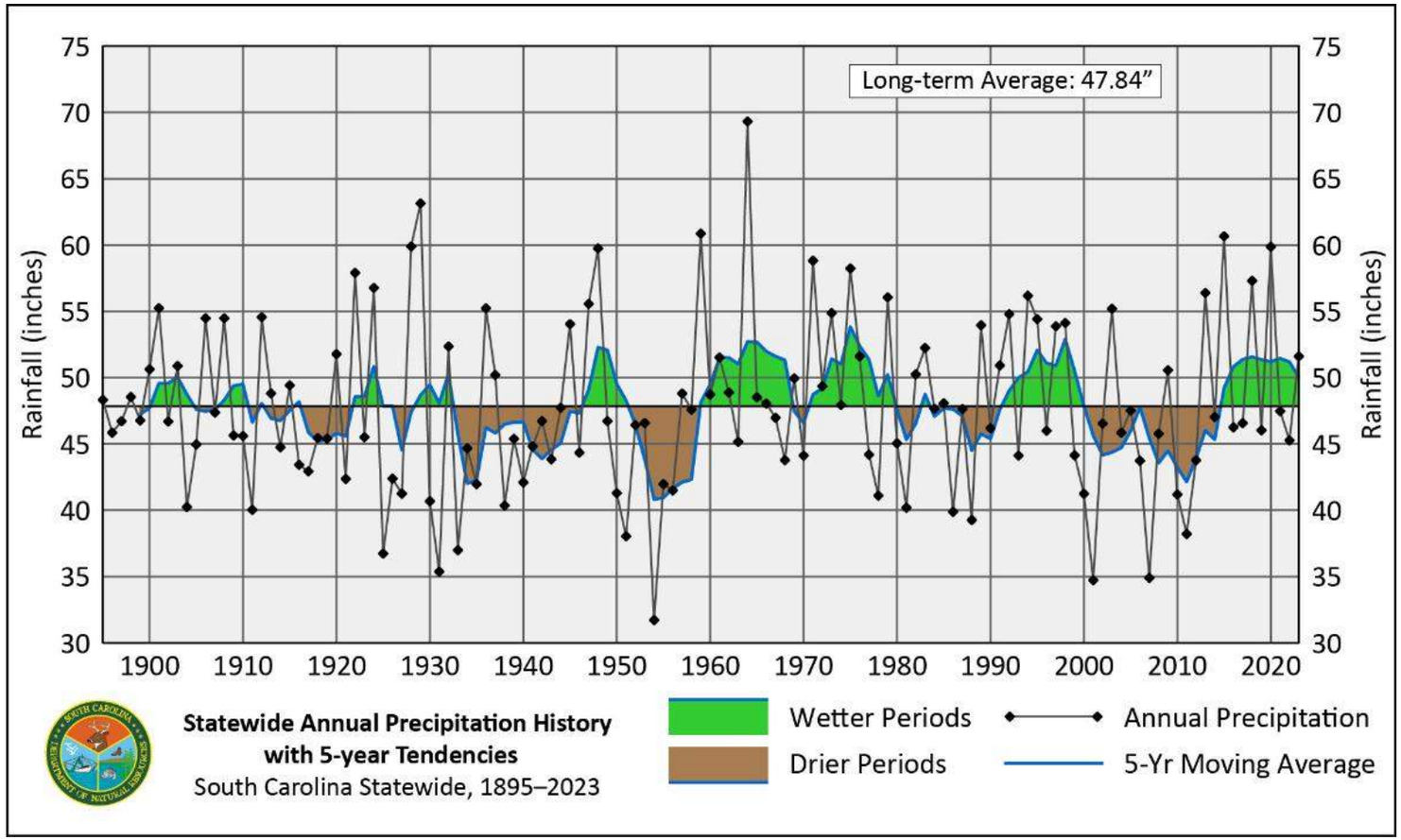
Water Use in South Carolina



Why State Water Planning?

Drought

SC generally has an abundance of water, but recent droughts (**1998-2002**, **2007-2008**, **2011-2012**, **2016**, **2019**, **2021**, **2024**) have stressed the State's water resources.

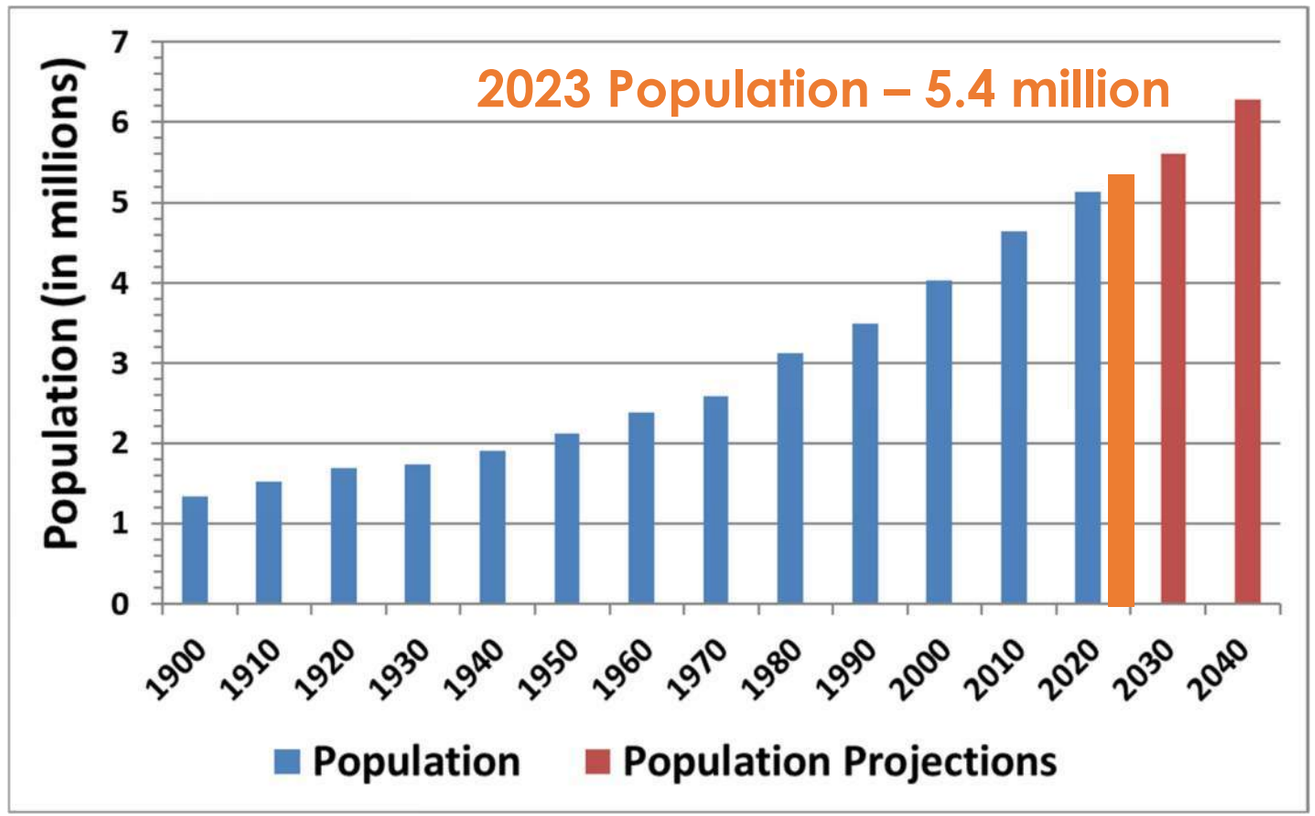


Statewide Average Annual Rainfall (inches) and 5-year Running Average

Why State Water Planning?

Population Growth → Increased Water Demand

- From 1990 – 2023, SC population increased from **3.5** to **5.4** million and is forecasted to increase to **6.3** million by 2040.
- Our growing population may increase future water demands and may increase competition for our water supplies.



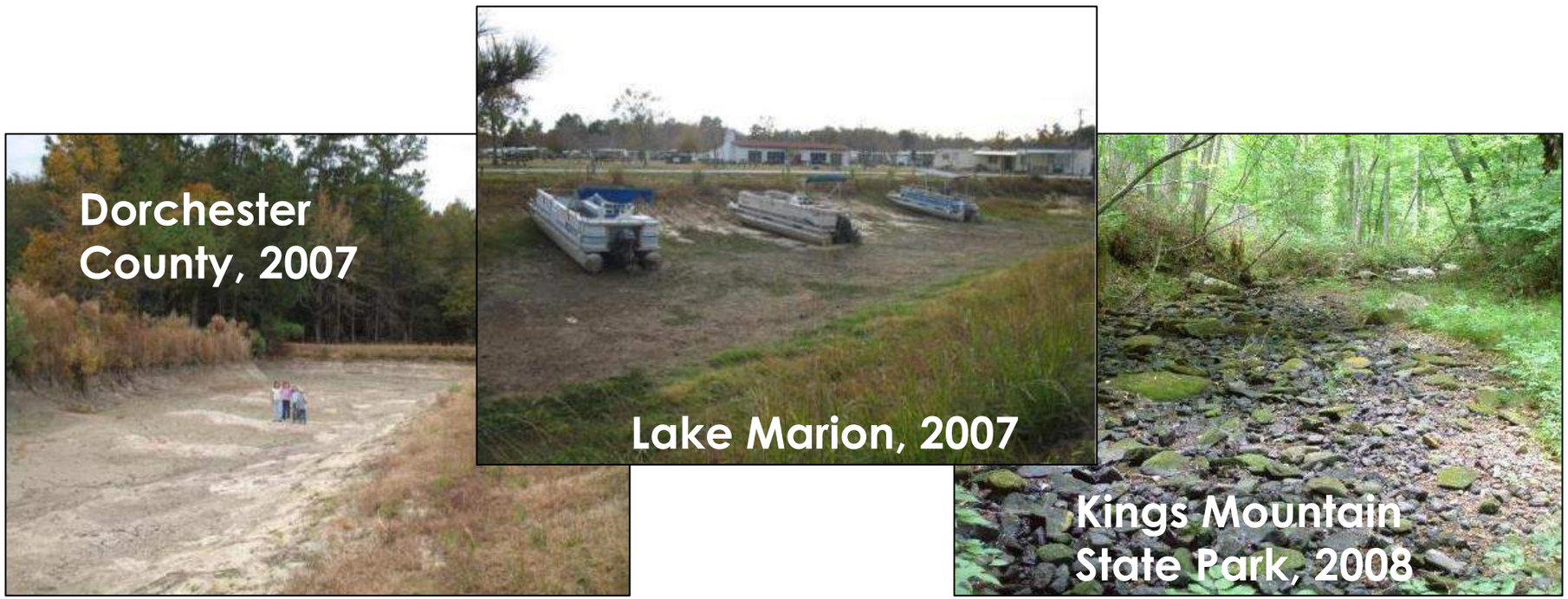
SC Population Growth from 1900 – 2023 and Projections for 2030 – 2040

Data from the SC Office of Revenue and Fiscal Affairs, 2024, and U.S. Census Bureau, 2024.

Why State Water Planning?

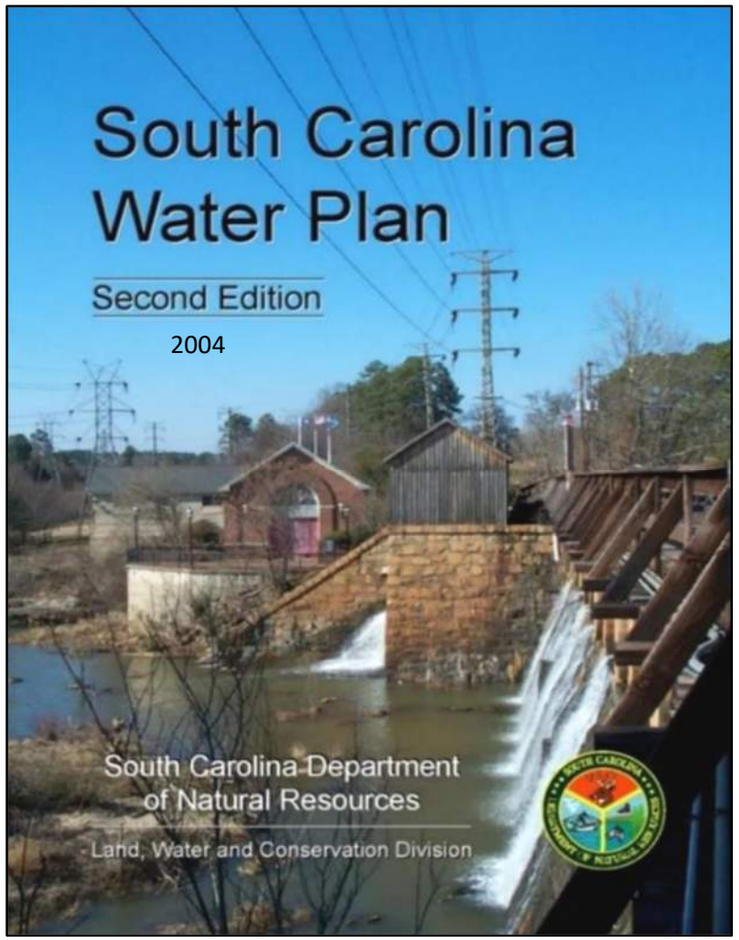
Tree-ring studies indicate the occurrence of more severe and longer-term droughts (Mega-droughts) over the past 400 years.

Uncertainty in future droughts + increased water demand = the need for comprehensive State and river basin planning.



Photos courtesy of National Drought Mitigation Center

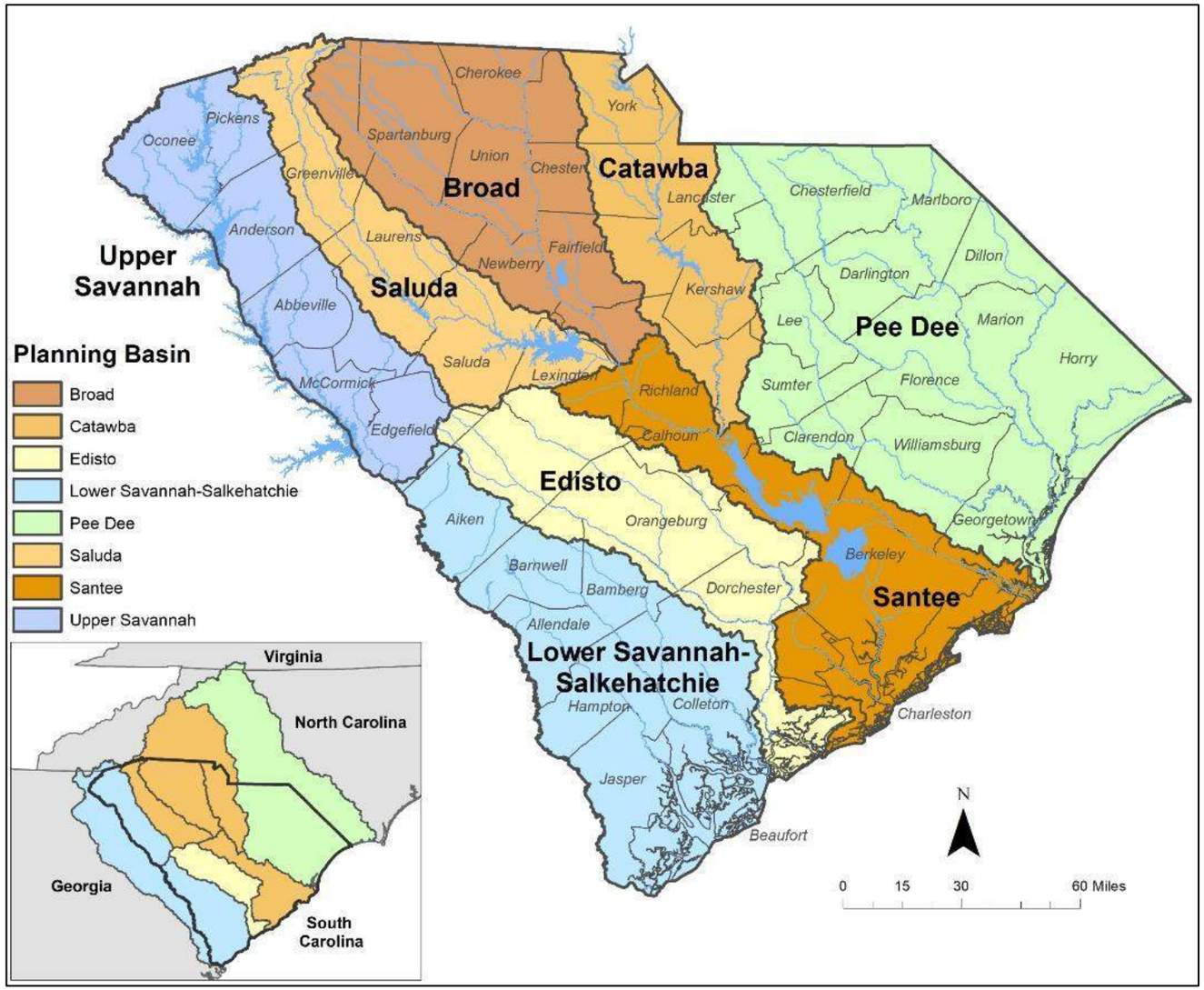
History of State Water Planning



- Prior to July 1, 2024, state water planning was the responsibility of SCDNR:
  - SCDNR published the first edition of the State Water Plan in 1998.
  - In 2004, SCDNR published the second edition of the South Carolina Water Plan incorporating lessons learned from the drought of 1998-2002.
  - One recommendation was to develop a regional water plan for each major river basin in the State.
  - In 2014, SCDNR initiated the first steps to developing regional water plans, now formerly called River Basin Plans.
- ***Pursuant to Act 60 of 2023 and effective July 1, 2024, water planning responsibilities were transferred to SCDES.***

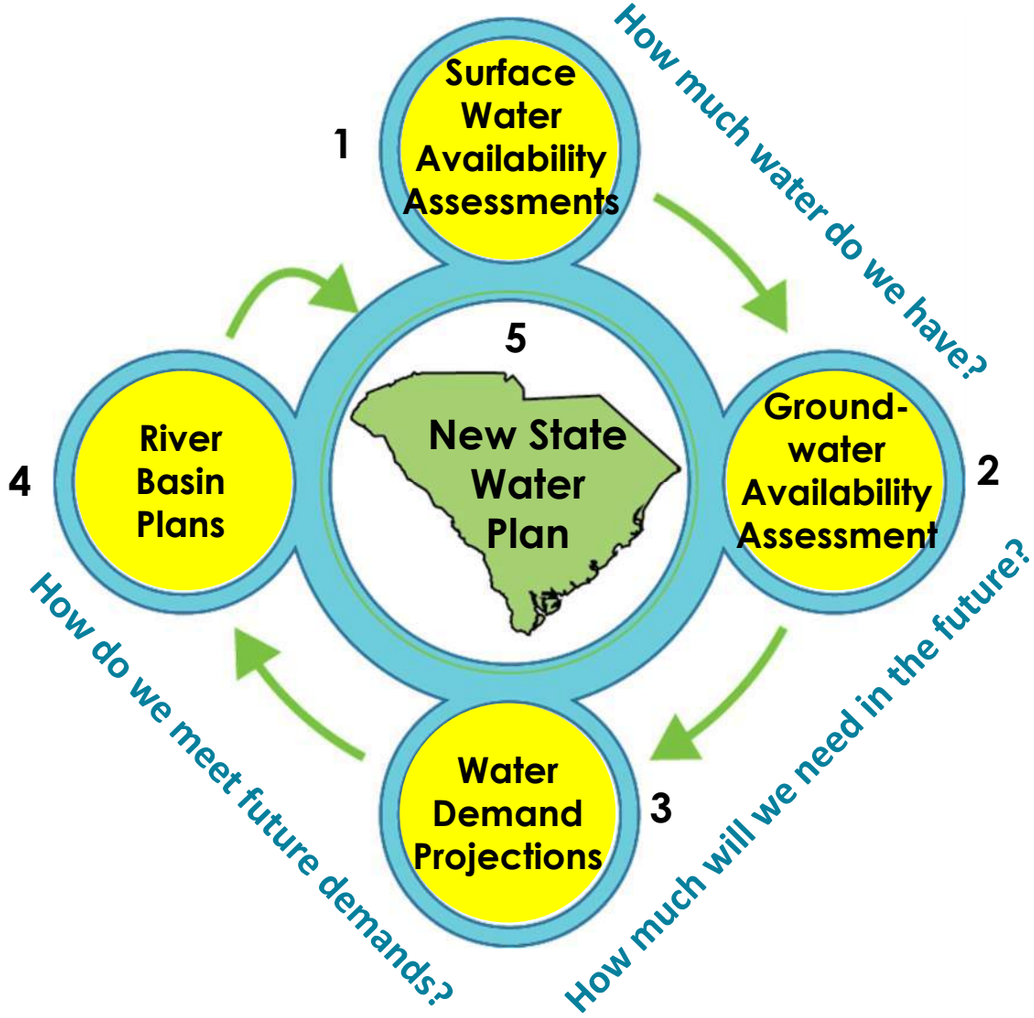
South Carolina's Eight Planning Basins

- River Basin Plans will be developed for the State's eight major river basins using a "bottom-up" approach where stakeholders in each basin lead the development of their basin plan.
- Collectively, the River Basin Plans will form the foundation of a new State Water Plan.



Five-step Process

1. ***Surface Water Assessments*** – completed in 2017 for each basin (CDM Smith, Inc).
   - Models are updated as needed.
2. ***Groundwater Assessment*** – in progress (USGS).
   - Models will not be available for first iteration of planning.
3. ***Water Demand Projections*** – methodology report completed in October 2019.
   - Projections completed for each basin as needed.
4. ***River Basin Plans*** – developed under the guidance of the South Carolina State Water Planning Framework (published in 2019).
   - Documents water supply, water shortages, and strategies to ensure water availability for all future uses.
5. ***State Water Plan*** – River Basin Plans will form the foundation of a new State Water Plan.

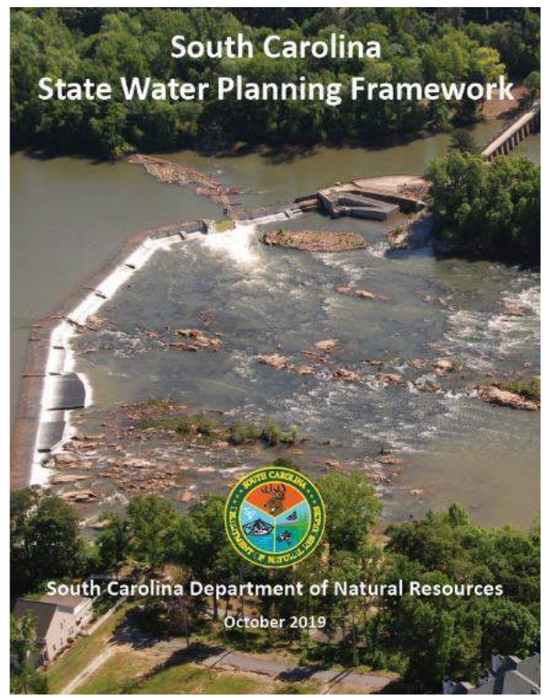


Cooperators:

SC DEPARTMENT of ENVIRONMENTAL SERVICES · US Army Corps of Engineers · CDM Smith · USGS science for a changing world · CLEMSON UNIVERSITY · Brown AND Caldwell

Planning Process Advisory Committee

- Convened by SCDNR in March 2018.
- Purpose - develop a guidance document (Planning Framework) for developing River Basin Plans and for updating the State Water Plan.
- South Carolina State Water Planning Framework (Planning Framework) was published in October 2019 after an 18-month process.
- **New WaterSC committee has recently replaced the PPAC.**



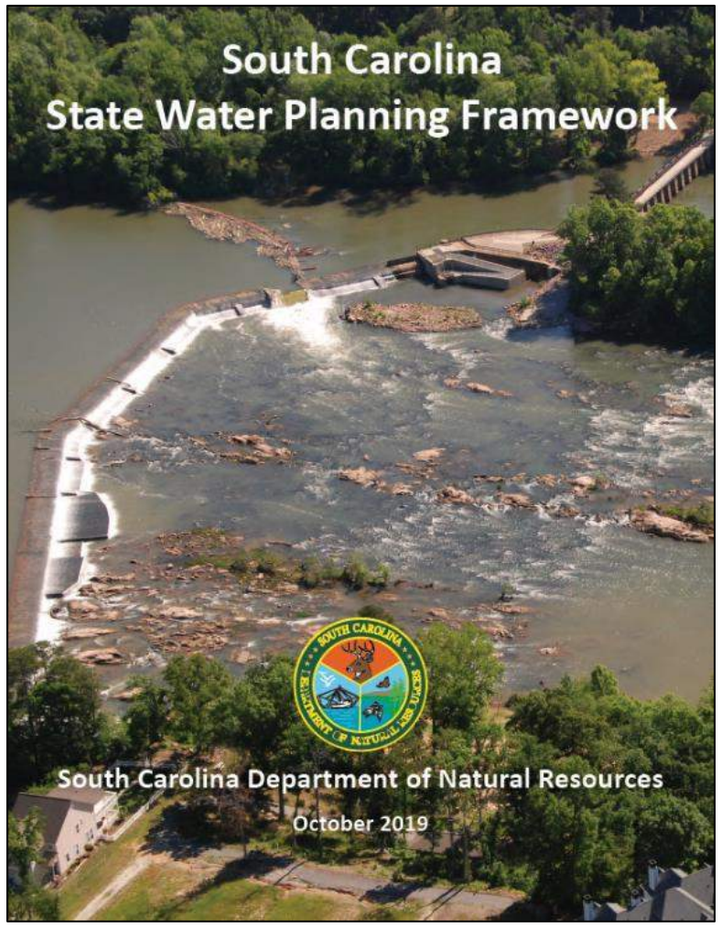
Planning Framework is available for review and download at:
https://des.sc.gov/programs/bureau-water/hydrology/water-planning

Contents of Planning Framework

Sections:

1. Executive Summary
2. Introduction
3. River Basin Planning Process
4. Methodologies for Evaluating Water Availability
5. River Basin Plan Table of Contents
6. River Basin Planning Process Implementation
7. River Basin Plan Implementation
8. State Water Plan

Appendix: River Basin Council Bylaws



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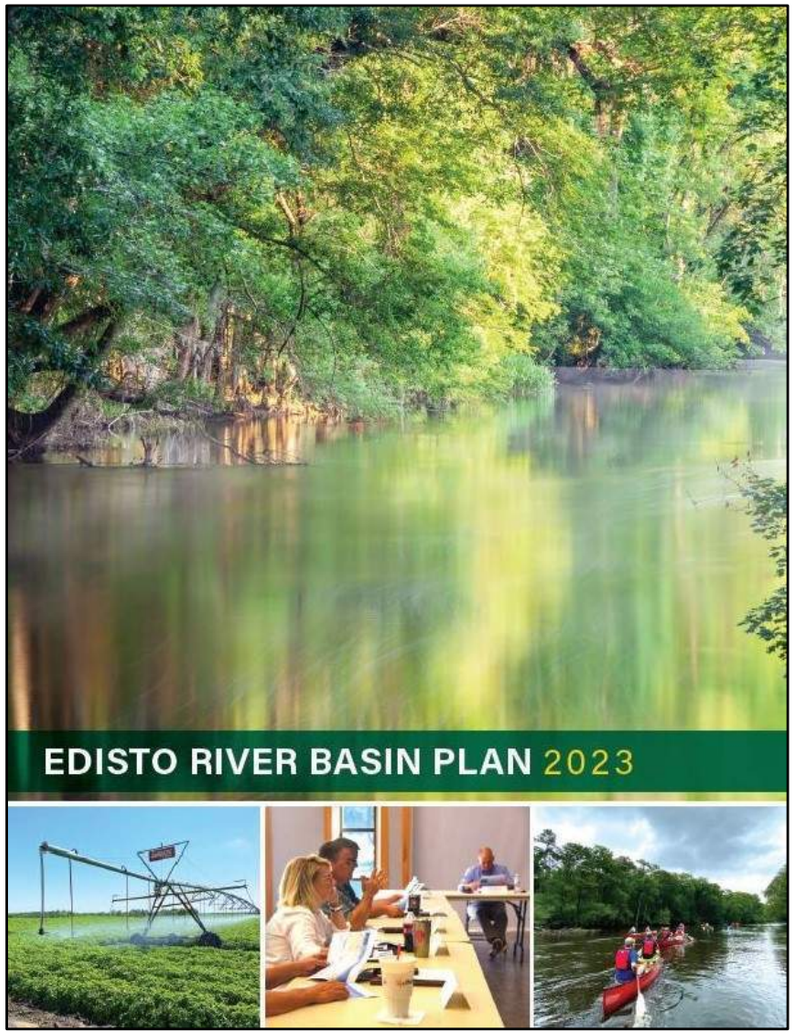
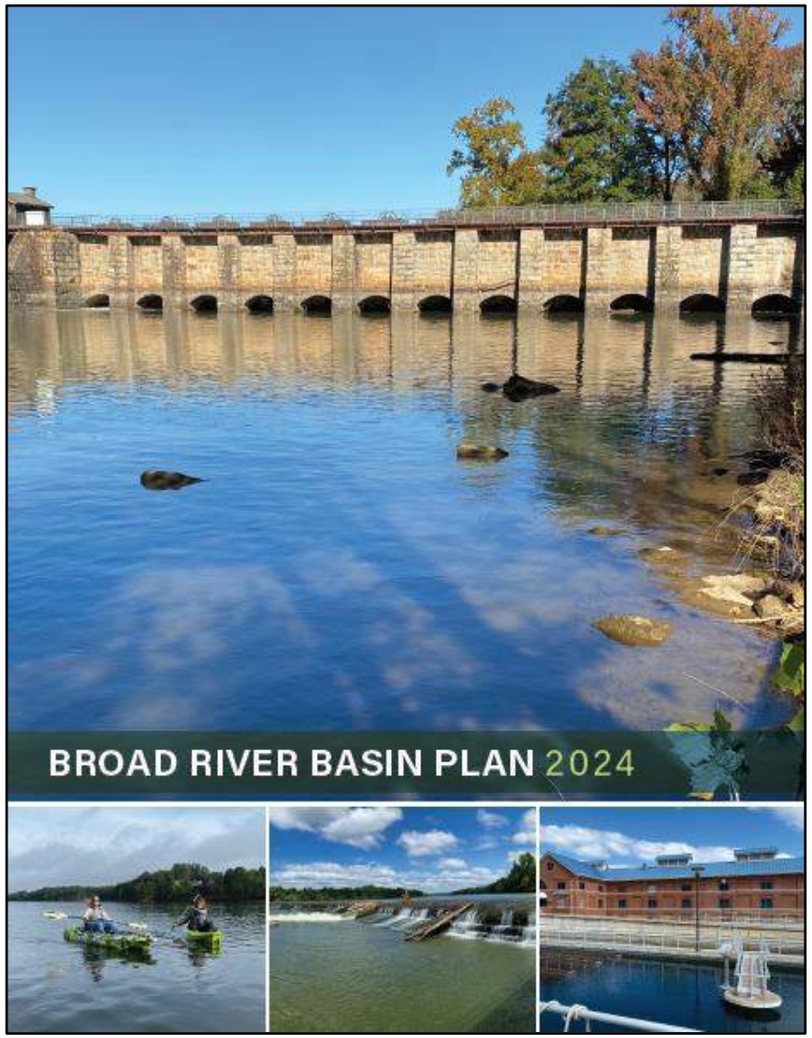
SC River Basin Planning: Status and Long-term Schedule

River Basin Planning Current Status

Basin	Status	Completion Date
Edisto	Completed	June 2023
Broad	Completed	February 2024
Pee Dee	June 2022 – present	March 2025
Saluda	March 2023 – present	April 2025
Upper Savannah	July 2023 – present	May 2025
Lower Savannah/ Salkehatchie	November 2023 – present	August 2025
Catawba	CWWMG's Integrated Resource Plan 2020 – present	2025
Santee	December 2024	Fall, 2025
State Water Plan	October 2024	December 2025

Completed River Basin Plans





Plans available for review at:

https://des.sc.gov/programs/bureau-water/hydrology/water-planning

The Charge for WaterSC

Executive Order No. 2024-22

- Balance the State's ***economic, environmental, and social needs***;
- Ensure the ***reliability, resiliency, sustainability, and sufficiency*** of the State's water resources ***for all existing and future uses***, while simultaneously ***protecting the environment***; and
- Support and facilitate additional ***collaboration*** with ongoing efforts and existing initiatives.

The Charge for WaterSC

Executive Order No. 2024-22

- Stakeholder Engagement Plan
  October 31, 2024
- Report to Surface Water Study Committee
  January 31, 2025
- Advise on updated State Water Plan
  December 31, 2025

The WaterSC Working Group

Sectors

- Academia
- Public Water Suppliers
- Conservation, Water and Land & Historic Preservation
- Agriculture
- Forestry
- Industry
- Energy
- Tourism and Hospitality
- Agency *ex officio*

SC DEPARTMENT of ENVIRONMENTAL SERVICES

SOUTH CAROLINA DEPT. OF COMMERCE

SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES

SOUTH CAROLINA DEPARTMENT OF PARKS, RECREATION & TOURISM

SOUTH CAROLINA DEPARTMENT OF AGRICULTURE SCDA 1878

SOUTH CAROLINA OFFICE OF RESILIENCE

The WaterSC Working Group

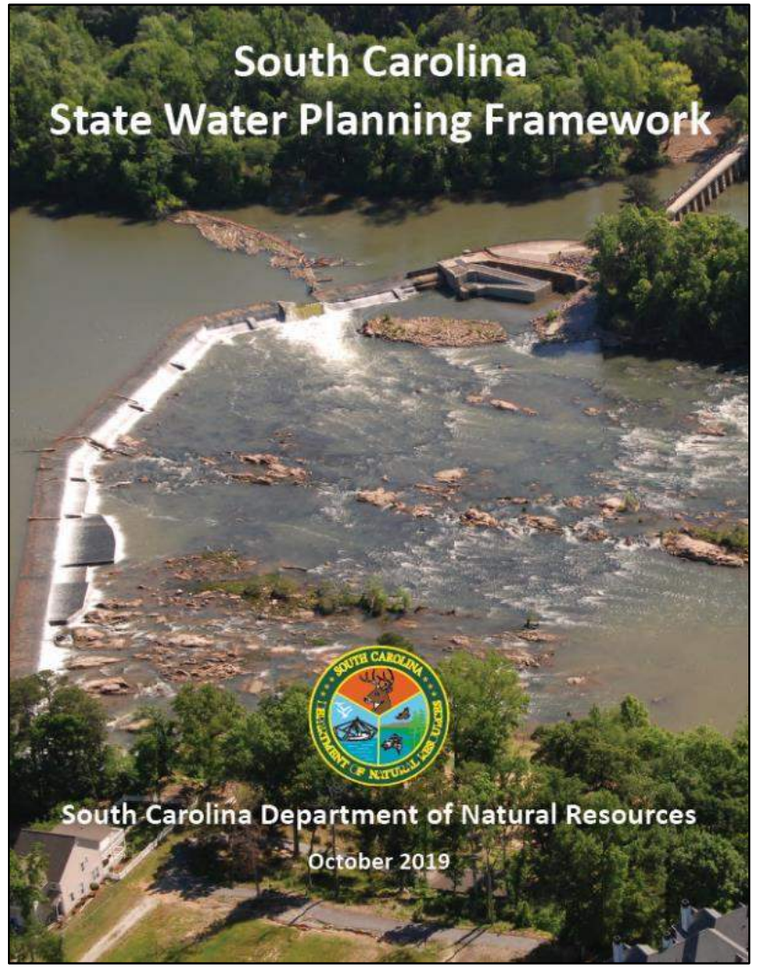
- Have a statewide resource-focused approach
- Remain committed to the process
- Serve as a voice and connection for stakeholder sectors and categories
- Provide transparency
- Be collaborative and solution-focused

What is a River Basin Plan?

What is a River Basin Plan?

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?
3. What will be the basin's water demand over the Planning Horizon, and will the water supply meet the demand?
4. What water management strategies will be employed to ensure the supply meets or exceeds the projected demand over the Planning Horizon?



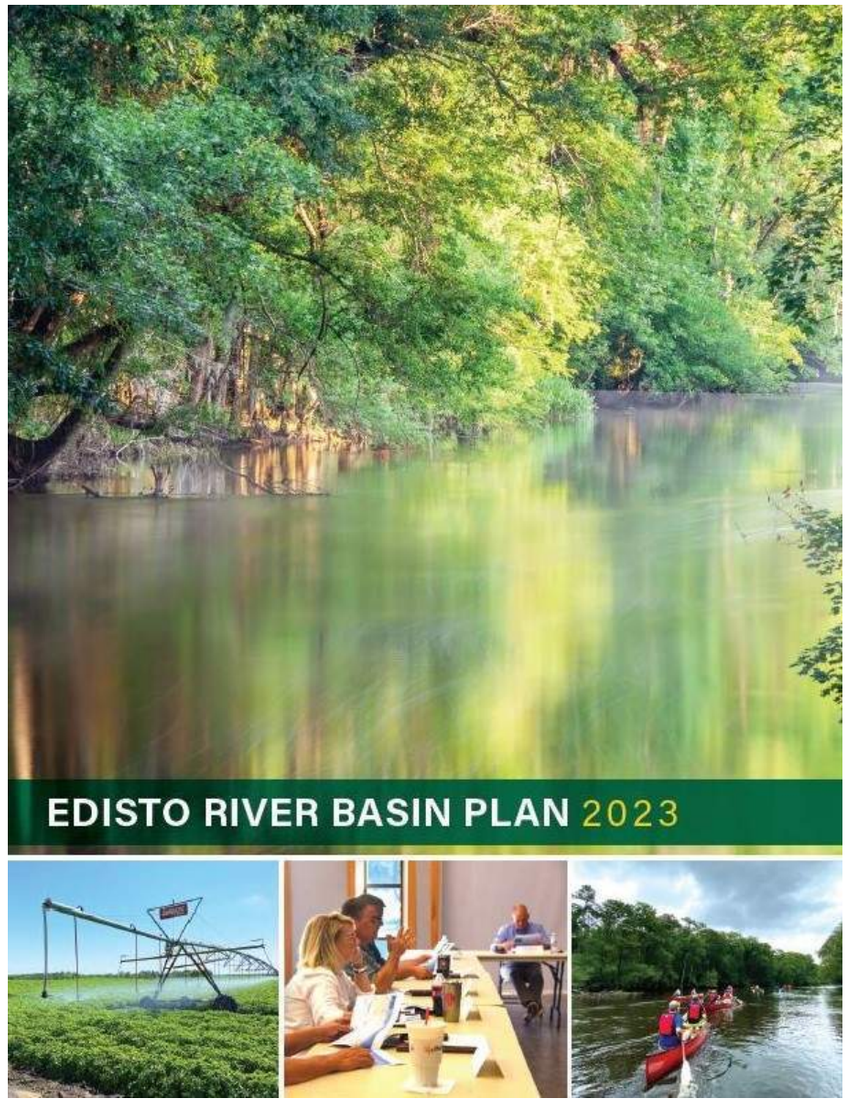
Proactive Water Management, not Reactive!

Guiding Principles

- Water is a limited natural resource and is a major factor for economic development and environmental protection.
- River Basin Plans should strive for the equitable use of water resources with the goal of ensuring water is available for all uses, when and where needed, throughout the Planning Horizon and under drought conditions.
- River Basin Plans should protect the public's health and well-being and should balance social, economic, and environmental needs.

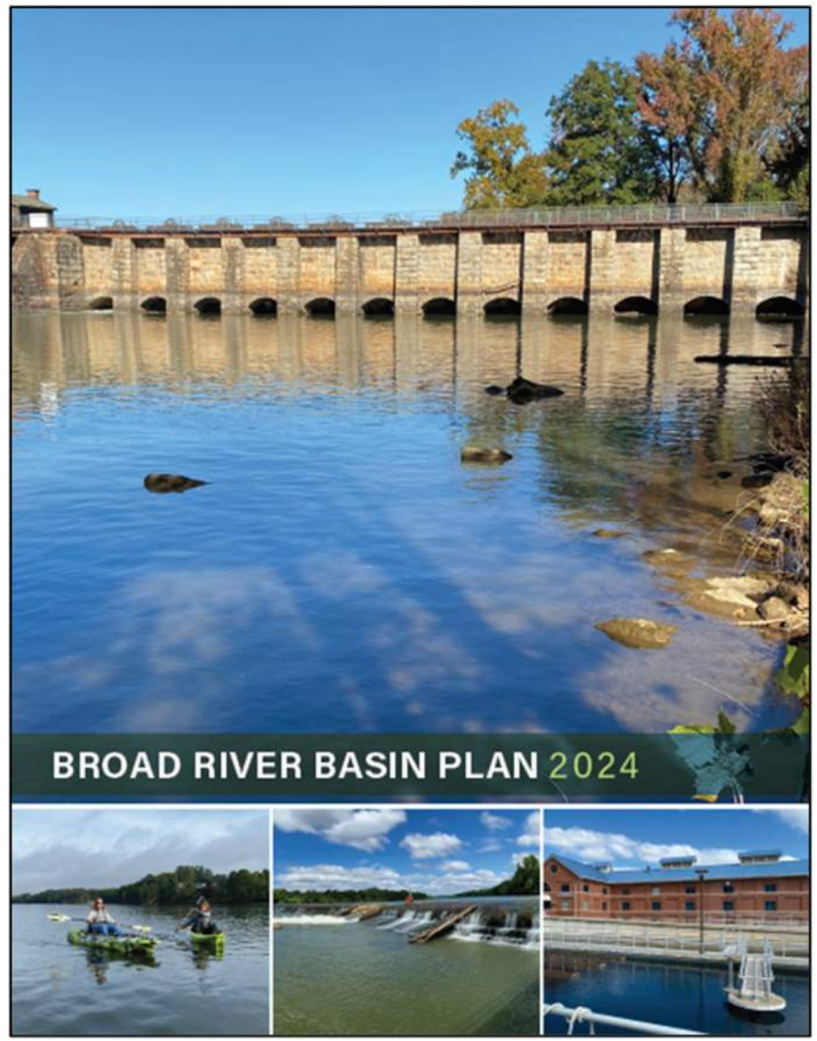
Features of a River Basin Plan

- **Stakeholder-developed.**
- Covers a **50-year** Planning Horizon.
- Considers both **surface water** and **groundwater** resources.
- Current focus is on water ***quantity*** not water ***quality*** with emphasis on drought conditions.
- **Not a regulatory document** but may include recommendations regarding State water policy, law, and regulations.
- Updated every 5-years – **water planning will be an ongoing process**.
- Supported by hydrologic data, models, and water-demand projections.



River Basin Plan Table of Contents

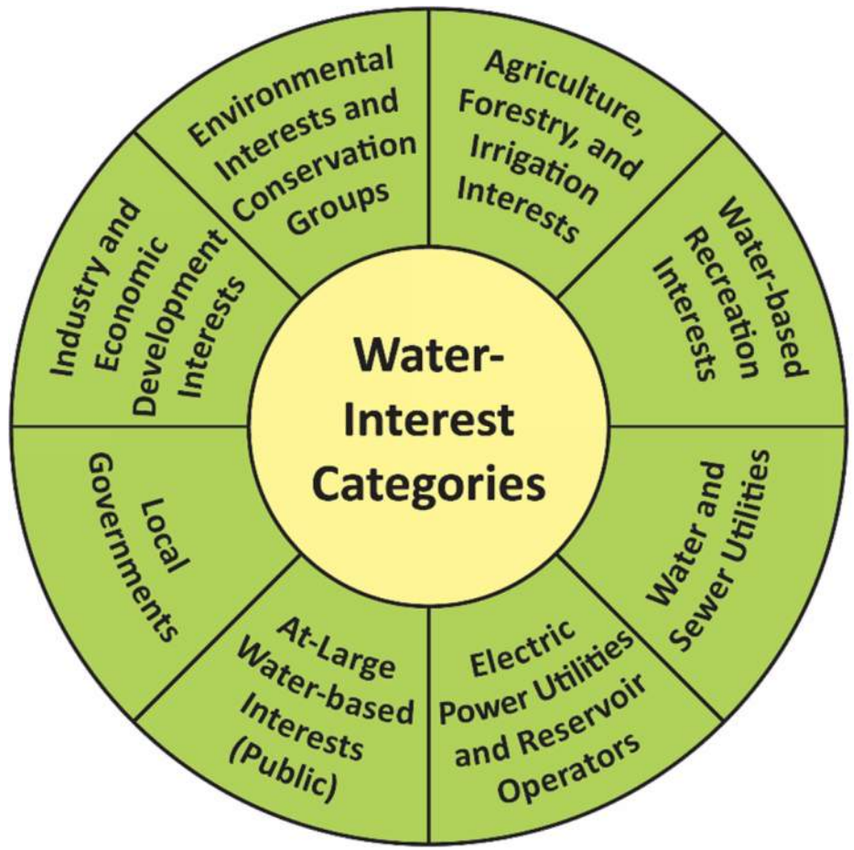
1. Introduction
2. Description of the Basin
3. Water Resources of the Basin
4. Current and Projected Water Demand
5. Comparison of Water Resource Availability and Water Demand
6. Water Management Strategies
7. Water Management Strategy Recommendations
8. Drought Response
9. Policy, Legislative, Regulatory, Technical, and Planning Process Recommendations
10. Implementation Plan



How will the River Basin Plan be Developed?

Planning Framework calls for the formation of a River Basin Council (RBC) in each planning basin

- **Stakeholder-led team** responsible for developing the River Basin Plan.
- **25-30** members representing **8 interest categories.**
- Governed by a set of Bylaws.
- **Consensus based** decision-making process.
- Chair and Vice-Chair elected by RBC.



RBC Roles and Responsibilities

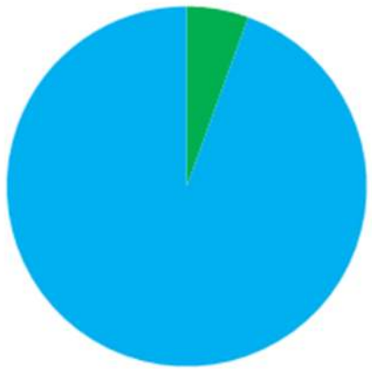
- Identify water shortages or conflicts using hydrologic models.
- Recommend strategies to mitigate or eliminate water use conflicts or water shortages.
- Help draft River Basin Plans.
- Communicate with stakeholders and the public on water planning activities.
- Recommend changes to water policy or legislation or to the water planning process.
- Update River Basin Plans every 5-years and amend the plans as needed.

Lower Santee Basin

- Lower Santee downstream of 3 other major river basins.
  - Broad, Catawba, Saluda
- Significant regulation upstream from reservoirs and hydroelectric projects operated by Duke, Dominion, and other smaller power companies.
- Lower Santee includes two regionally important reservoirs – Lake Moultrie and Lake Marion.
- Includes Congaree, Cooper, and Ashley subbasins.

2023 Lower Santee Water Use

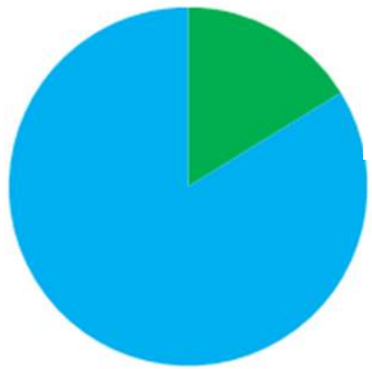
- Both surface water and groundwater are important resources in the basin.



Including Energy*

SW : 94% (438 MGD)

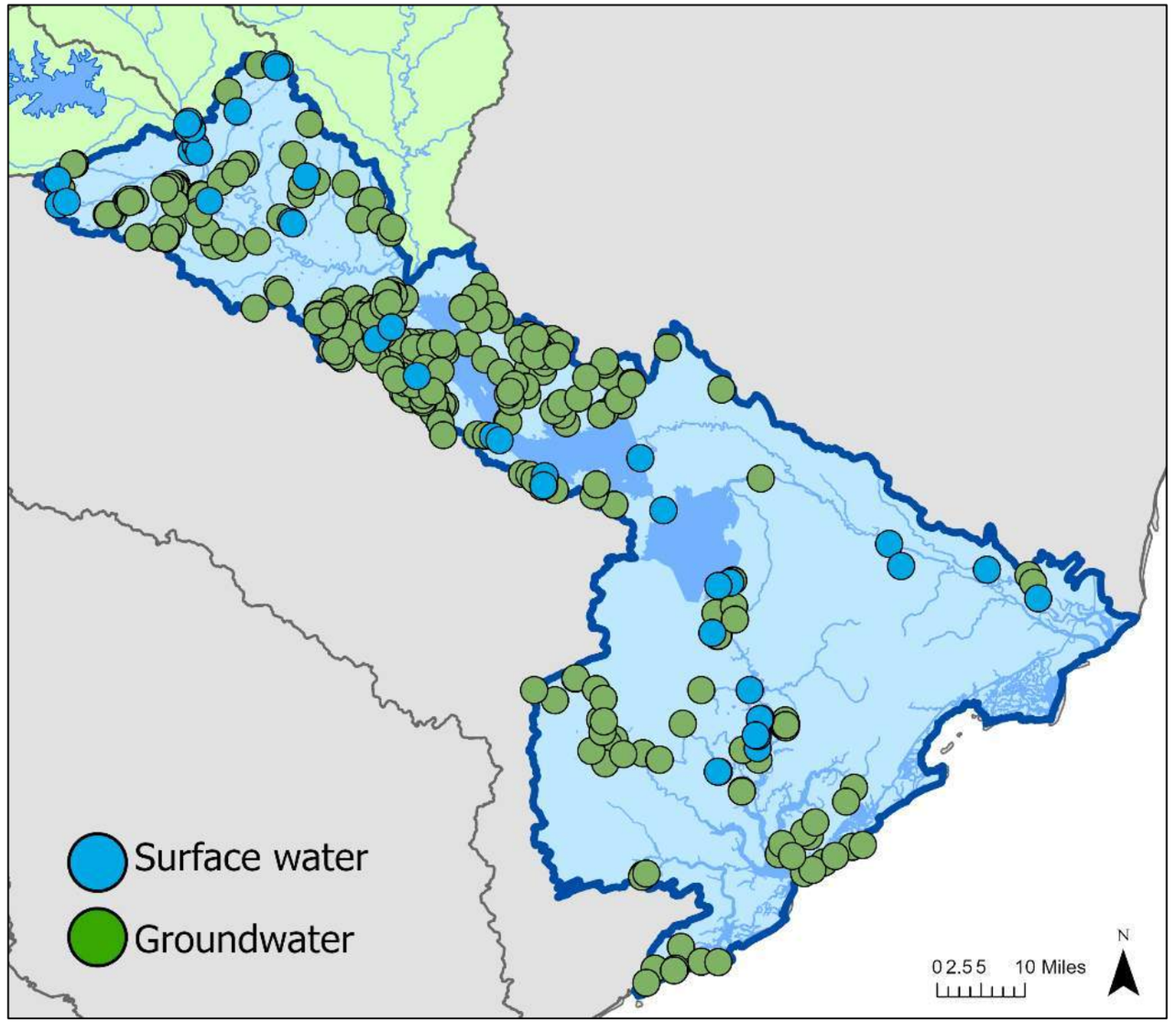
GW: 6% (26 MGD)



Excluding Energy

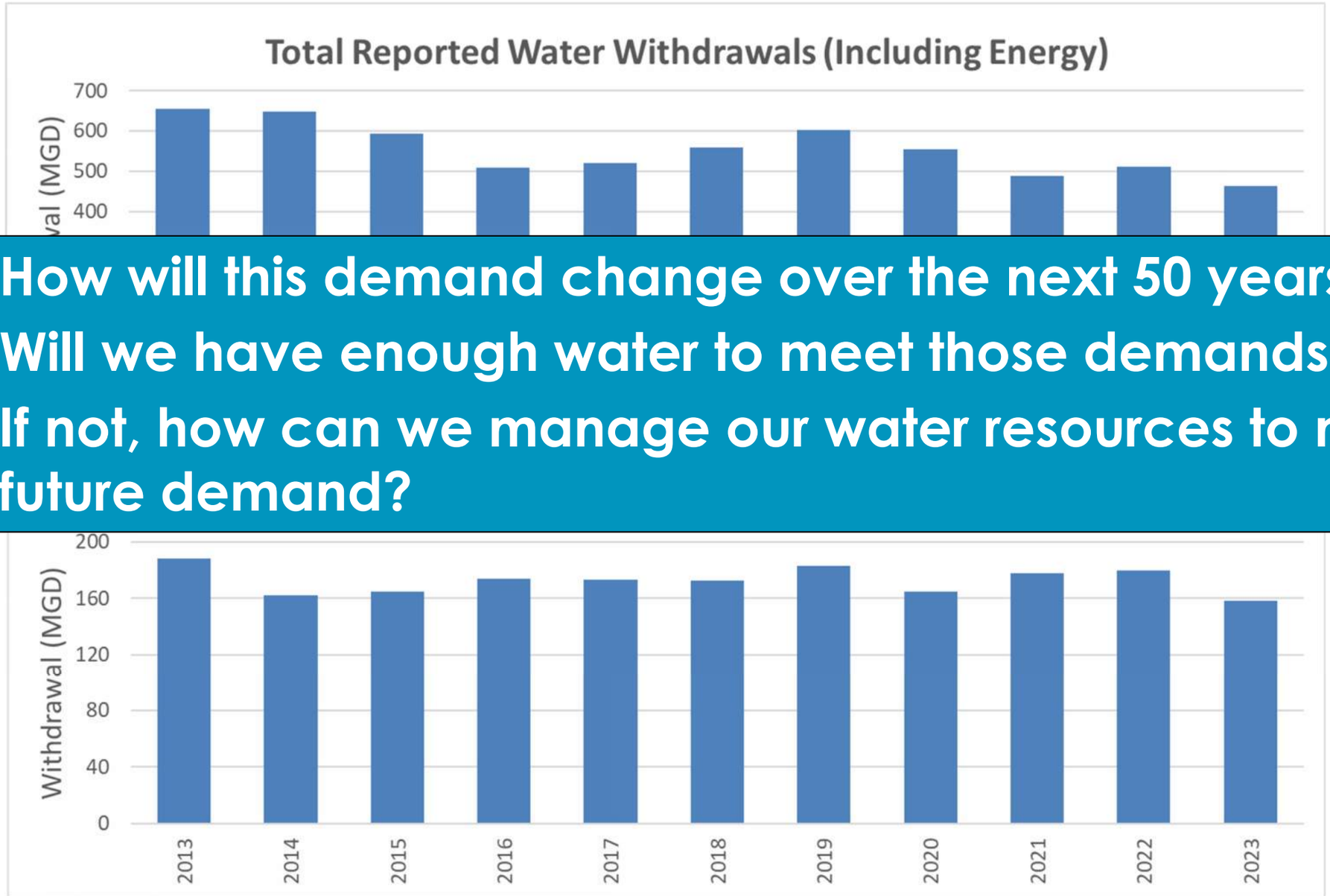
SW : 84% (133 MGD)

GW: 16% (26 MGD)



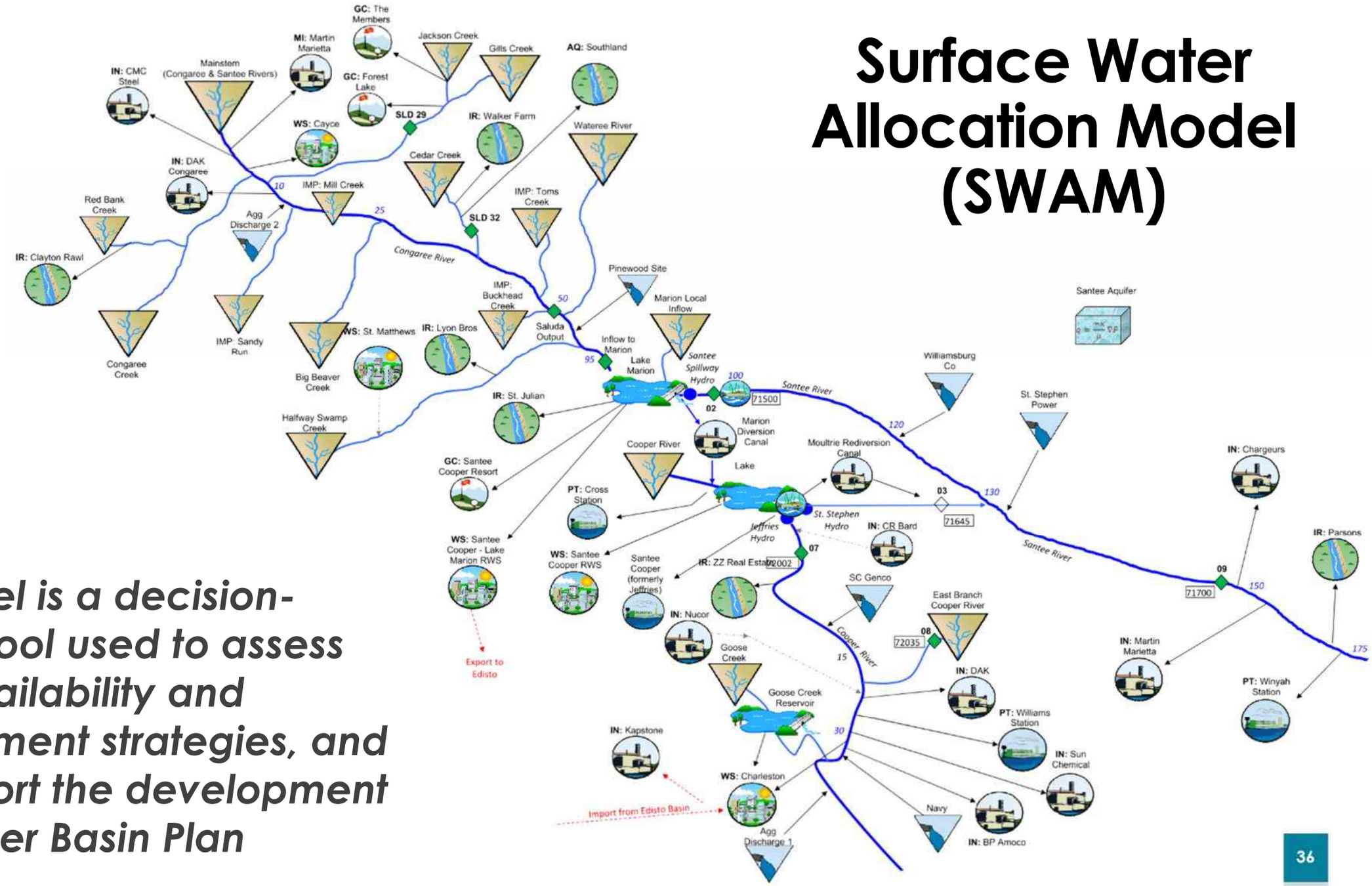
* Excludes hydroelectric 9ower

Reported Water Withdrawals (2013 – 2023)



- How will this demand change over the next 50 years?
- Will we have enough water to meet those demands?
- If not, how can we manage our water resources to meet future demand?

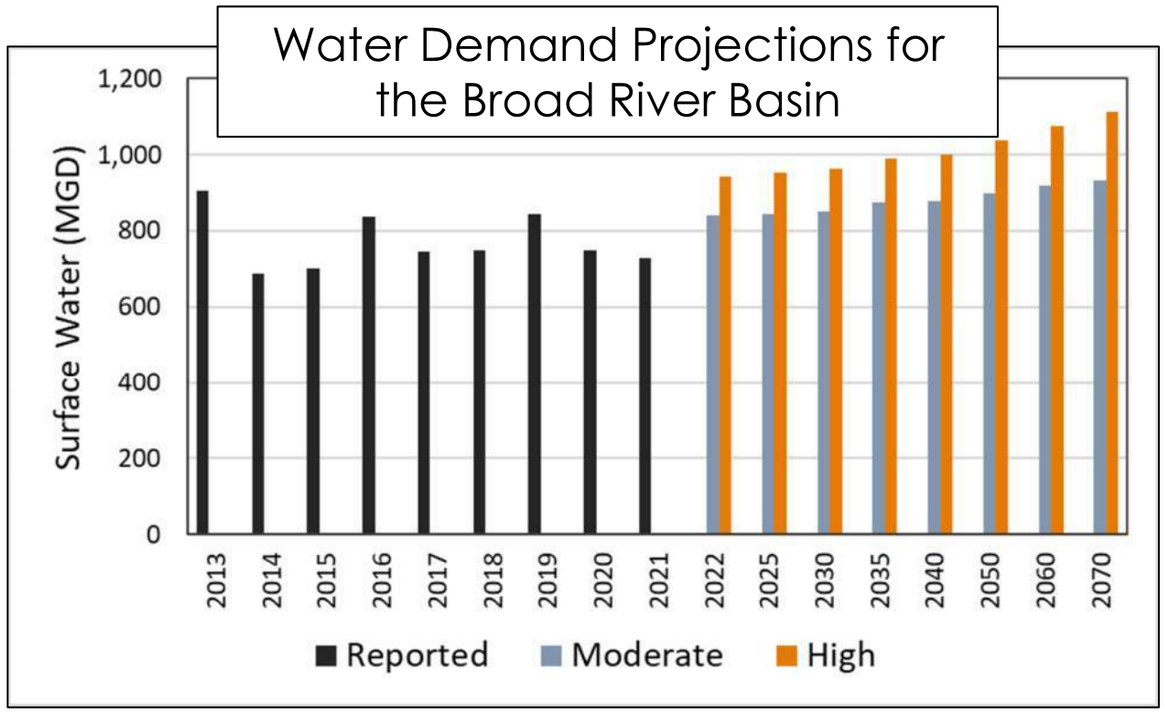
Surface Water Allocation Model (SWAM)



The model is a decision-making tool used to assess water availability and management strategies, and will support the development of the River Basin Plan

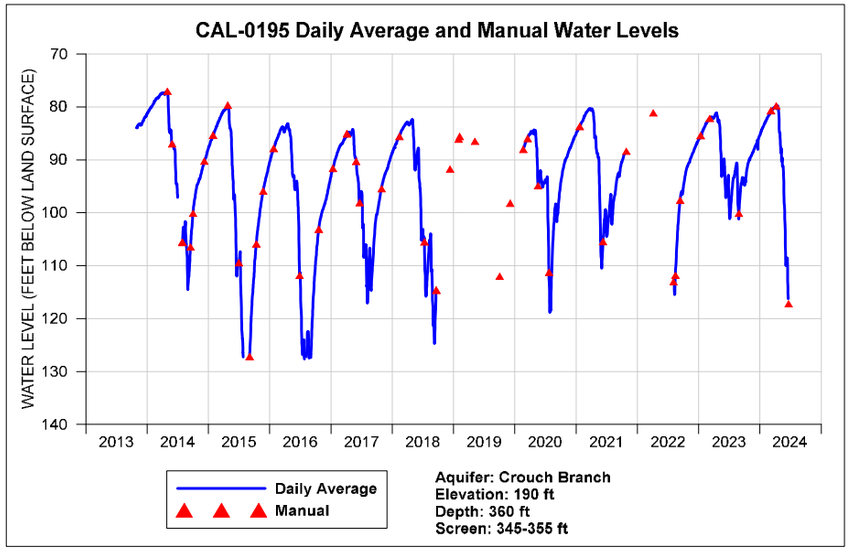
Surface Water Demand Scenarios

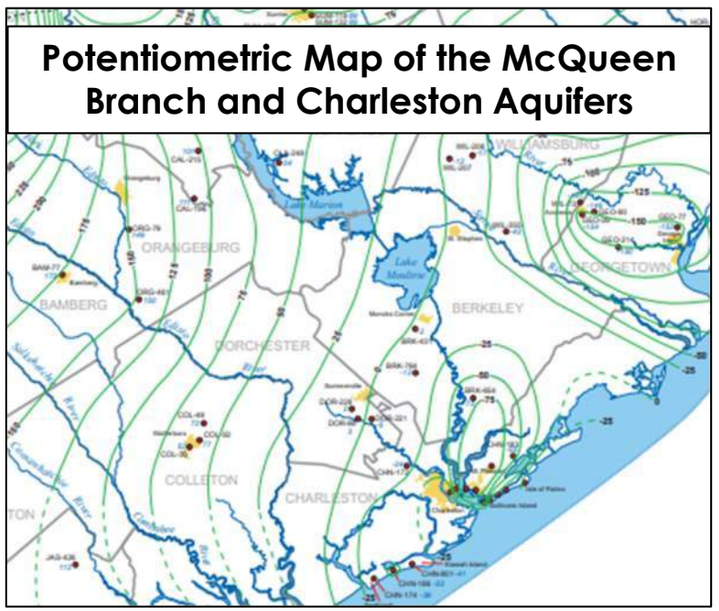
- Four scenarios to be reviewed by each River Basin Council:
  1. Current Surface Water Use
  2. Permitted and Registered Water Use
  3. Moderate Water-Demand Projection
  4. High Water-Demand Projection
- Scenarios focus primarily on "water demand" side as opposed to "water supply" side.
  - Option to test alternative drought scenarios
- Model will be used to:
  - Identify water shortages
  - Define water supply
  - Evaluate water management strategies



Big Picture – this is a gap analysis; the RBC will be determining where and when demand exceeds supply under varying demand scenarios and deciding how to manage water to close the gaps.

Santee Groundwater Assessment





- Assessment will include a review of:
  - Groundwater level data from SCDES and USGS monitoring networks.
  - SCDES potentiometric maps
  - Relevant SCDES/USGS groundwater studies
  - Groundwater Management Plans completed under SCDES's Capacity Use program.
  - Groundwater withdrawal data
  - Project groundwater use over the Planning Horizon
- Later iterations of basin planning will incorporate groundwater modeling
  - Development of model (USGS) is in progress but will not be available for the first Santee River Basin Plan.
  - Model will be a future decision-making tool used to assess groundwater availability.

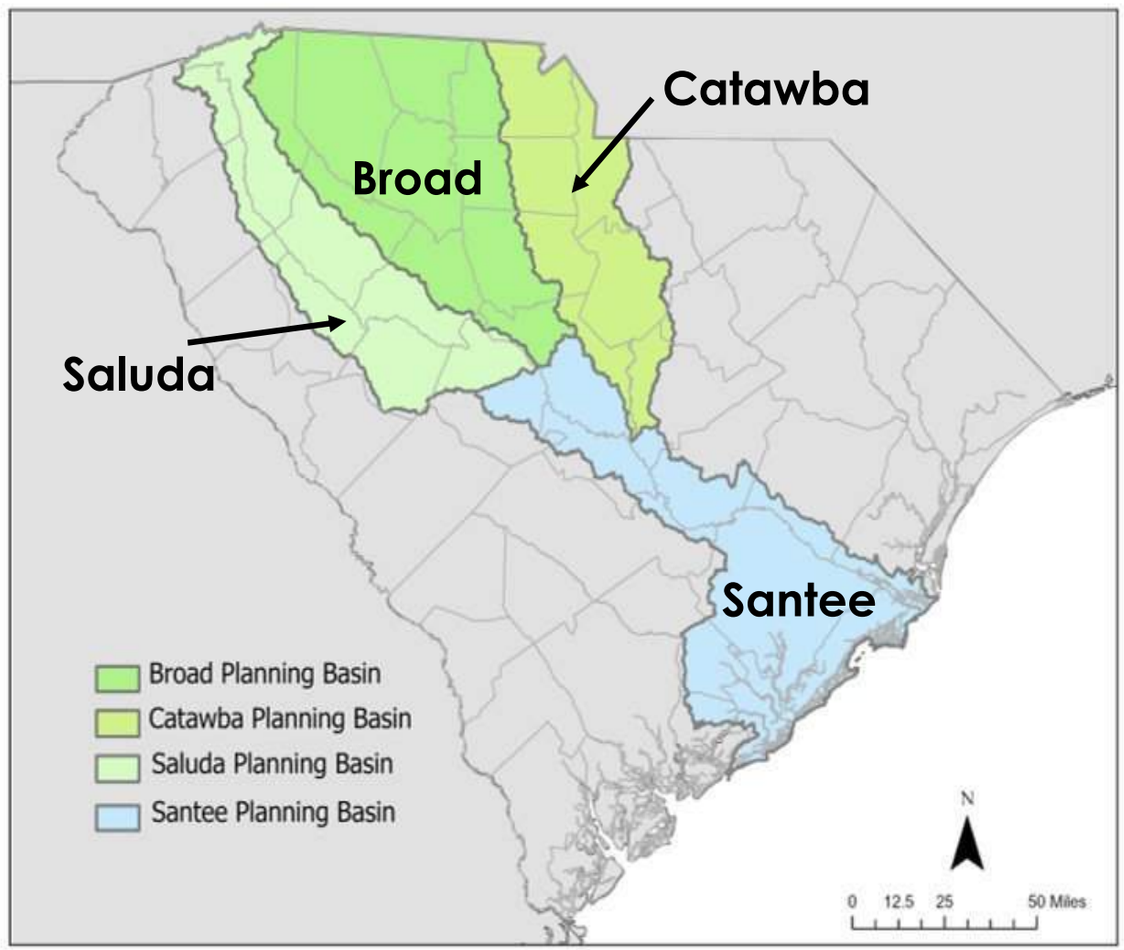
RBC Support

- **Contractors** (solicited and hired by SCDNR):
  - Meeting Facilitation, SW Technical Support, and River Basin Plan report writing – ***CDM Smith, Inc.***
  - Meeting Coordination (administrative and logistical support) and Public Outreach – ***SCDES/CDM Smith, Inc.***
- **Other State and Federal Agencies**:
  - RBCs can request agencies to serve as Advisors.
  - Participate in RBC meetings and subcommittee meetings as requested.
- **RBCs can request input from other outside Advisors.**

SCDES *will continue to provide oversight for the river basin planning process.*

Coordination with other Planning Bodies

- Planning Framework:
  - recognizes the existence of other formal water planning groups and drought management groups.
  - Emphasizes coordination with such groups and provides general guidelines.
- Inter-basin River Councils (IRCs):
  - Made up of RBC members from two or more basins.
  - A forum for adjoining basins to communicate and coordinate on mutual interests and to resolve conflicts.
- An IRC will be formed between the Santee planning basin and the Broad, Catawba, and Saluda planning basins.



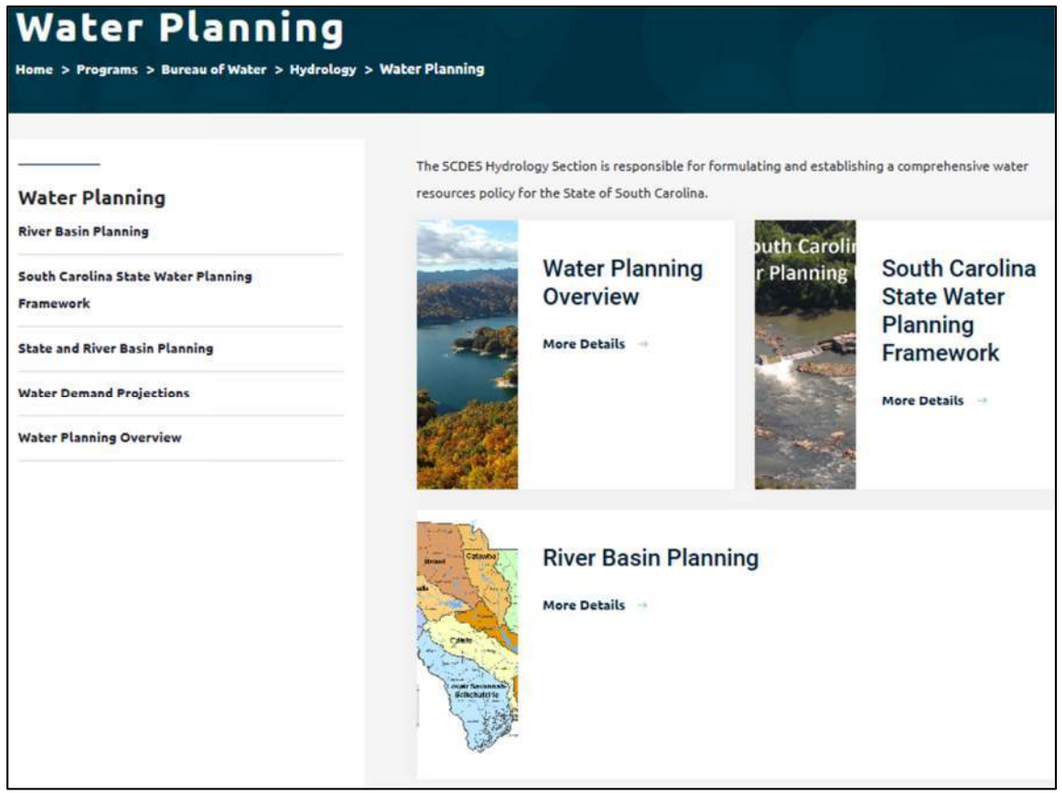
Stakeholder/Public Participation Guidelines

- Guidelines for stakeholder and public participation described in Section 3.7 of Planning Framework.
- Public meetings (3 to 4 per basin):
  - Prior to first RBC meeting – "kickoff" meeting(s).
  - After *draft* River Basin Plan is released.
  - After *final* River Basin Plan is released.
- Draft River Basin Plan public review period (30 days).
- RBC meetings:
  - Open to the public.
  - Each meeting will include public comment period.

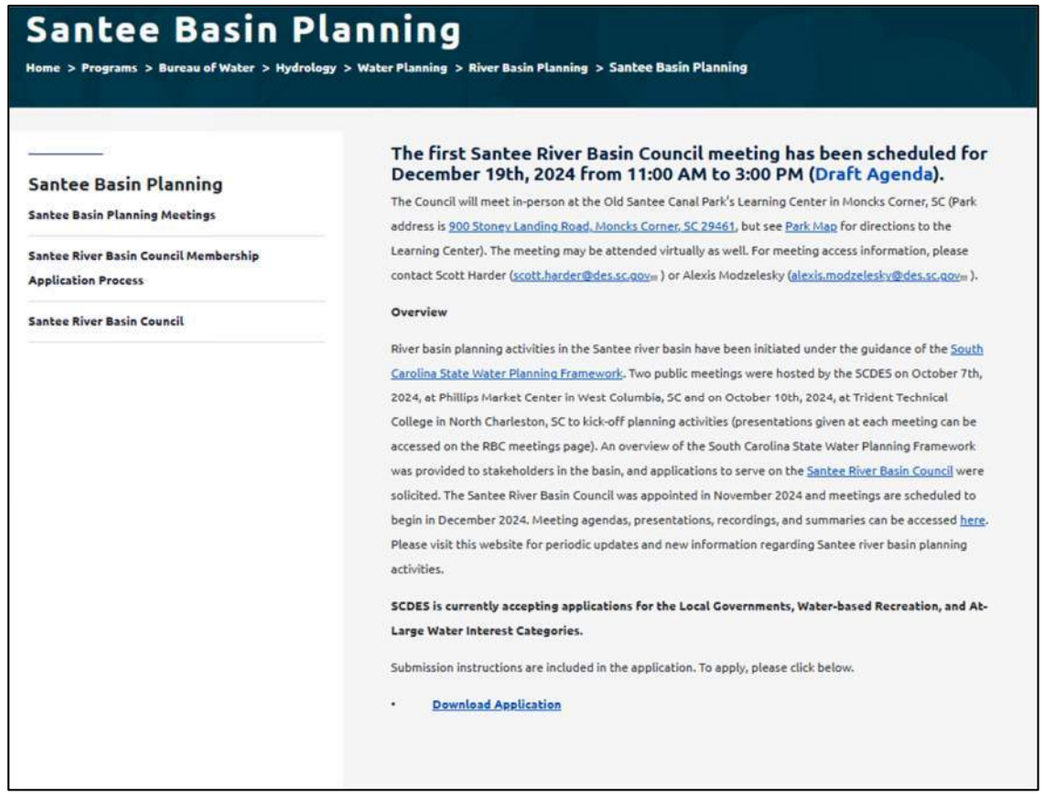
River Basin Plan Implementation

- River Basin Plans are not intended to be static documents.
- The River Basin Plan is required to have a 5-year ***Implementation Plan*** (Chapter 10 of the River Basin Plan):
  - Objectives – based on recommended water management strategies and other recommendations.
  - Schedule.
  - Budget.
- RBCs are expected to meet annually (between successive iterations of river basin planning) but frequency is dependent on objectives and available funding.
- Implementation challenges/considerations:
  - Funding.
  - Broader stakeholder buy-in.
  - No regulatory authority.

SCDES Hydrology Website



https://des.sc.gov/programs/bureau-water/hydrology/water-planning



https://des.sc.gov/programs/bureau-water/hydrology/water-planning/river-basin-planning/santee-basin-planning

Site will host:

- Announcements/Calendar of Events
- Access to water planning documents – Planning Framework, technical reports
- RBC meeting materials – agendas, presentations, recordings

Questions?

Scott Harder – scott.harder@des.sc.gov

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River Basin Planning Phases & Examples

John Boyer, CDM Smith

Agenda Item 5 (continued)

The Four Phases of the Planning Process

Phase 1	- Learn about the basin's water (and related) resources - Become familiar with rules and laws governing water use - Develop a vision statement and goals - Review water demand projections - Become familiar with the modeling tools

The focus of Phase 1 is on ***learning.***

What is expected of the RBC in Phase 1:

- Be inquisitive. Ask questions. Keep an open mind.
- Suggest and participate in field trips.
- Identify additional topics that the RBC should explore and learn.
- Select an alternate. Select a Chair & Vice Chair.

Phase 1 Topics

Informational Topics Often Covered

- ✓ Basin Climatology and SC Drought Response Act (SCDNR)
- ✓ Current Water Use and Future Demand Projections (SCDES)
- ✓ Groundwater Management Plans and CUAs (SCDES)
- ✓ Agribusiness (Nathan Smith, Clemson)
- ✓ Santee Cooper Reservoir and Power Operations (Santee Cooper)
- ? Marine Resources (SCDNR)
- ? Freshwater Aquatic Resources and Management (SCDNR)
- ? SC Resilience Plan (SCOR)
- ? USGS Monitoring and Low Flow Stats (USGS)

✓ ***Strongly recommended***

? ***Good information… may try to fit in if there is interest***

? ***Good information, but probably not enough time***

Field Trip Examples

- **Edisto:** Walthers Farm, Edisto River Canoeing, Charleston Water System Intake

- **Broad:** Columbia canal and WTP, Fairfeld Pumped Storage Facility, Parr Shoals Hydroelectric Facility, Lake Blalock Canoeing, Spartanburg Water System, Cooley Farms.

The Four Phases of the Planning Process

Phase 2	- Evaluate current and future water availability issues - Evaluate the safe yield of water supply reservoirs - Consider and evaluate flow-ecology relationships

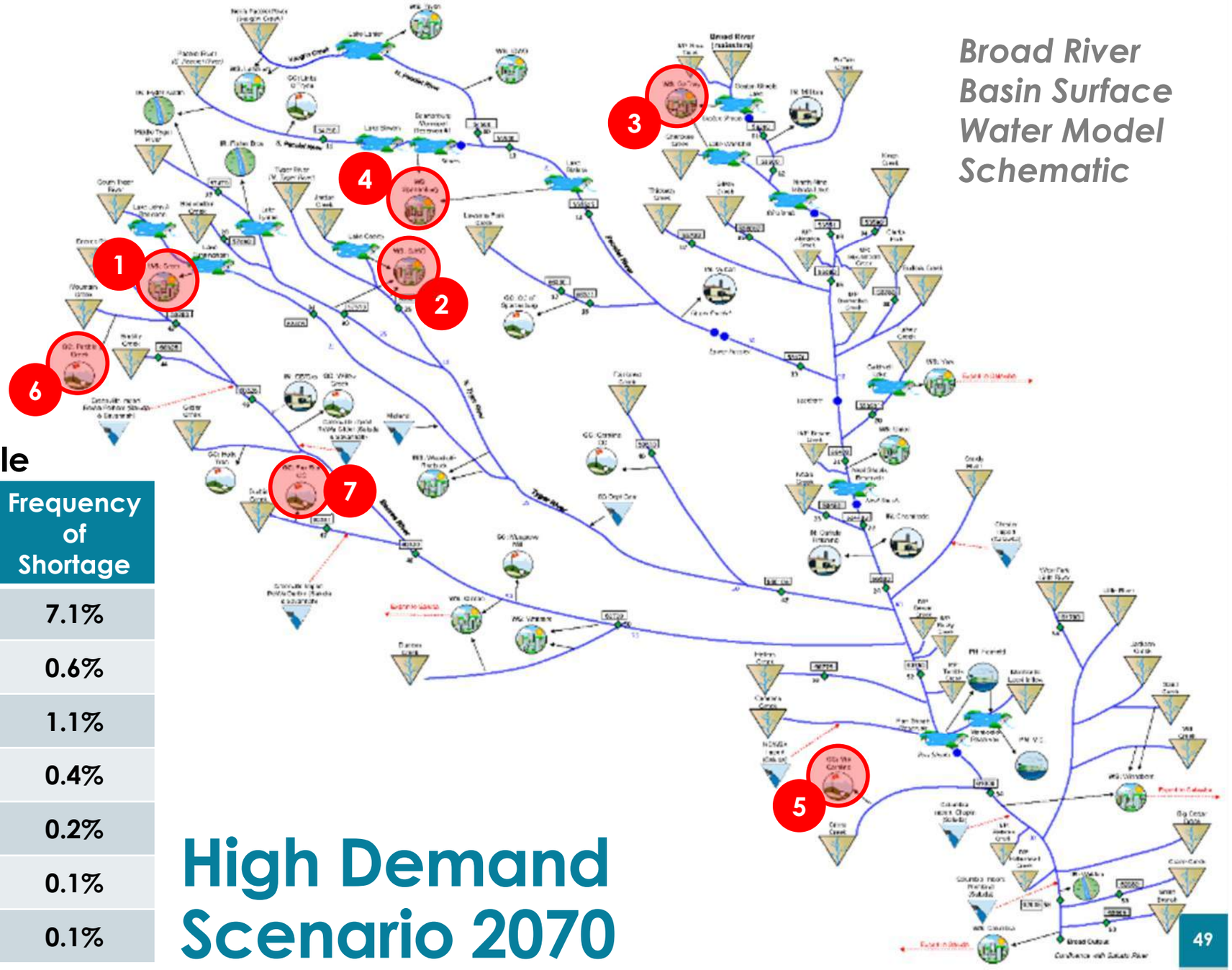
Phase 2 answers the question "***is there enough water to meet current and future needs?***"

What is expected of the RBC in Phase 2:

- Take a critical look at the surface water model inputs and outputs.
- Request additional analyses where warranted.

Phase 2 Example from the Broad

Evaluating future water availability issues



Broad River Basin Surface Water Model Schematic

Surface Water Shortage Table

Map ID	Water User	Frequency of Shortage
1	WS: Greer	7.1%
2	WS: SJWD	0.6%
3	WS: Gaffney	1.1%
4	WS: Spartanburg	0.4%
5	GC: Mid Carolina	0.2%
6	GC: Pebble Creek	0.1%
7	GC: Fox Run	0.1%

High Demand Scenario 2070

The Four Phases of the Planning Process

Phase 3	- Develop and evaluate **water management strategies** - Recommend and prioritize strategies

The focus of Phase 3 is on finding ***solutions.***

What is expected of the RBC in Phase 3:

- Provide direction to the modeling team on water management strategies to evaluate.
- Identify strategies that support a water conservation and water efficiency ethic.
- Recognize and consider the potential for changing conditions and select strategies appropriately.
- Begin reviewing and commenting on draft chapters of the Plan.

Phase 3 Example from the Broad

Evaluating water management strategies by modeling

"What if" Simulations…

- Water Utilities Drought Management Plans were triggered, and targeted demand reductions were achieved?
- Reservoir releases were optimized based on the (higher) projected demands (withdrawals)?
- Long-term reductions in per capita water demand were achieved through a portfolio of water conservation, water loss control, and water efficiency strategies?

Supply-Side Strategies that were Evaluated:

- Increasing dam height to increase reservoir storage
- Adding an off-line quarry for additional storage
- Adding a second intake and renegotiating average annual withdrawals allowed by FERC
- A new regional water supply reservoir

The Four Phases of the Planning Process

Phase 4	- Develop **legislative, policy, technical and planning process recommendations**
	- Prepare the **River Basin Plan that:**
	  - Includes an ***implementation plan***
	  - Identifies ***drought response initiatives***
	  - Considers ***public input***

Phase 4 focuses on ***achieving consensus*** **and** ***writing the Plan.***

What is expected of the RBC in Phase 4:

- Make timely decisions and recommendations
- Review and comment on draft chapters of the Plan. Make sure the Draft Plan accurately represents your sector's water-related interests.
- Participate in public outreach

Important Things to Remember

- **River basin planning is an ongoing process.**
    - Not all stakeholder needs and desires can be addressed during the first phase of planning.
- **The process is not intended to resolve issues associated with South Carolina water laws and regulations.**
    - But, through discussion, RBC recommendations on policies and regulations can be documented and summarized for agency and legislature consideration.
- The process is intended to be **stakeholder-driven** and leverage the knowledge of those that use, recreate, and seek to protect the water resources of the basins.
- The process provides **transparency** and uses the best-available science and tools to assess water availability and identify strategies to meet water demands 50 years into the future.