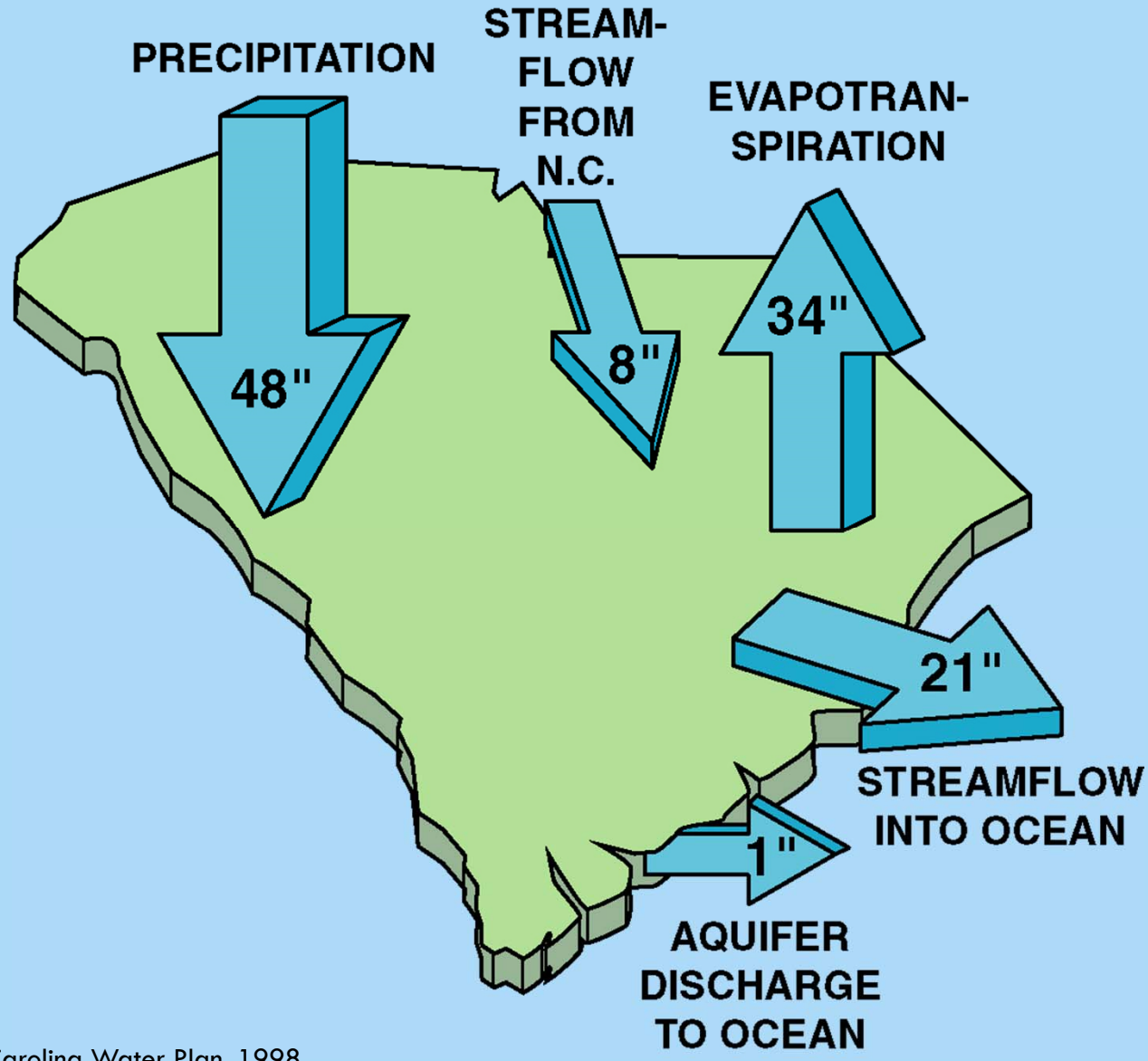
South Carolina Water Planning

Scott Harder
Hydrology Section
Land, Water and Conservation Division
S.C. Department of Natural Resources

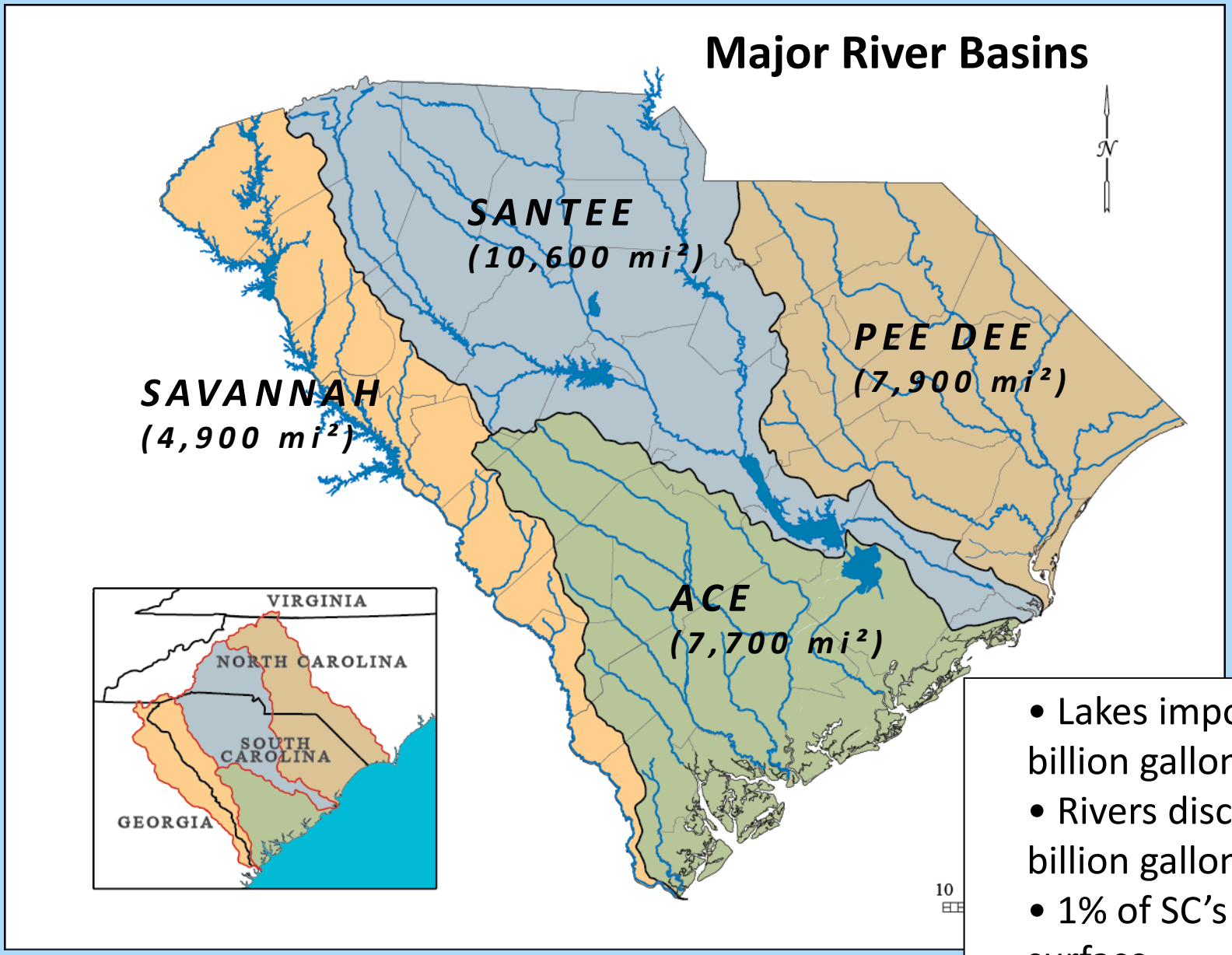
Indiana Water Summit
Indianapolis, Indiana
August 13th, 2018

South Carolina's Water Budget



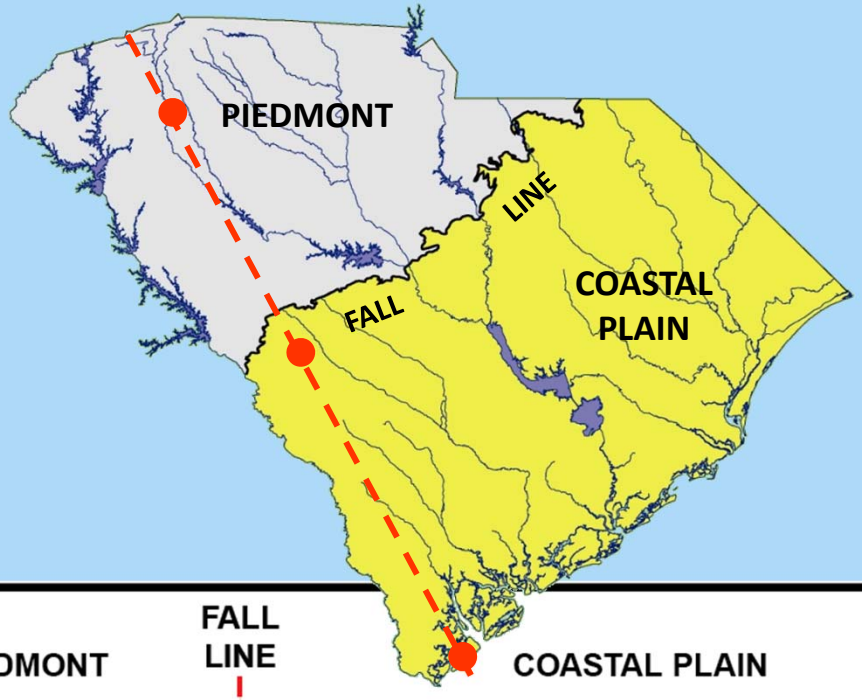
Source: South Carolina Water Plan, 1998

Surface Water

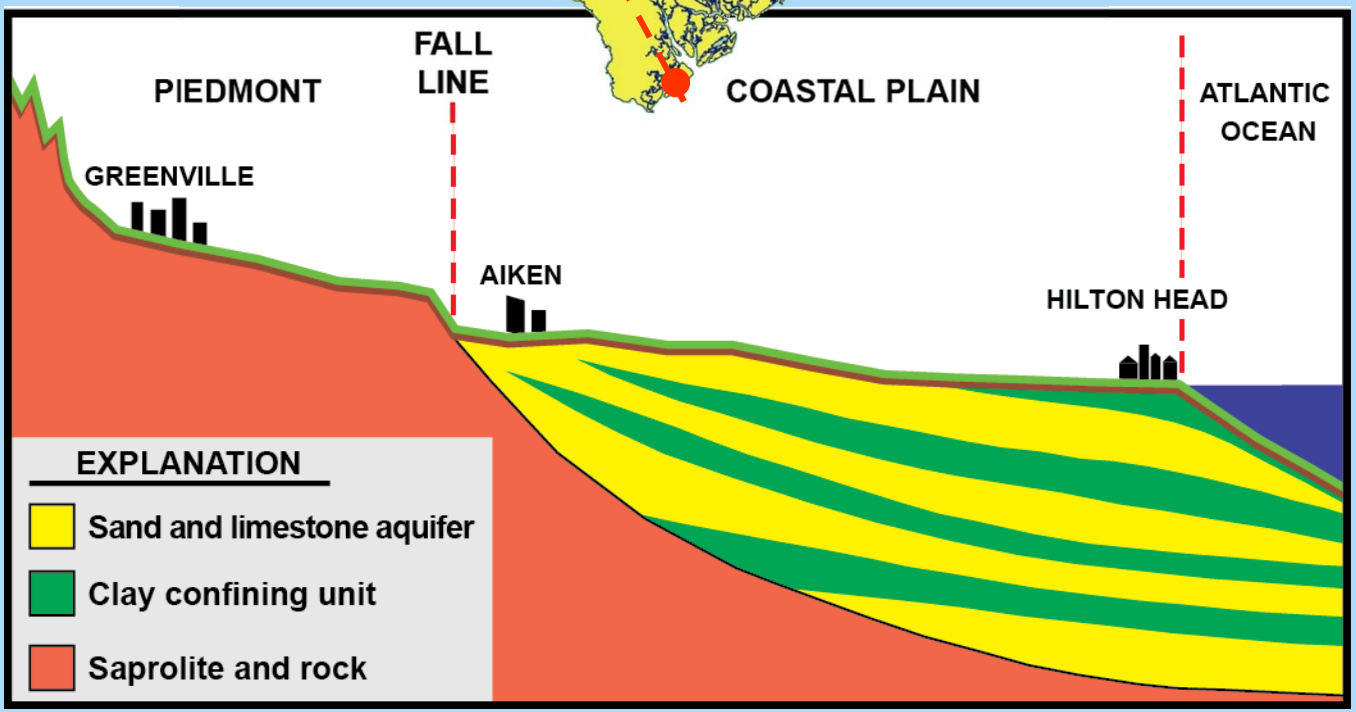


- Lakes impound 4,900 billion gallons
- Rivers discharge 33 billion gallons/day
- 1% of SC's water is on surface

Groundwater



- Aquifers store 390,000 billion gallons
- 99% of SC's water is underground
- Coastal Plain aquifers (95% of water)
- Fractures in bedrock (5% of water)



Water Resources Planning and Coordination Act (1967)

Created the S.C. Water Resources Commission in 1969

The Commission..

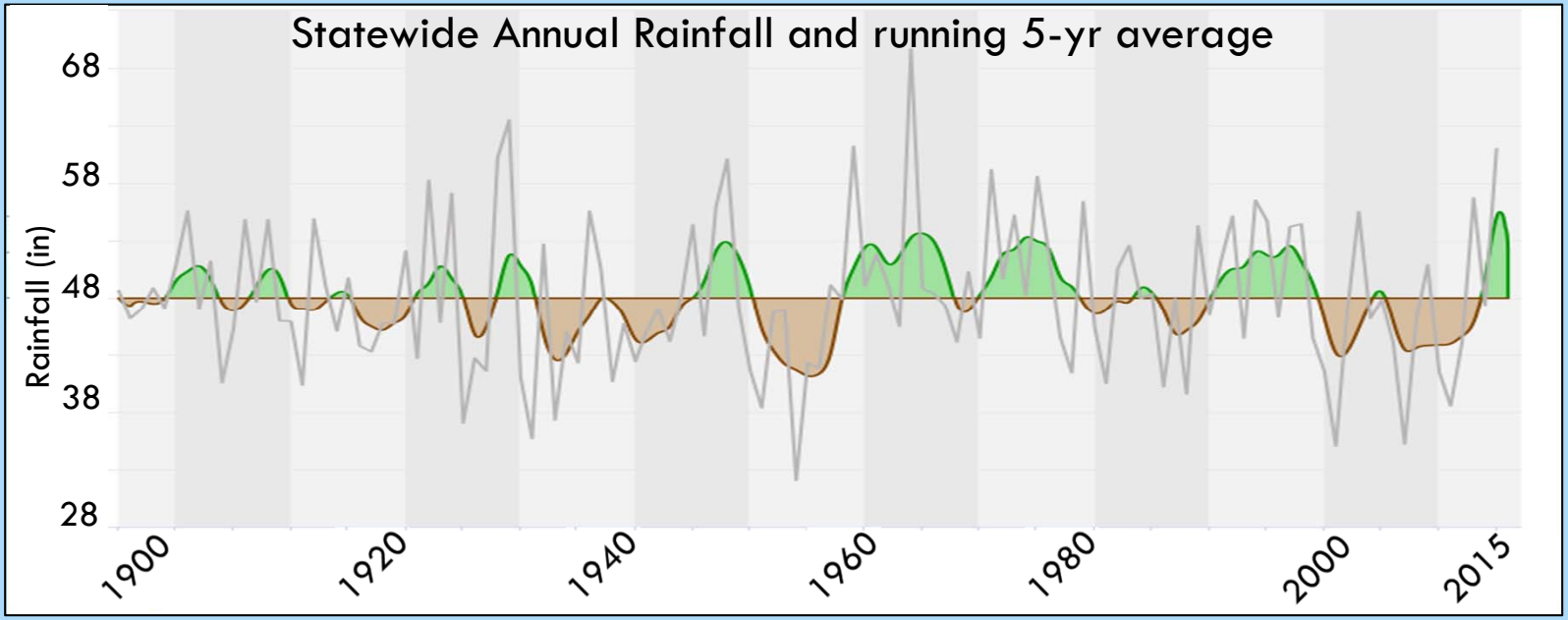
1) “shall advise and assist the Governor and the General Assembly in formulating and establishing a comprehensive water resources policy for the State…”

2) “shall encourage, assist and advise regional, metropolitan, and local governmental agencies…responsible for planning in relation to water aspects of their programs…”

In 1994, government restructuring resulted in the dismantling of the Commission. Water Quantity and Water Planning programs (and people) were transferred to the SCDNR while other programs were transferred to the SC Department of Health and Environmental Control (SCDHEC)

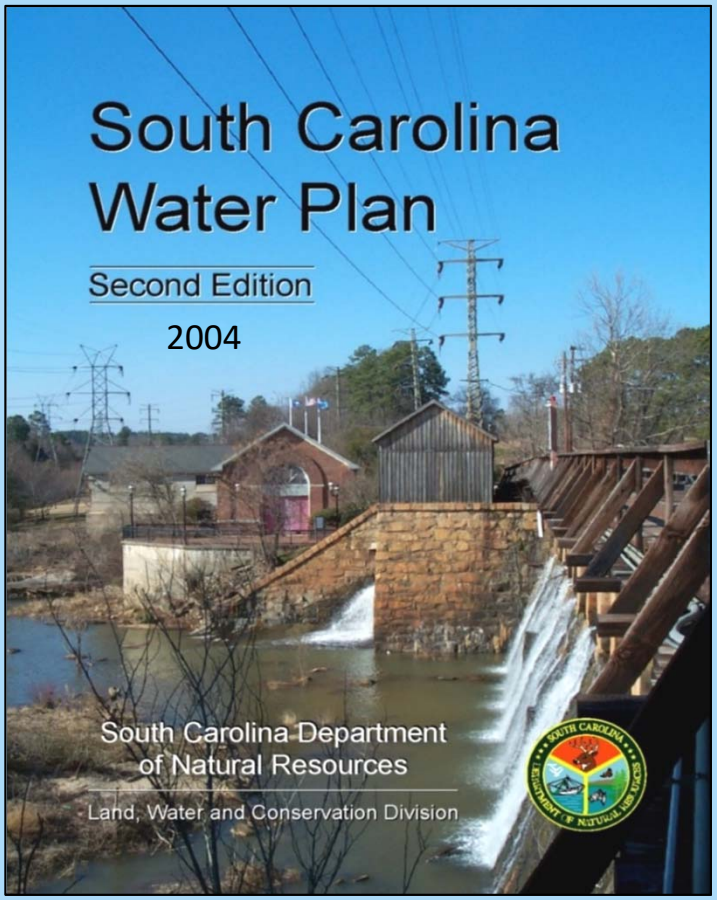
Why Water Planning?

- Population Growth – forecasted to increase by approximately 20% by 2030 (4.6 Million in 2010 – 5.5 Million in 2030) – *increased water demand*
- Uncertainties in water availability under future drought scenarios
  - *Recent droughts* (1998-2002, 2007-2008, 2011-2012)
  - *Historic droughts* - some studies show recent droughts may be relatively minor compared to droughts preceding 20th century
  - *Future drought?* – how could drought dynamics change in the future?



*Plot created by the Southern Climate Impacts Planning Program (SCIPP) – www.southernclimate.org

A Brief History of Water Planning…



- First Edition published in 1998
- In 2004, DNR published the second edition of the South Carolina Water Plan incorporating lessons learned from the drought of 1998-2002.
- One recommendation was for the development of regional water plans for each major river basin in the State.
- 10 years later – SCDNR and SCDHEC initiated the first step towards these regional water plans.

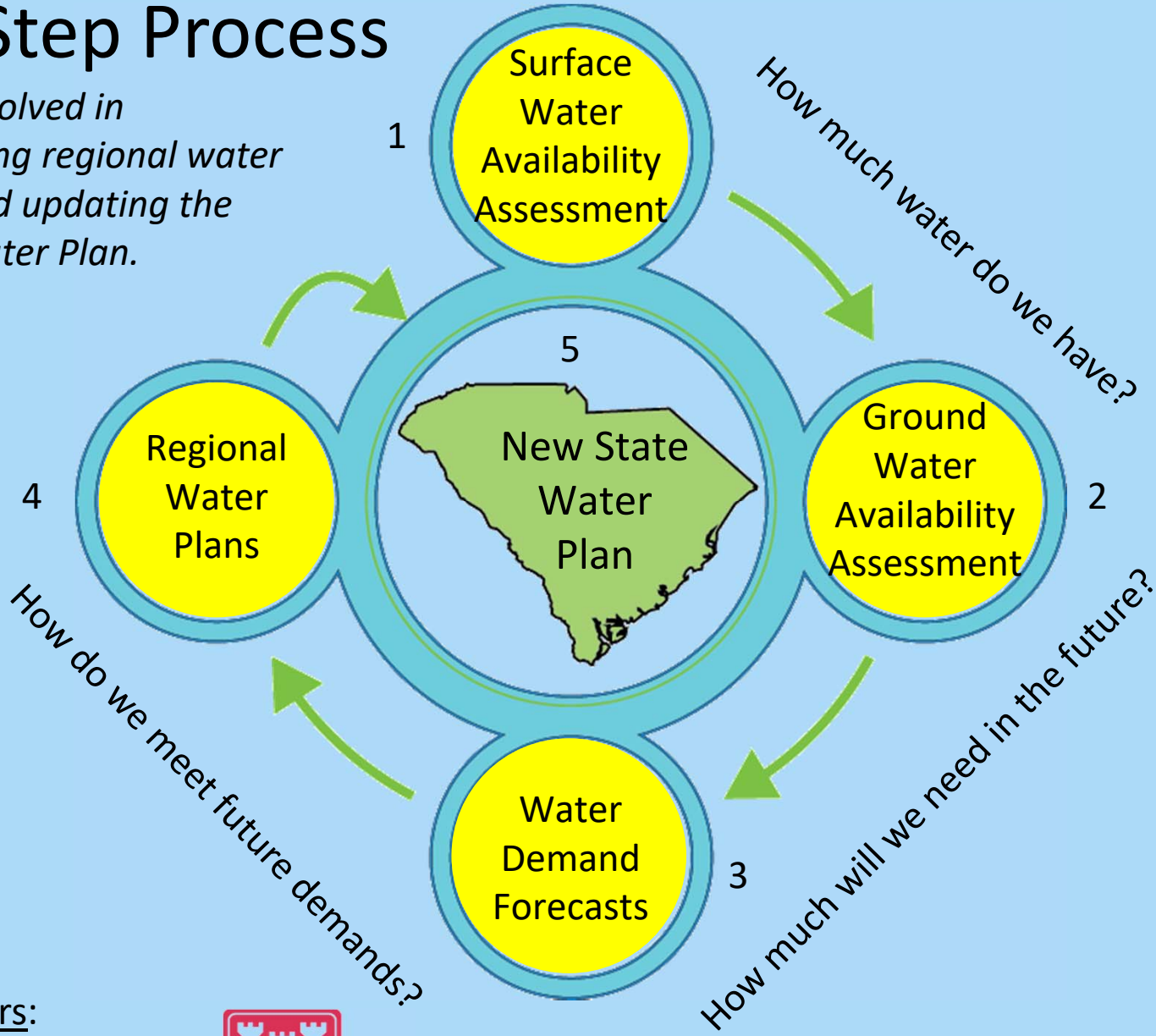
South Carolina's Major River Basins

The goal of water planning is to develop a water-resources management plan that ensures that an adequate and reliable supply of clean water will be available to sustain all future uses.

Water plans will be developed for each of these basins, the same basins used by DHEC for water-quality assessments and for managing interbasin transfers of water.

Five Step Process

Steps involved in developing regional water plans and updating the State Water Plan.



Cooperators:

dhec Healthy People. Healthy Communities.

US Army Corps of Engineers

CDM Smith

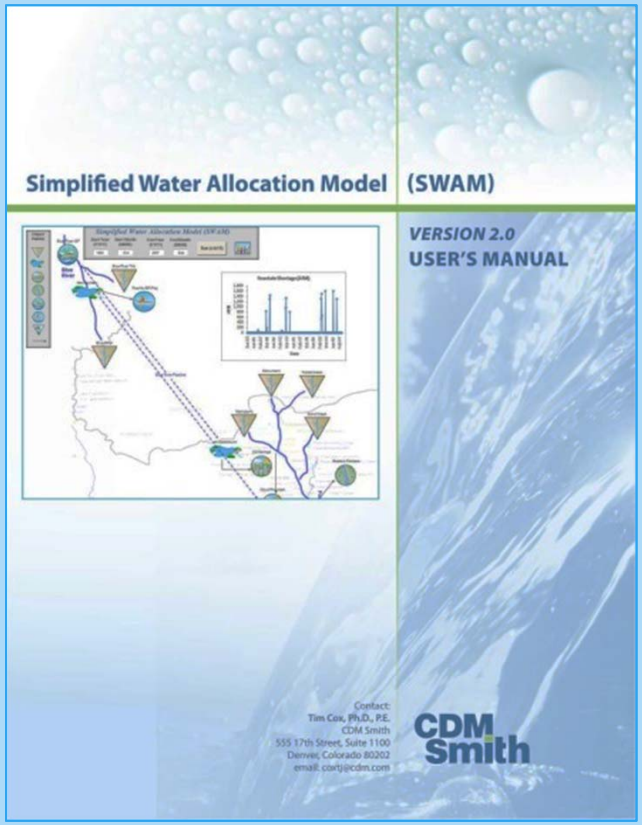
USGS science for a changing world

CLEMSON UNIVERSITY

Step 1. Surface-Water Availability Assessment

Purpose: To develop surface water quantity models for each basin.

- In August 2014, CDM Smith, Inc. was awarded a contract to develop surface-water quantity models for each basin using its *Simplified Water Allocation Model* (SWAM) modeling tool.
- "Final" models submitted to SCDNR in June 2017; however some basin models continue to be fine-tuned.
- Funding source: State (DNR)



CDM Smith

SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES

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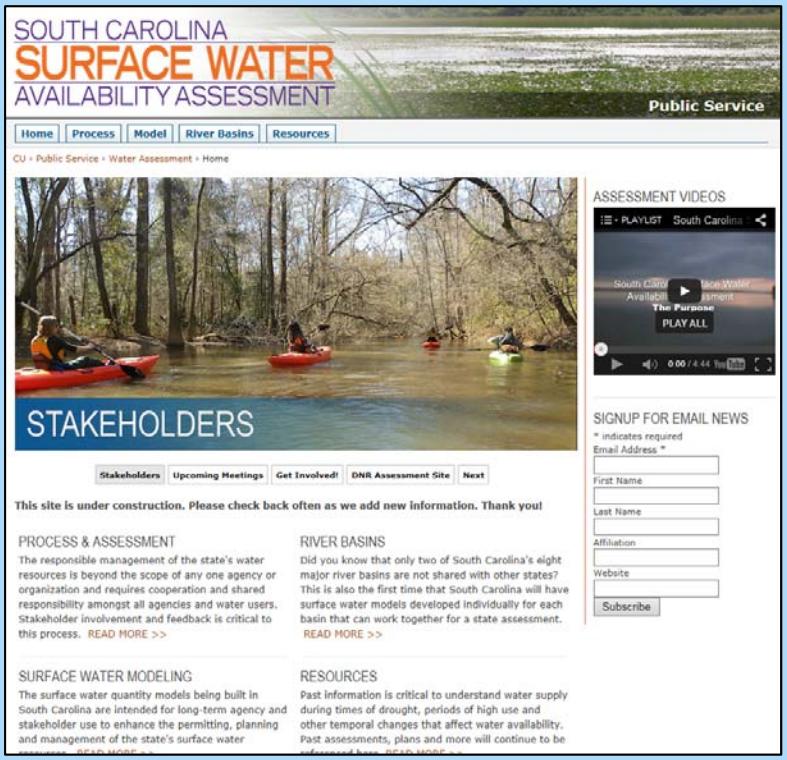
Stakeholder Meetings

- Two stakeholder meetings per basin
- Facilitated by Clemson University



www.scwatermodels.com

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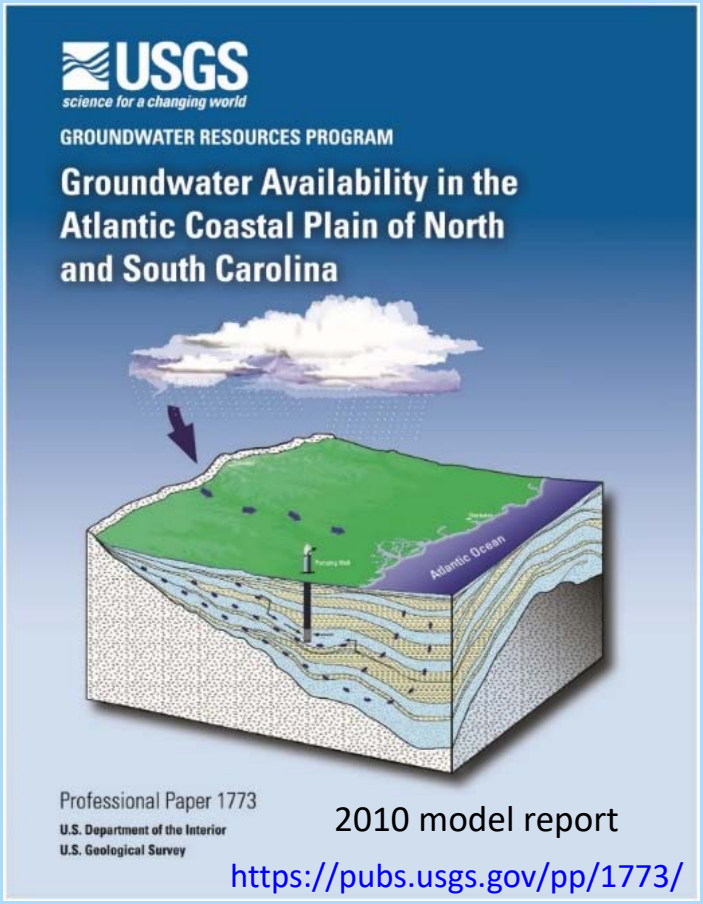
Technical Advisory Committee

Industry • **Public Supply** • **Agriculture** • **Energy** • **Environment** • **Legal**

Ruth Albright	*Synterra Corporation*
Ed Bruce	*Duke Energy*
Andy Fairey	*Charleston Water System*
Eric Krueger	*The Nature Conservancy*
Jesse Cannon	*Santee Cooper*
Heather Nix	*Upstate Forever*
K.C. Price	*Spartanburg Water*
Mullen Taylor	*Mullen Taylor, LLC*
Eddie Twilley	*Twilley, Fondren & Associates*
Harrison Watson	*WestRock*
Charles Wingard	*Walter P. Rawls and Sons, Inc.*

Step 2. Groundwater Availability Assessment

Purpose: To update the 2010 groundwater flow model of the Coastal Plain.



2010 model report

https://pubs.usgs.gov/pp/1773/

- In February 2016, the USGS was contracted to update the groundwater flow model of the Coastal Plain using USGS's modular hydrologic model *MODFLOW*.
- The updated model is expected to be completed in February 2019.
- Funding source: State (DNR and DHEC) and USACE (Charleston District).

US Army Corps of Engineers

USGS science for a changing world

DNR

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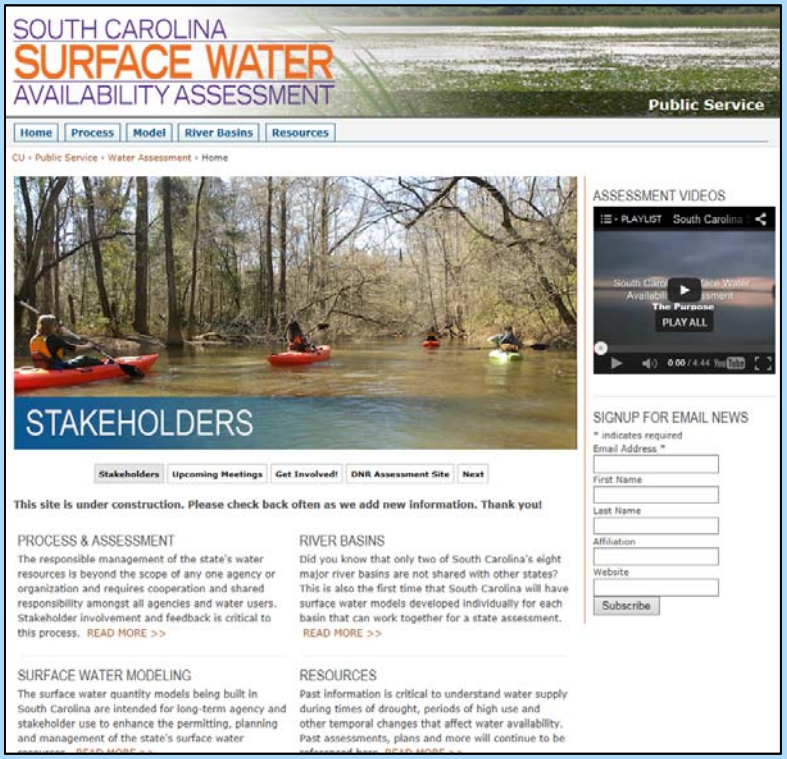
Stakeholder Meetings

- Facilitated by Clemson University
- Two stakeholder meetings held in 2017
- Two additional meetings planned (TBD)



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Technical Advisory Committee

Industry • **Public Supply** • **Universities**

Dr. Adem Ali	*College of Charleston*
Charlie Gray	*Chesterfield Co. Rural Water*
Clay Duffie	*Mount Pleasant Waterworks*
Kelley Ferda	*South Island Public Service Dist.*
Raymond Gagnon	*Georgetown County*
Lance Tully	*Nestle Waters*
Dr. Alicia Wilson	*University of South Carolina*

Step 3. Water Demand Projections

Purpose: To develop water demand projections for each basin from 2015-2065 in 5- and 10- year intervals.

- In August 2016, the USACE (Charleston District) and DNR were awarded a Planning Assistance to States (PAS) contract to develop water demand projections for the Savannah River basin.
- In July 2018, a second PAS agreement was signed to build upon work that had been done on the previous project.
- Funding source: USACE (Charleston District) and State (DNR)

US Army Corps of Engineers

DNR

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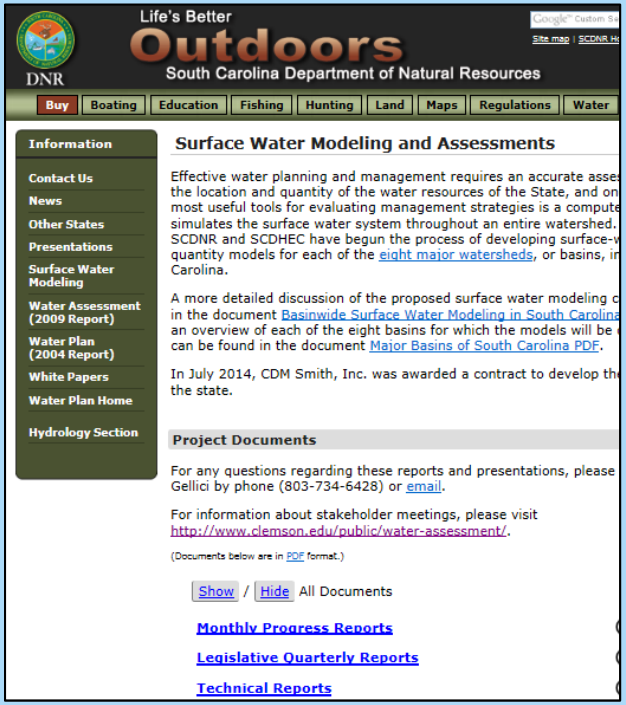
- *Current work*: Formation of Technical Working Group (TWG) to develop forecasting methodologies
  - Public and Domestic Supply, Agriculture, Energy, Industry, and Golf Course
  - Includes stakeholders from each water sector
  - Meets every two weeks
  - Final report expected by February 2019
- *Planned work*: Develop forecasts for Savannah River Basin
  - Pilot planning basin
  - Stakeholder meetings planned to solicit feedback and recommendations
  - Draft projects expected to be completed by June 2019

Future Work: Develop forecasts for seven other basins
(outside of scope of current PAS agreement)
- Funding and timeline not yet determined

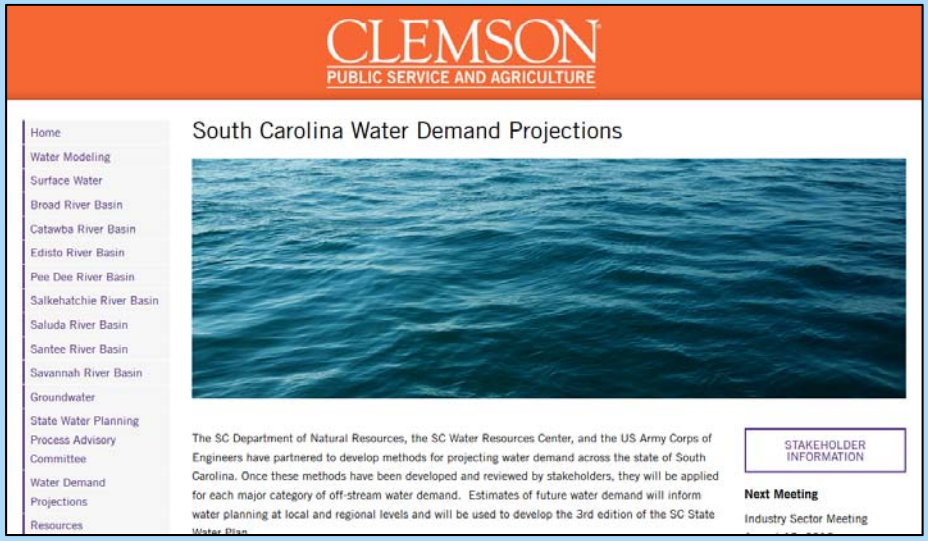
On the Web..



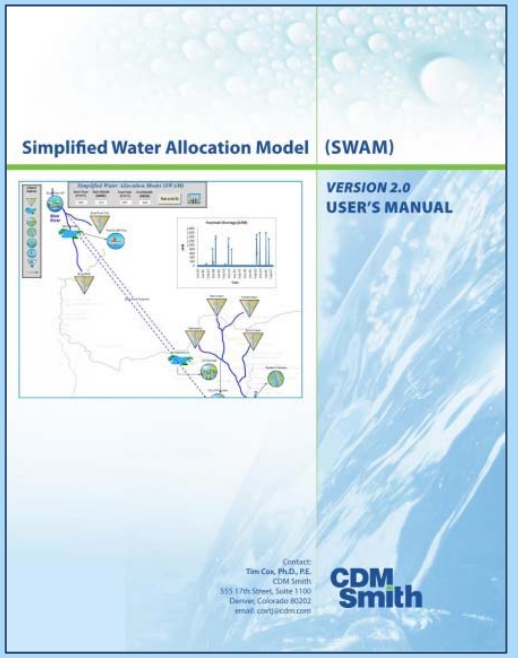
SW Assessments: http://www.dnr.sc.gov/water/waterplan/surfacewater.html

GW Assessments: https://www.usgs.gov/centers/sa-water/science/update-south-carolina-atlantic-coastal-plain-groundwater-availability-0?qt-science_center_objects=0#qt-science_center_objects

Water Demand Forecasts: https://www.clemson.edu/public/water-assessment/water_demand_projections.html

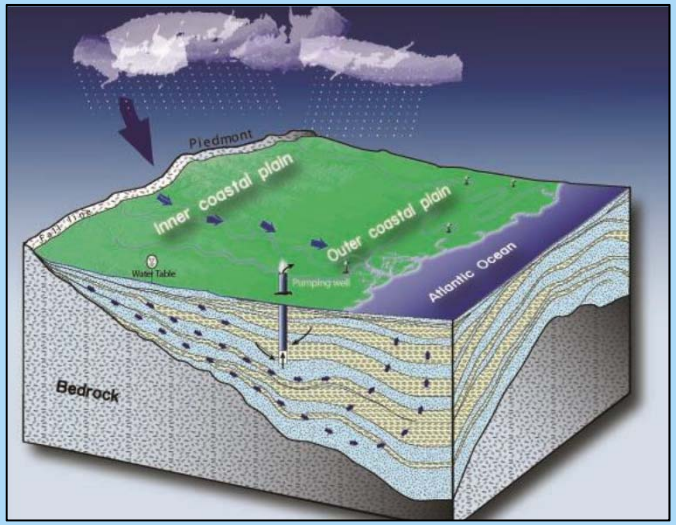


Purpose of Water Assessments – SWAM Model (SW), MODFLOW (GW)



Models will be used along with water demand forecasts to:

- Determine water availability
- Predict where and when water shortages might occur
- Test alternative water-management strategies
- Help resolve water disputes
- Evaluate IBTs and withdrawal permits (DHEC)
- Support development of drought management plans



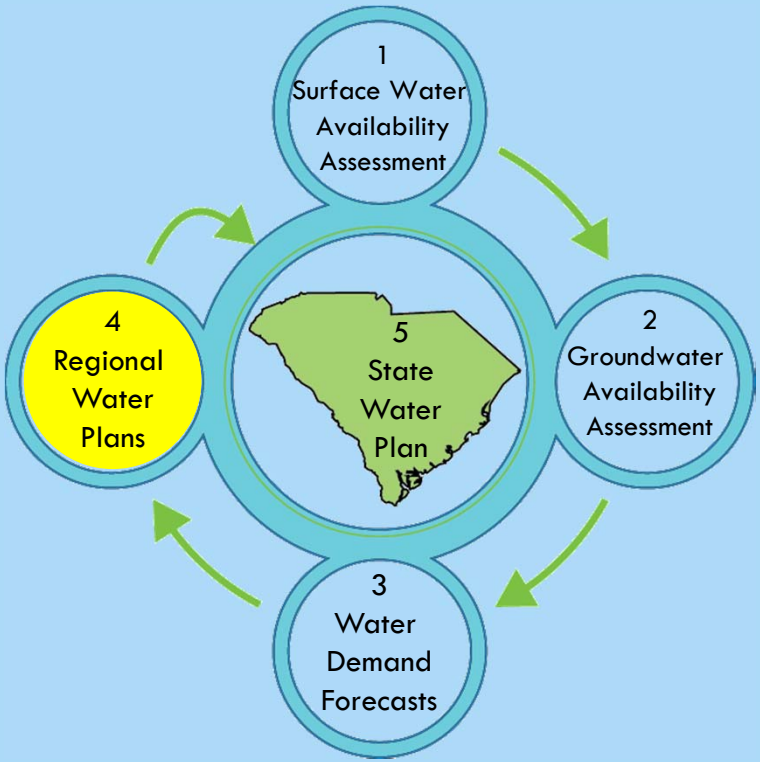
Ultimately, the models will *support* the development of regional water plans.

Step 4. Regional (Basinwide) Water Plans

Using the assessments and forecasts, and with oversight from State agencies, stakeholders will begin the process of developing regional water plans for each basin.

This step includes:

- The formation of basin advisory councils
- An evaluation of future water availability:
  - A gap-analysis to determine where and when shortages will occur
  - Reservoir safe yield studies
- An assessment of management strategies to meet the future demands or to plan for potential changes in water availability:
  - Demand side (water conservation measures, drought management plans)
  - Supply side (new water sources)



Planning Process Advisory Committee (PPAC)

Develop a guidance document for the regional water plans. Some of the subject matters addressed in the document will include:

- Vision and goals
- Process of designating members to the Basin Advisory Councils
- Roles and responsibilities of the Basin Advisory Councils
- Roles and responsibilities of the State agencies
- Council bylaws/operating charter for Basin Advisory Councils
- Regional water plan format and contents
- Public and stakeholder participation
- Financing of regional water plans
- Implementation of regional water plans
- Outline how the regional water plans fit into the State Water Plan
- Administrative rules

PPAC is meeting on a monthly basis
(First meeting held in March, 2018)

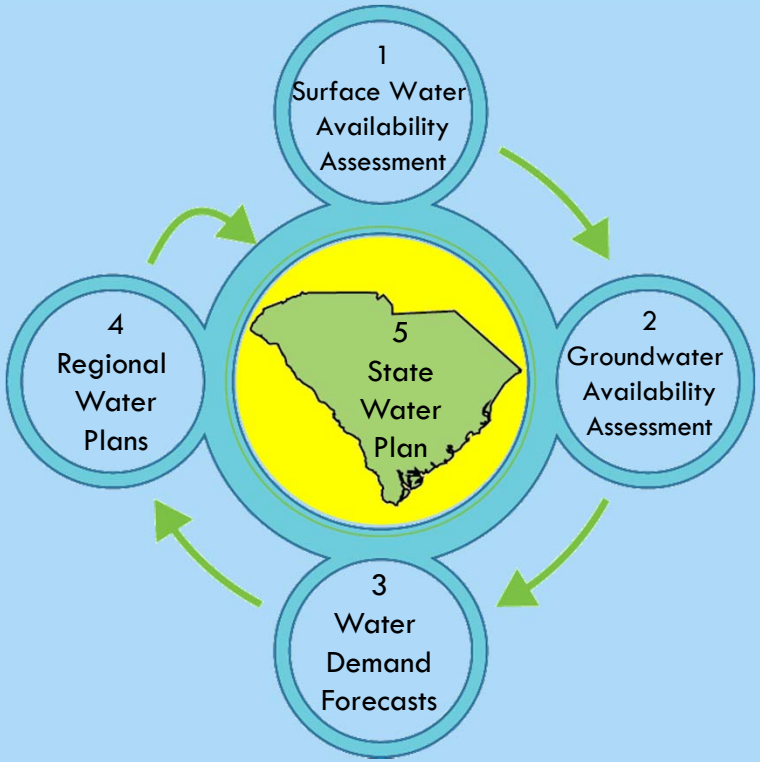
PPAC Committee Members

Jeffery Allen - **Clemson University, South Carolina Water Resources Center**
David Baize - **WEASC/SCAWWA**
Gary Spires – **South Carolina Farm Bureau**
David Bereskin - **Greenville Water**
Jesse Cannon - **Santee Cooper**
Fred Castles, III - **Catawba-Wateree Management Group**
Clay Duffie - **Mount Pleasant Waterworks**
J.J. Jowers, Jr - **Edisto Engineers and Surveyors, Inc., Citizen**
Eric Krueger - **The Nature Conservancy**
Jeff Lineberger - **Duke Energy**
Jill Miller - **South Carolina Rural Water Association**
Dean Moss, Jr – **Citizen, Formerly of Beaufort-Jasper Water and Sewer Authority**
Heather Nix - **Upstate Forever**
Myra Reece - **SCDHEC**
Ken Rentiers - **SCDNR**
Bill Stangler - **Congaree Riverkeeper**
Scott Willett - **Anderson Regional Joint Water System**
Charles Wingard - **Walter P. Rawl & Sons, Inc. (Agriculture)**

Step 5. Update the State Water Plan

Upon completion of the regional water plans, the State water plan will be updated by SCDNR.

- Assess the overall condition of water resources in the State
- Evaluate statewide trends in water use and availability
- Offer water-resource policy and program recommendations
- Introduce innovative practices



Water Planning Considerations and Challenges…

1. What degree of state legislation is needed to guide the water planning process?
   - SC has limited guidance
   - Other states (Texas, Georgia) have detailed legislation
2. What state advisory/oversight/steering committees are needed for the water planning process?
   - SC approach was to complete technical work (water assessments and water demand forecasts) prior to “planning activities”
   - Consider forming appropriate committees at the beginning of the process – could facilitate stakeholder support
3. Critically evaluate an appropriate stakeholder engagement process - difference between being “informed” and being “engaged”
   - Challenge – stakeholder “buy-in” difficult at times (but improving)

4. What existing planning groups or modeling tools are already available and effective?

5. Which basins share water with other states? Do these states already have water plan or water planning efforts in place?
   - NC, GA use different models for planning – inefficient and can lead to conflict
   - Coordinate appropriately with other states and consider using existing models/tools/existing planning structures in those states

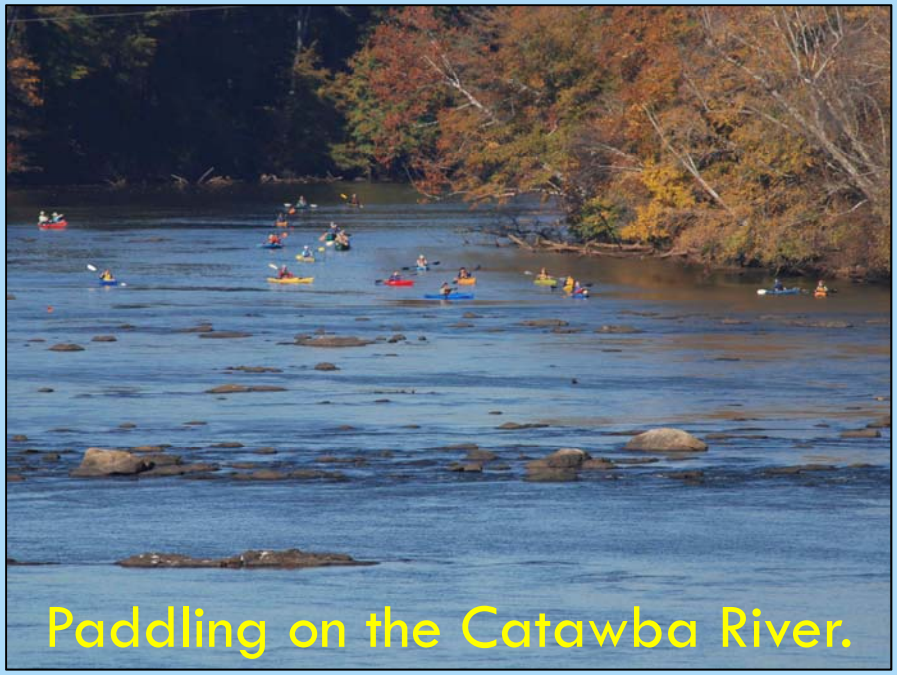
6. Water quality has not been formally addressed in SC water planning process to date… but should be.

7. Consider focusing on a “pilot” basin/area before committing to entire state.

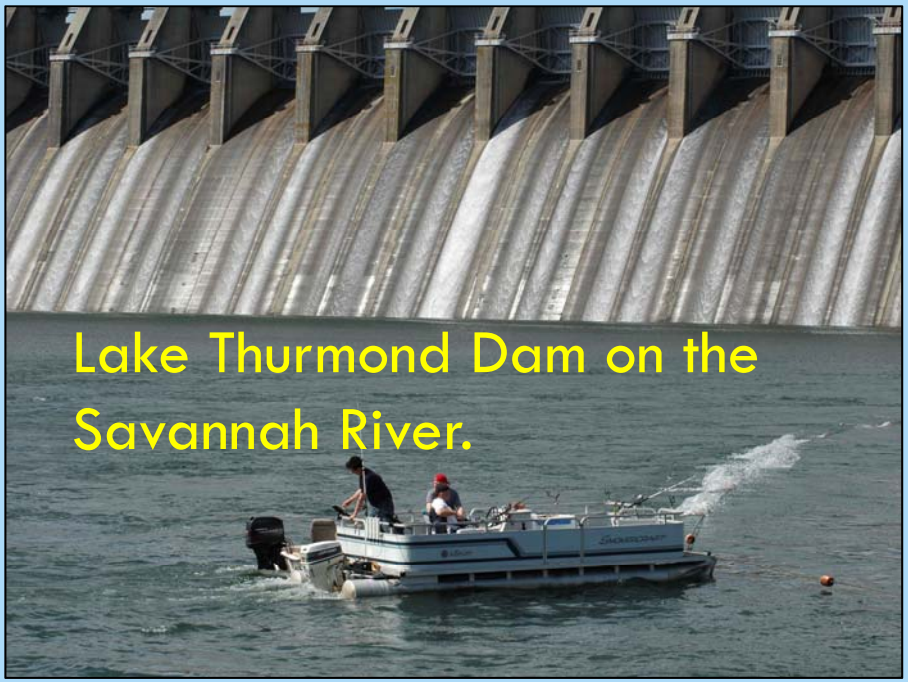
8. Be wary of a “one size fits all” approach - “consistency” can be overrated!

9. Critically evaluate the membership for any Technical Advisory Committees (TACs).

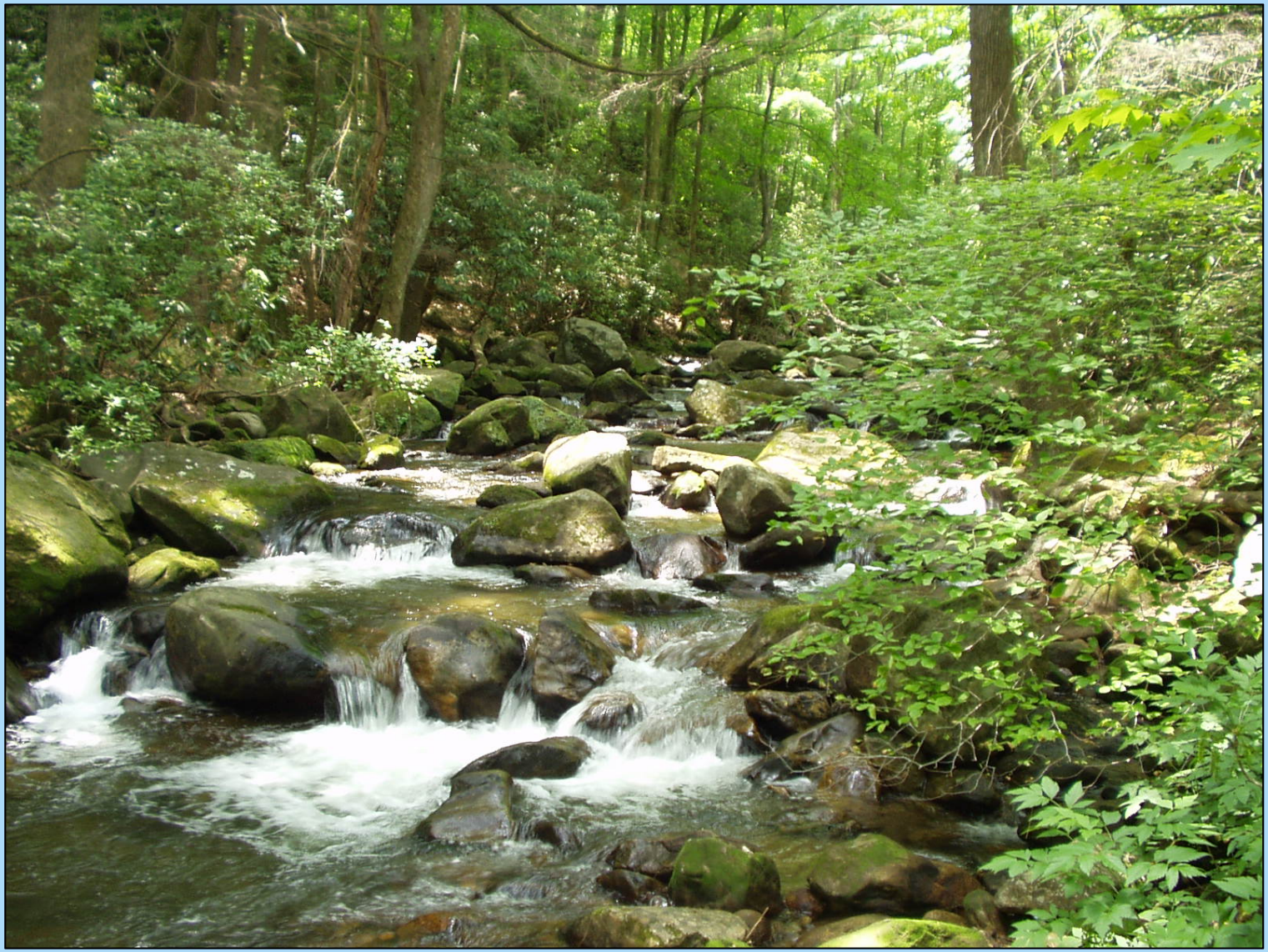
10. Lastly……lack of adequate funding has, is, and likely will continue to be a major challenge.



Paddling on the Catawba River.



Lake Thurmond Dam on the Savannah River.



Contact Info: Scott Harder, harders@dnr.sc.gov