Drought Management Plans in the Pee Dee Basin

Pee Dee River Basin Council

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Why are Drought Management Plans Important?

- The SWAM model will be used to evaluate the effectiveness of existing drought management plans in mitigating shortages
- The plans will inform shortage mitigation strategies

19
Plans reviewed

3 Plans cover water providers in the SWAM model

16 Plans were for water providers not in the SWAM model
  - Groundwater supplies
  - Coastal communities

WHAT IS DROUGHT?

Dry Pond in Dorchester County, 11-07

Photos courtesy of
http://www.scdrought.com/gallery.html

Jones Flat, 10-07

How you view water impacts your definition of drought

Meteorological drought

- Low precipitation

Hydrologic drought

- Reduced water supplies

Agricultural drought

- Poor soil moisture and reduced supplies

Ecological drought

- Loss of supply that makes recovery difficult – can be natural or human caused

Socioeconomic drought

- Weather-induced shortages of goods and services

South Carolina Drought Monitoring & Management

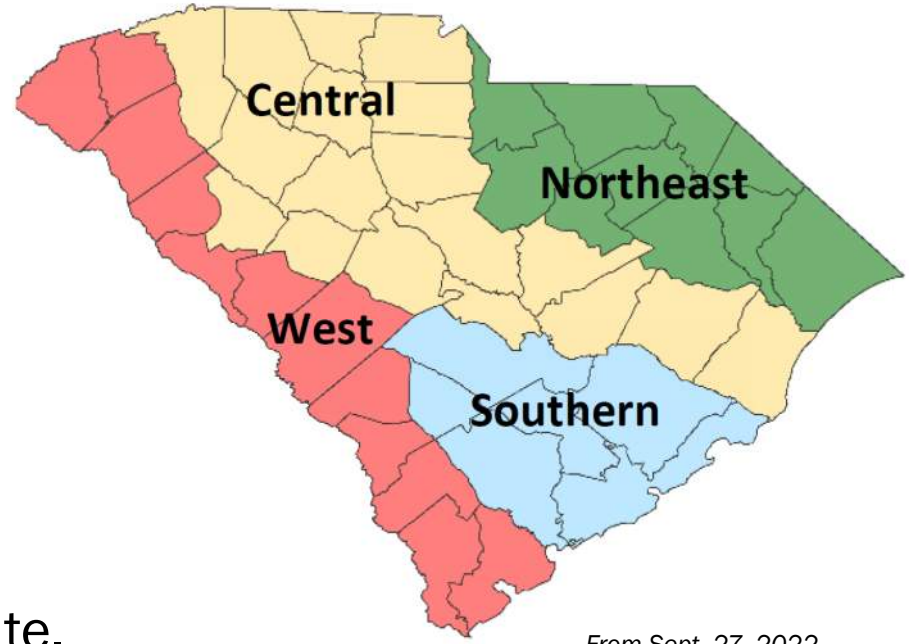
- Presented at the September 27th, 2022 RBC meeting

- Presentation recording: https://youtu.be/MN9k74pk_KE?t=8587

South Carolina Drought Response Program

- Consists of legislation, regulations, and procedures that establish recommended and required response

- The South Carolina Drought Response Act (2000) and the supporting regulations formally establish and describe the responsibilities of the South Carolina State Climatology Office and the South Carolina Drought Response Committee, the major drought decision-making entities in the State.



From Sept. 27, 2022
Pee Dee RBC presentation

Drought Severity Levels

Incipient

- Drier than normal
- Soil moisture declines
- Water demand increases

Moderate

- Water levels decrease
- Crops and plants wither
- Irrigation increases

Severe

- Water levels continue to drop
- Number of wildfires increase
- Poor grazing and agricultural conditions

Extreme

- Widespread impacts to agriculture, forestry, water utilities, and water dependent businesses

What are Drought Management Plans?

- Tool for water utilities to document drought indicators and address and mitigate droughts
- Objectives
  - Have clear triggers to identify drought conditions
  - Document actions utilities can take at each phase
- Drought Response ordinance is included
  - Provides authority to impose voluntary and mandatory restrictions
  - Curb specific water uses
  - Enforcement mechanism

Content of Drought Management Plans

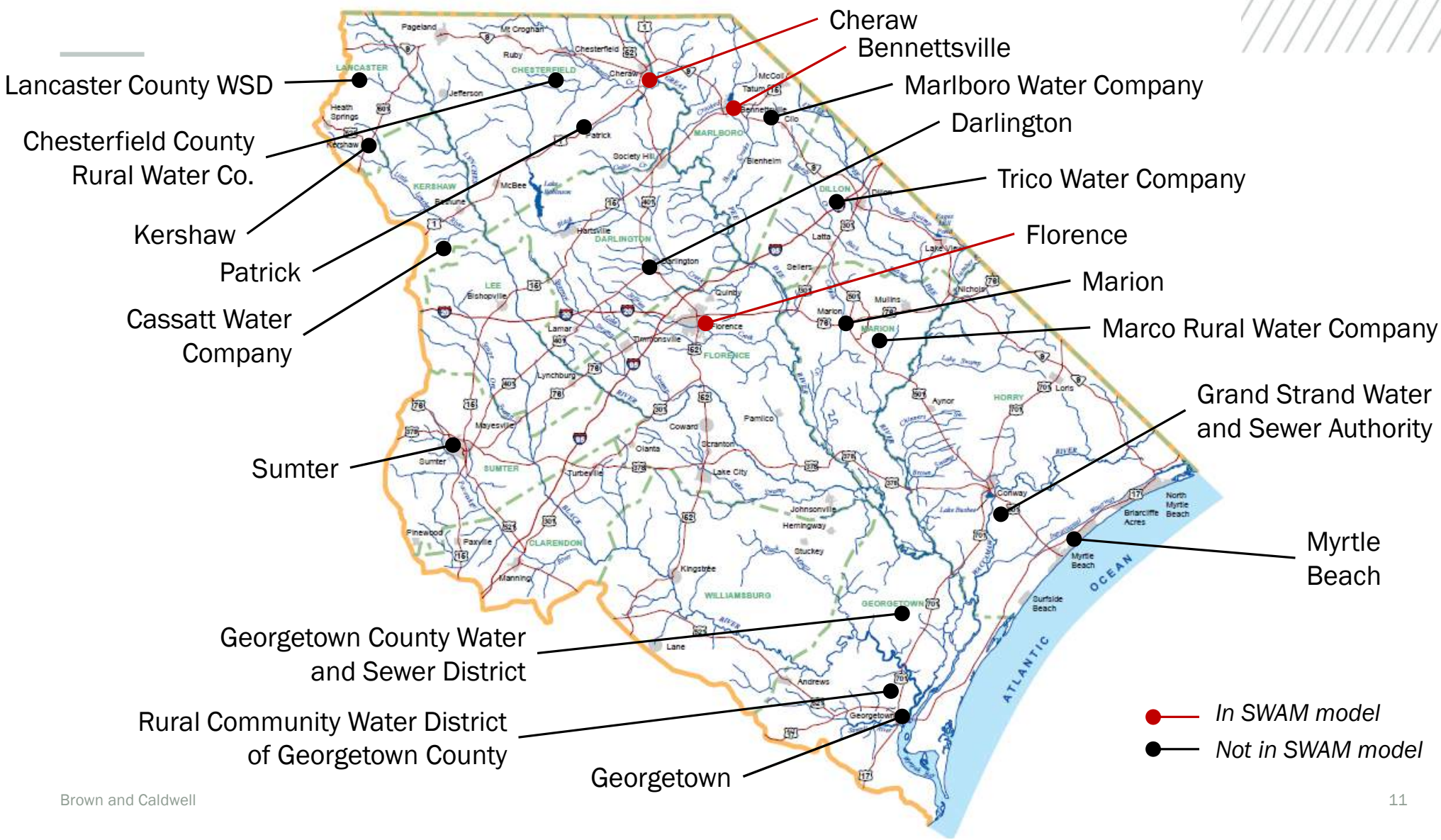
- **Water System Overview**
  - System layout, sources, capacities, connections, yields
  - Responsible representative for implementing plan
- **Drought indicators**
  - Conditions or triggers that describe drought phases
- **Mitigation measures**
  - Drought mitigation measures, cooperative agreements and alternative sources, pre-drought planning efforts
- **Drought Response Ordinance**

Entities Included in the Pee Dee SWAM Model

City of Bennettsville	City of Florence
Town of Cheraw	

Entities Not Included in the Pee Dee SWAM Model

Marco Rural Water Company (Marion)	Marlboro Water Company
Cassatt Water Company	Town of Patrick
Chesterfield County Rural Water Co. – Wolf Pond	Rural Community Water District of Georgetown County
City of Darlington	Georgetown County Water and Sewer District
City of Georgetown	Grand Strand Water and Sewer Authority
City of Marion	City of Myrtle Beach
City of Sumter	Town of Kershaw
Trico Water Company	Lancaster County Water and Sewer District


Cheraw
Bennettsville
Lancaster County WSD
Marlboro Water Company
Darlington
Chesterfield County Rural Water Co.
Trico Water Company
Florence
Kershaw
Marion
Patrick
Marco Rural Water Company
Cassatt Water Company
Grand Strand Water and Sewer Authority
Sumter
Myrtle Beach
Georgetown County Water and Sewer District
Rural Community Water District of Georgetown County
Georgetown
In SWAM model
Not in SWAM model

Drought Mitigation Strategies Vary by Severity

- Water systems implement drought response ordinances or plans based on local triggers and conditions
- Triggers describe conditions that indicate specific drought phases

  (Incipient triggers are not typically considered)
- Triggers are system dependent and vary across providers

Moderate

Severe

Extreme

Drought Triggers

Committee based

- Drought phases determined by the Drought Response Committee

Demand based

- Drought phases determined by specific increases in demand or specific water use levels over a specific period of time

Drought Triggers

Streamflow based

- Drought phases determined when streamflow falls below specific thresholds for specific periods of time.
- Could describe streamflows during specific months
- Coastal communities may include water quality criteria (i.e. conductivity)

Drought Triggers

Water level based

- Drought phases determined when water in storage facilities or aquifers drop to specific levels for specific periods of time

Storage index based

- Drought phases determined based on storage ratios and targets

Typical Demand Reduction Strategies

Moderate	**Voluntary**	– 20% reduction in residential use – 15% reduction in all other uses
Severe	**Voluntary**	– 25% reduction in residential use – 20% reduction in all other uses – Mandatory restrictions for non-essential uses
Extreme	**Mandatory**	– 30% reduction for residential use – 25% reduction for all other uses

Plans do not typically include demand reduction strategies at incipient stage (though some do)

Alternative Water Supply Agreements

- Many utilities have alternative water supply agreements with other entities

- Agreements identify:
  - Other suppliers providing water
  - Scenarios in which water is provided
  - Amounts

Thank you.

Questions?

Brown AND Caldwell