Overview of Edisto River Basin Water Management Strategies

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Planning Framework Definitions

- **Surface Water Management Strategy** – a water management strategy proposed to eliminate a Surface Water Shortage, reduce a Surface Water Shortage, or generally increase Surface Water.
- **Groundwater Management Strategy** – a water management strategy proposed to address a Groundwater Area of Concern or Groundwater Shortage.

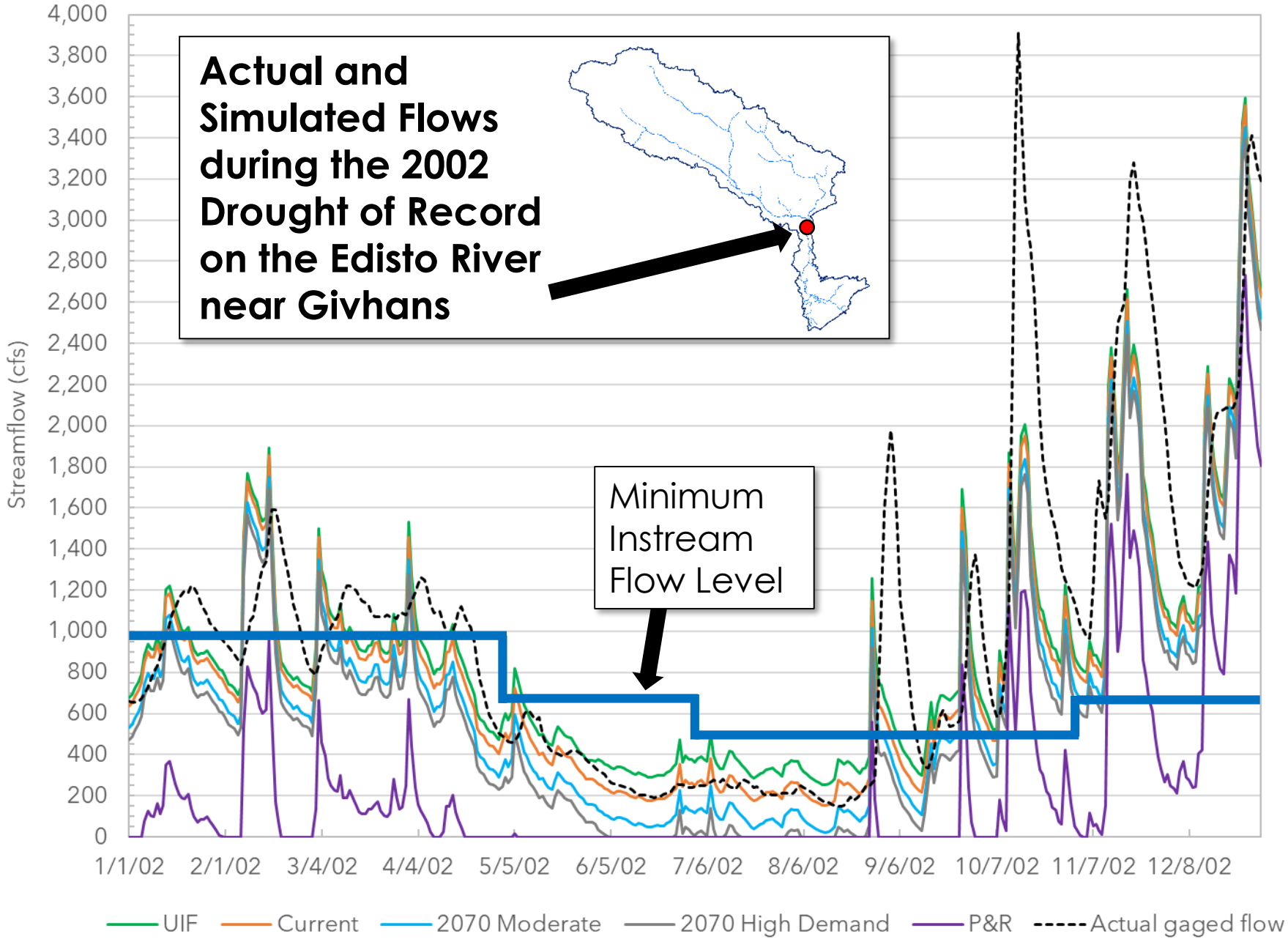
Drivers for Selecting Surface Water Management Strategies in the Edisto River Basin

1. Potential, infrequent agricultural shortages in smaller stream reaches (where there are no storage ponds)

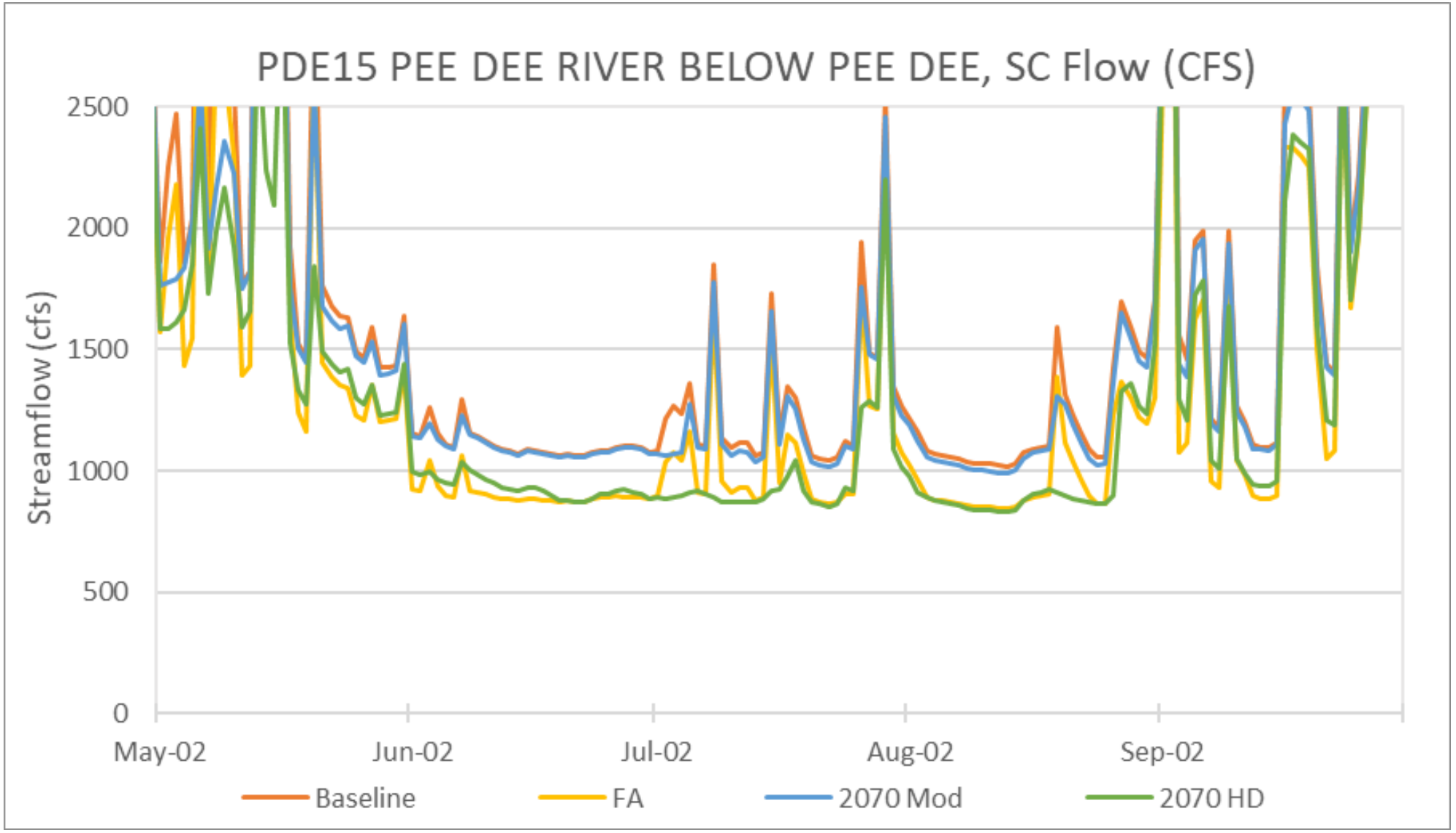
2. Projected High Demand Scenario shortage for Aiken and Charleston during the drought of record (2002) conditions.

3. Low streamflow, which may occur in all parts of the basin during severe and extreme drought, regardless of upstream withdrawals.

- Even without any surface water use, flows in the Edisto River and other reaches can drop below minimum instream flows during periods of low precipitation and drought.



Pee Dee River 2002 Low Flows



Flows below 2,500 cfs between May 2002 and Oct 2002

Goals and Solutions for Surface Water Management Strategies in the Edisto River Basin

1. **Goal:** Improve resilience, especially under severe and extreme drought conditions

   Solution: *Identify alternative supply options*

2. **Goal:** Promote a water conservation ethic

   Solution: *Identify basin-appropriate demand-side strategies that reduce water demand*

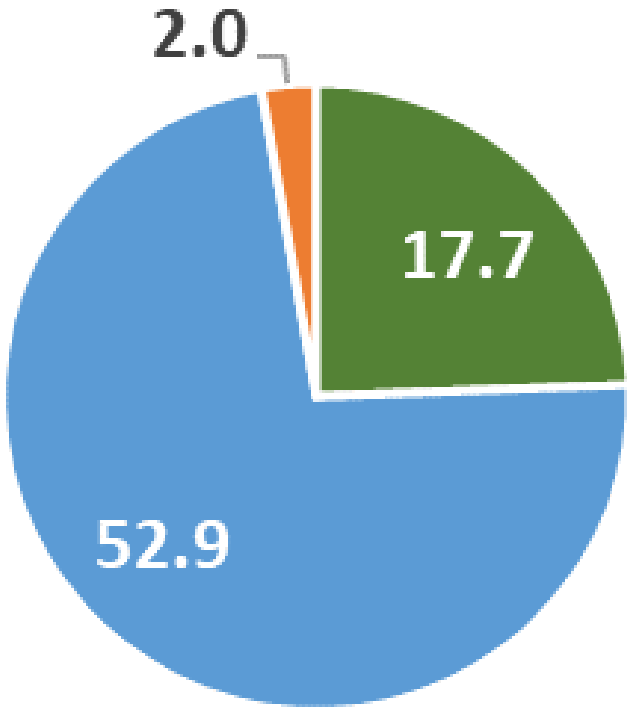
3. **Goal:** Identify a basin-wide strategy to better meet minimum flow requirements during severe and extreme drought conditions

   Solution: *Develop a low flow management strategy*

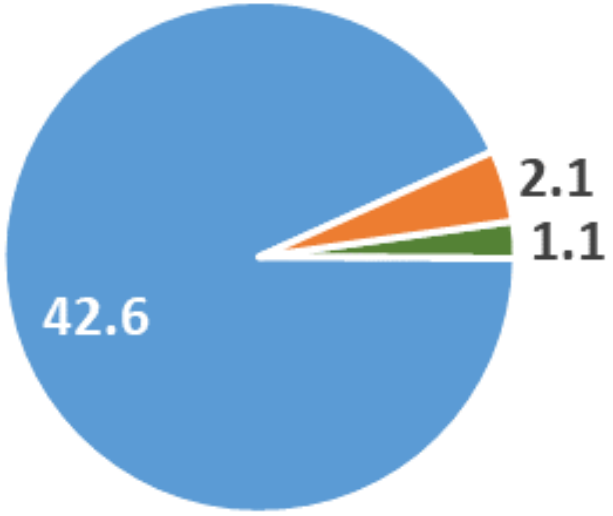
Where Were the Opportunities in the Edisto Basin?

Surface Water Consumptive Use by Sector

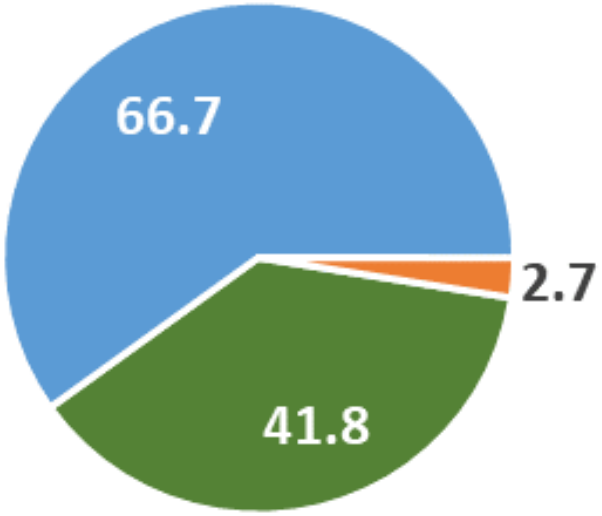
Current Use Scenario



Annual Average (MGD)



Winter (Dec-Feb) Average (MGD)

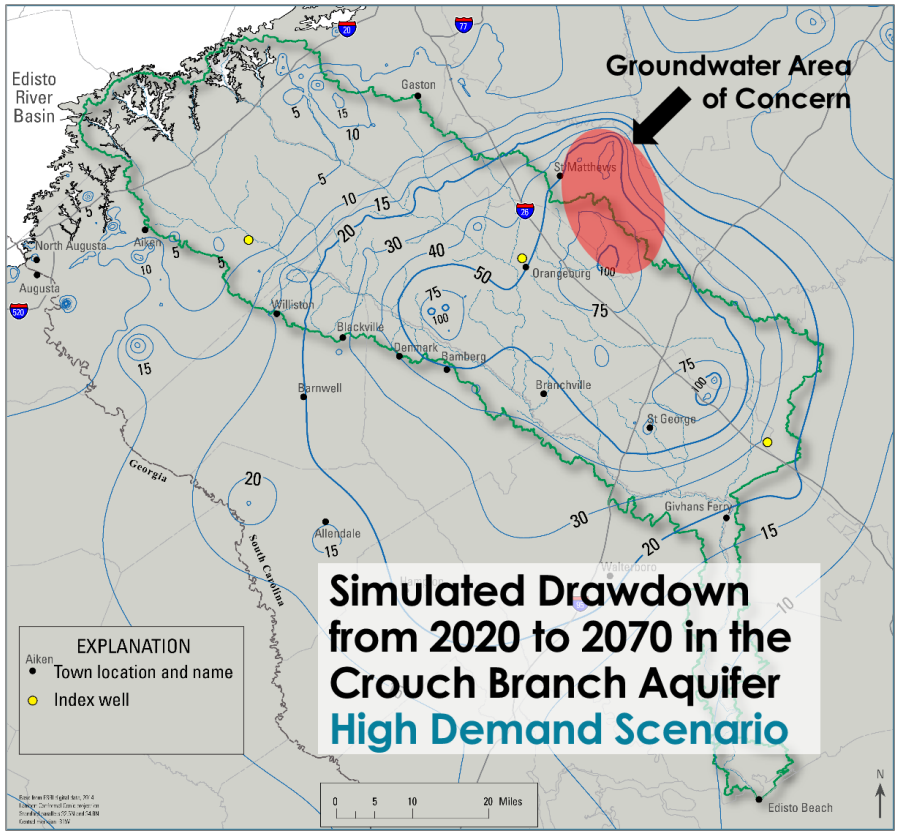


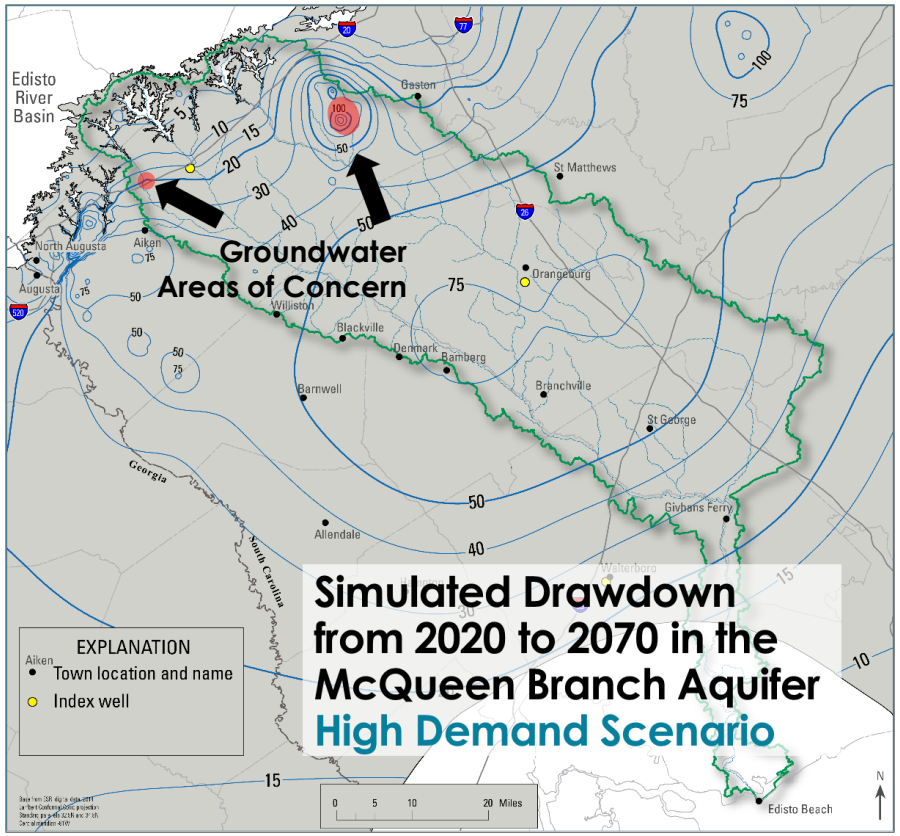
Summer (Jun-Aug) Average (MGD)

- Agriculture
- Municipal
- Thermoelectric

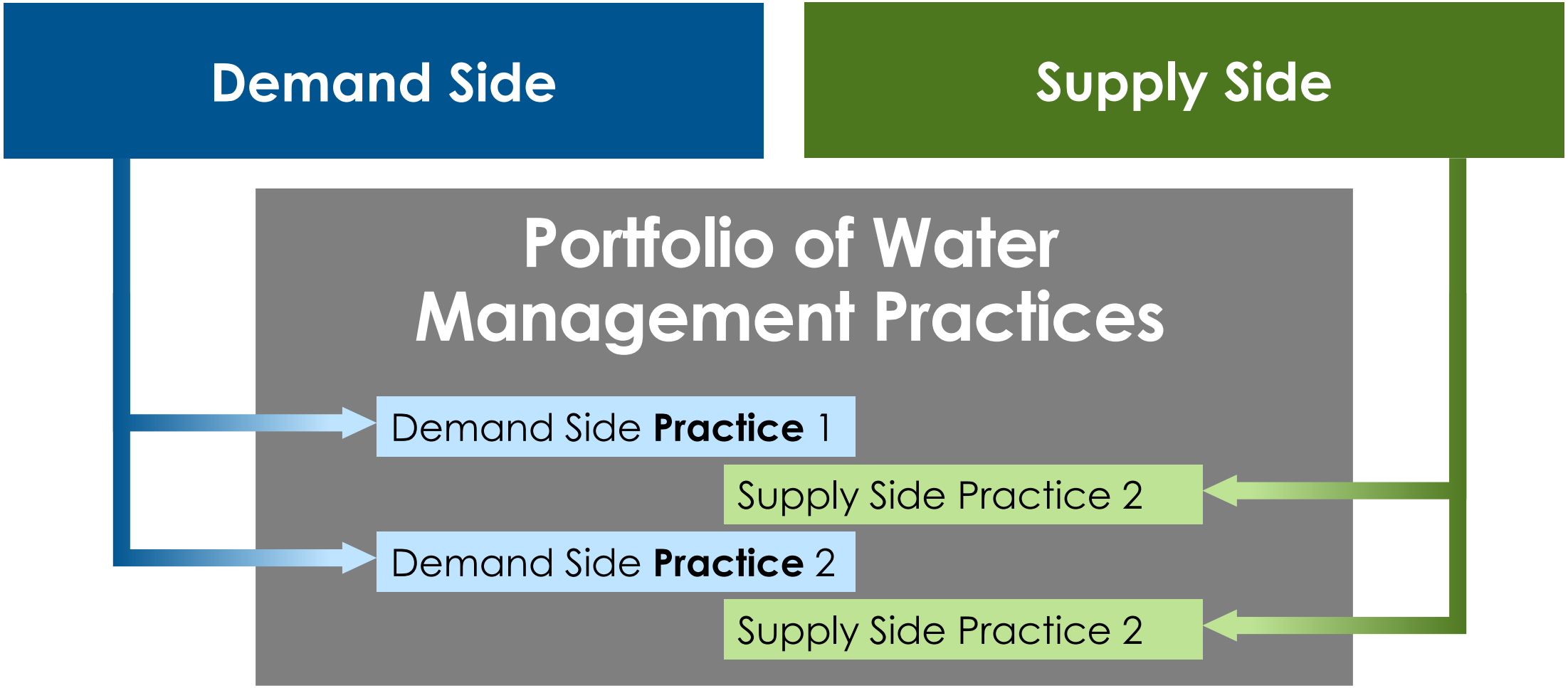
Drivers for Selecting Groundwater Management Strategies in the Edisto River Basin

1. Areas where groundwater levels are predicted to drop below the top of the Crouch and McQueen Branch aquifers.





Basin-wide Water Management Strategy



Water Management Strategies

Demand Side Strategies	Example Practices
Municipal conservation	Water loss control programs Low flow fixtures, toilets and appliances Pricing structures (ex. increasing block rates) Xeriscaping
Ag/Irrigation conservation	Water audits and center pivot sprinkler retrofits Dammer dikers Cover cropping, conservation tillage, mulch Soil Moisture sensors/smart irrigation Crop selection Irrigation scheduling Drip/Trickle irrigation (for select crops)

Water Management Strategies

Demand Side Strategies	Example Practices
Industrial conservation	Water reuse and recycling Water efficient processes Water loss control Low flow fixtures, toilets and appliances
Thermoelectric conservation	Reclaimed water Switch to combined-cycle natural gas Energy saving appliances (which reduces thermoelectric generation needs)

Water Management Strategies

Supply Side Strategies	Example Practices
New or Increased Storage	New impoundments, ponds, reservoirs, tanks Dredging (pond deepening) Reservoir expansion (raising dam height) Aquifer storage and recovery
Water Reclamation	Water reuse systems (non-potable) Direct potable reuse Stormwater capture and treatment
Conjunctive Use	Using groundwater to augment surface water during low flow periods

Water Management Strategies

Supply Side Strategies	Example Practices
Conveyance	Regional water systems Utility interconnections Interbasin transfers
Desalination	Treatment of brackish groundwater Desalination of seawater

Existing Water Management Strategies in the Edisto Basin

Walther Farms

- **Supply side -** Installed groundwater well to provide up to 20% of peak demand (conjunctive use)
- **Demand side -** Water audit/sprinkler head retrofits, eliminate end spray guns, cover cropping, dammer dikers

Existing Water Management Strategies in the Edisto Basin

City of Orangeburg

- Two Aquifer Storage and Recover (ASR) wells
- Interconnection with Lake Marion Regional Water System

Existing Water Management Strategies in the Edisto Basin

City of Aiken

- **Masons Branch Reservoir**
  - 1,254 acre-feet (340 mgal) storage
  - Releases only during extreme drought to augment flow in Shaw Creek, above the City's intake
  - Provides approximately 30-day supply during average use

Existing Water Management Strategies in the Edisto Basin

Dominion Energy Cope Station

South Fork Edisto River

- Moving from 100% groundwater to a combination of surface and groundwater by 2028
- Eventually will withdrawal ~90% from surface water and ~10% from groundwater when river conditions allow
- During low flow conditions, all water use at the station will be groundwater

Criteria to Evaluate Water Management Strategies

- Effectiveness
  - Analyze Performance Measures (via modeling)
  - Cost/benefit incl. capital and annual costs ($/MGD)
- Reliability (especially during drought)
- Permitting/regulatory including potential interbasin impacts
- Environmental impacts
- Socioeconomic impacts
- Water quality impacts and considerations
- Constructability

Edisto Surface Water Management Strategies

Portfolio of Demand Side Strategies

Agricultural Strategies

(in Order of Priority)

1. Water audits and nozzle retrofits
2. Irrigation equipment changes
3. Soil management and cover crops
4. Irrigation scheduling
5. Crop variety, type, and conversion
6. Future Technologies

Municipal Strategies (Examples – Priority will vary)

Conservation pricing structures
Leak detection and water loss control program
Toilet rebate program
Landscape irrigation program and codes
Time-of-day watering limit
Car wash recycling ordinances
Public education about water conservation
Residential water audits
Water efficiency standards for new construction
Reclaimed water programs

Edisto Surface Water Management Strategies

Supply Side Strategies

Conjunctive Use

- Switching from surface water use to groundwater use during times when river and streamflows are low.

Small Impoundments

- Serve to reduce or eliminate agricultural water shortages during drought conditions.

Low Flow Management Strategy

The strategy serves to augment municipal drought management plans by triggering tiered withdrawal curtailment by the largest water users in the basin when Edisto River flow reaches certain low levels.

Incremental Percent Below 20% of Median Flow	Edisto River Flow Range (cfs) at Givhans Ferry		Reduction Goal for Surface Water Withdrawals
	Lower	Upper	
0-20%	266	332	20%
20-40%	199	266	40%
40-60%	133	199	60%
60-80%	66	133	80%
80-100%	0	66	100%

Example RBC Recommendations

Technical and Program Recommendations

Example: SCDNR work with SCDHEC, USGS, and other partners to enhance monitoring capabilities in the identified Groundwater Areas of Concern.

Recommendations to Improve the River Basin Planning Process

Example: RBC members should communicate with legislative delegations throughout the river basin planning process to promote their familiarity with the process and its goals and to generate buy-in on its recommendations.

Policy, Legislative, and Regulatory Recommendations

Example: Reasonable Use criteria should be applied to all water use requests