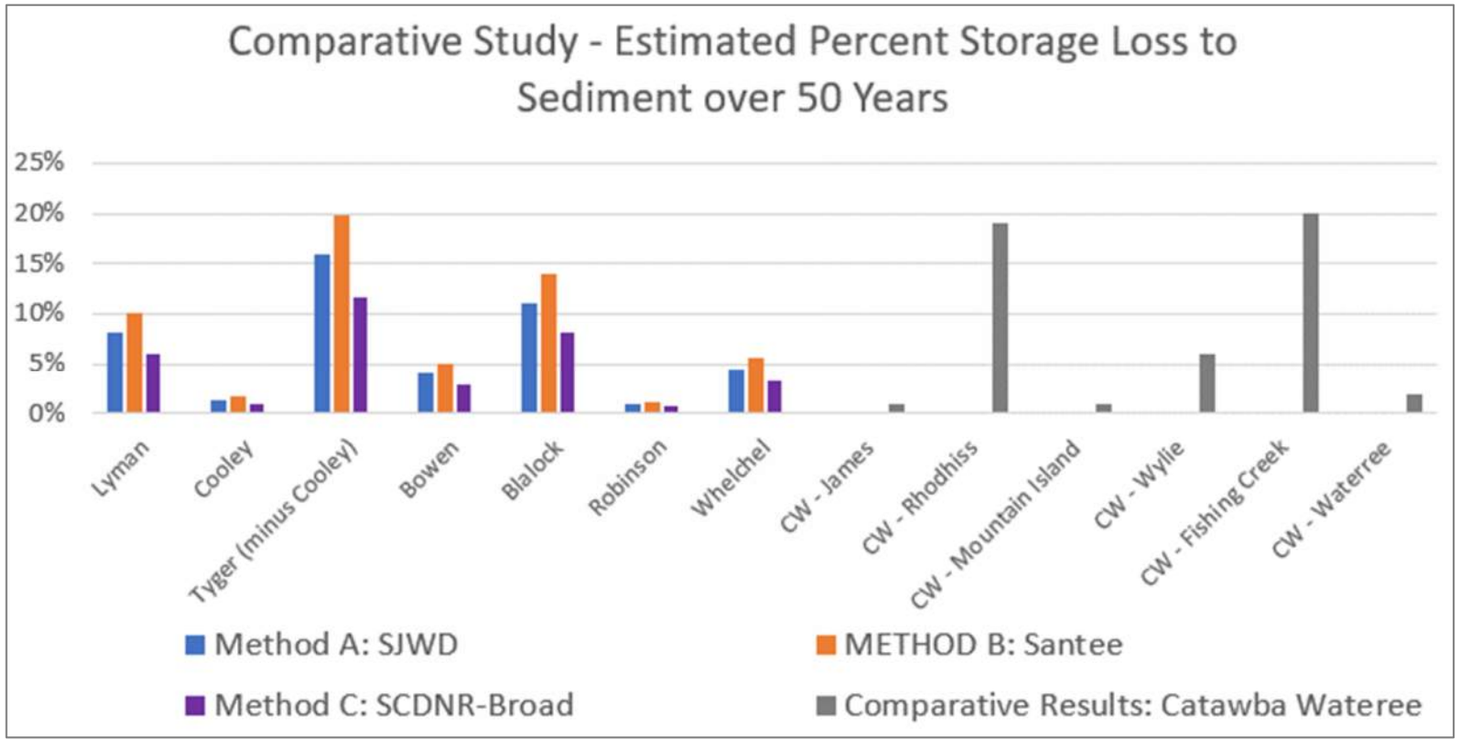
March RBC Meeting Review

Agenda Item 3

Estimated Potential Reservoir Sedimentation Analysis – 2070



Sample results from SJWD Study:

Reservoir	Sediment Volume* (MG)	Sediment Volume (% Available Storage)	% of Available Storage if Dead Pool Utilized for Sediment	Notes
Lyman	111	8%	8%	116 MG already: Could fill by 2604 per GMC
Cooley	22	1%	0%	
Tyger**	60	16%	16%	65 MG already. Could fil by 2255 per GMC
Bowen	199	4%	0%	
Blalock	659	11%	0%	
Robinson	43	1%	1%	
Whelchel	36	4%	3%	

** Sedimentation rate of 0.0028 in/year from upstream watershed assumed based on SJWD Water Resources Master Plan, GMC 2022*

*** Upstream area of Cooley subtracted*

Method A:

0.0028 in/year/mi^2

SJWD Water Resources Master Plan
GMC 2022

Method B: Santee River

168 tons/km^2/year

Quantifying the Lansdcape's Ecological Benefits - An Analysis of the Effect of Land Cover Change on Ecosystem Services. J. Carl Ureta, Lucas Clay, Marzieh Motallebi, and Joan Ureta
Land, 2021, 10,21. https://doi.org/10.3390/land10010021

Method C: SCDNR/USGS-Broad River

Up to 98 tons/km^2/year

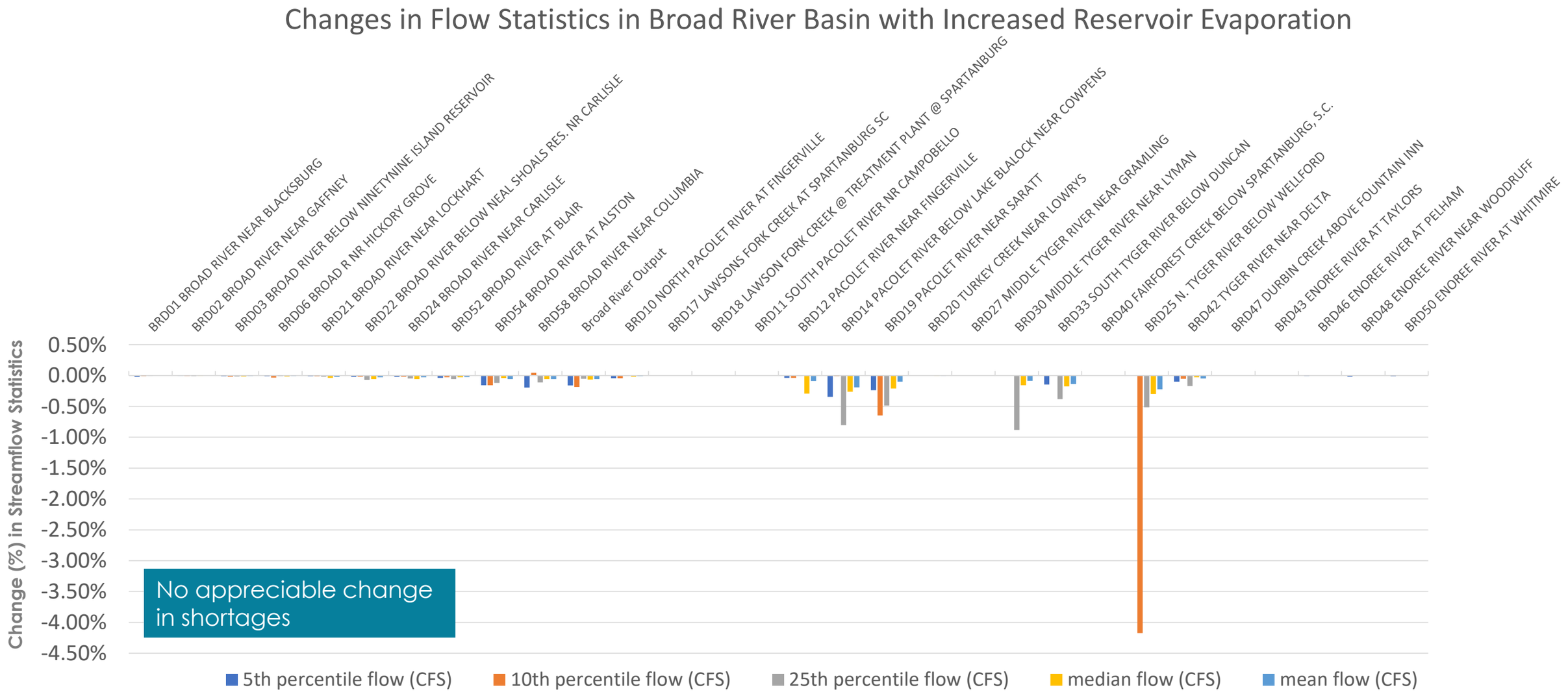
Sediment Source Identification and Load Prediction in a Mixed Use Piedmont Watershed, South Carolina
Kerry McCarney-Castle, Tristan M. Childress, Christian R. Heaton
Journal of Environmental Management 185 (20217) 60-69

Comparison to Catawba Wateree Study

(Results extrapolated over 50 years)

Catawba-Wateree Water Management Group
Sedimentation Monitoring Study
Final Report
Catawba-Wateree Hydroelectric Project
Dec-15

Increased Reservor Evaporation - Impacts to Streamflow

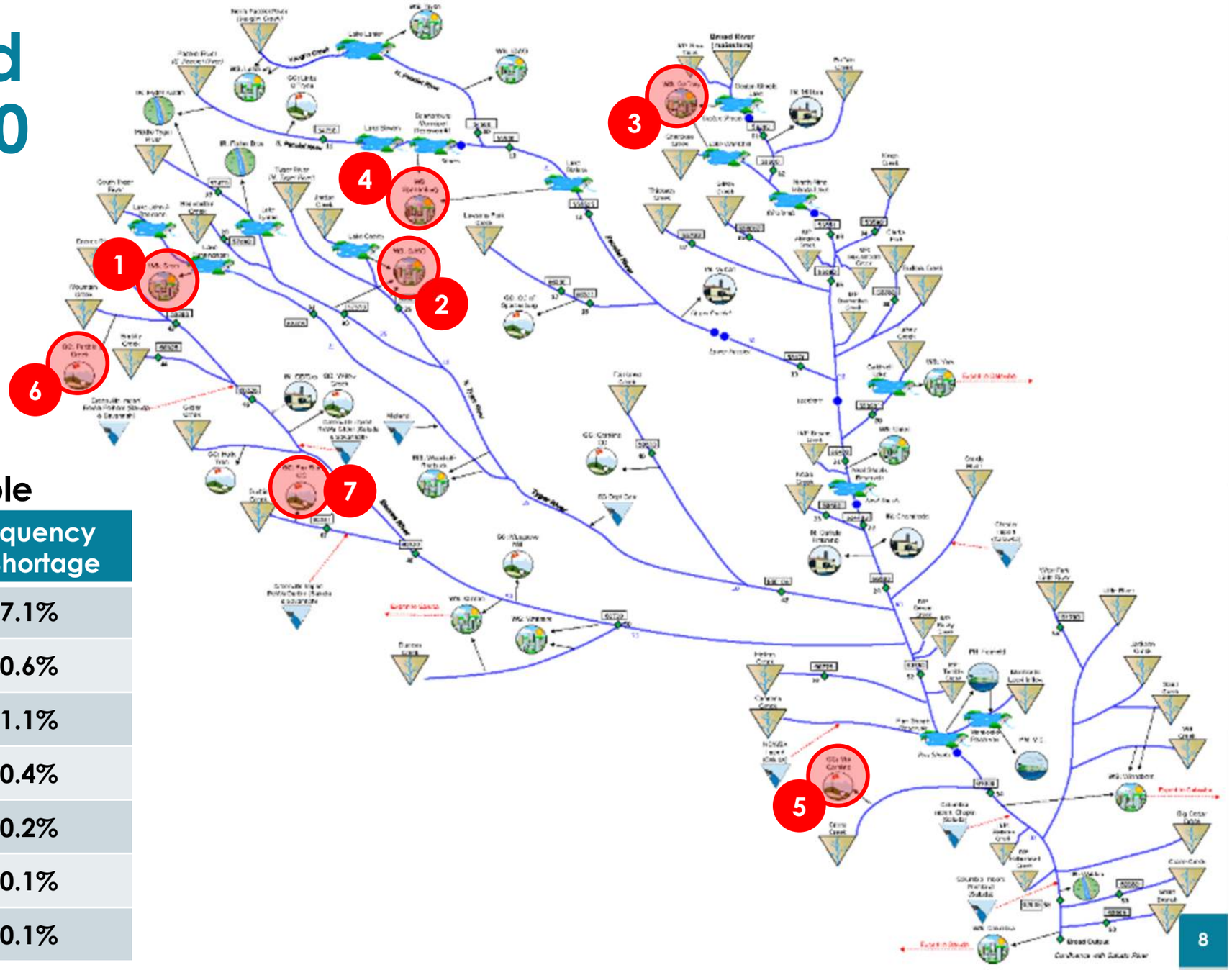


Other Topics Discussed in March

- Safe yield for Gaffney, Greer, and SJWD reservoirs
- Gaffney Supply-Side Strategies
  - Hypothetical 2 BG quarry
  - Additional storage in Lake Whelchel
- Next steps for evaluating and selection water management strategies
- Drought response

High Demand Scenario 2070

Initial results with no adjustment of reservoir operations



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%

Timing of High Demand Scenario Shortages

	Maximum Shortage (MGD) for Each High Demand Scenario						Frequency of Shortage for Each High Demand Scenario					
Water User Name	2025	2030	2040	2050	2060	2070	2025	2030	2040	2050	2060	2070
WS: Gaffney	6.2	10.0	12.9	18.9	23.3	27.8	0.3%	0.3%	0.5%	0.7%	1.0%	1.1%
WS: Spartanburg	No shortage				15.0	36.9	No shortage				0.1%	0.4%
WS: SJWD*	No shortage				6.9	18.3	No shortage				0.1%	0.6%
WS: Greer*	No shortage		4.2	9.3	13.3	17.0	No shortage		0.8%	2.6%	4.4%	7.1%
GC: Pebble Creek	0.1	0.1	0.1	0.1	0.1	0.1	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
GC: Fox Run CC	0.02	0.02	0.02	0.02	0.02	0.02	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
GC: Mid Carolina	0.03	0.03	0.03	0.03	0.03	0.03	0.3%	0.2%	0.2%	0.2%	0.2%	0.2%

Shortages were evaluated prior to making supply-side adjustments to optimize reservoir operations.

High Demand Scenario 2070 Shortages With and Without Drought Management Plan (DMP) Triggers and Tiered Reductions in Demand

Water User	Without DMP Reductions		With DMP Reductions in Demand	
	Freq. of Shortage	Max Shortage (MGD)	Freq. of Shortage	Max Shortage (MGD)
WS: Greer*	7.1%	17.0	No Change	
WS: SJWD*	0.6%	18.3	No Change	
WS: Gaffney	1.1%	27.8	0.8%	19.2
WS: Spartanburg	0.4%	36.9	0.1%	5.2
GC Mid Carolina	0.2%	0.03	No Change	
GC: Pebble Crk.	0.1%	0.1	No Change	
GC: Fox Run	0.1%	0.02	No Change	

"No Change" because no rules were in place to release more water from Lake Robinson (Greer) or Lake Lyman (SJWD)

Initial results with no adjustment of reservoir operations

What Effect to Demand Side Reductions of 10, 15 and 20 Percent Have on Reducing Projected Shortages When Applied to Public Water Supply Withdrawals?

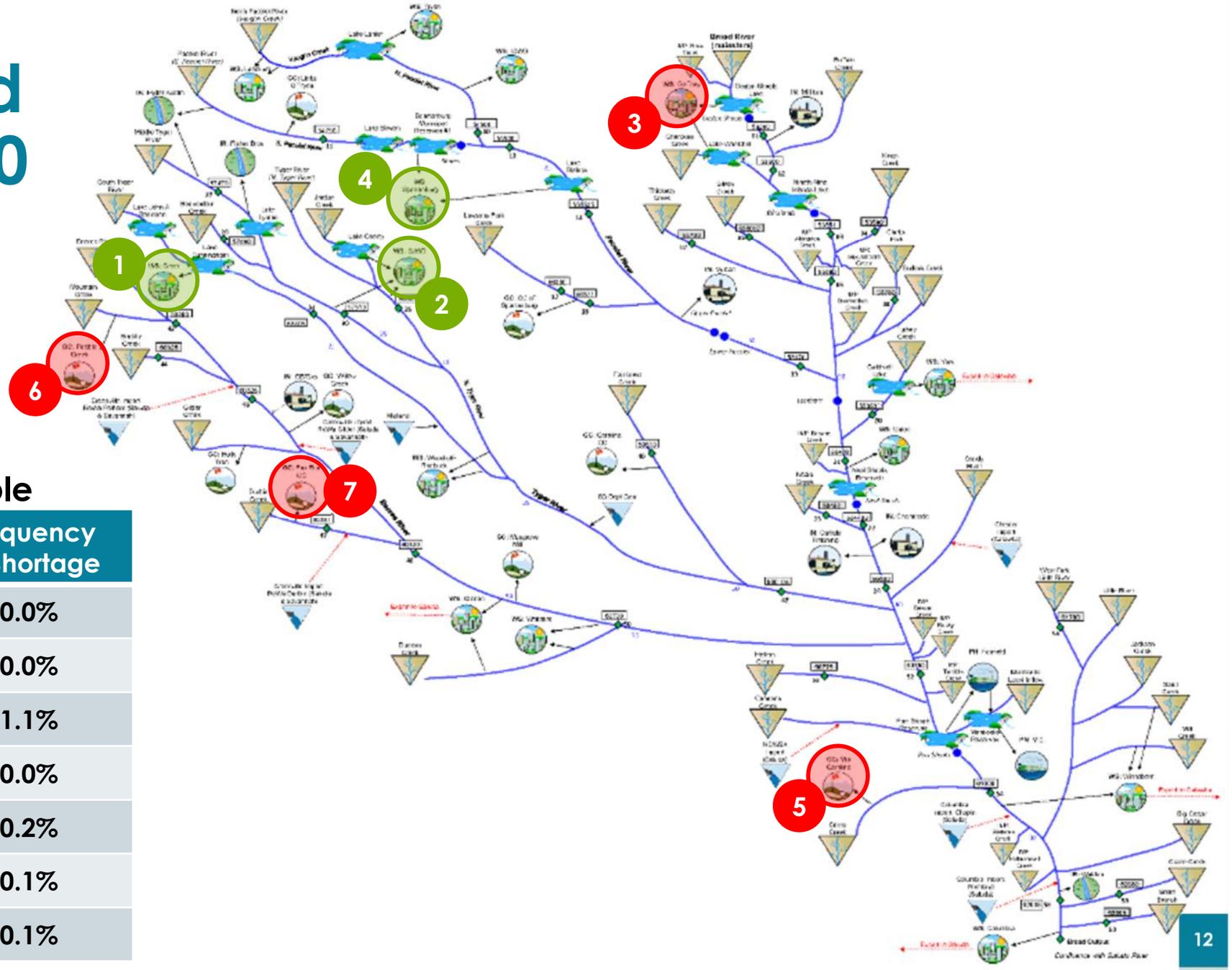
2070 High Demand Scenario

Water User	Frequency of Shortage				Maximum Shortage (MGD)			
	2070 High Demand	10% Demand Reduction	15% Demand Reduction	20% Demand Reduction	2070 High Demand	10% Demand Reduction	15% Demand Reduction	20% Demand Reduction
Gaffney	1.1%	1.0%	1.0%	0.8%	27.8	24.6	22.2	20.7
Spartanburg	0.4%	0.1%	0.1%	0.0%	36.9	19.8	4.8	0.0
SJWD	0.6%	0.4%	0.1%	0.0%	18.3	9.9	5.8	0.0
Greer	7.1%	5.4%	4.3%	3.4%	17.0	14.4	13.1	11.8

Shortages were evaluated prior to making supply-side adjustments to optimize reservoir operations for 2070 demands.

High Demand Scenario 2070

Results with minor adjustments to reservoir operations



Surface Water Shortage Table

Map ID	Water User	Frequency of Shortage
1	WS: Greer	0.0%
2	WS: SJWD	0.0%
3	WS: Gaffney	1.1%
4	WS: Spartanburg	0.0%
5	GC: Mid Carolina	0.2%
6	GC: Pebble Creek	0.1%
7	GC: Fox Run	0.1%