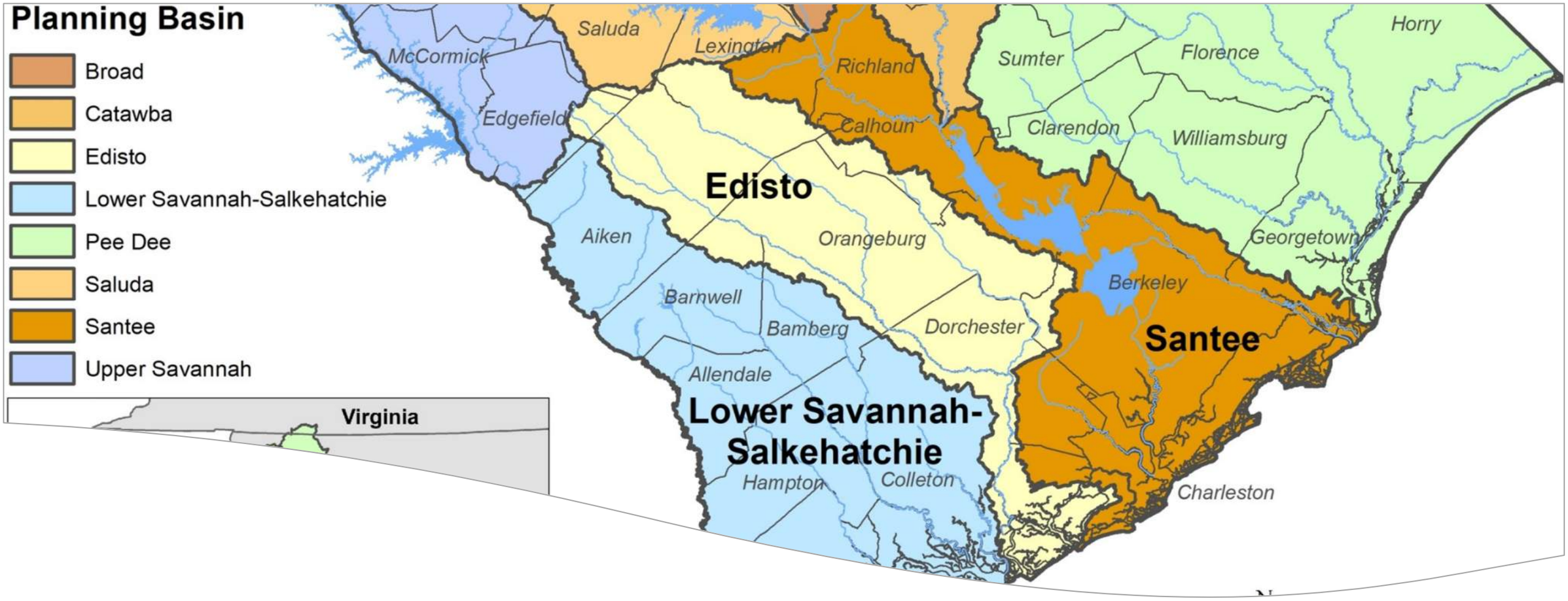
Review and Discuss RBC Membership

Agenda Item 3

Broad RBC Membership

RBC Member Name		Term Length	Term Expires	Interest Category	Total
John	Alexander	4	Feb 2026	Agriculture, Forestry, and Irrigation	2
Daniel	Hanks	3	Feb 2025	Agriculture, Forestry, and Irrigation	
James	Kilgo	2 +3	Feb 2027	At-Large	2
Angus	Lafaye	3	Feb 2025	At-Large	
Amy	Bresnahan	2 +3	Feb 2027	Electric Power Utilities	2
Jeff	Lineberger	3	Feb 2025	Electric Power Utilities	
Kristen	Austin	4	Feb 2026	Environmental	3
Erika	Hollis	2 +3	Feb 2027	Environmental	
Bill	Stangler	2 +3	Feb 2027	Environmental	
Paul	Pruitt	4	Feb 2026	Industry and Economic Development	1
Mark	Boland	4	Feb 2026	Local Governments	1
Frank	Eskridge	4	Feb 2026	Water and Sewer Utilities	4
Bryant	Fleming	3	Feb 2025	Water and Sewer Utilities	
Ken	Tuck	3	Feb 2025	Water and Sewer Utilities	
Jeff	Walker	3	Feb 2025	Water and Sewer Utilities	
Karen	Kustafik	2 +3	Feb 2027	Water-Based Recreation	1

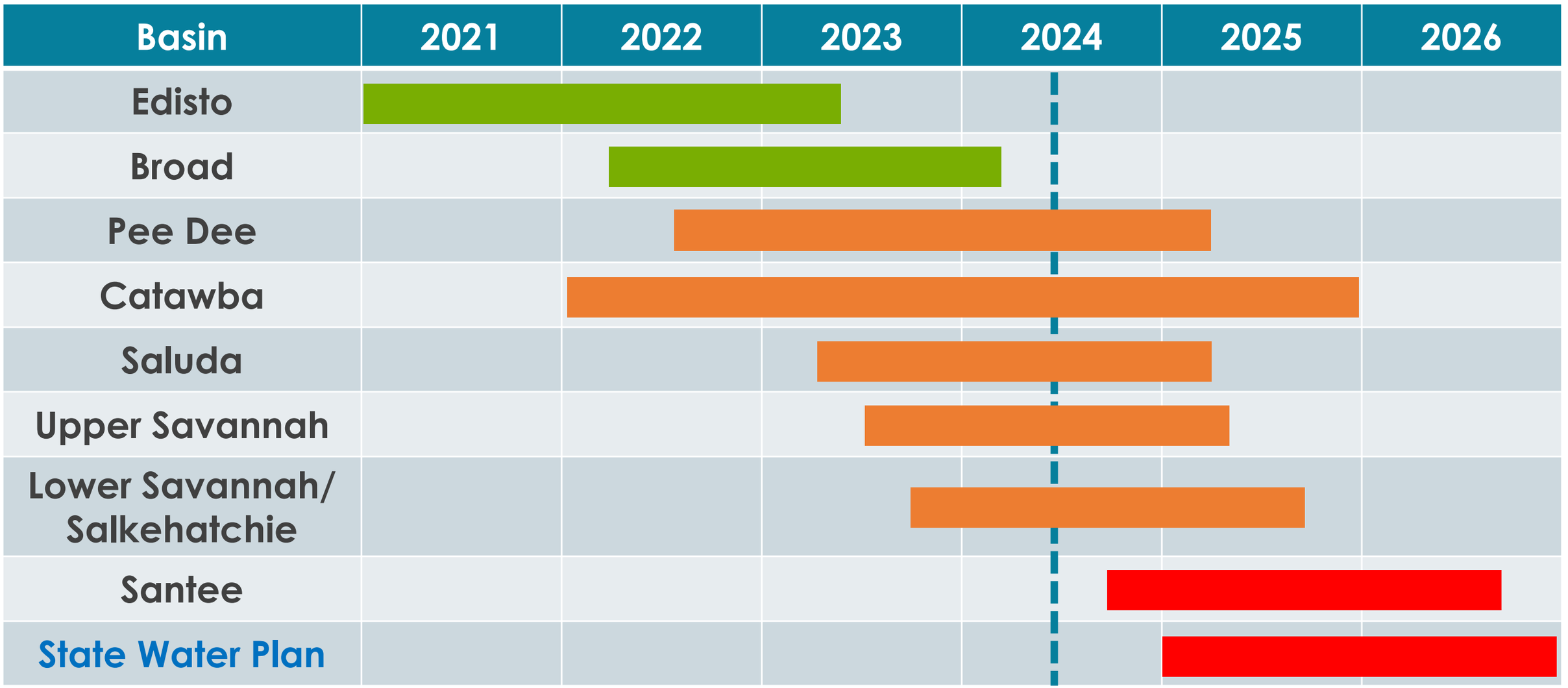


Update on Planning in other River Basins

Scott Harder, SCDNR and John Boyer

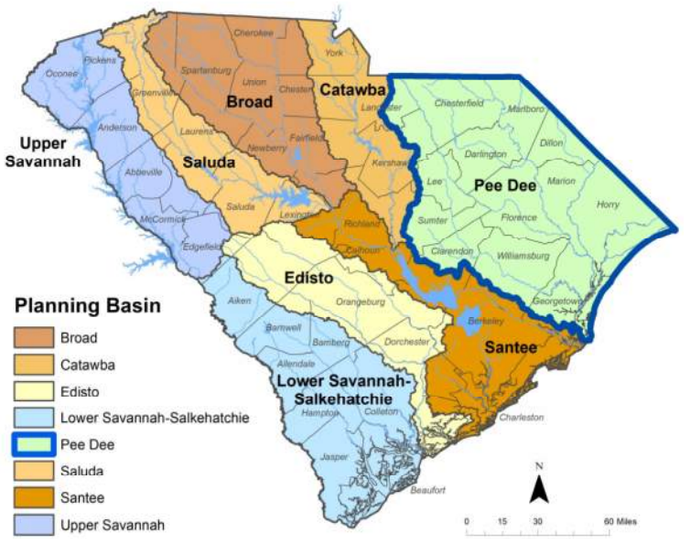
Agenda Item 4

State Water Plan - Schedule



Work on State Water Plan anticipated to begin in 2025

Pee Dee River Basin Planning



- 24 RBC meetings to date
- Chair – Buddy Richardson (USDA FSA)
- Vice-Chair – Cara Schildtknecht (Winyah Rivers Alliance).
- Currently in Phases II-IV
  - Surface water assessment is complete
  - Groundwater assessment is ongoing
  - Evaluation of management strategies is ongoing
  - Portions of the River Basin Plan have been prepared
- Final River Basin Plan – Winter 2024/2025.

Saluda River Basin Planning

Lake Murray Dam

ReWa Mauldin Rd WRRF

LCWSC WTP

- 14 RBC meetings to date
- Chair – K.C. Price, (LCWSC)
- Vice-Chair – Katherine Amidon (Bolton and Menk, Inc.)
- Currently in Phase IV
  - Working on drought management and other Plan recommendations
  - RBC has shown interest in protecting recreational flows
  - Field Trips to Lake Murray Dam, LCWSC WTP, ReWa WRRF, Unity Park, and various stream restoration sites
- Final River Basin Plan – February 2025.

Upper Savannah River Basin Planning

- 10 RBC meetings to date.
- Chair – Jill Miller (SCRWA)
- Vice – Chair, Jeff Phillips (Greenville Water)
- Currently in Phase III
  - Focus is on surface water
  - Developing drought management recommendations
- Final River Basin Plan – June 2025


Lake Jocassee Hydro and Dam


Clemson Simpson Agronomic Research Station

Lower Savannah-Salkehatchie River Basin Planning

- 6 RBC meetings to date.
- Chair – Kari Foy (Low Country Regional Water System)
- Vice-Chair – Ken Caldwell (Alliant Insurance Services, Tree Farmer)
- Currently in Phase II – Evaluation of surface water availability
- Water availability assessment will include both surface water and groundwater
- Final River Basin Plan – October 2025.

Interbasin River Council has been formed between the Upper Savannah and Lower Savannah-Salkehatchie RBCs


Hilton Head PSD RO Plant

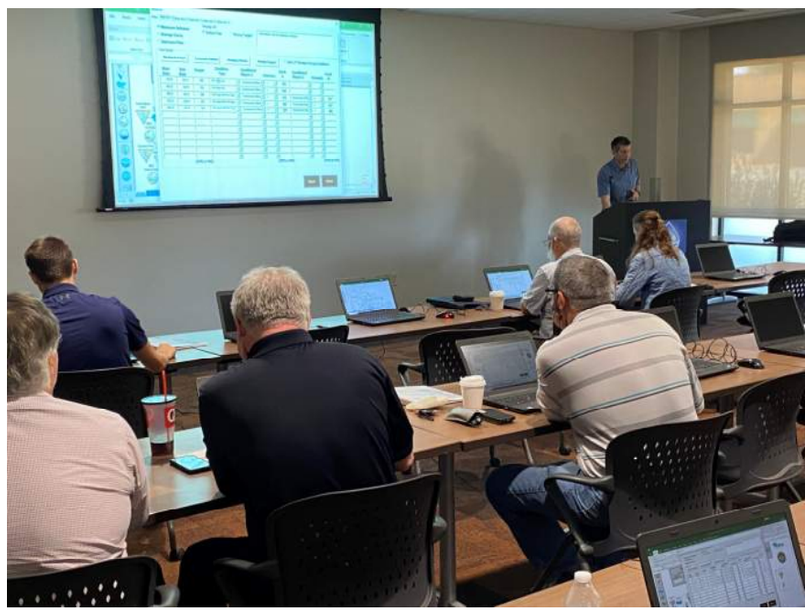

Hilton Head Reclaimed Water Wetland Discharge


Hilton Head ASR Well

Common Threads Emerging from the River Basin Planning Process

“Common Threads”

- **Surface Water Resources**:
  - Generally sufficient to meet current and projected future needs.
  - If fully permitted and registered amounts (surface water) were withdrawn, the basin would be notably more stressed with frequent shortages and more severe low flows.
- **Process recommendations**:
  - Emphasized educational outreach and communication with the public, other water users, and the State Legislature.
  - RBCs generally support continued funding for the river basin planning process by the State Legislature.

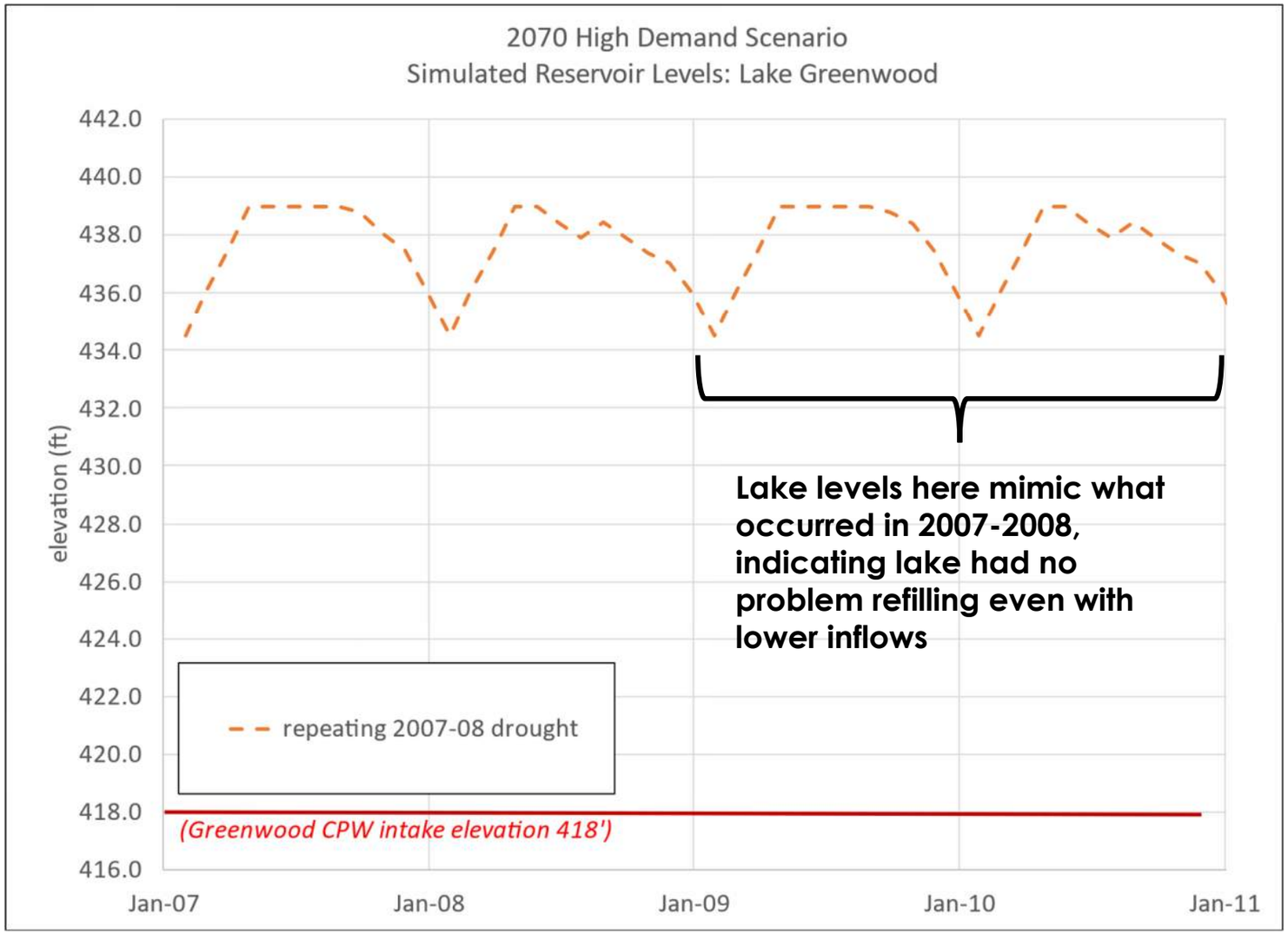


“Common Threads”

- **Technical**:
  - Emphasized need to enhance surface and groundwater monitoring.
  - Scope of planning should be expanded to:
    - Include water quality considerations.
    - Include impacts of land use change on water quantity and quality.
  - Future water availability analyses should consider potential changes in hydrology (water supply).
    - Climate Change scenarios.
    - Extending historic climate records (dendroclimatology, for example).

Extended Drought Analysis – Examples from the Saluda and Upper Savannah Basins

What is the impact to Saluda basin reservoirs if the drought of 2007-2008 were repeated?



Lake Greenwood levels repeating the hydrology of 2007-2008

(i.e., 2009-2010 hydrology was replaced with 2007-2008 hydrology)

2070 High Demand Scenario

Resequencing Historical Flows to Investigate Potential Future Droughts in the Upper Savannah Basin

Methods

Three (3) constructed scenarios:

1. Repeating 5-year drought constructed by splicing together the **five driest water years** in the hydrologic period of record with respect to mainstem total annual flow. These were **2001, 2008, 1981, 1988**, and **2017**.

2. **Repeating single year drought** corresponding to the **second driest water year (2008)** and identified as the critical single year drought with respect to Lake Thurmond water supply availability.

3. **Repeating synthetic drought year** constructed by splicing together the **twelve driest calendar month flows** in the hydrologic period of record.

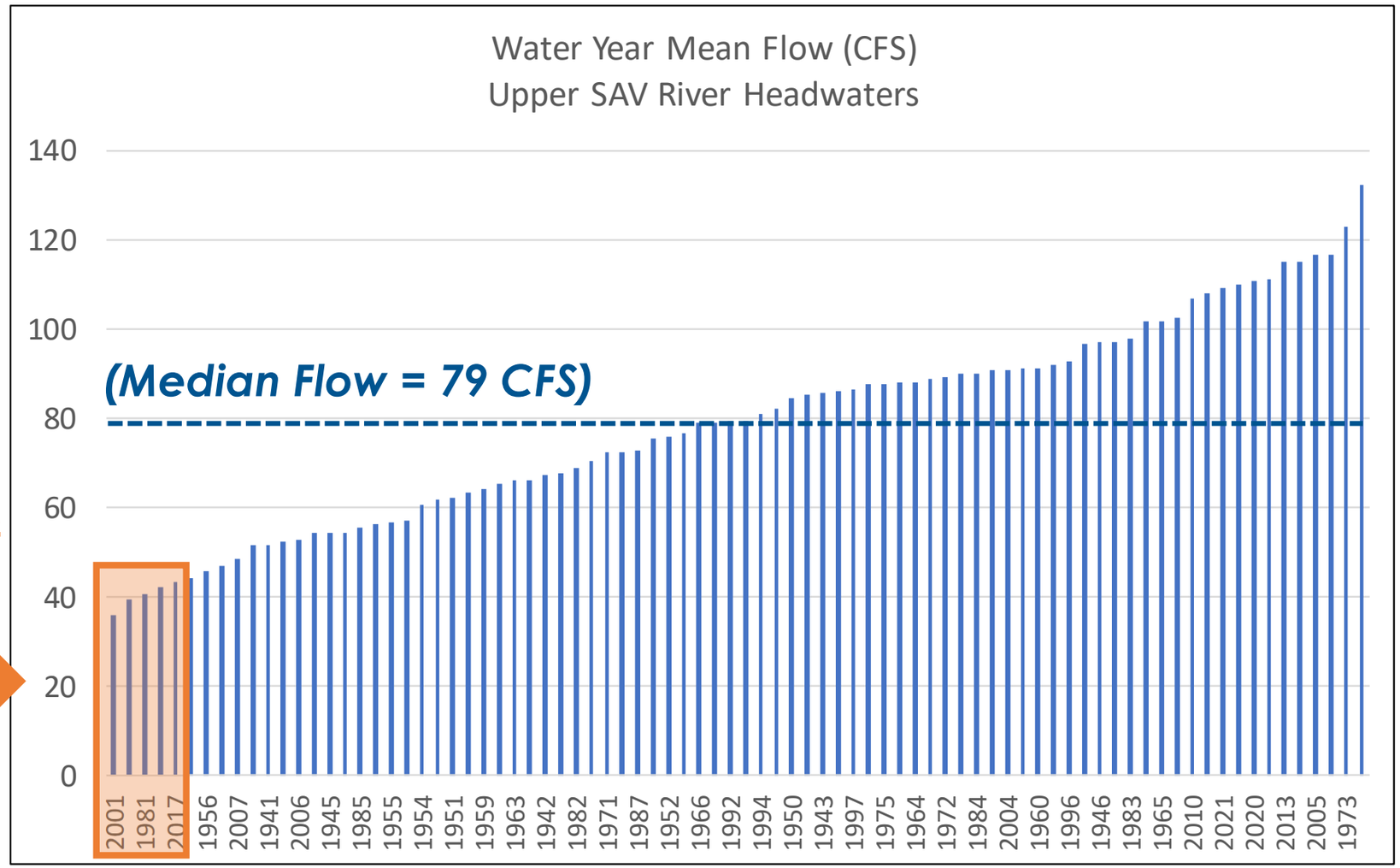
Resequencing Historical Flows to Investigate Potential Future Droughts

Methods

Ranked data based on mainstem headwater flows

5 Driest Years in terms of mainstem flow:

2001
2008
1981
1988
2017



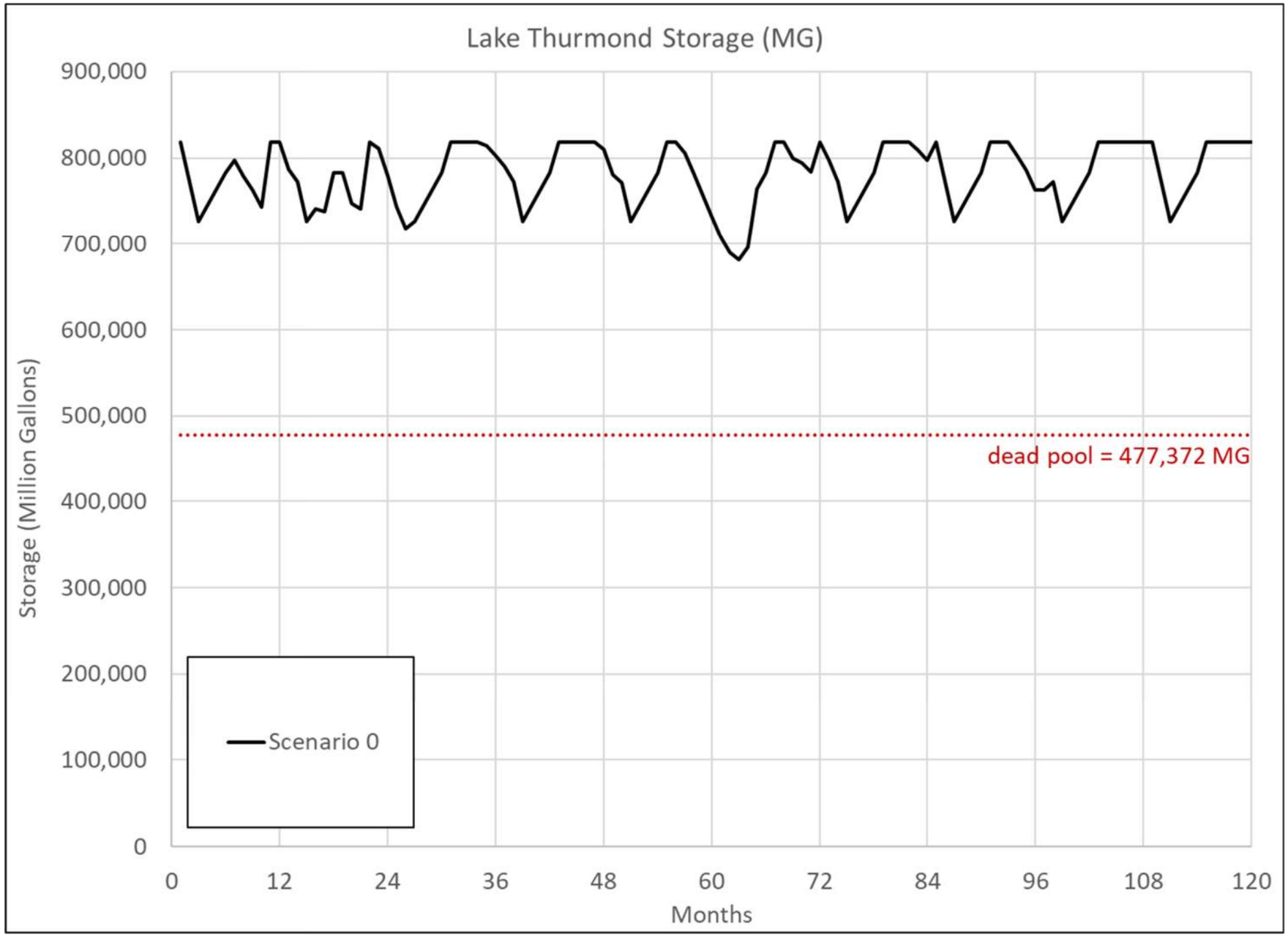
Resequencing Historical Flows to Investigate Potential Future Droughts

Methods

Scenario 3: 12 driest calendar months (Mainstem headwater flow)

Mean annual flow = 22.5 CFS

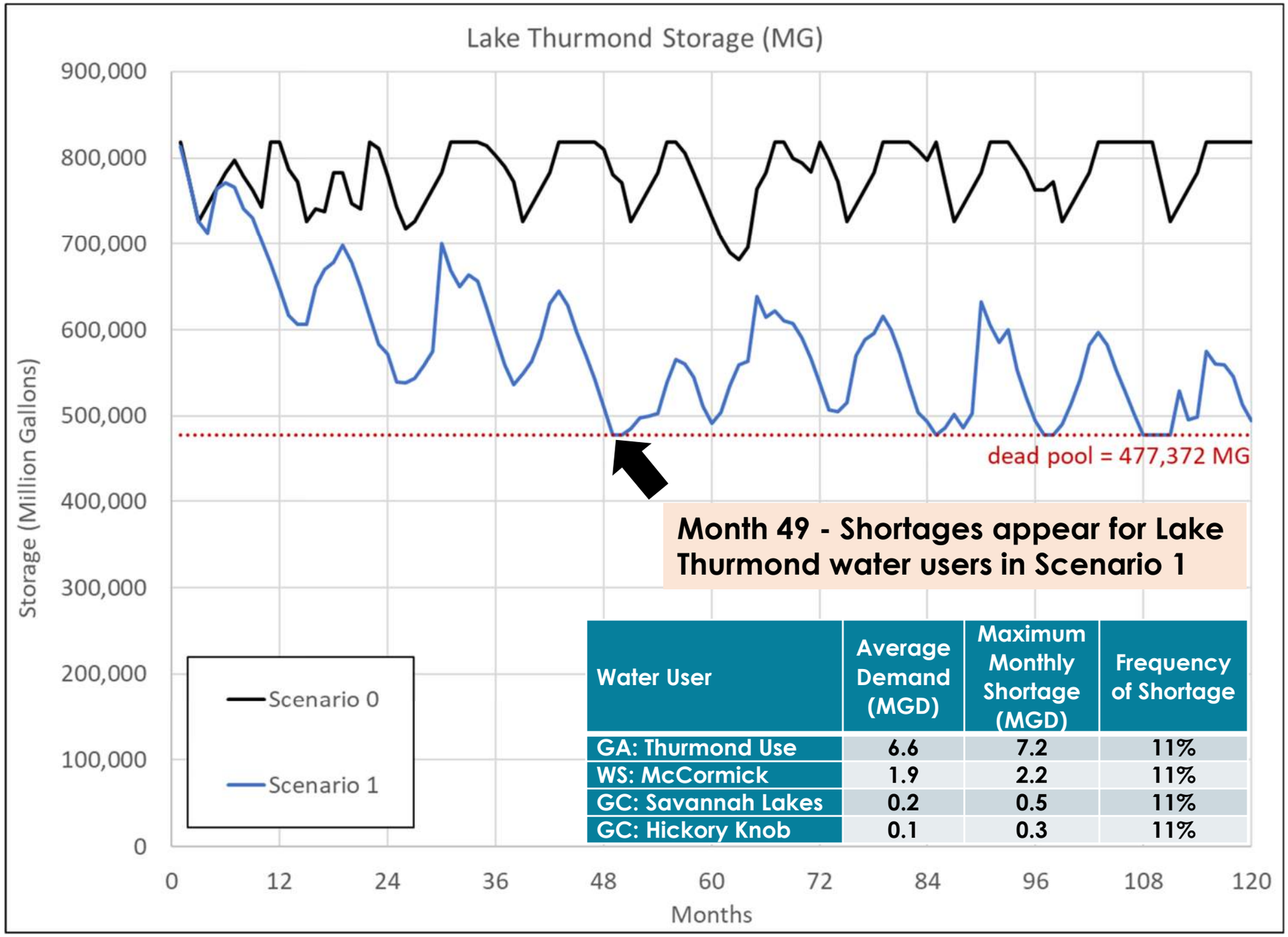
Jan	1956
Feb	2017
Mar	2017
Apr	1986
May	2001
Jun	2008
Jul	2008
Aug	2007
Sep	1954
Oct	1954
Nov	2016
Dec	1955



Resequencing Historical Flows to Investigate Potential Future Droughts

2070 High Demand Scenario is "Scenario 0"

Resequencing Historical Flows to Investigate Potential Future Droughts

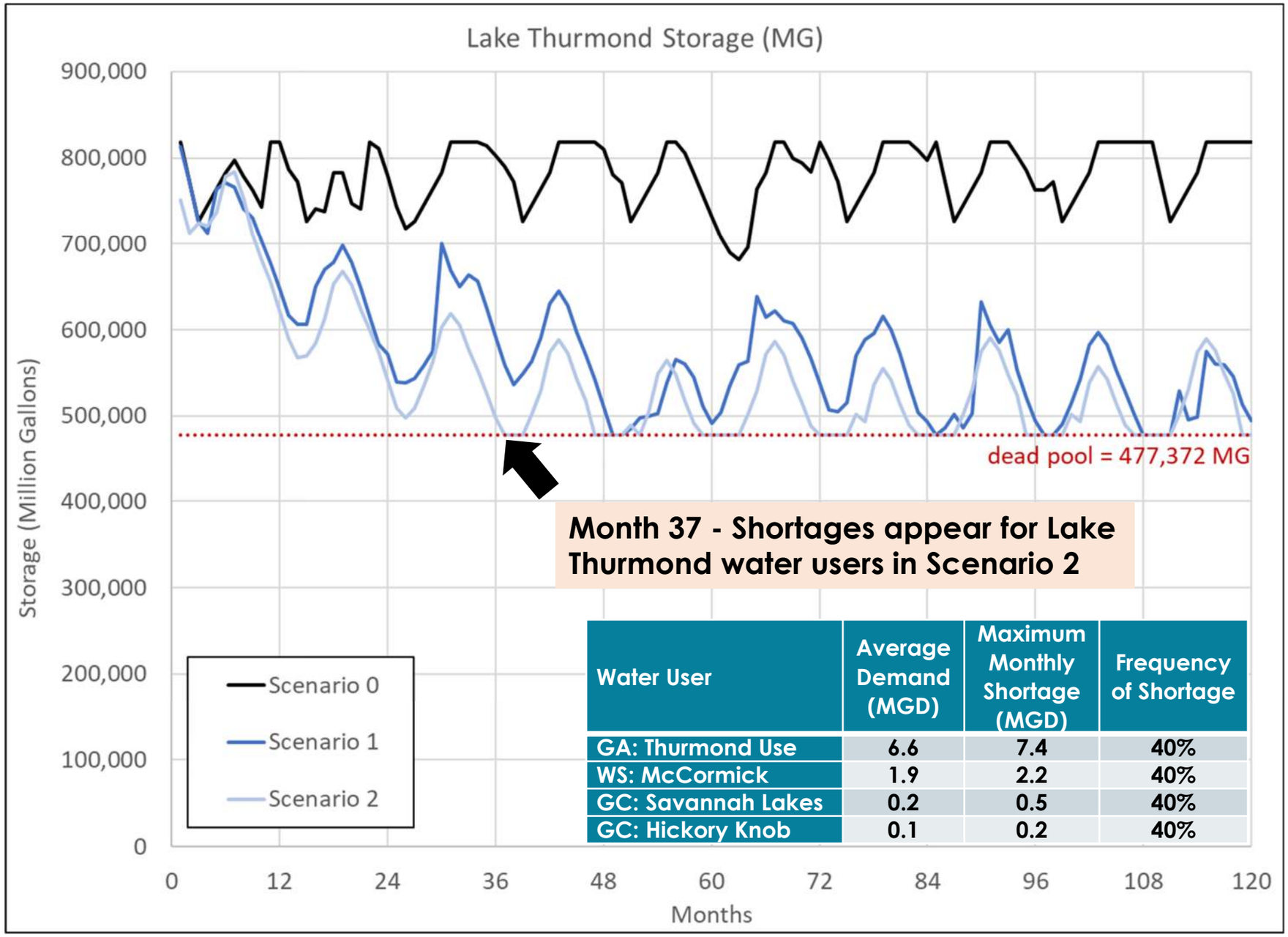


Month 49 - Shortages appear for Lake Thurmond water users in Scenario 1

Water User	Average Demand (MGD)	Maximum Monthly Shortage (MGD)	Frequency of Shortage
GA: Thurmond Use	6.6	7.2	11%
WS: McCormick	1.9	2.2	11%
GC: Savannah Lakes	0.2	0.5	11%
GC: Hickory Knob	0.1	0.3	11%

Scenario 1 Shortages

Resequencing Historical Flows to Investigate Potential Future Droughts

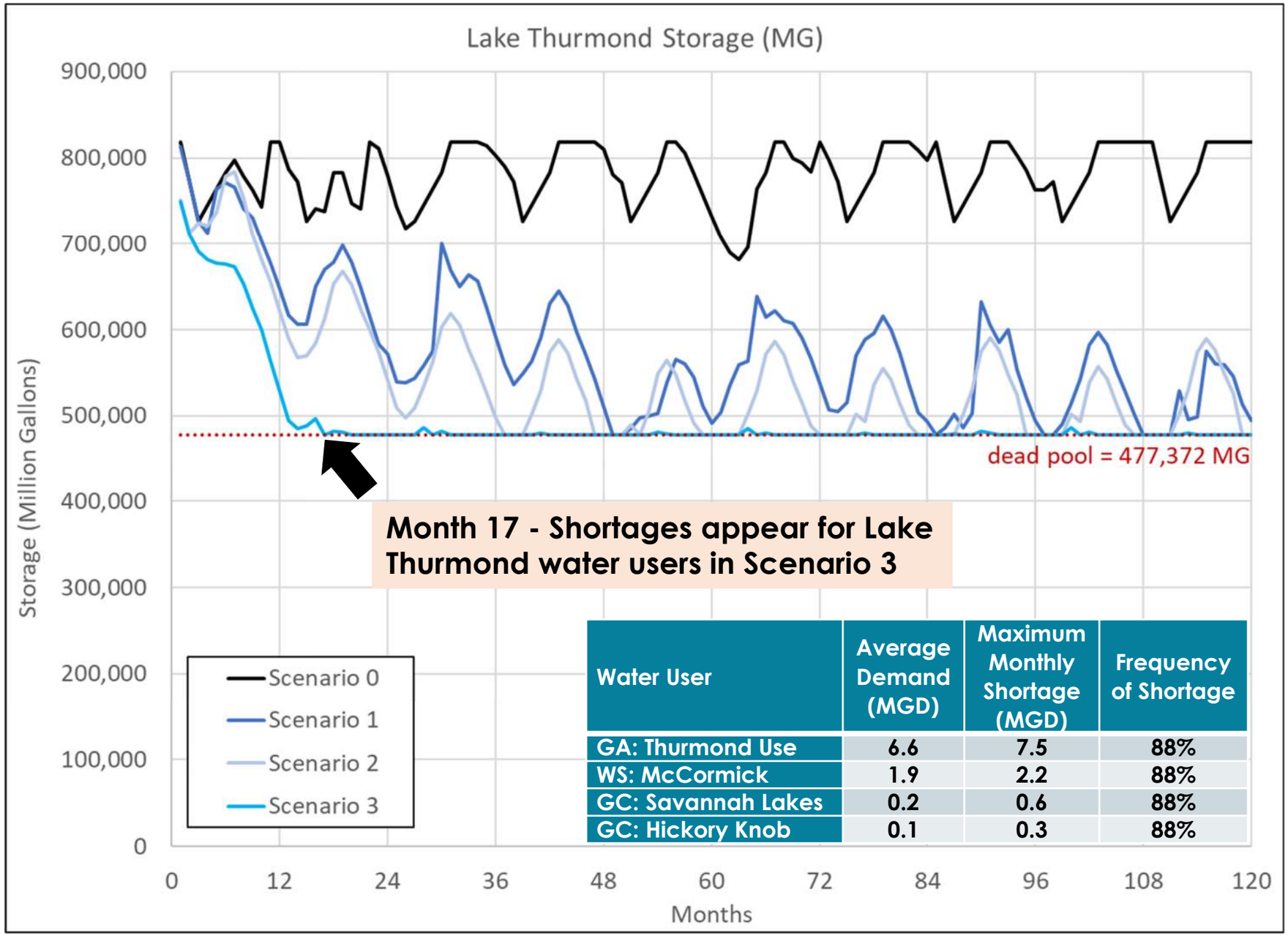


Month 37 - Shortages appear for Lake Thurmond water users in Scenario 2

Water User	Average Demand (MGD)	Maximum Monthly Shortage (MGD)	Frequency of Shortage
GA: Thurmond Use	6.6	7.4	40%
WS: McCormick	1.9	2.2	40%
GC: Savannah Lakes	0.2	0.5	40%
GC: Hickory Knob	0.1	0.2	40%

Scenario 2 Shortages

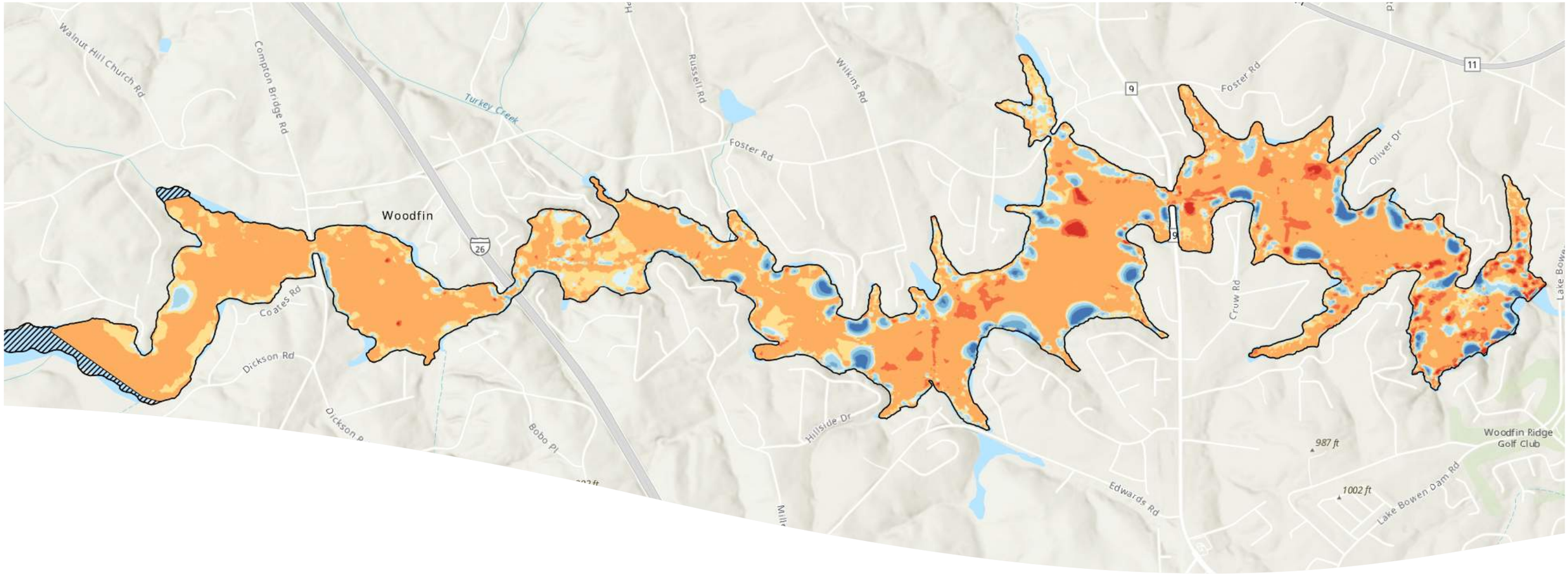
Resequencing Historical Flows to Investigate Potential Future Droughts



Month 17 - Shortages appear for Lake Thurmond water users in Scenario 3

Water User	Average Demand (MGD)	Maximum Monthly Shortage (MGD)	Frequency of Shortage
GA: Thurmond Use	6.6	7.5	88%
WS: McCormick	1.9	2.2	88%
GC: Savannah Lakes	0.2	0.6	88%
GC: Hickory Knob	0.1	0.3	88%

Scenario 3 Shortages



Spartanburg Water Sedimentation Study

Ken Tuck and John Boyer

Agenda Item 5

Broad River Basin Implementation Plan

Strategy	Strategy Priority	5-Year Actions
Objective 5. Improve technical understanding of water resource management issues		
A. Maintain and expand streamflow gages in the basin	1	1. Develop communication strategy for speaking with USGS and other entities funding stream gages (yr 1-2) 2. Outreach to USGS and current funding entities on the importance of streamflow data to the river basin planning process. RBC to support search for additional funding sources as needed (yr 3-5)
B. Research how changes in land-use impact water resources quality and quantity	2	1. Invite RTI to educate the RBC on Catawba Wateree Water Management Group (CWWMG) land conservation modeling. (yr 1-2) 2. Consider performing similar land conservation modeling to identify how land use changes may impact water resources (yrs 3-5).
C. Research financial impacts of increased sedimentation on reservoirs and water resources and communicate impacts to local governments	**2**	**1. Using estimates of sedimentation, and considering future land use (2070), estimate current and future loss of storage to Broad River basin reservoirs (yrs 1-2)** **2. Develop methodology to estimate financial impacts related to loss in storage (dredging, new supplies) (yrs 1-2)** **3. Communicate financial impacts of sedimentation on water supply relates to local governments (yrs 3-5)**

Problem Statement

Sedimentation in Lake Bowen, Municipal Reservoir #1 and Lake Blalock has the potential to reduce water supply storage capacity, increase the cost of water treatment, and impact lake recreation and aesthetics.

- As lake storage volumes decrease due to sedimentation, so will sediment trapping efficiency, resulting in an increase in suspended solids concentrations and higher treatment costs.
- Dredging of 289 acres in Lake Bowen and Municipal Reservoir #1 was estimated to cost more than $33M.
- Development and more frequent high-intensity storms may increase sediment loads coming into the reservoirs.

Project Objectives

1. **Analyze and estimate rates of sedimentation** to Spartanburg Water's reservoirs and potential loss of water supply storage.
2. **Estimate the financial impacts of sediment loading** to the reservoirs, including the cost to address reservoir sedimentation and the economic impacts of not addressing sedimentation.

Phase 1

3. **Develop and implement an outreach and education plan** to raise awareness of sources of sediment and the community-wide impact of sediment entering the reservoirs from erosion and transport in the watershed.
4. **Conduct a risk analysis** to determine how best to spend and prioritize limited funds to reduce sediment loading to the reservoirs and mitigate the impacts.

Phase 2

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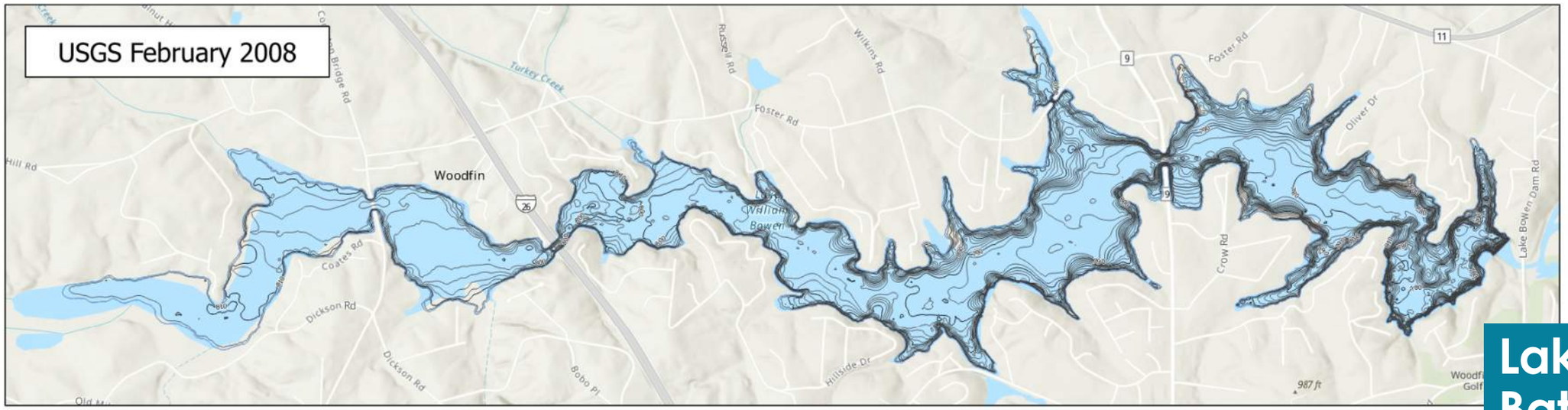
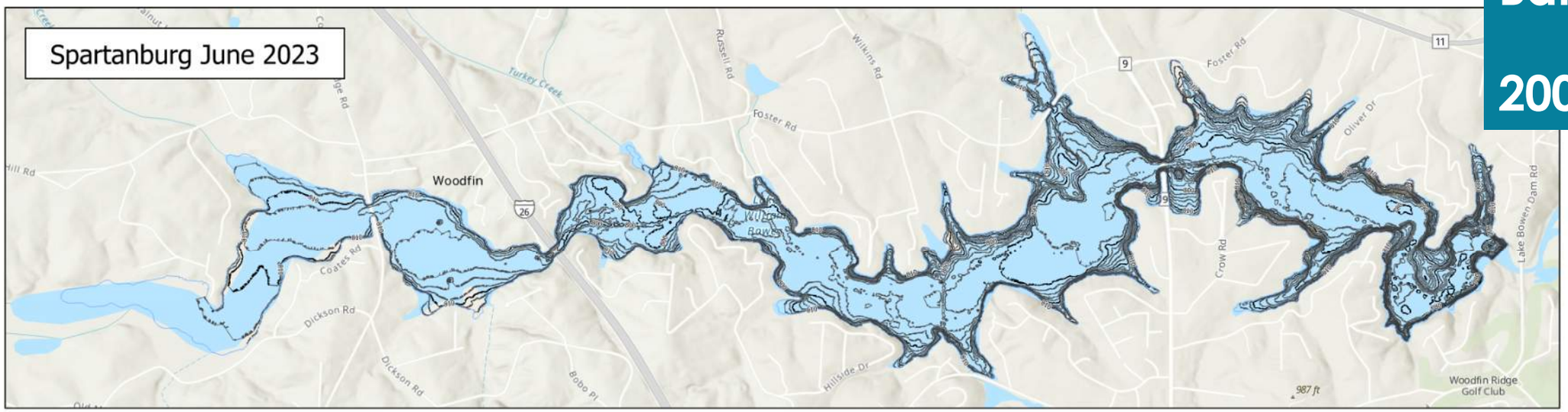
Lake Bowen Bathymetry

2008 and 2023





Legend

- Lake Boundary
- Intermediate Contour (2ft)
- Index Contour (10ft)

Datum NGVD 29

Bathymetry of
Lake William C. Bowen

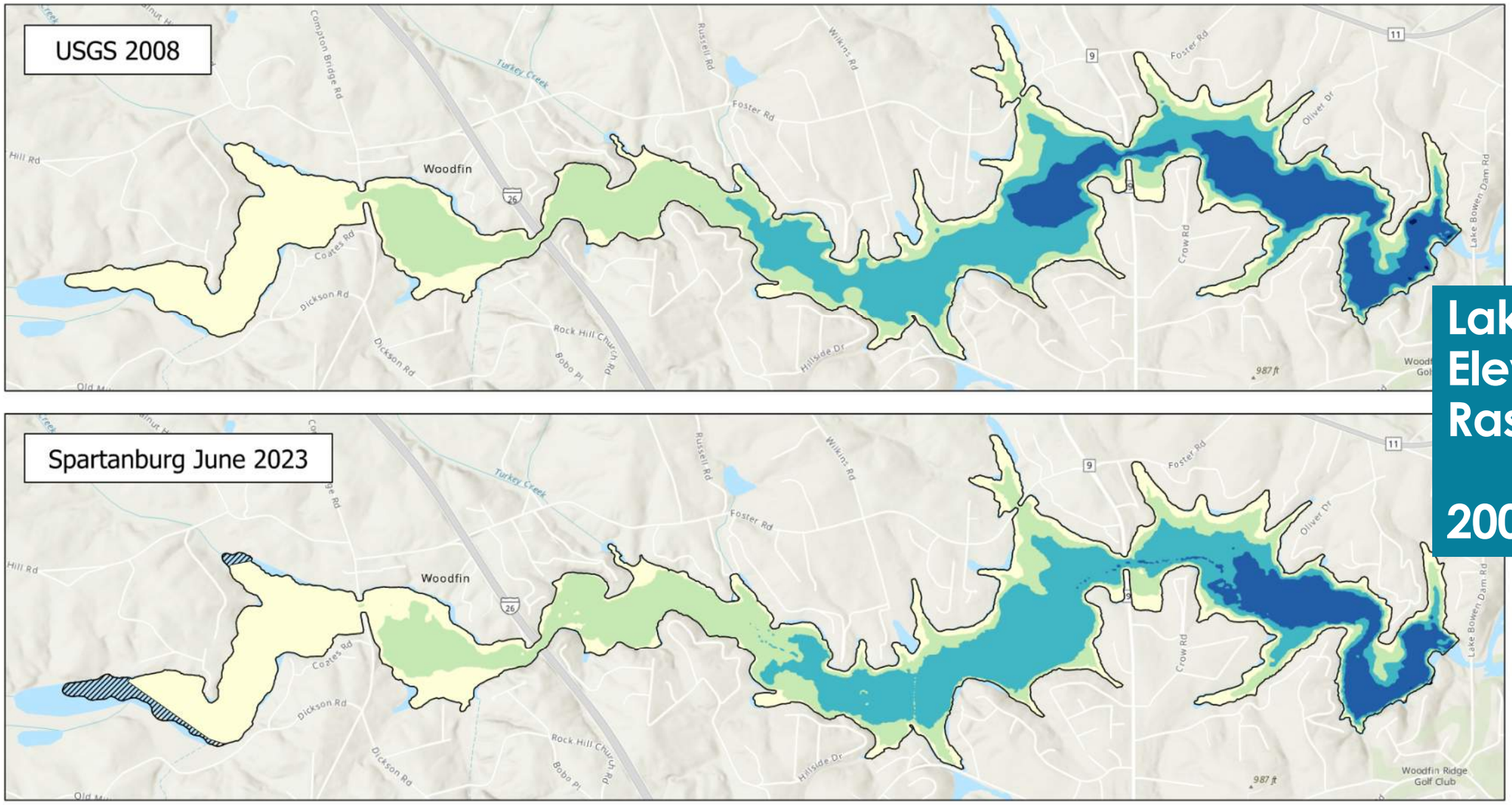
0 2,000 4,000 8,000 US Feet

N

DRAFT

Lake Bowen Elevation Rasters

2008 and 2023



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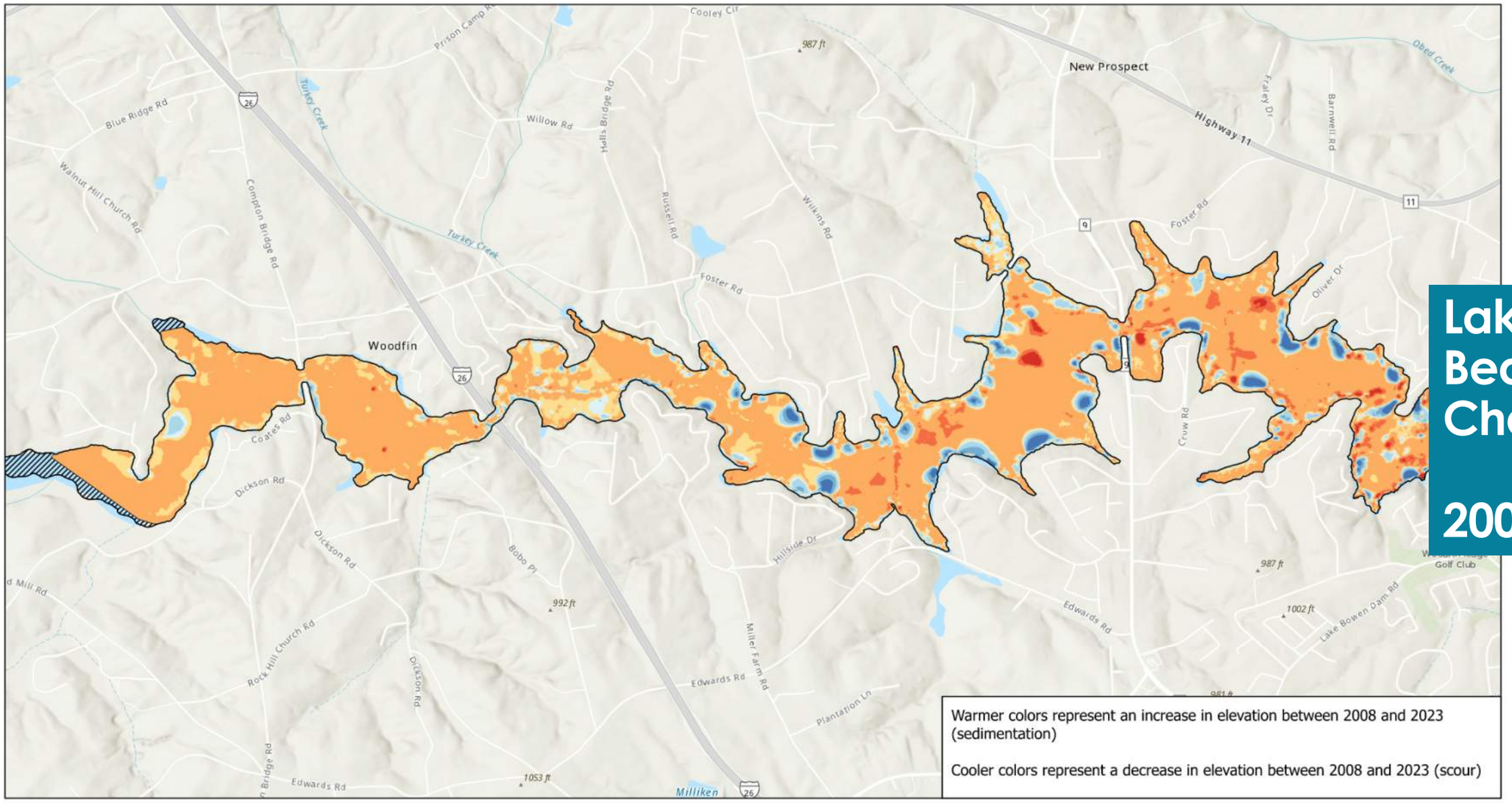
Lake Bowen Bed Elevation Change

2008 to 2023



Legend

Bed Elevation Change (ft MSL)
- Greater than 7
- 4 to 7
- 1 to 4
- 0 to 1
- 0 to -1
- -1 to -4
- -4 to -7
- Less than -7

Lake Boundary
No Contour Data

Datum NGVD 29

Lake William C. Bowen
2008 to 2023 Bed Elevation Change

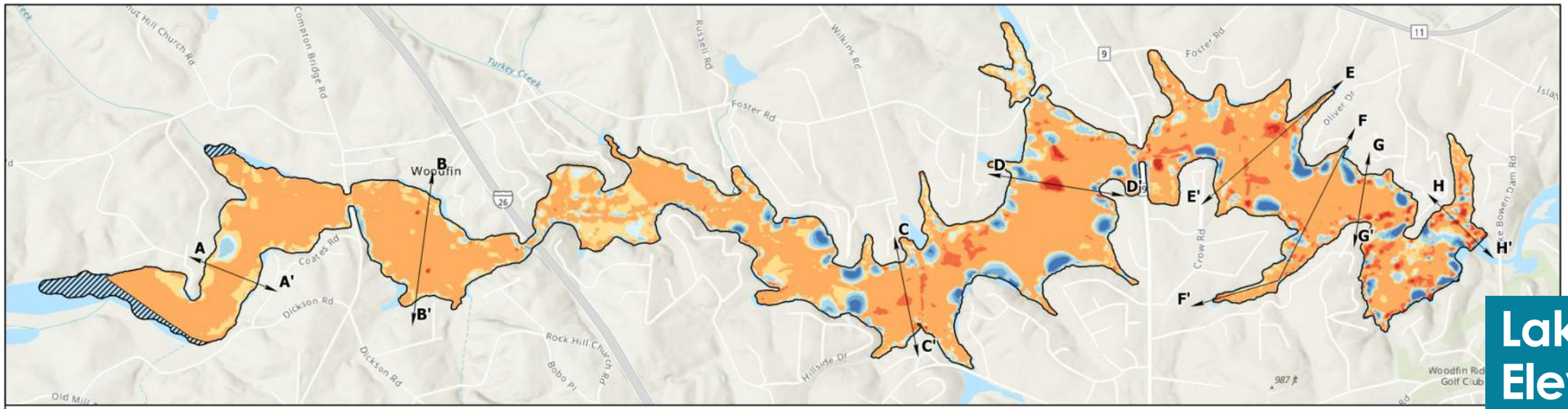
0 2,000 4,000 8,000 US Feet

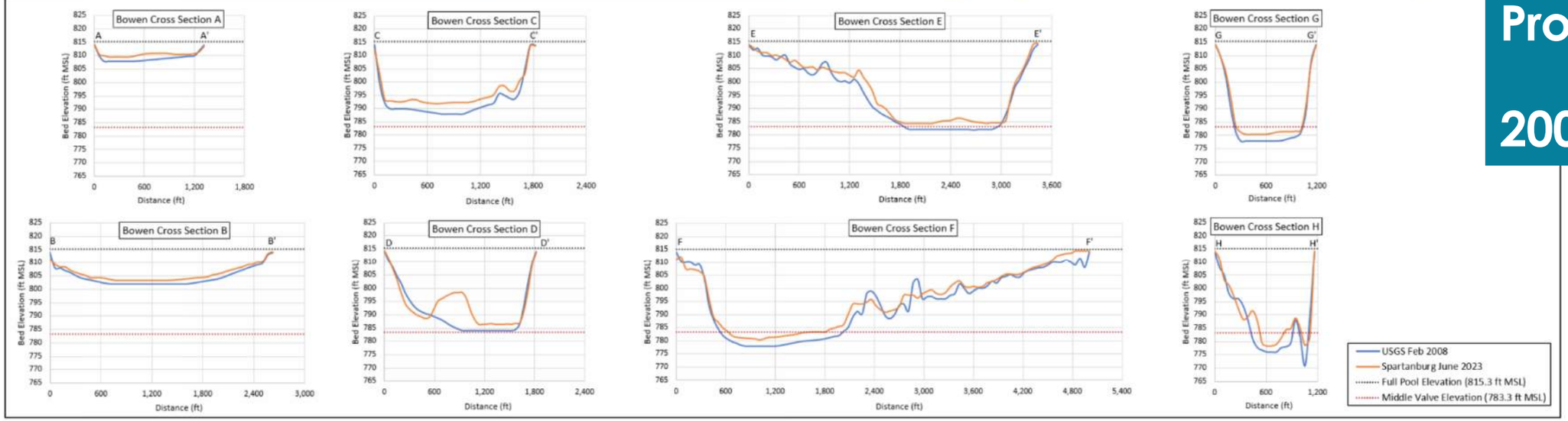
N

DRAFT

Lake Bowen Elevation Profiles

2008 and 2023





Legend

Bed Elevation Change (ft MSL)
- Greater than 7
- 4 to 7
- 1 to 4
- 0 to 1
- 0 to -1
- -1 to -4
- -4 to -7
- Less than -7

Lake Boundary
No Contour Data
Cross Section

Datum NGVD 29

Lake William C. Bowen
2008 and 2023
Elevation Profiles

0 2,000 4,000 8,000 US Feet

N

DRAFT

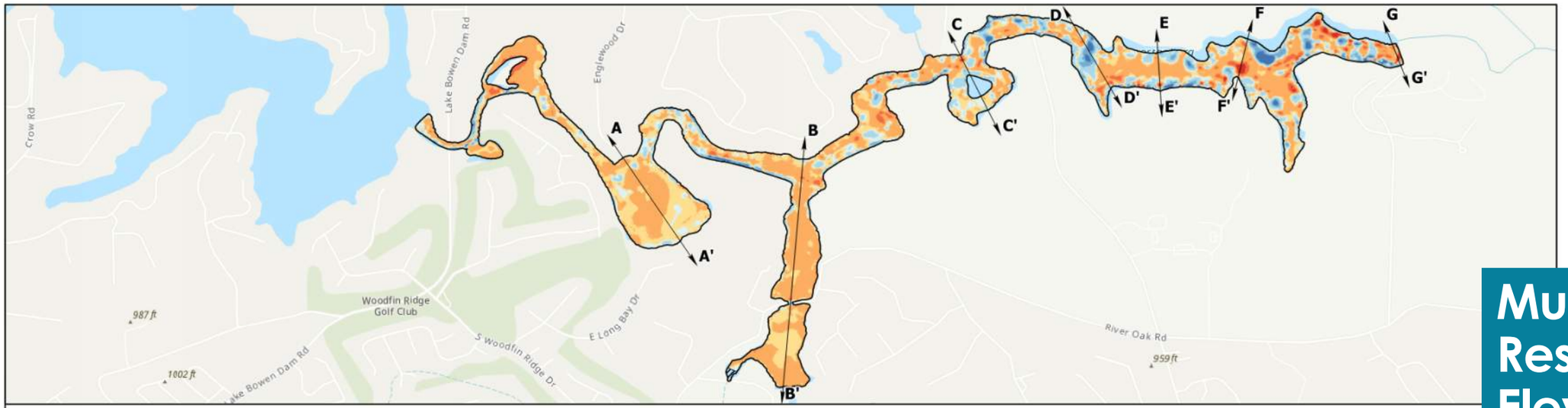
Lake Bowen Stage Storage Curves

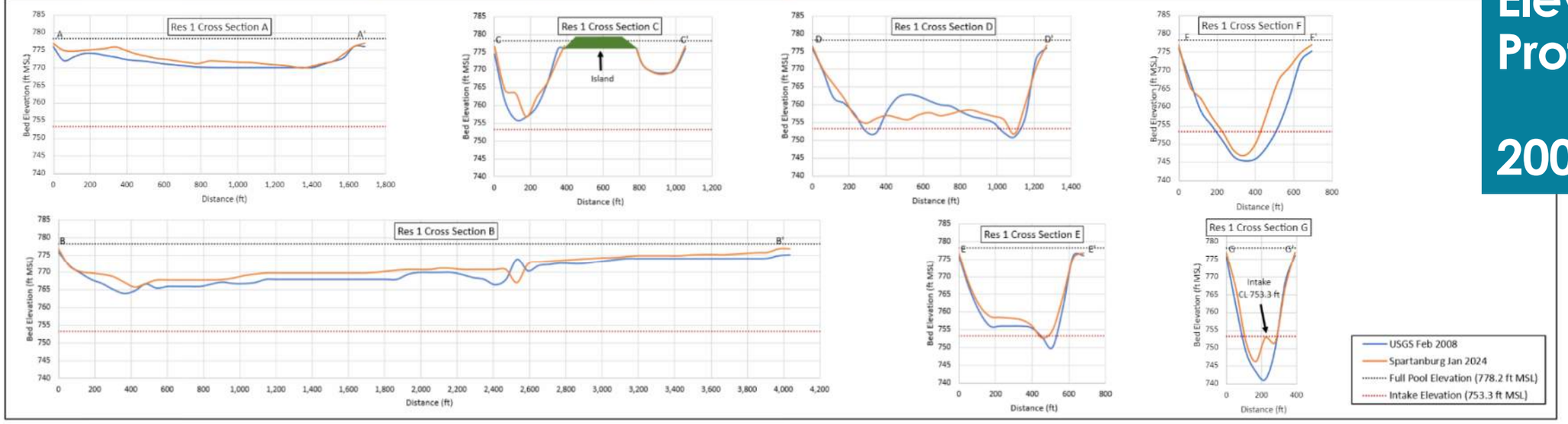
2008 and 2023

DRAFT

Municipal Reservoir #1 Elevation Profiles

2008 and 2024





Legend

Bed Elevation Change (ft MSL)
- Greater than 7
- 4 to 7
- 1 to 4
- 0 to 1
- 0 to -1
- -1 to -4
- -4 to -7
- Less than -7

- Lake Boundary
- No Contour Data
- Cross Section

Datum NGVD 29

Spartanburg Municipal Reservoir 1
2008 and 2024 Elevation Profiles

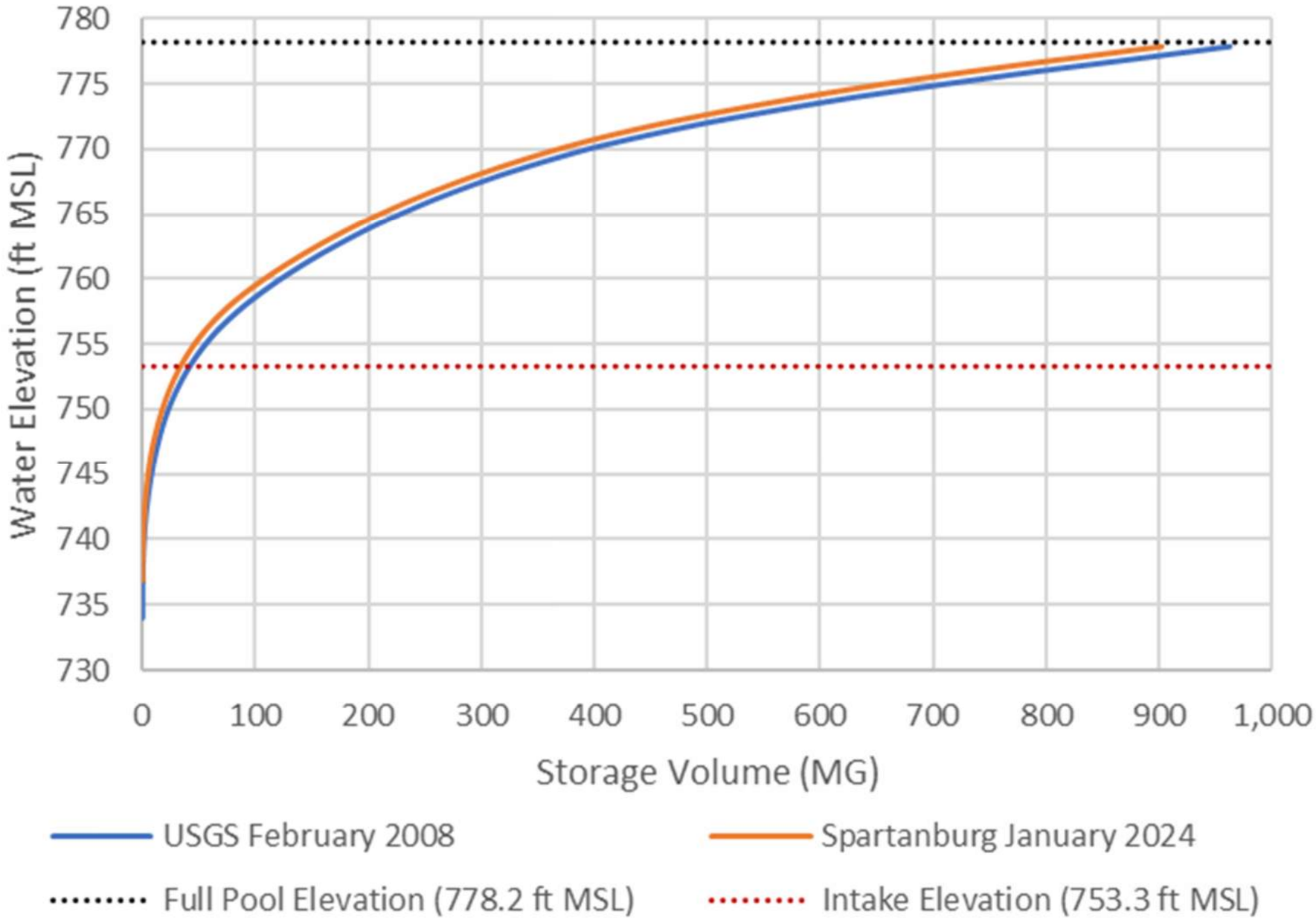
0 1,500 3,000 6,000 US Feet

N

DRAFT

Municipal Reservoir #1 Stage Storage Curves

2008 and 2024



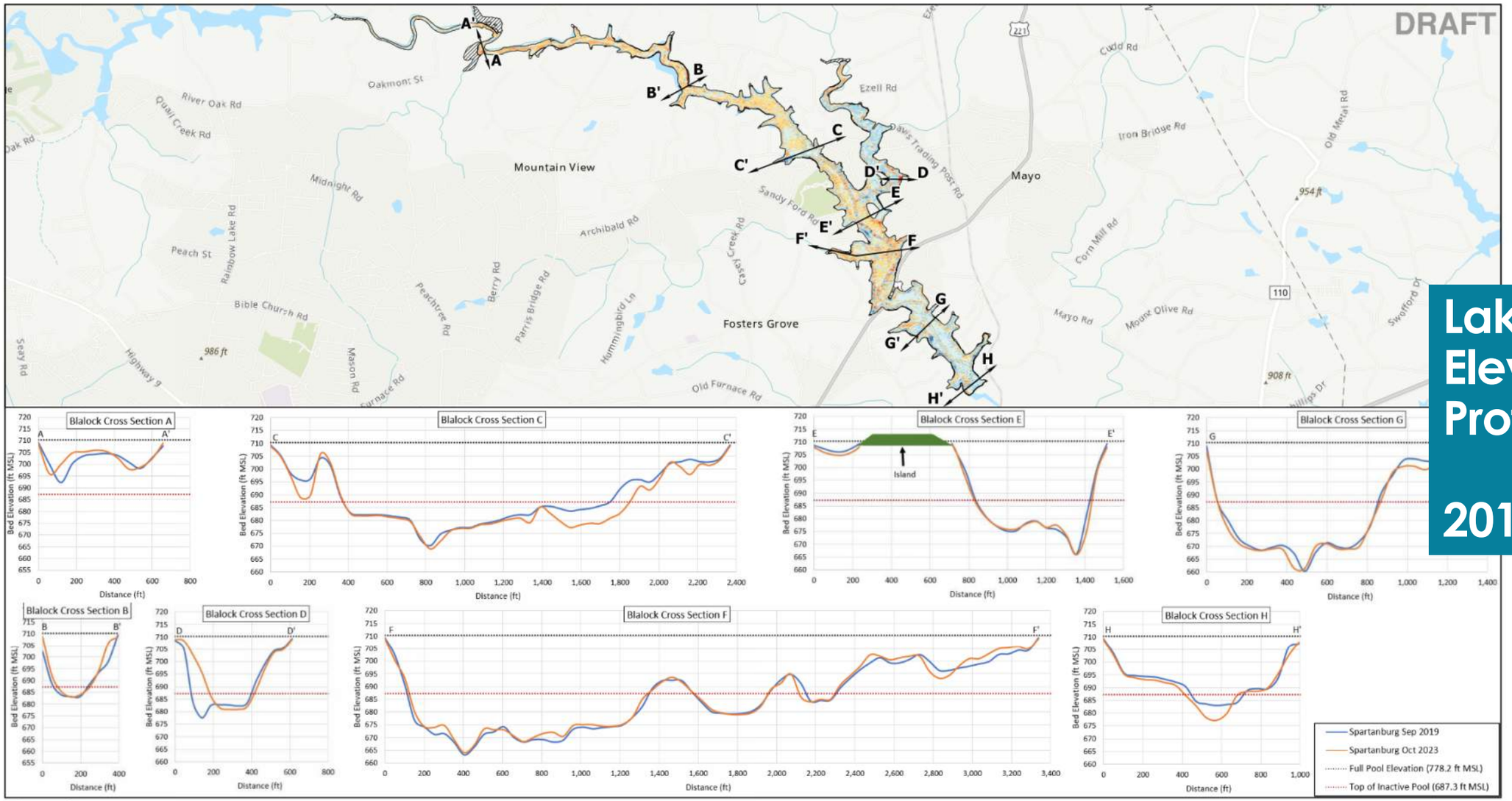
Estimated Storage Change and Sediment Loads Based on Bathymetric Survey Comparison

Lake	Volume Change						Net Sedimentation Rate* (tons/year)
	Sedimentation		Scour		Net Sedimentation		
	MG	% (1)	MG	% (1)	MG	% (1)	
Lake Bowen	770	10%	188	2%	**581**	**7%**	57,000 to 258,000
Municipal Reservoir #1	109	11%	49	5%	**60**	**6%**	6,000 to 26,000

** Net sedimentation rate based on bulk density range of 0.4 to 1.8 tons/cubic meter*

Lake Blalock Elevation Profiles

2019 and 2023



Legend

Bed Elevation Change (ft MSL)
- Greater than 7
- 4 to 7
- 1 to 4
- 0 to 1
- 0 to -1
- -1 to -4
- -4 to -7
- Less than -7

- Lake Boundary
- No Contour Data
- Cross Section

Datum NGVD 29

Lake Blalock
2019 to 2023
Elevation Profiles

0 5,000 10,000 20,000 US Feet

N

What are the Financial Impacts of Sedimentation?

- Loss of storage, resulting in cost to dredge to regain storage or develop new water supply
- Cost of treatment may increase due to increasing suspended solids and turbidity (chemical dosing, backwashing, solids handling, etc)
- Decrease on property values because of direct or indirect impacts of sedimentation
- Decrease in recreation/economic spending because of direct or indirect impacts of sedimentation