Technical Memorandum

To: *Upper Savannah River Basin Council (RBC)*

From: *CDM Smith*

Date: *April 8, 2024*

Subject: *Upper Savannah River Basin Surface Water Model Scenario Results (Preliminary)*

Overview

Attached are a set of tables and graphs summarizing *preliminary* model output and results for five scenarios: the **Current Use Scenario**, the **Unimpaired Flow (UIF) Scenario**, **Permitted and Registered (P&R) Scenario, Moderate Demand 2070,** and **High Demand 2070**. Preliminary results for the Current Use, UIF, and P&R Scenarios were originally presented in the January 9th Technical Memorandum. Results presented in this memo reflect very minor updates to the Scenario inputs.

All scenarios were simulated for an extended continuous hydrologic period (1939 – 2021) that includes critical drought periods in the 1950's and early 2000's, using a monthly time-step. The simulated scenarios use historic hydrology, a common method for understanding and evaluating water availability if hydrologic patterns over the available period of record do not change. The scenarios are described below:

Current Use Scenario. In this scenario, surface water withdrawals and returns (from all sources) generally reflect the 10-year historical average water use (2012-2021) for most surface water users. Withdrawals and returns for certain surface water users that have new withdrawals or new discharges are based on more recent, reported data, since their water use patterns have recently changed. All reservoir operations are modeled to represent current conditions, to the extent possible.

Unimpaired Flow (UIF) Scenario. This scenario represents "naturalized" flow, and removes the historical influence of surface water withdrawals, discharges, and reservoirs. It serves as a basis for comparison between managed flow and natural conditions throughout the basin.

Permitted and Registered (P&R) Use Scenario. For this scenario, surface water demands were set equal to the fully permitted or registered amount for each surface water user, including water users located in Georgia. In other words, it explores the question of, "what would the basin look like if everyone used their full legal allocation of water?" This is not intended to represent a realistic or even plausible scenario, but it serves to bracket the analysis with maximum allowable water use, while the UIF scenario brackets the other end with no water use.

Moderate Water Demand Projection Scenario. Demands are as projected by SCDNR, based on the assumption of normal climate conditions and moderate population and economic growth. For now, scenario results are presented for demands projected for year 2070. Projected 2070 demands for Georgia-side water users were determined using Georgia county- and sector-level demand forecasts, and the these demands were applied in both the moderate and high demand scenarios.

High Water Demand Projection Scenario. Demands are as set by SCDNR, based on the assumption of hot and dry climate conditions and high population and economic growth. For now, scenario results are presented for demands projected for year 2070.

The **2070 Moderate** and **High Demand Scenario** projections for Greenville Water in the Savannah and Saluda basins were developed based on discussion with Greenville Water and take into account the relatively lower combined safe yield of Table Rock and North Saluda Reservoirs in the Saluda basin, compared to Lake Keowee in the Savannah basin.

While the **P&R Scenario** does account for increased wastewater discharge for municipal and industrial surface water users with associated increases in usage, it does not account for:

1. The increase in wastewater discharges to surface water that might occur if all municipal and industrial groundwater users in the basin were withdrawing groundwater at their permitted or registered amount and returning the non-consumptively used portion (after treatment) to surface water. There are a total of eight industrial and municipal groundwater users (Pickens Roper, Pickens Middle, Pickens Eighteen, Owens Materials, WP Prop Clemson, Key Utility, Michelin, and US Army) that fall into this category in the Upper Savannah River basin.
2. The increase in wastewater discharges for municipal and industrial users that withdraw surface water from outside the Savannah River basin and discharge into the Savannah River basin, if they were withdrawing at their fully permitted amount. An example of this is the City of Greenwood, which withdraws surface water from the Saluda River basin but discharges its treated wastewater to Stevens Creek in the Savannah River basin. For the **P&R Scenario**, the discharge of water associated with the City of Greenwood is based on their current withdrawals, not their fully permitted withdrawals.

Results

For each scenario, there are several tables summarizing the output, as described below.

A. **Tables 1 through 4** list all water users, their withdrawal location, their average annual demand for the given scenario, and for the simulation period (1939-2021), the:
   - minimum physically available flow at the withdrawal locations (this includes total flow across all withdrawal locations, when a water user has multiple river sources);
   - the average surface water shortage at the withdrawal location (if any);
   - the maximum surface water shortage at the withdrawal location (if any); and
   - the frequency of the shortage (as a percentage of months in the simulated period).

The rows in the tables that are highlighted red identify water users with simulated water shortages. Table 1 summarizes the **Current Use Scenario**, Table 2 summarizes the **P&R Scenario,** Table 3 summarizes the **Moderate Demand Scenario, and** Table 4 summarizes the **High Demand Scenario**. No table was created for the **UIF Scenario** since there are no water users in that scenario.

B. **Table 5** provides a basin-wide summary of water supply shortages for the **Current Use**, **P&R, Moderate Demand, and High Demand Scenarios**. Statistics are based on all water users (Georgia and South Carolina) in the Upper Savannah basin and are alternatively calculated using only the South Carolina water users.

C. **Table 6** provides hydrologic performance measures (flow statistics) for each scenario at the nine initially selected Strategic Nodes shown in **Figure 1**.

D. **Table 7** shows the difference in hydrologic performance measures (flow statistics) for the **Current Use Scenario** compared to the **UIF Scenario** and for the **P&R Scenario** compared to the **UIF Scenario**. The **UIF Scenario** flow statistics are shown at the top, and the flow differences and percent differences are shown in the rows below, for each scenario. The minimum flow listed represents the minimum Physically Available Surface Water Supply[1] at each Strategic Node. Negative percent differences indicate lower flow in the **Current Use** or **P&R Scenario**, compared to the **UIF Scenario**. Positive percent differences indicate higher flow in the **Current Use** or **P&R Scenario**, compared to the **UIF Scenario**.

E. **Table 8** shows the difference in hydrologic performance measures (flow statistics) for the **P&R Scenario** compared to the **Current Use Scenario**. The **Current Use Scenario** flow statistics are shown at the top, and the flow differences and percent differences are shown in the rows below. Negative percent differences indicate lower flow in the **P&R Scenario**, compared to the **Current Use Scenario** and positive percent differences indicate higher lower flow.

F. **Table 9** shows the difference in hydrologic performance measures (flow statistics) for the **Moderate Demand Scenario** compared to the **Current Use Scenario** and for the **High Demand Scenario** compared to the **Current Use Scenario**. The **Current Use Scenario** flow statistics are shown at the top, and the flow differences and percent differences are shown in the rows below, for each scenario. The minimum flow listed represents the minimum Physically Available Surface Water Supply at each Strategic Node. Negative percent differences indicate lower flow in the **Moderate Demand** or **High Demand Scenario**, compared to the **Current Use Scenario**. Positive percent differences indicate higher flow in the **Moderate Demand** or **High Demand Scenario**, compared to the **Current Use Scenario**.

G. **Figure 2** shows reservoir storage plots for the waterbodies listed below for the **Current Use**, **P&R,** and **High Demand Scenarios**.

[1] The South Carolina State Water Planning Framework defines the Physically Available Surface Water Supply as *the maximum amount of water occurring 100 percent of the time at a location on a surface water body, with no defined conditions applied on the surface water body*.

- Lake Tugaloo on the Tugaloo River
- Lake Yonah on the Tugaloo River
- Bad Creek Reservoir
- Lake Jocassee on the Savannah River
- Lake Keowee on the Savannah River
- Lake Hartwell on the Savannah River
- Lake Secession on the Rocky River
- Lake Russell on the Savannah River
- Lake Thurmond on the Savannah River

Provided below are observations and notes, based on an initial review of the scenario results.

A. As shown in **Table 1**, there are no water users experiencing simulated "physical" shortages in the **Current Use Scenario**. Physical shortages occur when the demand exceeds the available supply.

B. As shown in **Table 2**, there are four water users experiencing simulated physical shortages in the **P&R Scenario**. Again, this scenario is not intended to represent a likely actual condition but serves more as a "what if" scenario to ascertain what currently allowable usage could mean in the basin. The water users are:

   a. City of Pickens WTP, at a frequency of 7 percent and a maximum shortage of 4.5 MGD. In the next 3 to 4 years, Pickens will no longer rely on Twelvemile Creek as its source of surface water supply, and will instead withdraw from Lake Keowee, as part of the Pickens Joint Regional Water System, which will include Pickens County Water Authority, City of Pickens, Easley-Central Water District, Six Mile Rural Community Water District, and the City of Liberty.

   b. Vulcan Construction Materials, at a frequency of 11 percent and a maximum shortage of 1.3 MGD.

   c. Hanson Aggregates (Anderson Facility), at a frequency of 3 percent and a maximum shortage of 0.6 MGD.

   d. WG Smith III (agricultural irrigator), at a frequency of 1 percent and a maximum shortage of 0.1 MGD. This water user's withdrawal location is from a 2.2-acre impoundment, which is not included in the model. This impoundment provides storage, and during times when Turkey Creek is simulated to have very low or no flow, the impoundment may provide enough water to prevent physical shortages.

B. As shown in **Table 3**, there are no water users experiencing simulated "physical" shortages in the **Moderate Demand Scenario**.

C. As shown in **Table 4**, there are 3 water users experiencing simulated physical shortages in the **High Demand Scenario**. The water users are:

a. City of Pickens WTP, at a frequency of 0.4 percent and a maximum shortage of 1.0 MGD. As previously noted, in 3 to 4 years, Pickens will begin withdrawing from Lake Keowee, as part of the Pickens Joint Regional Water System.

b. Vulcan Construction Materials, at a frequency of 12 percent and a maximum shortage of 2.5 MGD.

c. Hanson Aggregates (Anderson Facility), at a frequency of 1 percent and a maximum shortage of 0.3 MGD.

D. There are notable differences in performance measures when comparing the **UIF Scenario** to the **Current Use Scenario** (middle of **Table 7**).

a. At 7 of the 9 Strategic Nodes, mean flows in the **Current Use Scenario** are lower than the **UIF Scenario** by a range of 1 to 11 percent and average about 7 percent lower. At the Strategic Nodes on Eighteenmile Creek below Pendleton (SAV10) and on Stevens Creek near Modoc (SAV21), **Current Use Scenario** mean flows are approximately 1 percent higher than **UIF Scenario** mean flows because of upstream wastewater discharges.

b. There is generally a greater percent difference in the low flow statistics (minimum flow and 5^{th}, 10^{th}, and 25^{th} percentile flows) than the difference in mean flows between the **Current Use** and **UIF Scenarios**. At 2 of the 9 Strategic Nodes, the **Current Use Scenario** minimum flows range between 8 and 100 percent lower than **UIF Scenario** flows. The "0 cfs" minimum flows at the Keowee River Strategic Node and the Savannah River below Hartwell Lake (SAV12) Strategic Node may be a result of application of the complex reservoir operating rules at a monthly timestep, and need to be investigated further to determine their accuracy. At 6 of the Strategic Nodes, including 5 on the mainstem (Savannah River) the **Current Use Scenario** minimum flows are greater than the **UIF Scenario** flows, ranging from 6 to 191 percent. This is because of required minimum releases from the reservoirs, which result in higher minimum flows during drought, compared to UIF conditions. At the Strategic Node on Stevens Creek (SAV21), the **Current Use Scenario** minimum flow is 3 cubic feet per second (cfs), compared to a minimum flow of 0 cfs in the **UIF Scenario** because an upstream wastewater discharge (Greenwood Import).

E. Differences in the **UIF Scenario** flow compared to the **P&R Scenario** flow are generally even greater, as would be expected, given that these two scenarios highlight the two extremes (no water withdrawals and returns versus fully allocated withdrawals and returns).

F. There are also notable differences in performance measures when comparing the **Current Use Scenario** to the **P&R Scenario** (**Table 8**).

a. At 7 of the 9 Strategic Nodes, mean flows in the **P&R Scenario** are lower than the **Current Use Scenario** by a range of just above zero to 9 percent and average about 5 percent lower. At the Stevens Creek Strategic Node near Modoc (SAV21), **P&R Scenario**

mean flows are 1 percent higher than **Current Use Scenario** mean flows because of the upstream wastewater discharge from Greenwood.

G. There are notable differences in performance measures when comparing the **Current Use Scenario** to the **Moderate Demand** and **High Demand Scenarios** (**Table 9**).

   a. At 7 of the 9 Strategic Nodes, mean flows in the **High Demand Scenario** are lower than the **Current Use Scenario** by a range of just above zero to 4 percent and average about 2 percent lower. At the Keowee River Strategic Node, **High Demand Scenario** mean flows are higher than **Current Use Scenario** mean flows by a very small amount due to slight differences in reservoir operations. At the Stevens Creek Strategic Node near Modoc (SAV21), **High Demand Scenario** mean flows are 0.4 percent higher than **Current Use Scenario** mean flows because of the upstream wastewater discharge from Greenwood.

   b. There is generally a greater percent difference in the low flow statistics (minimum flow and 5^{th}, 10^{th}, and 25^{th} percentile flows) than the difference in mean flows between the **High Demand** and **Current Use Scenarios**. At 4 of the 9 Strategic Nodes, the **High Demand Scenario** minimum flows range between just above zero and 100 percent lower than **Current Use Scenario** flows. At 4 of the Strategic Nodes, including 3 on the mainstem (Savannah River) the **High Demand Scenario** minimum flows are greater than the **Current Use Scenario** flows, ranging from just over zero to 44 percent.

   c. Differences in the **Moderate Demand Scenario** flow compared to the **Current Use Scenario** flow are generally less than the **High Demand Scenario** compared to the **Current Use Scenario**, as would be expected.

H. As seen in **Figure 2**, impacts to reservoir storage under the **P&R Scenario** compared to the **Current Scenario** are minor. Lake Hartwell experiences reduced storage during drought periods in the 1950s, 1980s, and 2000s under the **P&R Scenario**, but stays above the dead pool storage level.

Please consider these results preliminary, as we have not yet completed a full review of output and results. We are providing these preliminary results so that the RBC can begin to become familiar with the output.

Table 1. Current Use Scenario Summary of Water Supply Shortages

Water User Name	Source Water	Location (mi)	Average Annual Demand (MGD)	Minimum Physically Available Flow (MGD)	Average Shortage (MGD)	Maximum Shortage (MGD)	Frequency of Shortage (%)
WS: Seneca	Mainstem/Lake Keowee	24.0	6.6	*NA*	0.0	0.0	0%
WS: Walhalla	Mainstem/Lake Keowee	24.0	2.05	*NA*	0.0	0.0	0%
PN: Oconee	Mainstem/Lake Keowee	24.0	25.87	*NA*	0.0	0.0	0%
WS: Greenville	Mainstem/Lake Keowee	24.0	22.9	*NA*	0.0	0.0	0%
GC: Reserve at Keowee	Mainstem/Lake Keowee	24.0	0.2	*NA*	0.0	0.0	0%
GC: Keowee Vineyards	Mainstem/Lake Keowee	24.0	0.1	*NA*	0.0	0.0	0%
GC: Keowee Springs	Mainstem/Lake Keowee	24.0	0.1	*NA*	0.0	0.0	0%
GC: Keowee Key	Mainstem/Lake Keowee	24.0	0.1	*NA*	0.0	0.0	0%
GC: Keowee Falls	Mainstem/Lake Keowee	24.0	0.1	*NA*	0.0	0.0	0%
GA: Tugaloo-Hartwell Use	Mainstem/Lake Hartwell Tugaloo River/Lake Yonah Tugaloo River	65.0 13.0 11.0	11.4	*NA* *NA* 84.0	0.0	0.0	0%
IN: Clemson Energy	Mainstem/Lake Hartwell	65.0	1.3	*NA*	0.0	0.0	0%
WS: Pioneer	Mainstem/Lake Hartwell	65.0	1.6	*NA*	0.0	0.0	0%
GC: Walker	Mainstem/Lake Hartwell	65.0	0.1	*NA*	0.0	0.0	0%
WS: ARJWS	Mainstem/Lake Hartwell	65.0	18.4	*NA*	0.0	0.0	0%
IN: ARJWS	Mainstem/Lake Hartwell	65.0	5.1	*NA*	0.0	0.0	0%
PT: SC Rainey Station	Mainstem	68.0	2.1	1,302.1	0.0	0.0	0%
WS: Mohawk	Mainstem/Lake Russell	94.0	0.0	*NA*	0.0	0.0	0%
GA: Russell Use	Mainstem/Lake Russell	94.0	1.5	*NA*	0.0	0.0	0%
WS: Abbeville	Mainstem/Lake Russell	94.0	2.0	*NA*	0.0	0.0	0%
GA: Thurmond Use	Mainstem/Lake Thurmond	131.5	5.8	*NA*	0.0	0.0	0%
WS: McCormick	Mainstem/Lake Thurmond	131.5	1.0	*NA*	0.0	0.0	0%
GC: Savannah Lakes	Mainstem/Lake Thurmond	131.5	0.1	*NA*	0.0	0.0	0%
GC: Hickory Knob	Mainstem/Lake Thurmond	131.5	0.1	*NA*	0.0	0.0	0%
IR: Holcombe Farm	Little River - Lake Keowee	1.5	0.0	2.4	0.0	0.0	0%
IR: Calyx	Little River - Lake Keowee	11.0	0.0	14.0	0.0	0.0	0%
IN: Vulcan	Golden Creek	2.1	0.1	0.7	0.0	0.0	0%
WS: Pickens	Twelvemile Creek	0.1	1.4	2.5	0.0	0.0	0%
WS: Easley Central WD	Twelvemile Creek	15.3	1.2	15.6	0.0	0.0	0%
IN: BASF	Twelvemile Creek	17.2	0.2	14.6	0.0	0.0	0%
IR: Head Lee Nursery	Coneross Creek	7.5	0.1	6.6	0.0	0.0	0%
IN: Milliken	Eighteenmile Creek	13.3	1.2	6.0	0.0	0.0	0%
WS: Westminster	Chauga River	18.7	1.7	23.7	0.0	0.0	0%
IN: Mt Vernon Mills	Three and Twenty Creek	12.1	0.0	7.5	0.0	0.0	0%
MI: Hanson Aggregates	Beaver Creek	3.1	0.3	0.3	0.0	0.0	0%
GA: Broad River Use	Broad River (GA)	0.5	3.1	62.4	0.0	0.0	0%
IR: WG Smith	Turkey Creek	5.4	0.0	0.0	0.0	0.0	0%
IR: Gurosik Farm	Stevens Creek	56.9	0.1	5.5	0.0	0.0	0%

IR = Agriculture (irrigator); GC = Golf Course (irrigator); MI = Mining Operation; WS = Public Water Supplier; PT = Power Thermal; PN = Power Nuclear; IN = Industry; GA = GA-Side Aggregated Water User

NA - Not applicable (reservoir withdrawal)

Table includes only the consumptive portion for PN: Oconee (1% of total demand).

Table 2. Permitted and Registered Scenario Summary of Water Supply Shortages

Water User Name	Source Water	Location (mi)	Average Annual Demand (MGD)	Minimum Physically Available Flow (MGD)	Average Shortage (MGD)	Maximum Shortage (MGD)	Frequency of Shortage (%)
WS: Seneca	Mainstem/Lake Keowee	24.0	30.2	*NA*	0.0	0.0	0%
WS: Walhalla	Mainstem/Lake Keowee	24.0	6.7	*NA*	0.0	0.0	0%
PN: Oconee	Mainstem/Lake Keowee	24.0	31.2	*NA*	0.0	0.0	0%
WS: Greenville	Mainstem/Lake Keowee	24.0	151.2	*NA*	0.0	0.0	0%
GC: Reserve at Keowee	Mainstem/Lake Keowee	24.0	2.0	*NA*	0.0	0.0	0%
GC: Keowee Vineyards	Mainstem/Lake Keowee	24.0	0.6	*NA*	0.0	0.0	0%
GC: Keowee Springs	Mainstem/Lake Keowee	24.0	0.6	*NA*	0.0	0.0	0%
GC: Keowee Key	Mainstem/Lake Keowee	24.0	1.5	*NA*	0.0	0.0	0%
GC: Keowee Falls	Mainstem/Lake Keowee	24.0	1.0	*NA*	0.0	0.0	0%
GA: Tugaloo-Hartwell Use	Mainstem/Lake Hartwell Tugaloo River/Lake Yonah Tugaloo River	65.0 13.0 11.0	37.0	*NA* *NA* 83.3	0.0	0.0	0%
IN: Clemson Energy	Mainstem/Lake Hartwell	65.0	18.5	*NA*	0.0	0.0	0%
WS: Pioneer	Mainstem/Lake Hartwell	65.0	7.7	*NA*	0.0	0.0	0%
GC: Walker	Mainstem/Lake Hartwell	65.0	1.6	*NA*	0.0	0.0	0%
WS: ARJWS	Mainstem/Lake Hartwell	65.0	61.2	*NA*	0.0	0.0	0%
IN: ARJWS	Mainstem/Lake Hartwell	65.0	26.5	*NA*	0.0	0.0	0%
PT: SC Rainey Station	Mainstem	68.0	16.7	67.8	0.0	0.0	0%
WS: Mohawk	Mainstem/Lake Russell	94.0	4.9		0.0	0.0	0%
GA: Russell Use	Mainstem/Lake Russell	94.0	5.4	*NA*	0.0	0.0	0%
WS: Abbeville	Mainstem/Lake Russell	94.0	10.4	*NA*	0.0	0.0	0%
GA: Thurmond Use	Mainstem/Lake Thurmond	131.5	15.9	*NA*	0.0	0.0	0%
WS: McCormick	Mainstem/Lake Thurmond	131.5	2.9	*NA*	0.0	0.0	0%
GC: Savannah Lakes	Mainstem/Lake Thurmond	131.5	3.5	*NA*	0.0	0.0	0%
GC: Hickory Knob	Mainstem/Lake Thurmond	131.5	0.8	*NA*	0.0	0.0	0%
IR: Holcombe Farm	Little River - Lake Keowee	1.5	0.1	2.4	0.0	0.0	0%
IR: Calyx	Little River - Lake Keowee	11.0	0.1	13.9	0.0	0.0	0%
IN: Vulcan	Golden Creek	2.1	2.1	0.7	0.1	1.3	11%
WS: Pickens	Twelvemile Creek	0.1	7.2	2.5	0.1	4.5	7%
WS: Easley Central WD	Twelvemile Creek	15.3	3.1	14.2	0.0	0.0	0%
IN: BASF	Twelvemile Creek	17.2	3.4	11.6	0.0	0.0	0%
IR: Head Lee Nursery	Coneross Creek	7.5	1.0	6.6	0.0	0.0	0%
IN: Milliken	Eighteenmile Creek	13.3	2.6	6.0	0.0	0.0	0%
WS: Westminster	Chauga River	18.7	4.1	23.7	0.0	0.0	0%
IN: Mt Vernon Mills	Three and Twenty Creek	12.1	0.7	7.5	0.0	0.0	0%
MI: Hanson Aggregates	Beaver Creek	3.1	1.0	0.3	0.0	0.6	3%
GA: Broad River Use	Broad River (GA)	0.5	6.7	62.4	0.0	0.0	0%
IR: WG Smith	Turkey Creek	5.4	0.1	0.0	0.0	0.1	1%
IR: Gurosik Farm	Stevens Creek	56.9	0.4	7.6	0.0	0.0	0%

IR = Agriculture (irrigator); GC = Golf Course (irrigator); MI = Mining Operation; WS = Public Water Supplier; PT = Power Thermal; PN = Power Nuclear; IN = Industry; GA = GA-Side Aggregated Water User

NA - Not applicable (reservoir withdrawal)

Table includes only the consumptive portion for PN: Oconee (1% of total demand).

Table 3. Moderate Demand 2070 Scenario Summary of Water Supply Shortages

Water User Name	Source Water	Location (mi)	Average Annual Demand (MGD)	Minimum Physically Available Flow (MGD)	Average Shortage (MGD)	Maximum Shortage (MGD)	Frequency of Shortage (%)
HUC103 Future IR	Mainstem/Lake Keowee	24.0	0.0	*NA*	0.0	0.0	0%
WS: Seneca	Mainstem/Lake Keowee	24.0	6.7	*NA*	0.0	0.0	0%
WS: Walhalla	Mainstem/Lake Keowee	24.0	1.83	*NA*	0.0	0.0	0%
PN: Oconee	Mainstem/Lake Keowee	24.0	26.03	*NA*	0.0	0.0	0%
WS: Greenville	Mainstem/Lake Keowee	24.0	71.6	*NA*	0.0	0.0	0%
GC: Reserve at Keowee	Mainstem/Lake Keowee	24.0	0.1	*NA*	0.0	0.0	0%
GC: Keowee Vineyards	Mainstem/Lake Keowee	24.0	0.1	*NA*	0.0	0.0	0%
GC: Keowee Springs	Mainstem/Lake Keowee	24.0	0.1	*NA*	0.0	0.0	0%
GC: Keowee Key	Mainstem/Lake Keowee	24.0	0.1	*NA*	0.0	0.0	0%
GC: Keowee Falls	Mainstem/Lake Keowee	24.0	0.1	*NA*	0.0	0.0	0%
GA: Tugaloo-Hartwell Use	Mainstem/Lake Hartwell Tugaloo River/Lake Yonah Tugaloo River	65.0 13.0 11.0	14.8	*NA* *NA* 93.1	0.0	0.0	0%
IN: Clemson Energy	Mainstem/Lake Hartwell	65.0	0.7	*NA*	0.0	0.0	0%
WS: Pioneer	Mainstem/Lake Hartwell	65.0	1.9	*NA*	0.0	0.0	0%
GC: Walker	Mainstem/Lake Hartwell	65.0	0.1	*NA*	0.0	0.0	0%
WS: ARJWS	Mainstem/Lake Hartwell	65.0	27.0	*NA*	0.0	0.0	0%
IN: ARJWS	Mainstem/Lake Hartwell	65.0	7.4	*NA*	0.0	0.0	0%
PT: SC Rainey Station	Mainstem	68.0	2.1	84.6	0.0	0.0	0%
WS: Mohawk	Mainstem/Lake Russell	94.0	0.0	*NA*	0.0	0.0	0%
GA: Russell Use	Mainstem/Lake Russell	94.0	1.5	*NA*	0.0	0.0	0%
WS: Abbeville	Mainstem/Lake Russell	94.0	2.8	*NA*	0.0	0.0	0%
GA: Thurmond Use	Mainstem/Lake Thurmond	131.5	6.7	*NA*	0.0	0.0	0%
WS: McCormick	Mainstem/Lake Thurmond	131.5	0.6	*NA*	0.0	0.0	0%
GC: Savannah Lakes	Mainstem/Lake Thurmond	131.5	0.1	*NA*	0.0	0.0	0%
GC: Hickory Knob	Mainstem/Lake Thurmond	131.5	0.1	*NA*	0.0	0.0	0%
IR: Holcombe Farm	Little River - Lake Keowee	1.5	0.0	2.4	0.0	0.0	0%
IR: Calyx	Little River - Lake Keowee	11.0	0.0	14.0	0.0	0.0	0%
IN: Vulcan	Golden Creek	2.1	0.1	0.7	0.0	0.0	0%
WS: Pickens	Twelvemile Creek	0.1	2.1	2.5	0.0	0.0	0%
WS: Easley Central WD	Twelvemile Creek	15.3	1.5	14.7	0.0	0.0	0%
IN: BASF	Twelvemile Creek	17.2	0.5	13.4	0.0	0.0	0%
IR: Head Lee Nursery	Coneross Creek	7.5	0.1	6.6	0.0	0.0	0%
HUC105 Future IR	Coneross Creek	29.7	0.0	15.9	0.0	0.0	0%
IN: Milliken	Eighteenmile Creek	13.3	2.2	6.0	0.0	0.0	0%
WS: Westminster	Chauga River	18.7	1.5	23.7	0.0	0.0	0%
IN: Mt Vernon Mills	Three and Twenty Creek	12.1	0.0	7.5	0.0	0.0	0%
MI: Hanson Aggregates	Beaver Creek	3.1	0.2	0.3	0.0	0.0	0%
GA: Broad River Use	Broad River (GA)	0.5	6.9	62.4	0.0	0.0	0%
IR: WG Smith	Turkey Creek	5.4	0.0	0.0	0.0	0.0	0%
IR: Gurosik Farm	Stevens Creek	56.9	0.1	5.2	0.0	0.0	0%
HUC703 Future IR	Stevens Creek	65.6	0.0	5.0	0.0	0.0	0%

IR = Agriculture (irrigator); GC = Golf Course (irrigator); MI = Mining Operation; WS = Public Water Supplier; PT = Power Thermal; PN = Power Nuclear; IN = Industry; GA = GA-Side Aggregated Water User

NA - Not applicable (reservoir withdrawal)

Table includes only the consumptive portion for PN: Oconee (1% of total demand).

Table 4. High Demand 2070 Scenario Summary of Water Supply Shortages

Water User Name	Source Water	Location (mi)	Average Annual Demand (MGD)	Minimum Physically Available Flow (MGD)	Average Shortage (MGD)	Maximum Shortage (MGD)	Frequency of Shortage (%)
HUC103 Future IR	Mainstem/Lake Keowee	24.0	0.0	*NA*	0.0	0.0	0%
WS: Seneca	Mainstem/Lake Keowee	24.0	9.5	*NA*	0.0	0.0	0%
WS: Walhalla	Mainstem/Lake Keowee	24.0	2.6	*NA*	0.0	0.0	0%
PN: Oconee	Mainstem/Lake Keowee	24.0	28.5	*NA*	0.0	0.0	0%
WS: Greenville	Mainstem/Lake Keowee	24.0	104.3	*NA*	0.0	0.0	0%
GC: Reserve at Keowee	Mainstem/Lake Keowee	24.0	0.2	*NA*	0.0	0.0	0%
GC: Keowee Vineyards	Mainstem/Lake Keowee	24.0	0.1	*NA*	0.0	0.0	0%
GC: Keowee Springs	Mainstem/Lake Keowee	24.0	0.2	*NA*	0.0	0.0	0%
GC: Keowee Key	Mainstem/Lake Keowee	24.0	0.1	*NA*	0.0	0.0	0%
GC: Keowee Falls	Mainstem/Lake Keowee	24.0	0.3	*NA*	0.0	0.0	0%
GA: Tugaloo-Hartwell Use	Mainstem/Lake Hartwell Tugaloo River/Lake Yonah Tugaloo River	65.0 13.0 11.0	14.8	*NA* *NA* 93.1	0.0	0.0	0%
IN: Clemson Energy	Mainstem/Lake Hartwell	65.0	4.2	*NA*	0.0	0.0	0%
WS: Pioneer	Mainstem/Lake Hartwell	65.0	2.7	*NA*	0.0	0.0	0%
GC: Walker	Mainstem/Lake Hartwell	65.0	0.2	*NA*	0.0	0.0	0%
WS: ARJWS	Mainstem/Lake Hartwell	65.0	36.2	*NA*	0.0	0.0	0%
IN: ARJWS	Mainstem/Lake Hartwell	65.0	9.9	*NA*	0.0	0.0	0%
PT: SC Rainey Station	Mainstem	68.0	2.5	87.5	0.0	0.0	0%
WS: Mohawk	Mainstem/Lake Russell	94.0	0.0	*NA*	0.0	0.0	0%
GA: Russell Use	Mainstem/Lake Russell	94.0	1.5	*NA*	0.0	0.0	0%
WS: Abbeville	Mainstem/Lake Russell	94.0	3.8	*NA*	0.0	0.0	0%
GA: Thurmond Use	Mainstem/Lake Thurmond	131.5	6.7	*NA*	0.0	0.0	0%
WS: McCormick	Mainstem/Lake Thurmond	131.5	1.9	*NA*	0.0	0.0	0%
GC: Savannah Lakes	Mainstem/Lake Thurmond	131.5	0.2	*NA*	0.0	0.0	0%
GC: Hickory Knob	Mainstem/Lake Thurmond	131.5	0.1	*NA*	0.0	0.0	0%
IR: Holcombe Farm	Little River - Lake Keowee	1.5	0.0	2.4	0.0	0.0	0%
IR: Calyx	Little River - Lake Keowee	11.0	0.1	14.0	0.0	0.0	0%
IN: Vulcan	Golden Creek	2.1	1.4	0.7	0.1	2.5	12%
WS: Pickens	Twelvemile Creek	0.1	2.8	2.5	0.002	1.0	0.4%
WS: Easley Central WD	Twelvemile Creek	15.3	2.0	14.2	0.0	0.0	0%
IN: BASF	Twelvemile Creek	17.2	0.8	12.4	0.0	0.0	0%
IR: Head Lee Nursery	Coneross Creek	7.5	0.1	6.6	0.0	0.0	0%
HUC105 Future IR	Coneross Creek	29.7	0.1	17.2	0.0	0.0	0%
IN: Milliken	Eighteenmile Creek	13.3	4.0	6.0	0.0	0.0	0%
WS: Westminster	Chauga River	18.7	2.1	23.7	0.0	0.0	0%
IN: Mt Vernon Mills	Three and Twenty Creek	12.1	0.0	7.5	0.0	0.0	0%
MI: Hanson Aggregates	Beaver Creek	3.1	0.5	0.3	0.002	0.3	1%
GA: Broad River Use	Broad River (GA)	0.5	6.9	62.4	0.0	0.0	0%
IR: WG Smith	Turkey Creek	5.4	0.0	0.0	0.0	0.0	0%
IR: Gurosik Farm	Stevens Creek	56.9	0.1	6.3	0.0	0.0	0%
HUC703 Future IR	Stevens Creek	65.6	0.1	6.1	0.0	0.0	0%

IR = Agriculture (irrigator); GC = Golf Course (irrigator); MI = Mining Operation; WS = Public Water Supplier; PT = Power Thermal; PN = Power Nuclear; IN = Industry; GA = GA-Side Aggregated Water User

NA - Not applicable (reservoir withdrawal)

Table includes only the consumptive portion for PN: Oconee (1% of total demand).

Table 5. Summary of Water Supply Shortages

Supply Shortage Metric	Current Use	Permitted & Registered	Moderate Demand 2070	High Demand 2070
GA-Side and SC-Side Water Users				
Total basin annual mean shortage (MGD)	0.0	0.18	0.00004	0.12
Maximum water user shortage (MGD)	0.0	4.5	0.04	2.5
Total basin annual mean shortage as a percentage of total water demand	0.0%	0.04%	0.00002%	0.05%
Percentage of surface water users experiencing a shortage	0.0%	10.8%	2.5%	7.5%
Average frequency of shortage (%)	0.0%	0.6%	0.003%	0.4%
SC Water Users Only (Not Including GA-Side Water Users)				
Total basin annual mean shortage (MGD)	0.0	0.18	0.00004	0.12
Maximum water user shortage (MGD)	0.0	4.5	0.04	2.5
Total basin annual mean shortage as a percentage of total water demand	0.0%	0.05%	0.00002%	0.05%
Percentage of surface water users experiencing a shortage	0.0%	12.1%	2.8%	8.3%
Average frequency of shortage (%)	0.0%	0.7%	0.003%	0.4%

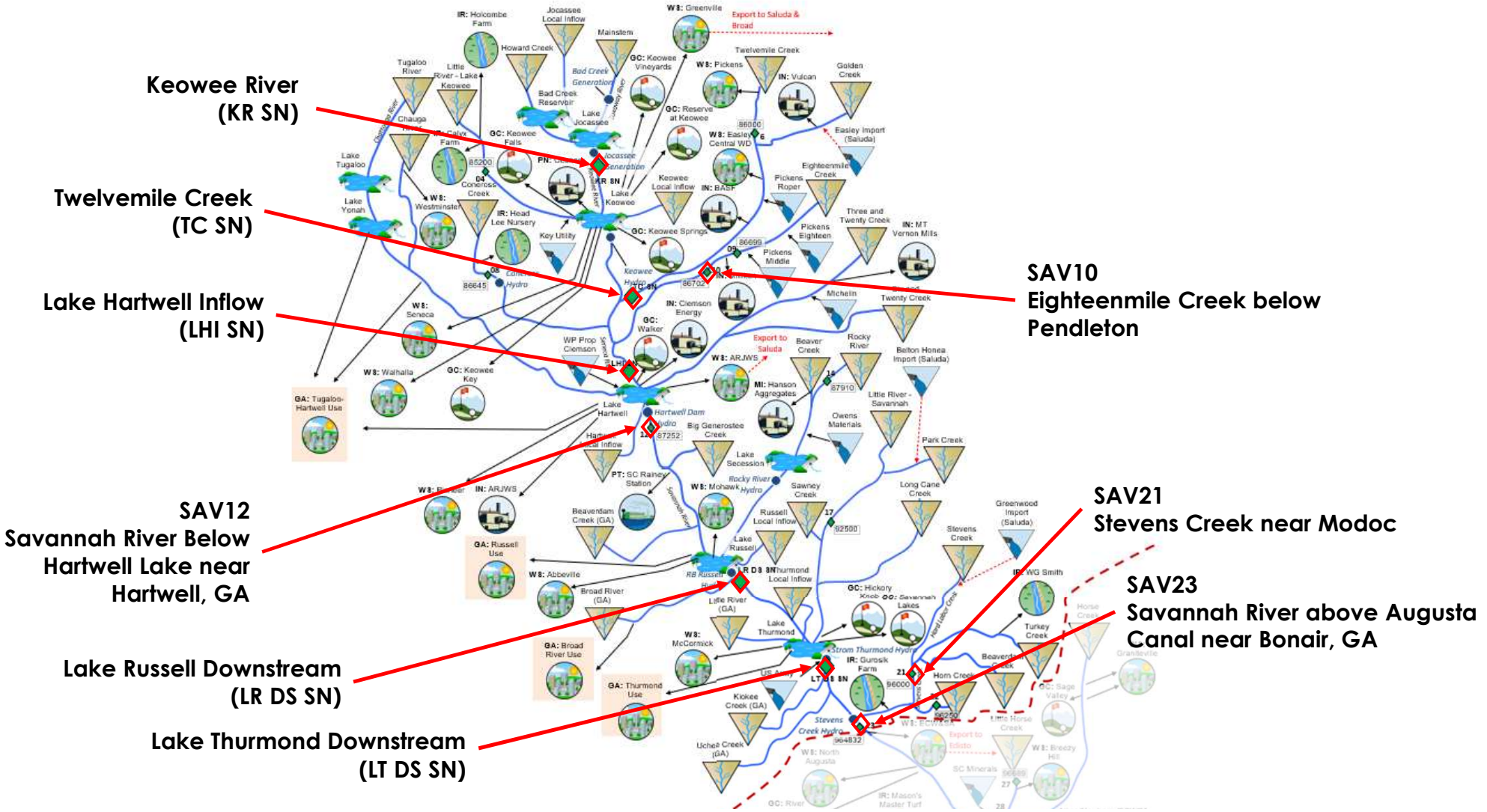

Figure 1. Strategic Nodes

Table 6. Hydrologic Performance Measures at Strategic Nodes

Performance Measure	Keowee River Strategic Node	Lake Hartwell Inflow Strategic Node	SAV12 Savannah River below Hartwell Lake near Hartwell, GA	Lake Russell Downstream Strategic Node	Lake Thurmond Downstream Strategic Node	SAV23 Savannah River above Augusta Canal near Bonair, GA	Twelvemile Creek Strategic Node	SAV10 Eighteenmile Creek Below Pendleton	SAV21 Stevens Creek near Modoc
	All values in CFS								
Unimpaired Flow (UIF) Scenario									
minimum flow	91	700	700	912	1,080	1,133	31	9	0
mean flow	572	4,482	4,482	7,270	8,901	9,671	266	72	386
median flow	503	3,949	3,949	6,130	7,429	7,951	229	61	169
25th percentile flow	339	2,645	2,645	4,008	4,777	5,078	150	40	50
10th percentile flow	237	1,794	1,794	2,702	3,262	3,476	102	26	18
5th percentile flow	191	1,470	1,470	2,146	2,621	2,857	78	20	10
Current Use Scenario									
minimum flow	0	744	2,000	2,050	3,101	3,300	28	9	3
mean flow	538	4,279	3,989	6,685	8,045	8,844	264	73	389
median flow	528	3,873	3,494	5,582	6,233	6,836	227	62	173
25th percentile flow	190	2,412	2,000	3,519	4,502	4,771	147	40	53
10th percentile flow	0	1,663	2,000	2,775	4,201	4,454	100	27	21
5th percentile flow	0	1,401	2,000	2,494	3,801	4,125	76	21	12
Permitted and Registered (P&R) Scenario									
minimum flow	0	742	0	1,261	3,101	3,339	23	9	6
mean flow	538	4,046	3,613	6,322	7,662	8,500	252	73	393
median flow	514	3,626	2,937	5,117	5,561	6,158	215	62	177
25th percentile flow	184	2,227	2,000	3,336	4,502	4,779	136	40	56
10th percentile flow	0	1,549	2,000	2,726	4,002	4,383	87	27	24
5th percentile flow	0	1,255	2,000	2,484	3,801	4,012	65	21	16
Moderate Demand 2070 Scenario									
minimum flow	0	759	0	2,054	3,102	3,301	27	9	2
mean flow	538	4,223	3,898	6,597	7,957	8,757	263	73	389
median flow	519	3,828	3,389	5,505	6,079	6,594	226	62	172
25th percentile flow	195	2,357	2,000	3,460	4,502	4,764	146	40	53
10th percentile flow	0	1,642	2,000	2,749	4,076	4,449	98	27	20
5th percentile flow	0	1,363	2,000	2,498	3,801	4,098	74	21	12
High Demand 2070 Scenario									
minimum flow	0	760	0	2,060	3,101	3,302	25	9	4
mean flow	538	4,170	3,821	6,527	7,885	8,686	260	73	391
median flow	514	3,744	3,231	5,357	6,009	6,469	223	62	174
25th percentile flow	195	2,331	2,000	3,419	4,502	4,760	144	40	55
10th percentile flow	0	1,598	2,000	2,736	4,002	4,427	96	27	22
5th percentile flow	0	1,300	2,000	2,493	3,801	4,092	72	21	14

Table 7. Difference in Performance Measures at Strategic Nodes from UIF Scenario

Performance Measure	Keowee River Strategic Node	Lake Hartwell Inflow Strategic Node	SAV12 Savannah River below Hartwell Lake near Hartwell, GA	Lake Russell Downstream Strategic Node	Lake Thurmond Downstream Strategic Node	SAV23 Savannah River above Augusta Canal near Bonair, GA	Twelvemile Creek Strategic Node	SAV10 Eighteenmile Creek Below Pendleton	SAV21 Stevens Creek near Modoc
Unimpaired Flow (UIF) Scenario									
minimum flow	**91**	**700**	**700**	**912**	**1,080**	**1,133**	**31**	**9**	**0**
mean flow	**572**	**4,482**	**4,482**	**7,270**	**8,901**	**9,671**	**266**	**72**	**386**
median flow	**503**	**3,949**	**3,949**	**6,130**	**7,429**	**7,951**	**229**	**61**	**169**
25th percentile flow	**339**	**2,645**	**2,645**	**4,008**	**4,777**	**5,078**	**150**	**40**	**50**
10th percentile flow	**237**	**1,794**	**1,794**	**2,702**	**3,262**	**3,476**	**102**	**26**	**18**
5th percentile flow	**191**	**1,470**	**1,470**	**2,146**	**2,621**	**2,857**	**78**	**20**	**10**
Current Use Scenario flow minus UIF Scenario flow (cfs)									
minimum flow	-91	44	1,300	1,137	2,021	2,166	-3	1	3
mean flow	-34	-204	-493	-586	-856	-827	-2	1	3
median flow	25	-76	-455	-548	-1,196	-1,115	-2	1	3
25th percentile flow	-149	-233	-645	-489	-275	-307	-2	1	3
10th percentile flow	-237	-131	206	73	939	978	-2	1	3
5th percentile flow	-191	-69	530	348	1,180	1,268	-2	1	3
Percent Difference between Current Use Scenario flow and UIF Scenario flow									
minimum flow	-100.0%	6.3%	185.8%	124.7%	187.1%	191.1%	-8.4%	7.3%	*NA*
mean flow	-5.9%	-4.5%	-11.0%	-8.1%	-9.6%	-8.5%	-0.7%	1.1%	0.8%
median flow	4.9%	-1.9%	-11.5%	-8.9%	-16.1%	-14.0%	-0.9%	1.1%	1.8%
25th percentile flow	-44.1%	-8.8%	-24.4%	-12.2%	-5.8%	-6.0%	-1.4%	1.7%	5.9%
10th percentile flow	-100.0%	-7.3%	11.5%	2.7%	28.8%	28.1%	-2.3%	2.7%	16.5%
5th percentile flow	-100.0%	-4.7%	36.1%	16.2%	45.0%	44.4%	-3.0%	3.6%	30.3%
P&R Scenario flow minus UIFScenario flow (cfs)									
minimum flow	-91	42	-700	349	2,021	2,206	-8	1	6
mean flow	-34	-437	-869	-949	-1,239	-1,171	-14	1	7
median flow	10	-323	-1,012	-1,013	-1,868	-1,793	-14	1	7
25th percentile flow	-155	-418	-645	-672	-275	-299	-14	1	6
10th percentile flow	-237	-244	206	24	739	907	-15	1	6
5th percentile flow	-191	-215	530	338	1,180	1,155	-13	1	6
Percent Difference between P&R Scenario flow and UIF Scenario flow									
minimum flow	-100.0%	6.0%	-100.0%	38.2%	187.1%	194.6%	-24.7%	6.0%	*NA*
mean flow	-5.9%	-9.7%	-19.4%	-13.0%	-13.9%	-12.1%	-5.2%	0.9%	1.7%
median flow	2.1%	-8.2%	-25.6%	-16.5%	-25.2%	-22.6%	-6.2%	0.9%	4.3%
25th percentile flow	-45.7%	-15.8%	-24.4%	-16.8%	-5.8%	-5.9%	-9.4%	1.4%	11.6%
10th percentile flow	-100.0%	-13.6%	11.5%	0.9%	22.7%	26.1%	-14.8%	2.3%	31.8%
5th percentile flow	-100.0%	-14.6%	36.1%	15.8%	45.0%	40.4%	-16.6%	3.1%	64.9%

Negative percent differences indicate lower flow in the Current Use or P&R Scenario, compared to the UIF Scenario

Table 8. Difference in Performance Measures at Strategic Nodes between the Current Use and P&R Scenarios

Performance Measure	Keowee River Strategic Node	Lake Hartwell Inflow Strategic Node	SAV12 Savannah River below Hartwell Lake near Hartwell, GA	Lake Russell Downstream Strategic Node	Lake Thurmond Downstream Strategic Node	SAV23 Savannah River above Augusta Canal near Bonair, GA	Twelvemile Creek Strategic Node	SAV10 Eighteenmile Creek Below Pendleton	SAV21 Stevens Creek near Modoc
Current Use Scenario (cfs)									
minimum flow	**0**	**744**	**2,000**	**2,050**	**3,101**	**3,300**	**28**	**9**	**3**
mean flow	**538**	**4,279**	**3,989**	**6,685**	**8,045**	**8,844**	**264**	**73**	**389**
median flow	**528**	**3,873**	**3,494**	**5,582**	**6,233**	**6,836**	**227**	**62**	**173**
25th percentile flow	**190**	**2,412**	**2,000**	**3,519**	**4,502**	**4,771**	**147**	**40**	**53**
10th percentile flow	**0**	**1,663**	**2,000**	**2,775**	**4,201**	**4,454**	**100**	**27**	**21**
5th percentile flow	**0**	**1,401**	**2,000**	**2,494**	**3,801**	**4,125**	**76**	**21**	**12**
P&R Scenario flow minus Current Use Scenario flow (cfs)									
minimum flow	0	-2	-2,000	-789	0	40	-5	0	3
mean flow	0	-233	-376	-363	-383	-344	-12	0	3
median flow	-14	-248	-557	-464	-672	-678	-12	0	4
25th percentile flow	-5	-185	0	-183	0	8	-12	0	3
10th percentile flow	0	-114	0	-49	-199	-71	-13	0	3
5th percentile flow	0	-146	0	-10	0	-113	-11	0	3
Percent Difference between P&R Scenario flow and Current Use Scenario flow									
minimum flow	*NA*	-0.2%	-100.0%	-38.5%	0.0%	1.2%	-17.7%	-1.2%	116.9%
mean flow	0.0%	-5.5%	-9.4%	-5.4%	-4.8%	-3.9%	-4.5%	-0.1%	0.9%
median flow	-2.7%	-6.4%	-15.9%	-8.3%	-10.8%	-9.9%	-5.3%	-0.2%	2.5%
25th percentile flow	-2.8%	-7.7%	0.0%	-5.2%	0.0%	0.2%	-8.1%	-0.3%	5.4%
10th percentile flow	*NA*	-6.8%	0.0%	-1.8%	-4.7%	-1.6%	-12.8%	-0.3%	13.1%
5th percentile flow	*NA*	-10.4%	0.0%	-0.4%	0.0%	-2.7%	-14.0%	-0.6%	26.6%

Negative percent differences indicate lower flow in the P&R Scenario, compared to the Current Use Scenario.

Table 9. Difference in Performance Measures at Strategic Nodes between the Current Use and 2070 Moderate and High Demand Scenarios

Performance Measure	Keowee River Strategic Node	Lake Hartwell Inflow Strategic Node	SAV12 Savannah River below Hartwell Lake near Hartwell, GA	Lake Russell Downstream Strategic Node	Lake Thurmond Downstream Strategic Node	SAV23 Savannah River above Augusta Canal near Bonair, GA	Twelvemile Creek Strategic Node	SAV10 Eighteenmile Creek Below Pendleton	SAV21 Stevens Creek near Modoc
Current Use Scenario									
minimum flow	**0**	**744**	**2,000**	**2,050**	**3,101**	**3,300**	**28**	**9**	**3**
mean flow	**538**	**4,279**	**3,989**	**6,685**	**8,045**	**8,844**	**264**	**73**	**389**
median flow	**528**	**3,873**	**3,494**	**5,582**	**6,233**	**6,836**	**227**	**62**	**173**
25th percentile flow	**190**	**2,412**	**2,000**	**3,519**	**4,502**	**4,771**	**147**	**40**	**53**
10th percentile flow	**0**	**1,663**	**2,000**	**2,775**	**4,201**	**4,454**	**100**	**27**	**21**
5th percentile flow	**0**	**1,401**	**2,000**	**2,494**	**3,801**	**4,125**	**76**	**21**	**12**
Moderate Demand 2070 Scenario minus Current Use Scenario flow (cfs)									
minimum flow	0	16	-2,000	4	1	1	-2	0	0
mean flow	0	-56	-92	-88	-88	-87	-1	0	-1
median flow	-8	-46	-105	-76	-154	-241	-1	0	-1
25th percentile flow	5	-55	0	-59	0	-7	-1	0	-1
10th percentile flow	0	-21	0	-27	-126	-5	-1	0	0
5th percentile flow	0	-38	0	4	0	-27	-2	0	0
Percent Difference between Moderate Demand 2070 Scenario minus Current Use Scenario flow									
minimum flow	*NA*	2.1%	-100.0%	0.2%	0.0%	0.0%	-6.3%	-0.7%	-15.6%
mean flow	0.0%	-1.3%	-2.3%	-1.3%	-1.1%	-1.0%	-0.4%	-0.1%	-0.1%
median flow	-1.6%	-1.2%	-3.0%	-1.4%	-2.5%	-3.5%	-0.5%	-0.1%	-0.3%
25th percentile flow	2.7%	-2.3%	0.0%	-1.7%	0.0%	-0.2%	-0.7%	-0.2%	-1.0%
10th percentile flow	*NA*	-1.3%	0.0%	-1.0%	-3.0%	-0.1%	-1.4%	-0.3%	-2.4%
5th percentile flow	*NA*	-2.7%	0.0%	0.2%	0.0%	-0.6%	-2.2%	-0.4%	-3.6%
High Demand 2070 Scenario minus Current Use Scenario flow (cfs)									
minimum flow	0	16	-2,000	10	0	2	-3	0	1
mean flow	0	-109	-169	-158	-160	-158	-4	0	1
median flow	-14	-129	-263	-224	-224	-367	-4	0	1
25th percentile flow	5	-80	0	-100	0	-11	-4	0	1
10th percentile flow	0	-65	0	-40	-199	-27	-4	0	1
5th percentile flow	0	-101	0	-1	0	-33	-4	0	1
Percent Difference between High Demand 2070 Scenario minus Current Use Scenario flow									
minimum flow	*NA*	2.1%	-100.0%	0.5%	0.0%	0.1%	-10.5%	-2.3%	44.3%
mean flow	0.0%	-2.5%	-4.2%	-2.4%	-2.0%	-1.8%	-1.5%	-0.3%	0.4%
median flow	-2.7%	-3.3%	-7.5%	-4.0%	-3.6%	-5.4%	-1.7%	-0.3%	0.7%
25th percentile flow	2.7%	-3.3%	0.0%	-2.8%	0.0%	-0.2%	-2.6%	-0.6%	2.6%
10th percentile flow	*NA*	-3.9%	0.0%	-1.4%	-4.7%	-0.6%	-4.3%	-0.8%	6.1%
5th percentile flow	*NA*	-7.2%	0.0%	0.0%	0.0%	-0.8%	-5.5%	-1.3%	10.6%

Negative percent differences indicate lower flow in the Moderate or High Demand Scenario, compared to the Current Use Scenario

Figure 2. Reservoir Storage Plots

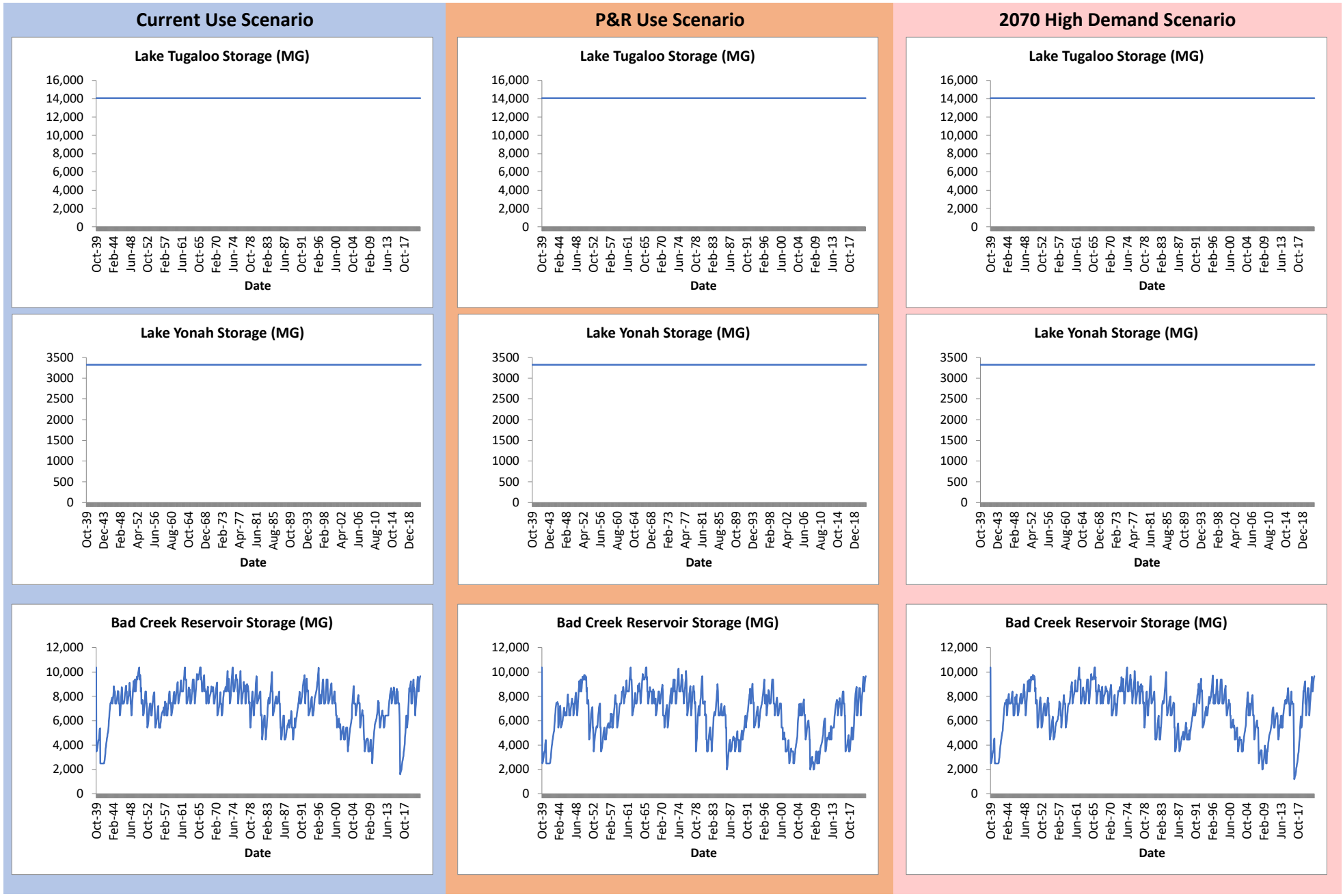

Figure 2. Reservoir Storage Plots (continued)

Figure 2. Reservoir Storage Plots (continued)