February 21, 2024

Saluda RBC Minutes

RBC Members Present: Larry Nates, Michael Waddell, Brandon Grooms, Tate Davis, Katherine Amidon, Rebecca Wade, Josie Newton, Phil Fragapane, Kevin Miller, Devin Orr, Melanie Ruhlman, Robert Hanley, Patrick Jackson, Kaleigh Sims, Jay Nicholson, Paul Lewis, Jeff Boss, Rick Huffman, Charlie Timmons, David Coggins, KC Price, & Eddie Owen

RBC Members Absent: Jason Davis, David Lawrence, Justin McGrady, Thompson Smith, & Rett Templeton (Julie Davis, alternate, present)

Planning Team Present: John Boyer, Tom Walker, Joe Koon, Scott Harder, Andy Wachob, Leigh Anne Monroe, Alexis Modzelesky, Hannah Hartley, & Kirk Westphal

Total Present: 46

Katherine Amidon called to order the February 21st, 2024, meeting of the Saluda RBC at 10:00 a.m. She introduced the meeting structure and reviewed the meeting objectives, including learning about making decisions by consensus, reviewing additional surface water analyses and reservoir safe yield analyses, learning about drought response strategies and examples from other locations and continuing discussion of water management strategies. Katherine reviewed corrections to the November meeting minutes. She requested motions to approve the meeting agenda and the minutes and summary documents from the previous meeting and November. The Saluda RBC members unanimously approved the RBC meeting agenda, the last two meeting minutes, and last two summaries.

Agenda approval: Robert Hanley – 1st and Kevin Miller – 2nd

Both sets of minutes and summaries approval: Kevin Miller – 1st and Paul Lewis – 2nd

The housekeeping items and Parking Lot include;

- engagement of the public with this process what, when, how, who – (status- ongoing)

- engagement of public officials (pertinent municipalities) to promote the plan when we get to the public comment period and beyond –(status- not started).
- Identify and engage stakeholders that are not involved in the basin council but have an overlapping or adjacent connection to our efforts. For example, NRCS, SC Forestry, SCEMD, etc., -(status- ongoing).
- Development and maintenance of a public facing data clearinghouse for all things water with the Saluda Basin- (status- not started).
- Funding for implementation-(status-not started)
- We have discussed some data, gaps-making sure we acknowledge those in our final report and determine how to mitigate those in the future- (status- started e.g., fish data in Blue Ridge)
- If we want to request additional surface water demand scenarios, we need to decide when.
- Determine how and when we will coordinate with other basin councils-(status- not started)
- What recommendations do we need to consider for non-FERC regulated dams and how they impact recreation-(status-not started)
- Visit and learn more about NRCS buffer and restorations-(status-April-May possibly)
- Keep apprised of the Surface Water Withdrawal Act-(status-ongoing)

Discussion:

Q: when engaging the public, do we have a talk on the river basin process?

A: Yes, we have them explained in detail in a PowerPoint that talks about the general planning process and status of things.

C: Also, there is a QR code or app that shows you the volume of water that changes in quantity over time. So that is one way to engage folks.

C: Within our membership – no one knows anything about it.

C: The process includes outreach from RBC members to other stakeholders.

C: Would be good to have a starting point for interacting with stakeholder groups.

C: John can forward the slide deck.

C: 14 schools in Columbia I give talks to and can incorporate into talks.

C: FORR or another group can create a kid-friendly PPT or materials

C: Senate Ag & Natural Resources Meeting tomorrow – surface water discussion – forming a committee.

Q: Is it live streamed?

A: Maybe, not sure.

Q: No bill in this session, correct?

A: Folks could try and get Representatives or Senators to come talk if the group would like to try.

Q: Safe yield discussion?

A: There's a petition and a response but nothing else currently.

C: At some point I would like to have the group have the discussion.

C: Table it to policy recommendations portion of the planning process.

Beginning to Consider Plan Recommendations: These are not Plan recommendations, but ones for the RBC to consider as we begin to develop and discuss recommendations for inclusion in the plan. Which are:

1. When updating Drought Management Plans, encourage water utilities to use the SWAM model to evaluate the potential effectiveness of drought triggers.
2. Consider use of the River Basin Plan as a tool for smart growth and economic development. The plan can highlight areas where water resources are abundant and are more amenable to growth.

C: Themes, topics, or very specific feedback and have productive meetings.

C: Go to Edisto and Broad plans and look at Chapter 9.

C: Ideally recommendations everyone can agree upon across the RBCs.

C: Halfway through the planning process overall.

C: Want to see something that has teeth.

C: Katherine and John are presenting at SCEC – can join the panel for that if attending and interested.

Public and Agency Comment (John Boyer): There was a free photography book for members at the meeting if interested and there was no agency comment.

Review of January Meeting Highlights: John Boyer facilitated this session, where he talked about a summary that shows projections (percent comparing different sectors), which includes Average Annual Surface Water Demands by Scenario (in MGD), including surface water use sector, current use, 2070 moderate demand, 2070 high demand, and permitted & registered. We looked at the modeling results showing the shortages across locations and sectors. Also, given the higher demand in 2070, we discussed water management strategies and the decisions about what strategies we want to put in the plan. In addition, the comparison of Reservoir Storage of Rock Lake and North Saluda, including their Current Use Scenarios and 2070 High Demand Scenarios. We looked at the percent change in Minimum Flow and 10th Percentile Flow between Current Use and the 2070 Moderate and High Demand Scenarios.

Discussion:

Q: With the exception of GVL water – do others assume drawdown to zero? Frequency of shortage water/not available?

A: Lake levels aren't going to zero and no minimum releases except GVL at 6 mgd.

Q: Withdraws from the river – does it go to zero?

A: Yes, we didn't set any rule for these runs.

C: MIF doesn't apply because most/all are grandfathered. Results are on a monthly timestep.

Q: Was there data from 1925 for North and South Saluda?

A: Likely in the mainstem – North and South maybe go back to the 1990s.

C: Back in 1925 instream flows during the summer went to zero at times.

C: Is there data that supports that?

C: Some of the older generations talk about it during intermittent droughts that they could walk across the North and South Saluda. There were none or minimal releases back 100 years ago. Not bone dry but very low levels. "Insignificant flows" – could walk across or drive across.

Making Decisions by Consensus:

Jeff Lineberger presented this session and started with the Process Matters- by making sure that the process is right and matters such that you have enough time to communicate and understand each other's interests, especially regarding water supply. The Process matters also included:

- Goal-a timely outcome all parties can live with
- Consensus Rating Scale for Near-Final Draft (Full endorsement, Endorsement with Minor Points of Contention, Endorsement with Major Points of Contention, Stand aside with Major Reservations and withdrawal)
- Final decision made by Majority Vote
- Understand, Negotiate, Measure, Adjust, cut
- Getting to Yes by Fisher, Ury and Patten

Interest-Based Negotiation Applied to Water Resource Decisions: We see on the map power projects (hydro) all over the Carolinas. Our strategy is to get a new settlement group within a 3-year window. We recorded some level of progress, although we didn't get everybody to sign those agreements. We wrote the hydro license applications such that they captured stakeholders' interest.

Some Observations:

- 2-step, consensus-based process allows collaborative problem-solving (which includes; Prevents domination by the majority, Allows trust-building and info-sharing under conditions of conflict, Consensus does not mean everyone will be equally happy, and All do accept that the decision is the best that could made at the time).
- Best active listeners(not talkers) are most effective
- Talking about interests (not positions) first exposes common ground
- Ratings greater than 1 don't indicate failure
- Leave time to work on issues causing any 3's and 4's
- 5's want out----let them go
- In the end, you either can or can't live with the River Basin Plan (if you can live with it, then support it)

Discussion:

C: There is an event March 28th by the CWWMG (non-profit) in the Catawba Wateree basin – Water for All Summit.

Q: What's the stick to get water utilities to reduce?

A: Part of the stick was we're going to run out of water.

A: Reservoir owners charge water withdrawals through FERC processes – We proposed charging during the relicensing project which got people's attention.

A: Recognition that water is a shared resource.

A: Duke wasn't rigorous in the past regarding intakes. A number of very shallow intakes and weren't doing the engineering we should have been doing. Most of the time we are water rich but what about other times?

Q: LIF protocol - one day and two day question?

A: Protocol in stage 3 – one day of watering.

A: Protocol in stage 4 – no outdoor watering.

A: LIF protocol saved us during that drought of record. Prevented intakes from being exposed. The CWWMG hired people to prepare contingency plans for members.

A: Mandatory water use restrictions made an impact in stage 2. Evaporation in the system (lakes) on a hot summer day. Natural evaporation for 11 lakes is 300 mgd which is more than humans use combined. Groundwater reversal – gw was sucking the lakes dry.

C: Two types of evaporation – natural and forced evaporation – steam plant effluent forces off more water evaporation.

Q: Lake levels to inches?

A: 300 mgd over 80,000 acres could convert to inches.

Q: The numbers in past evaporation 30% of capacity?

A: It could, depends on how water is used.

Q: Who runs Lake Keowee?

A: Duke Energy.

Q: Do you communicate with the USACE? Hartwell, Thurmond, & Russell?

A: Yes, and they have a drought contingency plan and we have our operating agreement with USACE. Match percentages and both share the pain of drought. Some plants have their own contingency plan.

Q: Overall consensus #?

A: Yes, when we have a draft plan put together.

A: Final plan will be Yes or No.

A: In the Broad, we got consensus but left things out of the plan. In the Edisto we took a different approach and documented points of contention (no-consensus). In the Broad, what can you live with approach.

Additional Surface Water Analyses:

Kirk Westphal discussed the steps and various CW-DMAG Drought Stages declared and looked at the historical timeline of LIP Stage and Water Restriction Actions During Drought.

CWWMG Low Inflow Protocol- Water Use Reduction Actions:

Stage 0- reduce Wylie Recreation Flow Releases and no actions for public water suppliers and owners of large water intakes.

Stage 1 reduces Project Flow Requirements. Implement voluntary water use restrictions, 2 days/week irrigation, and reduce vehicle washing. (Goal :3-5% water use reduction) action from public water suppliers.

Stage 2- Eliminate recreation flows, further reduce other Project Flow Requirements. Action from public water suppliers is implementing mandatory water use restrictions, 2 day/wk irrigation, and eliminate vehicle washing. (Goal: 5-10% water use reduction)

Stage 3- Reduce releases to critical Flows. Implement increased mandatory water use restrictions, 1 day/wk irrigation, and limit other outdoor water uses. (Goal: 10-20% water use reduction). However, in stages 1 to 3, action from Owners of Large Water Intakes-request voluntary reductions of customers/employees.

Stage 4, which is the emergency water use restrictions.

Triggers for each stage are based on a storage index, Drought Monitor 3-month average, and 6-month average stream flows.

Additional Surface Water Analyses:

John Boyer anchored this session by introducing the following ;

1. How do model results using a monthly versus daily timestep compare?
2. Using daily timestep, how often do flows drop below the Minimum Instream Flow (MIF) for each Scenario?
3. What is the impact to reservoirs if the drought of 2007-2008 were repeated?

Comparison of Monthly and Daily Timesteps for 2070 High Demand Scenario:

We saw 7 shortages, most of which were fairly infrequent, and the max shortage is pretty low, except for Greenville, with 67.9% (MGD). Using the same simulation for Daily shortages, we noticed a total of 15 different shortages. Most of these shortages occurred in the upper reaches of the tributaries. Also, the difference in 10^{th} percentile Flow (cfs) between 2070 High Demand Scenario Monthly and daily Simulation.

2009 SCDNR Instream Flow Policy:

- Adopted results of 1988 study (Seasonal variability in flows and Fisheries requirements as limiting).
- Based on variation in fish habitat needs in the Piedmont vs the Coastal Plain, DNR recommended MIFs vary.
- DNR will request MIFs below proposed or existing dams be maintained at minimum levels noted in the table (Table VI, DNR recommended minimum acceptable instream flows).

Comparison to Minimum Instream Flows- Saluda River Basin: Our results are from daily timestep simulations (gaga data used to calculate the MIF), including Saluda River near Greenville (80 yrs), near Williamston (27 yrs) and near Ware Shoals (83 yrs). In this simulation, we calculated the average annual flow and then applied that to 2030 or 2040 percentages to create the appropriate minimum flow. Our 2070 demand projections applied running that in the model, it bumps up to 4%; we saw everybody withdrawing at their fully permitted & registered amount once it's almost 60% daily analyses.

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

We looked at creating fake hydrology and repeating the drought of 2007-2008, and if we altered the hydrological inputs in the model by replacing and repeating with 2009 through 2011 hydrological inputs for those 2 years. We saw the impact on Lake Greenwood level over 2007-2010. Lake Levels here mimic what occurred in 2007-2008, indicating that the Lake had no problem refilling even with lower inflows (i.e., 2009-2010 hydrology was replaced with 2007-2008 hydrology). Similarly, the North Saluda Lake levels, using historical hydrology of 2007-2010, dropped to their dead pool because of the high demand for Greenville. There was no recovery in this period, indicating that Lake was not able to refill.

Question:

Limitations of the "Repeating Drought" Analysis:

- Under a repeating drought, groundwater levels might not recover as well, and the baseflow component of streamflow could be lower. This is not accounted for in the model.
- The analysis is sensitive to the time period selected (Repeating the worst part of the 2007-2008 drought would show more impacts; however, it reduces the plausibility of the analyses).

Nest Steps:

- Evaluate flow-ecology metrics using SWAM model daily timestep results for each planning scenario (March meeting)
- Consider if there is reason to establish one or more Reaches of Interest or Surface Water Condition at any location. Surface Water Condition defined by the RBC is the amount of water that can be withdrawn from surface water source and which can be applied to evaluate Surface Water Supply for planning purposes.
- Decide if there are any other Scenarios should be developed and evaluated.

Discussion during John's presentation:

Q: Same as before? No minimum instream flows included?

A: Correct.

Q: When we get to decision-making why would we use monthly when we have daily?

A: For most part monthly and daily are very similar. In other basins we used monthly. There's more uncertainty with daily, monthly might be in the framework wording.

A: Monthly was encouraged with less uncertainty.

A: We can do either one daily or monthly.

Q: Any way to gage impacts on recreational use?

A: Law was written to say it covers recreation. Below Saluda Lake Dam 20% is absolute minimum. My gut feel is that we had things in place to guarantee minimums then we wouldn't have an impaired stream.

C: 3 hydro systems in system aren't regulated by FERC. Missing gages. Water issue – possibly near Boyd Mills Pond below 4c impaired waterway Saluda Lake Dam.

C: Come back with a recommendation and we can run that with a scenario and see the results.

Q: Color code?

A: Blue are Saluda River.

Q: Yellow box, the numbers below are less? Why?

A: Discharges from places like ReWa.

Q: For Lake Murray, you didn't see any issues?

A: No, it followed its guide curve.

Q: How often they were in LIP stages?

A: We didn't look this time.

Q: Lake Greenwood when they get low they do inflow outflow due to FERC. Would've expected more on Lake Murray.

A: We'll look at Lake Murray again/closer.

C: When water gets tight Greenwood hoards the water.

A: We'll take another look.

A: One limitation of this modeling is GW levels being lower and losing more in streams and lakes (baseflow).

C: Eco-flow results will be interesting to see for maybe setting a SW condition.

Q: Can SW condition vary by month?

A: Sure it could but would need a basis and not be arbitrary.

Q: Do we apply these for full reach?

A: A point at the river.

Q: Kind of like the nodes? Do we need gages?

A: Could put virtual gages anywhere.

C: They've added a gage near I-85 where Saluda crosses under I-85. Now reporting flow.

C: Probably a DOT gage with funds.

C: Also new county stormwater gages.

Q: Value in running a scenario with no Keowee?

A: We're spending $100 million to make sure that doesn't happen.

Q: Merit of a joint basin group with Upper Savannah and Saluda IRC?

A: Can form. Up to the group – Saluda, Broad, Catawba, Santee, IRC was envisioned already.

C: I'd think we have more in common with the Upper Savannah than the Santee.

A: Yes, but Saluda water goes to the Santee so they will be interested in what Saluda does.

Scenario – increase evaporation due to climate scenario.

C: No humidity factor which doesn't account for dry/humid weather.

Q: Climate scenarios not in any RBC process yet?

A: No.

Q: Worst evaporation months in SC?

A: June, July, August.

Q: No evaporation in other months?

A: Yes, we will look into evaporation rates – there is evaporation.

C: Not readily available in all areas.

C: Used pan data for SWAM development.

Q: Reservoir operators – is evaporation an issue or concern?

A: We have a model and it is in our calculations for keeping reservoirs full.

Q: Other irrigation for lawns or thinking about evaporation?

A: Another uncertainty which could impact timing of flows.

C: Loss of canopy cover are going to impact evaporation. Relative humidity factor – good indication throughout the year.

C: 1 degree Fahrenheit for SC - in the Global Climate model for SC between 2 degrees and 10 degrees.

Additional Reservoir Safe Yield Results:

Kirk Westphal facilitated this session by defining Reservoir Safe Yield. Reservoir Safe Yield is the surface water supply for a reservoir or system of reservoirs over the simulated hydrologic period of record. It is also the maximum annual average demand that can be sustained through the period of record without depleting available storage.

The purpose of the Reservoir Safe Yield is to determine the amount of water that is physically available at a reservoir.

Method:

- Based on the shallowest intake for an essential water use in a reservoir, but also computed for deeper intakes of other users if applicable.
- Calculation apply current reservoir operating rules.
- Based on Current Demand, Permitted and Registered Demand, and 2070 High Demand Scenario.

It is important to note that the Reservoir Safe Yield differs from the basin safe yield by SCDHEC for withdrawal. Reservoir safe Yield: hypothetical maximum withdrawal volume used for planning while Basin Safe Yield: statistical availability at free-flowing in a river used for permit evaluation.

Method- Example from Broad River Basin:

- Remove permit/intake / treatment constraints at the reservoir
- Suspend target elevation rules
- Maintain downstream release rules
- Apply appropriate demand scenarios upstream
- Consolidate withdrawals from the reservoir to a single hypothetical user at the reservoir
- Gradually increase continuous annual withdrawal (with seasonality) until: lowest storage over period of record=Deadpool/ lowest allowable level and no shortages.

Table Rock Reservoir Safe Yield-Baseline:

The numbers are not an exact science, but they are estimated based on the hydrology in the model. That hydrology is often synthesized as in these 2 cases (demand and safe Yield). However, it does not matter which demand scenario running the current demand, 2070 high demand, or the permitted & registered because all that effects are the demand or is the availability of water upstream level. And there are no users upstream of Table Rock Reservoir, so the yield is a hypothetical value. There are no demands upstream, so we will get the same number for each of those demand scenarios.

North Saluda Reservoir Safe Yield- Baseline:

When we calculate a safe yield of 16 MGD (allowing it to go down to its lowest point), we get same results for the current, 2070 high demand and permitted & registered. Demands are ½ of WS: Greenville's total Demand per Scenario.

Table Rock and North Saluda Reservoirs Safe Yield -Variations:

We noticed that Table Rock reservoir was more sensitive to the 2008 drought in our simulation, and North Saluda was more sensitive to the 2002 drought. The Safe yield for North Saluda Reservoir Level (ft) with a yield of 7.4 MGD and Table Rock Reservoir Level (ft) with 6.8 MGD) if they are only allowed to operate within the top 5-foot maximum drawdown minimum release =4.65 cfs.

Summary of Scenario Demand and Safe Yield on Lake Rabon (MGD): Current demand is 1.5, 2070 High Demand is 2.42, and P & R is 30, with the three scenarios having the same Safe Yield of 2.

Summary of Scenario Demands and Safe Yield for WS (Deadpool 25,707 MG or 418 ft): Greenwood on Lake Greenwood (MGD): our current demand scenario is 12 with a Safe Yield of 260, 2070 High Demand is 20 with a Safe Yield of 247 and P & R Demands is 74 with a Safe Yield of 219.

Summary of Scenario Demands and Safe Yield for WS: LCWSC on Lake Greenwood (MGD):

Our current demand is 12 with a safe Yield of 162, 2070 High Demand is 20 with a Safe Yield of 153, and P& R Demand is 74 with a Safe Yield of 184. We noticed that P&R goes up due to the late rules that trigger a much lower outflow during low inflow periods. The rule in the model restricts outflow when the inflows are very low.

Lake Greenwood Safe Yield Comparison to Intakes: Lake Greenwood Elevation Under Firm **Yield Demands for WS: Greenwood:**

Taking the full yield of the lower intake shows the reservoir drawdown during the 2008 drought to the lower intake of the Greenwood water supply. The higher intake elevation of WS: LCWSC is (426 ft); we see a Time below WS: LCWSC intake at a max yield of WS: Greenwood for 6 months.

Discussion during Kirk's presentation:

Q: Seems backwards on the last slide.

A: N. Saluda larger and we noticed the same thing. Some differences in methodologies. Twice as much inflow going into Table Rock.

C: 22.4 – Table Rock and 28.2 North Saluda – previously calculated safe yield.

C: Calculated before 2008 drought?

C: 2002 drought was a higher value.

Q: How much were historic lake levels in those calculations?

A: Used in unimpaired UIF flow scenario development.

C: Lake levels in 2008 in drought they were artificially low in Table Rock and when they drought hit it went even lower. Could impact 2008 numbers?

A: That was accounted for and not included in mass balance. Will look into it.

A: Reservoirs also have different slopes. N. Saluda is higher in yield.

C: We have stream gage info we can share with the modeling team for validation.

Q: Did you do your own gaging?

A: I'd have to look back. We have USGS gages now.

C: How did you do your calculations?

C: During the 2008 drought, Table Rock was ran down before cranking Keowee up.

C: Plus it was artificially down for a new intake when the drought kicked off.

C: We set Adkins at a baseline and chased with Stovall.

C: Inflows are the weakest point so with data we could improve analysis.

C: Lake Rabon - Maintain 9 mgd correct? We had a number of 11 being safe yield if we add 9 to it that's what we'd expect.

A: Should be additive, will check that.

Q: Well be able to see if upper is exposed for 6 months. Equipment upgrade or deeper intake would help a scenario?

A: We haven't seen any shortage issues so we won't need to do that.

Q: Lake Murray didn't get close to 345 - correct in High Demand?

A: Correct.

Q: Martin's Lake in Gray Court could that lake be used for an intake?

A: All lakes are an option but I haven't looked at it.

C: Used to be called Reservoir #3 – old NRC lakes.

C: Top 4-5 feet could be pulled potentially. It is 100 acres.

C: What stream?

C: Maybe feeds into Rabon? Beaver dam creek.

Drought Response Examples:

John Boyer anchored this session by reiterating some of the questions from the January Meeting, which include;

- What can we learn from other areas that have been through drought, and what have they implemented in the basin?
- What has worked for them, and what has not worked?

The article titled " Drought in Urban Water Systems: Leaning Lessons for Climate Adaptive Capacity" is quite informative and useful because the authors reached out to 19 water managers from urban areas across the United States and asked them about how they respond to drought. And get their feedback from the water utilities. They addressed three questions: what were the short and long-term actions taken in response to drought? What constitutes an effective draft response, and how is this measured? And what are the limitations to drought response?

Some of those Significant Findings from that paper: Let's look at the most commonly mentioned response to drought across the cities that were sampled and how they broke them down into what is called water management strategies (demand and supply focus strategies).

Demand-Focused Water Management Strategies: We saw some of the water management strategies we have talked about, which include:

Mandatory Outdoor Use Restrictions, Voluntary Outdoor Use Restrictions, Incentives for Permanent fixture or landscaping changes, Rate adjustment, General public education on saving water, and planning.

Supply Focused:

New reservoir/increasing size of reservoir, New long-term contract, New connection, Diversifying water sources, Upgrading infrastructure, Purchasing new water rights, and New ways of reusing wastewater.

What constitutes an effective drought response, and how was this measured?

1. Reduction in per capita or overall water use
2. Ability to avoid mandatory restrictions
3. How supportive the public was in implementing response strategies
4. Ability to discontinue policies that limit use
5. Getting a positive response to communication efforts

They also gaged effectiveness of drought response in terms of…;

1. Robustness- being less sensitive to changing conditions
2. Flexibility-the ability to change in response to altered circumstances
3. Uncertainty over how policies will work (if the measures rely on actions taken by others)
4. Efficiency, Equity and Legitimacy

What Are Some Lessons Learned and Limitations to Drought Response?

- Voluntary measures or community education initiatives were vastly preferred compared to mandatory restrictions.
- Public perception-neither supply side responses nor demand side responses were immune from public criticism.
- Drought surcharges were rarely utilized as they were seen to be quite unpopular.
- Being part of a regional plan provided a sense of solidarity.

- Permanent reductions in demand allowed for a cushion between water supply and demand that could allow for banking water but made it difficult to achieve additional reductions in highly urban, low outdoor-use contexts.
- Most utilities are not yet weighing the tradeoffs that may be present in dealing with drought risk in the near term and climate change in the long term.
- Restrictions are more effective than pricing policies and tend to be more equitable across different income groups than pricing measures are, which fall more heavily on poorer households.
- A drought event itself may galvanize political will to implement policies that in normal years may not be publicly acceptable.
- Nearly every manager interviewed considered demand management an integral part of their practices; "Our customers expect us to be in the business of encouraging efficient and environmentally sound use of resources."

Discussion:

C: Would have to be very severe situation to try to implement mandatory restrictions. Better to sit with people and discuss. Don't dictate – let them tell you how they can help.

C: We implemented surcharges in GA during that drought and users didn't come back in some cases.

C: From GVL there is not a lot more we're going to get out of per capita – 1000 single family permits in first few months. Not a lot more room to go.

C: Mature households – 3-4000 gallons a month. The lower income people likely won't be impacted.

C: For our utility, poorer rural folks use 3500 gallons a month. Mine is not enforceable and use is different everywhere.

C: In the Catawba, no ordinance with teeth – we got that fixed. Get the ordinance passed.

C: Try to standardize things across some counties. "Our customers…".

C: Rural populations look at it as they use what they need to use. Subsistence gardens for some people. Nuances for rural water suppliers. They expect that out of us.

Q: Do you think there is anything to learn from Atlanta? Is there a river basin in GA similar to ours?

A: Lake Lanier to some degree there's a fight to release water from Lake Lanier.

C: GA realizes planning is very important due to drought they are way ahead of SC in a lot of ways. Metro North region has done a lot more.

The 2022 Missouri Drought Mitigation and Response Plan:

1. Describe the types of droughts that may occur and their impacts in Missouri
2. Assesses resiliency to drought-how prepared are water users in mitigating impacts from and responding to drought?
3. Quantifies potential economic impacts from drought.

Drought Mitigation and Response Plan Goals:

Reducing Impacts-:Reducing the impacts from drought on Missouri's economy, people, state and local assets, and environment.

Increasing Public Awareness-: Increase public awareness and provide education about drought planning, mitigation and response.

Enhancing Resiliency-: promote and help develop opportunities to improve resiliency to drought through interconnections, identification of break-up supplies, water reuse and other means that increase source of supply.

Promoting Water Conservation-: Encourage water conservation and promote efficient water use to reduce long-term vulnerability and as temporary drought response actions.

Adapting to Changing Climate-: Evaluate and prepare for impacts from changing climate conditions, including the potential for increased frequency, duration and severity of drought events.

Improving Monitoring-: Improve water availability monitoring, stay informed of evolving drought monitoring programs, and continue to refine triggers for the initiation and termination of drought mitigation and response programs.

Planning the Response-: Develop, review and update drought response plans and procedures.

Clarifying Roles & Responsibilities-: Clarify the roles, responsibilities, and capabilities of State and other agencies in preparing for and responding to drought conditions.

How will the Plan be Used?

- Section 8 of the plan includes a matrix of over 100 mitigation and response actions and strategies.
- Actions are identified for different water use sectors.
- Some actions are intended to be implemented at a local level, others at the state level.
- Many actions are region-specific.
- The matrix is intended to be regularly updated to capture new strategies and eliminate ineffective actions.

Example 1-Edisto RBC's Low Flow Management Strategy: The strategy augments statewide and municipal drought management plans by triggering tiered withdrawal curtailment by the largest surface water users in the basin when Edisto River flow reaches certain low levels. The goal is to maintain minimum flows primarily to protect ecology downstream, and we see the flow reduced from 20% to 40%---100%, which was the strategy.

Question:

Planning Framework Outline for Chapter 8. Drought Response:

1. Summarize existing drought plans and drought advisory groups
2. Summarize any drought response initiatives developed by the RBC
3. List recommendations on drought management or drought management strategies
4. Include a communication plan to inform stakeholders and the public on current drought conditions and activities regarding drought response.

Per the Planning Framework, the Specific Obligations of the RBC, with Support from the SCDNR, are:

- Collecting and evaluating local hydrologic information for drought assessment.
- Providing local drought information and recommendations to the DRC regarding drought declarations.
- Communicating drought conditions and drought declarations to the rest of the RBC, stakeholders, and the public.

- Advocating for a coordinated, basin-wide response by entities with drought management responsibilities.
- Coordinating with other drought management groups in the basin as needed.

Discussion:

Q: How did the Edisto RBC come up with upper and lower flows?

A: Jason Thompson from Charleston Water proposed it to maintain flows.

C: Why did they pick that number? What does 332 do that 199 doesn't do?

C: Our scenario went dry in the river and Charleston didn't want to dry out the river.

Q: Is this above or below the intake?

A: Below intake.

C: Hard to get stuff out of a pipe at that level.

C: They are further upstream .

Q: Would conjunctive use impact baseflow?

A: No only in the upper most part of the basin.

Additional Discussion of Water Management Strategies- Discussion Guide:

1. What existing water management strategies are already used in the Saluda basin? Consider and group these strategies by water use sector and whether they are:

a. Supply-side strategies

b. Demand-side strategies

c. Low flow management strategies

2. How effective are the existing strategies? Think in terms of their ability to reduce demands, increase supply availability, and prevent shortages.

3. Do you think strategies that are already in place can be expanded or improved?

4. What types of strategies are likely to be relevant in the Saluda Basin to reduce or eliminate projected shortages, increase available supply, minimize low flows, and help improve the flow regime for aquatic organisms and recreation? Which strategies should we evaluate using the surface water model?

Breakout Group Discussions:

Group Reports – Q1: Existing Strategies in the Basin:

• Water loss and control measures, including leak management via smart meters (including both AMI and AMR)

• Small impoundments (for golf and ag supply, generally) and larger reservoirs (for energy, public supply, and industry, generally)

• Tiered rate structures

• Public education (e.g. water bill inserts)

• Drought management plans

Group Reports – Q2: Effectiveness of Existing Strategies:

• Drought plans have limited effectiveness because only the governor has authority, in many cases, to enact mandatory water use restrictions.

• Public education (e.g. bill inserts) could be more effective.

• Small impoundments are recognized as being effective to maintain access to needed supply during low flow conditions, as evidenced by the fact that numerous agricultural water users build them to retain water.

• The major reservoirs in the Saluda basin are effective water supply strategies and meet other needs – such as recreation.

Group Reports – Q3: Can Existing Strategies be Expanded:

• Existing water infrastructure (conveyance, reservoirs, storage facilities) needs to be maintained. Aging infrastructure may result in increased water loss.

• It has become more difficult to permit and build even small impoundments. Impoundments serve as critical storage opportunities for water users located far away from major sources. Relying on small streams, especially near headwaters is difficult, unless impoundments area used to store water during dry periods, when lower order stream flows are reduced or zero.

• Watershed protections such as riparian buffers can be expanded to both improve water quality and reduce sediment loading to streams.

Group Reports – Q4: What Strategies are Relevant in the Saluda basin and Should be Further Evaluated?

• The advantages and disadvantages of reclaimed water (water reuse) were briefly discussed.

• In the Saluda basin, much of the water that is withdrawn is returned to the system and used further down the basin. This is a form of indirect potable reuse.

What Are Potential Uncertainties in the Saluda River Basin? (Saluda RBC identified Uncertainties: climate, population, land use, loss of power, type of industry/industrial growth, modeling and data gaps, politics/legislation, & regulatory.

C: GVL is not courting high water use in GVL.

C: City of Aiken talking about lowering water rate for large scale user.

Some of the discussions for our next meeting are Water Conservation and Efficiency Strategies, which include:

- Agricultural Portfolio of Water Efficiency Strategies
- Municipal Portfolio of Water Conservation and Efficiency Strategies
- Industrial and Energy Portfolio of Water Conservation and Efficiency Strategies

C: Info or data, bring that next month. ROI return on investment info/data.

Saluda RBC Meeting #12:

March 20 at LCWSC offices.

Information Topics:

- Additional surface water analyses
- Eco-flow relationships (Drs. Bower and Peoples, USGS and Clemson)
- Results of other analyses, per RBC request
- Discuss supply-side strategies.

Meeting adjourned: 2:06 pm

Minutes: Iffy Ogbekene and Tom Walker

Approved: 3/20/24

RBC Chat:

10:21:16 From Guy Schmoltze to Everyone:

I will be attending

10:23:04 From Guy Schmoltze to Everyone:

Sunday Morning at 9:40-10:10

10:23:22 From Guy Schmoltze to Everyone:

106/107

11:27:07 From Thomas Walker to Everyone:

15 minute break - until 11:40

11:54:21 From Kirk Westphal to Everyone:

Monthly timestep is useful here because it is a good indicator of trends. Daily simulation suggests that future hydrology will occur in exactly the same day-to-day sequence as we've seen historically, and that can be hard to justify, and easy to misinterpret. Comparing the two is useful to see if they generally lead to similar conclusions, or if you want to look at a certain question from different angles.

12:31:42 From Thomas Walker to Everyone:

start back at 12:45 or 12:50 closer to 12:50

14:05:56 From Josie Newton to Everyone:

Thank you!

14:06:08 From Thomas Walker to Everyone:

meeting adjourned