

Lower Savannah-Salkehatchie River Basin Council

June 6, 2024 Meeting Minutes

RBC Members Present: Ken Caldwell, Pete Nardi, Lynn McEwen, Dean Moss, Courtney Kimmel, Bill Wabbersen, Kari Foy, Brian Chemsak, Brad Young, Leslie Dickerson, Brandon Stutts, Reid Pollard, Jeff Hynds, Tommy Paradise, Lawrence Hayden, & Heyward Horton

RBC Members Absent: Danny Black (Kathy Rhoad, alternate, present), John Carman (Jim Marra, alternate, present), Will Williams, Taylor Brewer, Sara O'Connor, Austin Connelly, Sam Grubbs, Brad O'Neal, & Joseph Oswald

Planning Team Present: Scott Harder, John Boyer, Tom Walker, Brooke Czwartacki, Alexis Modzelesky, Leigh Anne Monroe, Hannah Hartley, Kirk Westphal, Andy Wachob, & Jeff Allen

Total Present: 38

1. Call the Meeting to Order (Kari Foy, RBC Chair) 10:00–10:10
 - a. Review of Meeting Objectives
 - b. Approval of Agenda
 - i. Agenda approved
 - ii. Lynn McEwen – 1st and Dean Moss – 2nd
 - c. Approval of April 4th Minutes and Summary
 - i. Typos in minutes
 - ii. Minutes approved
 - iii. Dean Moss – 1st and Bill Wabbersen – 2nd
 - d. Newsworthy Items
 - i. Ken attended a water resources workshop
 1. Statewide water planning workshop. Each RBC gave an overview of where they were in the planning process
 2. Passion from basins
 3. Try to get a link to that
 - ii. Broad RBC implementation meeting
 1. Putting their actions and strategies into practice
 2. Statewide RBC collaboration
 3. Panel discussion at Clemson's Water Resources Conference, 10/16-10/17 in Columbia. Some utilities, academics, regulatory agencies
 4. SCEC conference. Just water utilities attend
 5. May ask for volunteers to speak at the conferences
 6. Broad doing 2 discussions- implementation for the Broad and a broad discussion
 - iii. "Parts of SC are sinking, and quickly. Can we slow it down?" article
 1. Brooke on the cover
 2. Measurements of shallow, InSAR and GPS data.
 3. Deep subsidence
 4. Also spoke to Alex Butler and a professor at the Citadel
 5. Office of Resilience is looking at using a network of shallow wells
 6. Ongoing conversations between multiple state agencies

7. Q: How much of it is a function of the unique geology of different areas?
 A: Ongoing study with UofSC in the Beaufort area, not a lot of work on Floridan Aquifer. Multi-step process and ground-truthing needed. There's a risk of structural collapse with limestone, sink holes, geology is porous.

2. Public Comment (John Boyer) 10:10–10:15
- a. Public Comment Period
 - i. none
 - b. Agency Comment Period
 - i. none
3. May Field Trip Review (John Boyer) 10:15–10:20
- a. Hilton Head overview
 - b. Hilton Head PSD
 - c. Aquifer Storage and Recovery Well
 - d. Whooping Crane Pond Recycled Water Wetlands
 - e. Reverse Osmosis WTP
 - f. “One Water” future
 - g. Waddell Mariculture Center
4. Lower Savannah and Salkehatchie Basin Freshwater Aquatic Resources and SCDNR Fisheries Management (Chris Thomason, SCDNR) 10:20–10:50
- a. LSS map
 - b. 85 native species, 14 introduced species
 - c. Sportfish of the SS river basins
 - i. Salkehatchie River- “Redbreast River”. Dominant fisheries
 - ii. Brim species- blue gill, red ear, spotted sunfish, catfish
 - iii. Standardized Sampling
 - iv. Bartram bass- very unusual
 - v. Striped bass
 - 1. GA stocking coastal striped bass
 - d. Non-game fish of the SS basins
 - i. Majority of the fish in the basin
 - ii. Shiners, darters, sunfish
 - iii. Important to the environment
 - iv. Spotted sucker- good indicator species of good water quality
 - v. Robust redhorse-lost to science, rediscovered in the 90s
 - e. Diadromous fishes of the SS basins
 - i. American Chad
 - f. Sturgeon Telemetry study
 - i. Objectives
 - 1. Monitor sturgeon distribution in the estuary pre-, during and post-construction
 - 2. Observe potential changes in habitat preference relative to historic habitat data
 - ii. Receivers
 - 1. Deploy an array of 300 receivers in SC in most major river systems, ICW, and sounds
 - iii. Transmit 10 Atlantic and 10 short nose sturgeon per year

- iv. Transmitters have a battery life of 2.5-9 years with a unique frequency code
- v. Capture results
 - 1. 80 Atlantic Sturgeon, 83 short nose sturgeon, 163 total
- vi. Telemetry results
 - 1. 9 million detections
- vii. Summary
 - 1. Similar seasonal movement as historical data
 - 2. Juvenile sturgeon may be using alternative habitat in the Middle River under certain conditions
 - 3. Continued collection of telemetry data needed
 - 4. C: sturgeon recovering because they jump in front of boats in the Savannah River at night
- g. Nonnative/ invasive fish of the SS river basins
 - i. 14 species
 - ii. Smallmouth bass, Bartram's bass
 - iii. LS river ictalurid survey
 - 1. Flathead catfish. First documented 2010, fully colonized 2020
 - 2. Total numbers of catfish decline
 - 3. Ages of flathead catfish table. Young are dominating
 - 4. Eating catfish species
 - 5. No effective way to get rid of them once they've started reproducing
 - 6. Q: are they restricted to freshwater? A: can handle some salinity
- h. Acknowledgements
- i. Q: what's the state doing to restock freshwater fish? A: we do a lot of stocking, a number of freshwater hatcheries. Most rivers in the basin study are not being stocked, but LS is being stocked with stripers because they don't have enough natural reproduction. Stocking red breast in Edisto. GA stocking to maintain 30000 a year
- j. DOE monitoring is based on effects of chemicals in the system
 - i. Q: does DOE monitoring help at all? A: yes, if they tell us they're ratcheting up on chemicals or radioactive things, would be concerned and have to implement advisories
 - ii. C: Bill gives samples of his alligators for them to sample. DOE sampling for a lot of different things
- k. There was an event in 2014 in Little Salkehatchie where there were preceding dry months where parts had almost no water in the main channels of the braided system and only pools were left, and there was a fish kill. Chris quoted in the article. The state wasn't in a designated drought at the time.
- l. C: drought response meant well, but doesn't look out for everyone

Break

10:50–11:00

- 5. Surface Water Modeling Results and Discussion (John Boyer) 11:00–11:30
 - a. Moderate and High Demand Scenario Results
 - i. Base scenarios: current surface water use, permitted and registered, moderate water demand, high water demand. Additional: unimpaired flow
 - ii. Lower Savannah summary of average annual surface water demands by scenario
 - 1. Moderate demand 2070 goes up to 50 mgd
 - 2. High demand 2070 504 mgd

3. Q: why is the moderate demand for thermoelectric/ nuclear less than current use? A: How demand estimates were developed. current use long-term monthly average vs. moderate demand long-term monthly median. Do less years for moderate demand if there's been a recent change in water use
 4. Q: growth has been so dramatic over the last 5 years. Does that difference impact the moderate demand scenario? A: we typically use 10 years average unless we see something. Do a per capita water demand for public water supplies and project the population. In Beaufort, high demand looked more realistic than moderate demand.
 5. C: can run different models if needed
 6. C: this is surface water, a lot of demand is at groundwater
 7. C: went from 2 plants to 4 plants, no way that's going down. C: different supply numbers based on conditions
 8. C: If a new user/ power plant comes online, it does not include the years before they begin withdrawing in calibrations. High demand calibration for surface water, looking at the maximum monthly demand for every month of the year. Haven't applied those to groundwater, doesn't seem appropriate to apply maximum demands to an aquifer which will decline in the long run.
 9. Phase 3, water management plans based on high demand scenarios
- iii. Lower Savannah
1. Current use- no shortages
 - a. Q: average annual demand but do a monthly time step? A: The table shows the average annual demand. Model has monthly demand based on historical use
 2. Permitted and registered- some shortages on tributaries of the Savannah
 - a. C: permits based on the highest of several options
 3. 2070 moderate demand scenario- no shortages
 4. 2070 high demand scenario- 1 shortage in Graniteville
 - a. Vacluse, Flat Rock, and Bridge Creek Ponds are not represented in the model. They provide storage that would reduce/ eliminate shortages
- iv. Salkehatchie River Basin summary of average annual surface water demands by scenario
1. Only agricultural use
 - a. C: project small growth, 38-44% for agricultural irrigation. Leave existing users as they are
 - b. Agriculture methods are unique
- v. Salkehatchie
1. Current use- handful of infrequent shortages
 - a. Connolly- has 50-acre and 9-acre impoundments that aren't included in the model because they are too small
 2. Permitted and registered scenario- increased frequency of shortages and additional shortages
 3. 2070 moderate demand- same shortages/ frequencies from current use
 - a. Outlets of subbasins
 - b. Q: upside down triangles are NPDES discharges, is there a growth applied to those? A: no, trying to be conservative

4. 2070 High demand- looks like permitted and registered scenario
 - a. When adding in hypothetical users, don't add impoundments
 - b. Q: what uncertainties do you have in the frequency/ shortage numbers? A: hard to put an uncertainty number to it. Run the daily model, and then compare the frequency to measure the potential range. Limited info
 - c. Hard to put gages in many areas because of the braided channels. Makes it difficult to measure actual flows
 - d. Q: Did Edisto have the same difficulty with the lack of gauge data? A: no, they had more data
 - i. Q: Did the Edisto Four Hole swamp give issues? A: yes
 - e. Q: making the assumption that no municipalities will attempt to reservoir and withdraw surface water? A: yes. Could do more what-if scenarios if needed.
 - f. C: Vogtle plants are in GA. We took GA EPD's demand projections. they just made one demand projection.
 - g. C: (Alex's table) These are the distribution permits associated with Beaufort/ Jasper. Some population growth accounted for in permits. No 2024 data; didn't make an impact on projections. Moderate and high demands. Population projections for Beaufort/ Jasper
 - h. Alex is sending out a copy
 - i. C: 6/7 of users with shortage also have a groundwater well
- b. Comparisons to Minimum Instream Flows
 - i. This got skipped
- c. Extended Drought Analysis Results for the Savannah River Basin
 - i. Resequencing historical flows to investigate potential future droughts
 1. Methods
 - a. Supply-side investigation to quantify sensitivity to hydrologic non-stationarity
 - b. 2070 high-demand scenarios
 - c. Current reservoir operation rules
 - d. 3 scenarios- 5 driest water years, repeating single year drought, 12 driest calendar months
 - e. Ranked data based on mainstem headwater flows, reference data, precipitation
 2. Results
 - a. Lake Thurmond
 - i. Q: what's a dead pool? A: lowest level where you can pull out water for supply purposes
 - ii. Q: how is recreation affected? A: recreation is affected at different levels. Depends on dock elevation. Presenting these results to USRBC
 - iii. Scenario 1- shortages appear in month 49
 1. Q: does this assume that all of the reservoirs are being managed as they currently are? A: yes
 - iv. Scenario 2- shortages appear in month 37
 - v. Lake Thurmond storage and releases
 1. Scenario 1- less releases than normal
 2. Scenario 2- more severe

3. Scenario 3- most severe
 4. Q: what does this mean to you? A: need to label how much availability there is. Hard to distill availability to one number because there's different amounts of water available at different points in the system.
 5. C: critical question is what's the release for Thurmond. What's normal demand for US compared to available supply being released from Thurmond?
 6. Table shows differentiated demands by sectors, but demands are all over the place
 7. Q: what is the minimum release? A: to go from mgd to cfs, multiply mgd by 1.55. CFS is higher than mgd
3. Discussions and limitations
 - a. Reservoir operations play a role
 - b. No attempts have been made to directly incorporate future hydrologic or climate projections
 - c. Neglects changes in groundwater-surface water interactions
 - d. USACE drought contingency plans drought triggers conditioned on flow in Broad River
 - e. Interbasin council meeting in 2-3 months
 4. (after lunch) LS River Basin shortages using 2070 high demand
 - a. Drought scenario 1- no shortages
 - b. drought scenario 2- Dominion has shortage 2% of the time
 - c. drought scenario 3- Dominion has shortage 21% of the time
6. Drought Management and Response Discussion – Part 1 11:30–12:00
(John Boyer and Elliot Wickham)
- a. Overview of the RBC's Obligations for Drought Response
 - i. Specific drought response related obligations
 1. Collecting and evaluating local hydrologic info for drought assessment
 2. Providing local drought info and recommendations to the DRC regarding drought declarations
 3. Communicating drought conditions and drought declarations to the rest of the RBC, stakeholders and public
 4. Advocating for a coordinated, basin wide response by entities with drought management responsibilities
 5. Coordinating with other drought management groups in the basin as needed
 - ii. Planning framework outline for chapter 8 drought response
 1. Summarize existing drought plans and drought advisory groups
 2. Summarize any drought response initiative developed by the RBC
 3. List recommendations on drought management strategies
 4. Include a communication plan to inform stakeholders and the public on current drought conditions and activities regarding drought response
 - iii. Shared chapter 8 from the Broad
 1. Q: has anyone else written a chapter 8? A: Edisto has

2. Q: can we see more than 1? A: can circulate the Edisto one or go online. Edisto spent time developing a drought response strategy. Pee Dee also has one, looks similar to the Broad- in draft form
 3. Q: can we get hard copies of Edisto? A: bring 5-6 to next meeting. Broad is being printed now
- b. "An Upstate drought ended in January. For Farmers, the ramifications lasted for months" article
- i. Takeaways from the article
 1. Farmers often see the effects of drought well before the state officially declares one
 2. Warmer temperatures in the Upstate could mean more agricultural droughts and/or greater impacts
 - a. Farmers planting earlier in the year
 3. Some farmers are practicing "climate-smart" agriculture. They are basing decisions around weather patterns rather than traditional planting seasons
 - a. Q: would growing earlier lead to more irrigation? A: no, it's wetter
 - b. C: don't want newspaper in Greenville saying whether warmer temperatures could mean more agricultural droughts. Does that mean it could not mean that? It's not a fact, just an opinion. A novelist writing a report, not a scientist. A: it generates discussion and touches on issues we want to talk about. Some direct interviews with farmers. Hard for ag folks to attend because they're harvesting. Apologize for sending it out 2 days before
 - c. Q: most ag is on wells. Are there restrictions on withdrawals from wells as well? A: no, there's no restrictions on wells. They take what's available and find other sources if need be. Droughts affect surface water differently from groundwater. If drought is bad enough, farmers won't irrigate
- c. Differences Between Drought Response Committee and US Drought Monitor Processes and Outcomes
- i. Drought monitoring in SC
 1. SC Drought Response Committee- State-level monitoring group
 2. US Drought Monitor- national level
 - ii. SCDRC
 1. To carefully and closely monitor, conserve, and manage the state's water resources in the best interest of all South Carolinians
 2. DRC and DNR- State Climatology office
 - a. Statewide members and local members
 3. Meets as needed
 4. Makes county-level designations for drought severity: normal-extreme
 5. At severe and extreme levels, will make recommendations for nonessential water curtailment for only public water suppliers
 6. Public water suppliers are required to have local drought management plans and response ordinances for water conservation and may enact their plans based on DRC's county-level designations
 - iii. DRC indicators

1. Palmer Drought Severity Index, Crop Moisture Index, Standard Precipitation Index, Keetch-Bryam Drought Index, average daily streamflow, groundwater levels
2. Chart with indicators and severity levels
- iv. US Drought Monitor
 1. National product to map drought severity and extent
 2. Aims to capture and depict all types of droughts
 3. Some people use this for agricultural aid
- v. USDM process
 1. Map updated each week by 1 author
 2. USDM categories are based on convergence of evidence from multiple data points and indicators
 3. Most states provide input, but author gets final say
 4. Data: precipitation, soil moisture, vegetation health, surface water, evaporation, groundwater, impacts and condition monitoring reports
 5. Categories
 - a. Intensity based on historical likelihood
 - b. No drought- exceptional drought
 - c. Q: in the article, it said the farmers were under severely dry conditions and they were seeing drought signs before there was any indications from the state. How does that work? Would that area be described as abnormally dry? A: DRC looked at different counties in the Upstate and said it was an incipient drought. Don't know if enough of the indicators got far enough to get them considered. DRC has 6 members focused on public water supply, so it's skewed towards water supply @ the municipal level. Spartanburg was the only one that enacted voluntary restrictions. Drought affects ag faster than public water supply
 6. Weekly data review
- vi. USDM vs SCDRC
 1. Agency leads- federal vs state agencies
 2. Participants- federal and state agencies vs local stakeholders
 3. Frequency- weekly vs as needed
 4. Severity levels roughly the same
 5. Allows for- federal disaster declarations and loans for ag vs determining nonessential water use curtailment recommendations
 6. Why the maps look different
 - a. Time- as needed vs weekly
 - b. Indicators similar but not identical
 - c. DRC follows county lines, USDM uses data polygons
 7. Process outcomes
 - a. DRC
 - i. county-level drought designations that can result in local public water systems enacting drought management plan
 - ii. Severe/ extreme- make recommendations for nonessential water curtailment for only public water suppliers
 - b. USDM

- i. USDA may use USDM for agricultural aid depending on the severity and temporal extent
 - c. DRC relates to public water suppliers, USDM relates to ag
- vii. RBC could collect info in the basin and decide to act on it or get to DRC
 - 1. C: Sam would likely be the first one to hear about ag impacts, then would relay info to us, then we use that info. We hear from water systems if they're having issues
 - 2. C: ag community feels drought before at least 3 weeks before data posted
 - 3. Q: US map doesn't follow county lines. How are the lines drawn? A: Try to be very precise. For ag aid, go with highest designation
 - 4. Q: if state data shows higher drought than fed data, can farmers go to the feds and show that SC considers them a more significant drought? A: it would be difficult. Coming out of a drought situation, saying SCDRC hasn't met but USDM has met

Lunch

12:00–12:30

- 7. Drought Management and Response Discussion – Part 2 12:30–1:50
(John Boyer and Elliot Wickham)
 - a. Drought Response Strategies and Recommendations
 - i. Example drought management plans
 - 1. Key components of plans are drought indicators and triggers
 - 2. Best practices within the state of best practices
 - 3. Had 2 workshops with the Rural Water Association to work on their plans
 - 4. RWA is having a regional meeting on 8/29
 - 5. PDF version of this chart online
 - b. Drought in Urban Water Systems – Lessons Learned (article)
 - i. Authors interviewed water utility managers from 19 urban areas to understand
 - 1. What were the short- and long-term actions taken in response to drought
 - 2. What constitutes an effective drought response, and how was this measured?
 - 3. What are the limitations?
 - ii. Most commonly mentioned responses
 - 1. Demand side: Public education and outreach, water rate adjustments, water use restrictions
 - 2. Supply side: augment supply, connect with neighboring utilities, new reservoirs, new water rights
 - iii. What constitutes an effective drought response, and how was this measured?
 - 1. Reduction in per capita or overall water use
 - 2. Able 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
 - iv. Effectiveness of drought response in terms of
 - 1. Robustness
 - 2. Flexibility
 - 3. Uncertainty

4. Equity, efficiency, and legitimacy
- v. What are some lessons learned and limitations to drought response?
 1. Voluntary measures or community education initiatives were vastly preferred compared to mandatory restrictions
 2. Public perception- neither supply-side responses nor demand-side responses were immune from public criticism
 3. Drought surcharges were rarely utilized as they were seen to be quite unpopular
 - a. C: Greenville increasing their drought surcharge
 4. Being part of a regional plan provided a sense of solidarity
 5. 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 reduction in highly urban, low outdoor use contexts
 6. 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
 7. 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
 8. a drought event itself may galvanize political will to implement policies that in normal years may not be publicly acceptable
 9. nearly every manager interviewed considered demand management to be an integral part of their practices
 10. “The issue of certainty in supply that we all grew up with no longer exists, and we don’t know how different it’s going to be in the future, but we do know it’s going to be different”
- vi. Comments
 1. C: didn’t see the article as data.
 2. C: the area isn’t low outdoor use. Not relevant data
 3. C: if no one’s doing something, how did it make it into the research?
 4. Q: when are we going to say what we think of things? How are we going to put things in a useful context for us? A: A discussion is going to happen starting next meeting. These articles were to get you thinking and get people familiar with drought resources
 5. “Drought in the Southeast” article
 6. West DMA is full but need people for South DMA

8. Upcoming Schedule and Discussion Topics

1:50–2:00

- a. Next meeting: communication plan, drought management response strategies, example recommendations
- b. July 4th- no meeting
- c. August 1st- meeting
 - i. Overview of Salkehatchie agricultural operations
 - ii. Comparisons of scenario flows to minimum instream flows
 - iii. Flow ecology study results
 - iv. Continuation of drought management and response discussion

Motion to adjourn: Dean Moss – 1st and Ken Caldwell – 2nd

Meeting adjourned: 2:02 PM

Minutes: Taylor Le Moal and Tom Walker

Approved: 8/1/24

RBC Chat:

11:01:31 From Thomas Walker to Everyone:

10 min break - 11:10

11:31:11 From Lawrence Hayden to Everyone:

all good here

11:42:58 From Alex Pellett to Everyone:

Tom, I'm ready to respond to the questions raised earlier regarding Thermo-electric and Public Supply projections. I'd like to share my screen. It won't take long.

11:57:39 From Alex Pellett to Everyone:

That was Mr. Nardi who asked for a copy of the BJWSA report for Hilton Head PSD, correct?

11:57:59 From Thomas Walker to Everyone:

yes Pete Nardi HHI PSD

12:22:27 From Thomas Walker to Everyone:

20 min break for lunch restart around 12:40

14:01:20 From Lawrence Hayden to Everyone:

gone on vacation

14:01:41 From Leslie Dickerson to Everyone:

I might be in vacation but my alternate can attend.

14:01:43 From Thomas Walker to Everyone:

meeting adjourned

14:01:55 From Lawrence Hayden to Everyone:

thanks. I will try to call in