

Lower Savannah-Salkehatchie River Basin Council

**March 7, 2024 Meeting Minutes**

**RBC Members Present:** Jeff Hynds, Pete Nardi, Ken Caldwell, Dean Moss, Courtney Kimmel, Brian Chemsak, Brad Young, Sara O'Connor, Brandon Stutts, Lynn McEwen, Lawrence Hayden, Bill Wabbersen, Brad O'Neal, Reid Pollard, John Carman, Kari Foy, Heyward Horton, & Leslie Dickerson

**RBC Members Absent:** Austin Connolly (Angel Brabham, alternate, present), Danny Black (Kathy Rhoad, alternate, present), Taylor Brewer, Sam Grubbs, Joseph Oswald, Tommy Paradise, & Will Williams

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

**Total Present:** 43

1. Call the Meeting to Order (John Boyer) 10:00–10:10
  - a. Review of Meeting Objectives
    - i. Moving out of phase 1 and into phase 2
  - b. Approval of Agenda
    - i. Agenda approved
    - ii. Ken Caldwell – 1<sup>st</sup> and Dean Moss – 2<sup>nd</sup>
  - c. Approval of February 14<sup>th</sup> Minutes and Summary
    - i. Minutes and Summary approved
    - ii. Bill Wabbersen – 1<sup>st</sup> and Ken Caldwell – 2<sup>nd</sup>
  - d. Housekeeping Items
    - i. Newsworthy
      1. TNC purchased Gregorie Neck Property
      2. Sen. Tom Young offered to give legislative updates to RBC
      3. Senate Agriculture and Natural Resources committee to discuss surface water
      4. Google is trying to keep its water use secret
      5. Can bring up things you see in the news
      6. Severe Weather and Flood Safety Week
    - ii. Discussion:
      1. Q: Google said water use is proprietary? Don't have to report?
      2. A: Getting water from a utility and trying to keep it a secret.
      3. A: We have groundwater data for them and they are purchasing water and water utility doesn't parse out the data.
      4. C: Trying to understand their use and there isn't a Santee RBC yet.
      5. C: Hyundai Plant – Bulloch Co, GA 6.5 mgd from the Floridan Aquifer.
      6. C: Coastal GA is going to meet and want to know about Auto Plants and high water use.
2. Public Comment (John Boyer) 10:10–10:15

- a. Public Comment Period
    - i. none
  - b. Agency Comment Period
    - i. none
3. Agribusiness in the Lower Savannah and Salkehatchie River Basins 10:15–10:50  
(Dr. Nathan Smith, Clemson)
- a. SC agriculture
    - a. Farming down since 2017
    - b. Poultry top commodity- chicken, eggs and turkey. Other animals are important too
    - c. Fruits and vegetables- peaches, leafy green, tomatoes, watermelon
  - b. SC major crops by value of production
    - a. Where is hemp? Hemp permits staying stable. A lot of farmers who grew hemp don't grow it anymore since the CBD market crash
    - b. Sweet potatoes? Important, Aiken is a big producer. Hard to compete with NC, quarantine. 3-year rotation for sweet potatoes. Keep peanuts and soybeans out of the same field because diseases
  - c. SC Farm and Livestock Overview
    - a. Farm operations, livestock inventory, milk production
  - d. SC livestock and poultry by value
    - a. Are quail in broilers number? Don't have a number
    - b. How does the geography of the state affect distribution of crops? Coastal side has more cotton, corn, soybean, and peanuts. SC doesn't have a peanut shelling facility
  - e. Forestry
    - a. Forestland makes up nearly 70% of state land area
  - f. LSS
    - a. Land cover categories
    - b. USDA NASS CropScape
      - i. Corn planted acres
      - ii. Cotton planted acres
      - iii. Peanut planted acres
      - iv. Soybean planted acres
      - v. Wheat planted acres
      - vi. Peach planted acres
      - vii. Cattle inventory
      - viii. Hog inventory
      - ix. Poultry total sales
      - x. Market value of products sold
      - xi. Forestry acreage
      - xii. Harvested timber value
      - xiii. FSA-certified crop acres
  - g. Discussion
    - a. Q: Hemp?
    - b. A: Hemp is grown – permits have leveled out. I haven't looked at the value for hemp. CBD market crashed. It has been awhile – I'd have to look it up where it is currently.
    - c. Q: Sweet potatoes?
    - d. A: Aiken processes sweet potatoes – also goes to McCall's Foods in Effingham.

- e. A: NC quarantined us (SC) – more of a marketing thing.
- f. Q: Quail in Broilers?
- g. A: Don't have a number for quail.
- h. Q: Geography in State – impact crops which are grown.
- i. A: (on map) All red, yellow, green dots are row crops. Coastal Plain – sandier soil. Most of crops are grown on Coastal Plain. Cotton is grown around the middle area of the Coastal Plain. Will have a peanut splitting plant coming in. Average cow herd is around 30 head.
- j. Q: Turkey/chicken houses on the map?
- k. A: No looking at foliage on this map. Turkey processing in Kershaw County.
- l. Q: Watching the loss of crop land to influx of solar farms.
- m. A: We don't have that but got a request. We have a faculty member that has mapped pivots – he could map solar too.
- n. C: There has been some recent legislation to protect farm land. Incentive to not go solar.
- o. C: Power companies didn't have a lot of capacity for solar several years ago.
- p. Q: Acres of corn to grow to be commercially viable?
- q. A: Rotate corn and soybeans – 700 – 800 acres of corn. Could be some acres planted for wildlife but that shouldn't be in there.
- r. Q: Tomatoes a row crop?
- s. A: We characterize it as a specialty crop. Competition from South America and Mexico has pushed it out.
- t. Q: Difference in our basin for irrigation as compared to SC?
- u. A: Irrigation is costly and in this area water is more accessible.
- v. C: Can't grow corn dry here we have some aggressive farms in this region. As you move north into the Pee Dee there is less irrigation. Economics play a major role.
- w. C: South GA put in a lot of irrigation for peanuts years ago and irrigation equipment will be paid for over time and increases yield.
- x. Q: Do you have feed lot cattle in total?
- y. A: We don't, if we have them they are small.
- z. 2021 hemp value &2.963 million and avg per pound \$39.50 which is low. In some other states it is around \$300 avg per pound.

4. Marine Resources (Dr. Joey Ballenger, SCDNR)

10:50–11:20

- a. SCDNR Marine Resources Research Institute- conduct research and monitoring programs to assess the condition of coastal resources and provide data to address issues related to these resources
- b. SCDNR inshore fisheries research section
  - i. 2 primary species interest groups- estuarine finfish and coastal sharks
  - ii. Monitoring programs
    - 1. Trammel Net Survey
      - a. Sampling areas- Port Royal Sound
      - b. Target species- red drum, sheepshead, spotted seatrout, southern flounder
    - 2. COASTSPAN survey
      - a. Seasonal survey
      - b. Sampling gear
      - c. Target species- coastal sharks
    - 3. Electrofishing survey

- a. Monthly survey
    - b. Sampling areas- brackish upper estuary creek and riverbank habitats
    - c. Target species- red drum, spot, southern flounder, American eel, Atlantic croaker
  - 4. Adult red drum and shark longline survey
    - a. Seasonal survey
    - b. Target species- adult red drum and coastal sharks
    - c. Habitat- channels at the entrance of estuaries
  - 5. Processing of captured fish
    - a. All fish identified, counted and measured
    - b. Some fish tagged
    - c. Water conditions recorded
      - i. Q: Measure depth caught at?
      - ii. A: Longline yes, otherwise gear is too short.
- iii. Example data products
  - 1. What are we catching? Is it changing over time?
  - 2. When are these species found in the waters of the estuaries? Are they varying when they are found in the waters of the estuaries?
  - 3. Trends in abundance
    - i. Q: Data tied to sampling?
    - ii. A: Tied to real catch – catch per trammel net.
    - iii. C: Striped mullet data St Helena Sound – disappear in January but are there in November and December? (versus the other slide (yearly))
    - iv. C: Average monthly catch over the entire year.
    - v. Q: How are trends varying with salinity? Most decrease as salinity gets higher.
    - vi. A: Flow rates are going to have a different impact depending on species.
  - iv. Abundance of data
- c. Estuarine finfish research section
  - i. Marine stock enhancement research
  - ii. Climate change and increased tropical activity in the western Atlantic
  - iii. tropical systems evaluated
    - 1. storms impact recruitment success- post-hurricane better than pre-hurricane stocking.
- d. crustacean and mollusk research section
  - i. estuarine trawl survey
    - 1. Q: Why is Charleston monthly and the others are 4 times annually?
    - 2. A: Not enough \$ - equipment limitations – the 4 are during season signal times of the year.
    - 3. C: Should be more resources down here w/ Port Helena and Port Royal areas?
    - 4. similar to other long-term monitoring programs
    - 5. target species- invertebrates and finfish
  - ii. Long-term variability in species abundance
  - iii. species specific responses to salinity
  - iv. oyster demographic
    - 1. samples 35-37 sites annually.

2. Survey methods
3. Steady decline in mortality following 2015 rain event and subsequent storms
  - a. Q: How much data did we have pre 2015?
  - b. A: Project didn't start til after 2015
4. Averaging mortality rates by site
  - a. Fresh water kills oysters
  - b. Q: Increased oyster mortality since 2015. Could it be normal?
  - c. A: It could be normal, yes.
  - d. Q: When looking at oyster mortality in Appalachicola it was lack of fresh water.
  - e. A: Too low freshwater inflow can lead to increased mortality with deteriorating water quality.
- e. Environmental research section
  - i. SCECAP
    1. Environmental quality assessments
    2. SCECAP report published on DNR website
      - a. Water quality
      - b. Sediment quality
      - c. Biological condition
      - d. Habitat quality index
    3. Port Royal Sound environmental quality assessment
  - ii. Watershed studies and coastal development
  - iii. Tidal Creek research
- f. Contact list
- g. questions
  - i. Q: How does Waddell Center fit in?
  - ii. A: We have 1 offsite stock enhancement production facility, which is Waddell Center. Would love to have more facilities, very expensive to buy coastal property
  - iii. A: No one stationed at Waddell Center full-time
  - iv. A: Don't do any research on the Savannah River
  - v. Q: Does GA do more research on the Savannah?
  - vi. A: Don't know
  - vii. C: Salinity measured at low tide
  - viii. Q: Use any other organization's data?
  - ix. A: Yes, USGS
  - x. Q: Major takeaways from shark data?
  - xi. A: Some are improving some are declining. Shark populations are low in a lot of cases. Sharks can't increase quickly with 2-3 pups once every 2 years at times.

*Break*

*11:20–11:30*

5. Ecological Flow Relationships (Dr. Luke Bower, USGS and Dr. Brandon Peoples, Clemson) 11:30–12:00
  - a. SC freshwater diversity
  - b. Rivers face threats
    - i. Monitoring helps sustain designated uses
    - ii. Too much water to monitor (for people)
  - c. Use aquatic organisms to monitor river health

- i. Bioassessment
- d. Flow-ecology relationships
  - i. Q: Don't spawn get washed out by flow?
  - ii. A: Graph on slide made up for demonstration purposes.
  - iii. Use of relationships
    - 1. DNR/DHEC sample areas
    - 2. Q: How do separate water quality and flow?
    - 3. A: Hard to parse out, next presentation we will talk limitations.
  - iv. Purpose
    - 1. To provide insight on potential response of organisms to the alternate water withdrawal scenarios produced by SWAM
    - 2. Put SWAM results in biological context
      - a. Example: high demand water use scenario means 25% loss of fish species
  - v. How will this work?
    - 1. Figure out flow ecology relationships
      - a. Already done. Published paper
      - b. ELOHA framework
      - c. Biological data
        - i. 492 fish sites, 530 aquatic sites
        - ii. Q: Our basin – thin along the Savannah – they have the Ecology Lab near SRS, can you use their data? DOE collects data.
        - iii. A: Possibly but they would have to follow the same methods as DNR-DHEC.
        - iv. C: Wadeable streams are what is included in this project?
        - v. C: If DNR didn't collect it, its not included in this data set.
        - vi. Q: Primarily freshwater fish and insects in this study? Invasives?
        - vii. A: Native species spawning cycles can be disrupted allowing for invasives.
      - d. Hydrologic data
      - e. Build a hydrologic foundation of streamflow data
        - i. waterFALL model
        - ii. published paper
      - f. relevance of flow regime components
        - i. magnitude
        - ii. duration
        - iii. timing
          - 1. freshwater fish. Many invasive freshwater species
      - g. classify river types
        - i. ecoregions/ hydrologic class
      - h. identify relationships: some are informative
        - i. remove uninformative relationships
        - ii. 180 informative relationships
    - 2. Filter all the relationships and come to RBC
    - 3. Apply SWAM models to flow ecology models

- vi. Questions
- vii. Q: Relationships fairly stable on the Coastal Plain?
- viii. A: Classified by ecoregion and hydrologic class. Some may be applicable to here and Pee Dee but some won't be.

*Lunch*

*12:00–12:30*

- 6. Select RBC Chair and Vice Chair (John Boyer) 12:30–12:45
  - a. Chair and Vice Chair role- work with planning team to set agenda and talk about the project
  - b. Planning meetings: Virtual, 1x a month
  - c. Pete nominated Ken for Chair and Bill for Vice Chair.
  - d. Chair and vice chair have to be different water interest categories
  - e. Heyward Horton nominated Kari for Chair
  - f. Kari speech for Chair
  - g. Ken speech for Chair
  - h. Vote for chair
    - i. 9-7 Kari wins
  - i. Ken nominated for Vice Chair by Leslie Dickerson
  - j. Bill speech for VC
  - k. Vote for VC
    - i. 13 votes for Ken and Ken is the VC
- 7. Current Water Use and Demand Projection Methodology 12:45–1:30  
(Alexis Modzelesky, SCDNR; Laljeet Sangha, Clemson)
  - a. Water use in LSS
    - i. SC water withdrawal reporting
    - ii. 2022 reported SC water withdrawals
      - 1. Surface water withdrawals
        - a. Q: Permitted or actual withdrawals?
        - b. A: Reported
        - c. Q: What stream is providing water to golf courses on HHI?
        - d. A: We get stormwater runoff that we use.
        - e. C: Golf Clubs want to report to be permitted. Some are connected to stream.
        - f. C: On HHI its reclaimed water for Golf Clubs or bought from BJWSA or they use brackish groundwater.
        - g. Surface water withdrawals by subbasin
      - 2. Groundwater withdrawals
        - a. By subbasin
    - iii. Consumptive use by categories
      - 1. Water withdrawn but not returned to original source
      - 2. Q: If adjusting water supply for septic is it going into the ground?
      - 3. A: If a system is on a septic tank instead of municipal sewer system, the water is being consumed because its stored underground
    - iv. GA 2021 surface water withdrawals
      - 1. 5 nodes in SWAM model, 1 not
      - 2. Q: How do you count % usage if you pull water out of the ground and then it winds up being back on the surface?
      - 3. A: Pump from ground discharged into streams.

4. A: 2 different models, SWAM for surface. Do account for groundwater that's pulled into surface water in the model.
5. C: Impossible to be 100% efficient in irrigation the water is 800 feet deep – lose some to evapotranspiration and to run off.
6. C: We're trying to work on that assumption. Recharge groundwater or run off into ditches?
7. C: Depends on soil type and infrastructure on property. Do want some moisture to penetrate below the surface to put back what we're consuming. Depends on how heavily ditched your property is. Water will be recycled. Systems that pump groundwater, catch the runoff and pull surface flow. Want some moisture to pass below roots.
8. C: In whole water budget it is probably
9. C: Models aren't an exact representation. Should do SWAM training
10. C: In the VA state plan we had similar questions about consumptive use.
11. Q: Is evaporation consumptive use of surface water?
12. A: Time series for evaporation in reservoirs, don't account for evaporation for rivers. 100% consumptive because it gets evaporated into a cloud and doesn't get returned.
13. Q: Crops vs evaporation?
14. A: We care more about what is withdrawn and discharged/returned in SWAM. Account for water when it's pulled out and when its discharged, anything could happen in between
15. Q: What is the uncertainty?
16. A: Uncertainty in reported data.
17. Q: Total mgd withdrawals gross.
18. A: Yes, also have net numbers. They learned this at the SWAM training
19. C: GA model for their planning very coarse. Added more detail on SC side, simplified things on GA side. Focus more on tributaries of Savannah. GA less inclined to give out specific intake locations.
- v. 2021 GA Savannah-Ogeechee Groundwater withdrawals (excluding agriculture)
  1. County level info for security reasons
  2. Q: What's the groundwater source?
  3. A: Very good question – Floridan aquifer is most of it.
- vi. 2021 GA Savannah-Ogeechee Groundwater withdrawals with agriculture
  1. Aggregated by drainage area
- vii. GA Savannah-Ogeechee surface water withdrawals for agriculture
  1. Most surface water withdrawals from farm ponds
  2. Don't have withdrawal info right now
- viii. Historical water withdrawals
  1. Data limitations
    - a. Small withdrawals don't have to be reported, exemption criteria means they don't have to report, increasing trends could be because of increasing reporting compliance, errors during input, no metadata
  2. C: With groundwater we got the entire Coastal Plain to CUAs so they started reporting once the CUAs were established.
  3. Q: Artesan wells?
  4. A: We have some in our monitoring network.
  5. C: Just curious as there are some that people are pumping.
- ix. Trends



1. LSS SC reported water withdrawals
    - a. No big trends for surface or groundwater. Climate can play a role
  2. Surface water withdrawals by categories
    - a. Slight trends, could be caused by maintenance
    - b. Kimberly Clark increased usage, better reporting
  3. Groundwater withdrawal by categories
    - a. C: One example is 2013 one of the wettest summers and we do see a trend of reported groundwater withdrawals. Better recording/reporting or increased pumping. We think its both.
    - b. C: 2014 – 2018 or so statewide ½ of increase in gw was just increase in reporting. Increase reporting to USDA ag census and show spikes @ 2017 – 2018 but again improved reporting. 2019-2020 – beginning to align and less suspicion with the values. For the gw model, important to consider these limitations.
    - c. C: 2013 is right after the surface water law and reporting increased.
- x. Summary
1. Both surface water and groundwater are very important
  2. Surface water
    - a. Top 3 categories: thermoelectric, water supply, and industry
    - b. No strong trends
  3. Groundwater
    - a. Top 3 categories: water supply, agricultural irrigation, industry
    - b. Slight increasing trend for water supply and agricultural irrigation and decreasing trend in industry
  4. Email Priyanka about data questions
- b. LSS water demand projection (Laljeet Sangha)
- i. Is it possible to predict the future?
    1. 1970s predictions: some good, some not
  - ii. Projections are not forecasts
    1. Forecast- educated guess
    2. Projection- extrapolated trend
  - iii. Stakeholder input
  - iv. Development of methods
    1. Meeting with stakeholder interest groups
      - a. Stakeholder feedback
    2. Technical advisory conference calls
      - a. TAC feedback
    3. Publications
  - v. Equations
    1. Water demand mass balance
    2. Return flow mass balance
      - a. Mass balance illustration
    3. Detailed model
  - vi. Projections
    1. Preliminary draft results
    2. Public supply
      - a. Public supply systems

- b. Correction: issue with the naming system. Important part is interconnections
    - c. Population increasing, demand fairly consistent
    - d. Population drives water demand for public supply
  - 3. Manufacturing
    - a. Basin specific
    - b. Projected to have growth rate increase
    - c. Reality: water demand decreases as processes become more efficient
  - 4. Agricultural irrigation
    - a. Projected to grow 38%-44% over next 50 years
    - b. Data show 7% annual growth
  - 5. Possible research
    - a. Industrial water purchases from public suppliers
    - b. Breakdown of water system
    - c. Agricultural demand
    - d. Socioeconomic factors
  - 6. Questions
    - a. Q: In the title, PSD is actually BJWSA.
    - b. A: I've been updating the code and there are some labeling issues. This is the type of info/feedback we want.
- 8. February Meeting Highlights and Discussion (John Boyer) 1:30–1:50
  - a. C: Army Corps gave a lot of great info
  - b. C: We should thank them, very data rich presentation
  - c. C: Outcome of connection of GA and SC integrated committee
- 9. Upcoming Meeting Schedule, Topics, and Field Trips (John Boyer) 1:50–2:00
  - a. Tour of Brad's facility?
    - i. Brad has a drone, could do a presentation in May
  - b. Beaufort/ Jasper/ Hilton Head tour
  - c. Waddell facility tour
  - d. Regular meeting in April
  - e. 4/4/24 meeting- freshwater aquatic resources, hydrology 101, overview of modeling approaches and scenarios.

Meeting adjourned: 2:07 PM

Minutes: Taylor Le Moal and Tom Walker

Approved: 4/4/24

RBC Chat:

11:49:33 From Thomas Walker to Everyone:

break until 12:10 - 12:15

12:42:41 From Thomas Walker to Everyone:

any nominations?

12:47:29 From Brandon Stutts to Everyone:

yes

12:47:40 From Jeff Hynds to Everyone:

Kerry

12:52:36 From Jeff Hynds to Everyone:

Ken

12:52:46 From Lawrence Hayden to Everyone:

yes

12:52:49 From Brandon Stutts to Everyone:

ken

13:05:49 From Thomas Walker to Everyone:

one sec jeff

13:10:13 From Jeff Hynds to Everyone:

IS EVAPORTION a consumptive use of ground water

14:07:50 From Thomas Walker to Everyone:

meeting adjourned

14:07:53 From Lawrence Hayden to Everyone:

thanks very informative

14:07:59 From Thomas Walker to Everyone:

thanks!