**Pee Dee River Basin Council (RBC) Meeting #15 Minutes**
**August 22nd, 2023**

**RBC Members Present**: John Crutchfield, Doug Newton, Megan Hyman, Lindsay Privette, Cara Schildtknecht, Cliff Chamblee, Michael Bankert, Frances McClary, Snipe Allen, Tim Brown, Cynthia Walters, John Rivers, Eric Krueger, Jason Gamble, Walt Beard, Buddy Richardson, & Jeff Steinmetz

**Absent:** Cricket Adams, Michael Hemingway (Alternate Present), Jeff Parkey, Hughes Page (Seth Cook, alternate, present) & Bob Perry

**Planning Team Present:** JD Solomon, Matt Lindburg, Scott Harder, Brooke Czwartacki, Andy Wachob, Alexis Modzelesky, Joe Koon, Leigh Anne Monroe, Hannah Hartley, Thomas Walker, Jeff Allen, and Chikezie Isiguzo.

**Total Attendance:** 45

1. **Call the Meeting to Order (Buddy Richardson, J. D. Solomon - Facilitator)**
   a. Review of Meeting Objectives
   J. D. Solomon (the Facilitator) called the meeting to order at 9:00 AM and welcomed members to the 15th Pee Dee RBC meeting. The main objectives of the meeting included presentations on the Soil Water Balance Model (Recharge Model), the Groundwater Model Recharge Test and Preliminary Calibration Run Results, Surface Water Management Strategies, and Local Land Development Planning. Also included in the agenda was a discussion of Chapters 4-8 of the Pee Dee River Basin Plan.

   b. Approval of Agenda, June 27th and July 25th Minutes and Summary
   The agenda was unanimously approved. The members of the Pee Dee RBC unanimously approved the motion to adopt minutes of the June 27th and July 25th minutes and summary documents.
   June 27th motion made to approve the minutes and summary documents – 1st Buddy Richardson and 2nd John Crutchfield - unanimous
   July 25th motion made to approve the minutes and summary documents – 1st Buddy Richardson and 2nd Snipe Allen and Doug Newton - unanimous

2. **Public Comment (JD Solomon)**
   There were no public comments. Leigh Anne Monroe introduced a new team member – Alex (DHEC)
   Cara updated the RBC on a recent development regarding cross-state planning for mitigation – flood resilience between SC and NC.

3. **Soil Water Balance Model – Recharge Model (Priyanka More, SCDNR)**
   Priyanka More described the Soil Water Balance Model (SWB) primarily used to estimate the spatial and temporal distribution of groundwater recharge on a daily time step. She explained that Groundwater recharge is the volume of water that infiltrates past the root zone and reaches the water table, adding to the groundwater reservoir. The study area for the SWB model is the South Eastern coastal plain. Also, the recharge output from the SWB

model is a primary input to the Groundwater Flow model. The SWB model assumes that recharge takes place when soil moisture value exceeds the total available water in a cell and requires minimum data inputs of Climate (Precipitation, Temperature), Hydrologic Soil Group, Water Capacity, Land Cover, and Flow Direction. The model reports daily recharge value in inches, which is converted to a monthly average recharge in ft/day for USGS.

COMMENTS
Is this Model focused on natural recharge, or does it consider how recharge can change on irrigated lands?
Priyanka explained that the model has the capacity to consider additional water sources but that, as it is currently implemented, it does not include artificial sources of water.

Why do you look at North Carolina and Georgia, too, is it to train the model?
Priyanka explained that the model has to capture all the flows and avoid any limitations.

COMMENT
I sort of expected to see what we call circled areas around big areas of developed cities that have a lot of roofs and concrete. Doesn't that affect the absorption or the penetration?
Priyanka explained that the 2000ft/2000ft cell resolution allows the model to account for all the land spaces, regardless of the level of development.

4. **Groundwater Model Recharge Test Results (Andrea Hughes, USGS, and Brad Harken)**

Andrea Hughes introduced the presentation on the Ground Water Recharge Test and Preliminary run results. She explained the reason for evaluating recharge scenarios, highlighting its importance in the groundwater modeling process. While Scenario One and Scenario Two used Average Annual Recharge and Spatial Variation, Scenario Three used Long Term Average Recharge (1900-2022), Constant, with Spatial Variation. She presented POT Maps 101, which describes land surface contours, showing elevation points measured and topographic lines (connect points of equal land surface elevation). The Maps also showed water levels, described as confined and unconfined aquifers. The Point Map contours describe the water level points or equivalent pressure.

She presented the preliminary results of the model: the maximum change in water level between the three scenarios is 3ft, and the minimum change is 0ft; deeper aquifers near the coast are minimally impacted by the recharge scenarios when compared to aquifer locations near the Fall line; Change to pumping scenarios is expected to have a significantly greater impact on hydraulic head than recharge. Andrea promised to send updated results to the members of the Pee Dee RBC as soon as they are ready.

Question:
I live in a coastal community that's probably a mile from the ocean. A lot of the homeowners' irrigation wells have been sealed off because of too much salt that's killing the grasses and the plants. Does that imply that we are getting inflow from the ocean? Also, does that feature in your figures in any way?

Andrea explained that the Groundwater model covers the coastal areas in the State and that they are aware of the saltwater issue. She also explained that because there are cones of depression in the State of South Carolina and certain aquifers, we have a reversed movement of groundwater, instead of being a net flow out to the coast. In some areas, it is reversed, and it is coming in. And that's why we have been saltwater areas in some parts of the coast.

Question:
I love that underground water is under pressure. That's why, when they dig a well, the water comes up so many feet. How do you recharge it? It's like putting toothpaste back in the tube if it's under pressure. How do you add water to that?

Andrea explained that water flows “down pressure”. She explained that the recharge areas that are up at the Fall line have a higher elevation and a higher pressure than what is occurring at the lower level. She noted that the Fall line in South Carolina is a former seashore, and the need to understand these dynamics and the peculiarities of the Pee Dee basin.

Question:

If we know that water goes into the ground there, why are we not spending money to recharge it?
Andrea explained that there is a Federal program, the Underground Injection Control Program, that dictates what you can inject into the ground. We don’t allow a whole lot of groundwater injections. The injected water must meet or exceed drinking water standards, because we do not allow, like some States, for injection of waste or wastewater. Also, South Carolina does not have to deal with other situations, such as oil fields.

5. **Discussing Chapters 4 and 8, form Subcommittees (Matt Lindberg)**

Matt Lindberg briefed the members of the Pee Dee RBC about the status of the draft plan. The revision of the Chapter One draft following some comments is ongoing. The comment period of the Chapter Two draft will close on August 30. The final work of the Chapter Three and Chapter Five drafts is ongoing and will be sent to relevant subcommittees as soon as they are completed.

He explained that Chapter Four focuses on Current and Projected Water Demand. The Chapter is expected to feature the Current Water Demand, Permitted and Registered Water Use, Projection Methodology, and Projected Water Demand. Matt will send completed sections of the Chapter (draft) to the subcommittee and reviewers for their feedback.

Chapter Eight focuses on Drought Management. Matt and his team are already working on some sections, such as Existing Drought Management Plans and Drought Management Advisory Groups. Subsequent work will cover RBC Drought Response.

Matt called for volunteers for the subcommittees to review Chapters Four, Five, and Eight

The members of the Subcommittee are:

Chapter Four – subcommittee sub-chair – Cliff Chamblee

Chapter Five – subcommittee sub-chair – Buddy Richardson, Member: Snipe Allen

Chapter Eight – subcommittee sub-chair – Lindsay Privette, Member: Doug Newton

Matt also reminded members of the Pee Dee RBC to send in pictures for use in the final plan.

6. **Local Land Development Planning (Leigh Kane, Waccamaw Council of Governments)**

Leigh Kane introduced herself, highlighting her vast experience in land use and water planning at various levels of administration. She stated that local watershed protection helps in the management of water quantity (infiltration/runoff), protection of water quality, mitigation of future flood losses, and protection of the habitat.
She discussed some local government regulatory tools such as zoning, with which the local governments regulate uses, lot dimensions, landscaping, lot coverage, impervious surfaces, aesthetics, character, and overlays. Another tool is Land Development/Subdivision Regulation, with which the local governments regulate lot design, ingress/egress, roads, open space, and easements, Also, local governments may have Stormwater Regulations – onsite stormwater retention and grading (plays a significant role in clearing and grading in major subdivisions).

Using the cases of Tree protection and Landscape requirements, she discussed the challenges small local governments face in implementing regulations. She also discussed Low-impact development practices as ways to manage stormwater and promote infiltration. They can be regulated through zoning with impervious surface limits, parking lot design, and overlay. However, a Stormwater department really needs to be involved to evaluate if designed and maintained to meet onsite retention/infiltration requirements. Leigh demonstrated that requiring a percentage of upland property to remain undisturbed is a more effective way for onsite land protection compared to other methods.

Finally, Leigh noted local authorities require local capacity. She explained that many rural communities in the Pee Dee River Basin still do not have zoning or have limited staff to develop such ordinances and enforce them. Sometimes, the best place to start is public education. Regarding Riverine/wetland buffer widths, many local governments are hesitant to set a width and do not want to proceed with regulating wetlands or requiring local wetland protections unless the State or Army Corps leads the effort or sets the standard.

Question
Have you seen much push to focus on xeriscaping and maybe water-saving vegetation?

Leigh confirmed that she has not seen a lot of push for xeriscaping. However, it will most likely be more effective if it is implemented at a commercial or multi-family development level. She noted that she has seen drought-tolerant plants in some local government's landscaping list.
Leigh encouraged the members of the Pee Dee RBC to consider working with other stakeholders to promote discussions around what a model wetland buffer, protection, ordinance looks like, or model floodplain protection ordinance in relationship to a wetland or a river, especially as it affects zoning. Also, the Pee Dee RBC can make recommendations around watershed buffers that will encourage local governments to make new regulations.

7. **Surface Water Management Strategies review (JD Solomon)**

J. D. Solomon provided guidance on some surface water management strategies.

Some Demand Strategies include:
Industrial Conservation: Water reuse and recycling, Water efficient processes and Water loss control, Low flow fixtures, toilets, and appliances.

Thermoelectric Conversion: Reclaimed water, Switch to combined-cycle natural gas, Energy saving appliances.

Municipal Conservation: Water loss control programs, Low-flow fixtures, toilets, and appliances, Pricing structures, Xeriscaping.

Ag/Irrigation Conservation: Water audits and center pivot sprinkler retrofits, Dammer Dikers, Cover Cropping, Crop Selection.

Some Supply strategies include:
New or Increased Storage: New impoundments -ponds, reservoirs, tanks, Dredging (pond deepening, Reservoir expansion (raising dam height), aquifer storage, and recovery.

Water Reclamation: Water reuse systems (non-potable), Direct Potable use, Stormwater capture, and treatment.

Conjunctive Use:
Using groundwater to augment surface water during low flow periods.

Conveyance: Regional Water Systems, Utility Interconnections, Interbasin transfers.

Desalination: Treatment of brackish groundwater, Desalination of Seawater.

J. D. Solomon advised the members of the Pee Dee RBC to consider the peculiarities of the Pee Dee Basin in their discussion about the strategies.

8. **Surface Water Management Strategy Breakout Groups**

Group One, in addition to the suggested strategies, discussed the potential of solar as an alternative energy source leading to less reliance on water-based energy sources.

Group 1 notes: Demand Strategies

Industrial Conservation – all items good

Thermoelectric Conservation – A member mentioned Solar to reduce water use.

Municipal Conservation – all items good

Ag/Irrigation Conservation – Drop Dammer dikers

Supply Strategies

All strategies good with no additions added.

Group Two discussed that there may be ways of improving industrial conservation and thermo-electric. The group wondered about the net effect of implementing some of the strategies, like how many people it would take to key into a strategy for it to have a positive effect. The group also discussed how to look at drought, specific conservation versus everyday conservation activities.

On supply strategies, the group talked about desalinization. The group noted that solar is not quite a problem yet but thinks it is important to include it since the plan is looking at a long horizon into the future. It could develop as an issue in the future. They also talked about stormwater capture and treatment for water reclamation (stormwater, capture, and reuse without having to do massive amounts of treatment). The group also talked about conjunctive use, how practical it is, and if it is worth the investment.

Group 2 notes: Demand Strategies

What is the net effect of these strategies? Is it enough to make a difference?
Strategies should be evaluated for drought specific vs. everyday conservation
Water audits could provide top priorities

Industrial conservation

1. Water reuse and recycling
a. Reuse and recycling are already done
i. Sustainability drivers are internal.
ii. Encourage internal coolers to minimize, still some options but there are expensive
2. Water efficient processes Water loss control
3. Low flow fixtures, toilets, and appliances
a. depends on local codes, may not be required
i. alter building codes – review
ii. Incentives potential

Thermoelectric conservation

1. Reclaimed water
a. Already doing it; not going to waste
2. Switch to combined-cycle natural gas
a. High cost; lack of infrastructure
3. Energy saving appliances (which reduces thermoelectric generation needs)

Supply Strategies

Water Reclamation

Stormwater capture and reuse could be an idea

Conjunctive Use

How practical is it? Is it worth the investment?

Conveyance

1. Regional water systems
2. Utility interconnections Interbasin transfers

Desalination

Saltwater might not be an issue now, but it may be in the future

Pulls silting in; need maintenance

Group Three expanded the scope of the discussion to how the Pee Dee RBC may need to consider eventually morphing into a management group with the North Carolina side. J. D.. Solomon noted that this discussion was outside the strategy discussion of the breakout session and advised that it is more suited as a policy discussion. The group also mentioned deploying modern agricultural equipment and systems.

Group 3 notes:

1. Good with municipal side, not in tune with indigenous landscaping
2. Federal government dictates low-flow fixtures so contractors get those fixtures
3. Is this proactive or has the ship already sailed here?
4. Ship has sailed
5. Irrigated meters? Developers build a subdivision mandating irrigation systems (ex: M, W, F) and you see it during the summertime – HOAs aren't helping on water conservation (county ordinances or statewide?) – built in with HOAs irrigating during rainy days – 30% demand is irrigation

9. **Closing Comments and Upcoming (Buddy Richardson and JD Solomon)**

Plus Delta Discussion:

We didn't make it to agriculture. We went to Woodard Farms - was a good field trip and learned about ag efficiency.

Market dictates crops grown

Water balance

Solar offsets (can be done right or wrong)

Low capacity of some governments – recommend regional planning/COGs and other partnerships
Who ran out of water during the last large droughts? 2002 drought
Most of the area fixed our problems after the last droughts of 2002
Neighborhoods are wasting water
Conjunctive use – during high flowing events we should figure out a way to recharge the groundwater
Remove dammer dikers as those are really for potato crops
J. D. Solomon appreciated the members of the Pee Dee RBC for their participation and encouraged them to continue thinking through the strategies.
The next meeting will be held on September 26th , 2023, at the Clemson Pee Dee Research and Education Center, Classroom #240 Darlington, SC 29532
The meeting concluded at 12:35 PM.

Minutes: Chikezie Isiguzo and Tom Walker
Approved: 9/26/23

RBC Chat:

09:27:49 From Devendra Amatya To Everyone:

Priyanka, A nice presentation showing increasing recharge in recent years using a USGS WB model consistent with our Santee EF data. Just curious what PET method, if any used, was used for ET loss analysis? Was it Hargreaves-Samani PET?

09:30:18 From Devendra Amatya To Everyone:

Also how was the vegetation root depth estimated?

09:37:04 From Devendra Amatya To Everyone:

Thanks, Priyanka. If needed it may be interesting to compare some of these results for the SC coast from our FS WaSSI model ?

09:55:42 From Tim To Everyone:

I need to step away for a few for a quick meeting.

10:04:07 From Jimmy Clark To Everyone:

Potentiometric (POT) maps.

10:20:18 From Devendra Amatya To Everyone:

Nice work, Andrea

10:29:57 From Thomas Walker To Everyone:

thanks

10:31:06 From Thomas Walker To Everyone:

we're going to take a 10 min break before the next presentation

11:26:14 From Tim To Everyone:

I'm back

11:55:24 From Thomas Walker To Everyone:

if there aren't anymore things to discuss on the online group we'll just wait for the bigger rbc to get back together. i'm going to mute the mic

11:56:56 From Matt Lindburg, Brown and Caldwell To Everyone:

To the online group....if you have any comments on the demand strategies, we could add them to the chat.

11:57:24 From Matt Lindburg, Brown and Caldwell To Everyone:

Do any of the ag/irrigation conservation strategies resonate as being more or less effective?

11:58:50 From Matt Lindburg, Brown and Caldwell To Everyone:

I would guess that strategies that both save water while reducing costs or improving yield would be a primary focus.

11:59:51 From Seth Cook To Everyone:

The precision ag approach incorporating soil moisture measuring seems very effective to me. I do not know the percentage

of farmers that implement it.

12:00:40 From Matt Lindburg, Brown and Caldwell To Everyone:

Reacted to "The precision ag app..." with 👍

12:03:07 From Alex Pellett To Everyone:

The Clemson irrigation survey from 2018 indicated that most agricultural irrigators go by their observation of the field, and less than 20% used moisture meters. That is by the number of irrigators, it could be different in terms of the acreage impacted.

12:03:34 From Seth Cook To Everyone:

That number could be increased. As far as supply, there is mention of new impoundments, ponds... I am under the impression that dam

12:04:16 From Alex Pellett To Everyone:

(Sawyer et al, 2018 Presentation at SCWRC Conference). Absolutely could increase, I might bet it has already increased since then.

12:04:51 From Seth Cook To Everyone:

I am under the impression that dams are under more scrutiny follows the recent floods. Is it more difficult to get a dam approved and has the pace of new dams been affected?

12:07:56 From Thomas Walker To Everyone:

about 5 more minutes and then JD will pull the group back together

12:09:04 From Matt Lindburg, Brown and Caldwell To Everyone:

Given the general lack of significant surface water shortages, I could see that smaller-scale supply side strategies might be

implemented by individual water users. For example, for the limited shortages the modeling did identify, water users had small impoundments that they could draw on during drought (an thus mitigate the shortage that the model indicated could occur).

12:15:27 From Alex Pellett To Everyone:

Good question about dams, there are different (state) regulatory requirements for different classes of dams, based on dam height and downstream risks. There are also federal regulations, which I am less familiar with, but I believe there are some exceptions for agriculture, and also some changes or potential upcoming changes. So, we might be able to get answers to this question, based on the type of dam, from the regulatory authorities.

12:35:15 From Thomas Walker To Everyone:

meeting adjourned thanks