NC Nutrient Criteria Development Plan – Scientific Advisory Council (SAC)

06/8/2021

Attendees

SAC members in attendance:

Marcelo Ardon	Hans Pearl	Rachel Gittman (not present)
Jim Bowen	Lauren Petter	Martin Lebo (not present)
Jud Kenworthy	Fritz Rohde	Michael O'Driscoll (not present)
Jessie Jarvis	Wilson Laney (not present)	

NCDEQ staff in attendance:

Jim Hawhee	Nora Deamer	Dean Carpenter
Peter Johnston	Jing Lin	Heather Jennings
Susie Meadows	Nick Coco	Trish Murphy
Chris Ventaloro	Casey Knight	
Jeff Manning	Mike Templeton	

SAC meeting facilitator:

Emily Barrett

Meeting notes

All questions, comments and answers are paraphrased

1) **Convene** (Emily Barrett)
    a. DWR and SAC Rollcall Introductions
    b. Approval of March Minutes by Jim B. and Han P.

2) **Getting a feel for future meetings:** in-person or virtual. Shorter may be better for virtual.
3) **Update on clarity-related criteria issues** (Jim Hawhee)
    - Had a 3-hour meeting in March with 4 different presentations. Heavy content and great information. Not a lot of time for discussion and we probably need more of that; discussion time. However, a consensus from the group, is that establishing clarity related criteria is an option that we should pursue.
    - Martin Lebo emailed him and expressed a preference for a more direct criterion for clarity, like secchi or PAR. He also raised a good point that we should give some thought to natural conditions, like tannic waters, that are high in color; we should think about how we want our clarity standard to address.
        - Hans: PAR would incorporate a lot of the optical characteristics of the water. We're, episodically, seeing input of sediment from erosional events that have impacts on optics. So, would like to add the role of sediments to discuss.

- Jud K: I think one of the important issues that we face is, we don't really understand our sediment budgets in our estuaries. We see from light data there is a tremendous amount of influence from turbidity.
  Another issue: Colored water has been a driver of the development of the CHPP issue papers; the recognition of different light requirements for both high and low salinity species. Should be working collaboratively with the CHPP process.
  Nathan's work has shown how close we are to the threshold of water clarity that can support SAV and should keep that consistent with the CHPP process.
- Jim B: Maryland and Virginia have direct standards. Seems sensible for a direct standard for clarity.
- Jesse J: Should also have a turbidity standard and maybe chl a.

4) **Review of Maryland and Virginia Water Clarity Standards** (Jim Hawhee)
   a. We could potentially do something similar to what they have done.
   b. **Maryland** Clarity Standard overview: Developed clarity criteria that can be met one of several ways, such as:
      i. SAV acreage meets/exceeds SAV acreage restoration goal.
      ii. Exceeding the water clarity goal (extent of clear water is 2.5 times the extent of the SAV acreage restoration goal).
      iii. A combination of actual SAV acreage and meeting the applicable water clarity criteria in an additional, unvegetated shallow water area equals 2.5 times the remaining SAV acreage.
   c. **Virginia** Clarity standard overview: packed all into one table, identified SAV acreage restoration goal, identified percent light through water, identified clarity acreage goal, identified the temporal application. If you meet any of these, you have met the goal.
   d. **Open discussion**.
      - Jim B: In looking through the VA clarity acres (they seemed 2-3 times the SAV acres), it seemed that they have some sort of false ratio.
      - Jud K: The number that is fixed is the % and the depth will vary according to the segments.
      - Jesse J: I think it may help to share with everyone the documents that they reference (from 2000, 2003, 2004, 2017, etc.).
      - Emily B: Any thoughts on seasonality and determining it?
      - Jud: We have enough information to figure out our seasonality here.
      - Comment in Chat from Anne D.: "For permit reasons, NC uses Apr 1 - Oct 31. It varies by species but wide as possible was desired. This captures the peaks and tail ends of SAV growth."
      - Marcelo: Do we have acreage for restoration for NC?
      - Jud: We have what's been developed through the CHPP process and issue paper is an estimate of the maximum historical extent and we have maps (only high salinity).

- Casey K: Yes, through the issue paper and the CHPP, we developed SAV water bodies/regions and segmented high salinity from low salinity. Most of the mapping is based on available layers that go back to 1981, calling it the known, historic extent (a.k.a. the mosaic layer) of SAV and SAV habitat.
- Jud: The high salinity part of the system, we can reliably map and that's feasible. Right now, our biggest challenge is low salinity acreage values.
- Jim H: In the past we've put a sonar on a boat and basically did a linear transact at the 1-meter depth. Might be a less resource intensive way to get a relative health of the resource or from pilot sites?
- Jud: That's the sentinel site idea and those sites are established and can be mapped, but it's still resource intensive. Maybe we can use hybrid technologies, site-scanned Sonar in the deep water and aerial photography or satellite imagery in the shallow water or drones.
- Emily: Site-specific justification. We'd love to get you guys to think a little deeper about areas where site specific justification might be needed. And Judd, who are you referencing when you mention data foundations?
- Judd: Data foundations come from partnership work through a variety of sources, APNEP, … volunteer input.
  Also, it might be worth doing an exercise where we thought about what it would it cost to get water clarity acres versus actual acres. So, if the standard is based on water clarity, how much would it cost us to collect that information versus what it would cost to get the acreage data by a mapping process?
- Jim H: I do want to make sure that we're proceeding with a sense of what's realistic in terms of standards we can implement down the road. So, I do appreciate you mentioning that.
  If we were going to adopt some sort of restoration acreage goal, then we may have to tie that into a monitoring program that we can sustain.
- Marcelo: I like the idea of using historical extent as part of the goals, however, so much has been changing, like salinity, sediment delivery, browning of the water, so on, that might be challenging.
- Jud: Could use a hybrid approach for high salinity like in the Chesapeake model.
- Jim to Casey or Dean: In what timeline is the monitoring document progressing? And is there any consideration to potential applicability?
- Dean Carpenter: An initial monitoring plan was produced this past March and it addresses both low and high salinity. There was much more focus on developing the high salinity protocols and monitoring. Things are changing like, we're moving away from once every 5 to 6 year aerial survey and to more every year, but in smaller segments so that you cover the entire resource every 4 or 5 years, but any given year, you do more intensive efforts. In the low salinity system, we just can't do the aerial surveys, but starting to develop protocols.

- Emily: There's a bio-optical model that's being developed, does anyone want to comment on that?
- Jud: We've been working on this (Nathan Hall's work). The challenge with the bio-optical model is in transferring it into the low salinity SAV realm with the variability of CDOM. We need to calibrate that model in the low salinity environment. There are two things going on: the CDOM component and the nature of the different types/sizes of particles (organic matter or sediments). The nice thing about the model is we can reach back to sources. We can go forward to the SAV through the model's actual calculation of light attenuation in the water, you can use the model to substitute for a PAR sensor, a secchi disk. So, it has direct application to how much light is reaching the plants. Can decompose the model components to chlorophyll, suspended material, turbidity and CDOM and identify what the major driver of the light attenuation is. And sort those components out and lead you to the source of the stressor.
- Jim H: Maryland and Virginia don't directly utilize measurements from those models. I think they can more be used to establish a management strategy after the fact. Right? If we were to take a similar approach, would we need to supplement that approach with information from our bio-optical model in terms of developing the criteria itself or would we be, okay, using it on the back end?
- Jud: You could use it two ways: substitute it for PAR measurements/secchi depth or use it as a surveillance tool to identify potential sources of stressors.
- Casey: We should look at natural conditions and alterations (like, bridges, marinas,…).

e. Jim H: 3 questions for the group (regarding these Maryland and Virginia clarity standards and approaches):
    1. Is this a useful model in general for moving forward?
    2. Is this a useful model for moving forward with respect to the clarity component of it?
    3. Is it a useful model for moving forward with the SAV specific component of it?

So, do we want to continue to pursue this route on both the clarity and SAV sides?

- Utilized 'the reaction' signs of thumbs up or down for the**se.** Consensus is thumbs up for all.
- Jim H: There's a lot of site-specific considerations and maybe some challenges in front of us. But is moving forward with the SAV related piece (assessing some measure of growth or coverage) worth our time? Some thumbs up.
- Jud: Thumbs up, but we need to have more conversation about it. There's an interest in merging and hybridizing technologies to get the data we need.
- Heather Jennings Chat to everyone: "We just need to be cognizant that this waterbody is not the Chesapeake. While that is the data we have, we need more

data in NC that is Albemarle specific. We need to revisit when everything is fine tuned as Jud suggested."

5) **Update on NSTEPS** (Jim Hawhee)
   a. NSTEPS is a criteria development internal grant program with EPA in which they support work in High Rock Lake and Albemarle Sound.
   b. Right now working with EPA and TetraTech looking to sort of refine remote sensing algorithms along the North Carolina coast. So, we've compiled our chlorophyll a data, algal data and remote sensing data to remotely detect algal blooms across NC.
   c. Technical team is walking them through different decision points to improve utility of remote sensing.
6) **Update on High Rock Lake (HRL)** (Jim Hawhee)
   a. Concluded the HRL criteria development through the NCDP framework with SAC and CIC. Now the Division has made a proposal to the EMC Water Quality committee. Chris Ventaloro presented that on our behalf on May 12.
   b. The core recommendation is really the same as what came from the SAC, which is a geomean of 35 ug/L chl a standard at each of our segments and high rock lake.
   c. DWR sought approval to proceed to public notice in the hearing (Sept 1), which was granted, I believe we're slated for the EMC in July.
   d. So, in addition to the standards language that we provided that that agenda packet. It has kind of a technical overview of our recommendation, and it has the report and a regulatory impact analysis.
7) **Closing** (Emily Barrett)
   - The consensus was, we will be meeting via web for your next meeting.
   - Any other comments, Jim?
   - Jim H: Take home message/To Do's:
     - I'll plan to work with Jud and Hans. Debrief with staff and Jud/Hans debrief with co-chairs to come up with another meeting agenda to try and advance the conversation on these different elements.
     - Get the EPA materials from Jesse and will send those out to the group.
   - We did have 1 question in the chat. It's do you know when or if the Yadkin PeeDee assessment will occur?
   - Jim H: We are in the process of preparing the integrated report through 2020.
   - Edgar: I was asking about the every 5 year lake assessment for the ambient monitoring system.
   - Jim H: Our Intensive Survey Branch does our lake assessments, and my understanding is they are in the Yadkin PeeDee Basin this year. Reach out to Eric Morris for a more complete update.
8) **Meeting Adjourned** (Emily Barrett)