

NC Nutrient Criteria Development Plan – Scientific Advisory Council

1/18/2018

Attendees

SAC members in attendance:

Lauren Petter
Bill Hall
Linda Ehrlich
Hans Paerl
Clifton Bell
Astrid Schnetzer

Marcelo Ardon
Deanna Osmond
Michael O’Driscoll
Martin Lebo
Nathan Hall

SAC meeting facilitator:

Andy Sachs

NCDEQ DWR staff in attendance:

Jim Hawhee
Tammy Hill
Jeff Manning
Connie Brower
Christopher Ventaloro
Bongghi Hong

Nora Deamer
Brian Wrenn
Elizabeth Fensin
Mike Templeton

CIC members in attendance:

In person:

Andy McDaniel
Anne Coan
Bill Kreutzberger
Doug Durbin
Carla Seiwart

Meeting materials can be found on the Division of Water Resources Nutrient Criteria Development Plan Scientific Advisory Council webpage. Click [here](#) for a direct link.

Meeting notes

All questions, comments and answers are paraphrased

1. **Convene** (Andy Sachs, Brian Wrenn)
 - a. Meeting goals:
 - i. Update on pH criteria proposal from Clifton and Martin
 - ii. Update on Albemarle Sound
 - iii. Update on Middle Cape Fear River

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- b. Administrative business:
 - i. Request comments on meeting notes from September 2017 & November 2017 SAC meetings.
 - 1. Bill H. will submit comments for both to Brian W.
 - 2. SAC will approve as part of March meeting.
 - ii. Potential conflicts of interest:
 - 1. Brian thanks those who have provided conflict of interest statements and reminds others to send them in even if they do not have a conflict.
- 2. **Update on pH criterion proposal** (Clifton Bell, Martin Lebo)
 - a. Clifton has sent an update outline document to Brian W. that merges both Martin and his proposal. This has not been distributed to the other SAC members yet.
 - b. Two alternatives are proposed:
 - i. Option #1 = pH 6.0 – 9.5 as instantaneous value, with 10% exceedance/90% confidence
 - ii. Option #2 = pH 6.0 – 9.0 with vertical averaging, with 10% exceedance/90% confidence
 - c. Both proposals draw on the same background material
 - d. The draft proposal has not been completed. Hope to have it finished by early February for the SAC to review prior to the March 28th, 2018 SAC meeting. Clifton and Martin are about two or three weeks away from finishing it.
 - e. The goal is to have this be an official SAC document that either recommends a single proposed criterion or both criteria as options for adoption as water quality standards.
 - f. Proposal will discuss the following:
 - i. Existing water quality standard
 - ii. Effects of pH on aquatic life
 - iii. Relationship to ammonia toxicity
 - iv. Effects on public water supplies
 - v. Effects on recreation
 - vi. HRL specific pH information
 - vii. Outline of the proposals
 - g. Questions/comments:
 - i. Brian W. will distribute to the SAC the merged update document that Clifton has submitted.
 - ii. Clifton B.: The completed draft version will not be available for the SAC to review prior to the next CIC meeting.
 - iii. Brian W.: The SAC review should occur before it goes to the CIC. Would like the final proposals to be set before the CIC gets them.
 - iv. Connie B.: Important that all SAC members agree on this before it goes to the CIC.
- 3. **Albemarle Sound Update** (Jim Hawhee)
 - a. Albemarle Sound Phase I summary document update
 - b. The Phase I proceedings summary document is being prepared

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- i. It is currently being reviewed by the DWR public information office and should be ready in about one week.
 - ii. The target audience is the SAC and the CIC
 - iii. Topics include:
 1. Executive summary
 2. Overview of the Albemarle Sound Workgroup meetings and support materials
 3. Priority research recommendations and status
 4. Appendices which include:
 - Meeting minutes
 - Reports
 - Research proposals
- c. Review of research studies
- i. These are studies that were prioritized by the workgroup to provide additional information for Phase II decision making. They are in varying states of progress. There we 18 proposals overall.
 1. Clarity Optical Model
 - Not underway
 - Total Suspended Solids information is being collected by DWR to support model calibration
 2. Evaluation & summary of historical clarity data
 - Preliminary evaluation is being completed by DWR staff as time allows
 3. Nutrient bioassay studies
 - Two studies were submitted to WRRRI for funding
 - Both were denied funding
 - Hans P.: Two separate studies were proposed by Nathan Hall and Ryan Paerl. They were both judged to be of good quality, but there were about 25 proposals to WRRRI in total and funding was only provided for 2.5 studies.
 4. Quantify historical submerged aquatic vegetation (SAV) coverage
 - APNEP mapping efforts are mostly complete. Further evaluation is not underway.
 5. Evaluation of the correlation between dissolved oxygen sensitive fish species and habitat utility and seasonality
 - NOAA has done a lot of this work already
- d. What's next?
- i. SAC & CIC consideration of criteria proposed in Phase I
 - ii. Potential areas for discussion:
 1. Application and implication of a clarity standard

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2. Chlorophyll-a as a seasonal average
 3. N & P criteria: whether to establish and how to go about it?
 4. Bioconfirmation approach
- e. Questions/comments:
- i. Bill H.: What are the known impairments in Albemarle Sound?
 1. Jim H.: The estuary is a critical fish nursery for many sensitive and economically important species. There has been a lot of algal bloom activity in the freshwater areas (Chowan River) that empty to the sound. Question of when and how this might impact the estuary and sensitive fish. There has also been at least one cyanotoxin hit in the region.
 - Nathan H.: Over the past 10 years chlorophyll-a values have doubled from about 10 ug/L to about 20 ug/L. Not sure what is driving this. Also, SAV loss has been observed.
 - Bill H.: It will be helpful to have a list of the uses and any impaired waters in the sound.
 - Hans P.: There are other areas besides the freshwaters that are susceptible to algal blooms. These are important to consider as the blooms that do occur in these areas are associated with different species than the typical blue—greens that we are talking about in relation to HRL.
 - Astrid S.: We have been doing some research on dissolved toxins in the Chowan River (not further than Edenton, NC). These samples were collected between June 2016 and August 2017. They haven't been analyzed yet, but I can provide an update on this for the March SAC meeting.
 - Astrid S.: It would be good to hear from fishery experts regarding the importance of the Albemarle to aquatic life.
 - i. Jim H.: We can do this. We had experts speak before the Albemarle Workgroup. It would be helpful to have them come back.
 2. Clifton B.: There is sufficient data to quantify where SAV should be based on historical growth. This could be used to help establish appropriate goals.
 - Jim H.: The eastern portion of the sound has clearer waters and is better for using aerial imagery to determine SAV location. The western portion is less clear and the state is moving to boat based surveys in this area.
 - ii. Bill H.: Have the nutrient levels been increasing or decreasing?
 1. Nathan H.: As part of my study proposal to WRRRI I looked at some historical data (from DWR) for the estuary. Nitrogen has about doubled (0.3 to 0.6 mg/L) in the past 10 years. Phosphorous has remained stable.

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2. Brian W.: DWR has data that shows that nitrogen has been increasing and is back to the levels seen in the 1980's.
3. Mike O.: One of my graduate students is looking at salinity and has found a long-term increase in the salinity in the sound. This is significant in that the relationship between N, P and chlorophyll-a has been shown to increase as salinity increases.
- iii. Jim H.: Regarding scheduling, it would be for the SAC to give some thought as to the types of research being requested for Phase II. This could help prioritize where efforts should be focused.
 1. Brian W.: Think about the information that you need that falls outside of what the Division normally provides. Important to go back and read through the Phase I proposals.

Cape Fear River update (Brian Wrenn)

- f. Brief update on modeling efforts for the middle Cape Fear River
 - i. We have a proposal ready for monitoring that will support the development of the model
 - ii. There will be nine new stations that DWR will monitor
 - iii. There will be increased monitoring frequency to gather more information especially during warmer seasons
 - iv. This monitoring will occur near the Haw River, New River and in areas near Fayetteville
 - v. Monitoring coalitions will not have new stations. Frequency of monitoring at existing stations will be increased. We are actively seeking buy-in from the coalitions. Part of this will include a dissolved oxygen study relevant to nutrient loading (NPDES).
 - vi. Parameters will include:
 1. Orthophosphate
 2. BOD
 3. COD
 4. TOC
 5. Chlorophyll-a
 6. Phytoplankton
- g. Questions/comments:
 - i. Clifton B.: What modeling code is being selected and how will it be used?
 1. Brian W.: Pam Behm (DWR staff) will be able to provide more information on this. The model (CE-QUAL-W2) will be used for nutrient criteria development and for NPDES permitting.
 2. Clifton B.: Is it a nutrient model?
 3. Brian W.: Partly. It will also be used to model dissolved oxygen.
 4. Clifton B.: Is the primary purpose for BOD wastewater implications?

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5. Brian W.: That is one of the purposes. The other is for nutrient criteria development.
- ii. Deanna O.: Will this monitoring effort overlap with the work currently being done for Jordan Lake?
 1. Nora D.: This monitoring will occur only in the areas south of Jordan Lake.

Feedback for moving forward (Brian Wrenn)

- h. Brian asks SAC members for thoughts on how they want to organize future meetings. What do they want to focus on going forward?
 - i. Hans P.: Albemarle is an important system. There is evidence of increasing eutrophication in the system. This is a high priority system due to its importance as a fish nursery. Knowledge gaps regarding nutrients in the system. We can do literature searches, but this may not capture the unique nature of the system. We need more background information. What is the purpose if we don't have the data to inform our decisions.
 - ii. Clifton B.: Agrees with Hans. Difficult to move forward with Albemarle. Cape Fear River has more opportunity to move forward. We can narrow down based on literature and existing knowledge. Is the existing chlorophyll-a standard appropriate for a riverine system such as the CFP. If not, what can we suggest?
 - iii. Bill H.: We first need to see what data is available for both systems. Then we can make a decision how to proceed.
 - iv. Lauren P.: Agrees with Bill. For Albemarle, we can look at the Phase I report in detail and have a meeting to discuss. We can then discuss the Cape Fear in another meeting.
 - v. Andy S.: Are there objections to having a separate meeting for each system?
 - vi. Deanna O.: Can staff do some of this preliminary work? That might help to decide if we need two meetings for this.
 - vii. Hans P.: The Albemarle is probably the most important system for which we need to establish criteria. Can the SAC provide an official statement declaring that we need more information to study this system so that we can make these decisions?
 - viii. Andy S.: Staff is leaning towards working on the Cape Fear. Can we have a meeting to discuss the information that we have and the information that we need for the Albemarle? Then we can move forward to focus on the Cape Fear.
 - ix. Hans P.: In the Cape Fear, there is evidence that nutrients are not the limiting factor. Nutrients are more critical for the Albemarle.
 - x. Andy S.: Is there consensus on this path forward?
 - xi. Linda E.: That would be good.
 - xii. Marcelo A.: We've been doing flow studied in the Cape Fear. It would be good to take a field trip to see first-hand the range of conditions in the Cape Fear.
 - xiii. Jim H.: For the next SAC meeting we can start with the Phase I proposals and discuss which would be most beneficial to focus on.

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- xiv. Andy S.: So we have the following to focus on going forward:
 - 1. Prioritize the Albemarle Phase I research proposals
 - 2. Organize a field trip to the Cape Fear River
 - 3. Finalize HRL criteria
- xv. Brian W.: Look to get pH proposal from Clifton and Martin. For the next SAC meeting (March 31, 2018):
 - 1. HRL chlorophyll-a proposals (Lauren, Clifton)
 - 2. HRL pH
 - 3. Albemarle Phase I research proposal prioritization
 - 4. Cape Fear River