

**Science and Technical Advisory Committee
Fall Meeting (Webinar Only)
Albemarle-Pamlico National Estuary Partnership
December 1, 2020**

STAC Members: Brian Boutin (TNC), Bo Dame (Chowan U), Michelle Moorman (US-FWS), Jud Kenworthy (US-NOAA ret.), Wilson Laney (NCSU), Paul Angermeier (USGS/Virginia Tech U), Lee Bodkin (USGS), Eric Brittle (VA-DWR), Randall Etheridge (ECU), Don Field (US-NOAA), Erin Fleckenstein (NCCF), Joel Fodrie (UNC-CH-IMS), David Glenn (US-NWS), Tim Goodale (ECSU), Jane Harrison (NCSG), John Iames (US-EPA), Peter Kalla (US-EPA), Rua Mordecai (US-SACB), Dan Obenour (NCSU), Hans Paerl (UNC), Donna Schwede (US-EPA), Greg Taylor (US-NRCS), Doug Wakeman (Meredith U ret.), Rich Whittecar (ODU ret.)

Leadership Council: Paul Cough (US-EPA ret.)

Guests: Anne Deaton (NC-DMF), Michael Flynn (NCCF), Nathan Hall (UNC-CH-IMS), Rachel Hart (US-EPA), Casey Knight (NC-DMF), Forest Shepherd (NC-DWR), Kelly Somers (US-EPA)

APNEP Staff: Dean Carpenter, Tim Ellis, Bill Crowell, Stacey Feken, Heather Jennings, Jimmy Johnson, Trish Murphey

Call to Order / Welcome and Introductions / Meeting Notes Approval / Meeting Objectives

Dame: reviewed agenda and meeting goals.

- Meeting notes from the STAC summer meeting were moved/second and approved.

APNEP Staff Update and Member Reports

Carpenter: briefly reviewed APNEP staff and STAC member updates.

- Eight STAC members provided highlights

APNEP Staff Update on Submerged Aquatic Vegetation (SAV) Monitoring Plan

Carpenter: gave a presentation on the final development phase of the APNEP SAV monitoring plan

- See presentation slides (to be posted on [STAC events page](#))
- Purpose is to update STAC on progress made since the summer STAC meeting and ensure STAC members understand their role in the final development phase of the plan
- This plan is a “pilot” effort that will guide other monitoring and assessment teams (MATs); approval by Leadership Council in early 2021
- STAC members not interested in SAV and water quality can look to this SAV monitoring plan as a case study that other MATs should consider; a reminder that STAC members are assigned to at least one MAT
- A companion document is being developed for the APNEP monitoring framework that will address the “big picture” monitoring issues common to all components of the

APNEP regional ecosystem; longer-term vision is that there will be a framework and a master library of monitoring plans

- Two monitoring sub-committees of the APNEP SAV Team were formed, one for high salinity and one for low salinity. Each committee met on approximately a biweekly basis during September and October for a total of five meetings each, with the fifth meeting being a joint meeting of both committees. List of STAC members that were participating: Kenworthy, Corbett, Dame, Laney, Moorman, Fodrie, Field, Kalla.
- Summary table of committees' monitoring recommendations
- Timeline for final development phase

Open discussion on monitoring

- Laney: thought the SAV monitoring sub-committee meetings went well
- Laney: alerted the STAC to a new Smithsonian article on SAV: <https://www.smithsonianmag.com/science-nature/seagrass-ocean-secret-weapon-climate-change-180976235/>
- Dame and Laney: mentioned springboarding this SAV effort to other MATs
 - Start simple and pick 1-2 indicators per team to develop
 - Laney: suggested that American shad is a good species that North Carolina and Virginia could collaborate on through the new memorandum of understanding
 - Laney: asked Moorman about a water quality monitoring plan
 - Moorman: noted the automated water quality data tool being developed through an interagency collaboration between USFWS and USGS [editor's note: APNEP is supporting Nathan Hall's work on this project]
 - Moorman: will share the pilot report of this work with the STAC
 - ACTION ITEM: Staff (Ellis and Carpenter) will work with Moorman to schedule a Water Resources MAT meeting
 - Ellis: staff intention to develop the SAV plan first and then proceed to the supporting water quality components
- Dame and Laney: asked about plan for moving other MATs forward
 - Schwede: Air Resources MAT is ready to move forward with addressing monitoring needs (e.g., to determine a nitrogen budget)
- Mordecai: added to his member update that he has been helping a geologist make predicted maps of historic Carolina Bays more accessible. They cover Virginia down to part of Georgia and are based on LiDAR. Here is what the results look like: https://drive.google.com/file/d/1s7PuVOEq1h7DHHGUPORJ_jSZ4C9BgMn/view?usp=sharing. Here is a link to the work: <https://cintos.org/CarolinaBays/index.html>
 - Whittecar noted that he is looking for Carolina Bays with rich hydrological data for some research he is doing; he will talk offline with Boutin

Dame: transition to the next agenda topics, which are three presentations

Chlorophyll-a Standards for SAV Protection in APES

Hall: gave a presentation on an APNEP-funded analysis of chlorophyll-a standards for SAV protection in APES

- See presentation slides (to be posted on [STAC events page](#))
- Conclusions
 - Model works well for high-salinity waters where it was calibrated
 - Model will require recalibration for low-salinity waters
 - Poor CDOM estimation is not the only cause of bias but CDOM data is badly needed
 - High-salinity areas examined were near clarity thresholds but Chl *a* was a minor component of attenuation
 - Current Chl-*a* levels and water-quality standard (40 µg/L) are protective of clarity targets for high-salinity SAV [editor's note: this preliminary conclusion has since been retracted by Dr. Hall in response to subsequent findings.]
- Open discussion
 - Hall: re-emphasized that we need to start collecting CDOM data; it is cheap and needed to calibrate the bio-optical model for low salinity
 - Need to look into remote sensing data for CDOM
 - Dame: what type of spectrometer and drone sensors are needed to collect and assess CDOM data?; he and STAC member Corbett may try this out in Currituck Sound
 - Kenworthy: how to link Hall's findings back to nutrient data – Is our high-salinity SAV resource fairly safe from nitrogen danger?
 - Kenworthy: asked if Hall has to calibrate the model for all three low-salinity areas (Neuse R., Pamlico R., Albemarle Sound) or will rigorous calibration in one area be enough to extrapolate to the other two low-salinity areas?
 - Hall: could twist knobs in the model and get it to fit, but then it's just an empirical model with limited predictive power. He thinks a good calibration is needed for Albemarle Sound regardless because that system is very different from the others; however, the Neuse and Pamlico Rivers may be similar enough to just do calibration in one of those two systems

Chowan River and Albemarle Sound Nutrient Budgets

Paerl: gave a presentation on Chowan River and Albemarle Sound nutrient-bloom dynamics over the past 40 years

- See presentation slides (to be posted on [STAC events page](#))
- Conclusions
 - 40 years of bioassays has shown nitrogen to be the most limiting nutrient, but nitrogen and phosphorus co-limitation and even phosphorus limitation can occur, depending on bloom magnitude and presence of nitrogen fixing cyanobacteria
 - Nitrogen limitation has persisted, despite increases in nitrogen loading; most likely due to legacy phosphorus in the system, maintain phosphorus availability

- Nitrogen stimulation of algal production appears to have paralleled increases in chlorophyll in Albemarle Sound
- Further nitrogen input reductions needed, while holding the line on phosphorus inputs
- Need: identify nitrogen inputs...external sources vs. internal source (nitrogen fixation)
 - Then, determine reductions needed to get below bloom thresholds
- Climatic changes need to be taken into consideration (more episodic rainfall and extreme drought events, warming?) because they can affect nutrient-algal production relationships

Chowan Basin Water Resources Plan Development

Shepherd: gave a presentation on the 2021 Chowan River Basin Plan

- See presentation slides (to be posted on [STAC events page](#))
- Highlights
 - General overview of the basin plan process and the Chowan River plan
 - Recommendations for protecting water resources in the Chowan River basin
 - Identify and evaluate opportunities to continue promoting and implementing nutrient reducing best-management practices (BMPs) throughout the basin
 - Provide new financial support and additional staff to state agencies and review the Chowan River basin Ambient Monitoring System program
 - Establish better communication between Virginia DEQ, North Carolina DEQ, and APNEP
 - Continue to support and expand the ambient monitoring of groundwater in the Chowan River basin and statewide through the Ground Water Management Branch
 - Consider implementation of nonpoint source management strategies
 - Consider financial incentives to promote strategic preservation or restoration of riparian areas
 - Information about water use needs to be collected from all water users
 - Continue to work with the Nutrient Criteria Development Plan's Science Advisory Committee (SAC) to develop appropriate protective criteria
 - Timeline for other basin plans
 - White Oak (May 2021), Pasquotank (July 2021), Neuse (March 2022), Roanoke (January 2024), Tar-Pamlico (January 2026)
- Open discussion
 - Dame: wood pellet industry and forestry impacts?
 - Fleckenstein: plan needs more information on change in land uses; it currently just focuses on past land uses
 - Laney: how this new plan compares to information covered in past plans (indicators, etc.); how has the monitoring and management advanced over time?

Public Comments and Action Items

No public comments.