

**Science and Technical Advisory Committee**  
**Spring Meeting**  
**Albemarle-Pamlico National Estuary Partnership**  
April 30, 2019

STAC Members: Jessica Whitehead, Brian Boutin, Michelle Moorman, Reide Corbett, Paul Angermeier, Eric Brittle, Don Field, Erin Fleckenstein, David Glenn, John Iames, Pete Kalla, Jud Kenworthy, Burrell Montz, Rua Mordecai, Douglas Wakeman

Guests: Donna Schwede, Molly Yacano, David Dozier

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

**Call to Order / Welcome and Introductions / Approval of Fall 2018 meeting notes / Meeting objectives**

- Jess Whitehead calls meeting to order, welcomes everyone. Meetings held twice a year, summer and early winter. Next meeting will be on September 12 at Chowan University.
- Last meeting, focused on mariculture impacts, what APNEP could/should be doing. Today need to dig into progress from monitoring and assessment teams (MATs), looking at planning, monitoring, assessment for the update. Think about what has/hasn't been working on a member's assigned team, how that may apply to other teams.
- December 2018 meeting notes – any revisions needed? Motion to approve from Eric Brittle, seconded by Douglas Wakeman. All in favor.

**APNEP Staff Update and Member Reports**

- Dean Carpenter informs STAC about member report highlights, staff highlights.
  - o December 4 – EPA Program Evaluation Letter received (see appendix below). Multiple STAC members participated in program evaluation in May 2017.
  - o SAV Flights this spring – filling the gap in monitoring. Aerial component and boat-based component. NC DMF is assisting greatly with collecting boat-based “ground-truth” data.
- Bill Crowell –APNEP is currently zeroed out in the President's FY 2020 budget, was zeroed out in FY 2019 as well. The Association of National Estuary Programs (ANEP) works in Congress to assist in maintaining funding.
- Dean C – member reports. No questions.
- Dean C – new website, website revamped. Kelsey Ellis talks briefly about the new website, STAC feedback and questions are welcome.
- Dean C – Recognition of Burrell Montz for STAC membership, contributions. Presentation of plaque on behalf of APNEP staff. Recognition of Robin Dennis, who is stepping down from the STAC – was a STAC founding member, leader of Air Resources MAT.

**APNEP/NC Sea Grant Fellowship Report**

- Mollie Yacano, APNEP-SG Fellow, presenting findings of her research. Impacts of invasive *Phragmites* on nitrogen processing in the Albemarle-Pamlico system.

- Most eradication methods also destroy marsh platform, typically doesn't lead to reestablishment of native species
- Considered invasive and lowers biodiversity but performs similarly to native species in terms of carbon storage and shoreline stabilization. Vertical accretion, no difference in greenhouse gas emissions.
- Across all seasons, *Phragmites* has significantly higher rates of denitrification. Warmer summer temperatures may allow for higher rates of denitrification. Rates were sustained into the fall. Data also suggest steady rate of denitrification across native grasses and unvegetated mudflat.
- During storm events, all environment types may experience denitrification, though rate/variability may be small
- *Phragmites* denitrification increased post-hurricane Florence

### **APNEP Planning, Monitoring and Assessment Update**

- Dean C: second staff update. Overview of STAC history, strategic planning model. Update on APNEP's adaptive management cycle – plan, manage, assess, monitor. Overview of previous periods of STAC history, MAT activity 2017-2018.
- 2012 Ecosystem Assessment will be followed up by 2020 Ecosystem Assessment. 2020 Assessment will include indicator reports, syntheses addressing assessment sub-elements.
- Emphasis that this is partnership, need support from committee members to make things happen and move this forward.
- Tim Ellis: 2018 APNEP Program Evaluation by EPA – one of the core elements is the need to have monitoring and assessment to evaluate health of the system and determine if your CCMP is making a difference. EPA in their letter noted that they've been requesting a monitoring plan from APNEP since 2002, indicator development progress has been happening since 2004. Most recent evaluation period included 2012 ecosystem assessment but didn't have targets and management goals.
- EPA recognizes progress since 2017 with Monitoring and Assessment Teams. Encouraged APNEP to continue leveraging support to prioritize our limited resources and strategize monitoring efforts. APNEP has other initiatives so we need to be strategic.
- Challenges provided by EPA:
  - o Finalize completion of a monitoring strategy, adopt indicator suite, link indicators to a robust monitoring strategy
  - o Reporting – better communicate programmatic accomplishments and environmental results using NEP Program Evaluation Guidance
  - o Where we're stalled – monitoring plan in use that is recognized and/or approved by the Management Conference, and plan produces data to support an analysis of specific environmental conditions – requirement in NEP funding guidance
  - o Want to increase frequency of publishing environmental progress reports. Where we're stalled – reports aren't tied to indicators, health of the estuary, etc.

### **Water Resources Monitoring Design for AP Estuaries**

- Michelle Moorman: Overview of water monitoring program progress. There are lots of plans, indicators and actions out there – APNEP, USFWS, National Monitoring Network,

Landscape Conservation Cooperative (LCC) Conservation Blueprint. Sometimes feels like we're doing a lot of planning, but implementation can be an issue. CAPES group strategic plan has been stuck on how to move indicator assessment forward. Solution – focus on a couple conservation targets that were relevant to USFWS refuges in eastern North Carolina. Body of land they could actually influence and make a difference on. Then can expand as time goes on as needed.

- Question – how can we take APNEP's work and develop a monitoring design that works for APNEP/us? Michelle attended a half-day workshop on developing a collaborative monitoring program. Main focus is figuring out what your program design is – user, who, what, why, information needs. Then can get into the weeds of the technical design – indicators, quality of the data, etc. Also need to think about information design – how is data going to be turned into information? What will be reported, what information products will be developed? Then evaluation piece – how will we know if it is working?
- CCMP has comprehensive design, but Water Resources MAT has had trouble focusing efforts, have ended up with a lot of indicators. Given capacity, time, effort, feel like we need more focus. To do that, think about study purpose.
- Think as well about the data uses, decisions, and management uses. Who are the end users? Education/community inquiry, community or agency advocacy/planning, regulatory/legal.
- What is the information we will deliver? Will be indicator assessment, but what exactly does that look like. Other products needed as well?
- Process – clearly articulate study purpose so we can generate information products for our data users that generate results, outcomes, and impacts. What does the STAC want to learn from a collaborative monitoring design for APNEP?
  - o Study purposes will be selected from the CCMP, but maybe need to select a subset. Indicators have been created, but maybe need to select a subset as well.
- Effective monitoring design starts with a question – CCMP lays out the questions but given limited time/resources we need to focus efforts on a subset.
- Jud Kenworthy – APNEP is opportunistic, how do you strategize with that? Can't operate with that, need strategy to opportunistically harvest information that is already out there. Needs to be clarified first. To me, plan and strategy are different things. Doesn't seem to me that APNEP can approach things with a formal plan. Michelle M: Idea is we'd answer questions with work already being done, but strategy might help us figure out how to focus. Would also help APNEP prioritize limited resources.
- Rua Mordecai: Was thinking that it didn't mean APNEP needed to design monitoring strategy for each indicator but was figuring out which to utilize and how to use what's there and/or accelerate any monitoring.
- Jud Kenworthy: There seems to be recently this momentum towards communities of practice. For example, estuarine research federation is developing monitoring community of practice. Bring it up because it all revolves around developing plans, what data you collect and how you collect it. Less prescriptive, more strategic. Trying to get people to think along the same lines. Michelle M: That is a big part of that program design. Program design is what APNEP is going to focus on – big questions they're going to answer. Technical design is maybe saying, we're going to look at fecal indicators in the water column so if you want to

be part of our strategy/plan, not only are you going to collect fecal indicator data but will also upload to a water quality portal. Will let APNEP easily access info to conduct ecosystem assessment. Info that can be utilized for more than one purpose.

- Brian Boutin: Some CCMP outcomes are within APNEP's control, others are far beyond what APNEP can affect. When we think about indicator development, are we thinking about the ecosystem as a whole or are we thinking about being able to show that APNEP is making progress towards its goals? Tim E: Indicator development process has worked independently of CCMP implementation/success, has been more focused on determining health of system. EPA more geared towards monitoring strategy being tied to CCMP. What can you monitor to determine if CCMP is making a difference? Want to be able to know if you're making a difference. With Phase II of indicator development, tried to crosswalk indicators with ecosystem outcomes but it's still too much for program to tackle. What can we do to fulfill EPA requirement and get the best understanding of if we're making a difference through the CCMP? Brian B: Because MAT process was so independent of other APNEP activities, got very siloed. If things were supposed to be more integrated, could have gone about things in a different way to focus more on showing if APNEP is having an impact.
- Bill C: Have to be careful to not make it too simplistic, APNEP region is very large and it is a challenge. Other national estuary programs (NEPs) are smaller.

[Lunch]

### **Ecosystem Monitoring Design for A-P Estuaries**

- Jessica W: Michelle M and Tim E will reintroduce the discussion topic. Michelle M: sometimes an example can be helpful, although you don't want to give people any preconceptions. Showed MM's list of three questions. Each is linked to multiple ecosystem outcomes and actions.
  - Is water safe for human use? > Safe for personal contact in areas where people are recreating, are fish and shellfish safe for consumption
  - Does the estuary support keystone estuarine habitats? Does water quality meet standards for supporting these species?
  - How does climate, water resource management, and weather patterns impact flooding and droughts in land/water?
- Peter Kalla: Geared ultimately towards management decisions? If we're talking about management, why have climate/weather – why not just water management? Can't manage weather/climate. Michelle M: That's right, these are brainstorm and as we hone in on the questions, those are the kinds of specifics you have to get into.
- Paul Angermeier: Rationale for including those – first goal is region supporting sustainable communities, floods and droughts impact community sustainability. You can't do anything about it but it would be nice to know what the conditions are.
- Brian B: Question then, are communities in the A-P region sustainable? Climate may be driver but there has to be some indicator of sustainability.
- Bob Miller: What's the point of all this? Have to trim back – most important is to be able to tell someone who is making decisions about how to spend their money. Have to give them a small package, these would need to be narrowed down.

- Michelle M: I agree with you, that's the point of this brainstorming. Thinking about big questions that we want to chunk away at. These are just examples, thinking about where we would be going with the questions.
- Michelle M: Want to talk about how we are going to move this process forward, what questions the STAC might want to answer with this monitoring design.
- Jessica W: I needed to step back a bit before thinking about my questions, had to think about overall question. What does a healthy A-P estuary look like and how do we know? Helped to think through. How can we monitor what healthy looks like and explain that to different audiences?
- Rua M: Same, looked at other examples where they're trying to communicate with the public and also policymakers, others. Key thresholds, other examples. MM's examples are a really logical stepdown to that. How healthy is it for personal contact and use? Good step down, framework for breaking things down into a few sub questions. TE: CCMP was created with that overarching question, what is a healthy ecosystem. Was developed with largely different STAC, was determined that if these 12 outcomes were satisfied then the system could be considered healthy. Want monitoring strategy to reflect those 12 outcomes, are very broad but most things are included. RM: NCCA is an example of a monitoring program that wouldn't be reinventing the wheel, includes elements that map to a lot of the existing outcomes. A few high-level things that would resonate with people, would also nest within CCMP.
- Peter K: Clean Water Act has goals of fishability and swimmability. Burrell Montz: As social scientist, am thinking about indicators that prioritize human wellbeing and ecosystem wellbeing at the same time. There are a lot of them.
- Dean C: Discussion of doing the NCCA again, would need to be planning that now. Major investment on APNEP's part. Peter K: Didn't EPA provide money for the lab analysis? Dean C: Last cycle (2015), yes. RM: That's the point of picking a few key questions. Strategy component of the monitoring piece. That kind of approach is attractive, you have an existing infrastructure that covers a lot of these components but amplify this one piece and get measures that ... don't have to reinvent framework, protocols, etc. Tim E: Don't know if we looked deep enough into NCCA protocols to see if it would be informative for our adaptive management cycle. Data collected every 5 years, then takes 3-5 years to release results. Would be all we could do – couldn't do SAV, etc. But agree, looking at existing monitoring programs and efforts, what can we leverage to support our needs. Rua M: Would be hard to do something else like SAV. Saying that APNEP has really only done that over a long time with SAV, huge returns but huge lift. Don't want to create whole new monitoring protocol.
- Peter K: State does river monitoring, shellfish bed monitoring, etc. One gap is open water area between Outer Banks and inner shore. Don't know whether state or anyone else is out there, but I think they aren't. Jud K: It's sparse. Peter K: That's the best reason to continue doing the NCCA – covers that area. If we want to know about that. Tim E – agree, there's a tremendous value to developing a water-quality program for the Sounds. But at what cost to APNEP? Could we get more for that money doing it in a different framework, state sponsorship, kickstart with APNEP dollars, etc. Jessica W: Is that APNEP's sole authority or is that really the responsibility of other parts of DEQ? They should be sharing the financial

load if so. Tim E: We are hosted by DEQ but try to impress on APNEP partners that we view things as a partnership. Whatever we implement/design, want it to be a collaborative approach with buy in from multiple partners, recognize value of data for their needs and needs of greater scientific community. Have run into this issue with SAV, have gotten some state funding this year. Potential model for success. At state level, if there isn't a crisis, there usually isn't a response.

- Jessica W: Let's park the discussion of this particular assessment for the time being, try to keep focused on metrics that are within the control of APNEP that STAC can help inform today.
- Rua M: The surveys are still going to happen regardless, but would it have a statistically significant ability to detect a trend? Most things we would think about, no. Question is – do we invest more to get better data?
- Tim E: Can we talk about estuarine water quality as a priority for monitoring? Is that a goal we want to set for our monitoring strategy? Rua M: Yes, seems like a no brainer. Jud K: Pulled-up map of ambient water-quality monitoring program for North Carolina, there is a huge area in Pamlico/Core/Back Sound isn't being monitored. Albemarle Sound is more extensively monitored. Obviously need more monitoring stations, period. We can't really deal with water quality right now, big blue hole in monitoring. There's a huge void there. Rua M: Functionally all policymakers and members of the public are making decisions about health of the water right now. Feel confident that answer we come up with as a group would be better than where things are at right now. Shouldn't ignore the gaps but there are always going to be gaps. As long as we're open about potential issues with data, can still provide information/guidance – give people a better idea than they have now. John Iames – We've been talking about site specific stations, but we have a large initiative to look at sentinel data, gets into the sounds, etc. Don't know if cyanobacteria, algal blooms can be indicators because we have a very robust data set to support an assessment of nutrient issues in the sounds. That may answer the questions that map to the overall health of the system on the water side. Getting a really good time series, getting a really good spatial extent. In a good time period right now, can get more answers than we ever have before. Remote sensing in A-P/sounds. Sentinel – European satellite. Continuous data, 300m/side pixel – can't get into small tributaries but can look at bigger areas.
- Michelle M: Want to take a step back to think about overall questions. Paul Angermeier: Top priority should be identifying questions, we've started talking about data sufficiency problems. Need to decide on top priority questions, then talk about data availability.
- Michelle M: Maybe we should start a list of questions, make sure we get everyone's questions down. Gives us something to edit and prioritize from. Paul A: Could take outcomes, make them questions, and ask people to vote on them.
- Bob Miller: Is water quality getting better or worse? If it's getting worse, why? Need to have monitoring so you're forming a baseline so you can assess trends. Some of that watershed information you can get from county-planning organizations. Logical place to start.
- Brian B: going to agree with Paul, we have outcomes. Except for native species, each has an indicator clearly associated with them. Can then assess baseline and trend. Rua M: Like nested framework too. Was the whole idea behind the CCMP. Don't have to do cross-walking then. Some measures might double count, but that's okay. Like idea of just sticking



with this. Jessica W: Anyone feeling strongly the other direction? Bill C: Trying not to say anything but totally agree with what Paul A and Brian B are saying in the way we set things up, this is why we did things the way we did. For example, for the outcome “waters safe for personal contact” the indicator could be “days of beach closure”. Don’t think APNEP needs to report on *E. coli* levels, etc....yet there remains a need to be able to back up indicators with metrics. Paul A: Would add that being able to say, is metric going up or down and assign some kind of confidence level to that. How reliable are the measures being monitored?

- Bill C: Things under Goal 2 (native species) are murkier. Brian B: may still be able to simplify, find things that overlap. Challenge is separation into aquatic, wetland, and upland. Since this program is under the Clean Water Act, focus on water stuff. Finding indicators that relate specifically to things in the water. Rua M: Another shortcut is to use the SALCC information for upland, wetland, etc. Could inherit stuff they’ve already done, placeholder that will allow you to speak to those through the SALCC. Could be an approach to cover those. Other things could be phase 2, etc. Improvements.
- Michelle M: Not clear, want to develop a monitoring strategy for each ecosystem outcome? Or do we need to focus more? Brian B: Need to focus more. Bob Miller: Take a look at what data are available and try to get a run of what data has been collected. Paul A: I thought initial question was, which outcomes are the most important? Can’t do all of them with equal effort. So, question still remains – could take a vote on which of the 12 to focus on and rank them. Would give you an idea where to focus. Whole group isn’t equally workable. Some need to go on the front burner. Tim E: Yes, prioritization would be helpful. Need to get something underway. Peter K: What if everyone listed their top 3 out of these 12? Would that drive progress? Jessica W: My question is what are the prioritization criteria? Each person doesn’t necessarily have the background to assess each outcome equally. Peter K: if it’s too difficult for you, don’t put it on your three. Paul A: I have same issues too but am thinking that this group can represent some larger management/policymaking capacity – for who I represent, what are the priorities. Different from personal priorities. Question is, who else is going to do it? Rua M: combination of professional expertise and ability of the group to act as a reporting body.
- Jessica W: Is this something we want to do with the 50% of STAC in the room, or something with Google/Survey Monkey to make sure we’re sampling the entire STAC? Tim E: Entire STAC. Would be good to talk more now, but maybe we do this in Survey Monkey later. Would like to get some consensus – is that where we’re going to get prioritization? Most votes gets it? We’re not going to meet again for six months. Worry that problem with MATs will show up again here. Won’t get consensus. Brian B: Even fewer priorities is better than what it is now. Tim E: If we could talk a bit about prioritization criteria, I think that would be helpful. NEPs were set up as watershed organizations. Have to think about things at that scale and have embraced EBM which means thinking about SAV as an indicator of a larger ecosystem status. If we can come to agreement on criteria, then people will know how they’re supposed to be able to think about these things. Paul A: It’s an important question, not convinced we’ll find consensus. Might have to do with social issues, what the public cares about most, ecological integrity, political expediency – there are a number of different reasons.

- Rua M: If group focuses on a smaller set with reasoning behind it, will be more defensible later. Either pick a very limited set of criteria or have people explain their reasoning.
- Peter K: Reason APNEP exists is for the people that use the resource. Think what makes it good for people should be the criteria we use.
- Jessica W: Which people? Such a large region, how do we unpack who those people are?
- Bob M: With whom are we communicating? General public, want to pick things that people will understand and relate to. People don't care about the integrity of the ecosystem.
- Burrell Montz: Just depends on how you word it, can take the same measure and change how you explain it to reach different groups.
- Jessica W: I propose that the executive board have further discussion with staff to articulate prioritization criteria and then use that as an action item, push a survey back to the full STAC so that we can get some ranking information.
- Michelle M: Bringing it full circle, goal of this exercise is to help us focus our monitoring strategy design. STAC will guide that design.

#### **APNEP Air Resources Indicator Reports**

- Donna Schwede: Air Resources MAT have proposed indicators and metrics. Thinking about what's important and what can we do.
- Importance of bringing new/younger people onto the Team as older members head towards retirement
- Discussion of nitrogen metrics for 2020 report, data being put into report. Lots of other data being collected.
- Next steps – more frequent MAT meetings, development of indicator reports for nitrogen, ozone, regional climate, mercury
  - o Want to build support for APNEP in federal agencies – APNEP not on the radar like Chesapeake Bay, Narragansett

#### **Advancing the Development of APNEP Indicator Reports**

Dean C: Indicator reports are a mechanism to develop priority metrics, by doing an assessment on them now. Onus is on APNEP to report on a periodic basis, this might be an opportunity to do that. Reminder that by doing this exercise it would prepare us to develop a monitoring strategy. Questions to be addressed in each indicator report – Why is this indicator important?, What does this indicator report (metrics)?, What do the data show? Would show status and trends. Gives author team opportunity to show why they can't report on this indicator. Newer question for this round of assessments – Why is this happening? What are the implications for management? What are the proposed targets? By writing a five- to eight-page report, it would give us a better understanding of what data are out there and what data we can report. We would be better positioned to see what we can say about things without any additional major monitoring. Reports like previous assessment are targeted towards technically inclined manager. Subset would be distilled down to citizen report card. Could also be brought forward to leadership council, ...can map to outcomes. What is healthy, what is its current status? Once approved, then we would develop monitoring plan. Put our resources into monitoring this, seeing where there are gaps. Also a valuable exercise, as was discovered during discussions with the Air Resources MAT, if there is a triage situation – strategic way to think about



withdrawing stations. That is our thought. Year ago, talked as a committee – each MAT was going to do three indicator reports out of priority list, then go into monitoring. Always my vision has been after initial set of indicators, develop integrated monitoring strategy plan for all the MATs. Have been problems with this process, would appreciate conversation, commitments, approaches, processes, what we're trying to do is develop these monitoring plans and report back about this monitoring requirement.

- Erin Fleckenstein: Looking for feedback on how to get these assessments done? Dean C: Want to start looking at diagnosis. Want to develop product for the public, talks about beach closures, pathogens, etc.
- Brian B: Seems like the MATs need the guidance from the STAC to get priorities before they do their final ranking. We need to provide them with the list from the 12 outcomes so that they can move forward. DC: Staff try to get 10-12 partners serving on the MATs, a particular species often has not been recommended to represent a taxon because the person who's an expert in that discipline isn't present to advocate for it. Brian B: This strikes me as, being on the Aquatic Fauna MAT, if there is guidance from the STAC of which of the goals is priority and have some detail behind it, we could then go from there and say which indicators are helping us get towards that particular outcome. Right now, we're saying these are good indicators – but good for what? Dean C: STAC members are on all the MATs. Brian B: Have been going through this process for a long time, since 2009, and there hasn't been guidance in terms of what we're developing indicators for. If we have priorities, then individual MATs can figure out how that fits into priority outcomes. Otherwise we don't know why we're having indicators, am very confused about why we would have an indicator report.
- Dean C: Staff gave a presentation to the MAT, laid out the outcomes, showed outcomes that were relevant to aquatic fauna. Brian B: that could be anything, what has been the hang-up is what is the priority. We as STAC can determine priority outcomes which will then determine which indicators should be developed.
- Tim E: In 2017, tried to do indicator development process thinking about outcomes, but did it in separate teams trying to think about each set separately. Has worked for Air Resource for example, but not for all MATs. Since getting review letter, have tried to think about how we can be more productive in MAT process. Thought we have been picking indicators before deciding on monitoring process. Need to make connection to why we need to be looking at indicators in the first place. What is the role of the STAC in dictating how we develop the indicator reports going forward? We have a few from Air Resources and other MATs, but collectively we don't have many – not near enough to do an ecosystem assessment. Sounds like you're saying we need to establish priority outcomes first, which will dictate which indicators we focus on. Monitoring strategy needs to be developed first.
- Jessica W: one thing that makes it easier for the Air Resources MAT – limited number of things that can be managed locally/regionally. Other things are stressors/inputs for other MATs. Makes it a lot more manageable for us. Other MATs, like Water Resources, have a mind-boggling breadth. Very difficult to determine priorities. Shifting to having overall monitoring priorities may help MATs narrow what they're focused on. Rua M: Agree, thinking about terrestrial resources is the same issue. The detail level Dean is talking about, need tools to bound what is being discussed even further. If this committee also sets some

sharp bounds – no more than five, or three, indicators, to set bounds and get the best work out of people. Some people are being spread too thin. Tim E: Can also pull in experts across teams, those who have expertise in particular metric. Michelle M: To follow up on that, one of Donna's take-home messages is finding people who are working on this indicator as a part of their job is key. Line up indicator assessment with what people are working on at work. If we can focus and decide what we really want to include, then align expertise with indicators that fit with people's workloads.

- Erin F: You mentioned having a citizen version of the assessments, having that end goal will also help provide that focus. Chesapeake Bay example, picking indicators that people respond to. Might be fewer indicators under those bigger umbrella terms. Should be part of the conversation from the beginning.
- Donna S: You could pick your indicator either by something the people in the area really care about or pick the canary in the coal mine. Species that will tell you the sound is dying. Erin F: As far as a roadblock to move these assessments forward, need to find how we can match people's expertise with writing the reports.
- Rua M: Having periodic check-ins is really helpful, not monthly but reminds people to get things done right before/after a call. Erin F: NC Sea Grant has been a big proponent of strategic doing, is a really helpful way of doing things. Rua M: Yes, much more helpful than having a huge chunk to do over the course of a year. Taking little bites out of things is much easier.
- Michelle M: Two strategies for getting these done, can as team lead ask who wants to get these done. Second is to focus monitoring strategy on priority indicators, then finding appropriate partners to author. Tim E: Something we've thought about as staff is, have we maximized the utility of the MAT framework? Brian B: By doing prioritization, MATs will see some indicators that they haven't identified that need to be a part of that list. Things that are more integrated.
- Jud K: One other thing to think about is, using the Chesapeake Bay as an example, in the strategy when you select your priority indicators, you want to make sure that you can get good data for a long time.
- Rua M: Like this idea of starting with something that resonates with the public, something that has been/will be monitored in the long term. Think that as the STAC, if we had priorities we could come up with the subset of indicators over a few phone calls with the STAC. Could always bring it back to larger MATs if needed.
- Tim E: Need integration ability that STAC can provide. Having separate MATs isn't conducive to that. Could form teams for an indicator rather than forming teams based around topics.
- Paul A: Notion of what resonates with public has come up a bunch as a criterion, noticed that in Dean's flowchart earlier that human dimensions is listed. Jessica W: Needs of managers versus public, would get very different answers. Would get different answers from different geographies, parts of the public. Looking around this room, the diversity of people represented, would be uncomfortable with people on the STAC making these kinds of decisions and trying to represent the human interests of people across our region.
- Paul A: Am all for having report cards that people can relate to, but would be uncomfortable using the demographics of this room to make that decision. Doug Wakeman: I'm on the Human Dimensions MAT, talked about a number of indicators. Talked about

public access indicator for example. Also talked about demographic indicators that are good proxies for human health and/or describing the region. Then talked about which are easily quantifiable and which already have data available.

- Michelle M: Question about the EPA feedback – scope. Focus on the estuary and consider influence of uplands on that, or are we truly looking at the entire watershed? Tim E: EPA guidance is that monitoring needs to reflect CCMP priorities. Flexibility. You need to have a way of measuring success through what you track. Nothing from the EPA says we have to monitor at the watershed scale. Bill C: It's a priority of the management conference, so what STAC and Leadership Council, etc. say is what we focus on. Dean C: My perception of human dimensions MAT, hearkening back to ecosystem model. Humans are the drivers, are the recipients of the ecosystem services. There is readily accessible data on the former, also there is the notion of monitoring the human component, perception of well-being, etc. Also weighting, priorities – when indicators were first created, were vetted through policy board and citizen advisors. Suggested to staff on how to prioritize. Paul A: Think that's really important, implicitly that's a fundamental part of that.
- Jessica W: Instead of looking at things as what are public priorities, can we look at what is the canary in the coal mine? Paul A: Depends on if that matters to you. Can't expect one size fits all.
- Tim E: Asking Michelle M, how much does this public perception of indicators matter?  
Michelle M: Want to define your question, then define your users, then define the technical part of the monitoring strategy, then define your products.
- Paul A: You can take indicators and change how you talk about them to reach different audiences. Doesn't have to be all one or the other.
- Jessica W: Any public comment? No public comment. Sounding to me like there are some action items for the executive board, proposing we have a call amongst ourselves within the next month to follow up on prioritization. May need to think about, it may not be an issue of throwing things away and getting down to three or four outcomes, or may be thinking about rebalancing.
- Donna S: What is timeline? If STAC is meeting twice a year we're not making lightning progress. Dean C: Staff will have dialog with EPA about progress being made. Minimal monitoring plan to meet timeline, what is it?

USEPA Program Evaluation Letter: to be attached.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

DEC 4 2018

OFFICE OF WATER

Dr. William L. Crowell, Jr.  
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Raleigh, NC 27699-1601

Dear Dr. Crowell:

Thank you, Bill, and the Albemarle-Pamlico National Estuary Partnership (APNEP) staff, as well as your many partners, for contributing to a successful 2018 PE process. We recognize that everyone involved put considerable effort into both the PE package and the responses to our follow-up questions. We also appreciate your facilitation of the PE Review Team's site visit that enabled the Review Team to meet your staff and visit projects and people in your program area. The purpose of this letter is to provide the results of the Environmental Protection Agency's (EPA) 2018 Program Evaluation (PE), which covers a review period from July 1, 2012 through June 30, 2017.

I would like to note that your evaluation benefited from the voluntary participation of Dr. Duane De Freese, Executive Director of the Indian River Lagoon National Estuary Program (IRLNEP), who served in an ex-officio capacity on the PE Review Team. Dr. De Freese's participation provided the Review Team members with an invaluable National Estuary Program (NEP) perspective. Dr. De Freese also shared information about the Indian River Lagoon NEP that may be useful for your Partnership, and took several lessons learned back to his NEP.

The primary purpose of the EPA PE is to help EPA determine whether the 28 programs included in the NEP are making adequate progress implementing their Comprehensive Conservation and Management Plans (CCMPs). The evaluation process has considerably enhanced EPA Headquarters and Regional knowledge of each individual NEP and promoted sharing of innovative projects and approaches across all 28 NEPs. In addition, EPA uses the evaluation process to assess how the NEPs support Clean Water Act (CWA) core programs and to evaluate the extent and effectiveness of the NEPs' contributions to achievement of one relevant EPA 2016 - 2020 *Strategic Plan* goal--Goal 2: Protecting America's Waters, Objective 2.1, Protect Human Health and Objective 2.2, Protect and Restore Watersheds and Aquatic Ecosystems.

Based on the PE Review Team's findings, we believe your Partnership continues to make significant progress in implementing the APNEP CCMP. *We are pleased to announce that you have passed the 2018 PE and are eligible for funding authorized by CWA §320.*

### **2018 Program Evaluation Findings**

The following summary highlights the Review Team's key findings by identifying APNEP's: (I) Progress Made in the Areas Highlighted in the 2013 Program Evaluation, (II) Support of CWA Core Programs, (III) Strengths, and (IV) Challenges. This summary is intended both to recognize the Partnership's successes and to recommend efforts to further strengthen the Partnership. The Partnership's response to these recommendations will be evaluated in the next PE cycle.



## **I. Progress Made in the Areas Highlighted in the 2013 Program Evaluation Review**

### **Program Implementation and Reporting - Maintaining Visibility and Independence**

2013 letter recommendations:

- APNEP should maintain current staffing levels (Director, Project Manager, Program Scientist, Policy and Engagement Manager, Coastal Habitat Coordinator)
- The Host Agency (formerly NCDENR, now NCDEQ) should provide APNEP with direct administrative support

During a portion of the review period (2014-2016), APNEP staff was reduced to Director, Program Scientist, and Coastal Habitats Coordinator. Additionally, the Director and Coastal Habitats Coordinator positions were reduced to half time in order to support North Carolina Clean Water Management Trust Fund operations. This is contrary to the 2013 recommendation to maintain 2013 staffing levels; however, towards the end of the review period (Spring 2017), APNEP was allowed to fill vacancies and is now staffed at the level recommended by the Policy Board in 2014. The staff positions, all approved by the Policy Board, include Ecosystems Analyst, Communications and Outreach Specialist, and a new position of Watershed Manager. It is our understanding that the Virginia position has now been filled as well.

APNEP's host agency was reorganized by the North Carolina General Assembly from the North Carolina Department of Environment and Natural Resources (NCDENR) into the North Carolina Department of Environmental Quality (NCDEQ) in 2015. With this reorganization, NCDEQ moved APNEP into the Planning Section of the Division of Water Resources within NCDEQ. During this restructuring period, APNEP lacked direct administrative support, but was able to maintain limited autonomy and continued to fulfill its mission via active engagement of the Policy Board, Science and Technical Advisory Committee (STAC), and its partners. The Review Team's positive interactions with the leadership from NCDEQ's Office of the Secretary during the site visit are hopeful indications that as APNEP's host entity, NCDEQ reaffirms its administrative and fiduciary responsibilities as called out in the EPA-APNEP cooperative agreement.

Though technically outside the review period for this Program Evaluation, the Review Team would like to acknowledge the new NC Governor's Executive Order (EO), signed in November 2017. This new EO prescribes that APNEP will be housed within NCDEQ's Office of the Secretary, establishes a new Leadership Council (replacing the Policy Board), and details programmatic support from Executive Branch agencies and Council of State agencies as well as state universities to ensure they work cooperatively with APNEP in implementing the CCMP. In addition to the EO, a cooperative Memorandum of Understanding (MOU) between the State of North Carolina and the Commonwealth of Virginia was also signed in the Fall of 2017. These two documents illustrate continued commitment to APNEP's role as a visible, trusted, independent source of information for the communities and partners within the region.

### **Ecosystem Status and Trends - Need for Assessment and Monitoring**

2013 letter recommendations:

- Develop long-term monitoring plan and indicators of ecosystem and socio-economic conditions
- Leverage support from NCDEQ senior leadership as well as other state and federal partners

Development and implementation of a monitoring plan or strategy have been requested by the EPA since the 2002 Program Evaluation. Over the years, multiple efforts at finalizing indicator development have been attempted (2004-2006, 2006-2007, 2012-2013) but never quite materialized into a strategy or plan. APNEP published an Ecosystem Assessment in 2012 that contained the core indicators for the bi-state estuary system to accompany their new CCMP based on an Ecosystem Based Management (EBM) approach, and some monitoring

and assessment work was performed during the review period, including submerged aquatic vegetation (SAV) mapping and intensification of the National Aquatic Resource Survey in 2015. However, the need for a robust monitoring strategy and development of ecosystem and socio-economic indicators was not fully met during this review period.

Although implementation of this goal stalled during the review period, APNEP has made significant progress since 2017. APNEP has formed several Monitoring and Assessment Teams, which include STAC members, that are on track to provide indicators to the Management Conference for review in 2018. The Review Team encourages APNEP to continue to leverage support from NCDEQ leadership and other state and federal partners to prioritize limited resources and strategize monitoring efforts over APNEP's large program area.

### **Ecosystem Restoration and Protection - Need to Measure and Report on Short-term Project Outcomes**

2013 letter recommendations:

- Develop protocol to measure short-term outcomes of projects
- Establish project baselines to measure, track, and report on project progress

APNEP is currently developing an outcome tracking protocol that includes baseline data from funded projects to better assess their effectiveness. These metrics will then be compiled together for APNEP management to make long-term decisions about overall effectiveness in implementing the CCMP. Because APNEP is still developing ecosystem and management indicators, they were not able to report out on the collective status of short-term project outcomes during the review period. However, the Review Team is encouraged that the Partnership will continue to request metrics information in future project requirements. Additionally, the Review Team encourages APNEP to better align funded projects to meet programmatic outcomes that also lead to measurable environmental results.

### **Ecosystem Restoration and Protection - Need to Address Nutrient Criteria**

2013 letter recommendations:

- Work with partners to collect water quality monitoring data
- Support the development of models
- Facilitate stakeholder involvement in nutrient management
- Investigate relationships between contaminant loads and living resources
- Propose scientifically-based targets that DWR may consider as numeric criteria

The Review Team commends APNEP leadership, particularly the STAC, for taking a leadership role in convening scientists, stakeholders, and agency staff to build consensus on appropriate water quality nutrient criteria parameters. A series of nine meetings took place between 2014 and 2016, and the workgroup utilized NC's Nutrient Criteria Development Plan (NCDP) to facilitate their deliberations. While ultimately no criteria recommendations emerged from this effort, the workgroup identified many research priorities which the state lead, NC Division of Water Resources, is currently undertaking. Nutrient management is central to APNEP's many CCMP objectives. The Review Team encourages APNEP to cultivate and sustain continued engagement with the NC Scientific Advisory Council and the Nutrient Criteria Implementation Committee on this issue during the next cycle of criteria evaluation.

### **Program Implementation and Reporting - Financial Strategy for Communications**

2013 letter recommendations:

- NCDEQ to assist APNEP in leveraging other NCDEQ program resources
- Develop a strategy and funding plan for communication efforts



- Identify a tool for assessing impacts of investment in communication plan

APNEP continues to rely on the strong support of its partners to leverage communication and engagement activities throughout the region. Its communication plan serves as an effective guide for reaching out to a variety of audiences, partnering with the NC Environmental Education and Public Affairs Office to help spread the word about APNEP's wide-ranging activities. The Review Team commends the Partnership for developing a new communications strategy – the 2018 Engagement Strategy – that refines their engagement approach. The Review Team is pleased that APNEP is in the process of assessing the impact of its investments in communications and outreach efforts to better identify areas for improvement or new opportunities.

## **II. Support of CWA Core Programs**

### **Addressing Diffuse, Non-Point Sources of Pollution**

APNEP played a primary role in providing approximately \$75,000 of FY2013 EPA Section 320 funds to support a restoration project that enabled storage and filtration of surface runoff from 3,700 acres of cropland in Hyde County, NC. One water control structure, ten swales, and 8,750 feet of dike were cored as part of this project. This investment resulted in diverting approximately 100 million gallons of runoff generated by a 24-hour rain event through restored wetlands and away from the Alligator River, Long Shoal River, and Pamlico Sound. In addition to improved water quality benefits, this landscape-scale effort helps reverse decades of hydrological modifications and eventually restore these waters with a thriving shellfish population. A project of this magnitude also demonstrates effective, non-traditional partnerships among environmental organizations such as the NC Coastal Federation (the project lead); academia (NC State University); federal government (U.S. FWS, USDA-NRCS); and private landowners (Mattamuskeet Ventures).

### **Supporting Sustainable Wastewater Infrastructure**

APNEP provided \$12,000 to the towns of Columbia and Manteo in 2013 to quantify risks posed by rising sea levels on the towns' wastewater infrastructure. The project team used the EPA Climate Risk Evaluation and Assessment Tool (CREAT) under the EPA's Climate Ready Water Utilities initiative. The project team provided technical and financial recommendations for the towns to improve resiliency to coastal hazards and made suggestions for the towns to consider in their capital improvement planning.

## **III. Strengths Related to:**

### **Program Implementation and Reporting - Program Planning and Administration**

The EPA commends APNEP and its leadership for sustained focus on performance. Seventy-nine Section 320-funded projects contributed to restoring and protecting nearly 75,000 acres of habitat during the review period. APNEP also maintained its reputation as a trusted source for information sharing throughout the region. APNEP's strength during this review period was demonstrated in its strong leveraging capacity; it collaborated with partners to deliver 6:1 in primary leveraging and 13:1 overall. Much of the credit goes not only to its diverse network of partners but also to strong support from its Management Conference and staff, effectively returning APNEP to full staff capacity in a year.

### **Program Implementation and Reporting - Outreach and Public Involvement**

APNEP's outreach during this review period is one of its biggest accomplishments due to its multiple approaches for stakeholder engagement. Programs such as Shad in the Classroom and the Teacher Institute have encouraged greater environmental stewardship from both students and educators. The partnership with the

North Carolina Office of Environmental Education and Outreach is vital to the continued success of these programs.

APNEP hosted a 2013 symposium to report on the overall status of APNEP's natural habitats and resources and also led topical discussions (Low Impact Development Summit, Oyster Summit, Living Shorelines Workshop) meant to foster greater discussions and knowledge transfer among academia, research, and businesses.

Two Economic Valuations (2012 and 2016) were published with the goal of assisting APNEP in communicating the important economic and societal contributions made by the natural resources in the APNEP region. Above all, APNEP's excellent mechanism for sharing news and available resources, particularly through online media, assures that their stakeholders have access to the most current information. APNEP has a new draft Engagement Strategy which outlines even more methods for information sharing and stakeholder engagement.

While APNEP no longer has a dedicated Citizen Advisory Committee per se, the Review Team looks forward to seeing how the newly-formed Implementation Committee integrates the general public's input into the decision-making process.

#### **Ecosystem Status and Trends - NCCA 2015 Coastal Intensification Survey**

Every five years, the EPA's National Coastal Condition Assessment (NCCA) typically includes some sites within NEP boundaries in its survey design. In 2015, APNEP was the first NEP to participate in an intensification survey in which additional sites were added for better statistical estimates of the condition of its waters. This meant having to conduct training, coordinate sampling logistics, and procure needed supplies and equipment in a relatively short period of time. Since much of the current monitoring around the APNEP region has been focused in tributaries, the 2015 NCCA intensification survey complemented limited efforts along the Sounds, even in the absence of an APNEP monitoring strategy. You also gave a presentation on APNEP's experience and efforts during the national EPA-NEP workshop in March 2018. The Review Team commends the Partnership for taking this leadership opportunity and serving as a model for other NEPs that may choose to participate in the next NCCA survey in 2020.

#### **IV. Challenges Related to:**

##### **Program Planning and Administration - Develop a Common APNEP Vision to Promote its Program Identity**

While APNEP has successfully formed productive alliances over the years, the reviewers noted that APNEP lacks a strategic direction with clear year-to-year goals and objectives that focus its efforts. APNEP has a recent CCMP, but its implementation depends on EBM-based indicators that are still being developed. Developing a strategic plan would allow the Partnership to be recognized by the public and to receive appropriate credit for all the efforts it puts into CCMP implementation.

Over the course of the next review period, the EPA recommends that APNEP develop a vision statement, informed by its entire Management Conference and approved by its newly-formed Leadership Council, that articulates its exact role and explains APNEP's value to this bi-state estuary system. This statement should serve as a guiding principle for showcasing what the Partnership can offer and for elaborating how its partners can better support the APNEP brand in implementing the CCMP. This vision should also direct APNEP in prioritizing its limited resources to serve the large area within its boundaries.

##### **Financial Management - Explore Additional Opportunities for Funding CCMP Implementation Activities**



APNEP has successfully leveraged much of its non-federal match in the form of in-kind support from staff (Coastal Habitats Coordinator, Watershed Manager) and expenditures by the Clean Water Management Trust Fund and the Division of Water Infrastructure. The extensive list of partners throughout this large watershed has not translated to additional revenue for CCMP implementation. This means that a considerable portion of APNEP's base funding is used to support state staff, leaving limited EPA Section 320 base funds available to cover other important implementation activities.

Because APNEP has not yet developed a long-term funding strategy that enables it to target diverse funding sources, the EPA recommends that APNEP take steps to develop such a strategy to identify priorities, catalog potential funding sources, and obtain funds. APNEP should consider integrating strategic financial planning (i.e., cost-benefit analysis) into its current annual workplan process so it can better identify projects with the most likelihood of delivering environmental results. The EPA also recommends that APNEP use economic valuations to communicate the value of the estuary to the state(s) and encourage more direct financial support.

### **Assessment and Monitoring - Finalize Completion of a Monitoring Strategy**

The Review Team is aware that an initial suite of indicators is being considered for Management Conference approval by the end of 2018 now that APNEP has returned to full staff capacity. These indicators should be linked to a robust monitoring strategy, which serves as both a scientific tool and a decision-making tool that informs policy.

Given the increased public-sector emphasis on accountability and government stakeholder requests to demonstrate environmental results, APNEP leadership--from the Monitoring and Assessment Teams (MATs) and STAC to the Leadership Council--should prioritize completion of a monitoring strategy which reflects the Partnership's implementation priorities. Implementation of the monitoring strategy should begin by 2020, ahead of making revisions to the CCMP. To ensure timely delivery of the monitoring strategy, the Review Team requests that a progress report on its status be submitted to EPA to accompany APNEP's semi-annual reporting. To help meet this challenge, the EPA recommends that APNEP consult the latest NEP Funding Guidance for directions on developing a monitoring strategy. The Review Team also encourages APNEP to take advantage of technical resources from the EPA that can better inform the role of citizen science in APNEP's monitoring strategy.

### **Reporting - Better Communicate Programmatic Accomplishments and Environmental Results**

As previously mentioned in Section I, identifying metrics to gauge the effectiveness of short-term outcomes is critical for determining continued support of implementation projects. Even in the absence of measurable environmental results, CCMP activities should still demonstrate that APNEP is directly benefiting from these investments because they support its overall programmatic priorities. In the first iteration of the narrative section in the PE package, the significance of the projects chosen to highlight accomplishments in support of the six workplan elements (Habitat, Water Quality, Living Resources, Healthy Communities, Trainings, Direct Assistance) was not readily apparent to the Review Team because content was lacking in detail. The subsequent revision and multiple interactions at the site visit further illustrated the important role that partners play in advancing APNEP's mission through their own work.

It is important that programmatic milestones and environmental results be communicated to the public and to APNEP stakeholders to continue building long-term support for the Partnership. In addition to highlighting projects in the annual work plan, the EPA recommends the Partnership enhance its website by dedicating prominent space to more clearly emphasize accomplishments. This would supplement APNEP's other means of communication (mail list, blogs, social media) and could also help attract potential partners who might be interested in knowing how funds have been used to date and any plans for additional funding. The EPA also

recommends publishing an annual comprehensive report on projects and accomplishments to distribute to the public.

#### **Program Planning and Administration - Revise CCMP Before 2022**

One key theme that has emerged from other NEPs undergoing CCMP revision is the value of using the revision process to better identify existing and emerging impediments to effective implementation. As APNEP will likely have the next iteration of its CCMP in place before the next PE review, it is crucial that the Partnership consider how it can continue benefiting from its current suite of investments while positioning itself for long-term success.

The Review Team recommends that APNEP conduct a formal revision of its CCMP before 2022 by developing a process for assessing its priorities and identifying measurable environmental goals and targets. The revised CCMP should also include specific criteria for evaluating which projects are implemented over the next five to ten years. APNEP is reminded to consult the NEP Funding Guidance for directions and other deadlines pertaining to CCMPs.

Thank you again for participating in the PE process. We welcome any additional thoughts you may have either about the evaluation process itself or about EPA's involvement in the implementation of APNEP's CCMP. If you have any questions or comments, please contact me at (202) 566-2954 or Vince Bacalan at (202) 566-0930.

Sincerely,



Robert S. Benson  
Acting Chief, Partnership Programs Branch  
Office of Wetlands, Oceans and Watersheds  
U.S. Environmental Protection Agency

cc: John Goodin, U.S. EPA, Director, Office of Wetlands, Oceans and Watersheds  
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