



Albemarle-Pamlico National Estuary Partnership

Scientific and Technical Advisory Committee

August 18, 2016

East Carolina University, Greenville Centre, Room 1200
2200 Charles Boulevard, Greenville, North Carolina 27858

MEETING NOTES

APNEP STAC Members Present: Brian Boutin (for Christine Pickens), Bo Dame, Heather Deck, Robin Dennis, Erin Fleckenstein, Joel Fodrie, Kirk Havens, Peter Kalla, Jud Kenworthy, Wilson Laney, Sid Mitra, Burrell Montz, Michelle Moorman, Rua Mordecai, Hans Paerl, Tim Spruill, Doug Wakeman, Jess Whitehead, Rich Whittecar

Guests Present: Bill Swartley (NCFS Liaison)

APNEP Staff Present: Dean Carpenter, Bill Crowell, Stacey Feken, Coley Hughes, Jimmy Johnson

Call to Order Jud Kenworthy, STAC Co-Chair

Jud called the meeting to order and thanked everyone for coming. He noted that committee discussion would pick up today where they left off during the last STAC-only meeting in February 2015. Much has happened since then, and they will play catch up, and hear about everything that has been done. APNEP understands and appreciates that to put to work APNEP's [Comprehensive Conservation Management Plan](#) (CCMP) that really good science is required. STAC will hear about the progress of some of the action teams. The committee will meet some new members with new expertise for the STAC, who Dean will introduce. The bottom line for today is taking stock in what has been accomplished since the last meeting and figuring out how to move ahead. They will discuss the STAC action plan that was circulated to all the membership.

Welcome & Introductions

Jud asked us to do introductions. He asked new members in particular to introduce themselves. Everyone did so.

Approval of winter (February) and summer (July) 2015 meeting notes

Dean noted that he had distributed two sets of STAC meeting notes for review, one of the winter meeting and another from the joint summer meeting. Because the STAC had not had much time to review them, it was up to leadership whether to approve them now or not.

Jud suggested more time was needed and asked how to proceed. Dean said it could either be done online or at the fall meeting. Jud asked for online. Dean suggested a deadline of two weeks to provide recommended edits, after which he would send them out for approval.

Meeting objectives

Dean noted that traditionally he provides an overview of APNEP activities since the prior meeting. Based on recommendations from the STAC Executive Board to encourage member discussion on the activities raised, the overview format has changed a bit. Before describing the format change however, he noted that during lunch break he wanted to take a group photograph of members. Dean thanked Jimmy Johnson for arranging lunch, and Bill and Wilson for arranging the Triangle carpool. This being the first STAC meeting of 2016, he wished everyone a belated Happy New Year! He thanked Burrell for arranging the meeting location.

Returning to the format change, Dean noted that he had solicited from members highlights and upcoming events. Those submissions were compiled and provided to the STAC in a package, to give them an opportunity to reflect on the information provided before asking questions during the meeting. Dean thanked everyone for submitting highlights.

APNEP Staff Update Dean Carpenter, APNEP

Dean noted that he was going to highlight a few events from the staff submission. In January, staff moved from the Nature Research Center back into the Archdale Building, in which they had been located prior to 2012. They are back on the sixth floor of Archdale, where the original APES staff were located back in the mid-1980's. That is supposed to be a temporary residence, given that the Partnership staff is early in the process of transitioning to an academic institution. Dean asked Bill to provide us an update on that transition.

Bill noted that [North Carolina Division of Water Resources](#) (NCDWR) is the program host and since the move staff are being treated very well. NCDWR managers acknowledge that APNEP is different from all the other components. There have been a number of challenges however. One has been APNEP's responsibility to provide recommendations to the [Nutrients Workgroup](#). With APNEP now being part of NCDWR there is the appearance that agency is giving recommendations to itself. The Partnership will still provide the Division with a recommendation. Jim Hawhee, who transitioned from APNEP to the NCDWR, has continued to facilitate that workgroup. As far as transition to a university host goes, they needed to wait until the new state fiscal year (July) and changes in leadership occur. The leading university host candidate is UNC-Chapel Hill. The new leadership is more receptive to hosting APNEP. Their leadership is meeting today to discuss the move. Bill hoped that if everything works as anticipated, by next July they should be located at UNC-Chapel Hill. If that arrangement falls through, they will look at North Carolina State University. Bill noted that staff will keep members informed.

Hans asked if APNEP would be on campus in Chapel Hill. Bill indicated that the discussions have focused on off-campus locations, such as the Institute for the Environment, or Research Triangle Park facilities, or even stay where they are, with the space being considered state match. They do have to make sure

that the match and indirect costs are addressed. This could be a deal-breaker for the universities. There is also an administrative cost that must be dealt with, because APNEP does distribute grants. Bill believes he has negotiated match for many years through the [North Carolina Department of Environmental Quality](#) (NCDEQ).

Dean noted that to fulfill the mission where staff are housed is crucial. Another critical element is staff. Beginning in summer 2014 with the resignation of Lindsey Smart staff size decreased without the ability to rehire. While those were the program's dark ages, things have improved in 2016. Dr. Coley Hughes joined the staff in January as the project coordinator. In April Coley was promoted to an ecosystem analyst. They are currently advertising for a project coordinator. In March Stacey Feken was hired as policy & engagement manager (Jim Hawhee's former position). Bill noted that Dr. Dana Gonzalez is APNEP's new Virginia field representative.

Bill Crowell noted that this spring a NCDEQ report was provided to the General Assembly, which recommended leaving APNEP in NCDEQ for the time being. He also returned from half-time to full-time at APNEP, dropping the NC Clean Water Management Trust Fund duties.

Given that APNEP staff will have a staff planning session soon, staff would appreciate input from members on the science and technology aspects of APNEP. Also, in response to Bill's earlier invitation to EPA Office of Water policy advisor Dr. Ellen Gallinsky, she is visiting the APNEP region in late September for a two-day tour, and will meet with some STAC members to gain insights on various issues. The next STAC meeting will be joint with the Policy Board in November.

Dean asked if there were any questions on the staff reports he sent out. There were none. He noted members should feel free to ask him later. Dean asked if there were any questions on any of the member reports. He noted that all but two of the members providing them were in the room. There were no questions.

Dean provided a presentation on APNEP's Science and Technology Initiative, noting that this overview may sound familiar to long-time members. The initiative itself is to facilitate the use of science in the APNEP region. Dean showed a map of the implementation area and management institutions. The upper Roanoke, and near coastal marine systems are included. Dean showed a flow diagram of how the program is structured at the federal and state government levels. The USEPA oversees the program, provides the grant which supports the program in North Carolina and Virginia. The Partnership is funded for seven FTEs, and staff anticipate having all positions filled by early next year. There will be an Implementation Committee (taking the place of the former Citizens Advisory Committee and Management Advisory Committee) which will be responsible for overseeing implementation. They will work with the Policy Board to determine funding priorities and move the Action Teams forward. The Policy Board is APNEP's governing body.

Dean reviewed the STAC, noting that there are six new members making 34 members total (two vacancies remain to be filled). Traditionally STAC met quarterly, while more recently they are meeting no less than semiannually.

Dean reviewed APNEP's ecosystem-based approach. There are seven basic steps, which Dean reviewed. He showed us APNEP's adaptive management cycle: plan, manage, monitor and assess.

Dean reviewed APNEP's three ecosystem health goals involving respectively: human communities, native species, and water quantity and quality. Dean showed an example of a Drivers-Pressure-State-Ecosystem Services-Response (DPSER) model, which was developed by USEPA in 2010, and embodies the notion that everything is connected. APNEP had an ecosystem-based management (EBM) transition team in 2010, which was small (about 10 folks) and included policy as well as technical members.

Dean noted that APNEP's CCMP posed four questions: "What is a healthy Albemarle-Pamlico system?"; "What is the status?"; "What are the biggest threats?"; and "What actions should be taken that will move us from where we are today, to a healthier A-P system by 2022?" Because things have changed in the last five years, staff anticipates developing a version 2.1 in 2017.

Dean noted that the CCMP has 58 actions, which are aggregated into five components, and 15 groups of actions. One thing that wasn't finished from the 2012 CCMP process was to finalize APNEP's first set of core metrics, the indicators that define ecological health. As far as ecological condition components, there was much work done beginning in 2005 on indicators. Dean was hired in 2003 and among his initial responsibilities was leading indicator development. Dean reassured the old-timers who worked on indicator development that all of that work will be resurrected, and the monitoring and assessment teams during the second phase won't be starting from scratch. It is vital to get these metrics established in the planning component. Part of the indicator finalization is to identify ecological targets: for example, how many fish, and what sort of water quality, stakeholders wish to define as ecological health objectives. Dean asked for any questions. He noted that he had provided an example for the Human Communities goal, where there are five environmental outcomes. The spreadsheet reveals how you go from the general to the specific. He suggested that STAC have a meeting between now and the joint meeting in November to develop a presentation on these. Dean showed us another example for Native Species. There are also indicators reflective of ecosystem stressors.

Dean turned to regional ecosystem services, a classification based on the United Nations framework, and briefly reviewed those.

Dean suggested that to track things on the ground, APNEP must develop a monitoring program. The STAC has contributed some work in this area as well, and Dean reviewed some of that work which provides some of the underpinning. While there is a de-facto A-P monitoring network in place, he hopes that APNEP will be able to build upon that system. Dean plans to work with the outreach/education folks to get the word out about the importance of monitoring. We are dependent on our eyes and ears out there to know what is happening in the system.

Dean reviewed the ecosystem assessment protocol and format. This was the first comprehensive assessment done since the early 1990's. The [APNEP ecosystem assessment](#) featured 24 metrics, had a couple of coordinators (Carpenter and Dubbs), and 18 contributors (12 STAC and 6 non-STAC). This first version was not comprehensive. It was modeled after the Heinz Centers' "State of the Nations Ecosystems". Dean reviewed the commonalities between that process and the APNEP assessment. These included having a broad array of partners during indicator selection, data compilation and assessment. Dean reviewed the APNEP ecosystem assessment's organization and chapter components. Each ecosystem type had chemical, physical and biological components. Dean indicated that he plans to provide each chapter author an opportunity to provide a five-year update. He provided an indicator example from the Coasts, Sounds, Near Marine chapter: SAV Extent and Pattern. He showed us the 2006-2008 map for SAV, which is reflective of a lot of APNEP's work in gathering the data.

Dean moved to the 2016-2017 A-P ecosystem assessment activities. We want management feedback on the 2012 format; expand phase 1 assessment content; include chapter on forest, farmlands and grasslands; chapter on urban and suburban landscapes; additional indicator assessments; refinement of the 2012 assessments; a state of the ecosystem report card; and seek additional capacity. In fall of 2017, APNEP staff are planning a traditional “state of the sounds” type meeting which will provide a broad overview of activities.

Dean noted the other A-P ecosystem assessment enhancements: APNEP-oriented monitoring data; “beyond condition” outcomes for Phases 2 and 3; “beyond outcomes” management actions and stakeholder understanding; decision support system for citizens, policy makers, environmental managers, and environmental scientists. Ultimately, the science should be available in near real-time, to have the metrics reported to the social network, and be able to see things change, rather than periodic reporting. This is all in the monitoring and assessment arena.

Dean noted for new members, the STAC is an independent committee which should provide advice. He noted that while the Chesapeake Bay Program is much larger and has vastly more resources, the STAC does have a relatively complete staff now with a lot of expertise. If APNEP can line up with the missions of individual members, such as oysters and invasive species, those also line up with the APNEP CCMP actions and mission.

Dean opened the floor for questions, noting that he has provided much of this information to the STAC in the past, albeit in pieces. He feels that the indicators and monitoring is the fuel that feeds the assessment engine. We need to know if we are making a difference. The conventional wisdom is that the A-P system is in pretty good shape, but he remains to be convinced of that statement. There have been shifts from the historic baseline. He would like to find data to push back the more current baselines. With regard to SAV as an example, the early 2000’s was the period in which the SAV was first mapped. In contrast, the Tampa Bay NEP had imagery from the 1950’s to gauge their success. Dean has been supporting STAC member Don Field to seek baselines with pre-2000 imagery. Although the older images are of insufficient quality to determine SAV extent, the deepwater edge of SAV beds are detectable so he is examining whether we can track that metric as an indicator of condition.

Dean noted that he wanted to finish with the notion of ecosystem assessment reporting. That is a niche which none of the partners appear to be filling. NCDENR did have a policy of providing a “state of” report every other year, but that was dropped. The assessment approach we are taking is not unique to NEPs, and we hope that it can serve as a model for other parts of the state. Dean noted that we have gotten into ecosystem evaluation a little bit, and that is included in the highlights he provided.

Dean asked for any comments. Reide Corbett noted that he had arrived late then asked if the plan was to update the assessment as we had done in 2012. Yes, there will be some editors, and we have the 24 metrics that we used as examples. Dean suggested that we can discuss the metrics, and who the experts are in the region. The format is three to five pages. The process will be much the same.

Michelle noted that she and Rua had a conversation during their drive to the meeting site. She suggested that APNEP has a more systematic way of doing these assessments, such as using codes and script. We need to discuss whether everyone can do them in a different way, or use a common format. Rua noted that we could have one or two high-level indicators that we would evaluate each year. We could then get the STAC together and assess where we are during each time period.

Dean had envisioned that the data would determine the frequency of assessment.

Michelle noted the example of Delaware Bay, which used information that would feed into a traditional assessment, but you can also use computer services to generate monthly reports.

Dean indicated that he sees that as part of charge to the APNEP Decision Support Tools action team. That team had kicked off last month, and he anticipates they will indicate to STAC what they would like to see in that system. Any input will be welcomed.

Bill affirmed that the answer was absolutely yes, we want to go that way. Having a set of high-profile indicators will be important. Tampa Bay uses SAV condition as the overall indicator. Salmon habitats in the lower Columbia River is another one. SAV may be a good one to use, say in two years.

Dean noted that many of the NEPs focus solely on the estuary, but APNEP is trying to focus on the entire watershed, which is more ambitious.

Sid noted that before the dark years, we had a subgroup working on emerging contaminants and metals, and he wondered where that had gone. Dean asked him to hold that thought.

Dean asked for more thoughts.

Hans noted that there are indicators the public understands, for which we have a lot of data. Chlorophyll a is one of them. Water clarity can be translated to the public, like the guy who wades in the Bay and looks at his sneakers. One of his questions is, where is all this going in terms of the public and the people that we need to get behind this? There are some simple indicators that can be easily translated for the Raleigh television station, when they ask as to where we stand. Hans asked if they had looked at all of the avenues for getting this information out to the public, such as WRRRI and Sea Grant. It will be nice to have the public understand and appreciate this.

Bill stated that is right on. In many ways, we have been quietly doing good work. We have a challenge because of the size of our area. Other NEPs have one county or school district with which to work, and we have multiple ones. It is a challenge to get out the word. It is also a challenge to work within a regulatory agency. Stacey is going to be helping APNEP with this aspect. The assessment is a document of which Bill is proud, but it hasn't reached many people. There is an article in the newspaper today talking about blue-green algae in the waters of Pamlico Sound. People can see the water is green and we can explain to them why it is green. Having some of the indicators that resonate with the public is critical.

Hans asked about the [North Carolina Coastal Federation](#) (NCCF), which seems to be good about getting out the word. Erin noted that using Coastal Review Online is a good way to get out the word about coastal resources. NCCF are trying the best with the resources they have. They have more staff than APNEP and will be glad to help. They are putting out a state of the oyster report on an annual basis. It was targeted toward the legislature this year. They also want to have a one-pager for the public. This could be included with the APNEP status and trends.

Dean noted that while the technical assessments each will be five to six pages in length, but for the indicators to gain resonance, they will be distilled down to one to two pagers, written for a general

audience. That is an art. Jim Hawhee had drafted some examples up for consideration before he departed.

Erin noted that the [Chesapeake Bay Program](#) releases an annual assessment for ten indicators. They have data sets that go back years. When they put out the oyster report, they approached the University of Maryland, who has done those, and it was very expensive: \$30,000. Hans indicated that they could do those.

Rua noted that he had brought in some copies of the State of the South Atlantic. He will bring those in after lunch. It is a general document, perhaps more in the middle. He noted that is one case where we could use them for graphic design. Rua noted that cell phone bars are good for illustrative purposes to explain uncertainty.

Brian noted that the Chesapeake is very data rich. We have to find the sweet spot with regard to what resonates with the public. Some of the data may not have the spatial or temporal resolution to mean much to the public.

Michelle noted that it takes time and resources whether we do a huge number, or focus on a subset and do it better. That is one choice we need to make. A second thing is to identify the monitoring gaps.

Brian noted that when you put out a graph that identifies some trend, you have to be careful about what you put out there.

Heather stated that Pamlico Sound is having a tough summer, and that is giving us the opportunity to have a dialog with a lot of folks. They want to know why. Some of this is low-level and simple. She noted that vegetation is not always viewed as beneficial, it is seen as ugly. The public's ability to understand information is all over the map. There are the unique opportunities that pop up, and we are often unprepared. We need to have a plan in place ahead of time. We need to know what the public wants to know. We can try to use green, red and yellow when possible. Heather noted that they are trying to build off the NCCF, using some of their approaches. She noted that with climate change, opportunities will pop up more. She noted that she has never seen the Pamlico in the shape it is this year. The Chowan is another region. There is a lot of interest there, and there is a big gap. The Chowan River has been much greener in the last few years.

Bill noted that there is an APNEP partner up there, the Albemarle-Chowan Watershed Roundtable, and they are meeting today.

Stacey noted that this discussion is a good segue for her, into the conversation about the education and outreach.

Dean noted that we would have an opportunity to have more discussion about this later in the meeting and he appreciated the discussion.

Dean turned to the APNEP action teams. The 58 CCMP actions have been allocated to 13 action teams. The ones in red will be discussed in more detail today (Education and Engagement, Nutrients, Oysters, SAV, and Ecological flows). Green ones (Decision Support Tools, Shorelines, Emerging Contaminants and Metals, Freshwater Habitats and Fish Passage) are underway. Dean noted that some of the teams were merged, and later separated. Some of this was due to the staff capacity issue.

Dean showed us an example of a desired outcome: nutrients and pathogens do not harm species that depend on the waters. Dean noted that his graphic shows which team is responsible for which action, related to this outcome. Eight different action teams are involved in improving that particular outcome. That is why it is important to get all of the teams up and running. Once the teams are up and running with each STAC member assigned to at least one of the teams (which ideally are composed of managers and citizens) the liaisons can assist with deciding which steps to take for that particular action, and identify trigger points. They will assess whether the system is behaving as expected, and if it isn't, then decide how to change the program.

Dean asked for questions. There were none.

Dean asked Burrell to address the draft STAC Action Plan. He noted that he hoped the action team discussions this afternoon would not take long, and we could finish early.

Committee Discussion on STAC Action Plan Draft Burrell Montz, STAC Co-Chair

Burrell noted that we had a lengthy discussion in February about the action plan, and not much has changed. The structure is essentially the same. What we have to do is to decide about the proposed tasks. Dean projected the tasks on the screen. Burrell reviewed those and asked for comments and any problems. Dean explained that the input would be collected from members present, and others not here, the STAC Executive Committee will review, and then we will offer a final draft.

Burrell reviewed the specifics of the plan and asked for any comments. There were no comments.

The second set of tasks is under "Evaluate an effective information management system."

Sid asked if one of those three listed databases is being evaluated. Burrell indicated it is not an "or" or a "and." Collating the systems will be the challenge. Dean noted that with regard to reviewing and evaluation of proposals, he will work with STAC leadership to develop STAC review criteria.

Burrell noted that we are trying to agree on these activities today. She asked for any comments. There were none.

Burrell moved on to "Mandated Assistance." She asked for questions and comments on those. Hans suggested changing "Ambient" to "Estuary" then the abbreviation could be "APEMON."

Erin asked that we go back a slide, and asked specifically about the review and evaluation of proposals, and whether that was responding to an RFP, or creating one. Bill noted that from time to time, APNEP would apply for grants and would seek STAC review of those.

Burrell asked for any other comments and there were none. She indicated that it would be transmitted out to the entire STAC then for approval.

12:00 p.m. **Working Lunch: APNEP Nutrients Action Team Progress** Dean Carpenter

Dean noted that for each of the action teams on the agenda, there is a staff member listed as a liaison. He had invited former staff member Jim Hawhee to share his thoughts and lessons learned, Jim having

facilitated the Nutrients action team, which has been the most active of the teams and met the most often. Jim had also served as facilitator to the Education and Outreach action team. Jim's thoughts: 1) establishing and maintaining an action team requires considerable resources (staff resources, logistics, administrative, note taking, communication, expenditures on travel and hospitality, reporting; as well as external participants resources: opportunity cost and incidental expenses. Expect routine reevaluation from members in the context of their own job responsibilities. Is this a priority use of their time, what's the goal, and when will it be achieved? Balance interdisciplinary and consensus-building benefits of action teams with ideals regarding efficiency and bureaucracy.

Bill solicited input on any aspect of action team process. APNEP attempts to minimize costs and other factors, and he asked for feedback on how to make this relationship work better with members and their organizations.

2) First few meetings set the tone. Agenda planning should include avenues to develop consensus regarding action team direction. It may take several meetings for team members to build rapport and shared understanding of a topic, particularly if they aren't acquainted. In relation to action team goals, decision-making processes and ground rules should be thoroughly considered and discussed, then revisited regularly. Dean noted leaders should encourage everyone to make contributions. The interval between meeting is important and it may need to account for seasonality in workloads.

3) Leadership matters: APNEP takes the lead in organizing kickoffs, but potential for external action team leadership. Each approach brings a set of tradeoffs. Staff should serve as a source of consistency and direction and workgroup planning should account for the likelihood of personnel changes. Primary/secondary assignments helpful in this regard. Even with external leadership, APNEP should expect to sustain core administrative functions, including communications, financial arrangements, and notetaking. Reconciling external leadership of an "APNEP" action team could foreseeably become challenging in some circumstances, including long-term direction for the team in relation to the CCMP.

4) Information Sharing: combination of website, shared cloud drives and listserves have been helpful but imperfect. Technological transitions and security concerns within NCDEQ have been challenging. Video teleconferencing has considerable benefits but has been another technical challenge, particularly when hosting from remote locations.

5) Scope of Inquiry. The initial contaminants action team had four CCMP actions and several initial projects. Group members were split in their interests. Eventually, the workgroup itself was split.

6) Action team relationship to ecosystem approaches and APNEP institutions. 58 CCMP actions to address over a now six-year time horizon. When is an action team the most effective approach to addressing CCMP actions. APNEP financial flexibility, broad mission and interdisciplinary and well-connected staff makes it ideally suited to react quickly to new opportunities, but sometimes these were not foreseen in the CCMP, so how do we take advantage.

Dean reviewed the Contaminant Workgroup actions: A2.4, A2.5, C1.1, and C1.2. Before implementing certain action the team may require an assessment of the available resources, and sometimes it isn't there. You may have to assess which personal care pharmaceutical products need to be addressed first. Assessment and data collection may be the first need. The Nutrient action team began in 2014. It was scheduled to wrap up at the beginning of this fiscal year but it was delayed. Dean explained the process for the State to determine whether they are going to promulgate any criteria. Of note, Dean advised, is

that USEPA wanted North Carolina to update their Nutrient Management Plan, and they recommended some pilot areas. High Rock Lake, and the Cape Fear River, were two of the identified pilots. The State initially decided have an estuaries pilot, so that is why they are overseeing the Albemarle Sound pilot area. APNEP will finish their involvement with Phase I activities by the end of the calendar year, and then it is up for discussion whether there is a Phase II for APNEP. The NCDWR will definitely undertake Phase II. Bill advised that APNEP definitely would be one of the parties.

Jud asked Dean to highlight any outcomes of the Nutrient group. Dean asked Hans and Tim as STAC representatives on the team, to provide the highlights.

Tim noted that nutrients have kept a lot of people engaged and paid, for a hundred years or so. It is complicated. Nutrients are probably the number one water quality problem in the world. You can get into a lot of discussions. If you add nitrogen or phosphorus, you will see a response. The group has been looking at response variables, and causal variables. The nutrients themselves are causal, and oxygen, turbidity and other metrics are factored into the discussions. Tim would like to have seen a lot more structure to the process. Much has happened over the last 800 years, and especially since the 1950s. the discussion has focused on the criteria, and protective standards to be established. Tim stated that he thinks we already know, what we need to know. But there are other folks on the committee who want to be more specific in terms of the standards. We know generally about what concentrations cause the beginnings of eutrophication. Other members believe we need to customize the standards, but it becomes difficult to do that. Florida has a different standard for every river system, and it is complicated to track. Who will track all of those requirements? USEPA had suggested some nitrogen and phosphorus standards for lakes and streams as well as coastal systems, where nitrogen becomes limiting. The issues have been on which things to focus. Dissolved oxygen was discussed, along with water clarity, and Secchi disk readings. Also, when do we have a problem was a topic of discussion. Your use of the water determines what you think the problem is. Whether you are a discharger or a farmer, you have different responsibilities. Achieving consensus on the desired outcome is a challenge. All of these things play into the discussions. They have looked at approaches taken by other states and looked at the criteria out there. They have made proposals for both the response and causal variables that that will include nitrogen and phosphorus. They haven't decided anything yet. They made progress the last time in looking at response variables. It continues on. Tim anticipates two to three more meetings before the end. They didn't get through the response variables at their last meeting. Chlorophyll a, water clarity, and dissolved oxygen discussions are continuing. They are coming up with some reasonable standards.

Hans noted the conundrum was "use." High Rock Lake is loved by fishermen. It doesn't meet the state standard of 40 mg/L for chlorophyll at times but it meets the use. Drinking water is another use, downstream, and may constitute a problem there. You can see the complexities in all of this. The fishermen love it, and it doesn't appear to constitute a problem for fishing or dissolved oxygen. It wouldn't fit in some respects; however, if you get a blue-green algal bloom downstream then you have an issue. It is complicated and that is why they are wrestling with it.

Dean noted that is true of many of the issues in the CCMP. Do you want services, or do you want drinking water? Dean noted Jim's comments about sometimes the opportunities fit, and this is one of them, relative to the nutrient criteria. When the CCMP actions were drafted in 2012, staff had no idea that this opportunity would come along. APNEP could have a contaminants coordinator solely to work on nutrient and other issues. That is just one example of how priorities have to shift around.

APNEP Submerged Aquatic Vegetation Action Team Progress Dean Carpenter

Dean gave his presentation on the SAV restoration and protection strategies within the A-P region. This team has three actions: B2.2, C3.3 and D1.1. APNEP began facilitation of an SAV partnership in 2004. APNEP broadened the partnership from solely a monitoring focus to other aspects of SAV conservation. In 2009-2010 APNEP staff handed off facilitation to NCDMF staff, who did it for a couple years. In 2012 APNEP picked it up again. The monitoring and assessment portion will continue under APNEP's assessment side. This action team will deal more with the planning and management side. This team has had two meetings, the last one in April 2016. The long spans between workshops meant they needed to re-tool and re-group. With regard to restoration strategies, those can include: shoreline armor removal and modification, removal and modification of overwater structures, improvement of water clarity via reductions in anthropogenic nutrient and sediment loadings. What combination of actions can meet the target? We may develop a probabilistic model. Dean showed a graphic of SAV in North Carolina and Back Bay, Virginia during 2006-2008. Dean asked Jud and/or Wilson to share their impressions regarding the first two workshops. He wanted to assure everyone that APNEP is very active in the monitoring and assessment components. The monitoring has been based mostly on aerial overflights every five years, in contrast to Chesapeake Bay which is flown annually. Because many areas in the sounds are very turbid, APNEP received a Coastal Recreation Fishing License (CRFL) grant to develop boat-based monitoring protocols. This began in 2014 with Albemarle Sound. Jud and Dr. Joe Luczkovich were the principal investigators. Dean provided a slide which showed all of the information regarding monitoring and assessment. The boat-based protocols were developed in 2015-2016, with sentinel stations established in Albemarle Sound in 2015, and a pilot survey and 2016 sentinel station establishment in the Tar-Pamlico River. In 2015, APNEP did National Coastal Condition Assessment monitoring. During 2016, sentinel stations in Albemarle Sound will be revisited, and stations will be establishment in Core and Bogue Sounds, as well as a 2016 pilot survey in the Neuse River. These activities will provide more data for an updated assessment in 2016-2017.

Brian asked if the stations were for freshwater, saline waters, or both. Dean advised they were for both. He noted that more saline stations are being developed.

Rich asked Dean to define "sentinel" in this context. Dean noted that we can talk about areal extent but we can't monitor the entire area, so these are stations that will be monitored on at least an annual basis. During the first and second years they are established, they are monitored in spring and fall to determine an optimal monitoring period. There are ten stations in Albemarle Sound, and the Pamlico will have six or eight. They are trying to establish a balance between coverage and the needed resources. Rich asked if there are plans to go into Currituck Sound. Yes, but Dean noted that it is quite turbid up there. APNEP will be working with partners in Back Bay on that part. Dean asked if Jud and Wilson wanted to add anything.

Jud noted that we can remotely sense a portion of North Carolina's SAV resources, mostly in the back barrier portion of the sounds. That has been done for 25 years, and the water clarity and visibility allow us to do that work. He explained the map which Dean had projected. The yellow areas in the low-salinity area represent what was detected, and do not represent at all what may have been there. The SAV monitoring team has developed the boat-based sampling to assess the "invisible" seagrass. Based on boat-based monitoring, the yellow areas should expand over the next couple of years. We believe that we can continue to monitor remotely the higher salinity areas. It is difficult however to assess the changes in species composition without being on the water. That is why the SAV monitoring workgroup

has developed this multi-faceted approach. You can't just use one tool to capture it all. Also, the area of SAV habitat is spread out over a large area. With regard to restoration, until we can make the connections to the threats, we will just be compiling what we think can be done. As far as conservation goes, there are a whole host of issues which cut across workgroups, such as nutrients and water quality. Jud noted that in most of North Carolina's high-salinity areas, the water quality is pretty good. It will be awhile for the lower-salinity areas before we know what we need to do.

Joel Fodrie suggested that the group should think about shellfish leases. Shellfish harvesters in North Carolina want to expand those areas, and they want to go where the SAV is located.

Jud noted that is seriously being considered now. There is a group at the NOAA lab who is developing a national plan for shellfish aquaculture.

Brian noted that Wanchese Fish Culture and Joey Daniels at Bodie Island are showing that structures for aquaculture are actually allowing reestablishment of SAV. Visitors can see it, it is not just anecdotal. Jud noted that some similar information has been published for the Pacific Northwest.

Jud noted that there are lots of conservation questions, and no specific plans with respect to SAV restoration.

Dean noted that the APNEP SAV action team had talked about revisiting the Atlantic States Marine Fisheries Commission (ASMFC) SAV policy. Wilson noted that the ASMFC Habitat Committee has agreed to revisit the policy. This committee will review the commitments made by ASMFC and member states, and evaluate how well they were implemented, if in fact they were. There are many unanswered questions with respect to the biological community associated with SAV beds, and NOAA Beaufort Laboratory used to do much of that work. Jud noted that Joel's group is the only group in North Carolina doing that work now, because the NOAA lab's program no longer exists. Wilson noted that Michelle can at some point brief us on the situation with SAV in Lake Mattamuskeet, where that habitat is declining and studies are ongoing to try to determine why, including some studies by STAC member Mike Piehler.

Jud noted that some new CRFL grants have been submitted as well, in addition to the work that Joel and his lab are doing.

APNEP Education & Engagement Action Team Progress Stacey Feken, APNEP

Stacey noted that she is the lead staff facilitator for the APNEP Education & Engagement action team, and she is sure that members all know what they are doing through all of the APNEP media products. The action team has not actually met yet in 2016. They plan to have a conference call and then a meeting sometime this fall. Bill noted that the team actually had met twice before Stacey came on board. Stacey noted that she must review what the team was working on. Their actions: D1.1, D2.1, D2.2, D2.3, etc. She welcomed any thoughts on how better to communicate.

Stacey reviewed the action team's secondary goals: D1.3, D1.4, D3.1, and E2.2. Staff are seeking feedback on where to go next and how to get all the information to the public. Some of these actions overlap with the responsibilities of other teams, hence staff wants to coordinate with the other action teams to determine how they can support their efforts.

The team met last in March 2015 and reviewed a number of grant proposals, six of which were awarded. Those were listed on the screen: Seeds of Inspiration: Mano al Mername and the NCCF; Sea Wolves: CMAST; Sound Choices in EE: EENC conference; Secrets of the Swamp: NCSM; We are Nature Heroes: NC Aquarium, Roanoke Island; Cistern and Wildflower Meadow: NC Aquarium, Roanoke Island. Stacey reviewed each of these and explained them. Wilson asked if those six projects included any sort of before-and-after evaluation. Stacey indicated that they did, and she and Coley will discuss that more shortly.

Stacey reviewed some of the outreach activities. These included the Kids River Fest: Sound Rivers, May 2015; and Let's G.O. Williamston, May 26th this year. Stacey explained what was involved in each of these events.

Stacey reviewed the Shad in the Classroom and Roanoke River Days. While these didn't originate with the action team, APNEP has been involved in both. In response to Wilson's question her answer is "not yet, but yes we are going to do this."

Coley noted that they are focusing on the Teacher Institute and the Shad in the Classroom project to design follow-up evaluations. They want to determine what has been done with the funding that was put into these projects. Coley is investigating pilot studies for these two projects.

Stacey noted that APNEP wants to evaluate the investments in these projects, as well as the outcomes. They want to have feedback from STAC members as well as from the participating partners.

Stacey moved to the Teacher Institute, which was held two weeks ago. The NCCF and UNC-IMS run the program. She noted that Mike Piehler and some of his students participated this year. It was a very elite group of teachers who were excited about carrying this information back to their schools, and getting the word out to other teachers. APNEP has sponsored other teachers workshops throughout the region. Stacey mentioned Project Wet workshops as well. Stacey mentioned a networking event SciREN, a Triangle educator open house which is coming up soon in the Triangle area.

Rich noted that when they do teacher workshops in Virginia, they must tie them to curriculum standards. Is that the case in North Carolina? Stacey noted that APNEP sponsored two lesson plans, one on underwater grasses and one on blue crabs, and both are tied to curricula. Stacey asked for those interested in creating lesson plans to contact her.

Stacey noted that she has sought feedback from teachers, regarding career resources for high school graduates: non-degree options in environmental, wildlife, conservation, and water resources fields.

Stacey noted that APNEP is developing methods to measure outcomes and impacts of their environmental education programs. They want to develop metrics and tie back to CCMP outcomes.

Stacey reviewed upcoming events: SciREN Lesson Plan Workshop, August 27 at the North Carolina Museum of Natural Science; SciREN Triangle Educator Open House, September 9, at the North Carolina Museum of Natural Science; and National Estuaries Week, September 17-24. Next year is APNEP's 30th anniversary.

Stacey noted that APNEP communications are important. Staff are working on an APNEP communication strategy. They welcome assistance in developing communication strategies for use with

the public. They welcome any ideas that members have. The more she hears from the STAC, the more helpful it is for her and other staff. They are currently evaluating how valuable social media will be for them, especially because they don't have any dedicated staff for such efforts. They want to know what the best way is to get out the word, and how they can more effectively use the tools they have. They want to hear our feedback, and we can either call or send messages.

Stacey asked if we were familiar with the citizen science website iNaturalist.org. This is another way to use social media. Although she isn't aware of how effective it may be, she wanted to use an example of a tool that some may not be aware of, and asked that we share any others with staff.

APNEP Oyster Action Team Progress Erin Fleckenstein, NCCF

Erin noted that NCCF had an existing group, which serves as the APNEP Oyster action team. She provide some background. They had a Oyster Steering Committee meeting on a super snowy day in January, and had 65 people participate. They asked for input on who needed to be at the table for oyster restoration. The result was oyster harvesters, state and federal agencies, and academia and NGOs. That came down to about 15 people, but others are welcome to join as well. In March 2015 they held an oyster summit in Raleigh. They had a legislative reception after the summit, with some 50 legislators and their aides. The legislature in 2015 passed eight different bills related to oysters. Since then they have assisted the NCDMF with the legislative studies. The legislators were listening again, and increased appropriations for oysters again this year. Erin shared the amounts of funding and purposes. There were additional appropriations for staffing increases as well. It was a demonstration of how effective it is to speak with one voice. She referenced the State of the Oyster report. She noted that APNEP had funded the economic study of the oyster program. For every dollar spent there is a four dollar return, and they are pretty excited about that. North Carolina's shellfish fisheries management plan is being revised now, and should be approved in early 2017. There are a number of habitat improvement projects occurring. They have launched a website called NCOyster.org, which includes any information related to oysters happening within North Carolina. One of the other CCMP objectives is to facilitate restoration techniques and methods. These have a lot to do with decision tools. The Nature Conservancy (TNC) is launching a restoration application. North Carolina Sea Grant has been involved in developing a restoration map, and UNC-IMS is also engaged. While the three efforts are independent, they have been talking about how to bring them together under one roof, possibly on a web site.

Dennis asked if there was any collaboration with any of the oyster work going on in Chesapeake Bay. Erin noted that there has been conversation with that group. They are a bit ahead of us so it is good to watch them and learn.

Jud asked who is coordinating the whole siting process. Erin indicated that all siting is being done through NCDMF. Brian has met with them. There were 15-20 thresholds listed that needed to be examined. For example, oysters should not be placed on top of other oysters or on top of SAV, or in trawling areas. Erin noted that a lot of ground-truthing is required. Salinity, larval recruitment, and other factors all go into the model. Brian noted that all the areas have to be permitted.

Wilson asked if Erin had heard anything more about the US Army Corps of Engineers mitigation for Wanchese Harbor. She indicated that the Corps had put together an in-house proposal, but it turned out to be very expensive so now their plan is to purchase mitigation credits. Rich noted that they have oyster recipes on their web site.

2:25 p.m. **APNEP Ecological Flows Action Team Progress** Dean Carpenter

Dean noted that the APNEP Ecological Flows action team, like the Oysters action team, was also tagged on to something that was already ongoing. The North Carolina Legislature had created an Ecological Flows Science Advisory Board (EFSAB) that spent several years on this topic. This is for CCMP actions A3.3 and D3.2. The purpose is to have flows that meet and sustain ecosystem services. Most of the streamflow gages are located in the Piedmont, not in the coastal plain. Dr. Bob Christian approached APNEP and asked that STAC members who were interested form a coastal ecological flows work group. Mike Piehler and Dean were both part of that group, along with former STAC member Scott Ensign. There were some legislative constraints imposed on the group, including being able to look only at existing, and not historical flows. Scott Ensign had developed a geomorphic typology and associated in-stream habitats flow chart, which was useful to the group. The streams that were lunar tidally-influenced did not lend themselves to this approach. While EFSAB completed their process, APNEP wanted to carry it on. The action team has had two meetings so far. They had to do an assessment of the available data before they could get into the ecological flows aspect. They met in 2015 and again this spring. They developed a scope and elected two ECU faculty as co-leaders. Unfortunately, both of them left ECU, and that slowed things down somewhat. They have worked out a plan to take on the research that was approved by the action team. They are hoping to get a scope of work soon, and have the work begin this fall. Mike Piehler is the existing STAC member assigned to this action team.

Pete Kalla asked if anyone from the Corps was on that team. Rich noted that TNC has some staff who have developed some really good approaches to flow analysis. Rich asked why EFSAB was banned from looking at historic flows. Dean speculated the restriction was political rather than science-based. He noted that things are not restricted for the APNEP action team.

Wilson asked what the fate was of the final report that was developed by the EFSAB. Bill indicated that as far as he knows, nothing else has transpired.

Committee Discussion on Action Items Jud Kenworthy

Jud noted that the only action item was to send any thoughts on the STAC action plan to Dean.

Wilson suggested that in order to generate some products on a more short-term and timely basis, we could either hold a full STAC retreat or perhaps more efficiently, a STAC Executive Board retreat, to consider topics on which the STAC may wish to weigh in, to perhaps have an influence. He asked the STAC to consider that approach. One thing we might want to address is the current effort to eliminate the North Carolina buffers rules. Jud asked Dean to send out a request for ideas. Dean noted that he sent out such a request last Christmas, although he would be happy to send out another request. Bill noted that the climate has perhaps changed a bit, or could.

Wilson clarified that what he was seeking was a short list of issues of concern within the APNEP region, on which the STAC could have some meaningful influence. That could take two approaches: either producing an informational document which could be distributed to legislators and others, or a positional paper which we could carry to the APNEP Policy Board and ask them to push.

Hans noted that if STAC wants to do something on buffers they should recruit some outside help like Wendell Gilliam, who is retired now and would likely be pleased to assist. Wilson agreed that Wendell would be an excellent collaborator.

Bill noted that there are several opportunities currently in which the STAC may consider getting involved.

Bill noted that another action item is to update the list of STAC liaison assignments to the action teams. Staff will be working on that list. Also, Bill noted that they may need some support from the STAC as a body, or from various institutions throughout the state as individuals, with regard to moving to a university host. One thing which has arisen is that APNEP may need to find a way to support some graduate students to assist with the work on each of the actions. This would benefit the state personally, professionally and economically.

Public Comments Jud Kenworthy

There were no members of the general public present.

Dean noted that the next meeting would be joint with the Policy Board, on Wednesday, November 2.

Adjourn Jud Kenworthy