



Annual Joint Meeting of the
Science and Technical Advisory Committee and the
Monitoring Advisory and Coordination Committee

(STAC No. 39)

Tuesday, March 8, 2016

9:30 A.M. to 2:30 P.M.

Cusano Center at USFWS Heinz Tinicum Refuge – Philadelphia, PA

STAC Attendees

Gregory Breese, USFWS
Dave Bushek, Rutgers HSRL
Dorina Frizzera, NJDEP
Desmond Kahn, Fisheries Investigations
Susan Kilham, Drexel, STAC Chair
Danielle Kreeger, PDE
Hoss Liaghat, PADEP*
Kristin Regan, EPA R3
Alison Rogerson, DNREC
Kelly Somers, EPA R3
Kenneth Strait, PSEG
John Yagecic, DRBC
Elizabeth Watson, Drexel

Spencer Roberts, PDE
Doug Janiec, PDE Board
John Kennel, DNREC
Stephanie Kroll, ANSDU
Roger Thomas, ANSDU
Kelly O'Day, PWD
Carol Collier, WPF
Vic Poretti, NJDEP*
Shelia Eyler*
Nathan Boon*
Kelly Anderson, PWD
Joseph Kardos, PWD
John Jackson, Stroud
Theo Collins, Clean Ocean Action
Catie Tobin, Clean Ocean Action
Meg McGuire, Delaware Currents

MACC Attendees & Guests

Sarah Bouboulis, PDE
Angela Padeletti, PDE

***Adobe Connect**

1. Call to Order & Introductions

- 9:30 am: Sue Kilham (STAC Chair) called the meeting to order
- Attendees were asked to introduce themselves
- The meeting agenda was reviewed
- D. Kreeger reminded participants that the annual STAC and MACC joint meeting is important for the NEP as a means to coordinate monitoring needs and opportunities.
 - There is utility in both bottom-up and top-down approaches for coordinating monitoring. This annual meeting helps to regularly promote organic, bottom-up coordination, and periodic, broader planning activities (e.g. DEWOOS, 2007) provide top-down inventories and gap-filling.

2. National Estuary Program – Task Summary 2016-2018

- D. Kreeger provided a programmatic overview of current and upcoming NEP tasks needing technical input, including:
 - revision of the CCMP
 - revision of our measureable goals as part of the CCMP process
 - updating the 2012 Technical Report for the Estuary and Basin (TREB)
 - coordinating and hosting conferences such as the 2017 science summit and possibly a monitoring conference in early 2018

- Both the STAC and MACC will have important roles in these activities and products, least of which will be providing peer review

3. CCMP Revision Progress and Next Steps

- S. Bouboulis gave a presentation on the CCMP revision process
- The final product will be much leaner and focused than the original CCMP, a little over 100 pages total. A draft table of contents was shown
- Measureable goals will be included and used as drivers for CCMP actions. Since a lot of work went into developing our recent measureable goals, these will be used as guides for focusing. However, at least the short-term goals will need to be updated to better align them with tangible actions (some goals may be better framed as step-wise actions). The Steering Committee agreed to updating short-term goals as part of the CCMP process.
- Funding and capacity are not available to update the State of the Estuary public report, but an update of TREB has been approved, focusing on indicators that are best aligned with expected CCMP goals and actions. The timing should be as soon as possible to be most useful for guiding CCMP development/refinement.
- An expert list was prepared and vetted by the STAC and other groups, and a survey is being prepared to find out who wants to help and with what expertise
- Two rounds of technical workshops are planned, one set for this fall to help craft the initial CCMP draft, and a second set nearer the end to help polish and vet the drafts. For both the early and later rounds, three workshops are expected: one each per round for healthy waters, healthy communities and healthy habitats. A climate change workshop is also possible.
- The upcoming Science Summit (Cape May, January 2017) will provide an additional opportunity to report out on CCMP progress and gather input.
- D. Kreeger discussed how the various NEP tasks might be better coordinated over the next 10 years and beyond, by aligning schedules for major deliverables more sequentially and logically.
 - Priority setting activities (goals and planning) > CCMP implementation actions > monitoring of progress and conditions > indicator reporting, and then repeat
 - Aligning these processes that they feed into one another would be more efficient and effective, and would avoid having too many major work tasks in any given year
 - The STAC and MACC provide a platform for coordination among groups, avoiding redundancy and ensuring no major needs or opportunities are missed
- S. Bouboulis furnished more info on the CCMP process/plan
 - The CCMP has not been revised in 20years
 - The goal is to finish by 2018
 - The old CCMP had 77 action items. The new actions will be framed as per the goals categories, augmented with info from the upcoming expert surveys
 - The EIC will finalize the survey that will be sent out to experts ASAP
- By the 2017 Science Summit, we aim to have something to present to the experts, STAC, MACC, for more input
 - The public input period will be later in 2017
[Note: this was subsequently expanded to include an initial public info-gathering effort in summer 2016, followed by public vetting nearer the end]
- D. Kreeger presented on the monitoring plan section of the new CCMP
 - The “monitoring plan” will only be allotted 4 pages
 - Additional space for specifics can be included in supplementary material

- Based on initial discussions between PDE and DRBC, the MACC would be an ideal group to craft this monitoring plan part of the CCMP
- The updated TREB may be supplementary to the CCMP as well
- D. Kreeger, S. Kroll, D. Kahn each commented on the need for a shared effort in developing this monitoring section. The monitoring associated with the Delaware River Watershed Initiative can also be helpful.
- J. Yagecic committed MACC time to aid in developing the CCMP monitoring plan.
- K. Strait inquired if a finance plan will be included in the CCMP
 - S. Bouboulis - a finance plan will be included (operational science and restoration needs), similar in size to the monitoring plan section
 - D. Kreeger noted that there is still a need for a science and restoration trust to meet our needs, similar to Hudson River Foundation, Chesapeake Foundation, etc.
- D. Kreeger noted that those who respond to the CCMP expert surveys (sent out by S Bouboulis) will have a ticket to the technical workshops and ultimately be able to impact the CCMP.

4. TREB Updates

- D. Kreeger summarized the plan for the updating the technical portion of the State of the Estuary and River Basin report. Last year, we polled STAC members and former TREB authors in the following questions, aimed to gauge the need for an update and level of effort that would be needed:
 - Of the 50 indicators, which ones have newer data that could potentially affect the status, trends and needs in the 2012 report? Which should be updated?
 - How much effort (and funding) would it take to update those indicators?
 - Who is willing and able to help?
 - Have there been any high impact events (Hurricane Sandy, etc.) that would shift our focus?
- Take-home messages from that survey were that newer data exist and minimal effort would be needed for most indicators. However, the sediment and restoration chapters should be overhauled (or not updated since major effort would be needed).
- The current plan is to re-form or re-create the chapter based writing teams from the 2012 TREB, focusing on updating much of 6 of the 8 former chapters
 - Contractual support is being explored for Penn State, University of Delaware, and DRBC.
 - J. Yagecic confirmed that DRBC will plan to update more than just water data, including DO and nutrient data
 - S. Kilham emphasized the importance of DO and water quality in habitat health
 - C. Collier noted that the University of Vermont prepared a very useful basin-wide mapping project, intended for spring 2016 completion
 - Additionally, Shippensburg University is mapping land use under different scenarios.
 - Both groups are using the 2012 Land Use Land Cover data set, but at a higher resolution than what is currently available.
 - S. Kroll and J. Jackson confirmed that the Land Use Land Cover data used in 2012 is not the most up to date
 - They also confirmed that updates are needed for the fish data, especially in new areas used in fish reproduction.
 - Commitments to updating sections

- DRBC - water updates
 - DNREC - can help update the fish data
 - PWD/ANSO - J. Kardos and S. Kroll can help with DO data
 - ANSD/PDNREC – E. Watson and A. Rogerson can help with wetland data
 - Rutgers - D Bushek can lead on oyster data
 - EPA – K. Somers can help with Land Use Land Cover data
- The goal is to have the TREB updated 1 year from now
- D. Kreeger – wetland acreage may or may not have changed much between 2006-2012, despite rapid loss of tidal acres 1996-2006
 - G. Breese –there may not necessarily be a big loss in total wetland cover, but there may have been a big change in wetland type
 - D. Frizzera – there are post-Sandy data that still needs to be analyzed and assessed
 - D. Bushek – asked if the Sea Level Rise indicator will also get updated?
 - D. Frizzera – NJDEP is engaging NOAA to acquire updated vertical datum for the tidal section of the Delaware Basin. There will also be a comparison between current and 1977 relative sea level measurements
 - D. Kreeger – L Haaf (PDE) is exploring the rate of wetland erosion at fine scales
 - J. Kardos – Several recent papers have documented relationships between stream flows and precipitation
 - Also a recent paper looked at paleo-tides and made future projections
 - References for these papers will be sent out after the meeting
- S. Kilham, D. Kreeger and D. Frizzera discussed the emerging importance and difficulty of the locations of the head of tides, and comparing with historic records in both the main stem and tributaries
 - D. Kreeger – Each time the channel in Trenton is deepened, or the system otherwise gains volume, the tidal range appears to have increased, which may be important for MHHW flood scenarios
 - D. Frizzera – communities are starting to acknowledge the problem and recognize abnormal spring and king tides, more frequent inundation, and higher residence times
- D. Kreeger – Can we complete the TREB indicator updates in time for the PDE Summit?
 - K. Strait – The timing may hinge on how recent we attempt to go with the latest data, since the availability and timing of data varies by indicator
 - D. Frizzera – NOAA vertical datum updates should be available since this info is needed to guide future restoration planning and monitoring
 - S. Kilham – Asked when the Univ. of Vermont land use study will be done?
 - C. Collier – That was to be completed in 2015, but now will be completed spring 2016; updates should be available for the June STAC meeting
 - G. Breese –When will the TREB updates begin, and what is the planned timeline?
 - D. Kreeger – Goal is to get contracts in place for the 3 funded groups by early summer, and we/they will quickly form writing teams. Data collection would begin in summer and initial analyses would hopefully be completed by end of the year. Write-ups could then happen during winter. TREB supplement assembly by March, peer review and completion by end of spring 2017.
- Additional commitments to help
 - D. Frizzera – will help with wetland and climate sections
 - K. Anderson – PWD now has a climate person, and they should be willing to help
 - S. Kroll – will help with the river and macroinvertebrate sections

- D. Kreeger – Emphasized that the TREB is designed to look at the whole basin

5. 2017 Summit Update

- S. Bouboulis summarized plans and needs regarding the next Science and Environmental Summit. The meeting dates will be January 22-25, 2017 (Sunday to Wednesday)
- The theme will be “Reflecting on the Past, Planning for the Future”
 - This will play into the program’s 20th anniversary (past) and CCMP revision (future)
- There will be at least two invited speakers – one technical, one an elected official
- As usual, we will have regular sessions and special sessions. Regular sessions are designed to cover broad topics so everyone who wants to present/participate can find a place. Special session discussed by the STAC and others are likely to focus on post-Sandy lessons, scaling, and CCMP
 - J. Kardos – suggested an expansion of nutrient impacts on estuarine resources
 - S. Kilham – suggested a session on extreme events, not just Sandy
 - J. Yagecic – suggested a session on fish propagation, especially with new data on shifts in propagation and the need to bring more researchers and data together on the issue. Potentially, this is one of the biggest stories in the estuary at the moment with fish propagation now documented in places not seen before. How does water quality impacts and management fit in address this change?
 - D. Kreeger – What zones would this focus on?
 - J. Yagecic – Zones 2-5 primarily
 - D. Kreeger – We will soon be asking for volunteers to serve as moderators. Moderators function as session coordinators, helping to select the abstracts, align the sequence of presenters, and then handle the meeting introductions, etc. We always try to foster bridge building, pairing 2 moderators per session from different sectors: industry, regulatory, agencies, academics, etc.
 - D. Janiec – Suggested coordinating with surrounding NEPS (Inland Bays, Chesapeake, Barnegat Bay) and inviting people from those NEPs to speak or participate in a panel discussion
 - D. Frizzera – suggested a session on funding and strategic planning to bring in new ideas and concepts regarding funding streams
 - D. Kreeger – The 2015 Summit had a funding session
 - D. Kreeger – if anyone has further thoughts on speakers and sessions for the Summit, send them to her, S. Kilham, or S. Bouboulis

6. Monitoring Summit 2018

- D. Kreeger – Reviewed past attempts to inventory and coordinate monitoring across broad system components, such as the 2007 Delaware Bay pilot of the National Water Quality Monitoring Network, which led to the concept of DEWOOS (Delaware Estuary Watershed to Ocean Observing System).
 - The vision of that effort was an ecosystem-based monitoring system linking USGS (watersheds) and NOAA (coastal) observations systems. The report led by DRBC inventoried existing monitoring and completed a gap analysis of new monitoring that would be needed to achieve the full vision.
 - Although funding was never secured to implement DEWOOS per se, several good outcomes resulted such as funding for USGS for better water quality monitoring and grants to PDE to launch an integrated wetland monitoring program.

- Efforts like this (DEWOOS) are periodically useful, sufficing as a monitoring plan to take stock of where we are at and what emerging needs should be addressed. Since it has been almost 10 years since DEWOOS was articulated, PDE is interested in proposing a monitoring conference for immediately following the CCMP revision.
- The goals of this conference would be to share info on recent and planned monitoring, and to assess future needs.
- The proceedings might be translated into a new monitoring plan for the system, building on the short piece in the new CCMP, similar to how the proceedings of the first Science Conference (2005) were used to create a white paper on top science needs (2006). That white paper proved extremely useful in prioritizing new investments and programming for DELEP.
- D. Kreeger asked if the MACC, DRBC and the DRWI teams would be interested in working on this conference with PDE?
- C. Collier – late 2017 or early 2018 may be best for monitoring summit with goal of discussing why certain monitoring is needed, how it fits in, etc. Not all monitoring needs to agency monitoring. It could also incorporate things like citizen science.
 - Other things to discuss – what should we be looking for at different time frames? How should we monitor protected sites? It's important to remind ourselves of the importance of continued monitoring across the watershed, etc.
- J. Jackson – Maybe an entire monitoring summit is needed, but couldn't sessions within the Science Summit also focus on the CCMP and associated monitoring?
 - With regard to Citizen Science, it's often difficult to find the right balance in incorporating citizen science and public involvement into short and long term goals
- D. Frizzera – There is a need for a monitoring summit, and another facet would be finding agreement on usable and effective metrics and protocols. It would also be useful to make monitoring data searchable and retrievable in order to make decisions for next steps
- C. Collier – It would be a good idea to have this be a shared event open to everyone. It's important to make sure upstream and downstream goals and monitoring needs align, similar to how the Delaware Estuary Program and DRBC/DRWI whole watershed initiatives complement each other
- D. Bushek – For guiding research and scientific efforts, this monitoring, evaluation and reassessment focus would be very helpful
- After further discussion, the STAC, MACC and DRWI representatives agreed that a monitoring conference would be useful and could be co-organized.
 - The topic will continue to be explored in future meetings
 - PDE, DRBC and DRWI leads will investigate if there might be some funding to help plan and launch the meeting.
 - Timing would be in the intervening year between science summits; i.e., January 2018

7. Delaware River Watershed Initiative (DRWI) Updates

- **S. Kroll** presented on the recently released Monitoring Report produced by the Academy of Natural Sciences on behalf of the DRWI
 - William Penn Foundation launched the DRWI with the ANSP in 2013 with the goal of improving water quality through on-the-ground actions. This was achieved by fostering collaboration between research and restoration sectors. Around \$40 million has been invested in DRWI and it is part of the larger William Penn Watershed Protection Initiative

- The monitoring sites evaluated multiple indicators: fish, algae, macroinvertebrates, and water quality across 35 integrative sites, 77 project sites and 24 fish project sites. The monitoring led to the new 2016 Points of Departure report
- In each of the sub-watersheds that the DRWI is investigating, the following questions were studied. What does the baseline look like? What are responses of taxa to certain BMPs? What causality exists and where? Across the Delaware Watershed the goal is to watch streams improve according to scoring and ecological targets based off collected and measured baselines.
- The National Hydrologic Database was used to create consistent regionally scaled baselines to downscale from the HUC 12 level to smaller streams
- The DRWI Working Group is evaluating ecological targets of restoration and protection and how BMPs directly impact ecological processes and specific taxa. The working group is meeting in April, and then again in May or June.
- The Drexel Watershed Consortium and Delaware Watershed Research Fund have also created a \$300,000 consortium for non-ANS and Drexel research. An additional \$4 million is being used to solicit collaborative proposals for other researchers not affiliated with the ANS or Drexel. The objective is to support integrative research agendas for communities and local watersheds
- The DRWI report is available at ansp.org/drwi
- S. Kilham – How much historical information was used for site selection?
 - S. Kroll – There was not a lot of available/useful historical data. Another challenge was that historical data and methods were not consistent with modern sampling methods. For example, the DRWI is using a different sampling protocol than that used by PA Fish and Boat. But the group is still meeting with state agencies to incorporate all available data

8. Upper Basin High Resolution GIS

- J. Yagecic presented on new GIS data layers for the upper Delaware River Basin.
 - In 2010, it appeared that natural gas development in the upper basin was imminent. In response, DRBC received funds to develop a tool to evaluate natural gas development. Although natural gas plans are still not final, the GIS layers have been developed to be available as needed
 - The new layers were developed by UVM using high resolution layers from the USGS Headwater program. The layers created include those for riparian cover, tree cover, hydrology and land above Marcellus Shale deposits for the Upper Delaware Basin. Layers for water chemistry, macroinvertebrates, etc. can be added via queries from the National Water Quality Monitoring Portal
 - DRBC now needs help in understanding what would make it a better data set and useful to researchers

9. Trash and Microplastics

- K. O'Day presented on new initiatives and needs regarding trash pollution
 - Plastic is an emerging water quality issue (pictures of the stages of plastic breakdown in the Delaware Estuary). Street litter contributes to floatables accumulation along river banks. PWD collects 11-41 tons of marine debris per year, 56% of which is plastic. Living Lands and Waters collected over 32,000 pounds of plastic over 10 days in August and September 2015

- There is a need to connect what is being documented in the Atlantic Ocean with microplastics to what is happening in local rivers and across the estuary. The NOAA procedure for quantifying plastic debris does not include pieces less than 1 inch. But the smaller plastics may be the destructive group.
- In the Hudson, the NY/NJ Baykeeper counted plastic debris and found 38,524 to 556,484 pieces/km² (31% were fragments, 18% films, 38% foam, 6% line, 7% pellets; 87% of which could be related to street litter)
- The ecological and public health effects are largely unknown
- NJDEP will release a report later this year on the implications of plastic
- K. O'Day offered recommendations to the MACC and STAC:
 - Recognize plastic trash as a water quality issue
 - Participate in the EPA Region 2 Trash Free Waters Program
 - Encourage citizen science on plastic trash measurements
 - Encourage and support quantitative measurements/monitoring, which could be via cleanup programs. Assessments of long term trends are needed
 - Research the ecological impacts of plastic
 - Develop data collection and cleanup program (similar to Great Lakes initiatives)
- C. Tobin from the Clean Ocean Action program presented
 - Clean Ocean Action is a coalition of 117 groups, businesses and individuals. Since 1985 have removed 5.4 million pieces of trash from NJ beaches, engaging 105,543 people
 - Currently working on macro and microplastic sampling from Sandy Hook to Cape May
- S. Kilham – asked if increasing plastic production has led to an increase in plastic trash incidence?
 - C. Tobin and K. O'Day – It is difficult to know, but since beach cleanups began there does appear to be an increase in plastic trash. There are gaps in data since until recently trash was seen as an aesthetic problem, whereas now microplastics are receiving more attention as a pollution problem
 - Example: President Obama recently signed an executive order to phase out microbeads in commercial products
- D. Kreeger – noted that funding for trash/plastic research has been elusive. PDE has submitted proposals to study the effects on wetlands but always were declined. So PDE has been hesitant to devote more time to writing proposals
 - K. O'Day and T. Collins – measuring and quantifying impacts of plastics does not require a lot of funding usually.
- D. Bushek – We should look at the use of trash reels in Delaware Estuary to more effectively collect plastic trash, especially floatables
- D. Bushek, K. O'Day, T. Collins, D. Kreeger – discussed terminology challenges related to sizes of microplastics. A broad definition of less than 5mm is still not descriptive enough since effects on filter-feeders (less than 20 microns) may be much different than the effects on deposit and macro-feeders. Terms like picoplastics, nanoplastics may be needed
- K. Strait – mentions that combined sewer overflows can be a big factor for plastic trash dispersal
 - K. O'Day – Camden, NJ is now using nets on CSO outflows to catch plastics

10. Measureable Goals Revision

- D. Kreeger – as noted earlier, EPA has asked PDE to set clear, trackable (quantifiable) goals, and the STAC and partners worked for over 2 years to develop the first generation of goals. These

are meant to be stretch targets but also do-able. The Steering Committee approved them in late 2013. The groups are Healthy Waters, Healthy Habitats and Healthy Communities (now the main sections of the new CCMP)

- Some of the goals are contingent on funding/capacity. Some short-term goals are more like actions needed to achieve a target. The Steering Committee approved revising of short-term goals to make more consistent with expected CCMP actions.
- PDE will need input from the STAC and MACC on which goals should be revised and how
- A powerpoint will be sent around after the meeting so everyone can review the current goals and starting suggestions for revisions. Comments will be solicited by email, and the issue will also be on the agenda for the next STAC meeting in June.
- There is no urgency at the moment to have every goal set, but there is a need to show the Steering Committee that the process has started.
- Discussion – several members of the STAC and MACC agreed that the goals need revising and would help to do this as part of the CCMP revision process

11. STAC Business

- S. Kilham asked if there were any edits for the draft December 2015 STAC meeting minutes. None were requested. The draft minutes were accepted as final.
- The next STAC meeting was scheduled for Monday, June 20, 2016, to be held at the PDE conference room in Wilmington, DE
 - a. K. Strait – suggested using an online Doodle poll to see what time works best for setting future STAC meetings
 - b. At the next meeting, D. Bushek offered to give oyster and shellfisheries brief
 - c. The Fall STAC meeting will be held with the EIC, likely in September
 - d. The next joint MACC and STACC meeting will likely be a week or two after the 2017 Science Summit