



Science and Technical Advisory Committee

Partnership for the Delaware Estuary:
A National Estuary Program
www.DelawareEstuary.org

22nd STAC Meeting

Wednesday, August 10th, 2011
9:30 A.M. to 2:30 P.M.

Partnership for the Delaware Estuary - Wilmington, DE

Current STAC Members:

Sue Kilham (Chair) – Drexel University
Danielle Kreeger- PDE
Jen Adkins- PDE
Gregory Breese – USFWS
Thomas Belton- NJ DEP
John Kraeuter – Rutgers University
Ken Strait - PSEG
Jerre Mohler – USFWS
Doug Miller- UDel
David Burke– PADEP
Jeff Gebert – Army Corps of Engineers
Desmond Kahn - DNREC

Non STAC:

Jessica Sanchez- DRBC
John Yagecic- DRBC
Priscilla Cole- PDE
Andrew Homesy- UDel
Sari Rothrock- PDE
Ray Najjar- PSU (phone)
Laura Whalen- PDE
Simeon Hahn- NOAA
Brian Marsh- USFWS
Irene Purdy- EPA, Region II (phone)
Sherilyn Morgan - EPA

PDE Goals Update- Jennifer Adkins

Bob Connell, who had volunteered to work on the PDE goals, accepted a new position with USDA in Annapolis. As a result, he is unable to continue in this role. Bob's focus was on three goals: nutrient impacts, water flow (for ecology), and shellfish. He was working with partners to set numbers for interim and long-term standards on the goals table. Bob created a collaboration website to share information on his work and receive feedback from the STAC. Jen went through Bob Connell's work (and reasoning) to date. For each of the three goals there was an interim measure and a stretch measure. The group discussed the measures that Bob identified.

- Nutrient Impacts
 - Interim Measure
 - Reduction in stream miles of tributaries 303d-listed as Impaired
 - Bring designated uses up to existing uses (in order to lock in DO at current levels that reflect long-term improvement)
 - Stretch Measure
 - No long-term decline in dissolved oxygen levels in the mainstem and bay

- (Possibly) upgrade designated uses
- Results
 - Reduce percentage of tributaries impaired by nutrients
 - Maintain DO at current saturation levels (xx% at Ben Franklin Bridge and xx% at Reedy Point Bridge)
- Comments on the interim and stretch measures
 - Can these goals be accomplished?
 - Sue Kilham noted that the goal of ‘no long-term decrease in DO’ cannot be accomplished since the Bay is getting warmer (and will hold less water).
 - John Yagecic suggested that if we better manage the known point discharges in the Estuary, the dissolved oxygen will go up, making the measure somewhat achievable.
 - Danielle Kreeger noted that, in general, stretch measures are supposed to be difficult to reach. For wetlands, the stretch measure is no net loss. In reality, we want to strive to minimize net loss, because ‘no net loss’ cannot be achieved.
 - John Kraeuter suggested that we could measure by % saturation instead.
 - Desmond Kahn alerted the group to new research by Maryland DNR: [Impervious Surface, Summer Dissolved Oxygen, and Fish Distribution in Chesapeake Bay Subestuaries: Linking Watershed Development, Habitat Conditions, and Fisheries Management](#). DO levels in estuarine tributaries were found to be linked to the degree of impervious surface in the watershed. This is the first time it’s been shown for estuaries.
 - Issues with data—Nitrogen data and 303d metrics overall
 - One person said that most streams are not impaired by phosphorous, they’re impaired by nitrogen. Standards now for nitrogen in NJ are based around drinking water standards (around 10). But for freshwater aquatic species, it should be around 2. What we’re talking about is a stress response model. The DO is responding to the nutrients, and finding that the biotic responses occur at a much lower nutrient level (at least in freshwater) than we’re currently using for setting standards. Also, Barnegat Bay is being impaired for DO and is developing similar biocriteria to try to reflect real aquatic life changes instead of DO which might not be reflective of impacts on biology. I’m suggesting that if N is the limiting factor in the estuary and you’re looking to the tribs to tell you which streams are impaired you won’t find it because we’ve been looking at the wrong numbers for the past twenty years.
 - (46:44) Jessica: when we tried to look at just the Nitrogen data we found a differential- some places measure different things. It’s apples and oranges.

- Danielle: This is a STAC issue because we're getting into comparability of data. (47:07) For setting a goal, we need something consistent across the three states where we have ready access to data. If this is a long-term need, can we tease this info from existing data sets?
 - John Yagecic said that there's a broader problem, with 303d metrics. Every time the EPA looks at it it looks like things are rapidly declining. Not the case, so the belief is that the original measurements are not good.
 - Sherilyn: Can't speak to 303d metrics. Will ask Larry Merrill (and maybe Mark Baroth, Isabella Chekov) about the metrics and get back to the STAC.
 - Danielle: There's a sense that nutrients are impacting the tributaries, but we're not looking at the right stuff.
 - Andrew Homsey: comparing state to state creates data issues. Measurements are different, outputs are different, categories are different. It's more accurate to look at the % impaired, and % change.
 - John Yagecic: Speak to Larry Merrill.
 - Unidentified: it's a flawed approach. The EPA is trying to get narrative criteria to become quantitative, so it's trying to put numbers to something that has a visual assessment from 25 years ago.

- Water Flow (ecology)

Bob suggested that the measure should be salinity at critical reference points.

 - Interim Measure
 - Not practical to look at the actual ecological flow because of interannual variability. Interim measure could be, instead, to maintain 100 year flow at Trenton.
 - Stretch Measure
 - Use Haidvogel model to estimate typical salinity conditions, allowing for short-term variability.
 - Based on this model estimation, there should be no long-term movement of the 15 ppt line (or comparable benchmark).
 - Results
 - Maintain 100 year flow at Trenton
 - Maintain 15 PPT line (or comparable benchmark at long-term station, perhaps Commodore Barry Bridge)
 - Comments

- Increase percentage of suitable non-tidal streams inhabited by bivalves
- Comments
 - NMFS
 - John Kraeuter said that NMFS data for oysters is not good. Landing data for any population is bad. Maybe use population data. John says he will provide more information.
 - Danielle suggests that the STAC has already discussed the (inadequate) value of landings data in the past. Danielle explained the process of 'relaying' to the group.

More comments and suggestions should be submitted via the collaboration site. The purpose of this was to familiarize the STAC with what Bob said, how we translated it, and our next steps. The three goals Bob defined will go to the steering committee at the end of October. (The *TREB* assesses status and trends, the *PDE goal setting* sets goals.) Anyone who can help, please volunteer. Jen and Danielle will send out information to get on the collaboration site. **(UPDATE: Danielle emailed information on 8/17/11).** We need to set a schedule with action items, and we need someone to coordinate. The EIC will make the final edits.

Responsibilities for remaining Goals:

- Water quality/nutrients: Hoping that DRBC will help, but may not be able to. Someone from EPA will also help, maybe RTAG region members Mark Barath (EPA R3) or Isabella Chenkov (?).
- Salinity and Ecological flow: Leave it to the EIC?
- Fish and Shellfish habitat: John Kraeuter will start with oysters.
- Wetlands: PDE staff
- Fisheries: Jerre Mohler will help.

Work Group Updates (1:21:59)

- Regional Restoration- Laura and Simeon
 - project registry. Another round of promotion in the fall.
 - ACES projects (science monitoring project- SAV monitoring, shell planting) was very successful. Acquired funding for regional restoration project.
 - Each subgroup will meet in the fall.
- DEBI Project—Doug and Angela
 - DEBI Project officially came to a close. DEBI handout now available.
 - [CERF conference in November](#), presenting with Andrew.
 - Danielle- benthic workgroup will continue as a STAC-affiliated workgroup
 - Renee Seafoss picked up SAV surveys
 - Danielle freshwater mussels
 - Doug- works on open bay bottom habitats
- Mid-Atlantic Coastal Wetland Assessment Workgroup

- Rapid Assessment Monitoring (RAM) near Wilmington. Finished the bioassessment for the fixed station network. Going well despite weather challenges.
- Just learned that Barnegat Bay and PDE will receive EPA Region II funding from 2012-2015 (~\$360,000) to continue work in NJ. Funds officially awarded to the Ocean County College, which funds Barnegat Bay, who is subcontracting PDE. Still working to sustain the program in Delaware and Pennsylvania. Working to get funding in Region III, but would need a state agency to help. DRBC would qualify as a state institution. When grant opportunities arise, PDE will reach out to DRBC.
- Fish and Wildlife Cooperative: Jerre
 - ASMFC shad and herring management program. Shad implementation forum. Either a recovery plan (cease commercial harvest) or a sustainability plan (must prove population is not decreasing). Plan due in December. They think they'll pursue a sustainability plan. No indication that populations are declining.
 - DE channel deepening. How to better protect species. Stan Gorsky retired. Jerre now going to interact with Corps. Going to negotiate windows. Worried about sturgeon. Juveniles found around Marcus Hook. Not much information on impacts of hydraulic dredging on fish. Juvenile sturgeon found to be severely impacted by hydraulic dredging according to a USACE report from California. Simeon will provide Jerre with info on cumulative action impacts on fish. Desmond suggests that blasting is likely a bad thing for sturgeon. Jerre articulated that USACE did not address our concerns. Came back with a document on sea turtles and one fish species. The 'Clean Break' process produces CO₂ gas to fracture rock with minimal noise. Thinks USACE should investigate that. Simeon says that there's concern about blasting from direct (acute) impacts and (spawning) habitat. Danielle: *Corbicula* beds might be where sturgeon are feeding. SAV coming back. David Burke is interested in the windows.
- TAC/MACWQAC- John Yagecic. (1:39:07)
 - DRBC directed to pull back on advisory meetings. One TAC and no MAC meeting in 2011. There was one Water Quality Advisory Committee meeting.
 - The DRBC adopted new toxics criteria (except PCBs) at the end of 2010.
 - Monitoring- tremendous amount in relation to gas drilling. Monitoring pre-gas development now. Identified where there are data gaps in May. Currently monitoring gaps in New York. Deployed four hobo conductivity monitors in locations most likely to have gas development. Establishing baseline conditions right now. DRBC working with the National Park Service. Archived frozen water samples from 2009 and 2010. 700 samples from boundary and interstate and having Academy analyze for frac water-specific parameters including strontium.
 - Water quality Advisory Committee mostly working on nutrients. Point source monitoring requirement letters are going out this week or next. Have been coordinating with USGS on the nonpoint source loads models.
 - Fracking monitoring-all monitoring is biological monitoring (i.e., macroinvertebrates, no mussels or fish). Hobos- one is in mainstem at Calicoon, other three are in Equinunk

Creek, West branch Dyberry (1:44:03). NPS will deploy one monitor at one of their sites in Equinunk, and then DRBC will move to another site.

- Climate Change Group
 - Moved from adaptation identification to implementation. PDE and partners are now mainly focused on expanded planning for living shorelines (LS) across the estuary's 3 states. The goal is to help stabilize/stem habitat loss from erosion, provide coastal flood protection, and enhance ecosystem services (perhaps also passively trapping sediment.)
 - Funding for substantial programming for LS (aka, the Delaware Estuary Living Shorelines Initiative, DELSI) in all three states.
 - What types of LS tactics are appropriate in different areas and conditions and salinity.
 - Focusing on areas of interest for pilot sites. Working on funding.
 - VA and MD lots of LS effort, not much at all here.
 - Concurrent effort with community outreach closely related with DELSI.
 - Sue Killham said that she is very interested in helping with community outreach. *(Sari has taken note of Sue's interest and will reach out to her as the effort progresses.)*

Technical Report for the Estuary and Basin (TREB)

- General
 - First drafts were due July 1st, and received drafts were sent to reviewers on July 8th. All groups should have received preliminary comments by August 5th. Groups must release second drafts by August 15th. Everything must be received by Priscilla on September 12th so that Priscilla can put the latest drafts in a pdf in order for the EIC to look over the document as a whole. The draft will be sent to the EIC on September 16th (so that they can review it in time for their meeting on September 27th).
 - The schedule was created so that there would be three drafts before the EIC meeting.
 - If you receive sections to edit, help with content, not with minor editorial reviews.
 - Measurement consensus was for metric system.
 - DRBC employees will be taking a step back on the report and other projects. They will be significantly less focused on the non-tidal portion. The water quality portion will be lopsided.
 - DRBC employees have to step back because of deficit and drilling. Over the next fiscal year the vision for the DRBC will be different. Advisory committees, participation in organizations outside of DRBC, functions, re-negotiating AAs with state, regulatory authorities, tributaries- asked to step back. (1:51:00)
 - An analysis of the full range of basin for TREB would really help DRBC later (in 2 years when they do the 2013 State of the Basin). No forward path has yet been defined.
- CHAPTER 1: Watersheds.

Jessica Sanchez presented a powerpoint. She is still looking at future predictions and past trends. She added a section on data sources and processing. There are no maps in the section yet, but there will be. She included a graphic on the reporting hierarchy of watersheds by basin. Andrew Homesy presented slides on population. His data show population in the basin in 2010, and changes by state, county, and census block in the basin.

- Comments and Discussion (for Jessica's section)
 - Bay is not included in the charts (it can't be because as a land use type it dwarfs all other categories).
 - Questions about the tree quote- concerned parties are invited to make their concerns known or track changes in the doc **(2:19:51)**
 - Possibly look into widening of the Bay in the actions and needs section.
 - Group may be interested in more granularity in some categories. Is it possible to show forest layer, with a color scale showing forest loss?
 - Suggestion to color-code the HUCs by bin (less than 3 acre loss, less than 6 acre loss, etc.).
 - Suggestion to keep the focus in Actions and Needs on the forest cover. Possibly talk about pervious cover since there's a section on it. Possibly impervious cover per capita?
 - Actions and Needs section (for everyone) should cover two things:
 - Talk about data needs- availability and compatibility
 - Related to reversing trends—this is a conditions report, not a management report, so stay away from policy information. That said, you can write about the possible implications of trends, but only in relation to other pieces of the report (like climate change). **(2:56:44)**
- CHAPTER 2: Water Quantity **(3:28:30)**

Jessica presented for David Sayers. David would welcome help from USGS with flow statistics (and flow gauge funding), since Eric Vowinkel is unable. Updated the water withdrawals.

 - Comments and Questions
 - The group needs to consider where in the TREB a discussion of salinity should go—in the ecological flow section, the water quality section, or the climate change section.
 - Danielle wants to know how much of consumptive use is fresh vs. salt? (Salt is anything >.5 [potable]) Wants to know for salinity management.
 - Shows how NYC consumption dwarfs everything else. The pie charts used to illustrate use are the same representative size even though one is comparably much larger. May want to change that.
 - John Kraeuter is concerned about consistency in the units of measurement. **(3:34:28)**
- CHAPTER 3: Water Quality
John Yagecic presented water quality.
 - pH comments

- pH- increasing trend at each station. Because of ocean acidification, he expected the opposite.
 - Erik Silldorff is aware of one other paper looking at the same thing. Seen in the past—this is correlated with development (new cement).
 - Danielle- shells of bivalves in tidal vs. nontidal. ‘Buffering’ as the reason for increasing pH.
 - Ken- good pH data set at Trenton.
 - Desmond- concerned regarding data gathered in the winter. Equipment might freeze, giving an inaccurate reading.
 - Other Questions and Comments
 - Salinity repeated over the report- need to reconcile which section it goes in. Could go in Function section as a linkage and cross-cutting issue.
 - Graphics are more important than text.
 - Ensure that the reason for the trend is addressed in the text—for example, years are not standardized, and that changes the trend. The years are all starting from the line at the drought of record. Different periods of time create different trends.
 - Thermal loads from new industry (like the Salem plant, or reservoirs) could have an impact.
 - Concerns about the length of the text
 - No reason each section cannot be different lengths—why limit ourselves.
 - If a reviewer thinks it’s too much, that person can ask the section lead to prioritize better.
- CHAPTER 4: Sediments
- Jeff Gebert presents on sediment.
 - Questions and Comments
 - Grain size? Can DEBI information be used as an indicator (because we already have it)? Grain size is %silt vs. %sand, etc.
 - Danielle- does that mean something in terms of habitat?
 - It is one of a number of factors, and is important in terms of benthos. But it’s not predictive of anything. No trends.
 - Sediment and water quality
 - Sensors in the Estuary show no increasing or decreasing trend, just suspended. This could be possible if wetland loss means sediment increase. (Dredging offset by wetland loss?)
 - Should sediment discussions be in the Water Quality chapter?
 - Danielle explains sediment in the Estuary: In the upper Estuary, sediments are bad. In tidal, sediments are important. In some areas, suspended sediments are crucial, in other places they impair the ecosystem. If we’re removing more sediment from dredging than we’re

getting, the marshes will erode. The sediment is in surplus in upper estuary and deficit in lower estuary (Delaware Bay).

- Jeff disagrees. In 1849-1890, there was no dredging, and the same phenomenon (eroding marshline) existed (naturally). Chris Sommerfield's numbers are all over. Shows a vertical accumulation. One million metric tons per year. On the order of 3 mm SLR.
- Danielle disagrees with the study and places that were sampled. The system is in disequilibrium. Need to tell the story that removing through dredging is creating a problem somewhere. Would like to see a plot on erosion.
- CHAPTER 5: Aquatic Habitats
 - CHAPTER 5A: Subtidal- Doug and Angela

This is the first time benthic macrofauna has been measured in the Delaware Estuary. Species richness by river mile is well-correlated.

 - Questions and Comments
 - For one of the sections, should Doug summarize what's been done, or look at present?
 - Danielle suggests that he tease out abundance spatially of sensitive taxa, and say whether it has a positive or negative trend (diagnostic of good or bad). Need to do it for DEBI anyway. DEBI contaminants and chemistry need to be pulled in. Not sure if that should be for 5A or for water quality. (Priscilla already has this mapped.)
 - Doug will have to decide for himself. Group is of two minds.
 - CHAPTER 5B: Intertidal- Danielle

Tidal wetlands have one indicator. The NWI is an inadequate data set, and she will expand on this in her section. It is very old in some places. Land cover data is good across the Estuary, but granularity is not good. Estuarine emergence is indicator. Not sure if the data is accurate, but if it is, it is an interesting statement about salinity from 1988-1998. She will change acres to hectares. NJ losing more tidal wetlands than DE, and in general, the region is losing more salt marsh than palustrine. The major retreat is taking place on the Bayshore of NJ.

 - Questions and Comments
 - Group interest in loss by % of total in watershed.
 - CHAPTER 5C: Non-tidal- Greg Breeze, John Kraeuter, Desmond Kahn, Jerre Mohler.

Benthic macroinvertebrates. Data from five sources. Working with Gerald. Working on feature box for freshwater mussels. No reviews on the weakfish section yet.
- CHAPTER 6: Living Resources. No one presented.
- CHAPTER 7: Climate Change

Ray Najjar on the phone. He ran through the information in his report. (He does not have much information regarding salinity.) He listed his sections by primary and secondary indicators. Found that some things can be attributed to the NAOU.

- Questions and Comments
 - Global stilling of the wind—possible a feature box?
 - Measurement issues
 - Discovered water temperature trends are inaccurate because they only measure from April to November, not the entire year.
 - The same period is used in the barometric pressure data since 1948.
 - Water temperature surprises
 - Water temperature data is not correlated with air temperature data.
 - Could have to do with the influence of flow on water temperature. Higher flow keeps things cooler.
 - Suggestion that we've lost industrial base, reducing thermal inputs, and could be reflected in the water temperature.
- CHAPTER 8: Functions. No one presented.
- CHAPTER 9: Restoration
Restoration. Three indicators: acres restored annually (data submitted to the EPA annually), balance of restoration project types (only non-mitigative), and restoration need (based on other chapters). There may be a feature box on NRDA, and one on monitoring needs (can't talk about trends without information about monitoring, benchmarks.)

Closing Items

- Minutes went around the room, three edits made, minutes accepted
- David Wolanski is a STAC representative from DNREC. He has not been to a STAC meeting. The group should consider replacing him. Additionally—there still only 19 people on the STAC, but can have 21. Think about good people to join STAC.
- Get on collaboration site for PDE goals and comment.
- Calendar
 - **Priscilla must receive your third drafts by September 12th.**
 - **September 27th is the joint EIC/STAC meeting.**
 - October 13th is the dinner.
 - LS workshop will happen mid-November. Second set of LS workshops will be in the spring, with 15-20 coastal municipalities.