**Meeting Notes: Nutrient Scientific Advisory Board**

**May 2, 2023, 9:30 a.m. – 12:00 p.m.**

**Virtual Meeting – Teams**

**Attendees**

**Members and Alternates (X = present)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Representation** | **Member** (affiliation) |  | **Alternate** (affiliation) |  |
| Local Government | Drew Blake (Chatham Co) |  | Rachael Thorn |  |
| Josh Johnson (Multiple LG’s) | **X** |  |  |
| Eric Kulz (Cary) | **X** | Charles Brown |  |
| David Phlegar (Greensboro) | **X** | Kristine Williams |  |
| Allison Weakley (CH) | **X** |  |  |
| Sandra Wilbur (Durham) | **X** | JV Loperfido | **X** |
| Professional or Academic | Michael Burchell (NCSU) |  | Deanna Osmund |  |
| Professional Engineer | Sally Hoyt (UNC) | **X** | Bill Hunt |  |
| NC DOT Representative | Andy McDaniel | **X** | Brian Jacobson |  |
| Conservation Organization | Peter Raabe (American Rivers) |  | Grady McCallie | **X** |
| **Advisors** | | | | |
| Falls Lake Watershed\* | Forrest Westall UNRBA | **X** | Haywood Phthisic | **X** |
| Local Government | Bob Patterson Burlington |  |  |  |

**DEQ:**

* **DWR - John Huisman, Trish D’Arconte, Joey Hester, Ellie Rauh, Rich Gannon**
* **DEMLR – Jim Farkas**

**Guests:**

* **Anne Coan, NC Farm Bureau Federation**
* **Shawn Springer, Wake County**
* **Molly Zahorian, City of Raleigh**

**(Rich forgot to send notice to interested parties list)**

**AGENDA**

**9:30 Rich Gannon, DWR - Facilitator**

* **Administrative**
* **Introductions**
* **Approval of Dec 2022 Meeting Notes**

**9:45 – 11:45 Neuse/Tar-Pamlico 20-Year Report**

**John Huisman, DWR -**

* **NMSs Estuary Response Results**
* **NMSs Rules Implementation Compliance and Activities**
* **Watershed Changes – people, animals, land cover**

**Trish D’Arconte, DWR -**

* **Loading Trends to Estuaries and to Watershed Streams**
* **Research Findings**
* **Observations and Inferences**
* **Potential Adaptive Management Needs**

**11:45 – 12:00 Members’/Alternates’ Updates**

**12:00 Adjourn**

**Segment 1 – John: Estuary Response, Implementation Compliance, Watershed Changes**

**Q&A / Discussion**

* Andy – impairment conclusion is based on chlorophyll; curious what other metrics of ecological health may have been considered.
  + John – fish kills, blooms reported.
  + Rich – highly qualified recap of Nathan Hall’s NCWRA workshop presentation – diatoms up, dinoflagellates down, both “good” trends ecologically speaking.
    - Alix – Nathan’s work used pigments besides chl-a, which is different from the algal biomass that WSS has tracked. Think Nathan said he would cross-check with WSS.
  + Andy – old days at DWQ – weight of evidence expert opinion used to make impairment determinations, however that changed driven by EPA. NTL an enhancement to what DWR does now would be some kind of more robust, weight of evidence approach vs only chl-a.
  + Rich mentioned DWR monitors algal biomass at fixed estuary stations, has tracked over entire period, we included graphs of those in the report; no real trends apparent.
  + Trish, Ellie – reported kill events pretty much anecdotal info. Need for structured approach to be meaningful.
* Forrest – I have issues with equating chlorophyll-a exceedances to "impairment."  The fish kill reports should certainly be looked at as well as reported "blooms."  People can report fish kills by phone.  There is not always a causative determination.  It isn't always appropriate to equate all, even confirmed, kills to algae levels.  No doubt that these watershed need management, but there needs to be some qualification to the "data" we have.
* Alix – your message is fish kill reports are anecdotal, but kills went down in last 3 years when online reporting became available, and MODMON has been sampling biweekly for years, so based on that, you at least need to recognize the possibility that kills have actually been going down.
* Alix – Nathan at workshop showed that TKN has come down some in recent years, Neuse estuary, more recent than what’s in 20-yr report. Has DWR looked at more recent data? Maybe we’ve flushed out a lot of stored organics from the watershed.
* Forrest - The change in population in these watersheds is important.  It is also important to note what impact development has on watershed land use.  These watersheds still have huge natural or unmanaged area, the actual "developed" percentage is still low, which is a good thing. Hans' presentation shows that "natural" sources, particularly during storms dominate loading during those times. Watershed studies show that loading is complicated and natural areas are not a net-zero impact.  New development controls are critical in not allowing load from developed areas to grow, but we have to be realistic in how much we can control "developed" areas and the loading resulting from already developed land.

**Segment 2 – Trish: Estuary and Watershed Loading Trends, Research Findings, Inferences, Adaptive Needs**

**Q&A / Discussion**

* JV – TKN and precip relationship was striking. Did we look at TKN concentrations to get a handle on where it comes from, and baseflow vs stormflow?
  + One paper showed TKN really responds to rainfall, most during high flows.
  + But conflicting results as to whether ag or urban contributes more in wet years.
* Grady – does TKN rise reflect sources not addressed by rules or breakdown in how rules worked? If could have 2-3 studies to answer unknowns, what would they be?
  + Given Chowan seeing this, and Norway, maybe we’ve managed to store up a lot of N in our soils everywhere. TKN would suggest not a breakdown in management strategies. But maybe construction ESC. Maybe streambanks.
  + Ellie – are ways to fingerprint sources but are expensive.
  + Anne – legacy GW N complicates things.
  + Alix – have researchers estimated how recent TKN increases are, and are we on downward or upward slope of flushing.
  + Joey – buffer over credit noted.
* Eric –
  + agree wholeheartedly on need to revisit buffer credit that was set in the Stone Age practically.
  + Streambanks – rainfall has been increasing, so lacking any watershed changes streams can degrade anyway. And increased storm intensity.
  + Legacy sediments – pre European beaver impoundments now releasing.
* Andy – agree with Grady’s question about what research is really needed. How about use this look-back as opportunity to identify what we do and don’t know, and identify research to inform our management strategies. Concerned over guessing at the problem and find ourselves in the same boat in 20 years.
* Alix – saw something in Falls, thought it was a fluke there but saw in this report too. Algal densities last 4 years have come down, but seeing highest chl a concentrations in that time. Are they being stressed so as to make more pigment? Maybe reducing nutrient inputs has stressed them, or maybe other stressors. Point being, need to determine if chl-a alone is really a reliable indicator of algal production and of the impairment of designated uses.

**Member Updates**

* Andy – clarity standard is currently being considered by DWR via NCDP process. Would be good for NSAB to hear about it. Given what I know about Chesapeake, clarity there plays a big role in their analysis and management strategy.
* Eric – extremely well done report and presentations – thanks!
* Forrest – very complicated, algal behavior.
* Grady – still trying to figure out implications of Sackett decision by Supreme Court w.r.t. losing wetlands protection. Also depends on current General Assembly activity. Pretty concerned about the potential loss of filtering function on water quality.
  + Forrest – Grady makes an important point, which raises the importance of protecting wetlands, and makes the case for giving credit in these strategies for preservation of wetlands, forests and natural areas.
* Haywood – great presentation. NRCA members have invested over $500m, and still pushing numbers lower. But you can’t stop development. Chesapeake recently came out with similar report that only point sources working. Seeing organic N increasing nationwide. But can’t get blood from a turnip. And DON can’t be removed by a WWTP, so some places regulate only NO3 in discharge. Bear Creek showing big organic N loads in their report, but no development there.
* Sandy – excited to see where revision of buffer credit goes, and what that does to offset system.
* Joey – High Rock stakeholder process steaming forward, and they are paying attention to the findings of this report and what they imply for management there. Definitely want to learn from these basins and apply those findings in the High Rock NMS design.

Meeting adjourned at 11:53.