

NC Nutrient Scientific Advisory Board Meeting Summary

February 7, 2020 @ TJCOG

9:30 Am – 12:00 Pm

Attendees

Members / Advisors

Mike Burchell – NCSU BAE
Sally Hoyt – UNC
Bill Hunt - NCSU
Josh Johnson – AWCK
Eric Kulz - Cary
J.V. Loperfido – Durham
Grady McCallie – NC Conservation Network
Andy McDaniel – NCDOT
David Phlegar - Greensboro
Haywood Phthisic – LNBA
Peter Raabe – American Rivers
Allison Schwarz Weakley - Chapel Hill
Forrest Westall - UNRBA
Sandra Wilbur - Durham

DWR Staff www.deq.nc.gov/nps

Patrick Beggs
Trish D'Arconte
Rich Gannon
Jim Hawhee
Adugna Kebede

Guests

Teresa Andrews – Guilford County
Jim Bowen – UNC Charlotte
Anne Coan – NC Farm Bureau Federation
John Cox – retired stormwater professional
Marion Deerhake – NC EMC
Jacob Dorman – Contech Engineering Solutions
Gerald Featherstone – Haw River Assembly
Julie Henshaw – NCDACS - DSWC
Joey Hester – NCDACS - DSWC
Keith Larick – NC Farm Bureau
Alix Matos – Brown and Caldwell
Dan McLawhorn – Raleigh
Jonathan Miller – NCSU
Dan Obenour – NCSU
Wesley Poole – Orange County
Sushama Pradhan – NC DHHS
Ken Reckhow – Duke University
Jay Sauber – Sauber Water Quality Consulting
Emily Sutton – Haw River Assembly
Rahn Sutton – Contech Engineering Solutions
Steve Tedder – Black and Veatch
Rachel Thorn – Chatham County
Joseph Womble – NC Policy Collaboratory

Agenda Topics

- Approve meeting summary from January 3, 2020.
- Learn about the Jordan Lake Study Modeling work
 - Dan Obenour, NCSU Civil, Construction, and Environmental Engineering
 - Jonathan Miller, NCSU Civil, Construction, and Environmental Engineering
 - Jim Bowen, UNC-Charlotte Civil & Environmental Engineering

Meeting Materials and NSAB Charter are available online: www.deq.nc.gov/nps

The NSAB will plan to meet March 6, 2020, 9:30 am at TJCOG.

Meeting Summary

Patrick Beggs (DWR) opened the meeting with introductions and a review of the agenda.

The January 7, 2020 meeting summary was approved.

Drs. Obenour, Miller, and Bowen, undertook modeling of the Jordan Lake reservoir and watershed. Each presented his work to the NSAB. Those [presentations and research papers are available on the NSAB website](#). Questions and Discussion followed each presenter. Some of that is captured below.

Reservoir Model - Bayesian

Dan Obenour, NCSU Civil, Construction, and Environmental Engineering

[\[Please view the presentation on the NSAB website\]](#)

Discussion / Clarification:

- The reduction percentage refer to the total load, not individual sectors such as point or nonpoint.
- Models often don't predict the very highest points because they incorporate segment averages, and data can be collected in specific locations with high booms. However, model prediction interval captures data well.
- The model does not incorporate specific events, such as what occurs during a hurricane.
- Effectively communicating uncertainty is always a challenge.
- Report mentions large fractions of incoming nutrient load (24% N and 46% P) gets quickly deposited and buried in the upper reaches. It is not categorically buried or denitrified; it is settling out, but may at times be re-suspended.

Watershed Model

Jonathan Miller, NCSU Civil, Construction, and Environmental Engineering

[\[Please view the presentation on the NSAB website\]](#)

Discussion / Clarification:

- This model suggests that not much of NPS organic nutrient export gets retained, but a fair amount of retention happens from WWTP exports.
- WWTP permit data shows discharges to Falls Lake were doing better than to Jordan Lake, which were doing better than Greensboro discharges, with Falls an order of magnitude lower than Jordan and Greensboro 3-4x higher than Jordan. It is important to note permits are based on the assimilative capacity of watersheds according to DEQ so minor WWTPs discharge at higher concentrations, but their portion is a small amount of total loads. The impact of smaller WWTP being required to reduce their loads is probably minor because of lower flow.
- There may be many reasons to explain what the difference is between pre- and post-1980 development that yields such big differences in loads:
 - Sediment and erosion control wasn't really enforced until 80s and 90s; higher density urban cores are beginning in the 90s.
 - At a site scale, export rates can vary greatly; this model looks at averages. Therefore, it doesn't not mean that lands developed after 1980 don't export much. Higher density still exports a lot. A large portion of export comes from urban cores.
 - 1980s was when state sewer extension regs came into place making sewer lines less likely to be undersized.
 - In 40 years, we may be looking at today as we look at 1980s.
 - Older sections of town are higher-density, have older infrastructure, and no erosion control.

- We have more stringent local controls now, for example – flood controls.
- Sediment and erosion control is a very short-term thing. If this made a difference, once the sites were stabilized you may not see a difference, although increased runoff from any source can create scour.
- On-site stormwater control needs to be considered.

Reservoir Model - mechanistic

Jim Bowen, UNC-Charlotte Civil & Environmental Engineering

[\[Please view the presentation on the NSAB website\]](#)

Discussion / Clarification:

The Fitzpatrick and Di Toro model from Chesapeake Bay is used to help determine how the sediment and nutrient get replenished.

The mass balance of water column tied to mass balance of sediments.

Updates and Comments

When will the models be available for distribution?

Bowen: Before the end of summer. Currently making sure it is stable to run.

Miller: Currently working on making it user friendly.

Obenour: Maybe within a few weeks, if it is a priority

DWR staff will share the models as they become available.

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