Nutrient Scientific Advisory Board Meeting Summary
Nov 2, 2018 @ TJCOG
9:30 am – 12:00 pm

Attendees

Members / Advisors
Sally Hoyt - UNC
Brian Jacobson - AECOM
Josh Johnson - AWCK
Eric Kulz - Cary
Morgan DeWit - Chatham County
J.V. Lopervido - Durham
Grady McCallie - NC Conservation Network
Andy McDaniel - NCDOT
Deanna Osmond - NCSU
David Phlegar - Greensboro
Haywood Phthisic - LNBA
Peter Raabe - American Rivers
Allison Schwarz Weakley – Chapel Hill
Sandra Wilbur - Durham
Michelle Woolfolk - Durham

Facilitator
Jenny Halsey - TJCOG

Guests
Teresa Andrews - Guilford County
James Bowen - UNC Charlotte
Anne Coan - NC Farm Bureau Federation
John Cox - retired
Gerald L Featherstone - Haw River Assembly/CFRA
Sue Ellen Johnson - Regenerative and Resilient Agriculture Advisor
Adugna Kebede - DWR
Keith Larich - NC Farm Bureau Federation
Jiy Lin - DWR
Alix Matos - Brown and Caldwell
Jonathan Miller - NCSU
Jen Schmitz - TJCOG
Steve Wall - NC Policy Collaboratory
Jeff Warren - NC Policy Collaboratory

DWR Staff www.deq.nc.gov/nps
Rishi Bastakoti
Patrick Beggs
Trish D'Arconte
Rich Gannon
Jim Hawhee
John Huisman

Agenda Topics

- Learn about and provide input to the Jordan Lake Modeling projects of the NC Policy Collaboratory. Research and plans presented by Dr. Jim Bowen, UNC-C and Mr. Jonathan Miller, NCSU (for Dr. Ben Obenour, NCSU).

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

Meeting Summary

Jenny Halsey (TJCOG) opened the meeting with introductions and a review of the agenda. Jenny is the new facilitator for the NSAB.

The October 5, 2018 meeting summary was approved.

Jordan Lake Watershed and Water Quality Modeling to assess Eutrophication Trends under Historical and Projected Scenarios - Jonathan Miller

Jonathan Miller is a PhD student in Civil Engineering at NCSU, working with Dr. Ben Obenour. The presentation is available in pdf format. It is best to view the pdf for a summary of the presentation. Some brief points and discussion are found below.

Presentation Outline:

- Previous Jordan Lake research
- Bayesian modeling framework
- Hybrid Watershed modeling
- Jordan Lake water quality modeling

Modeling Approach:

- Parameterize a mechanistic model within a Bayesian statistical framework.
- Include past research (e.g., N:P ratios, benthic fluxes) as prior knowledge
- • Couple with watershed model to leverage 30+ years of historical loading data
- • Predict effects of watershed management and climate variability on system productivity

Objectives:

- Characterize long-term nutrient dynamics and controls on algal production
- Simulate longitudinal concentration gradients (nutrients, chlorophyll, turbidity, etc.)
- Understand the impact of Jordan Lake tributaries on different sections of the lake.
- How responsive will Jordan Lake be to reductions in nutrient loadings?
- How long might it take to see a difference?

Project Timeline:

- Develop WRTDS loading estimates of nitrogen and phosphorus (December 2018).
- Develop Jordan Lake watershed nutrient loading model (September 2019).
- Develop Jordan Lake reservoir water quality model (September 2019).
- Apply models for Scenario forecasts (November 2018).
- Final report (December 2019).

Questions/Comments/Discussion:

- The model is similar to SPARRPOW but enhances temporal dynamics
- Concern about agricultural nutrient loads may be double counted based on this presentation.
- Downscaling may allow us to see land management practices
- Precipitation was generally modeled as increased runoff
- This uses mostly DWR modeling data. May be good to work with Greensboro to acquire their data.
- 14 digit HUC sized will be used if possible but may need to delineate new HUCs to focus on Jordan watershed only.
- Will be able to incorporate as many previous export coefficients as needed
- Flow below gauging stations is currently not incorporated but a ratio related to watershed area will be calculated, allowing areas without gauges to be modeled according to characteristics of other areas.
- Be sure to incorporate land use.

- TN flow estimates are available for ungauged stations on the UNRBA website.
- Previous models are being incorporated in the design of this new model.
- Hurricane events are not included in the model.
- Suggestion to segment Jordan Lake additionally between New Hope and Haw arms. This may be difficult.
- For modeling confidence, cross validation can be run with data that go back 30 years, allowing gaps to be filled in.
- The Triangle Area Water Supply Monitoring Project has 30 years of water quality, stream flow, etc data available for Jordan and tributaries. www.tawsmp.org

Multi-dimensional mechanistic modeling of Jordan Lake – Project Description

Jim Bowen is an associate professor in the Civil and Environment Engineering Department at UNC-Charlotte. The presentation is available in pdf format. It is best to view the pdf for a summary of the presentation. Some brief points and discussion are found below.

Objectives:

- Setup and calibrate a mechanistic, multi-dimensional model of Jordan Lake, NC based on current monitoring data
- Run scenario tests to investigate system sensitivity to potential management actions (nutrient load reduction, circulation modification, others TBD)

Tasks

- Data Gathering, Initial Model Setup and Testing
- Model Calibration
- Scenario Testing
- Presentation of Initial Model Project Results (8/2019)
- Additional Work as Needed on Model Inputs, Calibration, and Scenario Tests

Some thoughts on the model plan

- Previous model was developed using data from almost 20 years ago
- Recent monitoring efforts provide data needed to run and calibrate model
- Tentative plan is to model some or all of 2014 –2017 time period
- Implementing a 3-d model (EFDC) for both hydrodynamics and water quality
- EFDC model will include sediment transport sub-model
- Will rely on Dan Obenour and colleague's work to specify time varying nutrient load
- Water quality calibration will take advantage of automated multi-criteria approach developed for the Neuse River model
- Consultation w/ stakeholders throughout project is planned

Questions/Comments/Discussion

- WRTDS models a period of time; if an event occurs in that time, the model should have the capability to accommodate it and also model the following year correctly because it captured lake dynamics.
- Hopefully we will incorporate vertical profiling to the model, including good wind information.

- DWR has not yet considered if the model will be used for jurisdictional allocations.
- Agricultural community stakeholder participation will help point out issues with nutrient load double counting.
- Need to consider improvements in air quality (deposition) and agricultural/urban best management practices.

Updates and Comments

- Thank you for the new SNAP tool!
- The expectation for UNC Collaboratory researchers is mainly for data recommendations. The Collaboratory will not be advocating for specific regulations.
- UNC Policy Collaboratory interim report will be out by the end of 2018.

- Jordan Lake One Water specific:
  - DWR will incorporate what it can of JLOW's public participation efforts as DWR moves forward with Jordan rulemaking plans.
  - The NSAB focuses on nutrients, JLOW may be a great forum for wider conversations about watershed management. Integrated watershed management is inherently different. It is not focused on the rules but will inform new rules. It may be a different process than what some are used to.
  - Previous DWR stakeholder processes were different than JLOW; the stakeholder process needs to be clear.
  - JLOW and many other entities can weigh in on what needs to be incorporated into the Jordan nutrient rules.

- DWR specific updates:
  - The NSAB 5-finger rule decision making procedure allows any member, alternate, advisor, staff, and facilitator to make a proposal
  - A survey of determining baseline collection to help determine credit for Street/Storm Drain Cleaning will be going out this winter.
  - Remedying Discharging Sand Filters practice will go out to public comment.
  - Working on getting the Neuse/Tar Pam rules fiscal note to the Office of State Budget and Management (OSBM) so it can be presented to the EMC in January, and then the public through comments and meetings.
  - Stream restoration/urban buffer credits are being worked on.
  - Nutrient trading framework is still being developed.

The NSAB will meet April 5, 2019, 9:30 am at TJCOG.