Water Resources
ENVIRONMENTAL QUALITY

2017 Annual Report of the Nutrient Scientific Advisory Board to the Secretary of the NC Department of Environmental Quality as required by Session Law 2009-216

July 1, 2017

Executive Summary

In its seventh year serving as a guide to the Division of Water Resources (DWR) Nonpoint Source Planning in implementing stormwater nutrient rule requirements pursuant to Session Law 2009-216, the Nutrient Scientific Advisory Board (NSAB) continued to meet and assist the DWR during 2016-2017. This annual report was assembled by Division staff with guidance, review and approval by the NSAB.

The board met three times over the past year in support of the following rule-related actions:

1. Collaborated with the staff and the Upper Neuse River Basin Association (UNRBA) on the development of nutrient crediting and design standards for additional load-reducing measures for use in both the Jordan and Falls watersheds. This included reviewing draft practice documents and providing input on the nutrient credit standards and design specifications for four practices.

2. Provided feedback and participated in testing recent updates to a stormwater runoff nutrient accounting tool, the Stormwater Nitrogen and Phosphorous Tool (SNAP).

3. Provided feedback on the Stormwater Control Measures Credit Document developed by the Division of Energy, Mineral, and Land Resources.

Sections II and III of this document provide summaries of these activities. More information on the board's activities, including previous annual reports, meeting agendas and minutes can be found at the Division's NSAB website at: https://deq.nc.gov/about/divisions/water-resources/planning/nonpoint-source-management/nutrient-scientific-advisory-board.

Contents

The Nutrient Scientific Advisory Board (NSAB), serving as a guide to the Division of Water Resources (DWR) Nonpoint Source Planning staff, continued to meet and assist the Division during 2016-2017. This annual report to the Secretary of the Department of Environmental Quality was assembled by Division staff with guidance, review and approval by the NSAB.

I. Background

Session Law 2009-216 established requirements for local governments and state and federal entities in the Jordan Lake watershed to reduce nutrient loading from existing developed lands. Given the precedent-setting nature of the requirements in this evolving area of nonpoint source water quality management, the drafters of the legislation felt it was important to establish an advisory body to assist the state in identifying all potential implementation options, their feasibility and value, and to identify any other analytical improvement needs for nutrient strategies in Jordan and other watersheds that may face similar requirements in the future. Therefore, the legislation also called for the formation a scientific advisory board for nutrient-impaired waters.

In July 2010, the Department of Environmental Quality Secretary established a 10-member Nutrient Scientific Advisory Board (NSAB), hereafter referred to as "the board" (see Appendix A for board membership). As specified in the legislation, up to six of the board's members are representatives of local governments in the Jordan Lake watershed, while other members represent the N.C. Department of Transportation (NCDOT), the conservation community, and water quality science and stormwater engineering expertise. In 2013 the board also decided to add an unofficial, non-voting member to represent local governments in the Falls Lake watershed.

The board is charged with the following duties as described in Section (4)(b) of the session law:

(1) Identify management strategies that can be used by local governments to reduce nutrient loading from existing development.
(2) Evaluate the feasibility, costs, and benefits of implementing the identified management strategies.
(3) Develop an accounting system for assignment of nutrient reduction credits for the identified management strategies.
(4) Identify the need for any improvements or refinements to modeling and other analytical tools used to evaluate water quality in nutrient-impaired waters and nutrient management strategies.

The session law also provides the board the option of recommending a method for estimating existing development load reduction needs for affected parties in the Jordan Lake watershed (Section (3)(d)(2)b.), and in Section (4)(c) charges the board more generally with advising the Secretary "on any other issue related to management and restoration of nutrient-impaired water bodies".

The board completed its initial two-year charge with its July 2012 report to the Secretary. In July 2013, Planning staff presented a draft model local program for Existing Development rules implementation to the Environmental Management Commission (EMC) and was granted additional time to work with affected parties to develop credit accounting for additional nutrient-reducing practices and other aspects of local guidance. Since then, the board has continued to actively assist the division in better defining the extent of reduction needs on, and improving the set of tools with which to control nutrient loading from, existing developed lands. The remainder of this report provides updates on the board's activities over the last year.

II. Nutrient Reduction Practices

Background:

Section 4.(b) of Session Law 2009-216 charged the board with identifying, evaluating and developing accounting methods for additional measures that could be used by affected parties to reduce nutrient loading from existing development. In July 2013, division staff presented a draft Model Local Program to the EMC that identified currently available nutrient-reducing practices in addition to an extensive list of other potentially creditable measures that was developed with input from the board.

In 2013, with guidance and review by the board, the division utilized Clean Water Act 205(j) grant funds to obtain a synthesis of the science characterizing the nutrient load reduction performance of six measures. The division has since used that product as a basis for its efforts to develop practice crediting and design specifications for these measures.

Under the division's credit development process, nutrient reduction practices documents are drafted with assistance from subject matter experts, shared with the NSAB for feedback, revised, released for public comment, further revised accordingly and then submitted to the DWR Division Director for approval. Approved practices add to the set of options that local governments and others may use to achieve load reductions from developed lands.

Separately, beginning in 2013, the Falls watershed organization of local governments, the Upper Neuse River Basin Association (UNRBA), used member's government funding and funding assistance from the department to contract for the development of nutrient crediting for an additional set of measures. During 2014, the contractor worked with the board, subject matter experts, the division and other stakeholders to identify ten priority measures for full credit development and five additional measures for future credit development pending funding. In 2015, the contractor began developing credit methods and design specifications for the priority practices.

Status:

During the three meetings held in this reporting cycle, the board provided input on a total of four nutrient reduction practices:

Cattle Exclusion---------- approved by the Director - April 2017

Illicit Discharge Detection and Elimination---------- approved by the Director - April 2017

Buffer Restoration in Developed Areas---------- in review after public comment

Land Conservation---------- in discussion with DWR Director and UNRBA

In September 2016, staff from the Division of Energy, Mineral, and Land Resources (DEMLR) presented to the NSAB for comment, its draft Stormwater Control Measures Credit Document following a public consultation and development process with a committee of stormwater management researchers and practitioners and DWR staff. Following NSAB review, DEMLR staff finalized the document and released it for use in January 2017. This document significantly advances the field of nutrient and general water quality crediting for stormwater treatment practices, including significant expansion of the set of available stormwater control measures (SCMs). Available SCMs now include: Bioretention, Disconnect

Impervious Surfaces, Dry Pond, Floating Treatment Wetlands, Green Roof, Infiltration Systems, Level Spreader - Filter Strip and Variants, Load Reduction on Redevelopment, Overtreatment of New Development, Permeable Pavement, Pollutant Removal Swale, Rainwater Harvesting, Sand Filters, StormFilter®, Stormwater Wetland, Wet Pond. In addition, undersizing and oversizing credit is now available for most of these SCMs, adding significant flexibility.

Updates from the previous reporting cycle

- The previously reviewed Soil Amendment practice received Director's Approval in March 2017.
- The structured approval process for nutrient reduction practices has been incorporated into a draft Catalog of Nutrient Reduction Practices with plans to submit the catalog to the EMC for approval in Fall 2017.

III. Stormwater Nitrogen and Phosphorous Accounting Tool

Background

In response to the Jordan Lake Rules for managing nutrients in stormwater, an accounting tool was designed in 2010 to allow developers to show compliance with new development nutrient export targets in the watershed. This Microsoft Excel-based spreadsheet estimated runoff volume, annual nutrient loading generated, and nutrient load reductions provided by conventional SCMs (Stormwater Control Measures).

The tool has since undergone revisions and is now used for compliance with the Jordan Lake and Falls Lake stormwater rules. It includes a small number of additional SCMs.

Status

In 2016, the NSAB participated in testing an updated version (4.0) of the tool which led to further revisions by staff. The resulting product includes the entire set of SCMs described in Section II, including many alternative SCM designs. It can calculate the treatment levels provided by SCMs that are undersized or oversized relative to regulatory requirements.

The tool supports both New Development and Existing Development stormwater rule compliance. It now identifies the user's New Development nutrient export targets depending on the watershed selected and other variables used to assign unit-area- loading rates and buy-down thresholds in the Jordan, Falls, Neuse, and Tar-Pamlico rules. It calculates the amount of treatment required for a site or the amount of overtreatment provided.

Many changes were made to improve usability, add calculations and outputs related to nutrient management and nutrient trading, improve error checking and handling, make future updates easier, and update the internal structure for potential merging with other stormwater calculation tools in the future. The tool is being renamed the Stormwater Nitrogen and Phosphorous Tool, or SNAP. The SNAP User Manual is now finalized and the tool and manual will soon replace the existing Jordan/Falls tool we used in the Neuse River and Tar-Pamlico River basins as those rules were readopted.

IV. Going Forward

The NSAB will continue to work on several important tasks in the coming year. Division staff expect to seek the board's evaluation of items including draft credit proposals for a number of additional nutrient reduction practices, Existing Development load assignments for Falls Lake local governments, and technical policy decisions to be included in an existing development model local program that should be completed during the course of the next year. As part of that model program, at the June 2017 meeting, DWR staff began a discussion with the NSAB about nutrient credit trading. That discussion should be completed by the end of 2017.

V. Appendix A: Nutrient Scientific Advisory Board Membership

Session Law 2009-216 (4)(a) calls for the establishment of the Board and stipulates a membership of five to ten members with the expertise or experience quoted below. Names and affiliations of the members currently occupying the applicable seats are provided in the footnotes.

Nutrient Scientific Board Members

	NSAB Position	Member	Organization
1	Local Government Representative[1]	Sandra Wilbur	City of Durham
2	Local Government Representative[1]	Allison Weakley	Town of Chapel Hill
3	Local Government Representative[1]	Michael Layne	City of Burlington
4	Local Government Representative[1]	David Phlegar	City of Greensboro
5	Local Government Representative[1]	Josh Johnson	Cities of Mebane and Graham; Towns of Elon and Gibsonville
6	Local Government Representative[1]	Eric Kulz	Town of Cary
7	Professional or Academic Representative[2]	Larry Band	UNC
8	Professional Engineer[3]	Bill Hunt	NCSU BAE
9	NC DOT Representative[4]	Andy McDaniel	NC DOT
10	Conservation Organization Representative[5]	Grady McCallie	NC Conservation Network
11	Falls Lake Watershed Representative[6]	Forrest Westall	Upper Neuse River Basin Association

[1] R*epresentatives of one or more local government in the Jordan Reservoir watershed. Local government representatives shall have experience in stormwater management, flood control, or management of a water or wastewater utility.*

[2] *One member with at least 10 years of professional or academic experience relevant to the management of nutrients in impaired water bodies and possessing a graduate degree in a related scientific discipline, such as aquatic science, biology, chemistry, geology, hydrology, environmental science, engineering, economics, or limnology.*

[3] *One professional engineer with expertise in stormwater management, hydrology, or flood control.*

[4] *One representative of the Department of Transportation with expertise in stormwater management.*

[5] *One representative of a conservation organization with expertise in stormwater management, urban landscape design, nutrient reduction, or water quality.*

[6] *This member was added to the Board in January 2013 at the request of the Board members. It is not a legislatively required position, and therefore is an unofficial member with no voting rights.*

(1-5 from Section 4.(a) of Session Law 2009-216)

VI. Appendix B: Excerpts from Session Law Related to the Establishment of the NSAB

Section 4.(a) - (c)

SESSION LAW 2009-216

AN ACT TO PROVIDE FOR IMPROVEMENTS IN THE MANAGEMENT OF THE JORDAN WATERSHED IN ORDER TO RESTORE WATER QUALITY IN THE JORDAN RESERVOIR.

The General Assembly of North Carolina enacts:

…

SECTION 4.(a) Scientific Advisory Board for Nutrient-Impaired Waters Established. – No later than July 1, 2010, the Secretary shall establish a Nutrient Sensitive Waters Scientific Advisory Board. The Scientific Advisory Board shall consist of no fewer than five and no more than 10 members with the following expertise or experience:

(1) Representatives of one or more local governments in the Jordan Reservoir watershed. Local government representatives shall have experience in stormwater management, flood control, or management of a water or wastewater utility.

(2) One member with at least 10 years of professional or academic experience relevant to the management of nutrients in impaired water bodies and possessing a graduate degree in a related scientific discipline, such as aquatic science, biology, chemistry, geology, hydrology, environmental science, engineering, economics, or limnology.

(3) One professional engineer with expertise in stormwater management, hydrology, or flood control.

(4) One representative of the Department of Transportation with expertise in stormwater management.

(5) One representative of a conservation organization with expertise in stormwater management, urban landscape design, nutrient reduction, or water quality.

SECTION 4.(b) Duties. – No later than July 1, 2012, the Scientific Advisory Board shall do all of the following:

(1) Identify management strategies that can be used by local governments to reduce nutrient loading from existing development.

(2) Evaluate the feasibility, costs, and benefits of implementing the identified management strategies.

(3) Develop an accounting system for assignment of nutrient reduction credits for the identified management strategies.

(4) Identify the need for any improvements or refinements to modeling and other analytical tools used to evaluate water quality in nutrient-impaired waters and nutrient management strategies.

SECTION 4.(c) Report; Miscellaneous Provisions. – The Scientific Advisory Board shall also advise the Secretary on any other issue related to management and restoration of nutrient-impaired water bodies. The Scientific Advisory Board shall submit an annual report to the Secretary no later than July 1 of each year concerning its activities, findings, and recommendations. Members of the Scientific Advisory Board shall be reimbursed for reasonable travel expenses to attend meetings convened by the Department for the purposes set out in this section.