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NORTH CAROLINA
Environmental Quality

2020 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, 2020

Executive Summary

During its tenth year serving as a guide to the Division of Water Resources (DWR) Nonpoint Source Planning Program in implementing Existing Development stormwater nutrient rule requirements pursuant to Session Law 2009-216, the Nutrient Scientific Advisory Board (NSAB) continued to meet and assist DWR. This annual report recaps the year's activities and was assembled by DWR staff with guidance, review and approval by the NSAB.

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

1. Reviewed and endorsed DWR-proposed nutrient credit standards and design specifications for street sweeping and storm drain cleaning practices.
2. Learned about the formation of, and were given the opportunity to volunteer for a Nutrient Data Standards workgroup for Stormwater Control Measures.
3. Learned about an alternative compliance approach being developed by the Upper Neuse River Basin Association for the current stage of the Falls Lake Nutrient Management Strategy, as well as the additional data and alternative strategy being developed for the second stage.
4. Learned about the latest stormwater management research from NCSU Biological and Agricultural engineering researchers.
5. Learned about current Jordan Lake modeling from the NC policy Collaboratory researchers and offered ideas for the upcoming Jordan Lake Nutrient Rules readoption.

This report summarizes these activities.

More information on the NSAB's activities, charter, meeting summaries and previous annual reports can be found online at: https://deq.nc.gov/about/divisions/water-resources/planning/nonpoint-source-management/nutrient-scientific-advisory-board.

Table of Contents

I. Introduction

The Nutrient Scientific Advisory Board (NSAB), serving as a guide to the Division of Water Resources (DWR), with assistance from DWR Nonpoint Source Planning staff, continued to meet and assist DWR during 2019-2020. This annual report to the Secretary of the Department of Environmental Quality was assembled by DWR staff with guidance, review, and approval by the NSAB.

Session Law 2009-216 established requirements for local governments and state/federal entities in the Jordan Lake watershed to reduce nutrient loading from existing developed lands. It also required the establishment of an advisory board to assist the state to identify, review, and refine strategies to reduce nutrient loading in the existing development community of Jordan Lake watershed and other watersheds that may face similar requirements in the future. Its full duties are listed in Session Law found in Section X below and include advising the Secretary "on any other issue related to management and restoration of nutrient-impaired water bodies".

In 2010, the Secretary established a 10-member Nutrient Scientific Advisory Board. As specified by legislation, up to six of the board's members are representatives of local governments in the Jordan Lake watershed, while other members represent the conservation community, water quality science, stormwater engineering expertise and the N.C. Department of Transportation. In 2013, the NSAB added an advisor from the Falls Lake watershed to represent local governments subject to a similar set of rules in Falls Lake watershed.

Since its inception, the NSAB has actively assisted DWR to both better define nutrient reduction needs and improve the tools to reduce nutrient loading from existing developed lands. The remainder of this report provides updates on the NSAB's activities over the last year.

II. Year in Review

The NSAB endorsed Streetsweeping and Storm Drain Cleaning as nutrient reduction practices. Updates on other practices are outlined in Section V below above.

Nutrient trading guidance was set aside temporarily as other initiatives took priority for DWR nutrient staff, including completion of rules readoption for Neuse and Tar-Pamlico nutrient strategies. DWR intends to finalize trading guidance that reflects current authorities with further input from the NSAB and the public.

The NSAB planned to review the Existing Development Model Program for Falls Lake. This priority, led by DWR nutrient staff, was supplanted by the emergence of a related proposal from Falls local governments for a novel alternative implementation approach to existing development, being developed by the Upper Neuse River Basin Association. with support from DWR. Drafts of this locally driven alternative approach were presented for discussion at two NSAB meetings this year. Currently, the Falls Existing Development Model Program is under development by DWR, incorporating this alternative option.

The Falls Lake alternative implementation approach recognizes and accounts for forest preservation efforts underway in the watershed and promotes ongoing preservation efforts. This alternative approach, in combination with management recommendations from the N.C. Policy Collaboratory, has resulted in highlighting the importance of forest preservation as an effective tool in managing healthy watersheds. It

continues to be critical to develop a long term management system that accounts for the benefits of forest preservation. Forest and natural systems preservation is supported as an appropriate investment option under the alternative approach.

III. Falls Lake Watershed Nutrient Strategy

While the NSAB was established primarily to assist the Jordan Lake nutrient strategy, it endeavors to learn about and transfer useful advances from nutrient strategies across NC including the nearby Falls Lake watershed. Durham and the NC Department of Transportation hold membership positions on the NSAB and straddle both the Jordan and Falls watershed, making them uniquely qualified to advise on both strategies. The Executive Director of the Upper Neuse River Basin Association (UNRBA) serves as an advisor to the NSAB, helping to span the information overlaps and gaps between both nutrient strategies.

This year, UNRBA staff presented:

- A summary of findings on reservoir nutrient behavior from their four-year, intensive Falls Lake monitoring and data analysis, which the NSAB considered relative to NC Policy Collaboratory study results for Jordan Lake reported in December 2019.
- An update on their ongoing process to develop paired watershed delivery and lake nutrient response models to inform the second stage of Falls nutrient management.
- The alternative compliance approach addressing existing development stormwater which they have been working on with DWR staff and others for the active first phase of the Falls rules. This approach in turn is providing a policy option for the NSAB and Jordan stakeholders to consider as they engage in the Jordan Lake One Water process (see Jordan item below).

All this Falls information provides the NSAB with a better understanding of stakeholder concerns as well as additional science and policy ideas for advancing watershed nutrient management.

IV. Jordan Lake Watershed Nutrient Rules Readoption

The NC Policy Collaboratory finished its Jordan Lake watershed research and modeling work in December 2019 and submitted its final report to the NC General Assembly in December 2019. The three water quality models developed for that process were presented to the NSAB in February 2020.

Additionally, the NSAB discussed the upcoming Jordan Rules readoption twice during this past year. The Board raised process needs, nutrient sources to consider and source control issues, and implementation policy ideas for staff's consideration.

The Division of Water Resources is using the Jordan Lake One Water (JLOW) planning process as its first step in public involvement for rules readoption. JLOW is a grass roots collaborative planning process initiated by watershed local governments and including other interested parties from across the watershed, including DWR and other DEQ divisions. Membership in the process continues to grow. Eight members of the NSAB serve on JLOW workgroups addressing the topics of: integrated watershed management;

practices evaluation, monitoring, and financing; and watershed organizational governance. Division staff and NSAB members periodically update the NSAB on JLOW planning activities. JLOW plans to release a draft set of recommendations for a Jordan Lake integrated watershed management plan in Fall 2020. A more comprehensive outreach and public input process by JLOW will follow before finalizing recommendations that will be submitted to DWR.

The JLOW integrated watershed management plan will be used to develop Jordan Lake watershed nutrient rule concepts as the rule readoption process continues. The NSAB will continue to stay involved in these processes.

Timeline for Jordan Lake Nutrient Rules Readoption:

2020

- Evaluate NC Policy Collaboratory findings
- Engage all stakeholders / Seek feedback / Fully participate in JLOW
- Receive JLOW recommendations

2021

- Develop rule concepts
- Engage all stakeholders / Seek feedback
- Develop draft rules

2022

- Revise and finalize draft rules
- Engage all stakeholders / Seek feedback
- Develop fiscal note

2023

- EMC approves rules and fiscal note for public comment
- Hearing Officers deliberate
- EMC adopts rules
- Rules Review Commission approves rules

V. Nutrient Reduction Practices

As they are approved by DWR, nutrient reduction practices of all kinds are added to the set of options local, state and federal parties may use to achieve nutrient load reductions from existing developed lands.

Staff develops new practice documents using DWR's credit development process; additions to research data; assistance from subject matter experts; discussion, review and advisement by the NSAB; and public comment. Vetted practices are approved by the DWR Director and added to the initial set approved by the EMC in 2013.

In the past year, the NSAB has approved credit documents for:

- Street Sweeping
- Storm Drain Cleaning

In the 2019 Annual report, the NSAB planned to review for potential endorsement the following nutrient reduction practices:

1. Street Sweeping – approved
2. Storm Drain Cleaning – approved
3. Forest Preservation – removed; See Section I
4. Malfunctioning Septic Systems - moved to 2020-21
5. Riparian Buffer Improvements and Stream Restoration in Developed Areas (renamed: Riparian Revegetation and Stream Bank Stabilization) – partially completed; remains a priority; moved to 2021-22, given complexity and staff workload
6. Urban Reforestation – moved to 2020-21, given staff workload
7. Wastewater Regionalization and Overtreatment – moved to 2020-21, with Falls Existing Development model program

VI. Stormwater Control Measures for Nutrient Management

The NSAB helps identify and develop nutrient management practices that are used throughout the state. Members learn about the latest research from university researchers and private entities. Many of these research projects have local government partners as project site hosts. As subject matter experts and practitioners, the NSAB membership is uniquely qualified to help researchers and division staff identify questions of science and implementation policy. In 2020 the NSAB received instruction from NCSU Biological and Agricultural Engineering researchers on several stormwater treatment practices: regenerative stormwater conveyance, sand filter, and subsurface gravel wetland.

Regenerative stormwater conveyance (RSC) is a stormwater control measure (SCM) retrofitting eroded gullies to provide runoff treatment and reduction. RSCs consist of a series of riffles and pools with an underlying sand media layer. RSCs incorporate stream restoration techniques (step-pool sequences) and stormwater management strategies (media filtration) to capture small events, convey larger flows, and reduce erosion.

Sub surface gravel wetlands are not yet an approved practice in NC but are being used in other states; the NSAB received an introduction to this practice's potential. Most stormwater sand filter research is on ground surface, open designs with limited nutrient performance focus; the NSAB was briefed on active research that is looking into below ground sand filters, especially for use in urban areas with limited space, that includes full evaluation of nutrient performance.

VII. Stormwater Control Measures - Nutrient Data Standards Workgroup

In 2019, with endorsement from the NSAB, the division formed a workgroup to develop nutrient data standards for Stormwater Control Measures (SCMs). Several NSAB members also serve on this workgroup.

Growing interest in finding the most cost-effective nutrient practices has included reevaluation of nutrient values previously established for urban stormwater control measures. This has led to a desire to standardize technical data requirements to support SCM nutrient credit revisions as well as new SCM approvals.

The Stormwater Program of the Division of Energy, Mineral and Land Resources (DEMLR) has authority for establishing and revising the set of acceptable SCMs for post-construction stormwater control. The Program works with stormwater researchers and the DWR NPS Planning Branch to set and revise nutrient credit assignments for these practices. The currently approved set of new development SCMs, including their nutrient crediting specifications, is captured in DEMLR's SCM Crediting Document.

NCSU researchers recently conducted a new analysis of SCM studies and are developing a screening tool for identifying suitable SCM treatment performance data. In April 2020, the workgroup began reviewing the research results and collaborating with the researchers on incorporating suitable data standards into the tool.

This workgroup goal is to develop data standards to support revisions to current SCM flow and nutrient values and to serve as planning guidance for future SCM studies. The nutrient data standards will be developed from the work of staff, subject matter experts, and stormwater researchers.

VIII. Next Year

The NSAB will continue work on several important tasks in the coming year:

- Providing input to DWR staff on the Falls Lake Existing Development Model Program.
- As part of JLOW and subsequent public input, NSAB members will continue to contribute recommendations for an integrated watershed management plan and Jordan Lake watershed rule concepts.
- As time permits, given the above priorities, the NSAB will review and potentially endorse additional nutrient credit practices that may include: Urban Reforestation; Bioswales; Wastewater Regionalization/Overtreatment; and Malfunctioning Septic Systems.

IX. Membership

Nutrient Scientific Board Members

	NSAB Position	Member	Organization
1	Local Government Representative	Sandra Wilbur	City of Durham
2		Allison Weakley	Town of Chapel Hill
3		Morgan DeWit	Chatham County
4		David Phlegar	City of Greensboro
5		Josh Johnson	Cities of Mebane and Graham; Towns of Elon and Gibsonville
6		Eric Kulz	Town of Cary
7	Professional or Academic Representative	Michael Burchell	NCSU
8	Professional Engineer	Sally Hoyt	UNC- Chapel Hill
9	NC DOT Representative	Andy McDaniel	NC DOT
10	Conservation Organization Representative	Peter Raabe	American Rivers
11	Falls Lake Watershed Representative [1]	Forrest Westall	Upper Neuse River Basin Association

Session Law 2009-216 (4)(a) listed in Section VIII calls for the establishment of the NSAB and stipulates five to 10 members with expertise or interests listed in the table above.

[1] In 2013 the NSAB chose to add an advisor to the board to represent the interests of Falls Lake Watershed local governments.

X. Establishment, Duties, and Authority of the NSAB

SESSION LAW 2009-216
Section 4.(a) - (c)

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.