

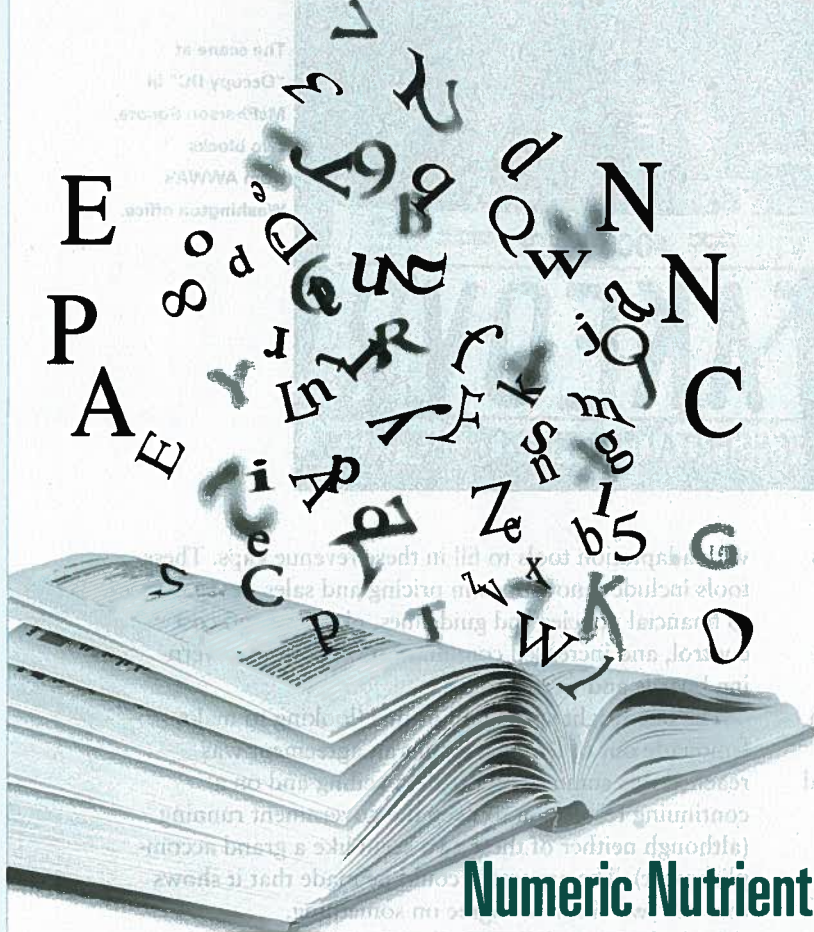
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Numeric Nutrient Criteria for Surface Waters: Coming to a Neighborhood Near You

Since 1996, the US Environmental Protection Agency (USEPA) has pushed the states to adopt numeric nutrient criteria (NNC) for surface waters. This effort stems from the agency's belief that nutrient pollution causes harmful algal blooms that produce toxins harmful to both humans and animals and that deplete oxygen in water bodies. Although nutrients are essential to the health and natural biological functions of ecosystems, excessive nutrient loading can lead to hypereutrophic conditions that can adversely affect a water body's natural biological health. Until recently, USEPA has allowed the states to use their discretion in developing NNC. That changed in January 2009 when the agency determined that the state of Florida was required to adopt NNC to comply with the requirements of the Clean Water Act (CWA). The response to USEPA's determination has been significant, generating political struggles between Florida and the USEPA, expensive rule development, and a wave of lawsuits challenging the NNC that USEPA adopted for Florida in December 2010. Regardless of the stand taken in this battle, state and local governments and private regulated interests throughout the United States can learn some valuable lessons from the Florida experience in order to avoid the upheaval Floridians are now experiencing.

WHAT ARE NNC?

The term "nutrient" is loosely used to describe a compound that is necessary for metabolism. Nutrients such as nitrogen and phosphorus are essential to cellular health and are critical to an ecosystem's well-being. Excessive nutrient levels, how-

ever, can be detrimental to water quality, and nutrients are considered “pollutants” that are regulated by the USEPA under the CWA. NNC are intended to quantitatively interpret the amount of nitrogen and phosphorus needed to support the expected biological functions of a given water body. Scientifically, NNC are also intended to encompass both causal and response variables to ensure the biological health of the waters of the United States.

THE LEGAL BACKGROUND AND USEPA'S MANDATE FOR NNC

Congress enacted the Federal Water Pollution Control Act of 1972 in response to widespread, unregulated water pollution. The act was designed to be a comprehensive environmental statute to “protect and restore the chemical, physical and biological integrity of the nation's waters” [33 U.S.C. §1251(a)]. This statute was amended in 1977 as the CWA and has become the principal environmental statute for protection of US water resources.

Section 303(c) of the CWA, 33 U.S.C. §1313(c), mandates that states adopt water quality standards for all navigable waters within their jurisdiction. These standards are reviewed and must ultimately be approved by the USEPA. Water quality standards have two components: (1) a designated-use component and (2) associated standards that are designed to protect the designated use. After designated uses are established, the states then must set water quality standards to protect these uses from impairment. The CWA allows water quality standards to be either narrative or numeric values. Most states, if not all, developed a narrative standard for nutrients because setting numeric nutrient standards is difficult from a scientific perspective. Until recently, no causal relationship had been proven linking nutrient levels to specific biological effects to aquatic environments. In fact, a causal relationship between nitrogen and phosphorus levels and biological conditions has only been demonstrated for lakes and springs, not for flowing waters. Florida's narrative standard simply stated “. . . [i]n no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of flora or fauna.” The determination of whether a nutrient discharge was likely to cause an imbalance was done on a case-by-case basis per water body.

According to a 1996 USEPA report to Congress, nutrients were identified as the second most significant cause of water impairment for all water types and the leading cause of impairment for lakes and coastal waters. Impairment occurs when a water body is polluted to a point that it does not meet its designated use. Once a water body is determined to be impaired, the CWA requires the state to restore the water, which is usually done via load reductions of the offending pollutant (i.e., total maximum daily loads

or TMDLs). In 1998, citing its concern that nutrient-loading may be the leading cause of impairment in US waters, USEPA announced that the states would be required to adopt NNC in lieu of narrative water quality standards. This announcement was formalized as the National Strategy for the Development of Regional Nutrient Criteria and was a component of President Clinton's broader Clean Water Action Plan. The action plan mandated USEPA to accelerate the development of numeric nutrient standards as part of state water quality standards by 2003. It was therefore clear in 1998 that the preferred approach for regulating nutrients (nitrogen and phosphorus) would be through numeric standards. It was also clear that if a state failed to develop NNC, the USEPA would develop and impose them itself.

USEPA focused on numeric nutrient standards based on its belief that narrative standards do not, in a timely fashion, identify impaired waters or put in place protective measures for such waters. USEPA assumed that the translation of narrative standards into measurable metrics on a case-by-case basis per water body was too time-consuming and inefficient. USEPA justified its approach on the belief that numeric criteria would:

- lead to easier and faster identification of impaired waters,
- lead to easier and faster development of TMDLs/restoration,
- facilitate protective permitting,
- facilitate evaluating the success of load-reduction programs,
- provide measurable baselines and goals, and
- avoid the ad hoc evaluations of water bodies (USEPA, 2007).

On Nov. 14, 2001, USEPA requested that each state develop an NNC plan outlining how the state planned to develop and adopt the criteria (USEPA, 2001). Although such plans were not required, USEPA strongly encouraged their development in order to reflect a mutually agreed on approach and schedule. Developing such plans afforded states some flexibility with regard to the timing of rule development as long as the state was making acceptable progress (USEPA, 2001). By 2008, 46 states had developed an NNC plan, 43 of which were approved by USEPA (2008). However, by 2008, only 18 states had adopted NNC for one or more parameters for part of one or more water body types. Further, no state had developed statewide NNC for all water bodies. All that changed in 2011 when the USEPA adopted and imposed NNC for all of Florida's lakes and flowing waters (excluding canals in south Florida).

THE FLORIDA EXPERIENCE

Florida was one of the states that developed a nutrient criteria plan that was approved by USEPA. With

USEPA's approval, Florida's plan was subsequently revised to establish a January 2011 submission date and a 2012 adoption date (Giattina, 2009).

Historically, Florida has been strongly proactive with regard to water resource protection. The state's efforts to restore and protect its waters have included such actions as being the first state to implement statewide stormwater treatment programs, being the first state to develop a comprehensive and systematic approach to identifying impaired waters and establishing TMDLs (Fla. Stat. §403.067), developing a water reuse program (Fla. Stat. §403.064; Fla. Admin. Code Ch. 62.610), implementing best management practices for nonpoint sources, adopting numeric nutrient response thresholds for determining waters that are nutrient-impaired, developing the Surface Water Improvement and Management Program that provides for the development of management and restoration plans for priority water bodies (Fla. Stat. §373.451–4595), developing numeric criteria for phosphorus within the Florida Everglades, investing \$3 billion in the development of stormwater facilities across the state, and investing \$20 million in the development of NNC (USEPA, 2010).

Despite these efforts—and in addition to having an approved NNC development plan—USEPA was sued by third parties to force the accelerated development of NNC for all of Florida's waters (*FWF v. Jackson*, N.D.). In connection with the lawsuit, USEPA informed the state that its narrative standard was not protective of the designated uses and immediate development of NNC was necessary for the state to be in compliance with the CWA. USEPA ultimately settled the lawsuit by agreeing to an expedited schedule for NNC adoption. In essence, the lawsuit supplanted USEPA's agreements with the state of Florida, resulting in an important warning for other states that have similar agreements with the agency. The settlement provided that if Florida did not comply with the expedited schedule, USEPA was obligated to develop the criteria within the set time frames. (The consent decree was later amended on Oct. 8, 2010, providing for development of NNC for all flowing waters, excluding the south Florida region, by Nov. 14, 2010. The revised consent decree required proposed numeric criteria for south Florida flowing waters and for coastal waters by November 2011.)

The settlement led to significant political struggles as Florida initially tried to develop criteria within a short time frame. The regulated community was left feeling as though USEPA had unjustifiably jettisoned what was a deliberative and cooperative process merely to settle a lawsuit. Many local governments, agricultural interests, and industry groups strongly opposed USEPA's determination and subsequent NNC rule, leading to a massive wave of lawsuits initiated by the state, several local governments, utilities, and industry groups.

WHY YOU SHOULD CARE

Other states and regulated communities within those states may ask why they should care about NNC and the Florida's experience with the USEPA. The simple answer is “. . . because you are next.” It is clear that nutrient pollution is a priority issue for USEPA and that establishing NNC nationwide is one of its primary goals. It is also clear that environmental groups can effectively take control of the process, with the help of the courts, through legal action against USEPA. Having an NNC development plan or similar agreement with the agency does not protect you. This has become apparent in other states (including Kentucky, Wisconsin, and Illinois), with environmental groups either threatening or filing similar lawsuits and pressing USEPA to pursue accelerated adoption of NNC.

What we know from Florida's experience is that it takes significant time and resources to develop scientifically sound NNC and to engage stakeholders in the development process. The overriding lesson to be learned is that state and local governments—as well as the regulated community—must be proactive in promoting the necessary legal and policy tools for developing and implementing NNC. The legal and policy framework for implementing NNC should encompass a broad array of tools tailored to the individual needs of the affected interests. This toolbox should include such components as described in the following sections.

Land use planning. The USEPA, through the CWA, primarily regulates point sources, which are generally discrete pipes or ditches that discharge into jurisdictional waters. Nonpoint sources, such as most agricultural operations and residential homes, are not regulated by the CWA but are generally a major source of nutrient loading. Although the USEPA may not have sufficient authority under the CWA to regulate nonpoint sources, state and local governments do via their land use powers. Land use planning provides an opportunity for more systematic and long-term controls to address the issue. Land use planning documents, including comprehensive plans and associated land development regulations, can be used by local governments to affect nutrient loading both proactively (new development) and retroactively (redevelopment projects).

Public finance. Proactive and reactive responses to nutrient pollution will necessarily require creative means for financing new infrastructure or improvements to existing infrastructure designed to improve nutrient levels in receiving waters. Establishing these financing mechanisms up front as part of a plan for compliance ensures a financial platform from which governmental entities can carry the costs of compliance.

Legislative actions. Although they have the authority, many state and local governments do not directly regulate nonpoint discharges. Legislative actions that

regulate nonpoint discharges, such as best management practices related to stormwater and fertilizer ordinances, can be useful in avoiding nutrient impairment of water bodies and ensure compliance with USEPA's mandates.

TMDLs. Implementation of NNC will likely result in more water bodies being identified for compliance, requiring the creation of TMDLs relating to the CWA. Most states do not have a meaningful process for developing or implementing TMDLs. Because understanding the NNC will be required in the near future, it is critical that other states develop, or refine, their TMDL process in order to ensure cost-effective and successful implementation of NNC.

Special purpose governments. Special districts with localized regulatory/planning authority and, more important, revenue-raising authority, can provide a mechanism for compliance on a basin-by-basin or watershed-by-watershed basis. Many states have the authority to establish special purpose governments/districts and should explore establishing them in advance of NNC and as tools to ensure compliance.

Pollutant trading programs. What is known is that nutrient-caused impairments are the result of future development and that future development will need to occur. Therefore, state and local governments and the regulated community need to develop solutions to allow for future development. Structuring pollutant trading programs, similar to those used in connection with air pollution programs, can provide a mechanism for compliance while providing entrepreneurial opportunities for future development.

Permitting. Regulatory programs will necessarily play a part in implementation, including the federal National Pollutant Discharge Elimination System, Municipal Separate Storm Sewer System, and Section 404 programs. State and local governments will need to develop permitting strategies with the USEPA for renewal of existing permits and for permitting new activities. This could include restructuring state and local water pollution permitting programs where they exist. It is important that state and local governments and the regulated community inventory existing permits and develop strategies for permit renewals in light of USEPA's focus on nutrient loading. It is equally important to critically plan for future infrastructure and permitting needs and ensure that practices are in place to best facilitate securing the necessary approvals.

For many areas, especially urbanized ones, simply retrofitting every water resource facility or constructing new end-of-pipe treatment facilities will not be prudent, affordable, or effective. It is impractical for a local government to condemn chunks of city blocks in order to reduce nutrient loads. It is equally imprudent and cost-prohibitive for the regulated commu-

nity to develop sophisticated treatment facilities in connection with private, permitted projects. Achieving compliance requires innovative approaches that account for existing development while enabling future development. How those innovative approaches are developed and implemented will vary depending on unique local circumstances and will require thoughtful planning in advance of any mandates from USEPA. This is the lesson from the Florida experience that other states need to take away from this article. The number of potential innovative solutions is limited only by the time available to develop and implement them. In Florida's case, time was not on the state's side and precluded possible innovative approaches. Other states should start developing NNC now and not wait to be next in line for a similar mandate from USEPA. Being proactive is the only way to ensure that the state and the local governments and regulated communities within that state are in control of their own destinies and resources.

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