

# NUMERIC NUTRIENT CRITERIA IN FLORIDA – AN OVERVIEW

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## **I. Introduction**

Most environmental professionals should now be familiar with the U.S. Environmental Protection Agency's ("EPA") Proposed Numeric Nutrient Criteria ("NNC") rulemaking initiative in Florida and elsewhere. This article will provide a brief overview and an update on recent events.

On January 26, 2010, the EPA published the NNC draft rule, titled "Water Quality Standards for the State of Florida's Lakes and Flowing Waters". The proposed rule was promulgated pursuant to a Consent Agreement the EPA entered into with several environmental groups that filed a lawsuit in federal district court alleging that the EPA had failed to enforce the Clean Water Act against the state. The focus of the allegations concerned nutrient levels in the state's water bodies and water segments. In response to the draft rule, the EPA held a total of six public hearings throughout the state in February and April of 2010, and approximately 22,000 public comments were received by the agency.

## **II. Background of Florida's Existing Water Quality Standards**

For years, Florida has used a narrative nutrient standard to guide the management and protection of its waters. Chapter 62-302.530, FAC, states that "in no case shall nutrient concentrations of body of water be altered so as to cause an imbalance in natural populations of flora or fauna." The narrative criteria also states that (for all waters of the state) "the discharge of nutrients shall continue to be limited as needed to prevent violations of other standards contained in this chapter [Chapter 62-302, FAC]. Man-induced nutrient enrichment (total nitrogen or total phosphorus) shall be considered degradation in relation to the provisions of Sections 62-302.300, 62-302.700, and 62-4.242, FAC."

The Florida Department of Environmental Protection (DEP) has relied on this narrative for many years because nutrients are unlike any other "pollutant" regulated by the Clean Water Act (CWA). Most water quality criteria are based on a toxicity threshold, where higher concentrations can be demonstrated to be harmful, and acceptable concentrations can be established at a level below which adverse responses occur. In contrast, nutrients are not only present naturally in aquatic systems, they are absolutely necessary for the proper functioning of biological communities, and are sometimes moderated in their expression by many natural factors.

On a parallel track, the DEP had been actively working with EPA on the development of numeric nutrient criteria for several years. DEP submitted its initial Draft Numeric Nutrient Criteria Development Plan to EPA Region IV in May 2002, and received mutual agreement on the Numeric Nutrient Criteria Development Plan from EPA on July 7, 2004. The DEP revised its plan in September 2007 to more accurately reflect its evolved strategy and technical approach, and DEP received mutual agreement on the 2007 revisions from EPA on September 28, 2007.

However, on January 14, 2009, EPA formally determined that numeric nutrient criteria should be established on an expedited schedule. On March 3, 2009 DEP submitted its Current Numeric Nutrient Criteria Development Plan to EPA Region IV. Since that time, a great deal has occurred and DEP has taken an alternative path towards rulemaking.

### **III. Lawsuit by Environmental Groups**

The primary impetus involved several environmental organizations in Florida which filed a lawsuit in federal court against the EPA Administrator alleging that the agency had failed to comply with its responsibility under the federal Clean Water Act to force the state of Florida to expeditiously adopt numeric nutrient criteria (*Florida Wildlife Federation, et al. v. EPA*). As a result of that lawsuit, in January 2009, EPA issued a “Determination Letter” to the DEP essentially requiring that it meet a strict deadline for adopting such standards (January 2010 for lakes, streams and Class III waters; January 2011 for coastal waters) or else the EPA would step in and establish federal criteria for the state.

On August 19, 2009 the EPA entered a Consent Decree in the federal lawsuit under which it would publish federal criteria for Florida and adopt rules under specified, strict timeframes.

### **IV. State of Florida DEP Reaction**

In the wake of the proposed settlement, DEP, for a period of time, opted to stop its effort to set numeric criteria, even though state officials say the state’s approach was better suited to address the significant regional variations in the state’s waterbodies.

While the State has now re-started, and concluded, its efforts to develop numeric nutrient standards, Florida is participating in, and commenting on, EPA’s efforts to develop numeric criteria. The state Department of Agriculture and Consumer Services (DACS) intervened in the consent decree between the agency and environmentalists, echoing arguments from a host of agriculture and other industry intervenors that the proposed numeric criteria will devastate the state’s economy without advancing the goals of the Clean Water Act. Additionally, several of Florida’s water management districts intervened in the lawsuit raising concerns as well.

As discussed in greater detail below, the DEP has commented that the numeric nutrient criteria will drive millions of dollars in unnecessary cleanup costs. DEP has taken the position that the EPA approach to NNC will result in a significant amount of error, meaning “false positives,” when municipalities, farms and others must limit their discharges into healthy streams and “false negatives,” when the numeric nutrient criteria will not require discharge limits for impaired streams. DEP has contended that Florida state law requires strict limits to meet discharge load limits, known as total maximum daily loads (TMDLs), municipalities will be required to spend millions of dollars in “unnecessary” cleanup costs.

## **V. EPA NNC Criteria for Florida**

The EPA NNC proposes numeric nutrient criteria for Florida lakes, streams, springs and clear streams, and canals. Below is a general description of the NNC criteria. However, the actual nutrient standards vary based upon EPA's defined watershed regions for each waterbody or water segment.

### ***A. Criteria for Lakes***

For lakes, EPA proposed standards for total nitrogen (TN), and total phosphorus (TP) criteria based on the "stressor-response" approach. The stressor-response approach analyzes the biological response and relates it to TN and TP levels (the stressors) for lakes in Florida. This method of setting standards is criticized as too broad and not taking into account the diversity of conditions present in Florida's lakes. For example, in certain regions of Florida, soils naturally contain high levels of phosphorous, yet lakes containing these soils are not biologically impaired. Thus, even where excessive plant growth does not occur, waters may be considered nutrient impaired simply because nutrient concentrations do not conform to EPA's proposed numeric criteria.

EPA also presumes that regulation of both nitrogen and phosphorus is required to control plant growth. However, certain systems are nitrogen or phosphorous limited, and therefore an increase in the non-limited nutrient would not result in a biological response. Thus, by not taking such conditions into account, critics believe that the EPA NNC are not based on the levels of nutrients needed to protect designated uses.

### ***B. Criteria for Rivers and Streams***

For rivers and streams, EPA proposed criteria based on the "referenced stream approach". EPA divided the state into geographical regions; analyzed nutrient data from a set of biologically healthy streams in each region; and then set the numeric nutrient criteria based on sparse, and at times unreliable, TP and TN data for these streams. This approach analyzed water quality data and identified sets of streams as healthy based on this data. However, according to published reports, by using this methodology of setting criteria, many streams are declared to be impaired without taking into consideration the unique conditions of each water body.

Historically, neither EPA, nor DEP, could establish a cause and effect relationship between nutrients and algal growth in Florida rivers and streams. By establishing criteria for rivers and streams without any consideration of cause and effect or consideration of an impairment threshold, opponents of the NNC argue that the proposed criteria are not scientifically defensible.

### ***C. Downstream Protection Values for Lakes***

EPA also proposed to lower its proposed criteria for streams that discharge into downstream lakes. These "downstream protective values" or stream DPVs are not based on any

information demonstrating that Florida receiving lakes have unacceptable chlorophyll-a levels (EPA's indicator of impairment). Instead, EPA used a model to calculate the acceptable DPV, based upon a projected protective loading to a "representative" lake. Using these multiple worst case assumptions, EPA has concluded that phosphorus loads originating even from unimpacted areas are a threat to Florida lakes, and has established criteria that some scientists and State of Florida representatives believe will greatly increase the number of Florida waterbodies considered to be impaired.

#### ***D. Criteria for Springs and Clear Streams***

For springs and clear streams, EPA is proposing a nitrate-nitrite criterion that EPA asserts is based on experimental laboratory data and field evaluations that show algal growth in response to nitrate-nitrite concentrations. Again, EPA did not establish a defined impairment level or demonstrate a cause and effect relationship between the stressor and the response.

#### ***E. Criteria for Canals***

For canals in south Florida, EPA proposed criteria that EPA asserts are based on levels found in canals that are meeting their designated uses with respect to nutrients. The proposed numeric criteria for canals, as with the stream criteria, are not based on any defined relationship between nutrient levels and use impairment. Critics believe that EPA's proposed criterion would regulate canals that are not impaired. Many question whether EPA's criterion for canals in southeast Florida is necessary to protect their designated uses.

### **VI. Implementation Issues**

In the NNC rulemaking documents, EPA has acknowledged that its proposed lake criteria does not account for natural lake variability other than the variability provided by color and alkalinity classification, and that its proposed streams criteria "may be either more stringent than necessary or not stringent enough to protect designated uses". EPA attempts to address these deficiencies by proposing that dischargers avoid meeting the criteria through variances, changes in designated uses, or the use of site specific alternative criteria. Alternatively, EPA suggests dischargers delay meeting the criteria through compliance schedules or new restoration standards.

### **VII. EPA Actions**

The EPA has opted to delay promulgation of criteria for downstream estuarine and coastal waters. In a joint June 7, 2010, court filing with the environmental organizations that filed the federal lawsuit, EPA proposed publication of draft criteria by November 2011, and final adoption by August 2012. In the filing, which was approved by the U.S. District Court for the Northern District of Florida, the EPA and environmental plaintiffs also agreed to extend until August 15, 2012, a court-ordered deadline for the EPA issuing the criteria for lakes and flowing waters in the South Florida region. Given the existence of over 2000 miles of canals, most of which are part of the massive federal Central and Southern Florida Flood Control Project, this is

a unique area where all flowing waters are either canals or wetlands, many of which are classified as "Class III," meaning they are reserved for recreational uses -- a major industry in South Florida. These areas include the Florida Everglades and urbanized Miami.

The EPA published notice in the Federal Register seeking comment on several options intended to provide flexibility to its proposed criteria for rivers and lakes. EPA has sought additional comment on options for its criteria for lakes and streams in a supplemental Notice published in the Federal Register. According to the Notice, EPA proposed to redraw some of the boundaries in the state's remaining watersheds in order to better reflect hydrology and soil composition data. The Notice also sought comment on whether it should consider alternative modeling procedures for certain downstream lakes and under which circumstances alternative models should be used.

To be sure, the Florida political delegation has also weighed in on this controversy. A bipartisan group of state and federal Florida lawmakers have sent several sets of letters and objections to EPA Administrator Lisa Jackson.

### **VIII. Economic Impacts and Compliance Costs**

DEP produced a Report entitled "Preliminary Estimate of Potential Compliance Costs and Benefits Associated with EPA's Proposed Numeric Nutrient Criteria for Florida" (the DEP Report).

The DEP found that EPA's economic impact analysis was essentially a preliminary estimate of the potential incremental compliance and state resource costs associated with EPA's proposed nutrient criteria for lakes and streams in Florida. Incremental costs associated with the proposed EPA NNC rules represented the costs above and beyond the costs that would be incurred for compliance with the baseline criteria. For this analysis, baseline costs represented the costs necessary for compliance with DEP's draft water quality standard (WQS) changes (Chapter 62-302 and 62-303; July 2009), and any costs incurred to reduce nutrient loads to waters on the existing state Clean Water Act (CWA) Section 303(d) list or with an existing total maximum daily load (TMDL).

The DEP and regulated interests have steadfastly asserted that the above cost estimates significantly underestimate those that would be incurred for compliance with EPA's proposed NNC.

In fact, the DEP performed a cost estimate that indicates that the EPA significantly underestimated the costs to achieve the proposed EPA criteria. As noted above, one of the primary reasons is that EPA assumed for all the estimates that certain costs would have already been incurred in order to meet the DEP's proposed NNC. This assumption is invalid because the DEP's proposed NNC have not yet been adopted, although the 2012 legislative ratification of DEP NNC rules is now imminent.

All of the DEP's estimates were based on additional costs that would be incurred above the currently implemented controls in order to achieve EPA's proposed criteria. In addition, the specific reasons for the economic impacts and compliance costs propounded by DEP were assessed by source sectors and determined in the DEP Report to be as follows:

- For domestic wastewater facilities, the level of technology used by EPA to estimate costs was not sufficient to achieve the proposed criteria. Additional technologies, such as reverse osmosis, will likely be required to meet the proposed criteria.
- For industrial wastewater facilities, EPA used an assumption that process controls on the order of \$25,000 per year would be sufficient for industrial wastewater facilities to meet the proposed criteria. However, source controls alone will not be sufficient to meet the proposed criteria. Certain facilities may require tertiary treatment similar to domestic wastewater treatment systems to meet the proposed criteria. Other industrial facilities have inorganic wastewater streams high in nitrogen and phosphorus that are not amenable to biological treatment and will require the use of chemical and physical treatment systems, such as reverse osmosis, to meet the proposed criteria.
- EPA failed to estimate any costs for the treatment of urban stormwater needed to meet the proposed criteria. Even though Florida has had stormwater treatment requirements for new development since the early 1980s, it is highly likely that "older" urban areas will need to construct stormwater system retrofits to meet the proposed EPA criteria.
- For agriculture, EPA significantly underestimated the affected acreage of agriculture (6.13 million acres versus 13.6 million acres for the FDACS estimate). In addition, the EPA cost estimate assumed that only a subset of typical BMPs would be needed to achieve the criterion. In contrast, the FDACS estimate assumed that ALL typical BMPs would be necessary.

In sum, DEP found that the cost estimates to comply with EPA's proposed numeric nutrient criteria indicated that the EPA severely underestimated the costs. The DEP's estimates indicated annual costs ranging from \$6 - \$12+ billion a year.

A study by the University of Florida and the Florida Department of Agriculture and Consumer Services concluded that the EPA NNC regulations would directly cost Florida's agricultural community roughly \$1 billion each year, with additional indirect costs also exceeding \$1 billion. The study goes on to indicate that implementation of the EPA regulations could put more than 14,000 agricultural workers out of a job.

#### **IX. Recent DEP and Related Legislative Actions**

In accordance with s. 120.541(3), F.S., the DEP submitted rule amendments to Rules 62-302 and 62-303, F.A.C., to the Legislature for ratification on December 9, 2011. The rule amendments were estimated to exceed the allowable thresholds for implementation costs for rule adoption without legislative ratification.

The rules were proposed for adoption by the ERC on December 8, 2011. Since the ERC proposed additional amendments to the rules for adoption, the DEP submitted a Notice of Change in the Florida Administrative Weekly, published December 22, 2011.

The approved state rules plus amendments set numeric nutrient criteria on the amount of phosphorus and nitrogen allowed in state waters. They replace Florida's narrative standard, which was the subject of the lawsuit and subsequent consent decree between the EPA and several environmental groups.

The Legislative Staff analysis of DEP's proposed NNC rules provided that "the approved state rules are more cost effective than the federal rules, and the DEP asserts they will afford the same level of protection for Florida's water bodies. While the numbers are the same or similar for the state and federal rules the implementation of state rules is more tailored to Florida's specific needs. The Florida State University Center for Economic Forecasting and Analysis estimated the costs of implementation for the DEP rules. The median cost estimate for the state rules is \$75 million annually. While those costs are significant, they are much less than some of the median cost estimates for the federal rules, which may be as high as \$4 billion annually.

After passage by the state House of Representatives and Senate, Governor Rick Scott signed House Bill 7051 into law on February 16, 2012. HB 7051 directs the FDEP to submit revisions to 62-302 and 62-303, F.A.C., to the U.S. EPA within 30 days of the effective date of the bill. These rule amendments contained the state level NNC developed by FDEP. The FDEP transmitted these rule amendments to the EPA on February 20, 2012 by letter from Sec. Herschel T. Vinyard, Jr. The letter requested that EPA "return to Floridians the responsibility for protecting Florida's waters."

#### **X. Legal Challenge to the Proposed DEP Rules**

Pursuant to s. 120.56, F.S., a Petition has been filed challenging the proposed rules. This will prevent or delay the DEP from filing the certification packages for these rules with the Department of State. The rule challenge seeks to invalidate the DEP's proposed numeric nutrient criteria rules because "contrary to DEP's claims, the rules are not designed to protect state waters from the adverse impacts of nutrient overenrichment. Instead, the Florida Wildlife Federation, et al, Petition contends that these rules go so far as to prevent a finding of impairment due to nutrients until the waterbody is covered with nutrient-fueled toxic blue-green algae (cyanobacteria)." The challenge asserts that certain provisions of the proposed rules are invalid exercises of delegated legislative authority. The hearing has been scheduled for February 27, 2012, through March 2, 2012.

Until the Administrative Law Judge issues an order in the administrative rule challenge proceeding, the DEP cannot file the proposed rules for adoption as final rules. Consequently, the Legislature will not be able to get a final adopted rule from the DEP for ratification during the 2012 Regular Session. For purposes of compliance with the federal Clean Water Act, the DEP's *adopted* rules must be approved by the EPA in order to replace the EPA's numeric nutrient criteria rules for Florida. In response to the recent state activity to implement state numeric nutrient rules, the EPA

has proposed to delay the implementation date of the federal rules from March 6, 2012, until June 4, 2012.

## **XI. Recent EPA Actions**

The highly awaited Science Advisory Board's (SAB) recommendations on the EPA's draft document *Methods and Approaches for Deriving Numeric Criteria for Nitrogen/Phosphorus Pollution in Florida's Estuaries, Coastal Waters, and Southern Inland Flowing Waters* caused EPA reconsideration of many of its approaches, analysis and methodologies. The EPA is modifying its methods and approaches and has considered its work on these proposed criteria a priority since the NNC methodologies were first presented to the SAB in December 2010.

The EPA agreed with the SAB's conclusion that a dual nutrient strategy that calls for developing both numeric nitrogen and phosphorus criteria is warranted. The EPA also agreed with the need to continue to develop numeric nutrient criteria using a combination of three general approaches: reference conditions, stressor-response and mechanistic modeling where data and models are available to give greater confidence in the resulting criteria values. The EPA intends to address the link between nitrogen and phosphorus pollution and the assessment endpoints in the different water body types.

With regard to estuaries, EPA acknowledged the need to develop "mechanistic models" for Florida's estuaries. EPA is supposedly developing these models, and is conducting calibration and sensitivity analyses on them. On the issue of additional measures to determine the health of seagrass and faunal communities to translate Florida's narrative nutrient criterion for estuaries, the EPA has indicated that a thorough literature review to evaluate the appropriate assessment endpoints to protect aquatic flora and fauna populations from nitrogen and phosphorus pollution was undertaken.

For coastal waters, the EPA supports use of satellite use of satellite imagery to derive numeric nutrient criteria for these waters as suggested by the SAB. The EPA plans to investigate how it can validate satellite data with the expanded use of field observations beyond the three-nautical-mile limit as the SAB also recommended.

For South Florida inland flowing waters, the EPA recognized the SAB's concerns about the challenges associated with deriving numeric nutrient criteria that would be protective within man-made and managed Class III canals. Because Florida has designated the uses of these waters no differently than other flowing waters within the state, state regulation currently requires these waters to meet the same water-quality goals and the same level of protection as other Class III waters across the state. In response to SAB recommendations, the EPA is exploring the use of natural factors for South Florida inland flowing waters in the derivation of numeric nutrient criteria. The EPA has also represented that it is evaluating options to characterize aquatic life in canals and other South Florida inland flowing waters, including the use of chlorophyll-a and periphyton data as well as the use of multiple lines of evidence. EPA

agreed with the SAB that nutrients in canals should be managed to ensure the attainment and maintenance of downstream water –quality standards.

Finally, the EPA is to take into account the SAB’s comments on the proposed approach to develop Downstream Protective Values to provide assurance that proposed water-quality standards for downstream estuaries will be attained and maintained by nutrient inputs from upstream sources.

## **XII. 2012 Updates**

First, there was a judicial ruling on the EPA NNC. On February 20, 2012, Judge Hinkle, the judge in the federal rule challenge to the U.S. EPA’s NNC, issued an Order on the Merits. In his Order, the Judge upholds the EPA’s determination that numeric nutrient criteria are necessary for Florida waters to meet the requirements of the Clean Water Act. However, it upholds the lake and spring criteria. In addition, the Order upholds the EPA decision to adopt downstream protection values, but overturns the downstream values from non-impaired waterbodies. Finally, the Order upholds the Administrator’s decision, and procedures, to allow for adopting – site-specific alternative criteria.

Following up on the SAB report, the National Academy of Sciences (NAS) released a report on March 6, 2012. In the report, the NAS committee questioned the validity of several assumptions in the EPA cost analysis and found that the EPA did not adequately report on the uncertainties that could affect the cost of the rule change. The committee concluded that the costs to switch to numeric criteria for limiting nutrient pollutants in Florida waters are expected to exceed the EPA estimates. The committee concluded that the EPA was correct in its approach to calculating the cost of the rule change. However, the agency underestimated both the number of newly impaired waters and the mitigation costs for the stormwater, agricultural, septic system, and government sectors. Further, the committee concluded there was significant uncertainty in the estimates for the municipal and industrial wastewater sectors, making it difficult to know whether the EPA underestimated or overestimated those costs.

Finally, there were two extensions of time granted regarding marine and estuary NNC and implementation of the lakes and flowing waters NNC by the EPA. First, EPA filed an unopposed motion to extend the consent decree deadline to propose marine, estuary, and South Florida canal criteria from March 15 to May 21, 2012. On March 2, 2012, Judge Hinkle entered an Order granting the Motion. The deadline for EPA to sign for publication a notice of final rulemaking for these waters was extended to January 7, 2013. As a result, the new date for a proposed marine NNC rule is May 21, 2012, with a final rule to be published approximately January 7, 2013.

Also, EPA published notice of the extension of time for implementation of the lakes and flowing waters NNC. A four-month delay of the implementation was approved from March 6, 2012 to June 6, 2012. As rationale for the extension, EPA stated that the extension would avoid the confusion and inefficiency that may occur should the federal criteria become effective while State criteria are being finalized by the State, submitted to EPA, and reviewed by EPA.

Therefore, if EPA NNC for lakes and flowing waters is to be implemented, the new date is June 6, 2012. However, the Order from Judge Hinkel may have an impact on how the NNC rule would be implemented with respect to streams and rivers. Further, these dates would be nullified if the EPA accepts the FDEP state-level NNC.

### **XIII. Conclusion – Looking to the Future**

The NNC rulemaking in Florida, and elsewhere, seems to be the leading edge of an EPA shift in programmatic focus and expansion of Clean Water Act-based water quality initiatives nationwide. EPA Administrator Jackson has repeatedly stated her desire “to see a huge leap forward in water quality as we saw in the 1970’s after the passage of the Clean Water Act.” Administrator Jackson has expressed that EPA will continue to seek significant improvements in water quality and sustainability. On a concurrent track, DEP has stepped up its efforts to set NNC standards for Florida.

Florida has much at stake from a resource protection and economic impact standpoint. Simply put, the question is now not whether Florida needs, or is otherwise required to adopt, NNC. Instead the question is what such standards should be based upon, in terms of data and science.