

Numeric nutrient criteria: A difficult road ahead

By STEVEN PEENE, PhD

In a letter received by the Florida Department of Environmental Protection on Jan. 14, 2009, U.S. Environmental Protection Agency Region 4 Assistant Administrator Benjamin H. Grumbles outlined an expedited schedule for the development of numeric nutrient criteria for Florida's streams, lakes, estuaries, and coastal waters. The letter reflects a significant milestone in a process that has been underway for many years.

Presently, Florida manages nutrient enrichment in its waters using a narrative criteria that states "in 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" (62-302.530 FAC). This criteria reflects the complex nature of the relationship between nutrients in a water body and what is deemed "healthy" for that water body. It also reflects how much variation exists throughout the state in terms of natural background nutrient concentrations and how waters react to them.

Yet, recognition exists that the narrative criteria and its implementation has at times proved insufficient at controlling nutrient pollution within the state. In a response to the EPA letter, DEP Secretary Mike Sole stated "The State of Florida recognizes that more needs to be done to address nutrient pollution in our rivers, streams, lakes and estuaries, and these actions will help our state and all of our stakeholders prevent and better manage sources of nitrogen and phosphorus from entering our waters."

Additionally, the time and money spent implementing the narrative criteria has historically resulted in delays in actions to address problems. The EPA letter states "Accurately determining, on a water-by-water basis for thousands of waters, the levels of nutrients that would 'cause an imbalance in natural populations of aquatic flora or fauna' is a difficult, lengthy, and data-intensive undertaking. This work involves performing detailed site-specific analyses of the receiving water and any other affected waters. If the state has not already completed this analysis for a par-

ticular water, it can be very difficult to accurately determine, in the context and timeframe of the NPDES permitting process, the levels of nutrients that would 'cause an imbalance in natural populations of aquatic flora or fauna' and process NPDES permits in a timely manner." EPA contends that the establishment of numeric nutrient criteria would accelerate actions to control nutrient pollution.

Defining fixed numeric criteria that would apply over relatively large regions is not an easy task either. DEP began this process a number of years ago, and in 2002 submitted its first Draft Numeric Nutrient Criteria Development Plan to EPA. This plan was approved in 2004. An updated plan was then submitted in 2007 and also approved by EPA. DEP also formed a Technical Advisory Committee consisting of representatives and experts from various groups throughout Florida to support the development.

In March of 2009, in response to the EPA letter which identified EPA's plan to adopt numeric nutrient criteria if Florida fails to do so within specified time periods, DEP released its present plan. This plan calls for establishment of criteria for lakes and streams around the end of 2009, and estuaries and coastal waters by the end of 2010.

The plan can be reviewed on-line at <http://www.dep.state.fl.us/water/wqssp/nutrients/docs/fl-nutrient-plan-v030309.pdf>.

A review of the proposed plan provides a glimpse into what the program will look like. DEP proposes to establish "regions" throughout the state where general conditions controlling nutrients and nutrient response are similar. This follows the approach used by EPA in other parts of the country, but establishes Florida-specific areas rather than using regions defined by EPA. Within any region, two potential methods will be used to define the numeric nutrient criteria.

The first, and preferred method, will establish a cause/effect relationship by region between nutrients and "valued ecological attributes." This means that data throughout the state will be analyzed and relationships will be developed that show nutrient levels where waters become "un-

healthy." This method requires a great deal of data.

In areas without enough data to develop the relationships between nutrient concentrations and water quality, a second method will be used where streams and lakes are identified that are "healthy" or "unimpacted." Under this method, the nutrient levels measured in these waterbodies will then define the criteria.

The data and analyses provided in the 2009 plan highlight some of the difficulties DEP faces in establishing "regional" criteria. Reference stations established in specific regions can show significant variations in nutrient levels. This means that two "reference" waterbodies in the same region may be deemed "healthy" but have different nutrient levels. Determination of what levels would be protective for one, while not imposing excessive restrictions on the other, becomes difficult.

DEP identified potential concerns in the draft plan stating "...the development of protective nutrient criteria is immensely more complicated than that for toxic substances. It must be recognized that nutrients should not be regulated at levels that are artificially lower than those concentrations required for normal ecosystem functioning."

DEP faces a considerable challenge in 2009 and 2010. Historic implementation of the narrative criteria has not always sufficiently protected the waters of Florida from increased nutrient pollution. As such, EPA has mandated that numeric criteria be established within the next two years.

If DEP fails to bring forward criteria acceptable to EPA, then EPA will establish criteria for Florida's waters. At the same time, DEP needs to retain a level of flexibility that recognizes the variation in nutrient levels throughout the state, and does not impose unnecessary, costly reductions.

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