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Controlling Nutrient Pollution: Difficulties in Establishing Criteria

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Special to the Legal

Nutrients in the form of nitrogen and phosphorous are essential for healthy plants and animals. Occurring naturally in the environment, nutrients are contained in the food that we eat, the fertilizers that we apply to our farms and the rivers that supply our drinking water. Without nutrients, life as we know it would not exist.

Unfortunately, with respect to nutrients, there can be too much of a good thing. In excessive amounts, nutrients may render a waterbody unfit for important uses such as fish consumption, potable or agricultural water supply, and recreation.

A visible sign of excessive nutrients in a waterbody is the presence of algal blooms. Algal blooms block sunlight, thereby damaging submerged vegetation beds and aquatic habitat. They also lower the concentration of dissolved oxygen in the water, potentially depriving fish and other aquatic organisms of sufficient oxygen to survive. Algal blooms may also produce harmful toxins. As a result of these concerns, nutrients are classified as pollutants under the Clean Water Act (CWA) and are recognized causes of waterbody impairments when present in excessive amounts.

The CWA requires each state to adopt water quality standards as one mechanism to restore and maintain the chemical, physical and biological integrity of the nation's waters. Water quality standards include designated uses for each waterbody within the state, water quality criteria to protect the designated uses and an anti-degradation requirement. A water quality criterion may be expressed in numeric form (e.g., it may set a specific allowable concentration of total nitrogen or total phosphorous) or it may be expressed in narrative form (e.g., Florida's criterion states that nutrients shall not cause an imbalance in natural populations of



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aquatic flora or fauna).

Regulatory agencies face significant challenges in developing scientifically based numeric nutrient criteria. In *Florida Wildlife Federation Inc. v. Jackson*, the court reviewed the EPA's numeric nutrient criteria for Florida's inland waters. The circumstances under which the EPA developed those criteria may portend similar EPA action in other states in the future.

Following enactment of the CWA, Florida designated uses for many of its waterbodies and established criteria to protect these uses. With respect to nutrients, Florida adopted a narrative criterion that specified: "In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna." This criterion, however, was widely exceeded throughout Florida. For example, Florida reported in 2008 that approximately 1,000 miles of rivers and streams, 350,000 acres of lakes and 900 square miles of estuaries within the state remained impaired for nutrients. The sources of these nutrients included stormwater runoff carrying fertilizers, animal wastes and other nutrients into waterbodies.

The EPA recognized that nutrient over-enrichment was a problem not only in Florida, but throughout the nation. In 1998, the EPA issued its CWA Action Plan and its "National Strategy for the Development of Regional Nutrient Criteria," which suggested or, according to some environmental groups, determined that numeric criteria for

nitrogen and phosphorous were necessary to meet the CWA's requirements. Numeric criteria would make it easier for states to set numeric limits in discharge permits and to establish total maximum daily loads (TMDLs) for those waterbodies impaired by nutrient pollution.

Consistent with the EPA's national strategy, Florida recognized that its narrative criterion for nutrients was inadequate. From at least 2001, Florida struggled to develop statewide numeric nutrient criteria. Florida repeatedly missed its own target dates. In 2008, environmental groups sued the EPA to compel it to establish numeric nutrient criteria for Florida's waters. In December 2009, the EPA administrator determined that a new or revised standard containing numeric nutrient criteria was necessary to meet the CWA's requirements and prevent nutrient overenrichment.

Once the administrator made this determination, the CWA required the EPA to promptly prepare and publish numeric nutrient criteria and adopt the new standard within 90 days after publication, unless Florida adopted and the EPA approved new state numeric criteria first. In light of this statutory requirement, the parties entered into a consent decree setting a schedule for the administrator to issue a proposed rule-making and to adopt a final rule.

The administrator signed a final rule on Nov. 14, 2010, setting numeric nutrient criteria for Florida's inland waters (except in South Florida). The rule established an effective date of March 6, 2012, although the EPA has sought to extend the effective date to June 4, 2012.

Challenges to the final nutrient rule were consolidated in the *FWFI* court. Florida and industry parties contended that the rule and the administrator's 2009 determination were arbitrary and capricious under the Administrative Procedure Act and other laws. They asserted, among other things,

that a revised or new water quality standard was not necessary and that the administrator had not shown a connection between the new numeric criteria and protection of the designated uses of Florida's waterbodies. In contrast, the plaintiff environmental groups supported the administrator's 2009 determination that numeric criteria were required but contended that the administrator should have set the criteria at a more stringent level.

The *FWFI* court readily agreed with the administrator that the impairment of Florida's waters lasting many years, as shown by studies conducted by the Florida Department of Environmental Protection and others, provided ample support for the administrator's determination. The more difficult question identified by the court was whether the administrator had acted arbitrarily and capriciously in selecting the specific values for nutrients set forth in the rule.

The administrator employed computer models and field studies to select the levels for total nitrogen and total phosphorous in lakes that would trigger adverse changes in flora and fauna. One measure of nutrients' effect on aquatic systems is the response in chlorophyll-a, a measure of algae growth. Because chlorophyll-a is a recognized indicator of water quality impairment and because the EPA demonstrated a relationship between nutrient concentrations and chlorophyll-a, the EPA's establishment of a criterion for chlorophyll-a was on sound footing.

The EPA not only set a numeric criterion for chlorophyll-a in the waterbodies, it also set numeric criteria for nitrogen and phosphorous at a level that would likely cause chlorophyll-a exceedances. The industry plaintiffs contended that chlorophyll-a levels alone should serve as the indicator of whether or not harm existed. The EPA countered that its models and studies demonstrated that where the phosphorous and nitrogen criteria were exceeded, harm would likely occur even if chlorophyll-a levels did not yet reflect impairment. The court agreed with the EPA that proof of likely harm in the future provided an adequate basis for setting nitrogen and phosphorous numeric criteria and that the EPA had not acted arbitrarily or capriciously in establishing numeric criteria for all three parameters.

The court also upheld the administrator's conclusion that only exceedances of the numeric levels for more than one year out of any consecutive three years would cause lasting harm to flora or fauna. Consequently,

the EPA had acted properly by including temporal conditions in its nutrient rule.

When developing nutrient criteria for streams, the administrator faced a particularly difficult challenge. Unlike the EPA's scientific studies of lakes, its models and field studies of streams did not demonstrate a sufficiently clear relationship between the quantity or concentration of nutrients and their effect on stream health to support selection of specific numeric criteria. Consequently, the administrator established numeric criteria for streams by using an alternate approach, the reference site method.

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To employ this method, the EPA identified a representative sample of minimally disturbed streams to be used as a surrogate for streams undisturbed by human activities. The EPA asserted that the nutrient characteristics of these reference streams reflected a balanced natural population of aquatic flora and fauna, and that increased concentrations of nutrients could upset that balance. The EPA developed numeric nutrient criteria based on the annual geometric mean for each nutrient in the reference streams. The EPA recognized that its reference site method may be underprotective or overprotective in some streams. It contended, however, that provisions of the rule allowing development of site-specific alternative criteria cured this potential defect.

The court rejected the EPA's alternate approach on the ground that it "aimed at the wrong target." Unlike the EPA's modeling and field study approach for lakes that identified harmful effects, the geometric mean calculations for rivers focused on all changes from natural conditions, not only on adverse effects. The court recognized that the EPA might have the authority to promulgate criteria that precluded any change, whether harmful or not, in the balance of aquatic organisms from natural conditions.

But the court emphasized that the EPA had not done so. Consequently, the court concluded that the EPA had acted arbitrarily and capriciously in utilizing a methodology that was not restricted to adverse effects.

The EPA's new rule also established a process for calculating downstream protection values at the point a stream entered a lake. This approach was designed to protect the lake from nutrient pollution contained in river waters entering the lake, even if the river was not itself impaired. The court concluded that where a lake is impaired, the EPA may set standards to prevent even a small pollutant load from a stream from entering the lake. But where a lake is not impaired, the EPA's methodology arbitrarily failed to set only those limits necessary to prevent harmful effects to the lake.

Florida remains dissatisfied with the criteria developed by the EPA and is seeking to substitute its own numeric criteria. On Feb. 16, Florida Gov. Rick Scott signed legislation to adopt the state's nitrogen and phosphorous criteria (HB 7051). The FDEP transmitted the rule amendments to the EPA for approval on Feb. 20. Florida contends that its numeric nitrogen and phosphorous criteria utilize site-specific analyses and result in a more cost-effective program than does the EPA's rule.

FWFI illustrates the difficulty of establishing nutrient criteria based on sound science. For lakes, the EPA's modeling and field studies showed a consistent cause-and-effect relationship between nutrient levels and harmful effects such as algal blooms. In contrast, modeling of Florida's rivers provided an insufficient scientific basis to support selection of numeric criteria. The reference site method successfully demonstrated changes in types and distribution of aquatic organisms as nutrient levels rose, but the court rejected its use to set criteria designed to prevent only harmful changes. Other states are seeking to develop numeric nutrient criteria for their waterbodies. The *FWFI* decision, the EPA's response to Florida's newly adopted criteria and the court's resolution of any subsequent challenges are likely to influence future regulation in other states and the economic costs imposed on the regulated community. •