Nutrients in the Heartland: Regulatory and Legal Issues Surrounding the Mighty Mississippi

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The Mississippi River will always have its own way; no engineering skill can persuade it to do otherwise.

—Mark Twain in *Eruption*

Last year, the Gulf of Mexico's "dead zone" spanned 2,889 square miles along the Louisiana and Texas shores. Environmental Protection Agency (EPA), Hypoxia in the News, http://water.epa.gov/type/watersheds/named/msbasin/gulfnews.cfm#2012zone (last visited Feb. 19, 2013). An area is considered "dead" when the dissolved oxygen levels fall below the threshold needed to support most aquatic life. Although the 2012 dead zone was the smallest in size since 2000, it still encompassed an area approximately the size of Delaware and Rhode Island combined. *Id.* Beyond the obvious concern for the well-being of aquatic life, there is an economic concern caused by the dead zone, because $2.8 billion is generated annually from the Gulf's fishery resources. National Oceanic and Atmospheric Administration, The Problem of Hypoxia in the Northern Gulf of Mexico, at 7, http://service.ncddc.noaa.gov/rdn/www/media/documents/hypoxia/hypox_finalprob.pdf (last visited Feb. 19, 2013).

Scientists studying the Gulf's dead (or hypoxic) zone have looked to excessive nutrients as one of the possible causes. Nutrients—primarily nitrogen and phosphorus—are critical for plant growth, both on land and in the water. The nutrients present in waterways allow algae and other plants to grow and contribute to the ecosystem. But there can be too much of a good thing. When nutrient levels in water become too high, the nutrients encourage the growth of large quantities of algae and other plants. This in turn causes the flora to dominate the use of dissolved oxygen in the water, causing a condition called hypoxia. Oxygen is critical not only for the plants but also for fish and shrimp and seafloor creatures such as mussels and crabs. Eventually, the very nutrients that should feed the ecosystem essentially destroy it.

The Mississippi River flows directly into the Gulf and is considered a significant nutrient source. The River flows 2,300 miles from its start in Minnesota to its finish south of New Orleans. Along the way, the River receives water from thirty-one states and two Canadian provinces. *See* National Park Service, Mississippi River Facts, www.nps.gov/miss/riverfacts.htm (last visited Feb. 19, 2013). The River's drainage basin covers more than 1,245,000 square miles from New York to Montana—a whopping 40 percent of the lower fourty-eight states—making it the third-largest basin in the world, behind only the Amazon and Congo Rivers. *See* U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), Mississippi River Basin Healthy Watersheds Initiative, at 1, www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcsdev11_023950.pdf (last visited Feb. 19, 2013).

The Upper Mississippi River is the 1,300-mile stretch of river that runs from Minnesota to the confluence with the Ohio River near southern Missouri. Thirty million people live within the Upper Mississippi River Basin in Illinois, Iowa, Minnesota, Missouri, and Wisconsin. *See* Upper Mississippi River Basin Association, River and Basin Facts, www.umrba.org/facts.htm (last visited Feb. 19, 2013). Runoff enters the Upper Mississippi River from many nonpoint sources, including cropland and pasture, which encompasses 60 percent of the Upper Mississippi River basin and produces half the nation's corn, 41 percent of the nation's soybean exports, and one-third of all the nation's hog and pig sales. *Id.*; USDA NRCS, Assessment of the Effects of Conservation Practices on Cultivated Cropland in the Upper Mississippi River Basin, at 6, www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1042093.pdf (last visited Feb. 19, 2013). Forestland represents an additional 20 percent of land in the Upper Basin, and about 11 percent is rangeland, water, wetlands, horticulture, and barren land. *Id.* at 11. In contrast to other major watersheds in the nation, urban areas (including most point sources) only account for 8 percent of the land. *Id.* Wastewater from point sources is discharged into the Upper Mississippi River from more than 275 facilities, including industrial facilities and municipal sewage treatment plants. *See* Upper Mississippi River Basin Association, River and Basin Facts, www.umrba.org/facts.htm (last visited Feb. 19, 2013).

Questions have been raised for years regarding the extent to which nutrients derived from portions of the Upper Mississippi River Basin contribute to the Gulf's dead zone. The issue has been studied and multiple regulatory efforts made to reduce nutrients from the Upper Mississippi River. These efforts continue today, although the degree to which nutrients from the Upper River contribute to Gulf hypoxia remains uncertain. In addition, efforts to reduce those contributions are complicated by a variety of issues, the primary of which is the interplay between industry, public utilities, and agriculture due to their number, influence, and diverse interests.

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This article describes EPA's numeric nutrient criteria efforts and the impact of litigation over nutrients, outlines the progress of state regulation of nutrients in the Upper Mississippi River Basin, and assesses potential courses of action to address nutrient criteria at the state level.

A Brief History of EPA's Involvement with Nutrients

The Clean Water Act's enforceable provisions are directed at discharges from point sources (pipes, outlets, and other discrete conveyances), while nonpoint source water pollution (runoff) is addressed primarily through nonregulatory programs under the Act. Nutrients are discharged from point and nonpoint sources, so a comprehensive program that encompasses all sources is very difficult. EPA has been working for years to achieve its ambitious goal of establishing nutrient criteria for every water body in every state. EPA has focused on this goal in part because it believes that "[n]utrient pollution is one of America's most widespread, costly and challenging environmental problems." EPA, Nutrient Pollution, http://epa.gov/nutrientpollution/problem/index.html (last visited Feb. 26, 2013). In the 1990s, EPA began gathering data on nutrients in four major water body types: (1) rivers and streams; (2) lakes, impoundments/reservoirs, and ponds; (3) estuarine and coastal marine waters; and (4) wetlands. *See National Nutrient Assessment Workshop Proceedings*, (EPA 822-R-96-004). This work led to EPA's June 1998 National Nutrient Strategy, which noted that excessive nutrients had been linked to hypoxia conditions in the Gulf of Mexico and set forth EPA's plan to develop and adopt numeric nutrient criteria in every state for all four types of water bodies. *See* U.S. Environmental Protection Agency, *National Strategy for the Development of Regional Nutrient Criteria*, at 2 (June 1998). EPA's National Nutrient Strategy also proposed a December 31, 2003, deadline for each state to adopt numeric nutrient criteria for all water bodies in the state; EPA threatened to initiate rulemaking to promulgate numeric nutrient criteria for any state that needed new or revised standards. *Id.* at 9–10.

In 2007 EPA encouraged all states to "accelerate their efforts and give priority to adopting numeric nutrient standards or numeric translators for narrative standards for all waters in States and Territories that contribute nutrient loadings to our waterways." Memorandum from Benjamin H. Grumbles to state water administrators, "Nutrient Pollution and Numeric Water Quality Standards," dated May 25, 2007, at 2.

As of August 2012—almost a decade after EPA's target deadline for nitrogen and phosphorous numeric criteria—no state had adopted numeric nutrient criteria for all water bodies, and fewer than ten states had adopted numeric nutrient criteria for one or more classes of water bodies. *See* U.S. Environmental Protection Agency, *Progress Toward Clean Water Act Adopted Numeric Nutrient Criteria* (Aug. 2012). Almost half of the country—twenty-three states—had not adopted any statewide or site-specific numeric nutrient criteria. *Id.*

However, through litigation, environmental activists have forced federal action on nutrients in the Chesapeake Bay and in Florida. Beginning in 1987, the governors of Maryland, Pennsylvania, and Virginia and the mayor of the District of Columbia sought to reduce the nitrogen and phosphorus entering the Chesapeake Bay. 1987 Chesapeake Bay Agreement, at p. 3. Despite these efforts, EPA reached two settlements—one in 1999 and another in May 2010—that required EPA to develop a Total Maximum Daily Load (TMDL) for the Chesapeake Bay watershed. *Chesapeake Bay Total Maximum Daily Load for Nitrogen, Phosphorus and Sediment* (Dec. 29, 2010) at 1-17 to 1-20 (citing *American Canoe Association v. EPA*, 98cv979 (June 11, 1999); *Fowler v. EPA*, 1:09-cv-00005-CKK (D.D.C.)). In December 2010, EPA issued the Chesapeake Bay TMDL, which contained nutrient limits for point and nonpoint sources. *See id.*

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Similarly, Florida issued its first draft plan to address nutrients in 2002. *See* Florida Department of Environmental Protection (DEP), State of Florida Draft Numeric Nutrient Criteria Development Plan (May 14, 2002). EPA approved this plan and later approved a January 2011 submission date for nutrient criteria. *See* DEP, State of Florida Numeric Nutrient Criteria Development Plan (Sept. 2007); Letter from James Giattina, EPA, to Jerry Brooks, DEP (Sept. 28, 2009). But EPA's settlement of a 2008 environmental activist lawsuit required EPA to develop numeric nutrient criteria by November 2010, which it did. Consent Decree, *Florida Wildlife Federation, et al. v. EPA*, Case No. 04:08-cv-324-RH-WCS (N.D. Fla. Dec. 30, 2009); *see also Numeric Nutrient Water Quality Criteria: Lessons from Florida*, 26 Nat. Res. & Env't 40 (Winter 2012). Today, EPA and Florida are in the process of determining which federal or state numeric nutrient criteria will apply.

Even though the Chesapeake Bay states and Florida had diligently been working toward nutrient reduction, EPA imposed nutrient requirements after settling with a litigating nongovernmental organization (NGO). These examples are important in light of a recently filed lawsuit involving nutrients and the Mississippi River.

Ongoing Litigation in the Mississippi River Basin

In 2008, NGOs petitioned EPA under Clean Water Act Section 303 to promptly prepare and publish revised water quality standards where necessary to meet CWA requirements, such as when states have failed to implement numeric nutrient criteria. *See* Petition for Rulemaking Under the Clean Water Act, 72 (July 30, 2008). EPA denied the petition three years later, stating that "use of [EPA's] rulemaking authority . . . is not a practical or efficient way to address nutrients at a

national or regional scale." Letter from Michael Shapiro, EPA to Kevin Reuther, Minnesota Center for Environmental Advocacy 4 (July 29, 2011). Although EPA noted that it "agree[d] that N[itrogen] and P[hosphorous] pollution present[] a significant water quality problem facing our nation," "long-standing policy, consistent with the CWA, has been that states should develop and adopt standards in the first instance." *Id.* at 1, 5.

As a result of EPA's denial of their petitions, in early 2012, the NGOs filed a lawsuit seeking to force EPA to establish numeric nutrient criteria for waters in the Mississippi River Basin and the northern Gulf of Mexico. Doc. 1, *Gulf Restoration Network, et al. v. EPA*, No. 2:12-cv-00677 (E.D. La. Mar. 13, 2012). Dispositive motions by both parties were pending when this article was written.

Many concerned interest groups have intervened in the litigation, as the outcome could greatly impact regulation of nutrients in the Mississippi River Basin if numeric nutrient criteria are imposed through court order or EPA settlement. The intervening interest groups highlight the diversity of dischargers in the Upper Mississippi River Basin and the difficulty in implementing numeric nutrient criteria in the area. For example, the National Association of Clean Water Agencies, which represents publicly owned treatment works (POTWs), intervened in support of EPA's denial of the rulemaking and argued that the relief plaintiffs request would place a disproportionate share of the regulatory and financial burden on point source dischargers, including POTWs, without addressing nonpoint sources. *See* Doc. 43, *Gulf Restoration Network, et al. v. EPA*, No. 2:12-cv-00677, 4 (E.D. La. May 24, 2012). In contrast, the "Agricultural Associations" argued that their nonpoint source members would be greatly impacted because, although they do not hold point source permits, they "implement nutrient management plans for nitrogen and phosphorus pursuant to state laws to minimize nutrient runoff from nonpoint sources." Doc. 36, *Gulf Restoration Network, et al. v. EPA*, No. 2:12-cv-00677, 4 (May 10, 2012).

Resolution of the litigation could decide how stakeholders in the Upper Mississippi River Basin will be impacted. A court order or settlement could force EPA to issue a TMDL for the Mississippi River or, alternatively, federal numeric nutrient criteria for states that do not already have EPA-approved criteria in place, as was done in Florida. Either outcome would impact industry, municipal sewage treatment plants, and agriculture by mandating compliance with stricter rules and likely requiring expensive technology and changes to practices that are not cost effective. In light of these possible litigation outcomes, it is important to understand what the Upper Mississippi River Basin states are doing.

Innovative State Efforts to Implement Numeric Nutrient Criteria

Minnesota. In an innovative attempt to sidestep issues with federal control over nutrient regulation in its waters, Minnesota signed a Memorandum of Understanding (MOU) with EPA to address nonpoint sources of nutrients. Memorandum of Understanding between Minnesota, U.S. Department of Agriculture, and U.S. Environmental Protection Agency (Jan. 17, 2012). The MOU created the Minnesota Agriculture Water Quality Certification Program (Program), which Minnesota hopes will accelerate the voluntary adoption of on-farm conservation practices that incorporate best-management practices. Minnesota Department of Agriculture, Minnesota Agricultural Water Quality Certification Program (Program), www.mda.state.mn.us/protecting/waterprotection/awqcprogram.aspx. The Program is still in development.

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The Program would use a unique approach to include nonpoint sources into nutrient regulation by guaranteeing farmers who implement and maintain approved conservation plans protection from any additional coverage of nutrient programs for the duration of their certification. *Id.* Thus, the Program simultaneously would attempt to fold nonpoint sources into its nutrient regulation regime and foreclose EPA involvement in such regulation through the joint participation in the MOU. Although the MOU itself does not have explicit language to prohibit EPA involvement in the program, EPA disclosed that it was not interested in developing its own water quality standards for the state and would stand back while Minnesota developed its program. Barry Amundson, *Minnesota Works on Voluntary Water Quality Program*, Tri-State Neighbor, (Aug. 24, 2012), www.tristateneighbor.com/news/regional/article_7e2c4632-ee29-11e1-ab88-001a4bcf887a.html. The Program would also assist in achieving the water quality levels in the state's TMDLs. This is a significant task, as Minnesota currently has TMDLs for roughly half of its waters. Minnesota is the nation's fifth most productive agricultural state with almost 27 million acres devoted to agricultural production, such that this Program could set a precedent for the UMRB. Additional effects may also be realized by Minnesota's efforts to target point sources in urban areas, such as in Minneapolis and St. Paul.

It is unclear whether the MOU and its resultant Program would withstand legal attacks from industry or environmental activist groups surrounding issues such as costs imposed, the validity of reductions claimed by the Program, and whether the state is staying within the scope of its authority under the Clean Water Act. However, at the very least, the Program offers some certainty related to the state's control of nutrient standards in the face of a very uncertain legal future.

Missouri. Missouri has also been working to regulate nutrients, but not without opposition and roadblocks. Missouri adopted nutrient criteria for lakes in October 2009, but EPA largely denied a substantial part of the rule in August 2011 on the basis that it found Missouri's approach to derive the criteria was not based on a sound scientific rationale because it did not include the necessary information to allow others

to independently reproduce the work. *See* Letter from Karl Brooks, EPA to Sara Parker Pauley, Missouri Department of Natural Resources (Aug. 16, 2011). The Missouri Department of Natural Resources (MDNR) is working to address this concern and include the changes in revisions to the state's water quality standards. Stakeholders are reviewing MDNR's proposed policy for implementation of the rule. Nutrient criteria for rivers and streams have not been developed yet. Nutrient standards for lakes are in the workgroup stage and will be the first standards that MDNR proposes. MDNR, Nutrient and Chlorophyll Criteria for Lakes Implementation Procedure for Permitted Facilities 2 (June 2011). MDNR plans to use modeling to establish the contribution of point and nonpoint sources into lake watersheds and to use best management practices, public education, and incentive programs to reduce nonpoint source contributions. *Id.* at 3. Ultimately, MDNR anticipates the new standards could lead to the development of a nutrient trading program. *Id.* Nutrient trading is a market-based approach to achieve water quality standards where a cap is set on a water body's total amount of nutrients and sources within the watershed are allowed to trade pollution "allowances" or units. Proponents of nutrient trading believe this is a cost-efficient option to achieving water quality standards because sources with low-cost reduction options are incentivized to reduce their pollution load beyond their requirement and sell the excess allowances to sources that have higher compliance costs.

Wisconsin. Wisconsin avoided imposition of a federal rule for numeric nutrient criteria in part by becoming the first state in the Upper Mississippi River Basin to develop numeric criteria for phosphorus. *See* Wis. Admin. Code Chapters 102 and 217. As part of its regulation of phosphorus, Wisconsin developed an implementation plan for numeric nutrient criteria that includes an innovative "Watershed Adaptive Management Option," which allows point sources to comply with phosphorus standards by nonpoint source reductions rather than by technology upgrades. *See* Wis. Admin. Code NR § 217.18. The idea behind the option is that phosphorus reductions at nonpoint sources may be done less expensively than at point sources. For example, the regulators state that phosphorus reductions at an industrial facility may cost approximately $120 per pound, whereas it may cost $30 per pound to achieve the same reductions through best-management practices on upstream farms. Paul Quinlan, *Industries Pay Farmers to Curb Runoff in Wis. Regulatory Policy*, Greenwire (Sept. 10, 2012), www.eenews.net/public/Greenwire/2012/09/10/3. EPA approved this plan in July 2012. Letter from Susan Hedman, EPA, to Cathy Stepp, Wisconsin Department of Natural Resources (July 25, 2012). Wisconsin's approach folds major nonpoint sources into its phosphorus regulatory system by allowing industry to pay farmers for nutrient reductions. The program would require a permittee to submit a Watershed Adaptive Management Request Form to Wisconsin's Department of Natural Resources that requires the permittee to show nonpoint sources significantly contribute to the phosphorus load. The implementation plan also proposes water quality trading, whereby permittees can apply to use pollution reduction credits instead of complying with their permit's phosphorus limits.

Similar to Wisconsin's proposed water quality trading scheme, various states are looking at cap-and-trade regulations to help reduce nutrient loads. For instance, on August 9, 2012, Ohio, Kentucky, and Indiana signed a water quality trading plan to reduce nutrients in the Ohio River Basin. This program would allow CWA National Pollutant Discharge Elimination System permit holders to achieve compliance through credits generated by reductions realized through Best Management Practices by nonpoint sources. Thus, the trading program incorporates nonpoint sources through financially incentivizing voluntary reductions, while leaving point sources as the entities that must comply with their permits.

Iowa. In November 2012, Iowa proposed a strategy to reduce nutrients through discharge permits for point sources and voluntary efforts by nonpoint sources. Iowa Nutrient Reduction Strategy, November 2012, www.nutrientstrategy.iastate.edu/ (last visited Feb. 19, 2013). Discharge permits would require technically feasible changes that are reasonable in relation to the estimated costs of the improvements and the end-users' ability to afford the costs. The proposed strategy indicates that the Iowa Department of Natural Resources would determine affordability by looking to the point source's individual circumstances and applying federal regulations and EPA guidance. *Id.* at Section 3, 1–6 (citing 40 C.F.R. Part 125 Subpart A and EPA, *Interim Economic Guidance for Water Quality Standards Workbook* (1995)). Voluntary efforts include adjusting timing of planting and sidedressing and using fertilizer instead of animal manure. When this article was written, the Iowa Department of Natural Resources was evaluating the 1,700 public comments received on the proposal. EPA commented on the proposal on January 9, 2013, offering recommendations to revise the draft nutrient reduction strategy and points to be addressed in implementation plans. Letter from Karl Brooks, EPA to Mr. Chuck Gipp, Iowa Department of Natural Resources and Mr. Bill Northey, Iowa Department of Agriculture and Land Stewardship (Jan. 9, 2013).

Conclusion

The ultimate impact of nutrients on the Upper Mississippi River Basin and the Gulf of Mexico is not clear. The science is not developed to the point that it can trace a single particle from a nutrient to a single source. Hence, numeric nutrient criteria efforts to date have largely focused on reducing nutrients discharged from point sources by regulation. However, point sources are working with agricultural and other communities in an attempt to share the burden of nutrient reduction from nonpoint sources, such as voluntarily developing and studying point and nonpoint source nutrient science. The Upper Mississippi River Basin has more agriculture than the Chesapeake Bay or Florida, and thus it will take more than regulated point sources to understand the science and impact of nutrients.

States have an incentive to develop their own numeric nutrient criteria and get them approved sooner rather than later. Chesapeake Bay and Florida demonstrate that even though states may be methodically working toward a reduction goal and an EPA-approved deadline, a settlement between EPA and an environmental activist group could expedite the process or impose EPA standards that the state must then work to replace. Yet, recent actions by EPA—such as standing back from Minnesota's nutrient program—seem to indicate that EPA is backing off from imposing nutrient criteria for states. Indeed, in a recent brief filed by EPA in the *Gulf Restoration Network* case, EPA stated that "experience in Florida suggests that . . .

making the required necessity determinations and then proposing and promulgating numeric nutrient criteria for each of the 10 states that touch the mainstream Mississippi River could take at least half a century—and would consume significant Agency time and effort in both administrative proceedings and litigation throughout that period." *See* Doc. 142, at 35.

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The innovative approaches by states such as Minnesota, Wisconsin and the Ohio River Basin states provide options for states to consider as they develop their numeric nutrient criteria and attempt to implement their nutrient criteria before they have little to no choice as a result of an EPA settlement. Like Minnesota, a state could provide the incentive of protection for nonpoint sources to adopt best-management practices. Or like Wisconsin, a state could provide financial incentives for nonpoint sources to adopt best-management practices and in the process assist point sources in meeting permit conditions. Or as with Iowa's proposal, a state could incorporate economically and technologically feasible requirements into permits for point sources and recommend best management practices to nonpoint sources. Or as in Ohio, Kentucky, and Indiana, a state could run a pilot program to determine whether nutrient trading would work in its state.

Point sources should keep in mind that future permits may include strict nutrient conditions that will be expensive to meet. Nutrient trading or other innovative solutions may provide some relief if numeric nutrient criteria and strict permit conditions are imposed. Nonpoint sources have attempted to avoid any nutrient regulation and can argue that nutrients cannot be linked to them or that the Clean Water Act does not provide jurisdiction over them. However, nonpoint sources may eventually be subject to nutrient criteria that they did not help develop. They also may stand to benefit financially through nutrient trading programs that reward better management practices.

States and stakeholders have the incentive to find a solution to numeric nutrient criteria. The alternative, an EPA-imposed deadline or criteria arising out of a settlement, likely is far worse than any compromise the states and stakeholders might reach. Ultimately, it remains to be seen how nutrients entering the Mighty Mississippi will be regulated.