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# Water Quality Trading: What Can We Learn From 10 Years of Wetland Mitigation Banking?

*The mitigation banking industry has grown tremendously since the early 1990s. The regulatory architects of the nascent water quality trading industry hope to learn from the mitigation banking experiment, replicating and improving upon its successes while managing the unique challenges of a market that commodifies water quality.*

BY ERIC RAFFINI AND MORGAN ROBERTSON

In 2003 the U.S. Environmental Protection Agency issued its *Water Quality Trading Policy*.<sup>1</sup> Water quality trading allows facilities facing high pollution-control costs to meet their regulatory requirements by purchasing environmentally equivalent or superior pollution reductions from another source, often at a lower cost. The policy, which hopes to achieve “water quality and environmental benefits greater than would otherwise be achieved under more traditional regulatory approaches,” established the ground rules for trading and encourages states, interstate agencies, and tribes to develop and implement water quality trading programs for nutrients, sediments, and other pollutants. The policy generated controversy among some stakeholder groups; environmental organizations warned that it would simply allow “polluters to avoid compliance by buying credits” and let “the water quality in some lakes, streams, and rivers be traded away for the benefit of other waterways.”<sup>2</sup>

However, since 2003 there has been significant interest and increased receptivity among environmental organizations and regulators toward the water quality trading concept.<sup>3</sup> Buoyed by targeted funding from EPA, more trading projects are underway nationwide than ever before. More than 70 water quality trading initiatives have been established since the 1980s, and at least 20 of those efforts were begun within the last two years.

While not a panacea for water pollution problems, under certain circumstances water quality trading can help states, tribes, and local governments achieve their water quality goals at a lower cost. Given the tight budgets that face every jurisdiction, a lower-cost option can mean the difference between improving water quality and maintaining the status quo. And cost savings from trading can be substantial: A finance panel that examined potential trading options for the Chesapeake Bay area recently concluded that “cap and trade programs . . . could save an

estimated \$1 billion in wastewater treatment costs if fully leveraged” to meet the Chesapeake Bay’s nutrient reduction needs.<sup>4</sup>

Water quality trading can also provide dischargers more flexibility in meeting pollutant load-reduction requirements. Trading can help identify options for meeting water-quality based National Pollutant Discharge Elimination System permit limits and can provide financial incentives for point source dischargers to install pollution-control technologies that exceed current performance requirements. The development of a water quality trading system may deliver significant economic and environmental benefits—but also poses distinct challenges. This article examines the water quality trading market as it exists today, and, by drawing comparisons between the wetland mitigation banking industry and the nascent water quality trading market, identifies the challenges and opportunities that market may face in the future.

## A Water Quality Trading Market in Nonpoint Source Pollution Credits

To date the majority of water quality trading activity has occurred among point source dischargers, i.e., facilities with NPDES permits. While this type of trading has added flexibility and improved cost savings, it will only go so far toward improving the condition of our nation’s waterways. Further progress depends upon how well we can cost-effectively eliminate nonpoint source pollution, such as agricultural runoff and urban stormwater. In watersheds where both point and nonpoint sources contribute to excessive nutrient loading, and point source abatement costs are significantly higher than nonpoint source abatement costs, a market that allows trading among point and nonpoint source dischargers can be an essential tool for improving water quality.

Why, then, haven’t we seen more trades involving nonpoint source dischargers? First, nonpoint source dischargers do not have to meet regulatory discharge limits, and so have few incentives to seek non-conventional pollution-reduction options such as water quality trades. Second, nonpoint source dischargers face more uncertainty than point source dischargers when trying to estimate pollutant loads and reductions. Nonpoint source pollutant loads are affected by complex factors such as precipitation variability, diverse methods for improving

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land practices, and a variable time lag between implementation of pollution controls and measurable results.

These difficulties are real, but certainly are not insurmountable. To maximize the potential environmental and economic benefits of water quality trading, we must find a way to expand the market beyond single-facility trades to trades that occur on a watershed scale among numerous point and nonpoint source pollutant dischargers.

### **Incorporating Wetlands into Water Quality Trading**

One way to foster a point and nonpoint source trading market is to encourage trades involving wetlands. Wetlands strategically located in a watershed and designed to maximize filtration benefits could be used to generate pollution-reduction credits, improving water quality by capturing nutrients and sediment and generating water quality credits that could be used by dischargers to comply with NPDES permit limits. Other activities designed to reduce nonpoint source pollution, such as streambank stabilization, conservation tillage, and erosion control, could also be used in a banking system for nonpoint source credits.

The guidance helped establish a market for wetland mitigation banking by defining bank operational parameters, suggesting planning considerations, and setting up a process for bank review and approval.

Instead of entrepreneurial bankers, a water quality trading market might be populated by third-party credit “brokers” who facilitate trades between point and nonpoint source dischargers. A nonpoint source credit broker, such as a watershed organization, farming co-op, or private party, could help connect point and nonpoint source dischargers by supplying, certifying, and guaranteeing pollution-reduction credits. The broker could work with farmers to identify, implement, and monitor on-farm practices that could be exchanged for nutrient reduction credits and sold to point source dischargers. A credit broker could locate and aggregate credits from multiple nonpoint source dischargers within a watershed or basin. Brokers could lower overall transaction costs by helping overcome the inefficiencies associated with dischargers individually having to negotiate and secure credits from multiple nonpoint source credit suppliers. Brokers also might be able to secure “escrow” or back-up

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## **The lack of clear provisions for long-term liability and maintenance has been an area of ecological concern in mitigation banking. The water quality trading industry need not go down the same path.**

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Constructed wetlands have been proven effective at removing nutrients and sediment from wastewater treatment plant effluent when the wetlands are co-located at a discharging facility. In 2002 Don Hey, senior vice-president of the nonprofit Wetlands Initiative, suggested the term “nitrogen farming” be used to describe the practice of constructing or restoring wetlands as a means of reducing nitrogen concentrations along the Illinois River.<sup>5</sup> Further study and demonstration is needed, however, to quantify the ability of treatment wetlands to produce nitrogen, phosphorus, and sediment water quality credits. While this effort might focus initially on wetlands specifically constructed to “treat” runoff, managers should maintain a preference for high-functioning wetlands that would provide biodiversity and habitat benefits as well water quality functions. The chance to restore, create, and enhance wetlands, helping meet national wetland goals while at the same time lowering the costs of achieving water quality goals and advancing water quality trading, is an unparalleled opportunity.

### **Learning from Wetland Mitigation Banking**

The water quality trading industry will need to develop stable processes for offering a suite of nonpoint source pollution-reducing measures, including wetland-related activities, as commodities in a water quality trading market, and the experiences of the wetland mitigation banking industry can be instructive in this regard. Over the last 10 years the number of wetland mitigation banks operating across the country has increased dramatically. This is in large part due to the 1995 *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*.<sup>6</sup>

credits more readily to cover any situations in which purchased credits do not materialize.

A market could emerge that would provide nonpoint source credits to point source dischargers, helping them meet permit obligations in much the same way that the wetland credit market emerged to help section 404 permittees meet Clean Water Act mitigation requirements. To the extent that entrepreneurial banking has been successful at solving persistent problems in wetland mitigation quality and management, it is worth considering how a regulatory structure resembling the banking format could be developed for water quality trading. It is also worth considering what challenges such an effort would face.

### **Liability**

At the inception of the wetland mitigation banking industry, regulatory and entrepreneurial partners realized that the legal and financial liability for site failure would have to be transferred from the mitigation credit purchaser to the third-party mitigator. This transfer is essential because the commodity in wetland banking is not healthy wetlands or clean water. Rather, it is the less concrete service of regulatory relief. Developers and polluters have no utility in clean water or healthy wetlands; what they want is a rapid permit process and the avoidance of liability for mitigation site failure. Thus, if they cannot purchase a release from liability as a part of the commodity, there is really no reason for them to go to the market.

Because it does not offer release from liability for site failure, the water quality system as it currently stands offers a commodity of only marginal interest to the pollutant dischargers who also are potential water quality credit purchasers, or at least a commodity with a significant drawback. They can discharge elevated pollutant loads, but must constantly monitor and maintain the mitigation measures that compensate for those elevated loads. Because the ecological performance of compensation sites is typically variable, and the techniques for measuring performance are poorly standardized, this will be a considerable task. The market-based solution may do little to solve the permittee's regulatory dilemma.

Transfer of legal and financial liability from the credit purchaser to another person or institution is one way of creating a more desirable commodity. Where this transfer is made impossible by statute (as with the NPDES program), other measures such as mandatory bonding and financial assurances can provide a similar liability-minimizing function.

Unfortunately, the institutions that normally provide financial assurances, such as bonding companies, have proven quite leery of underwriting the wetland mitigation bankers' assumption of liability. Even in regions with highly developed mitigation banking markets, it can be challenging for a banker without pre-existing networks of trust within the financial industry to find a bonding agency willing to stand behind the bizarre-sounding proposition of selling wetlands. Water quality credit providers would face a similar problem.

The concept of a "phased release" from liability, in which the financial assurances decrease as a wetland achieves performance standards, was from the outset a concession to the banking industry and may not be necessary in water quality trading. Much of regulators' experience at established wetland mitigation banking sites suggests that the theory behind phased release makes the economically tidy but ecologically unrealistic assumption that wetland banks will follow a linear trajectory towards full achievement of performance standards, and that there will be no backsliding. Where the best management practices that improve water quality by reducing nonpoint source pollution are concerned, there may be an even less clear purported "trajectory" toward environmental improvement.

The issue of the duration of liability is also complex. The wetland mitigation banking system has generally used a monitoring period of five years, after which the long-term site manager (usually a state or local resource agency) is charged with maintaining the site, using whatever monies have been established by the banker. The lack of clear provisions for long-term liability and maintenance has been an area of ecological concern in mitigation banking, and in fact with all section 404 mitigation. The water quality trading industry need not go down the same path.

### Agency Review

Mitigation Bank Review Teams (MBRTs) oversee the development of wetland mitigation bank proposals and instruments, certify the release of credits, and evaluate bank site progress through monitoring reports. The collaboration- and consensus-based process used by the MBRTs has done much in some regions to build trust among state and federal regulatory agencies, whose representatives serve on the teams, and to make an uncertain regulatory environment far more predictable for bankers. Where MBRTs function well, they can effectively exert a stabilizing influence on supply and demand without interfering in bankers' business decisions, while also providing credibility and oversight to the industry.

Given the potential benefit of the MBRT process, it is important also to note that MBRTs function poorly or not at all in many regions, and in some cases impede the development of the wetland banking market by failing to adopt firm decision timelines and applying professional judgment or federal guidance in a capricious or selective (from the bankers' perspective) manner. The purpose of an MBRT, and its potential analog in the arena of water quality trading, is to accelerate and render predictable the process of interagency consultation when large and controversial projects are being proposed. However, the 1995 banking guidance does not allow for the full realization of this purpose because, as guidance, it was unable to establish disciplined bank-review timelines and dispute-resolution procedures. Rather, the guidance left the bank-establishment process open to the vagaries of regional staff workload priorities. Consequently, some regional and district branches of MBRT-participating federal agencies have not been particularly rigorous in prioritizing MBRT attendance or training for MBRT participants. Unfortunately, because of the spatially dispersed nature of the nonpoint source pollution-reducing best management practices that would generate credits for a water quality trading market, the kind of site review that is key in the MBRT process will be physically much more difficult for the water quality trading industry than it is for wetland banking, since the latter developed to meet the regulatory need for the spatial consolidation of mitigation.

Any market in water quality must begin with an interagency team that is empowered to certify and release credits, both for the purposes of coordinating market supply with demand and for assuring public faith in the process. Regulatory language must mandate firm MBRT timelines and regular meetings, or else the benefits of the MBRT process will be realized only occasionally, and unpredictably.

### The Future of Water Quality Trading

The developments over the last 10 years in the field of wetland mitigation banking are instructive for the future of water quality trading in the United States, especially if regulators seek to expand the market to include more nonpoint source trading on a watershed scale. Lessons from the wetland mitigation banking industry can inform the development of future nonpoint source pollution credit banking markets, and also help incorporate wetlands in water quality trading programs. ■

### REFERENCES

- 1 U.S. Environmental Protection Agency, *Water Quality Trading Policy*, January 13, 2003, <http://www.epa.gov/owow/watershed/trading>.
- 2 *New Administration Water Pollution Trading Policy is Illegal*, Natural Resource Defense Council Press Release, January 13, 2003, <http://www.nrdc.org/media>.
- 3 See "Virginia Nutrient Trading Plan May End Chesapeake's Group's Suit," Water Policy Report, *Inside EPA*, April 4, 2005, <http://www.insideepa.com>; and Blacklocke and Dziegielewski, "The U.S. Environmental Protection Agency's Water Quality Trading Policy: New Opportunities for Environmental Advocacy Groups?" American Water Resources Association Hydrology & Watershed Management Technical Committee, *Watershed Update* 3 no. 1, [hydro@awra.org](mailto:hydro@awra.org).
- 4 Chesapeake Bay Watershed Blue Ribbon Finance Panel, *Saving a National Treasure: Financing the Cleanup of the Chesapeake Bay*, U.S. Chesapeake Bay Program, October 27, 2004, <http://www.chesapeakebay.net>.
- 5 Hey, Donald L., "Nitrogen Farming: Harvesting a Different Crop," *Restoration Ecology: The Journal of the Society for Ecological Restoration* 10 no. 1: March 2002.
- 6 U.S. Environmental Protection Agency and Departments of Agriculture, Commerce, Defense, and the Interior, *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*, 60 Fed. Reg. 228, 58605-58614, 1995, <http://www.usace.army.mil/inet/functions/cw/cecwo/reg/mitbankn.htm>.