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WATER QUALITY TRADING AND OTHER ECONOMIC OPPORTUNITIES FOR AGRICULTURAL PRODUCERS

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Peter Drucker, the godfather of modern management consulting, once said, "Whom the gods would destroy, they first give forty years of success." Over 33 years after the enactment of the nation's Clean Water Act (CWA), we are closing in on that 40-year mark. And the gods are not pleased.

There is a flattening out of the upward curve of progress towards better water quality in America. We confront seemingly intractable challenges, primarily stemming from our inability to grapple with diffuse, polluted runoff, so-called nonpoint source pollution, most of which, like row crop agriculture and the expansion of impervious surfaces in rapidly urbanizing communities, are largely beyond current regulatory regimes.

Gains in water quality over the past three decades are based primarily on the regulation and financial support given to point sources, municipalities and industries with the traditional large pipes discharging into the waters of the United States. The triumph over phosphorous pollution in the Great Lakes is the classic example of success predicated largely on the regulation of point source pollution, as is the present boom in recreational uses on the Potomac River here in Washington.

Yet, today 39 percent of assessed river miles, 45 percent of assessed lake acres, and 51 percent of assessed estuary miles are impaired. That is, they are not meeting water quality standards based on designated uses—fishing, swimming, drinking—and their supporting technical criteria.

The hypoxic zone in the Gulf of Mexico, an area larger than New Jersey, is the result of nutrient over-enrichment from an area draining the Missouri, Mississippi, and Ohio River

Basins, 90 percent of which is due to nonpoint source pollution, mostly agriculture. It is a measure of the relative insignificance of traditional point sources' contribution to the problem that Chicago is the single biggest point source discharger to the Gulf since the flow of the rivers draining into Lake Michigan were reversed over a hundred years ago.

Similar problems in the Chesapeake Bay are due in significant part to polluted runoff from agriculture which is estimated to contribute roughly 50 percent of the loadings. For many waters of the U.S., estuaries especially, these problems will be aggravated by population growth around coastal areas which will generate many multiple times the increase in impervious surfaces such as street pavement, sidewalks, parking lots, and the like. This will result in greater volumes of polluted urban wet weather runoff. Already, urban stormwater is the leading cause of impairment for nearly 40 percent of surveyed water bodies.

For now, and for the foreseeable future, point-source discharges, will be the focus of regulatory action, sometimes to a fault. They are the one category of dischargers which can be reached under the authorities of the CWA. Unfortunately, this may result in approaches which are not cost-effective and are often structural in character without seizing the multiple environmental benefits inherent in, say, nonstructural watershed approaches, i.e., better land management and protection.

The U.S. Environmental Protection Agency (EPA) has moved, very gradually, in the direction of encouraging water quality trading as a cost-effective means of compliance which, over time, could aid in the remediation of many environmental problems, or allow for the realization of multiple environmental benefits, over and above those of noncompliance with the CWA by regulated point sources exclusively.

This evolution culminated in the release of EPA's Water Quality Trading Policy in January of 2003 (http://www.epa.gov/owow/watershed/trading/final policy2003.html). In 2004 EPA also released its Water Quality Trading Assessment Handbook (http://www.epa.gov/owow/watershed/trading/handbook) which provides more technical guidance on the subject.

Water Quality Trading: A Brief Explanation

Trading is a technique which has demonstrated tremendous success in cost-effectively reducing air pollution as evidenced by the Clean Air Act's acid rain trading program as well as in the earlier phase-out of lead in gasoline. It capitalizes on the economies of scale and the control cost differentials among and between various sources of pollution.

By allowing one source to meet its regulatory obligations by using pollutant reductions created by another source, be it regulated or unregulated, that has lower pollution control costs, it creates economic incentives to improve water quality. The standards remain the same, but efficiency is increased, costs decreased, and, as we shall see, benefits are multiplied.

The motivation for trading between point sources is primarily cost reduction. For instance, the Connecticut Nitrogen Credit Exchange, on Long Island Sound, involving 79 publicly owned treatment works, has achieved more nitrogen reductions than expected while saving over $200 million dollars in anticipated costs. The state of Virginia just passed legislation for establishing a trading general permit, initially focused on point-to-point trading for nitrogen heading for Chesapeake Bay. This approach is expected to save money for the 125 significant dischargers to be covered by this umbrella-like permit.

However, in the realm of point-to-nonpoint source trading, there are great opportunities for generating multiple environmental or ecological benefits due to the possibility of encouraging a variety of watershed-based, conservation or land management practices

While compliance with the CWA is mandatory for any point source discharger, trading is an entirely *voluntary* enterprise whether it involves point sources exclusively or some combination of point and unregulated nonpoint sources. No entity has to enter into a trading arrangement. Such transactions are entirely optional.

Legal liability under a CWA National Pollutant Discharge Elimination System (NPDES) permit remains with the holder, i.e., the point source, even if it enters into a contractual relationship with an unregulated nonpoint source to obtain water quality credits through, for instance, the implementation of Best Management Practices (BMPs) on the land such as the planting of buffer strips or trees, the fencing of cows out of streams, or the restoration of wetlands. Any bargaining between a point and a nonpoint source will require discernment of the mutual benefit for both parties to the negotiations. No doubt, compliance and cost savings will be of paramount concern for the point sources. Profit or income will be the main driver for the nonpoint source.

In 2000 the World Resources Institute (WRI) conducted a study of three watersheds in Minnesota, Michigan, and Wisconsin and the cost of controlling phosphorous (http://sustag.wri.org/fertileground-pub-2690.html). The study found that the cost of reducing phosphorous from point sources was considerably higher than those based on trading between point and nonpoint sources. The estimates for point source controls ranged from $10.38 per pound in the Wisconsin watershed to $23.89 in the Michigan one. Using trading between point and nonpoint sources, these costs could be lowered to $5.95 per pound in Wisconsin, a reduction of over 40 percent, and to $4.04 in Michigan, a reduction of over 80 percent!

As the WRI study illustrates, the cost differentials between the two classes of sources are significant and offer real opportunities for point source cost savings and nonpoint source profits. There appears to be room for incentivizing agricultural producers to generate credits for sale to the regulated point sources above any baseline set by the regulatory agencies to meet a load allocation for such sources within a given trading area.

Brokers, Bankers, and Aggregators

Third parties, such as entrepreneurs, a conservation or agriculture commodity association, and land trusts, might want to participate or serve as a kind of broker, banker, or aggregator of credits generated by a large number of widely dispersed nonpoint sources who might require or seek technical advice and comfort with, or distance from, the regulatory process. Many nonpoint sources are relatively small enterprises, e.g., a dairy farm, which do not have parity with large, regulated point sources in any bargaining process. Third-part borkers/bankers/aggregators would assist in bringing these smaller, numerous sources into the market.

Besides developing a knowledge base of expertise—legal and technical—these brokers could ensure legitimacy in terms of adequate certification, monitoring, and modeling with respects to the generation of water quality credits.

The development of such brokering institutions would also provide a means of dealing with the inevitable change or disappearance of BMPs over time in light of changing economic conditions or a landowner's individual circumstances (e.g., plowing under buffer strips or cutting trees or selling property). Again, brokers/bankers/aggregators could assist in maintaining a steady, consistent portfolio of BMPs to meet the point sources' credit requirements for a constant level of pollutant reductions throughout the five-year duration of an NPDES permit.

There is much speculation as to the possibility of developing new markets for ecological services and the "stacking" of such benefits based on the same set of BMPs. Implementing BMPs for water quality credits might also generate benefits in terms of wildlife habitat, carbon or Greenhouse Gas (GHG) sequestration or reduction, as well as wetlands mitigation under the CWA's 404 program.

A glimpse of these potential markets may be found at Ecosystem Marketplace (www.EcosystemMarketplace.com), the first global clearinghouse for information on emerging trade in the basic work of healthy forests, including water filtration, soil quality maintenance, habitat, and climate stability through carbon dioxide sequestration. This new website tracks more than a dozen market-like mechanisms and payment arrangements for preserved biodiversity or ecosystem assets.

Multiple Benefits Illustrated

Again, my colleagues at WRI have suggested a provocative trading approach which links nitrogen reduction for the Gulf of Mexico with nitrous oxide, a potent GHG (http://sustag.wri.org/deadzonehypoxia-pub-3803.html).

One ton of nitrous oxide emissions has the same warming impact of 310 tons of carbon dioxide. Approximately 74 percent of all U.S. nitrous oxide emissions come from agriculture, primarily from agricultural soil management activities such as commercial fertilizer application and other cropping factors.

Lower nitrogen fertilizer use reduces both the nitrogen that leaches into waterway and the amount that is volatilized as GHGs. WRI also points out that the agricultural policies and decisions which slow the rate of nutrient losses into waterways frequently improve carbon sequestration and storage in soil.

Imagine a scenario, admittedly way over the horizon, where the Chicago Climate Exchange (www.chicagoclimatex.com) sets up a market for nitrous oxide. Agricultural producers would make money on both the water side and the climate side of the ledger. They could sell water credits to Chicago's wastewater system and climate credits, presumably, to fossil fuel sellers, to take just one example. Power companies are paying lots of money to plant trees, say, in the Mississippi Delta, to sequester carbon. Maybe there money would be better spent on nitrous oxide reductions.

There are many issues involved in the mechanics of trading. These merit a great deal of attention in terms of their technical and legal implications. But the message I leave with you today is that agricultural producers have great economic potential as sellers or providers of ecological services and multiple environmental benefits of which water quality is just one.

Thank you for your kind attention.