

Chicago Fed Letter

Recent developments in clean water legislation

Water is a vital commodity in the Midwest. It is heavily used for commercial, industrial, municipal, agricultural, transportation, and recreational purposes. The five Great Lakes constitute the largest system of surface fresh water, containing some 18% of the world's fresh water supply.

Water quality legislation in the United States has maintained its same basic structure since the passage of the Clean Water Act in 1972, the primary law protecting the nation's surface fresh water. Currently, two major new pieces of water quality legislation are being debated, the Clean Water Act Amendments (so-called "reauthorization") and the Great Lakes Water Quality Initiative. Now is an opportune time to ask how these two proposals would pursue the goal of improved water quality.

Various approaches for meeting national water quality goals are still being debated. In particular, analysts are asking whether proposals approach the problem in a comprehensive and cost-effective way. To upgrade the quality of lakes and rivers and to ensure that they are fishable and swimmable, it is widely agreed that regulation needs to include runoff from nonpoint sources and not only the more easily identifiable point sources of pollution, specifically municipalities and private business, that have borne the greatest monetary share of pollution control costs. Many also believe—although here there is less consensus—that in order not to waste scarce resources, flexibility should be allowed in the methods used to meet environmental standards. Finally,

the basic goal of zero-discharge or virtually eliminating certain chemicals is being assessed by comparing the risks various chemicals pose to the environment with the economic and social costs of essentially banning them.

In this *Chicago Fed Letter*, we will examine two current pieces of proposed water legislation and the impact they will have on the economy and the environment. First, we will assess the Administration's proposal for amending the Clean Water Act (CWA), with particular focus on the estimated costs and benefits. Second, we will examine the Great Lakes Water Quality Initiative, a proposal that will set uniform standards for water quality in the Great Lakes Basin and that may serve as a prototype for future national changes in water regulation.

The Clean Water Act: What will the proposed revision do?

In the coming weeks, the Senate Environment and Public Works Committee is expected to produce a draft overhaul of the 1972 Clean Water Act. The amendments proposed by the Clinton Administration are intended to improve the quality of surface fresh water throughout the U.S.¹ For example, they propose more aggressive control of pollution from nonpoint sources, principally from agricultural runoff. Estimates are that this type of control would improve water quality in 156,200 river miles and 7.1 million lake acres. Proposals for stricter storm water control would reduce future loadings of urban pollutants by an estimated 75-80% in developing areas and 15-25% in areas already developed. Stricter regulation of combined sewer

overflow would allow for the treatment of one billion gallons of raw sewage, significantly reducing loadings of total suspended solids (2 billion pounds per year).²

Besides having a broader scope, the Administration's proposal is innovative in that it would allow the use of a greater variety of regulatory methods to meet the stated goals. This includes targeting pollution control to specific uses or locations such as individual watersheds, and allowing greater flexibility in the ways in which water quality standards are to be met, including the potential use of market-based programs such as effluent trading. It is this difference in style of pollution regulation that is expected to provide cleaner water at a lower cost than would have been the case if the current approach had simply been extended with stricter interpretation and enforcement (see figure 1).

Estimating the costs

In March 1994, the Office of Water of the U.S. Environmental Protection Agency (EPA) issued a cost-benefit analysis of the CWA amendments. Figure 1 shows the sector-specific costs of compliance; it seems clear that under any scenario, private sources and municipalities will continue to assume the vast bulk of the regulatory burden. This distribution of costs is not surprising since water pollution occurs locally and thus requires municipal programs and facility-specific control.

Certain forms of water pollution control will also be more expensive than others. On a program basis, the most costly parts of the amendments will be the more stringent regulation of storm water runoff, which would

1. Estimated annual costs of major provisions of the Clean Water Act

Sector	Baseline spending ^a	Estimated spending under strict interpretation of the current CWA ^b	Revised spending, Administration proposal ^c
(-----billion dollars-----)			
Private sources ^d	30.0	47.0	31.0
Municipalities	23.0	36.0	25.0
Agriculture	0.5	0.5	1.2
State government	0.5	0.8	0.9
Federal agencies	10.0	13.0	11.0
Total	64.0	97.3	69.1

^aEstimated cost of CWA as currently enforced plus cost of enforcing recent rules now unenforced.

^b"Strict interpretation" reflects a more vigorous level of enforcement of the same environmental rules as "baseline spending." Some groups outside the EPA have advocated this.

^cReflects new, more stringent standards administered under a flexible compliance structure, but does not include potential cost savings from effluent trading.

^dConsist primarily of industrial point sources.

Source: U.S. Environmental Protection Agency, Office of Water, "President Clinton's clean water initiative: Analysis of benefits and costs," EPA 800-S-94-001, March 1994.

be paid for by private sources and municipalities, and the control of nonpoint sources (primarily agricultural runoff). Even using flexible methods, enhanced storm water control will cost municipalities an estimated \$1 billion to \$1.9 billion annually; private sources could expect to pay between \$345 million and \$1.6 billion. Controlling nonpoint sources, even if specific watersheds were targeted, would add \$1 billion to \$1.8 billion in costs to agriculture. However, some of the costs to agriculture may be mitigated by savings from altered farming practices, such as the reduced use of fertilizers and pesticides.

Finally, the total costs of compliance are expected to be moderated through the use of effluent trading. Patterned after trading programs introduced in the Clean Air Act Amendments of 1990, effluent trading would provide another avenue of compliance for firms and municipalities that might find the cost of additional pollution control excessive. As currently proposed, trading would be permitted among and between both point and nonpoint sources and is

estimated to yield savings between \$658 million and \$7.5 billion per year. Trading between point and nonpoint sources is expected to be the biggest cost saver, reducing expenditures by as much as \$5.6 billion.

. . . And the benefits

One of the most contentious questions behind the Clean Water Act Amendments is how to estimate the monetary benefits of clean water. While it is a fairly straightforward task to predict the reductions in pollution levels and the number of bodies of water that will become swimmable and fishable, it is difficult to translate these or other benefits into monetary terms. Nevertheless, the EPA estimates the monetary benefits of the proposed amendments to *urban areas* at between \$800 million and \$6 billion per year. These benefits are based on households' estimated valuation of clean water for a variety of purposes but exclude the estimated benefits to be derived from recreational uses of water as well as from increased biodiversity, reductions in water purification costs, reduced

need for dredging because of reductions in silt, and other hard-to-quantify effects. Other studies have shown that the monetary value of enhanced recreational use of water is particularly large, and that the EPA's numbers may therefore substantially underestimate the expected benefits.

On the basis of the EPA estimate of benefits, the expected annual aggregate costs for urban areas of the proposed amendments vary from \$10 billion to \$14 billion per year, while the corresponding benefits range from \$800 million to \$6 billion per year.³ Despite the apparent discrepancy, the amendments are being pursued because of the uncertainties associated with the costs and benefits of clean water and because it is impossible to determine with any precision the health risks from not improving water quality. In addition, it is possible that flexible compliance strategies may reduce costs further as firms incorporate them more fully into their regular production methods.

Water regulation in our backyard: The Great Lakes Water Quality Initiative

Water quality legislation is not just on the national agenda. Since the fairly long retention time associated with the Great Lakes water system makes it particularly susceptible to certain relatively nondegradable chemicals, it requires additional protection beyond that given to the rest of the nation's waters. Current water quality protection programs will not bring the concentrations of these pollutants down to levels that are harmless to the Great Lakes ecosystem. In response to these concerns, a sweeping agreement called the Great Lakes Water Quality Initiative (GLI) is about to bring significant changes to the management of the region's water quality.

The GLI is the domestic response to the Great Lakes Water Quality Agreement (GLWQA) signed by the U.S. and Canada in 1972 and updated in 1978. The agreement committed the two countries to improve water quality

ty in the Great Lakes and to virtually eliminate the discharge of persistent toxic pollutants. The 1990 U.S. Critical Programs Act requires the EPA to propose water quality regulations (called "guidance") consistent with the GLWQA for the Great Lakes. These proposed regulations were unveiled in April 1993 after four years of work by federal and state water pollution officials. Since then, a series of public hearings has been held to elicit public comments, which the EPA is now reviewing. The final regulations will set minimum water quality criteria and controls to be applied throughout the Great Lakes states to protect aquatic life, wildlife, and human health. They will also set the new policy for issuing discharge permits to point sources that discharge into the Great Lakes or their tributaries.

Evaluation of GLI

As the first effort to standardize water quality across the Great Lakes, the voluminous set of new guidelines in the EPA's proposed regulations would alter both water quality control and economic conditions in each of the eight Great Lakes states. They would also tighten regional environmental regulation and raise the cost of doing business in the region relative to the rest of the nation. Given heightened global competition and high pre-existing cost factors in the region, it is imperative that clean water legislation be as cost-effective as possible. Water quality regulation therefore should apply comprehensively across all sources, not just point sources as in the EPA's current proposed regulations, so that those sources which are now unregulated and which generally can reduce loadings most cost-effectively, can be included as well.⁴

Estimates of the GLI's costs and benefits differ widely. A study commissioned by the Council of Great Lakes Governors explicitly identifies areas of uncertainty and suggests changes that would improve the initiative's cost-effectiveness. If the initiative were implemented as written, annual

compliance costs are estimated to range from \$500 million to \$2.3 billion. In contrast, amending the initiative by a set of flexible measures—as identified in the study and suggested by the Council of Great Lakes Governors—would reduce annual costs to between \$59 million and \$500 million.⁵

Since issuing the guidance, the EPA has begun the process of coordinating programs dealing with nonpoint sources of pollution in the Great Lakes such as air deposition, urban runoff, contaminated sediments, and agricultural runoff. Efforts are under way to develop and implement so-called Lakewide Management Plans, as specified in the 1978 amendments to the GLI. These plans would allow for differences in the ecosystems of the five Great Lakes and provide a process for coordinating and prioritizing activities designed to reduce loadings of toxic substances from point and nonpoint sources.

Conclusion

Both the pending reauthorization of the CWA and the proposed regulations regarding water quality in the Great Lakes have helped focus the debate about desirable features of environmental regulation. Paramount to an efficient allocation of society's resources is an overall assessment of benefits and costs of any proposed legislation. Furthermore, it is important to realize that the regulatory toolbox can provide options and not just the uniform standard-setting of the past.

Allowing local regulatory solutions, customized to local problems, is one way of implementing regulation in a flexible manner. The proposed CWA Amendments would do this, for instance, by allowing watersheds to be managed through an integrated strategy involving both point and nonpoint sources. Such an integrated strategy enables a cost-effective program of regulatory actions in pursuit of a broad set of water quality goals. However, flexible approaches

to environmental regulation must also be accompanied by accountability and monitoring provisions.

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¹For a description of the Administration's clean water initiative, see U.S. Environmental Protection Agency, Office of Water, "President Clinton's clean water initiative: Analysis of benefits and costs," EPA 800-S-94-001, March 1994. EPA Administrator Carol Browner referred to runoff from agricultural lands and storm water runoff from city streets as the biggest remaining barrier to keeping the nation's water clean ("Tough rules sought for water pollution; industrial, farm runoff targeted," *Chicago Tribune*, February 2, 1994, section 1, p. 7).

²U.S. EPA (1994).

³It should be noted that while this estimate of benefits excludes certain classes of hard-to-measure benefits, it does assume that all of the quantifiable benefits will be attained immediately. The EPA also produced estimates that assume gradual attainment of the benefits over the first 15 years of the program, using two different discount rates of 7% and 3%. This reduced the monetary value of the benefits to a range of \$560 million to \$4.1 billion in the first case and \$660 million to \$4.9 billion in the second case.

⁴DRI/McGraw Hill, "The Great Lakes water quality initiative: Cost-effective measures to enhance environmental quality and regional competitiveness," Chicago, IL, 1993, p. IV-28.

⁵DRI/McGraw Hill (1993).

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Tracking Midwest manufacturing activity

Manufacturing output index (1987=100)

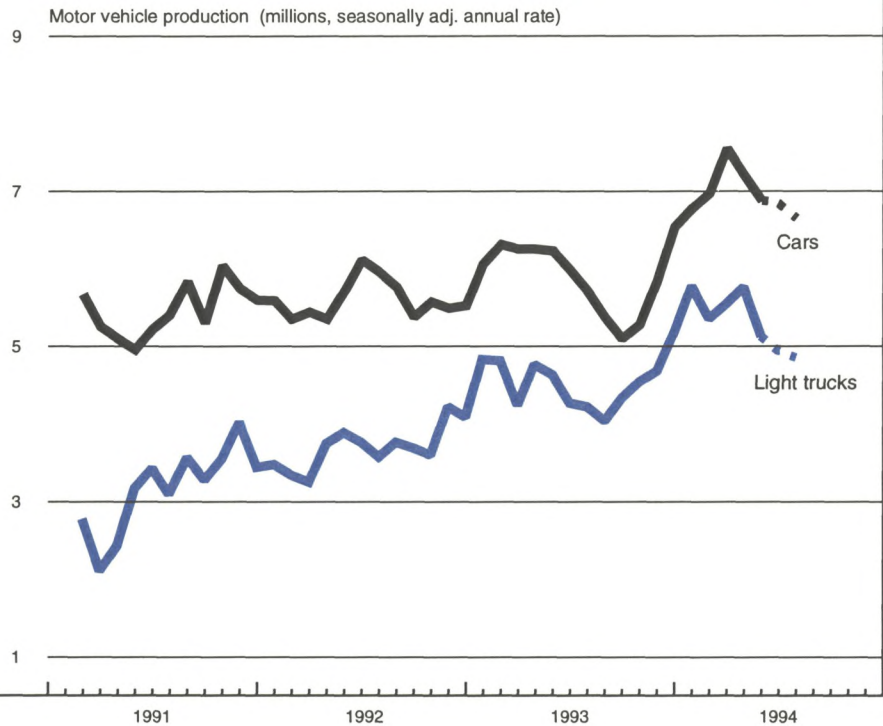
	Mar.	Month ago	Year ago
MMI	130.9	129.7	119.0
IP	117.0	116.3	110.5

Motor vehicle production (millions, seasonally adj. annual rate)

	Apr.	Month ago	Year ago
Cars	6.9	7.2	6.2
Light trucks	5.1	5.8	4.6

Purchasing managers' surveys: production index

	Apr.	Month ago	Year ago
MW	75.0	72.9	61.5
U.S.	62.7	64.0	52.5



Note: Dotted lines are estimated production from auto producers.

Light vehicle output is expected to decline in the second quarter on a seasonally adjusted basis, after surging in late 1993 and early 1994. Light truck production has been closing in on capacity limits, and automakers have not been able to increase output along the lines normally expected for this time of year. During April, however, a modest underbuild arose in car production, where capacity constraints have not been as serious.

Despite these developments, light vehicle output still remains well above the levels of a year earlier. Purchasing managers' surveys showed the region's overall industrial output building even greater momentum through April. Particularly strong gains have been posted in recent months in the broad-based Chicago survey.

Sources: The Midwest Manufacturing Index (MMI) is a composite index of 15 industries, based on monthly hours worked and kilowatt hours. IP represents the Federal Reserve Board industrial production index for the U.S. manufacturing sector. Autos and light trucks are measured in annualized physical units, using seasonal adjustments developed by the Board. The purchasing managers' survey production index for the Midwest is a weighted average of the production components from the Chicago, Detroit, and Milwaukee Purchasing Managers' Association survey, with assistance from Bishop Associates and Comerica.

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