



ARS chemists collect samples of oysters, water and sediment from the Choptank River on Maryland's Eastern Shore.

TMDLs: The EPA Fishes Something Nasty From the Clean Water Act

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On March 29, 1972, as Congress was grinding out the piece of legislation that we all know now as the “Clean Water Act,” Jamie Whitten, the powerful Mississippi Democrat, warned his House colleagues: “If you were to bring together all the authority, all the responsibility you have given to William Ruckelshaus [then Administrator of the Environmental Protection Agency] you would be amazed: He has the power of life and death over our economy.”

Ruckelshaus, fortunately, was not inclined to abuse the broad grant of powers that Whitten characterized as “far more than a good man would want, or a bad man should have, or that any ten men could handle.” The current EPA Administrator, however, is not similarly lacking in ambition. In the twilight of her tenure Carol Browner is proving just how wise the Mississippi congressman was.

Administrator Browner has already demonstrated her capacity and willingness to overreach even the prodigious Congress-given powers Whitten worried over. Last spring, her proposals to regulate ozone and airborne particulates—at an enormous potential cost to the economy—were quashed by a federal court as lacking science and as a usurpation of Congress’s legislative authority. So, with the wreckage of her failed air assault still smoking behind her, Browner is taking to the water. Last summer, she announced that she is moving forward with aggressive enforcement of section 303(d) of the Federal Water Pollution Control Act, usually referred to as “TMDLs”—a provision of the act the agency has wisely left in a corner gathering dust for the past 27 years.

If full implementation of TMDLs (Total Maximum Daily Loads) can be achieved nationwide, the federal government—specifically the EPA—will have gained control, as Whitten feared, over virtually the entire American economy.

On its face, the concept seems harmless, even constructive. The total maximum daily load is the amount of a particular pollutant that a body of water can tolerate on a daily basis and still retain its “integrity.” But under this disarmingly innocent façade is hidden a rat’s nest of uncertainty, ambiguity, and deception. Inside the EPA, TMDLs are known as “Too Many Damn Lawyers,” and for good reason.

The TMDL approach was the commonsense clean water strategy unsuccessfully championed by Ruckelshaus and the Nixon Administration in the 1972 Clean Water Act

debate. Attempts to clean up the nation's waters, Ruckelshaus argued, should be related to their actual condition. Water quality problems should be identified, analyzed, and remediated on a case-by-case basis. Substances responsible for impairing water quality should be traced to their sources; and polluters should be required to reduce or eliminate discharge of the guilty substances—in excess of the total maximum daily load—until the waters return to health. It sounds irresistibly simple, rational, effective, and fair—just as it does now when Administrator Browner disingenuously explains that since “no two pollution challenges are identical,” the EPA will “require site-specific cleanup plans for all remaining polluted water bodies.”

But TMDLs remain just as unworkable today as they were in 1972, principally because site-specific water quality plans require exhaustive scientific research. Thirty years ago the Clean Water Act made science irrelevant to achieving the country's water quality goals.

Sound Science Rejected

The TMDL approach was rejected in 1972 because of what the Senate Committee on Public Works, referred to as “an information gap”—a near total lack of knowledge of the actual condition of the nation's waters and an inability to establish “a clearly defined relationship between effluent discharge and water quality.” The committee declared this “information gap” a “major national concern.” Without knowing which waters were impaired, which substances were responsible, and lacking an understanding of the water quality impacts of specific discharges into specific bodies of water, the committee knew it would be impossible to address water quality on a case-by-case basis. The science was just not there.

When Ruckelshaus and the chairman of the president's Council on Environmental Quality, Russell Train, appeared before the House Committee on Public Works they argued, with great merit, that “it is absolutely essential to require precise effluent limitations for individual sources of discharge tailored to achieve water quality objectives.” Train begged for more time—at least until 1976—so that “a long overdue concerted effort” could be made to fill the scientific void. “I would be truly amazed,” Train told the committee, “if the Nation that has sent men to the moon and achieved dazzling technological accomplishments in other areas of national concern could not, within the next 5 years, master the ability to determine and predict relationships between what is discharged into the water and the resultant quality of the water.”

But Congress was under pressure. “We are methodically poisoning ourselves,” and “. . . we have the environmentalists on our back,” Democrat Robert Roe of New Jersey told Ruckelshaus. More time in which to resolve the scientific issues was not forthcoming.

On the table, ready for adoption was the majority's preferred alternative, called "zero-discharge." The proposed legislation assumed that the only way to arrest "the cancer of water pollution" and "continue to make life possible on this planet" was, in the words of the Senate committee report, to "restore the natural...integrity of the Nation's waters" through "the complete cessation of discharge of pollutants." The term "pollutant," moreover, was so broadly defined that virtually every substance known to humankind could be classified and proscribed as a "pollutant."

The "zero-discharge" option was quick, easy to understand, relied on tangibles like reinforced concrete, and, above all, guaranteed "pure water" to the public. It was, as New York Republican James Grover accurately observed, a "really good PR approach."

The opening section of the act stated, as its first goal, "that the discharge of pollutants into the navigable waters be eliminated by 1985." This goal was to be achieved by the development and implementation of technologies that would keep all undesirable substances from getting into the water in the first place.

As New York Republican James Buckley explained on the Senate floor: "The bill itself has abandoned the attempt, as an ultimate goal, of drawing a causal connection between the discharge of pollutants and the degradation of our streams. In effect, we are saying we know so little about the ultimate consequences of injecting new matter into water that it involves a presumption of pollution, and the way to insure ourselves against pollution is through the control and ultimate elimination of the discharge of pollutants."

As Ruckelshaus observed plaintively, there would be across-the-board implementation of expensive technologies without any reference at all to actual water quality. Billions would be spent, and we would never know, first, if it had been necessary, and, second, whether it had been effective. As Ruckelshaus told the House committee, "the social benefit we are all seeking—high quality water—is eliminated from the equation and technology is substituted in its place."

But, during the hearings, New York's Bella Abzug decisively trounced Ruckelshaus and Train. With three blunt but efficient blows of her rhetorical hammer, the redoubtable Democratic congresswoman nailed the coffin shut on TMDLs as a dominant strategy forever. First, she pointed out that there was no legal definition of acceptable "ambient water quality." Second, she reminded them that the existing anti-pollution enforcement program, based on a site-specific strategy, was ineffective because "You can't tell who is causing the problem." Finally, she queried—given the scientific and legal uncertainties attending the TMDL approach—"would you not create a lot of litigatable [sic] issues?" She was right, then, and, unfortunately, she is still right today.

With no idea of the true extent of the problem, (Ruckelshaus maintained that “10 percent of the dischargers [were] causing 90 percent of the problem), the nation blindly embarked on a classic big government one-size-fits-all technological program. It has already cost the nation the better part of a trillion dollars with uncertain results.

TMDLs did not entirely disappear. They survived as a second-tier strategy to be applied when the discharge-restricting technologies proved insufficient to restore water quality. Almost as afterthought, and with no apparent appreciation of the complexity or difficulty of what it was mandating, Congress attempted, in section 305 of the act, to remedy the “information gap.” It gave the EPA and the states until 1974 to collect the data that might make TMDLs practicable through a detailed inventory of the quality of all the nation’s navigable waters. That goal, predictably, was not achieved. Almost 30 years later, we have hardly begun to attain it.

The unassailable if simple-minded logic of the zero-discharge approach allowed everyone in Congress and the states to discount the need for meaningful real-world assessment of water quality. Obviously, if enough technology is applied, no pollutant will be discharged, and water will, necessarily, be “pure.” As a result, between 1972 and 1992, the taxpayers and industry spent nearly \$600 billion on pollutant removal technologies and less than \$25 million on water quality monitoring.

Our continuing lack of knowledge is a direct consequence of the direction Congress chose in 1972. Instead of reason, Congress cultivated hysteria by literally predicting the imminent end of life on the planet and chose to adopt objectives and goals that were, in hindsight, clearly naïve and unattainable. They are only saved from being a national embarrassment by the fact that they have been almost universally ignored.

The Past Is Prologue

According to Browner, the hundreds of billions of dollars we have spent thus far to achieve “clean” water have only bought us a 60 percent solution. “Forty percent of America’s surveyed waterways remain too polluted for fishing and swimming,” she claimed in August. Interestingly though, in 1997, only two years ago, she announced both that 57 percent and 30 percent of our waters were still unacceptably polluted. The truth is that neither she nor any one else has a clue about what the actual condition of the nation’s waters was in 1972, or is now.

Despite the EPA’s apparent aversion to using the same numbers twice, the agency has never claimed that any more than 19 percent of the nation’s rivers and streams have ever been assessed—even minimally. Despite the 1972 Congressional mandate, only a minute fraction of our waters have actually been monitored regularly over a significant enough period for enough chemical, biological and physical parameters to give a meaningful assessment of their water quality. The most recent

information available on the EPA web site indicates that only 5 out of 50 states even claim to have assessed the biological condition of as many as 25 percent of their rivers. The EPA even found it necessary to preface its National Water Quality Inventory with a caveat: “The data cannot be used to estimate national water-quality trends over time, and they cannot be used to compare the status of waters among States.”

Sadly, the scientific basis for the site-specific TMDL strategy Carol Browner is attempting to revive in the final year of her tenure is as non-existent now as it was thirty years ago.

“Normal” Water

TMDLs are simple and logical. In a thoroughly monitored world they would be a wonderful way to improve water quality. But we have no real-world benchmark for the “integrity” of water. If you cannot establish a true norm, you cannot confidently or reliably identify deviations from it, so there is no scientifically credible way to define what is a “maximum” tolerable load. Dr. Nancy Rabalais of the Louisiana Universities Marine Consortium, one of the nation’s most prominent crusaders against “nitrogen pollution,” candidly admitted at a 1997 conference: “I don’t know what a normal amount of nitrogen is.” The same is true of most substances commonly found in the nation’s waters. Nobody knows what “normal” water is. The best that environmental activists and federal agencies have come up with is: “water the way it was before humans polluted it.” In fact, the Clean Water Act defines “pollution” as any alteration to the “integrity” of water caused by human activity. The Chesapeake Bay Foundation assesses the bay’s water quality by comparing it to a completely imaginary standard—the condition of the Bay as it is conjectured to have been before the arrival of Europeans on the continent.

From Ignorance to Arrogance

Claims by state and federal officials that TMDLs will be based on “sound science” or “good data” are mostly disingenuous—it is too late for that. Even with the best intentions, one-year, two years, five years, even 10 years of comprehensive monitoring data may not tell us anything truly useful about ambient water quality; about the real world relationships between “natural” conditions—which are themselves in continual flux—and effluent discharges; or about optimal conditions for the full range of aquatic biota humans deem desirable.

Lacking a scientifically credible way to define and quantify the “integrity” of water, the EPA employs an outrageous but effective stratagem. Water bodies may be listed as “impaired” based on “professional judgment.” This means simply that a bureaucrat in your state capital can list the stream you live, work or play on as “impaired” without sampling the water, without even making a visual assessment. The mere presence in the watershed of suspect human activity—agriculture, wastewater

treatment, gardening, golfing, and so on *ad absurdum*—creates, in Buckley's phrase, "a presumption of pollution."

Having established which water bodies are in need of re-mediation, by conducting a mechanistic inventory of human "disturbances" of the natural environment in every watershed, the EPA will confidently proceed to the next steps in establishing a TMDL. With virtually no data, they will determine how much "pollution" water can tolerate without becoming "impaired," identify the precise sources of all the excess pollutants causing the impairment, including (says the EPA) even "unknown pollutants" and airborne substances from automobile exhausts that are presumed to end up in our water. Finally, they will determine the proportion of the excess pollution contributed by each source. In order to accomplish these impossible tasks, the EPA will transport us into the shadowy world of "trans-science"—a realm in which regulators resort to subjective intuitions and oversimplifications of reality because they have no valid scientific answers.

The Computer Model—Modern Day Legerdemain

Ultimately, there may be no way for science to provide definitive answers to the questions that are necessary to the development of TMDLs. The systems involved are so large, change so rapidly, and involve so many variables that no human-made model could hope to truly replicate them. Without substantial, sustained, systematic monitoring, TMDLs are, literally, a shot in the dark.

U.S. Geological Survey super-modeler Leonard Konikow, winner of the 1997 American Geological Society's Meinzer Award, has written at length about the quandary regulators face when confronted by the insurmountable obstacles which lie between them and verifiable scientific conclusions about the environment. Lacking real-world information, regulators have substituted calculations from computer models. The regulators argue that their models, if not really faithful to reality, are at least "*adequate* representations of the real system." As Konikow tells it, "Defining what is adequate will, in the end, be a subjective decision made by the regulator." Without a substantial body of monitoring data, who among us will be able to say they are wrong?

Computer models "lend undue credibility to a process that even [its proponents] point out is, in the end, inherently subjective," Konikow writes. The use of models, he concludes, "deceives society with the impression that, by expending sufficient effort, uncertainty can be eliminated and absolute knowledge can be attained." Models may be valuable tools for organizing scientific thinking and testing ideas, but not for making policy.

Never deterred by a lack of science, the EPA will nevertheless have the USGS or a university professor somewhere construct one of these mathematical models for your watershed. It will be as much like the real world as your child's rubber ducky is to

the mallard flying overhead. They will do the math, and all of the sources—manufacturers, municipal waste treatment plants, power generating facilities, farmers, automobile owners, *et alia*—will have to decide whether to retool, reduce, or retire. They will do whatever it takes to meet the quota assigned by the regulator (whether or not there is any real-world basis for it)—or pay the fines as a fixed cost of doing business. It doesn't take much imagination to see that TMDLs could be used to restrict the production of meat, regulate industrial output, reduce the generation of electricity, maybe eliminate Mr. Gore's hated internal combustion engine or end suburban sprawl.

“A Fundamental Shift In Clean Water Policy”

TMDLs mark a fundamental shift in clean water policy,” the Alliance for the Chesapeake Bay noted in its newsletter last fall. In the past, permits regulating the quality of discharges into the nation's waters were based on best available technology. “With TMDLs,” the Alliance points out, “water quality standards must be met regardless of whether the technology is available.”

A TMDL recently written for Indian River, Indian River Bay and Rehoboth Bay in Delaware requires that all wastewater treatment plant and industrial discharges to be “eliminated systematically,” and nutrient runoff to be reduced as much as 85 percent.

If, as Browner has promised, the EPA has resolved to advance “river by river, lake by lake, beach by beach, community by community” until every drop of water in America is “clean and safe,” then there will be no logical endpoint to this crusade—except, perhaps, in federal court.

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