

CLEAN WATER FOR POSTERITY AND PROSPERITY

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“When the well’s dry, we know the worth of water.”

— Benjamin Franklin

Thirty years after enactment of the Clean Water Act, the U.S. has made significant progress in cleaning up America’s lakes and streams. Yet, serious challenges remain in managing the nation’s water quality and quantity and, at the same time, we face a global water crisis of staggering proportions. Although highlighted by thoughtful publications as diverse as *Nature* and *The Economist*, this crisis has not been effectively communicated to the general public. It was the focus of last year’s Third World Water Forum in Kyoto, Japan, and a primary topic of discussion at the 2002 World Summit on Sustainable Development in Johannesburg, South Africa, yet it hardly registers on the U.S. government’s policy agenda. Its global scope and significance was outlined in an historic United Nations report, *Water for People, Water for Life*, published last year through the combined efforts of 23 UN agencies and secretariats, yet this compelling call to action has not been matched by deeds.

Confronting this crisis will call upon the combined talents and capacities of governments, businesses, civil society and the media. With stakes so high there are no “competing values,” only complementary interests in solving this crisis in the most effective and cost-effective way. And the first step is to free ourselves from the archaic and confounding rhetoric of current discourse about

environmental policy: the positing of false choices between the health of our economy and the health of our environment.

Water: Necessity of Life

There is no more water on Earth now than there was 2,000 years ago, yet our population and consumption rates have grown dramatically. Humans already use 54% of all accessible freshwater, with usage projected to increase to 70% by 2025. Meeting projected human water needs was the focus of “The International Year of Freshwater” in 2003, which received distressingly little attention in mainstream mass media. Last March, the Third World Water Forum marshaled compelling evidence of the human suffering caused by inadequate water supply and sanitation. Millions of people die prematurely every year because of lack of access to clean water; by 2050 seven billion people in sixty countries will have inadequate water supplies (without accounting for a 20% increase in water scarcity predicted by the UN due to global warming). The Forum followed the 2002 World Summit on Sustainable Development, at which governments were supposed to develop concrete plans to achieve the Millennium Goal of halving the proportion of people without safe drinking water by 2015.

U.S. interests in global security and sustainable development require an effective commitment to addressing the global water crisis. But, the U.S. faces daunting domestic challenges as well, both in supplying adequate water to meet projected future demand and in improved efforts to reduce pollution. As noted by the U.S. Environmental Protection Agency (EPA) in November 2003, “[t]his country faces both water infrastructure and water supply problems. The gap between needs and investments for water and wastewater infrastructure could potentially be \$224 billion over the next 20 years. Just as important, 36 states expect to experience water shortages over the next ten years, even without drought conditions.”

The Clean Water Act: Progress and Prospects

The days of burning rivers and dumping of untreated sewage and industrial waste are largely behind us, thanks to the 1972 Clean Water Act (CWA). This landmark environmental legislation set federal pollution control requirements based on what was determined technologically and economically achievable to

rid our nation's lakes, rivers and coastal waters of obvious pollution. The Act also authorized massive federal funding of municipal treatment facilities as part of its ambitious goal "to restore and maintain the chemical, physical, and biological integrity of the nation's waters."

Despite remarkable progress in improving water quality, this goal of the CWA still eludes us. Currently, only 66 percent of U.S. lakes and rivers pass the Act's basic requirement that all waters should be safe for fishing and swimming, and most Americans live within 10 miles of unsafely polluted waters. Much of the progress that has been realized resulted from dramatic reductions in pollution from industrial "point source" discharges such as factory waste pipes and from untreated municipal sewage effluent. Since the federally-mandated controls on industrial pollution were "technology-forcing," they resulted in more effective raw materials usage, improved efficiencies in manufacturing processes and, in many instances, cost savings. The economy-versus-the environment is not only a false paradigm for the future, but is also – in many instances – a false descriptor of past experience.

Curbing these direct discharges to lakes and rivers by industries and cities was the easy part of meeting CWA goals. Now, we face the challenge of dealing with so-called "non-point pollution," such as agricultural and urban runoff. The annual "dead zone" in the Gulf of Mexico and the decline of the once-thriving Chesapeake Bay fishery dramatically illustrate the scale of the problem.

Every summer in the Gulf of Mexico, severely depleted levels of oxygen in the Gulf's waters produce a condition known as hypoxia, which kills oxygen-dependent sea creatures within its approximate 8,500 square mile zone. While the dead zone varies in size, it has been growing steadily for a decade. As a direct result, oxygen levels routinely fall below a level that most marine life cannot survive, including commercial fish, crab and shrimp species. Its primary cause is excess nitrogen and phosphorous that runs off of Midwestern agricultural lands and is washed into the Gulf by the Mississippi River.

In the Chesapeake Bay watershed excess nitrogen and pollutants are destroying the blue crab population and other aquatic species, threatening livelihoods and a way of life. Sources include urban and agricultural runoff and effluent from

sewage treatment and industrial plants. Despite some early progress in cleaning up the Bay, water quality is now deteriorating rapidly.

Another continuing source of serious water pollution is air pollution. Air pollutants often end up being washed into lakes and rivers, becoming water pollution. For example, airborne mercury from coal-fired power plants is polluting the Great Lakes and other downwind watersheds to the point where many states warn pregnant women and small children against consuming sport-caught fish from contaminated lakes and rivers. Controlling this “toxic rain” requires aggressive and coordinated implementation and enforcement of the Clean Air Act and the Clean Water Act. Similarly, airborne emissions of nitrogen oxides are a major source of water pollution in the Chesapeake Bay; EPA estimates that one-quarter of the total nitrogen loading to the Bay comes from atmospheric sources.

Finally, biological pollution – the intentional or inadvertent introduction of non-native invasive species – is a serious environmental threat and is costly. Except for habitat loss, non-native species have been identified by the scientific community as the most important threat to biodiversity. According to the federally-mandated Aquatic Nuisances Task Force, at least 4,500 species of foreign origin have established free-living populations in the U.S. For example, thirty-two species of nonindigenous marine organisms have been identified in one small estuary – the South Slough National Estuarine Reserve, in Coos Bay, Oregon – and at least 136 nonindigenous aquatic species have been identified in the Great Lakes. The overall cost to the U.S. economy is estimated in the billions of dollars. For example, major water users from the Great Lakes spend an estimated \$30 million annually to control zebra mussel infestations and the U.S. and Canada spend over \$12 million a year to control sea lamprey populations in the Great Lakes.

Where Water Meets Land: Wetlands Conservation

The areas where water meets land, known generically as “wetlands,” are among the Earth’s most biologically rich and ecologically significant ecosystems. Wetlands play critical roles as natural water filters, as flood retention areas, as critical spawning habitat for commercially-valuable fish species, as nesting grounds for waterfowl and as home to a diverse array of wildlife species. Yet, these important ecosystems have been drastically affected by ill-advised development patterns, with less than half of the United States’ historic wetlands remaining.

Existing CWA protection of wetlands is based on an awkward collaboration between three federal agencies – the EPA, the Fish & Wildlife Service and the U.S. Army Corps of Engineers, which actually administers the wetlands “dredge-and fill” permit program. This program has been ineffective in curbing wetlands destruction to meet President George H.W. Bush’s “no net loss” mandate. And, recent administrative changes by EPA would narrow significantly the scope of the CWA program, leaving unprotected up to one-fifth of America’s remaining wetlands.

Water Quality and Quantity

The relationship between water quality and quantity is increasingly obvious as our ever-growing populace draws down finite water supplies. Consequences include increased non-point pollution (including nutrients, sedimentation and saltwater intrusion) and altered instream flows. The recent brinksmanship between the U.S. government and California over re-allocating water from the Colorado River illustrates the political complexity of meeting increasing urban water needs at the expense of agricultural interests.

Unwise, shortsighted water diversion, water overuse and water misuse are also major problems in supposed water-rich areas of the U.S. For example, despite their apparent vastness, the Great Lakes are vulnerable to pollution and to overuse. The Great Lakes region is already experiencing water shortages because of poorly planned urban sprawl and lower lake levels that may result from global warming. New water management approaches are being developed through interstate implementation of a new annex to the federally-approved 1986 compact among the Great Lakes states.

Similarly, “water wars” have flared among southeastern states over inadequate supplies for a growing population. Contentious negotiations between Georgia, Alabama and Florida have threatened the adequacy of future water supplies for Atlanta and other growing urban areas and have put at risk the unique and rich biological diversity of mollusks found in the Apalachicola-Chattahoochee-Flint ecosystem. Although last summer’s Memorandum of Agreement between the three states was a positive development, many challenges remain in effectively managing the Southeast’s diminishing freshwater supplies.

Overlaying these regional examples of historically mismanaged water resources is the history and current reality of the U.S. Army Corps of Engineer's civil works program. Recent investigations by the General Accounting Office, the Inspector General of the U.S. Army, the National Academy of Sciences, the *Washington Post*, and public interest groups have criticized the Corps' biased decision making process and the fiscally unsound and environmentally destructive projects that result. These projects include some of the most notorious examples of "pork barrel" politics such as the \$165 million Yazoo Pump Project in Mississippi and the \$100 million Devils Lake project in North Dakota. Estimates of the backlog of authorized Corps projects for which Congress has yet to provide funding run as high as \$30 billion. So far, bi-partisan efforts in Congress to defund the worst projects and reform the Corps' decision-making process have failed in the face of opposition from the "iron triangle" of local development interests, powerful congressional benefactors, and the institutional bias of the Corps' district offices.

Thinking Like a River: Developing a "Water Ethic"

More than half a century ago, noted scientist, conservationist and author Aldo Leopold called for the development of a "land ethic." The prerequisite to understanding our relationship to land – or, our environment – according to Leopold was to "quit thinking about decent land-use as solely an economic problem." He wrote: "We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect." A proper relationship with land requires a longer-term view than usually comprehended by market-based pricing schemes. It requires, said Leopold, "thinking like a mountain."

So, too, sound water management requires "thinking like a river." It demands an integrated approach to water management, recognizing the connection between wetlands conservation and water quality; between land management practices – especially in floodplains – and water quantity; between assuring adequate flows in environmentally sensitive headwaters streams and water quality in mainstem rivers. While the rhetoric of "watershed management" gains currency, the reality remains a fragmented approach.

More fundamental, however, than the structure of management regimes is the recognition that water is more than merely a commodity. The answer to the impending water crisis is ethical, as well as economic. It requires understanding the essential role of water in meeting basic human needs and in sustaining healthy ecosystems. As the recent UN Report on the global water crisis observed, “water has not only an economic value, but social, religious, cultural and environmental values as well, and [...] these are often interdependent.” Similarly, the first of the “Dublin Principles,” adopted in 1992 at the International Conference on Water and the Environment, states that “[f]resh water is a finite and vulnerable resource, essential to sustain life, development and the environment....”

Articulating a meaningful water ethic with universal application to water management decisions is a necessary precondition to meeting the global water crisis. This ethical imperative should include the following principles.

- 1. Governments must recognize that water is not merely a commodity and must assure that basic human needs for access to safe water supplies are satisfied.***

Increased attention to the global water crisis has led, among others, the UN Secretary General in his World Water Day statement in 2001 to suggest that access to safe water supplies should be recognized as a universal human right. Embryonic efforts to define this right have resulted in an internationally-recognized basic water requirement of 50 liters per capita per day. This view has widespread support among civil society organizations. In 2001, for example, 800 representatives of groups from 35 countries participated in the “Water for People and Nature” summit in Vancouver, Canada, and issued a manifesto calling for fresh water to be managed as a “global commons.” In 2002 environmental and sustainable development groups organized a global “freshwater caucus” to coordinate advocacy efforts at the World Summit on Sustainable Development, and the caucus continues to press governments for demonstrated progress toward meeting the Millennium Goal of halving the proportion of people without safe drinking water by 2015.

Early efforts to privatize water supply systems in developing countries have encountered public opposition, even civil unrest. As noted by *The Economist*, resistance to privatization will continue absent an ongoing role for governments

in assuring affording access to safe water by all. Opponents to bilateral and multilateral trade agreements have raised concerns that water will be treated as a commodity and, thus, government efforts to manage supplies fairly and sustainably will be subject to challenge before trade tribunals. These concerns have been raised specifically concerning the treatment of Great Lakes water as a “good” by the North American Free Trade Agreement; as a result, the Great Lakes governors have reasserted their control of Great Lake water through the “Annex 2000” process.

2. Conservation should be the strategy of first resort in meeting future human needs.

There is no more water to be made. Businessman Paul Hawken and his co-authors argue persuasively in *Natural Capitalism* that no supply-side strategy can keep up with projected human demands. The only solution is “to increase radically the productivity of water directly and where it’s used.” Meeting the water needs of people and wildlife requires learning how to make more efficient use of existing water resources.

In this instance, good economics often makes good environmental policy. Honest pricing and eliminating subsidies are among the most effective ways of encouraging water conservation, especially by agriculture which comprises approximately 80% of U.S. consumptive uses. Significant improvements are already underway in the industrial and commercial sectors with water efficiency improving more than twice as fast as energy efficiency. According to *Natural Capitalism*, water withdrawn per unit of U.S. GNP declined 38 percent from 1980-95. The *Economist* magazine notes that the steel industry has improved water efficiency ten-fold as measured by the amount of water required to make a ton of steel.

Urban uses also provide significant opportunities for water savings. According to a recent study by National Wildlife Federation hydrologist Dr. Norman Johns, Texas could save as much as 300 billion gallons of water annually if only its major municipalities would plan to use water as efficiently as El Paso and San Antonio. These water savings would avert the need to construct eight additional major dams proposed by Texas’ 2002 State Water Plan at an expense of

several billions of dollars. And, of course, water conservation means leaving more water in Texas rivers to sustain healthy coastal estuaries along the Gulf of Mexico.

3. Adequate “instream” flows must be assured to meet environmental requirements for perpetuating healthy populations of dependent indigenous species.

Conservation is not only often the most cost-effective approach to meeting human needs, but it can produce substantial environmental benefits and none too soon. A recent comprehensive study of U.S. freshwater ecosystems by The Heinz Center concluded that approximately one-third of freshwater species are at risk, noting that “[a]bout 20% of more than 4,000 native animal species that depend on streams, lakes, wetlands, or riparian areas are considered ‘imperiled’ or ‘crucially imperiled,’ and 4% may already be extinct.”

The failure to identify and satisfy the needs for environmental flows has created crises across the U.S., including disputes about salmon in the Columbia/Snake and Klamath rivers in the Pacific Northwest, sturgeon in the Missouri River, whooping cranes dependent on the Platte River in the Midwest, the silvery minnow in the Rio Grande River, and four endangered mussels in the Apalachicola-Chattahoochee-Flint Basin – to name just a few of the most publicized confrontations. Thoughtful planning to identify and assure minimum environmental flows could avoid such confrontations.

Significant environmental costs of proposed water projects should be calculated and considered in the planning process. Typically, they have been ignored or undervalued. Critics of the U.S. Army Corps of Engineers’ Civil Works program have focused on the failure to properly identify the environmental consequences of proposed projects. Bi-partisan bills requiring the Corps to consider these impacts are pending in Congress and are the centerpiece of a “Greening the Corps” campaign led by the 70-member Corps Reform Network.

4. Water management decisions should be made on a watershed basis.

Watersheds are dynamic ecosystems in which the health of the component parts – groundwater, intermittent headwater streams, wetlands, floodplains, mainstem rivers and estuaries – determine the health of the whole. Water management decisions should be made on a watershed basis with full acknowledge-

ment that adequate supplies of high quality water depend on an integrated understanding of the role of intermittent headwaters, wetlands, floodplains, groundwater and land use practices. Yet, management responsibilities remain fragmented, especially with respect to land-based development in wetlands and floodplains.

There are direct economic consequences of the failure to use watershed-based planning. For example, flood damages in the U.S. exceed \$4 billion annually; the direct human benefits of wetlands and floodplains are increasingly obvious and increasingly valuable. True watershed management requires identifying the interconnection between water quality/quantity and land use practices, especially development in wetlands and floodplains.

Recent federal policy initiatives are discouraging in this regard. The EPA has recently issued administrative “guidance” reducing the scope of wetlands protection under the Clean Water Act.. According to EPA’s estimates, the changes in this guidance could reduce federal protection of wetlands by up to 20%.

5. Restoration of degraded waters and damaged ecosystem should be a fundamental component of water resource planning and management.

Saving what’s left will not be good enough for the future. The damage to aquatic ecosystems worldwide has been significant. The UN estimates that 60 percent of the world’s large rivers have already been altered by dams and other structures, with attendant declines in commercial fisheries and devastating impacts on aquatic biodiversity. “Worldwide, of the creatures associated with inland waters, 24 percent of mammals and 12 percent of birds are threatened, as are a third of the 10 percent of fish species studied in detail so far. Inland water biodiversity is widely in decline, mainly from habitat disturbance, which can be taken as evidence of declining ecosystem condition.”

Increasingly, water resources management must focus on restoring degraded ecosystems for the benefit of people and wildlife. Hopefully, the \$8 billion federal-state partnership to restore the Everglades will inspire similar efforts elsewhere. Already, the “Coast 2050” plan would restore Louisiana’s vanishing coastal wetlands and restoration planning has begun in the Chesapeake Bay and Great Lakes regions. Approximately 20% of the Corps of Engineer’s budget is classified for environmental restoration and additional funds should be diverted from

environmentally damaging projects to restoring ecosystems. Restoration requirements should also be incorporated into existing permitting programs, as has been proposed in the Great Lakes region. Under the Annex 2000 criteria endorsed by the Great Lakes governors, applicants for permits to use Great Lakes water must demonstrate improvements to the Great Lakes ecosystem.

Conclusion

Within an ethical context and informed by sound science, policy makers must make enlightened water choices that support economic growth *and* provide access to water for people and wildlife. As the UN noted in its report last year, for the most part we have the knowledge and technologies to meet the global water crisis. The missing ingredient is leadership.

[The water] crisis is one of water governance, essentially caused by the ways in which we mismanage water resources.... In truth it is attitude and behaviour problems that lie at the heart of the crisis. We know most (but not all) of what the problems are and a good deal about where they are. We have knowledge and expertise to begin to tackle them. We have developed excellent concepts, such as equity and sustainability. Yet inertia at leadership level [sic], and a world population not fully aware of the scale of the problem (and in many cases not sufficiently empowered to do much about it) means we fail to take the timely corrective actions and put the concepts to work.

With leadership such as that represented at the Aspen Institute Environment and Economics Forum, we can achieve balanced solutions that will ensure a healthy economy and sustainable flows of clean water in the future for people and wildlife.

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