The Role of the U.S. EPA in Protecting Aquatic Ecosystems

Remarks by John Meagher
Director, Wetlands Division, U.S EPA
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This year is the twenty-fifth anniversary of the landmark Federal Water Pollution Control Act of 1972, which for the first time established a comprehensive national framework for improving the quality of the nation’s waters. At the time that legislation was enacted, the U.S. Environmental Protection Agency was only two years old, and many of the nation’s waters were in serious decline. There were startling signs of trouble - the Cuyahoga River catching fire, the dying of Lake Erie, and the Potomac River flowing through the nation’s capital with fetid sewage-laden waters. There were also many less dramatic yet pervasive water quality problems - inadequate municipal wastewater treatment capacity, poorly treated industrial discharges, and widespread destruction of the nation’s wetlands at a rate of about 450,000 acres per year.

The 1972 Act established an ambitious and costly national agenda to bring back the nation’s waters. A grants program was established that has provided tens of billions of dollars to fund the planning, design and construction of facilities to treat municipal wastewater; that program continues today after being changed to a loan program. A permit program was also established for municipal wastewater discharges. Industrial water pollution was addressed through a standards program that identified appropriate treatment technologies implemented through a permitting and enforcement program. States were charged with implementing a water quality standards program, which included specifying designated uses for water bodies, developing standards based upon water quality criteria developed by EPA, and an anti-degradation policy to protect existing uses of waters. In 1977, the Act was reauthorized in a manner that embraced Court decisions applying Clean Water Act protections to wetlands, while addressing landowner concerns by exempting from regulation some low-impact discharges of dredged and fill material,
providing for streamlined general permitting for other categories of low-impact activities, and 
authorizing States to assume regulatory responsibility in some waters. In 1987, the Act was 
again reauthorized with provisions for management plans and funding for non-point source 
pollution, a National Estuary Program that provides assistance to develop solutions to water 
quality and habitat degradation in major coastal bays, and for modifying the permit and 
enforcement program to address problems associated with stormwater runoff. In addition, 
federally recognized Tribes have been provided more authority to manage water quality 
programs on Tribal lands.

This statutory framework is now called the Clean Water Act, and it has resulted in 
significant progress towards cleaning up the nation’s waters. The annual volume of pollutants 
discharged to the nation’s waters has been reduced by billions of tons. Nearly two-thirds of the 
nation’s rivers and streams now meet the standards established by the States. Because of Clean 
Water Act protections and other programs, the nation’s annual rate of wetlands loss has been 
reduced to less than 100,000 acres. Ohio’s Cuyahoga River does not ignite; in fact, its improved 
quality has become a focus for a vibrant recreational area in Cleveland. Lake Erie, the Potomac 
River, and many other water bodies are much cleaner and biologically productive today.

Americans should take great pride in these accomplishments, as well as those made in 
improving our air quality and decontaminating our lands. The public determination to clean up 
our environment, expressed through our elected leaders and carried out by all sectors of society, 
has accomplished much over recent decades. For many the true significance of these 
accomplishments was illuminated by comparison when the iron curtain fell and revealed 
unimagined levels of environmental catastrophe.

Yet, progress has come at a cost. Tens of billions of dollars of taxpayer and private capital 
have been expended. And the debate has been vigorous over the regulatory burden placed on
businesses, restrictions on the use of private property, and the appropriate point of balance between cost and environmental benefit. There is a significant degree of polarization among different interests over federal programs and policies. These tensions were highlighted last year when President Clinton vetoed Congress' appropriations bill for EPA, which would have reduced the Agency's budget substantially and imposed legislative riders to limit the exercise of EPA's authorities.

One rider relevant to wetlands protection would have prohibited the use of funds by EPA to veto Section 404 projects. That authority, while used sparingly, is an important mechanism for EPA to establish the upper limit of acceptable degradation of waters and wetlands from development and water resource projects. In the West, EPA's veto of the Two Forks water supply dam on the North Fork of the Platte River near Denver, Colorado, exemplified the controversy that can be engendered by exercise of this EPA authority. The President's veto of EPA's fiscal year 1996 appropriations bill, which included the wetlands rider, created one of the impasses between Congress and the White House that caused the federal shutdowns a year ago and elevated the significance of the environment as an issue in the 1996 election campaign. Interestingly, this higher political profile for environmental issues provided more impetus for Congress to move environmental legislation in 1996, and reauthorizations of both the Safe Drinking Water Act and the Federal Insecticide, Fungicide, and Rodenticide Act were passed and signed into law before the end of the 104th Congress.

So after the first quarter century of effort, we have made considerable progress in better protecting our waters, but the public dialogue on water quality, aquatic habitat and other environmental issues is fractious and litigious. This is the backdrop against which to consider the remaining challenges the nation faces to meet the Clean Water Act goal of restoring and maintaining the physical, biological and chemical integrity of waters of the United States. Despite the many improvements that have been realized, much work remains to be done. About
35 per cent of our rivers and streams do not meet their State-designated uses. A high percentage of the species of animals in the U.S. that are endangered or threatened are aquatic-based. Over two-thirds of our species of freshwater mussels and crayfish are rare or imperiled, and over one-third of our species of fin fish are at risk. While our wetlands loss rate is declining, coastal Louisiana marshes are eroding at a rate of about 40 acres per day, every day. Many U.S. watersheds have only a fraction of their original wetlands remaining, and the biological productivity of those waters will remain impaired until well-planned ecological restoration is undertaken. Over-fertilization of our waters causes oxygen depletion, fish kills and dead zones like the large one in the Gulf of Mexico. Sediments in some of our waters, including parts of the Great Lakes, are contaminated by chemicals, often from historic discharges, which can enter the food web through bottom-dwelling organisms or can be resuspended through activities such as dredging.

We also face problems where the linkages among pollution, habitat overcrowding, and disease are not well understood. Examples of these include the massive die-off of fish and birds in the Salton Sea in California, and the recent discovery of large numbers of deformities in frogs in the upper Mid-West and Northeast, especially among water-dependent frog species. The loss of aquatic habitat such as wetlands is sometimes related to problems of disease in wildlife. In the Rainwater Basin of Nebraska, migrating waterfowl concentrate on the 10% of the wetlands that remain for resting and feeding, and this overcrowding results in outbreaks of a disease called avian cholera. In some years, tens of thousands of ducks and geese have died in the Rainwater Basin. In ocean waters, where nutrient pollution flowing from the land has spurred high rates of algal growth, coral reef diseases are much more common than in cleaner waters. Coral reefs in these waters, including those in U.S. coastal waters are dying out at high rates. Since one fourth of marine organisms depend on these reefs, this is a major threat to the productivity of ocean waters and the commercial fisheries that depend upon them.
The causes of these remaining problems differ from those we have concentrated on in the early decades of our national water quality efforts. In those years, we were able to make significant strides by installing pollution control equipment on wastewater streams before they were discharged to our waters. However, the remaining problems have causes that are more widespread and diffuse. In developed areas, stormwater runs off from paved areas carrying oil, grease, nutrients, salts and heavy metals. In other places, non-point source run-off transports sediment, pesticides, herbicides, and fertilizers from the land into the waters. These forms of pollution are not readily amenable to transport by pipeline to a centralized wastewater treatment facility. In addition, the loss and degradation of aquatic habitat has many causes, including drainage, clearing and filling for residential, commercial, and industrial development, agriculture, forestry, grazing, mining, and channelization and damming of rivers. As you well know in the West, the relationship between the integrity of aquatic ecosystems and competing human demand for water is a continuing challenge, and we are seeing more of that in the East. The sources of many of these problems are not amenable to solution with the historic approach of focusing regulatory authority and government grants on a fairly well defined set of discharges. The top-down, command and control government programs, while still important to address some remaining problems and to safeguard the progress we have made, must be supplemented with other approaches.

Because these remaining problems are not suitable to a one-size-fits-all approach, the solutions must be more customized. To accomplish this, EPA is working with States, Tribes and other partners to use a watershed approach to manage our water quality. Because watersheds are the hydrological units through which our surface waters flow, there are many linkages among water quality and habitat conditions, problems, and solutions. Therefore, an approach that is geographically customized based upon watershed boundaries provides a logical framework for our future water quality and habitat programs. While some related processes, such as groundwater flows and habitat for wide ranging species, will often operate on scales other than
watersheds, the approach is flexible enough to adjust the geographic focus to accommodate the problems that need to be addressed.

Because the watershed approach is a framework intended to be flexible and geographically customized, it is difficult to provide a single definition that encompasses all the programs and activities that it includes. It is easier to describe the steps that are common to many watershed planning efforts. All watershed approaches should be characterized by strong local involvement, opportunities for participation by all "stakeholders" that may be interested in or affected by decisions on water resources, and active efforts to engage the public throughout the watershed process. With this in mind, typical steps are:

1. Collection and evaluation of information to characterize the "baseline" condition of the rivers, lakes, wetlands and bays in the watershed
2. Identification of key issues and problems associated with the area's water resources
3. Setting goals for the watershed's water resources
4. Developing alternative plans to meet watershed goals, and assessing the advantages and disadvantages of each
5. Selecting the optimal alternative
6. Developing and implementing an action plan based upon the selected alternative
7. Monitoring implementation of the plan and adjusting it accordingly
The watershed approach has a number of advantages that make it suitable for responding to today’s problems in America’s waters. With a targeted geographic focus, it enables a better tailored approach to move beyond the baseline level of protection provided by regulatory programs and undertake additional actions to address specific problems in each watershed. In one watershed, the highest priority might be to address nutrient overloads and bacterial contamination from wet-weather flows, in another it might be restoring aquatic habitat, and in a third it might be source-water protection for drinking water. In many cases, it will involve identifying watershed-specific priority actions across a number of different problem areas.

The watershed approach also has the advantage of involving in the process to develop solutions more of those people who will be needed to implement those solutions. With the sources of today’s aquatic resource problems so diffuse, future progress will not depend exclusively on a discrete group of regulators and regulated end-of-pipe dischargers. We need local governments that have land use authorities to steer development in ways that does not further degrade water quality and habitat. Homeowners and commercial and corporate property managers can approach lawn care and landscaping, including application of chemicals, in ways that are sensitive to impacts on receiving waters. Farmers, foresters, ranchers, and miners can adopt land management practices to improve the quality of waters and aquatic habitat. Local watershed councils and citizen groups can undertake a variety of volunteer projects, including monitoring waters, restoring habitat, and public outreach. And all Americans can contribute by using water efficiently, disposing of waste oils and lawn and household chemicals soundly, and expressing consumer preferences for environmentally friendly products. Watershed approaches, with their strong local involvement, broad stakeholder participation and active public outreach, can generate support and enthusiasm among all those who will have a role in the more inclusive national effort upon which we are embarking.

Another very important advantage of the watershed approach is the opportunity to better
integrate habitat protection with improved water quality. While both are integral to healthy watersheds, in the past our programs have tended to address them separately. The water pollution control community has operated along one path relying upon standards, wastewater permitting and engineering approaches, while the fish and wildlife community has proceeded along its own path relying upon acquisition, voluntary and incentive-based stewardship, and regulation of activities impacting wetlands and free-flowing streams. Working on a watershed scale can help to unify water quality and habitat protection, as their interconnections emerge very prominently. Wetlands assimilate pollution and improve water quality; therefore, their loss degrades streams, lakes and bays. To achieve the benefits of clean water for healthy fisheries and the commercial and recreational industries they support, we must also have habitat such as wetlands for food and shelter, including for breeding, spawning and raising young fish. Also, species of fish and wildlife that are in decline, including those that are threatened and endangered, are often challenged by a combination of stressors including those related both to water quality and habitat condition. While EPA views better coordination of water quality and habitat protection as one of the promises of the watershed approach, we also realize that it will take a lot of work to make it succeed. Nevertheless, we think it is important to work across our different programs and areas of expertise to establish these linkages at the watershed level.

The watershed approach can also provide the opportunity to find solutions that move beyond the polarization that has characterized many water related issues. Developing a sound baseline of environmental information upon which to base decisions can provide a common understanding of the facts, an important beginning to building consensus. The inclusive nature of the watershed process, with opportunities for all stakeholders to participate and active outreach to citizens, is a good way to surface and discuss all concerns and viewpoints. While the watershed approach will not resolve all disputes among different viewpoints, the collaborative nature of the process can help to identify ways of meeting environmental objectives that have a broader base of support.
EPA is working with our partners to realign water programs and our delivery systems to advance the watershed approach. We urge the Commission to consider the watershed approach as an important part of its deliberations. We welcome your insights on how EPA can work with Western States, Tribes and other interests to make the watershed approach responsive to the water quality and habitat issues that you determine are most important.

In addition to questions about EPA's existing water programs and emerging directions, the Commission requested information about EPA's data bases. Data and information management are key areas of focus for EPA's water programs at this time. For one thing, a major tool that has aided the emergence of the watershed approach is the geographic information system, which greatly enhances our capability to organize and operate upon environmental data, and to array the results in ways that facilitate watershed management decisions. Another reason that environmental data is a current EPA priority is because of the emphasis in the Administration's Reinventing Government Initiative and in the Government Performance and Results Act on measuring the real-world effects of government programs. EPA is working with other Federal agencies, States, Tribes and other partners and has developed a nationwide water monitoring strategy, 18 core water indicators, and tools to improve monitoring programs at all scales. Our objective is to measure our performance in improving water quality and aquatic habitat in more concrete and environmentally meaningful ways. In particular, four current efforts are relevant to the questions posed by the Commission:

1. EPA will soon complete modernization of its data management systems for marine and freshwater ambient water quality and biological data. The project involves re-engineering three existing data systems including STORET that include over 250 million observations from over 850,000 sampling stations nationwide. These data, collected primarily by States, represent an investment of over $2.2 billion. The analytic tools associated with these systems support a wide range of EPA water quality and ecosystem health assessment activities. With the new data
management system, the water management community will have access to information and data structures that meet the current and future demands of their jobs, and that can be used to evaluate the effectiveness of pollution prevention and abatement programs.

2. Every two years, States and Tribes have submitted water quality monitoring information to EPA, which compiles the data, summarizes them, and transmits the results to Congress along with a nationwide analysis of the quality of the nation's waters. These documents, called Section 305(b) reports, are the principal means by which EPA, the Congress and the public evaluate the condition of our nation's waters, the progress made in restoring water quality, and the extent of remaining problems. Section 305(b) data is being used for the report that EPA is preparing for the Commission, entitled “Water in the West Today - Water Quality.” EPA, working with the States and Tribes, is in the process of revamping its approach to Section 305(b) reporting. Paper reports, which have been required by EPA every two years, will be required instead every five years. In between these five year reports, States and Tribes will submit annual updates electronically. This will improve the efficiency of reporting and better align reporting requirements with the programs of States and Tribes that are adopting a rotating approach to water quality monitoring, in which States/Tribes typically assess the waters of a given watershed or basin every five years. In addition EPA is working with States and Tribes to fill in gaps in the information reported, including agricultural data and data on lakes and wetlands.

3. Surf Your Watershed is an Internet Search engine, similar to Webcrawler or Yahoo, that enables everyone, including scientists, environmental professionals, students, and the interested public to access environmental information. “Surf,” however, adds an important feature - the user can find information on a watershed basis as well. Twenty one hundred and eleven watersheds across the country, defined by 8 digit Hydrologic Unit Codes established by the United States Geological Survey, are accessible through “Surf.” Watersheds can be located by entering a zip code, State, County, Indian Tribe, water body, or ecosystem and then “point and
click” to find information specific to the State/Tribe and watershed. Information available includes descriptions of protection efforts and volunteer opportunities, water resources, drinking water sources, land use, population, wastewater dischargers, and water quality. In addition, users can request a map of a watershed or a five-mile area, register and join chat rooms on topics related to the environment and watersheds, or comment directly to EPA. States, Tribes, and other Federal agencies can link their data to “Surf;” in fact, most of the data accessible is not EPA’s. Therefore, EPA serves more as a facilitator than the primary source of data. Surf is found at http://www.epa.gov/surf.

4. National Watershed Assessment Program (NWAP). EPA is working with its partners to use environmental data sets to characterize the condition and vulnerability to pollution of the 2111 watersheds in the continental U.S., as used in the “Surf” project. Watersheds will be characterized along a continuum of six categories ranging from “better” to “more serious water quality problems” with a seventh category depicting watersheds with insufficient data to allow characterization. NWAP is being developed in two phases; in the first, EPA will take the lead, with State and tribal input, to use 15 data layers from existing sources to characterize the condition of watersheds. In the second phase, States, Tribes and other partners will help develop a more complete data base, including information on biological integrity, habitat, groundwater, coastal conditions, and air deposition. The purposes of NWAP are to characterize nationwide water quality on a watershed basis, to encourage citizens to learn about their watersheds and become active in protecting them, to provide a baseline for a dialogue among EPA, States, Tribes and other partners on future watershed assessment and improvement, and to measure our progress toward healthy and productive watersheds.

The Commission also expressed interest in EPA’s budget for addressing the protection and restoration of Western Aquatic Ecosystems. In fiscal year 1997, the EPA budget for water quality includes $273 million. These funds include salary and benefit costs for a water quality
workforce of 1,830 in EPA, and also funding for contracts, general purpose grants and cooperative agreements. The President’s 1998 water quality budget, if approved by Congress, would remain at about the same level as 1997, but would increase emphasis on revitalizing the urban environment, improving effluent guidelines, strengthening community-based environmental protection, assisting States with Total Maximum Daily Loads, and addressing non-point sources. Investment is also proposed for the public’s right-to-know, which includes beach health protection, Surf Your Watershed and the National Watershed Assessment Program. Another $94.5 Million and 635 work years in this fiscal year are budgeted for drinking water programs, and the President has requested increases of $10.8 million and 79 work years for fiscal year 1998.

In addition to these funds, the 1997 EPA budget includes $216 million for State, Tribal, and Local water quality grants, including $80.7 million in Section 106 water quality grants ($19.1 million for the Western States), $100 million in nonpoint source grants ($34 million for the Western States), and $15 million in wetlands grants ($5.7 million for the Western States and Tribes). The Administration’s 1998 budget request would increase the funding level for Section 106 grants by about $15 million. This increase is intended for Total Maximum Daily Load program and for Tribal programs. Drinking water grants in Fiscal Year 1997 are funded at $90 million for public water systems supervision ($29.3 million for the Western States) and $10.5 million for underground injection control ($5.0 million for the Western States). The President’s 1998 budget includes an increase of $3.8 million in public water systems supervision for Tribal programs.

The final budget category is water infrastructure, which is funded at a level of $2.236 billion in fiscal year 1997 and proposed for a $158 million reduction in fiscal year 1998. Included in this category is the Clean Water State Revolving Fund at a level this year of $625 million ($148 million for Western States), which is proposed for a fiscal year 1998 increase to $1.075 billion
($255.9 million for Western States). Also included is the Drinking Water State Revolving Fund at a level of $1.275 billion ($418 million for Western States), which is proposed for a reduction to a total of $725 million in fiscal year 1998. Water infrastructure also includes $150 million in both fiscal years 1997 and 1998 for wastewater projects along the Mexico/U.S. border and for wastewater projects in the U.S. colonias, mostly in Texas.

In closing, EPA believes that the work of the Commission is vitally important to the future of Western waters. We appreciate the opportunities we have had to participate in your efforts; specifically, we are grateful for your invitation to be part of this aquatic ecology symposium. We will to continue to work with you, with Phil Metzger as EPA’s liaison to the Commission and Dr. Gene Reetz as EPA’s Regional representative, and look forward to the results of your deliberations.