THE 35TH ANNIVERSARY OF THE CLEAN WATER ACT: SUCCESSES AND FUTURE CHALLENGES
THURSDAY, OCTOBER 18, 2007
U.S. HOUSE OF REPRESENTATIVES
TRANSPORTATION AND INFRASTRUCTURE COMMITTEE

TESTIMONY OF PETER LEHNER, EXECUTIVE DIRECTOR,
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Chairman Oberstar, Ranking Member Mica, and Honorable Members of the Committee:

Thank you for the invitation and opportunity to appear before you today to commemorate 35 years of progress under the Clean Water Act and to look forward to future opportunities to improve the quality of the nation's aquatic resources. I am Peter Lehner, and I am Executive Director of the Natural Resources Defense Council. I first worked for NRDC from 1994 to 1999, as the senior attorney in charge of NRDC's Clean Water Project. From then until last year, I led the New York Attorney General's Environmental Protection Bureau. I have had the opportunity to implement, defend, and enforce the Clean Water Act for many years, and I am pleased to say that Congress's vision and foresight in enacting the law in 1972 has been apparent to me in the environmental progress that I have personally witnessed over the years. It is, therefore, a great honor to be here today to testify today for the 35th anniversary of the Clean Water Act and to be able to talk with you about the history and past successes of the Act and how to build on them to ensure that we have enough clean, safe water resources in the U.S. for generations to come.

The first topic I'd like to discuss is the value of clean water. Like so many things in life, we appreciate it most when we lose it – when there is a drought, a sewage spill, a boil water alert, a closed beach. But we are blessed in the U.S. with abundant, natural water supplies that support healthy ecosystems as well as a variety of human uses – swimming, fishing, boating, drinking water, irrigation, industrial uses, and spiritual uses. Clean water also supports the U.S economy – it increases property values, generates tourism, supports commercial and recreational fish and shellfish industries, is used by high tech industries, and serves as a shipping channel for goods and services. It is important to keep in mind that water resources belong to us all. All lives are enriched by having access to clean, safe waterways. As the late Senator John Chafee said, "[S]afe, clean, abundant water – in our homes, rivers, lakes, and streams – is one of our planet's greatest treasures."[1] Yet today we often treat water as worthless – for example, we throw it away in the form of stormwater rather than beneficially capturing and re-using rainfall.

While the U.S. and other developed countries have essentially eradicated diseases such as cholera, typhoid and malaria, in developing nations, these and other waterborne illnesses kill 5

[1] Statement of Senator John H. Chafee, introducing the Estuary Habitat Restoration Partnership Act, as cited in U.S. EPA, *Liquid Assets 2000* (May 2000).

million people each year –an estimated 5,000 children every day.[2] To a degree, these problems recall an earlier period in U.S. history. In the years leading up to the passage of the CWA in 1972, we had a water pollution crisis in the U.S. similar to those that a number of other countries face today. The Cuyahoga River was on fire, Lake Erie was declared dead, and the Hudson River was practically an open sewer. Industrial pollution, untreated sewage, and agricultural waste degraded our waterways. Two thirds of them were not safe to use.[3] Previous statutes based on assessing responsibility for pollution on a site-by-site basis were too slow and inefficient to get the job done. The Clean Water Act reversed the notion that discharges were authorized unless they could be shown to cause a specific problem in a specific water body. Instead, discharges were prohibited unless authorized by a permit and permits required the use of best technologies to prevent pollution. That was one of the principal and most successful innovations of the CWA.[4] The CWA also ushered in a substantial infusion of federal money to build new sewage treatment plants and upgrade existing plants nationwide to address a handful of conventional pollutants; this was not a new technology at the time, but it was still not in widespread application. The dredge-and-fill permitting program reduced wetlands loss by three-fourths. The CWA also recognized that swift, sure enforcement is the key to ensuring high rates of compliance. It required dischargers to monitor their own discharges and to report permit exceedances to the environmental authorities. It also gave citizens the right to bring actions to enforce the law.

The wisdom of many of the CWA innovations remains apparent today. The construction grants program for sewage treatment plants and the treatment improvements that it helped to fund have made dramatic reductions in the amount of sewage pollution in lakes and streams.[5] While still significant in certain watersheds, chemical and industrial pollution is no longer as large a contributor to water pollution problems nationwide as a result of implementing best available technologies nationwide. The relative ease of enforcing the CWA has turned concerned citizens into effective compliance watchdogs empowered to protect the waterways they use even when the government fails to do so. In particular, the Act was revolutionary because it gave citizens a strong role to play in protecting water resources and tools to help them do so. The law provides for self-reporting of discharge information, made publicly available, and it gives citizens the chance to participate in the permitting of pollution sources. In today's information economy, more information can be made more available to citizens using the Internet. EPA's Enforcement and Compliance History Online database is a good start, but it should include all types of dischargers (not just major sources) and more information (e.g., direct links to permit documents, pollution management plans, inspection reports, etc.).

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[2] World Health Organization and UNICEF Joint Monitoring Programme for Water Supply and Sanitation, *Water for Life: Making It Happen* (2005).

[3] For the history of the Clean Water Act, *see generally* NRDC, *Clean Water Act 20 Years Later (Oct. 1993)*

[4] This has been recognized by many environmental commenters, e.g., Testimony of Lisa Heinzerling, Professor of Law, Georgetown University Law Center, Before the Subcommittee on Energy Policy, Natural Resources and Regulatory Affairs, Committee on Government Reform, U.S. House of Representatives (Mar. 12, 2002) ("a fundamental premise of the Clean Water Act was that water pollution control ought not await quantification of the costs and benefits of such control."), available online at https://141.161.16.100/faculty/Heinzerling/Testimony/Testimony_%20March-12-2002.pdf; Garrison Summary: A Generational History of Environmental Law and its Grand Themes: A Near Decade of Garrison Lectures, 19 Pace Envrtl. Law Rev. 510 (2001-02)

[5] U.S. EPA, *Progress in Water Quality: An Evaluation of the National Investment in Municipal Wastewater Treatment* (June 2000), http://www.epa.gov/owmitnet/wquality/benefits.htm.

Following passage of the CWA, Americans had high hopes for restoring the health and beauty of U.S. waterways. The statute contained an ambitious goal, the elimination of discharges of pollution into waterways by 1985.[6] The idea was to reach that goal through technology innovation as well as implementing off-the-shelf technologies. We would find ways to re-use wastewaters and design closed-loop systems that would keep nature in balance. Unfortunately, we have never even come close to achieving that goal, now 22 years after 1985. Instead, water quality improvement reached a plateau about a decade ago.[7] The U.S. continues to rely upon technologies developed decades ago, or, in the case of wastewater treatment, almost 100 years ago.[8] We have allowed our sewer systems to fall into disrepair, allowing raw and partially treated sewage to flow into waterways because it never reaches the plant for treatment. The American Society of Civil Engineers gave grades of D- to waterways, wastewater, and drinking water in their last report card on the state of the nation's infrastructure. That was the lowest grade given to any type of infrastructure in the U.S.[9]

Even worse than the current state of our nation's water resources and the infrastructure that protects it are the trends. There is an upward trend for beach closings, red tides, dead zones, droughts, flooding, coral reef damage, nutrient pollution, and sewage pollution.[10] For example, at our current rate of investment, U.S. EPA has projected that sewage pollution will be as high in 2025 as it was in 1968, that is, before the passage of the Clean Water Act. [11]

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[6] 33 U.S.C. § 101(a)(1).

[7] www.epa.gov/owow/305b.

[8] Testimony of Nancy K. Stoner, Director, Clean Water Project, NRDC, before the House Transportation and Infrastructure's Water Resources and Environment Subcommittee (April 13, 2005), http://www.nrdc.org/water/pollution/tns0405.asp.

[9] http://www.asce.org/reportcard/2005/index.cfm.

[10] NRDC, *Testing the Waters*, pp. 1-2 (reporting annual percentage increase in beach closing and advisory days); Woods Hole Oceanographic Institute, *Harmful Algal Research and Response: A National Environmental Science Strategy* 2005-2015, available at www.esa.org/HARRNESS/harrnessReport10032005.pdf ("Whereas 30 years ago the [U.S. harmful algal bloom] problem was scattered and sporadic, today virtually every state is threatened by harmful or toxic algal species."); Raloff, Dead Waters, Science News Online June 5, 2004 ("the number of major dead zones has been roughly doubling every decade since the 1960s"); NRDC, *In Hot Water: Water Management Strategies to Weather the Effects of Global Warming* pp. 4-16, (July 2007), available at www.nrdc.org/globalWarming/hotwater/hotwater.pdf (experts predict that the frequency of damaging events such as droughts and flooding will increase in many areas due to climate change); *An Ocean Blueprint for the 21st Century,* Final Report of the U.S. Commission on Ocean Policy, p.22 (Sept. 2004) available at http://www.oceancommission.gov/documents ("[T]he world's coral reefs are increasingly showing signs of serious decline, with pristine reefs becoming rare and up to one-third of the world's reefs severely damaged according to some estimates"); NOAA, *National Estuarine Eutrophication Assessment: Effects of Nutrient Enrichment in the Nation's Estuaries,* pp. vi-vii (Sept. 1999), available at http://ian.umces.edu/neea/pdfs/eutro_report.pdf (The severity and extent of nutrient pollution are expected to worsen in more than half of the nation's estuaries and coastal waters by 2020).

[11] U.S. EPA, *The Clean Water and Drinking Water Infrastructure Gap Analysis*, EPA-816-R-02-020 (Sept. 2002).

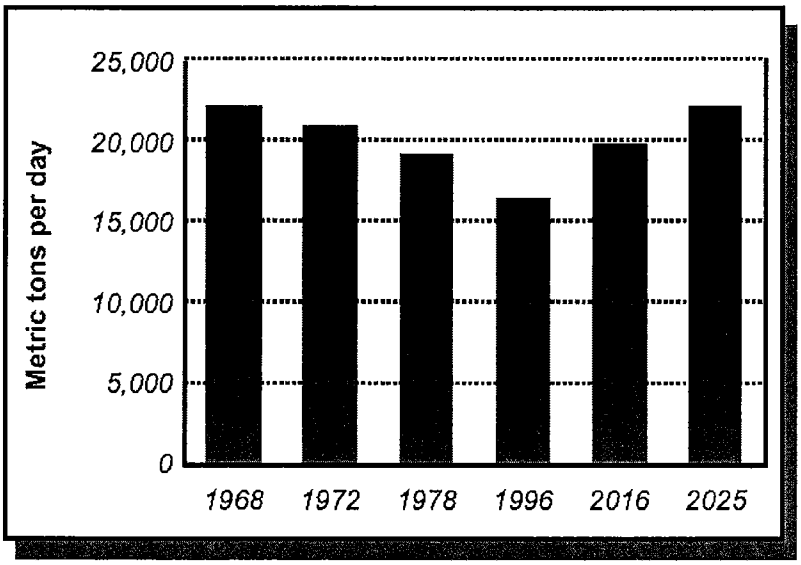


Figure 1–2: Projection of Increase in Biological Chemical Oxygen Demand (BOD)[8]

In addition, global warming is anticipated to have adverse effects on available freshwater resources. For example, as NRDC recently reported, experts project that global warming will decrease snowpack in the West, reduce water supplies, increase the magnitude and frequency of floods and droughts, and degrade aquatic habitat by reducing stream flows and increasing the temperature of waterways.[12]

In my estimation, the problems today fall in two general categories. There are a host of water quality problems that result from a lack of effective implementation and enforcement of the law. But there are also a number of issues that the Clean Water Act does not address at all or does not address effectively. I would like to talk about both kinds of problems. But I want also to focus on solutions to the concerns I've identified. Where the failure is one of implementation of the existing law, the solution is relatively apparent, if not always easy – we must step up our enforcement of the law. For emerging problems not fully addressed by the CWA, however, we must be more creative; below I discuss how the law can be extended to cover some of these newer areas. Still other concerns will need a broader perspective, one that focuses on integrating our management of all water resources and recognizes that the law's essential distinction between water quality and water quantity is artificial and ultimately unworkable for certain kinds of challenges.

[12] *In Hot Water,* pp. 4-16; *see also id.* at 12 ("The USGS modeled the effects of climate change on increased storm intensity and found that the risk of a 100-year flood event will grow larger in the 21st century. Instead of a 1 percent chance that in any year there will be a 100-year flood event, the likelihood in a single year could become as high as one in seventeen.").

A. SEVERAL PROBLEMS INITIALLY ADDRESSED BY THE CLEAN WATER ACT NEED RENEWED ATTENTION TODAY.

1. The geographic scope of the law is in doubt.

As this Committee well knows, there is significant uncertainty today about exactly which water bodies are actually protected by the various pollution control programs in the Clean Water Act. Two recent Supreme Court decisions have upset the historic understanding of the law that all types of water resources are protected. Together, these decisions have raised questions about the degree to which certain kinds of non-navigable water bodies are included in the law. EPA and the Corps have exacerbated this problem by issuing policy documents that further complicate decisions about what is protected and that create doubt about the status of water bodies that were not implicated by the Court's decisions.

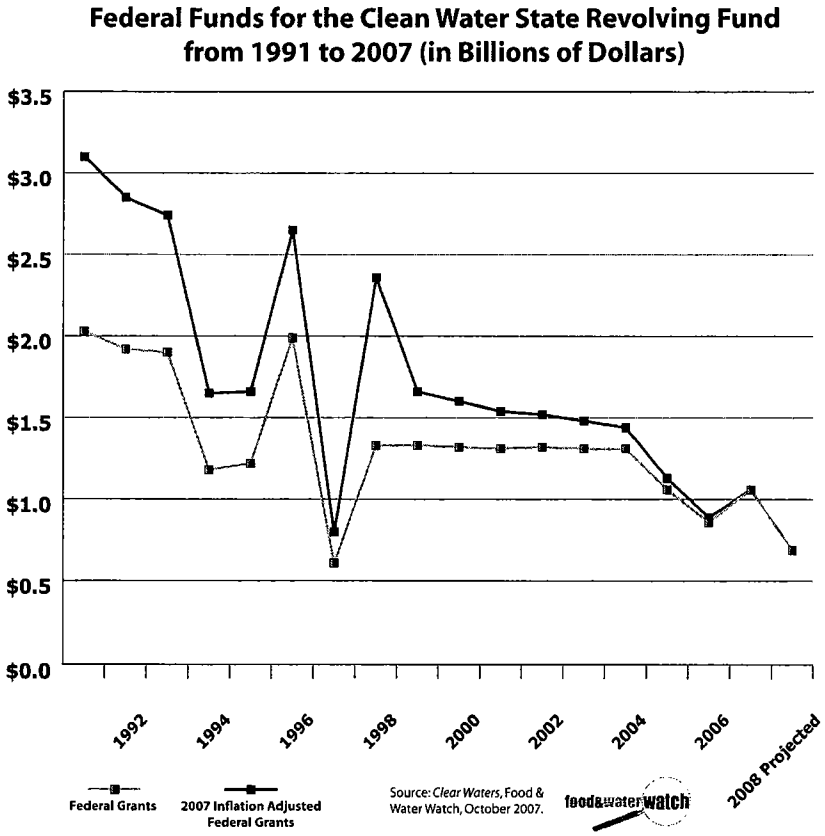
This problem is as fundamental as they come. We cannot effectively protect lakes, rivers, and coastal waters if we do not protect the waters that flow into them. Even where wetlands, seasonal streams and other waters are not continuously connected to other surface waters, they typically have important connections to groundwater, as well as biological and chemical connections that sustain healthy conditions in other wetlands, lakes, streams and rivers. Many of these systems also contribute to maintaining and protecting drinking water supplies. The Supreme Court's decisions threaten these values because they affect what kinds of aquatic resources can be considered "waters of the United States," a term that defines the scope of several protections in the law, ranging from the prohibition on unauthorized point source discharges to the oil spill prevention program and the obligation for states to identify impaired waters and develop total maximum daily loads needed for the cleanup of such waters. So, if they are not protected, they may be able to be destroyed completely or polluted with industrial waste without a Clean Water permit and potentially without any other type of regulatory oversight. This would be a disaster for those who depend on or who are trying to restore downstream waterways and who would bear the cost of cleaning up waters degraded by activities that are no longer prohibited by the Act.

Mr. Chairman, thank you and the numerous members of this Committee who are leading the effort in the House to restore clear protections for all of America's water resources. The Clean Water Restoration Act (H.R. 2421) honors the intent of the members of Congress in 1972 to broadly protect water bodies as part of a program "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[13]

2. Federal funding for infrastructure enhancements lags far behind the need.

Even while the problems are growing, the federal contribution to the Clean Water State Revolving Fund (SRF), the principal source of federal funding for clean water needs, is shrinking.

[13] 33 U.S.C. § 1251(a).



The funding gap is almost $20 billion annually, and both public and private investment in wastewater technology research and development that could save money in the long run is less than half of what it was in the 1970s.[14] As a proportion of overall wastewater infrastructure funding, federal support accounted for 78% of funding in 1978, but makes up just three percent today.[15] Projects funded by the Clean Water SRF provide water quality and community benefits, such as reduced discharges of raw sewage into rivers and lakes, less waterborne illness, enhanced wildlife habitat biodiversity, and more plentiful and safer drinking water sources.[16] It also protects businesses that are dependent upon clean water. SRF funded "projects create more than 400,000 jobs each year throughout the nation while providing other economic benefits for local communities."[17] Because it is matched at the state and local levels, the Clean Water SRF leverages non-federal investment at a rate of 2.23 times the federal dollar.[18] The Clean Water SRF has always been and continues to be a good investment.

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[14] www.epa.gov/owm.gapreport.pdf; U.S. EPA, A Retrospective Assessment of the Costs of the Clean Water Act, 1972 to 1997 (Oct. 2000) as cited by Julian Sandino, CH2MHill, "A Case for Changing the Water Infrastructure Paradigm," (Nov. 10, 2005).

[15] Food & Water Watch, *Clear Waters: Why America Needs a Clean Water Trust Fund* at v (Oct. 2007).

[16] U.S. EPA, *Financing America's Clean Water Since 1987: A Report of Progress and Innovation,* EPA-832-R-00-011, pp. 9-10 (May 2001), available at http://www.epa.gov/owmitnet/cwfinance/cwsrf/progress.pdf.

[17] AFSCME, et al., *All Dried Up: How Clean Water is Threatened by Budget Cuts*, p. 1 (2004). Available at http://www.nrdc.org/media/docs/040915.pdf.

[18] U.S. EPA, *Clean Water State Revolving Fund Programs- 2006 Annual Report*, p.18, available at www.epa.gov/owm/cwfinance/cwsrf/2006-annual-report.pdf.

One flaw in the way the program is presently implemented is that very little current Clean Water SRF funding goes to green infrastructure, which applies natural systems or designed or engineered systems that use soil and vegetation to mimic natural processes to protect and enhance environmental quality and provide utility services. However, where it is being employed, green infrastructure creates jobs for architects, designers, engineers, construction workers, maintenance workers, and a variety of small businesses engaged in designing and building green roofs, rain gardens, tree boxes, and other types of green infrastructure.[19] And both the clean waterways themselves and the green infrastructure that keeps them clean increase property values, revitalize blighted neighborhoods, enhance street life and community aesthetics, and provide free recreation.[20]

Again, we thank you, Mr. Chairman for your leadership in passing H.R. 720, the Water Quality Financing Act of 2007, earlier this year to increase the authorization for federal clean water funding and encourage it to be spent on existing needs and on projects, such as green infrastructure, that provide greater environmental benefit per federal dollar expended.

3. Sewage treatment is inadequate.

Progress in providing effective treatment of sewage is also at a standstill as a result of water pollution resulting from discharges of inadequately treated sewage from deteriorating collection systems and wastewater treatment facilities. The sewer systems are getting older, more antiquated, and are more likely to fail,[21] and they have more work to do, due to increasing population, land development that occurs at a rate more than twice the rate of population growth, and, as I mentioned, the projected impacts of global warming on water resources. There are many elements to the solutions – more federal, state, and local funding; priority for projects that provide the greatest environmental benefits; greater use of decentralized stormwater and wastewater treatment approaches that cost less and, when properly designed and maintained, can provide better treatment than centralized solutions; use of pollution prevention to reduce toxic contamination of sludge; consistent, effective use of disinfection technologies, and use of advanced treatment technologies that not only remove conventional pollutants from sewage, but also excessive nutrients.

One particular way in which the nation's sewage infrastructure under-serves us is that publicly owned treatment works (POTWs) do not effectively or consistently address one of the most serious water quality issues to which they contribute – nutrient pollution. Under the Act, POTWs must implement controls to achieve "effluent limitations based upon secondary treatment as defined by the Administrator,[22] but the agency has failed to update its rules defining what "secondary treatment" means for over two decades, and in particular has rejected citizen

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[19] http://www.treepeople.org/trees/default.htm (projects creation of 50,000 new jobs from green infrastructure initiative);); http://www.greenroofs.org/index.php?option=com_content&task=view&id=26&Itemid=40 (jobs for roofing industry projected to increase from 12,000 to 100,000 in Germany if all flat roofs were to be greened).

[20] NRDC, *Rooftops to Rivers: Green Strategies for Controlling Stormwater and Combined Sewer Overflows* (June 2006).

[21] U.S. EPA, *The Clean Water and Drinking Water Infrastructure Gap Analysis*, EPA-816-R-02-020 (Sept. 2002) (projects that 45% of sewer pipes will be in poor, very poor, or life elapsed condition by 2020, up from 10% in 1980 and 23% in 2000).

[22] 33 U.S.C. § 1311(b)(1)(B).

pleas to include nutrient pollution in the definition. This is a significant failure, as there are numerous methods to control nitrogen and phosphorus discharges at wastewater treatment plants, many of which can be accomplished by making minor retrofits to existing facilities.[23]

Another problem is our failure to effectively control raw sewage discharges from combined sewer systems. Combined sewer overflows discharge 850 billion gallons per year according to the most recent information available from U.S. EPA.[24] These overflows pose significant threats to human health, ecosystems, and the economy,[25] particularly in the Great Lakes, yet the pace at which those overflows are being reduced or eliminated is very slow. Part of the reason for the slow pace of progress may be that the CWA does not contain a deadline for remediating combined sewer overflows or even for having a long term plan in place to do so.[26] Congress may want to consider steps that it could take to speed up this process and ensure that the most environmentally beneficial approaches are used.

Lastly, we are presently missing an opportunity to reduce sewage pollution by ensuring that the public is informed when sewer systems overflow, when sewage backs up into homes or businesses, or when it is discharged without adequate treatment. The Raw Sewage Overflow Right to Know Act, HR 1720, would require sewer operators to monitor for spills and to provide prompt notification to the public and local public health authorities of sewer overflows that have the potential to protect public health. This would enable members of the public to protect themselves and their families, from exposure to raw sewage, which can make them sick, and it would help to build public support for sewer systems upgrades that are needed to ensure that all sewage receives effective treatment before it is discharged. In 1972, before the advent of the information age, such a requirement may have been onerous, but today, information of potential health hazards like raw sewage overflows can be shared in real time with everyone who has the potential to be harmed or who can take immediate action to protect others. We appreciate the leadership that this Committee has shown on this issue by holding a Subcommittee hearing on it earlier this week.

4. Beachwater contamination is insufficiently understood and its root causes are not being addressed.

Our beaches are one of our nation's national treasures, with more than half of all Americans visiting coastal areas each year. In 2000, economic activities related to the oceans contributed more than $117 billion annually to the U.S. gross domestic product. Ocean-related tourism and

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[23] *See generally* U.S. EPA, Biological Nutrient Removal Processes and Costs (June 2007) (summarizing multiple processes and nutrient removal capacities), available online at http://www.epa.gov/waterscience/criteria/nutrient/files/bio-removal.pdf.

[24] U.S.EPA news release (8/26/04), http://yosemite.epa.gov/opa/admpress.nsf/ec5b6cb1c087a230852573590040444 5/a0ee499a502cf63285256efc005a9847!OpenDocument

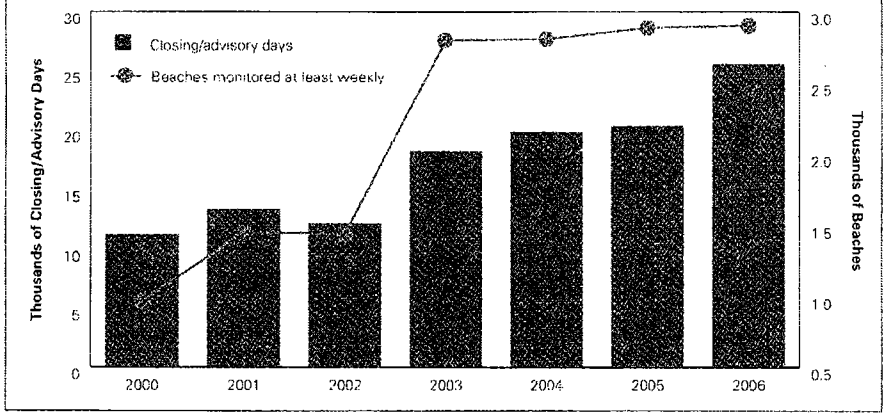
[25] Id.

[26] Copeland, C., "Water Quality: Implementing the Clean Water Act," Congressional Research Service,pp. 10-11 (Jan. 19, 2006).

recreation contributed roughly $59 billion and 1.6 million jobs to the U.S. economy in 2000.[27] Yet beachwater contamination threatens coastal economies. Waterborne pathogens contaminate water and sand and pose a threat to the health of beachgoers. Recognizing the need for consistent protection at recreational beaches, in 2000, Congress amended the CWA with the Beaches Environmental Assessment and Coastal Health (BEACH) Act, directing the EPA to develop public health based criteria for use in assessing beach water quality and to provide grants to states and local governments to develop water quality monitoring and public notification programs. As a result, every coastal state now has a beach water monitoring and public notification program.[28]

Despite this progress, pollutants continue to foul our waters, threatening human and ecological health. The more monitoring that is done, the more unhealthy beaches we find. As of 2006, there were more than 25,000 beach closing or advisory days in the U.S.[29]

Figure 1. Total Closing/Advisory Days, 2000–2006 (excluding extended and permanent)



Note: Because of inconsistencies in monitoring and closing/advisory practices among states and the different levels of data submission over time, it is difficult to make comparisons between states or to assess trends based on the closing/advisory data.

For more than half of the advisories and closings issued in 2006, the source of pollution was unknown and underlying causes remain unaddressed. The Beach Protection Act, HR 2537, would reauthorize federal funding for beachwater monitoring and public notification programs, by requiring EPA to approve and states to use rapid test methods to provide timely notification to the public about contaminated beachwaters, and allow beachwater grants to be used to find and remove the sources of beachwater pollution, not just test the water and notify the public that the water is polluted.

Again, we thank the Chairman and other members of the Committee for holding a hearing on this legislation earlier this year and urge you to move forward promptly to pass it so that Americans can begin to enjoy the benefits of enhanced beachwater quality and protection as soon as possible.

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[27] U.S. Commission on Ocean Policy, *An Ocean Blueprint for the 21st Century Final Report of the U.S. Commission on Ocean Policy,* Washington, D.C., September 20, 2004, p. 31, available at: http://www.oceancommission.gov.

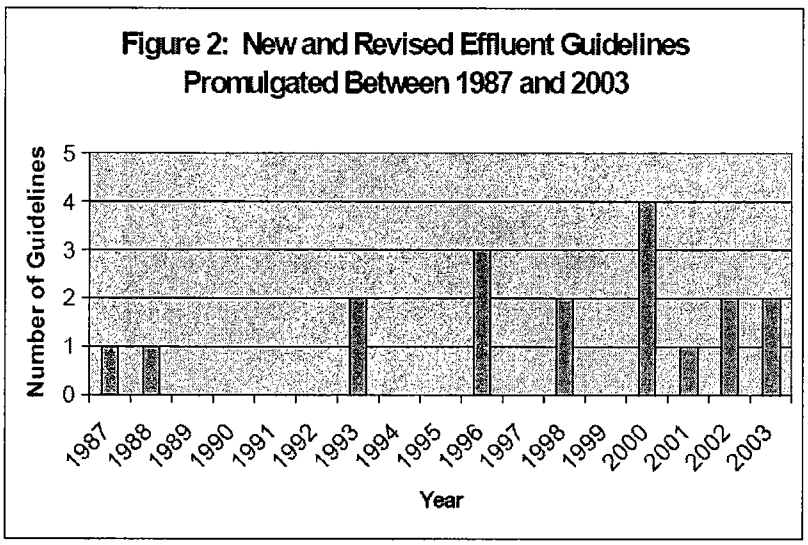
[28] NRDC, *Testing the Waters,* pp. 10-13 (August 2006).

[29] *Testing the Waters*, iv.

5. Technology standards for industrial dischargers are updated too slowly.

One of the main tools in the Clean Water Act to control point source pollution is the effluent guidelines program, under which EPA is to "identify, in terms of amounts of constituents and chemical, physical, and biological characteristics of pollutants the degree of effluent reduction attainable through the application of the best practicable control technology currently available for classes and categories of point sources (other than publicly owned treatment works). . . ."[30] Permits must reflect these technology-based controls. The law obliges EPA to revise these guidelines annually as appropriate.

Unfortunately, EPA's implementation of this program has been characterized primarily by delay. The figure below, reprinted from an EPA Inspector General report,[31] demonstrates that even though the agency has revised existing guidelines or issued new ones at an increased rate in recent years, EPA typically revises or issues fewer than two guidelines per year.[32]



At such a pace, we will be celebrating the 60th anniversary of the Clean Water Act before all of the 56 categories subject to existing effluent guidelines have been updated. Obviously, this kind of delay prevents the program from reflecting state-of-the-art pollution controls.

6. Permitting is too lax for both industrial and dredge-and-fill pollution.

The principal method by which the Clean Water Act limits the environmental consequences of activities that discharge into protected waters is by requiring such dischargers to obtain permits that minimize pollution. Both the industrial permitting program (the National Pollution

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[30] 33 U.S.C. § 1314(b)(1)(A).

[31] U.S. EPA, Office of Inspector General, Effectiveness of Effluent Guidelines Program for Reducing Pollutant Discharges Uncertain, at 6 (Aug. 24, 2004).

[32] Our review of more recent information indicates that EPA did not pick up the pace after the chart above was compiled. *See* U.S. EPA, Technical Support Document for the 2006 Effluent Guidelines Program Plan, at p. 5-3,Table 5-1 (Dec. 2006) ("Point Source Categories That Have Undergone a Recent Rulemaking or Review"; identifying two categories for 2004, and none for 2005 or 2006), available online at http://www.epa.gov/waterscience/guide/304m/2006-TSD-part02.pdf.

Discharge Elimination System, or NPDES, program) and the dredge-and-fill permit program suffer from inadequate implementation.

One significant concern with the NPDES program is that state- and EPA-issued permits often are extended beyond their statutory life of five years.[33] "As of June 2003 . . ., the backlog was reported as consisting of 1,120 major, 9,386 individual minor, and 6,512 general minor nonstormwater facilities."[34] And these are not merely minor delays, especially since EPA in 2002 re-defined the trigger for what is considered a backlogged permit from 45 days overdue to 180 days.[35] When such delays occur, there is an obvious potential to miss out on opportunities to prevent pollution; for example, recently-revised or promulgated effluent guidelines will not yet be applied to the source, and there will be a lag in incorporating water quality-based effluent limitations or wasteload allocations that become applicable during the term of the existing permit.

Another problem with NPDES permitting is that the permits either fail to include water quality based effluent limits altogether or those limits are not designed so as to ensure that water quality standards are met. Several years ago, EPA reviewed federal and state NPDES permitting practices and found that many permits were issued to dischargers based on the assumption that the water body could assimilate the effluent even though the assimilative capacity had already been assigned to other dischargers or the water was already impaired for the pollutants being discharged.[36] In such circumstances, the NPDES permit is actually adding to the pollution borne by a receiving water instead of helping to clean in up.

The primary flaw with the Corps' permits for the discharge of dredge or fill material is that they commonly fail to protect aquatic resources. The Corps rarely disapproves wetlands destruction permit applications even for activities that are not water dependent and can be moved to more suitable upland locations. In addition, although the Corps does the vast majority of its permitting business by issuing general permits for various activities on nationwide or regional basis, and although the Act only allows general permits for activities that "will cause only minimal adverse environmental effects when performed separately, and will have only minimal cumulative adverse effect on the environment,"[37] the Corps routinely authorizes activities that have vastly more than minimal impacts on the environment. For instance, the Corps' recently-issued suite of nationwide permits includes Nationwide Permit 21, which allows the disposal of surface coal mining waste in water bodies, and has been used to authorize the creation of enormous "valley fills" associated with mountaintop removal mine sites.[38] According to government estimates of the impact of mountaintop removal (a portion of which was permitted under NWP 21) in Appalachia, "[a]pproximately 1200 miles of headwater streams (or 2% of the streams in the study area) were directly impacted by MTM/VF features including coal removal areas, valley

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[33] 33 U.S.C. § 1342(b)(1)(B).
[34] U.S. EPA, Office of Inspector General, Efforts to Manage Backlog of Water Discharge Permits Need to Be Accompanied by Greater Program Integration, at 5 (June 13, 2005), available online at http://www.epa.gov/oig/reports/2005/20050613-2005-P-00018.pdf.
[35] *Id.* at 30.
[36] 65 Fed. Reg. 43586, 43641-42 (July 13, 2000).
[37] 33 U.S.C. §1344(e)(1).
[38] 72 Fed. Reg. 11,092, 11,113-17 (Mar. 12, 2007).

fills, roads, and ponds between 1992 and 2002. An estimated 724 stream miles (1.2 % of streams) were covered by valley fills from 1985 to 2001."[39]

With NWP 21 and many other general permits, the Corps has argued that this approach complies with the CWA because district engineers can require a permittee to mitigate a project's negative impacts (for instance, by creating a water body to "replace" the one impacted or destroyed). This notion is fundamentally wrong for multiple reasons, most notably because the Corps has little reason to believe that required mitigation projects will consistently restore lost functions. In fact, the Corps has conceded that mitigation has not fully achieved its goal:

> We acknowledge that the ecological success of compensatory mitigation projects varies widely. Some compensatory mitigation projects fail to meet their objectives, while others do result in successful replacement of aquatic resource functions that are lost as a result of activities authorized by NWPs. We are committed to improving compliance for compensatory mitigation required for Department of the Army permits, including NWPs.[40]

In similar fashion, a West Virginia district court recently ruled that the Corps' failed to evaluate the ecological and hydrological functions performed by the resources that had been authorized under a mining permit, and ruled that the Corps therefore "could not reasonably conclude that mitigation will offset the loss because it does not know what to replace."[41]

7. Enforcement resources are too few and the present administration's commitment to effective enforcement is questionable.

In an extensive article published a few weeks ago, the Washington Post concluded that criminal and civil enforcement by EPA took an extreme downturn in recent years. While not specific to water pollution cases, the analysis revealed that "the number of prosecutions, new investigations and total convictions [are] all down by more than a third" and that "[t]he number of civil lawsuits filed against defendants who refuse to settle environmental cases was down nearly 70 percent between fiscal years 2002 and 2006, compared with a four-year period in the late 1990s. . . . ."[42] Although EPA argued that the agency is focusing on major pollution-reducing cases, the evidence suggests that most of EPA's water cases do not fit this description. According to the EPA Inspector General, "[l]ess than 1 percent of the CWA cases accounted for 52 percent of the projected pollutant reductions from concluded CWA enforcement actions." The chart reproduced below indicates that most enforcement actions are not projected to have major pollution-reducing impacts.[43]

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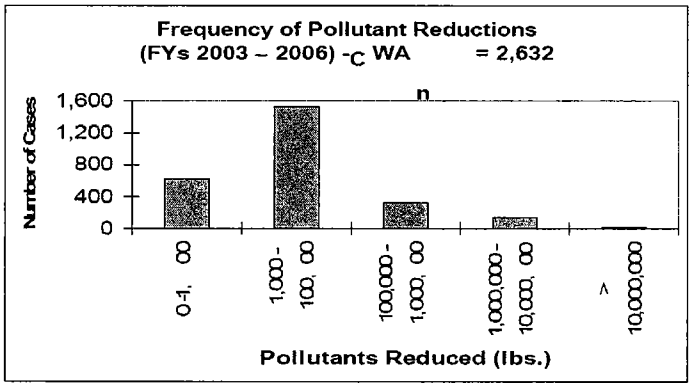
[39] U.S. EPA et al., Mountaintop Mining/Valley Fills in Appalachia: Final Programmatic Environmental Impact Statement, at 4 (Oct. 2005).
[40] 72 Fed. Reg. at 11100.
[41] *Ohio Valley Envtl. Coalition v. U.S. Army Corps of Eng'rs*, 479 F.Supp.2d 607,(S.D.W.Va. 2007); *see also id.* at 649 n. 69 ("At trial, Dr. Sudol [of the Corps] testified that he had no personal knowledge of any successful stream creation projects involving headwater streams, only anecdotal knowledge of a stream in southern California.").
[42] John Solomon & Juliet Eilperin, *Bush's EPA Is Pursuing Fewer Polluters: Probes and Prosecutions Have Declined Sharply*, at A1 (Sept. 30, 2007).
[43] U.S. EPA Office of Inspector General, Assessment of EPA's Projected Pollutant Reductions Resulting from Enforcement Actions and Settlements, "At a Glance" & at 17 (July 24, 2007).

Most Projected Pollutant Reductions from CWA Enforcement Actions are Modest (1,000 – 100,000 pounds)



More to the point, it is clear that there are fewer resources available for environmental enforcement. According to a July report by the Government Accountability Office, EPA's total budget for enforcement fell five percent in real terms from 1997 to 2006, with funding to regional enforcement (where most of the enforcement activity occurs) declining 8 percent in real terms.[44] EPA grants to states for environmental program implementation dropped nine percent in real terms over the same period.[45] Consistent with these declines, "EPA reduced the size of the regional enforcement workforce by about 5 percent over the 10 years," a problem exacerbated by the fact that "[t]hese reductions in funding occurred during a period when statutory and regulatory changes increased enforcement and other environmental program responsibilities."[46]

In light of the enforcement downturn, it is perhaps not surprising that the compliance rates of sources discharging pollution to our waterways are disappointing. The U.S. PIRG Education Fund's recent analysis of EPA data reveals that pollution limits in Clean Water Act permits are often exceeded. The report finds:

- "Nationally, more than 3600 major facilities (57%) exceeded their Clean Water Act permit limits at least once between January 1, 2005 and December 31, 2005."[47]
- "The 3600 major facilities exceeding their permits in the time period studied reported more than 24,400 exceedances of their Clean Water Act permit limits. This means that many facilities exceeded their permits more than once and for more than one pollutant."[48]

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[44] U.S. Government Accountability Office, Environmental Protection: EPA-State Enforcement Partnership Has Improved, but EPA's Oversight Needs Further Enhancement, at 12 (July 2007).
[45] *Id.* at 15.
[46] *Id.* at 13 & 7.
[47] U.S. PIRG Education Fund, Troubled Waters: An analysis of 2005 Clean Water Act compliance, at 7 (Oct. 2007).
[48] *Id.*

- "Nationally, 628 major facilities exceeded their Clean Water Act permit limits for at least half of the monthly reporting periods between January 1, 2005 and December 31, 2005."[49]
- "Major facilities exceeding their Clean Water Act permits, on average, exceeded their permit limits by 263% . . . ."[50]

This situation must be remedied. An adequate enforcement budget is the beginning of a solution, but agency follow-through is at least as important; if we are to see real deterrence, polluters must understand that if they violate the Clean Water Act, the government will not ignore their noncompliance.

8. Development pressures lead to increased stormwater pollution and sewage overflows, and techniques to minimize these impacts are infrequently employed.

Stormwater runoff from development is one of the largest and fastest growing sources of water pollution in the U.S. As of the most recently-published national water quality inventory, it is the largest source of pollution in ocean shoreline waters and the second largest source of pollution in estuaries and the Great Lakes.[51] As previously undeveloped land is paved over and built upon, the amount of stormwater running off roofs, streets and other impervious surfaces increases. The increased volume of stormwater runoff and the pollutants carried within it degrade the quality of local and regional water bodies. The problem of polluted stormwater runoff has two main components: the increased volume and rate of runoff from impervious surfaces and the concentration of pollutants in the runoff. Both components are highly related to development in urban and urbanizing areas. Sediments, toxic metal particles, pesticides and fertilizers, oil and grease, pathogens, excess nutrients, and trash are common stormwater pollutants. Many of these constituents end up on roads and parking lots during dry weather only to be washed into waterbodies when it rains or when snow melts. Together, these pollutants and the increased velocity and volume of runoff cause dramatic changes in hydrology and water quality that result in a variety of problems. These include increased flooding, stream channel degradation, habitat loss, changes in water temperature, contamination of water resources, and increased erosion and sedimentation. These changes affect ecosystem functions, biological diversity, public health, recreation, economic activity, and general community well-being.[52]

Thus, as development continues, nature's own ability to maintain a natural water balance is lost to a changing landscape and new impervious surfaces. Trees, vegetation and open space typical of undeveloped land capture rain and snowmelt allowing it to largely infiltrate where it falls. Under natural conditions, the amount of rain that is converted to runoff is often 1% of the rainfall volume. Replacing natural vegetation and landscape with impervious surfaces has significant environmental and public health impacts, including contaminated and depleted drinking water sources, flooding, loss of riparian habitat, and recreational waters that are no longer safe for swimming.

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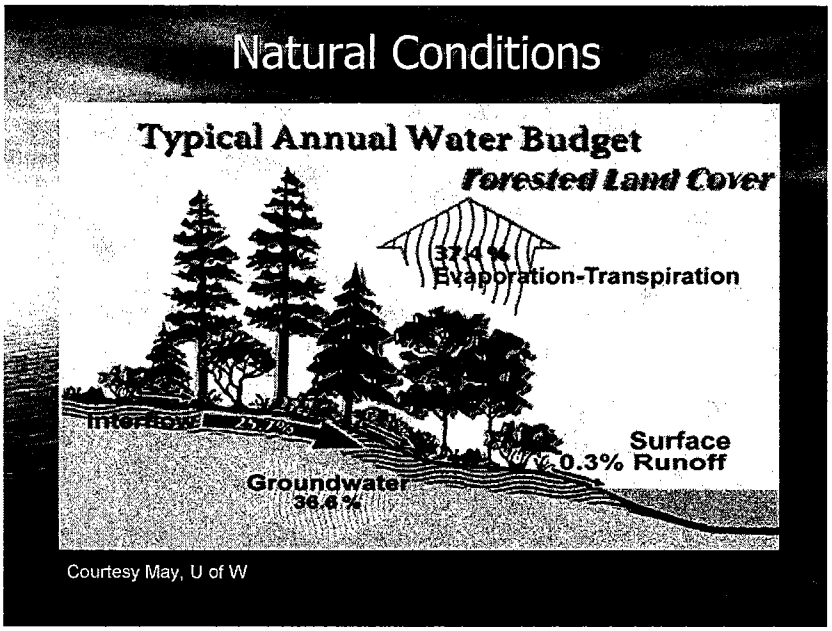
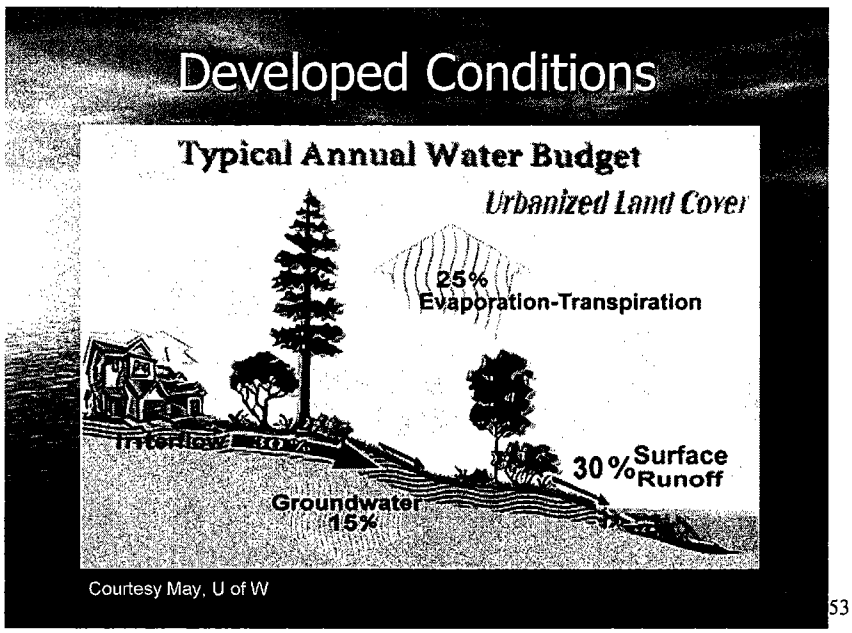
[49] *Id.*
[50] *Id.* at 8.
[51] www.epa.gov/owow/305b/200report/chp4.pdf.
[52] NRDC, *Stormwater Strategies: Community Responses to Runoff Pollution* (1999), available online at http://www.nrdc.org/water/pollution/storm/chap3.asp.





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The challenge of reducing stormwater pollution is finding an effective method of reducing the amount of stormwater created in urban environments. Methods currently used to manage stormwater largely fail to address the underlying problem of imperviousness. Stormwater collected in separate systems typically is not treated before being discharged, and even when it is treated, the treatment fails to address the scouring, erosion and other physical impacts of stormwater discharges.

[53] Slides courtesy of Christopher W. May, PhD, University of Washington.

Fortunately, there are a suite of solutions currently in use in a number of forward thinking communities that capture, retain, filter, and sometimes also harvest stormwater for re-use on site.[54] These approaches minimize the amount of stormwater generated on-site through strategies to reduce imperviousness and maximize infiltration and filtration, such as use of green roofs, rain gardens, permeable pavement, and grassy drainage swales. These approaches are often less expensive and more effective than current stormwater controls, and they not only reduce pollutant loads, but also prevent flooding, recharge groundwater supplies, cut water use, and restore natural stream flows. In areas with combined sewer systems, these on-site strategies are particularly attractive because the alternatives are underground or centralized storage systems that are often quite expensive and provide fewer benefits. One way to look at it is that for hundreds of millions (even billions) of dollars, a community can reduce sewage overflows to rivers and lakes by using hard infrastructure storage and treatment methods or it can reduce sewer overflow to rivers and lakes, create green space, restore degraded urban lands, increase real estate values, mitigate global climate change, reduce heat deaths, conserve water and energy, control floods, increase wildlife habitat, improve aesthetics, etc. all for the same dollar spent by investing in green infrastructure.[55]

There several opportunities on the horizon for shifting wastewater infrastructure investment toward green technologies to reduce stormwater pollution and combined sewer overflows. One is the effluent limitation guideline for construction and development that EPA is currently preparing under court order. That presents a promising opportunity to set new source performance standards for new development and redevelopment, which are the industry categories to which the new rules would apply. As with many things, it is much easier and cheaper to do it right the first time by designing development to prevent stormwater pollution in the first place rather than to retrofit existing development later. By adopting a standard that would require maintenance of pre-development hydrology on site, a standard that is already in use in several states and progressive communities, EPA could ensure that development does not continue to add to the pollution burden borne by communities across the U.S.

A second opportunity is presented by the partnership agreement that NRDC signed with U.S. EPA, the Low Impact Development Center, the National Association of Clean Water Agencies, and the Association of State and Interstate Water Pollution Control Administrators last spring.[56] Those groups, and many others that have endorsed the underlying principles, have committed to working together to promote the use of green infrastructure to address sewer overflows and stormwater pollution. That effort could really take off if there were a substantial infusion of federal funds to match state and local resources for research to support implementation of these approaches through existing regulatory programs. The greatest needs are for the development of models to project the environmental benefits of intensive, systematic application of these approaches and monitoring of results, both environmental and economic, such as job creation and property value enhancement.

Another opportunity for strengthening the stormwater program involves using the periodic renewal of municipal, industrial, and construction stormwater permits to strengthen discharge

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[54] NRDC, *Rooftops to Rivers* (June 2006).
[55] Adapted from a presentation by Steve Wise, Center for Neighborhood Technology (Sept. 2007).
[56] http://cfpub.epa.gov/npdes/greeninfrastructure/information.cfm.

limitations. Most of these permits are ineffective because they fail to contain clear, enforceable provisions. Instead, they frequently contain generic guidelines that are neither tailored to the needs of the receiving water nor do they require use of the best technologies available to reduce stormwater pollution. Worse still, the permit terms are often so vague that the permittee is asked to develop its own effluent limitations. Not surprisingly, these permits are rarely effective in controlling stormwater runoff.[57]

9. Pollution from animal factories continues to impact water bodies.

According to EPA and U.S. Department of Agriculture figures, facilities that confine animals generate roughly three times the raw waste that humans in the United States produce.[58] The waste generated at such sites is hardly benign: "The primary pollutants associated with animal wastes are nutrients (particularly nitrogen and phosphorus), organic matter, solids, pathogens, and odorous/volatile compounds. Animal waste also contains salts and trace elements, and to a lesser extent, antibiotics, pesticides, and hormones."[59] As a consequence, animal factories have the capacity to contribute significantly to water pollution.

Even though the Clean Water Act specifically identifies concentrated animal feeding operations (CAFOs) as point sources, EPA's recent history of regulating animal factories' water pollution discharges has been decidedly checkered. A 2003 regulation did a little good – after finding that "only a small number of Large animal factories have actually sought permits," EPA required animal factories to obtain permits unless they have no potential to discharge.[60] But that rule also was far too weak: EPA created a loophole for runoff from manure application areas by classifying much of that discharge as exempt "agricultural stormwater"; the agency relied heavily on nutrient management plans (essentially just animal factories' approach to manure application), but did not require the details of such plans to be part of the publicly-enforceable permit; and EPA did not require significant limits on pathogen discharges.

NRDC and others challenged the rules in court. The industry also sued. In a 2005 decision, the court agreed with us in large part, finding that nutrient management plans should be incorporated into facilities' permits and ordering EPA to reassess the feasibility of pathogen controls. The industry convinced the court that EPA cannot require permits purely based on facilities' potential to discharge, but indicated that there was a strong reason to require permits from this category of sources and left open the possibility that EPA could establish a presumption that large animal factories will actually discharge.[61]

Unfortunately, EPA has used the court's decision to propose a rule that is even weaker than the 2003 rule. The agency is now poised to unreasonably allow facilities to self-determine whether they are likely to discharge and therefore need to get permits, a step that EPA estimates will reduce the number of permitted facilities by a quarter as compared to the 2003 rule.[62] In

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[57] See., e.g., http://www.chesapeakebay.net/pubs/calendar/USWG_06-28-07_Presentation_2_8815.pdf.
[58] 68 Fed. Reg. 7176, 7180 (Feb. 12, 2003).
[59] Congressional Research Service, Animal Waste and Water Quality: EPA Regulation of Concentrated Animal Feeding Operations (CAFOs), at 5 (Sept. 21, 2006).
[60] 68 Fed. Reg. at 7201.
[61] *Waterkeeper Alliance, Inc. v. U.S. EPA*, 399 F.3d 486 (2d Cir. 2005).
[62] 71 Fed. Reg. 37,744, 37,774 (June 30, 2006).

addition, EPA has proposed to require nutrient management plans to be in permits, but also to continue to allow facilities to shield portions of their plans from being included in its citizen-enforceable permit.[63] Finally, the agency has failed to adequately address the fact that available technologies could improve the way that facilities can control pathogen discharges.[64]

There is only one real solution to the animal factory mess the agency is in the midst of creating – EPA must revoke its proposed rule and start again. It must demand that animal factories play by the same rules as any other polluting industry. What that means is that animal factories must obtain permits when it is reasonable to anticipate they will discharge, their pollution control strategy – their nutrient management plans – must be fully enforceable, and they must implement technology-based controls for the pollutants they discharge, such as pathogens. If EPA fails to act responsibly, it is incumbent on Congress to step in to ensure effective regulation of this industrial sector.

10. Invasive species are not yet adequately controlled under the Clean Water Act, and there are efforts afoot to exempt vessel discharges containing invasive species from the Act.

A critical threat to water quality and the health of our environment is the continued introduction of aquatic invasive species into our ports, rivers, lakes and wetlands.

In the Great Lakes alone, more than 160 invasive fish, plant, and parasitic species have invaded and established themselves, and researchers discover, on average, a new invasive species every eight months. While some are non-threatening, others are aggressive and highly adaptable. These invaders can reproduce quickly and be very difficult to eradicate. They have already contributed to the extinction of many plants and animals native to the Great Lakes region, which constitute 20% of the world's fresh water. As a result, the Lakes' natural biodiversity and water quality pay a heavy price as does the region's economy.

The Clean Water Act can be applied properly to the problem of aquatic invasive species and can significantly help meet the threat and protect against the continuing introduction of "living pollution" into our waters.

Last year, a federal court held that the Clean Water Act, by its plain terms, applies to pollution from vessels, including discharges of invasive species.[65] The court ordered that EPA's regulatory exclusion from Clean Water Act permitting for "discharge incidental to the normal operation of a vessel" will be vacated on September 30, 2008. Accordingly, ballast water, the major vector for aquatic invasive species, will soon finally be subject to the CWA. The case is now on appeal before the Ninth Circuit Court of Appeals.

Applying the CWA to ballast water discharges (invasive species, sediment, chemicals) will bring 35 years of program experience, regulatory expertise and case law to the problem of invasive species. For instance, having the law apply means that citizens will be able to challenge vessels'

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[63] *Id.* at 37,753-55
[64] *Id.* at 37,763-73
[65] *Northwest Environmental Advocates v. U.S. EPA*, No. 03-05760, 2006 WL 2669042 (N.D. Cal., Sept. 18, 2006).

failure to get pollution-limiting permits or their violation of such permits. Absent the CWA, an aquatic invasive species program will otherwise have to be reinvented.

Unfortunately, shipping interests are aggressively seeking to escape from effective regulation through legislation that would preempt application of the CWA to ballast water releases. We are dismayed that this Committee's ballast water legislation, contained in Title V of H.R. 2830, undercuts the CWA by eliminating pre-existing statutory savings clauses for the CWA and by suggesting that EPA's regulatory exemption may be proper. We look forward to working with members of the Committee and others in the House to address these concerns. It would be a mistake to turn our backs on the CWA now that aquatic invasive species are about to be included in its comprehensive, well-tested pollution control regime, with its long track record of reducing numerous types of water pollution from a wide variety of sources.

On the 35th anniversary of the CWA, it would be fitting and appropriate for Congress to reject the efforts to blunt the CWA, and speed the application of the Act to the serious problem of aquatic invasive species.

B. THE WATER IMPACTS OF LESS TRADITIONALLY-REGULATED WATER POLLUTION SOURCES CAN SIGNIFICANTLY AFFECT WATER QUALITY BUT TO DATE HAVE BEEN MOSTLY IGNORED IN NATIONAL WATER POLLUTION CONTROL POLICY.

1. Agricultural runoff

Raising crops and livestock can have enormous impacts on water quality. In particular:

> EPA's 2000 Inventory data indicate that the agricultural sector including crop production, pasture and range grazing, concentrated and confined animal feeding operations, and aquaculture is the leading contributor of pollutants to identified water quality impairments in the Nation's rivers and streams. This sector is also the leading contributor in the nation's lakes, ponds, and reservoirs. Agriculture is also identified as the fifth leading contributor to identified water quality impairments in the nation's estuaries.[66]

Agriculture contributes to water quality problems in several ways, but one of the most significant is that it is a leading source of nutrient pollution in waterways. One of the primary adverse effects of excess nutrients in aquatic systems is the creation of anoxic conditions, including so-called "dead" zones. This year, according to a report by Dr. Nancy Rabalais, the Gulf of Mexico "Dead Zone" ranks as one of the three largest areas of Gulf hypoxia measured to date, with an area of 20,500 square kilometers.[67] Nutrients are a key part of that problem. "Scientific investigations over the last several decades indicate overwhelmingly that oxygen stress in the northern Gulf of Mexico is caused primarily by excess nutrients delivered to Gulf waters from the Mississippi–Atchafalaya River drainage basin, in combination with the stratification of Gulf

[66] 68 Fed. Reg. at 7181.

[67] Louisiana Universities Marine Consortium, Press Release: Dead Zone Size Near Top End (July 28, 2007), available at http://gulfhypoxia.net/shelfwide07/PressRelease07.pdf.

waters."[68] Analyzing data over a 50-year period from the southwest coast of Florida, researchers at the University of Miami determined that *K. brevis* red tides are occurring with greater frequency, closer to shore, and during more months of the year. They attribute this phenomenon to greater inputs of nutrients into coastal waters due to increased agricultural runoff and sewage discharges in the watershed over that time period.[69]

Notwithstanding these impacts, however, the Clean Water Act largely takes a hands-off approach to most pollution from agriculture, as "non-point" source pollution is exempt from the Act's permitting requirements.[70] The Act expects states, among other things, to assess waters to identify where achieving water quality standards would not be possible without non-point controls.[71] States also must develop management programs subject to EPA approval, which identify best management practices (BMPs) to reduce loadings from relevant sources, specify the mechanisms to implement these BMPs, include a schedule to ensure that BMPs are utilized "at the earliest practicable date" and demonstrate the authority to implement the program.[72] These provisions hardly ensure that states will implement robust non-point controls. To the contrary, EPA may approve state management programs that do not fully address problems caused by non-point pollution; plans must only have sufficient measures to "reduce" non-point pollution and "improve" water quality.[73]

To address these concerns, we recommend improvements to the current approach to agricultural pollution:

- The CWA should require States to revisit the initial assessment of waters affected by non-point pollution and update their management plans accordingly; better track States' implementation of their plans and the actual water quality impacts of using the specified BMPs; and link availability of grant funding under section 319(h) to effective implementation of management plan.
- Congress should provide additional authority to require plans to have sufficient mechanisms to fully address the contribution to water quality impairments made by non-point pollution. In particular, if the law specifically required plans to implement and achieve total maximum daily loads developed for impaired water bodies, there would be a regulatory incentive to focus on those sources of pollution – including agricultural sources – that make the greatest contribution to the impairment.
- Congress should create an enforceable program to ensure widespread adoption of BMPs through conditions on Farm Bill payments or alternative means (for instance, requiring conventional water pollution control permits unless BMPs are implemented).

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[68] National Science and Technology Council, Committee on Environment and Natural Resources, Integrated Assessment of Hypoxia in the Northern Gulf of Mexico, at 13-14 (May 2000).
[69] Brand, L.E., Compton, A., "Long-term increase in *Karenia brevis* abundance along the Southwest Florida Coast," Harmful Algae, Vol. 6, No. 2, Feb. 2007, pp. 232-252, as cited in NRDC, Testing the Waters, p. 24 (Aug. 2007).
[70] An exception to this general principle is the animal sector. Concentrated animal feeding operations, as noted above, are specifically required by the law to be considered "point sources." *See* 33 U.S.C.A. § 1362 (14).
[71] 33 U.S.C. § 1329(a).
[72] *Id.* § 1329(b)(2).
[73] *Id.* § 1329(d)(2)(D).

Stepping beyond the Clean Water Act, a number of critical issues – energy policy, global warming, agriculture, and environmental sustainability – are coming to a head in the context of our national policy towards biofuels. A recent report issued by the National Academies of Science leads us to conclude that unless Congress acts decisively through the Farm Bill and comprehensive energy bill, increased biofuels production will increase water pollution from agriculture and intensify many regional and local water shortages.[74] Although the report details many agricultural practices, technologies, and alternative crops such as prairie grass that could help reduce total water use and water-pollution associated with the production of biofuels, policies must change for those strategies to become the norm. To deliver on the promise of biofuels, Congress must dramatically increase funding for Farm Bill conservation programs and reform them to get more conservation per dollar. We also need to shift our biofuels policies to improve environmental and energy security performance rather than simply increasing the volume of production.

2. Aerial deposition

Historically, neither the Clean Water Act itself nor the authorities charged with implementing it have focused much on water pollution that travels through the air before it reaches water bodies. It is impossible to deny, however, that such sources can be significant. For example, in 2000, aerial deposition of nitrogen represented about 32 percent of the total nitrogen entering the Chesapeake Bay.[75] More dramatically, mercury contamination of water bodies is widespread, largely as a result of airborne mercury deposition. According to EPA: "A total of 14,035,676 lake acres and 882,428 river miles were under [a fish consumption] advisory for mercury in 2005. In 2006, these numbers increased to 14,177,175 lake acres and 882,963 river miles. This represents an increase of 993,427 lake acres (+8%) and 117,564 river miles (+15%) under advisory between 2004 and 2006."[76]

EPA has essentially acted as though solving these problems is not appropriate under the Clean Water Act, and appears to have concluded that if it falls from the sky, it's the Clean Air Act's problem. For instance, the agency issued a guidance memorandum in March that sends a clear message to states that if their water bodies are impaired by mercury deposition, they may indefinitely delay developing a total maximum daily load for such waters by implementing, to some undefined degree, a program of identifying, reducing, and reporting on mercury pollution in the state.[77] But, as the agency candidly acknowledges, "EPA does not expect that States would necessarily demonstrate that their mercury reduction program will achieve water quality standards in order to" qualify for the delay the memo offers.[78]

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[74] National Research Council, Water Science & Technology Board, Water Implications of Biofuels Production in the United States (Oct. 2007).
[75] U.S. EPA Office of Inspector General, EPA Relying on Existing Clean Air Act Regulations to Reduce Atmospheric Deposition to the Chesapeake Bay and its Watershed, at 4 (Feb. 28, 2007).
[76] U.S. EPA Office of Water, Fact Sheet: 2005/2006 National Listing of Fish Advisories, at 5 (July 2007), available online at http://epa.gov/waterscience/fish/advisories/2006/tech.pdf.
[77] Memorandum from Craig Hooks, U.S. EPA Office of Water, Office of Wetlands, Oceans, and Watersheds, to EPA Regions 1-10 Water Division Directors (Mar. 8, 2007).
[78] *Id.* at 7.

It does not appear that EPA is addressing other airborne pollutants under the Clean Water Act either. In testimony to the Water Resources Subcommittee in April, Assistant Administrator Grumbles focused on the programs available under the Clean Air Act when discussing several different kinds of atmospheric deposition.[79] Likewise, the Center for Biological Diversity has petitioned a number of states to use the Clean Water Act to consider acidification from carbon dioxide emissions by including coastal ocean waters on their lists of impaired water bodies.[80] To our knowledge, no state has yet done such a thing, and EPA does not appear to have encouraged states to do so.

Air pollution control programs are not well-designed to protect water bodies. Water quality-based tools should be used to address the water quality problems that aerial deposition of pollution causes. One solution in this regard would be to require (and make enforceable) implementation plans for TMDLs so that aerial sources of water pollution can be made to control their emissions where it is needed to meet water quality standards.

3. Global Warming

We can hardly have expected Congress to consider climate change when the CWA was passed in 1972, but there is no excuse for not factoring it into decision-making about our water resources today. The world's climate is warming – by an average of 1.4 degrees Fahrenheit in the past century alone. Unless current trends are reversed, global warming pollution is projected to keep increasing rapidly, raising temperatures by as much as 10 degrees Fahrenheit by the end of this century, compromising our water supply, flood management systems, and aquatic ecosystems. Experts predict that rising temperatures will lead to less alpine snowpack, earlier and larger peak streamflows, greater evaporative losses, declining ecosystem health, sea level rise, more extreme weather events – including both floods and droughts – and hotter, drier summers. We're already seeing evidence of these trends around the West. For example, snowpack, acting as temporary storage, provides up to 75 percent of the region's annual water supply. However, additional increases in global temperatures will significantly decrease snowpack in the West by as much as 40 percent by 2060.[81] As stewards of one of the most valuable and scarce resources, water, Congress can lead the response to ongoing climate changes and help stave off further damage.

The most important step that Congress can take, of course, is to address Congress directly by enacting HR 1590, the Safe Climate Act of 2007, however, there are also a number of steps that Congress can take to mitigate the adverse effects of climate change on water resources, including the following:

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[79] Testimony of Benjamin H. Grumbles, Assistant Administrator For Water, U.S. EPA, Before the Subcommittee on Water Resources and Environment, Committee on Transportation and Infrastructure, United States House Of Representatives (Apr. 17, 2007). Absurdly, Mr. Grumbles presented the new EPA guidance allowing delays in mercury TMDLs as an example where "EPA is reducing the water quality impacts of air deposition of mercury under the CWA." *Id.* at 5.

[80] Center for Biological Diversity, Seven Coastal States Petitioned to Address Ocean Acidification: Clean Water Act Requires Regulation of Carbon Dioxide That Could Drive Ocean Species Extinct (Aug. 15, 2007), available online at www.biologicaldiversity.org/swcbd/PRESS/ocean-acidification-08-15-2007.html.

[81] NRDC, *In Hot Water* (July 2007).

- Require federal agencies to perform vulnerability analyses addressing the impacts of climate change on existing Corps flood management and water storage facilities and systems. This analysis should include changes in surface runoff, riverine hydrology, changes in watershed characteristics, sea level rise, etc.
- Require the Corps and EPA to integrate climate issues into ongoing planning (e.g. flood management, levee construction, flood conveyance and surface storage projects), operations, funding and regulatory work (e.g. sewer overflows, stormwater controls, total maximum daily loads, wetlands protection).
- Require Corps and FEMA analyses of 100yr floodplains for FEMA flood maps to address and provide for increases in the size, frequency, and timing of peak flows related to future climate change.
- Require DOE and other federal agencies evaluate the energy-related impacts of water management decisions, which can save both water and energy.[82]
- Require EPA to analyze the water quality impacts of climate change. Three of the primary mechanisms are increases in runoff and infiltration from higher peak rain events, lower summer surface and groundwater flows (thus concentrating pollutants and depleting available water supplies) and higher temperatures (reducing species diversity and increasing the need for trees, stream buffers, and other means of cooling waterways and the discharges into them).
- Require the Corps to evaluate surface storage re-operation opportunities – combined with explorations of potential increases in downstream floodways.
- Provide funding or other incentives to encourage integrated water resource management – analysis of long-term trends in needs and uses of water resources for the next 50 to 100 years in light of global warming and how to ensure that we maximize the availability of those resources for human and ecological needs.
- Address the residual risk in deep floodplains behind levees.
- Increase flood protection standards for urban areas to higher than the current 100-year level of protection taking into account changes in hydrology related to climate change.
- Strengthen protections for wetlands, headwaters, and forests because of the climate change protection they provide along with their other benefits.

4. Integrated Water Resource Management

As a number of the other topics that I have discussed have foretold, the big shift in water resource protection that is needed is a change from separate and disparate protections for surface waters as opposed to groundwaters, coastal waters as opposed to freshwaters, and tap water as opposed to source waters to an integrated approach. All of these waters are interrelated in terms of their functioning in both a natural and developed world. We need to start thinking of them much more in an integrated way and devise policy solutions that take advantage of synergies as opposed to narrow thinking that merely shifts a pollution problem from surface to groundwater or from waterbodies to lands.

[82] For a report exploring the very significant linkage between water and energy, see http://www.nrdc.org/water/conservation/edrain/contents.asp.

The next generation of protections for aquatic resources has to be much more holistic, but that will require major shifts in responsibility among agencies and institutions at the federal, state, and local levels. This effort will require us to integrate programs that promote or require water conservation, low impact development, smart growth, reforestation, wetland and stream restoration, stormwater harvesting, xeriscaping, floodplain protection, wetlands and headwaters protection, riparian buffers, source water protection, groundwater recharge, gray water recycling, coastal dune protection, water budgeting, and a whole host of other practices designed to maintain and restore U.S. water resources. We urge Congress to begin now to think about how to move to such a system, including through providing funding and incentives for research, pilot projects, and demonstrations of all kinds by those innovators interested in pioneering these approaches.

CONCLUSION

In short, while passage of the CWA was a tremendous achievement in the history of the environmental movement and achieved tremendous success in addressing some of the most egregious sources of water pollution, it is aging, and the bald spots and gray hairs are beginning to show rather clearly at this point. There is still a lot of work that needs to be done to carry forth the mandates of the Act and to provide adequate funding for its programs, but even that will not be enough to address the water resource challenges ahead of us. We need to look again at protection of our water resources from first principles, including the water cycle that we studied in grade school, and begin to construct the system that will ensure that our children and grandchildren can enjoy the many benefits of clean and safe water as we have. Let's honor the legacy of the Clean Water Act by moving forward.