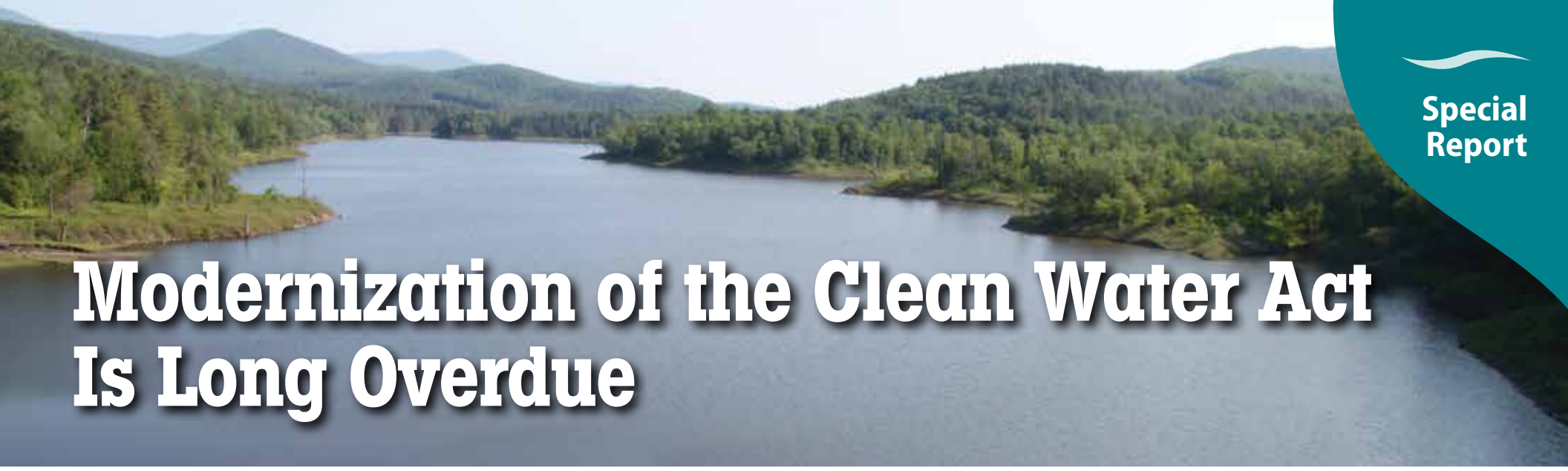

Special Report

Modernization of the Clean Water Act Is Long Overdue

By Heather Radcliffe, NEIWPCC

October 2015 marks the 43rd anniversary of the Clean Water Act and 28 years since its last major amendments. While there is much to celebrate—undeniably, significant progress in water quality has been made since 1972—it is time to move forward from boasting that our rivers no longer catch fire.

Despite more than forty years of regulation, "the physical, chemical, and biological integrity of the Nation's waters" have not, in the words of the Act, been "restore[d] and maintain[ed]," and all our nation's waters have not achieved the Act's fishable, swimmable goal (33 U.S.C. § 125(a)). Instead, nearly two thirds of all waters assessed by the states are impaired, including nearly 68 percent of the area of assessed lakes, ponds, and reservoirs and 78 percent of assessed bays and estuaries.[1]

The Clean Water Act—originally known as the Federal Water Pollution Control Act—was written in response to egregious pollution from wastewater-treatment facilities and major industrial sources. Today, we face many complex challenges not anticipated by the original authors of the Act, which was written to address the demands of society and the environment as they existed in 1972.

While the Clean Water Act catalyzed the cleanup of the most obvious point sources of pollution from many of our nation's waters, more work remains to be done, particularly on impairments resulting from nutrients and from pathogens like bacteria and viruses. Our commitment to protect and restore the physical, chemical, and biological integrity of our nation's waters has stalled.

This is not to say that the Clean Water Act has failed; it has not. It succeeded in reducing the point sources it was meant to, namely, the direct discharge of raw sewage and other pollutants into our nation's waters. Passed in 1972 and reauthorized in 1987, the Clean Water Act is reaching the limits of its potential. A new approach is required to regulate our water resources—one that takes into account the issues and needs that dominate present conditions.

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Twenty-First Century Challenges

The 1972 Clean Water Act has had major beneficial impacts on the quality of our nation's waters, but it does not provide the tools to solve our nation's twenty-first-century water challenges. A new Clean Water Act must address (1) jurisdiction, (2) aging water and wastewater infrastructure, (3) funding needs and affordability, (4) a watershed approach, (5) nonpoint-source pollution, (6) green infrastructure, (7) the energy-water nexus, and (8) climate change.[2]

Jurisdiction

The limits on the Clean Water Act's jurisdiction should be revised to reflect the interrelated and interdependent nature of the hydrologic cycle.

The issue of which waters are protected by the Clean Water Act is critical to the Act's entire functioning. The Clean Water Act regulates discharges to "navigable waters," which is statutorily defined as "the waters of the United States, including territorial seas" (33 U.S.C. § 1362(7)). This single definition applies to all regulatory provisions of the Act, including permit programs for discharge of dredged or fill material (404 permits, § 1344)[3] and other polluting discharges (NPDES permits, § 1342).

Jurisdiction overshadows the entire Act; it is a threshold issue for determining whether the Act applies to any given body of water. However, for decades after the enactment of the Clean Water Act, "waters of the United States" continued to be a heavily litigated and controversial phrase that was clouded by unclear, contradictory U.S. Supreme Court decisions and heavily criticized EPA guidance. It wasn't until June of 2015 that a comprehensive rule was published to better define the term.[4]

While EPA and the U.S. Army Corps of Engineers intended to conclusively settle this issue in finalizing the Clean Water Rule, the rule instead sparked congressional action in opposition to the rule and a flurry of legal action from states and other stakeholders. With litigation and congressional challenges pending, the final fate of the rule remains uncertain; the question of jurisdiction may still be unanswered.

While the scope of the Act continues to be debated in the present, the Act's legislative history makes it clear that Congress intended the Clean Water Act to have a broad geographic scope,[5] with a distinct recognition of water's ecological connectedness: "Water moves in hydrologic cycles and it is essential that discharge of pollutants be controlled at the source" (S. REP. NO. 92–414, at 77 (1977)). However, the Clean Water Act has limited jurisdiction, partly due to limiting judicial interpretations,[6] which leaves interconnected groundwater and some sensitive waters outside the Act's protection. The hydrological system relies on many healthy and resilient water types—including groundwater, wetlands, headwaters, and intermittent and ephemeral streams. However, the Clean Water Act fails to protect many of these essential elements.

A healthy water ecosystem is not possible under such limited jurisdiction when water-pollution control requires a broad and comprehensive approach based on the interconnectedness of water. Without resolution on the definition of "waters of the United States," regulatory uncertainty will continue, presenting a challenge in meeting the Clean Water Act's overall objective and goals.

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This special report is based on Ms. Radcliffe's 2012 paper, "Reauthorization of the Clean Water Act," which is available online at http://www.neiwpcc.org/cwamod/CWAModernization.pdf. Ms. Radcliffe holds a J.D. and a Master of Environmental Law and Policy from Vermont Law School and has been with NEIWPCC since 2012.

Infrastructure

Water and wastewater infrastructure is aging rapidly and requires costly repair, upgrade, and rehabilitation to protect public health and safety and to achieve and maintain environmental standards.

Our physical water and wastewater infrastructure—our facilities for water collection, storage, treatment, and distribution, our flood levees and floodways, ports and harbors, locks and canals—is vital to the prosperity of our communities. High-quality drinking-water and wastewater systems are essential to the environment, public health, safety, and overall quality of life in the United States. Undeniably, clean water is necessary for life to exist.

Toward that end, some infrastructure protects our environment by addressing sewer overflows and stormwater runoff; other infrastructure protects our health by maintaining clean drinking water that is free of waterborne diseases and makes our waters safe for fishing and swimming; still more infrastructure ensures public safety by maintaining a sufficient water supply for fire suppression. Our water and wastewater infrastructure is also vital to our economy, providing water critical to the daily operations of existing businesses, new commercial enterprises, and residential developments.

One dollar invested in water and wastewater infrastructure creates more jobs than any other type of infrastructure.

Yet, the most recent American Society of Civil Engineers' Infrastructure Report Card indicates that the United States is falling substantially behind in our water and wastewater infrastructure, which scored between "poor" and "failing" in the 2013 report.[7] This negative assessment is unlikely to improve without significant investment in our water and wastewater infrastructure. In fact, the most recent EPA estimates depict a $682.3-billion shortfall in water-infrastructure funding over the next two decades,[8] particularly because our infrastructure is aging and failing rapidly. The evidence for this includes 240,000 water-main breaks per year (with the number of breaks increasing substantially near the end of the system's service life) and up to 75,000 sanitary sewer overflows per year in the United States, resulting in the discharge of three to ten billion gallons of untreated wastewater.[9]

Broken water and sewer mains, sewage overflows, and other related issues cause significant losses and damages—as well as environmental-standards violations—that can and should be prevented through investments today. Aging infrastructure strains budgets beyond our ability to repair and replace before failure, which threatens water quality and public health.

Necessary capital investments today can prevent further infrastructure deterioration and create essential jobs. In fact, merely one dollar invested in water and wastewater infrastructure creates more jobs than in any other type of infrastructure. Each job created in the local water-and-sewer industry creates 3.68 jobs in the national economy. In addition, each public dollar invested in water infrastructure increases long-term GDP output by $6.35 and generates $2.62 in economic output in other industries.[10]

However, lack of adequate funding impedes the ability of local, state, and federal government to address aging and failing infrastructure. Federal and state funding available to municipalities for water and wastewater infrastructure has steadily decreased since the 1970s, with line items that once funded infrastructure projects, provided rate relief, or funded low-interest loans cut dramatically or eliminated entirely.[11] New initiatives such as the Water Infrastructure Finance and Innovation Act,[12] EPA's Water Infrastructure and Resiliency Finance Center,[13] and the President's Build America Investment Initiative[14] all aim to address these funding issues. Still, a far greater and more comprehensive commitment is needed to address the overwhelming gap between current needs and funding.[15]

Meeting the nation's needs to build, upgrade, rebuild, and repair water and wastewater infrastructure is a significant element in achieving the Clean Water Act's water-quality objectives. Without a considerable and sustained increase in infrastructure investment, failure will become more frequent, serious, and obtrusive, and our water and wastewater services will deteriorate rapidly. A new Clean Water Act must authorize enough funds to assist local and state governments with financing needed repairs and upgrades to ensure a steady supply of safe, clean water for present and future needs.

Nonpoint-source pollution is unregulated in most jurisdictions. At right: Some agricultural runoff in the Lake Champlain Basin.

Adequate Funding

Adequate funding is needed to ensure governments are able to reasonably and fully execute the Clean Water Act's mandates and goals.

Without funding, the Clean Water Act is merely words on paper. The Act's overall objective and goals will never be fully realized without proper funding to overcome current challenges. Yet, funding authorizations of some programs in the 1987 Clean Water Act amendments—such as grant assistance to states, research, and general wastewater treatment—expired in 1994. Although these programs continue to be funded on an ad-hoc yearly basis, competition exists with other national programs.

In addition to the funding necessary for infrastructure repairs and upgrades as described above, a new Clean Water Act must also authorize funding for implementation of all enforcement, monitoring, research, and innovation under the Act. Without proper resources, innovative approaches will never be explored and validated. In addition, staff must be funded to enforce regulations and monitor the Act's progress. Severe underfunding of the Clean Water Act's mandates limits the effectiveness of its programs. Thus, a revised Act must increase federal support to adequate funding levels sufficient to ensure water-quality goals are achieved. Failure to provide enough resources correlates directly with failure to improve water quality.

In the face of limited funding, many municipalities have taken on increasing levels of debt to maintain their water and wastewater infrastructure and meet Clean Water Act mandates without federal assistance, which is a concern because different communities have different abilities to pay. When municipalities take on more debt, the cost of water service often increases at a rate that puts a financial strain on low-income residents, particularly given that there are no federal programs to assist them with water bills. On the other hand, voters often underestimate the value of water and are unaware of the true costs to fully support, operate, maintain, and invest in their own infrastructure, which makes it difficult for municipalities to invest in anything more than the present costs of operation.

Affordability protections must be incorporated into the Act, but the high value of our water services must also be taken into account. Funding deficiencies and costs need to be addressed and cannot be overlooked. Therefore, a new Clean Water Act must authorize funds to cover the necessary costs for reliable clean water, taking into account the affordability factor for state and local governments.

Watershed Approach

Under the Clean Water Act, water-quality management has been characterized by compartmentalization and the creation of artificial boundaries where a watershed approach would be more natural, sustainable, holistic, and comprehensive.

Activities that occur anywhere in a watershed inevitably have an impact on the water quality and quantity in the rest of the watershed. In fact, water quality of rivers, streams, lakes, wetlands, and groundwater is a reflection of each individual water body's entire watershed. Yet watersheds often fall within multiple jurisdictions. Under the current regulatory framework, Clean Water Act enforcement and responsibility fall within political boundaries rather than watersheds, making it difficult to implement regional solutions, which have the potential to be more efficient and effective.

A preferred approach would instead use the natural hydrologic boundaries of watersheds to coordinate the protection and restoration of water resources. A watershed approach would include all stressors within the area rather than focusing on specific, individual sources of pollution, such as a sewage discharge pipe. In addition, whereas in the past, implementation has focused on chemical pollution, a comprehensive watershed

approach would fully incorporate the chemical, physical, and biological needs of the watershed into planning and management decisions and protect the aquatic ecosystem as a whole.

To achieve significant further progress toward the goals of the Clean Water Act and protect the more-than-$450-billion food-and-fiber, manufactured-goods, and tourism industries that depend on clean water and healthy watersheds,[16] a new Clean Water Act must consider the overall health of watersheds. Water resources cannot be managed sustainably without active and purposeful recognition of their many linkages and varied interconnections. If we are to succeed in addressing today's impairments, we must move beyond the conventional, site-specific, jurisdictional approach to water protection and recovery that has prevailed for forty years and begin using a more holistic watershed approach.

Nonpoint Source Pollution

The Clean Water Act needs a mechanism to address nonpoint-source pollution beyond the current voluntary program, which renders NPS pollution effectively unregulated despite being the leading cause of water pollution today.

Management of nonpoint-source (NPS) pollution is, undoubtedly, the issue in most dire need of attentive revision in the Clean Water Act. While many of our waters have improved since 1972—mainly due to the Act's control of traditional point sources through technology-based limitations—remaining water-quality impairment is largely attributable to nonpoint sources of pollution that are not directly or adequately controlled through the Act.[17] In fact, NPS pollution is the reason behind the impaired status of more than 33,000 U.S. water bodies.[18] The Act's success with controlling point sources contrasts starkly with its failure to address nonpoint sources such that NPS pollution has become the dominant cause of water pollution today.

The 1987 amendments established the first comprehensive program to address NPS pollution—though the term is not statutorily defined, nor has it been ever clearly defined since—in a new section 319 authorizing state planning and management programs. More than 560 water bodies impaired primarily by NPS pollution have been partially or fully restored as a result of section-319 projects, many of which are highlighted on EPA's success stories web page.[19] The web page offers well-deserved recognition and praise for restoration efforts that led to documented water-quality improvements. The success stories also serve as examples for other states to consider when dealing with their own NPS pollution.

Although section 319 leads the way in efforts to reduce NPS pollution, it is a voluntary, essentially unregulated program lacking mandatory compliance requirements and dependent on employment of unenforceable "Best Management Practices." EPA has little authority to discourage ineffective approaches.

All states, territories, and many tribes have completed NPS assessments and management-program plans under section 319, but the Act does not require the plans to be revised; as a result, most are currently outdated. Very few of the 43,000 impaired water bodies[20] in the United States will achieve water-quality standards without effective controls on nonpoint sources. Moreover, unimpaired waters are threatened by NPS pollution as new developments are built nearby. Therefore, a new Clean Water Act must more effectively address NPS pollution through a revision or complete overhaul of section 319.

Green Infrastructure

Many aspects of the Clean Water Act, particularly stormwater management, would benefit from green-infrastructure techniques, which should be fully and effectively incorporated into the Act.

Comprehensive water-resource management must incorporate efforts to restore the natural hydrology of our ecosystems, to mimic as much as possible the way hydrology functioned prior to development. The current Clean Water Act fails to take full advantage of the pollution-reduction benefits associated with green-infrastructure practices, such as preserving and restoring vegetated areas with rain gardens, roof gardens, and grassy swales; utilizing porous pavements; and creating riparian buffers, that mimic natural processes and allow rain to soak into the ground. Green infrastructure often offers cost-effective, sustainable methods for improving and maintaining the physical, chemical, and biological integrity of water that should be utilized by local, state, and federal governments.

Green infrastructure can provide multiple environmental benefits, such as air-quality improvements through filtering of particulate matter, reduced energy demands through cooling urban areas and shading building surfaces, and improved wildlife habitat.[21] Most importantly, green infrastructure is particularly effective for dealing with stormwater because it facilitates the infiltration, evapotranspiration, and reuse of stormwater by taking advantage of nature's own mechanisms.

Clean Water Act enforcement and responsibility fall within political boundaries rather than watersheds, making it difficult to implement regional solutions.

Incorporating green infrastructure into stormwater management reduces stormwater discharges, which are often polluted by pathogens, nutrients, sediment, and heavy metal; mitigates flood risk by slowing and reducing stormwater volume; and recharges groundwater. A new Clean Water Act must more effectively incorporate green infrastructure into its programs and invest in these sustainable practices.

The Water-Energy Nexus

The Clean Water Act must address the close connection between water and energy as it relates to water use and water quality.

Without energy, there would be limited water treatment and distribution, and without water, there would be limited energy production. The water-energy nexus is a reciprocal loop whereby demand for one drives demand for the other. Generating energy consumes significant amounts of water to cool power plants, generate hydropower, and extract, refine, and produce fuel. Similarly, providing clean water consumes significant amounts of energy for extracting, moving, and treating water. According to EPA, water and wastewater services account for about three to four percent of total energy use in the United States, equal to approximately 56 billion kilowatts or $4 billion.[22] This energy use is not only expensive, but it also adds about 45 million tons of greenhouse gas to the atmosphere each year.[23]

Despite the clear inextricable connection between water and energy, the Clean Water Act fails to address the water use embedded in energy production or the energy use embedded in water and wastewater services. Sustainable management of water requires consideration of energy (and vice versa). Therefore, a new Clean Water Act should specifically recognize the energy-water nexus and incorporate policies on increased coordination between both sectors, energy and water efficiency, and minimizing negative impacts to water resources from energy production.

This is particularly crucial as climate change and our growing population put more stress on water resources, making increased energy needs—and, consequently, water needs—inevitable.

Climate Change

The impacts from climate change, which threaten to stress existing water resources and the ecosystems that depend on them, must be taken into account in Clean Water Act programs.

Many of the problems of the current Clean Water Act, such as aging infrastructure, funding needs, nonpoint-source pollution, and energy use, will be exacerbated by climate change. Water-resources and water-quality impacts are actually among the most acknowledged of climate-change impacts.[24]

Climate change is expected to alter precipitation patterns and increase flooding and associated waterborne diseases, alter stream morphology, increase wet-weather pollution from stormwater overflows and overland runoff, and decrease overall water supplies in some parts of the country. All uses of water, including agricultural, municipal, industrial, and ecological, will be affected.

As these impacts change or weaken the health and stability of many ecosystems, water-quality standards will be increasingly violated and meeting the Clean Water Act's overall objective of "restor[ing] and maintain[ing] the chemical, physical, and biological integrity of the Nation's waters" (33 U.S.C. § 1251(a)) will become increasingly difficult.

As such, a new Clean Water Act should incorporate climate-change impacts into monitoring programs, water-quality standards, facility planning and design, wet-weather controls, and more. Effective, sustainable water management must not ignore climate-change impacts.

Urgent and Essential Reform

The Clean Water Act is an extraordinary and valuable piece of legislation. By setting national goals and objectives, technology-based and water-quality–based standards, funding wastewater facilities and research, and creating an administrative and enforcement structure, the Act enabled our nation to address our polluted waters.

The Act has served us well, but in its current form it is simply no longer achieving the water-quality improvements as initially intended. The bedrock principles of the 1972 Act remain sound, but those principles have not been implemented totally or adequately. The outlined challenges are serious and highlight the immediate need for updates and revisions to the Clean Water Act that reflect the realities of today and tomorrow.

The Clean Water Act of the future must build upon its predecessor's success with an eye toward the many challenges currently faced and those anticipated. If the Act is not modernized based on our changing environmental and societal circumstances, our nation's water quality will suffer immensely.

Reform of the Clean Water Act is urgent and essential to ensure that clean water is available to sustainably meet economic, social, and environmental purposes today and in the future.

Notes

1 U.S. EPA, National Summary of State Information, http://ofmpub.epa.gov/waters10/attains_nation_cy.control (last visited July 30, 2015) (54 percent of assessed rivers and streams, 89 percent of assessed coastal shoreline, 63 percent of assessed ocean and near coastal, and 48 percent of assessed wetlands are also impaired, based on information from the most recent integrated reports available as submitted by the states).

2 Other challenges not fully discussed include population growth, increased development and urbanization, emerging contaminants, intensified agricultural practices, water quantity, and cross-media concerns. Furthermore, it is important to note that this list is not a demonstration of regional issues, nor does it convey partisan issues. These challenges affect the health and well-being of every American, nationwide.

3 Section 404 is used to protect "wetlands," a term that appears only once in §404 and is not defined.

4 Clean Water Rule: Definition of "Waters of the United States," 80 Fed. Reg. 37,053 (June 29, 2015).

5 See, e.g., H.R. REP. NO. 92-911, at 131 (1972) ("One term that the Committee was reluctant to define was the term 'navigable waters.' The reluctance was based on the fear that any interpretation would be read narrowly. However, this is not the Committee's intent. The Committee fully intends that the term 'navigable waters' be given the broadest possible constitutional interpretation, unencumbered by agency determinations which have been made or may be made for administrative purposes").

6 See Solid Waste Agency of N. Cook Cnty. v. U.S. Army Corps of Eng'rs, 531 U.S. 159 (2001) (SWANCC created much confusion in the lower courts). See also Rapanos v. United States, 547 U.S. 715 (2006) (five years later, Rapanos did not help the situation, particularly because the Court did not produce a majority test for what constitutes "waters of the United States").

7 The American Society of Civil Engineers, 2013 Report Card for America's Infrastructure, Mar. 2013, available at http://www.infrastructurereportcard.org/a/#p/home (scoring D on dams, D on drinking water, D– on inland waterways, D– on levees, and D on wastewater, which are incremental improvements for drinking water and wastewater 2009 grades).

8 U.S. EPA, "Clean Watersheds Needs Survey 2008 Report to Congress," 2008, http://water.epa.gov/scitech/datait/databases/cwns/upload/cwns2008rtc.pdf (estimating—in January 2008 dollars—$298.1 billion nationwide investment need for wastewater-pollution control over the 20-year period of 2008–2027; does not include decentralized needs and needs for nonpoint-source-pollution control); U.S. EPA, "Drinking Water Infrastructure Needs Survey and Assessment: Fifth Report to Congress," Apr. 2013, http://water.epa.gov/grants_funding/dwsrf/upload/epa816r13006.pdf (estimating $384.2 billion nationwide investment need for drinking-water utilities over the 20-year period of 2011–2030).

9 U.S. EPA, "Aging Water Infrastructure Research: Addressing the Challenge through Science and Innovation," July 2011, http://www.epa.gov/nscep/index.html (search: 600F11010).

10 U.S. Conference of Mayors, "Local Government Investment in Municipal Water and Sewer Infrastructure: Adding Value to the National Economy," Aug. 14, 2008, http://www.usmayors.org/urbanwater/documents/LocalGovt%20InvtInMunicipalWaterandSewerInfrastructure.pdf (citing U.S. Department of Commerce estimates).

11 Funding has also been eliminated for the Clean Water Act Section 104(g) Wastewater Treatment Plant Operator On-Site Technical Assistance Training Program, which is crucial with the aging of the wastewater workforce for properly training a new workforce to operate our vital facilities.

12 Water Infrastructure Finance and Innovation Act (WIFIA), Pub. L. No. 113-121 (2014). See also, U.S. EPA, Water Infrastructure Finance and Innovation Act (WIFIA), http://water.epa.gov/grants_funding/cwsrf/wifia.cfm (last updated Apr. 14, 2015).

13 U.S. EPA, "Water Infrastructure and Resiliency Finance Center," http://water.epa.gov/infrastructure/waterfinancecenter.cfm (last updated May 6, 2015).

14 The White House: Office of the Press Secretary, "Fact Sheet: Building a 21st Century Infrastructure: Increasing Public and Private Collaboration with the Build America Investment Initiative," July 17, 2014, https://www.whitehouse.gov/the-press-office/2014/07/17/fact-sheet-building-21st-century-infrastructure-increasing-public-and-pr. See also, The White House: Office of the Press Secretary, "Fact Sheet: Increasing Investment in U.S. Roads, Ports and Drinking Water Systems Through Innovative Financing," Jan. 16, 2015, https://www.whitehouse.gov/the-press-office/2015/01/16/fact-sheet-increasing-investment-us-roads-ports-and-drinking-water-syste.

15 For more on this topic, see our August 2015 issue of *Interstate Water Report.*

16 U.S. EPA, "A Watershed Approach," http://water.epa.gov/type/watersheds/approach.cfm (last updated Sept. 12, 2013) ("A watershed approach is the most effective framework to address today's water resource challenges").

17 Such pollution includes runoff from construction sites, impervious surfaces, and agricultural fields, which contribute sediment, nutrients, pathogens, and heavy metals to receiving waters.

18 U.S. EPA, "A National Evaluation of the Clean Water Act Section 319 Program," Nov. 2011, http://water.epa.gov/polwaste/nps/upload/319evaluation.pdf (this is equal to about 75 percent of all impaired waters with total maximum daily loads.)

19 U.S. EPA, Section 319 "Nonpoint Source Success Stories," http://water.epa.gov/polwaste/nps/success319/ (last updated August 10, 2015).

20 See U.S. EPA, "National Summary of Impaired Waters and TMDL Information," http://ofmpub.epa.gov/tmdl_waters10/attains_nation_cy.control?p_report_type=T (last updated Aug. 13, 2015).

21 Additional benefits include creation of construction and maintenance jobs, and health benefits because green spaces and parks encourage outdoor physical activity.

22 U.S. EPA, Water & Energy Efficiency, 2008, http://water.epa.gov/infrastructure/sustain/waterefficiency.cfm (last updated Sept. 14, 2012).

23 MassDEP, Massachusetts Energy Management Pilot Program for Drinking Water and Wastewater Case Study, Dec. 2009, http://www.mass.gov/eea/docs/eea/wrc/mass-energy-pilot-cost-study.pdf (estimate assumes the average mix of energy sources).

24 Intergovernmental Panel on Climate Change, Climate Change 2014: Synthesis Report: Summary for Policymakers 6-16 (2014), available at http://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf.