Upgrading Our Water Systems

A National Overview of State-level Funding Initiatives for Water Infrastructure

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Prepared by Vivian Chang
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JERSEY WATER WORKS
Smart infrastructure. Strong communities.

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About Jersey Water Works

Jersey Water Works is a cross sector collaborative effort, working to transform New Jersey's inadequate water infrastructure through sustainable, cost-effective solutions that provide communities with clean water and waterways; healthier, safer neighborhoods; local jobs; flood and climate resilience; and economic growth. The Jersey Water Works Finance Committee reviewed and provided comments on this report.

About the Author

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Executive Summary

Investments in water infrastructure in the United States are facing major funding gaps. The recent water crisis in Flint, Michigan, was but one example of the systemic issues that are plaguing communities. Deferred maintenance on drinking water, wastewater, and stormwater systems affects water quality for the worse and causes economic losses. Over the next 25 years, the American Water Works Association estimates a $1 trillion cost to repair and expand drinking water systems alone.[i] Water utilities are using financing mechanisms such as low-cost loans from state revolving fund (SRF) programs and innovative public-private partnerships to stretch water funds, but many states are also providing direct funding assistance to address systemic gaps.

To assess the landscape of state water infrastructure funding, this paper researches current, past, and proposed state programs that raise new revenue for drinking water, wastewater and stormwater infrastructure. The criteria were limited to programs that commenced between 2001 and April 2017; are partly or wholly separate from SRFs; and bring in new revenue, rather than use existing funds. These programs were identified through the following process: 1) a comprehensive search was done of an online database containing all legislation requiring voter approval (Ballotpedia); 2) interviews were conducted with 13 stakeholders in water infrastructure; and 3) a scan was done of online information about high-profile state budget items. The report is comprehensive in its inclusion of all voter-approved state water funding programs, but it does not include every possible state program, given that some programs did not require voter approval. The report includes a representative sample of legislatively-authorized programs, but future research should go further in identifying all state-level water fund programs.

Twenty-eight current programs from 14 states were identified, along with three repealed or unsuccessful proposals, and three proposed programs (as of April 2017). Of the currently operating programs, the mean amount of revenue raised is $1.2 billion, while the median amount is $200 million. More than half of the programs are funded through bonds (general obligation and special revenue bonds), while six are funded through a state budget item. Five programs create a new tax or fee to fund water infrastructure. Nineteen programs provide funding for wastewater systems, 11 fund drinking water systems, and eight fund stormwater systems; many programs cover two or more forms of water infrastructure. Nearly half of all programs distribute the funds through a combination of grants and loans, while fewer distribute the funds as grants only.

Incorporated into this report are four case studies of major state-level programs for sustainable water infrastructure in New York, California, Maryland, and Massachusetts. The case studies demonstrate a variety of options in program structure, revenue sources, funding goals, and types of projects funded. The programs included are: New York's Water Infrastructure Improvement Act of 2015 and Clean Water Infrastructure Act of 2017; California's Proposition Bond (also known as the Water Act of 2014); Maryland's Chesapeake Bay Restoration Fee, which functions as a wastewater fee; and Massachusetts's Water Infrastructure Assessment and Planning Grants program. These case studies provide

a deeper look at four state-level efforts to provide sustainable water funding, and options for other states looking to design new programs.

The final section summarizes several state government reports that examine the current status of water infrastructure. Each report assesses the state of physical infrastructure and any funding gaps. Recommendations include further assessment, long-term planning, increasing efficiencies and sustainability, and finding new sources of funding.

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Introduction

As we have seen—from the crisis in Flint, Michigan, of lead contamination in drinking water, to the dumping of raw sewage into the Passaic River during Hurricane Sandy, to the toxic algae blooms in Toledo's water—the present condition of water infrastructure in many places is reaching its breaking point. Too often, cities and towns are suffering from costly water main breaks, lead contamination, additional treatment costs for excessive inflows into wastewater systems, losses from leaking pipes, and other signs of disrepair. Water main breaks alone are estimated to cost $2.6 billion annually, separate from the costs of regular leakage from aging pipes, money that could be better spent repairing or replacing these lines. [ii]

Accessible clean water is essential to building and maintaining communities and the systems of work and play that make them vibrant. Every day, more than 151,000 public water systems provide clean drinking water and wastewater treatment for nearly 300 million people in the United States.[iii] Clean water and sanitation are crucial to societal success and economic growth and sustainability. A 2006 poll of 11,000 medical professionals by the British Medical Journal named sanitation—clean water—as the greatest medical milestone of the last 150 years, ahead of vaccination, antibiotics, and anesthesia.[iv]

Across the United States and especially in older cities and towns, the gap between water system costs and actual funding is enormous. The American Water Works Association estimates that it will cost at least $1 trillion to restore and expand the nation's existing drinking water systems over the next 25 years.[v] In 2012, US EPA estimated the funding gap to fix existing wastewater and stormwater treatment infrastructure at $271 billion over a 20-year period.[vi] National trends on water infrastructure spending show a decline in capital investment by state and local governments relative to spending on operations and maintenance. Although state and local governments spent similar amounts on operations and maintenance (O&M) and capital expenditures from 1956–1980, they currently spend only half as much on capital investment as on O&M.[vii]

The funds required to upgrade and maintain public water systems are large enough that many municipalities, already squeezed by more than $1.7 trillion in debt nationally, cannot afford to take on more debt even through low-interest loans provided by the federal government through its state revolving fund (SRF) program.[viii] In addition, many systems do not recognize the potential savings available from fixing leaks that lead to water loss or the need for additional treatment of excess inflow – savings that could be used to offset the cost of new debt.

Public funding for water infrastructure (including drinking water, wastewater and stormwater infrastructure) comes from a combination of local, state, and federal government sources. Of these, user charges comprise the largest revenue source. These funds may be leveraged to borrow additional money, such as from the SRF program, in the bond market and by utilizing public-private partnerships. The share of funding from the federal government has declined since the 1970s to a current low of 4 percent of all government spending on water utilities.[ix] The EPA once provided as much as 30.5 percent of spending on water and wastewater utilities through grants and loan subsidies, but this has decreased significantly over time.[x]

The bulk of federal financial support currently is provided as low-interest loans through Clean Water and Drinking Water SRFs, rather than direct financial assistance or grants. Since 2013, the Clean Water SRF has provided an average of $1.42 billion to states annually, [xi] and the Drinking Water SRF has provided an average of $885 million to states annually.[xii] These programs are administered in partnership with state governments, which must provide a 20 percent match in funding.[xiii] These Clean Water and Drinking Water SRFs typically provide low-interest loans to local governments for investments in water infrastructure, non-point source pollution control, and conservation projects. (At times, SRF loans may provide for a small principal forgiveness component, which functions as a grant.)

The SRFs comprise most of state and federal funding for water infrastructure; however, this report focuses specifically on other state-level funding that entails raising new revenue. Similarly, there are methods of stretching infrastructure dollars, such as using public-private partnerships (PPPs) to leverage private-sector financing, or by supplementing with loans under the Water Infrastructure Finance and Innovation Act (WIFIA), which provides expanded credit for water and wastewater infrastructure projects. Through WIFIA, EPA has also launched the Water Infrastructure and Resiliency Finance Center to provide technical assistance to municipalities on innovative financing mechanisms.[xiv] However, the focus of this report is on state initiatives that specifically raise *new* revenue for water infrastructure.

Many states make significant contributions to water infrastructure spending. State governments can provide higher revenue streams, leverage greater investment by local utilities, and address regional issues, such as drought and compliance with federal regulations, that are beyond the jurisdiction of any single municipality.

Funding water infrastructure is an investment in better life outcomes for residents: Clean drinking water increases educational outcomes for children and builds healthier communities. Implementing large-scale programs to repair and upgrade aging water infrastructure also brings jobs to communities in need of employment opportunities and service upgrades. For instance, over 20 years, each $1 invested in water infrastructure returns $2.03 of local, state and federal tax revenue.[xv] Every $1 million in federal infrastructure spending generates 16.5 jobs, at an average pay of $60,000, and $2.95 million in economic output.[xvi] Adding one job in water infrastructure systems creates 3.68 jobs in the national economy.[xvii] By investing in water infrastructure, states can improve

system resiliency and encourage public utilities to use best practices in water management and efficiency.

The Trump administration has indicated that investment in infrastructure will be a priority: The president has made public statements about providing $1 trillion in tax incentives to finance new construction and repair of "crumbling bridges, roads, and waterways."[xviii] A significant investment at the national level could help restore water systems to adequate levels and truly invest in the country's future.

As Stephanie Miner, mayor of Syracuse, N.Y., has said, "You can't build a high-tech center if people can't make coffee or flush their toilets."[xix] Inadequate drinking water, wastewater or stormwater management should not be a limiting factor for a state's economic output. New Jersey can learn from other states as it seeks to ensure sustainable water infrastructure to support its investment in jobs, economic growth, healthy communities and the environment.

I. State Funding Initiatives for Water Infrastructure (2001–April 2017)

This report is a national overview of state-level funding initiatives for drinking water, wastewater and stormwater infrastructure. It includes a comprehensive survey of voter-approved state programs and a sampling of other prominent programs passed through state legislatures from 2001 to April 2017. The survey comprises 28 current programs from 14 states. Programs detailed in this report met the following criteria—each program:

1. Raises new revenue for drinking water, wastewater or stormwater infrastructure at the state level;
2. Is partly or entirely separate from existing SRF programs; and
3. Was initiated between 2001 and April 2017.

Types of water infrastructure covered include drinking water, stormwater, wastewater, combined sewer overflows, and green infrastructure. Information on funding programs was assembled through a database search of Ballotpedia and interviews with water infrastructure stakeholders. For timely comparison, the overview is limited to programs commenced between 2001 and April 2017. Due to time and capacity constraints, state programs were identified through a focused research process including:

- A database sweep of state ballot measures for water funding programs that met the three criteria listed above;
- Interviews with 13 water infrastructure stakeholders to identify database resources and prominent programs not captured in the previous step; and
- A scan of online, publicly available information on state budget proposals.

Although this report does not capture every state water funding initiative, it includes every voter-approved program from this period. It also includes a representative sampling of state initiatives that did not require voter approval, such as state budget allocations or government borrowing. However, it is entirely possible that states not included here have existing water infrastructure programs. Future research should include a more thorough review of state water initiatives that do not require voter approval.

Table 1. Summary Statistics of Current Programs

Average Amount (mean)	$1.2 billion
Average Amount (median)	$200 million
Age of Program (mean)	8.4 years
Number of Programs funded by Bonds (general obligation bonds or special revenue bonds)	16
Number of Programs funded through the State Budget	6
Number of Programs funded by a New Tax	4
Number of Programs funded by a New Fee	1
Number of Programs that disburse funds through Grants and Loans	13
Number of Programs that disburse funds through Grants Only	9
Number of Programs covering Drinking Water	11
Number of Programs covering Wastewater	19
Number of Programs covering Stormwater	8

A. Current State Funding Programs

The table below includes 28 currently operating programs in 14 states, as of April 2017. Included are details such as the amount of revenue raised, date of inception, source of revenues, types of water infrastructure covered, format for disbursement of funds, and other relevant information.

Table 2. Catalogue of Current State Programs

Program Name	Amount & Date	Funding Structure & Types of Projects Eligible
California Water Bond Prop 1 / AB 1471 Enacted the Water Quality, Supply, and Infrastructure Improvement Act of 2014 4th largest bond in state history	(2014) $7.12 billion	**Format:** General obligation bonds: • Distributed in grants and loans – state funding can cover no more than 50% of the total cost of a storage project • California Water Commission will decide on proposals, based on "public benefits" **Used For:** "Water supply infrastructure projects": such as public water system improvements, surface and groundwater storage, drinking water protection, water recycling and advanced water treatment technology, water supply management and conveyance, wastewater treatment, drought relief, emergency water supplies, and ecosystem and watershed protection and restoration. • $520 million to improve water quality for "beneficial use," for reducing and preventing drinking water contaminants, disadvantaged communities, and the State Water Pollution Control Revolving Fund Small Community Grant Fund • $1.495 billion for competitive grants for multi-benefit ecosystem and watershed protection and restoration projects • $810 million for expenditures on, and competitive grants and loans to, integrated regional water management plan projects • $2.7 billion for water storage projects, dams and reservoirs [for drought] • $725 million for water recycling and advanced water treatment technology projects • $900 million for competitive grants and loans for projects to prevent or clean up the contamination of groundwater that serves as a source of drinking water • $395 million for statewide flood management projects and activities • Potential programs: LA remediation of industrial pollution and water recycling, reduce importing of water; Santa Monica conservancy capture urban runoff and restore wetlands https://ballotpedia.org/California_Proposition_1,_Water_Bond_(2014)

Program Name	Amount & Date	Funding Structure & Types of Projects Eligible
		http://www.latimes.com/science/la-me-water-bond-20141029-story.html http://awpw.assembly.ca.gov/sites/awpw.assembly.ca.gov/files/Prop.%201%20Info%20Oversight%20Background.pdf http://bondaccountability.resources.ca.gov/p1.aspx

California Proposition 84 Bonds for Flood Control and Water Supply Improvements	(2006) $5.4 billion	**Format:** General obligation bonds—Disbursed as grants and loans
		Used For: Projects relating to safe drinking water, water quality and supply, flood control, waterway and natural resource protection, water pollution and contamination control, state and local park improvements, public access to natural resources, and water conservation efforts.
		▪ Provides funding for emergency drinking water, and exempts such expenditures from public contract and procurement requirements to ensure immediate action for public safety.
		▪ $1.525 billion for integrated regional water management, safe drinking water, and Delta and agricultural water quality projects;
		▪ $580 million for Sustainable Communities/Climate Change;
		  ▪ $90 million for urban water and energy conservation projects,
		  ▪ $400 million for local and regional parks,
		  ▪ $90 million for sustainable communities including incentives for conservation in local planning;
		▪ $65 million for Statewide Water Planning and Design (planning for future water needs, water conveyance systems, and flood control projects)
		▪ $928 million for regional conservancies, Delta and coastal fisheries restoration, restoration projects along the San Joaquin and Colorado Rivers, stormwater pollution prevention, and other projects such as public access, river parkways and urban stream restoration;
		▪ $800 million for state flood control projects, local flood control subventions outside of the Central Valley Flood Control System, and floodplain mapping and assistance for local land use planning;
		▪ $540 million for protection of various coastal areas and watersheds, Clean Beaches Program, and California Ocean Protection Trust Fund;
		▪ $500 million for State Parks and Natural Education Facilities;
		▪ $450 million for Forest and wildlife Conservation.
		
		https://ballotpedia.org/California_Proposition_84,_Bonds_for_Flood_Control_and_Water_Supply_Improvements_(2006)
		http://www.counties.org/sites/main/files/file-attachments/guide_to_prop__84_july07.pdf

Program Name	Amount & Date	Funding Structure & Types of Projects Eligible

California Proposition 1E / Disaster Preparedness and Flood Protection Bond Act of 2006	(2006) $4.09 billion	**Format:** General obligation bonds—Disbursed as grants and loans
		
		Used For: Financing disaster preparedness and flood prevention projects at the state and local levels
		• $3 billion for State Central Valley Flood Control System (evaluation, repair, and upkeep of flood control structures, including repair of erosion sites, channel sediment removal, environmental mitigation, and levee maintenance and improvement in the Sacramento-San Joaquin Delta. $200M of these funds will be used to refund the General Fund for critical levee work initiated pursuant to the Governor's 2006 Proclamation of Emergency, and payment of $105M associated with the cost of bond issuance)
		  o Funds capped at $200 million for any single project except improvements to Folsom Dam. May be expended for state financial participation in federal and state authorized flood control projects, feasibility studies and design of federal flood damage reduction and related projects, and reservoir reoperation and groundwater flood storage projects.
		• $500 million for Flood Control Subventions (the state's share of costs for authorized flood control and prevention projects outside of the Central Valley to 16 specific counties)
		• $300 million for Stormwater Flood Management (stormwater management projects in areas outside of the State Plan of Flood Control, including grants to local entities to cost-share stormwater runoff projects consistent with an integrated regional water management plan)
		  o Projects must have a non-state cost share of at least 50%
		• $290 million for Statewide Flood Protection Corridors and Bypasses (identification of flood risks and protection and enhancement of flood corridors and bypasses, including the creation of flood hazard maps, acquiring easements and constructing new levees to establish corridors and bypasses)
		
		https://ballotpedia.org/California_Proposition_1E,_Flood_Control_and_Drinking_Water_Structures_(2006)
		http://www.counties.org/sites/main/files/file-attachments/guide_to_prop__1e_july07.pdf
		http://bondaccountability.resources.ca.gov/p1e.aspx

California Prop 50 Bonds for	(2002) $3.4 billion	**Format:** General obligation bonds **Used For:** • For specified CALFED Bay-Delta Program projects including

Program Name	Amount & Date	Funding Structure & Types of Projects Eligible
Water Projects / Water Quality, Supply and Safe Drinking Water Projects Act		urban and agricultural water use efficiency projects • Grants and loans to reduce Colorado River water use • Purchasing, protecting and restoring coastal wetlands near urban areas • Competitive grants for water management and water quality improvement projects • Development of river parkways • Improved security for state, local and regional water systems • Grants for desalination and drinking water disinfecting projects." https://ballotpedia.org/California_Proposition_50,_Bonds_for_Water_Projects_(2002)
Colorado Nutrient Grant Domestic Wastewater Treatment Plant (HB 13-1191)	(2013) $15 million for 3 years (fund expired in September 2016)	**Format:** Created a nutrients grant fund (appropriates money from the General Fund into the Water Quality Control Division). • Grants for planning, design, construction and improvements in domestic wastewater treatment works that are owned or operated by a local government, to comply with nutrients management control regulation • Grants administered by the Department of Public Health and Environment • $15 million in 2013-2014, and $2 million in 2014-2015 **Used For:** • Construction (70% of funds), Design (22%), Planning and research (8%) • Studies on brewery waste as a carbon source, treatment optimization, construction of nitrogen removal upgrades in Boulder, CO • Nutrient management plan, design and construction of plant modifications, storage nitrification denitrification reactor design and construction in Eagle River Water and Sanitation District https://www.colorado.gov/pacific/sites/default/files/Reg%2085%20and%2031.17%20TRIH%20Progress%20Report%209-9-2015%20Final.pdf
Colorado Water Infrastructure Natural Disaster Grant Fund (HB 14-1002)	(2014) $19 million	**Format:** Creates a natural disaster grant fund (moves funds from the General Fund into the new fund) • Grants to local governments to recover from September 2013 floods – grants can be awarded only to municipalities in counties in which the governor declared a disaster emergency • Grants are to be used in 2014-2015 fiscal year and, as needed, in 2015-2016 fiscal year

Program Name	Amount & Date	Funding Structure & Types of Projects Eligible
		Used For: $17 million for flood recovery and $2 million for infrastructure improvements http://www.legispeak.com/bill/2014/hb14-1002
Hawaii Bonds for Dam and Reservoir Assistance Constitutional amendment	(2014) Was initially defeated in 2012	**Format:** Empowered the legislature to issue special purpose revenue bonds **Used For:** Loans and financial assistance to dam and reservoir owners for facility improvements https://ballotpedia.org/Hawaii_Bonds_for_Dam_and_Reservoir_Assistance,_Amendment_5_(2014) https://ballotpedia.org/Hawaii_Dam_and_Reservoir_Owners_Assistance_Amendment_(2012)
Massachusetts Water Infrastructure Assessment and Planning Grants State Capital Plan for 2017	(2014) $400,000 annually	**Format:** Grants • Proposed work must be completed by June 30, 2017 • 10 projects funded at up to $40,000 each **Used For:** • Assessment and planning for water infrastructure (drinking water, wastewater, and stormwater): o 1) Asset Management and Fiscal Sustainability Planning; o 2) Comprehensive Wastewater Management Planning; and o 3) Technical Assistance Projects • Meet state and federal requirements • Prepare public utility systems for budgetary planning for regular evaluative assessments and replacement of water infrastructure system assets • Planning projects must be complementary to existing infrastructure, not for new infrastructure http://www.mass.gov/eea/agencies/massdep/water/grants/water-infrastructure-assessment-and-planning-grants.html http://www.mass.gov/bb/cap/fy2017/dnld/fy17capitalplanma.pdf http://www.mass.gov/eea/docs/dep/water/rfp-17.doc
Massachusetts Municipal Water Infrastructure Investment Fund	(2016) **Assesse**d by municipal governments	**Format:** Municipalities may establish a special revenue fund that may be appropriated for expenditures for maintenance, improvements and investments to municipal drinking, wastewater and stormwater infrastructure assets • Funded by a property tax surcharge of up to 3 percent that will be assessed on each parcel of taxable real estate within the community, subject to towns opting in **Used For:** • Maintenance, improvements, and investments

Program Name	Amount & Date	Funding Structure & Types of Projects Eligible
		• Drinking water, wastewater, and stormwater infrastructure assets http://www.mass.gov/dor/docs/dls/publ/igr/2016/igr16-103.pdf
Maryland Chesapeake Bay Restoration (BRF) fee SB 320 (2004) / HB 446 (2012)	(2004) $77 million annually (2012) Increased to $127 million annually Fee charged to all homes / buildings [commercial buildings are charged by equivalent dwelling unit] that are served by a wastewater treatment plant or an on-site disposal (septic) system	**Format:** Fee charged to wastewater treatment plant users and septic users: • Creates a dedicated fund. In 2012, the BRF fee was doubled for most users served by wastewater treatment plants and those using on-site sewage disposal (septic) systems to $5/month per household ($60 annual). For wastewater treatment plant users and septic systems not discharging to the to the Chesapeake Bay and Coastal Bay watersheds, the fee remains at the current level of $2.50/month ($30 annual). Commercial and industrial users are charged $5/month ($60 annual) per equivalent dwelling unit (EDU). • Surcharge does not apply to facilities that do not discharge nitrogen or phosphorus as determined by the department, or meet 3 mg/l nitrogen and 0.3 mg/l phosphorus treatment levels, AND did not receive any state or federal grants. • Surcharge does not apply to facilities discharge non-contact cooling water, water from dewatering operations, or reclaimed wastewater from a facility whose users pay into the fund, AND the discharge does not result in a net increase in nutrient loading. • Started at $30/year in 2004, now $60/year since 2012 (except in some locations). Low-income households can request a Bay Restoration Hardship Exemption application annually **Used For:** • Wastewater Treatment Plants Fund to provide funding for upgrading 67 major, publicly owned sewer treatment plants that discharge into tidal waters o $100 million annually, after 2012 increase o MD Department of the Environment can issue bonds backed in full or in part by funds generated, to expedite implementation. o Up to 100% of eligible ENR [enhanced nutrient removal] cost can be provided for planning, design and construction of ENR facilities for flows up to the design capacity. For facilities completing both BNR and ENR upgrade under one project, cost associated with the BNR portion of the project will continue to be funded at 50%. o Up to $5 million per year from the Bay Restoration Fund through 2009 can be used for

Program Name	Amount & Date	Funding Structure & Types of Projects Eligible
		combined/separate sanitary sewer overflow (CSO/SSO) corrections and other sanitary sewer collection system rehabilitation projects. ▪ Up to 75% of eligible project cost will be provided for small (less than 10,000 in population), low-income communities. Up to 50% of eligible project cost will be provided for others. o After 2009, up to 10% of the fund is earmarked for ENR operation and maintenance (O&M) costs. • Onsite Disposal Systems Fund to use for septic system upgrades (60% of funds) and for cover crops (remaining 40%) o $27 million annually, after 2012 increase o 420,000 onsite systems in MD are eligible, with priority given to failing septic systems in Critical Areas o Funds can be provided for upgrades of existing systems to best available technology for nitrogen removal or for the marginal cost of using best available technology instead of conventional technology. http://www.mde.state.md.us/programs/Water/BayRestorationFund/Pages/index.aspx https://www.washingtonpost.com/local/flush-tax-in-maryland-to-double-in-july/2012/05/08/gIQADHIoCU_story.html?utm_term=.1cf6273c688b http://www.mde.maryland.gov/programs/Water/BayRestorationFund/Documents/www.mde.state.md.us/assets/document/BRF%20ImplementationReport1.pdf
Maine Fish Hatcheries Water, Dams and Transportation Improvements Bond	(2008) $29.7 million	**Format:** General obligation bonds **Used For:** • $300,000 for major rehabilitation work at existing dams owned by the state • $1 million for the Small Community Grant Program to provide grants to towns in rural areas to help replace malfunctioning septic systems that are polluting a water body or causing a public nuisance • $800,000 to reimburse eligible municipalities for up to 90% of planning and implementation costs to remediate pollution problems at closed municipal landfills, such as by extending waterlines and installing landfill gas collection systems to protect nearby residential property https://ballotpedia.org/Maine_Fish_Hatcheries_Water,_Dams_and_Transportation_Improvements,_Question_1_(June_2008)

Program Name	Amount & Date	Funding Structure & Types of Projects Eligible
Maine Drinking Water and Waste Water Treatment Facilities Bond Issue	(2007) $18.3 million	**Format:** General obligation bonds **Used For:** • $2.9 million for the State Revolving Loan Fund, to be matched by $14.5 million in federal funds, and distributed as low-interest loans to municipalities to repair, improve or upgrade wastewater treatment facilities (*this is the state's match to federal SRF funds)* • $12 million in grants to municipalities to construct, improve or upgrade wastewater treatment facilities https://ballotpedia.org/Maine_Drinking_Water_and_Waste_Water_Treatment_Facilities,_Question_2_(June_2007)
Maine Agriculture, Environment and Water Projects Bond Issue	(2005) $8.9 million	**Format:** General obligation bonds **Used For:** • $1 million would be distributed in grants to municipalities to remove and replace failing septic systems through the existing Small Communities Grant Program • $2.6 million for the existing State Revolving Loan Fund, to be matched by $13,000,000 in federal funds, and distributed as low interest loans to municipalities to repair, improve or upgrade wastewater treatment facilities (*state's match to federal SRF funds)* • $3.5 million in grants and low interest loans to eligible public water systems, through Maine's Safe Drinking Water Revolving Loan Fund, to construct and upgrade public drinking water systems *(state's match to federal SRF funds)* • $1 million in grants to farmers to subsidize the development of crop irrigation systems and sustainable water sources • $3.5 million for repairs and improvements to the University's livestock research and teaching facility at the J.F. Witter Center in Old Town, Maine. • *[This totals to $11.6M, which is more than the bond amount of $8.9M]* https://ballotpedia.org/Maine_Agriculture,_Environment_and_Water_Projects,_Question_3_(2005)
Maine Water Pollution and Drinking Water Bond Issue	(2003) $6.95 million	**Format:** General obligation bonds **Used For:** • $500,000 for the Small Communities Grant program, to help municipalities, quasi-municipal entities and unorganized townships replace wastewater discharge systems that are affecting public water systems or shellfish areas or otherwise causing a public nuisance

Program Name	Amount & Date	Funding Structure & Types of Projects Eligible
		• $2 million for the State Revolving Loan Program, to be matched by $10 million in federal funds *(state's match to federal SRF funds)* • $1.5 million in grants to subsidize construction of water pollution control facilities in communities with lower median household incomes • $500,000 for the cleanup of uncontrolled hazardous substance sites • $500,000 would provide grants to municipalities and individuals, to subsidize the removal of licensed overboard wastewater discharges into shellfish areas, great ponds, and drainage areas of less than 10 square miles. The percentage of grant support offered to individual homeowners would be based on income level • $750,000 in grants to subsidize the development of environmentally sound water supplies for crop irrigation • $1.2 million in grants and loans to eligible public water systems through the state's Safe Drinking Water Act Revolving Loan Fund *(state's match to federal SRF funding)* https://ballotpedia.org/Maine_Water_Pollution_and_Drinking_Water,_Question_4_(2003)
Minnesota Clean Water, Land, and Legacy Amendment / Sales Tax Increase Amendment	(2008) About $200 million annually (estimated at $11 billion over 25 years)	**Format:** Increase of 0.375 percentage points in sales and use tax until 2034. • Expected to generate about $300M per year. Costs average household about $60/year • Between 2009-2012, generated $339 million for Clean Water Fund **Used For:** • Environmental conservation projects to protect water supplies, as well as non-water-related "cultural and heritage" projects • Authorized by law to allocate 33 percent of the funds generated to the Clean Water Fund o To protect, enhance, and restore water quality in lakes, rivers, and streams and to protect groundwater from degradation (at least five percent of this amount must be spent only to protect drinking water sources) o Projects funded by the Clean Water Fund include: watershed monitoring, clean water retrofits, drainage management, hydrodynamic separator retrofit https://ballotpedia.org/Minnesota_Sales_Tax_Increase,_Amendment_1_(2008)

Program Name	Amount & Date	Funding Structure & Types of Projects Eligible
		http://www.legacy.leg.mn/projects/project/10 http://www.dnr.state.mn.us/legacy/index.html
New Jersey Dam, Lake, Stream, Flood Control, Water Resources, and Wastewater Treatment Bond Act of 2003	(2003) $200 million To be repaid over 35 years	**Format:** General obligation bonds **Used For:** • $15 million to restore and repair state-owned dams • $95 million in low-interest loans to owners of dams for dam restoration and repair projects • $15 million in low-interest loans to owners of lakes and streams and private lake associations, with local governments as co-applicants, for lake dredging and restoration, or stream cleaning and desnagging projects • $25 million to finance state flood control projects • $50 million for water resources projects and waste-water treatment system projects https://ballotpedia.org/New_Jersey_Question_3,_Bonds_for_Flood_Control_and_Water_Improvement_(2003) http://www.nj.gov/dep/damsafety/docs/chapter162.pdf
New Mexico Water Trust Fund Constitutional amendment	(2006) $40 million set aside initially	**Format:** Added a new section to Article 16 of the Constitution of New Mexico to create a "water trust fund" to support projects designed to preserve and protect the state's water supply. The amendment also mandated an annual distribution to support the fund. • Legislature appropriated $40 million in 2006 and $15 million in 2007. Distributes $4M annually to the Water Trust Board. **Used For:** Current status unclear, but the Water Trust Board continues to function • In 2016, example projects included an arsenic treatment facility, water distribution system improvements, dam renovation, and water storage tank rehabilitation https://ballotpedia.org/New_Mexico_Water_Trust_Fund,_Constitutional_Amendment_3_(2006) http://www.sic.state.nm.us/water-trust-permanent-fund.aspx http://www.nmfa.net/financing/water-programs/water-project-fund/ http://my.nmfa.net/NMFAInternet/GetDoc.aspx?docid=2859
New York Water Infrastructure Improvement Act of 2015 (WIIA)	(2015) $200 million over 3 years	**Format:** Established as part of 2015-2016 New York State Budget, as approved by the legislature • Disbursed as grants **Used For:** • $30 million of the funding available for clean water (wastewater) projects, with priority to projects that

Program Name	Amount & Date	Funding Structure & Types of Projects Eligible
		increase resiliency to sea level rise and extreme weather events o Covers up to 60% of the water and wastewater infrastructure project costs, with a cap of $5M per project • Administered by Environmental Facilities Corporation, Department of Health, and Department of Environmental Conservation • Late 2015: $75 million in grants had been disbursed to support 45 drinking water and wastewater infrastructure improvement projects • Late 2016: Had disbursed $87 million for drinking water and $88 million for clean water https://www.governor.ny.gov/news/governor-cuomo-announces-75-million-grants-local-governments-water-infrastructure-improvements http://www.adaptationclearinghouse.org/resources/new-york-state-water-infrastructure-improvement-act-of-2015.html https://www.efc.ny.gov/Default.aspx?tabid=660 http://www.arcgis.com/home/webmap/viewer.html?webmap=1547e59447bc4820972fbf525862112e&extent=-81.2184,40.1626,-70.32,45.4375
New York Expansion of WIIA in 2016-2017 State Fiscal Year Budget	(2016) $225 million	**Format:** Additional appropriation of $225 million to the 2015 Water Infrastructure Improvement Act • Disbursed as grants **Used For:** • $112.5 million for clean water projects o Projects are eligible for a grant of up to $5 million or 25 percent of total project cost, whichever is lesser • $112.5 million for drinking water projects o Projects are eligible for a grant of up to $3 million or 60 percent of total project cost, whichever is lesser http://www.dec.ny.gov/enb/20170503_not0.html http://nyassembly.gov/Press/20160401b/
New York Clean Water Infrastructure Act	(2017) $2.5 billion	**Format:** Established as part of 2017-2018 New York State Budget, as approved by the legislature • Disbursed as grants **Used For:** • $1 billion for grants to localities for water infrastructure improvements • $75 million for upgrades and replacements for septic systems and cesspools • $20 million for replacing lead drinking water service lines

Program Name	Amount & Date	Funding Structure & Types of Projects Eligible
		• $50 million for Green Infrastructure grants • $200 million for New York City for projects in the NYC watershed • Other funds for conservation The proposal had included: • **1) Municipal Drinking Water System Advancements** o Installing advanced treatment and filtration systems to treat and remove both regulated and unregulated contaminants found in drinking water; o Upgrading aging distribution and treatment systems, including replacement of lead service lines in low-income communities; and o Connecting contaminated private drinking water wells to regulated public drinking water systems. • **2) Municipal Wastewater Treatment Systems Improvements** o Installing advanced wastewater treatment systems, including those to address nitrogen loading on Long Island; o Upgrading aging wastewater treatment plants to increase capacity and improve resiliency; and o Connecting existing homes in densely populated communities to sewer systems or installing advanced public on-site septic systems • **3) Source Water Protection Actions** o Implementing recommendations of community-driven Source Water Protection Plans funded by the Environmental Protection Fund beginning in 2017-2018; o Conserving open spaces and building green infrastructure, such as constructed wetlands, to capture runoff and filter contaminants; o Ensuring proper management and storage of common contaminants like manure and road salt to prevent runoff https://www.budget.ny.gov/pubs/press/2017/pressRelease17_enactedPassage.html https://www.nrdc.org/experts/rich-schrader/environmental-issues-nys-2017-budget https://www.governor.ny.gov/news/governor-cuomo-presents-17th-proposal-2017-state-state-invest-2-billion-clean-water https://www.riverkeeper.org/blogs/water-quality-blogs/governor-proposes-2-billion-clean-water-infrastructure-act-2017/
Oklahoma Reserve Fund	(2012)	**Format:** General obligation bonds • Allows Oklahoma Water Resources Board to issue bonds,

Program Name	Amount & Date	Funding Structure & Types of Projects Eligible
Amendment / State Question 764 Constitutional amendment		not more than $300M **Used For:** • To provide a reserve fund for the Board, for certain water resource and sewage treatment funding programs https://buffalonews.com/2017/01/16/cuomos-2-billion-water-quality-proposal-counts-wetlands-well-pipes-sewer-lines/ https://ballotpedia.org/Oklahoma_Reserve_Fund_Amendment,_State_Question_764_(2012)
Pennsylvania Water and Sewer Improvements Bond Referendum Legislatively referred constitutional amendment	(2008) $400 million	**Format:** Bonds • Disbursed as grants and loans to municipalities and public utilities. Only $200 million may be used in outright grants to municipalities. **Used For:** • Can be used for the acquisition, construction, improvement, expansion, extension, repair or rehabilitation of drinking water system, stormwater and nonpoint source projects, nutrient credits and wastewater treatment system projects. • Defines "drinking water system" as something that "consists of reservoirs, wells, water treatment facilities and equipment such as pipes, tanks, filters and pumps, which collect, treat, store and supply safe drinking water for public use" https://ballotpedia.org/Pennsylvania_Water_And_Sewer_Improvements_Bond_Referendum_(2008)
Rhode Island Green Economy Bonds / Environmental and Recreational Improvement Bonds	(2016) $3 million (out of $35 million total borrowed) For projects between FY2018-2022	**Format:** General obligation bonds • Investments should commence in FY2018 and be completed by FY2022 **Used For:** • $3 million for Stormwater Pollution Prevention Program o Provides up to 75% in matching grants to public, private and/or nonprofit entities for stormwater pollution reduction projects o Clean up waterways and reduce stormwater pollution https://ballotpedia.org/Rhode_Island_Environmental_and_Recreational_Improvement_Bonds,_Question_6_(2016) http://www.gcpvd.org/2016/10/15/2016-rhode-island-statewide-ballot-questions/
Rhode Island Clean Water, Open Space	(2014) $23 million	**Format:** General obligation bonds **Used For:** • $3 million for flood prevention

Program Name	Amount & Date	Funding Structure & Types of Projects Eligible
and Healthy Communities Bonds	(out of $53 million total borrowed)	o Grants to public and/or nonprofit entities for project design and construction grants for repairing and/or removing dams, restoring and/or improving resiliency of vulnerable coastal habitats, and restoring rivers and stream floodplains. • $20 million to the Clean Water Revolving Fund for the RI Clean Water Finance Agency *(state's match to federal SRF funds)* o Finance water pollution abatement infrastructure projects https://ballotpedia.org/Rhode_Island_%E2%80%9Cclean_Water,_Open_Space_and_Healthy_Communities%E2%80%9D_Bonds,_Question_7_(2014)
Texas Water Development Bonds (Prop 16) Legislatively referred constitutional amendment	(2007) $250 million	**Format:** General bonds not to exceed $250M by the Texas Water Development Board **Used For:** • To provide financial assistance to economically distressed areas through the Texas Water Development Fund II's economically distressed areas program account (EDAP) o Planning; land acquisition; design; or construction of first-time service or improvements to water supply and wastewater collection and treatment works o Can obtain 50-100% of the financial assistance in grant form o EDAP provides $50 million in assistance annually https://ballotpedia.org/Texas_Water_Development_Bonds,_Proposition_16_(2007) http://www.capitol.state.tx.us/tlodocs/80R/billtext/html/SJ00020F.htm https://www.twdb.texas.gov/financial/programs/EDAP/
Texas Water Development Bonds (Prop 19) Constitutional amendment	(2001) $2 billion	**Format:** General bonds by TX Water Development Board **Used For:** • Water supply projects, water quality enhancement projects, flood control projects, state participation in water and wastewater facilities, and economically distressed areas https://ballotpedia.org/Texas_Water_Development_Bonds,_Proposition_19_(2001) http://www.lrl.state.tx.us/scanned/sessionLaws/77-0/HJR_81.pdf
Washington Local Revitalization Financing	(2009)	**Format:** Tax increment financing tool, uses bonds repaid by a local sales/use tax that is credited against the state tax, increased local sales/use tax, and funds from other local public sources. • Authorizes cities and counties to create "revitalization

Program Name	Amount & Date	Funding Structure & Types of Projects Eligible
Program 2SSB 5045		areas" and allows certain increases in local sales and use tax revenues and local property tax revenues generated from within the revitalization area, additional funds from other local public sources, and a state contribution to be used for payment of bonds issued for financing local public improvements within the revitalization area **Used For:** • Infrastructure improvements in the revitalization area can be used for stormwater and drainage management systems • Eligible costs: design, planning, acquisition, site preparation, construction, reconstruction, rehabilitation, improvement, and installation; relocating, maintaining, and operating property pending construction of public improvements; relocating utilities as a result of public improvements; financing public improvements; assessments incurred in revaluing real property; and, related administrative expenses and feasibility studies http://dor.wa.gov/content/doingbusiness/localrevitalizationfinancing.aspx http://lawfilesext.leg.wa.gov/biennium/2009-10/Pdf/Bill%20Reports/House/5045-S2%20HBA%20CEDT%2009.pdf
Washington Water System Acquisition and Rehabilitation Program	(2003) (Made permanent in 2008)	**Format:** Grants • Provides cost-share grants to public utilities to assist with costs of acquiring troubled water systems • Jointly administered with public works board and department of community, trade, and economic development • Funded 29 projects at $9.75M from 2003-2007 (95% of funds used to rehabilitate acquired water systems) **Used For:** • Assisting small systems to improve the quality of water supply service http://www.doh.wa.gov/portals/1/Documents/pubs/331-419.pdf https://app.leg.wa.gov/rcw/default.aspx?cite=70.119A.190

B. Failed Proposals and Repealed Programs

The table below includes two funding proposals that failed to receive approval from voters or legislatures in Colorado and Delaware, and one major funding program in Maryland that was repealed three years after inception.

Table 3. Failed funding proposals and repealed programs from 2001-2017.

Project Name	Amount & Date	Funding Structure & Types of Projects Eligible
Colorado Water Projects Bond Referendum	(2003) $2 billion Did not pass	**Proposed Format:** Would have allowed CO Water Conservation Board to issue bonds up to $2 billion **Proposed Uses:** • Public and private water projects • Drought relief through improvements to water infrastructure • Projects eligible for funding may acquire water rights, build new storage, improve existing facilities, or increase water conservation. Projects may also provide environmental and recreational benefits, protect agricultural water, or assist communities negatively impacted by water projects. Ineligible projects include public waste water and drinking water projects, and projects costing less than $5M https://ballotpedia.org/Colorado_Water_Projects_Bond,_Referendum_A_(2003)
Delaware Statewide tax proposal by Governor Jack Markell	(2014) $800 million over 5 years Rejected by legislators who did not want to levy new taxes	**Proposed Format:** Annual fee • Annual property tax, about $45/year for a typical homeowner. Would differ for large residential properties and multi-family sites. Based on equivalent dwelling units (EDU) for water and sewer billing. Would generate $30M annually from property taxes, and $60 million in new state borrowing or state-assisted loans. • Was opposed by legislators who did not want to institute new taxes. However, the state Senate established the Clean Water and Flood Abatement Task Force in 2015 to examine other possibilities **Proposed Uses:** • *Would have supported up to $120 million in annual grants, loans and other aid for water-related needs for five years.* • Curb stormwater runoff and flooding • Stormwater and flood control projects • Waterway restorations • Drinking water system upgrades • Toxic contamination cleanups • Planting strategies for farms to reduce flows of fertilizer-like

Project Name	Amount & Date	Funding Structure & Types of Projects Eligible
		nutrients into surface and groundwater • Help industries pay for cleaning up wastewater discharges http://www.delawareonline.com/story/news/2014/03/04/markell-water-quality-tax/6008877/ http://delawarestatenews.net/government/delaware-panel-eyes-new-effort-to-impose-water-tax/

Maryland Stormwater fee (also known as "rain tax") HB987 (2012)	(2012)
	
	Repealed in 2015
	
	Charged to property owners in the state's 10 largest jurisdictions (9 largest counties and Baltimore city)
		Format: Annual fee
		• The state law required counties to charge the annual fee to property owners. The fee was calculated based on square footage of surfaces on a property.
		• Repealed in 2015.
		
		Used For:
		• Created to comply with EPA order to clean up Chesapeake Bay estuary by 2017
		  • Stream and wetland restoration projects
		  • Monitoring and enforcement of stormwater management plans
		  • Mapping of impervious sources
		
		Fees are now optional, but counties are still required to manage polluted runoff. Many counties have continued to charge stormwater fees:
		• Howard County (now $15-90/year); Baltimore County (now $14-26, was $21-39); Montgomery County ($88 pre-existing fee); Charles County ($43); Harford County (repealed); Carroll County (replaced by county's property tax revenue); Anne Arundel, Carroll, Frederick, Prince George's, Baltimore city (have not changed fee yet)
		
		http://www.theepochtimes.com/n3/13701-maryland-rain-tax-will-calculate-rainfall-on-houses/
		http://www.baltimoresun.com/news/maryland/bs-md-rain-tax-20150419-story.html

C. Proposed Funding Initiatives

The table below includes a sample of funding proposals that have been proposed but not enacted, as of April 2017. Relevant stakeholders in each state are discussing the proposals, which may be implemented soon or ultimately unsuccessful.

Table 4. Current state funding proposals.

Proposal Name	Amount & Date	Funding Structure & Types of Projects Eligible

Minnesota Dayton-Smith Jobs Bill
 	
Plan proposed by Gov. Mark Dayton and Lt. Gov. Tina Smith
	(2017) $1.5 billion	**Proposed Format:** Bond of $1.5 billion for all projects
		
		Proposed Uses:
		• $167 million for water infrastructure to help communities rehabilitate wastewater and drinking water infrastructure systems, expand capacity, and meet water quality requirements
		  o $62 million for Point Source Implementation Grants, which help local governments fund water treatment plant upgrades. Funding is competitive and grants provide up to 50% of costs with a local match requirement.
		  o $80 million for the Wastewater Infrastructure Fund (WIF), which *supplement CWRF loans or match federal USDA funding.*
		  o *$25 million for state matches to the SRF program*
		• $11.5 million to complete construction of the Lewis & Clark Regional Water System to deliver clean water to the City of Worthington
		• $2 million to design and construct wastewater/septic systems at the Togo Correctional Facility
		• $5 million in grants to local governments to correct inflow and infiltration problems in municipal wastewater collection systems. Grants would require a match from local governments.
		
		https://mn.gov/governor/issues/jobs-bill/
		http://mn.gov/gov-stat/pdf/2017_01_04_MMB_Spreadsheet_and_Descriptions.pdf
		MN Year of Water Action:
		http://mn.gov/governor/issues/wateraction/

Minnesota Plan proposed by Gov. Mark Dayton	(2016) $220 million for 2 years	**Proposed Format:** Bonds • To disburse as grants and loans for cities • $167 million for cities • $30 million in agricultural conservation **Proposed Uses:** • $62 million for the Point Source Implementation Grant Program – treatment plant upgrades

Proposal Name	Amount & Date	Funding Structure & Types of Projects Eligible
		• $80 million for the Water Infrastructure Funding Program – rehabilitate wastewater and drinking water systems • $5 million for Keeping Clear Water out of Wastewater – inflow/infiltration grant program at Metropolitan Council • *Buffer Reimbursements – Reinvest in Minnesota Reserve Program, works with farmers and private landowners to restore and protect water quality, $30 million (for federal SRF match)* http://mn.gov/governor/assets/2016_01_14_water_infrastructure_quality_fact_sheet_tcm1055-115156.pdf "25 by '25" Water Quality Goal http://mn.gov/governor/newsroom/?id=1055-276817
Ohio State capital budget proposed by Gov. Kasich in 2016	(2016) Some portion of $425 million	**Proposed Format:** • Water supply and water treatment systems **Proposed Uses:** $323 million to Department of Natural Resources to support renovations, improvements and major maintenance at dams, state parks, and forests http://www.obm.ohio.gov/Budget/capital/doc/fy-17-18/Capital_Budget_Fact_Sheet_2016.pdf

II. Case Studies

As demonstrated previously in the table of state-level programs, many state governments are instituting programs to provide more sustainable funding for water infrastructure, including capital investments, operations and maintenance, and assessment and planning. States are recognizing the need to stop deferring maintenance and instead, invest in modernizing and improving the drinking water, stormwater, and waste water systems that serve millions of residents every day. Below we present four case studies on specific funding programs from New York, Maryland, California, and Massachusetts. The case studies represent a diversity of funding structures and program goals, such as improvements in wastewater treatment, new water storage, longer-term system planning, and more. Important also is the investigation of what motivated each state to create a new funding program. Prior to 2017, California had suffered from a long-term drought for several years, while Maryland saw the need to leverage new funding to comply with federal clean water regulations.

A. New York
Water Infrastructure Improvement Act (2015, 2016)
Clean Water Infrastructure Act (2017)

The Water Infrastructure Improvement Act (WIIA) is a funding initiative led by the New York state legislature and supported by Governor Andrew Cuomo, and funded by direct additions to the state budget. It was established in the 2015-2016 New York State Budget with an initial amount of $200 million for three years, then increased by $200 million in the 2016-2017 state budget.[xx] Grants are provided to local governments and public utilities, which have been used mainly in construction and planning of upgrades or replacements in wastewater treatment, storage, surface water filtration, and other projects. The program funded 45 drinking water and wastewater infrastructure improvement projects in 2015 and has received broad support.[xxi] In 2017, Gov. Cuomo led the passage of the Clean Water Infrastructure Act, which adds $2.5 billion to the 2017-2018 state budget for water infrastructure funding.[xxii]

Creation: The Water Infrastructure Improvement Act of 2015 (WIIA) was established as part of the 2015-2016 New York State Budget, shepherded by Governor Andrew Cuomo.[xxiii] WIIA expanded in the 2016-2017 State Fiscal Year Budget with an additional $200 million, and in April 2017, the state created the Clean Water Infrastructure Act to provide an additional $2.5 billion in funding for drinking water and stormwater systems.

Funding Structure: Funding for the WIIA is allocated directly from the New York State budget, and funds are distributed as grants. Details for the Clean Water Infrastructure Act are not yet available. The first three years of WIIA grants are allocated into the state's General Fund. Local governments, public utilities, and water finance authorities can receive the grants to cover up to 60% of the water and wastewater infrastructure project costs, with a cap of $5 million per project. Grants are administered by the Environmental Facilities Corporation (the state water infrastructure bank), the Department of Environmental Conservation; and drinking water grants specifically are co-administered with the state Department of Health. Project applicants are also encouraged work with the Environmental Facilities Corporation (which also oversees the State's SRF Program) to receive interest-free and low-interest loans to supplement the grants.

The goals of the Water Infrastructure Investment Act are to close the funding gap for communities, and "attract and retain private business investment." Estimates of the funding gap place it at $75 billion ($36 billion for wastewater infrastructure and $39 billion for drinking water infrastructure) over the next 20 years. The New York State Comptroller issued a report in 2014 that indicated "at least $800 million is needed as an annual investment to repair and replace the state's complex wastewater infrastructure systems alone, significant parts of which date back more than a century."

Amount: In total, $2.9 billion have been appropriated since 2015. The WIIA allocated $200 million for 3 years in 2015, and an additional $200 million was allocated in 2016 (note that the New York state legislature released a statement saying that WIIA has allocated $425

million total, a total that does not add up) The Clean Water Infrastructure Act appropriates $2.5 billion over 5 years starting in 2017.

Uses: The WIIA has appropriated funding for:

- Clean water (wastewater) projects, with priority to projects that increase resiliency to sea level rise and extreme weather events
- Late 2015:
    - Planning, design, and construction of sewage or wastewater treatment plant improvements
    - Planning, design, and construction of sanitary sewer improvements
    - Surface water treatment plant facility upgrades (drinking water)
    - Design and construction of sanity sewer separation to eliminate combined sewer overflows
    - Connecting water supplies
    - Water storage upgrades
    - New water meters
    - Construction of a new surface water filtration plant
    - Consolidation and upgrade of three deficient privately owned water systems into one publicly owned system
    - Construction of new transmission mains, a new treatment plant, new storage and new distribution mains
    - Upgrade of existing surface water filtration
    - Construction of a new arsenic removal system to treat existing groundwater sources
    - Installation of a bypass pumping system for future flood mitigation
    - Major rehabilitation of a surface water filtration plant
- Late 2016: Had disbursed $87 million for drinking water and $88 million for clean water
- Interactive map of projects funded in 2016: http://arcgis.com.maps.arcgis.com/home/webmap/viewer.html?webmap=dfa2b14377f240218163be838afd8e24

The Clean Water Infrastructure Act has appropriated funding for:

- $1 billion to upgrade drinking and sewer infrastructure.
- $350 million for clean water infrastructure projects after 2021.
- $245 million for water quality improvement projects.
- $200 million for drinking and wastewater infrastructure improvements in New York City's watershed.
- $150 million for intermunicipal water infrastructure grants.
- $130 million for drinking water remediation and mitigation of contaminated drinking water.
- $110 million for land acquisition projects for source water protection.
- $100 million for municipal water quality infrastructure programs.
- $75 million for upgrades and replacements of septic systems and cesspools.
- $50 million for green infrastructure projects.

- $50 million for concentrated animal feeding operations.
- $20 million for the replacement of lead drinking water service lines.
- $10 million for a water infrastructure emergency loan fund.
- $10 million for IT system upgrades related to mapping technologies.

Legislative History: The WIIA was created as part of the 2015-2016 New York State Budget to fund improvements for drinking water and wastewater systems, with priority for projects that increase resiliency to sea level rise and extreme weather events. It was renewed and expanded in the 2016-2017 State Budget with an additional allocation. The Clean Water Infrastructure Act was created in the 2017-2018 New York State Budget, after being announced by Gov. Cuomo in his 2017 State of the State Address. The new funding is proposed for drinking water and wastewater improvements, upgrades to septic systems, green infrastructure grants, and conservation projects.

Previously, Gov. Cuomo's record on water infrastructure funding was more controversial: in 2014, he proposed to use $500 million from the state Clean Water Drinking Water Revolving Fund to pay for a new Tappan Zee Bridge.[xxiv] After receiving major pushback from environmental groups and the public, Cuomo abandoned the plan and reconsidered the importance of water infrastructure funding.[xxv] He has since made more public statements on water quality issues, especially chemical contamination: "I think this is a national crisis when it comes to water quality. I think we are just starting to learn about chemicals in the water and just how dangerous they can be. I think as time goes on you are going to see more and more dangerous chemicals being disclosed in the water we're drinking."[xxvi]

A broad coalition of organizations in diverse sectors advocated heavily for the infrastructure funding—environmental, utility, construction industry, municipal government, and planning—and have continued to push for more funding each year.[xxvii] The coalition also authored a letter, signed by more than 60 organizations, addressed to Gov. Cuomo to urge him to increase investment in New York's aging water infrastructure in the 2017-2018 budget proposal. On April 10, 2017, the state of New York included a $2.5 billion Clean Water Infrastructure Act to provide funding for drinking water and wastewater facilities over the next five years.

Members of the NY State Assembly have also raised concern for the state's water infrastructure: Assembly Members Steven Englebright, John McDonald, Steven Otis, and Senators John DeFrancisco, Carl Marcellino and Thomas F. O'Mara have raised public awareness on the need for more sustainable funding.[xxix] The state Senate also called for a $5 billion bond program on top of Gov. Cuomo's proposal (which ultimately became the Clean Water Infrastructure Act).[xxx]

B. Maryland
Chesapeake Bay Restoration Fee (2004)

The Chesapeake Bay Restoration Fee (BRF), also called the "flush tax," is a set of fees charged to all users of wastewater treatments plants or septic systems (essentially, all Marylanders).[xxxi] The fee is $60 annually ($5 per month) for all buildings that discharge into the Chesapeake Bay or $30 annually ($2.50 per month) for buildings that do not. The fee is collected by utilities on the utility bill and sent to the state government. One charge is collected from users of onsite disposal systems (septic systems) for the Onsite Disposal Systems Fund, of which 60 percent of the funds are used for septic system upgrades and 40 percent to support cover crops. A parallel charge is collected from users of wastewater treatment plants for the Wastewater Treatment Plants Fund, which provides funding for upgrades of the 67 major, publicly owned sewer treatment plants that discharge into the Chesapeake Bay. Priority for wastewater funds will also be given to combined sewer overflow abatement. The impetus and purpose of the BRF is to bring Maryland into compliance with EPA standards for pollution discharge into the Chesapeake Bay.

Creation: MD began collecting the fee in 2004 (under SB 320), and increased the fee in 2012 (under HB 446). A decline in water quality in the Chesapeake Bay (due to phosphorus and nitrogen pollution) led to violation of federal requirements. The states around the Chesapeake Bay formed the 2000 Chesapeake Bay Agreement – Bay and River Quality Commitment, but so far Maryland is the only state to institute a fee to fund its cleanup efforts.[xxxii] The purpose of the fund is to finance the upgrade of wastewater treatment plants with enhanced nutrient removal technology. Effluent from wastewater treatment plants is one of the top three major contributors of nutrients entering the Bay (urban and agricultural runoffs are the other two).

Funding Structure: The Chesapeake Bay Restoration Fee (BRF) is charged to all users of wastewater treatment plants and septic systems and administered through a dedicated fund. In 2012, the BRF doubled for most users served by wastewater treatment plants and those using on-site sewage disposal (septic) systems, from $2.50/month to $5/month. Currently, the BRF is $5/month per household ($60 yearly). For wastewater treatment plant users and septic systems not discharging to the to the Chesapeake Bay and Coastal Bay watersheds, the fee is $2.50/month ($30 yearly). Commercial and industrial users are charged $5/month ($60 yearly) per equivalent dwelling unit (EDU).

Low-income households can be exempted from the fee by completing a Bay Restoration Hardship Exemption application every year.[xxxiii] Eligible applicants must meet at least two of the following criteria: 1) receiving an energy assistance subsidy; 2) receiving public assistance; 3) receiving veterans or social security disability benefits; 4) meeting income criteria.

The BRF does not apply to facilities that do not discharge nitrogen or phosphorus, or that meet specified nitrogen and phosphorus treatment levels, and have not received state or federal grants. BRF also does not apply to facilities that "discharge non-contact cooling

water, water from dewatering operations, or reclaimed wastewater from a facility whose users pay into the fund, and when the discharge does not result in a net increase in nutrient loading."[xxxiv]

Amount: Currently, $127 million annually (starting in 2012). Prior to the rate increase, the BRF raised $77 million annually (starting in 2004). The water utilities bill commercial and residential customers, then send the funds to the State of Maryland. An advisory committee was created which evaluates the cost, funding, and effectiveness of plant upgrades. The committee also advises counties and the MD Department of the Environment regarding the onsite system upgrade program and recommends changes to the restoration fee if necessary.

Uses:[xxxv]

1. Wastewater Treatment Plants Fund to provide funding for upgrading 67 major, publicly owned sewer treatment plants that discharge into tidal waters
    - $100 million annually (after 2012 increase)
    - MD Department of the Environment can issue bonds backed in full or in part by funds generated, to expedite implementation.
    - Up to 100 percent of eligible ENR [enhanced nutrient removal] cost can be provided for planning, design and construction of ENR facilities for flows up to the design capacity. For facilities completing both BNR and ENR upgrade under one project, cost associated with the BNR portion of the project will continue to be funded at 50 percent.
    - Up to $5 million per year from the Bay Restoration Fund through 2009 can be used for combined/separate sanitary sewer overflow (CSO/SSO) corrections and other sanitary sewer collection system rehabilitation projects.
        - Up to 75% of eligible project cost will be provided for small (less than 10,000 in population), low-income communities. Up to 50% of eligible project cost will be provided for others.
        - After 2009, up to 10% of the fund is earmarked for ENR operation and maintenance (O&M) costs.
2. Onsite Disposal Systems Fund to use for septic system upgrades (60% of funds) and for cover crops (remaining 40%)
    - $27 million annually (after 2012 increase)
    - 420,000 onsite systems in MD are eligible for funding, with priority given to failing septic systems in Critical Areas

Funds can be provided for upgrades of existing systems to best available technology for nitrogen removal or for the marginal cost of using best available technology instead of conventional technology.

Legislative History: The Chesapeake Bay Restoration Fee (BRF, also known as the "flush tax") was created in 2004 to fund wastewater treatment plant upgrades and bring Maryland into compliance with EPA standards. The BRF was seen as major environmental legislation under Governor Robert Ehrlich. People objected to the logistics and the charge

itself – septic users are charged the $30 fee at one time, rather than monthly, and some people objected to paying the fee.

The BRF was doubled in 2012 under Governor Martin O'Malley. This increase, and the concurrent creation of a stormwater fee (colloquially known as the "rain tax") were controversial[xxxvi]—the latter program has since been repealed. Some have suggested that the BRF increase and the stormwater fee contributed to O'Malley's re-election loss in 2016 to current Governor Larry Hogan.

C. California
Proposition 1, also known as the Water Bond of 2014 (2014)

California's Prop 1, or the Water Bond of 2014, is the fourth-largest bond measure in the state's history, providing $7.12 billion in general obligation bonds.[xxxvii] The state had been attempting since 2010 to pass this bond, especially in view of the ongoing multiyear drought. The bond provides major funding for water storage and contamination projects, but also supports regional needs in water recycling, flood management, integrated management, and watershed conservation. The ballot measure was supported by a broad, bipartisan coalition of elected officials, environmental organizations, water agencies, business, and agriculture groups. It was opposed by small environmental organizations and some local government groups due to worries about special interests (especially in agriculture) and environmental impacts of large dam construction.

Creation: The Water Bond passed in 2014 as a voter referendum referred by the legislature (under California's unique legislative structure). The ballot measure enacted the Water Quality, Supply, and Infrastructure Improvement Act of 2014. It was motivated by California's multi-year drought and had been through several iterations over four years.

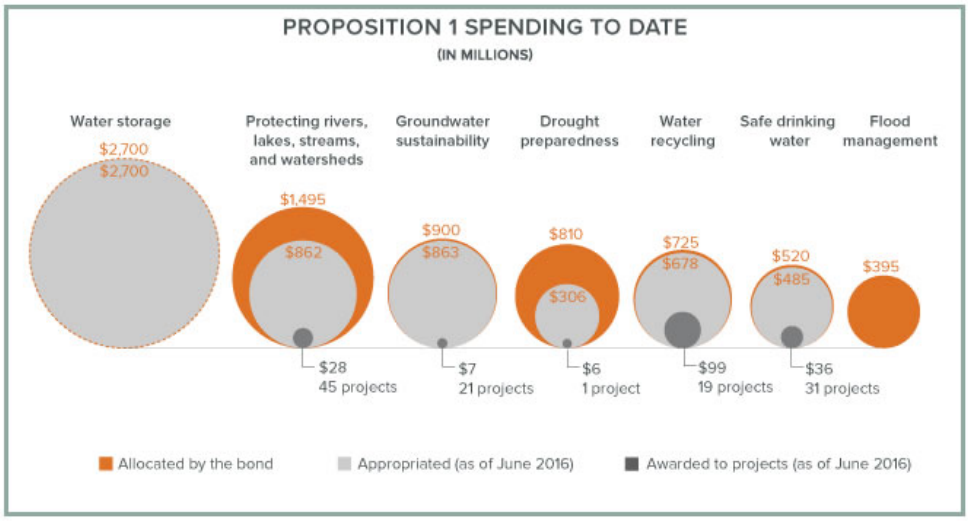
Funding Structure: Funding comes from general obligation bonds. The funds raised are distributed as grants and loans to local governments, water agencies, public utilities, and other public entities (school districts, nonprofits). Much of the bond funding is distributed through state agencies, which then distribute it as cost-share grants. The criteria for water storage proposals are set to be finalized by the California Water Commission in 2017. Using the finalized criteria, proposals for water storage projects will be rated on the criteria related to the "public benefits" that they provide, including "ecosystem and water quality improvements, flood control and recreation." Each storage project can receive no more than 50 percent of funds from the state and therefore must provide matching funds from non-state sources.

Amount: The Water Bond allows California to issue $7.12 billion in general obligation bonds, the fourth-largest bond in state history. The state expects to repay $360 million annually over 40 years.[xxxviii]

Uses: The seven areas of spending are: "surface and groundwater storage, drinking water protection, water recycling and advanced water treatment technology, water supply management and conveyance, wastewater treatment, drought relief, emergency water supplies, and ecosystem and watershed protection and restoration."

Grants awarded so far include: 31 grants to help disadvantaged communities with safe drinking water and wastewater treatment projects, 19 grants for urban wastewater recycling projects, 21 grants to better manage groundwater reserves, and 45 projects to address water supply and habitat to support native species around the state. As of June 2016, nearly 80% of the bond had been appropriated, as shown in the graph below.[xxxix]

Figure 3. Appropriated spending for projects using California's latest water bond funds (Prop 1), as of June 2016.



Specific spending proposals outlined in the Water Quality, Supply, and Infrastructure Improvement Act included:

- $2.7 billion for water storage projects, dams and reservoirs (helpful for Central Valley)
- $900 million for competitive grants and loans for projects to prevent or clean up the contamination of groundwater that serves as a source of drinking water (helpful for Los Angeles – remediation of industrial pollution, educes reliance by LA on imported supplies from Northern California and the Colorado River)
- $810 million for expenditures on, and competitive grants and loans to, integrated regional water management plan projects
- $725 million for water recycling and advanced water treatment technology projects (helpful for Los Angeles)
- $520 million to improve water quality for "beneficial use," for reducing and preventing drinking water contaminants, disadvantaged communities, and for the State Water Pollution Control Revolving Fund Small Community Grant Fund (helpful for poor, rural communities)
- $395 million for statewide flood management projects and activities
- $1.495 billion for competitive grants for multi-benefit ecosystem and watershed protection and restoration projects

However, no specific projects were earmarked.

Legislative History: Prop 1 (AB 1471) passed 67% to 33%, enacting the Water Quality, Supply, and Infrastructure Improvement Act of 2014. It was a replacement for a previous $11.14 billion bond that had been proposed by the legislature, which Governor Jerry Brown had called "pork-laden." The last statewide water bond was passed in 2006 (Prop 84), which authorized $5.4 billion for water projects.

The original water bond was to be voted on in November 2010, then removed and placed on the 2012 ballot, and finally removed again to be voted on and passed in 2014. It was delayed under two governors to ensure its passage (especially after the Great Recession), and to address concerns with the bond size and allegations of pork projects. Governor Brown called upon the legislature to reduce the borrowing amount, and worked in a bipartisan alliance with the legislature, eventually leading to official support for the measure from both parties and nearly all members of the state legislature.

The water bond was supported by a broad coalition of individuals and organizations, including:

- Elected officials such as Governor Brown, both of California's U.S. Senators, both the Democratic and Republican Parties of California;
- **Business** groups such as California Chamber of Commerce, LA Area Chamber of Commerce, Silicon Valley Leadership Group, and State Building and Construction Trades Council of California, and co-founder of Napster Sean Parker;
- Environmental NGOs such as The Nature Conservancy, NRDC, California League of Conservation Voters;
- Water-related organizations such as Association of California Water Agencies;
- **Agricultural** groups such as Western Growers, California Citrus Mutual, and California Farm Bureau Federation;
- Municipal groups such as Delta counties Coalition, League of California Cities, and California State Association of Counties; and
- **Local water suppliers** such as Fresno Irrigation District, Friant Water Authority, Long Beach Board of Water Commissioners, Metropolitan Water District of Southern California, and San Diego Water Authority;
- **Health** systems like California Hospitals Committee, California Association of Hospitals and Health Systems, Dignity Health, and Kaiser Permanente;
- Newspapers such as Marin Independent Journal, Modesto Bee, Napa Valley Register, Palm Springs Desert Sun, San Diego Union-Tribune, and San Francisco Chronicle

Arguments for the bond:

- Emphasis on the ongoing drought
- Claims that the bond does not raise taxes
- California's "water future"
- Family farms
- Business, jobs

The bond was opposed by:

- Smaller environmental groups such as Butte Environmental Council, Center for Biological Diversity, Environmental Protection Information Center, Friends of the Eel River, Food and Water Watch, Foothill Conservancy, Restore the Delta, San Francisco Baykeeper, Tar Sands Action, Wetlands Defense Fund;
- Water-related groups such as California Water Impact Network,
- Municipal groups such as Concerned Citizens Coalition of Stockton
- Fishing and gaming organizations;

- Central Delta Water Agency, South Delta Water Agency

Arguments against the bond:

- Sets the stage for two costly new dams and reservoirs long sought by agricultural businesses
- Concerns about “big agriculture” and “big unions” unduly influencing the bond measure
- Environmental concerns about large dam construction
- The bond does not provide near-term drought relief
- Concerns about subsidizing corporate agribusiness

D. Massachusetts
Water Infrastructure Assessment and Planning Grants (2014)

Since 2015, Massachusetts Department of Environmental Protection has made $400,000 available annually, from the Massachusetts State Capital Plan, to provide water infrastructure assessment and planning grants to public utilities.[xl] The goal of the program is to help prepare public utility systems for budgetary planning for regular evaluative assessments and replacement of water infrastructure system assets.

Creation: The grant program was created in 2015 and has been included in the State Capital Plan for 2017. Funds are targeted to help grant recipients meet comply with requirements under the Commonwealth of Massachusetts and the Federal Clean Water Act. The stated purpose of the program includes helping "to develop plans that will establish regular maintenance, upkeep and replacement of mechanical and static water system infrastructure utilized by drinking water, wastewater and stormwater systems owned by public entities."

Funding Structure: The grants are allocated by Massachusetts Department of Environmental Protection (MassDEP) to public utilities for drinking water, wastewater and stormwater systems. Recipients are required to provide a ten percent or twenty-five percent match, which can also be provided as in-kind services.

Amount: $400,000 has been allocated annually since 2015. Projects in the current round must be completed by June 30, 2017.

Uses: Grants are awarded to two types of planning projects:

1) Water Infrastructure Asset Management Plans
2) Comprehensive Wastewater Management Planning (CWMP)

Priority is given to public entities that have participated in US EPA's 2011 and/or 2015 Drinking Water Infrastructure Needs Assessment Survey (DWINSA). Planning projects must be complementary to existing infrastructure, not funding new infrastructure.

The call for proposals focuses on the following three types of projects, though no further detail is provided on the public website[xli]:

- 1) Asset Management and Fiscal Sustainability Planning;
- 2) Comprehensive Wastewater Management Planning; and
- 3) Technical Assistance Projects

History: Governor Charlie Baker instituted the new program for water system assessment and planning grants after taking office in 2015. In its first year, 15 communities received assessment and planning grants[xlii]. The State Capital Plan for 2017 has allocated $400,000 to the Massachusetts Executive Office of Energy and Environmental Affairs (in the governor's office) for the third round of these assessment and planning grants.

III. State Water Infrastructure Reports

Several states have recently commissioned reports to examine the status of their water infrastructure systems. Included below are brief descriptions of these reports, which provide insight into each state's recommendations and innovations in water infrastructure financing, assessment and planning, and opportunities for efficiency gains.

California: *Building California's Future Begins Today (2016)*
Issued in February 2016 by the California State Treasurer, the *Building California's Future Begins Today* report focuses on government transparency and "21st century economic development" in state public works. Overall, the report recommends 1) performing a statewide inventory of the infrastructure deficit; 2) determining ways to pay for construction, including public and private investments; and 3) creating a reserve fund to leverage excess tax revenues when the state's economy is in a boom period.

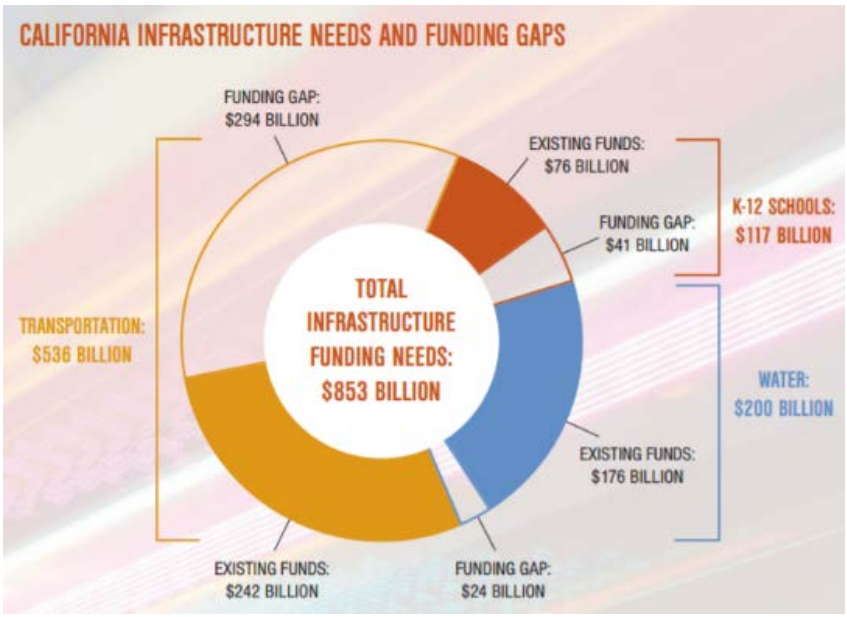


Figure 2: Funding gaps in California's infrastructure, based on a 2015 assessment. The state faces at least $24 billion in investments required to close the gap for water systems.[xliii]

Delaware: *Final Report of the Clean Water and Flood Abatement Task Force (2017)*
Issued in April 2017 to the Delaware General Assembly, the Final Report of the Clean Water and Flood Abatement Task Force makes recommendations for improving clean water and flood abatement in Delaware. The report estimates the current funding gap for "water quality programs" in Delaware at $100 million annually. Thus, the report recommends increasing governmental funding by creating a statewide per-household fee, applied as an increase in personal income taxes, and a per-business fee, applied as an increase in business license fees ("Clean Water Fee"). Such fees would be collected in a trust fund that

focuses "exclusively on water-quality projects and on the scientific monitoring and measurement" of project impacts, and would "enable sustained, reliable funding." The report also provides draft legislation ("Clean Water for Delaware Act") to establish such a trust fund, which would gather revenues from the Clean Water Fee. Funds would be directed to projects focused on reducing flood risks, removing pollutants, and supporting drinking water, wastewater, stormwater, and other eligible projects.

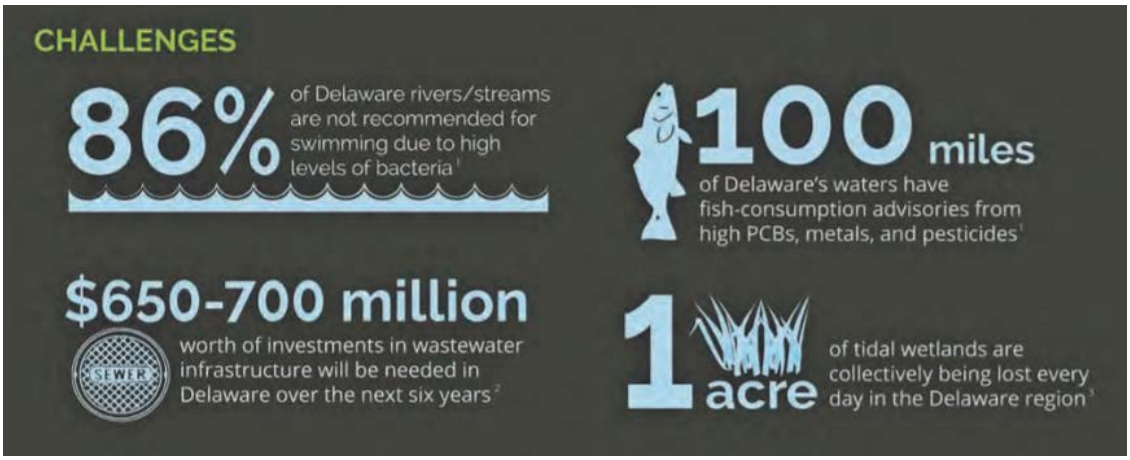


Figure 3: Summary of the current state of clean water sources and funding in Delaware, from the Clean Water and Flood Abatement Task Force report.

Indiana: *Evaluation of Indiana's Water Utilities (2016)*
Issued to the state legislature in November 2016 by the Indiana Finance Authority, *Evaluation of Indiana's Water Utilities: An analysis of the State's aging infrastructure* was prepared in compliance with state legislation requiring audits of every community water system. The report focuses solely on drinking water and "identified a $2.3 billion initial cost to upgrade infrastructure and recommended funding a new infrastructure program, prioritizing replacement of old water service lines, cultivating and standardizing asset management, naming a leader to coordinate water financing programs, and evaluating regionalization of utilities to improve efficiency." The report does not specify how Indiana would fund a new infrastructure program, but recognizes that "states need to be the primary support for utilities."

Massachusetts: *Costs, Regulation, and Financing of Massachusetts Water Infrastructure: Implications for Municipal Budgets (2017)*
Issued in January 2017 by the Office of the Massachusetts State Auditor, *Costs, Regulation, and Financing of Massachusetts Water Infrastructure: Implications for Municipal Budgets* "recommends expanding state grant and low-interest loan programs to cities and towns and creating a new state fund to provide $50 million annually for 10 years for regionalized water infrastructure projects." The recommendations are informed by a 2012 report called *Massachusetts's Water Infrastructure: Toward Financial Sustainability*, issued by the state Water Infrastructure Finance Commission. At the time, the state funding gap was estimated at $21.4 billion ($10.2 billion for drinking water and $11.2 billion for wastewater) over the next 20 years. The 2012 report includes surveys of public support for infrastructure

investment and concerns about water quality. Topline recommendations include: establishing a new water trust fund, finding cost efficiencies, promoting sustainability, and creating an asset-based analysis of the funding gap.

New York: ***Growing Cracks in the Foundation (2014)***
Issued by the New York State Comptroller in September 2014, *Growing Cracks in the Foundation: Local Governments Still Challenged to Keep Up with Vital Infrastructure Needs* is a follow-up to a 2012 report "detailing the fiscal limitations and deteriorating transportation, water and sewer infrastructure affecting governments across New York." The 2014 report estimates a funding gap of $89 billion for water and sewer systems, roads, and bridges over the next 20 years. It recommends a comprehensive process to estimate the level of investment needed, and outlines four main strategies to address the funding gap:

1) Strengthen Capital Planning
2) Seek Increased Federal Funding
3) Utilize Federal and State Grant Funding
4) Explore Public-Private Partnerships.

Pennsylvania: ***Creating a Sustainable Solution for Pennsylvania (2008)***
Issued in November 2008 by the Pennsylvania Governor's Sustainable Infrastructure Task Force, *Creating a Sustainable Solution for Pennsylvania: Governor's Sustainable Infrastructure Task Force Report* made recommendations on drinking water and wastewater system needs. The report found that the state had $36.5 billion in capital needs, and required $77.1 billion in funding for operation and maintenance, replacement and repair, and debt retirement. Options to increase funding include increases in user rates while keeping an eye on affordability, requiring all water systems to analyze the short- and long-term costs, efficient management, and rates based upon full cost of service.

Vermont: ***Clean Water Report (2017)***
Issued in January 2017 by the Vermont State Treasurer and required by state Act 64 of 2015 (An act relating to improving the quality of State waters), *Clean Water Report* provides funding and financing recommendations for the General Assembly on supporting the state Clean Water Fund and other water initiatives. The report was a multi-agency effort, completed in collaboration with the Department of Conservation within the Agency of Natural Resources, the Agency of Administration, the Department of Taxes, the Agency of Transportation, the Agency of Commerce and Economic Development, and the Agency of Agriculture. Overall, the report recommends making capital investments of $50 million or more for wastewater treatment over the next two years, using a variety of loan and tax sources. Local governments should be incentivized to coordinate decision-making, while redundancies should be addressed to reduce costs.

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