

Maine's Clean Water Infrastructure: Transformative Power and Ongoing Needs

by Brian Kavanah

Much of the improvement in Maine's water quality since the promulgation of the Clean Water Act (CWA) in 1972 is due to the development of our clean water infrastructure. Maine's clean water infrastructure, particularly municipal and quasi-municipal wastewater treatment facilities, was largely built after the establishment of the CWA when federal grant funding via the Environmental Protection Agency (EPA) Construction Grants Program was made available on a large scale. Clean water infrastructure is often out of sight and out of mind for most people, but the maintenance and upgrading of this essential infrastructure is critical to protect water quality and public health and to support economic growth.

Maine currently has 150 municipal and quasi-municipal wastewater treatment facilities (also known as publicly owned treatment works [POTWs]). These facilities, along with their associated sewer lines and pump stations, transport and treat the wastewater from our homes and businesses. Using a variety of physical, biological, and chemical processes, raw sewage is transformed to clear water that is clean enough to be discharged into our streams, rivers, and marine waters in a manner that ensures water quality standards will be met.

Most of these POTWs were originally built in the 1980s through the 1990s using EPA Construction Grants Program Funding, which covered most of the cost (typically 55%) with state and local funding providing the balance. While

most Maine POTWs were built in the 1980s and 1990s, many of Maine's sewer systems were established long before the CWA, some as long as 100 years ago. Clean water infrastructure has a useful life and must be periodically upgraded and replaced to maintain the water quality gains that have been realized. The typical useful life of a POTW is 30 to 40 years before a major upgrade is needed. Pump stations and mechanical and electrical equipment at the treatment facility generally have a shorter useful life and need to be replaced or upgraded sooner. Gravity sewers and force mains have a useful life of approximately 50 to 100 years.

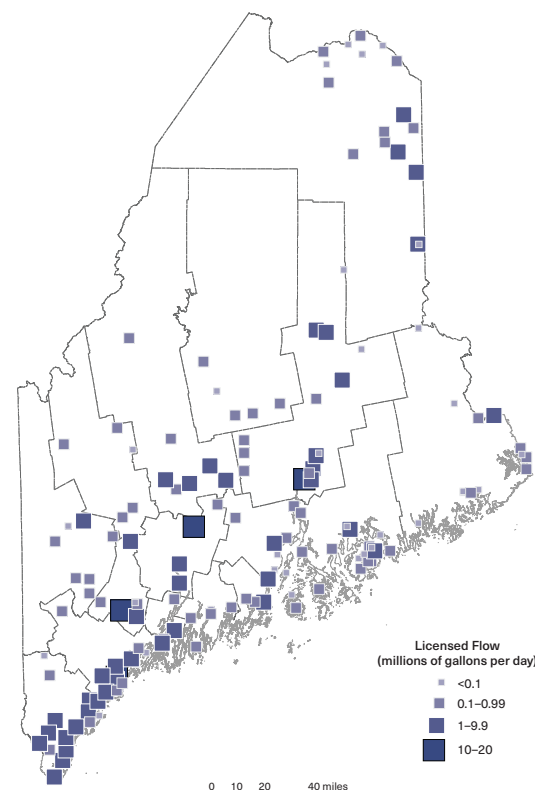
FUNDING NEEDS

The Maine Department of Environmental Protection (DEP) periodically conducts a needs survey to document clean water infrastructure needs to maintain and upgrade existing infrastructure. This is a forward-looking survey to estimate infrastructure needs for approximately the next 10 years. The most recent survey conducted in 2020 documents approximately \$1 billion in needs for the categories of wastewater treatment, sewer replacement or rehabilitation, new collector or interceptor

sewers, combined sewer overflow correction, and stormwater. (The results of the 2020 Clean Water Needs Survey are available as an online appendix: <https://digitalcommons.library.umaine.edu/mpr/vol32/iss1/5/>.) An updated survey is currently being conducted and results will likely be available in late 2023.

An aspect of clean water infrastructure that is worth noting is the significant progress in abatement of combined sewer overflows (CSOs) from combined sewer systems (CSS). A CSS carries a combination of sanitary wastewater and stormwater within the same pipes. They are typically older collection systems designed and installed prior to the advent of wastewater treatment facilities. CSOs are

FIGURE 1: Maine Publicly Owned Treatment Works



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discharges of untreated wastewater from a CSS. CSOs are hydraulic relief points in a CSS that discharge to a receiving water during wet weather to protect property and prevent sewer backups into people's basements. There are 31 Maine communities with CSOs. All CSO communities are required to implement a DEP approved plan to abate and eliminate CSOs. Since 1989, the overall CSO volume discharged annually has decreased by approximately 94 percent statewide, but there is still additional work to be done.

SOURCES OF FUNDING

Wastewater infrastructure is typically the highest-value asset a community owns, and in some circumstances, it cannot be affordably sustained solely through local rate payers. Therefore, broad-based public financing is provided via several federal and state programs.

Clean Water State Revolving Fund

Funding for EPA's Construction Grants Program ceased in 1990 and was replaced by the Clean Water State Revolving Fund (CWSRF). The CWSRF is a low-interest loan program administered by the DEP in partnership with the Maine Municipal Bond Bank to provide funding for clean water infrastructure projects. The fund is capitalized annually via grants appropriated by the US Congress and passed through the EPA to the states. States must provide matching funds of 20 percent (one state dollar provides five federal dollars). The repayment and interest money from the loans is recycled back into the program to fund additional water quality projects. The revolving nature of the program is designed to provide ongoing funding for

water quality projects. In recent years Congress has also allowed a certain percentage of the federal capitalization grants to be provided to borrowers as principal forgiveness such that the loan does not need to be repaid.

DEP solicits clean water infrastructure improvement proposals from Maine municipalities and quasi-municipal entities annually. These proposals are evaluated and ranked based on environmental benefit and potential economic hardship to ratepayers of the POTW. Principal forgiveness funds are directed to those communities with the highest level of economic hardship. Evaluation of economic hardship is based on a variety of community metrics including median household income, average sewer user rate as a percentage of the median household income, poverty rate, unemployment rate, and population trends.

A significant increase in CWSRF funding has recently become available via the federal Bipartisan Infrastructure Law (BIL) enacted in 2021. The BIL increased base funding for the CWSRF capitalization grants and provided new funding via supplemental funds and specialty funding for emerging contaminants. Increased funding will continue through 2026. Current estimates of total annual Maine CWSRF funding, including state matching funds and repayment money, is shown in Table 1. Actual amounts may vary year to year based on Congressional appropriations and other factors.

The CWSRF program also supports infrastructure sustainability by providing

TABLE 1: **Current Estimates of Maine CWSRF Funding**

Federal fiscal year (FFY)	Total estimate of CWSRF funding (millions)	% increase over FFY21 funding
2021	\$49.8	0%
2022	\$62.5	26%
2023	\$81.9	65%
2024	\$97.9	97%
2025	\$89.6	80%
2026	\$89.6	80%
Total	\$471.3	

principal forgiveness funding for fiscal sustainability plans (asset management plans with a water conservation component) and for climate adaptation plans for wastewater systems.

In addition to the CWSRF and the BIL, funding may also be available via Maine state grants, the USDA Rural Development, the Maine Department of Economic and Community Development, and the Northern Border Regional Commission. DEP coordinates project funding with these entities to leverage combined funds to their fullest potential.

State Wastewater Grants

Periodically, state grant money for wastewater infrastructure improvements is made available through environmental bond issues approved by the Maine Legislature and Maine voters. When available, these funds are administered by the DEP. The annual amount of available grants varies greatly, and in many years, these funds are not available. The most recent bond for \$30 million was approved in 2018. All of these funds have been committed to projects.

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*USDA Rural Development
Loans and Grants*

The USDA Rural Development Program provides low-interest loans and grants for the purpose of developing wastewater systems in rural areas with populations of 10,000 or less.

*Department of Economic and
Community Development
Block Grants*

Community Development Block Grants provide funds for eligible communities to address local issues, which are part of a community development strategy leading to future public and private investments. The eligible activities include sewer system installation/improvements and sewer system hookups for low- and moderate-income households.

*Northern Border Regional
Commission*

The Northern Border Regional Commission can invest in economic and infrastructure projects in the following Maine counties: Androscoggin, Aroostook, Franklin, Hancock, Kennebec, Knox, Oxford, Penobscot, Piscataquis, Somerset, Waldo, and Washington.

INFRASTRUCTURE STAFFING

While infrastructure is extremely important, the dedicated and skilled workers who operate and maintain Maine's wastewater infrastructure are just as important. Every POTW is required to have a licensed wastewater operator in responsible charge of the facility. In practice, most POTWs have multiple staff who are certified operators. Maine is fortunate to have a devoted and skilled

workforce that keeps this infrastructure functioning 24/7 and 365 days a year.

EMERGING CHALLENGES

The clean water infrastructure of today is primarily designed to reduce total suspended solids and oxygen-depleting pollutants and to provide disinfection to reduce potential pathogens. It has performed extremely well in this task and has resulted in dramatic improvement to Maine's water quality. However, current wastewater infrastructure was not designed to meet emerging challenges. Treatment of emerging pollutants of concern, such as the nutrients phosphorus and nitrogen, will likely require additional infrastructure upgrades at certain POTWs. In addition, as regulatory requirements evolve for the so called forever chemicals, per- and poly-fluoroalkyl substances (PFAS), new types of advanced wastewater infrastructure may be required at certain POTWs. The DEP expects these challenges to become clearer over the next several years.

Clean water is part of the Maine brand and our investments in clean water infrastructure and the resulting benefits have served Maine well. It is vitally important that we continue to make the necessary investments to maintain our clean water infrastructure so we can maintain and enhance water quality, public health, and the economic benefits this infrastructure provides.



Brian Kavanah has worked in the field of environmental protection for 35 years, holding a variety of positions with the Maine Department of Environmental Protection and briefly with the US Environmental Protection Agency in New York City. Brian was appointed as the director of the Bureau of Water Quality in April 2019. He is responsible for all aspects of the water quality programs at Maine DEP.