MAINE STATE LEGISLATURE

Maine Combined Sewer Overflow 2023 Status Report

June 2024

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STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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June 17, 2024

To: Combined Sewer Overflow (CSO) Permittees

Subject: 2023 Annual CSO Status Report for the State of Maine

Attached is a copy of the Maine Combined Sewer Overflow 2023 Status Report. This report is being distributed to CSO Permittee contacts, municipal officials, consulting engineers, and other interested people.

The report documents the efforts and progress that has been made by each CSO Permittee to eliminate or abate combined sewer overflows within their system.

Make no mistake, 2023 was a challenging year from a CSO perspective. Just when we were feeling bullish on the progress that has been made reducing CSO discharge into the rivers and bays of Maine, along comes a year like 2023, to temper our optimism. A year of heavy rainfall, drenching the State with 57.3 inches of precipitation on a CSO flow-weighted average. This is approximately 22% higher than the average since the start of the CSO Abatement Program.

Not only were there large, high intensity storms in 2023, they happened to occur at times that promoted maximum runoff. Such as in December, when the ground is frozen or in the summer when a storm closely follows another storm which has saturated the soil with water. Storms in quick succession can also hinder the ability to drain CSO storage tanks between storms. These conditions all occurred in 2023, and significantly increased the volume of CSO discharge and also the discharge per inch of precipitation compared to recent drier years.

In fact, you have to go back about a dozen years before you find one with a higher total CSO volume and a higher CSO discharge discharge per inch of precipitation. Does that mean all the sewer separation and addition of storage that's occurred over the last dozen years has gone for naught? Definitely not!

Last year was a good example of why we don't judge progress on CSO abatement based on one year's results. It's the trendline that remains the most important indicator of overall progress, and in that regard Maine CSO communities continue to make progress.

For a more detailed discussion on the variables that impact CSO discharge in any given year, please see the section titled, *Overall Trends and Considerations*, in the report's introduction.

The point is, when you have a multitude of variables which can impact CSO discharge, there will be years like 2023 where the worst conditions combine randomly to drive discharge up relative to prior years with similar rainfall but different antecedent conditions.

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Our advice to CSO permittees is to focus on the trendline and the progress that's been achieved and stick to your CSO abatement plan.

The Department's CSO website has a downloadable version of the current report and also includes copies of each report from the last three years. The website also contains links to other State and Federal documents that may be of interest. The report and other CSO materials may be found at: http://www.maine.gov/dep/water/cso/index.html.

The report is meant to be a snapshot of the CSO program status in Maine. We welcome any comments that you might have to improve the report. Thanks to all of you who have contributed data for this report, and most importantly thank you for your continued efforts to eliminate the public health hazard created by CSOs.

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Introduction

The purpose of this annual report is to inform the Combined Sewer Overflow (CSO) Permittees and the general public on the status of CSO abatement efforts in the State of Maine. The drive to reduce CSO discharge began in the early 1990s with the development of CSO Master Plans by 47 Maine CSO Permittees, with DEP approvals of the Master Plans starting in 1993. As such, the overall CSO abatement effort has been waged for 32 years in Maine. Over those three decades, thirteen CSO Permittees have completed their CSO abatement plan, closed their CSO locations, conducted post construction monitoring and exited the CSO program. At this point, the remaining 34 CSO Permittees have completed the less difficult CSO abatement projects, with the majority of the remaining projects being of a more complex and more expensive nature.

The CSO program compiles information from various documents and reports submitted to the Maine Department of Environmental Protection by the CSO Permittees (City/Town/District/Authority) or their consultants on their behalf. The majority of information comes from the CSO Master Plans (a.k.a. Long-Term Control Plans), Sewer System Evaluation Studies, Inflow/Infiltration Reports, Annual CSO Progress Reports, Annual CSO Activity and Volume Reports, and general correspondence.

At the start of each CSO Permittee's abatement program, initial flow data was collected to estimate the discharge volumes and frequencies, define the scale of the problem, and establish a corrective course of action. Since then, CSO flow monitoring plans have continued to improve, Permittees have a better understanding of their collection system's response to wet weather, and overall data reliability has increased.

What is a CSS and What are CSOs?

- Combined Sewer Systems (CSS) are defined as collection systems which carry a combination of sanitary wastewater and storm water within the same pipes. They are typically older collection systems designed and installed prior to the advent of wastewater treatment facilities. Newer collection systems are no longer being designed in this manner and no new CSO locations are being licensed.
- Combined Sewer Overflows (CSOs) are discharges of untreated wastewater from municipal CSSs. CSOs can be considered hydraulic relief points in a CSS which discharge to a receiving water during wet weather to protect property and prevent sewer backups into people's basements. CSOs typically consist of two components; a CSO Regulator where the untreated wastewater exits the sewer system, and a CSO outfall where the wastewater is discharged to the receiving water. Maine Pollution Discharge Elimination System (MePDES) permits issued by the State license the CSO outfalls, not the CSO regulators. Although uncommon, there can be more than one regulator discharging to a given CSO outfall.
- Difference between a CSO Outfall and a CSO Regulator:

    - CSO Outfall – a licensed pipe or structure that discharges untreated combined wastewater from an overwhelmed collection system to the receiving water during wet weather events in compliance with requirements of the MePDES permit and waste discharge license.

  - CSO Regulator – this is where combined wastewater exits the sewer collection system, prior to reaching the wastewater treatment facility (WWTF). Think of it as leakage on the way to the WWTF. This happens when flows are high enough to exceed a regulator weir elevation thereby diverting that portion of the flow to a CSO outfall. CSO regulators are not permitted structures, CSO outfalls are. There can be more than one CSO regulator per CSO outfall. For example, Portland/PWD currently have 26 CSO regulators for 23 CSO outfalls.

- Large volumes of water entering the CSS through catch basins, old and leaky pipes, roof drains, cellar drains, sump pumps, and other sources can cause the capacity of the system to be exceeded, resulting in discharges. Most Permittees distinguish between inflow and infiltration (I&I) from public sources (catch basins and pipe located within the public right of way) and private sources (roof drains, perimeter drains, sump pumps, and service pipes located on private property). Abatement of private sources of I&I are generally tackled last due to the expensive nature of the work.
- CSO discharges occur mostly during and after rain events or snowmelt. Depending on the amount of inflow (catch basins, sump pumps, roof drains) and infiltration (high groundwater leaking into sewer via cracks, loose joints) entering a CSS, flows during wet weather events can be as high as fifty (50) times the normal dry weather flows. This ratio of wet weather flow to dry weather flow is referred to as the **peaking factor**. For CSO Permittees in Maine, wet weather peaking factors range from about three, for Permittees that have implemented an effective sewer separation program, to over ten, for Permittees whose separation efforts have been less effective. Peaking factors are an indication of the sensitivity of a CSS to precipitation and also a good indicator of how combined the CSS still is.
- CSOs were originally added as hydraulic relief points within the CSS to allow the excess flows to be discharged in a controlled manner. These relief points are generally at topographic low points, near pump stations and river crossings.
- A CSO discharge is considered a legally allowable discharge under the MePDES permit program subject to the following two conditions:

  - The CSO Permittee must be pursuing a DEP approved CSO abatement plan.
  - The abatement plan must be on schedule.
  - If either condition is not met, the legal protection for CSO discharge goes away. Subsequent discharges are treated as illicit sanitary sewer overflows until the two conditions are once again met.

- Sewer separation projects are designed to separate out the stormwater collection system from the wastewater collection system so that the sewers only carry wastewater and all stormwater is handled separately. If enough separation work is completed, CSO locations are no longer needed and can be permanently closed.
- For CSO permittees who have reached the end of the construction phase for CSO abatement and are entering the 5-year post construction monitoring phase (PCMP), the DEP will often engage in discussions on converting the last active CSO, which is typically located closest to the WWTF, to an Emergency Overflow (EO) to prevent

flooding at the treatment plant and to protect nearby residences if a 25+ year storm rolls through. The EO has to be electronically monitored on a continuous basis with any discharge being treated as an illicit discharge and reported as a sanitary sewer overflow (SSO), subject to enforcement and fines. In this manner, the sewer collection system will still have one hydraulic circuit breaker to prevent flooding when the storms are of a 25 year return frequency and above.

- For those not familiar with Sanitary Sewer Overflows (SSOs), they are defined as illegal discharges subject to DEP fines and enforcement. SSOs can occur for a variety of reasons, including pipe blockages, maintenance issues, mechanical failures, and wet weather, and can occur at any point in the collection system.

What are the Impacts of CSOs?

- At the end of 2023, there were 34 Maine CSO Permittees (Towns, Cities, Utility Districts, Authorities) located in 31 Maine communites with CSO discharge points in their sewer collection systems. At the end of 2023, these Permittees collectively had 111 individual CSO discharge points (reduced from the original 340). Statewide, four CSO locations were permanently closed in 2023 with GAUD once again leading the charge closing CSO 006, CSO 007, and CSO 026, as well as closing three regulators which discharged to the still active CSO 029. The City of Portland closed CSO 013, and redirected flow from the three 013 regulators to the Back Cove West storage conduit. This reduced the number of CSO regulators in Portland's collection system from 13 to 10. Totals for the State at the end of 2023 include 111 active CSO outfalls and 118 active CSO regulators. The regulator total reflects the discovery of two additional regulators in Bangor. Both had gone undetected until the summer of 2023, with one discharging to CSO outfall # 020 – Carr Brook, and the other discharging to CSO outfall # 003 – Davis Brook. Bangor now has 8 CSO outfalls and 10 CSO regulators.
- The frequency of discharges varies greatly amongst Permittees, ranging from seldom, all the way to discharging in response to the smallest rainstorms. Dry weather CSO discharges are prohibited, as are CSO discharges due to mechanical failure, or inadequate operation and maintenance. In addition, no discharges should occur at flow rates below the design capacity of the collection system.
- In large communities, tens of millions of gallons per year of untreated combined sanitary sewage and storm water may be discharged. In the past five years statewide, total annual CSO discharges have ranged from approximately 212 to 745 million gallons. For comparison, the estimated volume from 1989, when most CSO abatement programs were just starting, was 6.2 billion gallons.
- CSOs discharge untreated combined sewage into ten major watersheds in Maine. The watersheds include seven (7) rivers and their tributaries (Androscoggin, Kennebec, Machias, Penobscot, St. Croix, St. John, and Saco) and three (3) bays (Casco Bay, Frenchman Bay, and Penobscot Bay). The receiving waters vary in size from the Atlantic Ocean all the way down to a handful of small streams. The latter are the focus of DEP's effort to eliminate CSO discharge to sensitive receiving waters. Sensitive receiving waters tend to be smaller streams, brooks, or tidal estuaries with low dilution factors.

- CSOs have wide variability of impacts depending on discharge volume, frequency, and the size and sensitivity of the receiving water. Water quality can be impaired by the addition of floatable solids, bacteria, and sometimes industrial pollutants that may be present in CSO discharges.
- Potential public health impacts from CSO discharges include the closure of beaches and shell fishing areas due to bacterial contamination, and the potential for drinking water supplies to be threatened/contaminated.
- Why is CSO abatement important? During wet weather, flows in a CSS can hydraulically overload the capacity of the collection system leading to CSOs, sanitary sewer overflows (SSOs), street flooding, back-ups into basements, and treatment facility upsets.

What is a CSO Permittee?

- CSO Permittee – a Town, City, Sewer District, or regional Wastewater Treatment Authority that has active CSO locations in their collection system which must be licensed.
- CSO Permittees are authorized to discharge untreated combined sanitary and storm waters subject to the conditions and requirements included in the Maine Pollutant Discharge Elimination System (MePDES) permit. In simple terms, a CSO Permittee receives legal protection for CSO discharges while they work to implement an approved CSO Master Plan to abate and eliminate said discharges.
- The Department of Environmental Protection issues CSO Permittees a wastewater discharge license that requires them to implement the Environmental Protection Agency's (EPA) Nine Minimum Control Best Management Practices (BMPs) for CSOs and develop, maintain and implement a CSO Master Plan (aka the Long Term Control Plan (LTCP)) to eliminate or abate their overflows. These actions are intended to bring them into compliance with EPA's April 19, 1994 Combined Sewer Overflow (CSO) Control Policy, the Clean Water Act, and State law (Maine DEP Chapter 570).
- Special Conditions in a Maine Pollutant Discharge Elimination System (MePDES) permit/Waste Discharge License require all CSO Permittees to submit an Annual CSO Progress Report to the Department, by March 1st of the following year for the previous calendar year.
- The Annual CSO Progress Report documents the Permittee's efforts to implement CSO abatement in a given year and collects pertinent fiscal and logistical information about their CSO abatement program. This information is used to track their CSO abatement progress and gather state-wide information on the CSO program and fiscal needs.

Where Did We Start?

- The CSO abatement movement began in 1989 with the publication of the National CSO Control Strategy by the EPA.
- At that time, the State of Maine had about 50 CSO Permittees that discharged an estimated 6.2 billion gallons of untreated wastewater and storm water into the surface waters of the State, primarily during wet weather events.

- At the start of the program in the late 1980s, CSO Permittees reported that over 1,700 individual CSO discharge events were occurring each year, through approximately 340 CSO outfall locations (an average of 5 discharge events per CSO location per year).
- On April 19, 1994 EPA issued a national policy statement entitled "Combined Sewer Overflow (CSO) Control Policy." This policy provided guidance to State permitting authorities and CSO Permittees on coordinating the planning, selection, and implementation of CSO controls that, once implemented, would allow CSO Permittees to achieve compliance with the requirements of the Clean Water Act (CWA).
- In February 2000, the Maine Department of Environmental Protection Chapter 570 Rules, entitled "Combined Sewer Overflow Abatement," took effect. This chapter established procedures for CSO evaluation, preparation of an abatement plan, and set forth minimum controls to reduce CSOs while long-term plans are completed. Chapter 570 also discussed the conditions under which new sources of wastewater could be added to a CSS with active CSOs.
- In December 2000, as part of the Consolidated Appropriations Act for Fiscal Year 2001 (P.L. 106-554), Congress amended the Clean Water Act (CWA) by adding Section 402(q), commonly referred to as the Wet Weather Water Quality Act of 2000. Section 402(q) requires that each permit, order, or decree issued pursuant to the CWA for a discharge from a municipal combined sewer system shall conform to the 1994 EPA CSO Control Policy.

What is Being Done to Eliminate/Abate CSO Discharges?

- All of Maine's CSO Permittees have completed or are currently working on implementing their CSO Master Plan, often referred to as a Long-Term Control Plan. These documents define the magnitude of the CSO discharges, their impacts on the environment, evaluate a range of abatement control alternatives and their financial impacts, and recommend a set of CSO controls that will eliminate/abate the CSO discharges.
- CSO abatement projects have reduced the discharge of untreated, combined sewage to receiving waters for all the CSO Permittees. Thirteen Permittees have eliminated their CSO discharges entirely, have left the CSO program, and are no longer licensed to discharge untreated combined sewage during wet weather. One additional permittee, Paris Utilities District, is nearing the end of its five year construction monitoring phase. PUD has positioned itself as the next permittee to leave the CSO program.
- Statewide, **currently licensed** CSO Permittees have reported investing approximately $826 million in CSO abatement since the program started (Note: this number has been adjusted to reflect recent audit). Of the total invested to date, the Maine Clean Water State Revolving Fund (CWSRF) has contributed approximately $348 million (42% of total expenditure on CSO abatement by current CSO Permittees).
- Anticipated infrastructure needs of current CSO Permittees over the next five years are estimated to be approximately $316.5 million.


Force Main Installation under the Kennebec River in Winslow at CSO #003 Prior to Storm

Where are We Now?

2023 Status

1) In 2023, the 34 currently licensed CSO Permittees reduced the total number of CSO discharge locations by four, from 115 to 111, (a complete listing of Maine's CSO Permittees, the number of CSO locations, and the corresponding receiving waters are listed on page 14). CSOs were closed in the communities of Augusta with three closures (GAUD), and Portland with one closure (City of Portland). With the addition of 2023 data, the chart on page 20, **Maine – Statewide Number of Combined Sewer Overflow Outfalls**, shows a 67.2% reduction in the overall number of CSO locations in Maine since the start of Maine's CSO Abatement Program.

2) In 2023, the CSO Permittees reported a total of 276 overflow event days which is the third lowest annual total on record for the State, despite the wet conditions. An overflow event is any calendar day that one or more CSO locations within a community experiences a discharge. The table on page 16, **Maine CSO Permittee Annual Number of CSO Discharge Events**, contains a historic listing of the annual number of CSO discharge events for each CSO Permittee.

3) The maximum number of overflow event days reported in 2023 from a single CSO Permittee was thirty seven (37). The average (mean) number of discharge event days per year for all Permittees was nine (9) event days and the median was five and one half (5.5) event days. Additional information can be found in the table on page 16, **Maine CSO Permittee Annual Number of CSO Discharge Events**.

4) Since 1989, the statewide flow weighted average annual precipitation for CSO Permittees in Maine has been 46.98 inches. In 2023, the annual precipitation measured by CSO Permittees varied significantly from 41.85 in Aroostock County to 72.4 inches in Washington County with a statewide flow weighted average of 57.31 inches. Comparatively speaking, 2023 was a wet year for precipitation in Maine.

5) The **Maine – Yearly CSO Volumes and Precipitation** chart on page 22 compares annual CSO discharge volumes to annual precipitation. The chart illustrates that CSO discharge volumes tend to mirror the annual upward and downward trends in precipitation totals, but also shows that the peaks have become less pronounced as the CSO abatement effort has progressed. The chart also shows a progressive widening of the gap between the annual precipitation trend line and the annual CSO discharge volume trend line. This widening gap illustrates that as CSO abatement projects continue to be implemented, collection systems are becoming **less sensitive to precipitation events.**

6) The CSO volume discharged statewide in 2023 was reported to be approximately 745.2 million gallons (MG). This is the highest annual discharge since 2014, when rainfall also exceeded 50 inches on a statewide average.

7) The table on page 15, **Maine CSO Permittee Flow Data**, contains a historic listing of the annual overflows from each CSO Permittee. The **Maine 2023 CSO Flow Comparison** pie chart on page 23 and the **Maine 2023 CSO Flow Comparison by Permittee** bar chart on page 24 show graphical comparisons of these overflow volumes between the CSO Permittees.

8) In 2023 the top five (5) CSO Permittees, ranked by discharge volume, accounted for approximately 88.2% of the total CSO volume discharged in the State. The top ten (10) CSO Permittees accounted for approximately 96.9% of the total CSO discharge volume. The remaining twenty-one (21) CSO Permittees accounted for 3.1% of the total CSO discharge volume. See the **Maine 2023 CSO Flow Comparison** pie chart on page 23 for a graphical comparison of CSO dischargers.

Sewer Separation in Downtown Biddeford (CSO #009)

9) CSO discharges by the City of Portland and the Portland Water District totalled 368.7 MG and accounted for approximately 49.5% of Maine's total CSO discharge volume in 2023; see the **Maine 2023 CSO Flow Comparison** pie chart on page 23. We're happy to report that the Back Cove West Storage Conduit officially went on line in the spring of 2023. The Back Cove South Storage Facility is scheduled to go into service at the end of 2024.

10) CSO discharges by the City of Lewiston and Lewiston-Auburn Water Pollution Control Authority (LAWPCA) totalled 195.9 MG in 2023 accounting for 26.3% of the overall statewide CSO discharge. LAWPCA is currently designing a 2.1 MG storage tank to reduce CSO discharge from Structure B at the LAWPCA facility. If the tank had of been on line in 2023, we estimate CSO discharge would have been reduced by 18.6 MG and the number of CSO events would have decreased substantially from 19 to 7.

Excavation and Pile Caps for the New Headworks Building at the Saco WRRF

11) In 2023, the State of Maine saw an intensification of the trend towards more high intensity rain events which can overwhelm any combined sewer collection system.[1] This trend of high intensity storms has worked against the progress made by Maine CSO communities.

12) The chart on page 25 – **Maine 2023 CSO Volume Discharged by Watershed**, is a graphical representation of the CSO volumes discharged by major watershed. In 2023, Casco Bay received approximately 50.3% of the statewide CSO volume discharged, followed by the Androscoggin River at 26.5%, the Penobscot River at 9.5%, the Kennebec River at 7.9%, the Saco River at 4.3%, Frenchman Bay at 1.0%. Discharges to the St. John River, St. Croix River, Machias River and Penobscot Bay account for the remaining ~0.5% of combined sewer overflow volumes.

13) The table on page 26 – **Maine Annual CSO Volume Discharged by Watershed**, shows the reported CSO discharge volumes for each CSO Permittee grouped by the receiving watersheds, both for 2023 and the previous five years.

[1] Fernandez, I., S. Birkel, C. Schmitt, J. Simonson, B. Lyon, A. Pershing, E. Stancioff, G. Jacobson, and P. Mayewski. 2020. Maine's Climate Future 2020 Update. Orono, ME: University of Maine. climatechange.umaine.edu/climate-matters/maines-climate-future/

14) CSO discharges are well documented contributors to beach and shellfish closures. Stating with certainty that specific CSO events are **solely** responsible for specific closures is more difficult and is beyond the scope of this report. In some areas of the State, there may be other factors that contribute to a beach or shell fishing area closure. These may include but are not necessarily limited to: urban storm water runoff, malfunctioning septic systems, domestic and non-domestic animal waste, agricultural runoff, and bathers. This Annual Report attempts to identify which beaches and shell fishing areas **may have** been impacted by CSO discharges in 2023.

15) In 2023, there was one beach closure due to CSO discharge and that again was in Portland at East End Beach. Willard Beach in South Portland was also closed due to bacterial issues unrelated to CSO discharge. Subsequent testing uncovered a cross connection between a leaking sewer and a stormdrain which discharges near the beach. This situation is being addressed by lining both pipes. There were also potential impacts on thirteen (13) beach areas from CSO discharges. They were: Bar Harbor (Town Beach off Town Pier & Hulls Cove); Biddeford/Saco (Hills Beach, Biddeford Pool, Middle Beach, Fortunes Rock Beach & Camp Ellis); Cape Elizabeth (Cliff House Beach, Casino Beach & Fort Williams Park); Portland (East End Beach); South Portland (Willard Beach); and Calais (Red Beach – though not considered a swimming beach).

16) In 2023 three (3) CSO Permittees reported that shell fishing areas were impacted by their CSO discharges (Machias, Calais, and Portland). All three reported shell fishing area closures, including eleven in Machias, which were attributed to CSO activity. The upgrades to the river crossing and construction of the pump station in Machias shown below will hopefully be completed in 2024, which should reduce CSO activity from that point forward.

Pump Station and Force Main Under the Machias River in Machias at CSO #002

Overall Trends and Considerations

1) The volume and frequency of CSO discharges vary from one wet weather event to the next based on existing groundwater levels, frozen or thawed ground, snowmelt, saturated soil conditions and rainfall volume, duration, and intensity. A good example of this are two storms that Lewiston experienced in 2023, which were of a similar size but happened in different times of the year when the ground conditions were totally different. On July 25th and 26th, Lewiston had 8.44 MG of CSO discharge in response to a 3.48 inch storm. On December 17th through 19th, Lewiston experienced a similar sized storm totalling 3.66 inches of rain which resulted in 22.88 MG of CSO discharge. Two similar sized storms with radically different CSO discharge because of when they occurred. The December rainstorm met frozen ground creating almost 100% runoff, which entered the sewer through the 221 catch basins still connected to Lewiston's sewer.

2) To evaluate CSO abatement progress it is best to look for a historical trend in reductions, rather than totals from year to year. The chart on page 18, **Maine – Statewide Combined Sewer Overflow Volume Discharged**, illustrates the continuing overall downward trend in the CSO volume discharged annually. Since the start of the CSO Abatement Program the cumulative reduction in CSO volume discharged annually has decreased by approximately 88% statewide. Recent progress has slowed as Permittees tackle the more difficult abatement projects and the frequency of larger and more intense storms has increased.[2]

3) Similarly, the chart on page 19, **Maine – Statewide Combined Sewer Overflow Annual Number of Discharge Events**, shows an overall downward trend in the number of overflow event days per year. Since the start of the CSO Abatement Program, the cumulative number of overflow event days experienced per year has decreased by approximately 84.3% statewide from 1,753 events in 1989 to 276 events in 2023.

4) CSO abatement progress should not be measured solely by comparing the volumes discharged from one year to the next, because the volume discharged is influenced by variations in precipitation amounts, intensity and timing, the total area drained by the collection system, the rate of snow melt, frozen or thawed ground, and existing groundwater levels. Even given the same annual precipitation, it is highly unlikely that any two years would result in the same volume of CSO discharges because of the complex relationship between these variables.

5) Trying to compare CSO abatement progress from year to year is difficult due to the varying conditions that influence the volume and frequency of overflows, not the least of which is annual precipitation patterns. To partially compensate for the fluctuation in annual precipitation patterns, the total volume of untreated combined sewage discharged can be unitized by taking into consideration the average annual precipitation received by each CSO Permittee. Just divide CSO volume by annual precipitation reported in inches to obtain a volume discharged per inch of precipitation. The chart on

[2] MCC STS. 2020. Scientific Assessment of Climate Change and Its Effects in Maine. A Report by the Scientific and Technical Subcommittee (STS) of the Maine Climate Council (MCC). Augusta, Maine. 370 pp.

page 21, **Maine Combined Sewer Overflows Annual Volume Discharged per Inch of Precipitation**, illustrates the unitized CSO discharge volume per year. This chart shows a continuing downward trend in the volume of combined sewage discharged per inch of annual precipitation, despite an uptick in 2023. Since the start of the CSO Abatement Program, overflow volumes have decreased from approximately **128** million gallons per inch of precipitation to **13.0** million gallons per inch of precipitation, a reduction of 89.8%. The reduction in CSO discharge per inch of rain mirrors the overall reduction in annual CSO discharge volume achieved statewide since the CSO Abatement Program started (88%). This analysis is useful as a general indicator of the CSO abatement progress that is being accomplished.

6) Precipitation and the CSO volume discharged does not have a simple linear relationship. Still, generally, as precipitation levels increase, the volume of combined sewage being discharged per inch of precipitation would increase, because of the sewers finite capacity to capture more storm water. Once the capacity of the combined sewer system is reached, any additional rainfall or snowmelt would overflow the already inundated system.

Sewer Separation on Main Street in the City of Calais

7) The susceptibility of a CSO Permittee's sewer collection system to excessive inflow and infiltration (I&I) is dependent on many factors including age and condition of pipe, degree of separation, quality of the original installation, how well the system has been maintained, etc. Therefore, wet weather conditions and precipitation patterns affect individual CSO Permittees differently. Systems with a large number of catch basins or roof drains still connected, or with a high percentage of impermeable surfaces, may be influenced to a greater degree by the inflow generated by intense summer storms. In communities where the sanitary and storm systems are largely separated and inflow is

not the main challenge, the cause of wet weather discharges might be more infiltration based. In these systems a high ground water table, often occurring in the spring, can promote infiltration into the collection system via leaky pipes and manholes. Therefore, direct comparisons between Permittees regarding their CSO abatement progress could be misleading.

8) Starting in 2018 the Annual Maine Combined Sewer Overflow Status Report has included a new section which summarizes the level of treatment provided by each of the thirty-four (34) Maine CSO Permittees. The **Maine CSO Permittee Level of Treatment** summary included on page 27 provides the total annual volume of wastewater collected by each of CSO communities, the percentage which receives secondary treatment, the percentage which receives only primary treatment (the bypass volume, for communities that have a permitted bypass of secondary treatment), and the percentage which receives no treatment (CSO volume). The summary is a good indication of which CSO Permittees are maximizing the percentage of flows which receive secondary treatment, and whether certain systems are overly reliant on their CSO bypass.

9) In addition to the CSO storage facilities mentioned previously, Lewiston/Auburn are currently in the design stage to add 2.1 MG of off-line storage at their LAWPCA treatment plant. The project will also increase the peak flow capacity of LAWPCA from 32 to 38 MGD. The storage tank at LAWPCA is scheduled to be on line by the end of 2026.

Recognitions

Yes, there were some bright spots in 2023.

1) Despite the heavy amount of precipitation Maine received in 2023, the following three (3) CSO permittees had zero CSO events and thus zero CSO discharge: Town of Bucksport, Kennebec Sanitary Treatment District (KSTD) and the City of Rockland. Congratulations on this achievement!

2) In 2023, the following CSO Permittees had their lowest number of CSO events on record despite higher CSO discharge volume: City of Biddeford (21) and City of Portland/PWD (37).

3) The Town of Skowhegan has achieved its two lowest number of CSO events on record, in 2022 and 2023, despite CSO discharge volume increasing.

4) CSO permittees that are currently in the Post Construction Monitoring Phase (PCMP) of their CSO abatement program include: Paris Utilities District, Town of Bucksport, City of Old Town, and Town of Cape Elizabeth – Ottawa Road

5) CSO Permittees nearing the completion of their construction phase of CSO abatement, and the start of post construction monitoring, include: City of Belfast, City of Calais.

6) We'd also like to recognize those CSO Permittees that treated more than 99% of their total flow volume to secondary treatment standards. They include: Belfast, Brewer,

Machias, Madawaska, Mechanic Falls, Orono, Paris UD, South Portland/Cape Elizabeth, and PWD/Westbrook. Congratulations on this achievement!

7) CSO permittees separated an additional 45 catch basins from their sewer collection systems in 2023 with the City of Lewiston leading the way with 18, followed by Bath with 8, Biddeford with 7, and Auburn and Portland with 4 each.

8) The City of Portland has been working diligently to reduce discharge at two CSO locations which discharge to sensitive receiving waters, CSO 039 (Nason Brook) and CSO 042 (Capisic Brook). CSO discharge into these two brooks, which had averaged 8.77 MG from 2017 to 2021, dropped to 363,000 gallons in 2022 and then again to 206,400 gallons in 2023. Excellent work by the City.

9) Portland Water District has been working to reduce discharge at CSO #002 which discharges to the Presumpscot River Estuary, a sensitive receiving water. CSO discharge, which had aveaged 98,000 gallons over the previous five years, dropped to zero in 2023. A great result for this sensitive receiving water.

10) Cleaning sewers reestablishes lost capacity and allows for a detailed condition assessment of the pipe and manholes. CSO communities cleaned over 107 miles of sewer mains in 2023 led by Bangor (43.6 miles) and Lewiston (21 miles).

Upgrade of Ottawa Road Pump Station at CSO #001 in Cape Elizabeth

11) Closed circuit TV inspection (CCTV) of sewer mains is one of the best tools available to determine pipe condition. In 2023, CSO communities CCTVed 124 miles of sewer mains with Lewiston (22 miles), Portland (21 miles), Bangor (20 miles), and GAUD (18 miles) leading the charge. I/I investigations were conducted on a total of 383 miles of sewers in 2023.

Maine Combined Sewer Overflow (CSO) Permittee List

(As of December 31, 2023)

	COMMUNITY/PERMITTEE	Outfalls	Regulators	No. of CSO Outfalls & Receiving Water
1.	**AUBURN SEWERAGE DISTRICT**	1	1	1-Androscoggin R.
2.	BANGOR	8	10*	5-Kenduskeag Str., 3-Penobscot R.
3.	BAR HARBOR (Hulls Cove)	1	1	1-Frenchman Bay
4.	BAR HARBOR (Main Plant)	3	3	2-Frenchman Bay, 1-Eddie Brook
5.	BATH	4	4	4-Kennebec R.
6.	BELFAST	2	2	2-Passagassawakeag R./Belfast Hbr.
7.	BIDDEFORD	7	7	7-Saco R.
8.	BREWER	4	4	3-Penobscot R., 1-Sedgeunkendunk Str.
9.	BUCKSPORT	0	0	SWIRL to Penobscot R.
10.	CALAIS	3	3	2-St. Croix R., 1-Landing Bk.
11.	**CAPE ELIZABETH – Ottawa Road PS** (Co-Permittees: So. Portland, PWD, & Cape Elizabeth)	1	1	1-Atlantic O.
12.	GARDINER	1	1	1-Kennebec R.
13.	GREATER AUGUSTA UTILITY DISTRICT (GAUD) & **Hallowell Sanitary Sewers & CSO**	10	11	10-Kennebec R.
14.	**HAMPDEN**	1	1	1-Souadabscook Str.
15.	KENNEBEC SANITARY TREATMENT District (KSTD)	2	2	2-Kennebec R.
16.	**LEWISTON**	8	9	3-Androscoggin R., 1-Goff Bk./Hart Bk., 4-Jepson Bk.
17.	LEWISTON-AUBURN Water Pollution Control Authority (LAWPCA)	1	1	1-Androscoggin R.
18.	MACHIAS	2	2	2-Machias R.
19.	MADAWASKA	2	2	2-St. John R.
20.	MECHANIC FALLS SANITARY DISTRICT	2	2	2-Little Androscoggin R.
21.	**MILFORD**	1	1	1-Penobscot R.
22.	OLD TOWN	3	3	2-Penobscot R., 1-Stillwater R.
23.	ORONO	1	1	1-Penobscot R.
24.	PARIS UD	0	0	0-Little Androscoggin R.
25.	**PORTLAND – CITY**	7	10	3-Back C., 1-Capisic Bk., 2-Portland Hbr., 1-Nason Bk. to Fore R. (marsh)
26.	PORTLAND – PORTLAND WATER DISTRICT (PWD)	16	16	5-Back C., 3-Casco B., 4-Fore R., 4-Portland Hbr.
27.	**RANDOLPH**	1	1	1-Kennebec R.
28.	ROCKLAND	1	1	1-Rockland Hbr.
29.	SACO	1	1	1-Saco R.
30.	SKOWHEGAN	5	5	5-Kennebec R.
31.	SOUTH PORTLAND	4	4	1-Barberry Ck., 1-Fore R., 1-Calvery P., 1-Portland Hbr.
32.	WESTBROOK	5	5	5-Presumpscot R.
33.	**WINSLOW**	2	2	1-Sebasticook R., 1-Kennebec R.
34.	WINTERPORT SEWERAGE DISTRICT	1	1	1-Penobscot R.
	TOTAL CSOs	111	118*	

34 CSO Permits, permitting 31 CSO Towns/Cities/Districts/Authorities
Two or more permits in one CSO Town/City
Two CSO Towns/Cities covered in one permit
Permittee has entered post-construction monitoring period prior to exiting the CSO program
CSO Outfall – where wastewater is discharged to the receiving water
CSO Regulator – where wastewater exits the sanitary sewer system
Bold = 9 Permittees with sewer system only. Sewers discharge to a POTW controlled by another entity.
*The City of Bangor total reflects the new total mentioned in the introduction.

Maine CSO Permittee Flow Data

Permittee	NPDES Permit No.	1987	1988	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Auburn S.D.	ME0100005	99,720,000	99,720,000	19,440,841	12,952,500	19,234,856	12,404,500	3,717,000	1,286,000	2,928,519	814,738	1,117,809	1,656,736	997,100	219,600	439,796	286,954	967,864
Bangor	ME0100781	635,000,000	635,000,000	347,360,000	389,300,000	146,000,000	69,940,000	32,140,000	87,748,000	40,109,000	48,586,000	13,310,000	50,547,000	96,009,000	58,745,000	77,720,893	52,468,359	62,551,149
Bar Harbor	ME0101214 & ME0102466	32,000,000	32,000,000	11,935,337	6,930,405	2,563,669	3,776,092	407,010	1,561,139	2,335,692	277,000	225,200	562,221	2,757,979	971,376	3,816,271	3,141,462	7,478,224
Bath	ME0100021	600,000,000	600,000,000	11,323,060	12,930,203	10,067,181	12,199,904	3,297,259	4,990,910	2,727,901	1,608,037	1,697,081	3,753,899	2,800,232	2,874,579	1,806,487	1,583,361	3,522,034
Belfast	ME0101532	736,000	736,000	260,036	486,919	490,495	0	0	0	0	0	0	305,071	330,905	96,444	264,774	444,090	504,877
Biddeford	ME0100048	400,000,000	400,000,000	435,972,508	381,853,242	113,907,851	141,198,828	90,581,675	194,302,147	95,830,208	99,492,656	49,504,091	70,814,300	69,451,000	34,644,000	26,649,500	14,543,300	30,003,000
Brewer	ME0100072	750,000,000	750,000,000	229,270,683	227,139,515	140,065,515	435,548	58,310	139,280	465,000	87,374	0	366,687	868,060	76,188	4,235,000	783,656	3,557,124
Bucksport	ME0100111	53,000,000	53,000,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Calais	ME0100129	42,000,000	42,000,000	21,263,750	31,134,915	16,860,000	18,210,000	18,311,206	20,775,288	5,292,778	4,624,354	4,512,300	10,000,030	2,403,000	1,839,927	587,400	3,848,188	2,937,000
Cape Elizabeth	ME0102806	5,400,000	5,400,000	3,527,000	3,955,292	1,072,000	2,735,000	41,000	1,440,000	277,000	251,000	277,000	375,000	432,000	2,000	230,000	3,300	254,900
Corinna S.D.	ME0100153	40,000,000	40,000,000															
Dover-Foxcroft	ME0100501	16,000	16,000															
East Millinocket	ME0100196	1,200,000	1,200,000															
Fairfield	ME0102393	300,000	300,000	0	0	0	0	0										
Fort Kent U.D.	ME0102369	3,000	3,000															
Gardiner	ME0101702	44,000,000	44,000,000	1,380,000	10,453,761	4,655,000	4,455,400	1,287,000	1,950,000	2,299,300	665,000	2,877,000	4,893,100	2,877,000	9,932,000	1,993,000	61,000	18,240,000
Greater Augusta U.D.	ME0100013	72,554,000	72,554,000	15,723,000	49,670,000	31,589,000	38,408,000	26,901,000	17,646,000	21,680,000	7,120,000	3,680,000	3,771,000	3,482,000	6,074,000	3,082,000	1,989,200	2,509,450
Hallowell W.D. - 2008 GAUD	ME0101010	350,000	350,000															
Hampden	ME0102512	1,201,000	39,600	500,000	500,000	500,000	0	0	0	24,105	151,055	0	1,250,000	1,933,080	244,200	319,902	205,128	117,216
Kennebec S.T.D.	ME0100854	2,500,000	2,500,000	0	0	0	135,444	0	0	1,797,554	0	0	324,228	0	0	0	0	0
Kittery	ME0100285	350,000	350,000															
Lewiston	ME0100994	208,900,000	208,900,000	116,557,656	113,285,042	78,521,909	90,103,658	32,772,894	21,355,331	30,574,217	25,477,213	12,808,039	18,552,725	21,743,196	22,923,950	8,480,003	20,781,523	83,310,342
Lewiston-Auburn W.P.C.A.	ME0101478	480,000,000	480,000,000	207,794,000	156,986,000	108,278,048	113,380,000	63,567,000	68,569,000	27,838,000	18,694,000	21,856,000	25,735,000	28,518,000	33,659,000	14,531,000	31,190,000	112,566,000
Lincoln S.D.	ME0101796	2,400,000	2,400,000															
Lisbon	ME0100307	600,000	600,000															
Livermore Falls	ME0100315																	
Machias	ME0100323	7,000,000	7,000,000	4,073,938	2,791,962	1,180,678	938,330	1,857,988	2,202,444	1,067,647	910,259	203,815	603,687	145,425	100,035	122,833	418,811	291,295
Madawaska	ME 0101681	3,200,000	3,200,000	15,800,000	1,107,610	1,490,000	377,488	349,400	1,830,563	0	0	1,562,430	3,988,640	8,205,821	10,242	422,838	616,123	423,493
Mechanic Falls S.D.	ME0100391	18,000,000	18,000,000	6,231,000	9,250,000	5,033,002	9,638,035	3,663,997	1,385,675	1,013,807	927,473	603,528	194,728	616,537	379,608	63,330	131,488	232,081
Milford	ME0102695	220,000	220,000	66,285	52,006	407,151	26,970	0	10,000	25,000	20,000	0	0	29,781	8,638	0	43,153	86,791
Milo W.D.	ME0100439	10,000	10,000															
Old Town	ME0100471	6,300,000	6,300,000	0	125,000	0	0	0	0	30,000	10,000	0	270,801	61,508	20,698	12,128	7,608	79,695
Orono	ME0100498	31,000,000	31,000,000	371,471	2,416,910	1,260,837	0	0	0	1,320,000	1,461,000	0	1,460,000	698,817	1,192,467	905,504	1,102,236	3,981,896
Paris U.D.	ME 0100951	1,000,000	1,000,000	0	110,000	0	1,020,000	0	0	0	0	0	0	0	0	0	0	442,000
Portland & PWD	City-ME0101435 / PWD-ME0102075	1,800,000,000	1,800,000,000	872,751,281	780,188,153	496,288,000	704,319,257	179,403,901	414,421,500	254,663,330	318,359,691	175,675,000	283,612,831	184,453,600	178,744,981	194,468,501	163,964,790	368,662,200
Presque Isle	ME0100561	27,500,000	27,500,000															
Randolph	ME0102423	10,000,000	10,000,000	488,645	285,719	223,934	988,434	50,054	101,183	0	515,240	0	105,695	3,500	67,300	1,400	8,900	25,700
Rockland	ME0100595	47,000,000	47,000,000	0							0	0	0	0	0	0	0	0
Saco	ME 0101117	176,000,000	176,000,000	27,015	924,014	1,372,128	2,964,929	1,100,985	1,739,425	1,057,000	599,000	304,000	2,139,000	2,675,000	978,000	2,487,000	242,000	1,860,000
Sanford S.D.	ME0100617	4,000,000	4,000,000	0	0	0	0											
Skowhegan	ME0100625	48,000,000	48,000,000	6,073,919	7,550,855	4,757,994	4,238,875	4,746,538	3,861,193	6,786,698	4,168,672	738,844	4,379,019	1,711,809	1,073,711	252,870	1,742,309	7,928,889
South Portland	ME0100633	500,000,000	500,000,000	12,183,196	42,095,393	14,906,594	37,134,882	1,858,579	15,531,600	11,161,602	6,240,350	2,033,229	3,533,710	8,651,990	859,095	2,511,052	1,561,258	1,191,467
Westbrook	ME0100846	50,000,000	50,000,000	7,069,280	14,105,989	12,202,000	18,903,485	6,222,000	11,932,000	4,423,000	7,447,100	1,285,000	1,631,000	9,816,000	3,227,000	1,038,000	926,156	4,906,800
Winslow	ME0102628	1,300,000	1,300,000	5,001	200,000	63,354	1,327,119	7,070	0	164,549	70,144	237,400	601,045	3,654,519	876,296	193,076	3,196,000	26,473,369
Winterport S.D.	ME0100749	680,000	680,000	18,000	0	0	0	0	60,000	90,000	0	0	138,000	0	0	108,000	54,000	96,000
Yarmouth	ME0100765	1,000	1,000															
Total Annual Discharge Volume (Gallons)		**6,203,441,000**	**6,202,279,600**	**2,678,291,397**	**2,347,466,902**	**2,258,781,405**	**1,212,991,196**	**1,289,260,178**	**472,341,866**	**874,838,678**	**515,981,907**	**548,577,356**	**294,507,766**	**495,565,153**	**455,326,859**	**359,840,335**	**305,344,353**	**745,200,856**
Total Annual Discharge Volume (Billion Gallons)		**6.20**	**6.20**	**2.68**	**2.35**	**2.26**	**1.21**	**1.29**	**0.47**	**0.87**	**0.52**	**0.55**	**0.29**	**0.50**	**0.46**	**0.36**	**0.31**	**0.75**

Notes: For legibility, discharge volume data for years 1989-2008 are not shown. Permittees highlighted in gray no longer maintain a CSO permit. Numbers in blue are estimated from LTCP/MP or subsequent high flow. Biddeford CSO volumes 2005-2016 have been adjusted due to under-estimation of flows. Brewer CSO volumes in 2022 were adjusted to account for missing CSO discharge data.

Maine CSO Permittee Annual Number of CSO Discharge Events

Permittee	NPDES Permit No.	1987	1988	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Auburn S.D.	ME0100005	80	80	61	37	11	8	5	5	2	8	2	2	5	4	3	2	5
Bangor	ME0100781	53	53	78	73	54	29	27	34	20	28	21	23	34	16	16	28	18
Bar Harbor	ME0101214 & ME0102466	155	155	28	19	6	13	6	17	5	2	3	7	14	5	8	11	9
Bath	ME0100021	64	64	21	20	12	23	18	18	8	14	10	14	15	17	14	20	17
Belfast	ME0101532	7	7	3	6	3	0	0	0	1	0	0	2	3	2	3	5	4
Biddeford	ME0100048	180	180	46	28	100	146	77	88	48	57	55	41	45	43	43	40	21
Brewer	ME0100072	95	95	56	50	45	5	3	3	1	2	0	4	4	2	8	7	6
Bucksport	ME0100111	53	53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Calais	ME0100129	15	15	14	8	6	14	8	14	6	7	9	15	6	2	2	10	7
Cape Elizabeth	ME0102806	5	5	17	12	6	11	2	12	2	6	2	4	2	1	2	4	6
Corinna S.D.	ME0100153	30	30															
Dover-Foxcroft	ME0100501	8	8															
East Millinocket	ME0100196	11	11															
Fairfield	ME0102393	15	15	0	0	0	0	0										
Fort Kent U.D.	ME0102369	10	10															
Gardiner	ME0101702	40	40	2	12	6	6	3	3	2	2	5	5	5	5	3	1	2
Greater Augusta U.D.	ME0100013	80	80	35	32	37	29	22	29	17	17	29	35	26	24	11	14	18
Hallowell W.D. - 2008 GAUD	ME0101010	14	14															
Hampden	ME0102512	1	3	1	1	1	0	0	0	1	1	0	1	2	1	2	2	2
Kennebec S.T.D.	ME0100854	15	15	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0
Kittery	ME0100285	7	7															
Lewiston	ME0100994	80	80	58	68	45	38	27	23	37	35	28	24	27	15	14	14	18
Lewiston-Auburn W.P.C.A.	ME0101478	80	80	36	44	37	22	32	26	17	17	10	20	19	23	14	22	19
Lincoln S.D.	ME0101796	10	10															
Lisbon	ME0100307	5	5															
Livermore Falls	ME0100315																	
Machias	ME0100323	15	15	13	9	7	9	6	13	7	8	7	11	7	5	1	8	11
Madawaska	ME 0101681	16	16	32	17	10	8	3	7	0	0	3	3	2	4	5	9	6
Mechanic Falls S.D.	ME0100391	42	42	42	18	39	28	17	30	17	25	12	12	16	12	6	11	11
Milford	ME0102695	8	8	1	3	2	1	0	1	1	1	0	0	1	2	0	2	2
Milo W.D.	ME0100439	3	3															
Old Town	ME0100471	25	25	0	1	0	0	0	0	1	1	0	2	2	3	2	2	3
Orono	ME0100498	30	30	3	3	2	0	0	0	2	4	0	1	2	3	3	3	4
Paris U.D.	ME 0100951	5	5	0	4	0	4	0	0	0	0	0	0	0	0	0	0	1
Portland & PWD	City-ME0101435 / PWD-ME0102075	100	100	104	79	88	70	63	75	58	56	38	49	46	41	61	52	37
Presque Isle	ME0100561	26	26															
Randolph	ME0102423	23	23	7	3	2	2	1	2	0	2	0	2	1	1	1	1	3
Rockland	ME0100595	23	23	0							0	0	0	0	0	0	0	0
Saco	ME 0101117	44	44	9	10	4	21	15	19	13	12	7	15	6	17	15	9	23
Sanford S.D.	ME0100617	10	10	0	0	0	0	0										
Skowhegan	ME0100625	160	160	17	23	21	25	36	28	20	23	23	21	23	21	16	4	7
South Portland	ME0100633	23	23	10	12	13	12	7	9	2	3	2	4	3	3	2	6	5
Westbrook (PWD)	ME0100846	50	50	11	12	16	13	60	70	49	38	2	6	4	3	2	2	4
Winslow	ME0102628	20	20	3	2	3	9	1	0	1	3	1	1	2	3	2	4	5
Winterport S.D.	ME0100749	8	8	1	0	0	0	0	1	2	0	0	1	0	0	3	2	2
Yarmouth	ME0100765	4	4															
Total Number of CSO Discharge Events		**1748**	**1750**	**792**	**709**	**606**	**576**	**547**	**439**	**527**	**341**	**372**	**269**	**326**	**322**	**278**	**295**	**276**

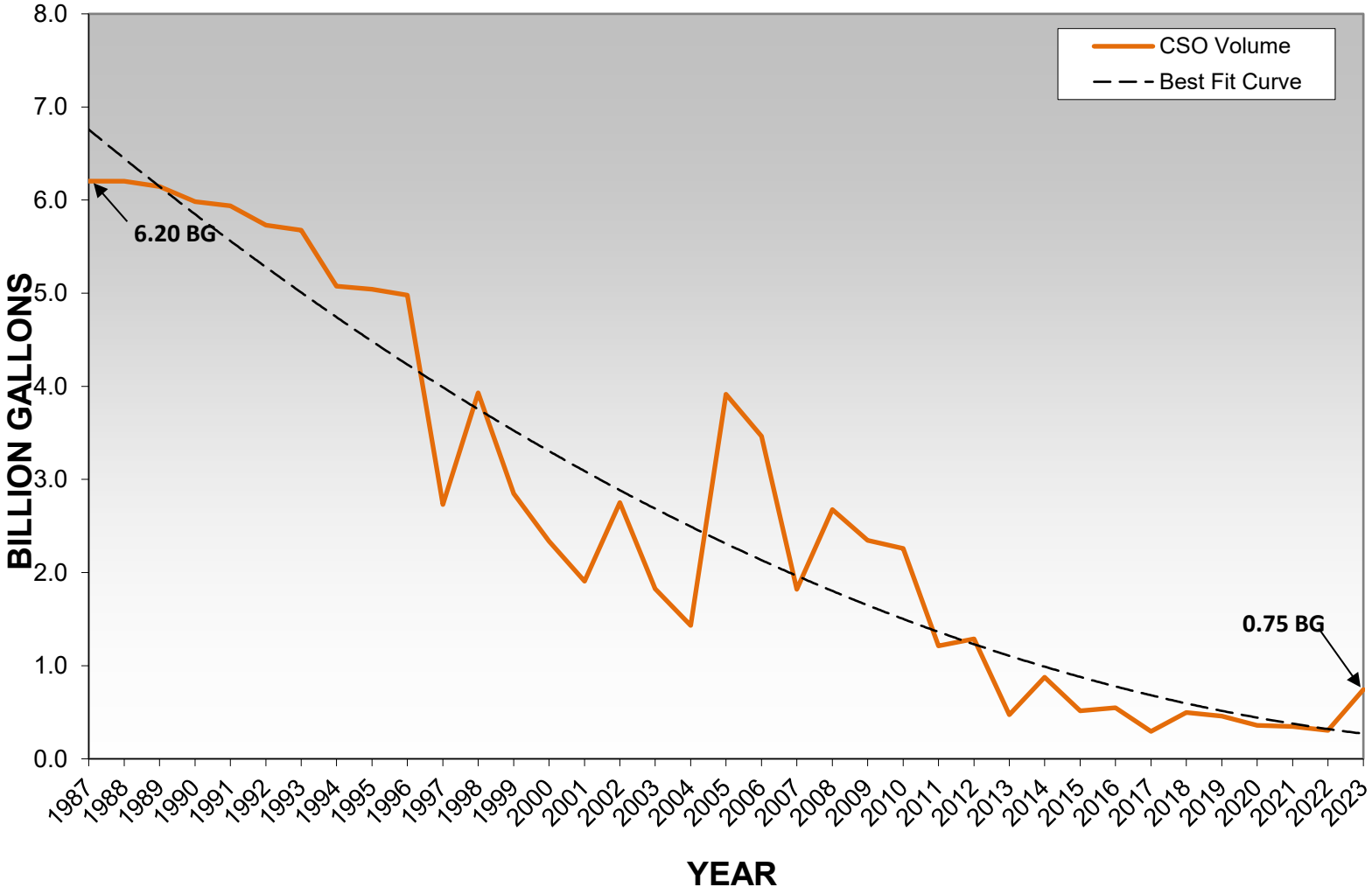
Note: For legibility, discharge event data for years 1989-2008 are not shown. Permittees highlighted in gray no longer maintain a CSO permit. Numbers in blue are estimated from LTCP/MP or other source.

Maine CSO Permittee Annual Number of CSO Outfalls

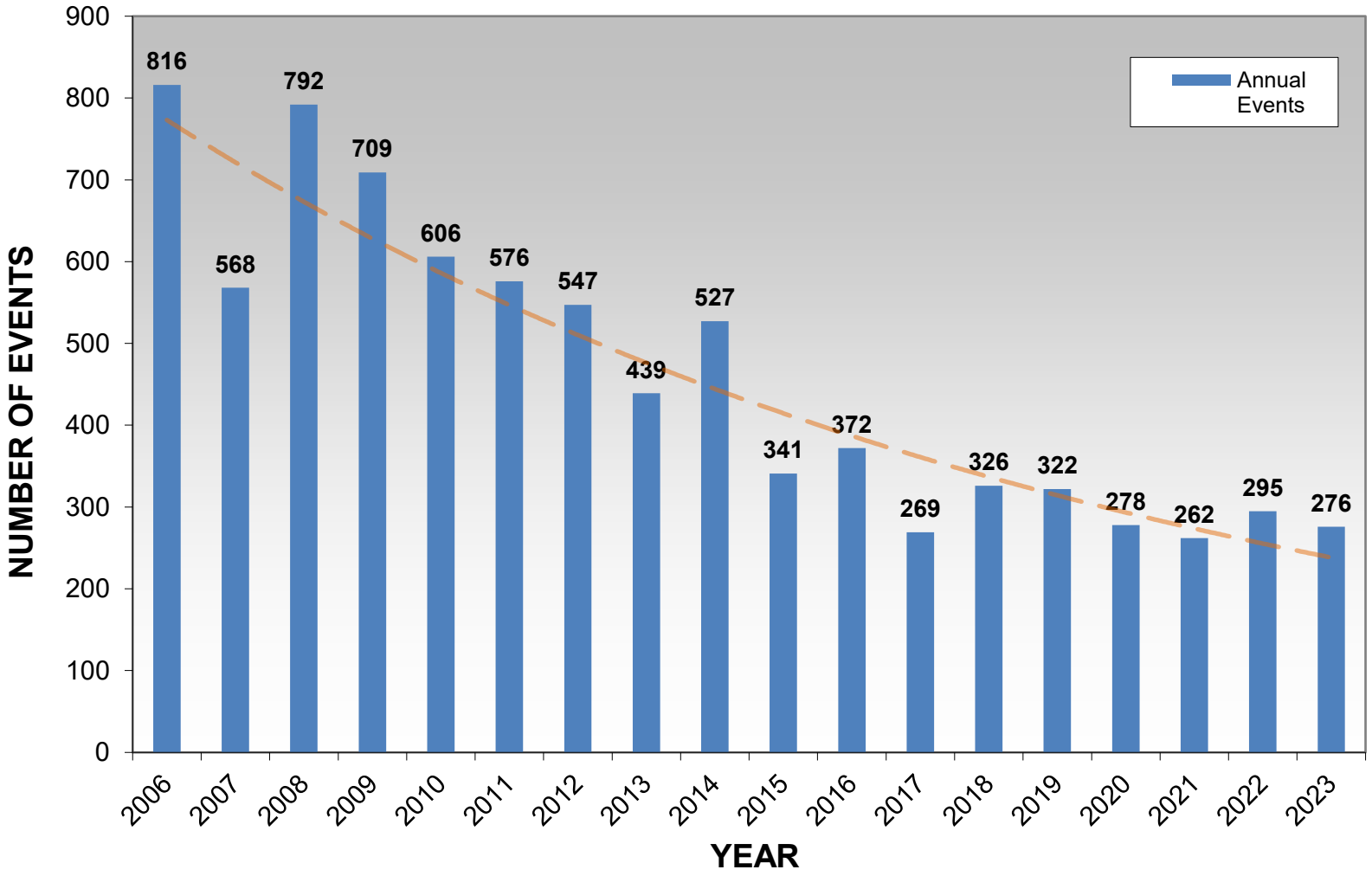
Permittee	NPDES Permit No.	Year Unknown	1987	1988	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Auburn S.D.	ME0100005	11	11	11	3	3	2	3	2	2	1	2	2	2	2	2	1	1	1
Bangor	ME0100781	22	22	22	7	7	9	9	9	9	9	9	9	8	8	8	8	8	8
Bar Harbor	ME0101214 & ME0102466	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Bath	ME0100021	9	9	9	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Belfast	ME0101532	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Biddeford	ME0100048	16	16	16	10	10	10	10	8	8	8	8	7	7	7	7	7	7	7
Brewer	ME0100072	10	10	10	6	5	5	4	4	4	4	4	4	4	4	4	4	4	4
Bucksport	ME0100111	2	2	2	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0
Calais	ME0100129	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3	3	3
Cape Elizabeth	ME0102806	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Corinna S.D.	ME0100153	5	5	5															
Dover-Foxcroft	ME0100501	15	15	15															
East Millinocket	ME0100196	5	5	5															
Fairfield	ME0102393	3	3	3	2	2	2	2	0										
Fort Kent U.D.	ME0102369	6	6	6															
Gardiner	ME0101702	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Greater Augusta U.D.	ME0100013	31	31	31	23	22	22	19	18	18	18	18	18	18	18	18	16	13	10
Hallowell W.D. – 2008 GAUD	ME0101010	1	1	1	-	-	-	-	-	-									
Hampden	ME0102512	6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Kennebec S.T.D.	ME0100854	5	5	5	3	3	3	3	3	3	3	3	3	3	2	2	2	2	2
Kittery	ME0100285	3	3	3															
Lewiston	ME0100994	32	32	32	22	20	18	18	16	11	10	8	8	8	8	8	8	8	8
Lewiston-Auburn W.P.C.A.	ME0101478	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Lincoln S.D.	ME0101796	1	1	1															
Lisbon	ME0100307	6	6	6															
Livermore Falls	ME0100315	5	5	5															
Machias	ME0100323	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Madawaska	ME 0101681	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mechanic Falls S.D.	ME0100391	4	4	4	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2
Milford	ME0102695	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Milo W.D.	ME0100439	3	3	3															
Old Town	ME0100471	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Orono	ME0100498	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Paris U.D.	ME 0100951	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0
Portland & PWD	City-ME0101435 / PWD-ME0102075	42	42	42	33	32	32	31	31	31	31	30	30	30	30	29	28	24	23
Presque Isle	ME0100561	1	1	1															
Randolph	ME0102423	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Rockland	ME0100595	8	8	8	2					1	1	1	1	1	1	1	1	1	1
Saco	ME 0101117	9	9	9	5	4	4	4	4	4	4	4	4	2	2	2	2	1	1
Sanford S.D.	ME0100617	3	3	3	1	1	1	1	0										
Skowhegan	ME0100625	10	10	10	7	7	7	7	7	7	7	7	7	5	5	5	5	5	5
South Portland	ME0100633	35	28	28	6	6	6	6	6	6	6	6	6	4	4	4	4	4	4
Westbrook (PWD)	ME0100846	7	7	7	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Winslow	ME0102628	2	2	2	1	2	2	2	2	2	2	3	3	3	2	2	2	2	2
Winterport S.D.	ME0100749	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Yarmouth	ME0100765	2	2	2															
Total Annual CSO Discharge Outfalls		**350**	**338**	**338**	**177**	**171**	**164**	**163**	**159**	**149**	**145**	**143**	**142**	**140**	**133**	**131**	**130**	**115**	**111**

Note: For legibility, outfall data for years 1989-2008 are not shown. Permittees highlighted in gray no longer maintain a CSO permit. Numbers in blue are estimated from LTCP/MP or other source.

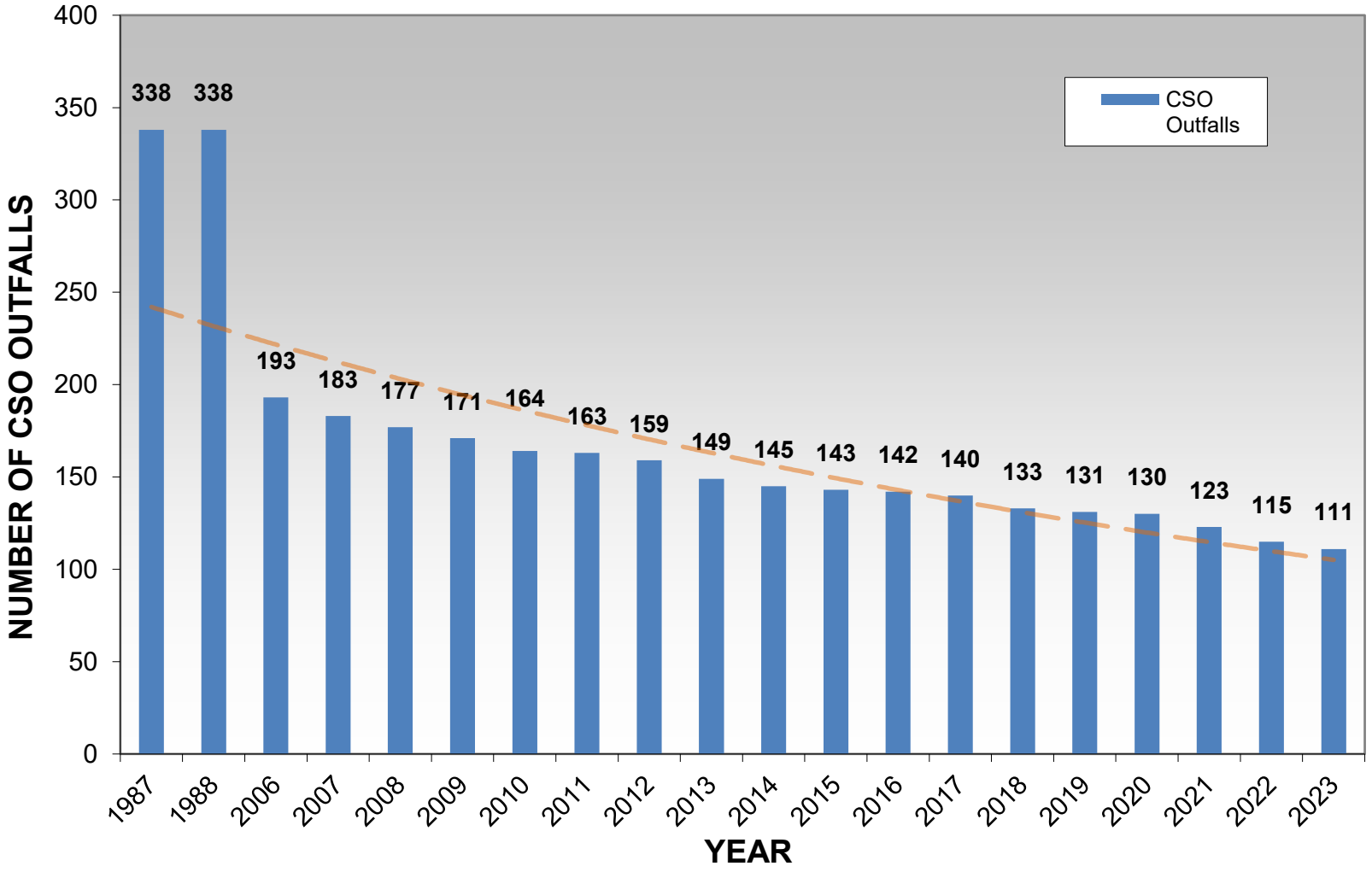
MAINE - STATEWIDE
COMBINED SEWER OVERFLOW (CSO)
VOLUME DISCHARGED



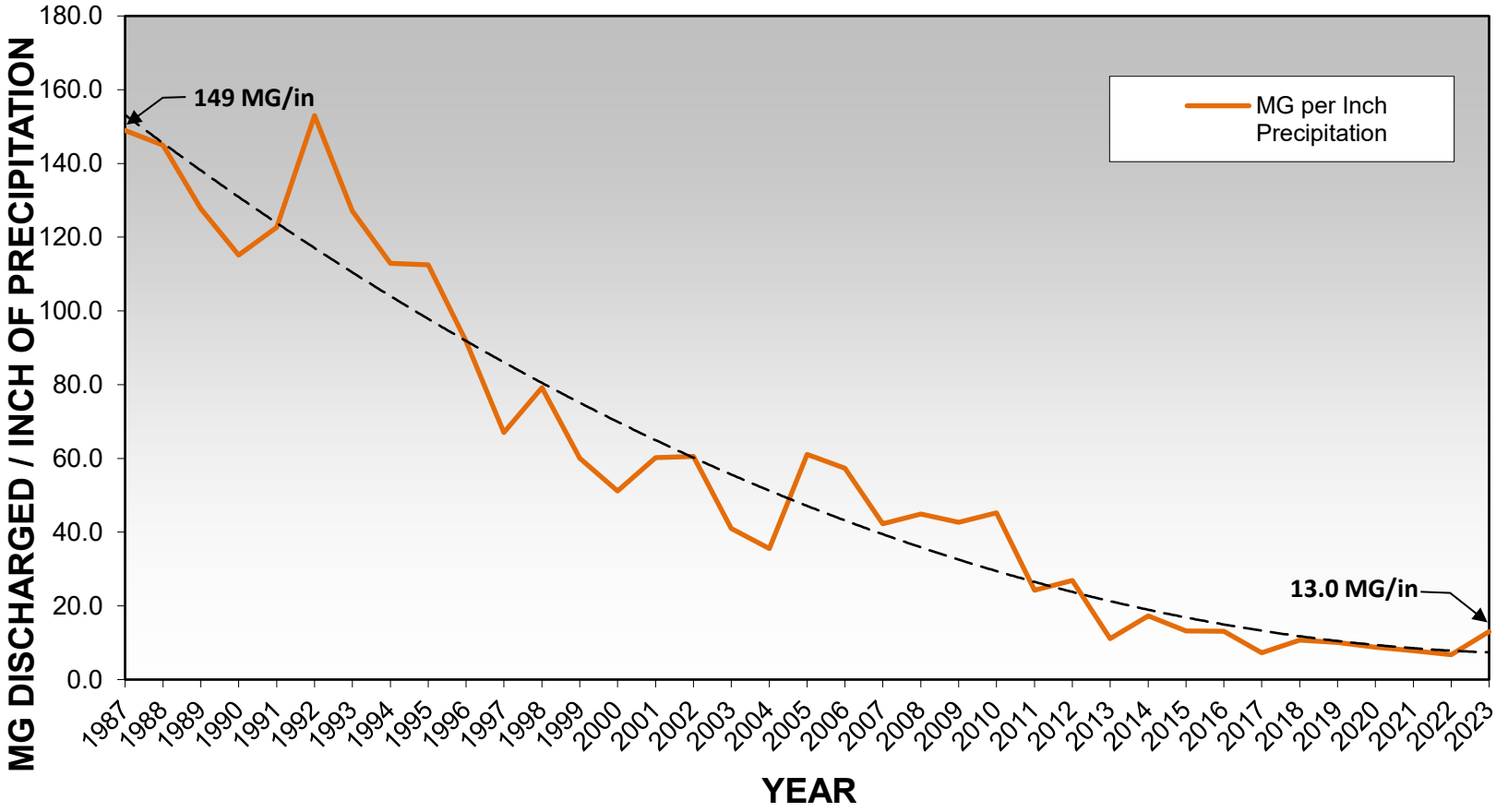
MAINE - STATEWIDE
COMBINED SEWER OVERFLOW (CSO)
ANNUAL NUMBER OF DISCHARGE EVENTS



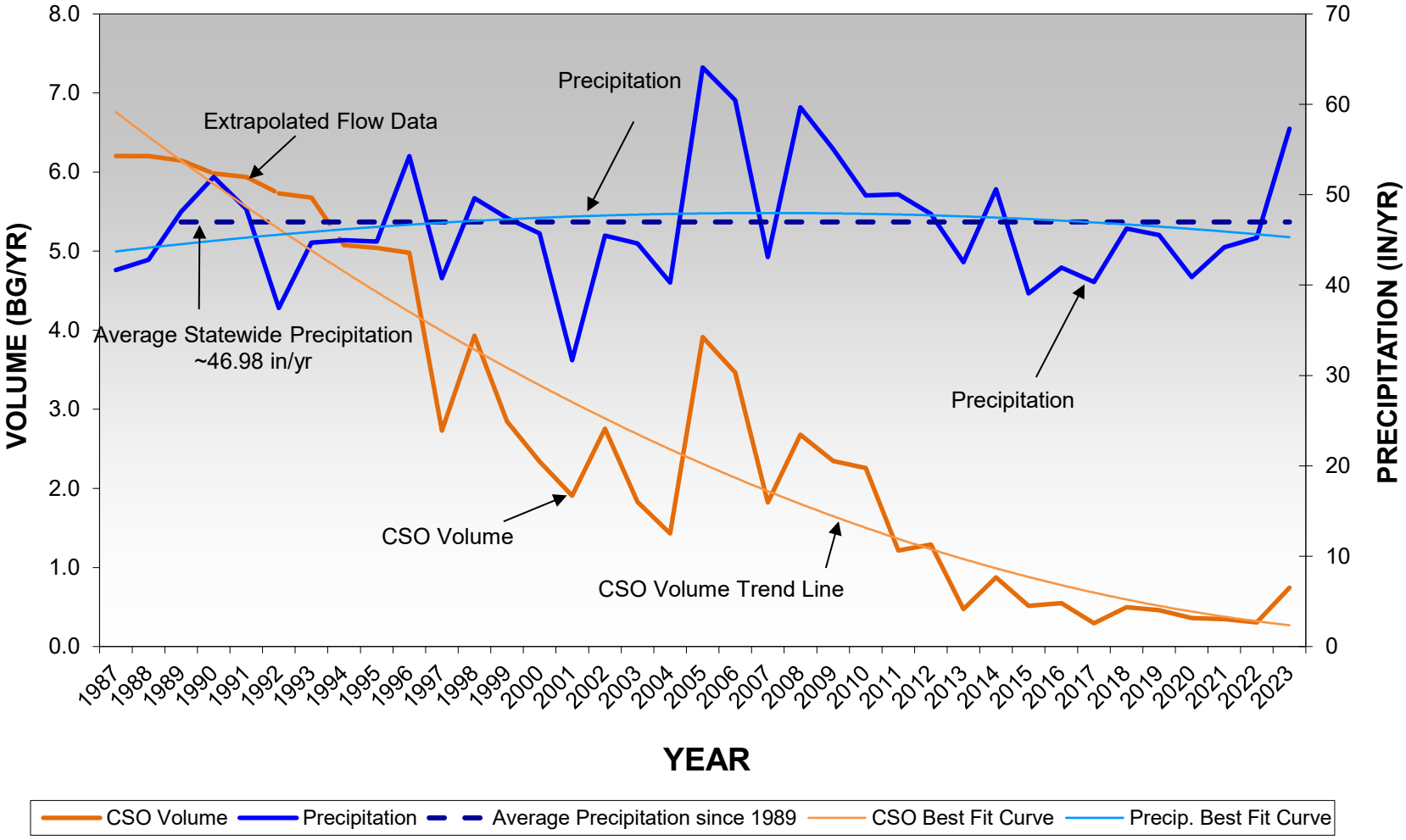
MAINE - STATEWIDE
COMBINED SEWER OVERFLOW (CSO) OUTFALLS



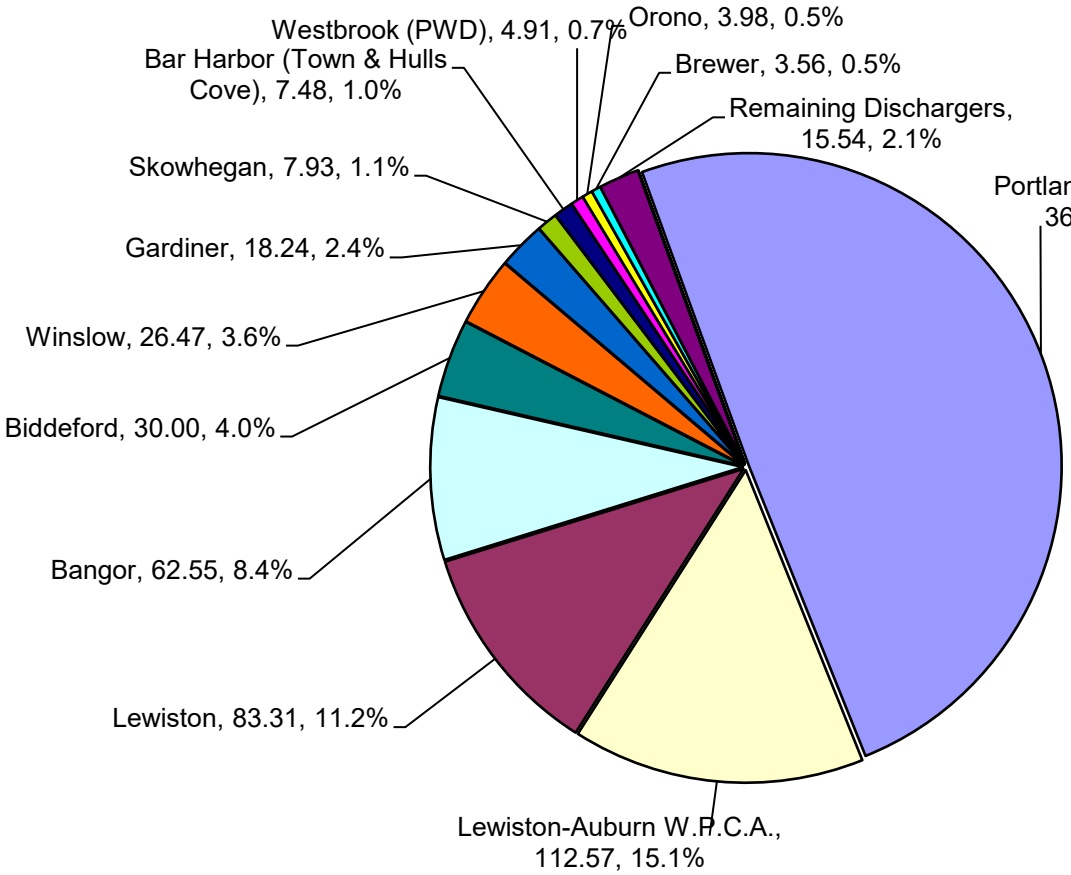
MAINE - COMBINED SEWER OVERFLOWS
ANNUAL VOLUME DISCHARGED PER INCH OF PRECIPITATION



MAINE - YEARLY CSO VOLUMES AND PRECIPITATION



MAINE 2023 CSO FLOW COMPARISON
34 CSO PERMITTEES
31 DISCHARGERS - 0.75 BILLION GALLONS

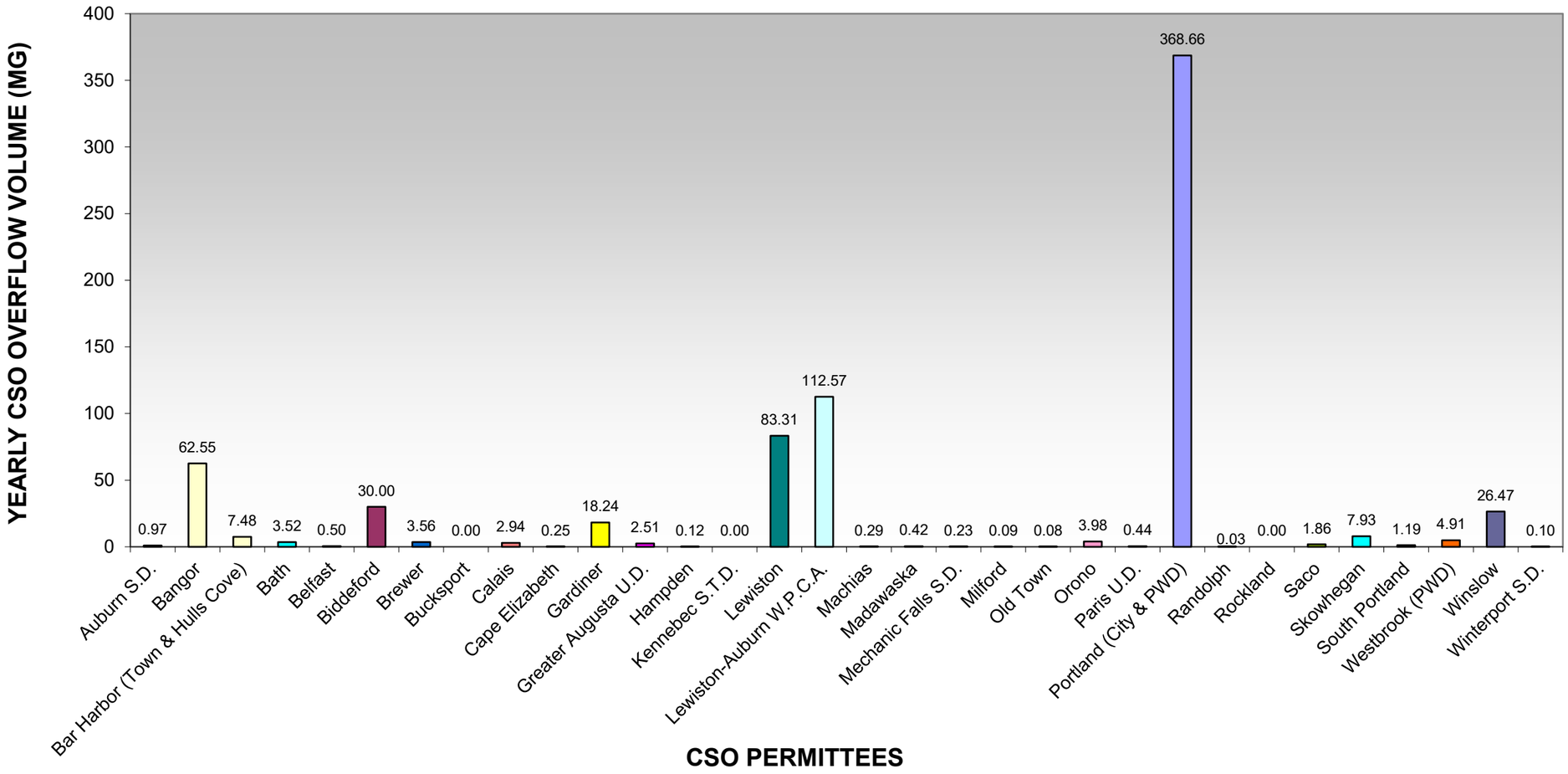


Three Permittees without CSO Discharge in 2023:
Bucksport
Kennebec S.T.D.
Rockland

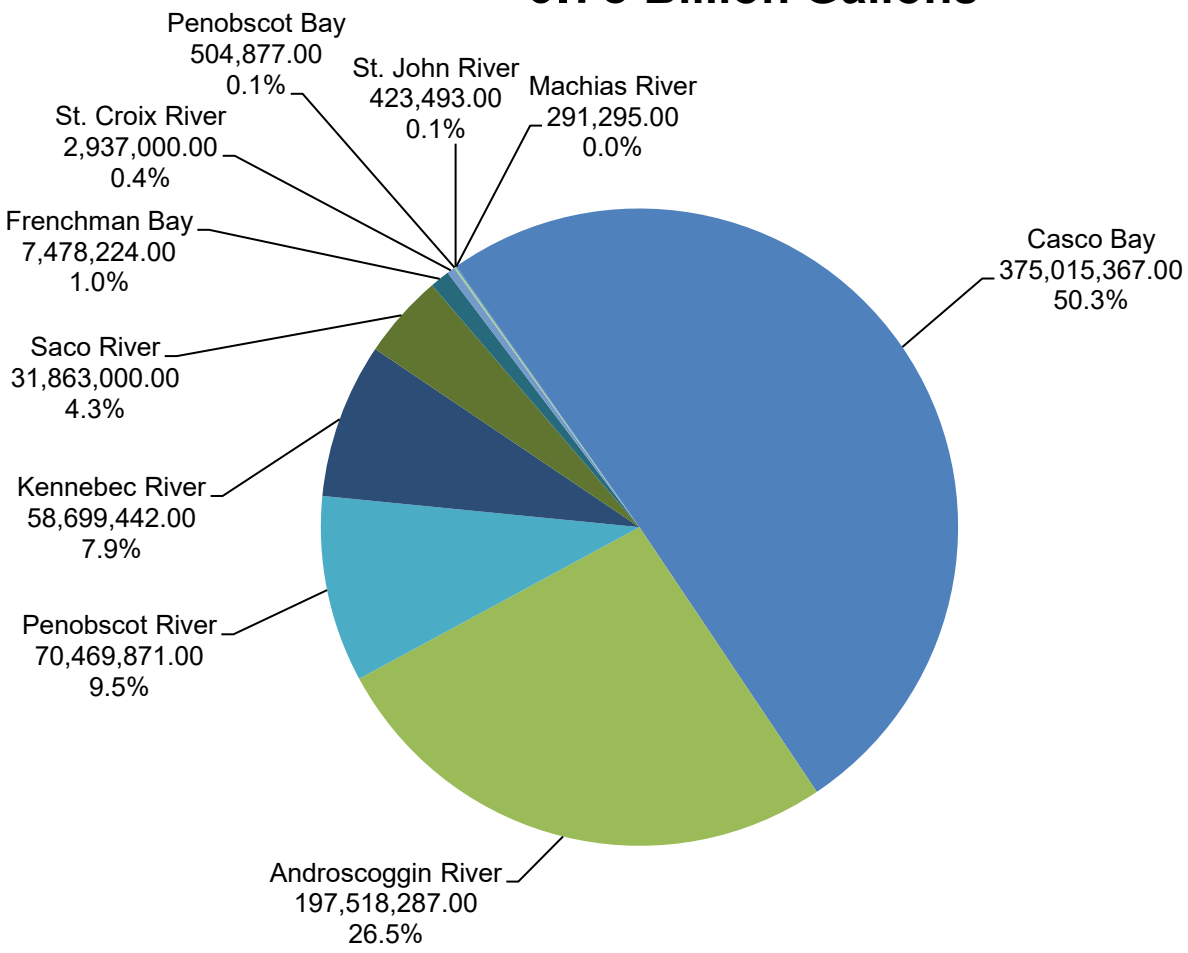
Remaining 17 Dischargers (Million Gallons, Percent of Total):
Bath 3.52, 0.47%
Calais 2.94, 0.39%
Greater Augusta U.D. 2.51, 0.34%
Saco 1.86, 0.25%
South Portland 1.19, 0.16%
Auburn S.D. 0.97, 0.13%
Belfast 0.50, 0.07%
Paris U.D. 0.44, 0.06%
Madawaska 0.42, 0.06%
Machias 0.29, 0.04%
Cape Elizabeth 0.25, 0.03%
Mechanic Falls S.D. 0.23, 0.03%
Hampden 0.12, 0.01%
Winterport S.D. 0.10, 0.01%
Milford 0.09, 0.01%
Old Town 0.08, 0.003%
Randolph 0.03, 0.003%

Discharger, Overflow in Million Gallons (MG), Percent of Total

Maine 2023 CSO Flow Comparison by Permittee
0.75 Billion Gallons



Maine 2023 CSO Volume Discharged by Watershed
0.75 Billion Gallons



Receiving Waterbody, Overflow in Million Gallons (MG), Percent of Total

Maine Annual CSO Volume Discharged by Watershed

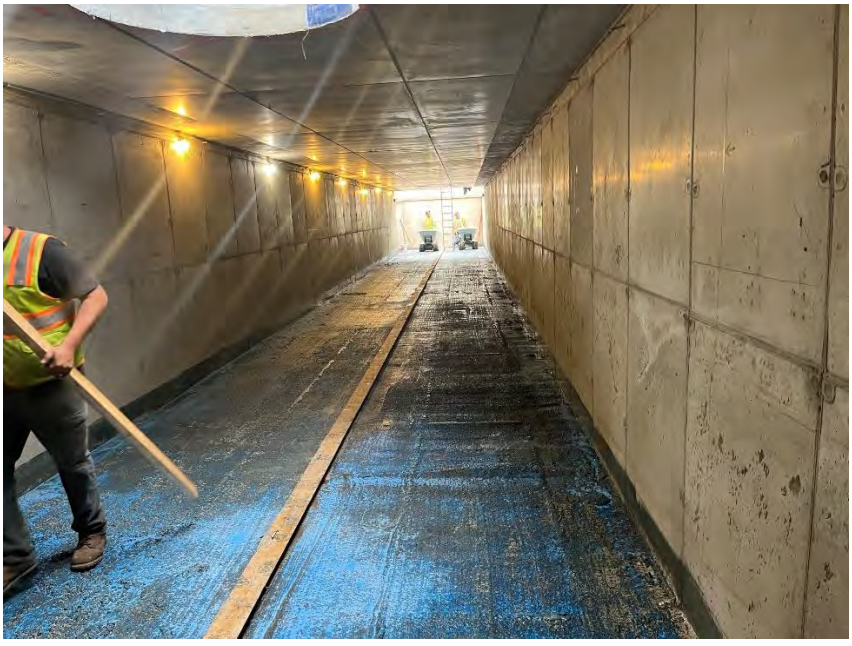
		Annual Discharge Volume (Gallons)					
	Permittee	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Androscoggin River	Auburn SD	1,656,736	997,100	219,600	439,796	286,954	967,864
	Lewiston-Auburn WPCA	25,735,000	28,518,000	33,659,000	14,531,000	31,190,000	112,566,000
	Lewiston	18,552,725	21,743,196	22,923,950	8,480,003	20,781,523	83,310,342
	Mechanic Falls SD	194,728	616,537	379,608	63,330	131,488	232,081
	Paris UD	0	0	0	0	0	442,000
	Sub Total	***46,139,189***	***51,874,833***	***57,182,158***	***23,514,129***	***52,389,965***	***197,518,287***
Casco Bay	Cape Elizabeth	375,000	432,000	2,000	230,000	3,300	254,900
	Portland-City & PWD	283,612,831	184,453,600	178,744,981	194,468,501	163,964,790	368,662,200
	South Portland	3,533,710	8,651,990	859,095	2,511,052	1,561,258	1,191,467
	Westbrook	1,631,000	9,816,000	3,227,000	1,038,000	926,156	4,906,800
	Sub Total	***289,152,541***	***203,353,590***	***182,833,076***	***198,247,553***	***166,455,504***	***375,015,367***
Frenchman Bay	Bar Harbor	562,221	2,757,979	971,376	3,816,271	3,141,462	7,478,224
	Sub Total	***562,221***	***2,757,979***	***971,376***	***3,816,271***	***3,141,462***	***7,478,224***
Kennebec River	Bath	3,753,899	2,800,232	2,874,579	1,806,487	1,583,361	3,522,034
	Gardiner	4,893,100	2,877,000	9,932,000	1,993,000	61,000	18,240,000
	Greater Augusta UD	3,771,000	3,482,000	6,074,000	3,082,000	1,989,200	2,509,450
	Kennebec STD	324,228	0	0	0	0	0
	Randolph	105,695	3,500	67,300	1,400	8,900	25,700
	Skowhegan	4,379,019	1,711,809	1,073,711	252,870	1,742,309	7,928,889
	Winslow	601,045	3,654,519	876,296	193,076	3,196,000	26,473,369
	Sub Total	***17,827,986***	***14,529,060***	***20,897,886***	***7,328,833***	***8,580,770***	***58,699,442***
Machias River	Machias	603,687	145,425	100,035	122,833	418,811	291,295
	Sub Total	***603,687***	***145,425***	***100,035***	***122,833***	***418,811***	***291,295***
Penobscot Bay	Belfast	305,071	330,905	96,444	264,774	444,090	504,877
	Rockland	0	0	0	0	0	0
	Sub Total	***305,071***	***330,905***	***96,444***	***264,774***	***444,090***	***504,877***
Penobscot River	Bangor	50,547,000	96,009,000	58,745,000	77,720,893	52,468,359	62,551,149
	Brewer	366,687	868,060	76,188	4,235,000	783,656	3,557,124
	Bucksport	0	0	0	0	0	0
	Hampden	1,250,000	1,933,080	244,200	319,902	205,128	117,216
	Milford	0	0	0	0	43,153	86,791
	Old Town	270,801	61,508	20,698	12,128	7,608	79,695
	Orono	1,460,000	698,817	1,192,467	905,504	1,102,236	3,981,896
	Winterport SD	138,000	0	0	108,000	54,000	96,000
	Sub Total	***54,032,488***	***99,570,465***	***60,278,553***	***83,301,427***	***54,664,140***	***70,469,871***
Saco River	Biddeford	70,814,300	69,451,000	34,644,000	26,649,500	14,543,300	30,003,000
	Saco	2,139,000	2,675,000	978,000	2,487,000	242,000	1,860,000
	Sub Total	***72,953,300***	***72,126,000***	***35,622,000***	***29,136,500***	***14,785,300***	***31,863,000***
St. Croix River	Calais	10,000,030	2,403,000	1,839,927	587,400	3,848,188	2,937,000
	Sub Total	***10,000,030***	***2,403,000***	***1,839,927***	***587,400***	***3,848,188***	***2,937,000***
St. John River	Madawaska	3,988,640	8,205,821	10,242	422,838	616,123	423,493
	Sub Total	***3,988,640***	***8,205,821***	***10,242***	***422,838***	***616,123***	***423,493***
	Total Annual Volume	**495,565,153**	**455,297,078**	**359,831,697**	**346,742,558**	**305,344,353**	**745,200,856**

Maine CSO Permittee Level of Treatment

	2019 Average Annual Rainfall (Inches): 45.57				2020 Average Annual Rainfall (Inches): 40.88				2021 Average Annual Rainfall (Inches): 44.19				2022 Average Annual Rainfall (Inches): 45.24				2023 Average Annual Rainfall (Inches): 57.31			
CSO Permittees	Total Volume[1,2] (MG)	Secondary Treatment	Primary Treatment	CSO	Total Volume[1,2] (MG)	Secondary Treatment	Primary Treatment	CSO	Total Volume[1,2] (MG)	Secondary Treatment	Primary Treatment	CSO	Total Volume[1,2] (MG)	Secondary Treatment	Primary Treatment	CSO	Total Volume[1,2] (MG)	Secondary Treatment	Primary Treatment	CSO
Bangor & Hampden	3,265.8	95.56%	1.50%	2.94%	2,851.3	96.44%	1.49%	2.07%	2,932.3	96.25%	1.09%	2.66%	3,319.0	96.87%	1.54%	1.59%	3513.0	97.26%	0.95%	1.78%
Bar Harbor	422.0	99.35%		0.65%	349.9	99.72%		0.28%	380.3	99.00%		1.00%	415.9	99.24%		0.76%	429.5	98.26%		1.74%
Bath	782.5	95.24%	4.40%	0.36%	728.7	92.89%	6.72%	0.39%	711.4	92.36%	7.39%	0.25%	711.4	95.69%	4.08%	0.22%	818.4	94.02%	5.55%	0.43%
Belfast	240.2	99.86%		0.14%	202.0	99.95%		0.05%	231.4	99.89%		0.11%	227.0	99.80%		0.20%	289.7	99.83%		0.17%
Biddeford	1,142.9	93.92%		6.08%	1,011.6	96.58%		3.42%	869.1	96.93%		3.07%	849.6	98.29%		1.71%	1084.3	97.23%		2.77%
Brewer	680.7	99.87%	0.00%	0.13%	680.4	99.99%	0.00%	0.01%	724.7	99.42%	0.00%	0.58%	854.9	99.91%	0.00%	0.09%	845.2	99.58%	0.00%	0.42%
Bucksport[3]	97.3	99.15%	0.85%	0.00%	107.1	98.19%	1.81%	0.00%	120.5	96.52%	3.48%	0.00%	125.8	96.09%	3.91%	0.00%	137.0	97.75%	2.25%	0.00%
Calais	238.7	95.59%	3.40%	1.01%	202.2	92.15%	6.94%	0.91%	190.0	96.91%	2.78%	0.31%	235.4	94.98%	3.38%	1.63%	269.6	94.98%	3.93%	1.09%
Gardiner & Randolph	408.1	97.74%	1.55%	0.71%	371.1	95.00%	2.31%	2.69%	349.5	98.98%	0.45%	0.57%	399.4	99.37%	0.61%	0.02%	552.0	95.32%	1.37%	3.31%
GAUD & Hallowell	1,853.8	98.40%	1.41%	0.19%	1,650.3	98.22%	1.41%	0.37%	1,311.0	99.22%	0.54%	0.24%	2,213.8	99.26%	0.65%	0.09%	2099.5	98.60%	1.28%	0.12%
KSTD & Winslow	2,394.5	100.00%		0.00%	2,184.0	99.96%		0.04%	2,074.0	99.99%		0.01%	2,262.3	99.86%		0.14%	2623.0	98.99%		1.01%
LAWPCA, Lewiston & Auburn	3,427.3	98.12%	0.39%	1.50%	3,434.3	97.53%	0.82%	1.65%	3,196.0	96.26%	3.01%	0.73%	3,419.2	98.41%	0.06%	1.53%	4256.7	94.81%	0.56%	4.62%
Machias	85.3	99.83%		0.17%	62.7	99.84%		0.16%	65.2	99.81%		0.19%	84.3	99.50%		0.50%	92.1	99.68%		0.32%
Madawaska	129.6	93.67%		6.33%	123.9	99.99%		0.01%	105.8	99.60%		0.40%	145.4	99.58%		0.42%	140.4	99.70%		0.30%
Mechanic Falls	86.2	99.29%		0.71%	79.7	99.52%		0.48%	64.0	99.90%		0.10%	70.4	99.81%		0.19%	108.9	99.79%		0.21%
Old Town & Milford	579.3	99.11%	0.87%	0.02%	448.8	98.95%	1.04%	0.01%	471.8	99.05%	0.95%	0.00%	537.4	99.20%	0.79%	0.01%	579.2	98.61%	1.36%	0.03%
Orono	500.8	99.86%		0.14%	400.1	99.70%		0.30%	419.9	99.78%		0.22%	455.5	99.76%		0.24%	507.4	99.22%		0.78%
Paris UD	121.8	100.00%		0.00%	110.3	100.00%		0.00%	96.3	100.00%		0.00%	108.2	100.00%		0.00%	134.2	99.67%		0.33%
Portland & PWD[3]	6,100.6	92.90%	4.07%	3.02%	5,938.0	92.75%	4.24%	3.01%	5,552.8	92.92%	3.58%	3.50%	5,218.8	92.22%	4.64%	3.14%	6360.0	89.19%	5.02%	5.80%
Rockland	998.0	75.94%	24.06%	0.00%	820.4	84.74%	15.26%	0.00%	868.0	87.31%	12.69%	0.00%	816.1	91.81%	8.19%	0.00%	1059.5	93.54%	6.46%	0.00%
Saco	776.2	99.22%	0.43%	0.34%	784.0	99.51%	0.36%	0.12%	800.9	99.18%	0.51%	0.31%	762.3	99.69%	0.28%	0.03%	975.8	98.72%	1.09%	0.19%
Skowhegan	326.1	97.26%	2.22%	0.52%	262.8	95.65%	3.94%	0.41%	223.6	99.47%	0.37%	0.16%	247.0	98.39%	0.91%	0.71%	316.4	96.45%	1.05%	2.51%
South Portland & Cape Elizabeth[4]	2,052.6	98.67%	0.89%	0.44%	2,001.5	99.81%	0.14%	0.04%	1,909.5	99.48%	0.37%	0.14%	1,967.4	99.87%	0.05%	0.08%	2277.7	99.57%	0.36%	0.06%
Westbrook & PWD	1,157.2	99.15%		0.85%	1,115.1	99.71%		0.29%	1,081.8	99.90%		0.10%	1,122.7	99.92%		0.08%	1308.1	99.62%		0.38%
SUM	**27,867.4**				**25,920.2**				**24,750.0**				**26,569.1**				**30,777.5**			
MEAN	**1,161.1**	**96.99%**	**3.29%**	**1.09%**	**1,080.0**	**97.37%**	**3.32%**	**0.70%**	**1,031.2**	**97.84%**	**2.66%**	**0.61%**	**1,107.0**	**98.23%**	**2.08%**	**0.56%**	**1,282.4**	**97.52%**	**2.23%**	**1.18%**
MEDIAN	**630.0**	**98.89%**	**1.46%**	**0.40%**	**564.6**	**99.23%**	**1.65%**	**0.28%**	**591.6**	**99.20%**	**1.02%**	**0.23%**	**624.4**	**99.32%**	**0.85%**	**0.19%**	**698.8**	**98.61%**	**1.32%**	**0.40%**

Notes: [1]Volume data was obtained from monthly Discharge Monitoring Reports entered and submitted through NetDMR by each Facility
[2]Total Volume: Total Volume Taken on by System = Secondary Treatment Volume + Primary Treatment Volume + CSO Volume + SSO Volume (SSO Volumes too small to affect Percentages, therefore not displayed)
[3]Updates were made to treatment volumes and percentages for 2018 and 2019 for Bucksport and for 2018-2021 for Portland & PWD
[4]A calculation error for South Portland & Cape Elizabeth's 2022 data was corrected. The Sum, Mean, and Median data for 2022 was also corrected.

Maine CSO Permittee Level of Treatment



Photos on Cover Page and this page are taken from the Horrigan Court Pump Station Upgrade Project at CSO #006 in Biddeford, which includes a 100,000 gallon CSO Storage Tank