

# Maine Combined Sewer Overflow 2016 Status Report

*April 2017*

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Document No.: DEPLQ0972I-2017



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## **Introduction**

The purpose of this report is to inform the Combined Sewer Overflow (CSO) communities and the general public on the status of the CSO program in the State of Maine.

The CSO program compiles information from various documents and reports submitted to the Maine Department of Environmental Protection by the CSO Communities (City/Town/District) or their consultants on their behalf. A majority of the 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, and general correspondence.

At the start of any CSO Community's abatement program, initial flow data was collected to estimate the existing discharge volumes and frequencies, define the problems, and establish a corrective course of action. This often occurred over a relatively short period of time (a year or two) and may not have captured as many representative wet weather events as desired. However, this data was the best available information at the time and established the overflow baselines that are used within this report. Since then, CSO flow monitoring plans have continued to improve and overall data reliability has increased, giving the program better data for specific yearly wet weather patterns.

## **What Are CSOs?**

- Combined Sewer Systems (CSS) – are defined as collection systems which carry a combination of sanitary wastewater, stormwater, and sometimes industrial wastes within the same pipes. They are typically older collection systems designed and installed prior to advent of wastewater treatment facilities.
- Combined Sewer Overflows (CSOs) are discharges of untreated wastewater from municipal CSS's.
- CSO discharges occur mostly during and after rain events or snowmelt. Flows within the CSS during these wet weather events can be as high as fifty (50) times the normal dry weather flows.
- 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.
- CSO's were originally added as hydraulic relief points within the CSS to allow the excess flows to be discharged. These relief points are generally at topographic low points, near pump stations and river crossings.

## **What Are The Impacts Of CSOs?**

- Currently there are 31 Maine communities (towns, cities, utility districts) with CSO discharge points in their sewerage systems (reduced from an original 60). These communities collectively have 142 individual CSO discharge points (reduced from an original 340).
- The frequency of discharges varies greatly from community to community, ranging from seldom to occurring in response to all but the smallest rain storms.
- In large communities hundreds of millions of gallons per year of untreated combined sanitary sewage and storm water may be discharged. In the past three years statewide, total annual CSO discharges have ranged from approximately 438 to 715 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 to receiving waters that vary in size from the Atlantic Ocean and large rivers to small streams and drainage creeks.
- Water quality is 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 shellfishing areas due to bacterial contamination, and the potential for drinking water supplies to be threatened.
- During wet weather, flows in a CSS can hydraulically overload the capacity of the collection system leading to treatment facility upsets, street flooding, and back-ups into basements.

## **What Is A CSO Community?**

- CSO Communities are permitted dischargers of untreated combined sanitary and storm waters. The Department of Environmental Protection issues CSO communities a wastewater discharge license that requires them to implement Environmental Protection Agency's (EPA) Nine Minimum Control Best Management Practices (BMPs) for CSO's, develop a CSO Master Plan (aka the Long Term Control Plan (LTCP)) to eliminate or abate their overflows, and finally to implement the plan that will bring them into compliance with EPA's April 19, 1994 Combined Sewer Overflow (CSO) Control Policy, the Clean Water Act, and State law.
- Special Conditions in their Maine Pollutant Discharge Elimination System (MEPDES) permit/Waste Discharge License require all CSO communities to submit an Annual CSO Progress Report to the Department for the previous year, by March 1<sup>st</sup> of the following year.
- The Annual CSO Progress Report documents the Community's efforts to comply with the Nine Minimum Controls for CSO abatement, 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 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 60 CSO Communities 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 1980's, CSO communities 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 communities on coordinating the planning, selection, and implementation of CSO controls, that once implemented, would allow CSO communities 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 sets forth minimum controls to reduce CSOs while long-term plans are being completed.
- 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 Communities have completed or are currently working on implementing the CSO controls recommended in 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 CSO discharges.
- CSO abatement projects have reduced the discharge of untreated, combined sewage to receiving waters in all of the CSO Communities. A number of communities have eliminated their CSO discharges entirely and are no longer licensed to discharge untreated combined sewage during wet weather.
- Statewide, currently licensed CSO Communities have reported investing approximately \$545 million in CSO abatement since the program started (\$29 million in 2016 alone). Of the total invested to date, the Maine Clean Water State Revolving Fund (CWSRF) has contributed \$340.7 million (63% of total expenditure on CSO abatement by current

CSO communities).

- Statewide, previously licensed CSO Communities, that since have left the program, reported investing a total of approximately \$462 million on CSO abatement, with the CWSRF providing \$114.7 million of that total (25% of total expenditure on CSO abatement by prior CSO communities).
- Anticipated infrastructure needs of current CSO communities over the next five years are estimated to be approximately \$277 million.

## **Where Are We Now?**

### **2016 Status**

- 1) In 2016, the 31 currently licensed CSO Communities reduced the total number of CSO discharge locations by one (1), from 143 to 142 (a complete listing of Maine's CSO Communities, the number of CSO locations, and the corresponding receiving waters are listed on page 8). CSO's were closed in the communities of Lewiston (2) and Portland (1). These were partially offset by CSO's being re-opened to prevent backups and property damage in the communities of Auburn (1) and Winslow (1), for a net drop of one CSO location in the statewide total. With the addition of 2016 data, the chart on page 14, **Maine Statewide Number of Combined Sewer Overflow Outfalls**, shows a 58% reduction in the overall number of CSO locations in Maine since 1989.
- 2) In 2016, the CSO Communities reported a total of 372 overflow event days. This total is arrived at by summing the number of days that each CSO Community experienced an overflow event. An overflow event is any calendar day in which one or more CSO locations within a community experiences a discharge. The table on page 10, **Maine CSO Community Annual Number of CSO Discharge Events**, contains a historic listing of the annual number of CSO discharge events for each CSO Community.
- 3) The maximum number of overflow event days reported in 2016 from a single CSO community was fifty-seven (57). The average (mean) number of discharge event days for all communities was twelve (12) event days and the median was four (4) event days. Additional information can be found in the table on page 10, **Maine CSO Community Annual Number of CSO Discharge Events**.
- 4) Since 1989, the statewide average annual precipitation in Maine has been approximately 47 inches. In 2016, the annual precipitation measured by CSO Communities varied significantly from 31.0 to 50.34 inches. The **Maine Yearly CSO Volumes and Precipitation** chart on page 16 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. 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 appears to indicate that as CSO abatement projects continue to be completed, overflow volumes are becoming less influenced by precipitation events.

- 5) The CSO volume discharged statewide in 2016 was reported to be approximately 474 million gallons. The table on page 9, **Maine CSO Community Flow Data**, contains a historic listing of the annual overflows from each CSO Community. The **Maine 2016 CSO Flow Comparison** pie chart on page 17 and the **Maine 2016 CSO Flow Comparison by Community** bar chart on page 18 show graphical comparisons of these overflow volumes between the CSO Communities.
- 6) The precipitation in 2016 had a weighted average of 41.79", which was 6% higher than 2015's precipitation. This extra 2-1/4" of annual precipitation contributed to the slight increase in overall CSO discharge volume in 2016 (8% increase over 2015, from 438.5 MG to 473.6 MG).
- 7) A comparison of statewide annual precipitation totals over a longer time frame, indicates the 2016 total falls below the weighted average precipitation for the previous five years (44.39"), and also below the weighted average precipitation since 1989 (47.22"). If one compares the 2016 overflow volume with the average overflow volume from the previous five years (655.9 MG), it shows a reduction of approximately 28%, while the rainfall in 2016 was only 6% less than the average rainfall for the same five year period.
- 8) In 2016, the top five (5) CSO communities, ranked by discharge volume, accounted for approximately 92% of the total CSO volume discharged in the State. The top ten (10) CSO communities accounted for approximately 98% of the total CSO discharge volume. The remaining twenty one (21) CSO communities accounted for less than 2% of the total CSO discharge volume. See the **Maine 2016 CSO Flow Comparison** pie chart on page 17 for a graphical comparison of CSO dischargers.
- 9) CSO discharges by the City of Portland and the Portland Water District accounted for approximately 67% of Maine's total CSO discharge volume in 2016; see the **Maine 2016 CSO Flow Comparison** pie chart on page 17. Given the outsized impact that Portland's CSO discharge contribution has on the State's total discharge volume, it may be informative to exclude Portland's data when examining Maine's overall CSO abatement progress. After removing Portland's CSO discharge volume from the state total, the overflow volume from the remaining thirty CSO Communities decreased from approximately 184 million gallons in 2015, to 155.2 million gallons in 2016, a reduction of over 15%.
- 10) The chart on page 19 – **Maine 2016 CSO Volume Discharged by Watershed**, is a graphical representation of the CSO volumes discharged by major watershed. In 2016, Casco Bay received approximately 70.2% of the statewide CSO volume discharged, followed by the Penobscot River at 10.6%, the Androscoggin River at 9.7%, the Saco River at 5.3%, the Kennebec River at 3.0%, and the St. Croix River at 1.0%. Discharges to Frenchman Bay and the Machias River accounted for the remaining ~0.3% of combined sewer overflow volumes. The 2016 data shows a reduction in CSO discharge volume compared to 2015 for the Androscoggin River (a 26.4% decrease), the Kennebec River (60.1%) and Frenchman's Bay (88.1%). 2016 CSO discharge volumes were higher than 2015 volumes for Casco Bay (a 22.8% increase), the Penobscot River (a 19.6% increase), and the Saco River (a 29.1% increase). The Table



on page 20 – **Maine Annual CSO Volume Discharged by Watershed**, shows the reported CSO discharge volumes for each CSO community grouped by the receiving watersheds, both for 2016 and the previous four years.

- 11) CSO discharges are well documented contributor's 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 shellfishing area being closed. 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. What is being assessed in this Annual Report is which beaches and shellfishing areas may have been impacted by CSO discharges.
- 12) In 2016, seven (7) CSO Communities reported possible 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). The following beach advisories were reported to the Maine Healthy Beaches web-site ([www.maineoastdata.org/public/CurrentBeachStatus.aspx](http://www.maineoastdata.org/public/CurrentBeachStatus.aspx)) in 2016 due to rainfall or contamination, though not specifically identified as being caused by CSO activity: Portland, East End: 5 advisories and South Portland, Willard Beach: 9 advisories).
- 13) In 2016, six (6) CSO Communities reported that shellfishing areas could have been impacted by their CSO discharges (Bar Harbor, Biddeford, Calais, Machias, Portland and South Portland). Of these, five (5) communities (Bar Harbor, Biddeford, Calais, Machias, Portland) reported shellfishing area closures, which may or may not have been attributed to CSO activity.

### **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 conditions, frozen or thawed ground, snowmelt, and rainfall volume, duration, and intensity. To evaluate CSO abatement progress it is best to look for an historical trend in reductions, rather than totals from year to year. The chart on page 12, **Maine Statewide Combined Sewer Overflow Volume Discharged**, illustrates the continuing overall downward trend in the CSO volume discharged annually. Since 1989, the overall CSO volume discharged annually has decreased by approximately 92% statewide.
- 2) Similarly, the chart on page 13, **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 1989, the number of overflow event days experienced per year has decreased by approximately 79% statewide.
- 3) 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 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.

- 4) 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 Community. Just divide CSO volume by annual precipitation reported in inches to obtain a volume discharged per inch of precipitation. The chart on page 15, **Maine Combined Sewer Overflows Annual Volume Discharged per Inch of Precipitation**, illustrates 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. Since 1989, overflow volumes have decreased from approximately 128 million gallons per inch of precipitation to 11 million gallons per inch of precipitation, a reduction of 91%. The reduction in CSO discharge volume per inch of rain, mirrors the overall reduction in annual CSO discharge volume achieved statewide thus far (92%). This analysis is useful as a general indicator of the CSO abatement progress that is being accomplished.
- 5) Precipitation and the CSO volume discharged does not have a simple linear relationship. Still, as a general rule, 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.
- 6) The susceptibility of a CSO community'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 Communities 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 communities regarding their CSO abatement progress could be misleading.

# MAINE COMBINED SEWER OVERFLOW (CSO) COMMUNITY LIST (As of December 31, 2016)



COMMUNITY/PERMITTEE	CSOs	Number of CSOs & Receiving Water
1. AUBURN SEWERAGE DISTRICT .....	2	2-Androscoggin Rv. (Miller St #005 re-open 8-16-16)
2. BANGOR .....	9	6-Kenduskeag Str., 3-Penobscot Rv.
3. BAR HARBOR (Hulls Cove) .....	1	1-Frenchman Bay
4. BAR HARBOR (Main Plant) .....	3	2-Frenchman Bay, 1-Eddie Brook
5. BATH .....	4	4-Kennebec Rv.
6. BELFAST .....	2	2-Passagassawakeag River/Belfast Harbor
7. BIDDEFORD .....	8	8-Saco Rv.
8. BREWER .....	4	3-Penobscot River, 1-Sedgeunkendunk Str.
9. BUCKSPORT .....	1	1-Penobscot Rv.
10. CALAIS .....	5	4-St. Croix Rv., 1-Landing Brook
11. CAPE ELIZABETH – Ottawa Road PS (Co-Permittees - So. Portland, PWD, & Cape Eliz.)	1	1-Atlantic Ocean
12. GARDINER .....	1	1-Kennebec Rv.
13. GREATER AUGUSTA UTILITY DISTRICT (GAUD)... (Includes Hallowell Sanitary Sewers & CSO)	18	1-Kennedy Bk., 17-Kennebec Rv.
14. HAMPDEN .....	1	1-Souadabscook Str.
15. KENNEBEC SANITARY TREATMENT District (KSTD)	3	3-Kennebec Rv.
16. LEWISTON .....	8	3-Androscoggin Rv., 1-Goff Bk./Hart Bk., 4-Jepson Bk. (Beech St. #011 and Lowell St #021 closed on 12-28-16)
17. LEWISTON-AUBURN Water Pollution Control Authority (LAWPCA) .....	1	1-Androscoggin Rv.
18. MACHIAS .....	2	2-Machias Rv.
19. MADAWASKA .....	2	2-St. John Rv.
20. MECHANIC FALLS SANITARY DISTRICT .....	2	2-Little Androscoggin Rv.
21. MILFORD .....	1	1-Penobscot Rv.
22. OLD TOWN .....	3	2-Penobscot Rv., 1-Stillwater Rv.
23. ORONO .....	1	1-Penobscot Rv.
24. PARIS UD .....	1	1-Little Androscoggin Rv.
25. PORTLAND – CITY .....	12	6-Back Cove, 1-Capiscic Bk., 4-Portland Harbor., 1-Nason Brook To Fore River (marsh) (Warren Ave. #043 closed in early 2016)
26. PORTLAND – PORTLAND WATER DISTRICT (PWD)	18	9-Back Cove, 3-Casco Bay, 4-Fore Rv., 2- Portland Harbor
27. RANDOLPH .....	1	1-Kennebec Rv.
28. ROCKLAND .....	1	1-Rockland Harbor
29. SACO .....	4	1-Bear Bk., 3-Saco Rv.
30. SKOWHEGAN .....	7	7-Kennebec Rv.
31. SOUTH PORTLAND .....	6	1-Barberry Ck., 1-Fore Rv., 1-Calvery Pond., 2-Portland Hbr., 1-Long Creek
32. WESTBROOK .....	5	5-Presumpscot Rv.
33. WINSLOW .....	3	2-Sebasticook Rv. 1-Kennebec R. (re-opened China Rd #004)
34. WINTERPORT SEWERAGE DISTRICT .....	1	1-Penobscot Rv.
TOTAL CSOs		142

34 CSO Permits, permitting 31 CSO Towns/Cities

Two or more permits in one CSO Town/City

Two CSO Towns/Cities covered in one permit

**Bold** = 9 communities with sewer system only. Sewers discharge to a POTW controlled by another entity.

MAINE CSO COMMUNITY FLOW DATA

Annual Volumes (Gallons)																		
*** No longer a CSO Community																		
		Year																
Community	NPDES Permit No.	1987	1988	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Auburn S.D.	ME0100005	99,720,000	99,720,000	66,307,631	19,197,928	4,687,316	37,155,818	28,936,137	23,622,547	23,984,272	19,440,841	12,952,500	19,234,856	12,404,500	3,717,000	1,286,000	2,928,519	814,738
Bangor	ME0100781	635,000,000	635,000,000	161,000,000	204,000,000	193,870,000	303,160,000	272,750,000	150,580,000	378,640,000	347,360,000	389,300,000	146,000,000	69,940,000	32,140,000	87,748,000	40,109,000	48,586,000
Bar Harbor	ME0101214 & ME0102466	32,000,000	32,000,000	2,729,389	2,845,621	290,133	13,661,958	5,102,820	8,719,436	12,601,889	11,935,337	6,930,405	2,563,669	3,776,092	407,010	1,561,139	2,335,692	277,000
Bath	ME0100021	600,000,000	600,000,000	4,341,921	16,496,467	6,055,666	60,338,026	36,105,688	20,783,335	24,383,599	11,323,060	12,930,203	10,067,181	12,199,904	3,297,259	4,990,910	2,727,901	1,608,037
Belfast	ME0101532	736,000	736,000	0	0	0	1,796,747	485,451	1,035,392	198,370	260,036	486,919	490,495	0	0	0	0	0
Biddeford	ME0100048	400,000,000	400,000,000	415,694,234	136,417,937	101,087,776	301,372,131	163,423,532	150,304,402	147,313,000	146,452,750	127,029,700	41,609,559	79,848,639	43,252,373	34,049,095	18,358,229	24,471,000
Brewer	ME0100072	750,000,000	750,000,000	417,536,641	509,412,078	279,830,419	592,984,187	247,538,580	231,283,607	289,560,294	229,270,683	227,139,515	140,065,515	435,548	58,310	139,280	465,000	87,374
Bucksport	ME0100111	53,000,000	53,000,000	53,000,000	53,000,000	371,970	16,623,000	5,546,501	20,000	0	0	0	0	0	0	0	0	0
Calais	ME0100129	42,000,000	42,000,000	42,000,000	26,280,000	5,290,000	42,140,000	20,409,850	22,060,520	18,989,779	21,263,750	31,134,915	16,860,000	18,210,000	18,311,206	20,775,288	5,292,778	4,624,354
Cape Elizabeth	ME0102806	5,400,000	5,400,000	0	630,000	1,325,000	4,807,000	5,365,000	3,254,000	2,567,000	3,527,000	3,955,292	1,072,000	2,735,000	41,000	1,440,000	277,000	251,000
Corinna S.D.***	ME0100153	40,000,000	40,000,000	2,000	2,000	0												
Dover-Foxcroft***	ME0100501	16,000	16,000	0	0	0	199,000	0										
East Millinocket***	ME0100196	1,200,000	1,200,000	0	0	0	0	0										
Fairfield***	ME0102393	300,000	300,000	65,296	0	0	0	0	0	0	0	0	0	0	0			
Fort Kent U.D.***	ME0102369	3,000	3,000	0	2,400	41,000	600,000											
Gardiner	ME0101702	44,000,000	44,000,000	11,528,900	13,149,700	5,113,000	46,616,000	10,269,400	2,487,000	5,000,000	1,380,000	10,453,761	4,655,000	4,455,400	1,287,000	1,950,000	2,299,300	665,000
Greater Augusta U.D.	ME0100013	72,554,000	72,554,000	2,191,067	7,089,337	3,881,421	26,553,055	14,539,424	10,000,000	48,965,215	15,723,000	49,670,000	31,589,000	38,408,000	26,901,000	17,646,000	21,680,000	7,120,000
Hallowell W.D. - 2008 GAUD	ME0101010	350,000	350,000	0	100,000	0	700,000	150,000	150,000	-	-	-	-	-	-	-	-	-
Hampden	ME0102512	1,201,000	39,600	0	262,900	0	43,862,280	0	85,000	0	500,000	500,000	500,000	0	0	0	24,105	151,055
Kennebec S.T.D.	ME0100854	2,500,000	2,500,000	0	858,175	341,948	2,438,706	385,734	1,136,649	2,209,107	0	0	0	135,444	0	0	1,797,554	0
Kittery***	ME0100285	350,000	350,000	0	0	33,900	0											
Lewiston	ME0100994	208,900,000	208,900,000	176,395,415	199,236,985	82,766,343	249,891,633	159,807,018	90,983,189	152,039,341	116,557,656	113,285,042	78,521,909	90,103,658	32,772,894	21,355,331	30,574,217	25,477,213
Lewiston-Auburn W.P.C.A.	ME0101478	480,000,000	480,000,000	111,036,000	113,088,000	83,045,000	480,025,000	265,521,000	142,286,000	292,244,000	207,794,000	156,986,000	108,278,048	113,380,000	63,567,000	68,569,000	27,838,000	18,694,000
Lincoln S.D.***	ME0101796	2,400,000	2,400,000															
Lisbon***	ME0100307	600,000	600,000	0	0	0												
Livermore Falls***	ME0100315																	
Machias	ME0100323	7,000,000	7,000,000	722,293	2,533,245	2,124,118	6,646,222	3,008,025	2,263,720	2,328,905	4,073,938	2,791,962	1,180,678	938,330	1,857,988	2,202,444	1,067,647	910,259
Madawaska	ME 0101681	3,200,000	3,200,000	3,892	100,000	1,749,764	8,215,460	3,700,002	2,667,765	24,194,225	15,800,000	1,107,610	1,490,000	377,488	349,400	1,830,563	0	0
Mechanic Falls S.D.	ME0100391	18,000,000	18,000,000	1,001,489	2,389,769	963,114	11,765,409	9,419,000	11,853,000	11,223,600	6,231,000	9,250,000	5,033,002	9,638,035	3,663,997	1,385,675	1,013,807	927,473
Milford	ME0102695	220,000	220,000	220,000	220,000	220,000	0	211,070	0	88,365	66,285	52,006	407,151	26,970	0	10,000	25,000	20,000
Milo W.D.***	ME0100439	10,000	10,000	0	2,000	0	10,000	0	501,000	750								
Old Town	ME0100471	6,300,000	6,300,000	1,597,324	6,296,537	425,832	4,779,340	321,105	770,699	254,967	0	125,000	0	0	0	0	30,000	10,000
Orono	ME0100498	31,000,000	31,000,000	494,000	1,179,000	0	18,467,330	1,314,000	7,360,000	4,820,000	371,471	2,416,910	1,260,837	0	0	0	1,320,000	1,461,000
Paris U.D.	ME 0100951	1,000,000	1,000,000	0	175,000	0	288,000	173,500	206,000	84,000	0	110,000	0	1,020,000	0	0	0	0
Portland & PWD	City-ME0101435 / PWD-ME0102075	1,800,000,000	1,800,000,000	1,245,153,000	454,680,000	607,351,945	1,296,000,000	1,816,525,856	589,203,712	883,105,087	872,751,281	780,188,153	496,288,000	704,319,257	179,403,901	414,421,500	254,663,330	318,359,691
Presque Isle***	ME0100561	27,500,000	27,500,000															
Randolph	ME0102423	10,000,000	10,000,000	196,591	432,500	0	1,058,039	266,256	459,476	1,413,880	488,645	285,719	223,934	988,434	50,054	101,183	0	515,240
Rockland	ME0100595	47,000,000	47,000,000	20,000,000	20,000,000	7,000,000	0	0	0	0	0	0						0
Saco	ME 0101117	176,000,000	176,000,000	4,316,465	5,758,842	10,313,025	176,214,902	38,451,182	1,950,000	100,000	27,015	924,014	1,372,128	2,964,929	1,100,985	1,739,425	1,057,000	599,000
Sanford S.D.***	ME0100617	4,000,000	4,000,000	0	0	0	0	15,000	0	0	0	0	0	0	0			
Skowhegan	ME0100625	48,000,000	48,000,000	10,883,416	22,768,111	12,082,768	47,873,323	31,314,358	21,596,631	61,963,453	6,073,919	7,550,855	4,757,994	4,238,875	4,746,538	3,861,193	6,786,698	4,168,672
South Portland	ME0100633	500,000,000	500,000,000	4,467,429	7,896,125	19,812,914	26,810,104	26,118,706	15,727,553	12,883,433	12,183,196	42,095,393	14,906,594	37,134,882	1,858,579	15,531,600	11,161,602	6,240,350
Westbrook	ME0100846	50,000,000	50,000,000	271,000	7,000	944,000	11,119,000	40,636,729	15,879,000	7,379,066	7,069,280	14,105,989	12,202,000	18,903,485	6,222,000	11,932,000	4,423,000	7,447,100
Winslow	ME0102628	1,300,000	1,300,000	0	0	0	23,652	0	725,000	235,000	5,001	200,000	63,354	1,327,119	7,070	0	164,549	70,144
Winterport S.D.	ME0100749	680,000	680,000	144,000	570,000	91,000	677,800	0	102,000	252,000	18,000	0	0	0	0	60,000	90,000	0
Yarmouth***	ME0100765	1,000	1,000	0														
Total		6,203,441,000	6,202,279,600	2,753,299,393	1,827,077,657	1,431,109,372	3,834,873,122	3,207,810,924	1,530,056,633	2,409,022,597	2,057,947,144	2,003,957,863	1,140,692,904	1,227,909,989	425,012,564	714,585,626	438,509,928	473,555,700
Total In Billion Gallons		6.20	6.20	2.75	1.83	1.43	3.83	3.21	1.53	2.41	2.06	2.00	1.14	1.23	0.43	0.71	0.44	0.47

**Note:** For legibility, discharge volume data for years 1989-2001 are not shown.

# MAINE CSO COMMUNITY ANNUAL NUMBER OF CSO DISCHARGE EVENTS

Annual Number of CSO Discharge Events																		
No longer a CSO Community																		
Year																		
Community	NPDES Permit No.	1987	1988	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Auburn S.D.	ME0100005	80	80	67	62	24	58	37	42	59	61	37	11	8	5	5	2	8
Bangor	ME0100781	53	53	40	49	42	46	58	25	65	78	73	54	29	27	34	20	28
Bar Harbor	ME0101214 & ME0102466	155	155	21	16	5	22	18	10	27	28	19	6	13	6	17	5	2
Bath	ME0100021	64	64	25	23	20	33	32	25	29	21	20	12	23	18	18	8	14
Belfast	ME0101532	7	7	0	0	0	5	3	5	4	3	6	3	0	0	0	1	0
Biddeford	ME0100048	180	180	150	93	61	104	82	70	53	46	28	100	146	77	88	48	57
Brewer	ME0100072	95	95	72	66	72	78	45	38	59	56	50	45	5	3	3	1	2
Bucksport	ME0100111	53	53	24	25	8	24	18	2	0	0	0	0	0	0	0	0	0
Calais	ME0100129	15	15	15	15	9	15	5	8	10	14	8	6	14	8	14	6	7
Cape Elizabeth	ME0102806	5	5	0	2	5	20	20	5	11	17	12	6	11	2	12	2	6
Corinna S.D.	ME0100153	30	30	1	1	0												
Dover-Foxcroft	ME0100501	8	8	0	0	0	2	0										
East Millinocket	ME0100196	11	11	0	0	0	0	0										
Fairfield	ME0102393	15	15	4	0	0	0	0	0	0	0	0	0	0	0			
Fort Kent U.D.	ME0102369	10	10	0	2	1	4											
Gardiner	ME0101702	40	40	13	24	11	41	14	2	8	2	12	6	6	3	3	2	2
Greater Augusta U.D.	ME0100013	80	80	58	70	58	73	50	29	34	35	32	37	29	22	29	17	17
Hallowell W.D. - 2008 GAUD	ME0101010	14	14	0	2	0	14	3	3	-	-	-	-	-	-	-	-	-
Hampden	ME0102512	1	3	0	2	0	13	0	1	0	1	1	1	0	0	0	1	1
Kennebec S.T.D.	ME0100854	15	15	0	5	7	9	3	1	4	0	0	0	1	0	0	1	0
Kittery	ME0100285	7	7	0	0	1	0											
Lewiston	ME0100994	80	80	57	55	65	69	70	38	71	58	68	45	38	27	23	37	35
Lewiston-Auburn W.P.C.A.	ME0101478	80	80	25	23	35	49	44	29	38	36	44	37	22	32	26	17	17
Lincoln S.D.	ME0101796	10	10															
Lisbon	ME0100307	5	5	0	0	0												
Livermore Falls	ME0100315																	
Machias	ME0100323	15	15	4	16	8	15	10	5	12	13	9	7	9	6	13	7	8
Madawaska	ME 0101681	16	16	1	7	4	65	14	17	18	32	17	10	8	3	7	0	0
Mechanic Falls S.D.	ME0100391	42	42	15	20	12	29	23	9	42	42	18	39	28	17	30	17	25
Milford	ME0102695	8	8	8	8	8	0	8	0	4	1	3	2	1	0	1	1	1
Milo W.D.	ME0100439	3	3	0	1	0	1	0	2	1								
Old Town	ME0100471	25	25	5	7	1	13	1	4	4	0	1	0	0	0	0	1	1
Orono	ME0100498	30	30	1	2	0	12	3	6	7	3	3	2	0	0	0	2	4
Paris U.D.	ME 0100951	5	5	0	1	0	2	2	2	2	0	4	0	4	0	0	0	0
Portland & PWD	City-ME0101435 / PWD-ME0102075	100	100	141	71	86	88	93	58	87	104	79	88	70	63	75	58	56
Presque Isle	ME0100561	26	26															
Randolph	ME0102423	23	23	3	2	0	8	3	1	9	7	3	2	2	1	2	0	2
Rockland	ME0100595	23	23	11	6	2	0	0	0	0	0							0
Saco	ME 0101117	44	44	36	22	32	41	24	12	12	9	10	4	21	15	19	13	12
Sanford S.D.	ME0100617	10	10	0	0	0	0	1	0	0	0	0	0	0	0			
Skowhegan	ME0100625	160	160	115	77	53	81	81	55	58	17	23	21	25	36	28	20	23
South Portland	ME0100633	23	23	11	10	10	20	20	5	10	10	12	13	12	7	9	2	3
Westbrook (PWD)	ME0100846	50	50	33	7	13	17	31	55	50	11	12	16	13	60	70	49	38
Winslow	ME0102628	20	20	0	0	0	1	0	3	3	3	2	3	9	1	0	1	3
Winterport S.D.	ME0100749	8	8	3	8	1	2	0	1	1	1	0	0	0	0	1	2	0
Yarmouth	ME0100765	4	4	0														
Total		1748	1750	959	800	654	1074	816	568	792	709	606	576	547	439	527	341	372

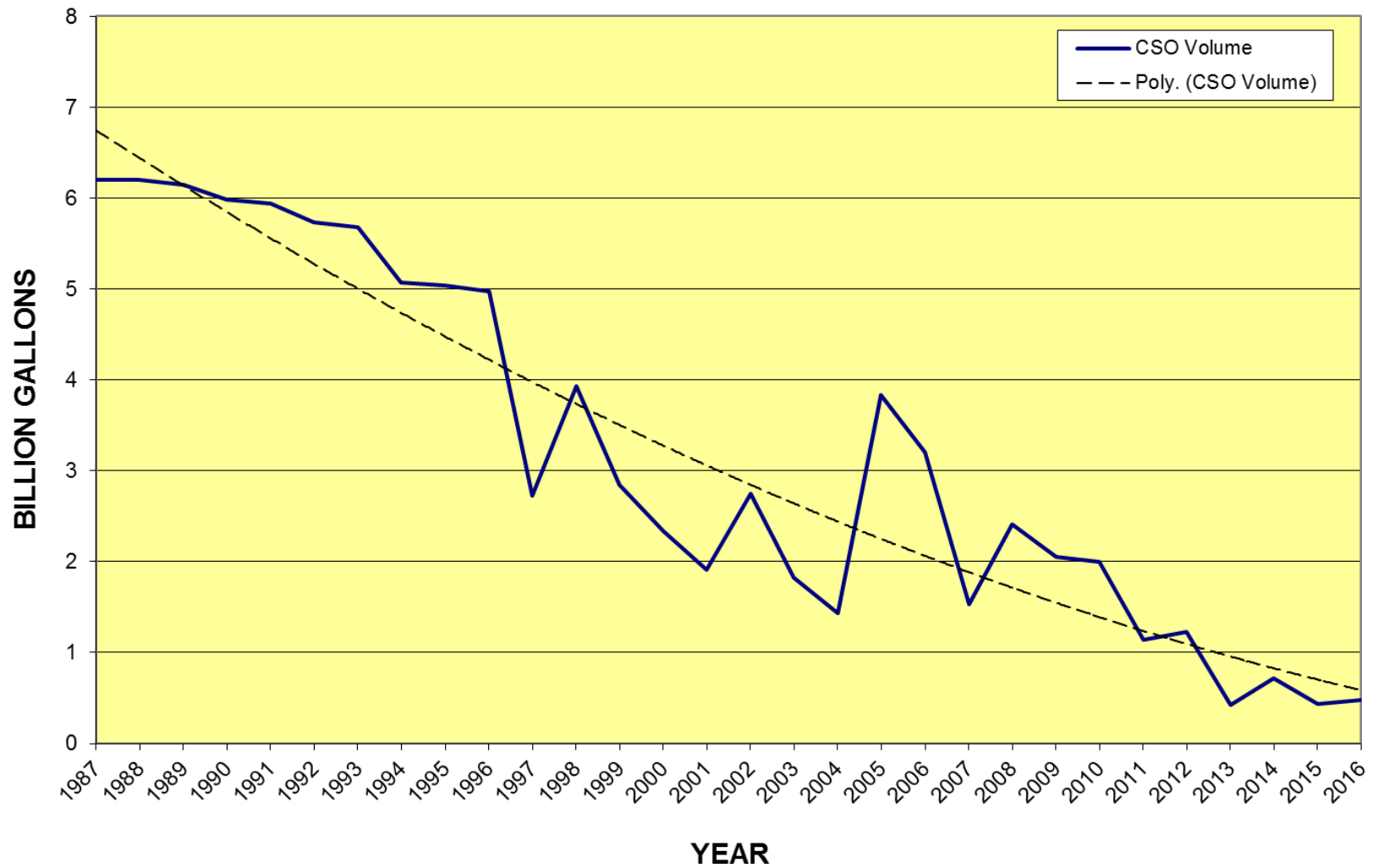
**Note:** For legibility, discharge events data for years 1989-2001 are not shown.

MAINE CSO COMMUNITY ANNUAL NUMBER OF CSO OUTFALLS

		CSO Count by Community																			
No longer a CSO Community																					
		Year																			
Community	NPDES Permit No.	Year Unknown	1987	1988	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016		
Auburn S.D.	ME0100005	11	11	11	6	6	6	6	5	4	3	3	3	2	3	2	2	1	2		
Bangor	ME0100781	22	22	22	12	12	12	12	11	11	7	7	7	9	9	9	9	9	9		
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	12	11	11	11	11	11	10	10	10	10	10	8	8	8	8		
Brewer	ME0100072	10	10	10	7	7	7	7	7	6	6	6	5	5	4	4	4	4	4		
Bucksport	ME0100111	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1		
Calais	ME0100129	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5		
Cape Elizabeth		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	1	1	0														
Dover-Foxcroft	ME0100501	15	15	15	4	4	4	4	4												
East Millinocket	ME0100196	5	5	5	1	1	1	1	1												
Fairfield	ME0102393	3	3	3	2	2	2	2	2	2	2	2	2	2	2	0					
Fort Kent U.D.	ME0102369	6	6	6	1	1	1	1													
Gardiner	ME0101702	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1		
Greater Augusta U.D.	ME0100013	31	31	31	23	24	24	24	23	23	24	23	22	22	19	18	18	18	18		
Hallowell W.D. - 2008 GAUD	ME0101010	1	1	1	1	1	1	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	3	3	3	3	3		
Kittery	ME0100285	3	3	3	3	3	3	3													
Lewiston	ME0100994	32	32	32	30	30	30	26	24	23	22	22	20	18	18	16	11	10	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	0	0															
Lisbon	ME0100307	6	6	6	2	2	2														
Livermore Falls	ME0100315	5	5	5	0	0															
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	1	1	1	1	1	1	3	3	3	3	3	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	3	3	3	3	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	1	1	1		
Portland & PWD	City-ME0101435 / PWD-ME0102075	42	42	42	34	34	34	34	33	33	33	33	32	32	31	31	31	31	30		
Presque Isle	ME0100561	1	1	1	0	0															
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	4	4	4	4	3	2	2								1	1	1
Saco	ME 0101117	9	9	9	5	5	5	5	5	5	6	5	4	4	4	4	4	4	4		
Sanford S.D.	ME0100617	3	3	3	2	2	2	2	2	2	1	1	1	1	0						
Skowhegan	ME0100625	10	10	10	9	9	9	9	9	9	8	7	7	7	7	7	7	7	7		
South Portland	ME0100633	35	28	28	8	8	7	6	5	5	6	6	6	6	6	6	6	6	6		
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	2	2	1	1	1	1	1	1	2	2	2	2	2	2	3		
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	1	0															
		350	338	338	216	215	212	205	193	183	177	171	164	163	159	149	145	143	142		

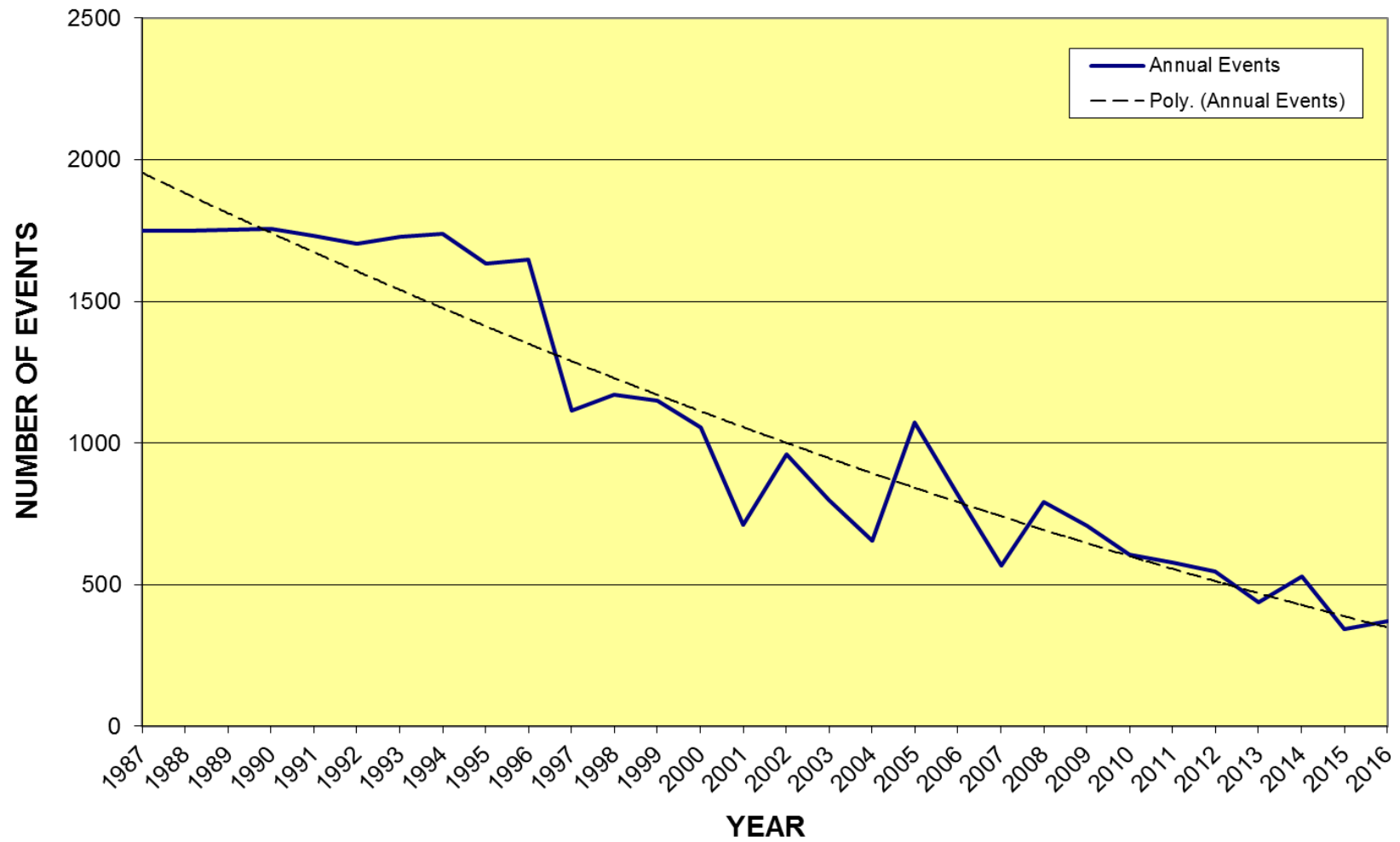
**Note:** For legibility, CSO outfall data for years 1989-2001 are not shown.

# MAINE - STATEWIDE COMBINED SEWER OVERFLOW (CSO) VOLUME DISCHARGED

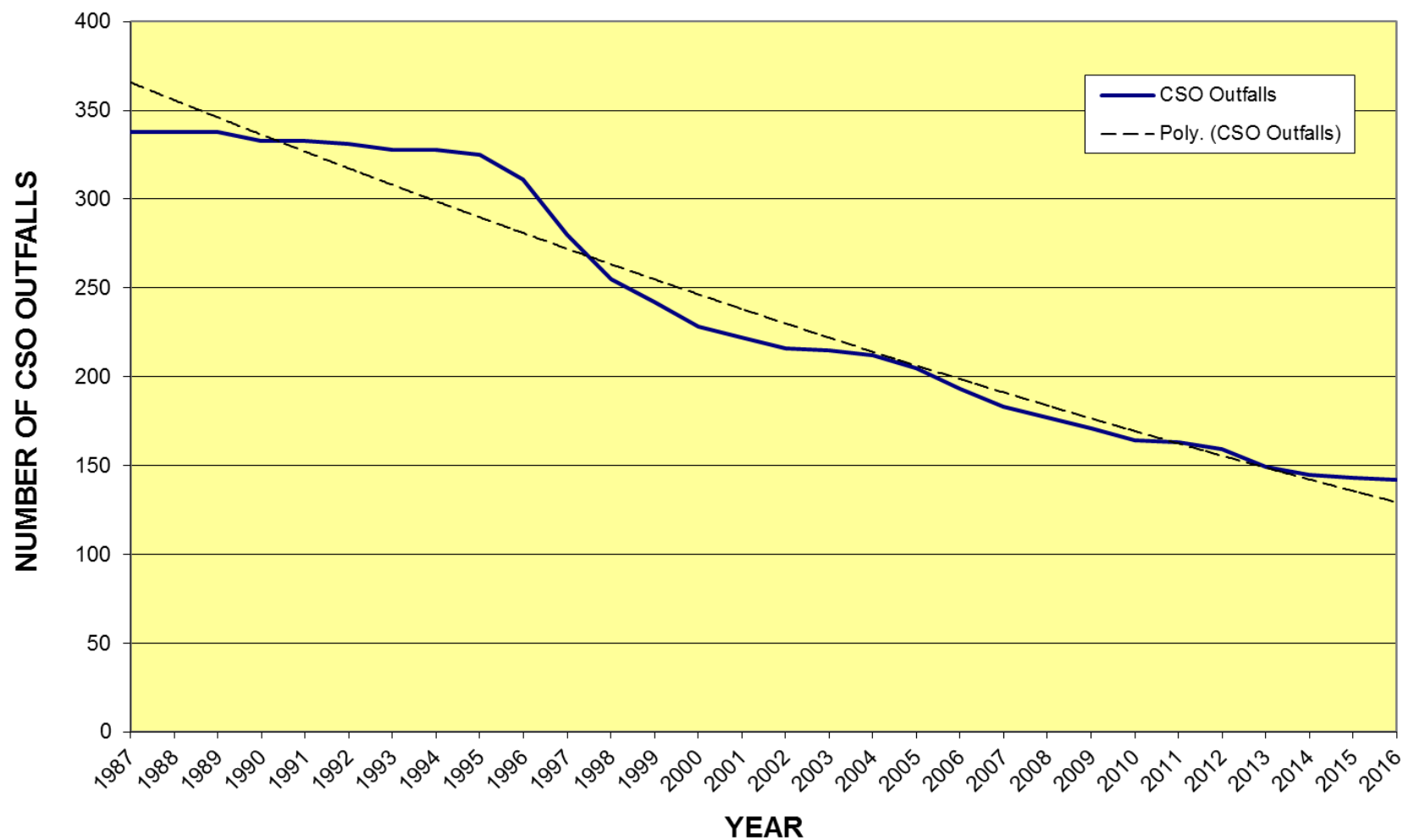




# MAINE - STATEWIDE COMBINED SEWER OVERFLOW (CSO) ANNUAL NUMBER OF DISCHARGE EVENTS

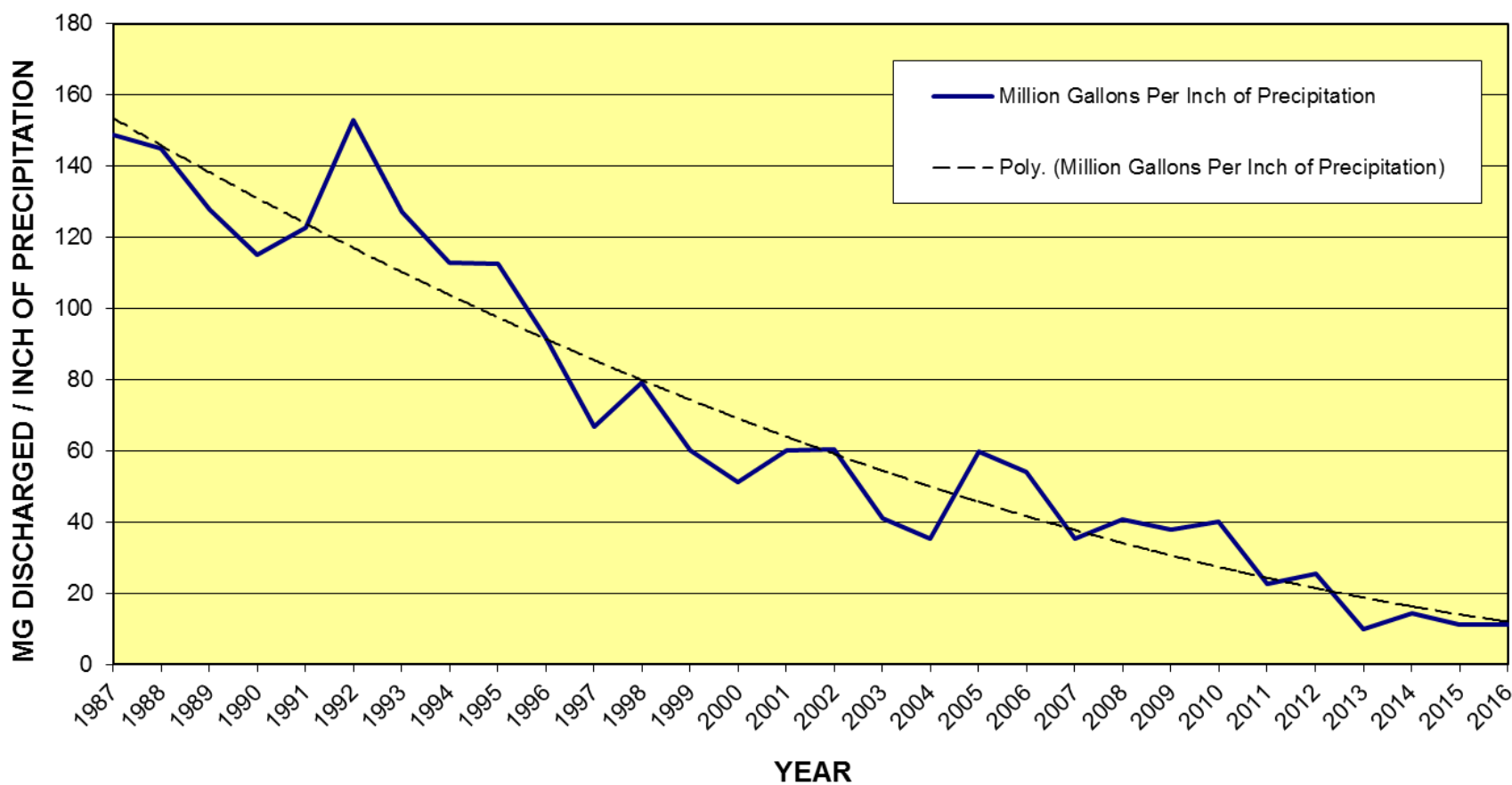


# MAINE - STATEWIDE NUMBER OF COMBINED SEWER OVERFLOW (CSO) OUTFALLS

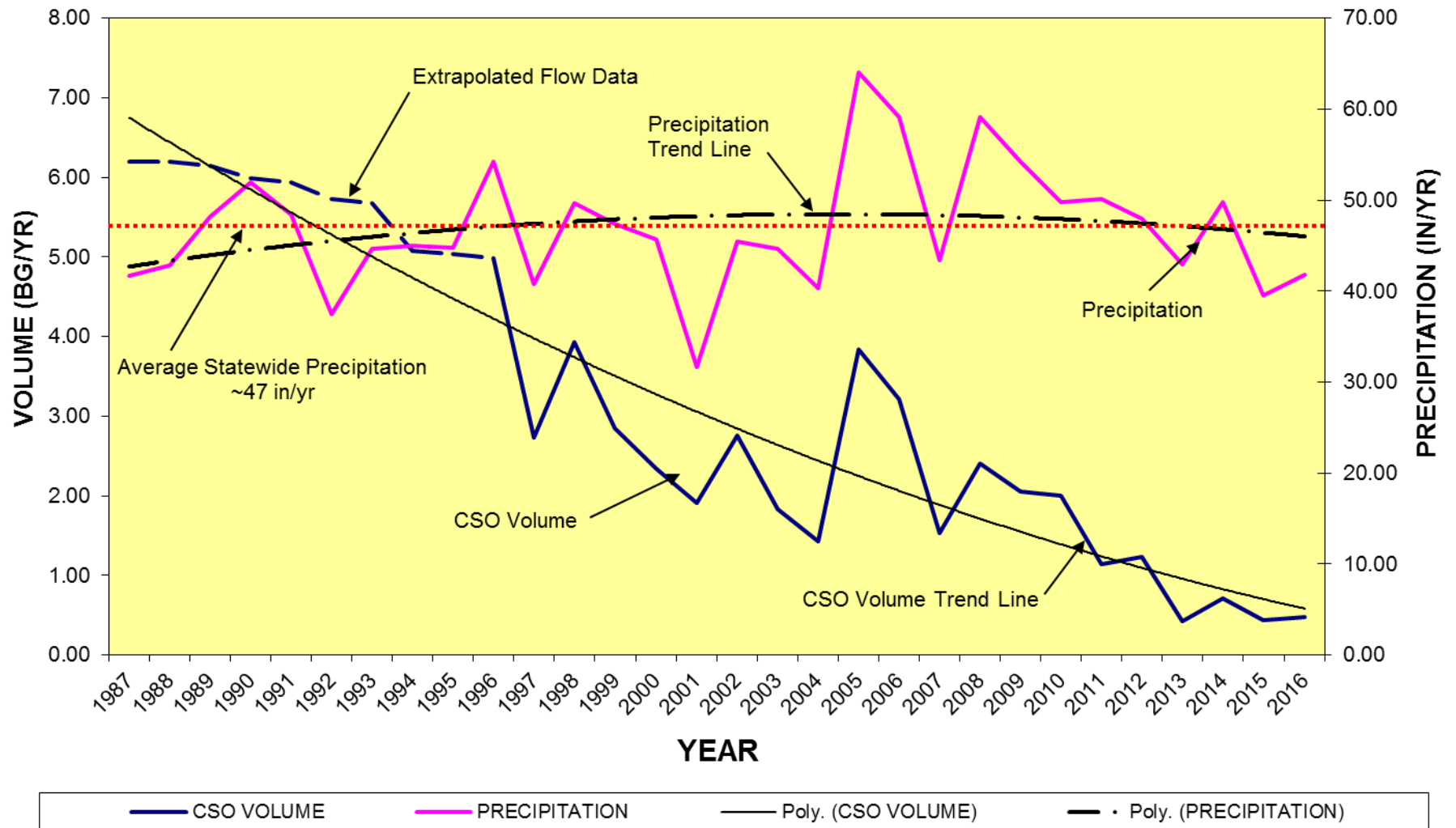




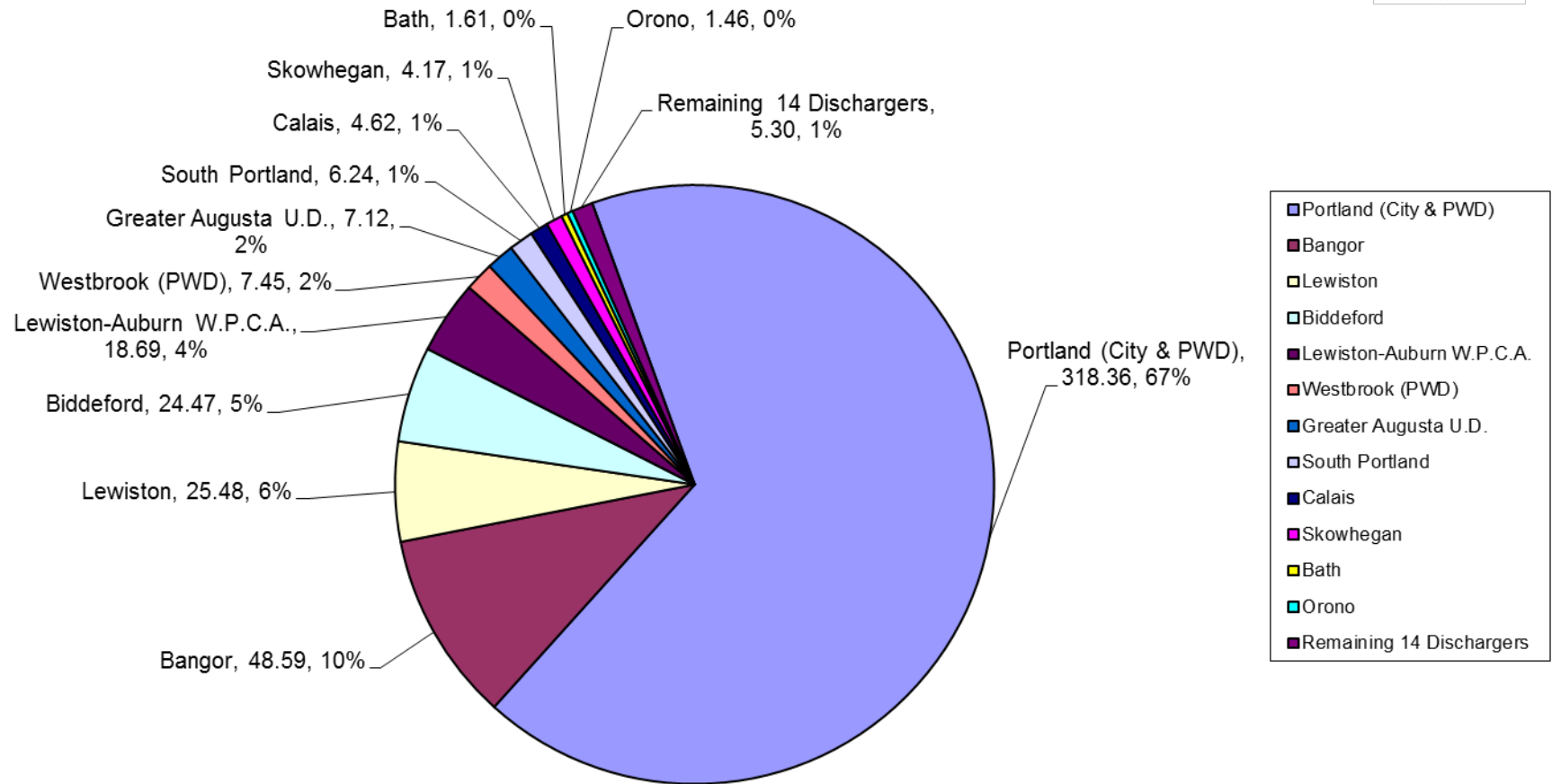
# MAINE COMBINED SEWER OVERFLOWS ANNUAL VOLUME DISCHARGED PER INCH OF PRECIPITATION



# MAINE YEARLY CSO VOLUMES AND PRECIPITATION



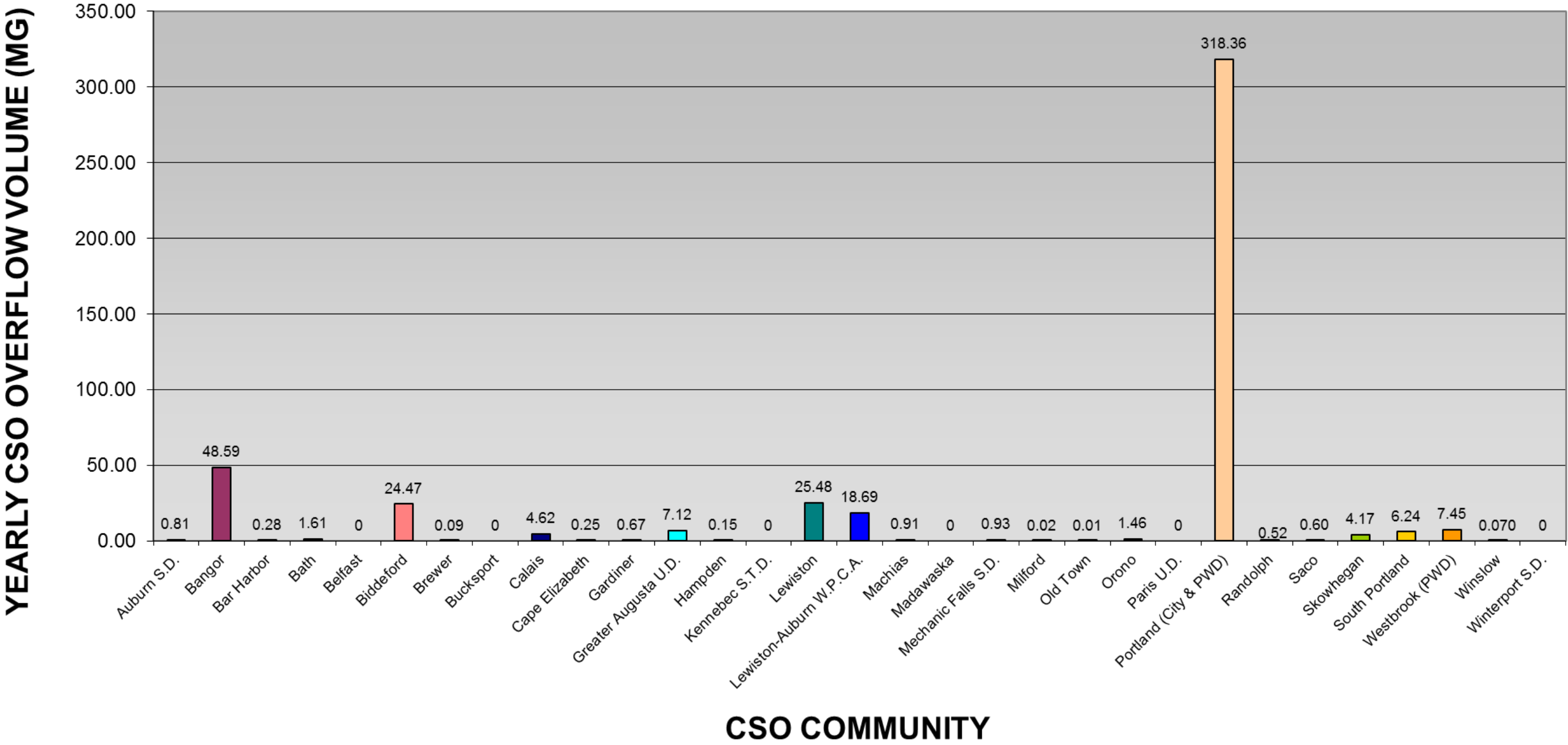
**Maine 2016 CSO FLOW COMPARISON  
31 CSO COMMUNITIES  
27 DISCHARGERS - 0.47 BILLION GALLONS**



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

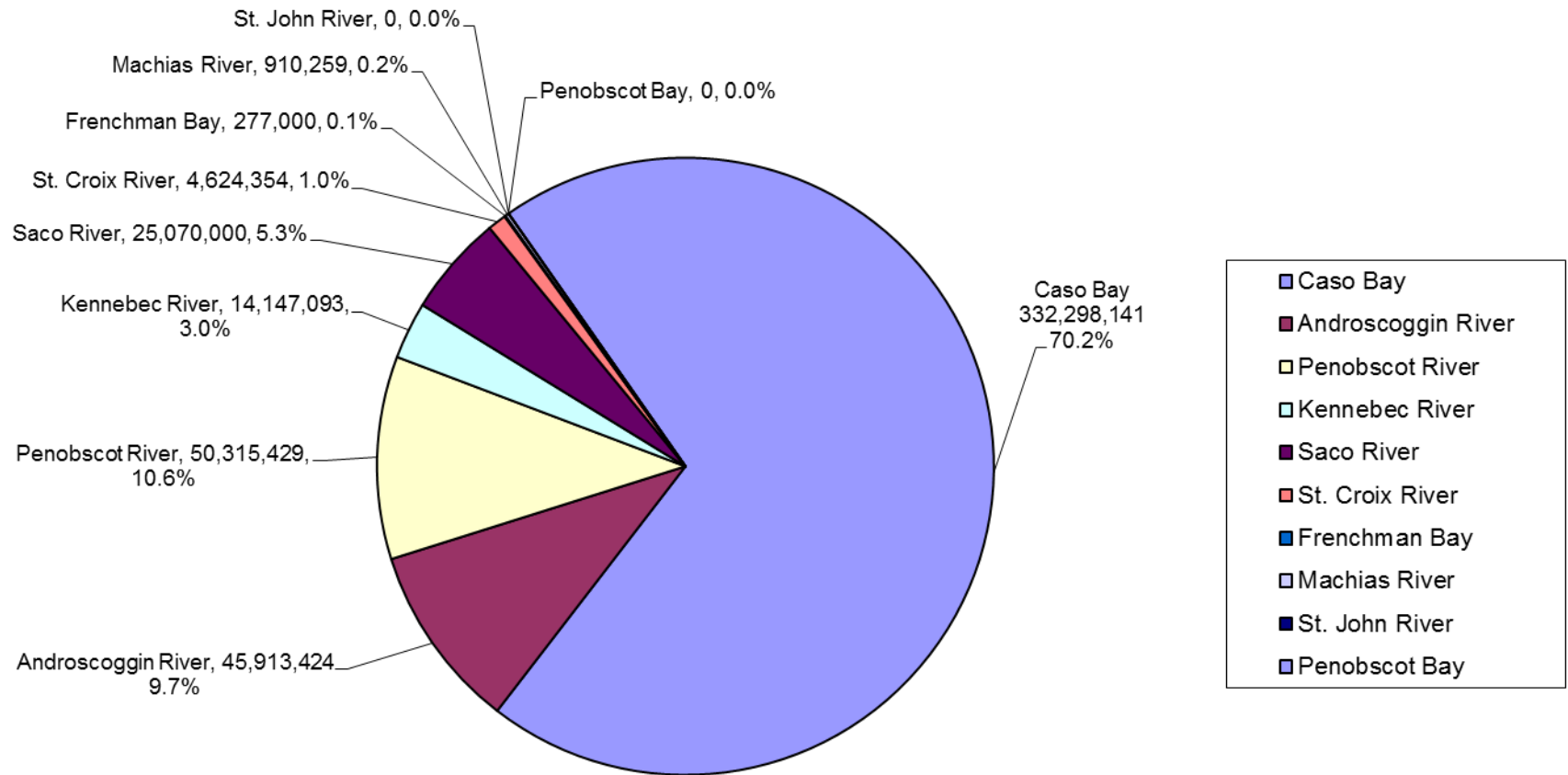
# Maine 2016 CSO FLOW COMPARISON BY COMMUNITY

## 0.47 Billion Gallons





# Maine 2016 CSO Volume Discharged by Watershed 0.47 Billion Gallons



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

# MAINE ANNUAL CSO VOLUME DISCHARGED BY WATERSHED

	Community	Annual CSO Flows (Gallons)					
		2011	2012	2013	2014	2015	2016
Androscoggin River	Auburn SD	19,234,856	12,404,500	3,717,000	1,286,000	2,928,519	814,738
	Lewiston-Auburn WPCA	108,278,048	113,380,000	63,567,000	68,569,000	27,838,000	18,694,000
	Lewiston	78,521,909	90,103,658	32,772,894	21,355,331	30,574,217	25,477,213
	Mechanic Falls SD	5,033,002	9,638,035	3,663,997	1,385,675	1,013,807	927,473
	Paris UD	0	1,020,000	0	0	0	0
	<b>Sub Total</b>	<b>211,067,815</b>	<b>226,546,193</b>	<b>103,720,891</b>	<b>92,596,006</b>	<b>62,354,543</b>	<b>45,913,424</b>
Casco Bay	Cape Elizabeth	1,072,000	2,735,000	41,000	1,440,000	277,000	251,000
	Portland-City & PWD	496,288,000	704,319,257	179,403,901	414,421,500	254,663,330	318,359,691
	South Portland	14,906,594	37,134,882	1,858,579	15,531,600	11,161,602	6,240,350
	Westbrook	12,202,000	18,903,485	6,222,000	11,932,000	4,423,000	7,447,100
	<b>Sub Total</b>	<b>524,468,594</b>	<b>763,092,624</b>	<b>187,525,480</b>	<b>443,325,100</b>	<b>270,524,932</b>	<b>332,298,141</b>
Frenchman Bay	Bar Harbor	2,563,669	3,776,092	407,010	1,561,139	2,335,692	277,000
	<b>Sub Total</b>	<b>2,563,669</b>	<b>3,776,092</b>	<b>407,010</b>	<b>1,561,139</b>	<b>2,335,692</b>	<b>277,000</b>
Kennebec River	Augusta SD	31,589,000	38,408,000	26,901,000	17,646,000	21,680,000	7,120,000
	Bath	10,067,181	12,199,904	3,297,259	4,990,910	2,727,901	1,608,037
	Gardiner	4,655,000	4,455,400	1,287,000	1,950,000	2,299,300	665,000
	Kennebec STD	0	135,444	0	0	1,797,554	0
	Randolph	223,934	988,434	50,054	101,183	0	515,240
	Skowhegan	4,757,994	4,238,875	4,746,538	3,861,193	6,786,698	4,168,672
	Winslow	63,354	1,327,119	7,070	0	164,549	70,144
	<b>Sub Total</b>	<b>51,356,463</b>	<b>61,753,176</b>	<b>36,288,921</b>	<b>28,549,286</b>	<b>35,456,002</b>	<b>14,147,093</b>
Machias River	Machias	1,180,678	938,330	1,857,988	2,202,444	1,067,647	910,259
	<b>Sub Total</b>	<b>1,180,678</b>	<b>938,330</b>	<b>1,857,988</b>	<b>2,202,444</b>	<b>1,067,647</b>	<b>910,259</b>
Penobscot Bay	Belfast	490,495	0	0	0	0	0
	Rockland	0	0	0	0	0	0
	<b>Sub Total</b>	<b>490,495</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Penobscot River	Bangor	146,000,000	69,940,000	32,140,000	87,748,000	40,109,000	48,586,000
	Brewer	140,065,515	435,548	58,310	139,280	465,000	87,374
	Bucksport	0	0	0	0	0	0
	Hampden	500,000	0	0	0	24,105	151,055
	Milford	407,151	26,970	0	10,000	25,000	20,000
	Old Town	0	0	0	0	30,000	10,000
	Orono	1,260,837	0	0	0	1,320,000	1,461,000
	Winterport SD	0	0	0	60,000	90,000	0
	<b>Sub Total</b>	<b>288,233,503</b>	<b>70,402,518</b>	<b>32,198,310</b>	<b>87,957,280</b>	<b>42,063,105</b>	<b>50,315,429</b>
Saco River	Biddeford	41,609,559	79,848,639	43,252,373	34,049,095	18,358,229	24,471,000
	Saco	1,372,128	2,964,929	1,100,985	1,739,425	1,057,000	599,000
	<b>Sub Total</b>	<b>42,981,687</b>	<b>82,813,568</b>	<b>44,353,358</b>	<b>35,788,520</b>	<b>19,415,229</b>	<b>25,070,000</b>
St. Croix River	Calais	16,860,000	18,210,000	18,311,206	20,775,288	5,292,778	4,624,354
	<b>Sub Total</b>	<b>16,860,000</b>	<b>18,210,000</b>	<b>18,311,206</b>	<b>20,775,288</b>	<b>5,292,778</b>	<b>4,624,354</b>
St. John River	Madawaska	1,490,000	377,488	349,400	1,830,563	0	0
	<b>Sub Total</b>	<b>1,490,000</b>	<b>377,488</b>	<b>349,400</b>	<b>1,830,563</b>	<b>0</b>	<b>0</b>
	<b>Total Annual Flow</b>	<b>1,140,692,904</b>	<b>1,227,909,989</b>	<b>425,012,564</b>	<b>714,585,626</b>	<b>438,509,928</b>	<b>473,555,700</b>