Maryland
Department of
the Environment

SSO Trend Overview

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Objectives

- Determine significance of SSO nitrogen loads
- Conduct SSO load trend analysis at State and finer scales
- Provide SSO nutrient loads to the Chesapeake Bay Program

2017 Wastewater Workgroup Study

- Estimated 30 mg/L SSO TN concentration
  - Mid-point between Bypass (20 mg/L) and Raw Sewage (40 mg/L)

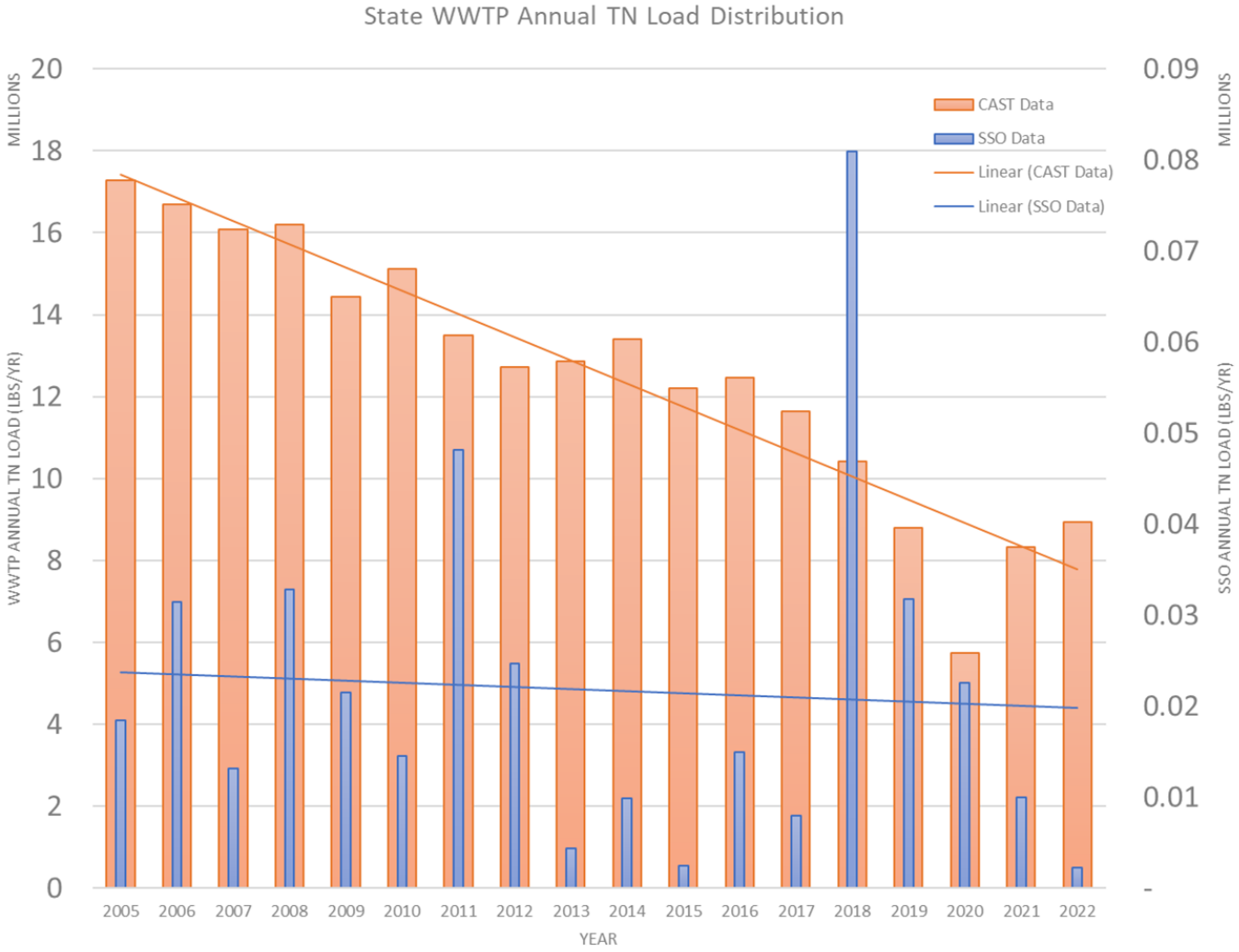
- Possibility that the increased elimination of CSOs will translate to an uptick in SSO events

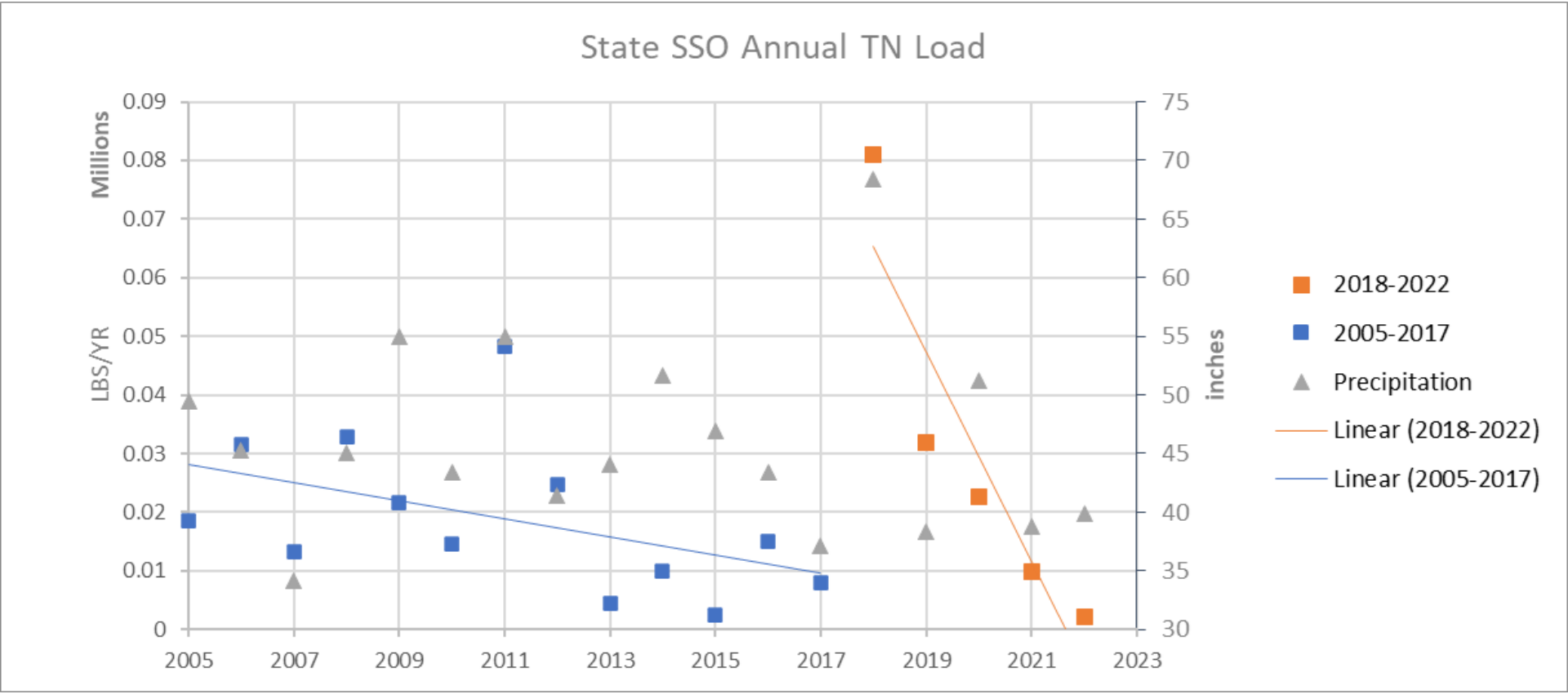
- SSO loads significant during storm events and would improve model performance

- Recommendation to include SSO and Bypass loads in future model and begin collecting data

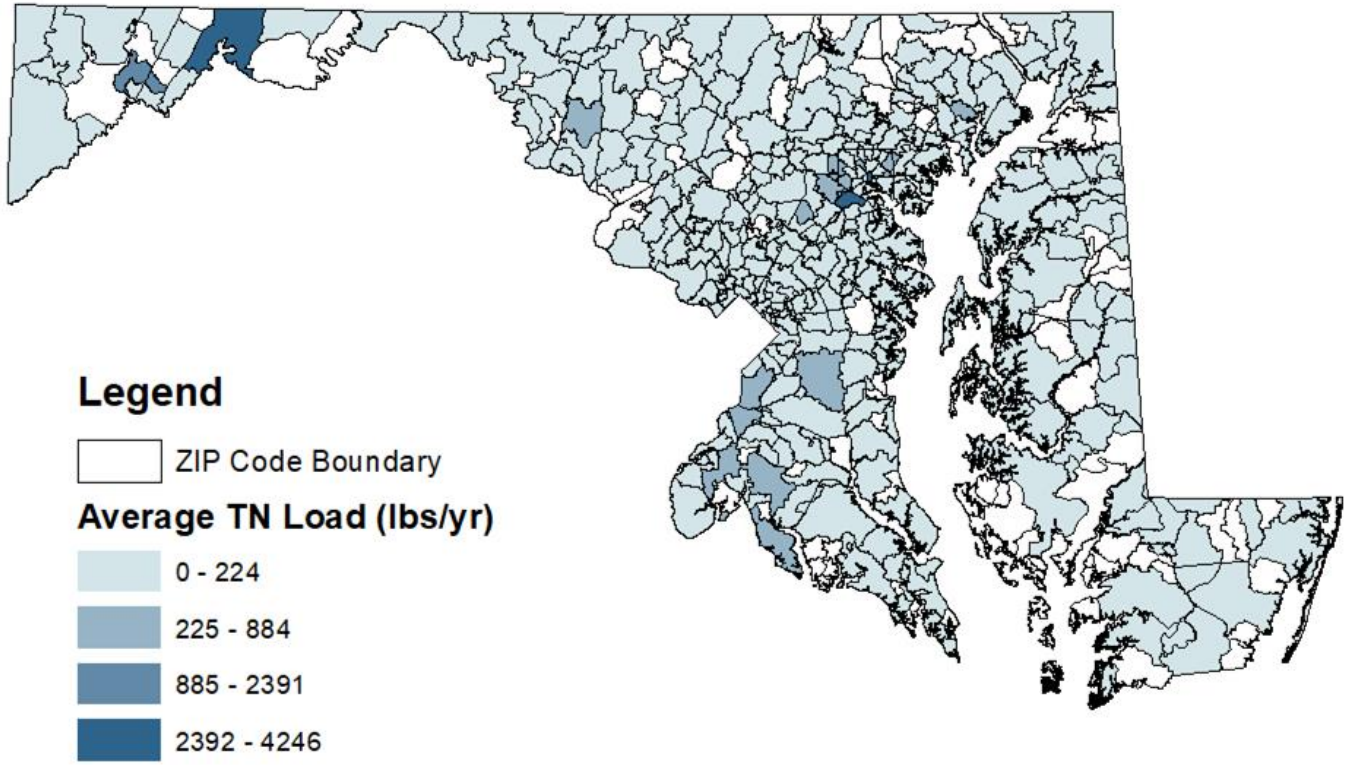
Method

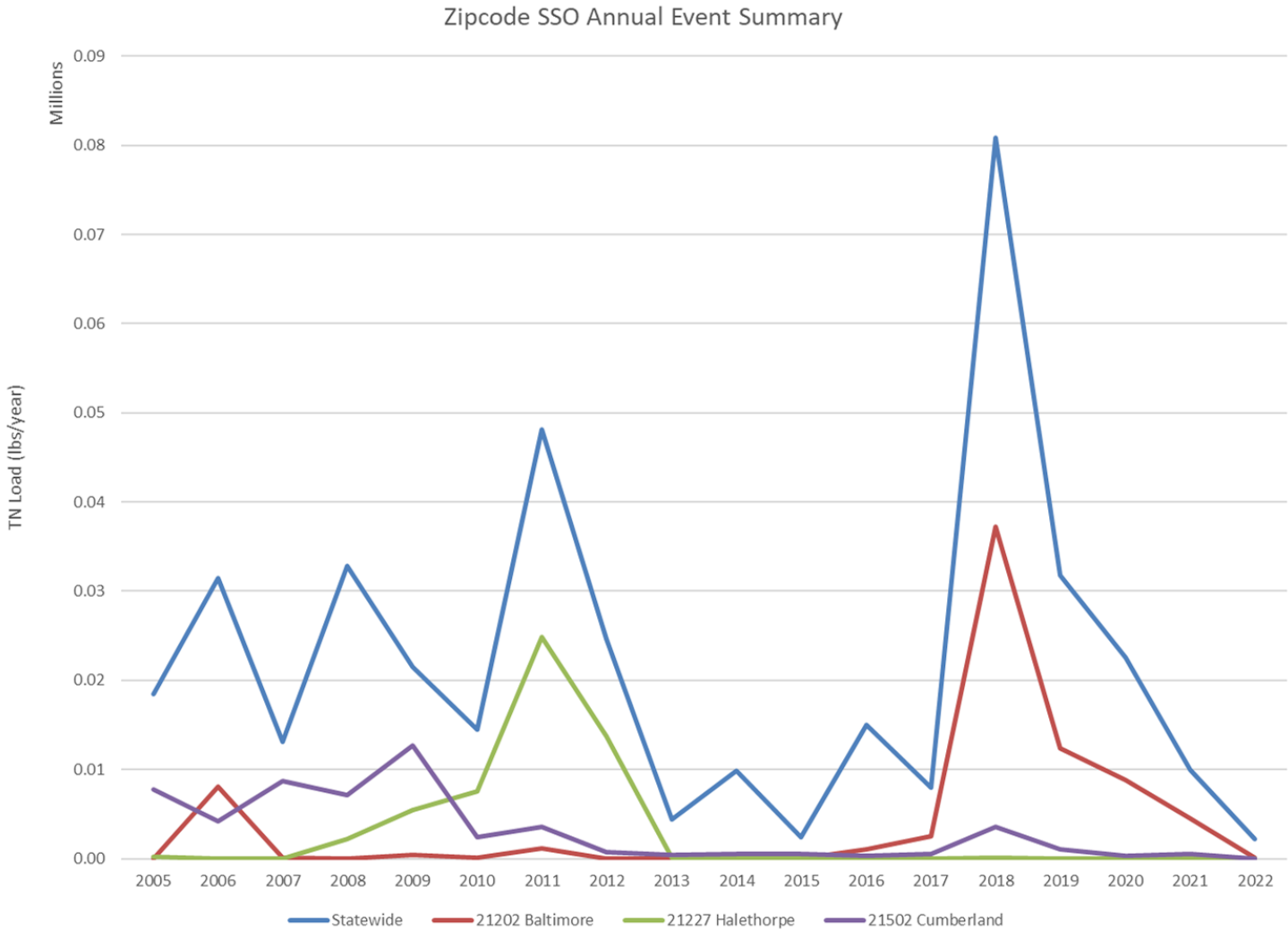
- Downloaded SSO statewide data from the Maryland Reported Sewer Overflow Database
- Looked at data attributes such as collection systems, receiving waters and ZIP code associated with SSO records
  - Watershed attributes only available since 2005
- Determined that ZIP code records provided the best information available to aggregate loads at the MD 8-digit scale
- Calculated annual TN load from net gallons released


State WWTP Annual TN Load Distribution
MILLIONS
WWTP ANNUAL TN LOAD (LBS/YR)
20
18
16
14
12
10
8
6
4
2
0
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
-
MILLIONS
SSO ANNUAL TN LOAD (LBS/YR)
CAST Data
SSO Data
Linear (CAST Data)
Linear (SSO Data)
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
YEAR

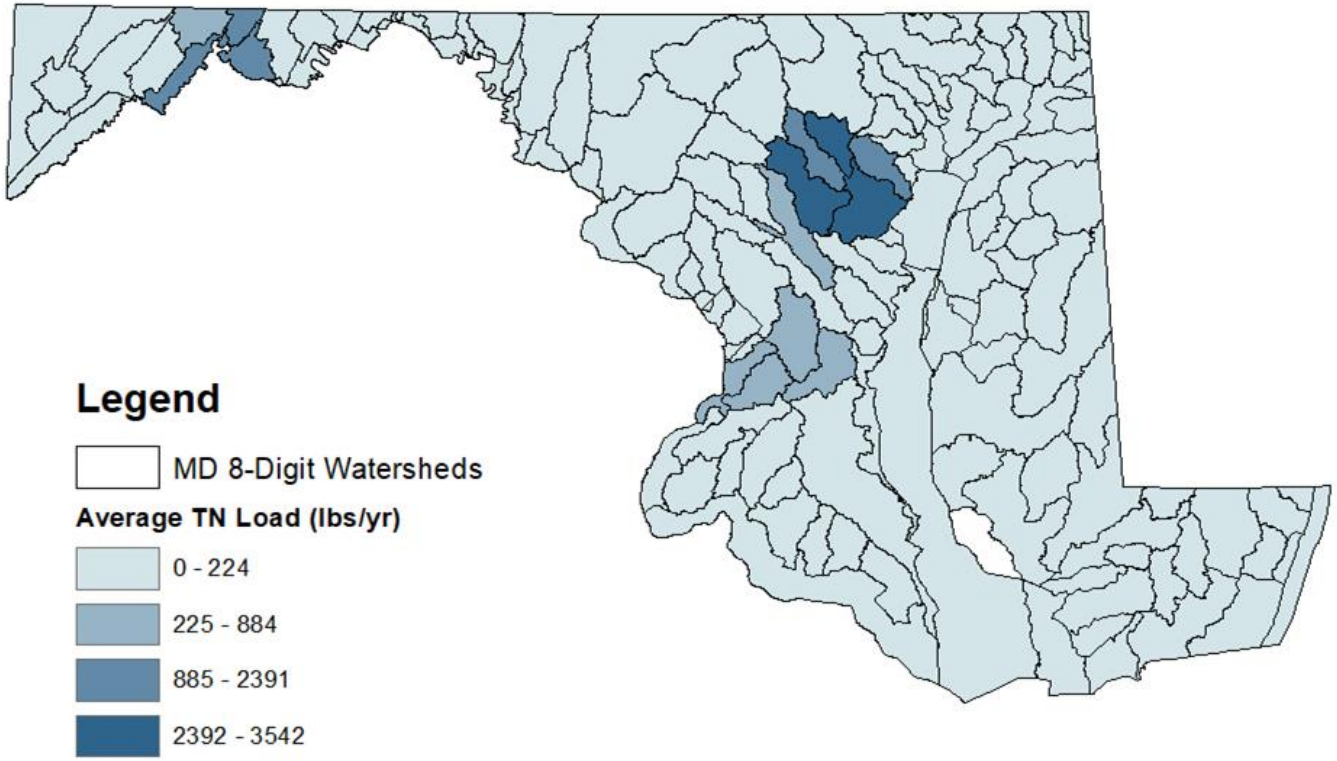

State SSO Annual TN Load
Millions
LBS/YR
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
75
70
65
60
55
50
45
40
35
30
inches
2018-2022
2005-2017
Precipitation
Linear (2018-2022)
Linear (2005-2017)

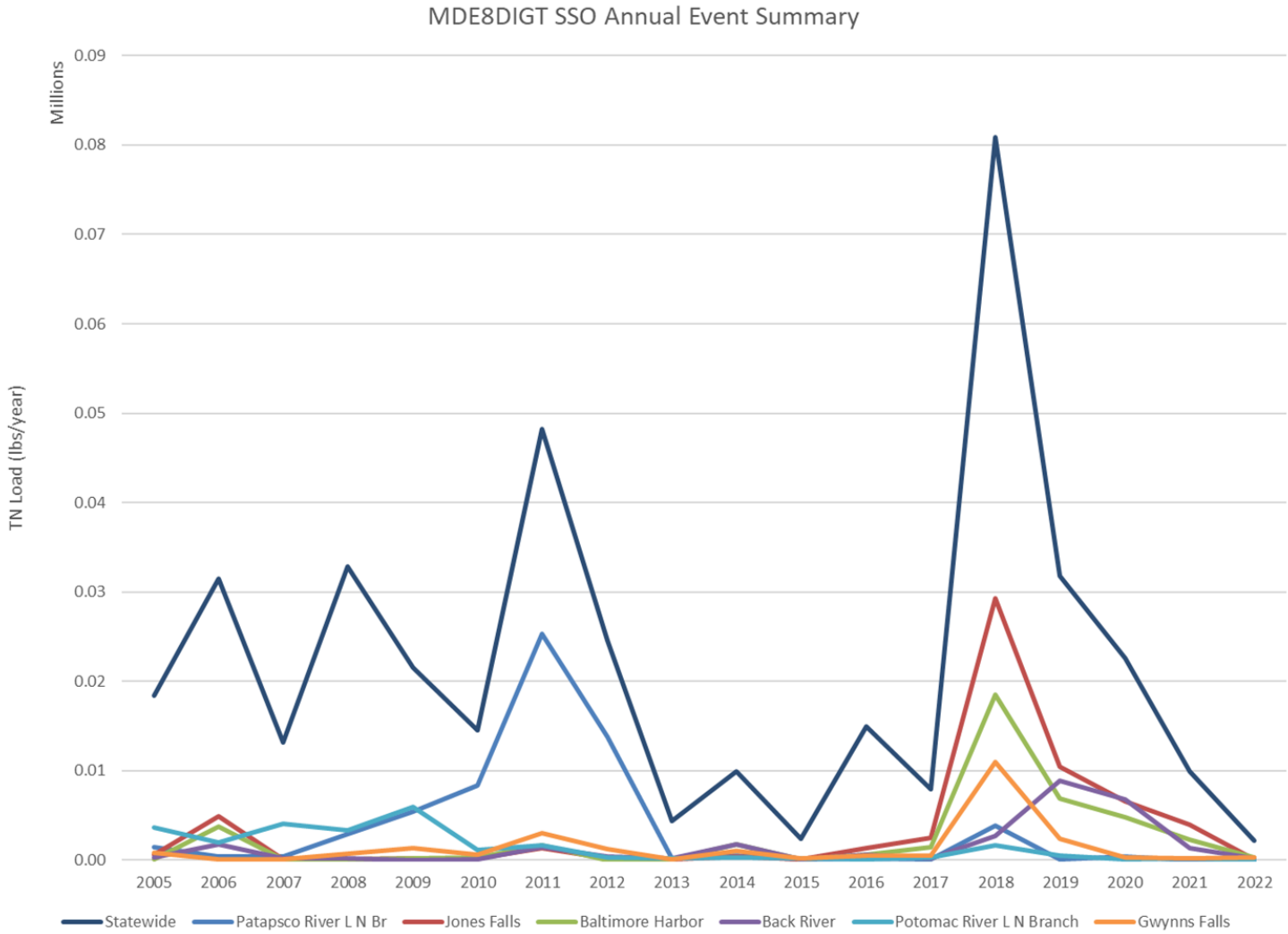
Average SSO TN Load (2005-2022)




Zipcode SSO Annual Event Summary
Millions
TN Load (lbs/year)
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
Statewide
21202 Baltimore
21227 Halethorpe
21502 Cumberland

Average SSO TN Load (2005-2022)




MDE8DIGT SSO Annual Event Summary
Millions
TN Load (lbs/year)
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
Statewide
Patapsco River L N Br
Jones Falls
Baltimore Harbor
Back River
Potomac River L N Branch
Gwynns Falls

Summary

- SSO annual TN load was estimated using a 30 mg/L TN concentration based on assumptions made in the 2017 CBP Wastewater Workgroup report
- All SSO TN loads are <1% of the total WWTP TN load even in 2018, the wettest year in the last 40 years
- Downward trend in both SSO load and WWTP load
- SSO load could cause localized impact, particularly for bacteria