

MS4 Annual Report

Committee on Environment

Phil Gaebler - City of Madison Engineering Department

6/17/2019

Report Overview

- ▶ 1st Year of Online Reporting
 - ▶ Minimal Control Measures
 - ▶ Fiscal Analysis
 - ▶ Progress

Minimal Control Measures

1. Public Education and Outreach
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Pollutant Control
5. Post-Construction Storm Water Management
6. Pollution Prevention
7. Storm Sewer System Map

Public Education and Outreach

► Waterways Newsletter

- Leaf management
- WI Salt Wise
- Invasive Species

► Ripple-Effects

- <https://www.ripple-effects.com/>
- Storm Drain Murals
- Demonstration Materials
- Plant Dane
- Rain Garden Workshops

MadisonWaterWays

News from your Stormwater Utility & Sewer Utility

www.cityofmadison.com/engineering/stormwater

FALL, 2018

Historic Flooding in Madison: Cleaning Up, Moving Forward from Summer Storms

Report Your Storm-Related Problems to City Engineering

by Greg Fries, Engineering Division

The historic flooding in Madison and surrounding areas this summer points to the need to reconsider how we, as a community, design new developments, manage our lakes and think about the extremes of our weather patterns now and in the future. The first step is to document all the problems that were experienced during the August 20th storm and the days that followed, as lake levels rose and Lake Monona flooded downtown Madison. City Engineering received hundreds of contacts as a result of this storm, but we know it is not a complete list.

We want to know about storm-related problems you experienced. If you haven't reported your flooding issue, please report at: cityofmadison.com/reportflooding. If you have already reported via 2-1-1 or other means, City Engineering would appreciate you re-reporting your flood concern through the portal to ensure that we have accurate and complete information.

The most severe storm that hit on August 20th dumped approximately 10 inches or more on the west side of Madison and Dane County. This rain happened over a span of approximately eight hours and qualifies as a 1000-year, or historic event. But what does that mean?

Engineers often use the term "100-year storm event" to describe an intense storm. This term offers little comfort when you may have been impacted by two in the same year. A short explanation of this term is, according to historical data about rainfall, the probability of Madison receiving 6.66 inches of rain in 24 hours is once in 100 years. In other words, such a rain event has a one percent chance of occurring in any year.


You may have noticed there were two components to the storm referenced above. First, there was the amount of rain and second, the span of time in which it fell. It is possible to have a 100-year, 1-hour storm (3.04 inches) and a 100-year, 24-hour storm (6.66 inches) and all the mixes of time and amount of rain in between those examples.

Damage from the August 20th storm has been devastating for many residents whose homes were significantly wrecked by flood waters. In some areas on the west side, flood water overtopped streets by nearly five feet. While most City critical infrastructure is functional again, City Engineering and other City agencies are still assessing all the damage reports to public and private properties.

As if the immediate flooding caused by the rain was not enough, the volume of water caused Lake Mendota to rise 16 inches one day after the rain. Within a few days, Lake Monona rose to more than 10 inches above the 100-year flood elevation, setting new record highs. Downtown Madison was flooded. Streets were closed, parking was removed, and sandbags were filled. Volunteer groups and the National Guard rallied to help sandbag impacted properties. Madison alone deployed over 225,000 sandbags.

The next stage of this event will be just as difficult to manage. Going into winter with high lake levels, significant ice damage along the shoreline can be expected. If we also have significant snowfall and spring rains, high lake levels and flooding concerns will persist in 2019.

We want to know about storm-related problems you experienced. Please report at: cityofmadison.com/reportflooding.



A Message from Our City Engineer

The severe storm that hit Madison on August 20, 2018 was arguably the most devastating storm in the City of Madison's 170-year history. Although even worse outside of Madison, here in the City it accounted for millions of dollars in damages and, sadly, the loss of a life.

The tragic storm and the threat of flooding that resulted from high lake levels that followed the storm brought out the very best in people. Staff from 11 agencies came together to manage the event. A public information campaign was launched that included press releases, social media, and the hand delivery of information to residents and businesses that were in harm's way. The City undertook its first sandbag production effort, at times working through the night producing sandbags. Staff also worked through the night to close roadways if necessary and to provide up to the minute information to the public. Using our website, the City undertook an effort to match volunteers with people needing help. Thousands of volunteers assisted in the effort to protect properties with sandbags. The National Guard and the Department of Corrections also assisted in the sandbagging effort.

The National Weather Service, Dane County Emergency Management, Dane County Land and Water Resources, the Wisconsin DOT Traffic Operations Center, Wisconsin Emergency Management and the University of Wisconsin all assisted. Non-profit organizations such as the United Way, Community Partners, Big Top Events, the Red Cross and the Salvation Army contributed in meaningful ways.

These organizations and the many citizen volunteers who assisted, in most cases, helped people they had never met before.

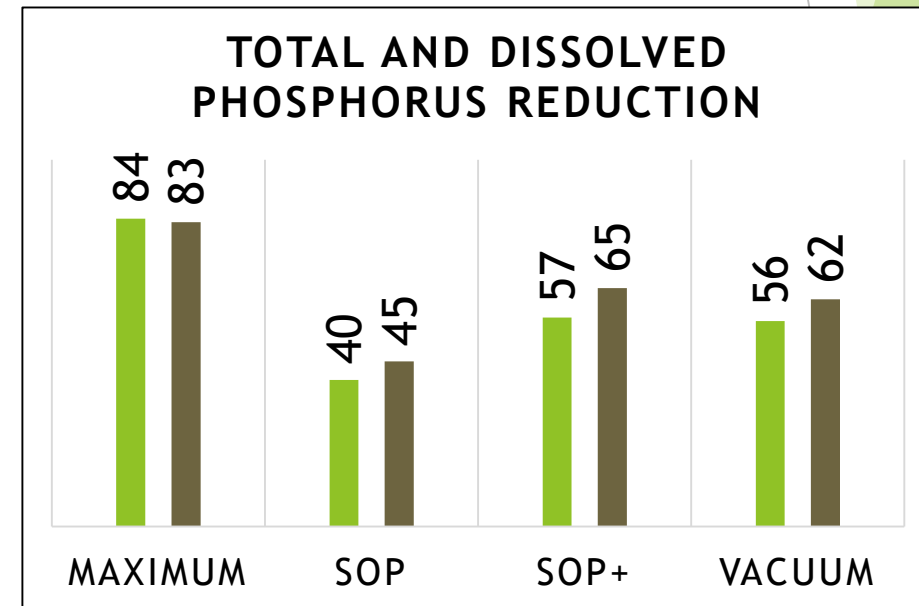
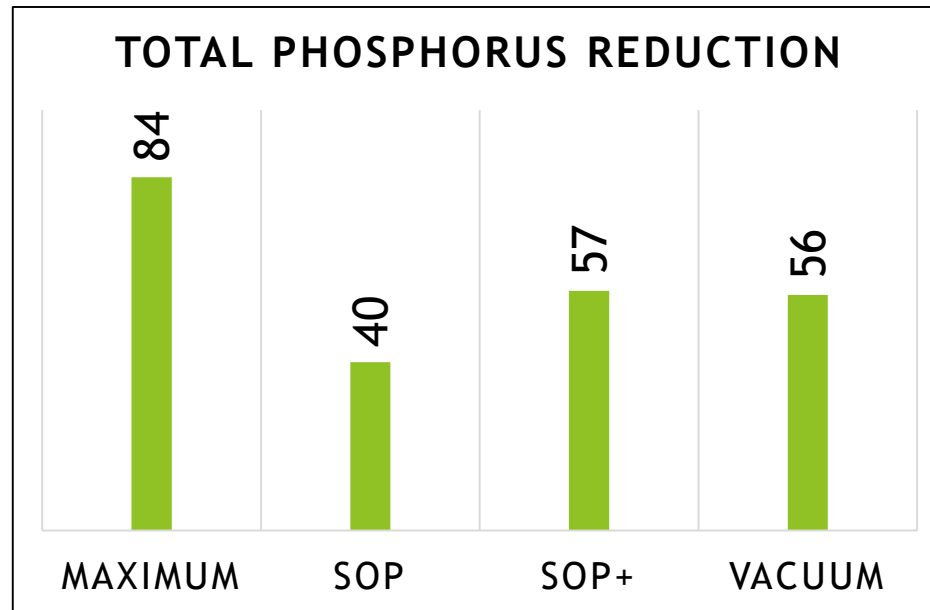
Thank you to all who came together in service to our community at a great time of need.

Rob Phillips

City of Madison - Leaf Collection plus Sweeping “Madison SOP, SOP+, and Vacuum-Mulch”

Leaf Collection		Street Cleaning		Year Completed	Title
Method	Frequency	Method	Frequency		
Transfer	Weekly	Mechanical/blower	Pre-event	2015	Upper Maximal
Transfer	Biweekly	Mechanical	Biweekly	2016	Madison SOP
Transfer	Biweekly	Regenerative Air	Weekly	2017	Madison SOP+
Vacuum	Weekly	Regenerative Air	Weekly	2017	Vacuum Mulch
Transfer ¹	Biweekly	Regenerative Air	Weekly	2018	Madison SOP+

¹ Medium density canopy



Public Education and Outreach

- ▶ Waterways Newsletter
 - ▶ Leaf management
 - ▶ WI Salt Wise
 - ▶ Invasive Species Removal
- ▶ Ripple-Effects
 - ▶ <https://www.ripple-effects.com/>
 - ▶ Storm Drain Murals
 - ▶ Demonstration Materials
 - ▶ Plant Dane
 - ▶ Rain Garden Workshops

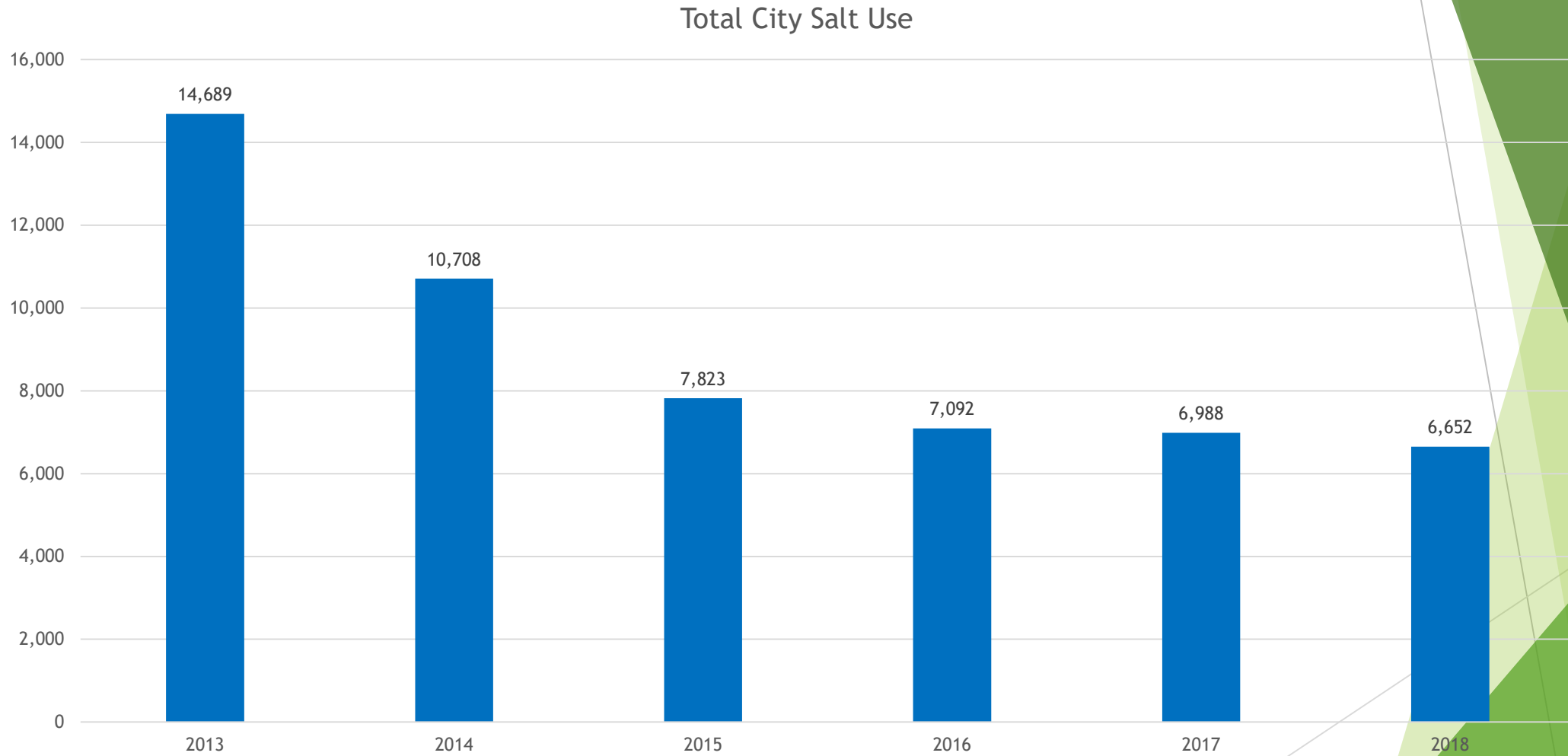


City of Madison

Winter Salt Certification

- ▶ Certification program to get public and private applicators educated on ways to effectively reduce de-icing salt.
 - ▶ 2018 - Updated Parking Lot Training Slides
 - ▶ 2019- Updating the Training Manual
 - ▶ Over 500 applicators Certified
 - ▶ Reviewing applications for certified organizations

City Salt Use



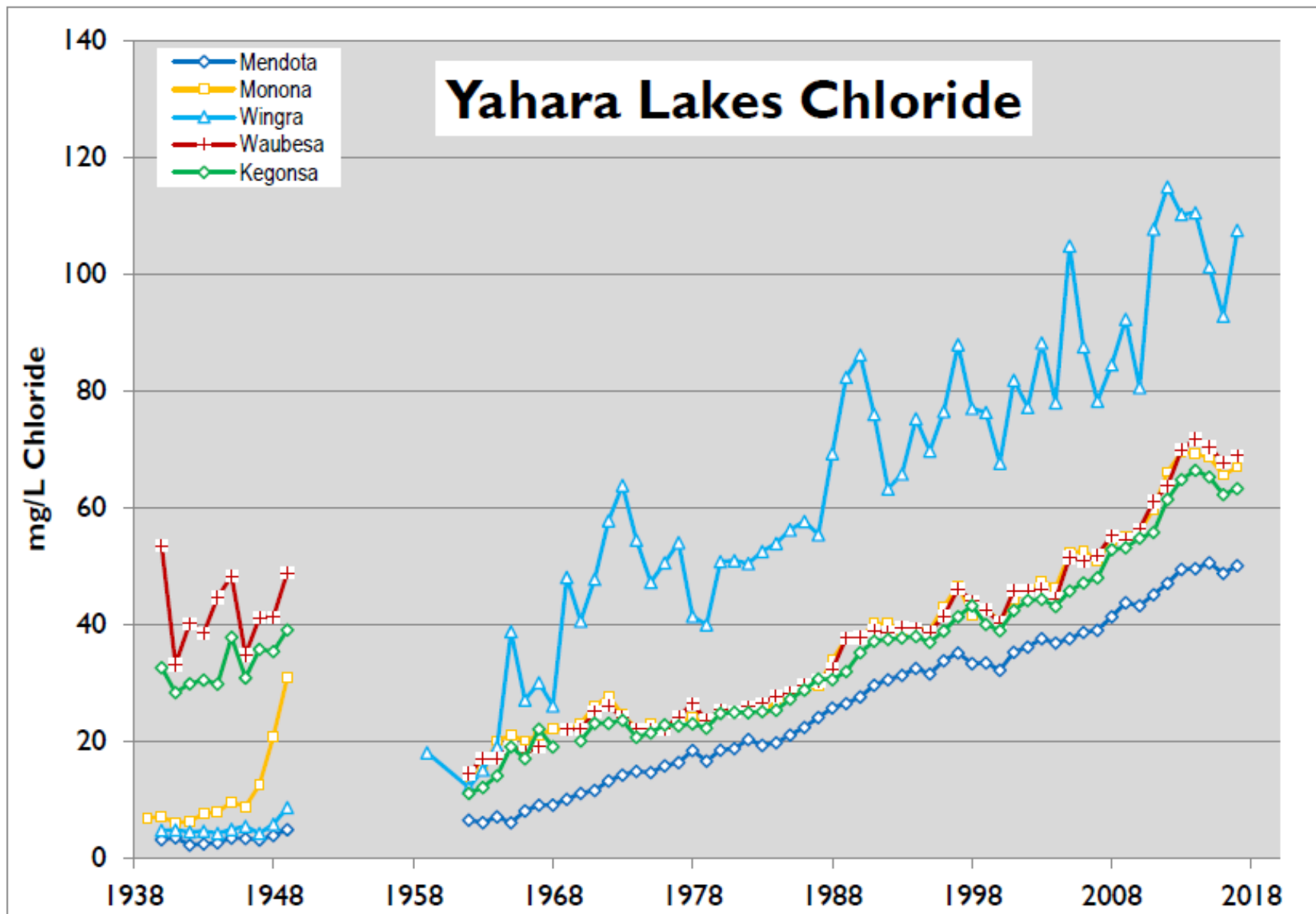


Figure 2: Chloride trends in the Yahara Lakes.

Street Sweeping

- ▶ Clean Streets Clean Lakes Initiative
 - ▶ Weekly Sweeping with Parking Restrictions
 - ▶ 4802 Tons Collected



Ponds and Greenways

- ▶ 303 Ponds owned and managed by the City
 - ▶ Inspected for sediment depth, bank erosion and clogging
 - ▶ Maintained as needed



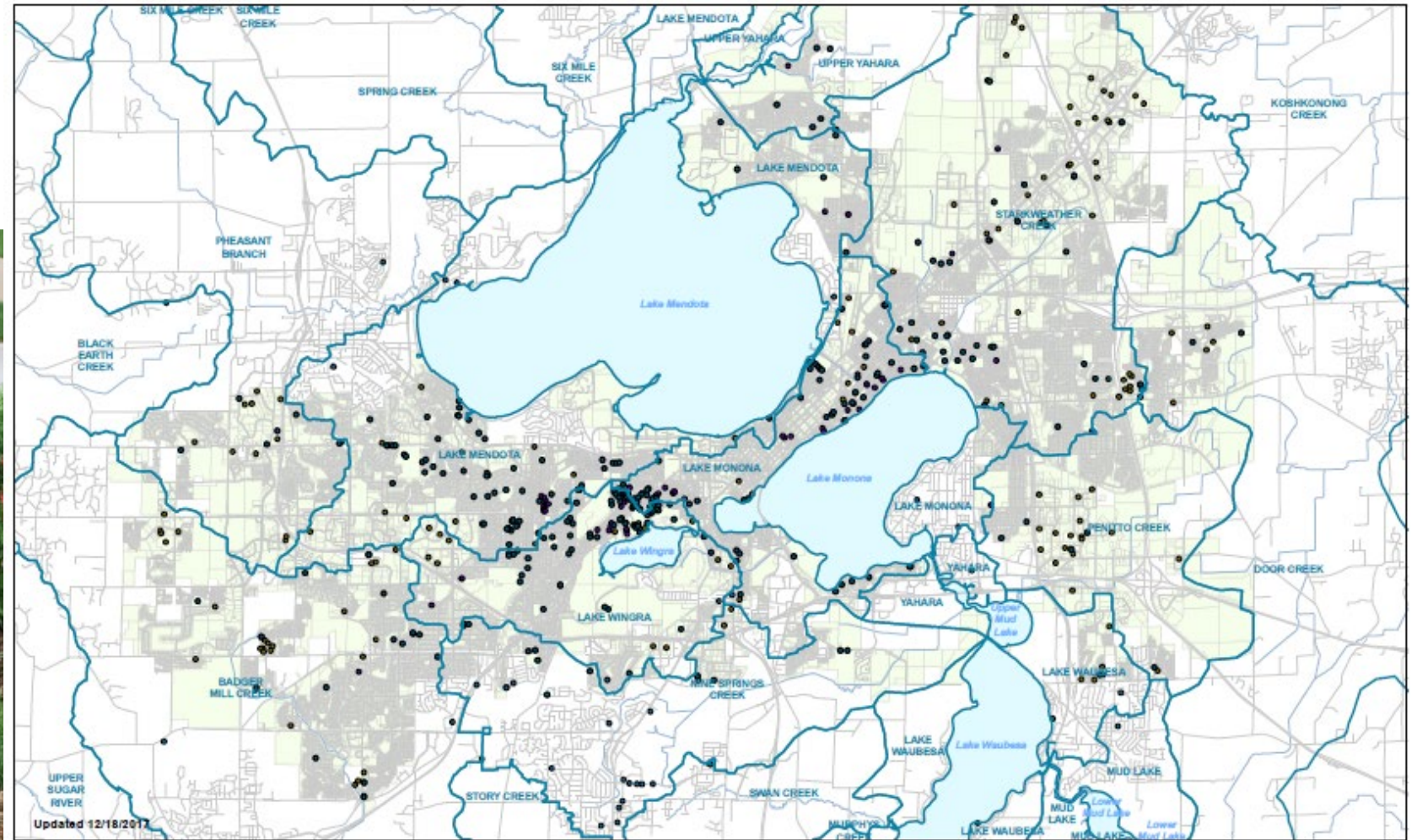
IDDE

- ▶ Illicit Discharge Detection and Elimination
 - ▶ Tests all 590 outfalls on a four year rotation
 - ▶ Water that should go to Madison Metro Sewerage District that goes to Storm Sewer
 - ▶ Cross Connections
 - ▶ Dumping
 - ▶ Concrete
 - ▶ Carpet Cleaners
 - ▶ Painters



Rain Gardens

Continue to promote public and private installation



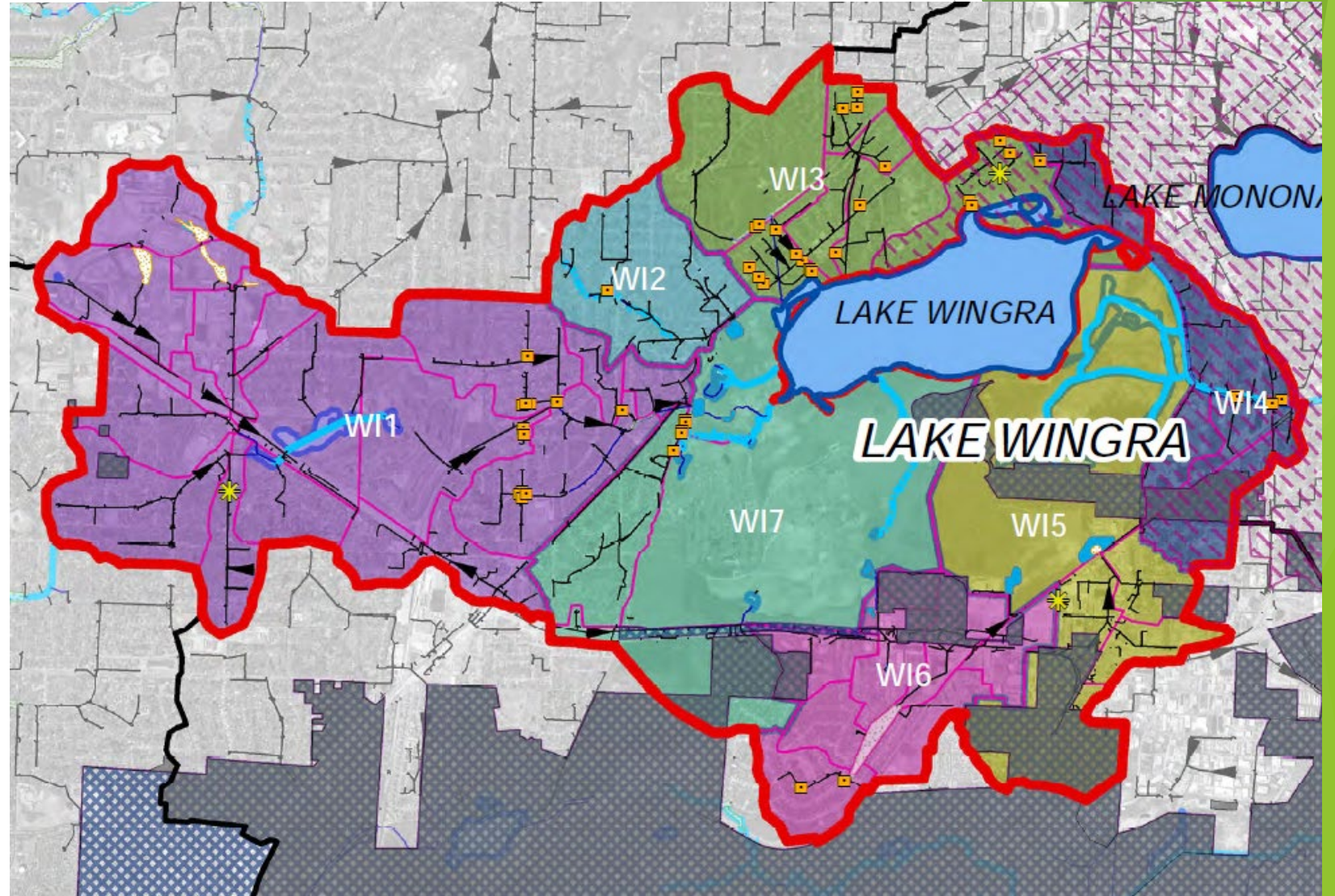
City of Madison - Rain Gardens
616 rain gardens and counting

0 1 2 4 Miles



Watershed Modeling

- All Landuse and Treatment Entered into WinSLAMM Model
- 1- Yr of rain processed
- TSS and Phosphorus Tracked
- City wide 36% TSS and 27% reduction compared to no treatment
- This does not include private treatment



Stormwater Utility

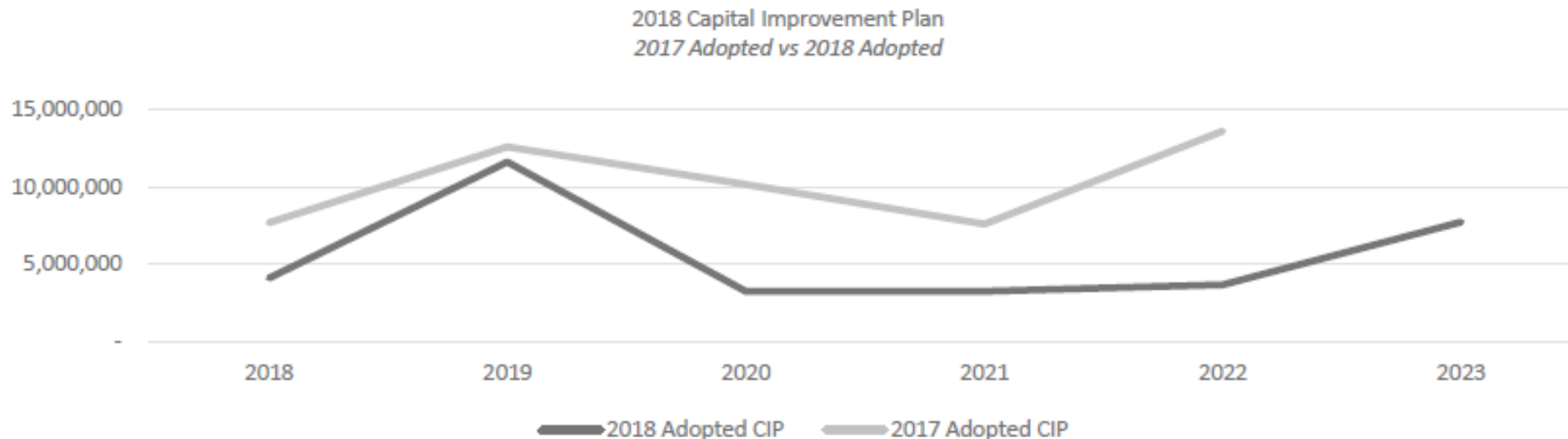
Stormwater Utility

Capital Improvement Plan

Project Summary

	2018	2019	2020	2021	2022	2023
Citywide Flood Mitigation	350,000	875,000	550,000	575,000	675,000	4,575,000
Starkweather Coagulant Treatment	900,000	5,000,000	100,000	-	-	-
Storm Sewer System Improvements	475,000	475,000	475,000	475,000	475,000	475,000
Stormwater Quality System Improvements	2,105,000	4,815,000	1,665,000	1,740,000	2,285,000	2,435,000
Street Cleaning Equipment - Streets	270,000	440,000	455,000	455,000	227,000	250,000
Total	\$ 4,100,000	\$ 11,605,000	\$ 3,245,000	\$ 3,245,000	\$ 3,662,000	\$ 7,735,000

Changes from 2017 CIP



Erosion Control

- ▶ Issued 209 Permits for 2018
 - ▶ 33 Verbal Warnings
 - ▶ 35 Notice of Violations
- ▶ Green Tier Erosion Control Tour
- ▶ Framed Inlet Standard Created



Framed Inlet Protection



Going Forward

- ▶ 2019
- ▶ Continue Outreach and Education Efforts
- ▶ Work to Reduce Phosphorus and TSS
 - ▶ Leaf Collection
 - ▶ Pond Conversions
- ▶ Improve and Expand Salt Certification
- ▶ Continue with Erosion Control Inspections and Education