



# City of Madison

City of Madison  
Madison, WI 53703  
www.cityofmadison.com

## Agenda - Approved

### COMMON COUNCIL - DISCUSSION

*Consider: Who benefits? Who is burdened?  
Who does not have a voice at the table?  
How can policymakers mitigate unintended consequences?*

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Tuesday, December 16, 2025

6:05 PM

Room 215, Madison Municipal Building, 215  
Martin Luther King Jr Blvd.

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#### Common Council Briefing: Love Our Lakes

Quorum of the Common Council may be present at this discussion

This discussion is a briefing and not a Common Council meeting. The Common Council will not take any formal action at this discussion (no votes, no introduction of legislation, etc.). No public testimony will be taken at the discussion. Please send any written comments to [allalders@cityofmadison.com](mailto:allalders@cityofmadison.com).

If you would like to observe the discussion, you can attend in person or visit <https://www.cityofmadison.com/watchCouncil> to watch online. This meeting may be viewed live on Charter Spectrum Channel 994, AT&T U-Verse Channel 99 or at [www.madisoncitychannel.tv](http://www.madisoncitychannel.tv).

If you need an interpreter, translator, materials in alternate formats or other accommodations to access this service, activity or program, please call the phone number below at least three business days prior to the meeting.

Si necesita un intérprete, un traductor, materiales en formatos alternativos u otros arreglos para acceder a este servicio, actividad o programa, comuníquese al número de teléfono que figura a continuación tres días hábiles como mínimo antes de la reunión.

Yog hais tias koj xav tau ib tug neeg txhais lus, ib tug neeg txhais ntawv, cov ntawv ua lwm hom ntawv los sis lwm cov kev pab kom siv tau cov kev pab, cov kev ua ub no (activity) los sis qhov kev pab cuam, thov hu rau tus xov toj hauv qab yam tsawg peb hnuv ua hauj lwm ua ntej yuav tuaj sib tham.

For accommodations, contact the Office of the Common Council at [council@cityofmadison.com](mailto:council@cityofmadison.com) or (608) 266-4071

**91091**

City Strategies to Maintain and Improve Lake Health

**Attachments:** [Lake Health Presentation1.pdf](#)



# City of Madison

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## Master

**File Number: 91091**

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**Version:** 1

**Reference:**

**Controlling Body:** COMMON  
COUNCIL -  
DISCUSSION

**File Created Date :** 12/01/2025

**File Name:** City Strategies to Maintain and Improve Lake Health

**Final Action:**

**Title:** City Strategies to Maintain and Improve Lake Health

### Notes:

### Sponsors:

**Effective Date:**

**Attachments:** Lake Health Presentation1.pdf

**Enactment Number:**

**Author:**

**Hearing Date:**

**Entered by:** kkapusta-pofahl@cityofmadison.com

**Published Date:**

### History of Legislative File

Ver- sion:	Acting Body:	Date:	Action:	Sent To:	Due Date:	Return Date:	Result:
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### Text of Legislative File 91091

#### Title

City Strategies to Maintain and Improve Lake Health

# LOVE OUR LAKES

KEEPING OUR LAKES HEALTHY

December 16, 2025

Engineering Stormwater, Streets Division, Parks Division

# KEEPING OUR LAKES HEALTHY

- WHAT IS THE ISSUE
  - LAKES ARE IMPAIRED
  - COMMON TYPES OF POLLUTION
  - YAHARA RIVER WATERSHED AND THE ROCK RIVER BASIN
- WHAT ARE THE REGULATIONS
- HOW DOES THE CITY FIT INTO THE EQUATION
  - STREETS
  - PARKS
  - ENGINEERING STORMWATER
  - COMMUNITY PARTNERS

# THE ISSUE – WATERS ARE IMPAIRED

## WHAT DOES IT MEAN TO HAVE IMPAIRED WATER?

CLEAN WATER ACT SECTION 303(D) LIST OF WATERS **NOT** MEETING WATER QUALITY STANDARDS DUE TO POLLUTION

STATEWIDE THERE ARE:

- IMPAIRED WATERS (1491)
- WATERS IN RESTORATION (671)
- WATERS ATTAINING STANDARDS (38)

Sunlight, high temperatures, and nutrients like phosphorous and nitrogen can increase the chance that a bloom will occur.

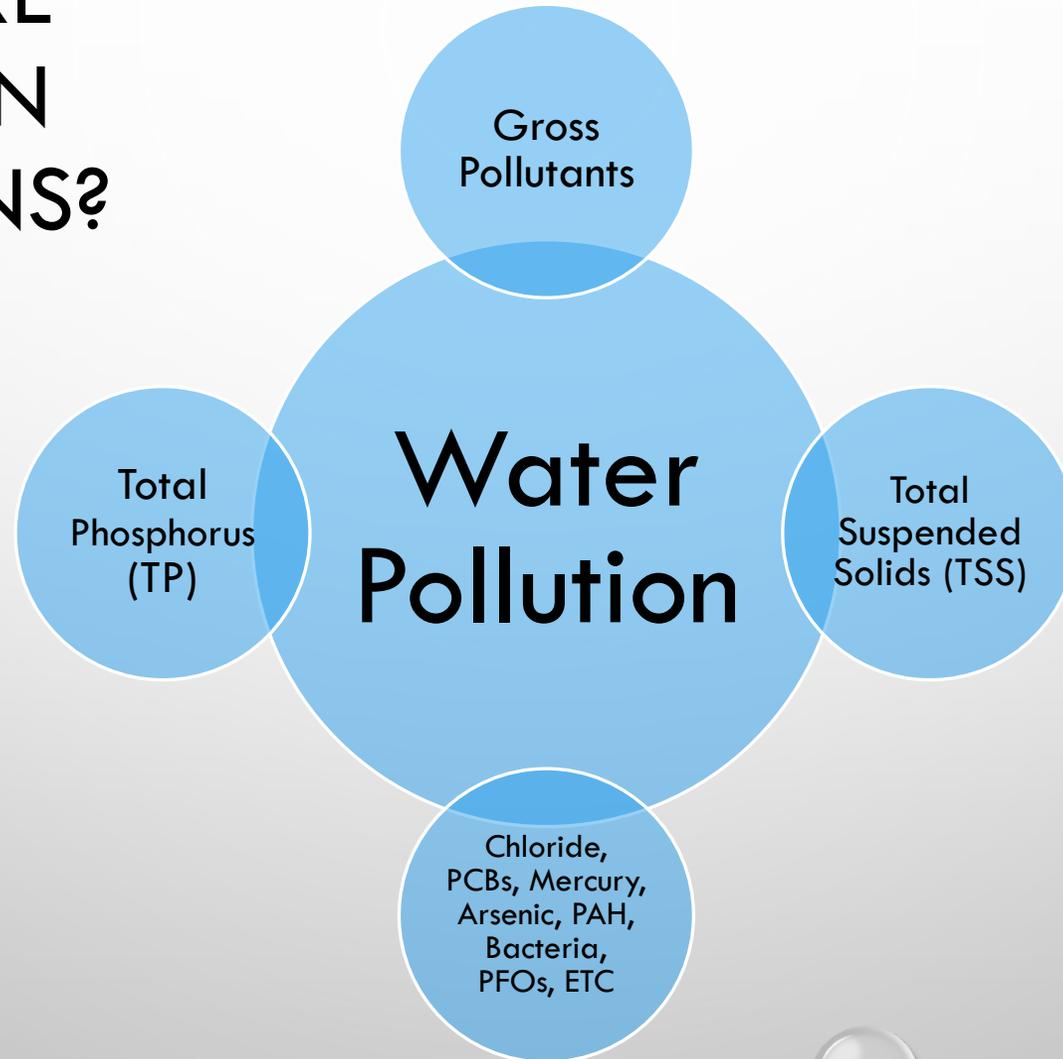


Algal Bloom, picture courtesy of Wisconsin Department of Health Services

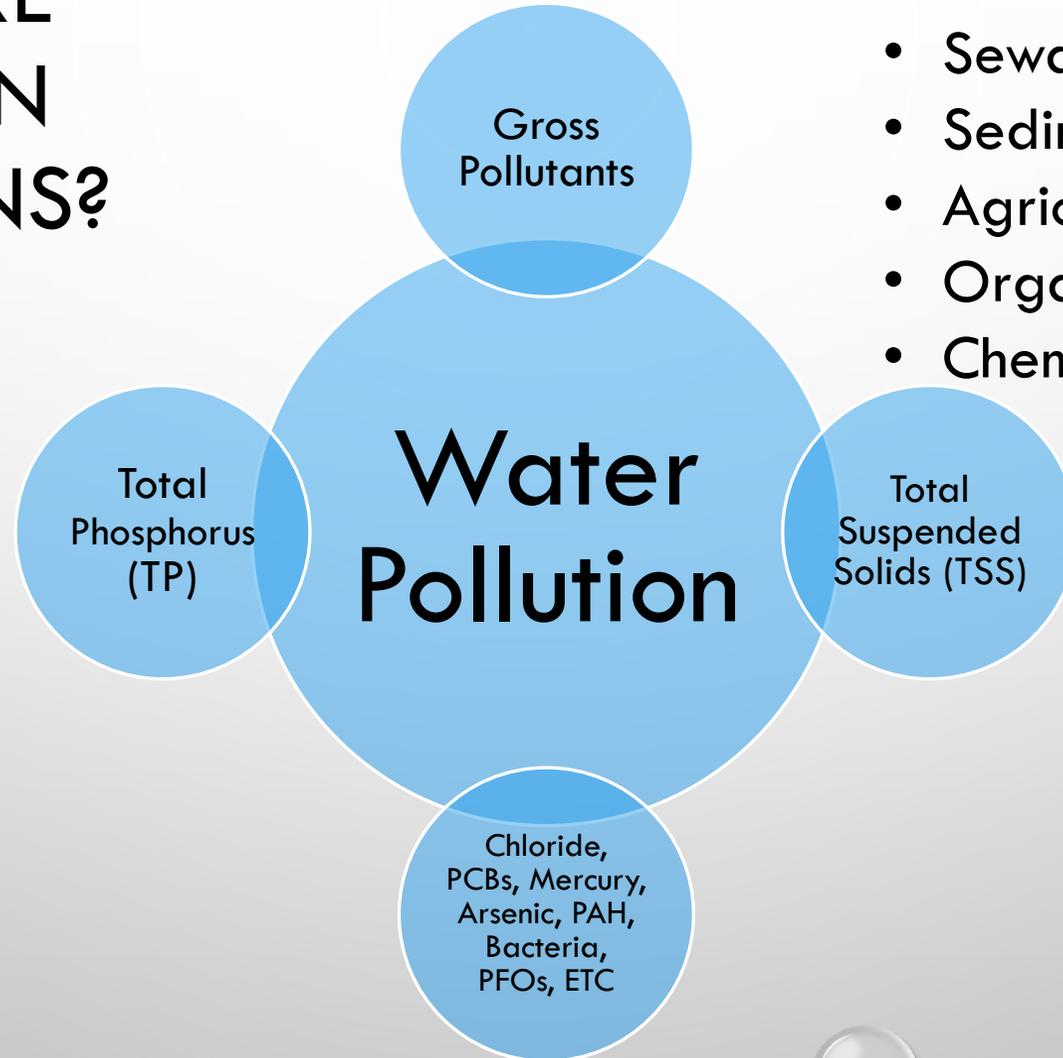


Sediment Plume Starkweather Creek  
Photo courtesy of Brian Standing

# WHAT ARE COMMON POLLUTIONS?



# WHAT ARE COMMON POLLUTIONS?



## Commons Sources of Contaminants:

- Garbage and litter
- Fertilizers
- Sewage and animal waste
- Sediment and erosion
- Agriculture runoff
- Organic matter
- Chemicals and Pharmaceuticals

# WHAT ARE COMMON POLLUTIONS?

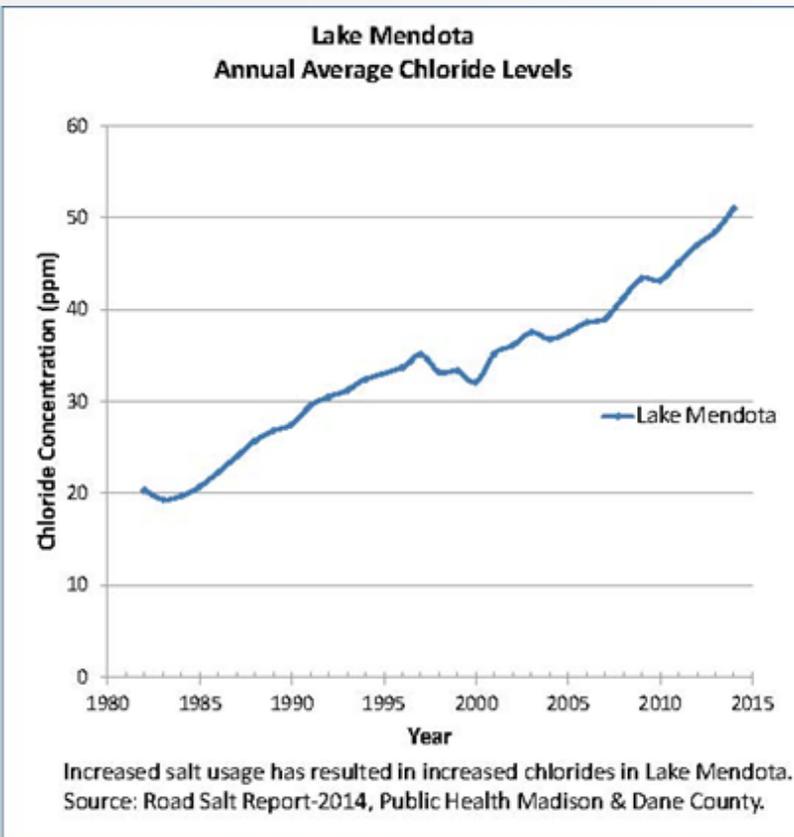
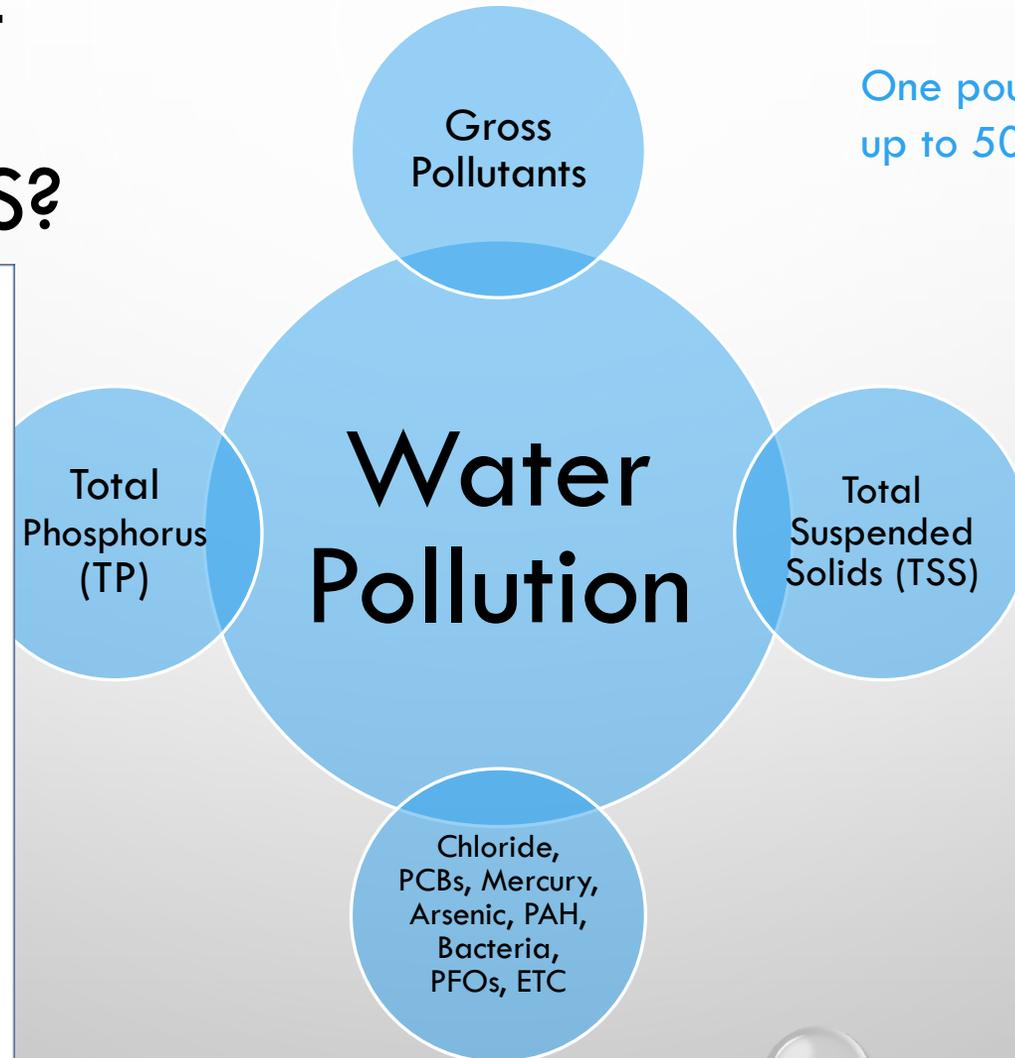
1 gallon of oil can pollute  
1M gallons of drinking water

## DID YOU KNOW...

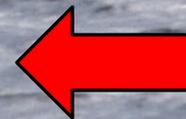
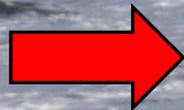
One pound of TP can produce  
up to 500 pounds of algae.

TSS causes decreased light and lower oxygen level and generally degraded water quality for habitat in addition to creating sediment deposits that impact water depths.

Approximately 56% of the total annual TP load to the lakes occurs in about 1 month in the fall.



It only takes 1 teaspoon of salt to pollute 5 gallons of water to a level that is toxic for freshwater ecosystems



# Dane County Impaired Waters listing

LOCAL_WATERBODY_NAME	COUNTY_NAME	WATER_TYPE	POLLUTANT	IMPAIRMENT	STATUS_CODE	TMDL_PRIORITY
Braze Lake	Dane	Lake	Total Phosphorus	Excess Algal Growth, Degraded Aquatic Vegetation, Eutrophication	303d Listed	Low
Lake Kegonsa	Dane	Lake	Total Phosphorus	Excess Algal Growth, Eutrophication	TMDL Approved	Not Applicable
Lake Kegonsa	Dane	Lake	PFOS	PFOS Contaminated Fish Tissue	303d Listed	Low
Belleville Millpond	Dane	Lake	Total Phosphorus	Excess Algal Growth, Eutrophication	303d Listed	Medium
Odana Pond	Dane	Lake	Chloride	Acute Aquatic Toxicity, Chronic Aquatic Toxicity	303d Listed	Low
Odana Pond	Dane	Lake	Total Phosphorus	Excess Algal Growth, Eutrophication	303d Listed	Low
Goose Lake	Dane	Lake	Total Phosphorus	Excess Algal Growth, Eutrophication	303d Listed	Medium
Lower Mud Lake	Dane	Lake	PFOS	PFOS Contaminated Fish Tissue	303d Listed	Low
Upper Mud Lake	Dane	Lake	PFOS	PFOS Contaminated Fish Tissue	303d Listed	Low
Stewart Lake	Dane	Lake	Total Phosphorus	Excess Algal Growth, Eutrophication	303d Listed	Medium
Wi-173-Lw18-978900	Columbia, Dane	Lake	Total Phosphorus	High Phosphorus Levels	303d Listed	Low
Fish Lake	Dane	Lake	Total Phosphorus	Excess Algal Growth, Eutrophication	303d Listed	Low
Mud Lake	Dane	Lake	Total Phosphorus	High Phosphorus Levels	303d Listed	Low
Tiedemans Pond	Dane	Lake	Total Phosphorus	Excess Algal Growth, Eutrophication	303d Listed	Low
Indian Lake	Dane	Lake	Total Phosphorus	Excess Algal Growth, Eutrophication	303d Listed	Medium
Lake Koshkonong	Dane, Jefferson, Rock	Lake	Sediment/Total Suspended Solids	Degraded Habitat, Turbidity	TMDL Approved	Not Applicable
Lake Koshkonong	Dane, Jefferson, Rock	Lake	Total Phosphorus	Low DO, Excess Algal Growth, Eutrophication	TMDL Approved	Not Applicable
Lake Waubesa	Dane	Lake	Total Phosphorus	High Phosphorus Levels, Excess Algal Growth	TMDL Approved	Not Applicable
Lake Waubesa	Dane	Lake	Mercury	NA	Water Delisted	Delisted 2006
Lake Waubesa	Dane	Lake	PFOS	PFOS Contaminated Fish Tissue	303d Listed	Low
Monona Lake	Dane	Lake	Total Phosphorus	Excess Algal Growth, Eutrophication	TMDL Approved	Not Applicable
Monona Lake	Dane	Lake	Mercury	NA	Pollutant Removed	Delisted 2008
Monona Lake	Dane	Lake	PCBs	PCBs Contaminated Fish Tissue, PCB Contaminated Sediments	303d Listed	Low
Monona Lake	Dane	Lake	PFOS	Elevated Human Health Risks - Toxics, PFOS Contaminated Fish Tissue	303d Listed	Low
Lake Wingra	Dane	Lake	Total Phosphorus	NA	Pollutant Removed	Delisted 2016
Lake Wingra	Dane	Lake	PCBs	PCBs Contaminated Fish Tissue	303d Listed	Low
Mendota Lake	Dane	Lake	Total Phosphorus	High Phosphorus Levels, Excess Algal Growth	TMDL Approved	Not Applicable
Mendota Lake	Dane	Lake	PCBs	NA	Pollutant Removed	Delisted 2022

# WHERE DOES THE WATER COME FROM?

The most of Madison is part of the **Yahara River Watershed**.

- The SW side of Madison drains to the Sugar River (also impaired).
- Much of the upper reaches of the Yahara Watershed are in agriculture.
- Note the large amounts of land that are not in Madison

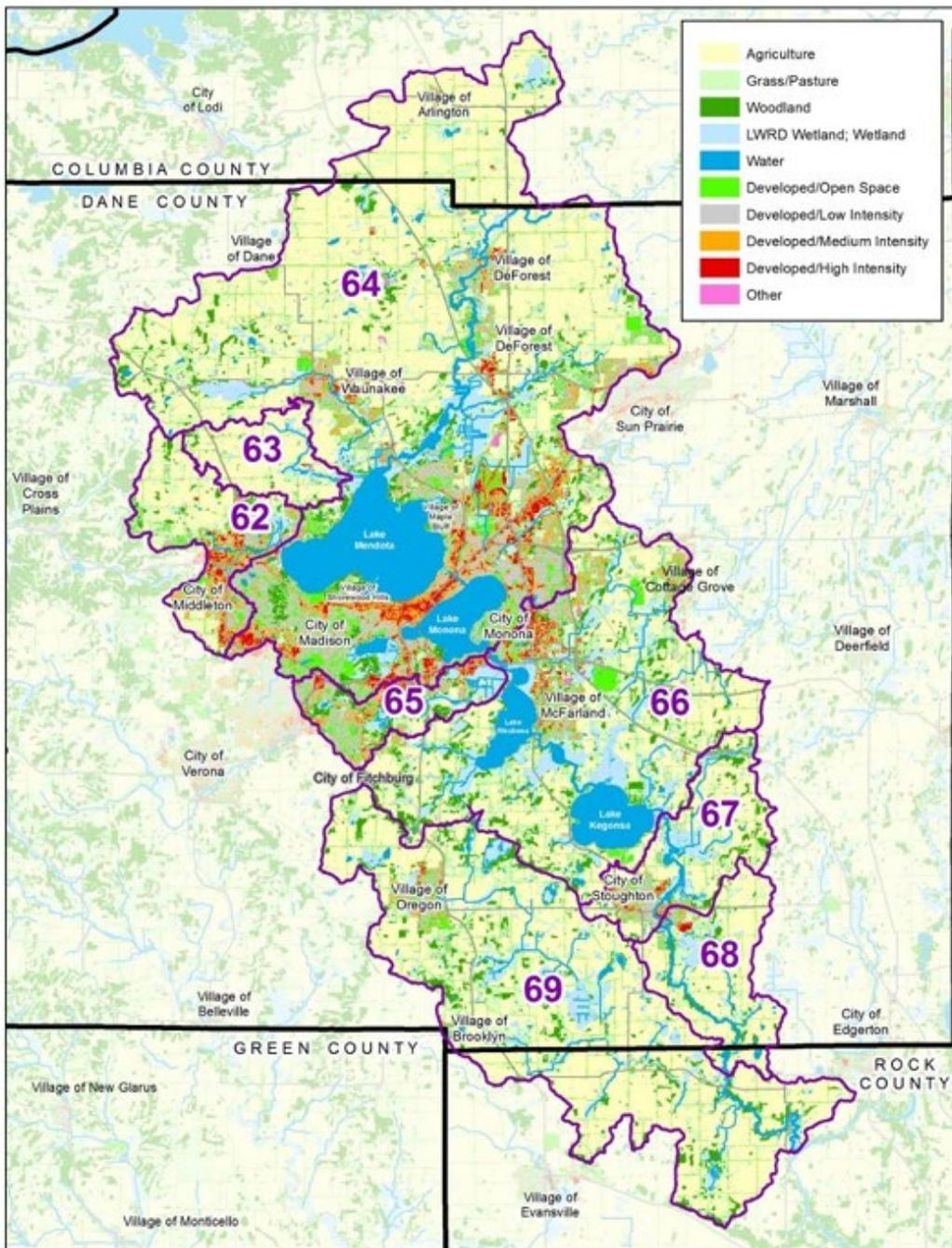
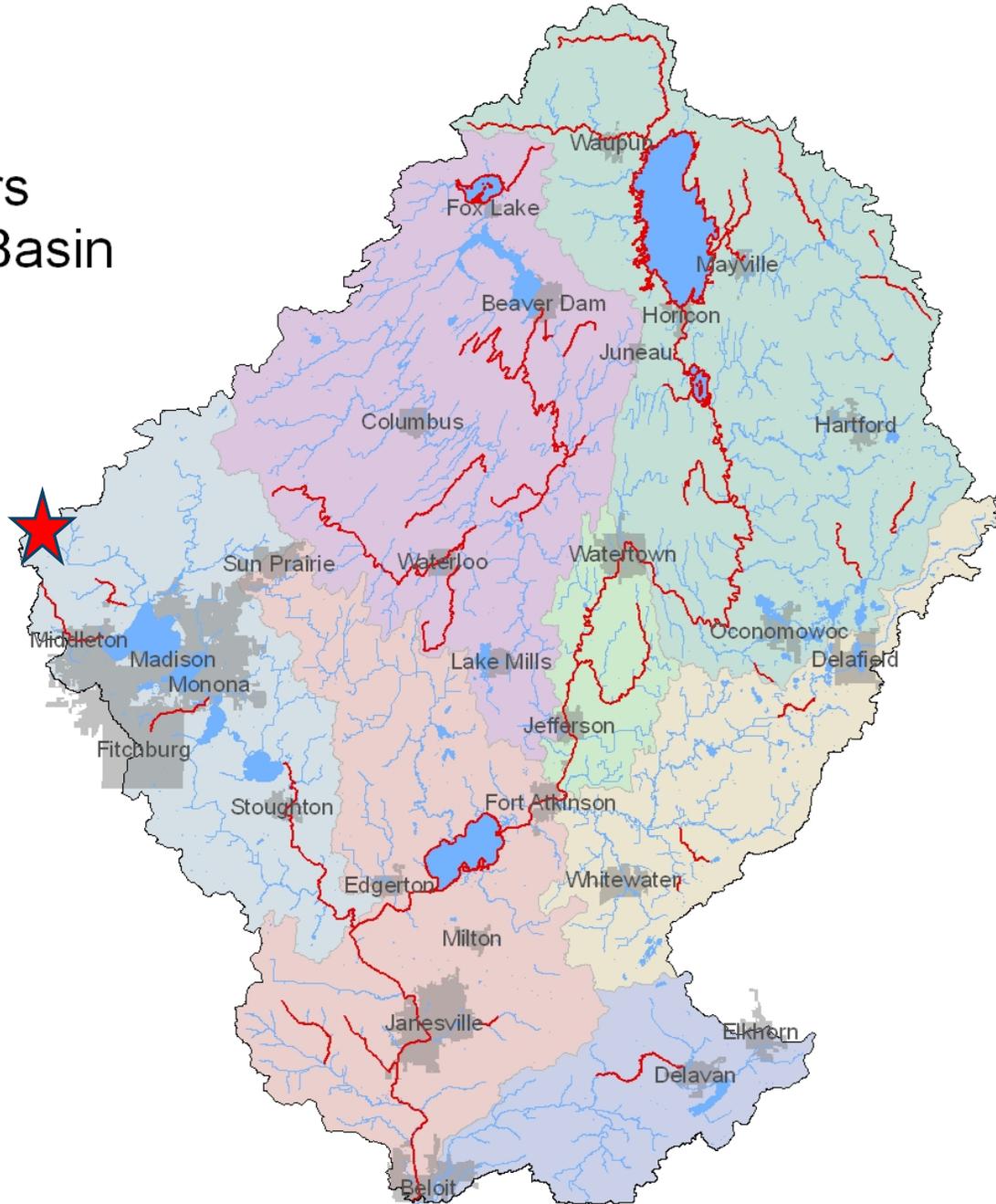


Figure 7: Land Cover in the Yahara Watershed (Dane County LWRD)

# Impaired Waters in the Rock River Basin

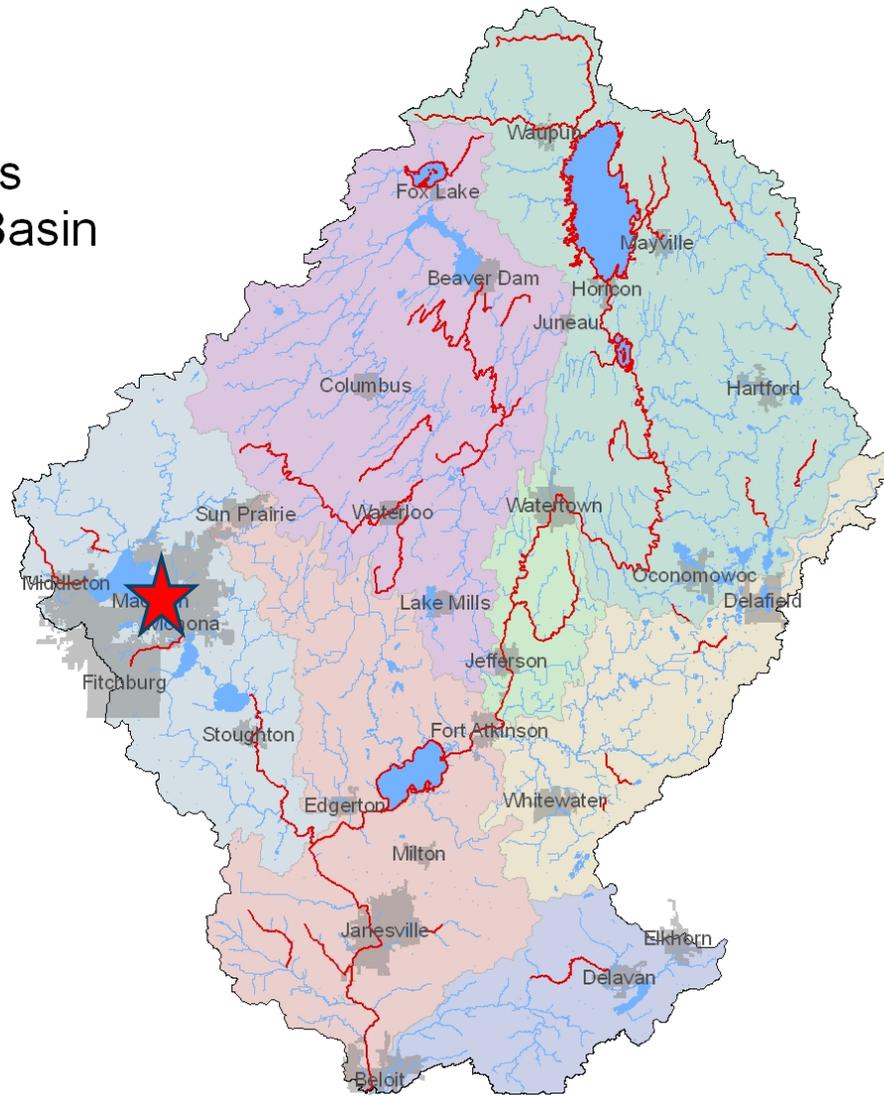
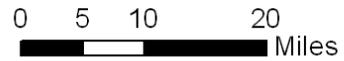
# THE YAHARA RIVER WATERSHED IS JUST ONE PART OF THE LARGER ROCK RIVER BASIN



Impaired Waters

0 5 10 20 Miles

## Impaired Waters in the Rock River Basin



## THE ROCK RIVER BASIN TMDL

A TMDL (Total Maximum Daily Load) is the amount of a specific pollutant a water body can receive while still meeting **water quality standards** and its intended uses, like **swimming or fishing**.

TMDLs help serve as planning tools for action plans to restore the water body's health.

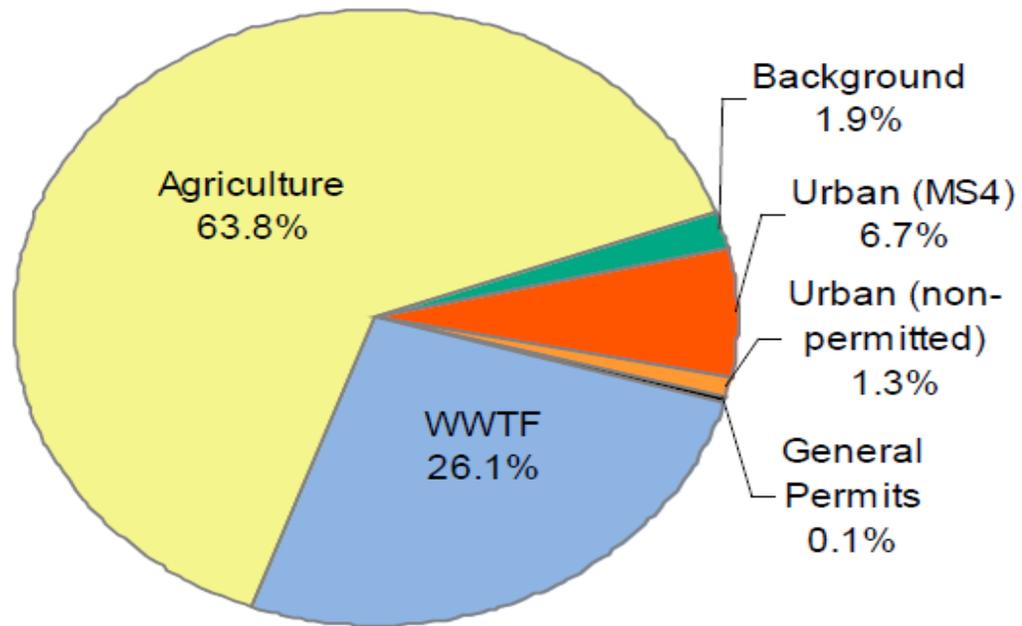


36 Approved TMDLs  
currently in Wisconsin

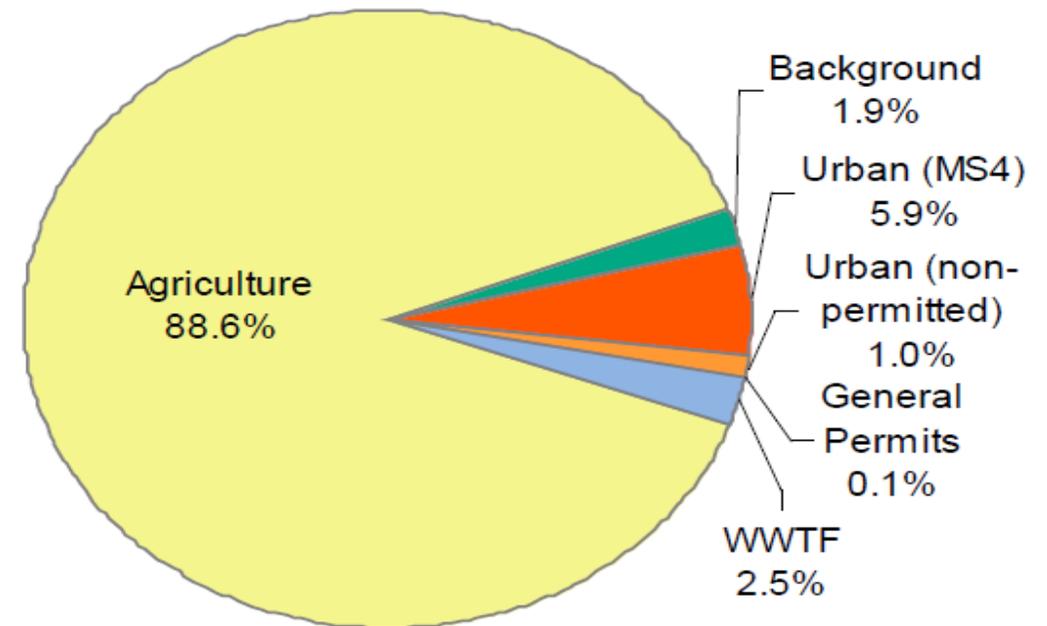
Madison is one of many contributors to water quality issues in receiving waters.

City of Madison is in the Rock River TMDL requires capture of Total Phosphorus (TP) and Total Suspended Solids (TSS)

*Rock River TMDL – Final Report*



**Figure 11. Average annual distribution of baseline TP sources in the Rock River Basin.**



**Figure 13. Average annual distribution of baseline TSS sources in the Rock River Basin.**

# WATER QUALITY REGULATIONS – IT'S COMPLICATED!

Clean Water Act

TMDL

WDNR – WPDES Permit

Madison Area MS4 Permit

Madison Metropolitan Sewer District Industrial Discharge Permit

Local Governments

Yahara WINS

City of Madison

Madison Area Municipal Stormwater Partnership (MAMSWaP)

Dane County Land Conservation – Reduce TP via Contracts w/ Farmers

Yahara Pride Farms – Reduce TP via Contracts w/ Farmers

City of Madison

MGO

Specific TMDL Mandated Reductions (2036)

Pay/Trade to satisfy TMDL Requirement

# WHO ARE OUR PARTNERS?

## Yahara WINS Partners

Agricultural producers (e.g. Yahara Pride Farms)

County, State & Federal agencies (e.g. Dane County LWRD, USGS)

Non-profit groups focused on conservation and/or water quality

(e.g. Sand County Foundation, Clean Lakes Alliance)

Friends groups

University researchers

Others



## MAMSWaP Partners

City of Fitchburg

City of Madison

City of Monona

City of Sun Prairie

City of Verona

County of Dane

Village of Cross Plains

Village of Maple Bluff

Village of McFarland

Village of Oregon

Village of Shorewood Hills

Village of Waunakee

Village of Windsor

Town of Blooming Grove

Town of Burke

Town of Middleton

Town of Westport

University of Wisconsin-  
Madison

City of Middleton

City of Stoughton

Village of Cottage Grove

Village of DeForest

**TAKE  
ALWAYS SO  
FAR...**

It's a big issue

There are a lot of regulations  
involved

There are a lot of players  
involved

# SO HOW DOES THE CITY FIT INTO THE EQUATION?



**STREETS**



**PARKS**



**ENGINEERING  
STORMWATER**



**COMMUNITY**

# STREETS DIVISION





# Water Quality and the Streets & Urban Forestry Division

# Street Sweeping

- 9 Street Sweepers
- Operate from March to December
- Shifted to 4, 10-hour shifts for more sweeping capacity
- Every street in Madison swept multiple times during the operation window
  - In 2025 (as of 11/14):
    - 48,669 miles swept in total
    - 11,863 work hours dedicated to sweeping



# Clean Streets, Clean Lakes

- Isthmus and neighboring areas have weekly 4-hour parking restrictions.
- In the warmer months, it is used for weekly street sweeping.
- Curbside access is important so we can gather debris that accumulates in the gutter
  - It's also important to follow the parking rules



# Sweeping Tons of Debris

- Tons of debris is swept up each year.
- In 2025, we collected 4,818.39 tons from the road.
- Tonnage number **does not include** leaves swept in the fall and composted.



# Leaf Collection

Leaves in the street create a nutrient-rich runoff. Leaves and yard waste are banned from landfills. Curbside collection in fall gives residents 3 guaranteed chances for leaf pickup.



Sweepers trail behind collection crews. They gather up leaf debris from the roads. There is a gap between collection & sweeping, but we work to keep the gap small.



**Then there's winter.**



Average Tons of Salt Used by the Streets Division from  
Winter of 2019-2020 to Winter of 2024-25:  
**6,800 tons**



# Salt Concerns Are Not New

- All the salt on sidewalks, parking lots, and roads finds its way into our waters
- Enters the storm drains and out into our lakes & infiltrates our drinking water.
- This has been a known problem *for decades.*
  - See this Capital Times article from **1977.**

## City wells fail to meet EPA salt standards

By WHITNEY GOULD  
Of The Capital Times Staff

Although the city has cut back drastically on its use of de-icing road salt in recent years, the water in several Madison wells still contains salt concentrations above the level at which the Environmental Protection Agency recommends a warning for the sake of hypertension sufferers. University of Wisconsin researchers have found.

Dan Willard, the environmental studies professor who did the study, thinks the city probably should alert residents whose water comes from the affected wells. But City Health Director Karl Mohr says that would upset people needlessly when there is no real cause for alarm.

Using data collected by the city, Willard, France Beach and Tim Diehl traced the rise in sodium and chloride levels in 13 of the city's 27 wells between 1951 and 1975.

The increases, also reflected in the water in our lakes, parallel what until recently was a continuous growth of road salt use dating back to the '60s, Willard concluded. Much of the salt flushed off the streets seeps through soil into ground water which is the source of our drinking water.

The most dramatic jump was in Well No. 7 on North Randall Avenue, where sodium levels rose from three to 25 parts-per-million (ppm) in the 24-year period and chloride escalated from 19 to 56 ppm.

Two other wells of 14 tested had sodium levels above 25 ppm, the level at which the EPA advises a warning for those with high blood pressures, which is linked to the water-retention properties of sodium.

They were Well No. 2 on Vilas Avenue and Well No. 17 on South Hancock Street, according to Willard. Well No. 1 near Lake Wingra showed an increase in sodium from 18 ppm in 1951 to 25 ppm in 1972 and an increase in chloride of 3 ppm in 1951 to 23 ppm in 1975.

(The wells throughout the city are all interconnected. But in most cases, people living in a given area are getting their water from the nearest well, according to Water Utility officials.)

The elevated salt levels are well

(Continued on Page 4, Col. 3)

MADISON, WIS., Monday, June 27, 1977

## City wells rather salty

(Continued on Page 4, Col. 3)

within the 250 ppm safety limit set by the U.S. Public Health Service for drinking water, and Willard stresses there is "no cause for alarm."

But he thinks it might be a good idea for the city to include a note in the water bills of people whose water supply comes from the affected wells, to alert those on low-salt diets.

"It probably should be something more than the warnings on cigarette packages, which nobody pays any attention to, and something less than 'Everybody should get out of town,' " he said.

But Mohr said he saw no need for such a notice. "I hate to do something like that unless it's absolutely necessary," he said. "In many cases you just alarm people for no reason. And in most instances where people have been diagnosed as hypertensive, their physicians are taking these things into account" is recommending limits on salt intake.

City Water Utility Manager Larry Russell agrees with Mohr. "Any kind of a general warning would be more of a scare than anything else," he says, noting, however, that at one point the city did send out a note to dietitians advising them of the rise in salt levels.

At the current levels, a person would have to consume huge quantities of water to be affected by the salt content, Russell said, and short of drinking distilled water, there's not much that anybody can do about the situation.

But Russell added that the city is watching the salt figures as indicators of ground water quality.

In the meantime, warns Russell, a larger health hazard for some people is softened drinking water, which contains salt concentrations as high as 100 ppm.

In most cases, the cold water coming out of a home faucet is not softened. But city inspectors, according to Russell, occasionally come upon a home where a water softener has been attached directly to the incoming water line, thus adding softening salts to the drinking water as well as that used for washing.

"It's not a large problem," he said, "but there probably are some people who are drinking softened water and don't know it."

Willard expects salt concentrations in the wells to decrease in the next few years, to reflect reductions in the use of road salt. But it won't happen right away, he said, because ground water moves very slowly.

In the winter of 1972-73, the city dumped some 3,500 tons of de-icing salt on its streets, according to streets supervisor Lloyd Sarbacher. Concern about salt contamination prompted the City Council to order a program of gradual reduction. And by last winter, salt use had been cut back to 1,519 tons — a drop of 73 per cent.

"A rare example of protective legislation in time," Willard said of the salt cutbacks.

# Salt Isn't Just a Madison Issue

## The Washington Post

Scientists have found a 'sleeping giant' of environmental problems: Earth is getting saltier

Salt used to de-ice roads is the single biggest source of salt in the U.S.

October 31, 2023

**milwaukee journal sentinel** Jan. 14, 2025

**Wisconsin waters have a road salt problem. Here's what to know, and how to help.**

**Chicago Tribune** March 18, 2021

Salt may be a savior for roads, but it imperils Chicago-area water and wildlife. Some communities and agencies are working to change that.

**9NEWS** December 29, 2014

**Study: Road salt polluting Denver's Cherry Creek**

**Vermont's Own WCAX 3** Jun. 26, 2024

**Road salt runoff causes increased chloride levels in Lake Champlain**

**CBC**

Kitchener-Waterloo Nov 26, 2023

**Reducing road salt use 'not something that can wait' as Ontario lakes see oxygen depletion, researcher says**

Waterloo region's salt philosophy is 'applying the right amount in the right area,' manager says

**k m u w** January 25, 2023

**Salt makes icy roads less dicey, but it poisons the land. Here's what Kansas is doing about it**

**THE MAINE MONITOR** January 14, 2024

**How pesticides, road salt threaten Maine's water supply**

**FOX 2 now**

MISSOURI

**Road salt runoff creates environmental harm to wildlife** Jan 14, 2025

**91.3 WYSO** January 31, 2024

**Road salt use has doubled in the U.S., and it's polluting water. How Ohio is trying to prevent that.**

**The New York Times** Mar 25, 2025

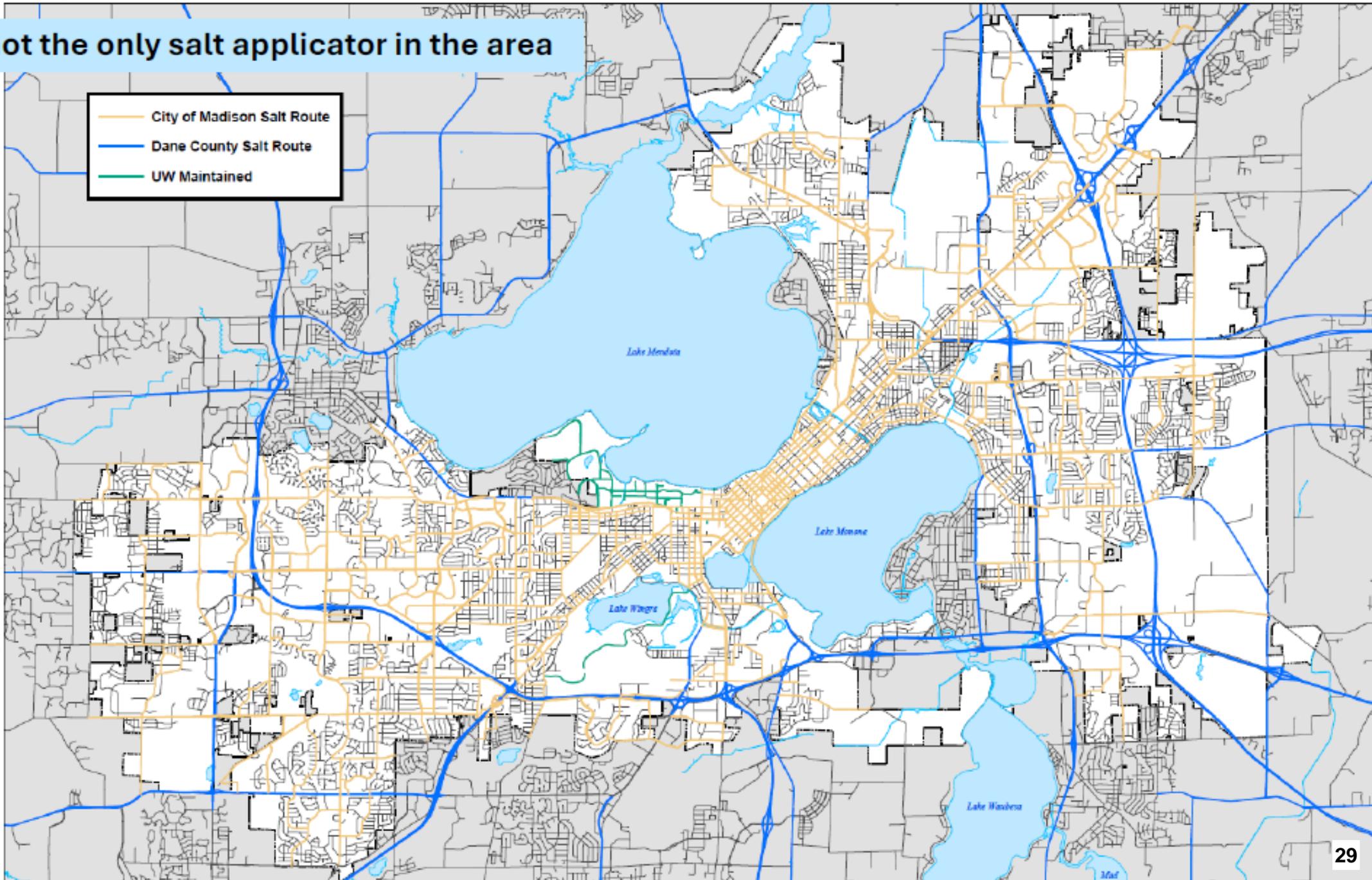
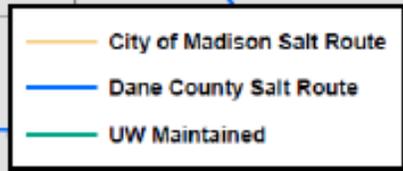
**Salty Suburban Roads Are Clouding the Future of N.Y.C. Drinking Water**

**Detroit Free Press** April 13, 2017

**Michigan lakes are getting saltier; road salt to blame**

*If trend continues, study predicts, salt levels will present risk to aquatic ecosystem in inland lakes*

# Madison is not the only salt applicator in the area



Dane County  
Highway

University

Private lots &  
roads

Other  
municipalities

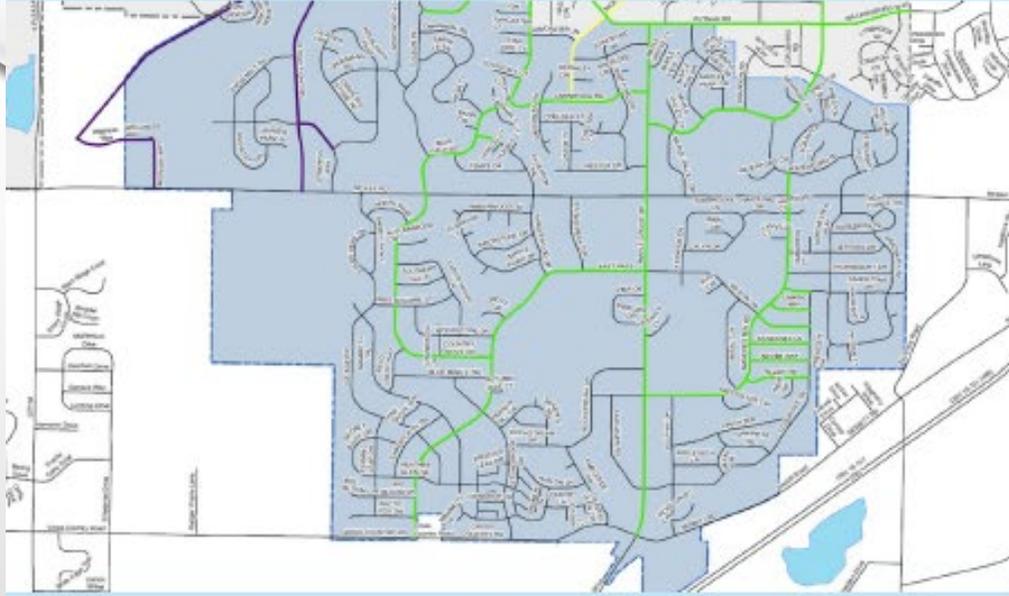




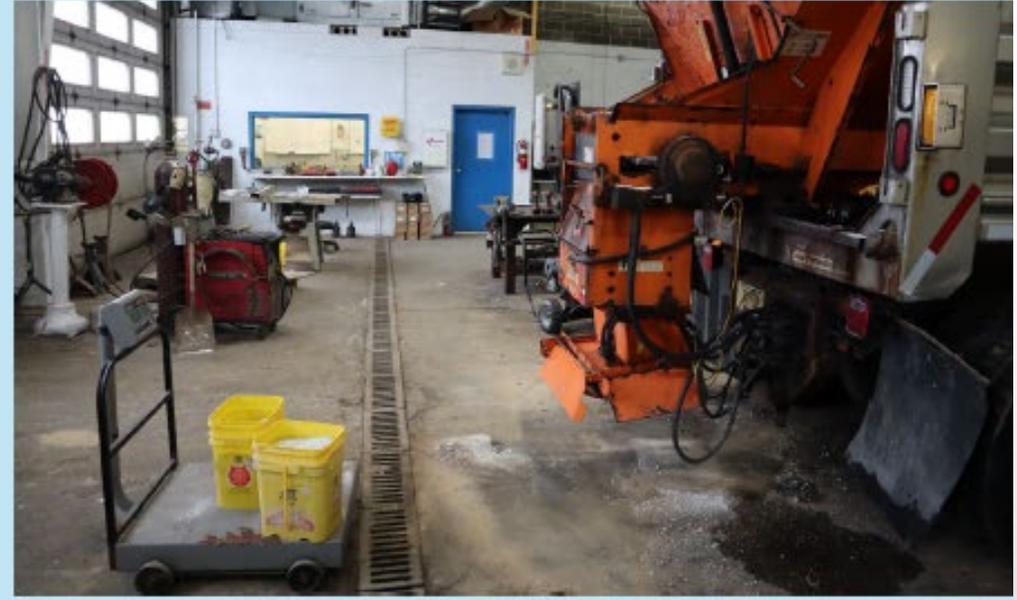
## Pre-treat brining when conditions allow



## Route Evaluations & Reductions



## Equipment Calibration



Salt Applicator Trainings



Improved Salt Use Tracking

# Continuous Improvement



**For second year, trying a new style of plow blade that should conform better with curved the road surfaces**



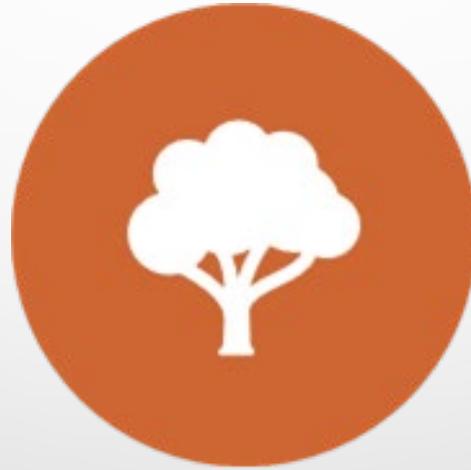
**Vaisala GroundCast monitors to help get more accurate pavement temperatures**

# And in the spring, sweeping restarts...

- Sweepers run 16 hours a day in the spring
  - Shifts usually begin sometime in March
  - Collects all the leftover grit, salt, sand, etc. from the winter
- After spring clean-up sweeping settles into routine rounds



# PARKS



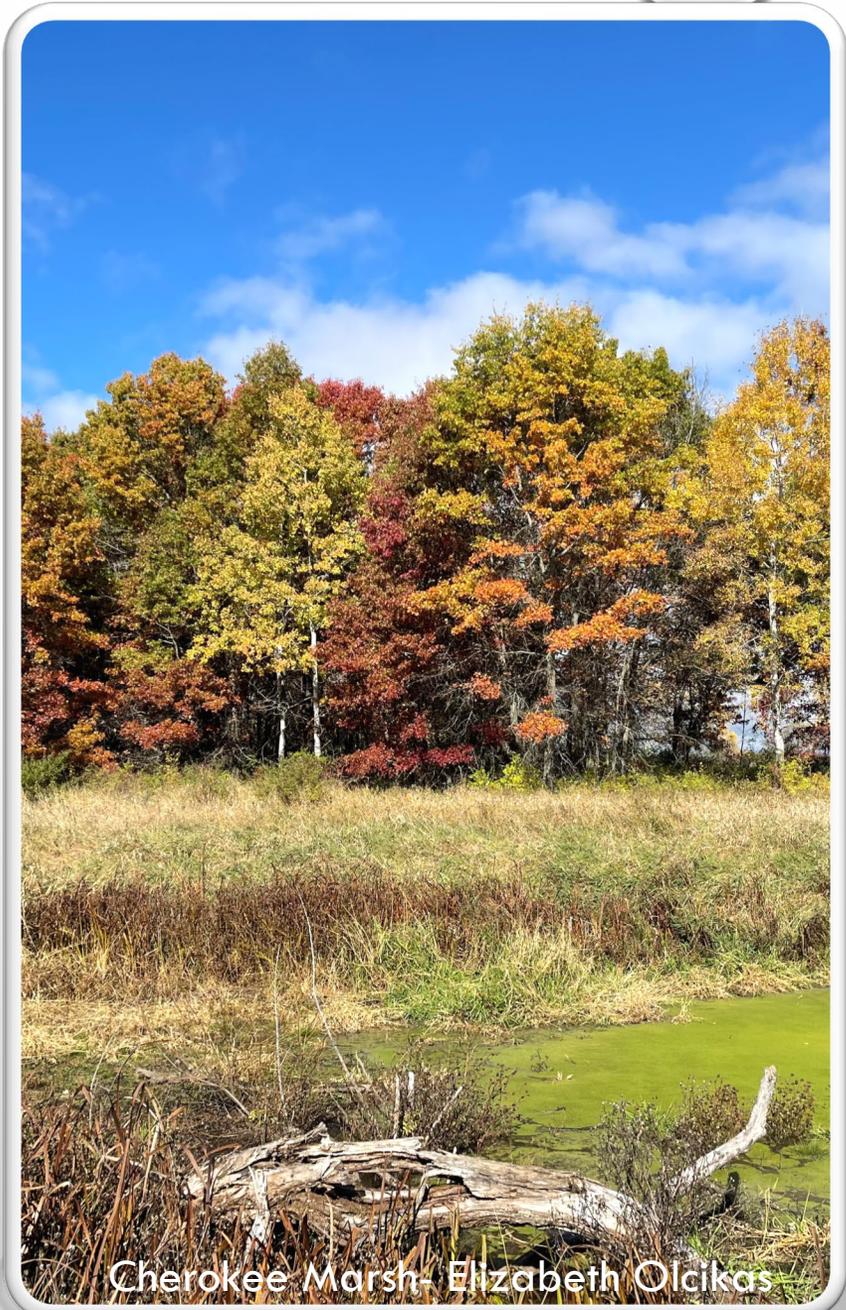
# LOVING OUR LAKES- CITY OF MADISON PARKS DIVISION



James Madison Park – Brian Shore

# PARKS AS GREEN INFRASTRUCTURE

- 290 PARKS AND 5,700 ACRES
  - >1,000 acres of wetland
  - 21 Conservation Parks
  - 1,830 acres managed in natural state
  - 384 acres of Managed Meadows
  - 16 acres of Demonstration Gardens & Tropical Conservatory at Olbrich Botanical Gardens
  - Rain Gardens & Ponds within parks & golf courses
  - 17.5 miles of managed shoreline



Cherokee Marsh - Elizabeth Olcik

# WETLANDS & WATERFRONTS MANAGEMENT GOALS

- Prevent shoreline erosion.
- Reduce runoff, sedimentation, and nutrient loading into water.
- Regulate movement of geese and other waterfowl away from areas frequently used by humans.
- Protect turtle and waterfowl nests when discovered.
- Allow park users clean, safe access to connect with the water.

# LAND MANAGEMENT PRACTICES AT WATERFRONT

- Landscape buffers along shorelines.
  - Native vegetation, diverse plant communities, limit spread of harmful invasive plant species, limit and mitigate hydrological disturbances.
- Integrated Pest Management approach to managing geese in heavily used waterfronts.



Managed Meadow at Hudson Park overlooking Lake Monona

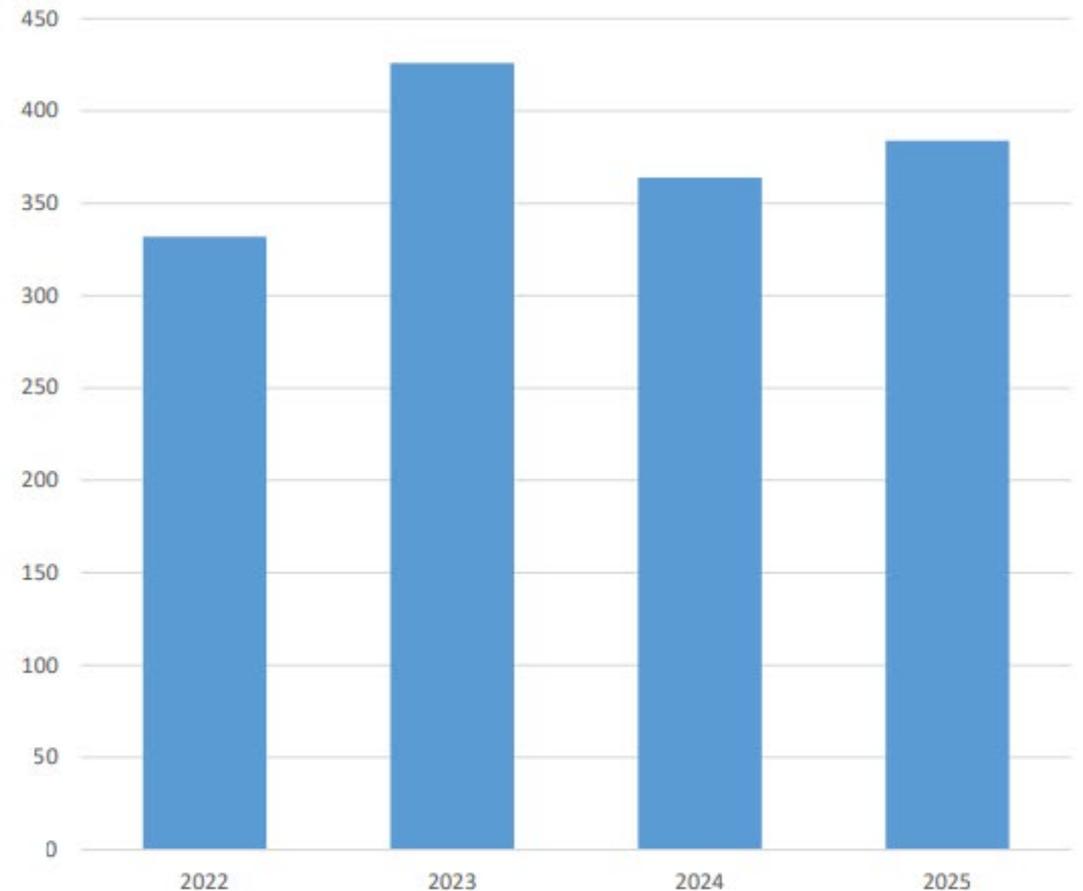
# FURTHER FROM SHORE: LAND MANAGEMENT PRACTICES

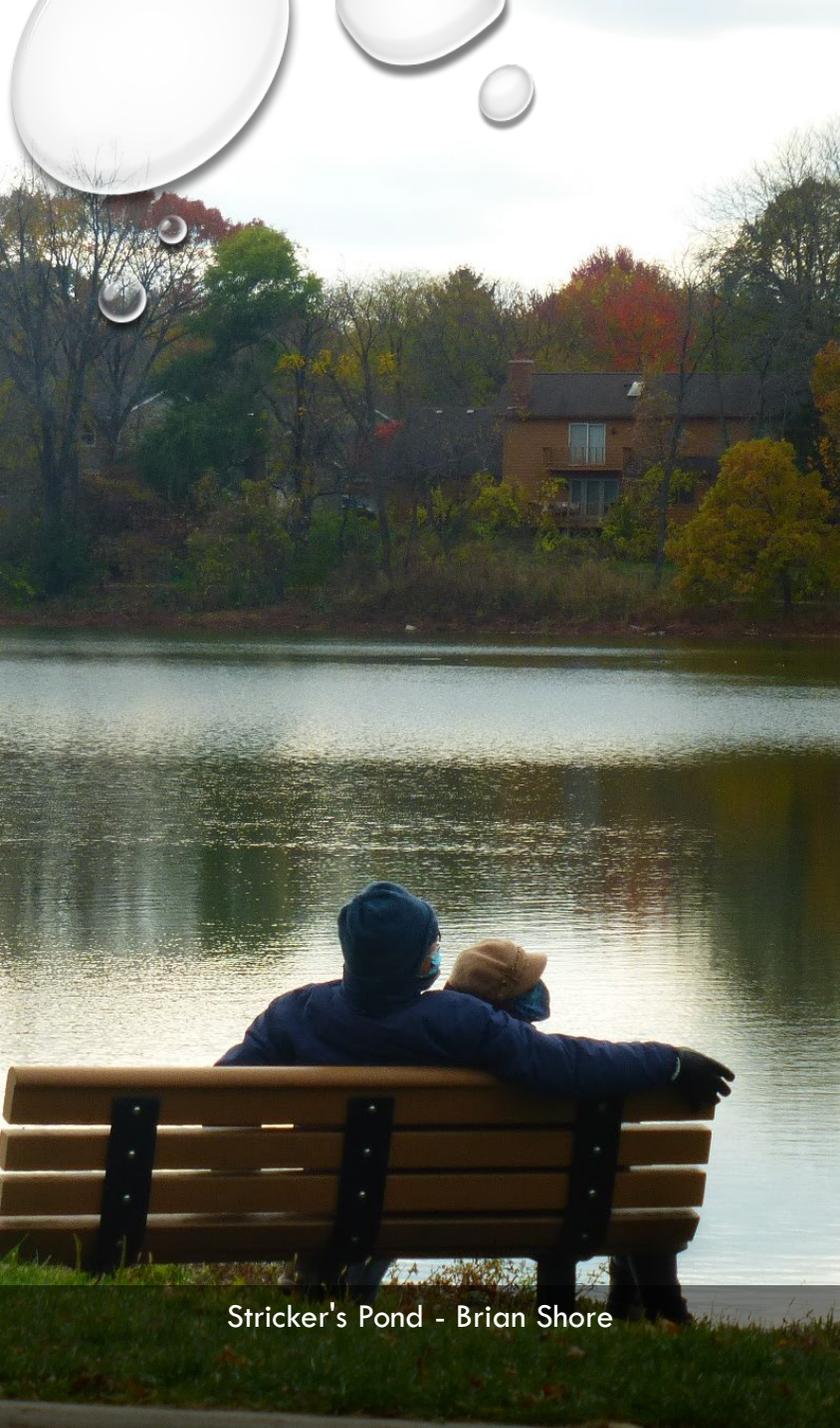
- Grass Clippings: minimizing the amount of grass left on pavement
  - Mowing active turf areas at regular frequency
  - Removing debris from paved areas
- Managing Leaf Debris
  - Leaves in most parks are mulched into the turf
  - Leaves from densely shaded areas are removed



Fall Leaf Removal at Forest Hill Cemetery

# BALANCING ACTIVE RECREATION AREAS WITH NATURAL LANDSCAPES





Stricker's Pond - Brian Shore

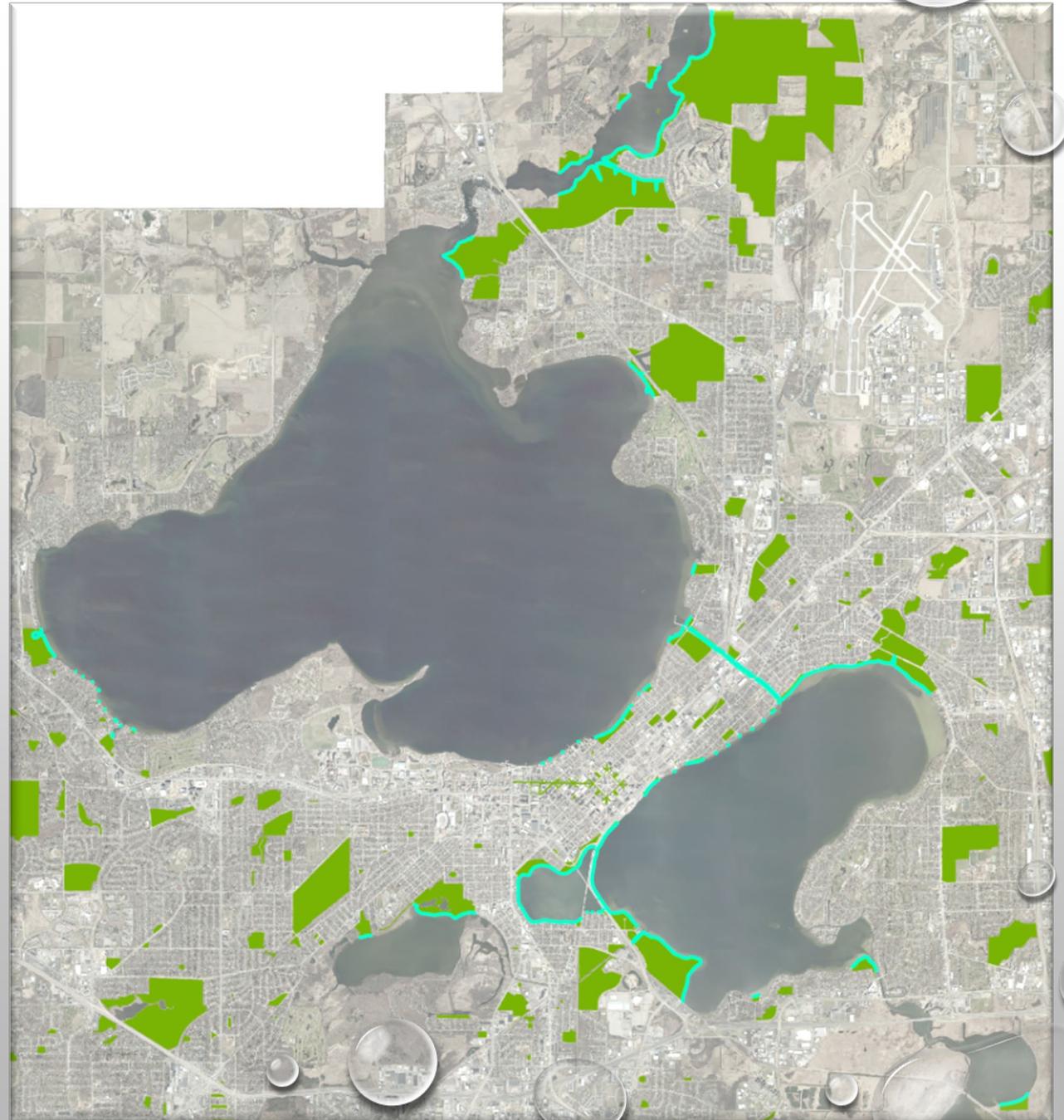
# CONNECTING PEOPLE TO OUR LAKES

2025-2030 POSP Strategy: Improve public access to lakes and waterways.

- Engage the community in the design process to increase water access on public lands.
- Provide opportunities for year-round water recreation.
- Support efforts of partners and stakeholders to improve water quality in Madison's lakes and waterways.
- Encourage creative placemaking opportunities to connect the community to water.

# LAKE & WATERFRONT ACCESS

- 56 PARKS WITH SHORELINE ACCESS
- 17.5 MILES OF SHORELINE IN PARKS
- 12 PUBLIC BEACHES
- 10 BOAT LAUNCHES
- SEASONAL & YEAR-ROUND PIERS



# ACCESS TO LAKES VIA WATERCRAFT

- 6,744 Lake Access Permits issued in 2024
- 441 Kayak & Canoe Permits issued in 2024
- 30 Spaces at Marshall Park Mooring Field
- Agreements with light duty dock installation companies for private properties
- Agreements with heavy duty construction companies for private shoreline restoration work



Marshall Park Beach

# YEAR-ROUND RECREATION

Top 5 Favorite Park Uses from POSP:

Activities Involving Madison Lakes:

- Boating
- Fishing
- Paddle sports
- Swimming
- Ice skating
- Ice fishing
- Ice boating



Tenney Park by Luna Collins



PHMDC Beach monitoring at Spring Harbor Beach

# COLLABORATING WITH PARTNERS

- DANE COUNTY
  - DAILY WATER QUALITY TESTING AT BEACHES -PHMDC
  - AQUATIC PLANT HARVESTING OPERATIONS
    - FLOOD MITIGATION
    - NAVIGATION & RECREATION
- CLEAN LAKES ALLIANCE
- VOLUNTEERS
- CONTRACTUAL PARTNERS FOR RECREATIONAL ACTIVITIES

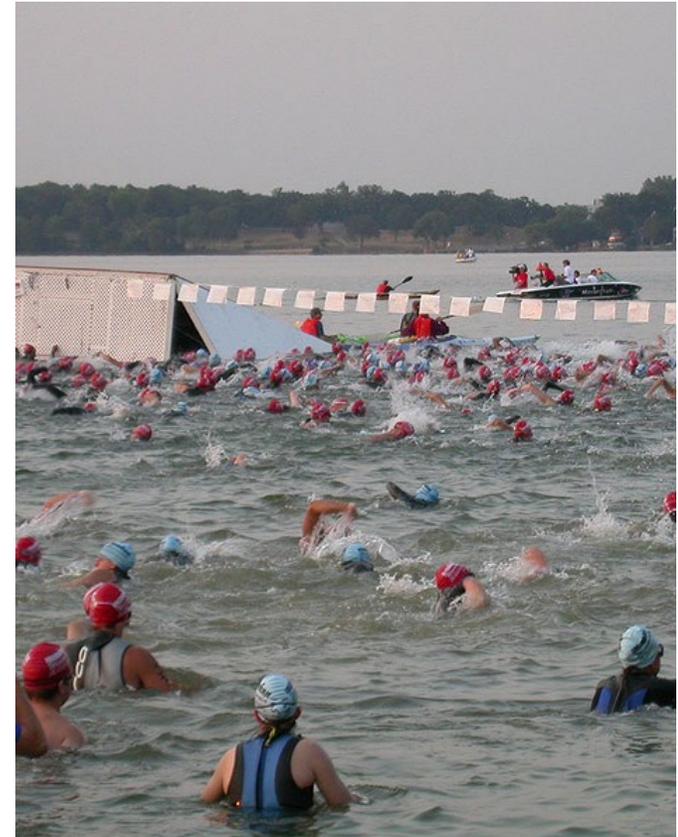
# CREATING PLACEMAKING OPPORTUNITIES

- Recreational activities with a public access focus
  - Madison Boats
  - MSCR
    - Tenney Park Pontoon Rides
    - Access for camps, canoe rides
  - Olbrich Biergarten
  - Rutabaga Kayak Rentals
  - Pontoon Porch



# Creating Placemaking Opportunities (cont'd)

- Recreational activities with semi-public access
  - MadSki Team
  - Mendota Yacht Club – Burrows Park
  - Mendota Rowing Club - Hoover Boat House
  - UW Rowing Club
- Permitting for special events
  - Regattas – E-Scow, M-Scow
  - Ironman



Iron Man at Law Park

# COMMUNITY ENGAGEMENT IN DESIGN PROCESS

- Madison LakeWay
  - 1.7-mile section of shoreline
  - Decades of community advocacy & support
  - Significant public engagement in Master plan & Design Process
  - Design emphasis on water quality improvements, Education & connection with the lake

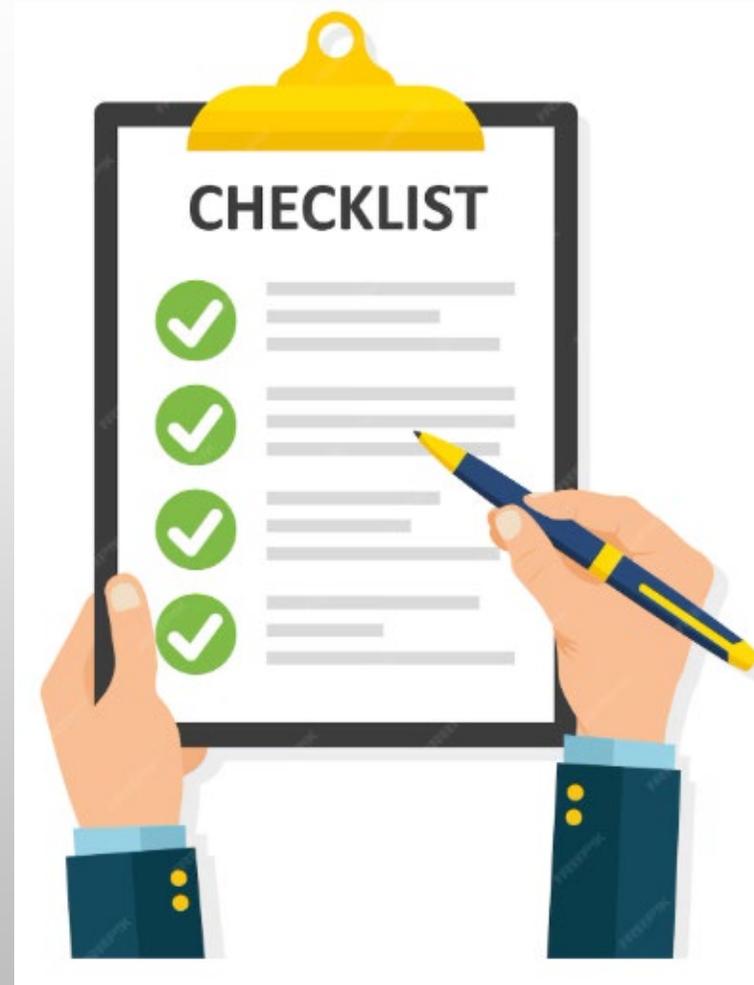


Photo Attributions: Sasaki Associates, Inc.

# ENGINEERING STORMWATER UTILITY

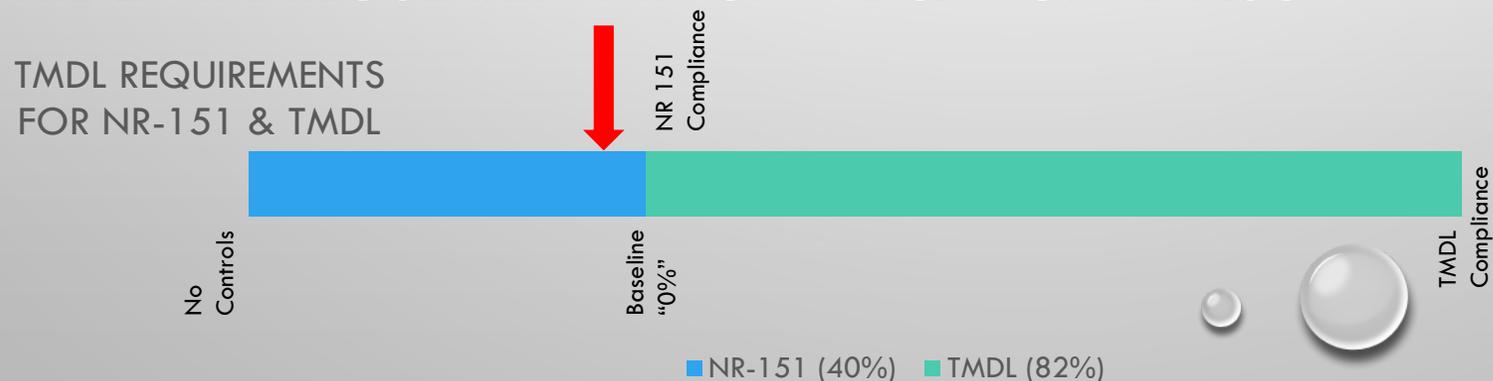


# HOW ARE WE DOING WITH OUR REQUIREMENTS?



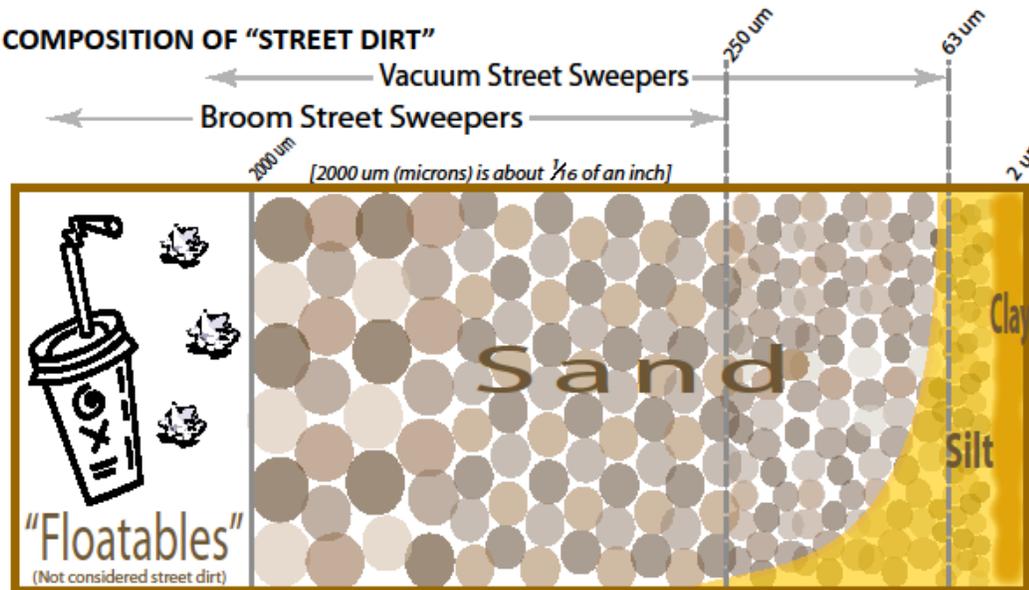
# HOW DO WE MEET THE NR-151 AND TMDL REGULATIONS??

- MEETING THE REQUIREMENTS OF NR-151 IS THE BEGINNING OF THE REDUCTIONS REQUIRED BY THE TMDL
  - WE MUST REDUCE TSS BY 40% COMPARED TO NO CONTROLS TO COMPLY WITH NR-151 (BUT ACT-10 PREVENTS WDNR FROM ENFORCING MORE THAN 20%)
- 40% REDUCTION IS A BASELINE OF 0% TREATMENT FOR THE TMDL
  - AS MEASURED FROM A BASELINE OF 0% THE TMDL REQUIRES AN 82% TSS CONTROL FOR THE ENTIRE REGULATED PART OF THE CITY OF MADISON

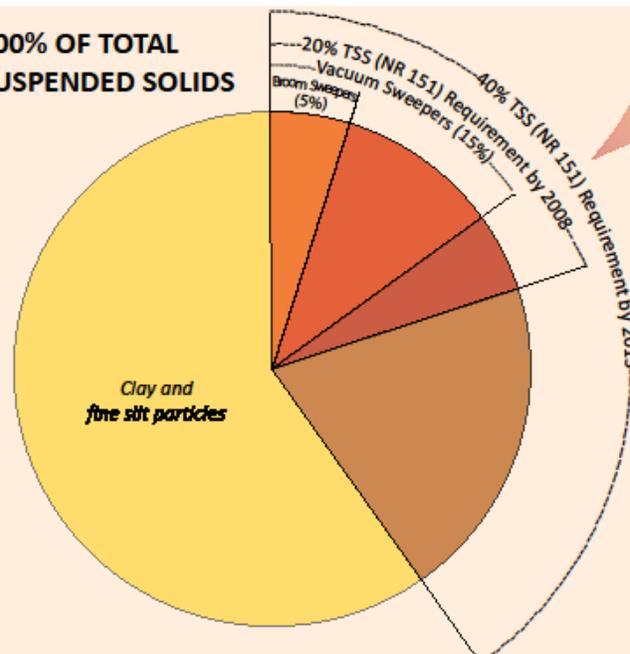


# Street Sweeping and DNR Regulations

## COMPOSITION OF "STREET DIRT"



## 100% OF TOTAL SUSPENDED SOLIDS



The values for sweeping are under perfect conditions; actual collection is less.

**TOTAL SUSPENDED SOLIDS**  
The Story...  
About 95% of dirt on the street is SAND. Broom Sweepers can pick up about 65% of street dirt; Vacuum Sweepers can get up to 95%.

However...  
DNR Regulations state that we have to control **Total Suspended Solids (TSS)**. Sand makes up a very small portion of TSS; silt and clay (much smaller particles) make up most of TSS.

Sweepers aren't able to pick up much of the smaller particles (Broom Sweepers get about 5%; Vacuum Sweepers up to 15%).

Other practices like Detention Ponds can control up to 80% TSS, but they are generally only located in areas developed after 1980. State Regulations indicate that **CITYWIDE** we have to control **20% TSS by 2008** and **40% by 2013**.

- WHAT DOES AN 82% REDUCTION IN TOTAL SUSPENDED SOLIDS MEAN?
- WE HAVE TO REMOVE DOWN TO THE 3 MICRON PARTICLE IN STORMWATER
- THAT IS THE LIMIT OF WHAT CAN SETTLE OUT IN A STORM POND
- A HUMAN HAIR IS ABOUT 70 MICRONS IN DIAMETER.

# HOW DO WE MEET THE NR-151 AND TMDL REGULATIONS??

- A 40% TSS REDUCTION RESULTS IN A 27% TP REDUCTION
- AN 80% TSS REDUCTION RESULTS IN A 40% TP REDUCTION

Removal rates for various practices, assuming the system is functioning as intended:

- 1) ponds can remove 80% TSS
- 2) catchbasins/screens can remove 15% TSS
- 3) street sweeping can remove 5-12% TSS
- 4) infiltration practices can remove 100% TSS
- 5) coagulant treatment can remove 80% TP & TSS
- 6) leaf collection is an open question

# HOW DO WE MEET THE NR-151 AND TMDL REGULATIONS??

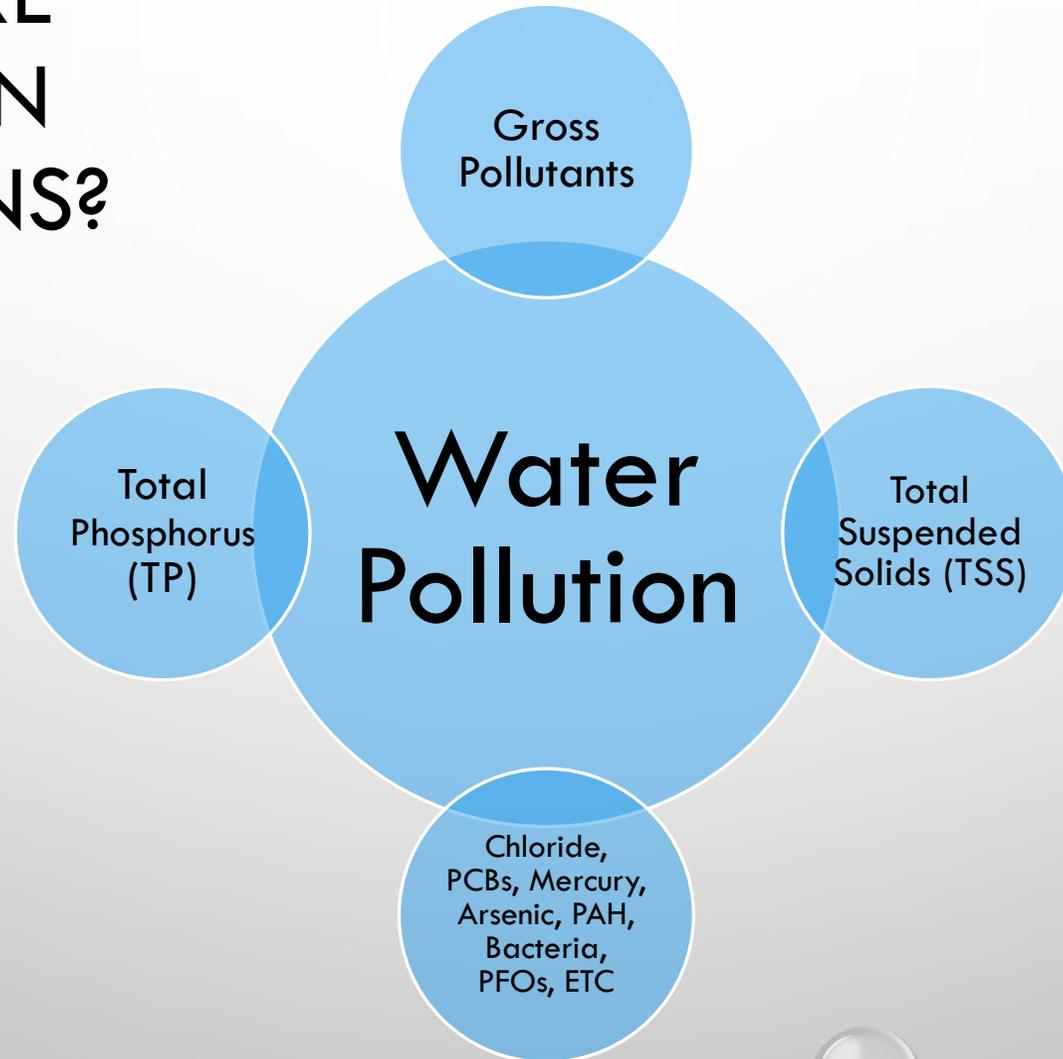
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- 5) coagulant treatment can remove 80% TP & TSS
- 6) leaf collection is an open question

**ALL PRACTICES REQUIRE ROUTINE MAINTENANCE TO FUNCTION CORRECT AND TO RECEIVE "CREDIT" UNDER THE REGULATIONS**

# WHAT ARE COMMON POLLUTIONS?



# WHAT POLLUTANTS DO WE TRY TO CAPTURE?

- GROSS POLLUTANTS



**CDS® Units –  
Continuous Deflection  
Separation Technology**



# WHAT POLLUTANTS DO WE TRY TO CAPTURE?

- GROSS POLLUTANTS
- TOTAL SUSPENDED SOLIDS (TSS)



## TRADITIONAL TREATMENTS

- 1) ponds
- 2) catchbasins/screens
- 3) sweeping
- 4) infiltration/raingardens

## NEWER TREATMENT

- 5) adaptive management

# WHAT POLLUTANTS DO WE TRY TO CAPTURE?

- GROSS POLLUTANTS
- TOTAL SUSPENDED SOLIDS (TSS)
- TOTAL PHOSPHOROUS (TP)

TSS and TP go hand in hand...

A 40% TSS reduction results in a 27% TP reduction  
An 80% TSS reduction results in a 40% TP reduction

## Measurement of Phosphorus in Water and Leaves



The image is a composite of two photographs. The left photograph shows a clear glass jar with a black lid, partially filled with a dark brown, turbid liquid, representing a water sample. The right photograph shows a stream with white water rapids, and a large leaf floating in the water, heavily coated with a thick layer of brown sediment, illustrating the connection between water turbidity and phosphorus levels.

Photo by USGS

 USGS  
United States Geological Survey

# Madison leaf Management

- **Existing Costs:**
  - \$2.3 million for leaf collection and composting
  - In 2016: 15,774 tons of leaves collected
- **Current phosphorus reduction counted towards TMDL: zero**
- **Public Perception:**
  - Skepticism that current practices were beneficial
  - Request to switch to vacuum collection
- **Important research for TMDLs across the country**



Madison SOP

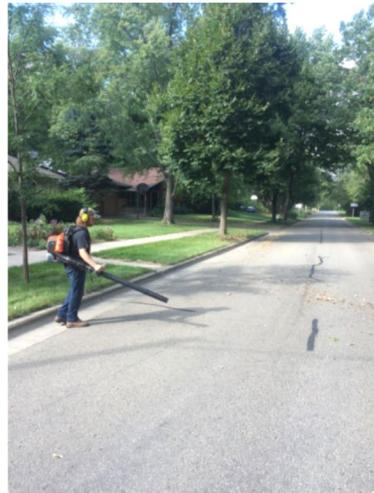
- Repurposed Garbage Truck
- Broom Pusher
- Vacuum to follow

# LEAVES AND SWEEPING

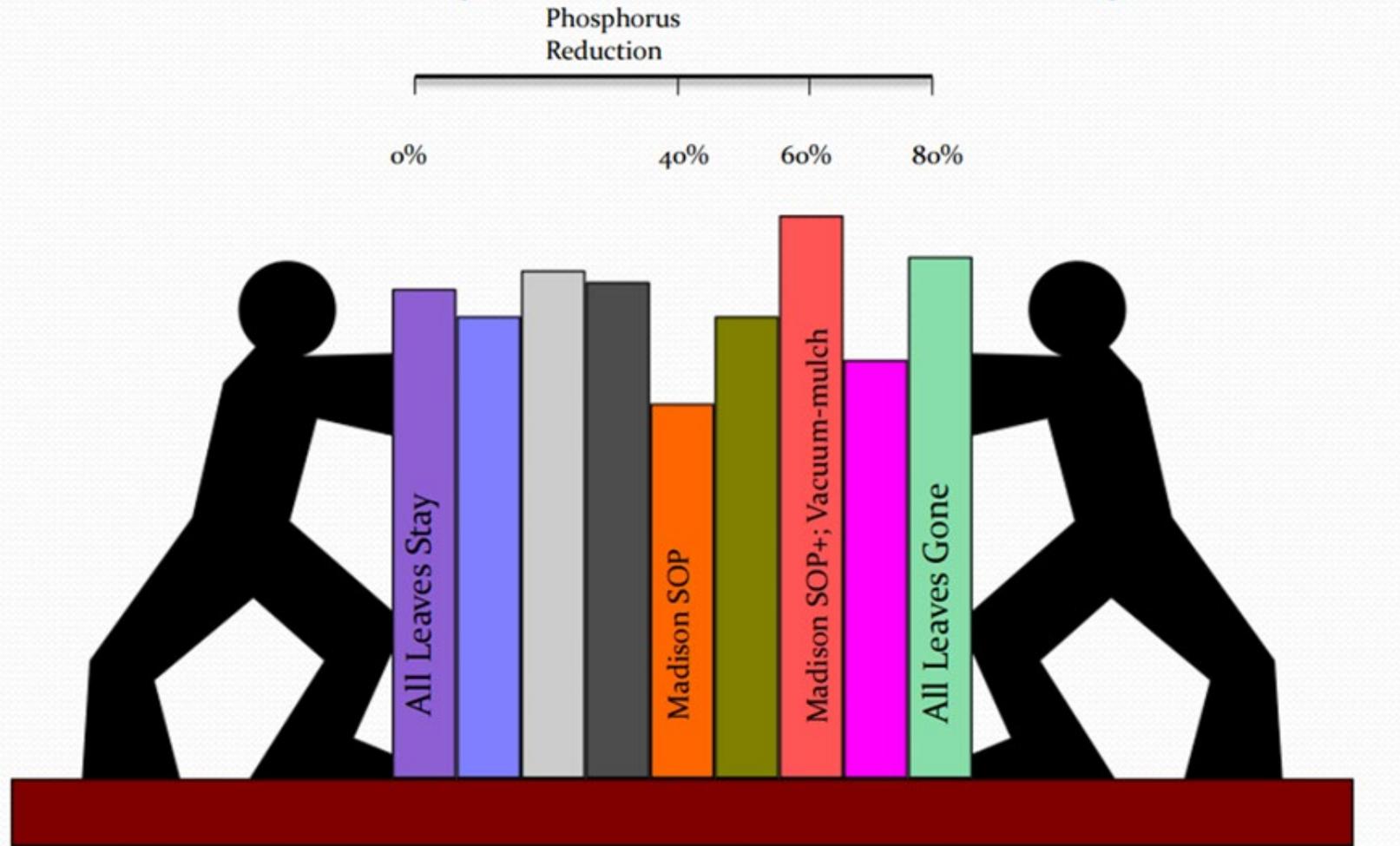
- APPROXIMATELY 56% OF THE TOTAL ANNUAL TP LOAD TO THE LAKES OCCURS IN ABOUT 1 MONTH IN THE FALL.
- STREET SWEEPING CAN REMOVE
- 5-12% TSS

# “Escalated” Leaf Management

In addition to municipal efforts, USGS field crews would clear all organic debris from street surface prior to rain event



# Collection Impacts on Total Phosphorus



# WHAT POLLUTANTS DO WE TRY TO CAPTURE?

- GROSS POLLUTANTS
- TOTAL SUSPENDED SOLIDS (TSS)
- TOTAL PHOSPHOROUS (TP)
- OTHER POLLUTANTS OF CONCERN (CHLORIDES)



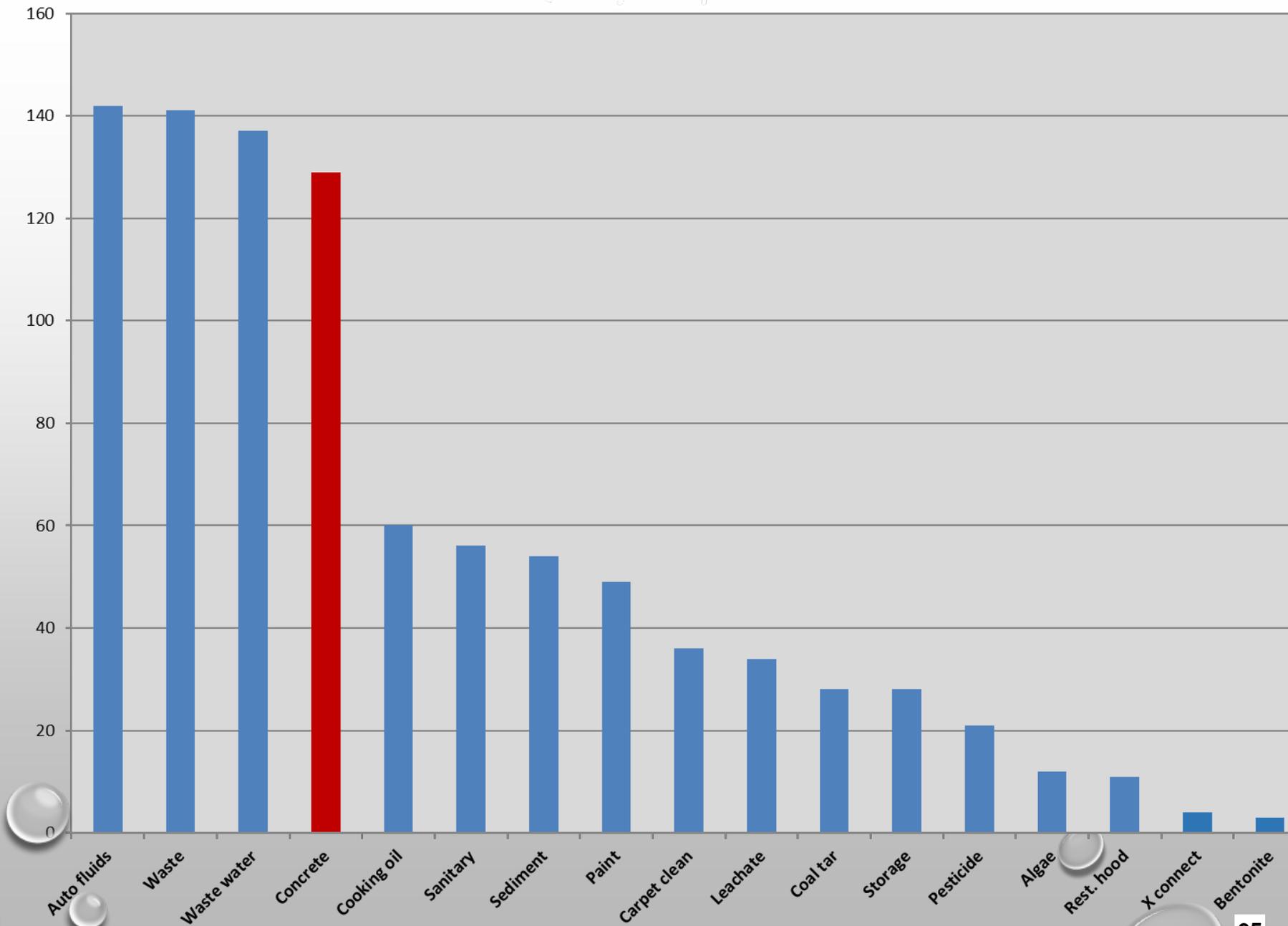
Salt Applicator Training

# WHAT POLLUTANTS DO WE TRY TO CAPTURE?

- GROSS POLLUTANTS
- TOTAL SUSPENDED SOLIDS (TSS)
- TOTAL PHOSPHOROUS (TP)
- OTHER POLLUTANTS OF CONCERN (ILLICIT DISCHARGES)

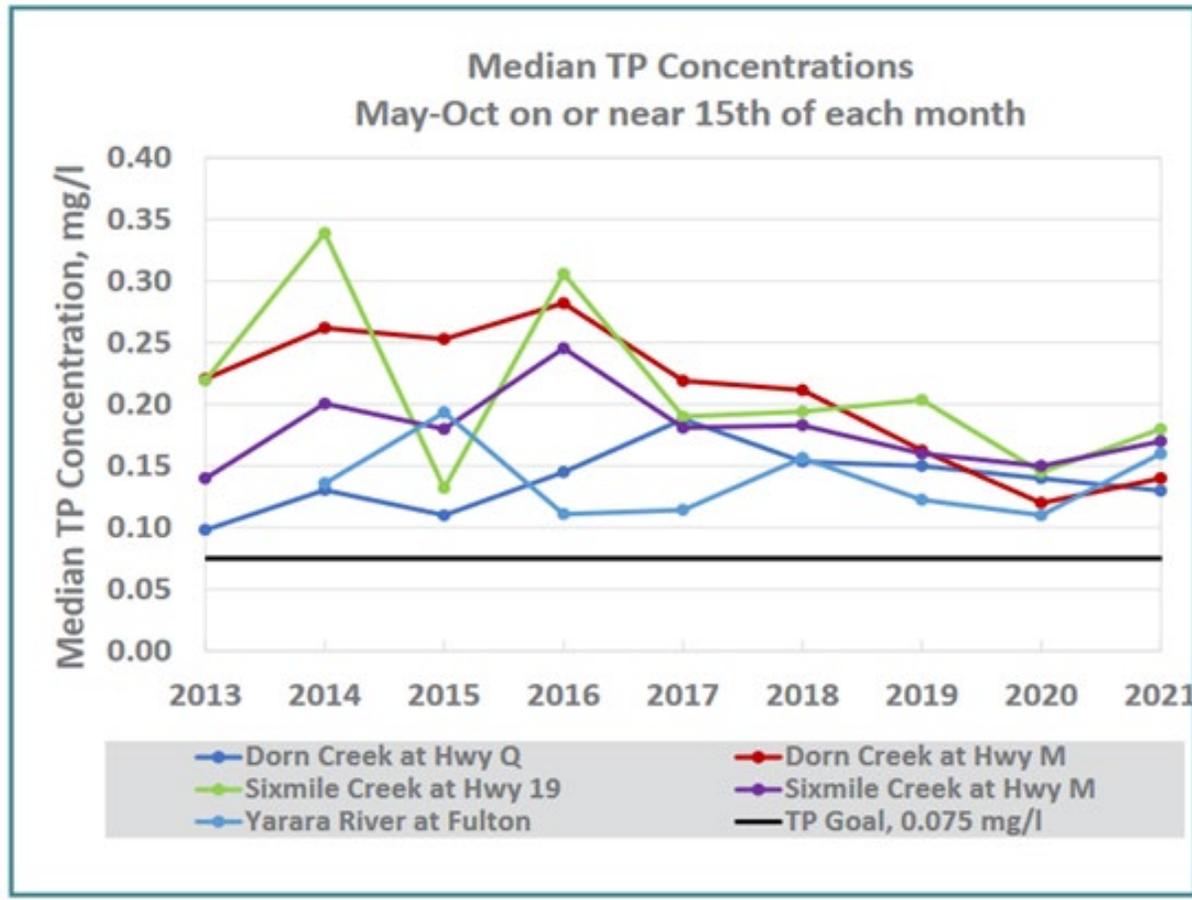


# COMMON TYPES OF ILLICIT DISCHARGES



# WHAT DO OUR PARTNERS DO?

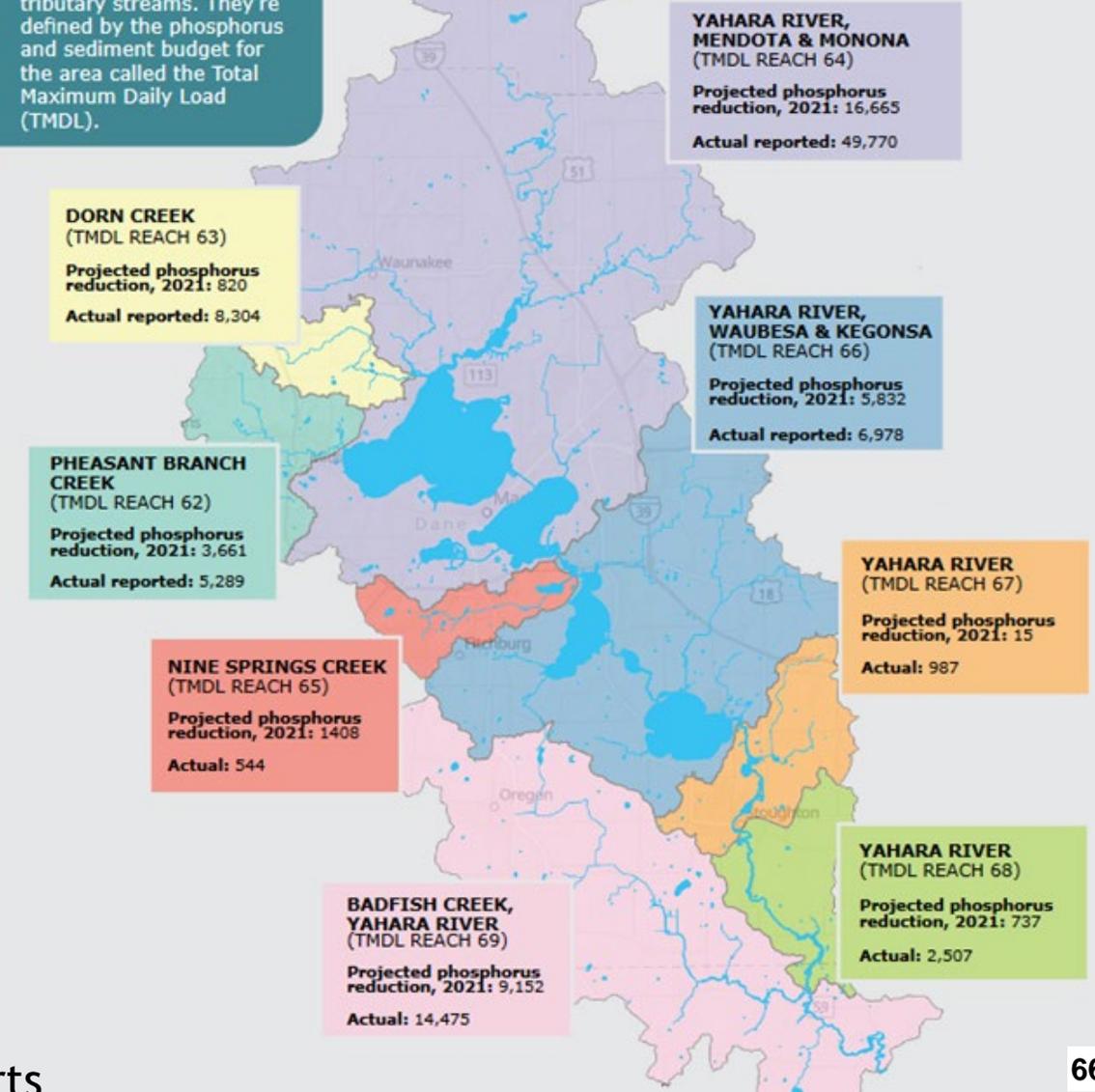
## Adaptive Management TMDL Compliance



The Yahara Watershed is divided into eight areas, called reaches, that correspond to the water bodies that receive that area's runoff and smaller tributary streams. They're defined by the phosphorus and sediment budget for the area called the Total Maximum Daily Load (TMDL).

## REDUCTIONS BY TMDL REACH

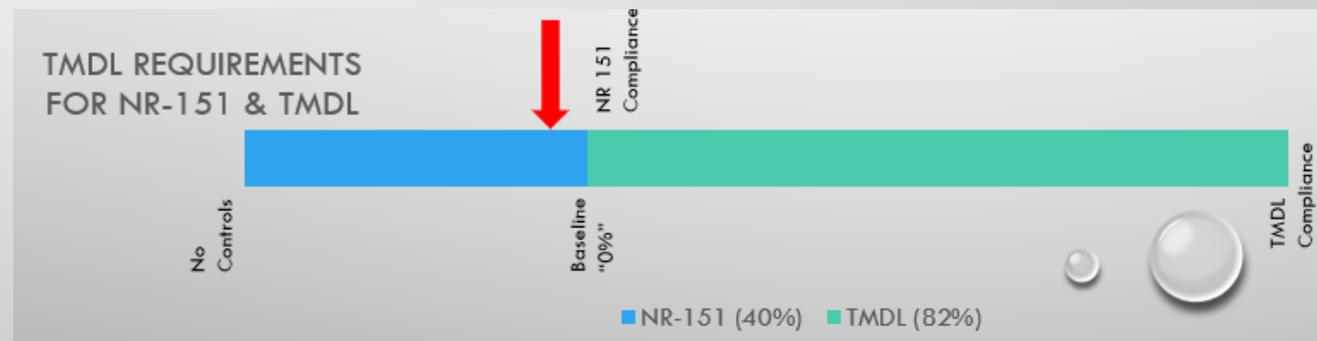
All reductions in this map are in pounds.



# WHERE DO WE STAND?

## Adaptive Management TMDL Compliance – 2021 Report snapshot

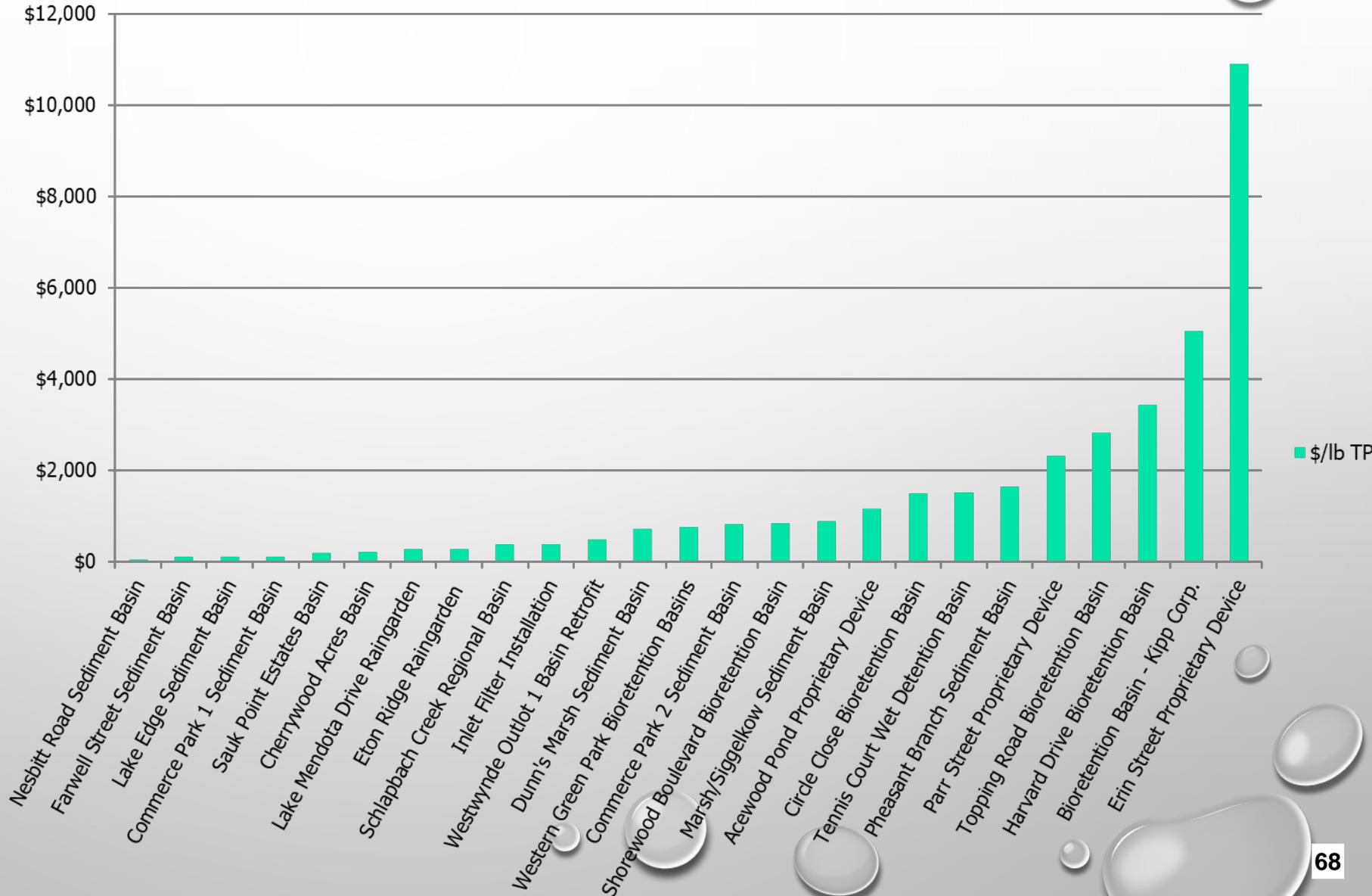
- MADISON CONTRIBUTED
  - \$504,394 IN 2021 ( 1/3 OF CONTRIBUTIONS)
  - ADDRESSES 10,254 LB OF TP
- PROGRAM IS AHEAD OF SCHEDULE
  - 88,854 LB TP CAPTURED VS 38,290 LB TP GOAL FOR 2021
  - TP \$/LB IS LOWER THAN INITIALLY THOUGHT
- ULTIMATE GOAL 96,000 LB
  - MADISON'S MS4 PRODUCES 29,839 LB TP A YEAR IN THE TMDL
  - CURRENTLY CAPTURES 7,877 LB ANNUALLY
- **MADISON NEEDS TO CAPTURE AN ADDITIONAL ~400,000 LB OF TSS ANNUALLY WITHIN THE MS4 TMDL ZONE TO REACH THE 0 (BASELINE OF THE TMDL)**



# WHAT ARE THE CHALLENGES?

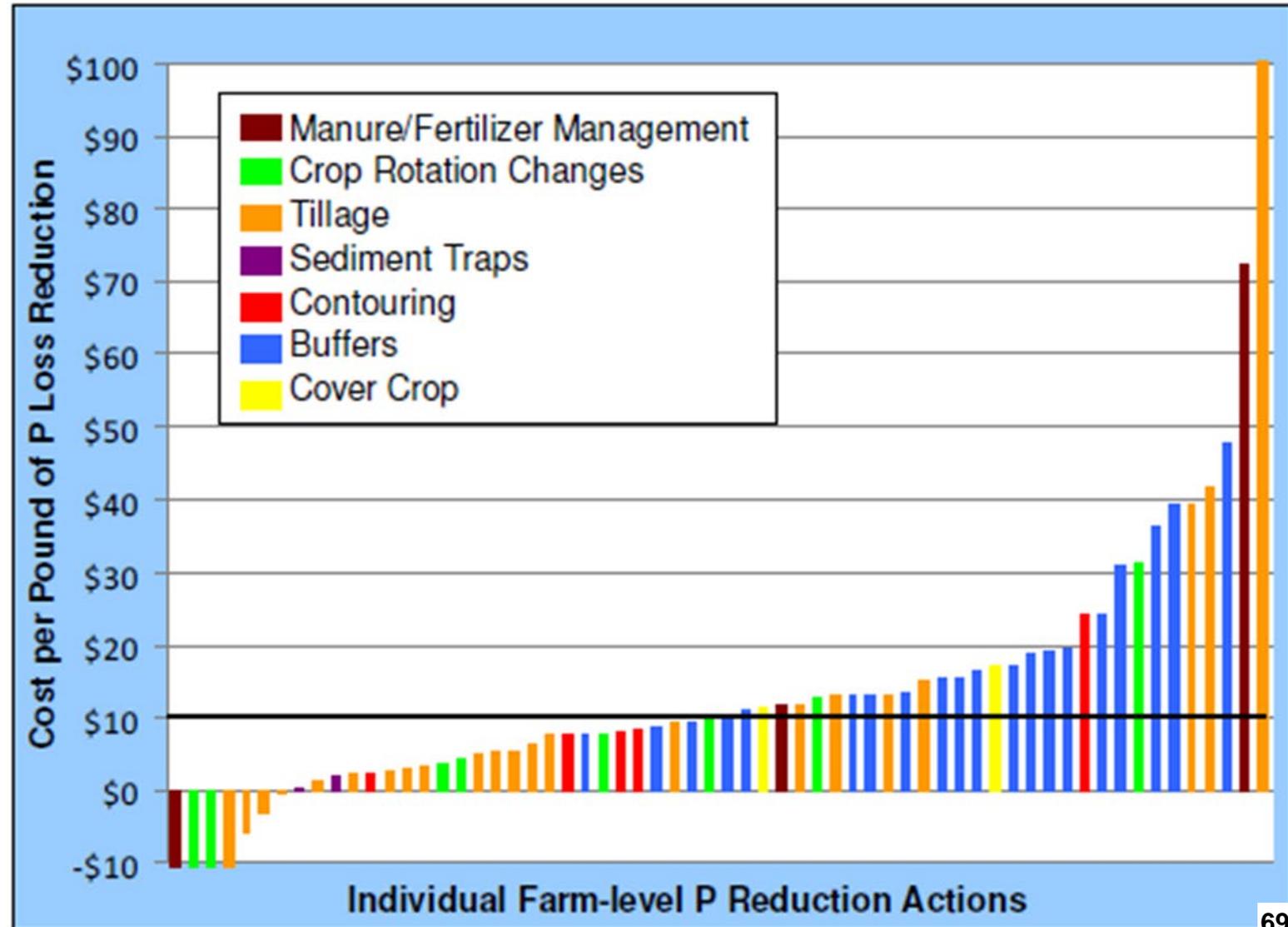
## FINANCIAL CHALLENGES

- IT IS AT LEAST AN ORDER OF MAGNITUDE CHEAPER TO REDUCE TSS AND TP FROM AGRICULTURAL LANDS COMPARED TO URBAN LANDS – COSTS ARE GENERALLY LESS THAN 100 \$/LB/YEAR
- FOR URBAN PROJECTS GENERALLY A TRADITIONAL PUBLIC WORKS PROJECT IS A GOOD VALUE IF COSTS ARE LESS THAN 500+ \$/LB/YEAR



# WHAT ARE THE CHALLENGES?

Figure 1. Cost of Specific P Reduction Actions per lb. of P Loss Reduced on Iowa Farms

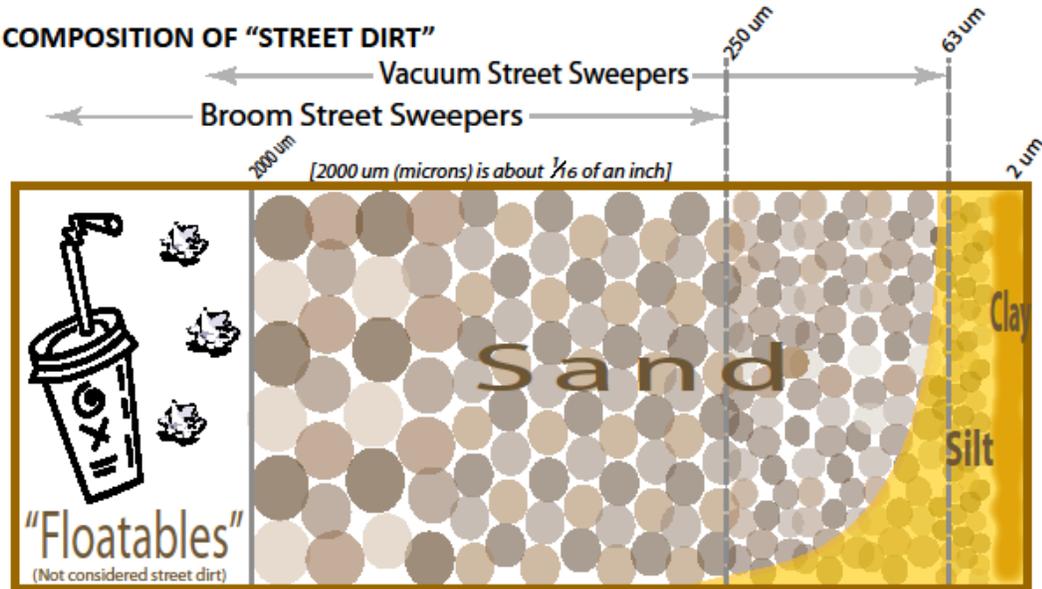


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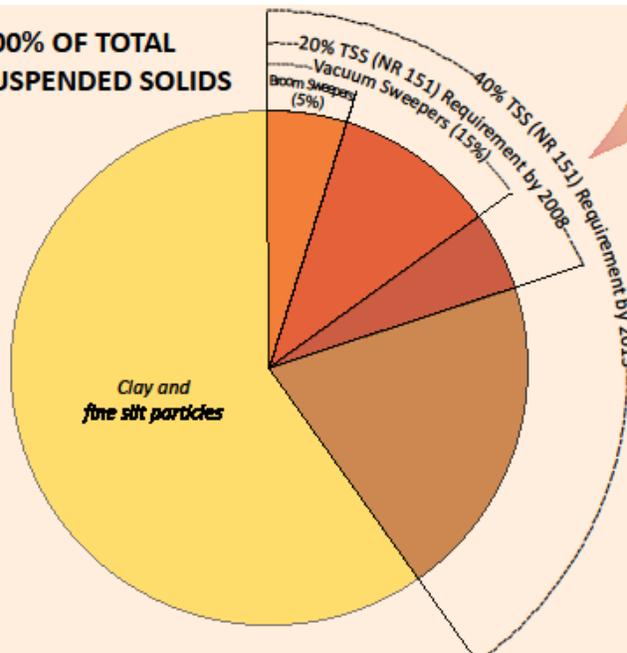
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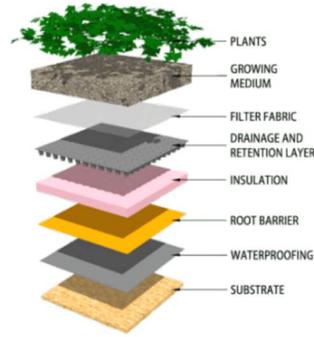
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- STREET SWEEPING – HAS SOME LIMITATIONS DUE TO HOW THE WDNR DETERMINES WHAT TSS IS.
- SWEEPING TO REMOVE DEBRIS DOESN'T NECESSARILY "COUNT" UNLESS REMOVING THE SMALLEST OF PARTICLE SIZES

- A green roof turns a surface that typically impervious surface into a pervious one
- Water is stored on the roof for plants to uptake and evapotranspire



<https://mngreenroofs.org/2012/02/leatherman-garage/>



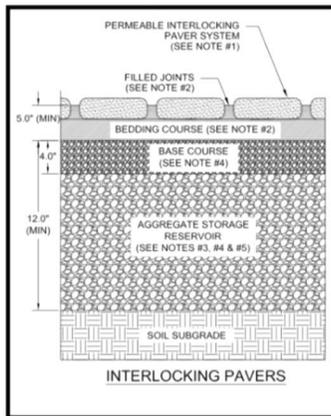
CITY OF MADISON



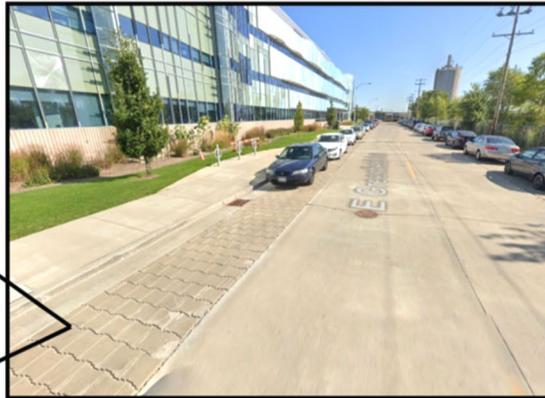
# CONTINUED WORK ON MEETING OUR GOALS

- MODIFICATIONS TO MGO CHAPTER 37 IN 2020
  - REQUIREMENTS FOR DEVELOPMENTS TO INFILTRATE MORE WATER
  - PUSHING DEVELOPMENTS TOWARDS GREEN ROOFS
- EDUCATION AND OUTREACH
  - LEAF STUDIES
  - GREEN INFRASTRUCTURE STUDY PILOT
- RAIN GARDEN INCENTIVES AND GRANTS
  - PRIVATE PROPERTY RAIN GARDEN GRANTS
  - TERRACE RAIN GARDENS WITH ROAD PROJECTS

## Permeable Road Surface



<https://dnr.wi.gov/topic/stormwater/documents/1008PermeablePavement.pdf>



- Water flows through the driving surface into a rock crib
- This soaks into the ground or is carried to storm sewer
- Treats and slows runoff
- Needs Maintenance - Vacuuming
- Chloride is an issue as it can end up in ground water

CITY OF MADISON



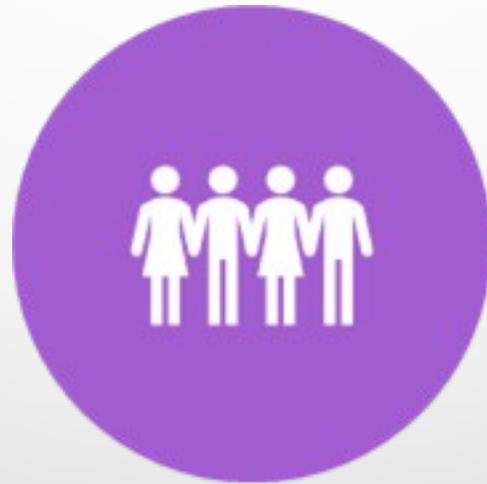


# PUBLIC WORKS PROJECTS

- NEW 'WET' PONDS – FOR FLOOD AND SWQ IMPROVEMENTS
  - HERRLING PROPERTY
  - MARTY FARM PROPERTY AT ELVER PARK
- EXPANSION OF WEST TOWNE POND
- ADDITIONAL CATCHBASINS AND WATER QUALITY DEVICES WITH STREET PROJECTS
- CONTINUED INSTALLATION OF RAIN GARDENS ON PUBLIC LANDS
- CONTINUED DREDGING TO ENSURE OUR FACILITIES WORK AS THEY NEED TO



# COMMUNITY PARTNERS





## Join us in keeping streets leaf-free!

In the fall, timely removal of street leaf litter can reduce the amount of phosphorus in urban stormwater by 80% compared to no leaf removal! Communities across Dane County are working hard to reduce stormwater pollution to protect our waters, but they can't do it alone. You can help!

1. Safely remove leaves from the street in front of your home **before it rains**.
2. Follow your community's guidelines for leaf collection or recycle leaves on your property. Mulch leaves into lawn with a mower or bag mulched leaves and add to garden beds. Mulched leaves are great for your soil and provide a free source of fertilizer. Many communities also offer curbside leaf pick up or free access to yard waste drop off sites.
3. Sign up to receive Leaf-free Streets Rain Alerts this fall (Oct. 1- Nov. 30). Alerts will be issued 1-2 days before a significant rain event reminding you that it's time to remove street leaves. **\*\*\*This program is only available to Dane County residents or businesses.\*\*\***

[Sign up for Text Alerts](#)

[Sign up for Email Alerts](#)

4. Help spread the Leaf-free Streets message in your neighborhood! Sign up for a yard sign and check out the [Leaf-free Streets Toolkit](#) for resources.

[Request a Yard Sign](#)

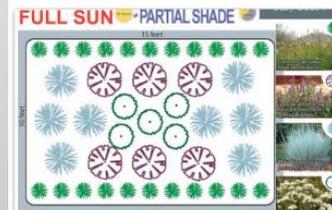


## Rain Gardens

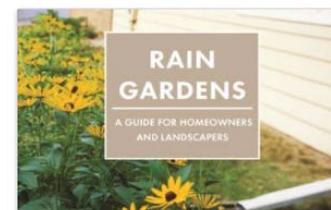
Rain gardens are shallow depressions that are planted with native flowering plants and grasses, which not only looks great, but also helps soak up rain water and melted snow and provides habitat for beneficial insects and birds. The runoff soaks into the ground rather than causing erosion or carrying pollution to the nearest lake or stream.



Cost can vary from very low cost to thousands. If you do the design, digging and planting, you can save a lot of money. The biggest expense is usually the plants. Rain gardens require little maintenance once established. It's also that much less turf you have to mow!



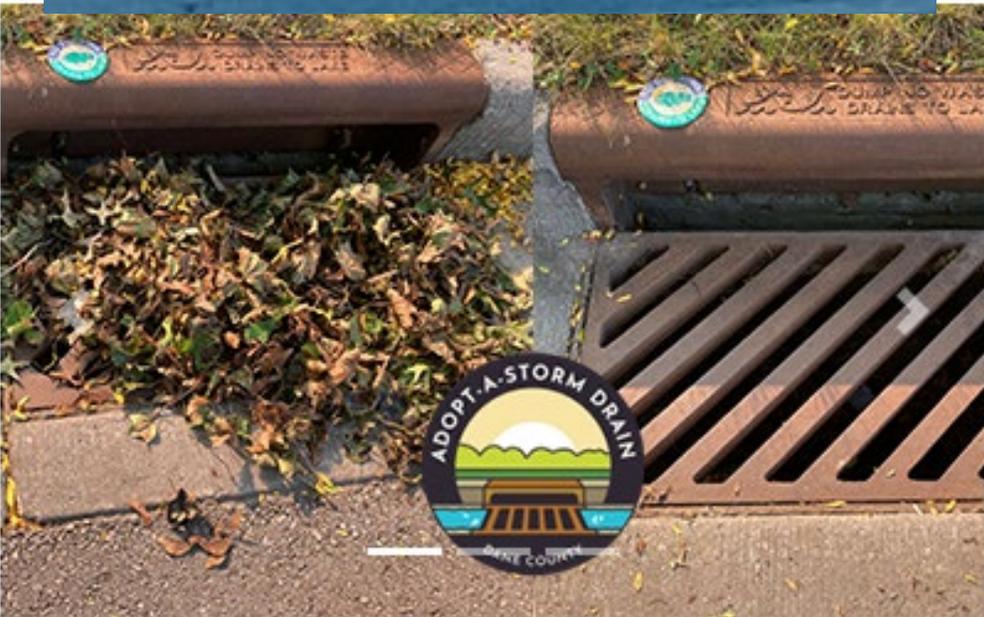
[Free Rain Garden Designs](#)



[Rain Garden Manual \(DNR\)](#)



[Plant Selection](#)





## FRESHWATER SALINIZATION

Causes, Consequences, and Trends



DR. MEGAN RIPPY



DR. STAN GRANT

**MONDAY, JANUARY 26**  
**12:30-1:00PM CT**

Get the big picture on freshwater salinization—then dive into a real-world case from the Occoquan Reservoir that highlights the complexity of the issue and practical management solutions.

## SALT WISE STORIES



PHILL SEXTON



ARON RODMAN

**TUESDAY, JANUARY 27**  
**12:30-1:00PM CT**

Hear directly from winter maintenance practitioners who have seen the business case for smarter salting, transformed their operations, and now educate and inspire others.

## SMART SALTING CONTRACTS



MARTIN TIRADO



JIM TURCAN

**WEDNESDAY, JANUARY 28**  
**12:30-1:00PM CT**

Knowing how to ask for winter maintenance best practices on your property can be difficult. Learn the basics from industry professionals and know what resources are available to support you.

## ENGINEERING SOLUTIONS



CONNIE FORTIN



WILF NIXON

**THURSDAY, JANUARY 29**  
**12:30-1:00PM CT**

Innovative engineering — from salt-savvy infrastructure design to smart sensors and AI-driven storm management — can cut winter salt use without compromising safety.

## ADVOCATING FOR CHANGE



ABBY HILEMAN



MARY ROONEY

**FRIDAY, JANUARY 30**  
**11:00AM-12:00PM CT**  
**CONVERSATION TABLE**

Want to make a difference? Let's talk practical ways to mobilize your community, collaborate with local leaders, and champion policies that support smarter winter maintenance.

## SALT MONITORING 101



LAUREN EATON



PAIGE VICHIOLA-SILVA

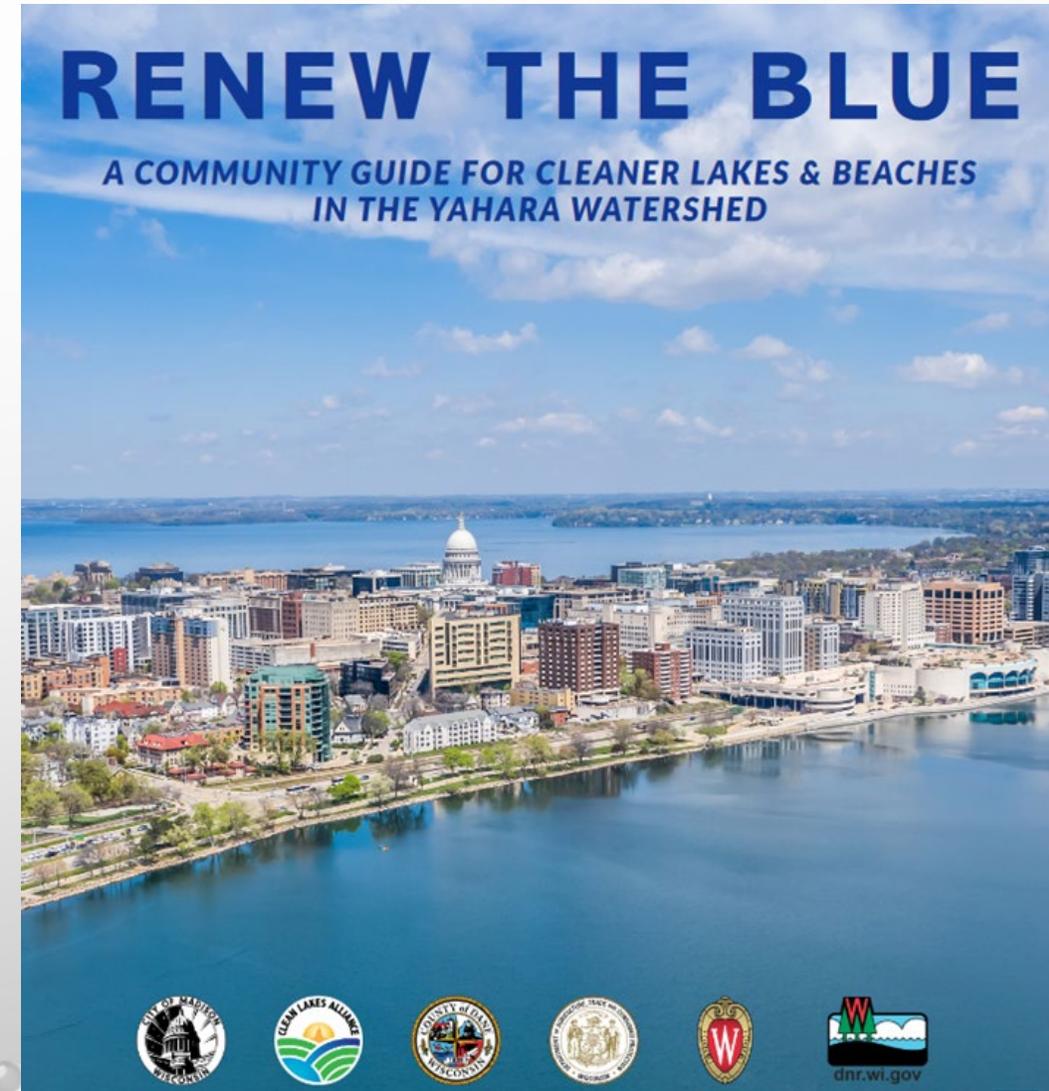
**FRIDAY, JANUARY 30**  
**12:00-1:00PM CT**  
**CONVERSATION TABLE**

Lauren and Paige will share their monitoring experiences on the Farmington River in Connecticut and the Rouge River in Michigan before fielding participant questions and discussion topics.

# RENEW THE BLUE – CLEAN LAKE ALLIANCE 2022

## TOP RECOMMENDATION THAT IMPACT CITY OF MADISON

- INCREASE **MUNICIPAL STREET-CLEANING** MILES AND FREQUENCY DURING THE FALL.
  - REGULARLY REMOVE LEAF LITTER FROM STREETS TO PREVENT RAINWATER-LEACHED PHOSPHORUS FROM ENTERING STORM SEWER SYSTEMS.
- INCREASE **GREEN-INFRASTRUCTURE INSTALLATIONS** IN PARKS, NEW DEVELOPMENTS, AND ON EXISTING RESIDENTIAL AND COMMERCIAL PROPERTIES.
  - INCORPORATE NATURE-BASED SOLUTIONS SUCH AS RAIN GARDENS, BIOSWALES, INFILTRATION TRENCHES, AND PERMEABLE PAVEMENT TO CAPTURE, ABSORB, AND FILTER RUNOFF.
- USE TOOLS SUCH **AS STORMWATER UTILITY CREDITS**, RATE ADJUSTMENTS, AND RECOGNITIONS TO REWARD ACTION.



**QUESTIONS?**