



Effective Salt Management Practices

Presentation to Water
Utility Board

February 26, 2025

Presenters:

Joe Grande – Madison Water Utility

Charlie Romines – Streets Division

Allison Madison – Wisconsin Salt Wise

Road Salt & The Water Cycle



ROAD SALT (SODIUM CHLORIDE)
IS A DE-ICING AGENT



IT IS USED FOR WINTER ROAD
MAINTENANCE

Road Salt & The Water Cycle

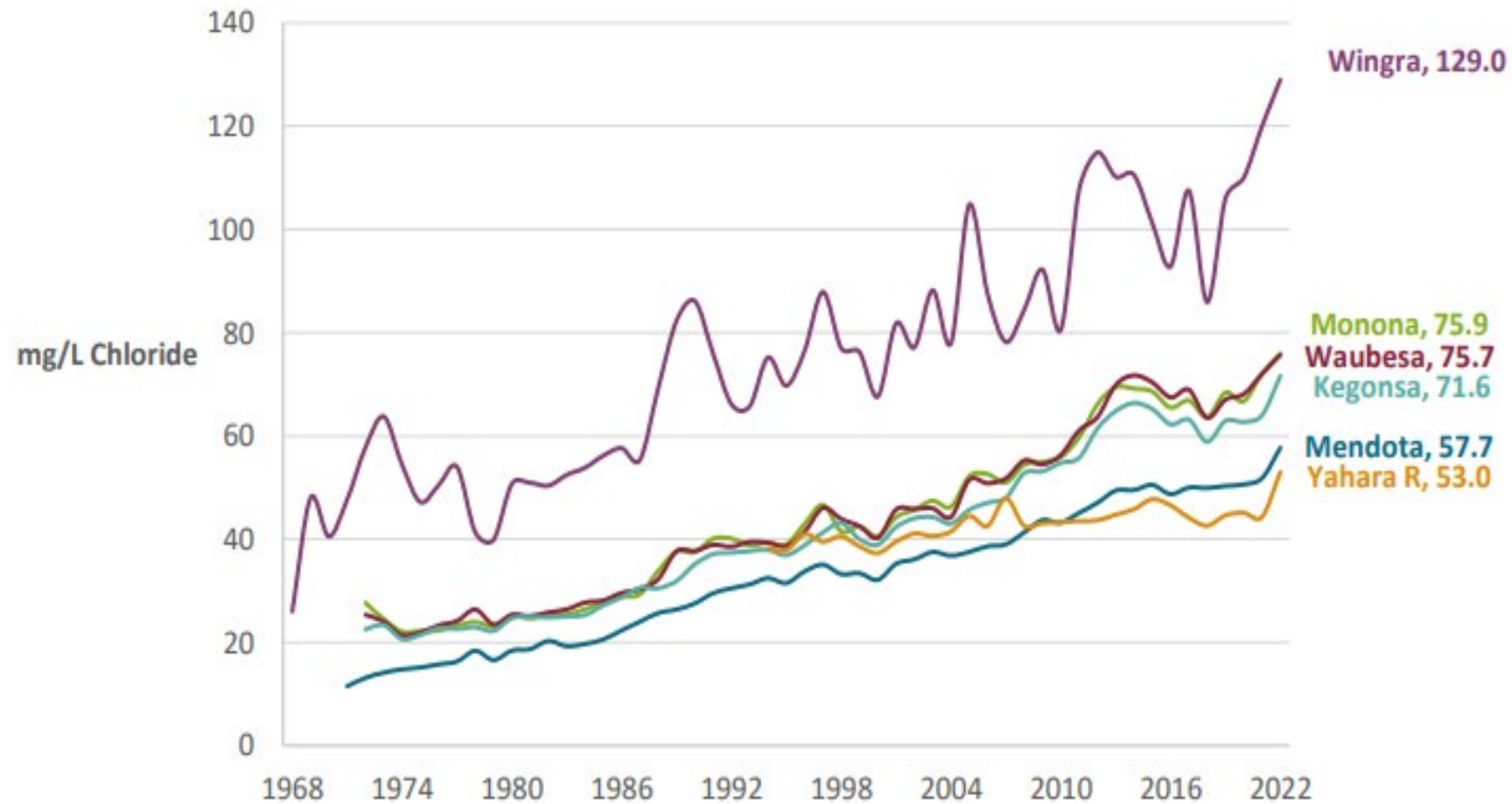


Madison-area lakes and groundwater show rising sodium and chloride levels that are related to winter road salt

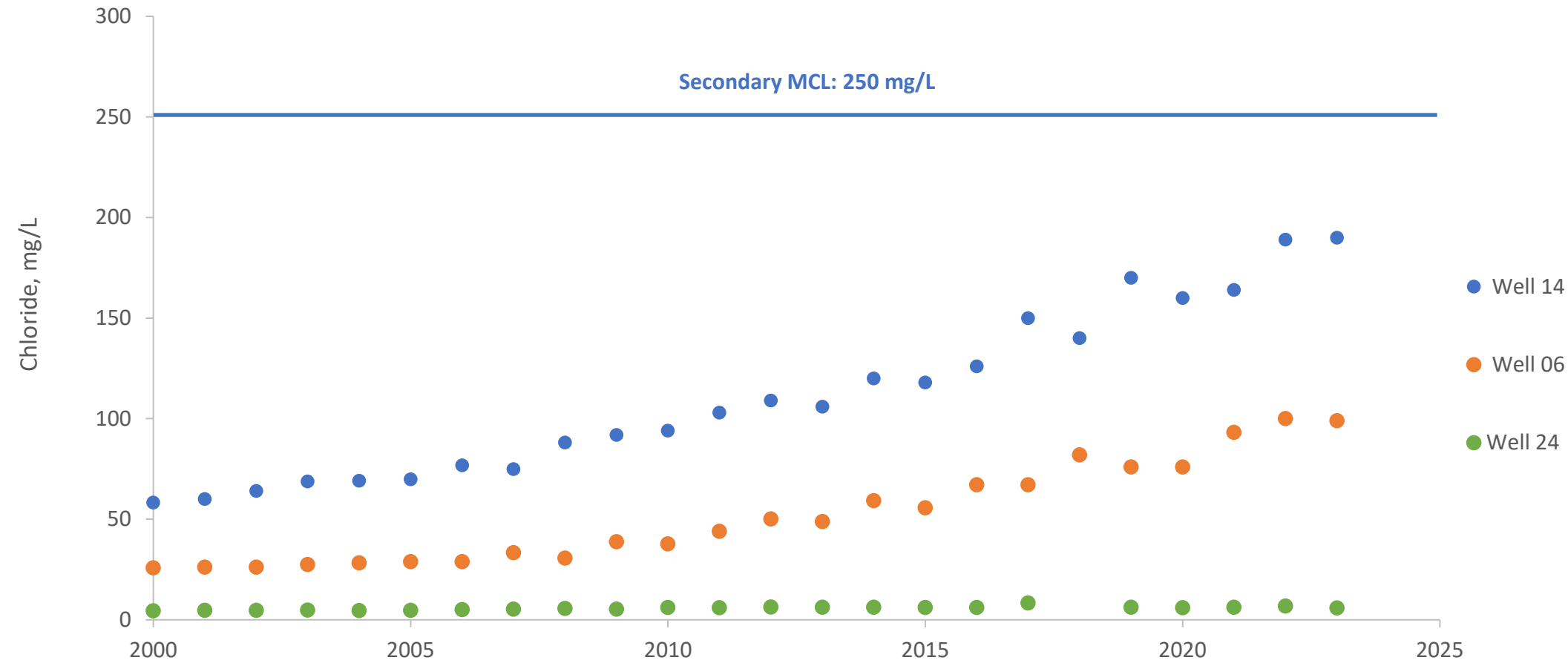
Over the last twenty years, sodium and chloride levels have more than tripled at some City of Madison wells

Deep aquifer wells are less vulnerable but still show signs of impact

Chloride in Madison-Area Lakes



Chloride in Select Madison Wells



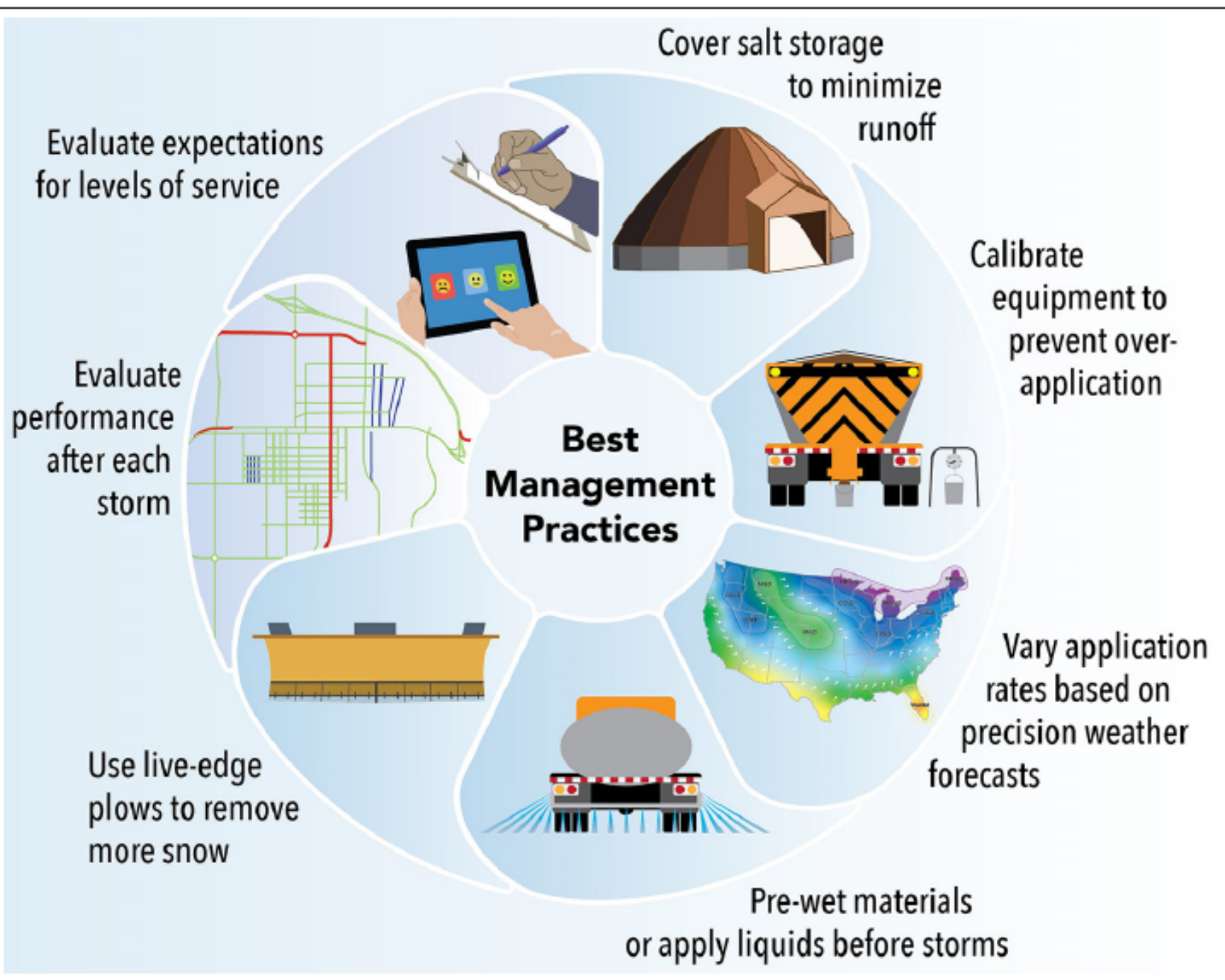
Effective Salt Management Practices

Examples of Best Practices:

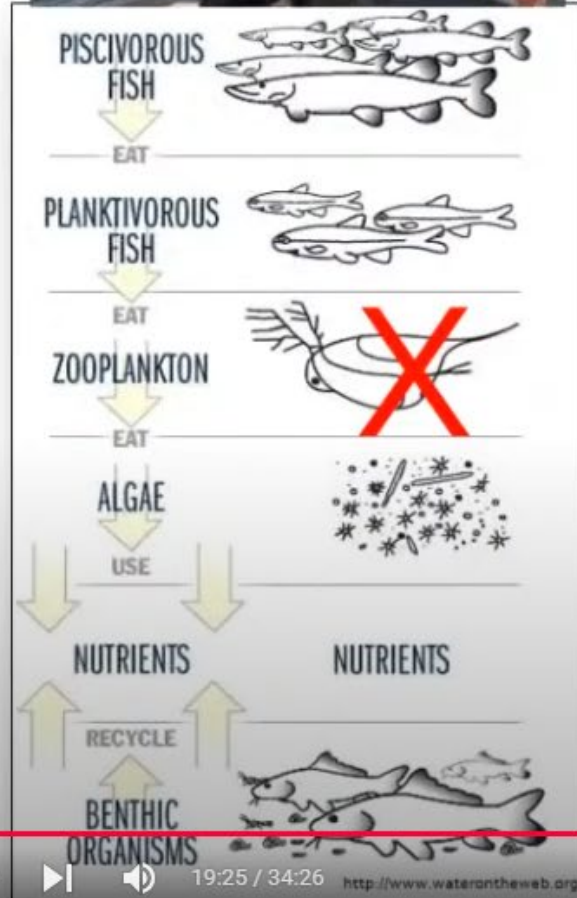
Responsible Use of Salt

*Allison Madison
Program Manager*





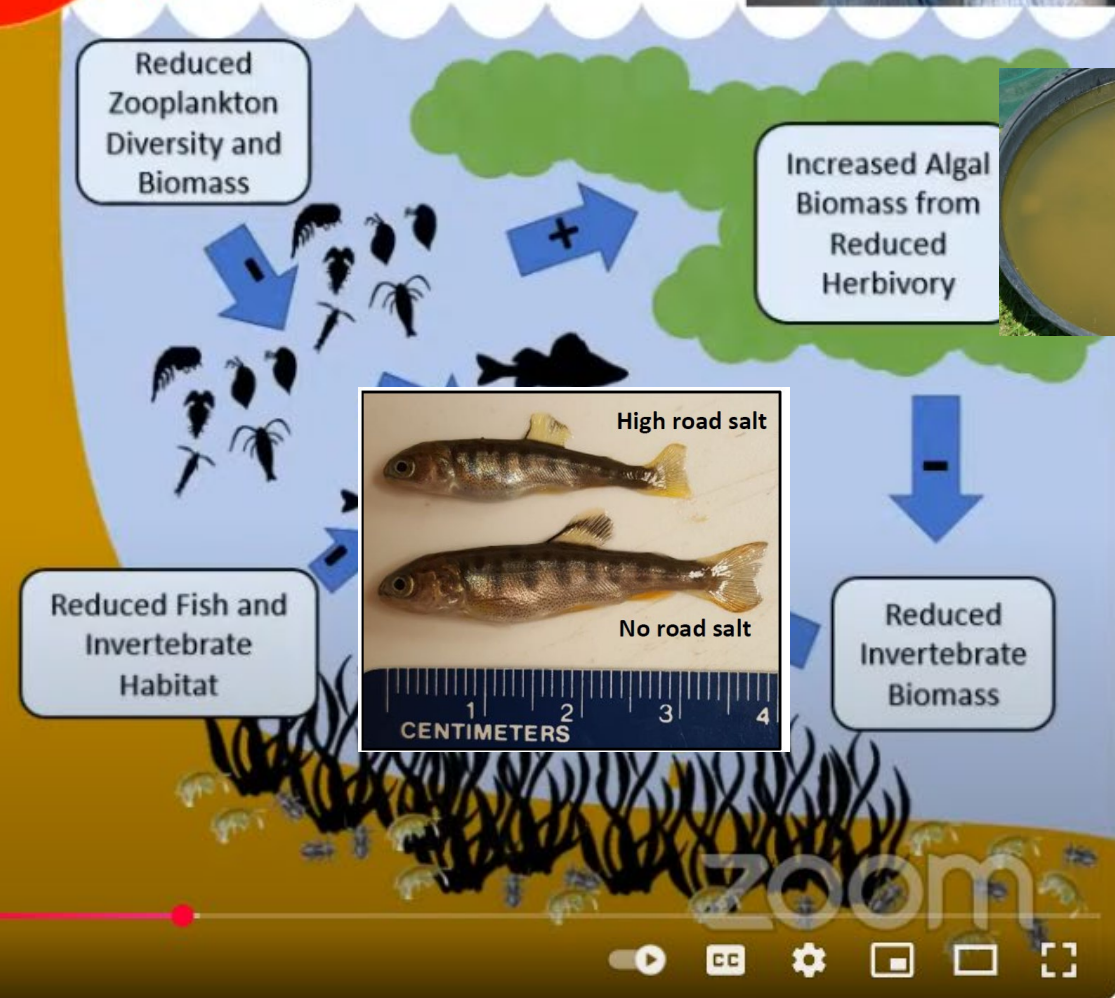
Allison Madison
wisaltwise@gmail.com



Salt
Pollution

Putting together the
impacts on lake f

Bill, University ...



Ecological Consequences of Salting our Freshwater

Bill Hintz, University of Toledo



WI Salt Wise
333 subscribers

Analytics

Edit video

15



Share

Promote

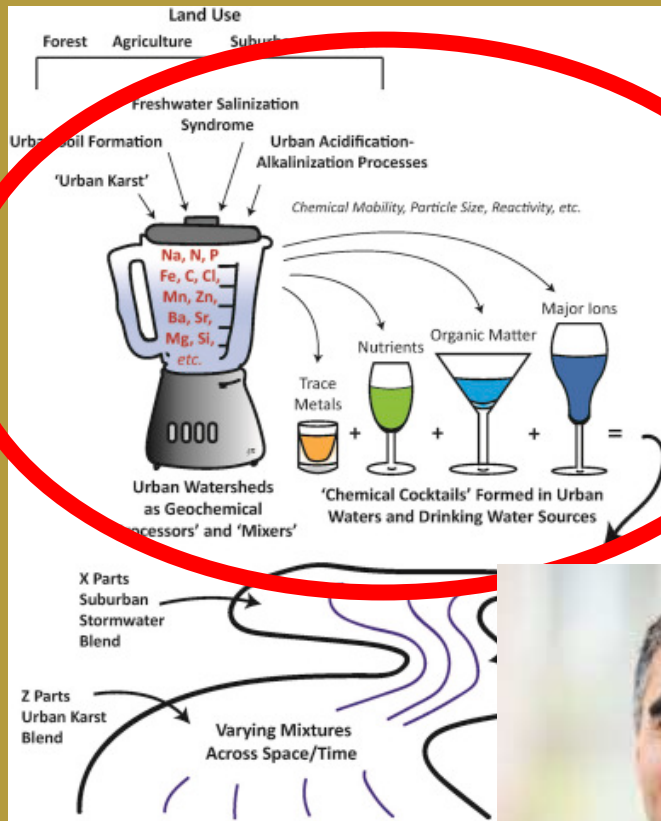
Download

Clip



424 views Streamed 1 year ago

Chemical cocktail formation and soil salinization



Sujay Kaushal,
University of Maryland



Brown water pours from an opened hydrant on Wednesday in Potomac, Md. Montgomery County residents have been making reports about it since March. Officials blame salt and manganese. (Michael S. Williamson/The Washington Post)

2024 Program Impact

- 11 agency trainings
- 9 equipment open houses
- 16 workshops
- 1,000+ industry professionals

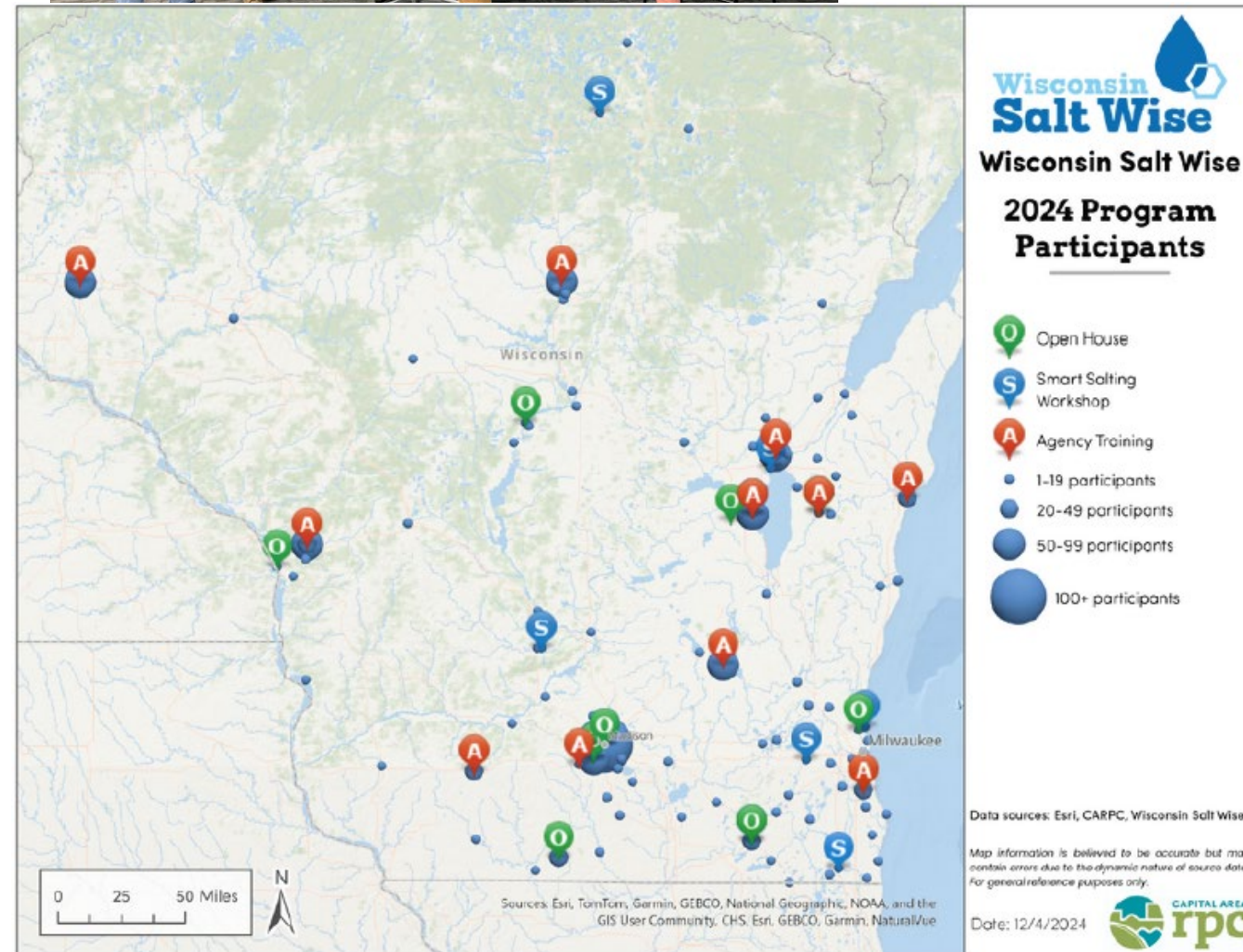
Wisconsin Salt Wise discusses smart salting ahead of winter

Caitlin Tyka Oct 23, 2024 Updated Oct 23, 2024 0

f x e i s



FITCHBURG (WKOW) -- Winter is right around the corner and crews are preparing



Addressing barriers: Liability Funding Public Perception



State of Wisconsin
2023 - 2024 LEGISLATURE

LRB-1077/1
ZDW:skw

2023 BILL

- 1 AN ACT to create 20.370 (4) (gs), 25.46 (1) (en) and 281.335 of the statutes;
- 2 relating to: creating a deicer applicators certification program and making an
- 3 appropriation.

Analysis by the Legislative Reference Bureau

This bill requires the Department of Natural Resources to develop a program for training and certifying individual commercial applicators of deicing substances in the best practices for the removal of snow and ice that protects water quality. Under the bill, a commercial applicator certified by DNR and the owner of real estate that contracts with a certified commercial applicator are not liable for damages arising from hazards resulting from the accumulation of snow and ice on any real estate maintained by the certified commercial applicator when the hazard is caused solely by snow or ice and the certified commercial applicator used best management practices for snow and ice removal and deicing approved by DNR.

For further information see the state fiscal estimate, which will be printed as an appendix to this bill.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

- 4 SECTION 1. 20.005 (3) (schedule) of the statutes: at the appropriate place, insert
- 5 the following amounts for the purposes indicated:

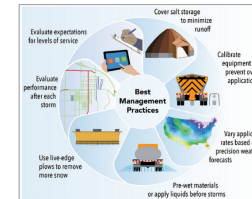


AMPLIFYING THE POWER OF BEST PRACTICES

To ensure the greatest impact of program dollars, all applicants should complete the Wisconsin APWA Excellence in Snow and Ice Control self-assessment as a pre- and post-measure of practices. This self-assessment requires evidence of calibration for each salt spreader. Calibration alone consistently cuts salt use by 20-40%.

Grant recipients should commit to pursuing smart salting training for operators and to host and/or attend a regional winter equipment open house to share their experience and learnings with a network of peers to further promote knowledge-sharing among agencies.

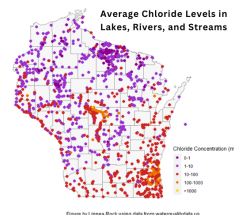
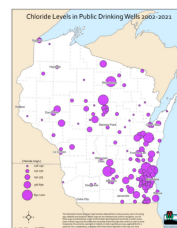
The scoring rubric for the grant applications could be designed to preferentially support communities of need: towns, villages, more rural counties, and/or joint applications with a coalition of agencies that wish to make a shared purchase of a brine maker, calibration scale, remote weather stations, etc.



EXAMPLES OF QUALIFIED EQUIPMENT

- Pavement temperature sensors
- Sectional or live-edge blades
- Rubberized blades
- Remote weather stations
- Pre-wet systems
- Anti-icing systems
- Storage tanks

SALT LEVELS: PAST, CURRENT, FUTURE



Background levels of chloride (salt) in drinking water and surface water are 0-10mg/L across most of the state.

Today, chloride levels are commonly in the 10's to 100's year-round and, spike into the 1,000's in our urbanized streams. 208 public drinking water wells exceed 120 mg/L, the preventative action limit for chloride.

WINTER SALT WEEK 2025

DAILY LIVE STREAMS: 1:30 PM ET / 12:30 PM CT

MONDAY AN EYE ON SALT POLLUTION

27
JAN

ABBY HILEMAN
IZAIAK WALTON LEAGUE OF AMERICA



TUESDAY DILUTION IS NOT THE SOLUTION

28
JAN

DR. JESS HUA
UW-MADISON FOREST AND WILDLIFE
ECOLOGY DEPARTMENT



WEDNESDAY PUBLIC WORKS PERSPECTIVES

29
JAN

MUNICIPAL AGENCY STAFF
MAINE, MARYLAND, MICHIGAN,
MINNESOTA, NEW JERSEY, NEW
HAMPSHIRE, OHIO, PENNSYLVANIA,
WISCONSIN,



THURSDAY POLICY SOLUTIONS PANEL

30
JAN

TED DIERS
NEW HAMPSHIRE DEPARTMENT OF
ENVIRONMENTAL SERVICES
CARA HARDESTY
OHIO ENVIRONMENTAL PROTECTION
AGENCY

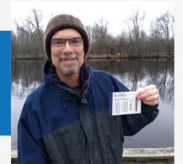


BRIAN GRUIDL
CITY OF BLOOMINGTON, MN

FRIDAY LOCAL ACTION DAY

31
JAN

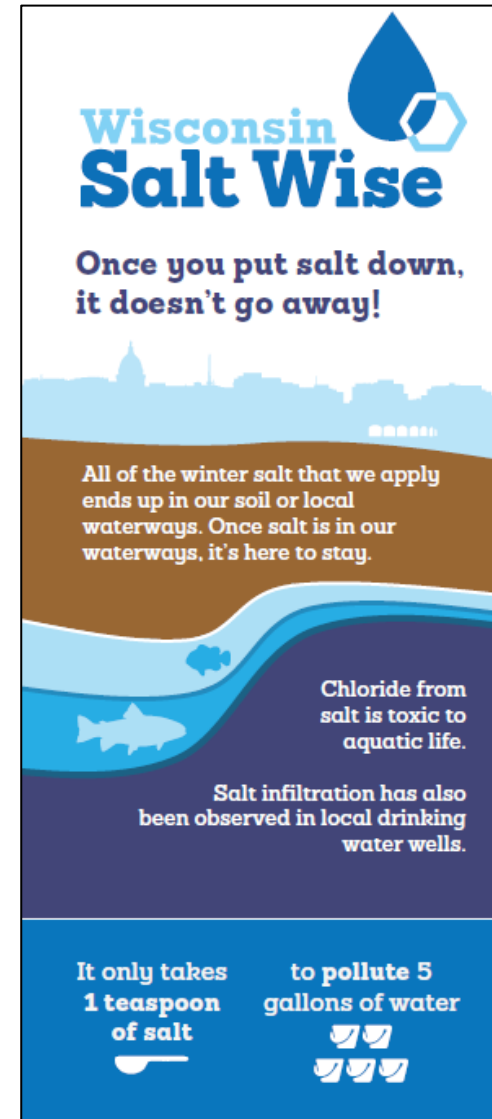
SALT MONITORING NEAR YOU
LOOK ONLINE FOR THE NEAREST EVENT



- 900+ registrants
- 30+ states
- 3,000+ views

Next Steps

- **2026**
 - Revamp “Salt Wise certified” contractor program
 - Virtual and in-person workshops for property managers/contract signers
- **EASY collaborations**
 - Join a Wednesday Webinar
 - Sign up for our quarterly newsletter
 - Like us and share posts on social media
 - wisaltwise@gmail.com
- **Secure funding for 2026**
 - Call/email state legislators - \$5 grant program
 - Water utilities across the state?!?
 - Other ideas?



Effective Salt Management Practices

Snow Response: *Effects on Drinking Water*

Charlie Romines
Streets Division Superintendent





Streets Division & Salting

Winter 2025

Charlie Romines Streets Division Superintendent



Not a New Problem

- All the salt from every salt user down on roads finds its way into our waters
- Enters the storm drains and out into our drinking water.
- This has been a known problem *for decades*
 - See this Capital Times article from **1977**.
- We **must** be cautious with salt

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 Kari Mohr says that would upset people needlessly when there is no real cause for alarm.

Using data collected by the city, Willard, Prince 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 '50s, 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. 4 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 55 ppm.

Two other wells of 14 tested had sodium levels above 20 ppm, the level at which the EPA advises a warning for those with high blood pressure, 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. 2 near Lake Wingra showed an increase in sodium from 10 ppm in 1951 to 35 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" in 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 dieticians 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 decline 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 5,001 tons of de-icing salt on its streets, according to streets supervisor Lloyd Sarbacker. 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.

The Salt Problem Isn't Just a Madison

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.

MISSOURI

FOX 2 now

Road salt runoff creates environmental harm to wildlife

Jan 14, 2025



Jun. 26, 2024

Road salt runoff causes increased chloride levels in Lake Champlain



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



January 25, 2023

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

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

Detroit Free Press

April 13, 2017

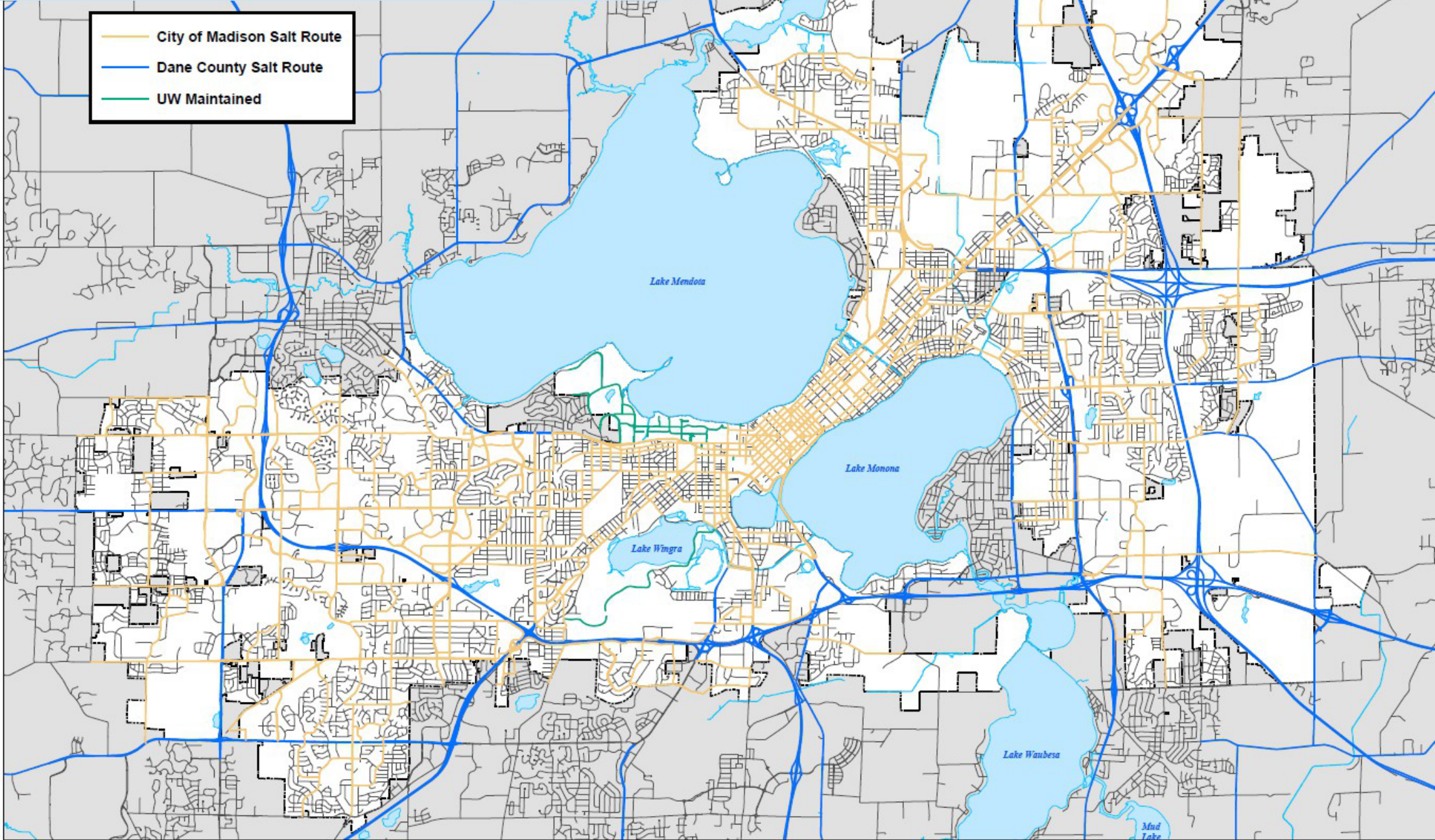
Michigan lakes are getting saltier; road salt to blame

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

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.

City of Madison is not the only salt applicator in the area



Dane County
Highway

University

Private lots &
roads

Other
municipalities

How does the Streets Division use salt on the roads?



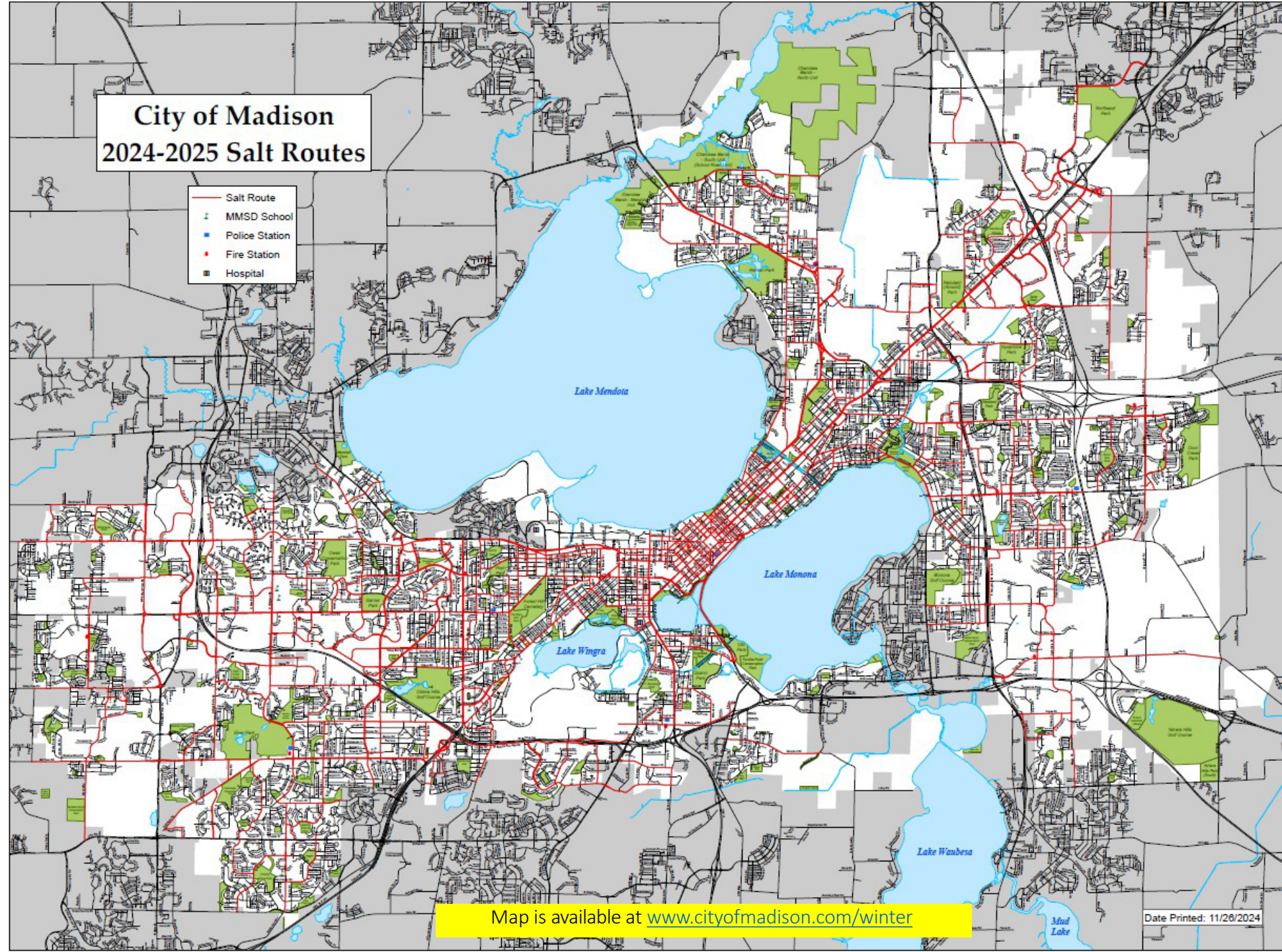
Salt spread on salt routes only.

Salt applied at rates appropriate for weather conditions.

782 miles of traffic lanes that make up the main thoroughfares.

32 individual trucks cover these routes. Each truck takes roughly 3 hours to complete 1 lap through route under best case conditions.

Used by Metro Buses, near schools, near emergency services (hospitals, fire stations, etc.)



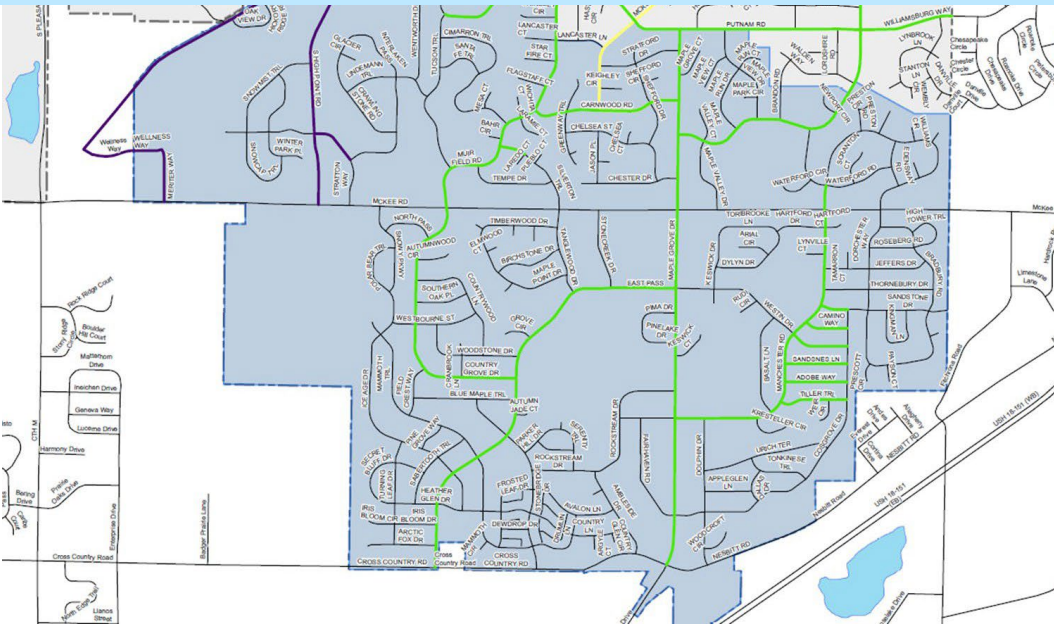


How does the Streets Division Control Salt Use

Pre-treat brining when conditions allow



Route Evaluations & Reductions



How the
Streets
Division
Controls
Salt Use



Salt Applicator Trainings

Equipment Calibration



Improved Salt Use Tracking

Still Learning and Improving



Piloting new style of plow blade that may conform with the road surface better



Vaisala GroundCast monitors to help get more accurate pavement temperatures

What Salt Routes Look Like (Eventually)

Salt, time, temperature, and traffic combine to help make roads free from snow (mostly).

This is Olin Ave between S. Park Street and John Nolen Drive.



When it's it's too cold to salt.

This is Colony Drive between Inner and Gammon. It's part of the salt route for John Muir Elementary. Sand used for traction since temperatures were below 20 degrees.



This is a plowed residential street.



Magnesium Chloride (New for 2024-2025)



Average Tons of Salt Used by the Streets Division from
Winter of 2018-19 to Winter of 2023-24:
8,199.88 tons



Effective Salt Management Practices

Questions / Comments ?

