Clean Water, Safe Roads

We Shouldn't Have to Make a Choice

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Salt Summit-Lake George Association-
October 13, 2022

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Summary PowerPoint Created by Katie Whittaker, CAC Member, Town of Beekman , New York

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The Agenda

Session 1 (8:00-9:20)

8:00am **Welcome**
Kathy Flacke Muncil, CEO & Board Chair, Fort William Henry Corporation
Matt Simpson, NYS Assembly, Horicon

8:15am **Jefferson Project Update**
Jonathon Berrelli, PhD, Renesselaer Polytechnic Institute

8:40am **Impacts of Salt Storage in Lake George Watershed**
Brea Arvidson, Manager, Water Quality Research, Lake George Association

9:05am **The Art of Water Quality**
Michale Glennon, PhD, Paul Smith's College

Session 2 (9:35-10:50)

9:35am **The Evolution & Economics of the Lake George Salt Reduction Initiative**
Introduction: Eric Siy, President, Lake George Association
Phill Sexton, Founder & Managing Director, WIT Advisors

9:45am **Progress on Movement to Brine**
Fort William Henry, Warren County DPW, Town of Queensbury, Town of Hague, Town of Peru, and Town of Edinburg

10:15am **SWiM Certification Presentation**

10:20am **Clean Water Safe Road Program**
Sawyer Cresap, Executive Director, AdkAction

10:35am **Sponsor Presentations**
James Hignight, Deicing Depot; Steve Sepaniak, Metal Pless; Joe Cashin, Innovative Surface Solutions

Session 3 (11:00-1:15)

11:00am **Demos**
Live demos, with videos and interviews for virtual attendees

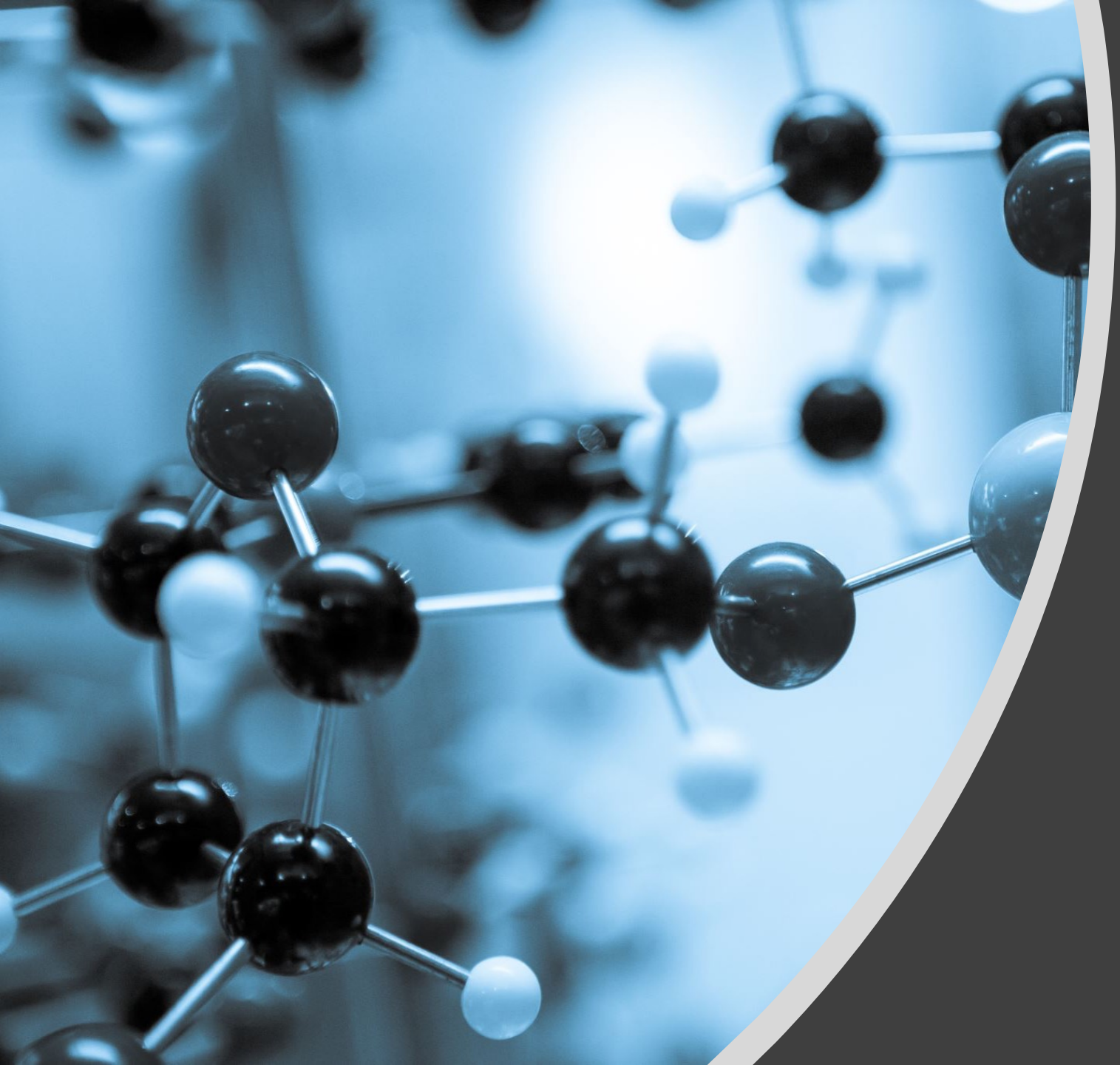
12:00pm **Lunch**

12:30pm **Keynote and Q&A: The Global and Local Need to Strengthen Our Clean Water Laws**
Marc Yaggi, Chief Executive Officer, Waterkeeper Alliance

Session 4 (1:15-3:00)

1:15pm **Road Salt Reduction & The Issues and Concerns that Effect The Adirondack Park – Panel Discussion**
Bob Kafin, Environmental Lawyer, Adirondack Council; Tracy Eldridge, Superintendent, Hamilton County DPW; Dave Miller, Clean Water Program Coordinator, Adirondack Council; Phill Sexton, Founder & Managing Director, WIT Advisors

2:15pm **Clear Roads Project Using GIS to Highlight Highway Segments Sensitive to Deicing Materials**



The Science

Lake George- Specific Info

- Sulfate and nitrogen are decreasing in Lake George- sulfate is decreasing due to a decrease in acid rain
- Alkalinity, chloride and sodium have increased in Lake George
- Temperature and chlorophyll are also increasing but not as rapidly
- Data from surface/below surface and deep water/shallow water portions of the lake are similar for chloride
- On average, chloride is higher in shallow nearshore areas, but not by much
- RATE OF CHANGE IN CHLORIDE (commonly used Earth Science equation): Chloride is increasing at variable rates. In 2013/2014 there was a large spike, then rate decreased. Why???? (not answered)
- Actions to decrease salt are working, but levels are still very high
- In the 1970s, salt was 4 mg/L. It is now in the 40s mg/L. Goal: 10 mg/L

Impact of Higher Sodium Chloride Levels in Mirror Lake

MIRROR LAKE COMPLETELY TURNED OVER IN SPRING OF 2022 FOR THE FIRST TIME SINCE 2020, AND FOR ONLY THE SECOND TIME IN THE LAST FIVE YEARS.

MIRROR LAKE FAILED TO TURN OVER IN 2017, 2018, 2019 AND 2021 BECAUSE OF A HIGH CONCENTRATION OF SALT IN THE LAKE — A DIRECT RESULT OF ROAD SALT USE, ACCORDING TO AUSABLE RIVER ASSOCIATION WATER QUALITY ASSOCIATE LEANNA THALMANN

TURNOVER IS IMPORTANT FOR LARGE LAKES BECAUSE THE PROCESS REPLENISHES OXYGEN AND DISTRIBUTES NUTRIENTS THROUGHOUT THE LAKE. TURNOVER IS A PROCESS THAT MOST LAKES GO THROUGH EACH FALL AND SPRING, ACCORDING TO THE AUSABLE RIVER ASSOCIATION.

SOURCE AND MORE INFORMATION CAN BE FOUND HERE: HTTPS://WWW.ADIRONDACKDAILYENTERPRISE.COM/NEWS/LOCAL-NEWS/2022/08/MIRROR-LAKE-SALT-LEVELS-CONTINUE-TO-DROP/#:~:TEXT=MIRROR%20LAKE%20FAILED%20TO%20TURN%20OVER%20IN%202017,,BOTTOM%20OF%20THE%20LAKE,%20WHICH%20CAN%20PREVENT%20MIXING.

Studying Impacts

- Food webs are often used to look at impacts and changes
- Acceptable safety threshold in the US: <230 mg/L (less in Canada)
- When studying impacts on aquatic species, it is also important to look at the species, the design of the experiment, and other environmental factors/stressors
- See higher concentrations in the streams than the lakes

Solutions, Actions, and Implementation

Some Background….

1 teaspoon of salt pollutes 5 gallons of water

1 tonne salt = ~159,500 teaspoons

1 tonne salt = ~2000 pounds

~193,000 tonnes of salt applied annually in the Adirondack Park

It is projected that if salt use is reduced by 50%, there would be around $12+ million in savings

Reducing Salt

- Calibrating machinery (at least 2x per year)
- Computerized application systems
- Road temperature data to determine output necessary (data on temperature and salt concentrations can be found on a slide later on in this presentation)
- Measuring routes
- Automated technology to keep application amounts consistent
- Live edge plows that can remove snow more effectively from roadway, reducing need for salt application- some of these live edge sectional plows saves on gas mileage
- Pre-wetting ahead of storms
- GPS data
- Applying an aggregate (additive for grip used in freezing rain)
- Anti-icing (granular base just before storm in lower traffic conditions- turns into brine on contact instead of the liquid brine which can create more ice)
- Use scales to weigh trucks to see how much salt is being used to make sure it is not excessive

More Possible Salt Reduction Strategies

- Hotels such as Fort William Henry uses a chloride-free treatment (potassium formate- this compound has been studied as a potential environmentally friendly deicing salt for use on roads)- As a result, there is less tracking in of salt, less destruction to carpeting, and less destruction to concrete areas
- Using RWIS (Road Weather Information Systems) and camera technology to better anticipate needs in a storm- more information on RWIS can be found here: http://www.utrc2.org/sites/default/files/Final-Report-Road-Weather-Information-Systems.pdf

  https://trid.trb.org/view/1552380
- Cut down trees near roadways to increase sun exposure

(need to consider impacts of cutting down the trees on soil erosion, increased runoff, loss of habitats/nesting spots, etc)

- Number that kept coming up- may be a potential goal: 100 pounds per lane mile-one town started with more than double this and didn't see any negative change with the decrease (only positives!!!)

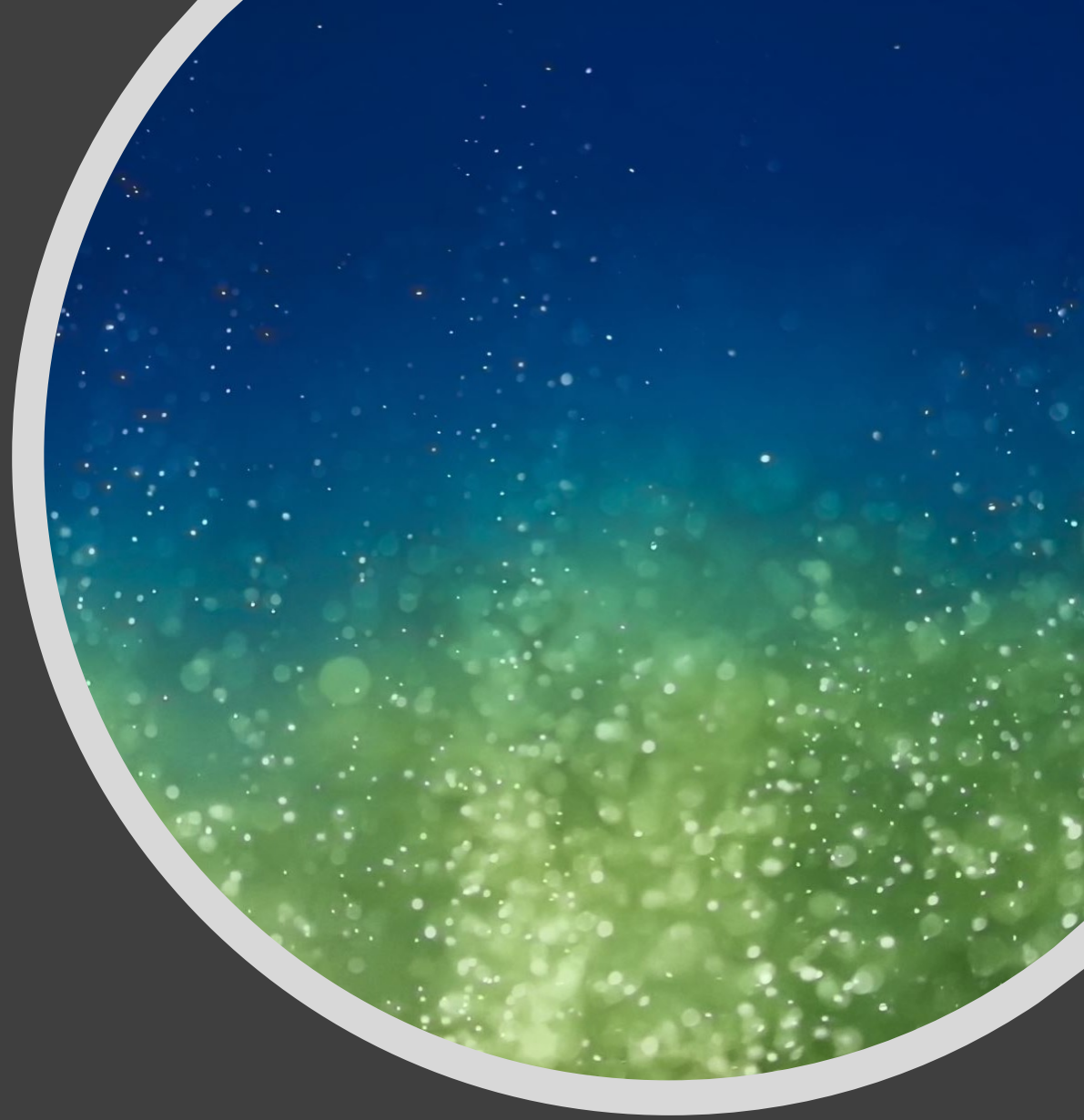
And some more!

- Encourage cultural shifts in driving behaviors (like decreasing motor vehicle speed in snow/ice storms)
- Some salt suppliers penalize those buying the salt if they do not use 75% of salt requested- working to remove this penalty and make it unlawful to enforce may encourage some groups to decrease salt use
- Solar salt- less impurities, but still high in sodium chloride!- Using this may mean lower need for salt overall, decreasing the amount used. More info on types of salt here: https://www.indywaterpros.com/blog/types-of-water-softener-salt

Brine Makers

IT IS POSSIBLE THAT BRINE MAKERS COULD BE BORROWED FROM OTHER MUNICIPALITIES-WARREN COUNTY HAS SOME AS PART OF A GRANT-LIKE PROGRAM THAT CAN BE BORROWED. OTHER TOWNS/COUNTIES MAY HAVE SOMETHING SIMILAR OR SOMETHING SIMILAR THAT COULD BE INSTATED.

SOME TOWNS ARE TESTING “BRINE ONLY” TREATMENTS WITH NO USE OF ROCK SALT TO SEE RESULTS- THIS IS BEING DONE ON CERTAIN ROADS WITH CERTAIN TRAFFIC CONDITIONS



Freezing rain requires more salt, but there is a point where salt addition does not make a difference!

Interesting Concept!: Straight salt takes less salt overall than when the salt is mixed with other components such as sand

2022 SALT SUMMIT

DE-ICERS	STARTING CONC.	SG (Lbs / Gal)	EUTECTIC TEMP.	Lbs of Active Ingredient /Gal	Cl IONS %	Cl IONS (Lbs / Gal)	GALLONS OF DEICER REQUIRED TO MELT 100 LBS OF ICE				LBS CHLORIDE ION CONTRIBUTION TO MELT 100 LBS OF ICE			
							23° F	14° F	5° F	-4° F	23° F	14° F	5° F	-4° F
Salt Brine (23.0%)	23.0	9.81	-6° F	2.25	60.66%	1.37	5.4	15.9	48.3	226.6	7.4	21.7	66.1	310.0
$MgCl_2$ (30%)	30.0	10.76	-27° F	3.22	74.47%	2.40	2.8	5.4	8.1	11.4	6.8	12.9	19.5	27.3
$CaCl_2$ (30%)	30.0	10.73	-53° F	3.23	63.86%	2.06	3.4	6.5	10.8	16.1	7.0	13.3	22.2	33.0
MAG 22%	22.0	10.09	-27° F	2.21	74.47%	1.65	4.6	9.9	17.4	26.4	7.6	16.4	28.7	43.7
$MgCl_2$ & Corn Syrup	27.0	10.76	-85° F	2.90	74.47%	2.16	2.5	4.6	6.8	8.7	5.4	10.1	14.8	18.9
$MgCl_2$ & Molasses	22.4	10.84	-49° F	2.43	74.47%	1.81	2.1	3.7	5.9	10.0	3.7	6.7	10.7	18.1

Progress on Movement to Brine: Representatives from Fort William Henry Hotel and Various Town/County Highway Departments

Clear Roads Project-Joe Thompson NYSDOT

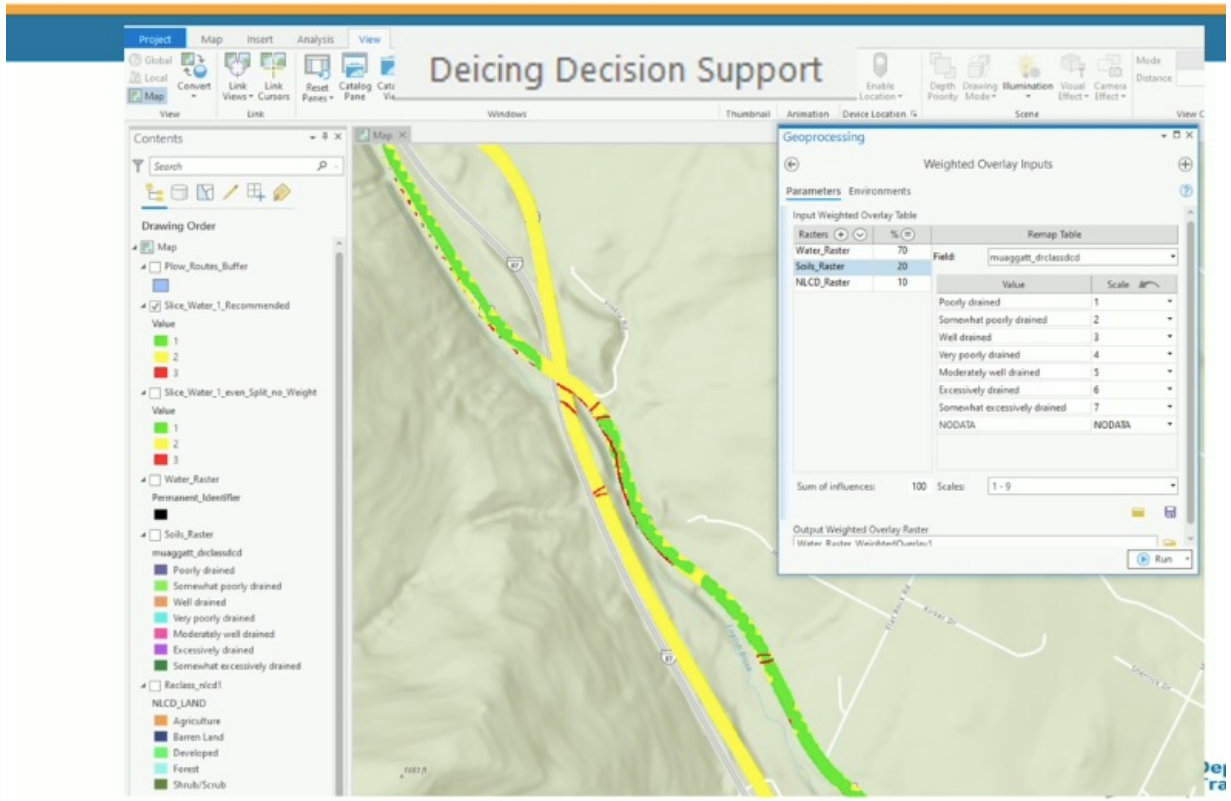
Website in the Additional Resources section

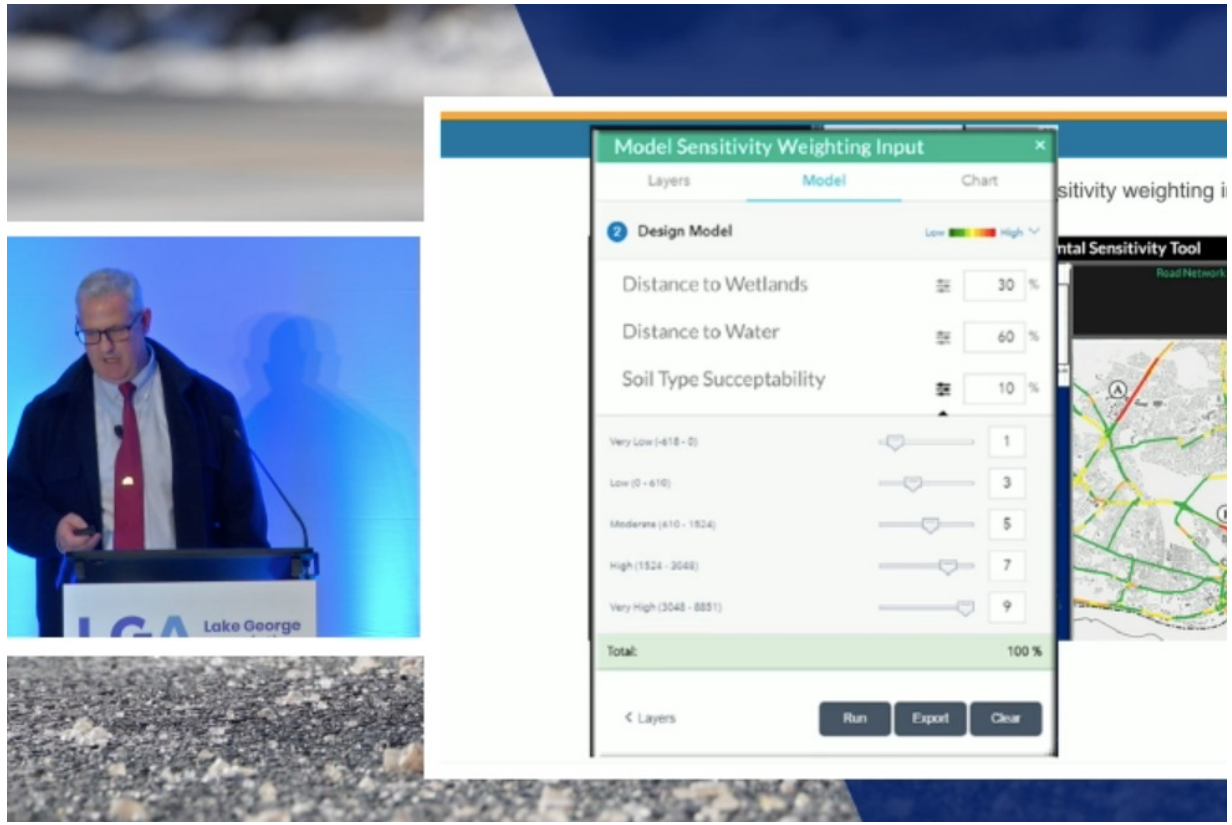
Project Goal: To improve planning by developing an easy-to-use GIS tool that will help agencies to identify roadway segments where vulnerable environmental resources may be impacted by snow/ice control activities

Things to consider: Salt storage and transport, water quality, impacts to lakes and streams, impacts to groundwater, surface impacts, vegetation impacts, fish and wildlife impacts

Data is nationally available

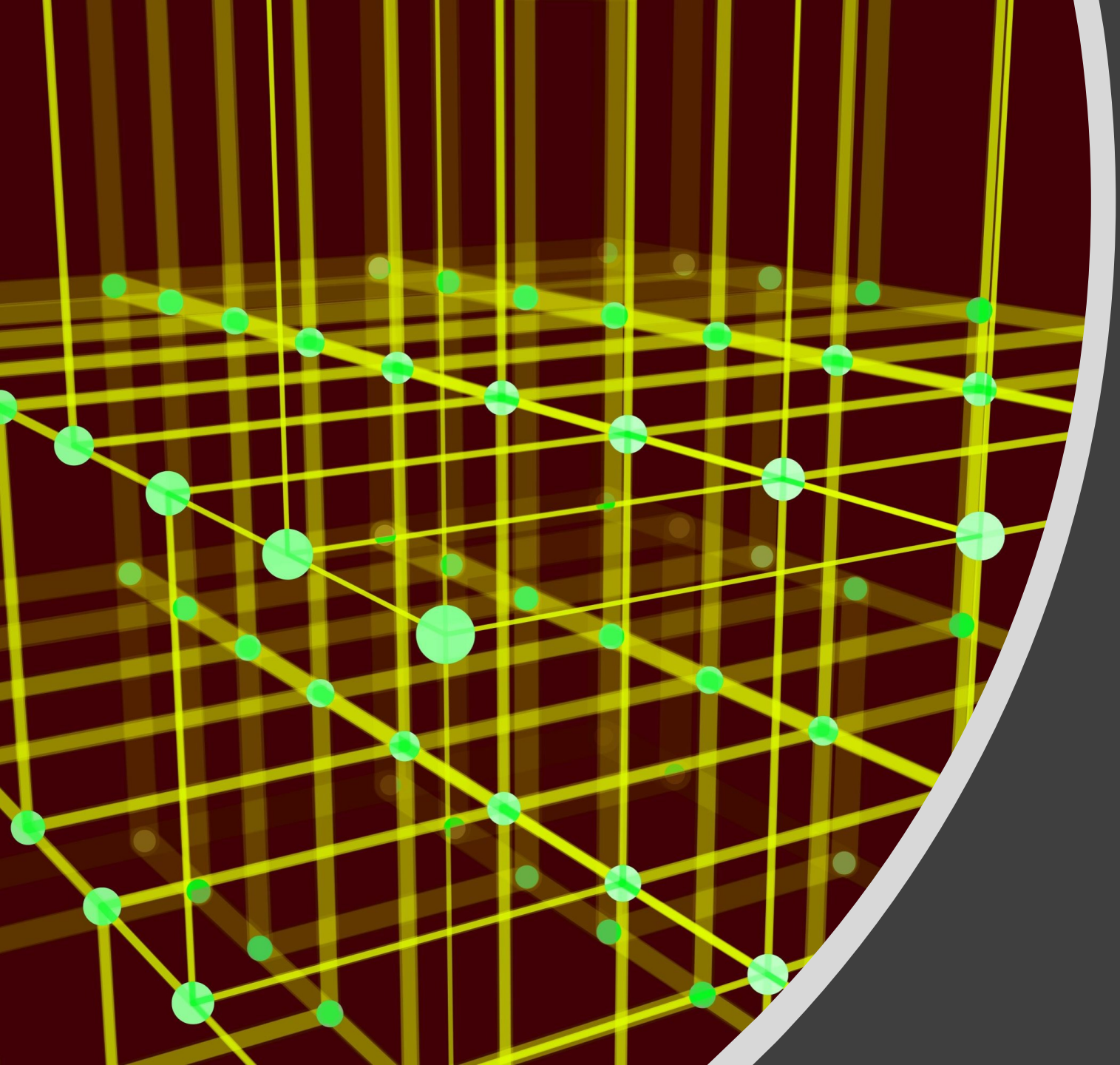
GIS Program Outputs





Salt Transport- Wasteful vs. Not Wasteful

- 4 Things Happen
- Bounces off the road if the truck is going to fast
- Gets blown off to the shoulder by traffic
- Gets plowed off
- Turns into brine and does its' job



Other

Additional Perk:

- Using less sand/salt not only protects the environment, but lessens the amount of cleanup needed in the spring
- Here is some more information on the NY Road Salt Reduction Act: https://www.lakechamplaincommittee.org/learn/news/item/ny-road-salt-reduction-act-signed-into-law

Private and Commercial Sector Concerns

Concerns were raised about the private sector and their applications

This includes private property owners and commercial road maintenance groups

Most of the salt runoff is coming from private property into Lake George- as a community we need to look at individual practices and go chloride-free if possible (this applies to areas outside of Lake George!)

Contractors watch their bottom line more than anyone- they want savings, so it is important that salt saving/money saving techniques are shared with them as well

The Art of Water Quality

- Data can be represented in knitting
- This project blends data with art
- Ideas for winter pieces: freeze records from the NWS (www.weather.gov/btv/lakeclose), snowfall record, ice fishing data, etc.
- More resources for data and examples are listed at the end of this presentation

Additional Resources and References

- Jefferson Project- Johnathan Berrelli- https://JeffersonProject.live
- Impacts of Salt Storage in Lake George Watershed- Brea Arvidson
- The Art of Water Quality- Michale Glennon-Science Director-willing to put data into fiber and has money to transport gallery- mglennon@paulsmiths.edu- www.adkwatershed.org/wool-water
- Road Salt Data:

a. https://www.adkwatershed.org/sites/default/files/alap_2018_v1_web.pdf
b. https://www.ausableriver.org/watershed/lakes/mirror-lake/current-water-quality

- The Evolution & Economics of the Lake George Salt Reduction Initiative- Eric Siy, Phill Sexton
- Clean Water Safe Road Program- Sawyer Cresap- ADKAction- https://www.adkaction.org/project/reducing-road-salt/
- The Global and Local Need to Strengthen Our Clean Water Laws- Marc Yaggi- CEO- Waterkeeper Alliance
- Clear Roads Project Using GIS to Highlight Highway Segments Sensitive to Deicing Materials- Joe Thompson, NYSDOT (https://clearroads.org)
- Sponsors: De-Icing Depot, Metal Pless, Innovative Surface Solution (Joe Cashen- willing to speak with Town Boards and has extensive presentation)