

The State of Chlorides in New Hampshire

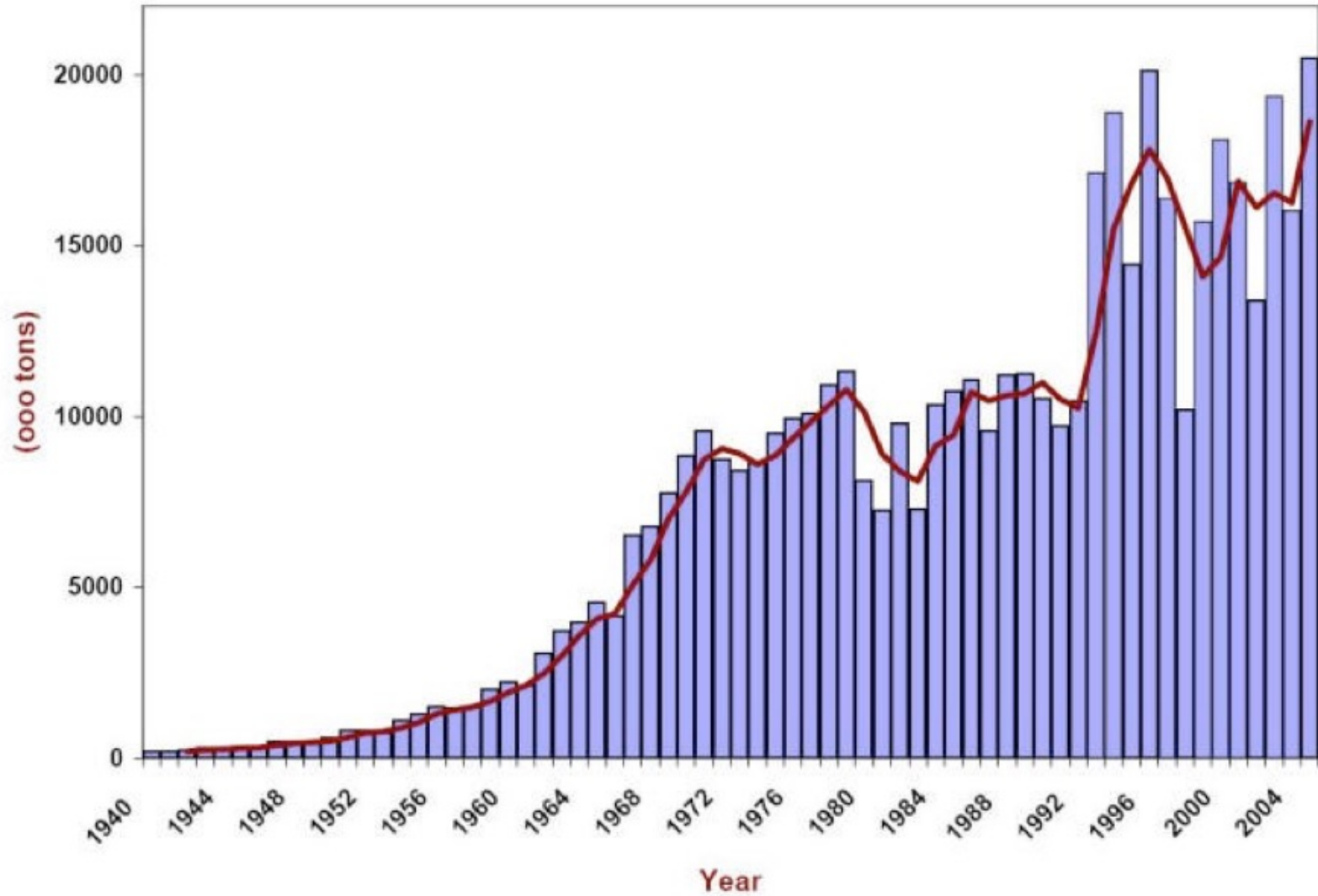


**Connecticut
Extension Webinar**
March 20, 2018
Ted Diers, NHDES

Separated at birth?



Salt use in the US



Source: Salt Institute

Why do you care about salt?

1. Infrastructure impacts.
2. Environmental impacts.
3. Winter maintenance costs.
4. Regulatory pressure.
5. *My boss makes me care.*



Why salt matters ...



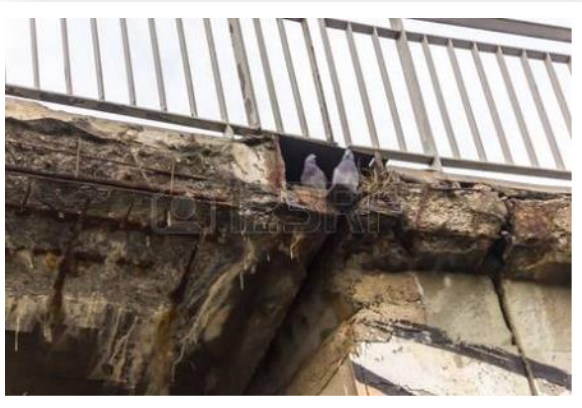
Dead trees



Wells



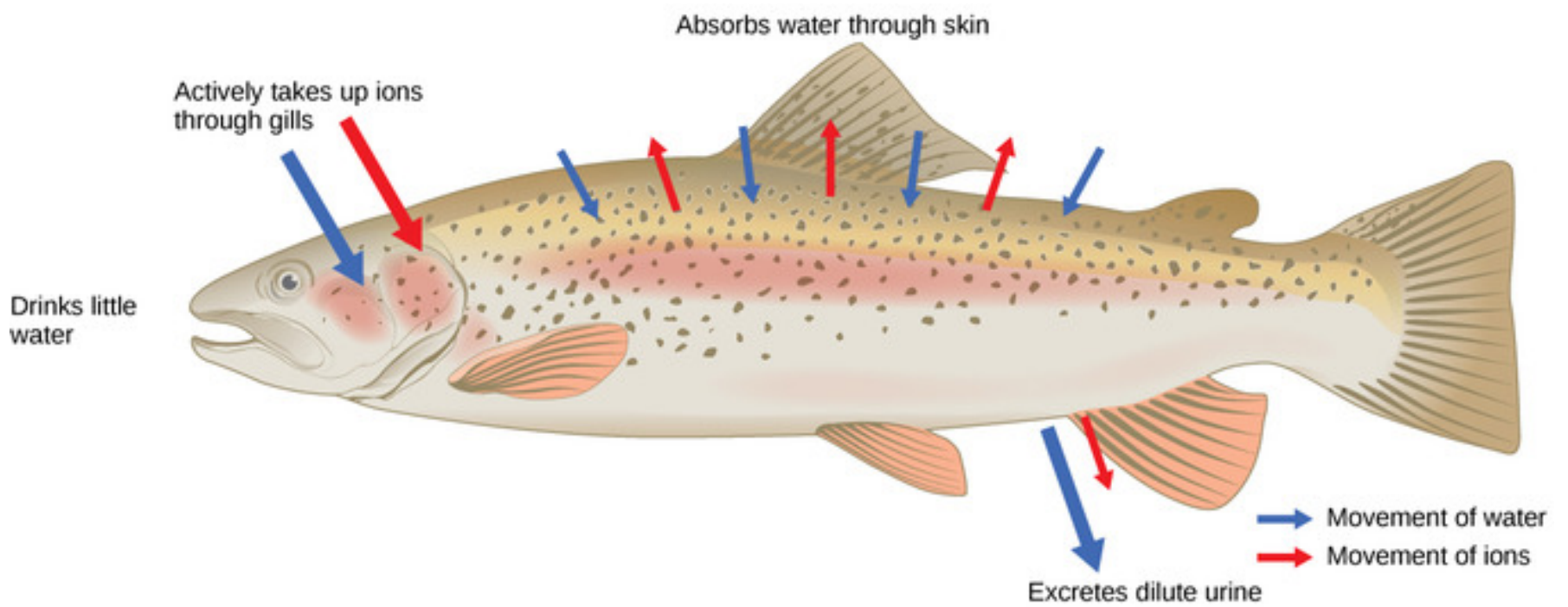
Toxic for fish



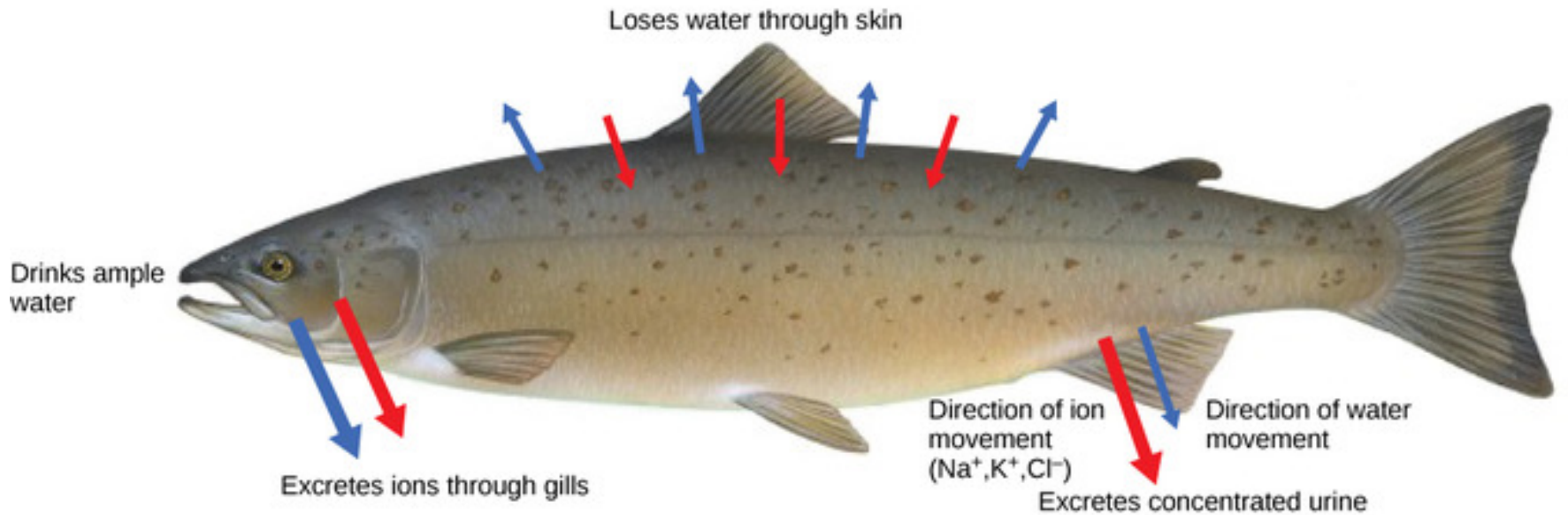
Infrastructure
damage



Limits to
development



(a) Osmoregulation in a freshwater environment



(b) Osmoregulation in a saltwater environment

Mg/l = ppm

| | Cl- (mg/L) |
|---------------------------------|---------------------------------------|
| Human health | 250 |
| Wildlife | 600 |
| Aquatic organisms | 860 – 1-hour mean 230 – 4-day mean |
| Terrestrial and emergent plants | 300 |
| Aquatic plants | 200 – 36,400 |



-- Chloride is the problem.

-- Mussels, zooplankton and macroinvertebrates very sensitive

Other issues

- Density of runoff water
 - Effect on phosphorus
- Combination effects
 - Chloride PLUS
 - acidic PLUS
 - low-hardness PLUS
 - low DO

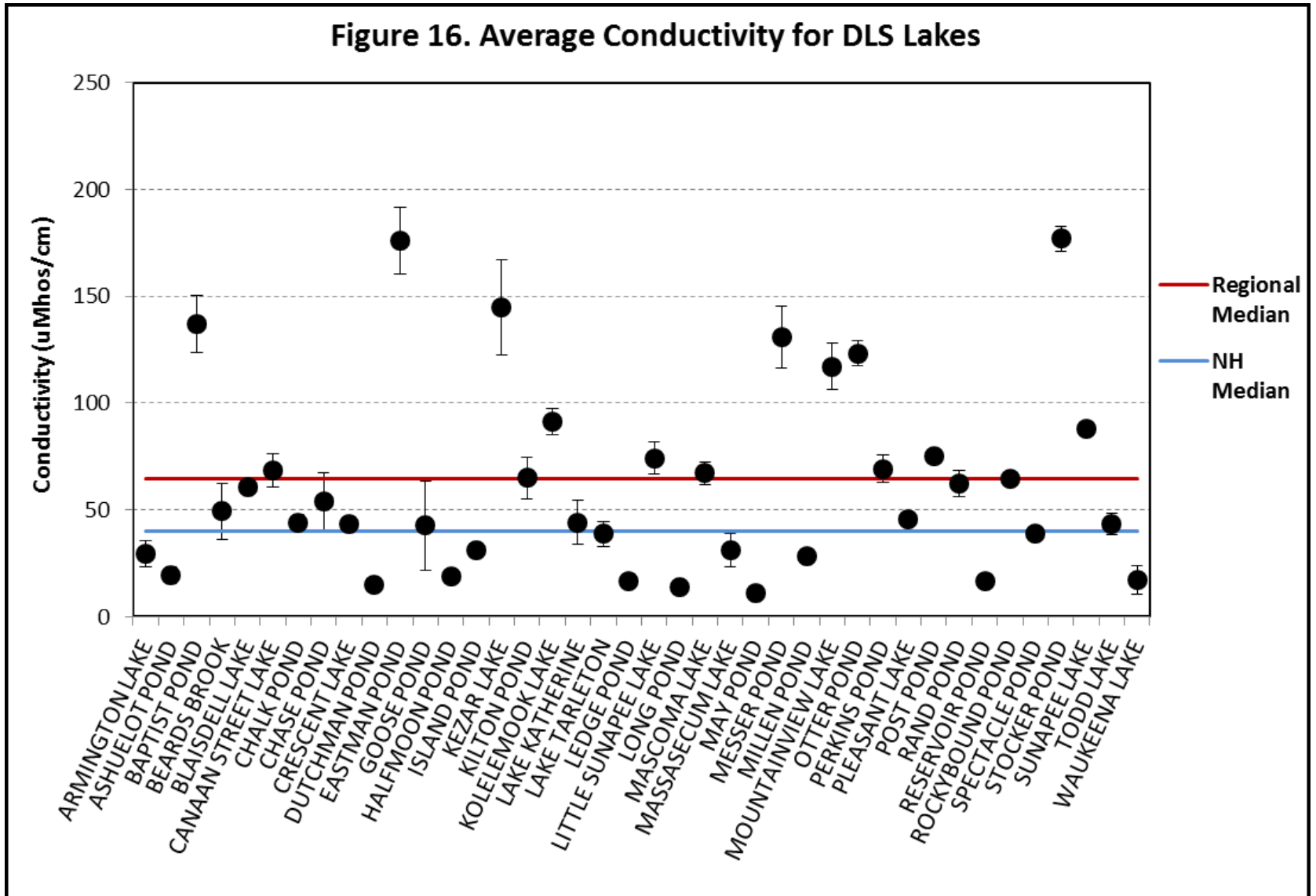


Tap Water



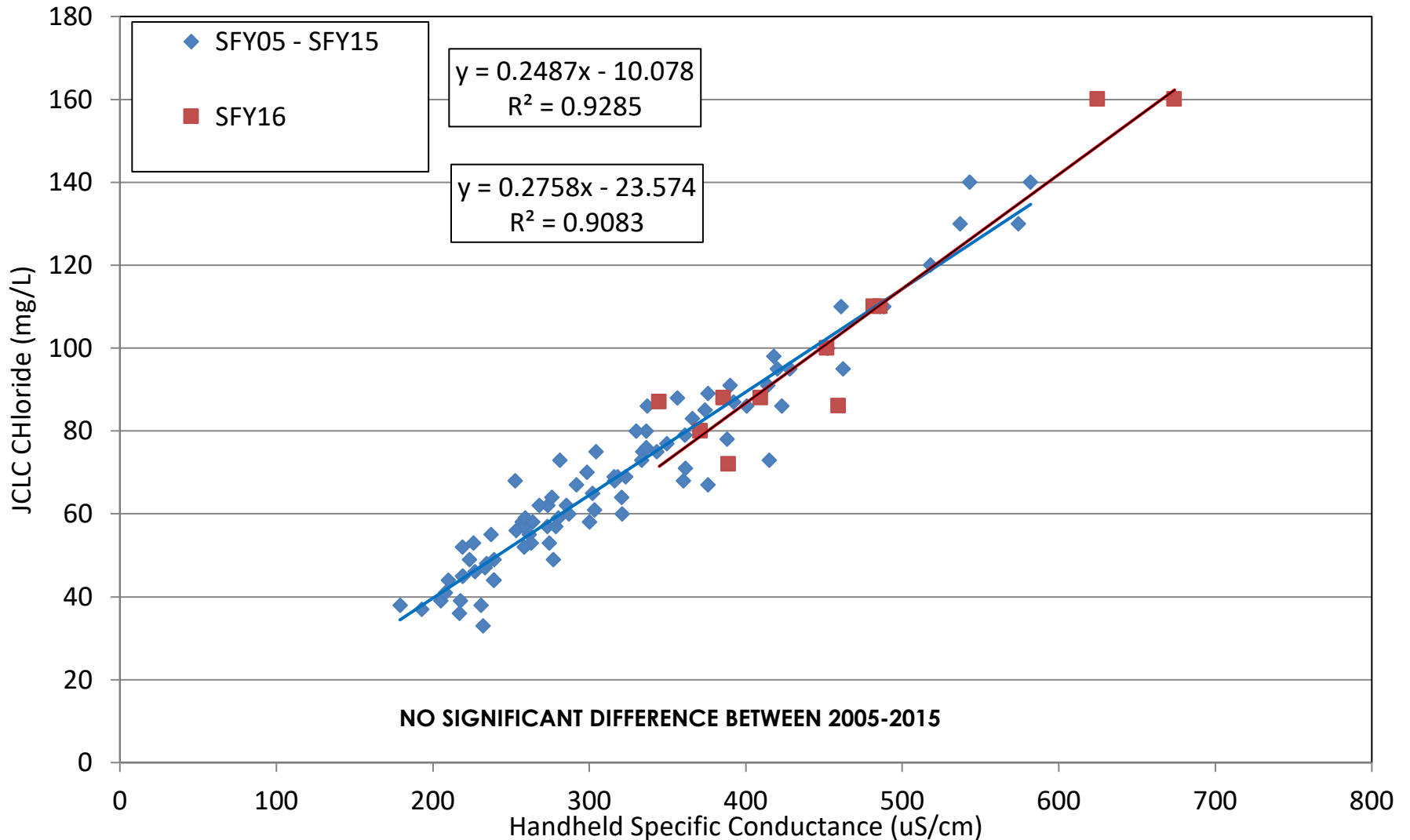
Salt Water

Figure 16. Average Conductivity for DLS Lakes

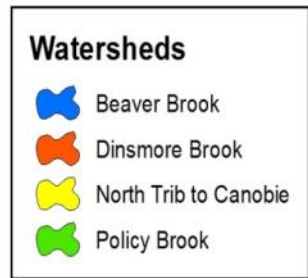
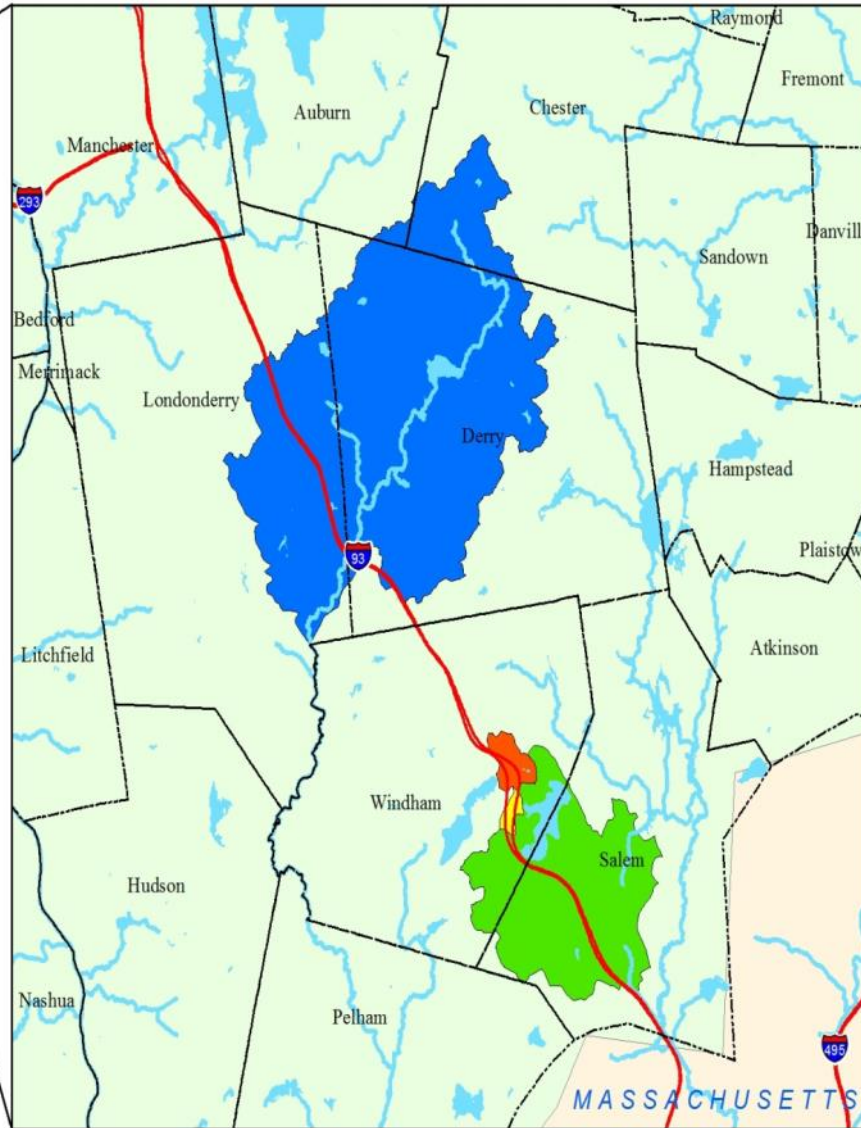
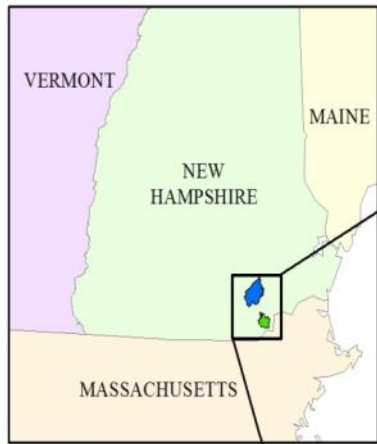


Yes, the problem is salt

10A-BVR JCLC Chloride vs Handheld Specific Conductance



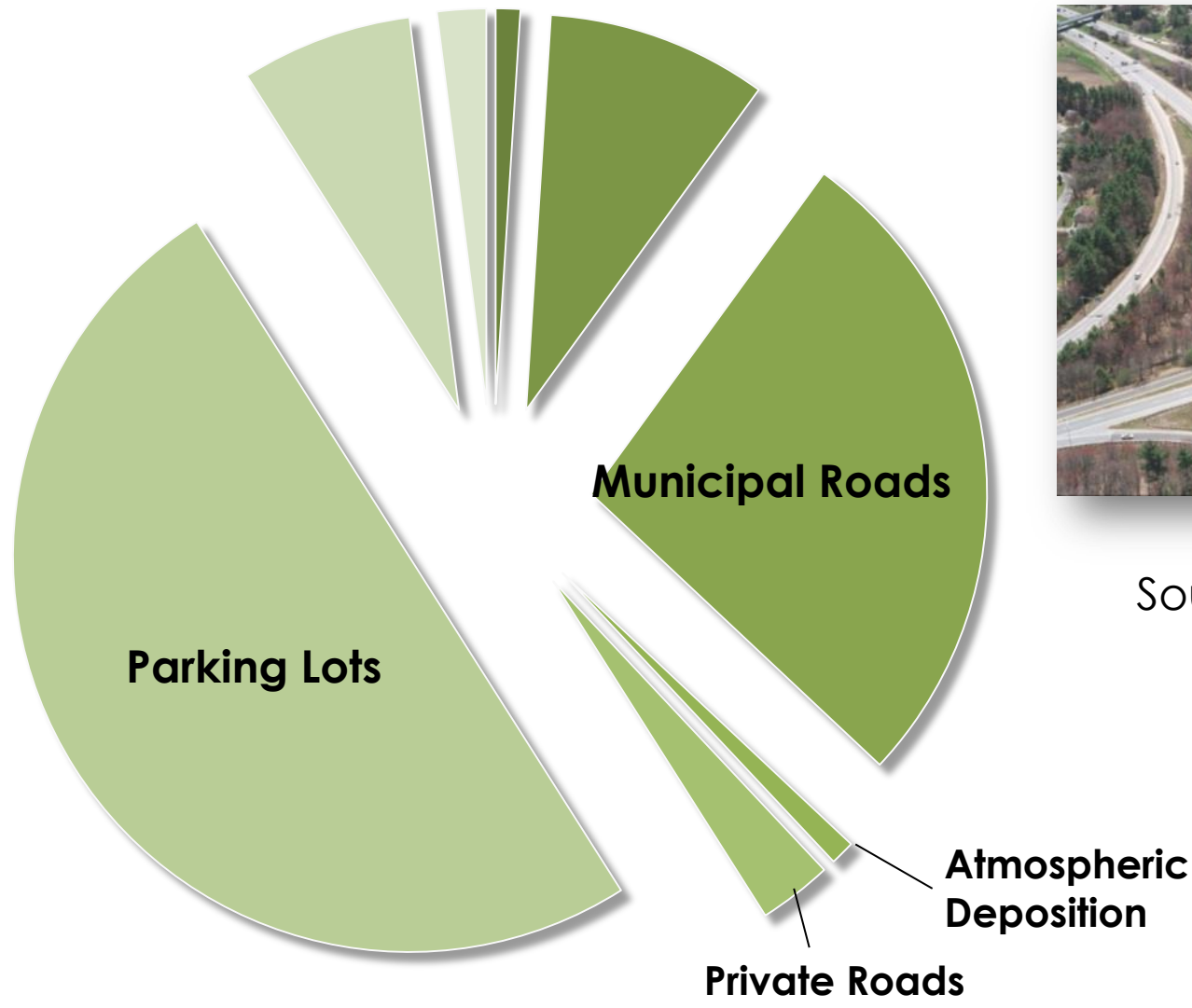
Chloride Impaired Waters



44 impaired waterbodies state-wide

4 TMDLs

Where Does the Salt Come From?



Southern I-93 corridor

What sector do you represent?

1. Municipality
2. State agency
3. Environmental organization/concern
4. Homeowner
5. Just bored on Tuesdays at 2 pm.

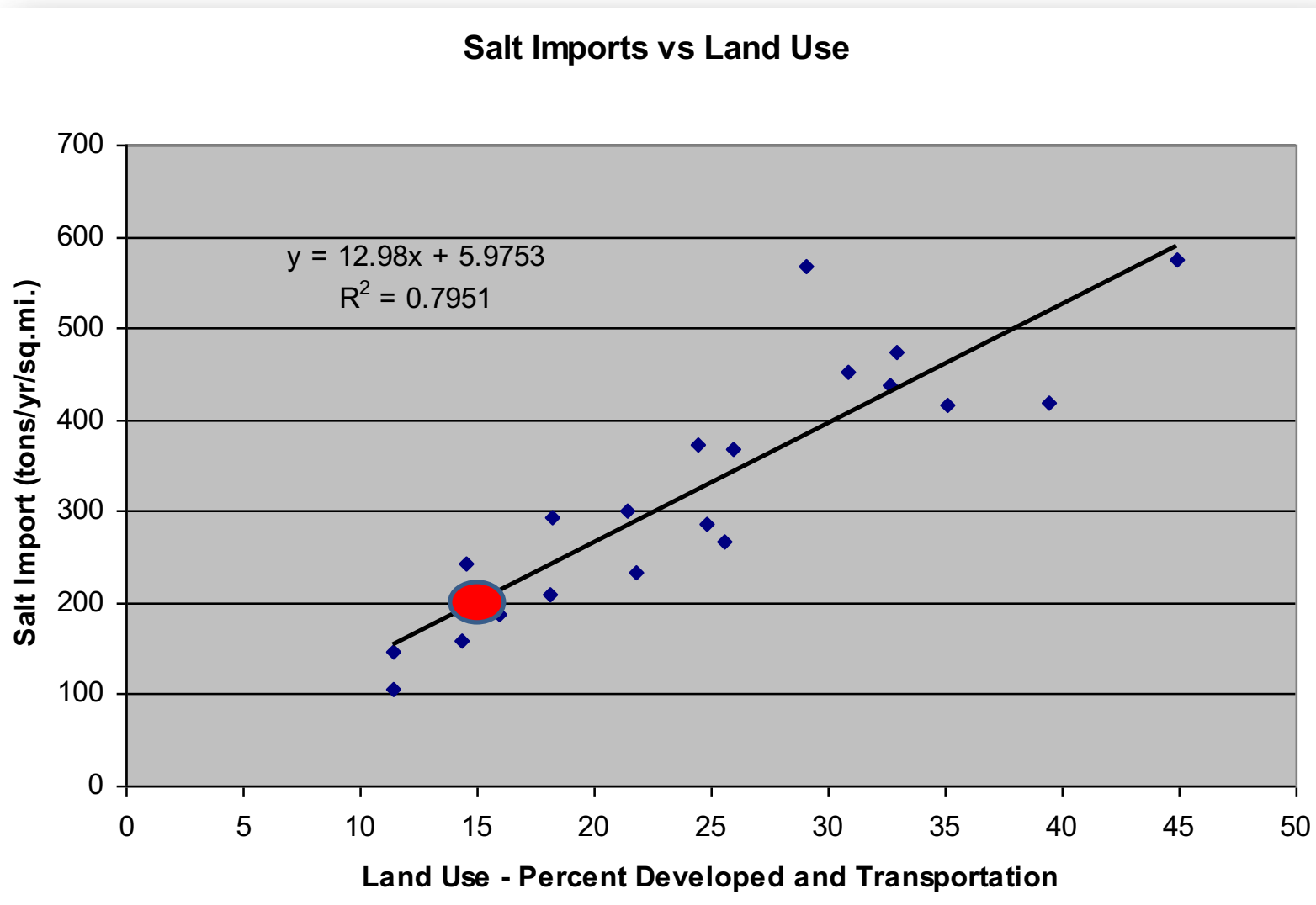


Other Salt sources?

- Septic systems and water softeners
- Dirt road dust suppression ~ 1 ton/ln mile
- Salt storage



Land Use and Salt Imports



Developed and transportation 15% = impaired waters





The issue is over-application!

Solution



Salt Applicator Certification Program



efficiency



costs



public safety



documentation



environmental quality



LIABILITY



Overcoming the Challenges

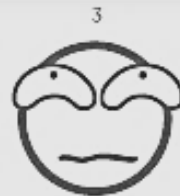
- Training
- Liability
- Costs
- Culture



Denial



Anger



Bargaining



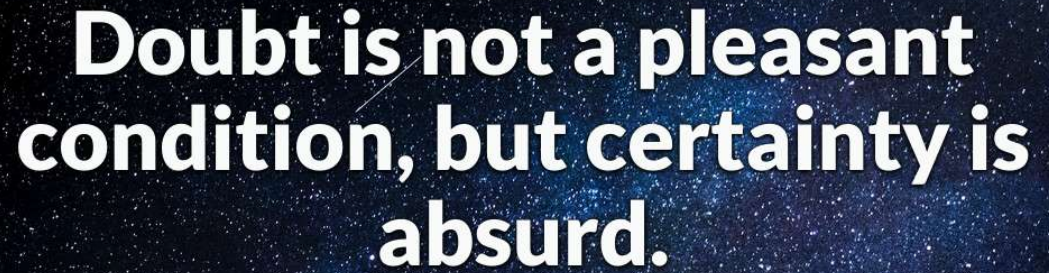
Depression



Acceptance

What do you think is the biggest challenge to reducing salt use?

1. Training
2. Liability
3. Costs
4. Culture
5. I'm not convinced we need to use less salt.

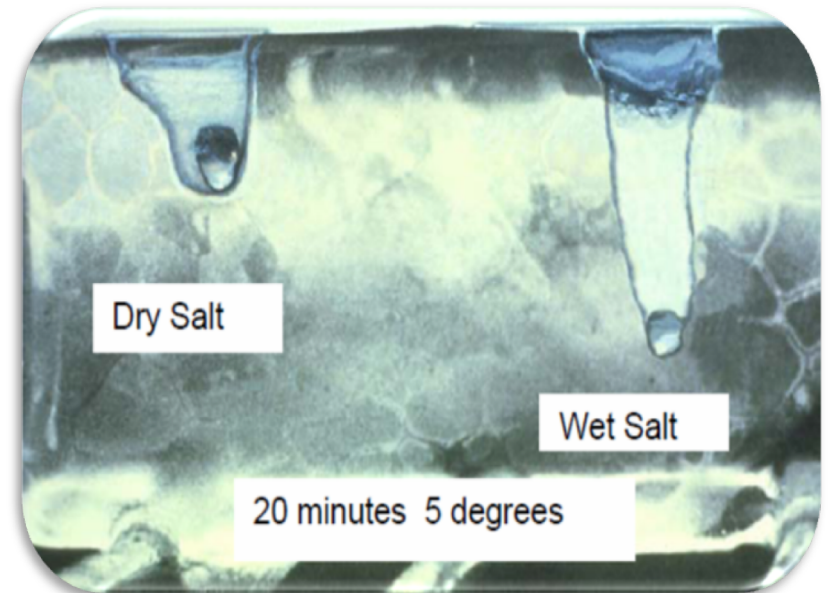


Doubt is not a pleasant condition, but certainty is absurd.

Voltaire

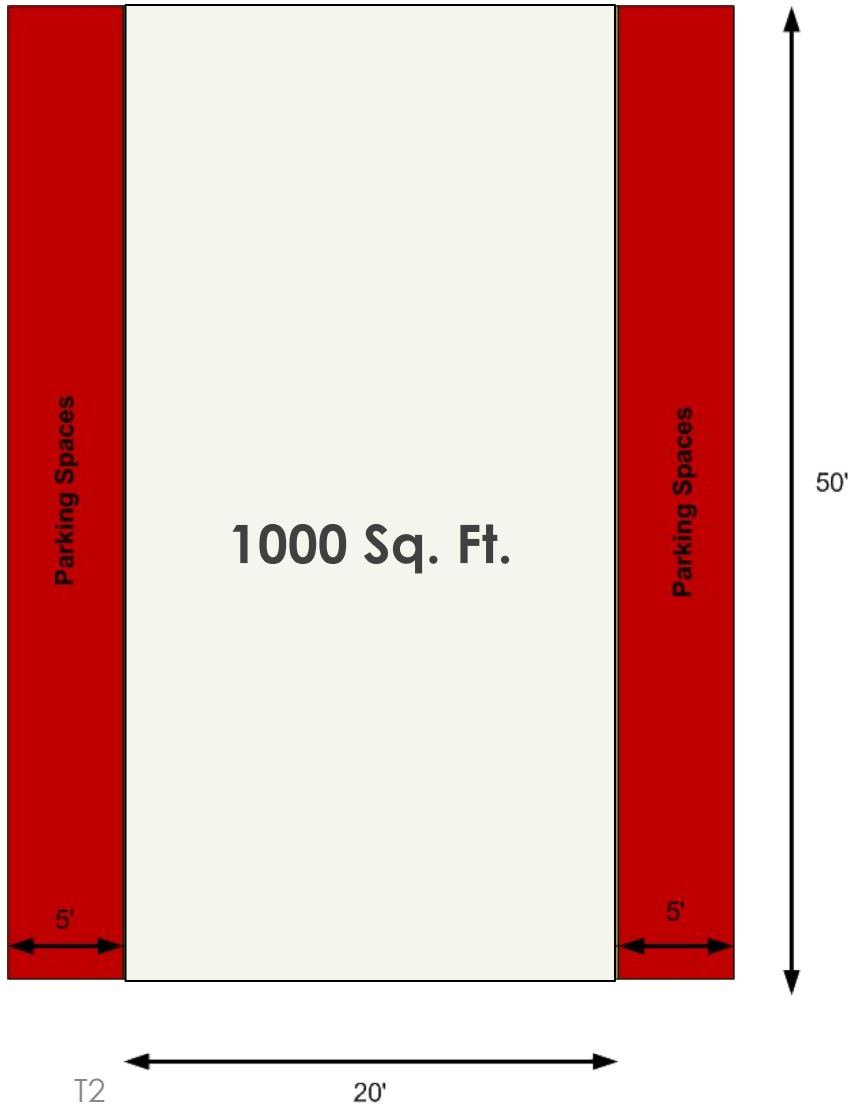
How Salt Works

- Salt molecules pull water molecules out of ice formations – to form a salt brine with a reduced freezing temperature.
- Once the brine is formed the melting process is greatly accelerated
- The effectiveness of salt changes with temperature!



Source: Wisconsin DOT Transportation Bulletin #22

Calibration



- Measure & Mark Test Grid
 - Drive over the test grid at a typical application speed
 - Sweep up material and weigh to determine application rate
- Settings to keep track of:
- Gate Height
 - Auger/Belt Speed
 - Pony Motor RPMs

Parking Lot Application Rates

| Pavement Temp. (°F) and Trend (↑↓) | Weather Condition | Maintenance Actions | Application Rate (lbs/per 1000 sq.ft.) | | | |
|------------------------------------|-------------------|--------------------------------|---|---|----------|-----------------|
| | | | Salt Prewetted/Pretreated with salt brine | Salt Prewetted/Pretreated with other blends | Dry salt | Winter sand |
| >30 ↑ | Snow | Plow, treat intersections only | 4.5 | 4 | 4.5 | Not recommended |
| | Frz. Rain | Apply chemical | 5.75 | 5.25 | 6.5 | Not recommended |
| 30 ↓ | Snow | Plow and apply chemical | 5.75 | 5.25 | 6.5 | Not recommended |
| | Frz. Rain | Apply chemical | 6.5 | 5.75 | 7 | Not recommended |
| 25 - 30 ↑ | Snow | Plow and apply chemical | 5.75 | 5.25 | 6.5 | Not recommended |
| | Frz. Rain | Apply chemical | 6.5 | 5.75 | 7 | Not recommended |
| 25 - 30 ↓ | Snow | Plow and apply chemical | 5.75 | 5.25 | 6.5 | Not recommended |
| | Frz. Rain | Apply chemical | 7 | 6.5 | 8.25 | 10.5 |

Application Rates – (Continued)

| Pavement Temp. (°F) and Trend (↑↓) | Weather Condition | Maintenance Actions | Application Rate (lbs/per 1000 sq.ft.) | | | |
|------------------------------------|-------------------|---|---|---|-----------------|-----------------------------|
| | | | Salt Prewetted/Pretreated with salt brine | Salt Prewetted/Pretreated with other blends | Dry salt | Winter sand |
| 20 - 25 ↑ | Snow or frz. Rain | Plow and Apply chemical | 7 | 6.5 | 8.25 | 10.5 for frz. Rain |
| 20 - 25 ↓ | Snow | Plow and apply chemical | 5.75 | 7.5 | 9.5 | Not recommended |
| | Frz. Rain | Apply chemical | 7 | 7.5 | 10 | 10.5 |
| 15 - 20 ↑ | Snow | Plow and apply chemical | 7.5 | 7.5 | 9.5 | Not recommended |
| | Frz. Rain | Apply chemical | 8.75 | 7.5 | 10 | 10.5 |
| 15 - 20 ↓ | Snow or Frz. Rain | Plow and apply chemical | 8.25 | 7.5 | 10 | 10.5 for frz. Rain |
| 0 to 15 ↑↓ | Snow | Plow, treat with blends, sand hazardous areas | Not recommended | 10 | Not recommended | 13 and spot-treat as needed |
| < 0 | Snow | Plow, treat with blends, sand hazardous areas | Not recommended | 23 | Not recommended | 13 and spot-treat as needed |



During The Storm Activities - Review

- Plowing is the #1 winter maintenance activity! Mechanical removal of snow and ice is preferred
- Salt does not begin melting until a brine is formed
- Pre-wet salt is more efficient and effective than dry salt
- Salt be used to loosen the ice/pavement bond – NOT to ‘burn off’ the ice
- Salt application rates vary with PAVEMENT temperature
- Know how to use the application rate chart!
- Cover deicing materials, store on an impervious surface, and control Drainage

Online Salt Accounting System – LOG BOOK



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New Hampshire Salt Management System



Track
Annual
Salt
Usage

Record annual salt use
Report on annual salt use



Log
Book

Store and track clients
Record client services
Track total annual services

[Get Started](#)

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Documentation is essential !!!

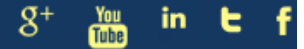
Brine

- Advanced class
- Big reductions



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DON'T WAIT
Clock's Ticking

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If you have suffered an injury from a slip and fall accident, you may be able to get a cash settlement for your medical bills, lost income and pain and suffering, among other losses. Our experienced slip and fall lawyers charge no fee unless you receive a settlement or award. Please contact us toll free 24/7 or online for a free (no obligation) case evaluation.



*Have You Been Injured in a Slip and Fall Accident?
Call Us Today for a Free Case Evaluation.*

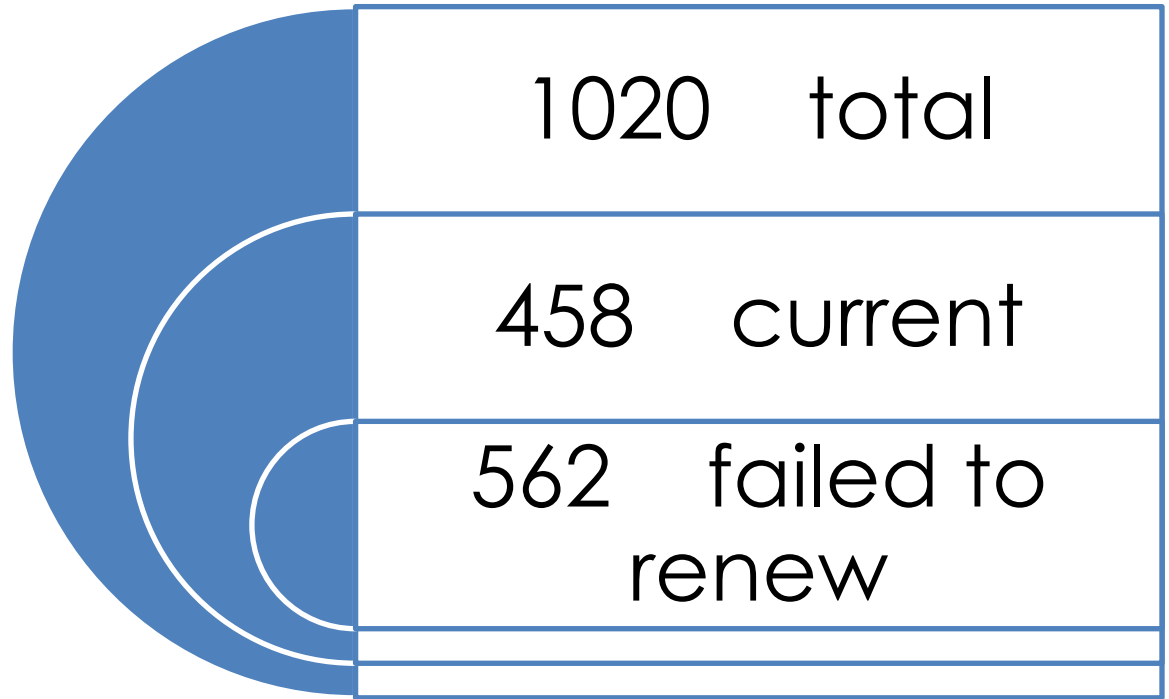
Do You Have a Slip and Fall Case?

Liability

- Certification
- Liability protection
- Like ski-areas



Certified Salt Applicators



- 11 companies – slip and fall claims
- 2 cases dropped when certification was cited

No renewal = no liability protection



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Municipal Issues

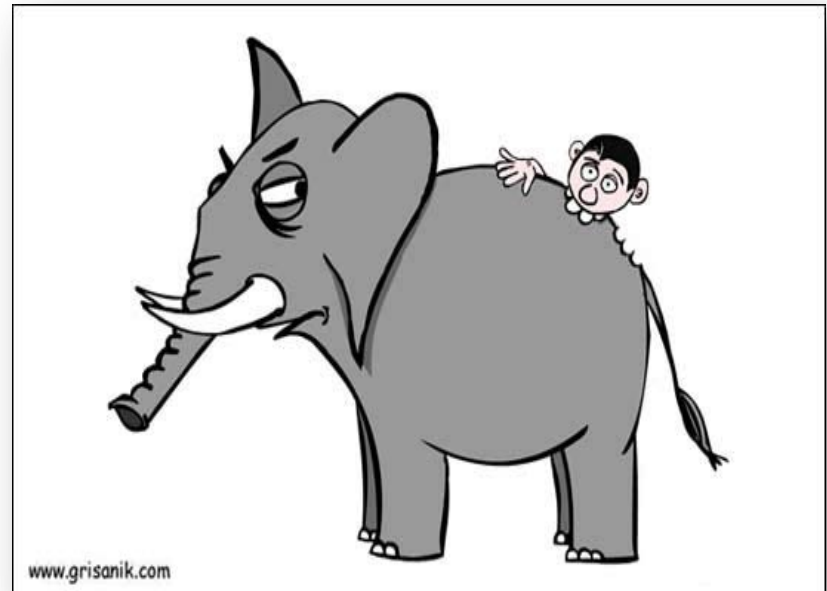
- **Equipment \$** – ground speed control (GPS, Viasys), underbelly plows, MetalPles plows, brine
- **Training** – GreenSnoPro, local training
- **Certification** – liability
- **Incentives** – *esprit de corps*
- **Permits and MS4** – local mandates
- **Design** – pervious pavers, heated sidewalks, sun/shade, garages, awnings

Does it work and does it impact cost?

Big issue, small bites

- Focus on worst watersheds, early adopters and advocates
- Is liability a real issue?
- Are Green SnoPros using less?
- Administrative burden -- Fees
- Public safety
- Equipment costs
- Alternative materials
- Renewing certifications

Too much is the problem!



Questions



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