



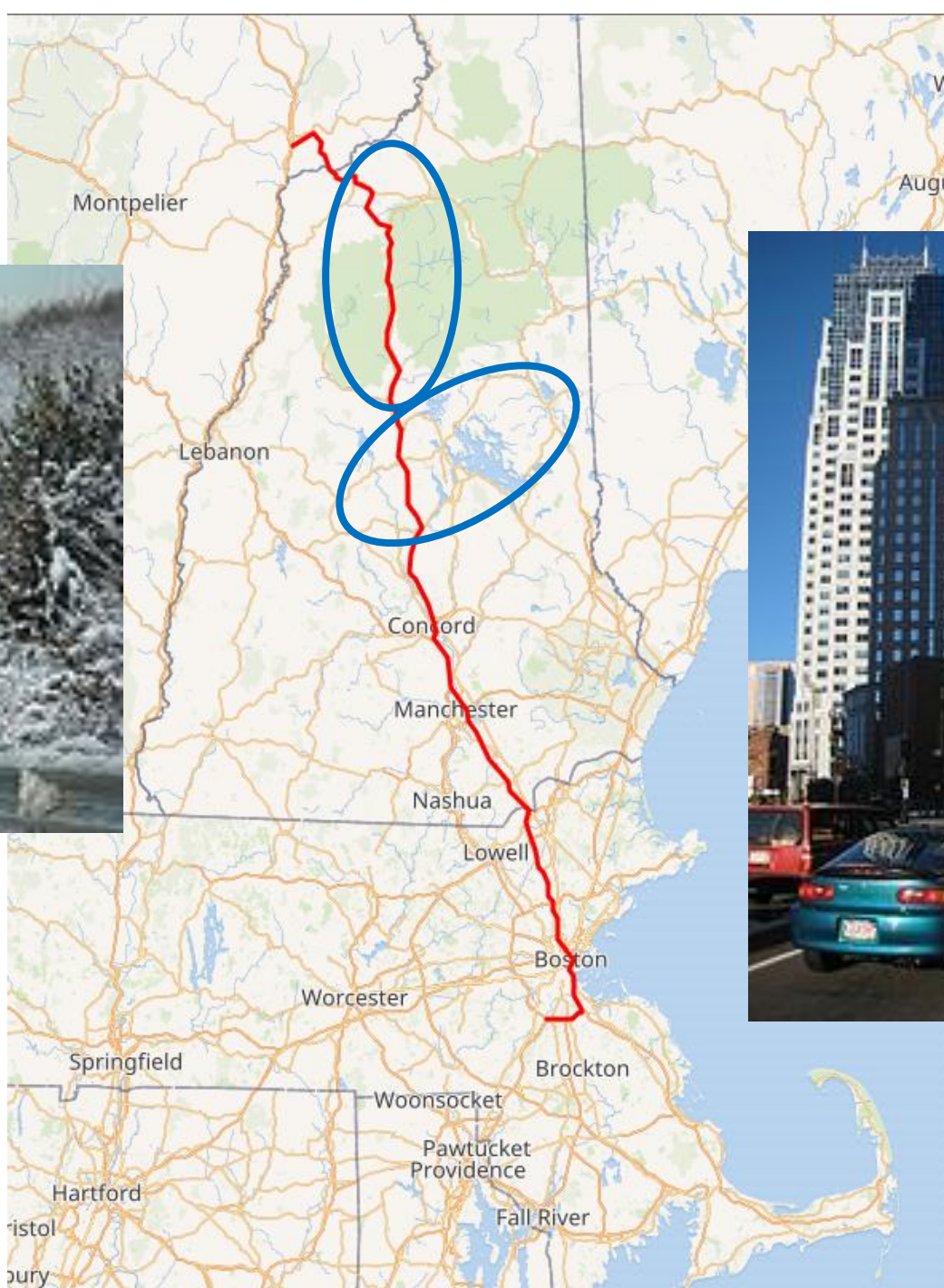
# Salt on I-93: Chronicle of a chloride corridor catastrophe

Curated by

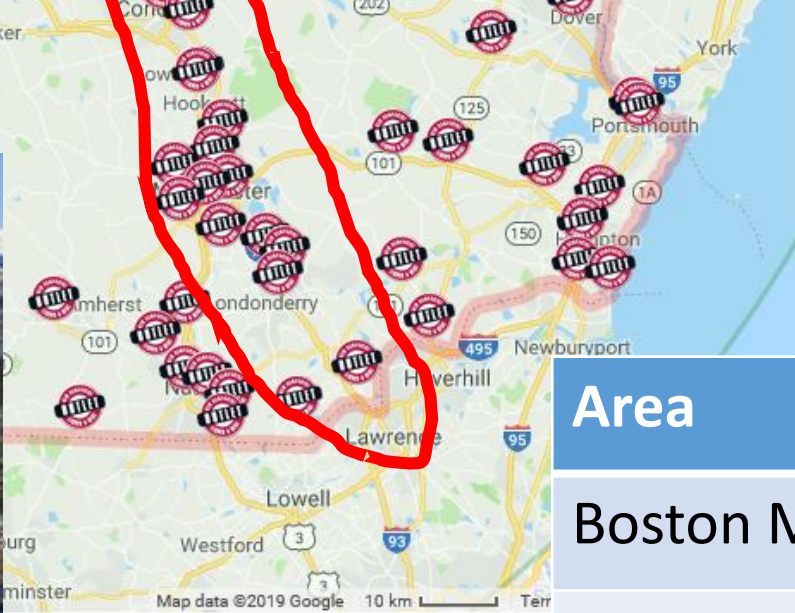
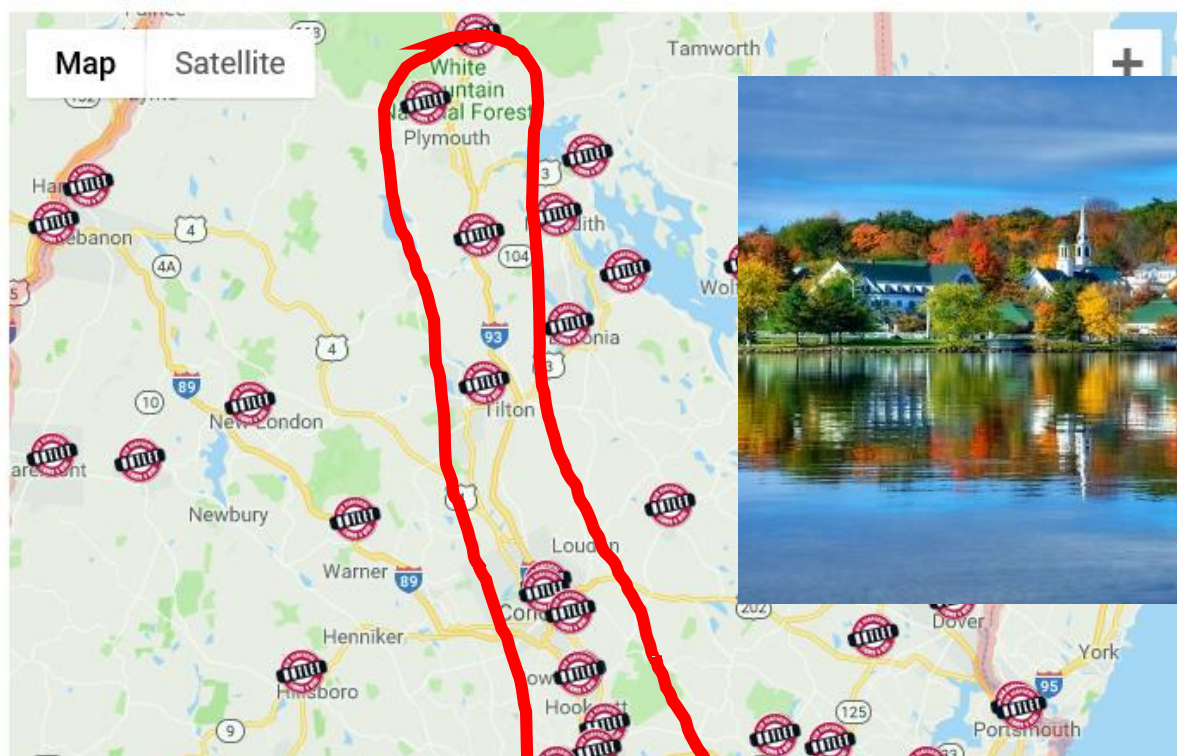
Ted Diers, Administrator

NHDES, Watershed Management Bureau

# The Corridor







Area	Population
Boston Metro	4,628,910
Entire state of NH	1,343,000



	Traffic Volume
1962 – As designed	60,000 – 70,000 vehicles per day
1997 – “Existing Condition”	100,000 + vehicles per day
2020 -- Estimated	140,000 + vehicles per day



# Creating copious capacity

Double the size of the highway

Bigger off and on-ramps.

Park-n-rides.

Drainage -- open to closed system.

More plowing = more salt.



# The Chlorides

## POLICY BROOK BEHIND ROCKINGHAM MALL, SALEM, NH

**MAXIMUM**

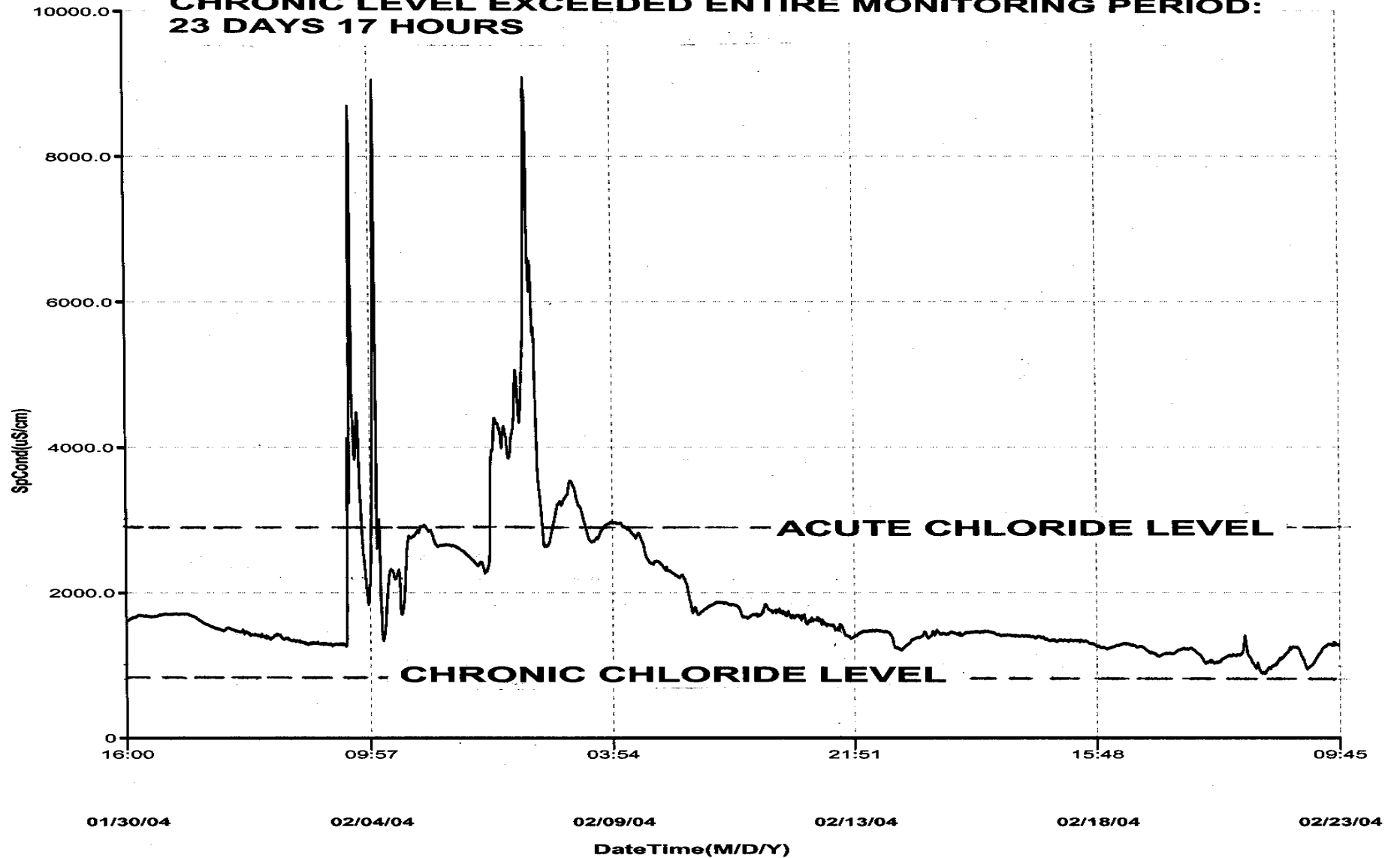
9,071

n = 2,280

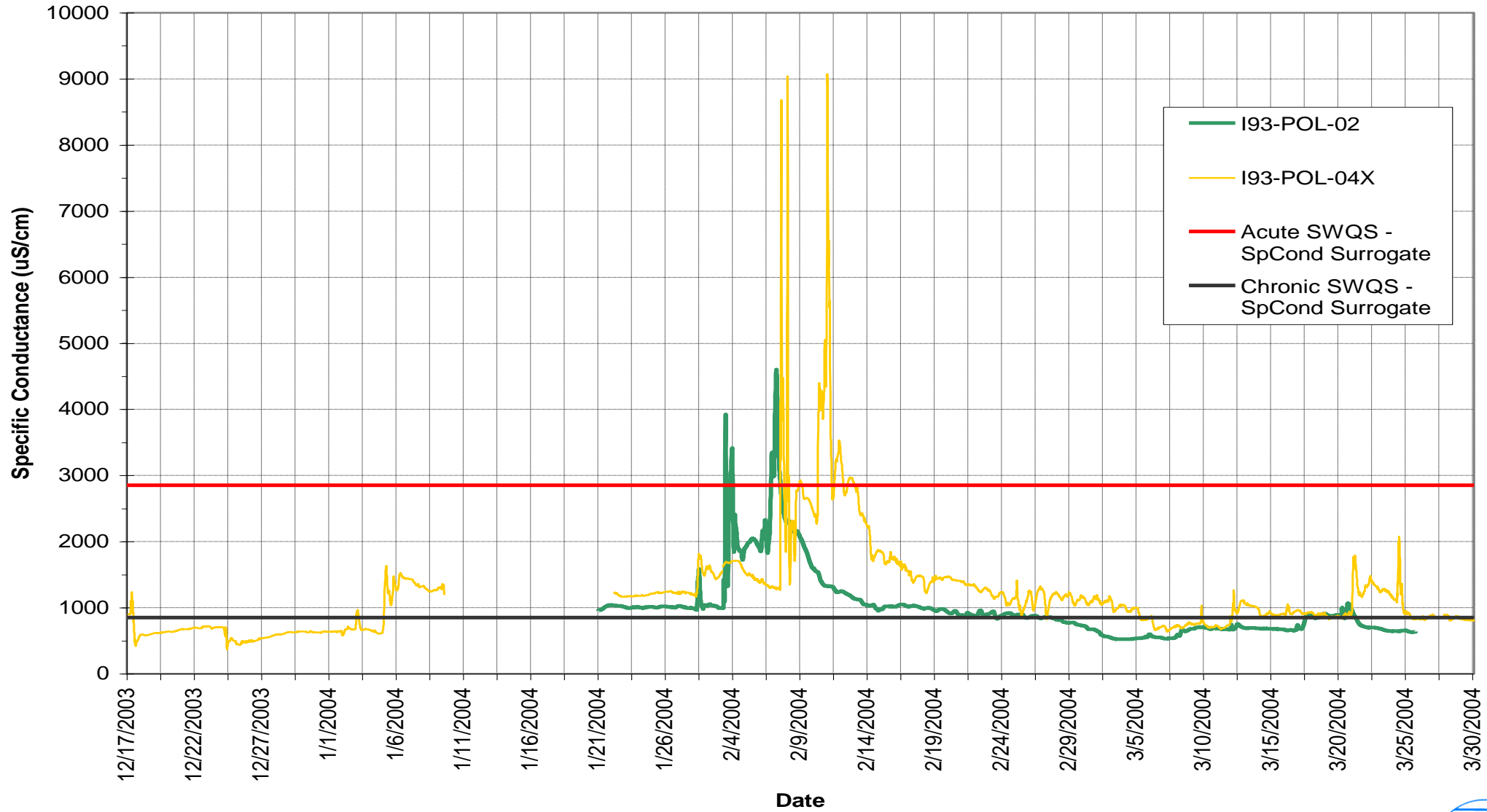
**MEAN**

1,885 uS/cm

**ACUTE CHLORIDE LEVEL EXCEEDED FOR 69 HOURS  
CHRONIC LEVEL EXCEEDED ENTIRE MONITORING PERIOD:  
23 DAYS 17 HOURS**



# Colossal conductance



Data collected by USEPA

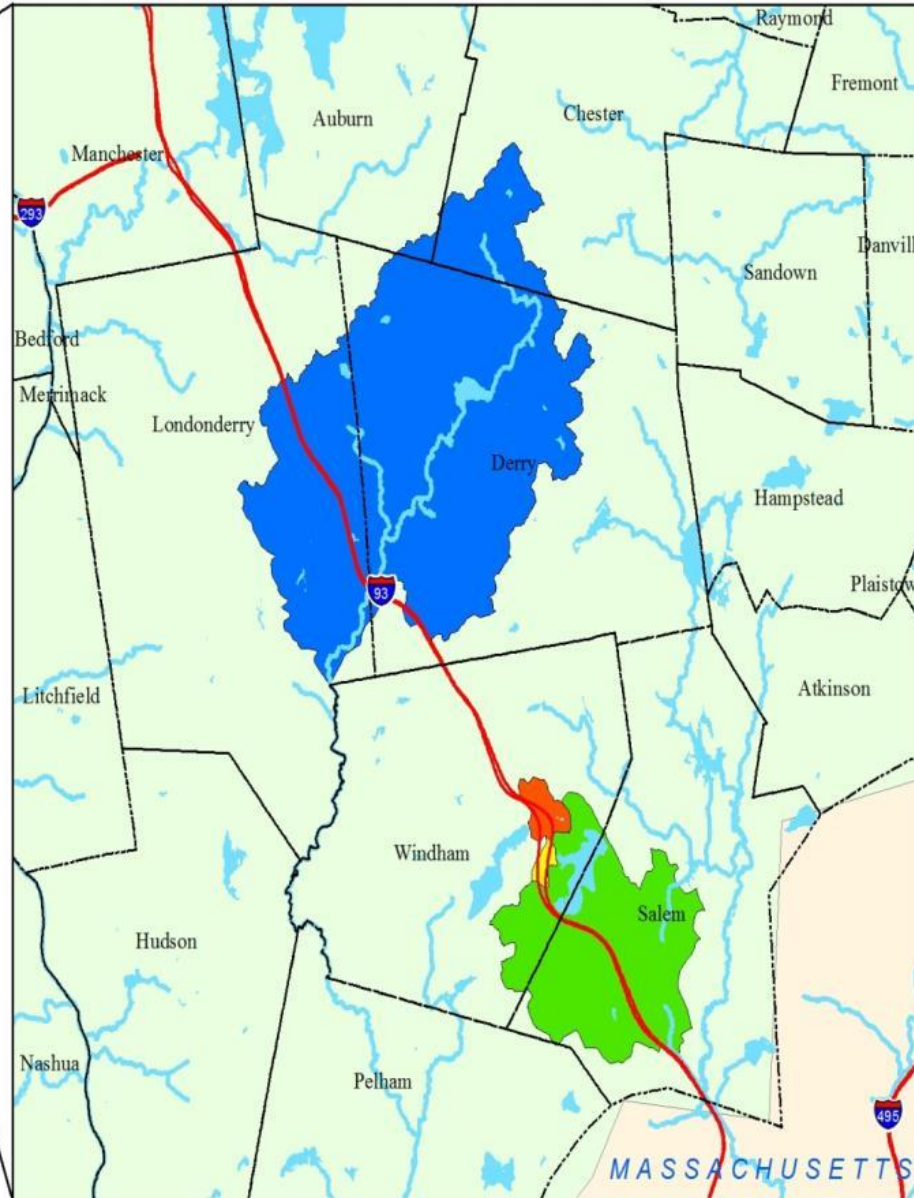
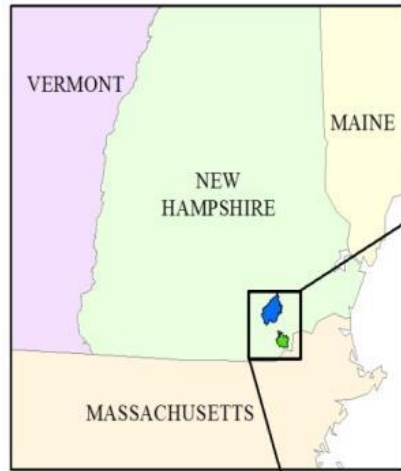








# Chloride Impaired Waters



44 impaired waterbodies state-wide

## The Record of Decision – ROD – Federal Highways – 2005

In order to comply with water quality standards, FHWA and New Hampshire Department of Transportation ... the project to impaired wa **... adaptive management approach ...** developed an adaptive management approach that allows the project to provide for current needs and allow efficient and safe operation through the design year of 2020, without causing or contributing to water quality violations.

- NHDOT can build 6 lanes.
- Cannot build 8 lanes unless satisfies conditions of the 401 cert.



# Section 401 Water quality certification – NHDES – 2006

- E-7. The Applicant shall participate in TMDL studies by the Department for the surface waters impaired for chlorides, including the unnamed tributary to Weir Brook, ... fund a TMDL ... more Weir Brook. Participation may include, but is not limited to, funding of TMDL studies, assistance with water quality monitoring to facilitate development of the TMDLs, and outreach, education and technical support during both preparation of studies and implementation of chloride load reductions.
  
- E-8. The TMDL studies shall be designed to assess and quantify sources of chloride to ... establish implementation plan ... d to sources to Surface waters that do not meet water quality standards. The Applicant shall comply with all TMDL implementation requirements.
  
- E-9. After EPA approval of the TMDL reports and publication of the TMDL implementation plan, the Applicant shall ... implement the plan ... at apply to ... on plans.

# Cantankerous claims and cases

UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF NEW HAMPSHIRE

Conservation Law Foundation

v.

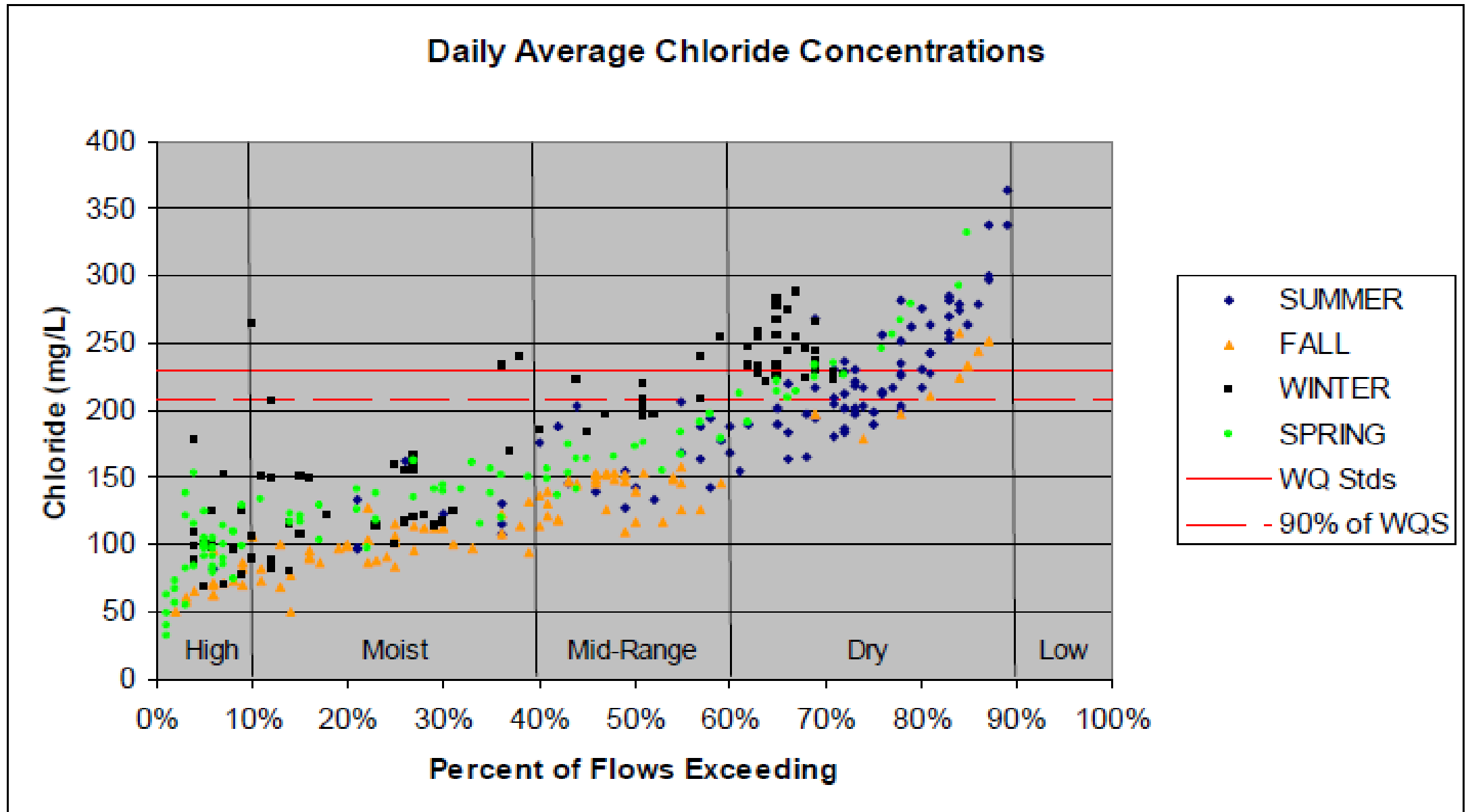
Case No. 06-cv-45-PB

Opinion No. 2007 DNH 106

Federal Highway Administration and  
New Hampshire Department of Transportation



# Complicated Calculations



Policy Brook TMDL Sectors	Average use 2008-2015 Tons/year	Allocation tons/year	Reduction needed
DOT – 2 Lanes	635	900	0
Municipal roads	1768	1044	41%
Private	2976	1505	50%
<b>TOTAL *</b>	<b>5567</b>	<b>3635</b>	<b>35%</b>
DOT - 4 lanes	1018	900	12%



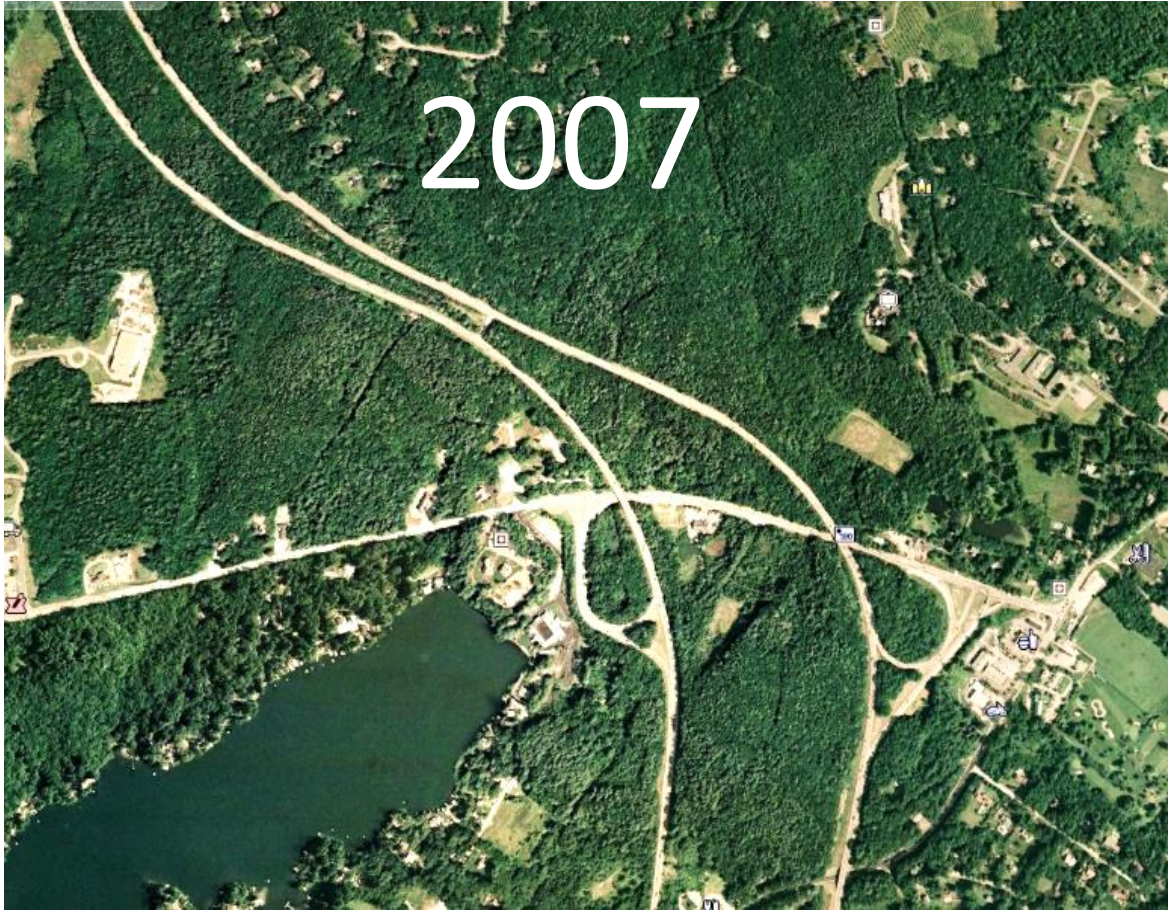


Away we go ....





2007



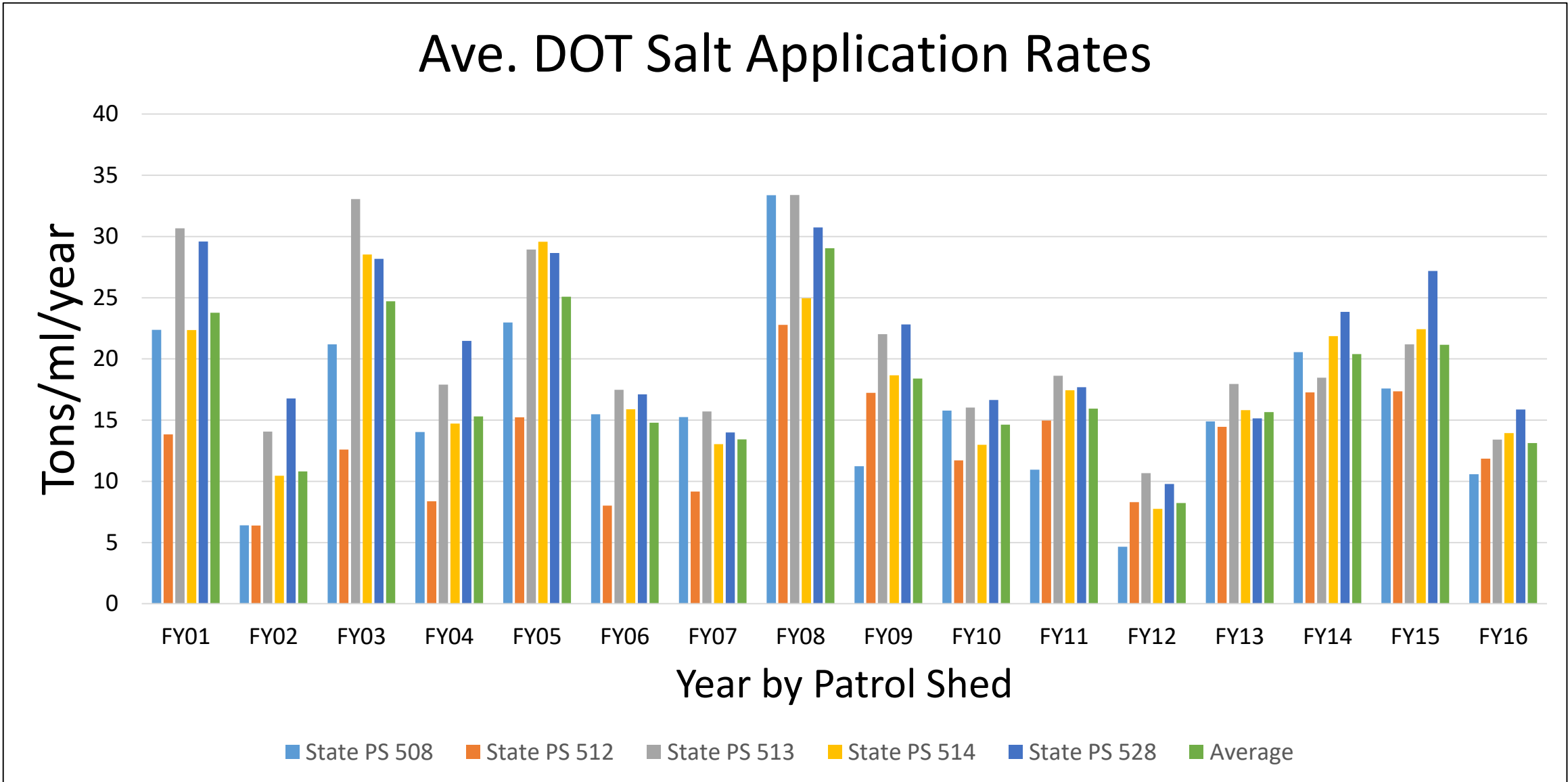
Copious concrete

2018





# Counting chlorides

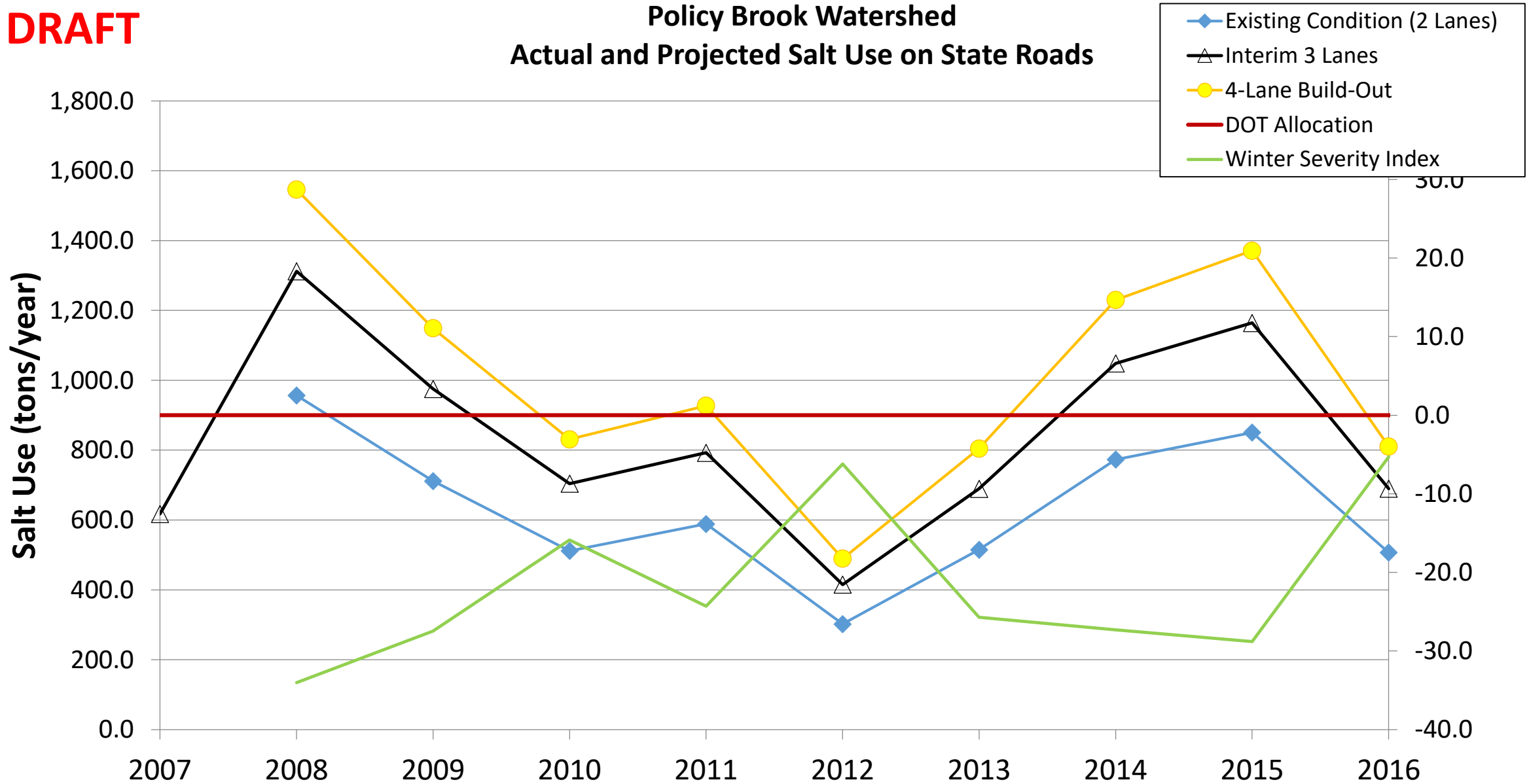




# Counting chlorides

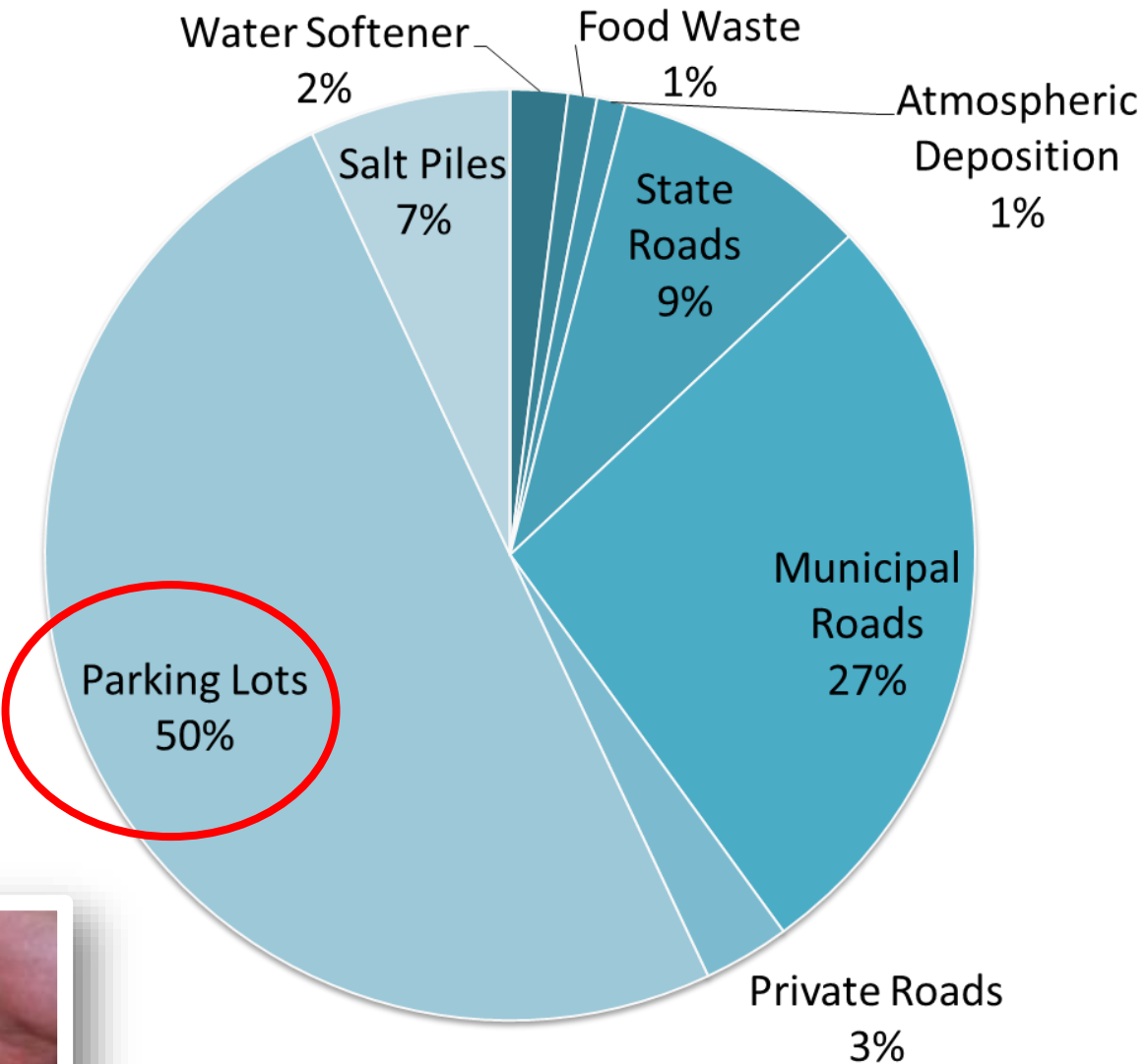
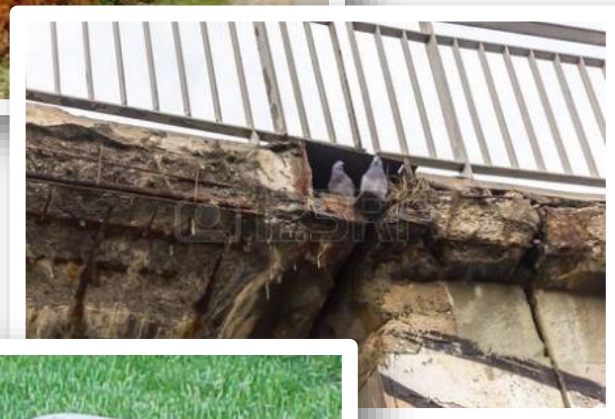
**DRAFT**

**Policy Brook Watershed  
Actual and Projected Salt Use on State Roads**



Policy Brook Sectors	Average use 2008-2015 Tons/year	Allocation tons/year	Reduction needed
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<b>TOTAL *</b>	<b>5567</b>	<b>3635</b>	<b>35%</b>
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# Credible constituencies?





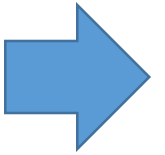
# Salt Applicator Certification Program



efficiency



costs



public safety



documentation



environmental quality



LIABILITY



# Conquering the culture

- Liability
- Inertia
- Training
- Costs



Denial



Anger



Bargaining

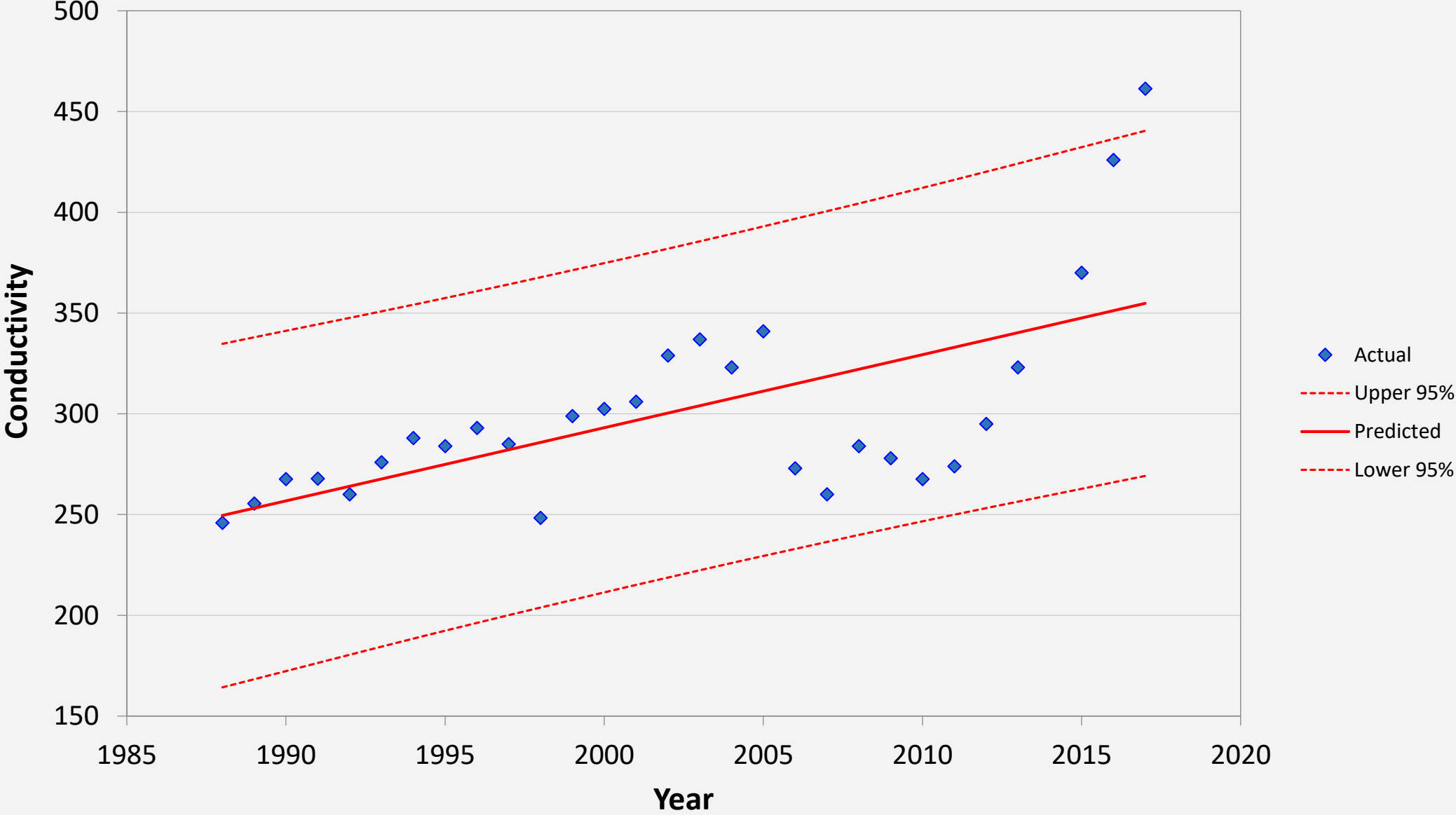


Depression



Acceptance

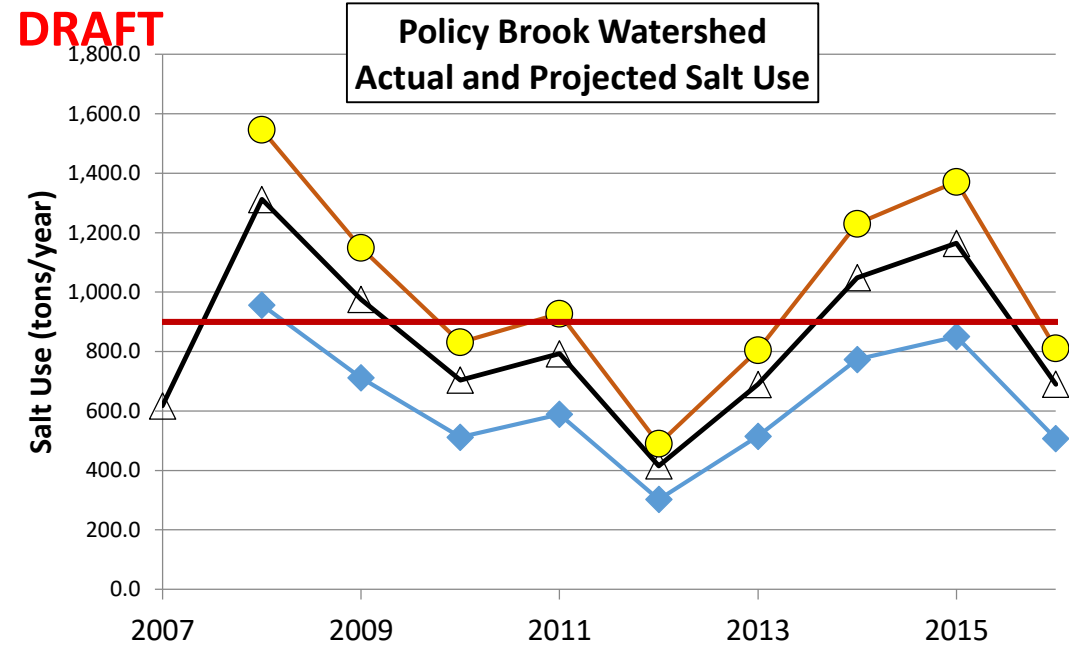
# Cobbetts Pond Conductivity Trend





# Cornucopia of curses

- Can you count grains of salt?
- Closed vs. open drainage?
- What about that 4<sup>th</sup> Lane?
- How about another exit?
- Secondary and induced development
- What does “no additional chlorides mean”?
- What does “full implementation of the TMDL” mean?



Pre-salted?





Questions or comments?

