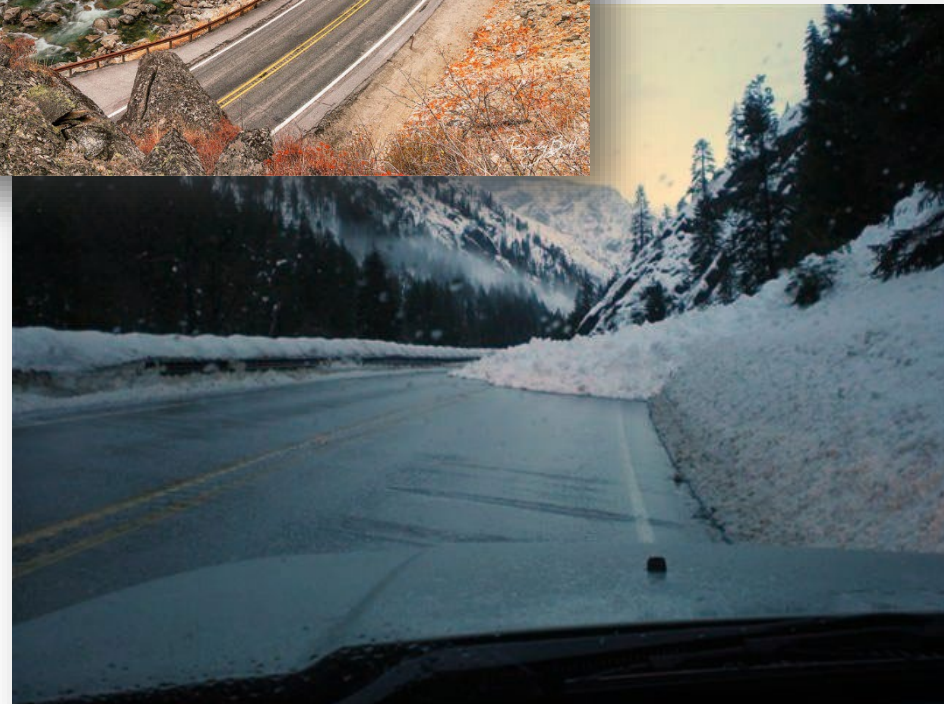# Tree Browning- Chloride Monitoring Program

James Morin, Maintenance Operations Branch Mgr.

August 6th, 2024

Roger Millar, Secretary of Transportation

Amy Scarton, Deputy Secretary of Transportation

Background

- WSDOT began using salt in 1998-2000

- Sensitive waterbodies, aquatic species and vegetation.

- Learned from other States

- Training

- Calibration

- De minimis salt use

- Research/Testing-Impacts of Highway Deicers on Peshastin Creek-2001

Needle Browning

Inside

Section

3-18

THE WENATCHEE W RLD

Holida ham

How to bu
cook and
carve Easter's
main course
**Food, Health,
Page C1**

❖ PUBLISHED IN THE APPLE CAPITAL OF THE WORLD AND THE BUCKLE OF THE POWER BELT OF THE GREAT NORTHWEST ❖

Rafters ready!
Heavy snows expected to bring
lots of white water **Your Sports, Page B2**

DOT deicer burning roadside trees

BY JAY PATRICK
World staff writer

WENATCHEE — A chemical used by the state Department of Transportation to melt ice on roads is damaging tens of thousands of pine and fir trees along the state's mountain passes. Following a brutal winter, the recent phenomenon, called "needle browning," will be more evident than ever this spring.

Some trees die as a result of exposure to the deicer, said Jim Hatfield, a forest pathologist with the Wenatchee-Okan-ogan National Forest.

The DOT says the deicer — calcium chloride, a form of salt — temporarily damages some trees but doesn't kill any.

Hatfield said his agency hasn't formally studied needle browning. However, he has casually investigated changes to trees near roads where chemical deicer started being used almost exclusively four years ago. Before that, the deicers had been mixed with sand since being introduced in the early 1990s. Plain salt has fallen out of favor because the damage it does to the environment is well-documented and because it corrodes vehicles and infrastructure, such as bridge decks. Calcium chloride is also highly corrosive but is considered less harmful to plants than salt.

"I would definitely say it's something we should be looking into more in-depth," said Hatfield. He's noted that some trees on the side of the road buried partway in snow emerge after the melt with a distinct burn line. He said burning appears to be more widespread along parts of the highway where vehicles travel fast. Hatfield said he thinks vehicles kick up a chloride mist that floats approximately 50-75 feet from the road, coating pine and fir trees.

Doug Pierce, environmental operations manager with the DOT, said calcium chloride deicer can burn roadside trees, but damage is minimal and trees recover in the summer.

Hatfield said most trees do regrow over and around parts killed, but some

World photo/Jay Patrick

Fir and pine trees on Blewett Pass show signs of "needle browning," a condition that has become common since the state Department of Transportation moved to a primarily chemical regimen for deicing roads.

A LUCKY BIRTHDAY BOY

Supreme Court upholds state's open primary
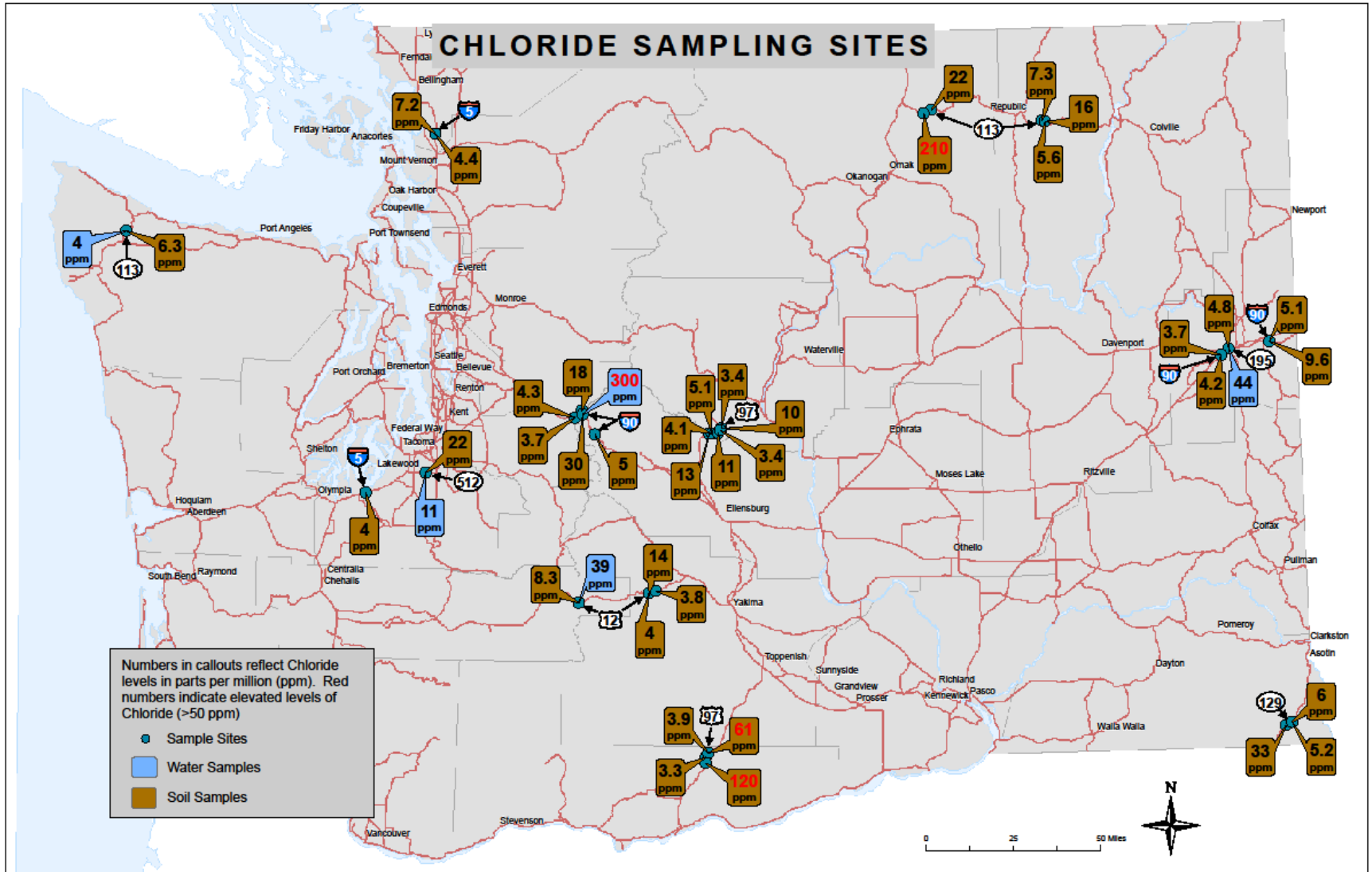
6

Aerial Deposition

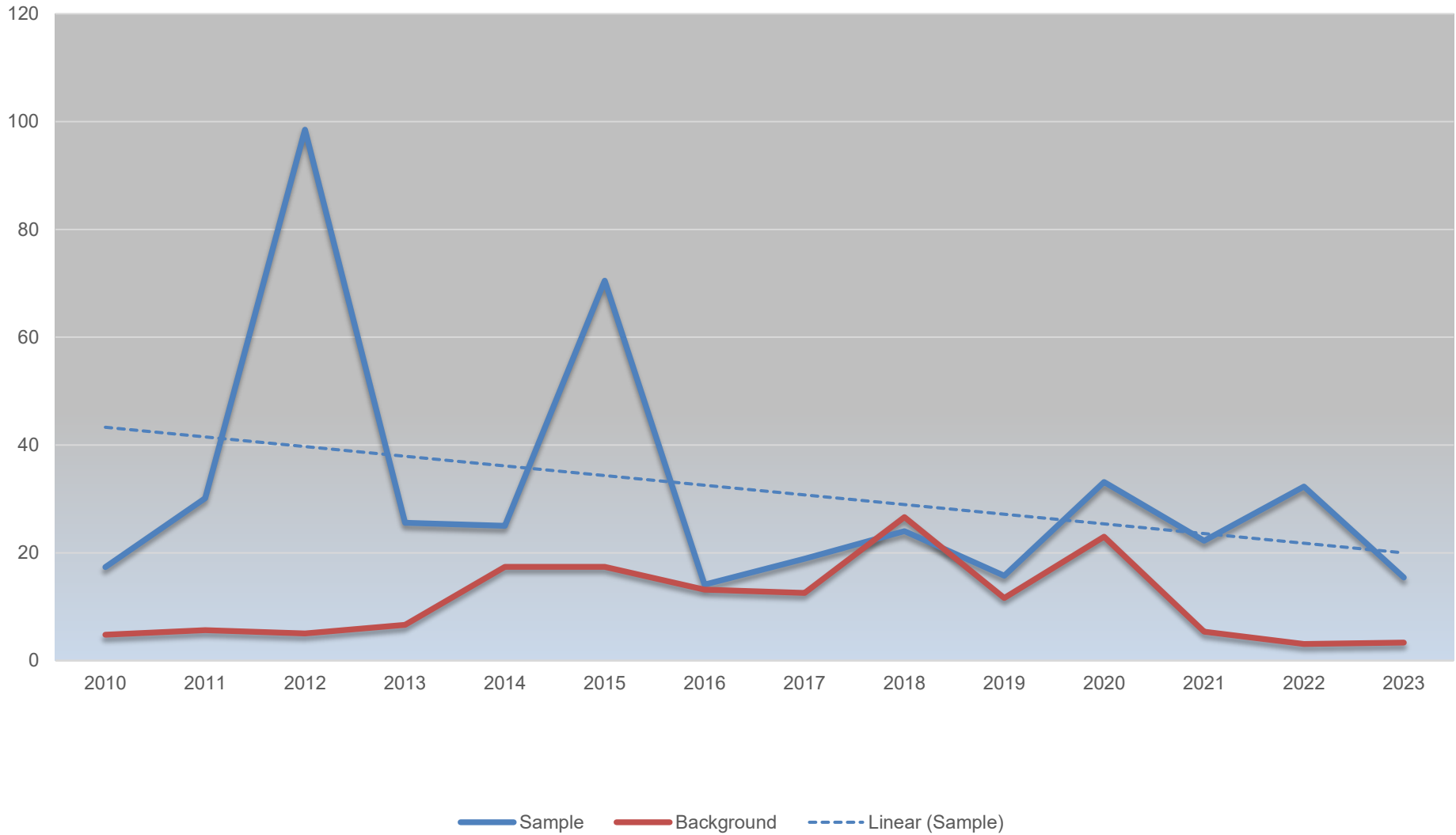# Uptake and Accumulation

- Taken into the plant through the roots in solution to twigs
- Symptoms:
  - Reduced plant vigor
  - Reduced leaf size
  - Leaf chlorosis
  - Leaf Burn
  - Tissue death
  - Fewer seeds
- Chloride in unaffected foliar tissue 0.1%
- Chloride levels in affected needles in the range of **0.3%**
- **280 ppm** may start to see impacts to fine feeder roots
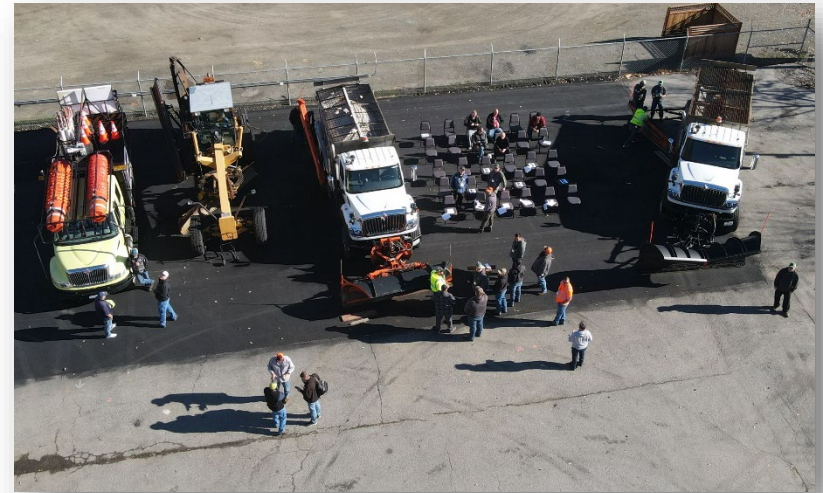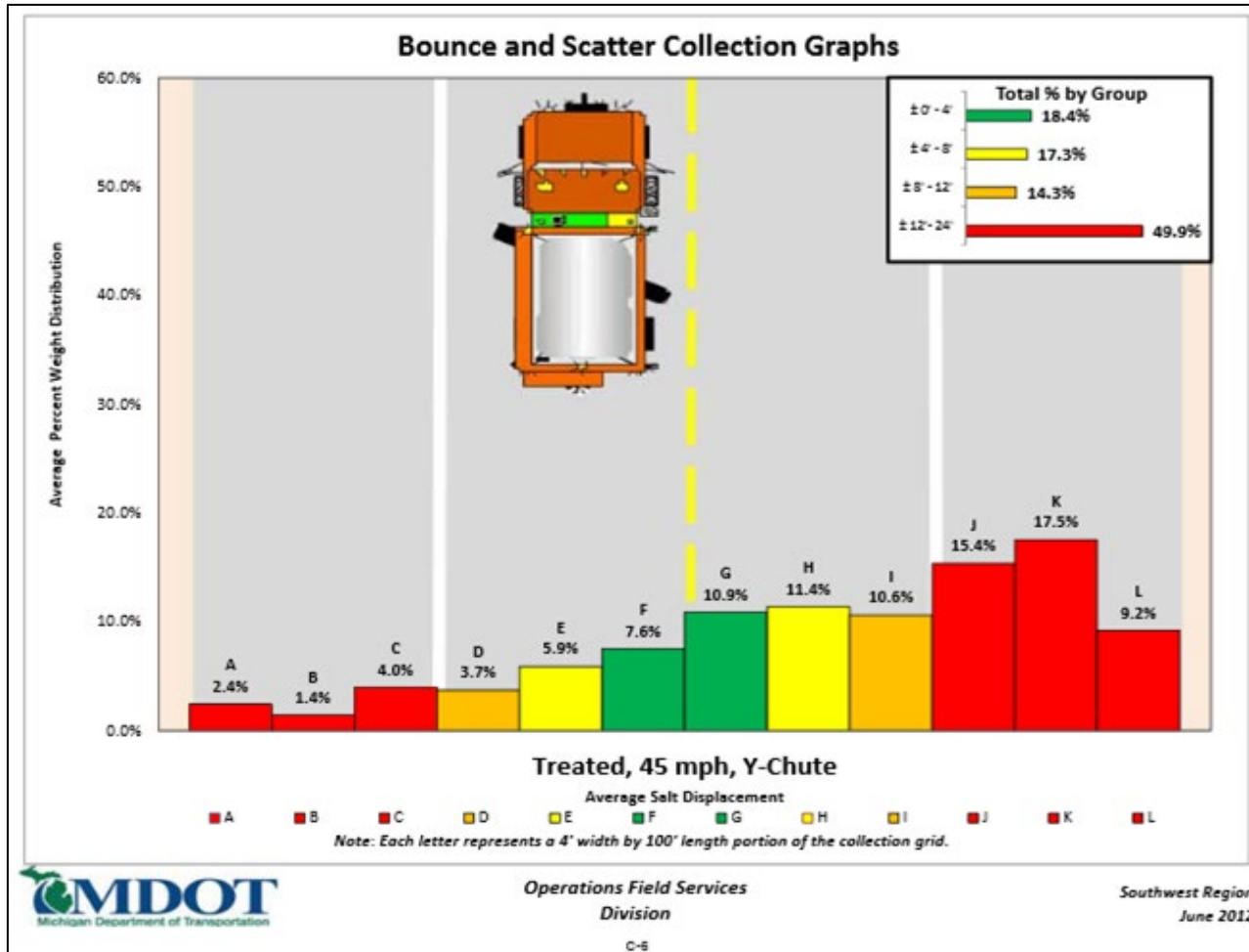
Monitoring

CHLORIDE SAMPLING SITES

10

Chloride Sampling

Legend: Sample, Background, Linear (Sample)

Best Practices- Training

- Snow and Ice Academy
- Pre-Winter Meetings
- Pacific Northwest Snowfighters
- Specialized Training

Best Practices- Pre-Wet/Speed

Bounce and Scatter Collection Graphs

Treated, 45 mph, Y-Chute
Average Salt Displacement

Note: Each letter represents a 4' width by 100' length portion of the collection grid.

Operations Field Services Division

Southwest Region June 2012

MDOT
Michigan Department of Transportation

- **Speed=45 MPH**

- **18% of salt stayed on target**
- **50% of salt bounced entirely off the road**

CLEAR ROADS
research for winter highway maintenance
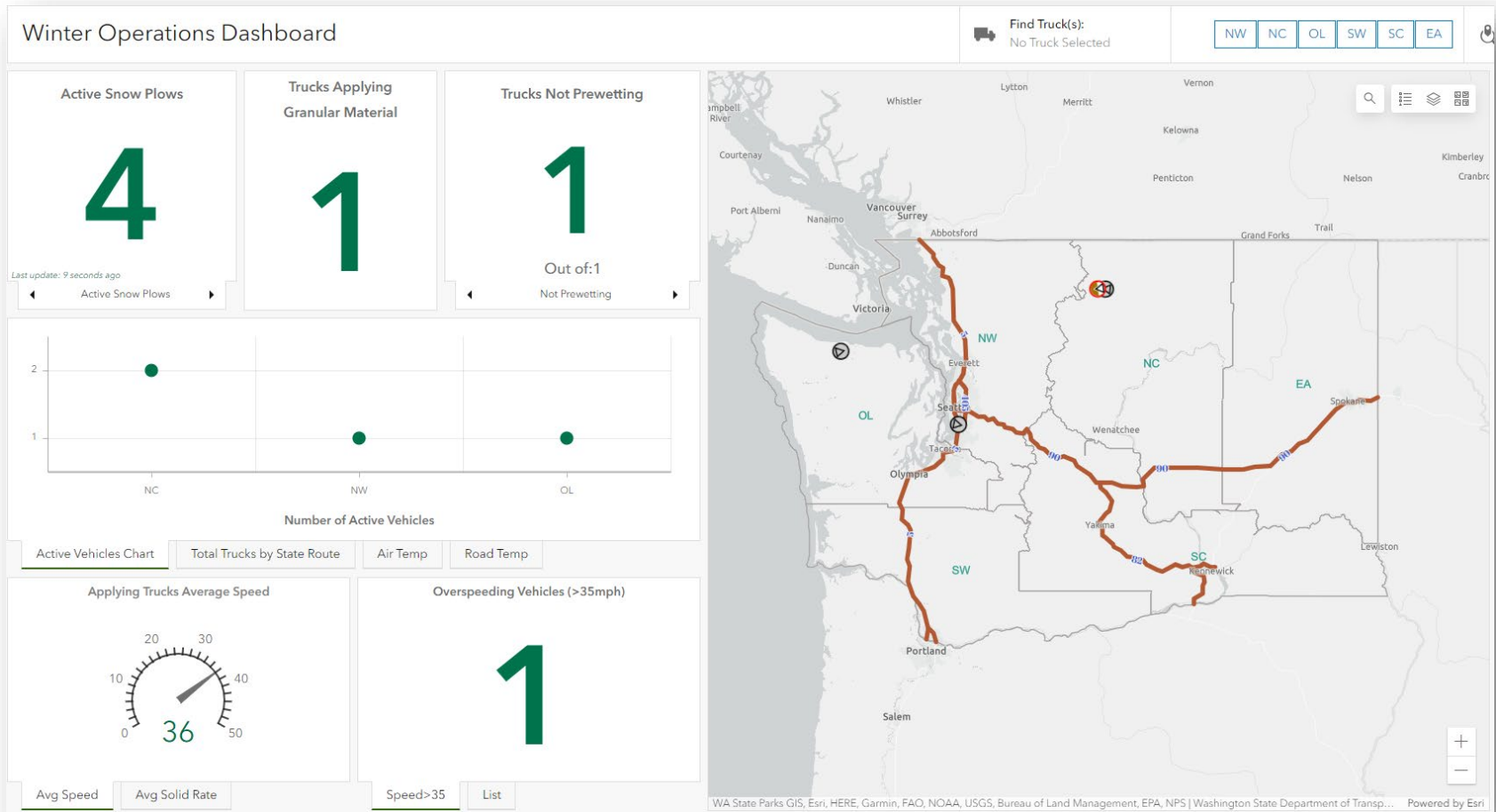
WSDOT

Best Practices- Calibration

Precision Application

Regular Calibration

Best Practices- AVL

Questions