

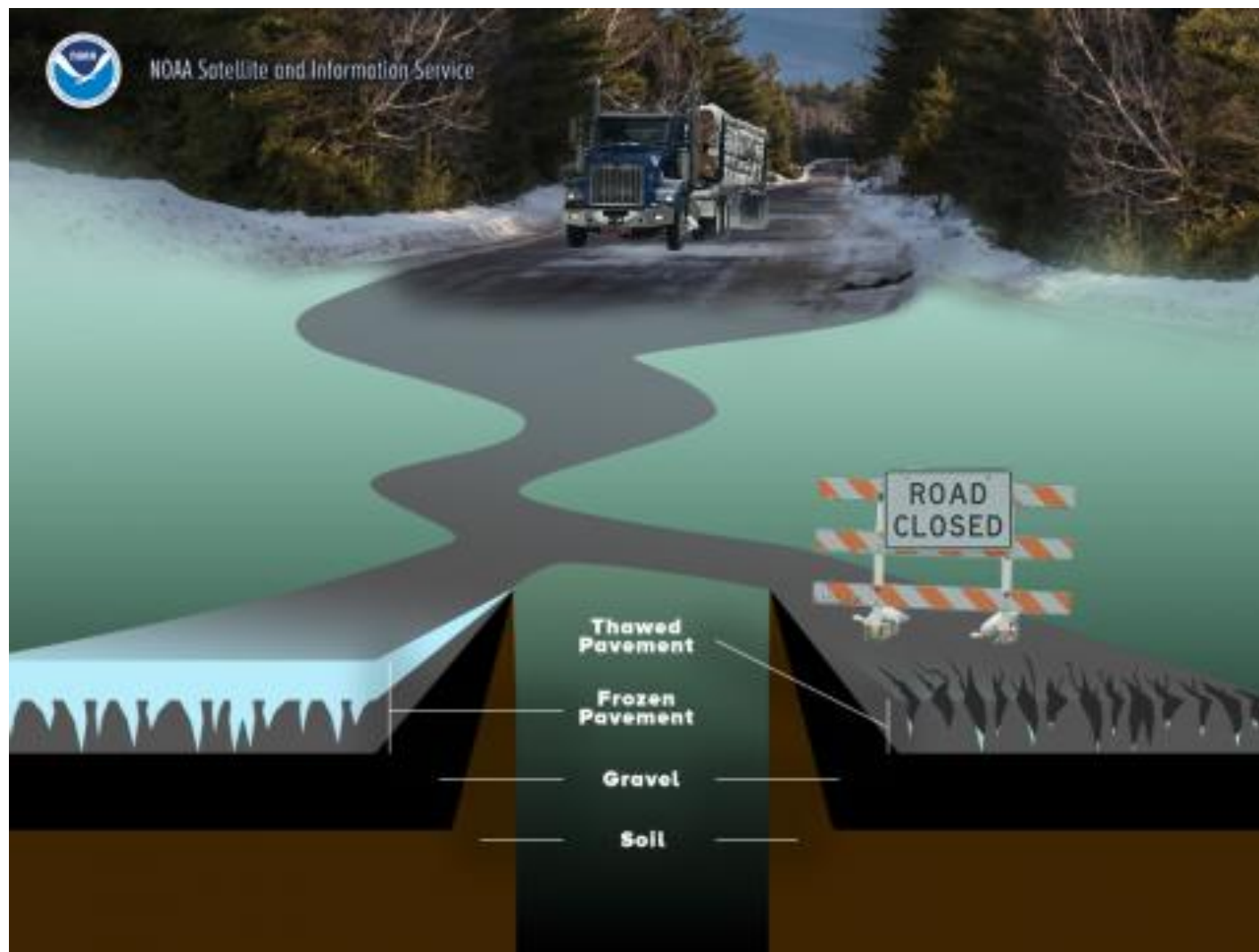
Roadway Freezing/Thawing Decision Support Tool

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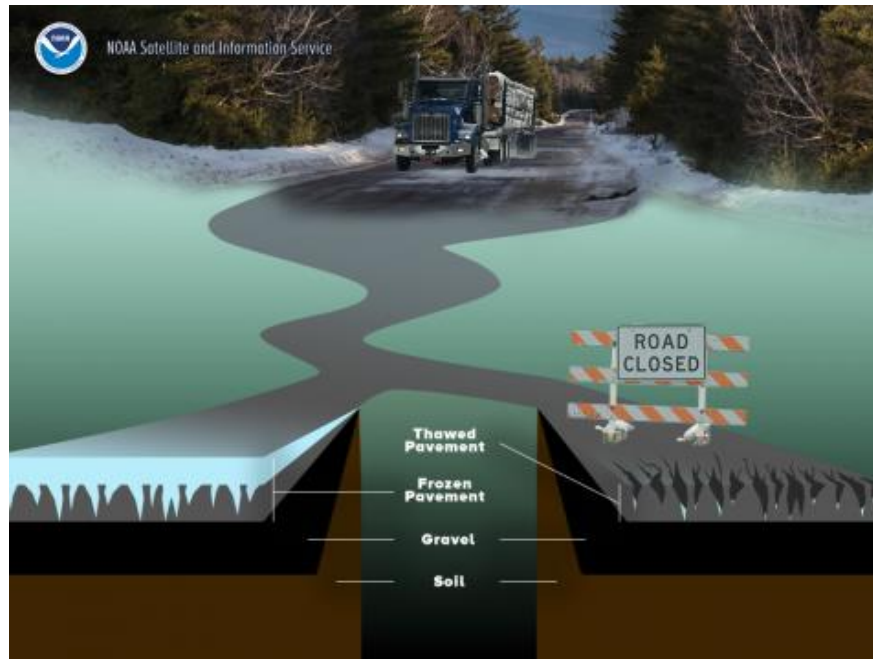
Office of the New York State Climatologist

The Problem



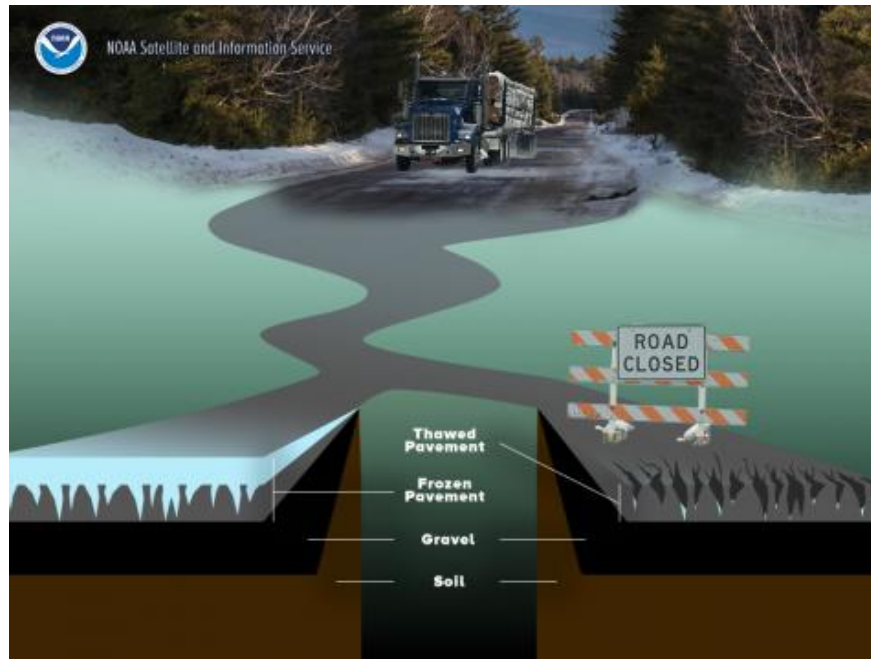
Winter Road Freezing

- When roads are frozen ...
 - Increased strength of roads
 - Winter Weight Premiums increase amount of weight a truck can haul



Spring Road Thawing

- When roads are thawing ...
 - Decreased structural integrity of roads
 - More susceptible to damage
 - Seasonal Load Restrictions decrease amount of weight a truck can haul



Balancing issues

- Seasonal Load Restrictions
 - Protection of roads
 - Economic and environmental issues
 - Increased cost to trucking companies and increased carbon emissions
 - Alternate routes – more miles
 - Increase number of smaller truckloads – more miles

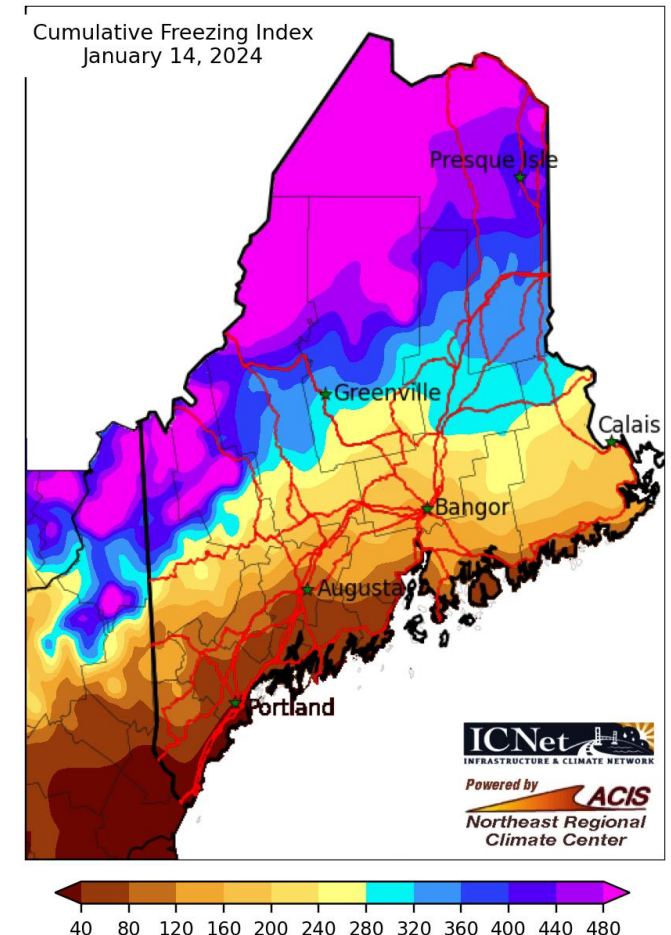
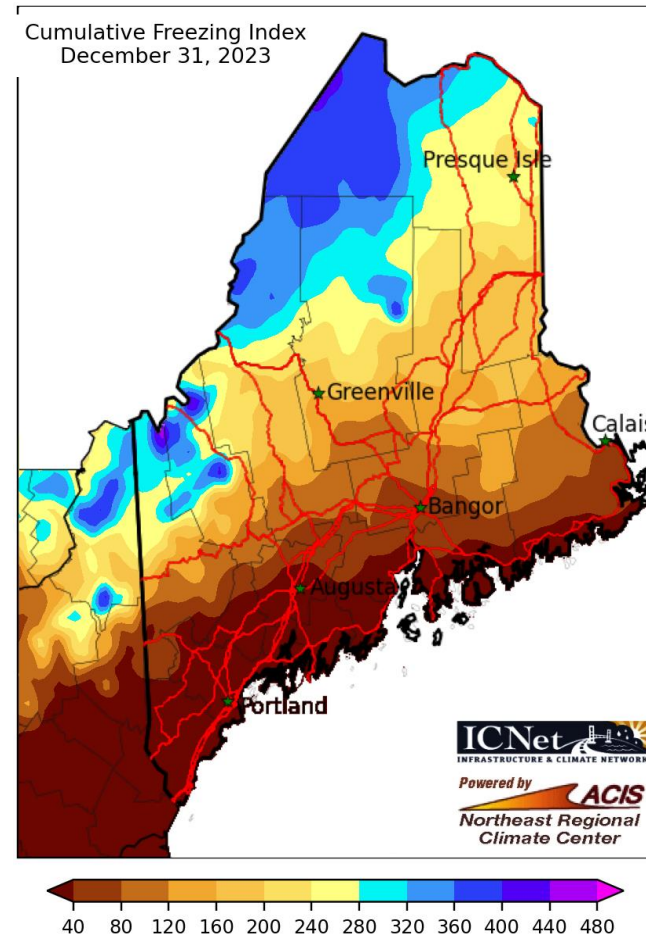


Freeze Thaw Tool

- Scientific approach to informed decision-making
- Fashioned after Minnesota DOT
- Indices based on air temperatures above/below 32°F
 - CFI (cumulative freezing index) above 280 – frozen enough for WWP
 - CTI (cumulative thawing index) above 25 – SLR go into effect
- NRCC 4-km gridded air temperature datasets
 - Current conditions and 6-day forecast
- Northeast, Michigan, Wisconsin, North Dakota

Cumulative Freezing Index Maps

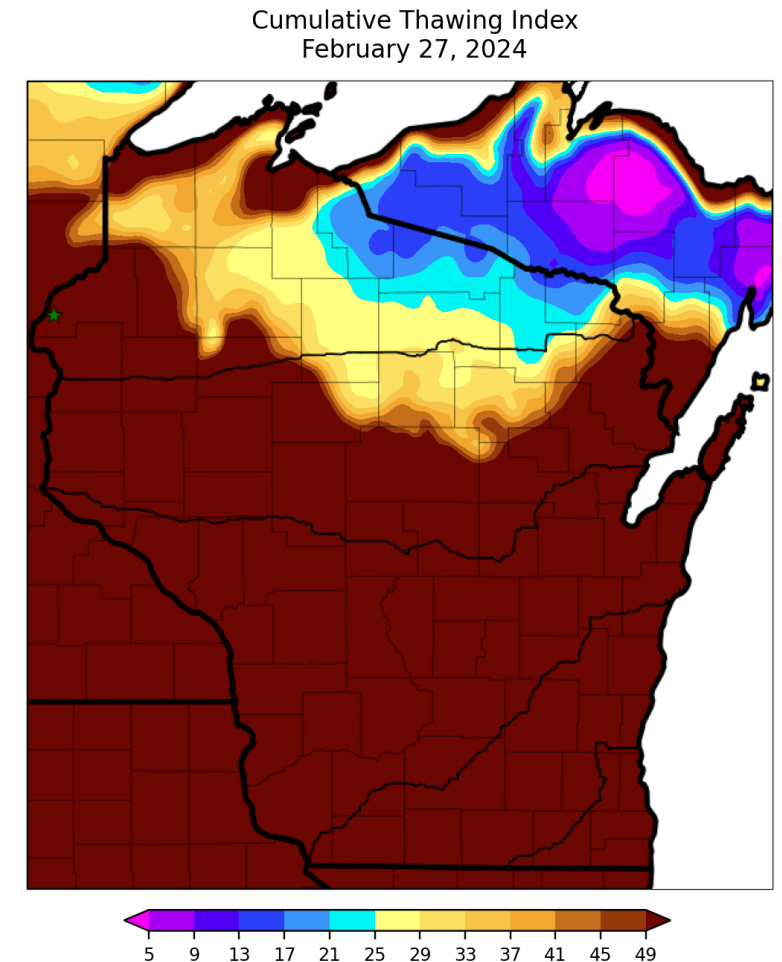
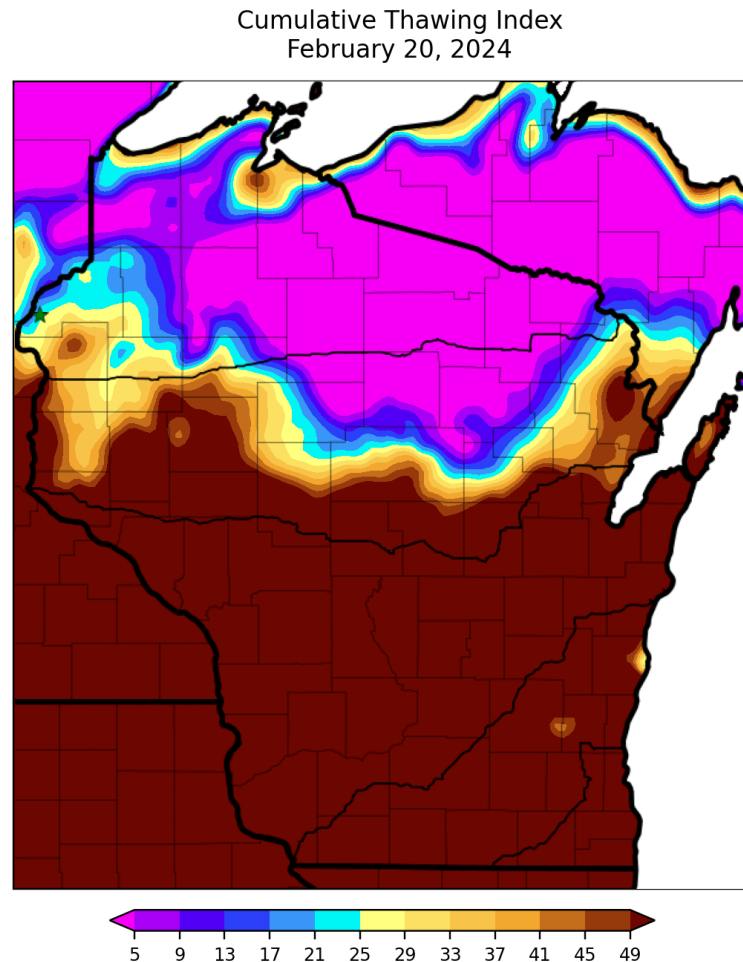
Winter Weight Premiums can be allowed when the 3-day weather forecast indicates that the cumulative freezing will exceed **280°F-days** and extended forecasts predict continued freezing temperatures.



Cumulative Thawing Index Maps

Seasonal Load Restrictions

can be scheduled when the 3-day weather forecast indicates that the cumulative thawing index will exceed **25°F-days** and longer-range forecasts predict continued warmth.



Future Potential for Timber Harvest

- This could be used as the basis for a similar tool for logging roads
 - Paved vs. unpaved roads
 - Effect of snow/ice cover – plowed vs. unplowed roads



Useful links

- NRCC Roadway Freezing/Thawing Tool
 - <https://www.nrcc.cornell.edu/industry/roads/>
- NOAA News article
 - [NCEI's Data Helps DOTs in the Northeast Conserve Low-Volume Roads](#)