

# The State of Road Weather Research

## SIRWEC 2016

April 25 2016  
Fort Collins, Colorado

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Ontario Ministry of Transportation  
TRB Maintenance and Preservation Section

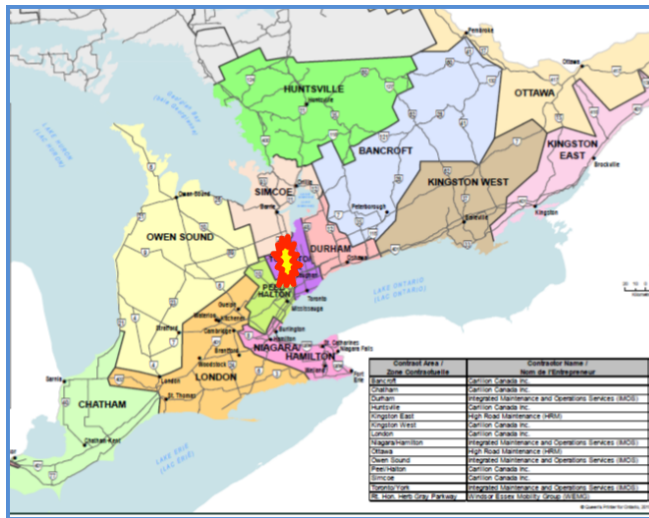
# Messages

Our work is critical!  
Advance of the discipline  
Where we are headed.....

# Road-weather is critical



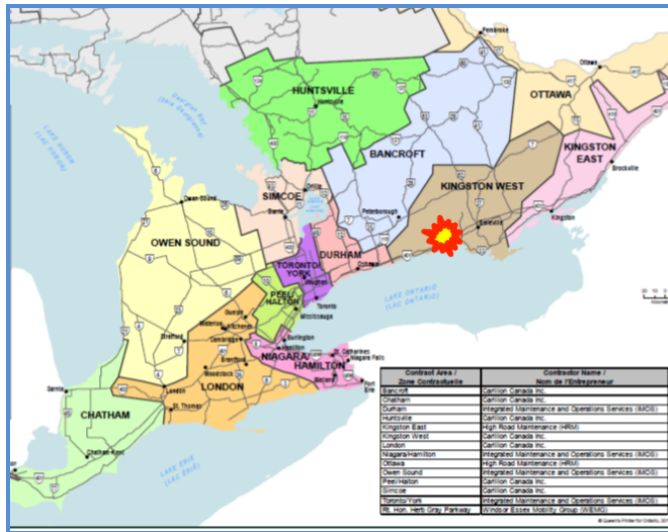
# Critical when there is a snow squall



Hwy 400, Feb. 27 2014  
12 hour closure over 15 km  
AADT: 84,000; 42,000 trips  
96 vehicles  
3 injuries



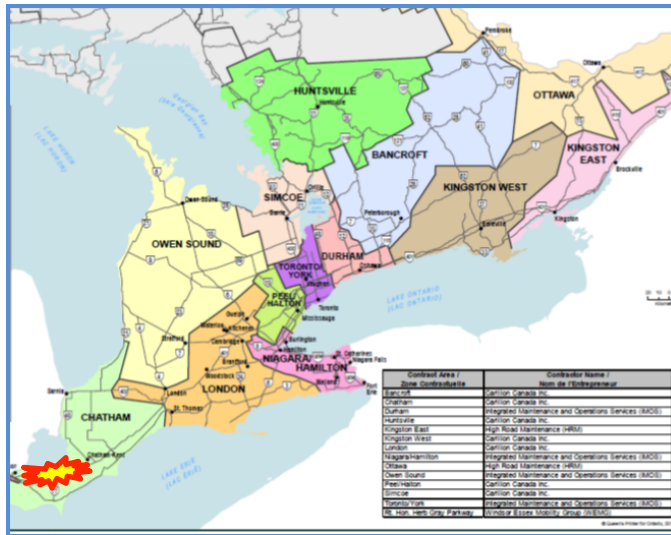
# Critical when there is black ice



Hwy 401, March 8 2015  
18 hour closure, 15,000 trips  
AADT: 40,000  
50 vehicles  
4 injuries



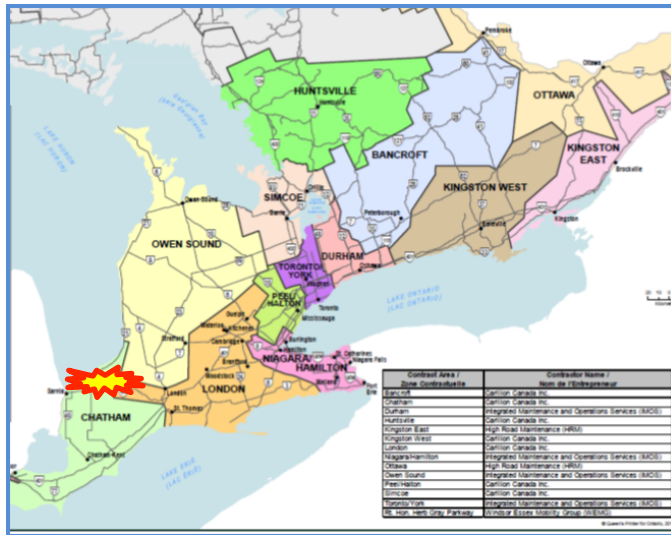
# Critical when visibility is nil



Hwy 401, Sept. 3, 1999  
24 hour closure, 24,000 trips  
AADT: 24,000  
87 vehicles  
62 injuries  
8 deaths



# Critical in extreme white-out



Hwy 402, December 13 2010  
 360 vehicles trapped  
 3 day closure  
 75,000 trips delayed  
 1 person dead



# Yes, road-weather is important!

- 22% of vehicle accidents (USA)
- Speed reduction
- Capacity reduction
- Economic loss
- Injury
- Loss of life
- **# vehicles per incident**
- **Longest time to recovery**



# Advance of a discipline

## February 1984, the Hague

The Standing International Road Weather Commission (SIRWEC) operates as a forum for the exchange of information relevant to the field of road meteorology. ...seeks to identify those areas where increased and/or new research and development may yield improvements in practices, techniques, systems and methodology, to the general benefits of the art.



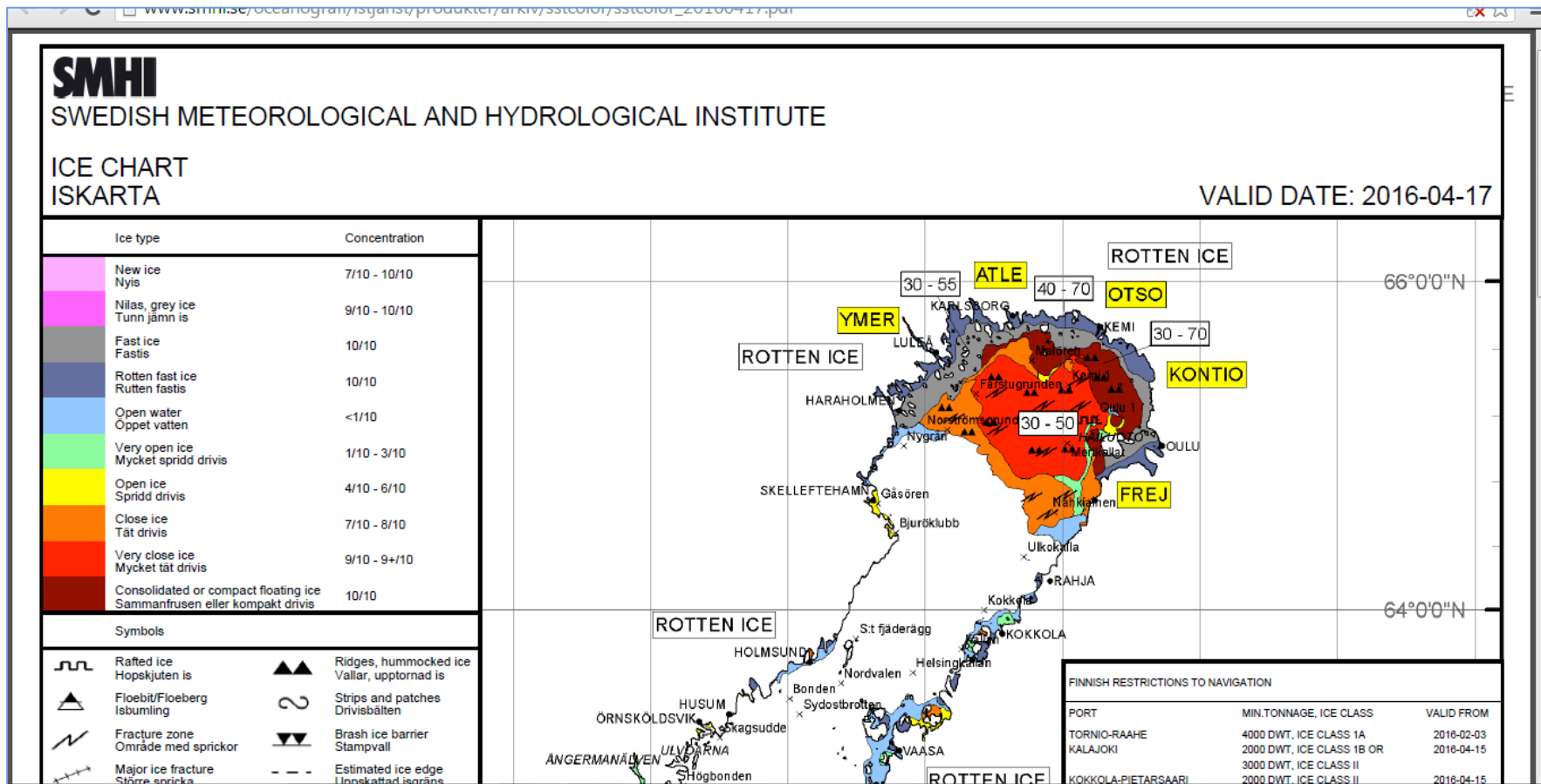
# 1984 and beyond...



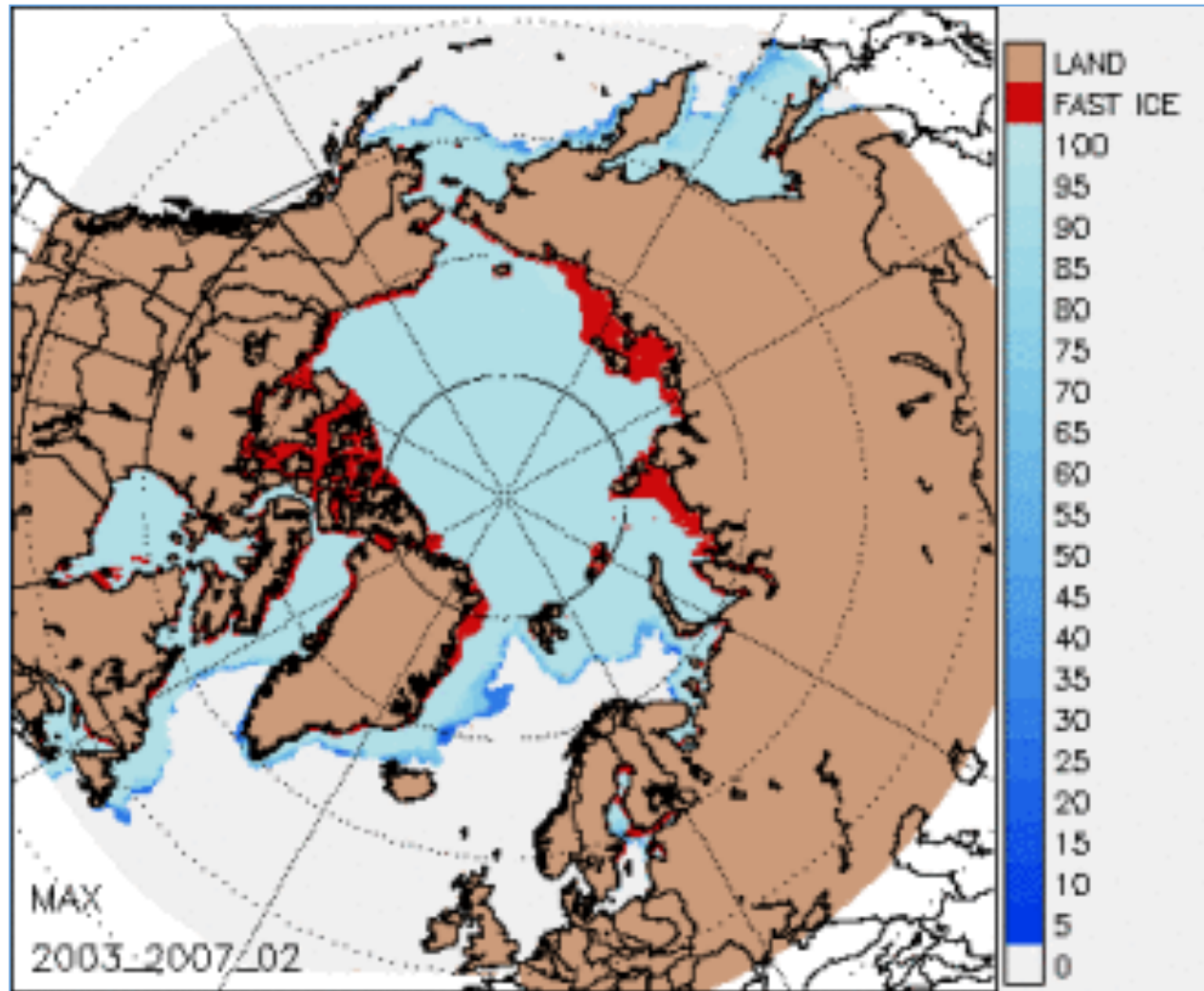
Weather research  
supporting  
transportation.



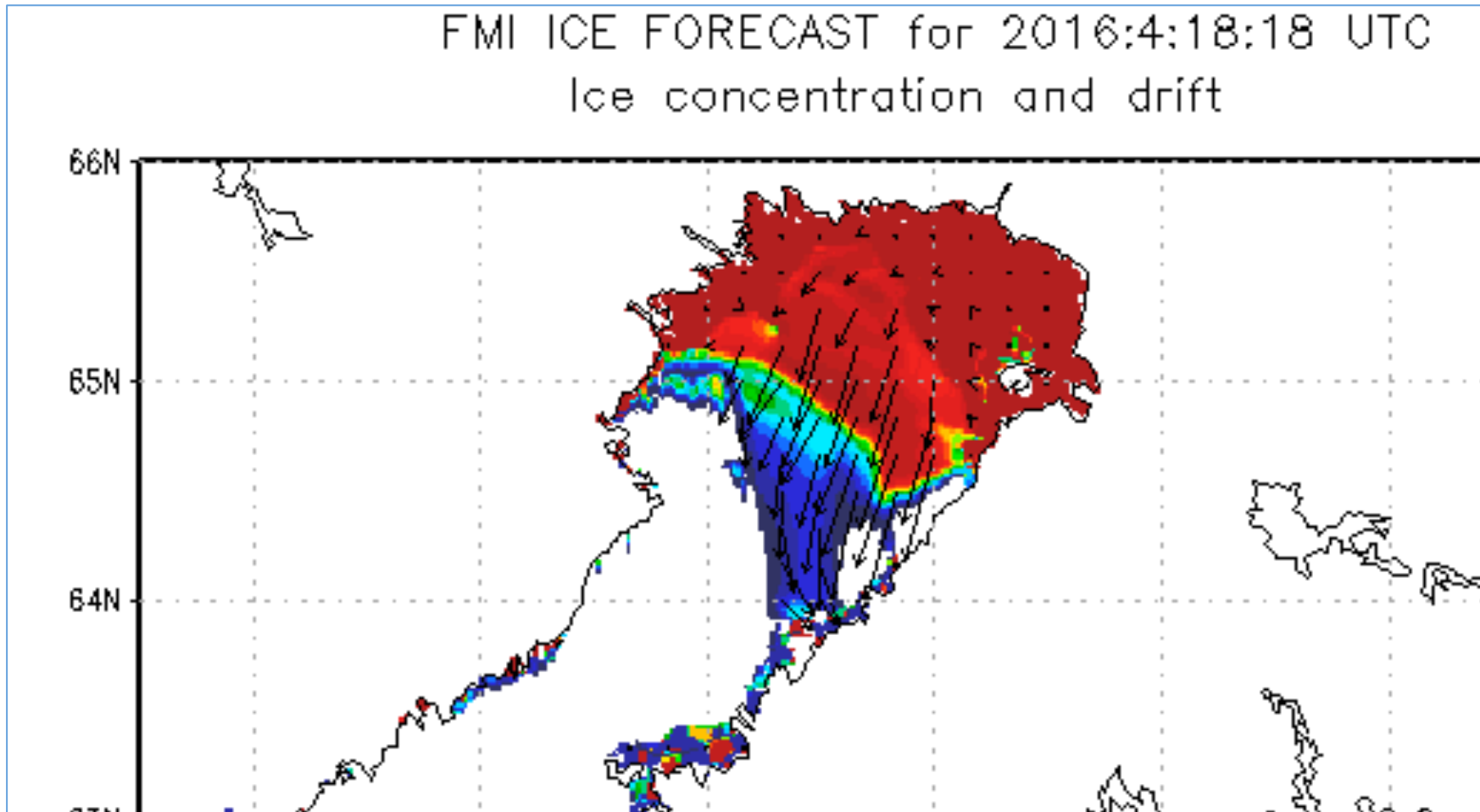
# Information to knowledge; mapping



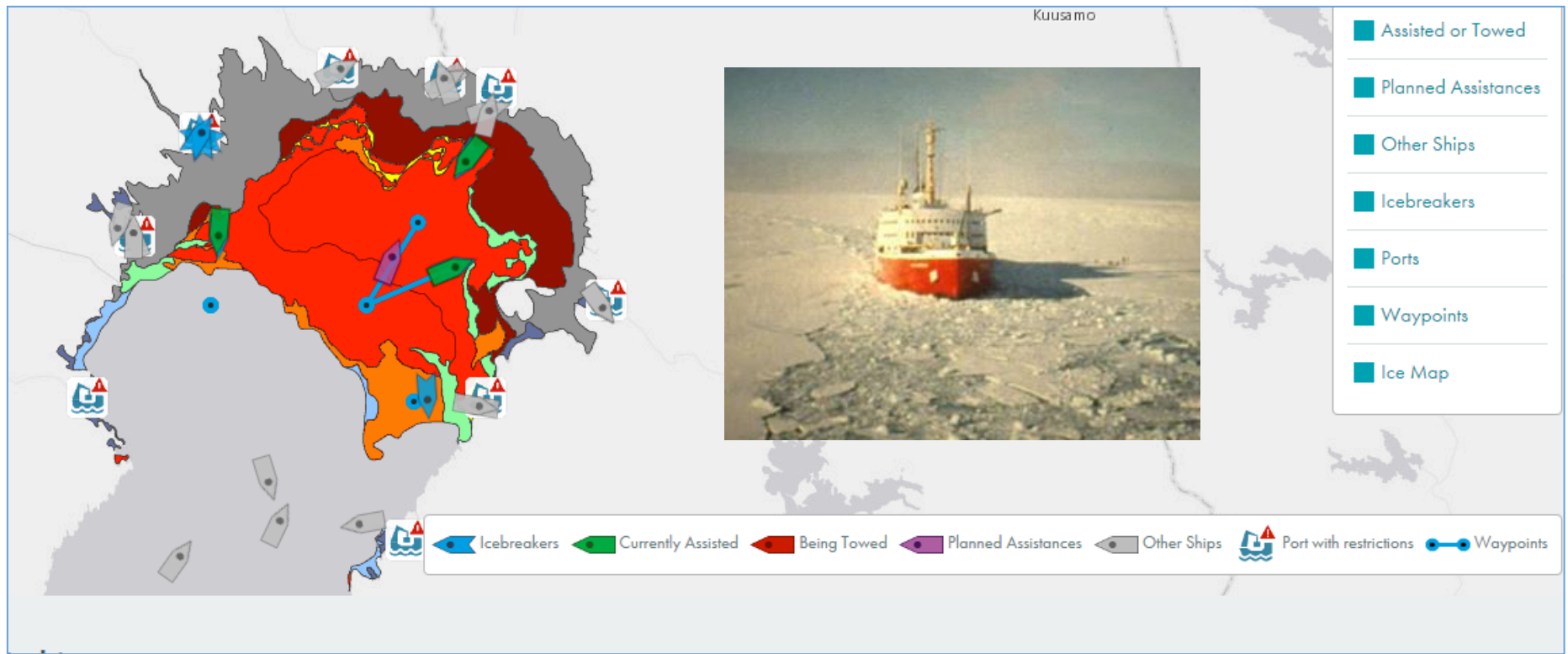
# Information to knowledge; climatology



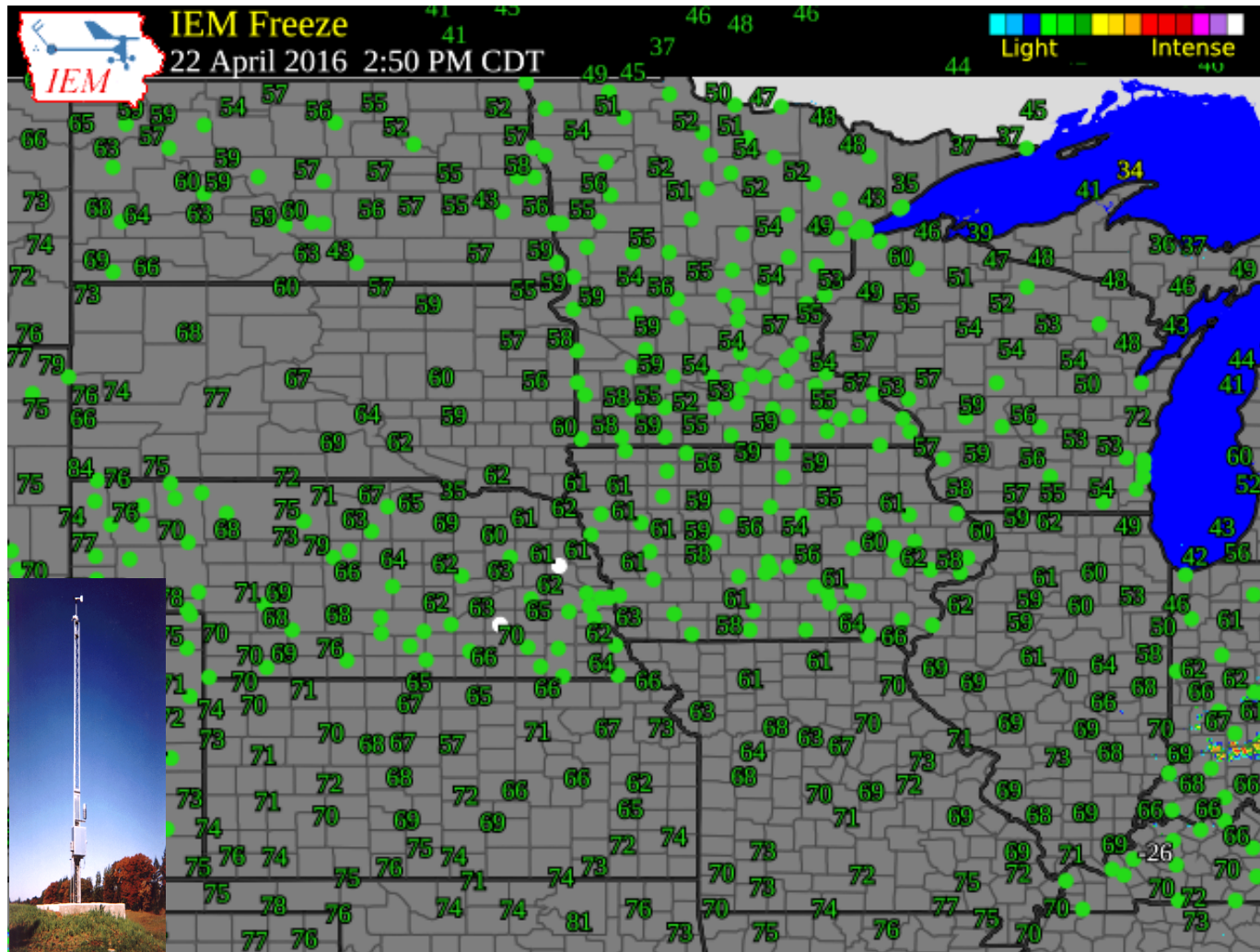
# Information to knowledge; forecasting



# Information to knowledge; decision support

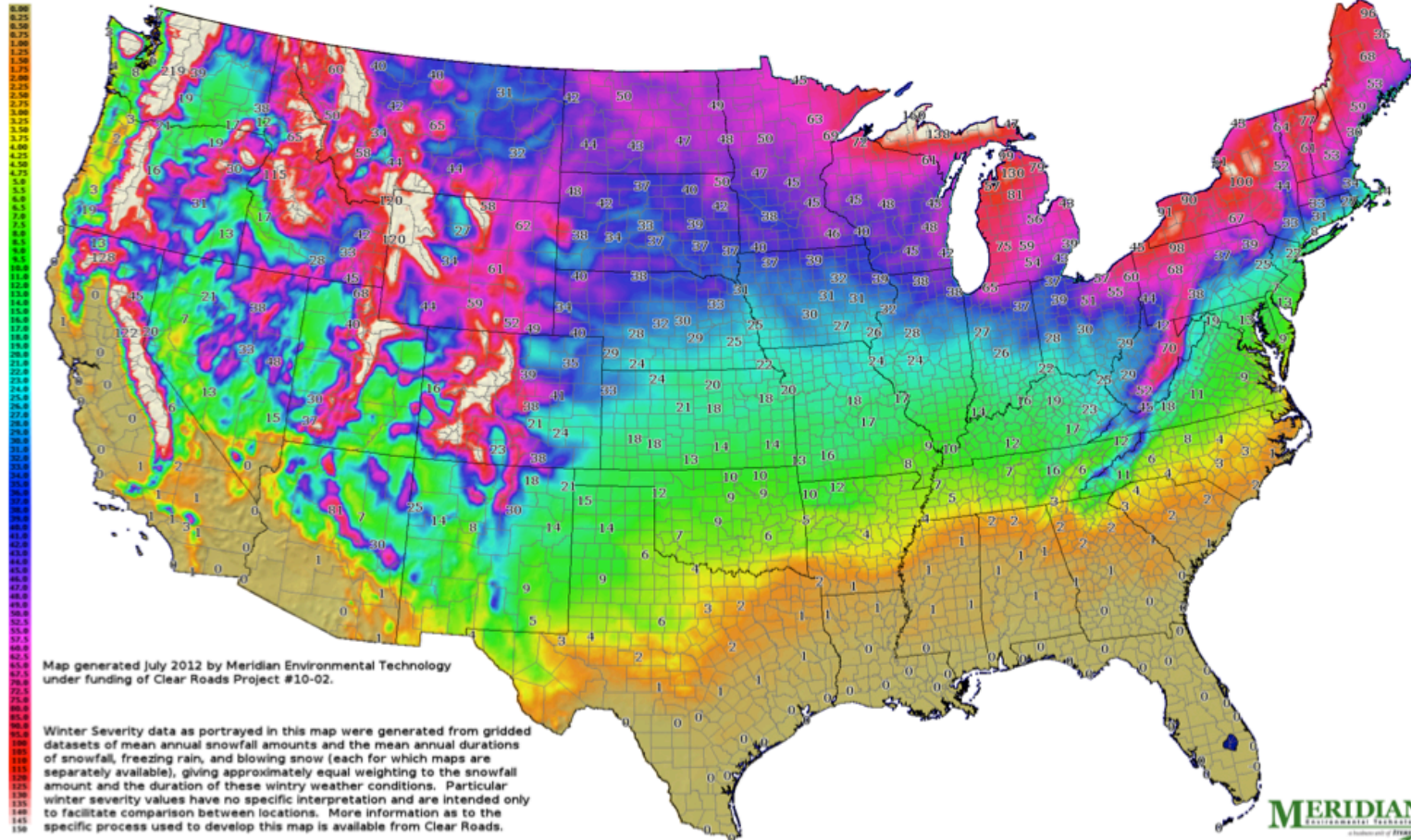


# Information to knowledge; mapping



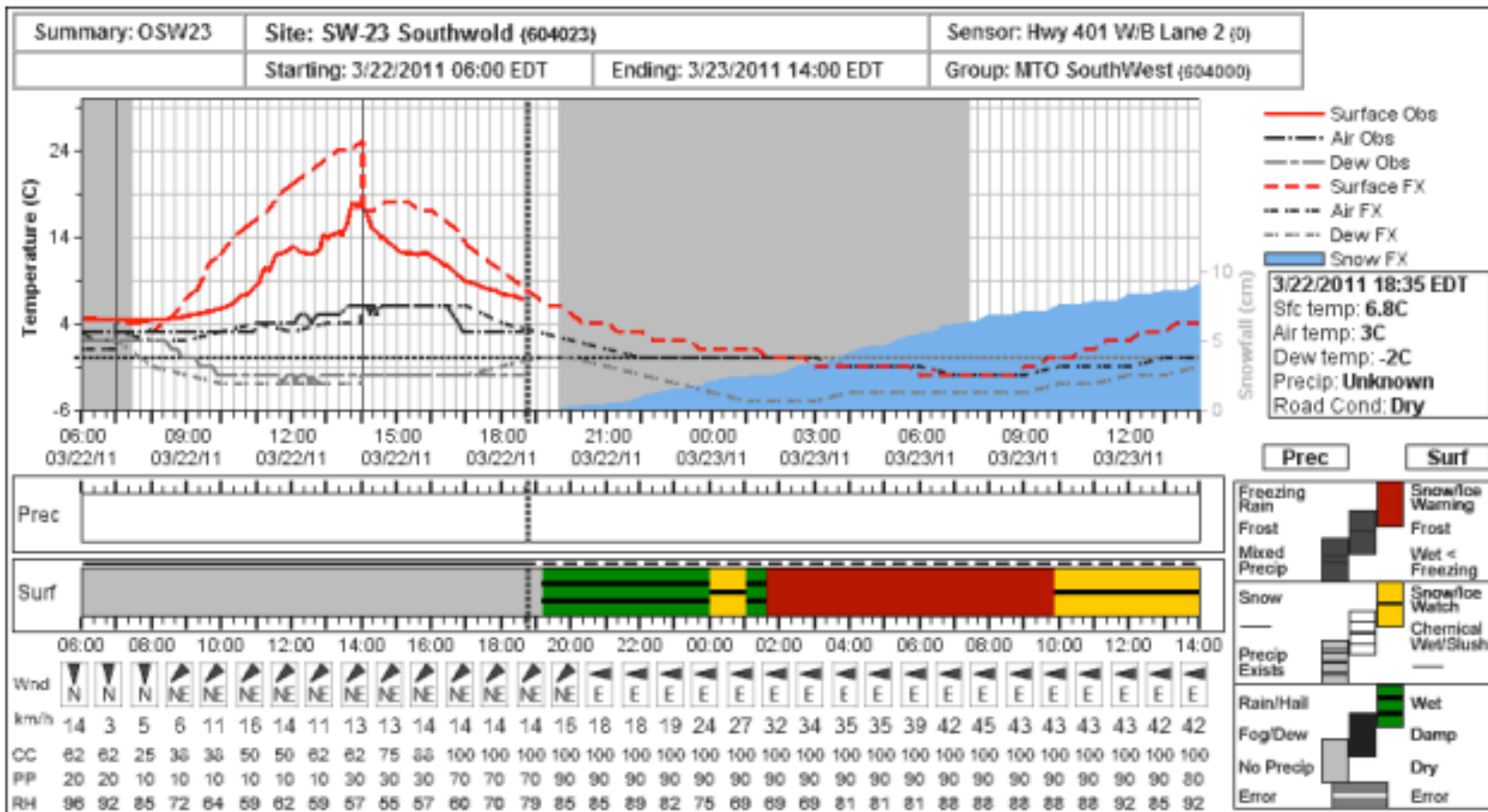
# Information to knowledge; climatology

## U.S. Winter Severity for Winter Road Maintenance

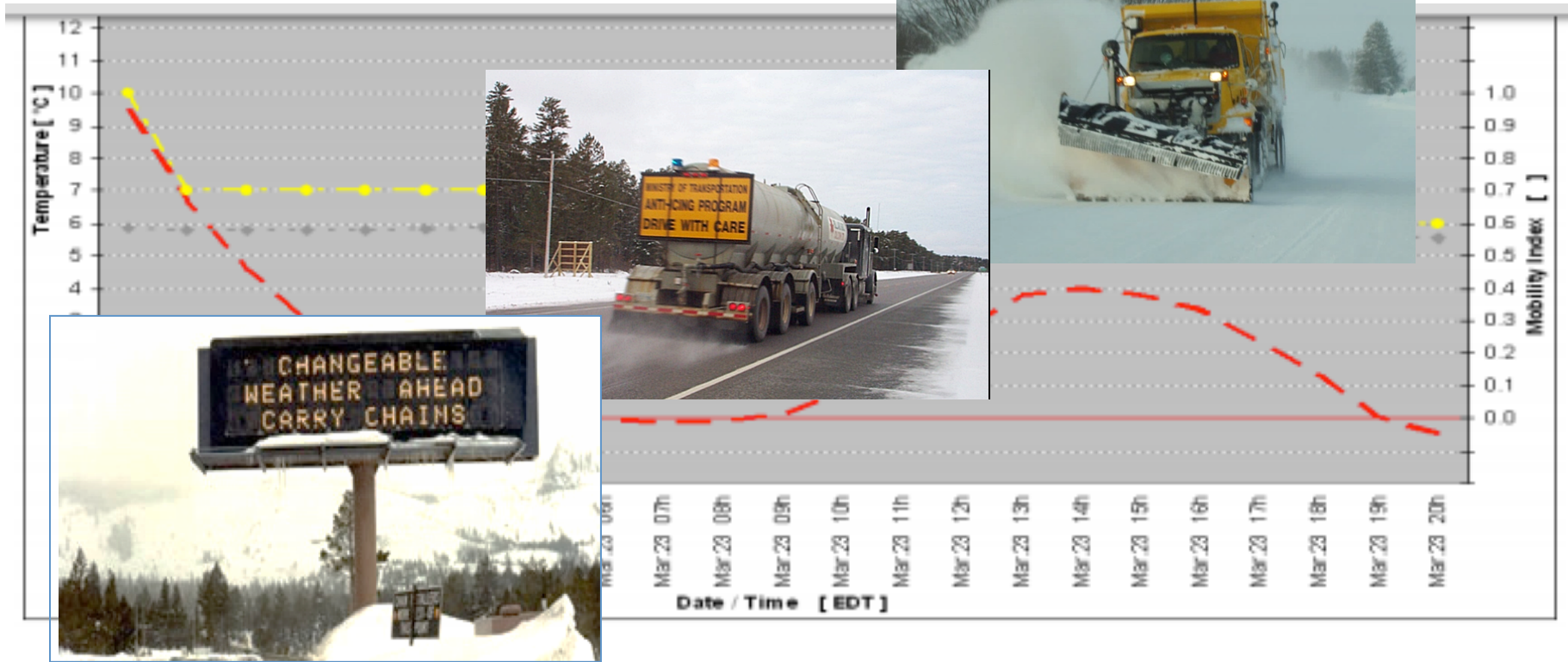




# Information to knowledge; forecasting

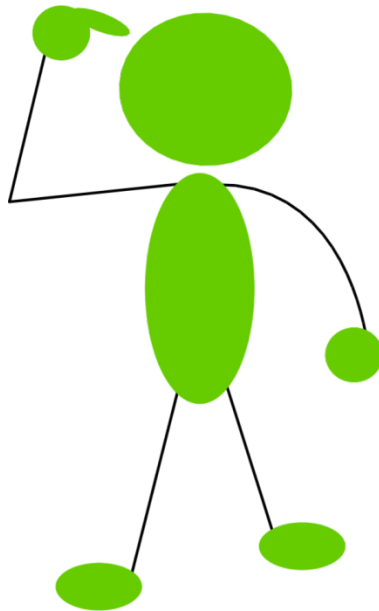


# Information to knowledge; decision support

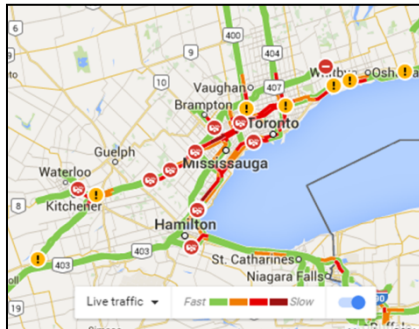


# Where we are headed....

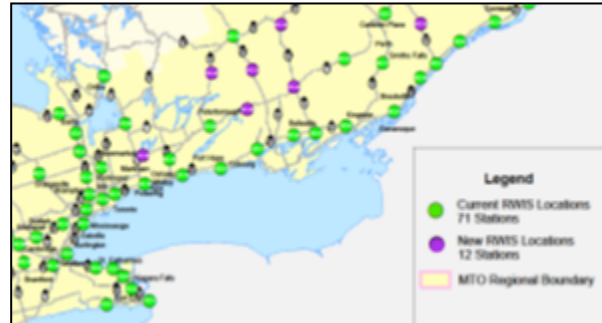
1. Big data
2. Micro forecasting
3. Environmental sustainability



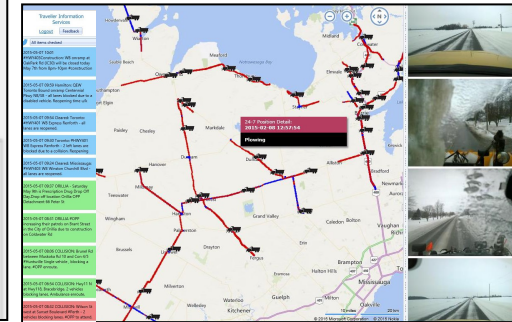
# Big data fusion



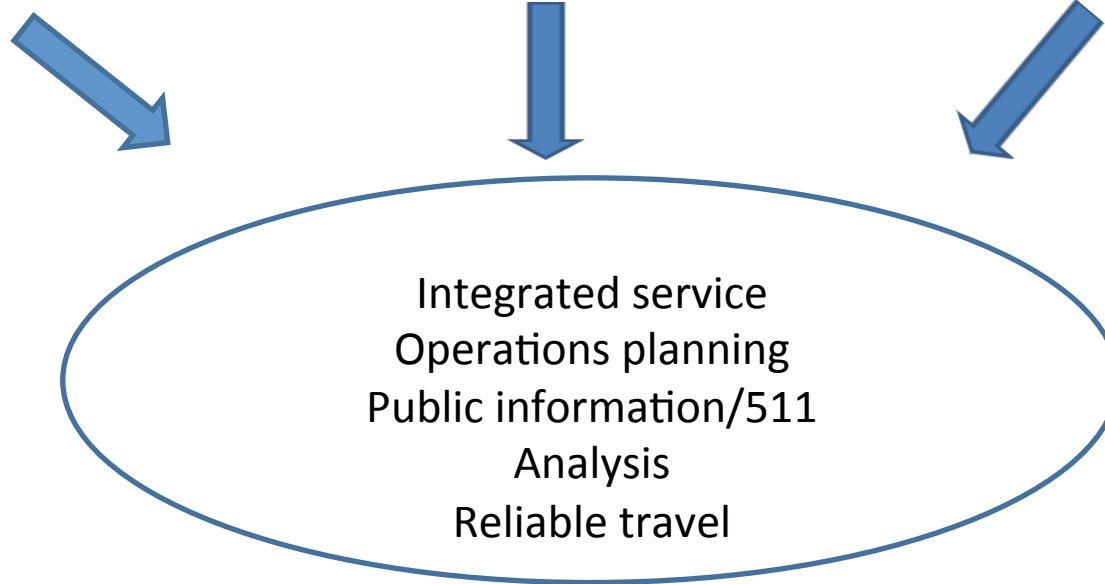
Traffic



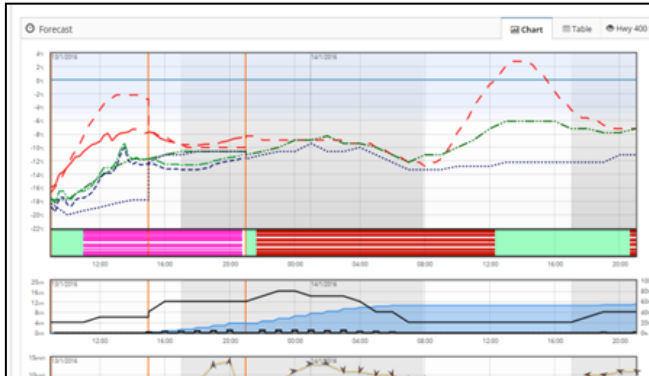
weather+ road conditions



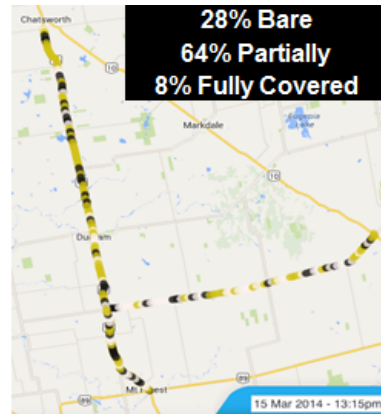
road conditions + operations



# Micro forecasting

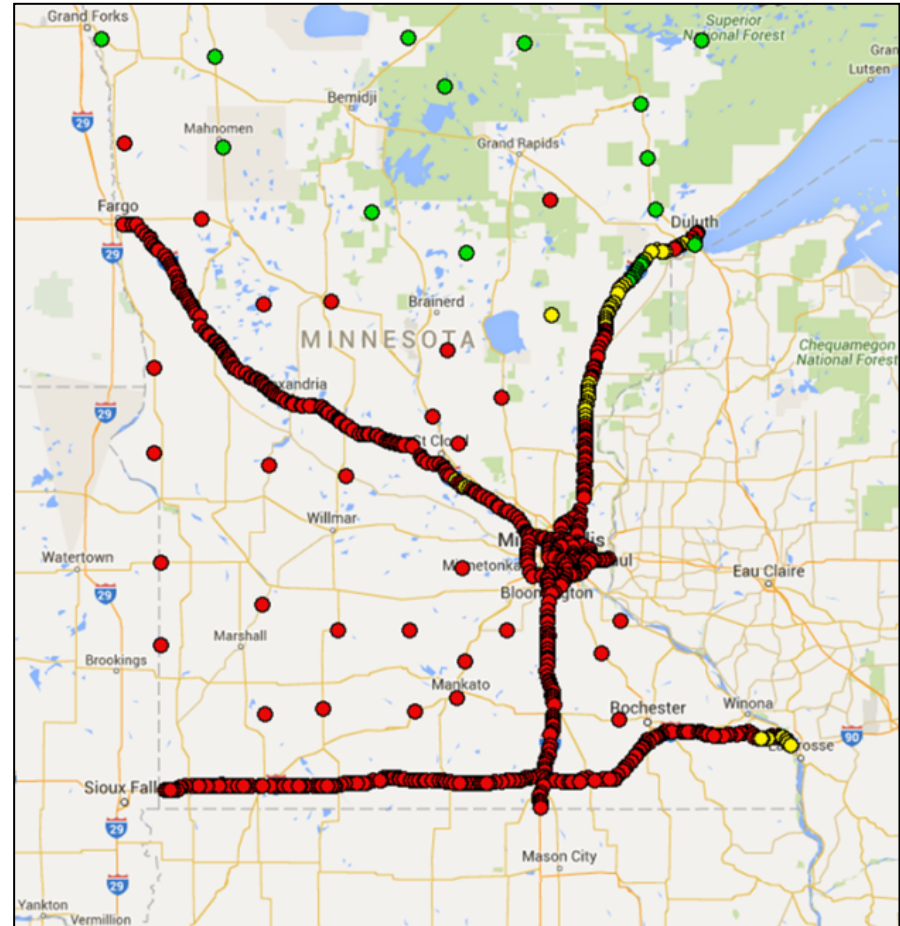


Site information



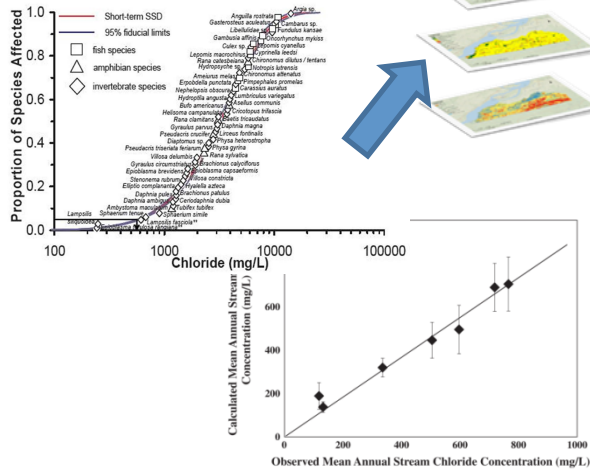
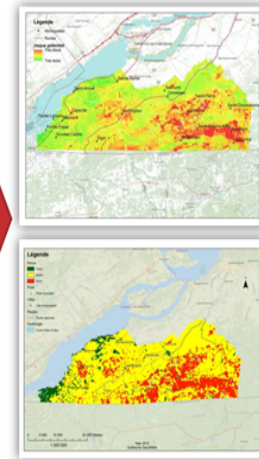
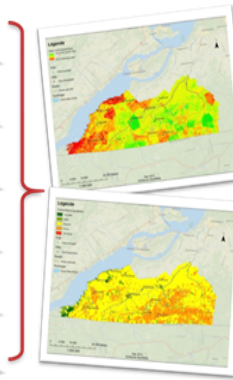
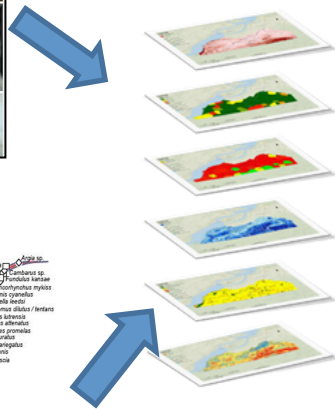
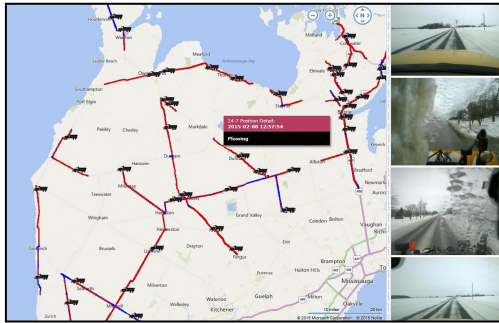
— Bare    — Partially Covered    — Fully Covered

Mobile observation



Micro-forecast

# Sustainability



Information

Knowledge

Wisdom

Action

# Information...knowledge...wisdom

...to make our roads safer to drive on in all weather conditions.

