Utilizing the METRo Road Surface Model for High-Impact Winter Events

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Annual Winter Weather Driving Impacts

- 500,000 Vehicle Crashes
- 1,800 fatalities
- 140,000 injuries
- $2.3 Billion spent on mitigation alone
Weather-Ready Nation

- Focus on impact-based DSS
- Can be difficult to identify high-impact winter events
- Need an objective tool to integrate all relevant factors and provide guidance
METRo

- **Model for the Environment and Temperature of Roads**

- **Open Source**

Performance

~50% of forecasts within ±2°C

(Crevier and Delage, 2001)

Fig. 2. Frequency distribution of road temperature errors for all three stations in automatic mode sampled every 20 min for the whole duration of forecasts (24 h) for both 0300 and 1500 LT runs.
Performance

MAE < 3°C when roads temps ± 10°C

(Rutz and Gibson, 2013)
Performance

(Rutz and Gibson, 2013)
November 22nd, 2014

- Freezing drizzle, 06-15Z
- Freezing rain advisory issued
- Numerous accidents in morning commute
January 12th, 2015

- Snow, sleet, and freezing rain
- Air temperatures $\sim 0^\circ C$
- Road temps $< 0^\circ C$
November 11th, 2013

- Clipper, 1-2” of snow during afternoon
- Air temperatures slightly below freezing
- No headlines issued & little to no impacts
Benefits of METRo

- Useful in transition seasons & when temps~0°C
- Very helpful with timing impacts to roads (crucial for DOT’s)
- Great situational awareness tool
- Objective guidance for forecasters
- Easy to install and run
Drawbacks of METRo

- Highly dependent on accurate atmospheric forecast
- Need more robust verification stats
- Limited accounting for road treatment
- Point forecast only
Warning

- METRo forecasts must be kept internal

- Site-specific pavement forecasts cannot be distributed in any public product

- Providing ourselves guidance to enhance existing NWS products (e.g., headline decisions during a low-accumulation, high-impact event)
WR METRo Output
(dev.wrh.noaa.gov/wrh/metro/)

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**METRo Roadcasts**

**Station Plot**

**Layer Options**

**Verification**

**Legend**

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**Au Train**

**Threat:** Dew

**Starting:** 08/12/2015 3:29 AM EDT

**Updated:** 08/10/2015 6:16 PM EDT

**Temperatures**

Click and drag in the plot area to zoom in

**Sky Condition**

Click and drag in the plot area to zoom in

**Fluxes**

Click and drag in the plot area to zoom in
How it works at WR...

- At :55, RWIS data provided by MesoWest

- At :10, NDFD, NAM, and RWIS are downloaded and a "setup" program creates necessary files for each site

- METRo then runs at each site

- Roadcasts usually online by ~:30 (these graphics are dynamically generated – not saved)
Thank you!

- [http://youtu.be/3Z6NRcoQw5I](http://youtu.be/3Z6NRcoQw5I)

- Questions?

- Amos.Dodson@noaa.gov or Jonathan.Rutz@noaa.gov
References


- Federal Highway Administration, cited 2012: How do weather events impact roads? [Available online at www.ops.fhwa.dot.gov/weather/q1_roadimpact.htm]
