

# The MDSS Mesoscale Model Ensemble

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# Review

- Locally-controlled regional (mesoscale) models add value to NWS services
  - added resolution in space and time
  - more natural precip amounts, type
  - improved timeliness
- Ensembles of equally-likely forecasts make better forecasts than any of the ensemble members

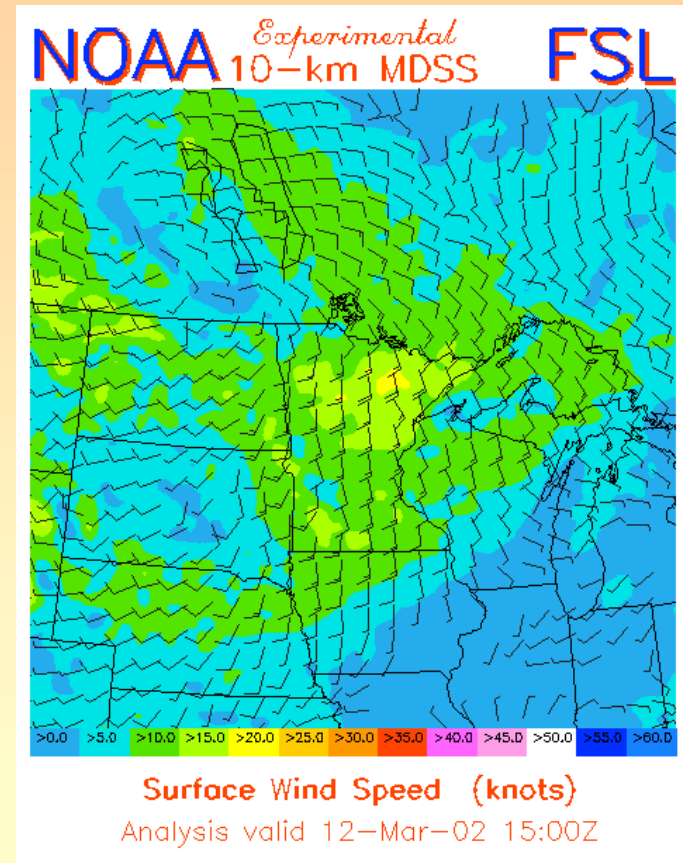


# Ensemble members

- MM5 loaded and bounded by AVN
- MM5 loaded and bounded by Eta
- RAMS loaded and bounded by AVN
- RAMS loaded and bounded by Eta

# Configuration

- 10-km spatial resolution
- 200x200 gridpoints, 30-sec timestep
- 4 forecasts per day out to 48 hours
- Real-time delivery of model grids to NCAR via LDM



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## FSL MDSS Ensemble of Models

**Road Weather**

Maintenance Decision Support System (MDSS)

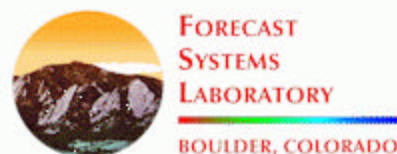
Select a Model Initial Time: 13 Mar 2002 - 21Z run

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These model runs of MM5 and RAMS were generated in real time during the late winter of 2002 over an area centered on Minnesota. Each of these models was initialized by two different models (NCEP's AVN and Eta) for a total of four model runs, each run four times per day out to 36 or 48 hours.

This work is done in support of the [Maintenance Decision Support System \(MDSS\)](#) project sponsored by the Federal Highways Administration. The goal of this project is to create a decision support software package to help winter road maintenance personnel decide how to best respond to weather problems on highways. MDSS takes automated weather observations and forecasts and runs pavement conditions models to suggest an optimum combination of plowing and chemical applications, and recommends the time to make these treatments.

 [MM5 configuration](#)  [RAMS configuration](#)



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*This page developed by [Bill Moninger](#) and [Randy Collander](#).  
The FSL MDSS ensemble models are set up and run by [Paul Schultz](#).  
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## 13-Mar-2002, 21 UTC run

Maintenance Decision Support System (MDSS)

Click on a check mark to see an image or animation (java) in a separate window.

	All times (loop)	Anal-ysis Wed 21	Forecast valid times (UTC)															
			Thu 00	Thu 03	Thu 06	Thu 09	Thu 12	Thu 15	Thu 18	Thu 21	Fri 00	Fri 03	Fri 06	Fri 09	Fri 12	Fri 15	Fri 18	Fri 21
MM5 Eta T	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MM5 AVN T	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RAMS Eta T	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RAMS AVN T	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MM5 Eta Wind	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MM5 AVN Wind	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RAMS Eta Wind	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RAMS AVN Wind	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MM5 Eta T / Wind	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MM5 AVN T / Wind	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RAMS Eta T / Wind	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RAMS AVN T / Wind	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MM5 Eta T / 3h precip	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MM5 AVN T / 3h precip	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RAMS Eta T / 3h precip	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
RAMS AVN T / 3h precip	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



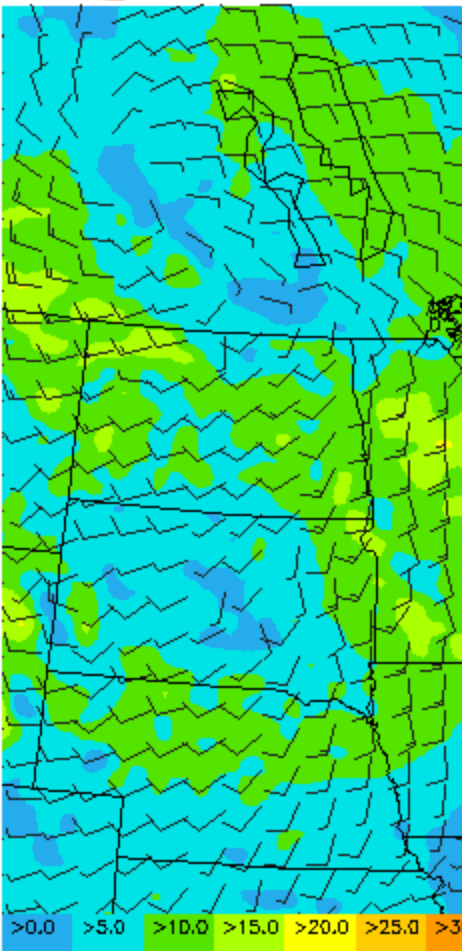
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Direct questions about the models to Paul Schultz, [schultz@fsl.noaa.gov](mailto:schultz@fsl.noaa.gov)

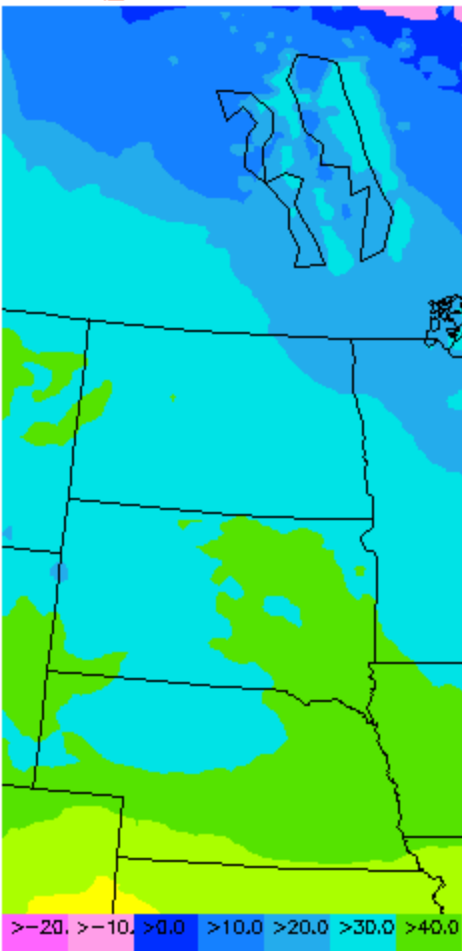
Last modified: Fri Sep 28 11:38:17 2001

**NOAA** *Experi*  
10-km



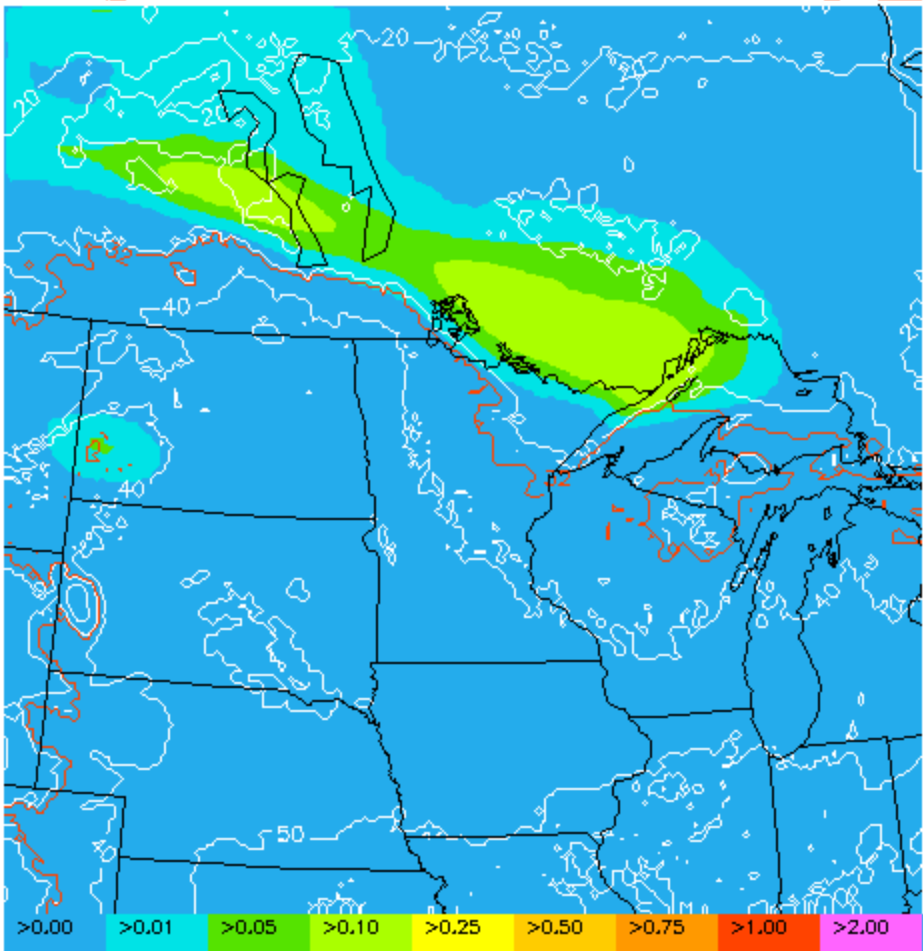
**Surface Wind**  
Analysis valid 12

**NOAA** *Experi*  
10-km



**Surface Temp**  
33-hr fcst valid 14

**NOAA** *Experimental*  
10-km MDSS



**Precipitation / Surface temp (inches - 3hr accum / °F)**  
3-hr fcst valid 12-Mar-02 18:00Z

**FSL**

MM5-Eta  
wind+speed

MM5-AVN  
temperature

RAMS-AVN  
precip+temp

# Goals up to now

- Demonstrate real-time capabilities
  - Model output data is converted to GRIB format
  - Model output is communicated immediately upon completion; minimum latency
  - Everything is reliable
- Develop a graphical user interface





Horizontal Vertical

Projection

Map Projection: (lambert suggested) **Lambert Conformal**

Centerpoint Longitude (degrees): -96.3

Centerpoint Latitude (degrees): 34.74

True Longitude (degrees):

True Latitude 1 (degrees):

True Latitude 2 (degrees):

Grid

Horizontal Dimension X: 100

Horizontal Dimension Y: 81

Distance between Grid Points(km): 38

Actions

Clear Undo Update

Corners: UL: -112.05, 45.00, LR: -80.55, 24.48

No. Grid Points: 8100

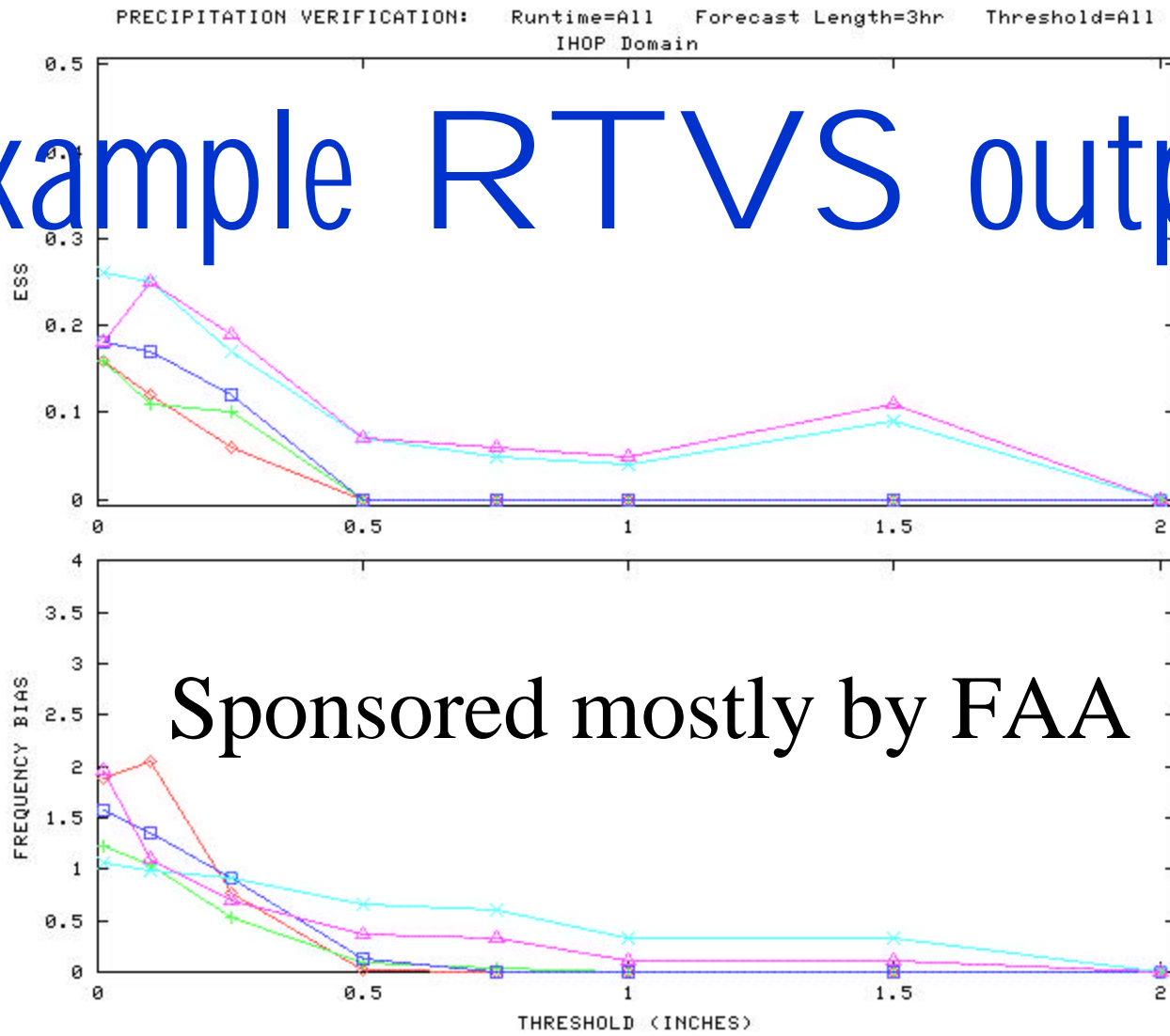
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# Validation plans

- RTVS for precip forecasts
- Generation/verification of PoPs
- State variables (temp, rh, wind)
- Comparisons with NCEP services
- *Assess value within RWFS*



# Example RTVS output



Sponsored mostly by FAA

Generated on 29 May 2002 by NOAA/FSL-RTVS  
=== IHOP Domain ===

- ◆ eta12 results from 2002-05-24 thru 2002-05-28
- + ruc10 results from 2002-05-24 thru 2002-05-28
- ruc20 results from 2002-05-24 thru 2002-05-28
- × lapsmm5 4 results from 2002-05-24 thru 2002-05-28
- △ lapsmm5 12 results from 2002-05-24 thru 2002-05-28

# Plans

- Add WRF to ensemble
- Support next demo
- More:
  - Validation
  - GUI
  - Post-processing and display
- Packaging

