

P77 Demonstrating the utility of the Mesoscale Model Evaluation Testbed (MMET) in a research environment

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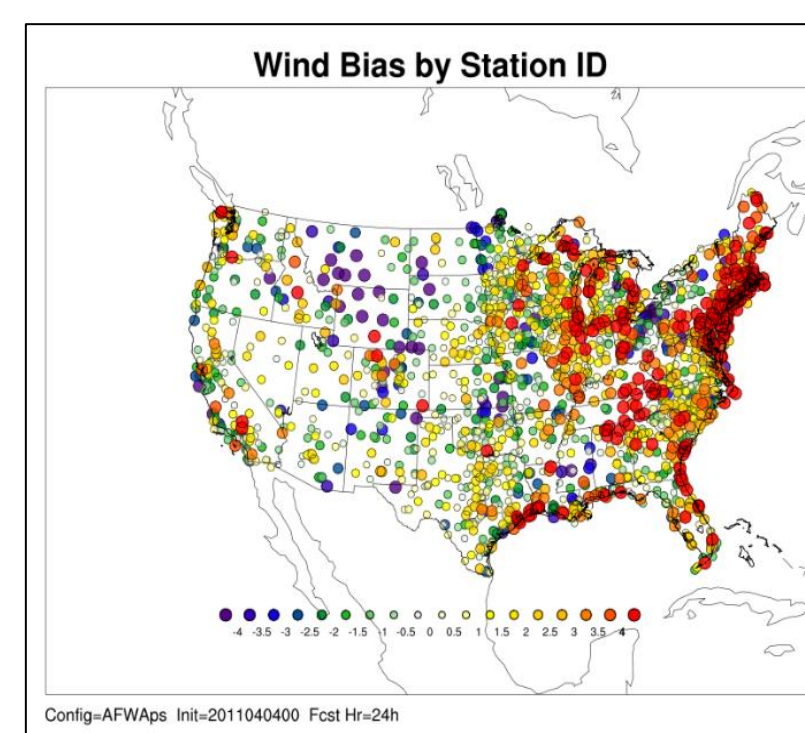
Motivation: The *Mesoscale Model Evaluation Testbed (MMET)* was established by the Developmental Testbed Center (DTC) to *assist the research community* in efficiently demonstrating the merits of a new technique by *providing datasets to utilize for testing* in a common framework in order to effectively *transition promising new advances into operations*.

MMET & DTC Baseline Testing

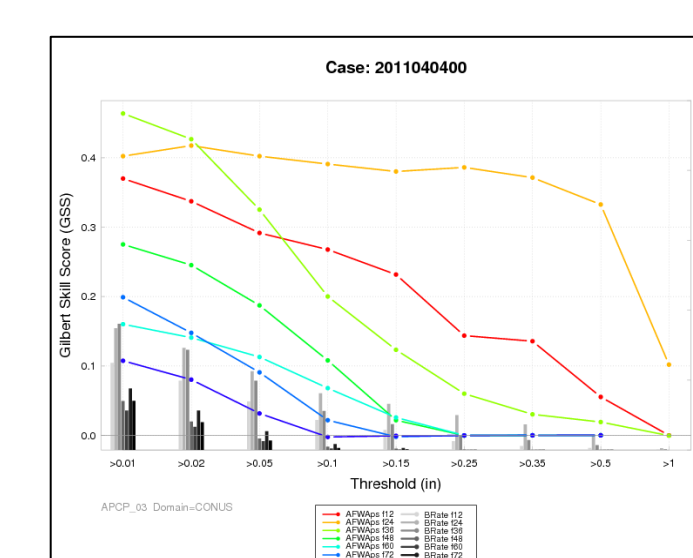
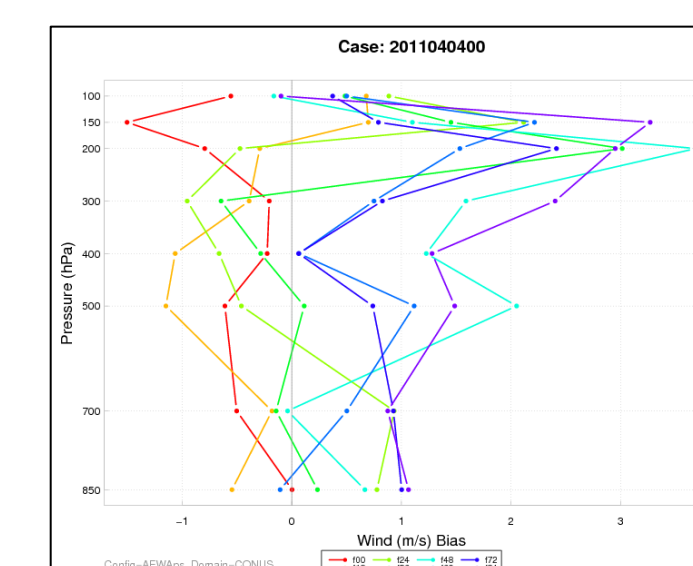
- MMET is hosted by the DTC, with data served through **R**epository for **A**rchiving, **M**anaging and **A**ccessing **D**iverse **D**ATA (**RAMADDA**)
- The DTC provides the user community with:
 - *Model input* and *observational datasets* for testing
 - *Baseline results* established by the DTC for select Operational Configurations (OCs), allowing for direct comparisons between new innovations and OCs
 - *Scripts* to assist with post-processing, graphics generation, and model evaluation
 - For *further information* on the testing protocol, case descriptions, access to RAMADDA or to nominate additional cases of interested to be included in MMET, please visit: <http://www.dtcenter.org/eval/mmet>

Acknowledgments: The Developmental Testbed Center is funded by the National Oceanic and Atmospheric Administration (NOAA), the Air Force Weather Agency (AFWA), the National Center for Atmospheric Research (NCAR) and the National Science Foundation (NSF). NCAR is sponsored by NSF.

Example of baseline results:
4 Apr 2011 00 UTC
(Record breaking severe day)



Statistics generated by the
Model Evaluation Tools (MET)



MMET Cases	Meteorological Scenario
20090228	Mid-Atlantic <i>snow storm</i> where NAM model produced high QPF shifted too far north
20090311	<i>High dew point</i> predictions by NAM over the upper midwest and in areas of snow
20091007	<i>HIRESW</i> runs <i>underperformed</i> compared to coarser NAM model
20091217	" <i>Snowpocalypse '09</i> ": NAM produced high QPF over mid-Atlantic, lack of cessation of precipitation associated with decreasing cloud top over eastern North Carolina
20100428-0504	Historic Tennessee <i>flooding</i> associated w/ an atmospheric river
20110404	Record breaking <i>severe</i> report day
20110518-26	Extended period of <i>severe weather</i> outbreak covering much of the midwest and into the eastern states later in the period
20111128	<i>Cutoff low</i> over SW US; NAM had difficulties throughout the winter of breaking down cutoff lows and progressing them eastward
20120203-05	<i>Snow storm</i> over Colorado, Nebraska, etc.; NAM predicted too little precipitation in the warm sector and too much snow north of front (persistent bias)

User Case #1: 28 Apr – 4 May 2010 **Flooding in TN** Submitted by Pedro Jimenez & Jimy Dudhia

Case Details

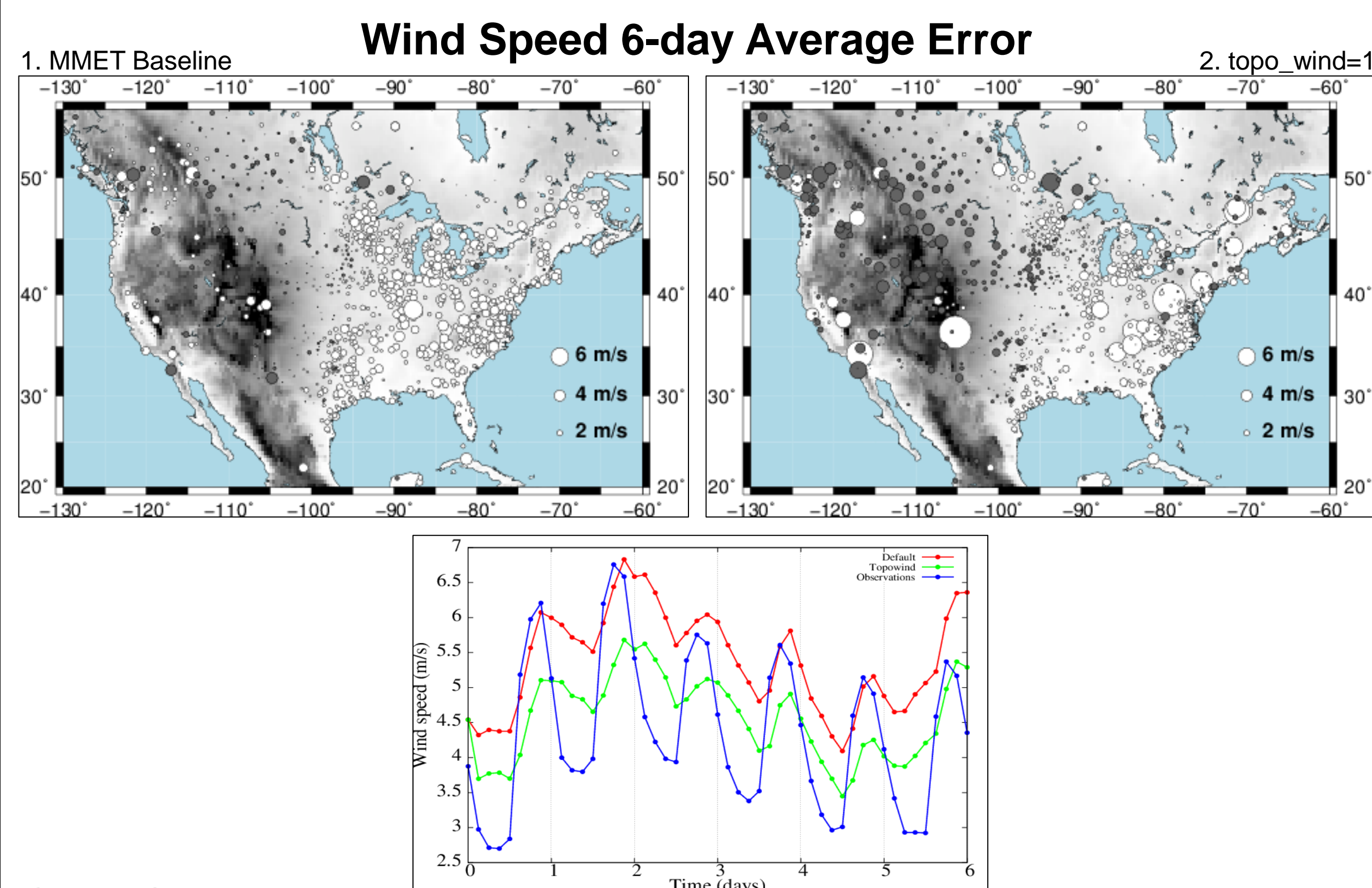
Forecasts: All simulations: 15-km grid length

1. WRF v3.4 ARW baseline configuration namelist from DTC (MMET Baseline Configuration)

2. WRF v3.4 ARW namelist w/ *topo_wind=1* activated

Model Initialization: Utilized IC/BC files from DTC

Verification: Utilized observation files provided by DTC



Case Summary

- Overall 6-day domain average with *topo_wind=1* smaller than default
- Reduces diurnal mean bias but does not capture full diurnal amplitude
- **Future work:** reduce the effect of *topo_wind=1* in daytime convective planetary boundary layer

User Case #2: 17 Dec 2009 **"Snowpocalypse"** Submitted by Gary Lackmann

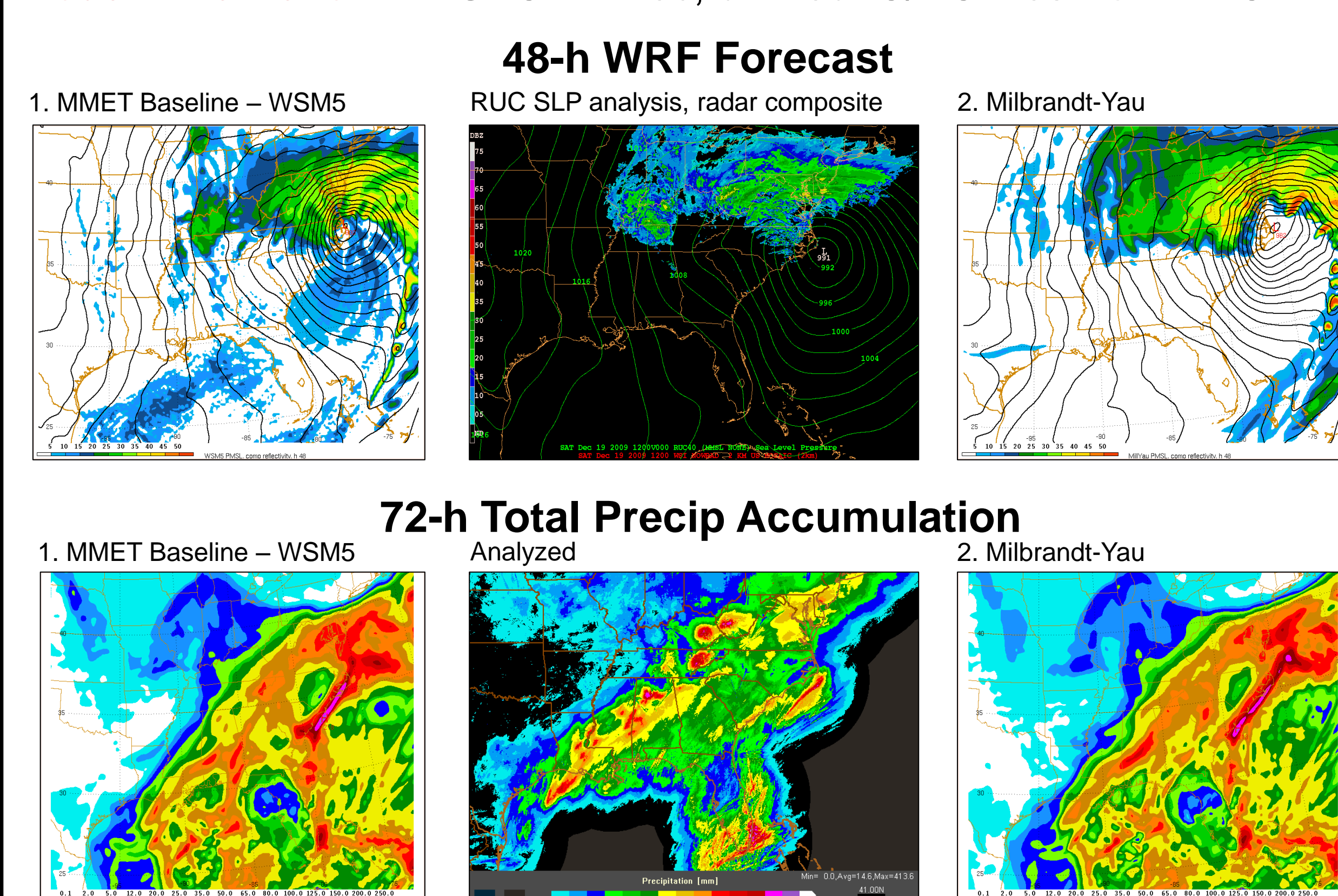
Case Details

Forecasts: All simulations: 15-km grid length

1. WRF v3.4 ARW baseline configuration namelist from DTC (MMET Baseline Configuration w/ *WSM5* microphysics)

2. WRF v3.4 ARW namelist w/ *Milbrandt-Yau* microphysics

Model Initialization: 12 UTC 17 Dec, utilized IC/BC files from DTC



Case Summary

- Both forecasts captured main features
 - Axis of precipitation over coastal Carolinas and VA
 - Precipitation minimum over FL
- Significant over-prediction over NC, SC, and VA and issues with cessation of precipitation
- **Future work:** perform verification of simulations with MET

User Case #3: 1 – 3 May 2010 **Flooding in TN** Submitted by Kelly Mahoney

Case Details

Forecasts: Simulations #1-3: 15-km grid length; Simulation #4: 4-km grid length/1.3-km inner nest

1. WRF v3.5 ARW baseline configuration namelist from DTC (MMET Baseline Configuration w/ *WSM5*)

2. WRF v3.5 ARW namelist w/ *Thompson* microphysics

3. WRF v3.5 ARW namelist w/ *Thompson* MP and *no CP scheme*

4. WRF v3.5 ARW namelist w/ *#3 physics* and *4-km/1.3-km grid length*

Model Initialization: Utilized IC/BC files from DTC for simulations #1–3, NAM 00 UTC 20100501 forecast from DTC to produce IC/BCs for #4

