The Mesoscale Model Evaluation Testbed (MMET): Assisting with the Transition of Promising NWP Techniques from Research to Operations

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Motivation: A testing protocol detailing the procedures necessary to advance new innovations efficiently and effectively through the research to operations (R2O) process was defined by the Developmental Testbed Center (DTC) in collaboration with its operational partners. As part of this process, the Mesoscale Model Evaluation Testbed (MMET) was established to assist the research community in demonstrating the merits of a new technique by providing datasets to utilize for testing in a common framework.

DTC Mission

The fundamental purpose of the DTC is to facilitate the transition of NWP technology between research & operations. DTC facilitates:

- OZR transition by making the operational NWP systems available to the research community
- RZO transition by performing extensive testing & evaluation of new NWP innovations in a functionally similar operational environment
- Interaction between research & operational NWP communities through the organization of community workshops/meetings & hosting a DTC Visitor Program

MMET & DTC Baseline Testing

- MMET is a mechanism to assist the research community with the initial stage of testing to efficiently demonstrate the merits of a new technique
- 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 of new OCs
  - Scripts to assist with post-processing, graphics generation, and model evaluation
  - MMET is hosted by the DTC, with data served through Repository for Archiving, Managing and Accessing Diverse Data (RAMADDA)
  - For further information on the testing protocol, case descriptions, and access to RAMADDA: http://www.dtcenter.org/eval/mmnet

Example of baseline results 20110522 00 UTC ini (Joplin, MO tornado)

Case Details: “Snowpocalypse”

Submitted by Gary Lackmann

Forecasts: WRF v3.4 ARW baseline configuration namelist from DTC

Model Initialization: Utilized IC and BC files provided by DTC

48-h WRF Forecast

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

User Case #2 – 20100428-20100504 Flooding in TN

Submitted by Pedro Jimenez & Jimy Dudhia

Forecasts: WRF v3.4 ARW baseline configuration namelist from DTC

Model Initialization: Utilized IC and BC files provided by 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 to reduce convective mixing and vertical transport of momentum

User Case #1 – 20091217 12 UTC “Snowpocalypse”

Submitted by Gary Lackmann

72-h Total Precip Accumulation

Moving Forward with MMET

- Run case suite with WRF-ARW (v3.5) & NMMB
- Continue to add more cases, including routine, high-impact and field campaign cases (e.g., Hurricane Sandy)
- Allow for user community to nominate cases of interest via web submission form: http://www.dtcenter.org/eval/mmnet/cases/form_submission.php

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