

P15 Multiscale modeling for tactical Army nowcasting.

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The Weather Research and Forecast (WRF) model is tailored and improved for use as a high-resolution Army nowcasting tool for short-range updated forecasts of battlefield meteorological and aerosol fields. It supports various Army research programs, provides a means for evaluating tactical meteorological sensing strategies, and serves as a tool for boundary layer meteorological investigations (where Army operates).

At sub-km resolutions, numerical weather models have been challenged by issues involving severe terrain slope, reduced validity of certain parameterized sub-grid physics assumptions, and overall inherent limits to predictability at such scales. Furthermore, computational considerations are formidable at these scales, so different computing (Linux cluster to high-end laptop) solutions are explored along with novel limited-area model nesting strategies to achieve near-km/sub-km solutions in a timely manner. In addition, proper data assimilation strategies to best ingest raw weather (and even non-weather) observations into the model, including in situ and remotely sensed platforms (lidar, radar, UAVs, satellite, surface, radiosonde, etc) have also been developed. An array of methods such as Newtonian relaxation nudging, 3D variational, and ensembling (including hybrids) is being explored for supporting Army nowcasting purposes. Results based on these data assimilation techniques will be shown at the workshop.