

Title: Developing sub-domain verification methods based on GIS tools

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Abstract: The meteorological community makes extensive use of the Model Evaluation Tools (MET) developed by National Center for Atmospheric Research for numerical weather prediction model verification through grid-to-point, grid-to-grid and object-based domain level analyses. MET Grid-Stat has been used to perform grid-to-grid neighborhood verification to account for the uncertainty inherent in high resolution forecasting, and MET Method for Object-based Diagnostic Evaluation (MODE) has been used to develop techniques for object-based spatial verification of high resolution forecast grids for continuous meteorological variables.

High resolution modeling requires more focused spatial and temporal verification over parts of the domain. With a Geographical Information System (GIS), researchers can now consider terrain type/slope and land use effects and other spatial and temporal variables as explanatory metrics in model assessments. GIS techniques, when coupled with high resolution point and gridded observations sets, allow location-based approaches that permit discovery of spatial and temporal scales where models do not sufficiently resolve the desired phenomena.

In this paper we discuss our initial GIS approach to verify WRF-ARW with a one-kilometer horizontal resolution inner domain centered over the Los Angeles Basin. The LA Basin contains a mixture of urban, sub-urban, agricultural and mountainous terrain types along with a rich array of observational data with which to illustrate our ability to conduct sub-domain verification.