# The NWS Southern Region Modeling Initiative at WFO Melbourne, FL

David W. Sharp[1], Peter F. Blottman[1], Scott M. Spratt[1],
Matthew R. Volkmer[1], Bartlett C. Hagemeyer[1], and Jonathan L. Case[2]

[1]*NOAA/National Weather Service Melbourne, FL*

[2]*ENSCO, Inc., Cocoa Beach, FL & Applied Meteorology Unit, NASA/Kennedy Space Center, FL*

Efforts in local modeling have been underway at the National Weather Service (NWS) in Melbourne, FL (MLB) since the late 1990s, with much of this work performed in collaboration with the Applied Meteorology Unit at the Kennedy Space Center. The vision has been to provide mesoscale forecasters at the Weather Forecast Office (WFO) with timely and accurate high-resolution guidance over east-central Florida in order to continually maintain a forecast of the highest integrity suitable for tactical use. Considerable focus, therefore, has been placed within the first 24 hours, with emphasis on the 0-12 hour time frame. For WFO MLB, this emphasis has come to represent the time frame where mesoscale forecasting expertise best matches user demands for highly precise weather information (in both time and space).

Recently, a working paradigm has evolved regarding the role of local modeling and its value to the ever-evolving forecast process. First, of paramount importance is the appreciation for a real-time 3-dimensional data assimilation system for the purpose of generating high-resolution gridded analyses. These analyses integrate both traditional and non-traditional observational data sets of high quality, including ingests from multiple Doppler radars. The attempt is to anchor the starting point for a confident mesoscale forecast by means of analyses of comparable resolution. At WFO MLB, a version of the Advanced Regional Prediction System (ARPS) Data Analysis System (ADAS) has been configured to provide gridded analyses at a spatial resolution of 4 km and with a temporal resolution of 15 minutes. Output is routinely made available for display on the Advanced Weather Interactive Processing System (AWIPS), where the benefits of gridded analyses proved to be multi-fold. So far, ADAS output has shown direct diagnostic utility during critical freeze situations, for outlooking local severe weather potential, for depicting aviation-sensitive low-level wind sheer, and for assessing red flag wildfire conditions. Another application is that the output is available for ingestion within the Integrated Forecast Preparations System/Graphical Forecast Editor (IFPS/GFE) for use as the initial hour forecast, for access as persistence grids, for making verification grids, for developing bias grids, and for creating (situational) climatology grids.

Second, high-resolution analyses are also made available to hot-start the local ARPS model. The forecast model is configured with the same domain and spatial resolution as ADAS for consistency and designed to predict convection explicitly. It is cycled with the diagnostic to provide a new 9-hour prognostic suite every 3 hours on a 10-node/20-processor linux cluster. The local model has already shown promise in forecasting the timing and placement of convective initiation and subsequent intensity. Like ADAS, output is made available on AWIPS for direct use, but can also be ingested into IFPS/GFE for use in the first period forecast. Together, these efforts help mesoscale forecasters to realize the true value of local modeling. This paper/presentation will discuss the experiences of the local modeling initiative at WFO Melbourne and its contribution to improving forecasts for east-central Florida.