

Analysis of the WRF model performance for lake-effect event “Javanese”

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Abstract

The WRF model is a state-of-the-art forecasting system that we have used to study lake-effect storms. For the lake-effect storm Javanese (primarily a Lake Ontario event that occurred during the period of February 5-8, 2006), the NMM and ARW cores of the WRF were run with horizontal grid resolutions of 4, 8 and 10km, and 25 and 37 vertical levels of for each horizontal resolution. The performances of these runs were then compared to a control run in which 31 vertical levels and a horizontal grid resolution of 6 km were used for the NMM core. This control run represents the model configuration currently used by the National Weather Service office in Buffalo, NY. All of these model simulations were then compared with radar data from the actual event.

Early results from this case appear to indicate that while the model handled such factors as snow band location and intensity accurately during the event’s peak hours, it struggled on other important issues such as the time of initiation and demise and the connection (or lack thereof) of an upstream Lake Huron influence with the Lake Ontario band. One particular example was when the control run of the WRF allowed the established Lake Ontario band to persist longer at a greater intensity than occurred near the end of the model run due to the presence of a Georgian Bay connection that did not appear to exist based on radar observations. Challenges that lie ahead include determining if any components within the WRF system are responsible for the aforementioned forecasting, as well as determining which configuration gives the most accurate forecast in a timely manner.