Development of a Near Real-time Satellite Verification and Forecaster Guidance System for the High-Resolution Rapid Refresh (HRRR) Model

Principal Investigators: Jason Otkin (CIMSS) and Justin Sieglaff (CIMSS)

Abstract

We propose to develop a near real-time satellite-based verification system for the High Resolution Rapid Refresh (HRRR) model that will provide operational forecasters objective tools to quickly determine the accuracy of current and prior HRRR model forecasts. This capability is becoming increasingly important due to the implementation of rapidly updating, high-resolution numerical models with many overlapping forecasting cycles. Synthetic GOES infrared brightness temperatures will be generated for each HRRR model forecast cycle using the Community Radiative Transfer Model (CRTM), and will then be compared to GOES observations using various statistical techniques. The proposed analysis system will leverage existing satellite-derived validation tools developed by the assembled team, and will be used to examine the accuracy of the simulated cloud and water vapor fields at each model forecast time. Because forecast skill often varies with space and time, the statistics will be computed for pre-defined regions across the contiguous U.S. The analysis system and statistical results will be presented to operational forecasters and the research community at the Hazardous Weather Testbed Spring Experiment and at the Aviation Weather Testbed via an interactive webpage. Participant feedback will be used to enhance the analysis and display system. GOES, and eventually GOES-R, observations are critical for this validation system because they provide unique information about the spatial distribution of water vapor and clouds associated with various hazardous weather phenomena such as severe thunderstorms, winter storms, and turbulence.