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Zhuo Wang 6-2 Using VIIRS Land Surface Temperature to Evaluate NCEP North American Mesoscale Model (NAM) Forecast Yunyue Yu, Peng Yu, Yuling Liu, Mike Ek, and Yihua Wu

Land surface temperature (LST) is one of the crucial parameters in weather and climate prediction. Satellite measurements of boundary conditions, such as sea surface temperature (SST) have been successfully used to improve numerical weather forecast. However, due to the difficulties in the simulation of land surface emissivity and temperature, the satellite data over land still not widely used.

The NCEP North American Mesoscale Forecast System (NAM) is a numerical weather prediction model for short-term weather forecasting. LST is a land parameter used for verification of NCEP operational forecasting models.

The VIIRS sensor is a component of the current Suomi National Polar-orbiting Partnership (S-NPP) satellite and the following Joint Polar-orbiting Satellite System (JPSS). The S-NPP VIIRS LST is a granule-level real-time measurement over global land coverage with spatial resolution of 750m at nadir, which can provide regional or global evaluation of model forecast performance.

In this study, preliminary analysis was done to improve the use of VIIRS LST data in NOAA forecasting models, including the comparison of VIIRS LSTs with NAM model forecast LSTs. We have investigated the difference between the model and satellite data, and evaluated how observed differences can be used to improve the forecast model performance. NAM hourly forecast LSTs were compared with the VIIRS LSTs in March 2012. In general, results from this case study indicate that the patterns of NAM and VIIRS LST are consistent. The VIIRS LST variation is larger than NAM LST. NAM and VIIRS LST difference has zonal and meridional distribution, which reflects the geographic features. The NAM-VIIRS LST difference does not show a time dependent feature.