

Development of real time all-weather layer precipitable water products in AWIPS II by fusing the GOES-R and NWP for local forecasters

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Abstract

Observations of moisture transportation in pre-convection environment and during storm development are very useful for forecasters. NOAA's next generation of Geostationary Operational Environmental Satellite (GOES-R) series provides high temporal (every 5 minutes) and spatial (2 km) resolution moisture information not seen before. Since there will be no sounder onboard the GOES-R series, the GOES-R ABI will be used to continue the current GOES Sounder legacy atmospheric profile (LAP) products. However, the current operational GOES Sounder and the next GOES-R LAP products are only available in clear skies. Extending the use of IR measurements into cloudy regions would increase the completeness of moisture information. In typical scenes, completely clear-sky observations from the infrared (IR) observations are available for only 10 – 50% of the image, depending on the spatial resolution. Studies show that cloudy regions are responsible for the development of error in NWP forecasts (McNally 2002) and exhibit more forecast error than clear skies. Building on the GOES-R LAP algorithm, CIMSS scientists and NOAA collaborators propose to develop all-weather real time layer precipitable water (LPW) analyses and implement them into the Advanced Weather Interactive Processing System (AWIPS II) to allow operational meteorologists to monitor a controlling ingredient in the initiation, development, and decay of convective cells and systems. The unique LPW products have the advantages of availability in all sky and weather conditions. Three layer PW products with flexible spatial (2 – 10 km) and temporal (5 minutes – 1 hour) resolution will be developed, which will supplement the operational GOES-R LAP products.