

## **Assimilating Satellite Observations of Clouds and Precipitation into the NCEP NWP Models**

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The majority of satellite channel data affected by clouds are discarded in the NCEP operational data assimilation systems. These systems have been geared towards utilization of observations in clear sky conditions, since this is the most straightforward use of the data. However, as clouds and precipitation often occur in regions with high forecast sensitivity, improvements in the temperature, moisture, wind and cloud analysis of these regions are likely to contribute to significant gains in NWP accuracy.

Efforts to assimilate cloud affected radiance data in the NCEP NWP models has been progressing continuously under NOAA/NCEP, NASA, HFIP and JCSDA support. The work initially is directed towards the inclusion of microwave satellite data with a cloud signal, since the microwave data has the ability to penetrate most clouds. This presentation gives a report on the progress made to date and describes the new components incorporated in the analysis system to add the capability to assimilate cloud and precipitation affected radiance data. Finally, preliminary impacts of cloudy radiance data assimilation on NCEP global NWP forecasts and HWRF model forecasts are presented.