

NOAA Satellite Precipitation Validation System – A Standardized System to Assess Satellite Precipitation Products.

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The NOAA Satellite Precipitation Validation System (NPreciSe) is a standardized framework that evaluates satellite-based precipitation products against ground-based radar observations across the continental United States (CONUS) in near-real-time. The system provides objective feedback to algorithm developers while serving as a one-stop validation resource for end-users. NPreciSe performs instantaneous validation of satellite Level-2 precipitation estimate products delivered by the Goddard Profiling Algorithm (GPROF), Microwave Integrated Retrieval System (MiRS), and Snowfall Rate Retrieval Algorithm (SFR) for different passive microwave sensors. In addition, the system also evaluates Level-3 gridded precipitation products including Self-Calibrating Multivariate Precipitation Retrieval (SCaMPR), Climate Prediction Center Morphing Technique (CMORPH), Integrated Multi-satellitE Retrievals for GPM (IMERG), Global Satellite Mapping of Precipitation (GSMaP), Precipitation Estimation from Remotely Sensed Information using Artificial Neural Networks (PERSIANN), and Tomorrow.io's Unified Precipitation at hourly temporal resolution. Reference datasets include Multi-Radar/Multi-Sensor (MRMS) and Stage IV Precipitation Analysis. Validation outputs are disseminated through web-based interactive platform with visualizations, spatial performance maps, and statistical metrics at instantaneous, daily, and monthly timescales, enabling user-friendly and consistent assessment of satellite precipitation performance.