

REGIONAL VALIDATION OF SATELLITE-BASED GLOBAL PRECIPITATION ESTIMATES

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The Global Precipitation Climatology Project (GPCP) provides the global climate research community with global gridded precipitation data sets using infrared and microwave satellite observations as well as the raingauge-based analyses. The current operational combined product (Version 1c) incorporates (1) geostationary and polar-orbiting satellite infrared temperature histograms for the estimation of convective-type precipitation in the 40°N to 40°S latitude belt, (2) polar-orbiting satellite 19GHz-microwave radiances for estimating frontal-type precipitation in oceanic regions, (3) polar-orbiting satellite 85GHz-microwave radiances for estimating frontal type precipitation in extra-tropical land and ocean regions and (4) for the land surface gridded analyses based raingauge measurements. The latter are processed by the Global Precipitation Climatology Centre (GPCC) and used for bias reduction of the satellite-based estimates. The product series starts with July 1987 and is being updated on a near real-time basis. The spatial resolution is 2.5° by 2.5° latitude and longitude. Polar regions are not covered by data in this product.

A new experimental combined product (Version 2x) includes precipitation estimates from TOVS (Susskind et al., 1997) in addition to the Version 1c database filling data voids at high latitudes. It also retrospectively extends the combination to months January 1986 to June 1987 based on raingauge data, infrared temperatures and TOVS only, and further back to January 1979 using raingauge observations and satellite outgoing longwave radiation data. This data set covers the entire globe and the period from 1979 to 1999 so far.

Another new GPCP combined product provides daily precipitation data on 1°x1° gridcells (Adler et al., 1999). Starting in October 1996 the GPCP began producing 3-hourly merged global infrared (IR) brightness temperature (Tb) histograms on a 1°x1° grid in the band 40°N- 40°S, and this collection has prompted this new global One-Degree Daily (1DD) product which has been computed for the period 1997-1998. In its first release, the 1DD uses the "best" quasi-global observational estimators of underlying statistics to adjust quasi-global observational datasets that have desirable time/space coverage: The Special Sensor/Microwave Imager (SSM/I; 0.5°x0.5° by orbit, GPROF algorithm) provides fractional occurrence. The GPCP Satellite-Gauge Combination Version 2x (see above) provides monthly accumulation for an overall adjustment of the 1DD. This dependence on scaled cloud information implies that users should expect large error bars on the individual daily values, while space and/or time averages should be more reliable.

The GPCC is checking the performance of the monthly and daily GPCP products using additional in-situ data from dense raingauge networks out of selected regions. These data are carefully quality-controlled and corrected due systematic measuring errors caused by wind influences and evaporation losses. First results of a comparison study over the BALTEX have already been published on internet (<http://www-med-physik.vu-wien.ac.at/staff/rub/pro/GPCC/applications.htm>). The methods and more results may be discussed during the conference.

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