

Gridded analysis products provided and quality control by the Global Precipitation Climatology Centre (GPCC)

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Since its start in 1989 the Global Precipitation Climatology Centre (GPCC) performs global analyses of monthly precipitation for the earth's land-surface on the basis of in-situ measurements. The GPCC provides several gridded near-real-time as well as non-real-time global precipitation products. The GPCC uses the daily SYNOP and the monthly climate (CLIMAT) messages, as well as data from station networks operated by the National Meteorological/Hydrological Services worldwide and other global precipitation data collections (i.e. FAO, CRU and GHCN), as well as regional data sets.

Near-real-time products are the 'First Guess Product' and 'Monitoring Product', both with a spatial resolution of $1^{\circ} \times 1^{\circ}$. Only an automatic quality control runs during the generation of the 'First Guess Product', whereas the data base is extended and a manual quality control is carried out for the 'Monitoring Product'.

In addition the GPCC offers several non-real-time products based on additional data from national meteorological or hydrological services or other organizations. These are the 'Climatology' (based on ca. 64,400 stations with climatological normals). The new version of the 'Full Data Reanalysis' extends the time period from 1901 till 2009 based on an enlarged data base (ca. 11,000 stations in 1901, up to a maximum of ca. 47,000 stations in 1986/87 and slowly declining thereafter) and the quality control has been further improved. Since the data coverage for the 'Full Data Product' is time dependent it is not well suited for trend analysis. 'VASCLimO' is currently the homogenized product, which covers the period from 1951 till 2000. It will be replaced by the new product 'HOMPRA', which will extend the period from 1951 to 2005 and is scheduled to be delivered in 2011.

Also in 2011 an analysis of daily precipitation is scheduled to start on basis of global SYNOP reports. This new 'First Guess Daily' will be released together with the 'First Guess Product' 3 to 5 days after the end of each month.

The acquired data sets are pre-checked, reformatted and then imported into a relational data base, where they are archived separately in source specific slots, thus allowing a cross-comparison of data from the different sources. Any time new data sets are imported to the data base the metadata in the input data set are compared to those already available in the data base. In case of discrepancies (e.g. deviating coordinates), external geographical sources of information are utilized to decide whether a correction of the metadata in the data base is required or not, thus resulting in a perpetual improvement of the station metadata.

Since the beginning of 2009 the precipitation data to be imported is compared against a background statistic. Exceptional values are checked and either confirmed, corrected if possible, or excluded from the analyses. In preparation of GPCC's new analyses the entire data base has been checked statistically, for homogeneity over time and for spatial consistency.

In comparative analyses the quality of the data from the different sources was evaluated and ranked. If data from different sources are available for a given station and month/year, the data with the highest quality are selected for the analyses according to this priority scheme.

Since the data base has substantially grown compared to the previous reanalysis in 2008 the GPCC has put intensive efforts into its updates of the publicly available (<http://gpcc.dwd.de>) gridded precipitation climatology and re-analyses data sets, accomplished in December 2010.