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A new monthly precipitation climatology for the global land areas for the period 1951 to 2000

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Globally gridded precipitation-data sets are an essential base for various applications in the geosciences and especially in climate research, as for instance global and regional studies on the hydrological cycle and on climate variability, verification and calibration of satellite based climate data or the evaluation of global circulation models (GCM's). As all these applications require reliable high quality precipitation fields the underlying station data have to meet high demands concerning the quality of the observed precipitation data as well as the correctness of station meta data and also with respect to sufficient spatial station density and distribution. Concerning the use of globally gridded climate data for analyses of long-term climate variability it has to be ensured that station-data used for gridding are as continous and homogeneous as possible.

Within the framework of the DEKLIM (German Climate Research Programme)-funded research project VASClimO (Variability Analysis of Surface Climate Observations) a new gridded monthly precipitation dataset for the period 1951 to 2000 covering the global land areas with a spatial resolution of 0.5˚x0.5˚ is developed on the basis of the most comprehensive data-base of monthly observed precipitation data world-wide that resides with the GPCC (Global Precipitation Climatology Centre).

In order to minimise the risk of generating temporal inhomogeneities in the gridded data due to varying station densities only station time series with a minimum of 90% data availability during the analysed period (1951 – 2000) are used. In a first step all station-data are subjected to a multi-stage quality control of station-meta data as well as observed values. This includes the detection and correction of errors in station- meta data, the detection and if necessary elimination of temporal and spatial outliers and in

a subsequent step the testing of time-series homogeneity and the homogenization of series with significant inhomogeneities.

More than 9000 station time series are finally used for interpolation to a regular 0.5˚ x 0.5˚ grid using the Spheremap interpolation algorithm according to Shepard (1968) and Willmott et al. (1985). The resulting gridded data-set is highly suitable for the application in studies concerning long-term aspects of spatio-temporal climate variability.

A first version of a globally gridded homogeneous monthly precipitation climatology from 1951 to 2000 is produced and will be made freely available to the scientific community via the World Wide Web.

The interpolated data are going to be compared to the products of other groups (i.e. New et al. 2000). Finally the gridded data will be used for climate variability studies within the project VASClimO.

With an increasing amount of available information the data-set is going to be updated irregularly. Furthermore different versions will be produced in order to optimally meet different needs, i.e. for trend investigations extreme precipitation should be removed prior to interpolation.

References:

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