



STAMMEX high resolution gridded daily precipitation dataset over Germany: a new potential for regional precipitation climate research

Olga Zolina (1,3), Clemens Simmer (2), Alice Kapala (2), Hermann Mächel (4), Sergey Gulev (3), and Pavel Groisman (5)

(1) Université Joseph Fourier, LGGE, France (olga.zolina@ujf-grenoble.fr), (2) Meteorologisches Institut, Universität Bonn, Germany, (3) P.P. Shirshov Institute of Oceanology, Moscow Russia, (4) Deutscher Wetterdienst, Offenbach, Germany, (5) National Climate Data Center (NCDC), Asheville NC, USA

We present new high resolution precipitation daily grids developed at Meteorological Institute, University of Bonn and German Weather Service (DWD) under the STAMMEX project (Spatial and Temporal Scales and Mechanisms of Extreme Precipitation Events over Central Europe). Daily precipitation grids have been developed from the daily-observing precipitation network of DWD, which runs one of the World's densest rain gauge networks comprising more than 7500 stations. Several quality-controlled daily gridded products with homogenized sampling were developed covering the periods 1931-onwards (with 0.5 degree resolution), 1951-onwards (0.25 degree and 0.5 degree), and 1971-2000 (0.1 degree). Different methods were tested to select the best gridding methodology that minimizes errors of integral grid estimates over hilly terrain. Besides daily precipitation values with uncertainty estimates (which include standard estimates of the kriging uncertainty as well as error estimates derived by a bootstrapping algorithm), the STAMMEX data sets include a variety of statistics that characterize temporal and spatial dynamics of the precipitation distribution (quantiles, extremes, wet/dry spells, etc.). Comparisons with existing continental-scale daily precipitation grids (e.g., CRU, ECA E-OBS, GCOS) which include considerably less observations compared to those used in STAMMEX, demonstrate the added value of high-resolution grids for extreme rainfall analyses. These data exhibit spatial variability pattern and trends in precipitation extremes, which are missed or incorrectly reproduced over Central Europe from coarser resolution grids based on sparser networks. The STAMMEX dataset can be used for high-quality climate diagnostics of precipitation variability, as a reference for reanalyses and remotely-sensed precipitation products (including the upcoming Global Precipitation Mission products), and for input into regional climate and operational weather forecast models. We will present numerous application of the STAMMEX grids spanning from case studies of the major Central European floods to long-term changes in different precipitation statistics, including those accounting for the alternation of dry and wet periods and precipitation intensities associated with prolonged rainy episodes.