

# Extreme Daily Precipitation in Germany

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[Download Gumbel parameters here.](#)

[Download Visualization software here.](#)

[Download return periods and thresholds here.](#)

The German Meteorological Service (DWD) currently observes daily precipitation sums at about 3000 stations. Records with not more than 1 missing day are available at 1769 stations in Germany for the period 1951 to 2000.

Tim Staeger and myself fitted Gumbel distributions to the annual maxima of daily, two-day and three-day precipitation sums. The results can be downloaded as csv files [here](#).

The files for the coefficient  $a$  and  $b$  have a different number of columns. However, they all consist of a header line plus 6601 lines of which each contains the parameter estimates and further information for a grid point within Germany on 5'x5' grid. The grid size is below 10km. We used Kriging interpolation.

All files start with Longitude [°], Latitude [°], Altitude [m], Gumbel\_Parameter [mm], and Jackknife Error [mm].

Files with coefficients  $a$  of the Gumbel Distributions furthermore provide the 2 columns Vertical Gradient [mm/100m] and Explained Variance by Vert. Grad. [%].

Jackknife Error:

The Jackknife Error for each of the stations is the difference of the observed or estimated value at the station and the interpolated value to that station given the surrounding stations but leaving out the station for which the Jackknife Error is to be estimated. We provide for each grid point the Jackknife Error of the closest station. Thus, averaging over all the grid points leads to an area-weighted Jackknife Error.

Vertical gradient of  $a$ :

We saw that the Gumbel coefficient  $a$  has a pronounced vertical gradient. Therefore we performed linear regression with altitude for the 50 closest stations of each grid point. The resulting local vertical gradient and its explained variance are provided in the according files.

Furthermore grids of **return periods** in years which correspond to thresholds of 40, 50, 60, 70 80, 90, 100, 120, and 150 mm are calculated. Also **thresholds** in

mm corresponding to return periods of 2, 5, 10, 20, 50, 100, 200, 500, and 1000 years are provided. They can be downloaded [here](#).

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