

DATA SET DESCRIPTION

Grids of multi-annual means of annual sunshine duration for Germany

Version v21.3 & recent

Cite data set as: DWD Climate Data Center (CDC): Grids of multi-annual means of annual sunshine duration for Germany, version v21.3, 2017.

Dataset-ID: urn:x-wmo:md:de.dwd.cdc::GRD_DEU_P30Y_SD_P1Y

INTENT OF THE DATASET

The grids are derived from DWD stations and legally and qualitatively equivalent partner stations in Germany run for climatological and climate related applications.

POINT OF CONTACT

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DATA DESCRIPTION

Spatial coverage	Germany
Temporal coverage	1961-01-01 until - 1991-01-01
Spatial resolution	1 km x 1 km
Temporal resolution	reference period (30 years)
Projection	EPSG:31467 DHDN / 3-degree Gauss-Kruger zone 3
Format(s)	The data are stored as INT-16Bit values. Missing values are marked with -999.
Units	Multi-annual mean of sunshine duration in h
Uncertainties	Uncertainties are caused by the interpolation method, and erroneous or missing observations. When comparing grid fields for different periods, it should be considered that the measurement network has changed over time.

DATA ORIGIN

The grids for the reference periods are based on homogenized station data [Herzog und Müller-Westermeier, 1998]. The 30 year averages were calculated for or each calendar month of the year before the spatial interpolation. The gridding method is based on height regression and Inverse Distance Weight (IDW), see Müller-Westermeier, 1995: The station density allows for a linear regression

between topographic height and climatological parameters within a region, and varies somewhat between the regions in Germany [Maier und Müller-Westermeier, 2010]. The regression coefficients were determined separately for each month, based on the monthly means recorded 1951-1980. Using these interpolated regression coefficients, in a first step, the station values are reduced to the reference height and attributed to the grid cells. In case several stations refer to a grid cell, the mean was taken. In a second step, the values at reference height were interpolated horizontally to cover the grid (weighted with the inverse square distance). Finally, in a third step, the values at reference height are transformed to values corresponding to the topographic elevation using again the spatially variable regression function. This is done with the DWD digital topographic height model. When grid cells contain a station, the value of the latter is simply interpolated vertically to the height of the grid cell.

VALIDATION AND UNCERTAINTY ESTIMATE

The given resolution of 1 km x 1 km is the resolution of the employed digital height model. The gridded data miss processes relevant for local climate which are not covered by observations of the station network or cannot be reproduced by the gridding method explained above. The actual information density depends on the station network.

CONSIDERATIONS FOR APPLICATIONS

The grids of the multi-annual means are only produced every 10 years.

REFERENCES

Müller-Westermeier, G.: Numerische Verfahren zur Erstellung klimatologischer Karten, Berichte des Deutschen Wetterdienstes 193, Selbstverlag des Deutschen Wetterdienstes, Offenbach am Main, 1995.

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Maier, U. und Müller-Westermeier, G.: Verifikation klimatologischer Rasterfelder, Berichte des Deutschen Wetterdienstes 235, Selbstverlag des Deutschen Wetterdienstes,

Müller-Westermeier, G., Walter, A., Dittmann, E.: Klimaatlas Bundesrepublik Deutschland, Teil 1-4, Selbstverlag des Deutschen Wetterdienstes, Offenbach am Main, 2005.

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REVISION HISTORY

This version is a result of a research project. It is possible that errors in the metadata or the data itself are detected and corrected. That will be documented in the file Change_log_REA_OD.txt, however, no versions of the COSMO-REA6 dataset will be saved.

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