# DATA SET DESCRIPTION

## Grids of monthly total sunshine duration over Germany

## Version v1.0

**Cite data set as:** DWD Climate Data Center (CDC): Grids of monthly total sunshine duration over Germany, version v1.0.

### INTENT OF THE DATASET

This describes the freely available data of the DWD Climate Data Center. Grids are derived from DWD stations and legally and qualitatively equivalent partner stations in Germany run for climatological and climate related applications, considering the height dependencies.

### POINT OF CONTACT

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### DATA DESCRIPTION

| | |
|---|---|
| **Spatial coverage** | Germany |
| **Temporal coverage** | 01.01.1951 - current |
| **Spatial resolution** | 1 km x 1 km |
| **Temporal resolution** | monthly |
| **Projection** | 3-degree Gauss-Kruger zone 3, Ellipsoid Bessel, Datum Potsdam (central point Rauenberg), EPSG:31467, see http://spatialreference.org/ref/epsg/31467/. o define the spatial projection in GIS, the file https://opendata.dwd.de/climate_environment/CDC/help/gk3.prj can be used. Help is given on importing into ESRI ArcGIS in https://opendata.dwd.de/climate_environment/CDC/help/Hilfe_Gauss-Krueger-Raster2GIS.pdf. |
| **Format(s)** | The file in ESRI-ascii-grid-format has in the header the coordinates for the lower left grid cell, including the definition of its center [XLLCENTER],[YLLCENTER] or its corner [XLLCORNER],[YLLCORNER]. It contains a table of 654 x 866 numbers. Each row goes from West to East. The first row is the northernmost one (654 values with 4 digits). Missing values are marked with -999. |
| **Parameters** | Monthly total sunshine duration given 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 are based on DWD station data [Kaspar et al., 2013]. First, the relative deviations from the reference period (1961-90) are calculated for each station. In a second step, the relative differences are interpolated horizontally with inverse distance weighting (IDW), i.e., weights are inverse squares of distance. Finally the interpolated relative differences are multiplied with the respective grids of the reference period. In 2008, the grids were calculated back to 1951, with quality controlled station data which were digitized by then. Since 2008, the grids are extended monthly (with the recent data). Grid cells of locations where station values are available, are using the station values, and are not influenced by the interpolation. In cases of several stations within a grid cell, the average is used.

## 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 are visualized from the year 2000 onwards at the DWD website http://www.dwd.de/DE/leistungen/klimakartendeutschland/klimakartendeutschland.html.

## REFERENCES

Kaspar et al.: Monitoring of climate change in Germany – data, products and services of Germany`s National Climate Data Centre. Adv. Sci. Res., 10, 99–106, 2013.

Maier, U. und Müller-Westermeier, G.: Verifikation klimatologischer Rasterfelder, Berichte des Deutschen Wetterdienstes 235, Selbstverlag des Deutschen Wetterdienstes, Offenbach am Main, 2010.

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

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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## COPYRIGHT



## REVISION HISTORY

This document is maintained by DWD division National Climate Monitoring, last edited 18.12.2018.