

## DATA SET DESCRIPTION

### *Monthly means of hourly grids of sea level pressure for Germany (project TRY Advancement)*

#### Version V001

**Cite data set as:** Krähenmann, S., Walter, A., Brienen, S., Imbery, F., Matzarakis, A.: Monthly means of hourly grids of sea level pressure for Germany (project TRY Advancement), Version V001, DWD Climate Data Center (CDC), DOI:10.5676/DWD\_CDC/TRY\_Basis\_v001, 2016.

#### INTENT OF THE DATASET

This document describes freely available data of the DWD Climate Data Centre which are the raw data set used for input to generate the German Test Reference Years (2017). The commissioned research project "TRY Advancement" was supported with funding from the Research Initiative Future Building through BBSR.

#### POINT OF CONTACT

Deutscher Wetterdienst  
CDC - Vertrieb Klima und Umwelt  
Frankfurter Straße 135  
63067 Offenbach  
Tel.: + 49 (0) 69 8062-4400  
Fax.: + 49 (0) 69 8062-4499  
Mail: Klima.Vertrieb@DWD.de

#### DATA DESCRIPTION

|                            |  |
|----------------------------|--|
| <b>Spatial coverage</b>    | Germany  |
| <b>Temporal coverage</b>   | 01.01.1995 - 31.12.2012  |
| <b>Spatial resolution</b>  | 1 km x 1 km  |
| <b>Temporal resolution</b> | monthly  |
| <b>Projection</b>          | ETRS89 / ETRS-LCC, ellipsoid GRS80, EPSG: 3034, see <a href="http://spatialreference.org/ref/epsg/3034/">http://spatialreference.org/ref/epsg/3034/</a> .  |
| <b>Format(s)</b>           | NetCDF   |
| <b>Parameters</b>          | mean sea level pressure [hPa] in the data PRED_*monmean.nc   |
| <b>Uncertainties</b>       | Uncertainties result from the interpolation procedure and from erroneous or missing observations. When comparing grids of different years, changes of the station network over the time have to be taken into account. |

#### DATA ORIGIN

Input data for the gridding are synoptic station data from the DWD MIRAKEL database. The gridding method described below is applied to hourly values. Monthly means are derived by averaging the hourly grids. The gridding of sea level pressure (SLP) is based on a two-step interpolation approach which was also used within the E-OBS project (Van den Besselar, 2011). The approach involves two

dimensional thin plate splines (TPS, Hutchinson, 1998) interpolation of daily SLP means, followed by kriging of the hourly deviations from the daily mean. 2-D TPS (with latitude and longitude as independent variables) generates a background field of smoothly varying hourly deviations, which is a prerequisite of kriging interpolation. Summation of the daily background field and the hourly anomalies yields the hourly SLP grids.

## **VALIDATION AND UNCERTAINTY ESTIMATE**

The 1 km<sup>2</sup> resolution of the grids matches the resolution of the digital elevation model. Small scale pressure anomalies (e.g. due to Foehn), which are not directly captured by the station network, are not considered in the grids. The true information density depends on the station density, particularly in regions of complex terrain. Over the period 1995-2012 data from about 150 stations contributed to the gridding. The station number varies with time. Changes of station elevations due to station relocations are considered within the interpolation process.

## **CONSIDERATIONS FOR APPLICATIONS**

The interpolation of hourly values focuses on temporal consistency over a day and consistency between parameters. Due to changes in the station network (openings and closings of stations and relocation), climatological analysis (e.g. identification of long-term trends) are not possible.

## **REFERENCES**

Hutchinson MF (1998) Interpolation of Rainfall Data with Thin Plate Smoothing Splines: Analysis of Topographic Dependence. *J G I D A* 2:168-185.

Krähenmann S, Walter A, Imbery F, Brienen S, Matzarakis A (2016): High-resolution grids of hourly meteorological variables for Germany. *TAAC*. doi:10.1007/s00704-016-2003-7

Van den Besselaar EJM, Haylock MR, Van der Schrier G, Klein Tank AMG (2011) A European daily high-resolution observational gridded data set of sea level pressure. *J Geophys Res* 116:D11110. doi:10.1029/2010JD015468

## **COPYRIGHT**

The instructions in [ftp://ftp-cdc.dwd.de/pub/CDC/Terms\\_of\\_use.pdf](ftp://ftp-cdc.dwd.de/pub/CDC/Terms_of_use.pdf) should be followed. The DWD website provides comprehensive copyright information.

## **REVISION HISTORY**

The data are output of a project and not subject to change. This document is maintained by the Climate and Environmental Consultancy Department (KU11), DWD, last edited 19.12.2018.