

## DATA SET DESCRIPTION

### *Daily means of hourly grids of vapor pressure for Germany (project TRY Advancement)*

#### Version V001

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#### 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

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#### 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>	daily
<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 vapor pressure [g / kg dry air] in 2m above ground in the data X_*daymean.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, supplemented by satellite observations (CM-SAF) and model data (COSMO-CLM). Vapor pressure depends on dew point temperature and air pressure. The dew point is the temperature to which humid air must be cooled (while air pressure stays constant) until it becomes fully saturated. Hence, both dew

point and air pressure are firstly interpolated to subsequently derive vapor pressure. Vapor pressure is calculated from hourly values. Daily means are derived by averaging the hourly grids.

## VALIDATION AND UNCERTAINTY ESTIMATE

The 1 km<sup>2</sup> resolution of the grids matches the resolution of the digital elevation model. Processes affected by climate and weather (e.g. cold drainage flow) which are not directly captured by the station network or by the regression approach 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 300 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. The gridding procedures (and the background maps) are based on the assumption that both air pressure and dew point are spatially well correlated. This is an often made assumption for monthly data and yields satisfactory results. However, for daily grids and dew point in particular this assumption does not always hold. The daily grids represent a first pragmatic estimation and should therefore be used with caution. Application of the daily dataset requires thorough validation before any application. The dataset has proven to be excellently suited for its original application (test reference years).

## REFERENCES

Air temperature: [https://opendata.dwd.de/climate\\_environment/CDC/grids\\_germany/hourly/Project\\_TRY/dew\\_point/DESCRIPTION\\_gridsgermany\\_hourly\\_Project\\_TRY\\_dew\\_point\\_en.pdf](https://opendata.dwd.de/climate_environment/CDC/grids_germany/hourly/Project_TRY/dew_point/DESCRIPTION_gridsgermany_hourly_Project_TRY_dew_point_en.pdf)

Dew point: [https://opendata.dwd.de/climate\\_environment/CDC/grids\\_germany/hourly/Project\\_TRY/pressure/DESCRIPTION\\_gridsgermany\\_hourly\\_Project\\_TRY\\_pressure\\_en.pdf](https://opendata.dwd.de/climate_environment/CDC/grids_germany/hourly/Project_TRY/pressure/DESCRIPTION_gridsgermany_hourly_Project_TRY_pressure_en.pdf)

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

## 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.