

DATA SET DESCRIPTION

Hourly grids of relative humidity 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

Spatial coverage	Germany
Temporal coverage	01.01.1995 - 31.12.2012
Spatial resolution	1 km x 1 km
Temporal resolution	hourly
Projection	ETRS89 / ETRS-LCC, ellipsoid GRS80, EPSG: 3034, see http://spatialreference.org/ref/epsg/3034/ .
Format(s)	NetCDF
Parameters	relative humidity [%] in 2m above ground in the data RH_*.nc
Uncertainties	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). Relative humidity depends on atmospheric moisture content and air temperature. 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 temperature parameters are firstly interpolated to subsequently derive relative humidity.

VALIDATION AND UNCERTAINTY ESTIMATE

The 1 km² 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 temperature and dew point are spatially well correlated. This is an often made assumption for monthly data and yields satisfactory results. However, for hourly grids this assumption does not always hold. The hourly grids represent a first pragmatic estimation of a pattern which varies strongly in space and time and should therefore be used with caution. Application of the hourly 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/air_temperature_mean/DESCRIPTION_gridsgermany_hourly_Project_TRY_air_temperature_en.pdf

Dew point: https://opendata.dwd.de/climate_environment/CDC/grids_germany/hourly/Project_TRY/dew_point/DESCRIPTION_gridsgermany_hourly_Project_TRY_dew_point_en.pdf

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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.