Deutscher Wetterdienst
Wetter und Klima aus einer Hand

DATA SET DESCRIPTION

Daily mean of relative humidity at 2 m above ground in % for Germany

Version v21.3 & recent

Cite data set as: DWD Climate Data Center (CDC): Daily mean of relative humidity at 2 m above ground in % for Germany, version v21.3, last accessed: <date>.

Dataset-ID: urn:x-wmo:md:de.dwd.cdc::OBS_DEU_P1D_RF
alias: urn:x-wmo:md:de.dwd.cdc::VGSL_UPM_MN004

INTENT OF THE DATASET

This data are from DWD stations operated for climatological and climate related applications (partner stations not included).
Comprehensive station metadata (station relocation, instrument change, time zones, change of algorithms) are included in the downloads from the CDC Portal.
Up until the cut off date , 2020-12-31, the data are versioned, for more recent data the quality control has not yet been completed.

POINT OF CONTACT

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DATA DESCRIPTION

Spatial coverage	Germany		
Temporal coverage	1824-11-20 until - yesterday		
Temporal resolution	daily		
Projection	EPSG:4326		
Units	GUID	CDC system wide unique identifier of the observation record	String (PRODUCT_CODE.NUMBER)
	SDO_GEOM	the geometry of the spatial data object	String (OGC WKT)
	SDO_TYPE	type of the spatial data object, like Station, Region, Cell, ...	String (OGC WKT)
	SDO_GUID	CDC system wide unique identifier of the spatial data object (SDO)	

SDO_CODE	ID of the spatial data object (SDO), as it is defined in the domain of the DWD	String
SDO_NAME	name of the spatial data object (SDO), as it is defined in the domain of the DWD	String
ZEITSTEMPEL	reference datetime for the value (! = measurement time)	datetime (YYYY-MM-DD hh:mi:ss)
ZEITINTERVALL	length of the reference interval	String (ISO_8601#time_intervals)
WERT	Daily mean of relative humidity at 2 m above ground in %	Number
EINHEIT	Unit of measure of the value	String
QUALITAET_BYTE	QUALITAET_BYTE (QB) denotes whether the value was objected to and/or corrected (see quality flag)	Number
QUALITAET_NIVEAU	QUALITAET_NIVEAU (QN) describes the procedure of quality control and refers to a complete set of parameters at a specific date.(see quality flag)	Number
BEOBACHTER_GUID	::TO-DEPRECATE@cdc2.1-next:: CDC system wide unique identifier of the spatial data object (SDO)	Number
STATION_ID	::TO-DEPRECATE@cdc2.1-next:: ID of the spatial data object (SDO), as it is defined in the domain of the DWD	String
STATION_NAME	::TO-DEPRECATE@cdc2.1-next:: name of the spatial data object (SDO), as it is defined in the domain of the DWD	String
GEOM	::TO-DEPRECATE@cdc2.1-next:: the geometry of the spatial data object	String (OGC WKT)

Uncertainties   The stations are nowadays selected and operated according to WMO guidelines. Though these guidelines aim at minimizing possible local effects, still some applications of certain parameters may require the consideration of local and regional effects. Note that when going back to historical times, such guidelines might not have been in place. Depending on the application, local, regional and influences changing with time should be considered, which can be location- and parameter specific. Sources of long-term uncertainty are (1) changes in station height when station was re-located, information on this is within the station's zip-files in Metadaten_Geographie* ; (2) changes in the observation times and (3) changes in the averaging interval. Details on (2) and (3) can be found in the stationwise zipped Metadaten_Parameter*. Uncertainties are also expected from (4) changes in instrumentation, see Metadaten_Geraete* and possibly also from (5) varying quality control procedures (Behrendt et al., 2011). Further, uncertainties are known to come from (6) errors during data transfer or errors in the software, (7) change of observing personnel, and (8) others, see Freydank, 2014 .

Quality information   The QUALITAETS_BYTE (QB) denotes whether the value was objected to and/or corrected.

Explanation for QB:
_____
QB = 0 : denotes not flagged,
QB = 1 : had no objections (either checked and not objected, or not checked and not objected, this can be interpreted only when considering QN);
QB = 2 : corrected;
QB = 3 : confirmed with objection rejected;
QB = 4 : added or calculated;
QB = 5 : objected;
QB = 6 : only formally checked;
QB = 7 : formal objection;
QB = -999 : quality flag does not exist.
_____

The QUALITAETS_NIVEAU (QN) shows the quality control procedure applied for a data report (of several parameters) for a certain reporting time.

Explanation for QN:
_____
QN = 1 : only formal control;
QN = 2 : controlled with individually defined criteria;
QN = 3 : automatic control and correction;
QN = 5 : historic, subjective procedures;
QN = 7 : second control done, before correction;
QN = 8 : quality control outside ROUTINE;
QN = 9 : not all parameters corrected;
QN = 10 : quality control finished, all corrections finished.
_____
Data before and including 1980 can reach as best quality check level QN=5. Data after 1980 can reach QN=10 as best quality check level.
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DATA ORIGIN

The data are taken from the station measuring networks of Deutscher Wetterdienst as well as its predecessor organisations. The dataset is regularly updated with recent as well as with recovered historical data.
From 1997 onwards, the data have been imported operationally into the central specialist database and archived, see Behrendt et al., 2011, and Kaspar et al., 2013. Note that when going back to historical times, guidelines on observation procedure, instruments and observation times were issued by the authority in charge (see, e.g., Freydank, 2014), and might be incompletely recorded in the metadata. As explained in Kaspar et al., 2013 in the early years numerous meteorological agencies were active in the area of todays Germany. After establishment of the der International Meteorological Organization (IMO) in 1873, the various standards were gradually harmonized, resulting in a single standard 1936. After 1945, the standards in East and West Germany developed differently, and were harmonized again after re-unification in 1990. Between the end of the nineties and 2009 many stations were changed from manual to automated.

VALIDATION AND UNCERTAINTY ESTIMATE

Considerations of quality assurance are explained in Kaspar et al., 2013: several steps of quality control, including and manualinspection and automatic tests for completeness, temporal and internal consistency, and against statistical thresholds based on thesoftware QualiMet (see Spengler, 2002). The automatic quality control aims to identify and to correct random and gross errors. Nosystematic corrections (like "Richter correction") are applied. The values collected electronically from 2003 onward are checked withQualiMet. Some doubtful values remain, especially in data prior to 1979. The digitized paper records are quality controlled. The datagiven here were not subjected to homogenization procedures.The history of instrumental design, observation practice, and possibly changing representativity has to be considered for the individualstations when interpreting changes in the statistical properties of the time series. It is strongly suggested to investigate the records ofthe station history which are provided together with the data. Note that in the 1990s many stations had the transition from manual toautomated stations, entailing possible changes in certain statistical properties.

CONSIDERATIONS FOR APPLICATIONS

For the long term stability, refer to the relevant aspects of discussed in the section uncertainty.

ADDITIONAL INFORMATION

For the most recent data the quality control is not completed yet. There are still issues to be discovered in the historical data. We welcome any hints to improve the data basis (see contact).

REFERENCES

Behrendt, J., et al.: Beschreibung der Datenbasis des NKDZ. Version 3.5, Offenbach, 15.02.2011.

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Spengler, R.: The new Quality Control- and Monitoring System of the Deutscher Wetterdienst. Proceedings of the WMO Technical Conference on Meteorological and Environmental Instruments
and Methods of Observation, Bratislava, 2002.

Freydank, E.: 150 Jahre staatliche Wetter- und Klimabeobachtungen in Sachsen. Tharandter Klimaprotokolle Band 21, 2014.

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DWD Vorschriften und Betriebsunterlagen Nr. 3 (VuB 3), Beobachterhandbuch (BHB) für Wettermeldestellen des synoptisch-klimatologischen Mess- und Beobachtungsnetzes, März 2014a.

DWD Vorschriften und Betriebsunterlagen Nr. 2 (VuB 2), Wetterschlüsselhandbuch Band D, Nov 2013.

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REVISION HISTORY

This document is maintained by the Climate Data Center (CDC) of DWD, last edited on 2021-07-14.