DATA SET DESCRIPTION

Historical hourly station observations of air and dew point temperature 2 m above ground in °C for Germany

Version v21.3

Cite data set as: DWD Climate Data Center (CDC): Historical hourly station observations of air and dew point temperature 2 m above ground in °C for Germany, Version v21.3, 2021.

Dataset-ID: urn:x-wmo:md:de.dwd.cdc::obsgermany-climate-hourly-dew_point-historical

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.

POINT OF CONTACT

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DATA DESCRIPTION

Spatial coverage Germany

Temporal coverage 1949-01-01 until - 2020-12-31

Temporal resolution hourly

Units

STATIONS_ID	
MESS_DATUM	
QN_8	quality level
TT	airtemperature
TD	dew point temperatuer
eor	end of record

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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:

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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.

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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

These climate data are from the station networks of Deutschen Wetterdienst which are regularly updated with recent data, and with recovered historical data. From 1997 onwards, the data are operationally collected in the central MIRAKEL data base and archived, see Behrendt et al., 2011, and Kaspar et al., 2013. For details on current measurement and observation procedures see VuB 3 Beobachterhandbuch (DWD, 2014a), VuB 3 Technikerhandbuch (DWD, 2014b) and VuB 2 Wetterschlüsselhandbuch (DWD, 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 recorded incompletely 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 automatised.

VALIDATION AND UNCERTAINTY ESTIMATE

Several steps of operational automatic quality control are applied (see Kaspar et al., 2013). Procedures completed depend on age of data. Automatic tests include tests for completeness, temporal and internal consistency, and against statistical thresholds (based on the software QualiMet, Spengler, 2002).

CONSIDERATIONS FOR APPLICATIONS

When data from both directories 'historical' and 'recent' are used together, the difference in the quality control procedure should be considered. For the long term stability, refer to the relevant aspects of discussed in the section uncertainty.

ADDITIONAL INFORMATION

There are still issues to be discovered in the historical data. We welcome any hints to improve the data basis (see contact).

REFERENCES

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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.

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REVISION HISTORY

This version is a result of a research project. It is possible that errors in the metadata or the data itself are detected and corrected. That will be documented in the file Change_log_REA_OD.txt, however, no versions of the COSMO-REA6 dataset will be saved.

This document is maintained by the Climate Data Center (CDC) of DWD, last edited on $LAST_MODIFIED;.