



DATASET DESCRIPTION

Daily station observations of soil temperature station data for Germany

Version: v24.3

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Dataset-ID: urn:wmo:md:de-dwd-cdc:obsgermany-climate-daily-soil_temperature

Dataset-URL: https://opendata.dwd.de/climate_environment/CDC/observations_germany/climate/daily/soil_temperature/recent/

Dataset-URL: https://opendata.dwd.de/climate_environment/CDC/observations_germany/climate/daily/soil_temperature/historical/

ABSTRACT

These data originate from the stations of the DWD and legally as well as qualitatively equal partner network stations. Extensive station metadata, such as station relocations, instrument changes, reference time changes, algorithm changes or operator information are included.

The dataset is divided into a versioned part with completed quality check, in the directory `./historical/`.
And a part for which the quality check has not yet been completed, in the directory `./recent/`.

The folder `./timeseries_overview/` contains information about long time series.

POINT OF CONTACT

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DATASET DESCRIPTION

Parameter	soil temperature
Unit(s)	°C
Statistical processing	time series
Temporal coverage	1949-01-01 -- ...
Temporal resolution	
Spatial coverage	stations in Germany
Projection	WGS 84 (EPSG:4326)
Format description	obsgermany-climate-daily-soil_temperature-recent : In the folder <code>recent/</code> for each station a zip-archive is provided. The zip-archive contains the data and meta information about the station, instruments and algorithms. The naming schema of the zip-archives is: <code>*_{product_code}_{station_id}_akt.zip</code>

Format description	obsgermany-climate-daily-soil_temperature-historical : In the folder recent/ for each station a zip-archive is provided. The zip-archive contains the data and meta information about the station, instruments and algorithms.				
	The naming schema of the zip-archives is: *_{product_code}_{station_id}_{begin_date}_{end_date}_hist.zip				
application schema	csv dialect description				
	delimiter	line terminator	header	quote char	
	;	\\r\\n	true	"	
	csv content description				
	column name	description	uom	type	format
	STATIONS_ID	DWD Station ID		VARCHAR2	
	MESS_DATUM	reference date for the measurement		NUMBER	YYYYMMDD
	QN_2	the code of the quality level reflects the quality control procedure applied for the data		VARCHAR2	numerical code
	V_TE002M	daily soil temperature in 2 cm depth	°C	NUMBER	9990.0
	V_TE005M	daily soil temperature in 5 cm depth	°C	NUMBER	9990.0
	V_TE010M	daily soil temperature in 10 cm depth	°C	NUMBER	9990.0
	V_TE020M	daily soil temperature in 20 cm depth	°C	NUMBER	9990.0
	V_TE050M	daily soil temperature in 50 cm depth	°C	NUMBER	9990.0
Quality Information	The QUALITAETS_NIVEAU (QN) shows the quality control procedure applied for a data report (of several parameters) for a certain reporting time.				
	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. 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. The QUALITAETS_BYTE (QB) denotes whether the value was objected to and/or corrected. 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.				

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 today's 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.

RESOURCE MAINTENANCE

In the directory recent/ the data files are updated daily. On a rolling basis, the data of the last 500 days - up to yesterday - are exchanged. Quality control has not yet been completed for these data, so there may always be changes in the values.

In the directory historical/ the data files are updated annually. Quality control has been completed for this data, so that the values for the version are constant. During the annual version change, both corrections and historical additions are incorporated.

VALIDATION AND UNCERTAINTY ESTIMATE

The quality control (see Spengler, 2002) of this data is not completed yet. Various levels of quality control (see Kaspar et al., 2013) are in progress.

UNCERTAINTIES

Nowadays, the stations in the DWD measurement networks are set up and operated in accordance with WMO regulations. Stations in the equivalent partner networks may deviate from WMO regulations. 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: - changes in station height when station was re-located - changes in instrumentation - changes in the observation times - changes in the calculation rule - varying quality control procedures (Behrendt et al., 2011) - errors during data transfer or errors in the software - change of observing personnel - and others (Freydank, 2014)

CONSIDERATIONS FOR APPLICATIONS

For any data analysis, the metadata available in the *.zip files should be taken into account.

ADDITIONAL INFORMATION

For extending the time series into the past, see subdirectories ../historical/. 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 consider the uncertainties explained in the data set descriptions within subdirectories /historical/.

LITERATURE

[Behrendt, J., et al.: Beschreibung der Datenbasis des NKDZ. Version 3.5, Offenbach, 15.02.2011.](#)

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

[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. 3 \(VuB 3\), Technikerhandbuch \(THB\) für Wettermeldestellen des synoptisch-klimatologischen Mess- und Beobachtungsnetzes, März 2014b.](#)

[Kaspar, F., et al.: Monitoring of climate change in Germany – data, products and services of Germany's National Climate Data Centre. Adv. Sci. Res., 10, doi:10.5194/asr-10-99-2013, 99–106, 2013.](#)

[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

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