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Deutscher Wetterdienst
Wetter und Klima aus einer Hand

DATASET DESCRIPTION

Historical daily precipitation observations for Germany

Version: v23.3

Publication date: 2023

Cite data set as:	Historical daily precipitation observations for Germany, Version v23.3
Dataset-ID:	urn:x-wmo:md:de.dwd.cdc::obsgermany-climate-daily-more_precip-historical
Dataset-URL:	https://opendata.dwd.de/climate_environment/CDC/observations_germany/climate/daily/more_precip/historical/

ABSTRACT

These data originate from the stations of the DWD and legally and qualitatively equivalent partner networks. Extensive station metadata (station relocations, instrument changes, change of reference time, changes in algorithms) are included in the download.
Quality control has been completed for the data.

POINT OF CONTACT

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DATASET DESCRIPTION

Parameter	snow depth, precipitation parameters, kind of precipitation, height of newly fallen snow, precipitation height, form of precipitation
Unit(s)	mm, cm
Statistical processing	time series, daily sum, daily value
Temporal coverage	1781-01-01 -- 2022-12-31
Spatial coverage	stations in Germany
Projection	WGS 84 (EPSG:4326)
Format description	For each station a zip archive is provided in the historical/ folder. The zip archive contains the data and meta information on the station, instruments and algorithms. The naming scheme 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	Station ID		VARCHAR2	
MESS_DATUM	reference date		NUMBER	YYYYMMDD
QN_6	quality level of the following columns		NUMBER	numerical code
RS	daily precipitation height	mm	NUMBER	9990.0
RSF	[\Niederschlagsform numerical code:\,\0 : kein Niederschlag (konventionelle oder automatische Messung),entspricht WMO Code-Zahl 10\,\1 : nur Regen (in historischen Daten vor 1979)\,\4 : Form nicht bekannt, obwohl Niederschlag gemeldet\,\6 : nur Regen; flüssiger Niederschlag bei automatischen Stationen, entspricht WMO Code-Zahl 11\, \7 : nur Schnee; fester Niederschlag bei automatischen Stationen, entspricht WMO Code-Zahl 12\,\8 : Regen und Schnee (und /oder Schneeregen); flüssiger und fester Niederschlag bei automatischen Stationen, entspricht WMO Code-Zahl 13\, \9 : fehlender Wert oder Niederschlagsform nicht feststellbar bei automatischer Messung, entspricht WMO Code-Zahl 15\]	numerical code	NUMBER	
SH_TAG	height of snow pack	cm	NUMBER	9990
NSH_TAG	fresh snow depth	cm	NUMBER	9990

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 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.

RESOURCE MAINTENANCE

In order to incorporate newly digitised historical data and to make corrections and improvements, the dataset is replaced annually by a new version. In addition, the versioned data is extended in time by the previous and completed year.

VALIDATION AND UNCERTAINTY ESTIMATE

The precipitation data are only checked with respect to spatial consistency. With the automatic quality control, random gross errors are identified and eliminated. Systematic corrections (like, e.g., Richter-korrection) were not applied. The data provided here have not been subjected to homogenization procedures. The data in the directory /kl/ are, when presen there, in general of superior quality than in the directory /more_precip/ (where more stations are provided).

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 .

CONSIDERATIONS FOR APPLICATIONS

For long-term effects in precipitation note that the height of the instrument changed systematically over time: in earlier years, and at mountain stations, was the precipitation measurement 1.5 m above ground, afterwards at lower heights at a increasing number of stations (details are not included in the metadata yet). Missing precipitation observation during 1940-1950 were derived from neighbouring stations. Before 1969, in East Germany, and before 1971 in West Germany, the integrated precipitation recordings were stored for the day on which the morning reading was performed. Here, all values are converted and related to the day contributing the largest part of the measurement interval.
The procedures for observations, and the interval definition can change over time. Thus, the station specific metadata as given in Metadaten* have to be taken into account. From the early nineties onwards, metadata were collected electronically, and provided here. The most relevant metadata recorded on paper before the early nineties are in the process of being digitized at DWD. For detailed studies, you can apply for access to the paper archive.

ADDITIONAL INFORMATION

For extending the time series with recent data (where quality control is not completed yet), see subdirectories ../recent/. When data from both directories "historical" and "recent" are used together, the difference in the quality control procedure should be considered. There are still issues to be discovered in the historical data. We welcome any hints to improve the data basis (see contact).

LITERATURE

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REVISION HISTORY

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