DWD

Deutscher Wetterdienst
Wetter und Klima aus einer Hand

DATASET DESCRIPTION

Monthly precipitation observations for Germany

Version: v24.03

Publication date: 2024

Cite data set as:	Monthly precipitation observations for Germany, Version v24.03
Dataset-ID:	urn:wmo:md:de-dwd-cdc:obsgermany-climate-monthly-more_precip
Dataset-URL:	https://opendata.dwd.de/climate_environment/CDC/observations_germany/climate/monthly/more_precip/recent
Dataset-URL:	https://opendata.dwd.de/climate_environment/CDC/observations_germany/climate/monthly/more_precip/historical/
Dataset-URL:	https://opendata.dwd.de/climate_environment/CDC/observations_germany/climate/monthly/more_precip/timeseries_overview
Dataset-URL:	https://opendata.dwd.de/climate_environment/CDC/observations_germany/climate/monthly/more_precip/recent/RR_Monatswerte_Beschreibung_Stationen.txt
Dataset-URL:	https://opendata.dwd.de/climate_environment/CDC/observations_germany/climate/monthly/more_precip/historical/RR_Monatswerte_Beschreibung_Stationen.txt

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	precipitation height, snow depth, height of newly fallen snow
Statistical processing	monthly sum, monthly max
Temporal coverage	1781-01-01 -- ...
Spatial coverage	stations in Germany
Projection	WGS 84 (EPSG:4326)

Format description	obsgermany-climate-monthly-more_precip-recent : 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}_akt.zip
Format description	obsgermany-climate-monthly-more_precip-historical : In the folder historical/ 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
Format description	obsgermany-climate-monthly-more_precip-timeseries overview : In the folder ./timeseries_overview, information on long time series is available. The files provided (TimeSeries_[DataType]_[Interval]_GE_[XXXYears]_[Parameter].html or ***.txt) contain a sorted overview of stations for which time series of >=100, >=50 and >=30 years are available. Information on the proportion of missing values is also provided. Content description Stations_id := Identifier of the station; Start := Start date of the time series; End := End date of the time series; Number_years := Number of years of measurement operation; Missing_Years := Number of missing years of measurement operation; Missing_values := number of missing values ; max(Missing_period)>=25 := More than 25 years missing in the time series: Indication of start date and end date; Station name := Station name of the current location ; Federal state := Name of the federal state
Format description	obsgermany-climate-monthly-more_precip-recent-observing_facilities : The file contains the observing facilities for which are recent data are provide. The file contains the geographical information for the recent geolocation of the observing facility.
Format description	obsgermany-climate-monthly-more_precip-historical-observing_facilities : The file contains the observing facilities for which are historical data are provide. The file contains the geographical information for the recent geolocation of the observing facility.

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		NUMBER	
MESS_DATUM_BEGINN	end of interval		NUMBER	YYYYMMDD
MESS_DATUM_ENDE	end of interval		NUMBER	YYYYMMDD
QN_6	quality level of the data in the following columns		NUMBER	numerical code
MO_NSH	monthly sum of daily fresh snow	cm	NUMBER	
MO_RR	monthly sum of precipitation height	mm	NUMBER	
MO_SH_S	monthly sum of daily height of snow pack	cm	NUMBER	
MX_RS	monthly maximum of daily precipitation height	mm	NUMBER	

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

These precipitation data are from the precipitation observation networks of Deutscher Wetterdienst and its predecessor organisations, and are regularly updated with recent data as well as 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 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 automatised.

The monthly means are calculated for each month from the respective daily values (of the same version), and only in the case the daily values are complete. If some daily valus are missing, no monthly mean is given. For some stations monthly values exist and no daily values are available (e.g., burned in the wars, or not yet digitized). For these cases, the monthly values are included here.

RESOURCE MAINTENANCE

In the directory recent/ the data files are updated on a monthly basis. The data files of the current year are exchanged. Quality control has not yet been completed for these data, so there may occurr 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 precipitation data are only checked with respect to spatial consistency. With the automatic quality control, random gross errors are identified and eliminated. No systematic corrections (like "Richter correction") are applied. The data provided here have not been subjected to homogenization procedures. The data in the directory /kl/ are, when present 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. 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 can change over time. Therefore, for investigation of trends, 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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