www.dwd.de

Deutscher Wetterdienst
Wetter und Klima aus einer Hand

DATASET DESCRIPTION

5-minute station observations of precipitation for Germany

Version: v24.3

Publication date: 2024

Cite data set as:	5-minute station observations of precipitation for Germany, Version v24.3
Dataset-ID:	urn:x-wmo:md:de.dwd.cdc::obsgermany-climate-5min-rr
Dataset-URL:	https://opendata.dwd.de/climate_environment/CDC/observations_germany/climate/5_minutes/precipitation/now
Dataset-URL:	https://opendata.dwd.de/climate_environment/CDC/observations_germany/climate/5_minutes/precipitation/recent
Dataset-URL:	https://opendata.dwd.de/climate_environment/CDC/observations_germany/climate/5_minutes/precipitation/historical/
Dataset-URL:	https://opendata.dwd.de/climate_environment/CDC/observations_germany/climate/5_minutes/precipitation/meta_data
Dataset-URL:	https://opendata.dwd.de/climate_environment/CDC/observations_germany/climate/5_minutes/precipitation/historical/5min_rr_Beschreibung_Stationen.txt

ABSTRACT

These data originate from the stations of the DWD and legally as well as qualitatively equal partner networks.
Extensive station metadata (station relocations,instrument changes, reference time changes, algorithm changes) are included with the download.

The dataset is divided into:
- directory ./historical/ , a versioned part with completed quality check
- directory ./recent/ , a daily updating part, for which the quality check has not yet been completed
- directory ./now/ , an hourly updating part for which the quality check has not yet been completed
- directory ./metadata/ , a daily updating part with the metadata about the stations, their instruments and measurement rules.

POINT OF CONTACT

Deutscher Wetterdienst
CDC - Vertrieb Klima und Umwelt
Frankfurter Strasse 135
63067 Offenbach
Tel:+ 49 (0) 69 8062-4400
Fax:+ 49 (0) 69 8062-4499
E-Mail:klima.vertrieb@dwd.de

DATASET DESCRIPTION

Parameter	precipitation height, duration of precipitation, precipitation fallen indicator, precipitation parameters
Unit(s)	numerical code, mm, minutes
Statistical processing	5-minute sum, 5-minute value, time series
Temporal coverage	1989-10-14 -- ...
Spatial coverage	stations in Germany
Projection	WGS 84 (EPSG:4326)

Format description

obsgermany-climate-5min-precipitation-now :
In the folder now/ for each station a zip-archive is provided.
The naming schema of the zip-archives is: *_{product_code}_{station_id}_now.zip.
The time stamp is given in UTC.

Format description

obsgermany-climate-5min-precipitation-recent :
In the folder recent/ for each station a zip-archive is provided.
The naming schema of the zip-archives is: *_{product_code}_{station_id}_akt.zip.
The time stamp is given in UTC.

Format description

obsgermany-climate-5min-precipitation-historical :
In the folder historical/ for each station a zip-archive is provided.
The naming schema of the zip-archives is: *_{product_code}_{station_id}_{begin_date}_{end_date}_hist.zip.
The measurements are assigned to a time stamp in MEZ before the year 2000, and to a time stamp in UTC from the year 2000 dedicated.

Format description

obsgermany-climate-5min-precipitation-meta_data :
In the folder meta_data/ for each station a zip-archive is provided.
The zip-archive contains the meta-information about the station, instruments and algorithms.

The naming schema of the zip-archives is: *_{product_code}_{station_id}.zip

Format description

5min_rr_Beschreibung_Stationen :
The file 5min_rr_Beschreibung_Stationen.txt contains information on the recent geographical position and the temporal data coverage per station.

application schema

csv dialect description

delimiter	line terminator	header	quote char
;	\\r\\n	true	\"

csv content description

column name	description	uom	type	format
MESS_DATUM	reference date		NUMBER	YYYYMMDDHH24
QN	quality level	numerical code	NUMBER	990
RS_COUNT	[\count minute values\,\missing_value=-999\]	minute	NUMBER	9990.0
RS_05	[\Sum of the precipitation height of the previous 5 minutes\,\missing_value=-999\]	mm	NUMBER	9990.90
RS_IND_05	[\indicator of precipitation\,\if QN = 1 then:\,\0 = no precipitation, permanent sensor installed\,\1 = precipitation, permanent sensor installed\,\2 = no precipitation, heating in operation, permanent sensor installed\,\3 = precipitation, heating in operation, permanent sensor installed\,\if QN > 1 then:\,\0 = no precipitation\,\1 = precipitation\,\missing_value=-999\]	numerical code	NUMBER	990

Quality Information

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

QN = 1 : only formal control;
QN = 2 : controlled with individually defined criteria;
QN = 3 : automatic control and correction;

DATA ORIGIN

These data are from the station networks of Deutschen Wetterdienst and legally as well as qualitatively equal partner networks. For details on the measurement procedures VuB 3 Beobachterhandbuch (DWD, 2014a), VuB 3 Technikerhandbuch (DWD, 2014b) and VuB 2 Wetterschlüsselhandbuch (DWD, 2013).

RESOURCE MAINTENANCE

In the now/ directory, the data is updated at a frequency of < 1 h. The data of the previous day is exchanged on a rolling basis until the last available measurement.
Quality control has not yet been completed for these data, so there may always be changes in the values.

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 check and uncertainty assessment routines are explained in Kaspar et al., 2013. In addition to automated tests that check completeness, temporal and spatial consistency and compare them against statistical thresholds (QualiMet software, Spengler, 2002), an additional manual quality control is carried out.

UNCERTAINTIES

The stations in the DWD monitoring networks are set up and operated according to 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 (1) changes in station height when station was re-located, information on this is within the station's zip-files in Metadaten_Geographie*.
Uncertainties are also expected from (2) changes in instrumentation, see Metadaten_Geraete* and possibly also from (3) varying quality control procedures (Behrendt et al., 2011).
Further, uncertainties are known to come from (4) errors during data transfer or errors in the software, (5) change of observing personnel, and (6) others, see Freydank, 2014.

CONSIDERATIONS FOR APPLICATIONS

When using the "historical/", "recent/" and "now" directories together, the temporal overlap
and the different type of quality control must be taken into account.

Data sets with quality level QN=1 may contain significant errors. Users have to decide whether for their particular application the more error-prone 10-minute data should be used or rather higher quality data (hourly or daily values).

When investigating long-term changes or trends, consider the station-specific metadata provided in Metadaten_Parameter*, Metadaten_Geraete*, and Metadaten_Geographie*, which are provided for each station in the directory "meta_data/" as a zip file.

The meaning of the time stamp is instrument dependent. For the instrument rain[e]H3, the time stamp denotes the end of the measurement inverval. In case of instrument Pluvio Ott a time delay of approximately 5 minutes is introduced due to the inertia of the instrument response. This time shift is applicable for precipitation measurements from November 2008 onwards for DWD station measurements with instrument Pluvio Ott. Until Oktober 2008, the time delay for Pluvio Ott was variable, spanning from seconds (in case of heavy precipitation) to 30 minutes (light precipitation) and cannot be stated in more detail. The 10min values are calculated from the 1min values with the respective time stamps. For instance, from November 2008 onward, the 10min value from Pluvio Ott with time stamp 11:50 UTC corresponds to the actual 10min intervall ending 11:45 UTC.

If precipitation indicator = 2 occurs along with precipitation depth > 0 mm, then this is a known error, which will currently not be corrected in the unaudited data.

The count value RS_Count is not output for the collective obsgermany-climate-5min-precipitation-historical, as the data of the different measuring devices, drop counter or electronic rain gauges with tilting scales, are output in the historical data files.

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).

LITERATURE

Becker, R. and Behrens, K.: Quality assessment of heterogeneous surface radiation network data, Adv. Sci. Res., 8, 93-97, doi:10.5194/asr-8-93-2012, 2012.

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.

COPYRIGHT

REVISION HISTORY

This document is maintained by Deutscher Wetterdienst, Climate Data Center (CDC) - Betrieb, last edited at 2024-05-31.