

DATA SET DESCRIPTION

Historical daily observations of snow height and water equivalent for Germany

Version v002

Cite data set as: DWD Climate Data Center (CDC): Historical daily observations of snow height and water equivalent for Germany, version v002, 2018.

INTENT OF THE DATASET

These historical data are quality controlled measurements and observations derived from DWD stations and legally and qualitatively equivalent partner stations operated for climatological and climate related applications. Comprehensive station metadata (station relocation, instrument change, time zones, change of algorithms) are included.

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
Mail: klima.vertrieb@dwd.de

DATA DESCRIPTION

Spatial coverage stations in Germany

Temporal coverage 14.12.1927 - 31.12.2017

Temporal resolution daily

Format(s) The station observations (produkt_*.txt) are zipped together with the station metadata. The latter are given in *.txt as well as *.html. The file Metadaten_Parameter* contains a listing of the parameters measured at the station (the parameter portfolio) with begin, end, units, measurement procedures, averaging formulas, measurement times and applied time units (e.g., MOZ or UTC) which are all related to the Station Id and the station name valid now. The instrument history is sorted according to the parameters (see file Metadaten_Geraete*). There the history of sensor height, type of instrument and measurement procedure is given, together with the historical station names. The station ID is unique and does not change over time. For a convenient documentation of station name change, see Metadaten_Stationsname*. The geographical metadata of the station (longitude, latitude, height) is listed in Metadaten_Geographie*.txt together with the Stations_id and the current station name. All these information is combined into a single zip-file for each station: *_[Stations_id]_[from]_[to]_hist.zip. An overview over all stations with start and end dates is given in the station list: [Stationsliste](#). Note that for convenience, the list comprises not only stations given here, but also stations with more complicated copyright regulations which may be obtained for certain applications, requiring discussion with the point of contact.

Parameters The file produkt*.txt comprises following parameters:

STATIONS_ID	station id	
MESS_DATUM	date	yyyymmdd
QN_6	quality level of next columns	coding see paragraph "Quality information"
ASH_6	height of snow pack sample	cm
SH_TAG	total snow depth	cm
WASH_6	total snow water equivalent	mm
WAAS_6	sampled snow pack water equivalent	mm

eor Ende data record
Missing values are marked as -999.

Uncertainties It should be kept in mind that the snow pack can be locally highly variable.

Quality information

The quality levels "Qualitätsniveau" (QN) given here apply for the respective following columns. The values are the minima of the QN of the respective daily values. QN denotes the method of quality control, with which erroneous values are identified and apply for the whole set of parameters at a certain time. For the individual parameters there exist quality bytes in the internal DWD data base, which are not published here. Values identified as wrong are not published. Various methods of quality control (at different levels) are employed to decide which value is identified as wrong. In the past, different procedures have been employed. The quality procedures are coded as following:

quality level (column header: QN_)

- 1- only formal control during decoding and import
- 2- controlled with individually defined criteria
- 3- ROUTINE control with QUALIMET and QCSY
- 5- historic, subjective procedures
- 7- ROUTINE control, not yet corrected
- 8- quality control outside ROUTINE
- 9- ROUTINE control, not all parameters corrected
- 10- ROUTINE control finished, respective corrections finished

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 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 automatised.

VALIDATION AND UNCERTAINTY ESTIMATE

The automatic quality control was run to identify and eliminate random gross errors.

CONSIDERATIONS FOR APPLICATIONS

When investigating long term changes or trends, consider changes in station location, changes in instrumentation, measurement procedures and observation intervals - see the various metadata information provided Metadaten_Parameter*, Metadaten_Geraete* und Metadaten_Geographie*. Starting in the nineties, the metadata are electronically recorded and provided together with the station measurements. For the time before, efforts are continuing to digitize the most relevant metadata based on the paper records however, many gaps are still remaining. For detailed studies, DWD can grant access to the station records.

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).

REFERENCES

Behrendt, J., et al.: Beschreibung der Datenbasis des NKDZ. Version 3.5, Offenbach, 15.02.2011.

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Freydank, E.: 150 Jahre staatliche Wetter- und Klimabeobachtungen in Sachsen. Tharandter Klimaprotokolle Band 21, 2014.

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

The instructions in ftp://ftp-cdc.dwd.de/pub/CDC/Terms_of_use.pdf should be followed. The DWD website provides comprehensive copyright information.

REVISION HISTORY

The data in the directories */historical/ are provided in approximately annual intervals as versioned data sets to take into account the dataset extension in time and any updates and the historical data rescued in the meantime. Compared to the previous versions, this version includes additional historical data. This document is maintained by the National Climate Data Centre (NKDZ) of DWD, last edited 19.12.2018.