

DATA SET DESCRIPTION

Calculated daily values for different characteristic elements of soil and crops

Version V0.x

Cite data set as: DWD Climate Data Center: Calculated daily values for different characteristic elements of soil and crops, version V0.x, 2015.

INTENT OF THE DATASET

For different locations in Germany, values for soil moisture, soil temperatures and evaporation of crops were calculated. Such values are very useful for issues concerning water and heat balance in the soil. Measurements of such elements are rarely available.

POINT OF CONTACT

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DATA DESCRIPTION

Spatial coverage	Germany
Temporal coverage	1.1.1991 earliest values - 31.12. from last year
Spatial resolution	locations in Germany
Temporal resolution	daily values; time series
Format(s)	Every gzip compressed ascii file contains a time series for one location. The parameters are given in columns separated by the delimiter ' ';'. The first row is the header.
Parameters	The elements (parameters) are as follows: real evapotranspiration VGSL mm over gras and sandy loam (AMBAV) potential evapotranspiration over VPGB mm gras (AMBAV) potential evaporation over VPGH mm gras (Haude) mean daily soil temperature in 5 cm depth TS05 °C for uncovered typical soil in 5 cm depth mean daily soil temperature in 5 cm depth TS10 °C for uncovered typical soil in 10 cm depth mean daily soil temperature in 5 cm depth TS20 °C

for uncovered typical soil in 20 cm depth mean daily soil	TS50	°C
temperature in 5 cm depth for uncovered typical soil in 50 cm depth mean daily soil	TS100	°C
temperature in 5 cm depth for uncovered typical soil in 1 m depth frost depth at midday for uncovered soil	ZFUMI	cm
soil moisture under grass and sandy loam between 0 and 10 cm depth in % plant useable water	BF10	%nFK
soil moisture under grass and sandy loam between 10 and 20 cm depth in % plant useable water	BF20	%nFK
soil moisture under grass and sandy loam between 20 and 30 cm depth in % plant useable water	BF30	%nFK
soil moisture under grass and sandy loam between 30 and 40 cm depth in % plant useable water	BF40	%nFK
soil moisture under grass and sandy loam between 40 and 50 cm depth in % plant useable water	BF50	%nFK
soil moisture under grass and sandy loam between 50 and 60 cm depth in % plant useable water	BF60	%nFK
soil moisture under grass and sandy loam up to 60 cm depth	BFGSL	%nFK
soil moisture under grass and loamy sand up to 60 cm depth	BFGLS	%nFK

Uncertainties The accuracy of the values depends on the quality of the models as well as on the quality of the model input. Most important are hourly input values from temperature, wind velocity, relative humidity and precipitation (all of which are measured). Global radiation and longwave radiation though is often derived from the observed sunshine duration and cloud cover.

Quality information No quality flags are given.

DATA ORIGIN

All values concerning to soil moisture and some evapotranspirations are computed by the agrometeorological model AMBAV. The soil sandy loam has a wilting point of 13 volumic % and a field capacity of 37 volumic %. The potential evaporation after Haude is calculated by a simple formula and is often used but not as correct as other evapotranspirations. All soil temperatures and frost depths are calculated by the model AMBETI, which was also developed at the agrometeorological research center in Braunschweig.

VALIDATION AND UNCERTAINTY ESTIMATE

Measurements of soil moisture are complex and expensiv, so only temporal validations at different locations, soil typs and canopies were made in the past and showed good results after calibration. The calculated soil temperatures can be validated against measured values in same depth and show really good results even with snow cover in winter times.

REFERENCES

Braden, H., 1995: The model AMBETI. - A detailed description of a soil-plant-atmosphere model, Berichte des Deutschen Wetterdienstes, Nr. 195.

Löpmeier, F.-J. (1994): Berechnung der Bodenfeuchte und Verdunstung mittels agrarmeteorologischer Modelle. Zeitschrift f. Bewässerungswirtschaft, 29, 157–167.

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REVISION HISTORY

All calculated values are used in daily advisory work and therefore passed plausibility checks by advisors and customers. Internal balance checks for water and heat are implemented in the models. This document was last edited 19.12.2018.