3D Soil Hydraulic Database of Europe at 250 m and 1 km resolution

(EU-SoilHydroGrids ver 1.0)

Description

The database contains frequently used soil hydraulic properties at seven soil depths up to 2 m at 250 m and 1 km resolution. Soil hydraulic properties have been calculated with the European pedotransfer functions (EU-PTF) (Tóth et al., 2015) based on the SoilGrids 250m and 1km dataset (Hengl et al., 2017).

The database includes information on the soil water content at the most frequently used matric potential values, saturated hydraulic conductivity, Mualem- van Genuchten parameters of the moisture retention and hydraulic conductivity curves.

No data refer to missing information on soil properties from SoilGrids for the whole profile or occurrence of bedrock at a given depth.

Coordinate reference system is WGS84 with Azimuthal Equidistant projection for 250 m resolution and WGS84 (EPGS 4326) for 1 km resolution.

The multi-layered EU-SoilHydroGrids is freely available for non-commercial use.

Please find further information about the database in Tóth et al. (2017).

Name and unit of soil hydraulic parameters available from the dataset:

- Saturated water content (THS) [$cm^3\ cm^{-3}$] × 100
- Water content at field capacity (FC) [$cm^3\ cm^{-3}$] × 100
- Water content at wilting point (WP) [$cm^3\ cm^{-3}$] × 100
- Saturated hydraulic conductivity (KS) [$cm\ day^{-1}$] × 100
- Parameters of the moisture retention (MRC) and hydraulic conductivity curve (HCC) × 10000:

  - 250 m resolution:
    - Parameters of the moisture retention curve (MRC) × 10000 on 5 bands:
      - band 1: θ_r parameter [$cm^3\ cm^{-3}$] × 10000
      - band 2: θ_s parameter [$cm^3\ cm^{-3}$] × 10000
      - band 3: α parameter [cm^{-1}] × 10000
      - band 4 n parameter [-] × 10000
      - band 5 m parameter [-] × 10000
    - Parameters of the unsaturated hydraulic conductivity curve (HCC) × 10000 on 7 bands: θ_r, θ_s, α, n, m, K_0, L [same units as in 1 km]

  - 1 km resolution:
    - Parameters of the moisture retention curve (MRC) × 10000
      - θ_r parameter (MRC_thr) [$cm^3\ cm^{-3}$] × 10000
      - θ_s parameter (MRC_ths) [$cm^3\ cm^{-3}$] × 10000
      - α parameter (MRC_alp) [cm^{-1}] × 10000
      - n parameter (MRC_n) [-]× 10000
      - m parameter (MRC_m) [-] × 10000

- Parameters of the hydraulic conductivity curve (HCC) × 10000
  - θ_r parameter (HCC_thr) [$cm^3\ cm^{-3}$] × 10000
  - θ_s parameter (HCC_ths) [$cm^3\ cm^{-3}$] × 10000
  - α parameter (HCC_alp) [cm^{-1}] × 10000
  - n parameter (HCC_n) [-]× 10000
  - m parameter (HCC_m) [-]× 10000
  - K_0 parameter (HCC_K0) [$cm\ day^{-1}$] × 10000
  - L parameter (HCC_L) [-]× 10000

Depth is indicated in the file name according to the following notation:

- sl1: 0 cm
- sl2: 5 cm
- sl3: 15 cm
- sl4: 30 cm
- sl5: 60 cm
- sl6: 100 cm
- sl7: 200 cm

References

Hengl T, Mendes de Jesus J, Heuvelink GBM, Ruiperez Gonzalez M, Kilibarda M, et al. 2017. SoilGrids250m: Global gridded soil information based on machine learning. PLOS ONE 12(2): e0169748.

Tóth, B., Weynants, M., Nemes, A., Makó, A., Bilas, G. and Tóth, G. 2015. New generation of hydraulic pedotransfer functions for Europe. European Journal of Soil Science. 66: 226–238.

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