A Big Earth Data Platform for Three Poles

**China Soil Moisture Dataset (2000-2020)**

1、Description

We developed a 1-km resolution long-term soil moisture dataset of China derived through machine learning trained with in-situ measurements of 1,648 stations, named as SMCI1.0 (Soil moisture of China based on In-situ data, Li et al, 2022). SMCI1.0 provides 10-layer soil moisture with 10 cm intervals up to 100 cm deep at daily resolution over the period 2000-2020. Random Forest is used to predict soil moisture using ERA5-land time series, leaf area index, land cover type, topography and soil properties as covariates. Using in-situ soil moisture as the benchmark (The data comes from China Meteorological Administration), two independent experiments are conducted to investigate the estimation accuracy of the SMCI1.0: year-to-year experiment (ubRMSE ranges from 0.041-0.052 and R ranges from 0.883-0.919) and station-to-station experiment (ubRMSE ranges from 0.045-0.051 and R ranges from 0.866-0.893). As SMCI1.0 is based on in-situ data, it can be useful complements of existing model-based and satellite-based datasets for various hydrological, meteorological, and ecological analyses and modeling, especially for those applications requiring high resolution SM maps. Please read the readme file for more details. We provided two versions with different resolution, i.e., 30 arc seconds (~1km) and 0.1 degree (~9km).

2、Keywords

Theme：Soil,Soil moisture dataset,Others,machine learning,Soil moisture,Humidity/Dryness
Discipline：Atmosphere,Terrestrial Surface,Others
Places：CHINA
Time：2000-2020

3、Data details

1.Scale：1000000

2.Projection：World\_Sinusoidal

3.Filesize：512000.0MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：54.0 | - |
| west：73.0 | - | east：136.0 |
| - | south：18.0 | - |

5、Time frame:1999-12-31 08:00:00+00:00--2020-12-31 08:00:00+00:00

6、Reference method

References to data:

LI Qingliang , SHANGGUAN Wei, SHI Gaosong . China Soil Moisture Dataset (2000-2020). A Big Earth Data Platform for Three Poles, doi:10.11888/Terre.tpdc.2724152022

References to articles:

Li, Q., Shi, G., Shangguan, W., Nourani, V., Li, J., Li, L., Huang, F., Zhang, Y., Wang, C., Wang, D., Qiu, J., Lu, X., & Dai, Y. (2022). A 1 km daily soil moisture dataset over China using in situ measurement and machine learning. Earth Syst. Sci. Data, 14, 5267–5286, https://doi.org/10.5194/essd-14-5267-2022.

7、Supporting project information

National Natural Science Foundation of China (42105144)
National Natural Science Foundation of China (41975122)

8、Data resource provider

name: SHI Gaosong
unit: College of Computer Science and Technology, Changchun Normal University
email: 715434161@qq.com

name: SHANGGUAN Wei
unit: Atmospheric Sciences, Sun Yat-sen University
email: shgwei@mail.sysu.edu.cn

name: LI Qingliang
unit: College of Computer Science and Technology, Changchun Normal University
email: liqingliang@ccsfu.edu.cn