A Big Earth Data Platform for Three Poles

**The mean annual ground temperature (MAGT) and permafrost thermal stability dataset over Tibetan Plateau for 2005-2015**

1、Description

Mean annual ground temperature (MAGT) at a depth of zero annual amplitude and permafrost thermal stability type are fundamental importance for engineering planning and design, ecosystem management in permafrost region. This dataset is produced by integrating remotely sensed freezing degree-days and thawing degree-days, snow cover days, leaf area index, soil bulk density, high-accuracy soil moisture data, and in situ MAGT measurements from 237 boreholes for the 2010s (2005-2015) on the Tibetan Plateau (TP) by using an ensemble learning method that employs a support vector regression (SVR) model based on distance-blocked resampling training data with 200 repetitions. Validation of the new permafrost map indicates that it is probably the most accurate of all available maps at present. The RMSE of MAGT is approximately 0.75 °C and the bias is approximately 0.01 °C. This map shows that the total area of permafrost on the TP is approximately 115.02 (105.47-129.59) \*104 km2. The areas corresponding to the very stable, stable, semi-stable, transitional, and unstable types are 0.86\*104 km2, 9.62\*104 km2, 38.45\*104 km2, 42.29\*104 km2, and 23.80\*104 km2, respectively. This new dataset is available for evaluate the permafrost change in the future on the TP as a baseline. More details can be found in Ran et al., (2020) that published at Science China Earth Sciences.

2、Keywords

Theme：Ground temperature,Permafrost,Frozen Ground  
Discipline：Cryosphere  
Places：Third Pole, Qinghai Tibet Plateau  
Time：2010

3、Data details

1.Scale：None

2.Projection：WGS84

3.Filesize：43.6MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：40.0 | - |
| west：74.0 | - | east：105.0 |
| - | south：26.0 | - |

5、Time frame:2010-01-27 08:00:00+00:00--2011-01-26 19:59:59+00:00

6、Reference method

References to data:

LI Xin, RAN Youhua. The mean annual ground temperature (MAGT) and permafrost thermal stability dataset over Tibetan Plateau for 2005-2015. A Big Earth Data Platform for Three Poles, doi:10.11888/Geogra.tpdc.2706722019

References to articles:

冉有华, 李新, 程国栋, 南卓铜, 车金星, 盛煜, 吴青柏, 金会军, 罗栋梁, 唐志光, 吴小波. (2020). 2005~2015年青藏高原多年冻土稳定性制图. 中国科学: 地球科学, 50, doi: 10.1360/N072020-0074  
  
Ran, Y., Li, X., Cheng, G., Nan, Z., Che, J., Sheng, Y., Wu, Q., Jin, H., Luo, D., Tang, Z., & Wu, X. (2020). Mapping the permafrost stability on the Tibetan Plateau for 2005–2015. Science China Earth Sciences, 63,https://doi.org/10.1007/s11430-020-9685-3  
  
Ran, Y.H., Li, X., & Cheng, G.D. (2018). Climate warming over the past half century has led to thermal degradation of permafrost on the qinghai–tibet plateau. The Cryosphere, 12(2), 595-608.

7、Supporting project information

CASEarth:Big Earth Data for Three Poles（grant No. XDA19070000）

8、Data resource provider

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