A Big Earth Data Platform for Three Poles

**2002-2017 Global AMSR-E/2 Near-surface Freeze/Thaw state (0.05°)**

1、Description

The freeze/thaw status of the near-surface soil is the water-ice phase transition that occurred at the top soil layer. It is an important indicator as a giant on-off “switch” of the land surface processes including water, energy, and carbon exchanges between the land surface and atmosphere. The freeze/thaw status is an essential variable for understanding how the ecosystem responds to and affects global changes. This dataset is based on the AMSR-E, AMSR2 passive microwave brightness temperature data and MODIS optical remote sensing data. The freeze-thaw discriminant function algorithm and downscaling algorithm are used to generate the global near-surface soil freeze-thaw status with a spatial resolution of grids at 0.05° from 2002 to 2017. The dataset can be used for the analysis of the spatial distribution and trend changes of global freeze-thaw cycles, such as the freeze/thaw onset dates and duration. It provides data support for understanding the interaction mechanism between the land surface freeze-thaw cycle and the land-atmosphere exchanges under the context of global changes.

2、Keywords

Theme：Cryosphere remote sensing products,Surface Freeze-thaw Cycle/state Remote Sensing,Freeze thawing,Frozen Ground
Discipline：Cryosphere
Places：Global scale
Time：2002-2017

3、Data details

1.Scale：None

2.Projection：

3.Filesize：2959.0MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：90.0 | - |
| west：-180.0 | - | east：180.0 |
| - | south：-90.0 | - |

5、Time frame:2002-06-19 08:00:00+00:00--2017-12-31 08:00:00+00:00

6、Reference method

References to data:

ZHANG Ziqian, Zhao Tianjie. 2002-2017 Global AMSR-E/2 Near-surface Freeze/Thaw state (0.05°). A Big Earth Data Platform for Three Poles, doi:10.11888/Geocry.tpdc.2702832019

References to articles:

Zhao, T., Shi, J., Hu, T., Zhao, L., Zou, D., Wang, T., ... & Wang, P. (2017). Estimation of high‐resolution near‐surface freeze/thaw state by the integration of microwave and thermal infrared remote sensing data on the Tibetan Plateau. Earth and Space Science, 4(8), 472-484.

Hu, T., Zhao, T., Shi, J., Wu, S., Liu, D., Qin, H., & Zhao, K. (2017). High-resolution mapping of freeze/thaw status in china via fusion of MODIS and AMSR2 data. Remote Sensing, 9(12), 1339.

7、Supporting project information

CASEarth:Big Earth Data for Three Poles（grant No. XDA19070000）
Second Tibetan Plateau Scientific Expedition Program

8、Data resource provider

name: Zhao Tianjie
unit: Institute of Remote Sensing and Digital Earth, Chinese Academy of Sciences
email: zhaotj@radi.ac.cn

name: ZHANG Ziqian
unit:
email: zhangzq55@mail2.sysu.edu.cn