A Big Earth Data Platform for Three Poles

**2002-2019 Global AMSR-E/2 Near-surface Freeze/Thaw state (0.25°)**

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 and AMSR2 passive microwave brightness temperature data, and the freeze-thaw discriminant function algorithm is used to generate the global near-surface soil freeze-thaw status with a spatial resolution of grids at 0.25° from 2002 to 2019. 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：globe
Time：2002-2019

3、Data details

1.Scale：70000000

2.Projection：

3.Filesize：233.0MB

4.Data format：Binary

4、Space scope

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

5、Time frame:2002-06-19 00:00:00+00:00--2019-12-31 00:00:00+00:00

6、Reference method

References to data:

2002-2019 Global AMSR-E/2 Near-surface Freeze/Thaw state (0.25°). A Big Earth Data Platform for Three Poles, doi:10.11888/Glacio.tpdc.2708902018

References to articles:

Hu T, Zhao T, Zhao K, et al. A continuous global record of near-surface soil freeze/thaw status from AMSR-E and AMSR2 data[J]. International Journal of Remote Sensing, 2019, 40(18): 6993-7016.

Wang P K, Zhao T J, Shi J C, et al. Parameterization of the freeze/thaw discriminant function algorithm using dense in-situ observation network data[J]. Int. J. Digit. Earth, 2019, 12(8): 980-994.

Zhao TJ, Zhang LX, Jiang LM, Zhao SJ, Chai LN, Jin R. A new soil freeze thaw discriminant algorithm using AMSR-E passive microwave imagery. Hydrological Processes, 2011, 25(11): 1704-1716. DOI: 10.1002/hyp.7930.

7、Supporting project information

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

8、Data resource provider