A Big Earth Data Platform for Three Poles

**Global air freeze-thaw index based on observations（1973-2021）**

1、Description

Freeze-thaw index is an important sensitive indicator of climate change, and is also widely used in the study of frozen soil changes. The research on the spatial distribution characteristics and time variation trend of freezing and thawing index in the global scope can provide a basis for the global frozen soil environment assessment, engineering construction and coping with climate change. This data set is based on the daily temperature observation data of more than 14000 stations covering the global land from 1973 to 2021 to calculate the air freezing index (FI) and air melting index (TI). The freezing/thawing index is the cumulative value of the daily average temperature below/above 0 ℃ during the freezing/thawing period. Considering that the index calculation should cover the whole freezing/thawing period and ensure the continuity of the calculation period, the northern hemisphere takes July 1 of that year to June 30 of the next year as a freezing period, and takes January 1 to December 30 of that year as a melting period, while the southern hemisphere has the opposite freezing/thawing period. The stations with missing survey years were not filled, which, on the one hand, avoided the uncertainty error caused by interpolation on the results, and on the other hand, retained the authenticity and accuracy of the data as much as possible. The study of global freeze-thaw index can effectively and comprehensively understand the near surface heat state, and can provide important support for exploring the changes of freeze-thaw state.

2、Keywords

Theme：Temperature,Frozen Ground  
Discipline：Atmosphere,Cryosphere  
Places：global  
Time：long-term

3、Data details

1.Scale：None

2.Projection：

3.Filesize：390.0MB

4.Data format：None

4、Space scope

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

5、Time frame:1972-12-31 16:00:00+00:00--2021-12-30 16:00:00+00:00

6、Reference method

References to data:

PENG Xiaoqing, CHEN Cong , MU Cuicui . Global air freeze-thaw index based on observations（1973-2021）. A Big Earth Data Platform for Three Poles, doi:10.11888/Cryos.tpdc.2728452022

References to articles:

陈聪, 彭小清, 李璇佳, 田伟伟, 杨光尚. (2023). 基于观测数据的全球空气冻融指数变化研究. 冰川冻土.  
  
Peng, X., Zhang, T., Liu, Y., & Luo, J. (2019). Past and projected freezing/thawing indices in the northern hemisphere. Journal of Applied Meteorology and Climatology, 58(3), 495-510.

7、Supporting project information

Research on the mechanism, influence and climate effect of rapid change in the Arctic  
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8、Data resource provider

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