A Big Earth Data Platform for Three Poles

**The surface temperature data of the Tibet engineering corridor (2000-2010)**

1、Description

As the main parameter in the land surface energy balance, surface temperature indicates the degree of land-atmosphere energy and water transfer and is widely used in research on climatology, hydrology and ecology.  
In the study of frozen soil, climate is one of the decisive factors for the existence and development of frozen soil. The surface temperature is the main climatic factor affecting the distribution of frozen soil and affects the occurrence, development and distribution of frozen soil. It is the upper boundary condition for modelling frozen soil and is significant to the study of hydrological processes in cold regions.  
The data set was based on the DEM and observation station data of the Tibetan Plateau Engineering Corridor and analysed the changing trend of surface temperature on the Tibetan Plateau from 2000 to 2014. Using the surface temperature data products MOD11A1/A2 and MYD11A1/A2 of MODIS aboard Terra and Aqua, the surface temperature information under cloud cover was reconstructed based on the spatio-temporal information of the images. The reconstruction information and surface temperature representativeness problems were analysed using information obtained from 8 sites, including the Kunlun Mountains (wetland, grassland), Beiluhe (grassland, meadow), Kaixinling (meadow, grassland), and Tanggula Mountain (meadow, wetland). According to the correlation coefficient (R2), root-mean-square error (RMSE), mean absolute error (MAE) and mean deviation (MBE), the following results were obtained: (1) the reconstruction accuracy of MODIS surface temperature under cloud cover is higher when it is based on spatio-temporal information; (2) the weighted average representation is the best when generalizing four observations of Terra and Aqua.  
By analysing the reconstruction of MODIS surface temperature information and representativeness problems, the average annual MODIS surface temperature data of the Tibetan Plateau and the engineering corridor from 2000 to 2010 were obtained. According to the data set, the surface temperature from 2000 to 2010 also experienced volatile rising trends from 2000 to 2010, which is basically consistent with the changing trend of the climate change in the permafrost regions of the Tibetan Plateau and the Qinghai-Tibet Engineering Corridor.

2、Keywords

Theme：Ground temperature,Cryosphere remote sensing products,Surface Freeze-thaw Cycle/state Remote Sensing,Frozen Ground  
Discipline：Cryosphere  
Places：the Qinghai-Tibet Engineering Corridor  
Time：2000-2010

3、Data details

1.Scale：None

2.Projection：

3.Filesize：30.0MB

4.Data format：TIFF

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：35.43 | - |
| west：92.83 | - | east：93.5 |
| - | south：34.68 | - |

5、Time frame:2000-01-10 16:00:00+00:00--2011-01-09 16:00:00+00:00

6、Reference method

References to data:

NIU Fujun. The surface temperature data of the Tibet engineering corridor (2000-2010). A Big Earth Data Platform for Three Poles, doi:10.11888/AtmosEnviron.tpe.0000081.file2018

References to articles:

Niu, F.J., Zheng, H., & Li, A. (2018). The study of frost heave mechanism of high-speed railway foundation by field-monitored data and indoor verification experiment. Acta Geotechnica.

7、Supporting project information

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8、Data resource provider

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