A Big Earth Data Platform for Three Poles

**An inventory of retrogressive thaw slumps along the vulnerable Qinghai-Tibet engineering corridor (2019)**

1、Description

Retrogressive thaw slumps (RTSs) are slope failures caused by the thawing of ice-rich permafrost. Once developed, they usually retreat at high speeds (meters to tens of meters) towards the upslope direction, and the mudflow may destroy infrastructure and release carbon stored in frozen ground. RTSs are frequently distributed in permafrost areas and increase dramatically but lack investigation. Qinghai Tibet Engineering Corridor crosses the permafrost, links the inland and the Tibet. However, in this critical area, we lack knowledge of the distribution and impact of RTSs. To compile the first comprehensive inventory of RTSs, this study uses an iterative semi-automatic method based on deep learning and manual inspection to delineate RTSs in 2019 images. The images from PlanetScope CubeSat have a resolution of 3 meters, have four bands, cover a corridor area of approximately 54,000 square kilometers. The method combines the high efficiency and automation of deep learning and the reliability of the manual inspection to map the entire region ninth, which minimize the missings and misidentification.
The manual inspection is based on geomorphic features and temporal changes (2016 to 2020) of RTSs. The inventory which includes 875 RTSs with their attributes, including identification, Longitude and Latitude, possibilities and time, provides a benchmark dataset for quantifying permafrost degradation and its impact.

2、Keywords

Theme：Permafrost degradation;,Frozen Ground,machine learning
Discipline：Cryosphere
Places：The Qinghai-Tibet Engineering Corridor
Time：2019

3、Data details

1.Scale：None

2.Projection：WGS84

3.Filesize：330.0MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：35.99 | - |
| west：90.91 | - | east：95.15 |
| - | south：31.74 | - |

5、Time frame:2019-06-30 16:00:00+00:00--2019-08-30 16:00:00+00:00

6、Reference method

References to data:

HUANG Lingcao, XIA Zhuoxuan, LIU Lin. An inventory of retrogressive thaw slumps along the vulnerable Qinghai-Tibet engineering corridor (2019). A Big Earth Data Platform for Three Poles, doi:10.11888/Cryos.tpdc.2726722021

References to articles:

Xia, Z., Huang, L., Fan, C., Jia, S., Lin, Z., Liu, L., Luo, J., Niu, F.,& Zhang, T. (2022). Retrogressive thaw slumps along the Qinghai--Tibet Engineering Corridor: a comprehensive inventory and their distribution characteristics. Earth System Science Data, 14(9), 3875--3887.(https://doi.org/10.5194/essd-14-3875-2022)

7、Supporting project information

8、Data resource provider

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