A Big Earth Data Platform for Three Poles

**Glacier coverage data on the Tibetan Plateau in 2017 (TPG2017, Version1.0)**

1、Description

The Tibetan Plateau Glacier Data –TPG2017 is a glacial coverage data on the Tibetan Plateau from selected 210 scenes of Landsat 8 Operational Land Imager (OLI) images with 30-m spatial resolution from 2013 to 2018, among of which 90% was in 2017 and 85% in winter. Therefore, 2017 was defined as the reference year for the mosaic image. Glacier outlines were digitized on-screen manually from the 2017 image mosaic, relying on false-colour image composites (RGB by bands 654), which allowed us to distinguish ice/snow from cloud. Debris-free ice was distinguished from the debris and debris-covered ice by its higher reflectance. Debris-covered ice was not delineated in this data. The delineated glacier outlines were compared with band-ratio (e.g. TM3/TM5) results, and validated by overlapping them onto Google Earth imagery, SRTM DEM, topographic maps and corresponding satellite images. For areas with mountain shadows and snow cover, they were verified by different methods using data from different seasons. For glaciers in deep shadow, Google EarthTM imagery from different dates was used as the reference for manual delineation. Steep slopes or headwalls were also excluded in the TPG2017. Areas that appeared in any of these sources to have the characteristics of exposed ground/basement/bed rock were manually delineated as non-glacier, and were also cross-checked with CGI-1 and CGI-2. Steep hanging glaciers were included in TPG2017 if they were identifiable on images in all other three epochs (i.e. TPG1976, TPG2001, and TPG2013). The accuracy of manual digitization was controlled within one half-pixel. All glacier areas were calculated on the WGS84 spheroid in an Albers equal-area map projection centred at (95°E, 30°N) with standard parallels at 15°N and 65°N. Our results showed that the relative deviation of manual interpretation was less than 3.9%.

2、Keywords

Theme：Glaciers,Glacier coverage,Remote Sensing Technology,Optical remote sensing,Glacier(Ice Sheet)  
Discipline：Remote Sensing Technology,Cryosphere  
Places：Tibetan Plateau  
Time：2017

3、Data details

1.Scale：None

2.Projection：Albers

3.Filesize：11571.2MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：40.0 | - |
| west：72.0 | - | east：105.0 |
| - | south：26.0 | - |

5、Time frame:2012-12-31 16:00:00+00:00--2018-12-29 16:00:00+00:00

6、Reference method

References to data:

YE Qinghua. Glacier coverage data on the Tibetan Plateau in 2017 (TPG2017, Version1.0). A Big Earth Data Platform for Three Poles, doi:10.11888/Glacio.tpdc.2709242019

References to articles:

Ye, Q.H., Zong, J.B., Tian, L.D., Cogley, J.G., Song, C.Q., & Guo, W.Q. (2017). Glacier changes on the Tibetan Plateau derived from Landsat imagery: mid-1970s-2000-2013. Journal of Glaciology, 63(238), 273-287. doi:10.1017/jog.2016.137

7、Supporting project information

CASEarth:Big Earth Data for Three Poles（grant No. XDA19070000）  
The Second Tibetan Plateau Scientific Expedition and Research Program (STEP), Grant No. 2019QZKK0202

8、Data resource provider

name: YE Qinghua  
unit: Institute of Tibetan Plateau Research, Chinese Academy of Sciences  
email: yeqh@itpcas.ac.cn