A Big Earth Data Platform for Three Poles

**Glacier coverage data on the Tibetan Plateau in 2013 (TPG2013, Version1.0)**

1、Description

The Tibetan Plateau Glacier Data –TPG2013 is a glacial coverage data on the Tibetan Plateau around 2013. 128 Landsat 8 Operational Land Imager (OLI) images were selected with 30-m spatial resolution, for comparability with previous and current glacier inventories. Besides, about 20 images acquired in 2014 were used to complete the full coverage of the TP. The most frequent year in this period was defined as the reference year for the mosaic image: i.e. 2013. Glacier outlines were digitized on-screen manually from the 2013 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. [To minimize the effects of snow or cloud cover on glacierized areas, high-resolution (30 m spatial resolution and 4-day repetition cycle) images were also used for reference in glacier delineation from the Chinese satellites HJ-1A and HJ-1B, which were launched on Sep.6th 2008. Both carried as payload two 4-band CCD cameras with swath width 700 km (360 km per camera). All HJ-1A/1B data in 2012, 2013 and 2014 (65 scenes, Fig.S1, Table S1) were from China Centre for Resources Satellite Data and Application (CRESDA; http://www.cresda.com/n16/n92006/n92066/n98627/index.html). Each scene was orthorectified with respect to the 30m-resolution digital elevation model (DEM) of the Shuttle Radar Topography Mission (SRTM) and Landsat images.] 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. Topographic maps from the 1970s and all available satellite images (including Google EarthTM imagery and HJ-1A/1B satellite data) were used as base reference data. 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 TPG2013. 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 TPG2013 if they were identifiable on images in all 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：2013

3、Data details

1.Scale：None

2.Projection：Albers

3.Filesize：86500.0MB

4.Data format：Shapefile

4、Space scope

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

5、Time frame:2011-12-31 16:00:00+00:00--2014-12-29 16:00:00+00:00

6、Reference method

References to data:

YE Qinghua. Glacier coverage data on the Tibetan Plateau in 2013 (TPG2013, Version1.0). A Big Earth Data Platform for Three Poles, doi:10.11888/GlaciolGeocryol.tpe.0000015.file2018

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

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8、Data resource provider

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