A Big Earth Data Platform for Three Poles

**Glacier coverage data on the Tibetan Plateau in 2001 (TPG2001, Version1.0)**

1、Description

The Tibetan Plateau Glacial Data –TPG2001 is a glacial coverage data on the Tibetan Plateau in around 2000 from 150 scenes of Landsat7 TM/ETM+ images by 30 m spatial resolution. The selected Landsat7 TM/ETM+ images were within the period between 1999 and 2002, including 61 scenes (41%) in 2001 and 47 scenes (31%) in 2000. Among all the images, 71% was taken in winter. The most frequent year in this period was defined as the reference year for the mosaic image: i.e. 2001. Glacier outlines were digitized on-screen manually from the 2001 image mosaic, relying on false-colour image composites (RGB by bands 543), 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. Topographic maps from the 1970s and all available satellite images (including Google EarthTM imagery) 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 TPG2001. 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 TPG2001 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 3.8%.

2、Keywords

Theme：Glaciers,Glacier coverage,Remote Sensing Technology,Optical remote sensing,Glacier(Ice Sheet)
Discipline：Remote Sensing Technology,Cryosphere
Places：Tibetan Plateau
Time：2001

3、Data details

1.Scale：None

2.Projection：Albers

3.Filesize：86500.0MB

4.Data format：Shapefile、tif

4、Space scope

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

5、Time frame:1998-12-31 16:00:00+00:00--2002-12-29 16:00:00+00:00

6、Reference method

References to data:

YE Qinghua. Glacier coverage data on the Tibetan Plateau in 2001 (TPG2001, Version1.0). A Big Earth Data Platform for Three Poles, doi:10.11888/GlaciolGeocryol.tpe.0000013.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

CASEarth:Big Earth Data for Three Poles（grant No. XDA19070000）
the Second Tibetan Plateau Scientific Expedition and Research Program

8、Data resource provider

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