时空三极环境大数据平台

**An improved Terra–Aqua MODIS snow cover and Randolph Glacier Inventory 6.0 combined product (MOYDGL06\*) for high-mountain Asia between 2002 and 2018**

英文标题：An improved Terra–Aqua MODIS snow cover and Randolph Glacier Inventory 6.0 combined product (MOYDGL06\*) for high-mountain Asia between 2002 and 2018

1、摘要

Snow is a significant component of the ecosystem and water resources in high-mountain Asia (HMA). Therefore, accurate, continuous, and long-term snow monitoring is indispensable for the water resources management and economic development. The present study improves the Moderate Resolution Imaging Spectroradiometer (MODIS) onboard Terra and Aqua satellites 8 d (“d” denotes “day”) composite snow cover Collection 6 (C6) products, named MOD10A2.006 (Terra) and MYD10A2.006 (Aqua), for HMA with a multistep approach. The primary purpose of this study was to reduce uncertainty in the Terra–Aqua MODIS snow cover products and generate a combined snow cover product. For reducing underestimation mainly caused by cloud cover, we used seasonal, temporal, and spatial filters. For reducing overestimation caused by MODIS sensors, we combined Terra and Aqua MODIS snow cover products, considering snow only if a pixel represents snow in both the products; otherwise it is classified as no snow, unlike some previous studies which consider snow if any of the Terra or Aqua product identifies snow. Our methodology generates a new product which removes a significant amount of uncertainty in Terra and Aqua MODIS 8 d composite C6 products comprising 46 % overestimation and 3.66 % underestimation, mainly caused by sensor limitations and cloud cover, respectively. The results were validated using Landsat 8 data, both for winter and summer at 20 well-distributed sites in the study area. Our validated adopted methodology improved accuracy by 10 % on average, compared to Landsat data. The final product covers the period from 2002 to 2018, comprising a combination of snow and glaciers created by merging Randolph Glacier Inventory version 6.0 (RGI 6.0) separated as debris-covered and debris-free with the final snow product MOYDGL06\*. We have processed approximately 746 images of both Terra and Aqua MODIS snow containing approximately 100 000 satellite individual images. Furthermore, this product can serve as a valuable input dataset for hydrological and glaciological modelling to assess the melt contribution of snow-covered areas. The data, which can be used in various climatological and water-related studies, are available for end users at https://doi.org/10.1594/PANGAEA.901821 (Muhammad and Thapa, 2019).

2、关键词

主题关键词：MODIS,积雪,冰川覆盖,冰冻圈遥感产品,冰冻圈遥感,冰川编目,Randolph冰川目录,积雪,冰川（含冰盖）,MOD10A12 MYD10A2,雪盖（积雪）  
学科关键词：冰冻圈  
地点关键词：High Mountain Asia  
时间关键词：2002-2018

3、数据细节

1.比例尺：None

2.投影：WGS84

3.文件大小：3713.0MB

4.数据格式：None

4、空间范围

|  |  |  |
| --- | --- | --- |
| - | 北：49.19 | - |
| 西：58.22 | - | 东：122.48 |
| - | 南：24.32 | - |

5、时间范围2002-10-31 16:00:00+00:00--2019-01-15 16:00:00+00:00

6、引用方式

数据的引用:

Sher Muhammad. An improved Terra–Aqua MODIS snow cover and Randolph Glacier Inventory 6.0 combined product (MOYDGL06\*) for high-mountain Asia between 2002 and 2018. 时空三极环境大数据平台, DOI:10.1594/PANGAEA.901821, CSTR:, 2020.[SHER Muhammad. An improved Terra–Aqua MODIS snow cover and Randolph Glacier Inventory 6.0 combined product (MOYDGL06\*) for high-mountain Asia between 2002 and 2018. A Big Earth Data Platform for Three Poles, DOI:10.1594/PANGAEA.901821, CSTR:, 2020]

文章的引用:

7、资助项目信息

8、数据资源提供者

姓名: Sher Muhammad  
单位: International Center for Integrated Mountain Development (ICIMOD)  
电子邮件: sher.muhammad@icimod.org