A Big Earth Data Platform for Three Poles

**Daily cloud-free snow cover products for Tibetan Plateau from 2002 to 2021**

1、Description

Based on long-term series Moderate Resolution Imaging Spectroradiometer (MODIS) snow cover products, daily snow cover products without data gaps at 500 m spatial resolution over the Tibetan Plateau from 2002 to 2021 were generated by employing a Hidden Markov Random Field (HMRF) modeling technique. This HMRF framework optimally integrates spectral, spatiotemporal, and environmental information together, which not only fills data gaps caused by frequent clouds, but also improves the accuracy of the original MODIS snow cover products. In particular, this technology incorporates solar radiation as an environmental contextual information to improve the accuracy of snow identification in mountainous areas. Validation with in situ observations and snow cover derived from Landsat-8 OLI images revealed that these new snow cover products achieved an accuracy of 98.31% and 92.44%, respectively. Specifically, the accuracy of the new snow products is higher during the snow transition period and in complex terrains with higher elevations as well as sunny slopes. These gap-free snow cover products effectively improve the spatiotemporal continuity and the low accuracy in complex terrains of the original MODIS snow products, and is thus the basis for the study of climate change and hydrological cycling in the TP.

2、Keywords

Theme：MODIS,Daily Snow Cover,Snow,Surface Freeze-thaw Cycle/state Remote Sensing,Remote Sensing Technology,Visible remote sensing  
Discipline：Remote Sensing Technology,Cryosphere  
Places：Tibetan Plateau  
Time：2002-2021

3、Data details

1.Scale：None

2.Projection：UTM

3.Filesize：1597.44MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：39.78 | - |
| west：73.31 | - | east：104.78 |
| - | south：26.0 | - |

5、Time frame:2002-05-14 16:00:00+00:00--2021-12-31 03:59:59+00:00

6、Reference method

References to data:

HUANG Yan , XU Jianghui . Daily cloud-free snow cover products for Tibetan Plateau from 2002 to 2021. A Big Earth Data Platform for Three Poles, doi:10.11888/Cryos.tpdc.2722042022

References to articles:

Huang, Y., Liu, H., Yu, B., Wu, J., Kang, E. L., Xu, M., Wang, S., Klein, A., & Chen, Y. (2018). Improving MODIS snow products with a HMRF-based spatio-temporal modeling technique in the Upper Rio Grande Basin. Remote Sensing of Environment, 204, 568-582.

7、Supporting project information

National Natural Science Foundation of China

8、Data resource provider

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