A Big Earth Data Platform for Three Poles

**HiWATER：Dataset of fractional snow cover area in the Heihe River Basin**

1、Description

The data set provided the cloudless Fractional Snow Cover area (FSC) time-series product basing on the MODIS data and covered the Heihe River Basin from January 2010 to December 2013. They also provide the high spatial (500 m) and temporal (1 day) resolution. Firstly, the end-member were automatically extracted by the fast autonomous spectral end-member determination (N-FINDR) maximizing volume iteration algorithm. Combining N-FINDR with the orthogonal subspace projection (OSP) approach, we propose an improved end-member extraction algorithm using a maximizing, volume-based iterative method. All the 6 end-members were extracted including snow, soil, water, bare land, vegetation, and cloud, respectively. Then, the 10-day spectral library time series based on prior knowledge of Heihe basin are built for 2009. The primary data were produced using the fully constrained least squares (FCLS) linear spectral mixture analysis method by the spectral library. Finally，the cubic spline interpolation algorithm were used to the eliminate the cloud pixels completely and obtain the data set. The data are validated by the fractional snow cover derived from Landsat imagery and the results indicate that the improved algorithm can obtain the end-member information accurately, and the retrieved fractional snow cover has better accuracy than the MODIS fractional snow-cover product (MOD10A1). So the data set can provide more accurate input for the hydrology and climate model.

2、Keywords

Theme：Cryosphere remote sensing products,Surface Freeze-thaw Cycle/state Remote Sensing
Discipline：Cryosphere
Places：Heihe River Basin
Time：2010, 2011, 2012, 2010-01 to 2012-12

3、Data details

1.Scale：None

2.Projection：4326

3.Filesize：1003.52MB

4.Data format：ENVI标准格式 (BIL)

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：42.1 | - |
| west：97.8 | - | east：101.8 |
| - | south：37.3 | - |

5、Time frame:2010-01-11 00:00:00+00:00--2013-01-10 00:00:00+00:00

6、Reference method

References to data:

LI Xin. HiWATER：Dataset of fractional snow cover area in the Heihe River Basin. A Big Earth Data Platform for Three Poles, doi:10.3972/hiwater.218.2014.db2017

References to articles:

Li, X., Liu, S.M., Xiao, Q., Ma, M.G., Jin, R., Che, T., Wang, W.Z., Hu, X.L., Xu, Z.W., Wen, J.G., Wang, L.X. (2017). A multiscale dataset for understanding complex eco-hydrological processes in a heterogeneous oasis system. Scientific Data, 4, 170083. doi:10.1038/sdata.2017.83.

Zhang Y, Huang XD, Hao XH, Wang J, Wang W, Liang TG. Fractional snow-cover mapping using an improved endmember extraction algorithm. Journal of Applied Remote Sensing, 2014, 8(1): 084691. doi: 10.1117/1.JRS.8.084691.

Che, T., Li, X., Liu, S., Li, H., Xu, Z., Tan, J., Zhang, Y., Ren, Z., Xiao, L., Deng, J., Jin, R., Ma, M., Wang, J., & Yang, X. (2019). Integrated hydrometeorological, snow and frozen-ground observations in the alpine region of the Heihe River Basin, China. Earth System Science Data, 11, 1483-1499

7、Supporting project information

The CAS (Chinese Academy of Sciences) Action Plan for West Development Project

8、Data resource provider

name: LI Xin
unit:
email: xinli@itpcas.ac.cn