A Big Earth Data Platform for Three Poles

**HiWATER: 1km/5day compositing Leaf Area Index (LAI) product of the Heihe River Basin (2010-2014)**

1、Description

The 1 km / 5-day Lai data set of Heihe River basin provides the 5-day Lai synthesis results of 2010-2014. The data uses Terra / MODIS, Aqua / MODIS, as well as domestic satellites fy3a / MERSI and fy3b / MERSI sensor data to build a multi-source remote sensing data set with a spatial resolution of 1 km and a time resolution of 5 days. Multi-source remote sensing data sets can provide more angles and more observations than a single sensor in a limited time. However, due to the difference of on orbit running time and performance of sensors, the observation quality of multi-source data sets is uneven. Therefore, in order to make more effective use of multi-source data sets, the algorithm first classifies the quality of multi-source data sets, which can be divided into first level data, second level data and third level data according to the observation rationality. The third level data are observations polluted by thin clouds and are not used for calculation. The purpose of quality evaluation and classification is to provide the basis for the selection of the optimal data set and the design of inversion algorithm flow. Leaf area index product inversion algorithm is designed to distinguish mountain land and vegetation type, using different neural network inversion model. Based on global DEM map and surface classification map, PROSAIL model is used for continuous vegetation such as grassland and crops, and gost model is used for forest and mountain vegetation. Using the reference map generated by the measured ground data of the forests in the upper reaches of Heihe River and the oasis in the middle reaches, and scaling up the corresponding high-resolution reference map to 1km resolution, compared with the Lai product, the product has a good correlation between the farmland and the forest area and the reference value, and the overall accuracy basically meets the accuracy threshold of 0.5%, 20% specified by GCOS. By cross comparing this product with Lais products such as MODIS, geov1 and glass, the accuracy of this Lai product is better than that of similar products compared with reference value. In a word, the synthetic Lai data set of 1km / 5 days in Heihe River Basin comprehensively uses multi-source remote sensing data to improve the estimation accuracy and time resolution of Lai parameter products, so as to better serve the application of remote sensing data products.

2、Keywords

Theme：Vegetation coverage data,Ecological remote sensing products,Land-use and land-cover change(LUCC),Terrestrial Surface Remote Sensing  
Discipline：Terrestrial Surface  
Places：Heihe River Basin, the artificial oasis experimental area in the middle reaches, the cold region hydrology experimental area in the upper reaches, the natural oasis eco-hydrology experimental area in the lower reaches  
Time：2010, 2014, 2011, 2012, 2013

3、Data details

1.Scale：None

2.Projection：WSG-84

3.Filesize：30.12MB

4.Data format：ENVI标准格式

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：42.69 | - |
| west：97.11 | - | east：101.96 |
| - | south：37.74 | - |

5、Time frame:2011-01-11 16:00:00+00:00--2015-01-10 16:00:00+00:00

6、Reference method

References to data:

Yin Gaofei, YIN Gaofei, LI Jing, ZHONG Bo, WU Shanlong, WU Junjun. HiWATER: 1km/5day compositing Leaf Area Index (LAI) product of the Heihe River Basin (2010-2014). A Big Earth Data Platform for Three Poles, doi:10.3972/hiwater.292.2016.db2017

References to articles:

Yin G, Li J, Liu Q, et al. Regional Leaf Area Index Retrieval Based on Remote Sensing: The Role of Radiative Transfer Model Selection. Remote Sensing, 2015, 7(4): 4604-4625.  
  
Yin, G, Li J, Liu Q, Zhong B, Li A. Improving LAI Spatio-temporal Continuity through Combination of MODIS and MERSI Data. Remote Sensing Letters, (minor revision).  
  
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.

7、Supporting project information

The CAS (Chinese Academy of Sciences) Action Plan for West Development Project  
National High-tech R&D Program of China (863 Program)  
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8、Data resource provider

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