A Big Earth Data Platform for Three Poles

**HiWATER: Dataset of fractional vegetation cover over the midstream of Heihe River Basin (2012.05.25-09.14)**

1、Description

This dataset is the Fractional Vegetation Cover observation in the artificial oasis experimental region of the middle stream of the Heihe River Basin. The observations lasted for a vegetation growth cycle from May 2012 to September 2012 (UTC+8).  
Instruments and measurement method:  
Digital photography measurement is implemented to measure the FVC. Plot positions, photographic method and data processing method are dedicatedly designed.  
Details are described in the following:  
0. In ﬁeld measurements, a long stick with the camera mounted on one end is beneﬁcial to conveniently measure various species of vegetation, enabling a larger area to be photographed with a smaller ﬁeld of view. The stick can be used to change the camera height; a ﬁxed-focus camera can be placed at the end of the instrument platform at the front end of the support bar, and the camera can be operated by remote control.   
1. For row crop like corn, the plot is set to be 10×10 m2, and for the orchard, plot scale is 30×30 m2. Shoot 9 times along two perpendicularly crossed rectangular-belt transects. The picture generated of each time is used to calculate a FVC value. “True FVC” of the plot is then acquired as the average of these 9 FVC values.  
2. The photographic method used depends on the species of vegetation and planting pattern: Low crops (<2 m) in rows in a situation with a small ﬁeld of view (<30 ), rows of more than two cycles should be included in the ﬁeld of view, and the side length of the image should be parallel to the row. If there are no more than two complete cycles, then information regarding row spacing and plant spacing are required. The FVC of the entire cycle, that is, the FVC of the quadrat, can be obtained from the number of rows included in the ﬁeld of view.   
3. High vegetation in rows (>2 m) Through the top-down photography of the low vegetation underneath the crown and the bottom-up photography beneath the tree crown, the FVC within the crown projection area can be obtained by weighting the FVC obtained from the two images. Next, the low vegetation between the trees is photographed, and the FVC that does not lie within the crown projection area is calculated. Finally, the average area of the tree crown is obtained using the tree crown projection method. The ratio of the crown projection area to the area outside the projection is calculated based on row spacing, and the FVC of the quadrat is obtained by weighting.  
4. FVC extraction from the classiﬁcation of digital images. Many methods are available to extract the FVC from digital images, and the degree of automation and the precision of identiﬁcation are important factors that affect the efﬁciency of ﬁeld measurements. This method, which is proposed by the authors, has the advantages of a simple algorithm, a high degree of automation and high precision, as well as ease of operation.

2、Keywords

Theme：Vegetation,Remote Sensing Technology,Fisheye camera,Vegetation cover  
Discipline：Terrestrial Surface,Remote Sensing Technology  
Places：Heihe River Basin, the artificial oasis experimental area in the middle reaches, desert, desert, wetland, crop land,   
Time：2012-07-24, 2012-07-07, 2012-06-18, 2012-06-28, 2012-07-14, 2012, 2012-06-23, 2012-05-30, 2012-05-26, 2012-09-14, 2012-06-01, 2012-08-03, 2012-08-28, 2012-06-02, 2012-05-28, 2012-07-13, 2012-06-07, 2012-06-08, 2012-06-11, 2012-05-25, 2012-08-12, 2012-07-03, 2012-06-10, 2012-07-09, 2012-06-03, 2012-07-23

3、Data details

1.Scale：None

2.Projection：4326

3.Filesize：21504.0MB

4.Data format：文本, \*.xls

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：38.855 | - |
| west：100.373 | - | east：100.373 |
| - | south：38.855 | - |

5、Time frame:2012-12-14 07:00:00+00:00--2013-04-05 10:31:00+00:00

6、Reference method

References to data:

MA Mingguo, MU Xihan, HUANG Shuai. HiWATER: Dataset of fractional vegetation cover over the midstream of Heihe River Basin (2012.05.25-09.14). A Big Earth Data Platform for Three Poles, doi:10.3972/hiwater.043.2013.db2018

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.

7、Supporting project information

Heihe Watershed Allied Telemetry Experimental Research (HiWATER)

8、Data resource provider

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