A Big Earth Data Platform for Three Poles

**HiWATER: Dataset of fractional vegetation cover and biomass observed in the middle of Heihe River Basin (2013)**

1、Description

The dataset includes the fractional vegetation cover data generated from the stations of crop land, wetland, Gebi desert and desert steppe in Yingke Oasis and biomass data generated from the stations of crop land (corn) and wetland. The observations lasted for a vegetation growth cycle from 19 May, 2012 to 15 September, 2012.
1. Fractional vegetation cover observation
1.1 Observation time
1.1.1 Station of the crop land: The observations lasted from 20 May, 2012 to 15 September, 2012, and in five-day periods for each observation before 31 July and in ten-day periods for each observation after 31 July.
The observation time for the station of crop land (corn) are 2013-5-20, 2013-5-25, 2013-5-30, 2013-6-5, 2013-6-10, 2013-6-16, 2013-6-22, 2013-6-27, 2013-7-2, 2013-7-7, 2013-7-12, 2013-7-17, 2013-7-27, 2013-8-3, 2013-8-13, 2013-8-25, 2013-9-5 and 2013-9-15.
1.1.2 The other four stations: The observations lasted from 20 May, 2012 to 15 September, 2012 and in ten-day periods for each observation.
The observation time for the crop land are 2013-5-20, 2013-6-5, 2013-6-16, 2013-6-27, 2013-7-7, 2013-7-17, 2013-7-27, 2013-8-3, 2013-8-13, 2013-8-25, 2013-9-5 and 2013-9-15.
1.2 method
1.2.1 Instruments and measurement method
Digital photography measurement is implemented to measure the FVC. Plot positions, photographic method and data processing method are dedicatedly designed. 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.
1.2.2 Design of the samples
Three and two plots with the area of 10×10 m^2 were measured for the station of the crop land and wetland, respectively. One plot with the area of 10×10 m^2 was measured for the other three stations. 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.
1.2.3 Photographic method
The photographic method used depends on the species of vegetation and planting pattern. A long stick with the camera mounted on one end is used for the stations of crop land and wetland. For the station of the crop land, rows of more than two cycles should be included in the ﬁeld of view (<30), 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. For other three stations, the photos of FVC were obtained by directly photographing for the lower heights of the vegetation.
1.2.4 Method for calculating the FVC
The FVC calculation was implemented by the Beijing Normal University. The detail method can be found in the reference below. 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 (see the reference).
2. Biomass observation
2.1. Observation time
2.1.1 Station of the crop land: The observations lasted from 20 May 2012 to 15 September 2012, and in five-day periods for each observation before 31 July and in ten-day periods for each observation after 31 July.
The observation time for the crop land are 2013-5-25, 2013-5-30, 2013-6-5, 2013-6-10, 2013-6-16, 2013-6-22, 2013-6-27, 2013-7-2, 2013-7-7, 2013-7-12, 2013-7-17, 2013-7-27, 2013-8-3, 2013-8-13, 2013-8-25, 2013-9-5 and 2013-9-15.
2.1.2 The station of wetland: The observations lasted from 20 May 2012 to 15 September 2012, and in ten-day periods for each observation.
The observation time for the crop land are 2013-6-5, 2013-6-16, 2013-6-27, 2013-7-7, 2013-7-17, 2013-7-27, 2013-8-3, 2013-8-13, 2013-8-25, 2013-9-5 and 2013-9-15.
2.2. Method
Station of the crop land: Three plots were selected and three strains of corn for each observation were random selected for each plot to measure the fresh weight (the aboveground biomass and underground biomass) and dry weight. Per unit biomass can be obtained according to the planting structure.
Station of the wetland: Two plots of reed with the area of 0.5 m × 0.5 m were random selected for each observation. The reed of the two plots was cut to measure the fresh weight (the aboveground biomass) and dry weight.
2.3. Instruments
Balance (accuracy 0.01 g); drying oven
3. Data storage
All observation data were stored in excel. Other data including plant spacing, row spacing, seeding time, irrigation time, the time of cutting male parent and the harvest time of the corn for the station of cropland were also stored in the excel.

2、Keywords

Theme：Vegetation,Biomass,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, Daman Superstation,
Time：2013-05-20 to 2013-09-15, 2013

3、Data details

1.Scale：None

2.Projection：4326

3.Filesize：3561.0MB

4.Data format：文本

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：38.98 | - |
| west：100.25 | - | east：100.7 |
| - | south：38.5 | - |

5、Time frame:2013-12-01 00:00:00+00:00--2014-03-29 00:00:00+00:00

6、Reference method

References to data:

MA Mingguo, Li Yimeng. HiWATER: Dataset of fractional vegetation cover and biomass observed in the middle of Heihe River Basin (2013). A Big Earth Data Platform for Three Poles, doi:10.3972/hiwater.154.2013.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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