A Big Earth Data Platform for Three Poles

**HiWATER: Dataset of fractional vegetation cover and biomass observed in the middle reaches of the Heihe River Basin (2014)**

1、Description

This data includes the coverage data set of vegetation in one growth cycle in five stations of Daman super station, wetland, desert, desert and Gobi, and the biomass data set of maize and wetland reed in one growth cycle in Daman super station. The observation time starts from May 10, 2014 and ends on September 11, 2014.   
1 coverage observation   
1.1 observation time   
1.1.1 super station: the observation period is from May 10 to September 11, 2014. Before July 20, the observation is once every five days. After July 20, the observation is once every 10 days. A total of 17 observations are made. The specific observation time is as follows:;   
Super stations: May 10, 15, 20, 25, 30, 10, 15, 20, 20, 30, 30, 30, 30, 30, 7, 10, 10, 10, 10, 10, 15   
1.1.2 other four stations: the observation period is from May 20 to September 15, 2014, once every 10 days, and 11 observations have been made in total. The specific observation time is as follows:;   
Other four stations: May 10, 2014, May 20, 2014, May 30, 2014, June 10, 2014, June 20, 2014, June 30, July 10, 2014, July 20, August 5, 2014, August 17, 2014, September 11, 2014   
1.2 observation method   
1.2.1 measuring instruments and principles:   
The digital camera is placed on the instrument platform at the front end of the simple support pole to keep the shooting vertical and downward and remotely control the camera measurement data. The observation frame can be used to change the shooting height of the camera and realize targeted measurement for different types of vegetation.   
1.2.2 design of sample   
Super station: take 3 plots in total, the sample size of each plot is 10 × 10 meters, take photos along two diagonal lines in turn each time, take 9-10 photos in total; Wetland station: take 2 sample plots, each plot is 10 × 10 meters in size, and take 9-10 photos for each survey;   
3 other stations: select 1 sample plot, each sample plot is 10 × 10 meters in size, and take 9-10 photos for each survey;   
1.2.3 shooting method   
For the super station corn and wetland station reed, the observation frame is directly used to ensure that the camera on the observation frame is far higher than the vegetation crown height. Samples are taken along the diagonal in the square quadrat, and then the arithmetic average is made. In the case of a small field angle (< 30 °), the field of view includes more than 2 ridges with a full cycle, and the side length of the photo is parallel to the ridge; in the other three sites, due to the relatively low vegetation, the camera is directly used to take pictures vertically downward (without using the bracket).   
1.2.4 coverage calculation   
The coverage calculation is completed by Beijing Normal University, and an automatic classification method is adopted. For details, see article 1 of "recommended references". By transforming RGB color space to lab space which is easier to distinguish green vegetation, the histogram of green component A is clustered to separate green vegetation and non green background, and the vegetation coverage of a single photo is obtained. The advantage of this method lies in its simple algorithm, easy to implement and high degree of automation and precision. In the future, more rapid, automatic and accurate classification methods are needed to maximize the advantages of digital camera methods.   
2 biomass observation   
2.1 observation time   
2.1.1 corn: the observation period is from May 10 to September 11, 2014, once every 5 days before July 20, and once every 10 days after July 20. A total of 17 observations have been made. The specific observation time is as follows:;   
Super stations: May 10, 15, 20, 25, 30, 10, 15, 20, 20, 30, 30, 30, 30, 30, 7, 10, 10, 10, 10, 10, 15   
2.1.2 Reed: the observation period is from May 20 to September 15, 2014, once every 10 days, and 11 observations have been made in total. The specific observation time is as follows:; 2014-5-10、2014-5-20、2014-5-30、2014-6-10、2014-6-20、2014-6-30、2014-7-10、2014-7-20、2014-8-5、2014-8-17、2014-9-11   
2.2 observation method   
Corn: select three sample plots, and select three corn plants that represent the average level of each sample plot for each observation, respectively weigh the fresh weight (aboveground biomass + underground biomass) and the corresponding dry weight (85 ℃ constant temperature drying), and calculate the biomass of unit area corn according to the plant spacing and row spacing;   
Reed: set two 0.5m × 0.5m quadrats, cut them in the same place, and weigh the fresh weight (stem and leaf) and dry weight (constant temperature drying at 85 ℃) of reed respectively.   
2.3 observation instruments   
Balance (accuracy 0.01g), oven.   
3 data storage   
All the observation data were recorded in the excel table first, and then stored in the excel table. At the same time, the data of corn planting structure was sorted out, including the plant spacing, row spacing, planting time, irrigation time, except for the parent time, harvesting time and other relevant information.

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：2014, 2014-05-10 to 2014-09-11

3、Data details

1.Scale：None

2.Projection：4326

3.Filesize：0.05MB

4.Data format：文本

4、Space scope

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

5、Time frame:2014-05-21 00:00:00+00:00--2014-09-22 00:00:00+00:00

6、Reference method

References to data:

TAN Junlei, MA Mingguo, Li Yimeng, GENG Liying, YU Wenping. HiWATER: Dataset of fractional vegetation cover and biomass observed in the middle reaches of the Heihe River Basin (2014). A Big Earth Data Platform for Three Poles, doi:10.3972/hiwater.281.2015.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.

7、Supporting project information

Heihe Watershed Allied Telemetry Experimental Research (HiWATER)

8、Data resource provider

name: GENG Liying  
unit:   
email: gengly02@163.com  
  
name: TAN Junlei  
unit:   
email: tanjunlei@163.com  
  
name: MA Mingguo  
unit: Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences  
email: mmg@lzb.ac.cn  
  
name: Li Yimeng  
unit:   
email:   
  
name: YU Wenping  
unit:   
email: ywpgis2005@163.com