A Big Earth Data Platform for Three Poles

**WATER: Dataset of diurnal FPAR change observations in the Yingke oasis foci experimental areas**

1、Description

The dataset of diurnal FPAR change observations was obtained in the Yingke oasis foci experimental areas. Observation items included:  
 (1) Maize canopy reflectance spectra by ASD and 50% grey board, leaf SPAD by the chlorophyll meter and leaf photosynthesis by LI-6400 in Yingke oasis maize field on Jul. 5, 2008 (fixed point observations from 10:00-20:00 at intervals of one hour, and half an hour from 16:00)  
 Besides, Photo: photosynthetic rate (µmol CO2 m-2 s-1), Cond: stomatal conductance (mol H2O m-2 s-1), Ci: intercellular CO2 viscosity (µmol CO2 mol-1), Trmmol: transpiration rate (mmol H2O m-2 s-1), VpdL: vapor pressure deficiency of leaves (kPa), Tleaf: leaf temperature (°C), ParIn\_µm: active radiation of interior photosynthesis (µmol m-2 s-1), and ParOutµm: active radiation of outdoor photosynthesis (µmol m-2 s-1) were all archived.  
 (2) Maize canopy reflectance spectra, leaf photosynthesis and diurnal FPAR change by ASD (Institute of Remote Sensing Applications), 50% grey board (Institute of Remote Sensing Applications), LI-6400 (Institute of Remote Sensing Applications) and SUNSCAN (Beijing academy of Agriculture and Forestry Sciences).   
 Based on calibration lamp data (serial number: 64831), radiance spectrum on Jul. 9 by 1050 spectrometer (Beijing academy of Agriculture and Forestry Sciences) and 50% grey board and 99% white board calibration data, the spectrum data were preprocessed.  
 Calibration was undertaken in accordance with the following precedures:  
 a) The original DN was converted into radiance and further into readable EXCEL format by the spectrometer-matched calibration lamp data and ASD.   
 b) Solar radiance was got by 99% white board radiance. solar radiance=the reference board radiance/the reference board reflectance.  
 c) Spectrum from Agriculture and Forestry Sciences was sampled at an interval of 1.438nm, which was made into data at 1nm intervals by segmentation interpolation.   
 d) Based on b=16.087a (where a is radiance before fitting and b after fitting), radiance data got by 68731 spectrograph were processed.  
 The original maize leaf photosynthesis data (by LI-6400) were introduced into EXCEL format, diurnal changes of each leaf were archived as one single unit according to leaf classification.   
 Maize FPAR (the fraction of photosynthetically active radiation) was got by FPAR= (canopyPAR－surface transmissionPAR－canopy reflection PAR+surface reflectionPAR) /canopy PAR; APAR= FPAR×canopy PAR. The unit for PAR was µmol m-2 s-1. The data included number (the whole leaf), observation time (hh:mm:ss), upper light (µmol m-2 s-1), upper reflectivity (µmol m-2 s-1), lower light (µmol m-2 s-1), lower reflectivity (µmol m-2 s-1) and Spread: variation coefficients of the probe optical intensity.

2、Keywords

Theme：Photosynthetically active radiation,Photosynthesis,Canopy spectrum,Leaf area index,Terrain spectrometer,Vegetation,Terrestrial Surface Remote Sensing  
Discipline：Terrestrial Surface  
Places：Heihe River Basin, Arid Region Hydrology in the Middle Reaches,   
Time：2008-07-14, 2008,

3、Data details

1.Scale：None

2.Projection：4326

3.Filesize：89.3MB

4.Data format：

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：38.88 | - |
| west：100.37 | - | east：100.46 |
| - | south：38.812 | - |

5、Time frame:2008-12-07 08:00:00+00:00--2009-01-21 08:00:00+00:00

6、Reference method

References to data:

YANG Guijun, Liu Liangyun. WATER: Dataset of diurnal FPAR change observations in the Yingke oasis foci experimental areas. A Big Earth Data Platform for Three Poles, doi:10.3972/water973.0134.db2014

References to articles:

陶欣, 范闻捷, 王大成, 闫彬彦, 徐希孺. 植被FAPAR的遥感模型与反演研究. 地球科学进展, 2009, 24(7): 741-747.

7、Supporting project information

The CAS (Chinese Academy of Sciences) Action Plan for West Development Project  
National Program on Key Basic Research Project (973 Program

8、Data resource provider

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