A Big Earth Data Platform for Three Poles

**HiWATER: Dataset of ground truth measurements synchronizing with TerraSAR-X satellite overpassing in the Daman Superstation (June 15, 2012)**

1、Description

On June 15, 2012, the satellite transit ground synchronous observation was carried out in the TerraSAR-X sample near the super station in the dense observation area of Daman. TerraSAR-X satellite carries X-band synthetic aperture radar (SAR). The daily transit image is HH / VV polarized, with a nominal resolution of 3 m, an incidence angle of 22-24 ° and a transit time of 19:03 (Beijing time), which mainly covers the ecological and hydrological experimental area of the middle reaches artificial oasis. The local synchronous data set can provide the basic ground data set for the development and verification of active microwave remote sensing soil moisture retrieval algorithm.   
Quadrat and sampling strategy:   
Six natural blocks are selected in the southeast of the super station, with an area of about 100 m × 100 m. One plot in the northwest corner of the sample plot is watermelon field, others are corn. The basis of sample selection is: (1) considering different vegetation types, i.e. watermelon and corn; (2) considering the visible light pixel, the sample size of 100m square can guarantee at least 4 30 M-pixel is located in the sample; (3) the location of the sample is near the super station, with convenient transportation. The observation of the super station is in the north, and there is a water net node on both sides of the East and the west, which makes it possible to integrate these observations in the future; (4) in addition, there are some obvious points around the sample, which can ensure that the geometric correction of the SAR image is more accurate in the future.   
Considering the resolution of the image, 21 splines (distributed from east to West) are collected at 5 m intervals. Each line has 23 points (north-south direction) at 5 m intervals. Four hydroprobe data acquisition systems (HDAS, reference 2) are used to measure at the same time. The sampling interval is controlled by the scale and moving splines on the measuring line to make up for the lack of using hand-held GPS.   
Measurement content:   
About 500 points on the quadrat were obtained, and each point was observed twice, i.e. in each sampling point, once in the film (marked a in the data record) and once out of the film (marked b in the data record); although the watermelon land was also covered with film, considering that it was not laid horizontally, only the soil moisture at the non covered position was measured (marked b in both data records). As the HDAS system uses pogo portable soil sensor, the soil temperature, soil moisture (volume moisture content), loss tangent, soil conductivity, real part and imaginary part of soil complex dielectric are observed. The vegetation team completed the measurement of biomass, Lai, vegetation water content, plant height, row ridge distance, chlorophyll, etc.   
Data:   
This data set includes two parts: soil moisture observation and vegetation observation. The former saves the data format as a vector file, the spatial location is the location of each sampling point (WGS84 + UTM 47N), and the measurement information of soil moisture is recorded in the attribute file; the vegetation sampling information is recorded in the excel table.

2、Keywords

Theme：Soil,Radar remote sensing,Soil temperature,Soil moisture/Water content,Terrestrial Surface Remote Sensing  
Discipline：Terrestrial Surface  
Places：Heihe River Basin, the artificial oasis experimental area in the middle reaches, Daman Superstation  
Time：2012, 2012-06-15

3、Data details

1.Scale：None

2.Projection：4326

3.Filesize：8.8MB

4.Data format：文本

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：38.855 | - |
| west：100.372 | - | east：100.374 |
| - | south：38.853 | - |

5、Time frame:2018-12-15 18:46:56+00:00--2018-12-15 18:46:56+00:00

6、Reference method

References to data:

MA Mingguo, LI Xin, WANG Shuguo. HiWATER: Dataset of ground truth measurements synchronizing with TerraSAR-X satellite overpassing in the Daman Superstation (June 15, 2012). A Big Earth Data Platform for Three Poles, doi:10.3972/hiwater.048.2013.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)  
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8、Data resource provider

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