A Big Earth Data Platform for Three Poles

**Qilian Mountains integrated observatory network: Dataset of Heihe integrated observatory network (an observation system of meteorological elements gradient of Daman superstation, 2018)**

1、Description

This dataset includes data recorded by the Heihe integrated observatory network obtained from an observation system of Meteorological elements gradient of Daman Superstation from January 1 to December 31, 2018. The site (100.372° E, 38.856° N) was located on a cropland (maize surface) in the Daman irrigation, which is near Zhangye city, Gansu Province. The elevation is 1556 m. The installation heights and orientations of different sensors and measured quantities were as follows: air temperature and humidity profile (AV-14TH;3, 5, 10, 15, 20, 30, and 40 m, towards north), wind speed and direction profile (windsonic; 3, 5, 10, 15, 20, 30, and 40 m, towards north), air pressure (CS100; 2 m), rain gauge (TE525M; 2.5 m, 8 m in west of tower), four-component radiometer (PIR&PSP; 12 m, towards south), two infrared temperature sensors (IRTC3; 12 m, towards south, vertically downward), photosynthetically active radiation (LI190SB; 12 m, towards south, vertically upward; another four photosynthetically active radiation, PQS-1; two above the plants (12 m) and two below the plants (0.3 m), towards south, each with one vertically downward and one vertically upward), soil heat flux (HFP01SC; 3 duplicates with G1 below the vegetation; G2 and G3 between plants, -0.06 m), a TCAV averaging soil thermocouple probe (TCAV; -0.02, -0.04 m), soil temperature profile (AV-10T; 0, -0.02, -0.04, -0.1, -0.2, -0.4, -0.8, -1.2, and -1.6 m), soil moisture profile (CS616; -0.02, -0.04, -0.1, -0.2, -0.4, -0.8, -1.2, and -1.6 m).  
The observations included the following: air temperature and humidity (Ta\_3 m, Ta\_5 m, Ta\_10 m, Ta\_15 m, Ta\_20 m, Ta\_30 m, and Ta\_40 m; RH\_3 m, RH\_5 m, RH\_10 m, RH\_15 m, RH\_20 m, RH\_30 m, and RH\_40 m) (℃ and %, respectively), wind speed (Ws\_3 m, Ws\_5 m, Ws\_10 m, Ws\_15 m, Ws\_20 m, Ws\_30 m, and Ws\_40 m) (m/s), wind direction (WD\_3 m, WD\_5 m, WD\_10 m, WD\_15 m, WD\_20 m, WD\_30m, and WD\_40 m) (°), air pressure (press) (hpa), precipitation (rain) (mm), four-component radiation (DR, incoming shortwave radiation; UR, outgoing shortwave radiation; DLR\_Cor, incoming longwave radiation; ULR\_Cor, outgoing longwave radiation; Rn, net radiation) (W/m^2), infrared temperature (IRT\_1 and IRT\_2) (℃), photosynthetically active radiation (PAR) (μmol/ (s m-2)), average soil temperature (TCAV, ℃), soil heat flux (Gs\_1, below the vegetation; Gs\_2, and Gs\_3, between plants) (W/m^2), soil temperature (Ts\_0 cm, Ts\_2 cm, Ts\_4 cm, Ts\_10 cm, Ts\_20 cm, Ts\_40 cm, Ts\_80 cm, Ts\_120 cm, and Ts\_160 cm) (℃), soil moisture (Ms\_2 cm, Ms\_4 cm, Ms\_10 cm, Ms\_20 cm, Ms\_40 cm, Ms\_80 cm, Ms\_120 cm, and Ms\_160 cm) (%, volumetric water content), above the plants photosynthetically active radiation of upward and downward (PAR\_U\_up and PAR\_U\_down) (μmol/ (s m-2)), and below the plants photosynthetically active radiation of upward and downward (PAR\_D\_up and PAR\_D\_down) (μmol/ (s m-2)).  
The data processing and quality control steps were as follows: (1) The AWS data were averaged over intervals of 10 min for a total of 144 records per day.The meterological data during September 17 and November 7 and TCAV data after November 7 were wrong because the malfunction of datalogger. The missing data were denoted by -6999. (2) Data in duplicate records were rejected. (3) Unphysical data were rejected. (4) The data marked in red are problematic data. (5) The format of the date and time was unified, and the date and time were collected in the same column, for example, date and time: 2018-6-10 10:30. Moreover, suspicious data were marked in red.  
For more information, please refer to Liu et al. (2018) (for sites information), Liu et al. (2011) for data processing) in the Citation section.

2、Keywords

Theme：Soil,Precipitation,Temperature,Surface air temperature,Earth SurFace Processes,Winds,Humidity/Dryness,Meteorological element,wind speed,Soil heat flux  
Discipline：Atmosphere,Terrestrial Surface  
Places：Heihe River Basin, The artificial oasis experimental area in the middle reaches, Daman superstation  
Time：2018

3、Data details

1.Scale：None

2.Projection：None

3.Filesize：21.2MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：38.8555 | - |
| west：100.3722 | - | east：100.3722 |
| - | south：38.8555 | - |

5、Time frame:2018-07-26 08:00:00+00:00--2019-07-25 08:00:00+00:00

6、Reference method

References to data:

TAN Junlei, LI Xin, XU Ziwei, CHE Tao, REN Zhiguo. Qilian Mountains integrated observatory network: Dataset of Heihe integrated observatory network (an observation system of meteorological elements gradient of Daman superstation, 2018). A Big Earth Data Platform for Three Poles, doi:10.11888/Meteoro.tpdc.2707762019

References to articles:

Liu, S.M., Li, X., Xu, Z.W., Che, T., Xiao, Q., Ma, M.G., Liu, Q.H., Jin, R., Guo, J.W., Wang, L.X., Wang, W.Z., Qi, Y., Li, H.Y., Xu, T.R., Ran, Y.H., Hu, X.L., Shi, S.J., Zhu, Z.L., Tan, J.L., Zhang, Y., & Ren, Z.G. (2018). The Heihe Integrated Observatory Network: A Basin-Scale Land Surface Processes Observatory in China. Vadose Zone Journal, 17(1), 180072. doi:10.2136/vzj2018.04.0072.  
  
Liu, S.M., Xu, Z.W., Wang, W.Z., Bai, J., Jia, Z., Zhu, M., & Wang, J.M. (2011). A comparison of eddy-covariance and large aperture scintillometer measurements with respect to the energy balance closure problem. Hydrology and Earth System Sciences, 15(4), 1291-1306.

7、Supporting project information

Pan-Third Pole Environment Study for a Green Silk Road-A CAS Strategic Priority A Program

8、Data resource provider

name: XU Ziwei  
unit: Beijing Normal University  
email: xuzw@bnu.edu.cn  
  
name: TAN Junlei  
unit:   
email: tanjunlei@163.com  
  
name: REN Zhiguo  
unit: Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences  
email:   
  
name: LI Xin  
unit:   
email: xinli@itpcas.ac.cn  
  
name: CHE Tao  
unit:   
email: chetao@lzb.ac.cn