A Big Earth Data Platform for Three Poles

**HiWATER: Dataset of hydrometeorological observation network (an observation system of meteorological elements gradient of Daman superstation, 2013)**

1、Description

This dataset includes data recorded by the Hydrometeorological observation network obtained from an observation system of Meteorological elements gradient of Daman Superstation between 26 September, 2012, and 31 December, 2013. 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 were installed on 28 July, 2013, 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 CO2 and H2O density profile data were missing during 15 December, 2012 and 1 April, 2013 because of datalogger malfunction; the wind speed profile data were missing during 29 November, 2012 and 22 December, 2012 because the malfunction of sensors; the wind speed/direction data at 5 m height were missing from 26 October, 2012 to 27 November, 2012, and from 9 December, 2012 to 23 December, 2012 because of the sensor malfunction. 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: 2013-6-10 10:30. (6) Finally, the naming convention was AWS+ site no. Moreover, suspicious data were marked in red.  
For information of hydrometeorological network or station, please refer to Liu et al.(2018), and for observation data processing, please refer to Liu et al.(2011).

2、Keywords

Theme：Precipitation,Meteorological element  
Discipline：Atmosphere  
Places：Heihe River Basin, the artificial oasis experimental area in the middle reaches, Daman Superstation  
Time：2012-09-15 to 2013-12-31, 2013

3、Data details

1.Scale：None

2.Projection：4326

3.Filesize：42.57MB

4.Data format：文本

4、Space scope

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

5、Time frame:2012-09-23 00:00:00+00:00--2014-01-08 20:00:00+00:00

6、Reference method

References to data:

TAN Junlei, LI Xin, LIU Shaomin, XU Ziwei, CHE Tao, REN Zhiguo. HiWATER: Dataset of hydrometeorological observation network (an observation system of meteorological elements gradient of Daman superstation, 2013). A Big Earth Data Platform for Three Poles, doi:10.3972/hiwater.189.2014.db2016

References to articles:

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.  
  
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.

7、Supporting project information

National Natural Science Foundation of China

8、Data resource provider

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