A Big Earth Data Platform for Three Poles

**HiWATER: Dataset of hydrometeorological observation network (an observation system of meteorological elements gradient of Daman superstation, 2014)**

1、Description

This data set contains the data of meteorological element gradient observation system of dashman superstation in the middle reaches of heihe hydrometeorological observation network from January 1, 2014 to December 31, 2014.The station is located in the farmland of daman irrigation district of zhangye city, gansu province.The longitude and latitude of the observation point are 100.3722e, 38.8555n and 1556m above sea level.The wind speed/direction, air temperature and relative humidity sensors are located at 3m, 5m, 10m, 15m, 20m, 30m and 40m respectively, with a total of 7 layers, facing due north.The barometer is installed at 2m;The tilting bucket rain gauge was installed at about 8m on the west side of the tower, with a height of 2.5m;The four-component radiometer is installed at 12m, facing due south;Two infrared thermometers are installed at 12m, facing due south and the probe facing vertically downward.Soil heat flow plate (self-calibration formal) (3 pieces) were buried in the ground 6cm in turn, 2m away from the tower body due south, two of which (Gs\_2 and Gs\_3) were buried between the trees, and one (Gs\_1) was buried under the plants.The mean soil temperature sensor TCAV is buried 2cm and 4cm underground, facing due south and 2m away from the tower body.The soil temperature probe is buried at 0cm of the surface and 2cm, 4cm, 10cm, 20cm, 40cm, 80cm, 120cm and 160cm underground, 2m to the south of the meteorological tower.The soil water sensor is buried 2cm, 4cm, 10cm, 20cm, 40cm, 80cm, 120cm and 160cm underground, 2m to the south of the meteorological tower.The photosynthetic effective radiometer is installed at 12m with the probe facing vertically upward.Four other photosynthetically active radiometers were installed above and inside the canopy, 12m above the canopy (one probe vertically up and one probe vertically down), and 0.3m above the canopy (one probe vertically up and one probe vertically down), facing due south.  
The observation items are: wind speed (WS\_3m, WS\_5m, WS\_10m, WS\_15m, WS\_20m, WS\_30m, WS\_40m) (unit: m/s), wind direction (WD\_3m, WD\_5m, WD\_10m, WD\_15m, WD\_20m, WD\_30m, WD\_40m) (unit:Air temperature and humidity (Ta\_3m, Ta\_5m, Ta\_10m, Ta\_15m, Ta\_20m, Ta\_30m, Ta\_40m and RH\_3m, RH\_5m, RH\_10m, RH\_15m, RH\_20m, RH\_30m, RH\_40m) (unit: Celsius, percentage), air pressure (Press) (unit: hpa), precipitation (Rain) (unit: mm), four-component radiation (DR, UR, DLR\_Cor, ULR\_Cor, Rn) (unit:Watts/m2), surface radiant temperature (IRT\_1, IRT\_2) (unit: Celsius), average soil temperature (TCAV) (unit: Celsius), soil heat flux (Gs\_1, Gs\_2, Gs\_3) (unit: watts/m2), soil moisture (Ms\_2cm, Ms\_4cm, Ms\_10cm, Ms\_20cm, Ms\_40cm, Ms\_80cm, Ms\_120cm, Ms\_160cm) (unit:Soil temperature (Ts\_0cm, Ts\_2cm, Ts\_4cm, Ts\_10cm, Ts\_20cm, Ts\_40cm, Ts\_80cm, Ts\_120cm, Ts\_160cm)Mmol/m s) and the upward and downward photosynthetic effective radiation (PAR\_D\_up, PAR\_D\_down) under the canopy (in mmol/m s).  
Processing and quality control of observed data :(1) ensure 144 pieces of data every day (every 10min), and mark by -6999 in case of data missing;Non-soil data (wind speed, wind direction, air temperature and humidity, air pressure, precipitation, four-component radiation, surface radiation temperature and photosynthetically active radiation) were missing between June 20, 2014 and June 27, 2014 due to the data collector.The wind speed and direction of 3m were between January 17th, 2014 -- January 21st, 2014 and February 10th, 2014 -- February 2nd, 2014.5m wind speed and direction between 2014.2.10-3.2due to sensor problems, data is missing;The soil temperature was between October, 2014 and December, 2014. Due to the problem of the data collector, the data was missing.(2) excluding the time with duplicate records;(3) data that obviously exceeds the physical significance or the range of the instrument is deleted;(4) the part marked with red letter in the data is the data in question;(5) date and time have the same format, and date and time are in the same column.For example, the time is: 2014-6-1010:30;(6) the naming rule is: AWS+ site name.  
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：2014, 2014-01-01 to 2014-12-31

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:2014-01-15 16:00:00+00:00--2015-01-14 16:00:00+00:00

6、Reference method

References to data:

TAN Junlei, LI Xin, XU Ziwei, CHE Tao, REN Zhiguo. HiWATER: Dataset of hydrometeorological observation network (an observation system of meteorological elements gradient of Daman superstation, 2014). A Big Earth Data Platform for Three Poles, doi:10.3972/hiwater.258.2015.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

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