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 Sidaoqiao Superstation, 2021)**

1、Description

This dataset includes data recorded by the Heihe integrated observatory network obtained from an observation system of Meteorological elements gradient of Sidaoqiao Superstation from January 1 to December 31, 2021. The site (101.137° E, 42.001° N) was located on a tamarix (Tamarix chinensis Lour.) surface in the Sidaoqiao, Dalaihubu Town, Ejin Banner, Inner Mongolia Autonomous Region. The elevation is 873 m. The installation heights and orientations of different sensors and measured quantities were as follows: air temperature and humidity profile (HC2S3; 5, 7, 10, 15, 20 and 28 m, towards north), wind speed profile (010C; 5, 7, 10, 15, 20 and 28 m, towards north), wind direction profile (020C; 15 m, towards north), air pressure (CS100; in waterproof box), rain gauge (TE525M; 28 m, towards south), four-component radiometer (CNR4; 10 m, towards south), two infrared temperature sensors (SI-111; 10 m, towards south, vertically downward), two photosynthetically active radiation (PQS-1; 10 m, towards south, one vertically upward and one vertically downward), soil heat flux (HFP01SC; 3 duplicates with G1 below the tamarix; G2 and G3 between plants, -0.06 m), a TCAV averaging soil thermocouple probe (installed on 17 July, 2013, TCAV; -0.02, -0.04 m), soil temperature profile (109ss-L; 0, -0.02, -0.04, -0.1, -0.2, -0.4, -0.8, -1.2, -1.6, -2.0 m), and soil moisture profile (install on 7 December, 2013, ML2X; -0.02, -0.04, -0.1, -0.2, -0.4, -0.8, -1.2, -1.6, -2.0 m).
The observations included the following: air temperature and humidity (Ta\_5 m, Ta\_7 m, Ta\_10 m, Ta\_15 m, Ta\_20 m and Ta\_28 m; RH\_5 m, RH\_7 m, RH\_10 m, RH\_15 m, RH\_20 m and RH\_28 m) (℃ and %, respectively), wind speed (Ws\_5 m, Ws\_7 m, Ws\_10 m, Ws\_15 m, Ws\_20 m and Ws\_28 m) (m/s), wind direction (WD\_15 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 of upward and downward (PAR\_up and PAR\_down) (μmol/ (s m^-2)), average soil temperature (TCAV, ℃), soil heat flux (Gs\_1, Gs\_2 and Gs\_3) (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, Ts\_160 cm, Ts\_200 cm) (℃), and soil moisture (Ms\_2 cm, Ms\_4 cm, Ms\_10 cm, Ms\_20 cm, Ms\_40 cm, Ms\_80 cm, Ms\_120 cm, Ms\_160 cm, Ms\_200 cm) (%, volumetric water content).
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. (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: 2021-9-10 10:30. (6) Finally, the naming convention was AWS+ site no. 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：Visibility,Hydrology
Discipline：Atmosphere,Terrestrial Surface
Places：The lower reaches of the heihe river, Heihe River Basin, Sidaoqiao superstation
Time：In 2021

3、Data details

1.Scale：None

2.Projection：None

3.Filesize：21.7MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：42.001 | - |
| west：101.137 | - | east：101.137 |
| - | south：42.001 | - |

5、Time frame:2020-12-31 16:00:00+00:00--2021-12-30 16:00:00+00:00

6、Reference method

References to data:

LIU Shaomin, ZHANG Yang, XU Ziwei, REN Zhiguo, TAN Junlei, CHE Tao. Qilian Mountains integrated observatory network: Dataset of Heihe integrated observatory network (an observation system of Meteorological elements gradient of Sidaoqiao Superstation, 2021). A Big Earth Data Platform for Three Poles, doi:10.11888/Atmos.tpdc.2724902022

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.

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: LIU Shaomin
unit: Beijing Normal University
email: smliu@bnu.edu.cn

name: CHE Tao
unit:
email: chetao@lzb.ac.cn

name: ZHANG Yang
unit:
email: zhangyang@lzb.ac.cn

name: TAN Junlei
unit:
email: tanjunlei@lzb.ac.cn

name: REN Zhiguo
unit:
email: rzgehu@lzb.ac.cn