A Big Earth Data Platform for Three Poles

**Multi-scale surface flux and meteorological elements observation dataset in the Hai River Basin(Huailai station-automatic weather station-40m tower, 2021)**

1、Description

This dataset obtained from an observation system of Meteorological elements gradient of Huailai station from January 1 to December 31, 2021. The site (115.7923° E, 40.3574° N) was located on a cropland (maize surface) which is near Donghuayuan town of Huailai city, Hebei Province. The elevation is 480 m. The installation heights and orientations of different sensors and measured quantities were as follows: air temperature and humidity profile (3, 5, 10, 15, 20, 30, and 40 m, towards north), wind speed and direction profile (3, 5, 10, 15, 20, 30, and 40 m, towards north), air pressure (in the box), rain gauge (3 m, south of tower), four-component radiometer (4 m, south of tower), two infrared temperature sensors (4 m, south of tower, vertically downward), photosynthetically active radiation (4 m, south of tower, vertically upward), soil heat flux -0.06 m), a TCAV averaging soil thermocouple probe (-0.02, -0.04 m), soil temperature profile (-0.02, -0.04, -0.1, -0.2, -0.4, -0.8, -1.2, and -1.6 m), soil moisture profile (-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\_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\_10 m, Ws\_15 m, Ws\_20 m, Ws\_30 m) (m/s), wind direction (WD\_10 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) (W/m^2), soil temperature (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).  
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 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: 2021-6-10 10:30. Moreover, suspicious data were marked in red.  
For more information, please refer to Guo et al. (2020) (for sites information), Liu et al. (2013) for data processing) in the Citation section.

2、Keywords

Theme：Meteorological data,Hydrology  
Discipline：Atmosphere,Terrestrial Surface  
Places：Huailai, Haihe river basin  
Time：2021

3、Data details

1.Scale：None

2.Projection：

3.Filesize：15.2MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：40.3574 | - |
| west：115.7923 | - | east：115.7923 |
| - | south：40.3574 | - |

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, XU Ziwei, BAI Junhua, XIAO Qing. Multi-scale surface flux and meteorological elements observation dataset in the Hai River Basin(Huailai station-automatic weather station-40m tower, 2021). A Big Earth Data Platform for Three Poles, doi:10.11888/Atmos.tpdc.2729242022

References to articles:

Guo, A.L., Liu, S.M., Zhu, Z.L., Xu, Z.W., Xiao, Q., Ju, Q., Zhang, Y., & Yang, X.F. (2020). Impact of Lake/Reservoir Expansion and Shrinkage on Energy and Water Vapor Fluxes in the Surrounding Area. Journal of Geophysical Research: Atmospheres, 125, e2020JD032833. https://doi.org/10.1029/2020JD032833.  
  
Liu, S.M., Xu, Z.W., Zhu, Z.L., Jia, Z.Z., &Zhu, M.J. (2013). Measurements of evapotranspiration from eddy-covariance systems and large aperture scintillometers in the Hai River Basin, China. Journal of Hydrology, 487, 24-38.

7、Supporting project information

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

8、Data resource provider

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