Cold and Arid Regions Science Data Center

HiWATER: Dataset of Hydrometeorological observation network (automatic weather station of E’bao station)

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Abstract

This dataset includes data recorded by the Hydrometeorological observation network obtained from the automatic weather station (AWS) at the observation system of Meteorological elements gradient of E’bao station between 11 June, 2013, and 31 December, 2013. The site (100.915° E, 37.949° N) was located on a cold grassland surface in the pasture, which is near E’bao town, Qilian County, Qinghai Province. The elevation is 3294 m. The installation heights and orientations of different sensors and measured quantities were as follows: air temperature and humidity profile (HMP45D; 5 m, north), wind speed and direction profile (03001; 10 m, north), air pressure (278; in the tamper box on the ground), rain gauge (TE525M; 10 m), four-component radiometer (CNR4; 6 m, south), two infrared temperature sensors (IRTC3; 6 m, south, vertically downward), soil heat flux (HFT3; 3 duplicates, -0.06 m), soil temperature profile (AV-10T; 0, -0.04, -0.1, -0.2, -0.4, -0.8, -1.2, and -1.6 m), and soil moisture profile (ECh2o-5; -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_5 m; RH_5 m) (°C and %, respectively), wind speed (Ws_10 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/m2), infrared temperature (IRT_1 and IRT_2) (°C), soil heat flux (Gs_1, Gs_2 and Gs_3) (W/m2), soil temperature (Ts_0 cm, Ts_4 cm, Ts_10 cm, Ts_20 cm, Ts_40 cm, Ts_80 cm, Ts_120 cm, and Ts_160 cm) (°C), and soil moisture (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 precipitation data were missing before 31 July, 2013 because of the wiring problem. 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: 2013-9-10 10:30. (6) Finally, the naming convention was AWS+ site no. Moreover, suspicious data were marked in red.
For more information, please refer to Li et al. (2013) (for hydrometeorological observation network or sites information), Liu et al. (2011) (for data processing) in the Citation section.

Keywords

Theme: meteorological element, automatic weather station, Hydrometeorology observation network, cold grassland,
Place: the cold region hydrology experimental area, E’bao station, Heihe River Basin,
Temporal: 2013, 2013-06-11 to 2013-12-31,
Discipline: Atmospheric science, Geographic science,
Statrum:

ISO 19115 Category

Category: geoscientificInformation

Detail

Project: +proj=longlat +datum=WGS84 +no_defs
Data Volume(MB): 9.76
Data Format: *.xlsx

Position and Thumbnail

N:37.9492

W:100.915

E:100.915

S:37.9492

Temporal Range

Start: 2013-06-11
End: 2013-12-31

Citation

1. Liu SM, Li X, Xu ZW, Che T, Xiao Q, Ma MG, Liu QH, Jin R, Guo JW, Wang LX, Wang WZ, Qi Y, Li HY, Xu TR, Ran YH, Hu XL, Shi SJ, Zhu ZL, Tan JL, Zhang Y, Ren ZG. The Heihe Integrated Observatory Network: A basin-scale land surface processes observatory in China. Vadose Zone Journal, 2018, 17:180072. doi:10.2136/vzj2018.04.0072
2. Liu SM, Xu ZW, Wang WZ, Bai J, Jia Z, Zhu M, Wang JM. A comparison of eddy-covariance and large aperture scintillometer measurements with respect to the energy balance closure problem. Hydrology and Earth System Sciences, 2011, 15(4): 1291-1306. doi:10.5194/hess-15-1291-2011.

Recommended Publications

1. Liu SM, Xu ZW, Song LS, Zhao QY, Ge Y, Xu TR, Ma YF, Zhu ZL, Jia ZZ, Zhang F. Upscaling evapotranspiration measurements from multi-site to the satellite pixel scale over heterogeneous land surfaces. Agricultural and Forest Meteorology, 2016, 230-231, 97-113. doi:10.1016/j.agrformet.2016.04.008.
2. Xu ZW, Ma YF, Liu SM, Shi SJ, Wang JM. Assessment of the energy balance closure under advective conditions and its impact using remote sensing data. Journal of Applied Meteorology and Climatology, 2017, 56: 127-140, doi: 10.1175/JAMC-D-16-0096.1.
3. Song LS, Liu SM, Kustas W P, Zhou J, Xu ZW, Xia T, Li MS. Application of remote sensing-based two-source energy balance model for mapping field surface fluxes with composite and component surface temperatures. Agricultural and Forest Meteorology, 2016, doi:10.1016/j.agrformet.2016.01.005.
4. Song LS , Kustas WP, Liu SM, Colaizzi PD, Nieto H, Xu ZW, Ma YF, Li MS, Xu TR, Agam N, Tolk JA, Evett SR. Applications of a thermal-based two-source energy balance model using Priestley-Taylor approach for surface temperature partitioning under advective conditions. Journal of Hydrology, 2016, doi:10.1016/j.jhydrol.2016.06.034.
5. Zhang Q, Sun R, Jiang GQ, Xu ZW, Liu SM. Carbon and energy flux from a Phragmites australis wetland in Zhangye oasis-desert area, China. Agricultural and Forest Meteorology, 2016, doi: 10.1016/j.agrformet.2016.02.019.
6. Xu TR, Bateni S.M., Liang SL. Estimating turbulent heat fluxes with a weak-constraint data assimilation scheme: A case study (HiWATER-MUSOEXE). IEEE Geoscience and Remote Sensing Letters, 2015, 12 (1), 68-72.doi:10.1109/LGRS.2014.2326180
7. Wang JM, Zhuang JX, Wang WZ, Liu SM, Xu ZW. Assessment of uncertainties in eddy covariance flux measurement based on intensive flux matrix of HiWATER-MUSOEXE. IEEE Geoscience and Remote Sensing Letters, 2015, 12 (2), 259-263. doi:10.1109/LGRS.2014.2334703
8. Song LS, Liu SM, Zhang X, Zhou J, Li MS. Estimating and Validating Soil Evaporation and Crop Transpiration During the HiWATER-MUSOEXE. IEEE Geoscience and Remote Sensing Letters, 2015, 12 (2), 334-338. doi:10.1109/LGRS.2014.2339360
9. Qiao C, Sun R, Xu ZW, Zhang L, Liu LY, Hao LY, Jiang GQ. A study of shelterbelt transpiration and cropland evapotranspiration in an irrigated area in the middle reaches of the Heihe River in northwestern China. IEEE Geoscience and Remote Sensing Letters, 2015, 12(2), 369-373. doi:10.1109/LGRS.2014.2342219
10. Zhu ZL, Tan L, Gao SG, Jiao QS. Oberservation on soil moisture of irrigated cropland by cosmic-ray probe. IEEE Geoscience and Remote Sensing Letters, 2015, 12(3), 472-476.
11. Ge Y, Liang YZ, Wang JH, Zhao QY, Liu SM. Upscaling sensible heat fluxes with area-to-area regression kriging. IEEE Geoscience and Remote Sensing Letters, 2015, 12(3), 656-660.doi:10.1109/LGRS.2014.2355871
12. Ma YF, Liu SM, Zhang F, Zhou J, Jia ZZ. Estimations of regional surface energy fluxes over heterogeneous oasis-desert surfaces in the middle reaches of the Heihe River during HiWATER-MUSOEXE. IEEE Geoscience and Remote Sensing Letters, 2015, 12(3), 671-675. doi:10.1109/LGRS.2014.2356652

13. Bai, J., Jia, L., Liu, S., Xu, Z., Hu, G., Zhu, M., Song, L.. Characterizing the Footprint of Eddy Covariance System and Large Aperture Scintillometer Measurements to Validate Satellite-Based Surface Fluxes. IEEE Geoscience and Remote Sensing Letters, 2015, 12(5), 943-947. doi:10.1109/LGRS.2014.2368580
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17. Song LS, Liu SM, William Kustas P, Zhou J, Ma YF. Using the Surface Temperature-Albedo Space to Separate Regional Soil and Vegetation Temperatures from ASTER Data. Remote Sensing, 2015, 7(5):5828-5848. doi:10.3390/rs70505828
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22. Xu ZW, Liu SM, Li X, Shi SJ, Wang JM, Zhu ZL, Xu TR, Wang WZ, Ma MG. Intercomparison of surface energy flux measurement systems used during the HiWATER-MUSOEXE. Journal of Geophysical Research, 2013,118, 13140-13157, doi:10.1002/2013JD020260.
23. Liu SM, Xu ZW, Zhu ZL, Jia ZZ, Zhu MJ. Measurements of evapotranspiration from eddy-covariance systems and large aperture scintillometers in the Hai River Basin, China. Journal of Hydrology, 2013, 487, 24-38.

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1. National Natural Science Foundation of China：(No: 91125002)

Limitation

1. The dataset is generated from the "Heihe Watershed Allied Telemetry Experimental Research (HiWATER)". User must have a clear statement in the article of the original data source and cite the dataset and papers in the Citation section.

Online Resources

1. ftp://ftp2.westgis.ac.cn
2. http://card.westgis.ac.cn

Contacts

1. Author
Zhang Xi Organization: Beijing Normal University
Address: China Beijing Xinjiekouwai Street No.19
Zip code: 100875 Phone: Email: zhangxi901124@sina.com

2. Author

Liu Shaomin Organization: Beijing Normal University
Address: China Beijing Xinjiekouwai Street No.19
Zip code: 100875 Phone: 010-58802240 Email: smliu@bnu.edu.cn

3. Distributor
Cold and Arid Regions Science Data Center at Lanzhou (CARD) Organization: Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences
Address: China Lanzhou No. 320 Donggang West Road
Zip code: 730000 Phone: 0931-4967287 Email: westdc@lzb.ac.cn

4. Point of Contact
Xu Ziwei Organization: Beijing Normal University
Address: China Beijing Xinjiekouwai Street No.19
Zip code: 100875 Phone: Email: xuzw@bnu.edu.cn

5. Principal Investigator
Liu Shaomin Organization: Beijing Normal University
Address: China Beijing Xinjiekouwai Street No.19
Zip code: 100875 Phone: 010-58802240 Email: smliu@bnu.edu.cn

6. Principal Investigator
Xu Ziwei Organization: Beijing Normal University
Address: China Beijing Xinjiekouwai Street No.19
Zip code: 100875 Phone: Email: xuzw@bnu.edu.cn

7. Principal Investigator
Li Xin Organization: Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences
Address: China Lanzhou Donggang West Road No. 320
Zip code: 730000 Phone: 0931-4967249 Email: lixin@lzb.ac.cn

8. Principal Investigator
Che Tao Organization: Cold and Arid Regions Environmental and Engineering Research Institute, Chinese Academy of Sciences
Address: China Lanzhou Donggang West Road No. 320
Zip code: 730000 Phone: Email: chetao@lzb.ac.cn

9. Principal Investigator
Shi Shengjin Organization: Rainroot Scientific Limited
Address: China Beijing Fenghui middle road No.7, new materials building 904
Zip code: 100094 Phone: Email:

10. Resource Provider
Liu Shaomin Organization: Beijing Normal University
Address: China Beijing Xinjiekouwai Street No.19
Zip code: 100875 Phone: 010-58802240 Email: smliu@bnu.edu.cn