



## Cold and Arid Regions Science Data Center

HiWATER: Dataset of Hydrometeorological observation network (an automatic weather station of Sidaoqiao cropland 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 Sidaoqiao cropland station between 9 July, 2013, and 31 December, 2013. The site (101.134 ° E, 42.005 ° N) was located on a cropland (melon) surface in the Sidaoqiao, Dalaihubu Town, Ejin Banner, Inner Mongolia Autonomous Region. The elevation is 875 m. The installation heights and orientations of different sensors and measured quantities were as follows: four-component radiometer (CM21; 6 m, south), two infrared temperature sensors (SI-111; 6 m, south, vertically downward), two photosynthetically active radiation (PQS-1; 6 m, south, one vertically upward and one vertically downward), soil heat flux (HFP01; 3 duplicates with G1 below the vegetation; G2 and G3 between plants, -0.06 m), and soil temperature profile (AV-10T; 0, -0.02 and -0.04 m).

The observations included the following: 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) ( $\mu mol / (s m^2)$ ), soil heat flux (Gs\_1, Gs\_2 and Gs\_3) ( $W/m^2$ ), the soil temperature (Ts\_0 cm, Ts\_2 cm and Ts\_4 cm) ( ).

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: 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, cropland,  
Place: the natural oasis eco-hydrology experimental area, cropland station, Heihe River Basin,  
Temporal: 2013, 2013-07-09 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): 3.14  
Data Format: \*.xlsx

## Position and Thumbnail

N:42.0048

## Temporal Range

Start: 2013-07-09

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.
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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
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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. Observation 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.

#### DOI

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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>

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