

An evapotranspiration dataset based on upscaling eddy covariance observations over the temperate semi-arid grassland of China

1. – General

As an important part of global semi-arid grassland, adequately understanding the spatio-temporal variability of evapotranspiration (ET) over the temperate semi-arid grassland of China (TSGC) could advance our understanding of climate, hydrological and ecological processes over global semi-arid areas. Based on the largest number of in-situ ET measurements (13 flux towers) within the TSGC, we applied the support vector regression method to develop a high-quality ET dataset at 1 km spatial resolution and 8-day timescale for the TSGC from 1982 to 2015. The model performed well in validation against flux tower-measured data and comparison with water-balance derived ET.

2. – Coverage

Within the temperate semi-arid region of China, the regions which were always identified as grassland in all sessions of land use data during 1982-2015 were selected as TSGC.

See the file “Coverage_The temperate semi-arid grassland of China.tif” in the folder. The grids within the region are masked with 1.

3. – Forcing datasets

Details of eddy covariance flux towers, gridded meteorological and remote sensing data, and methods can be found in article:

Pang, X., Lei, H., Cong, Z., Yang, H., Duan, L., & Yang, D. (2021). Long term variation of evapotranspiration and water balance based on upscaling eddy covariance observations over the temperate semi-arid grassland of China. *Agricultural and Forest Meteorology*, 308-309, 108566. doi:<https://doi.org/10.1016/j.agrformet.2021.108566>

4. – File organization

Datasets are organized in netcdf files. There is one netcdf file per year, and they are stored as a 3D array with dimensions 2093 x 1123 x 46 (46 is the number of 8-day per year). Therefore, the first cell corresponds to the 1st 8-day of the corresponding year, and it is centred at latitude 35.5176

and longitude 103.4511. 'DATA' is 8-day ET [mm/8d]. Missing values in the files are masked with NaN.

Size: 29.3 GBytes

5. – *Data policy*

Use of the data is subject to the following terms and conditions:

1. Acknowledgements. Whenever this ET dataset is used in a scientific publication, the following references should be cited:

Pang, X., Lei, H., Cong, Z., Yang, H., Duan, L., & Yang, D. (2021). Long term variation of evapotranspiration and water balance based on upscaling eddy covariance observations over the temperate semi-arid grassland of China. *Agricultural and Forest Meteorology*, 308-309, 108566. doi:<https://doi.org/10.1016/j.agrformet.2021.108566>

2. Scientific use only. This ET dataset will not be used for commercial purposes.

Any feedback about the dataset or article is highly appreciated and can be sent through email to

leihm@mail.tsinghua.edu.cn and pxx18@mails.tsinghua.edu.cn.