A Big Earth Data Platform for Three Poles

**ETMonitor Global Actual Evapotranspiration Dataset with 1-km Resolution**

1、Description

Terrestrial actual evapotranspiration (ET) is an essential ecohydrological process linking the land surface energy, water and carbon cycles, and plays a critical role in the earth system. This global ET dataset is obtained based on ETMonitor model, which combines parameterizations for different processes and land cover types, with multi-source satellite data as input. Several open accessed remote sensing variables, e.g., LAI, FVC, albedo, surface soil moisture, dynamic surface water cover and snow/ice cover, were used as input to estimate daily ET. The meteorological variables from ERA5 reanalysis dataset were also adopted. The ETMonitor model is applied at daily scale to estimate the ET components at 1-km resolution, including vegetation transpiration, soil evaporation, canopy precipitation interception loss, water surface evaporation and snow/ice sublimation on daily step, and the total actual ET is estimated as the sum of these components. Overall, the actual ET estimated by ETMonitor agreed well with ground measurements from 251 flux towers across various ecosystems and climate zones globally, with high correlation (0.75), low bias (0.08mm/d), and low root mean square error (0.93 mm/d). The estimated ET showed reasonable spatial patterns, and superior in presenting the spatial variation of ET especially in the mountain regions and in the arid irrigated cropland regions. The ET estimation is conducted at daily temporal step and 1km spatial resolution. For easier publication, the daily/1-km ET from ETMonitor (https://doi.org//10.12237/casearth.6253cddc819aec49731a4bc2) was summed to obtain monthly ET in this dataset. The data type is 16-bit signed integer, the scale factor is 0.1, and the unit is mm/month. The missing values were filled by -1.

2、Keywords

Theme：Land-surface evapotranspiration,Evapotranspiration,Satellite,Remote Sensing Product,Evapotranspiration,Remote Sensing Technology,Hydrology,Terrestrial Surface Remote Sensing  
Discipline：Terrestrial Surface,Remote Sensing Technology  
Places：Global  
Time：Daily, Monthly

3、Data details

1.Scale：None

2.Projection：

3.Filesize：122000.0MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：90.0 | - |
| west：-180.0 | - | east：180.0 |
| - | south：-90.0 | - |

5、Time frame:2000-05-31 16:00:00+00:00--2019-12-30 16:00:00+00:00

6、Reference method

References to data:

HU Guangcheng , ZHENG Chaolei , JIA Li . ETMonitor Global Actual Evapotranspiration Dataset with 1-km Resolution. A Big Earth Data Platform for Three Poles, doi:10.11888/RemoteSen.tpdc.2728312022

References to articles:

Zheng C., Jia L., Hu G. Global Land Surface Evapotranspiration Monitoring by ETMonitor Model Driven by Multi-source Satellite Earth Observations. Journal of Hydrology, 2022, 128444; https://doi.org/10.1016/j.jhydrol.2022.128444.

7、Supporting project information

Strategic Priority Research Program of the Chinese Academy of Sciences  
the Major Research plan of the National Natural Science Foundation of China  
the Strategic Priority Research Program of the Chinese Academy of Sciences

8、Data resource provider

name: JIA Li   
unit: Aerospace Information Research Institute, Chinese Academy of Sciences  
email: jiali@aircas.ac.cn  
  
name: ZHENG Chaolei   
unit: Aerospace Information Research Institute, Chinese Academy of Sciences  
email: zhengcl@aircas.ac.cn  
  
name: HU Guangcheng   
unit: Aerospace Information Research Institute, Chinese Academy of Sciences  
email: hugc@aircas.ac.cn