A Big Earth Data Platform for Three Poles

**Long-term irrigation water use data with high spatiotemporal resolution (monthly, 1km) across the continental United States (2000-2020)**

1、Description

About 70% of the world's water withdrawl is used for agriculture, and irrigation water accounts for more than 90% of the total water consumption. Due to varied irrigation water sources, irrigation facilities, and crop planting types, there is large spatial heterogeneity in irrigation water use. Irrigation water can be consumed by evapotranspiration or stored as soil water in the root zone soil layer, while the portion exceeding the saturation zone will recharge groundwater. The complexity of irrigation processes above makes it extremely difficult and challenging to estimate irrigation water use.  
Based on the soil water balance under irrigation, formulas to estimate irrigation water use (IWU) were deduced by us, considering multiple processes of irrigation (evapotranspiration, root zone soil moisture, and deep percolation). Remotely sensed and modeled actual evapotranspiration, modeled root zone soil moisture were used in our approach to generate the monthly IWU across the continental United States during 2000-2020 at a high spatial resolution (1 km). The results show that our approach has the mechnism to characterize multiple irrigation processes and can obtain IWU data with excelent accuracy at high spatiotemporal resolution.

2、Keywords

Theme：Irrigation,Water Resources  
Discipline：Human-nature Relationship  
Places：The Contiguous United States  
Time：2000-2020

3、Data details

1.Scale：None

2.Projection：WGS84

3.Filesize：3643.0MB

4.Data format：None

4、Space scope

|  |  |  |
| --- | --- | --- |
| - | north：49.5 | - |
| west：-125.0 | - | east：-66.49 |
| - | south：23.99 | - |

5、Time frame:None--None

6、Reference method

References to data:

ZHANG Caijin , LONG Di. Long-term irrigation water use data with high spatiotemporal resolution (monthly, 1km) across the continental United States (2000-2020). A Big Earth Data Platform for Three Poles, doi:10.1029/2021WR0313822022

References to articles:

Zhang, C., & Long, D. (2021). Estimating spatially explicit irrigation water use based on remotely sensed evapotranspiration and modeled root zone soil moisture. Water Resources   
Research, 57, e2021WR031382. https://doi.org/10.1029/2021WR031382

7、Supporting project information

The Major Science and Technology Projects of Inner Mongolia Autonomous Region  
National Key Research and Development Program of China  
National Natural Science Foundation of China

8、Data resource provider

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