

IRRIGATION DATASETS DEVELOPED IN THE CCI-AWU PROJECT

This file contains the description of the irrigation datasets developed within the Climate Change Initiative Anthropogenic Water User precursor project (CCI-AWU). They were obtained through the SM-based inversion approach (Brocca et al., 2018; Dari et al., 2023), the SM-based Delta approach (Zaussinger et al., 2019; Zappa et al., 2021, 2024), and the Model-Observation integration approach using the Noah-MP land surface model (Niu et al., 2011) coupled with a sprinkler irrigation scheme (Ozdogan et al., 2010) and overlaid with irrigated area maps derived from satellite observations. The datasets were produced over the Ebro Basin (Spain), the Murray-Darling Basin (Australia), the Contiguous United States (CONUS), and India.

Format:

AWU_<method>_<site>_<product>.nc

- **<method>** refers to the dataset generation approach, which includes "SM_Delta" for the SM-based Delta method, "SM_Inversion" for the SM-based Inversion method, and "NoahMP" for the Model-observation integration approach.
- **<site>** identifies the four study regions: "CONUS" for the Contiguous United States, "Murray" for the Murray-Darling Basin, "Ebro" for the Ebro Basin, and "India" for the Indian subcontinent.
- **<product>** varies depending on the dataset type (soil moisture data, evapotranspiration data, or irrigated area maps) used. For the SM-based Delta method, products include "CCI_Combined_FLUXCOM", "CCI_Passive_FLUXCOM", "CCI_Active_FLUXCOM", "CCI_Combined_SSEBOP", "CCI_Passive_SSEBOP", and "CCI_Active_SSEBOP". For the SM-based Inversion method, products include "CCI_Combined", "CCI_Passive", "ASCAT", "SMOS", and "SMAP". For the Model-Observation integration method, the products are "Landsat", "Method1", and "Method2".

Description:

The reader is referred to Deliverable 3 Algorithms Theoretical Basis Document (ATBD), Deliverable 4 Product Validation and Algorithm Assessment Report (PVASR), and Deliverable 6 Product Validation and Intercomparison Report (PVIR) of the CCI-AWU project for details on the methodology used to develop the datasets and on the validation performance evaluation.

Temporal aggregation:

Monthly.

Variables:

For SM-based Inversion and SM-based Delta datasets:

- **Irrigation** [mm/month]

For Model-observation integration (Noah-MP) datasets:

- **IWU_ensmean** [mm/month]
- **IWU_uncertainty** [mm/month]

Coordinates:

- **time**: Represents the date of the irrigation data stored in the NetCDF file. The format is YYYY-MM-DD, where YYYY is the four-digit year, MM is the two-digit month (ranging from 01 to 12), and DD corresponds to the last day of the respective month.
- **lon** [degree]: Longitude coordinate.
- **lat** [degree]: Latitude coordinate.

Files creators institutions and contacts:

SM-based Inversion datasets:

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SM-based Delta datasets:

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Model-Observation Integration (Noah-MP) datasets:

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References:

Brocca, L., Tarpanelli, A., Filippucci, P., Dorigo, W., Zaussinger, F., Gruber, A., Fernández-Prieto, D., 2018. How much water is used for irrigation? A new approach exploiting coarse resolution satellite soil moisture products. *International Journal of Applied Earth Observation and Geoinformation* 73, 752–766. <https://doi.org/10.1016/j.jag.2018.08.023>

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Zaussinger, F., Dorigo, W., Gruber, A., Tarpanelli, A., Filippucci, P., Brocca, L., 2019. Estimating irrigation water use over the contiguous United States by combining satellite and reanalysis soil moisture data. *Hydrology and Earth System Sciences* 23, 897–923. <https://doi.org/10.5194/hess-23-897-2019>