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Integration of evapotranspiration estimates from scaled sap flow values and eddy covariance measurements in the BRIDGET toolbox

Sibylle K. Hassler¹, Peter Dietrich², Ralf Kiese³, Mirko Mälicke¹, Matthias Mauder³, Jörg Meyer⁴, Corinna Rebmann⁵, Marcus Strobl⁴, and Erwin Zehe¹

¹Karlsruhe Institute of Technology (KIT), Institute of Water and River Basin Management, Chair of Hydrology, Karlsruhe, Germany (sibylle.hassler@kit.edu)

²Helmholtz Centre for Environmental Research GmbH - UFZ, Monitoring and Exploration Technologies, Leipzig, Germany

³Karlsruhe Institute of Technology (KIT), Institute of Meteorology and Climate Research - Atmospheric Environmental Research, Garmisch-Partenkirchen, Germany

⁴Karlsruhe Institute of Technology (KIT), Steinbuch Centre for Computing, Eggenstein-Leopoldshafen, Germany

⁵Helmholtz Centre for Environmental Research GmbH - UFZ, Computational Hydrosystems, Leipzig, Germany

Comparing estimates of evapotranspiration (ET) from different in-situ measurements – or between in-situ measurements and remote sensing products or modelling outputs – always entails the challenge of different scales and method-specific uncertainties. Especially when the estimates originate in different research disciplines, addressing and quantifying the various sources of uncertainty of the scaled ET values becomes a difficult task for individual researchers who are not familiar with all the methodological details.

The BRIDGET toolbox – developed within the Digital Earth project – wants to support the integration and scaling of diverse in-situ ET measurements by providing tools for storage, merging and visualisation of multi-scale and multi-sensor ET data. This requires an appropriate metadata description for the various measurements as well as an assessment of method-specific uncertainties which need to be supported by domain experts. We combine these tools in a standalone python package and also implement them in an existing virtual research environment (V-FOR-WaTer).

Our first use case defines and quantifies the various sources of uncertainty when scaling sap flow values from individual sensor measurements in a tree up to the transpiration estimate of a stand. Comparison estimates come from eddy covariance measurements, lysimeters and remote sensing products.