



## **Tower-scale performance of four observation-based evapotranspiration algorithms within the WACMOS-ET project**

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Research on climate variations and the development of predictive capabilities largely rely on globally available reference data series of the different components of the energy and water cycles. Several efforts have recently aimed at producing large-scale and long-term reference data sets of these components, e.g. based on in situ observations and remote sensing, in order to allow for diagnostic analyses of the drivers of temporal variations in the climate system.

Evapotranspiration (ET) is an essential component of the energy and water cycle, which cannot be monitored directly on a global scale by remote sensing techniques. In recent years, several global multi-year ET data sets have been derived from remote sensing-based estimates, observation-driven land surface model simulations or atmospheric reanalyses. The LandFlux-EVAL initiative presented an ensemble-evaluation of these data sets over the time periods 1989-1995 and 1989-2005 (Mueller et al. 2013).

The WACMOS-ET project (<http://wacmoset.estellus.eu>) started in the year 2012 and constitutes an ESA contribution to the GEWEX initiative LandFlux. It focuses on advancing the development of ET estimates at global, regional and tower scales. WACMOS-ET aims at developing a Reference Input Data Set exploiting European Earth Observations assets and deriving ET estimates produced by a set of four ET algorithms covering the period 2005-2007. The algorithms used are the SEBS (Su et al., 2002), Penman-Monteith from MODIS (Mu et al., 2011), the Priestley and Taylor JPL model (Fisher et al., 2008) and GLEAM (Miralles et al., 2011). The algorithms are run with Fluxnet tower observations, reanalysis data (ERA-Interim), and satellite forcings. They are cross-compared and validated against in-situ data. In this presentation the performance of the different ET algorithms with respect to different temporal resolutions, hydrological regimes, land cover types (including grassland, cropland, shrubland, vegetation mosaic, savanna, woody savanna, needleleaf forest, deciduous forest and mixed forest) are evaluated at the tower-scale in 24 pre-selected study regions on three continents (Europe, North America, and Australia).

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