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# Evaluation of various LandFlux evapotranspiration algorithms using the LandFlux-EVAL synthesis benchmark products and observational data

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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 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 can not 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).
Currently, a multi-decadal global reference heat flux data set for ET at the land surface is being developed within the LandFlux initiative of the Global Energy and Water Cycle Experiment (GEWEX). This LandFlux v0 ET data set comprises four ET algorithms forced with a common radiation and surface meteorology. In order to estimate the agreement of this LandFlux v0 ET data with existing data sets, it is compared to the recently available LandFlux-EVAL synthesis benchmark product. Additional evaluation of the LandFlux v0 ET data set is based on a comparison to in situ observations of a weighing lysimeter from the hydrological research site Rietholzbach in Switzerland. These analyses serve as a test bed for similar evaluation procedures that are envisaged for ESA's WACMOS-ET initiative (http://wacmoset.estellus.eu).

Reference:
Mueller, B., Hirschi, M., Jimenez, C., Ciais, P., Dirmeyer, P. A., Dolman, A. J., Fisher, J. B., Jung, M., Ludwig, F., Maignan, F., Miralles, D. G., McCabe, M. F., Reichstein, M., Sheffield, J., Wang, K., Wood, E. F., Zhang, Y., and Seneviratne, S. I. (2013). Benchmark products for land evapotranspiration: LandFlux-EVAL multi-data set synthesis. Hydrology and Earth System Sciences, 17(10): 3707–3720.