



Global estimation of evapotranspiration from the GEWEX LandFlux Initiative: model intercomparison and evaluation at the tower scale

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The GEWEX Data and Assessments Panel (GDAP) initiated the LandFlux Project with an aim to develop a multi-decadal, global reference terrestrial surface heat flux data set: primarily for evaporation, but also providing coverage of the sensible heat flux at the land surface. One of the major motivations behind this effort was the need to fill a gap in the capacity to evaluate a range of global flux estimates, particularly those being delivered as part of GCM, reanalysis and LSM modeling activities. Recent evaluation efforts of the LandFlux product have focused on global scale intercomparisons (Jiménez et al. 2011, Mueller et al. 2011) and have demonstrated that large differences still exist between products.

The absolute performance of these different algorithms is yet to be explored, and to a certain extent, the creation of a future high quality blended evaporation datasets relies on the investigation of this performance. One of the major limitations has been the lack of a common set of input data with which to run the models and the existence of a comprehensive set of meteorological measurements with which to compare estimates against.

To this end, an evaluation of the contributing LandFlux models has been undertaken over a number of FLUXNET tower sites using a recently developed common forcing data set. In order to examine some of the inherent issues of scale and to understand some of the apparent discrepancies in simulations, the LandFLUX models are also run with tower based forcing. While comparisons with eddy covariance based flux measurements provide a measure of evaluation that is not attainable at the global scale, these data may not necessarily be appropriate for identifying the “best” performing model at the global scale. The need for other evaluation metrics is also briefly discussed.