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Evaluation of high resolution satellite based evapotranspiration estimates over the Tibetan Plateau

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Knowledge of evapotranspiration (ET) is important for the study of land-atmosphere-biosphere interactions over the Tibetan Plateau (TP). However, accurate estimation of ET over the TP is challenging, due to its unique and special geographical position and physical environment. Satellite derived high resolution ET estimates have been developed to get large-scale dataset of a quality that is usually only observed at point scale. The purpose of this paper is to provide a detailed cross comparison of existing ET products over the TP. Five available ET products based on different models and forcing data are included for comparison. A newly merged synthesis ET product from the Global Energy and Water Cycle Experiment-sponsored LandFlux-EVAL project is used as reference dataset. Results show that all products can capture well the seasonal variability with minimum ET in the summer and maximum ET in the winter. Regarding the spatial pattern, the High Resolution Land Surface Parameters from Space (HOLAPS) ET dataset is very similar to LandFlux-EVAL with ET decreases from the southeast to northwest over the TP. Further comparison against the LandFlux-EVAL over four sub-regions reveals that the HOLAPS agrees best with LandFlux-EVAL having the highest correlation coefficient (R) and lowest Root Mean Square Difference (RMSD). These results indicate the potential for the application of the HOLAPS dataset in understanding the and-atmosphere-biosphere interactions over the TP.