

PROPOSAL FOR FLUXNET SYNTHESIS PUBLICATION FOR OPENED FLUXNET-LA-THUILE DATA SET



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Collaborators needing access to data:

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TITLE OF PAPER AND OUTLINE

Title: Evaluation of global terrestrial latent heat flux simulations of 45 *CMIP5* models using global eddy covariance observations

Description: The sum of water lost from the land surface to the atmosphere through evaporation and transpiration, also known as Latent heat flux (*LE*), is a key component of hydrologic, energy, and carbon cycles. Approximately 60-80% of the precipitation on earth's surface returns to the atmosphere as *LE* that becomes the source of future precipitation in the regional and global water cycles. Therefore, changes in *LE* have a great impact on the global hydrologic cycle and energy budget.

The Coupled Model Intercomparison Project phase 5 (*CMIP5*) for 5th Intergovernmental Panel on Climate Change's (*IPCC*) latest assessment report (*IPCC-AR5*) has provided an opportunity for assessing global terrestrial *LE* variations. However, assessment of the *CMIP5 GCM LE* simulation using substantial ground-measured observations is rare, but is critical for understanding the interactions between land surfaces and the atmosphere, improving water and land resource management, detecting and assessing droughts, and performing regional hydrological applications.

In this study, we will evaluate *LE* simulations of 45 *CMIP5* models and merged *CMIP5* models based on *FLUXNET EC* observations to improve global terrestrial *LE* simulation among different land cover types. The objectives of our study are to: (1) evaluate the performance of the *CMIP5 GCM LE* simulations over various biomes and geographical regions; (2) generate global *LE* product with resolutions of 1 degree

from 1970–2005 by merging multiple *CMIP5 GCM LE* datasets and (3) detect the spatiotemporal variability in global terrestrial *LE* and its attributions.

PROPOSED SITES TO BE INVOLVED

We will use FLUXNET data from 2000 to the present, in correspondence with the availability of MODIS data products. We request access to the whole La Thuile dataset for this analysis.

PROPOSED RULES FOR CO-AUTHORSHIP

All data contributors making an intellectual contribution will be included as named co-authors. Data contributors not making an intellectual contribution will be included as group co-authors in the author list, if possible with the journal (i.e., "and the FLUXNET Synthesis Group"). Group co-authors will be identified by name in the acknowledgements. We will circulate a summary of initial findings to all data providers and request feedback. Following the initial findings will be a draft manuscript, which will also circulate and request feedback. Data providers who have contributed intellectually and who will be included as co-authors will be sent the final version of the manuscript prior to journal submission.