

## 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:** Generating High Resolution Global Product of Land Surface Evapotranspiration during 1982-2013

**Description:** Evapotranspiration (ET) over land, the sum of water lost to the atmosphere from the land surface through evaporation and from plant canopies via transpiration, is a key component of the hydrological, energy, and carbon cycles. Approximately 60-80% of the precipitation on the earth's surface returns to the atmosphere as ET that becomes the source of future precipitation in the regional and global water cycles. Therefore, changes in ET have a great impact on the global hydrologic cycle and energy budget. Generating high resolution ET product at broader spatial scale 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.

A number of predictive models are available for quantifying ET at large scales, such as MODIS algorithm (Mu et al., 2011), RRS-PM (Yuan et al., 2010), PT-JPL (Fisher et al., 2008), MRS-PT (Yao et al., 2012), and UMD-Wang (Wang et al., 2010). However, large uncertainties in ET estimation remain due partially to the resolution. FLUXNET data offers a unique opportunity to evaluate ET modes at the larger scales.

In this study, we will first develop a combined dataset to fill the geographic gaps, and then examine multiple ET models (e.g., MODIS algorithm, RRS-PM, PT-JPL, MRS-PT, and UMD-Wang). We will estimate global ET integrating various model results using ensemble prediction method with high-resolution and long time

series. The objectives of our study are to: (1) evaluate the performance of multiple ET models over various biomes and geographical regions; (2) generate global ET product with resolutions of 5 km×5 km during 1982-1999 and 1 km×1km during 2000-2013 using Bayesian Model Averaging (BMA) method; (3) perform uncertainty analysis of global ET product generated by BMA method. The ET product of land surface will be open to the public.

#### **PROPOSED SITES TO BE INVOLVED**

We will use FLUXNET data from 2000 to the present, corresponding to 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 coauthors. Data contributors not making an intellectual contribution will be included as group coauthors in the author list, if possible with the journal (i.e., "and the FLUXNET Synthesis Group"). Group coauthors will be identified by name in the acknowledgements. We will circulate a summary of initial findings to all data providers, and solicit feedback; this will be followed by a draft manuscript, which we will also circulate for feedback. Data providers who have contributed intellectually and will be included as coauthors will be sent the final version of the manuscript prior to journal submission.