PROPOSAL FOR FLUXNET SYNTHESIS PUBLICATION

Initial coordinators: Collaborators needing access to data:

Wenping Yuan and Jiquan Chen

Affiliations:

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DATASET PROPOSED

We request access to the whole LaThuile data set.

TITLE OF PAPER AND OUTLINE

TITLE: Global Comparison of Light Use Efficiency Models for Vegetation Gross Primary Production

Terrestrial gross primary productivity (GPP) is the largest and most variable component of the carbon cycle. Small fluctuations in GPP can cause large changes in terrestrial carbon budget and influence future climate warming scenarios. Terrestrial GPP also provides important societal services through provision of food, fiber and energy. Regular monitoring of terrestrial GPP is therefore required to understand and assess dynamics in the global carbon cycle, forecast future climate, and ensure long term security in services provided by terrestrial ecosystems.

Predicting the gross primary productivity (GPP) of terrestrial ecosystems has been a major challenge in quantifying the global carbon cycle. Among all the predictive methods, the light use efficiency (LUE) model may have the most potential to adequately address the spatial and temporal dynamics of GPP because of its theoretical basis and practicality. Moreover, LUE model integrates satellite data which provides temporally continuous and spatially extensive coverage. Recent studies have showed the large uncertainties among different LUE models over the different regions. FLUXNET data offers a unique opportunity to evaluate LUE modes at the larger scales.

In this study, we will first develop a combined dataset to fill the geographic gaps and, then, examine multiple GPP LUE models (e.g., CASA, VPRM, C-Fix, EC-LUE, CFLUX). We will estimate global GPP integrating various model results using ensemble prediction method. Specific objectives are to

(1) evaluate multiple models performance over the various biomes and geographical regions;

(2) compare the consistence on the environmental responses of GPP between estimations and observations;

(3) build the ensemble prediction strategy for global GPP estimations.

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 LaThuile data set 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.

Please see the CV of Jiquan Chen and Wenping Yuan at the following pages.