PROPOSAL FOR FLUXNET SYNTHESIS PUBLICATION

Initial coordinators:: Collaborators needing access to data:

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DATASET PROPOSED

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TITLE OF PAPER AND OUTLINE

TITLE: Global pattern of water use efficiency and its underlying mechanism

Description

Water use efficiency (WUE) is an important index reflecting the coupling between carbon and water cycles. Analyzing the spatial variation of WUE would improve our understanding on global carbon cycles, which would be also helpful for understanding the feedback of ecosystem function to the climate system. The knowledge about the spatial variation of WUE is also useful for assessing the water resource on the carbon uptake capacity.

Though there are many definitions, WUE defined as the ratio of annual total gross primary productivity to annual total evapotranspiration has been intensively investigated. Many factors, including mean annual air temperature (MAT), mean annual precipitation (MAP), and mean annual leaf area index (MLAI) were found to strongly affected the spatial variation of WUE.

Recently, we found that spatial variation of WUE was not only affected by MAT, MAP, and MLAI, but also was strongly affected by the altitude. Therefore, reanalyzing the global pattern of WUE may be interesting. In addition, WUE was found to be correlated with its components such as inherent water use efficiency, T/ET, and so on. Investigating the relationships between WUE and its components and factors affecting the spatial variation of WUE components would benefit the mechanisms underlying the spatial variation of WUE.

By integrating the FLUXNET dataset, we want to analyze the global pattern of WUE, which is defined as the ratio of annual total gross primary productivity to annual total evapotranspiration. Then we separate WUE into its components (inherent water use efficiency, T/ET, and so on) and reveal factors affecting the spatial variation of WUE components. Then the mechanism underlying the global pattern of WUE will be investigated, which would improve our understanding on the global carbon and water cycles.

PROPOSED SITES TO BE INVOLVED

All sites with enough and good quality data. Besides GPP and ET, the core variables needed in this analysis should include net radiation, wind speed, CO_2 concentration, air temperature, relative humidity at 30 min scale.

PROPOSED RULES FOR CO-AUTHORSHIP

The rules as proposed in the disclaimer for the FLUXNET2007 synthesis will be applied.