

FLUXNET Grassland Synthesis Paper Proposal

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Proposed title: Gross productivity, respiration, and carbon sequestration potential of grassland ecosystems of the world: synthesis of flux tower measurements

Rationale: Recent studies on partitioning and multifactorial analysis of CO₂ exchange of eddy covariance and Bowen ratio – energy balance flux tower data from more than 50 sites in North America, Europe, and Asia (Gilmanov et al., 2005a,b, 2006, 2007a,b) demonstrated wide range of CO₂ exchange regimes and carbon sequestration capabilities of world grasslands in their relation to climate, soils, and management. Expansion of these preliminary syntheses by incorporation of additional data from FLUXNET sites (especially, new sites from East and SE Asia, South America, Australia, and Africa) have a potential to considerably improve our understanding of the role of grasslands in the global carbon cycle and their reaction to the anticipated changes in climate and management. The paper will feature an attempt to stratify grassland flux data into management categories (e.g., ungrazed, grazed, cut for hay) as well as “longitudinal” analysis of several particularly long (since 1995 to present) flux measurement data sets as tools to detect direct effects of climate and CO₂ concentration. For the sites with available canopy architecture and LAI dynamics data, systematic comparison of ecosystem-scale (per m² ground) and ecophysiological (per 1 m² leaf area) CO₂ exchange parameters using advanced canopy photosynthesis models will be conducted to facilitated modeling and scaling-up grassland flux tower measurements.

References

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