

PROPOSAL FOR FLUXNET SYNTHESIS PUBLICATION



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TITLE OF PAPER AND OUTLINE

A new global spatialized estimate of NEP, GPP and TER and analysis of uncertainty and limiting factors using data driven models and eddy covariance measurements

The number of eddy covariance sites today available, covering different biomes and climatic regions, give us the possibility to use these data to parametrize data-driven models with the aim to assess the magnitude and spatial distribution of NEP, GPP and TER at global scale.

In this paper we will use daily eddy covariance data to obtain spatialized fluxes at 0.25 degree spatial resolution and weekly time resolution with three different approaches:

- Look up Tables: Cfluxes data will be used to create a multidimensional LUT where the input variables will be both meteorological and remotely sensed data. Combinations of the input variables where no flux data are available will be filled with interpolations. The LUT will be used to assess pixel by pixel the Cfluxes.
- RUE model: a Radiation use efficiency model based on the MOD17 (Running et al.) will be also applied. FPAR data will be retrieved from different sensors (Modis, SeaWif) and the max radiation use efficiency will be calculated using the Cfluxes data at site level. Ecosystem respiration will be calculated using a model that is a further development from Reichstein et al 2003 (cf. also GPP-TER-NEP topic).
- Artificial Neural Networks: ANNs will be trained using Cfluxes data and then applied at global scale. ANN input will be meteorological data and remotely sensed data. Different ANNs will be trained for the different PFT and Biomes

To assess the uncertainty in the assessed Cfluxes, the models will be parametrized using different subsets of the Cfluxes data and the impact on the output analyzed. The same method will be used to assess the impact on management and disturbances, comparing the output obtained parametrizing the models with disturbed and not disturbed sites.

Model parameters analysis (like sensitivity, ANN connection's weight and RUE limitation factors analysis) will be performed to understand the relative role of the different input variables in the Cfluxes definition at global scale and produce maps of the limiting factors for the three Cfluxes component (GPP, NEP and TER).

PROPOSED SITES TO BE INVOLVED

All sites maybe considered for this analysis.

PROPOSED RULES FOR CO-AUTHORSHIP

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