PROPOSAL FOR FLUXNET SYNTHESIS PUBLICATION

Initial coordinators:	Christopher R Schwalm
Collaborators needing access to data:	FLUXCOMP Coordinators: Martin Jung, Markus Reichstein, Dario Papale,
Affiliations:	CRS - Northern Arizona University MJ and MR - MPI-Jena DP - University of Tuscia

DATASET PROPOSED

LaThuile, i.e., the complete dataset

TITLE OF PAPER AND OUTLINE

Using FLUXNET to diagnose climatic variability of the terrestrial carbon sink from 1948 to 2099

Translating footprint scale eddy covariance data to global fields is an emerging application of FLUXNET data. Recent so-called upscaling efforts have been used to, for example, quantify changes in carbon sink status attributable to changing hydroclimate (Schwalm et al., 2011), constraint global GPP (Beer et al., 2010), and diagnose changes in global land evapotranspiration (Jung et al., 2009). Upscaled FLUXNET data also presents a clear opportunity to generate observationally-based benchmarks for land surface modelling. Approaches to upscaling are highly variable and the resulting global fields are difficult to validate. Another limitation of current upscaling approaches is their heavy reliance on satellite data. This limits upscaled products to the 1982-present time period. The goal of this proposal is to generate, in monthly time step, global maps of NEE from 1948-2099. The methodology will, instead of remotely-sensed fields, use forcing datasets aligned with the land surface modelling community (e.g., MERRA or other reanalysis data). This includes IPCC scenarios that allow for the response surfaces encoded in FLUXNET to be used in forecast mode. While the initial focus is on NEE from 1948-2009 a host of different forcing datasets is envisioned. This will proved basic diagnostic information on algorithm uncertainty via intermodel spread. Similarly, the initial focus on NEE will be extended to other carbon fluxes. This proposal is intended to generate a contribution to the ongoing “FLUXCOMP – an intercomparison study on the estimation of global flux fields from eddy covariance data using empirical up-scaling techniques” led by Martin Jung, Markus Reichstein and Dario Papale.

Beer C et al. (2010) Terrestrial gross carbon dioxide uptake: Global distribution and covariation with climate. Science 329:834–838.

Jung M et al. (2010) Recent decline in the global land evapotranspiration trend due to limited moisture supply. Nature 467:951–954.

Schwalm CR et al. (2011) Carbon consequences of global hydrologic change, 1948-2009, J. Geophys. Res., 116, G03042, doi:10.1029/2011JG001674.

PROPOSED SITES TO BE INVOLVED

The proposal has a global focus. All sites with at least 1 year of carbon flux data and meteorological fields will be used.

PROPOSED RULES FOR CO-AUTHORSHIP

Persons that have contributed data and/or have given intellectual input will be invited for co-authorship. All data contributors will be invited to give intellectual input.