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## PROPOSAL FOR FLUXNET SYNTHESIS PUBLICATION


**Initial coordinators::** Enrico Tomelleri, Mirco Migliavacca, Nuno Carvalhais

**Collaborators needing access to data:** Miguel Mahecha, Markus Reichstein

**Affiliations:** Università degli Studi di Milano – Bicocca; Max-Max-Planck-Institute for Biogeochemistry;


## TITLE OF PAPER AND OUTLINE

### Climatic effects on the inter-annual variability of net ecosystem fluxes of North America and Europe

The connection between climate variability and global carbon cycle has already been shown to be linked with the North Atlantic Oscillation (NAO) ([1]). A positive phase of the NAO is associated with more and stronger winter storms crossing the North Atlantic on a more northerly route, causing major anomalies in sea surface temperature, currents and convective activity throughout the North Atlantic. A long-term trend towards very positive values has culminated in the early 1990s, and since then a decreasing trend is happening ([1]).

Identification of the climatic drivers of the net ecosystem fluxes is becoming a rising issue. In particular the effects of year-to-year climate variability on regional budgets and the understanding of the underlying biogeochemical processes are of fundamental importance due to the intensification of extreme climatic events like precipitation ([2]) and drought events ([3]).

With the present study we want to identify the relations between climatic variability (e.g. NAO) and the regional carbon budgets of North America and Europe. In doing this we will keep special focus both on temporal and spatial scale. For this purpose we will take advantage of the high-density of FLUXNET measurement sites in these areas.

We will apply a radiation use efficiency model for GPP ([4]) combined with a semi-empirical total ecosystem respiration model ([5]).

As drivers for the model we will use climatic and fraction of adsorbed photosynthetic radiation (FPAR) records.

We will make use of in-situ calibrated model parameters to estimate the ecosystem carbon fluxes. The model will be spatially applied according to the similarity in the climatic-phenological space of each grid pixel with the measurement site to which it was calibrated (e.g., [6]).

In order to identify spatial patterns in the correlation between climate variability and the regional carbon budgets we will use inversion regions from the TransCom project ([7]). Furthermore we will apply advanced time series analysis techniques to identify climate-carbon cycle relations at different temporal scales.

## PROPOSED SITES TO BE INVOLVED

The analysis will be performed using daily averages and the geographical scale will be global. The following IGBP Class will be included: grassland, cropland, deciduous broad leaf forest, evergreen broad leaf forest, evergreen needle leaf forests, mixed forest, savanna, shrubland. We may take in consideration all sites containing at least 1 full year of flux measurements and meteorological data covering at least 85% of the whole year (gaps must be homogeneously distributed).

## PROPOSED RULES FOR CO-AUTHORSHIP

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

## REFERENCES


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