

Proposal for Fluxnet synthesis publication

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Title of paper: “Multi-scale land-atmosphere interactions”

This paper aims at a global and multi-scale synthesis analysis of land-atmosphere interactions based on Fluxnet measurements and other common datasets. One focus of this study is to bridge the gap between the local-scale measurements (Fluxnet) and regional-scale fluxes and interactions based on other datasets and observations.

METHODS

Land-atmosphere interactions involving the energy and water cycles will be the main focus of this study (e.g. Seneviratne et al. 2006a,b; Teuling et al. 2006). These will be investigated using correlation and regression analyses based on physical considerations. The following datasets will be used in combination with the Fluxnet data for the proposed investigation: ground observations (temperature, precipitation, runoff, radiation), model data (from global climate models, regional climate models and/or land surface models), satellite measurements (GRACE), and diagnostic basin-scale atmospheric-terrestrial water balance estimates (Seneviratne et al. 2004, Hirschi et al. 2006; http://iacweb.ethz.ch/data/water_balance/).

RESEARCH QUESTIONS

The following research questions will be addressed in this synthesis paper:

- 1) What is the level of agreement between current datasets regarding land surface processes (evapotranspiration, soil moisture variations) and land-atmosphere interactions (links between soil moisture and temperature/precipitation)?
- 2) What is the level of realism of current models with regard to these processes and interactions?
- 3) Can point-scale Fluxnet measurements be related to regional-scale estimates of the same quantities or fluxes (soil moisture, evapotranspiration, energy fluxes)?
- 4) Are there differences or similarities in the location of regions of strong land-atmosphere coupling based on model and observations?

In the investigation of these research questions, the specific added-value of the Fluxnet observations will be addressed. In particular we will reflect on possible deficiencies of the model data compared to the Fluxnet observations, as well as on local-scale vs. large-scale features that can (or cannot) be identified in the various datasets.

PROPOSED SITES TO BE INVOLVED

All sites containing at least 5 full years of flux and meteorological data may be considered for this analysis.

PROPOSED RULES FOR CO-AUTHORSHIP

The rules as proposed in the disclaimer for the Fluxnet2007 synthesis will be applied.

REFERENCES

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