PROPOSAL FOR FLUXNET SYNTHESIS PUBLICATION

Initial coordinators: Antje Moffat, Markus Reichstein

Collaborators needing access to data: Alessandro Cescatti, Gitta Lasslop, Sönke Zaehle

Affiliations: Max-Planck Institute for Biogeochemistry, Jena
Joint Research Centre, Ispra

TITLE OF PAPER AND OUTLINE

Effect of diffuse radiation on ecosystem-level water use efficiency

The importance of diffuse radiation for terrestrial net carbon exchanges is widely recognized. However, effects on terrestrial water cycling are still largely unknown. In this study, we investigate the influence of light quality on ecosystem-atmosphere carbon and water exchanges using an inductive approach based on artificial neural networks. The functional relationships between meteorology and ecosystem fluxes, such as the hierarchy of the climatic controls or their multivariate dependencies, are identified directly from observations. To check the generality of the obtained relationships, the approach will be applied to a wide variety of ecosystems covered by the FLUXNET data set.

We hypothesize that a higher fraction of diffuse light typically enhances ecosystem-level water use efficiency (GPP/LE, NEE/LE) of photosynthesis, and that there are significant differences between vegetation types with respect to the effect of diffuse radiation on the water use efficiency. A comparison of these findings with typical land-surface schemes is intended.

This proposal is scientifically and methodologically complementary to the ongoing work by Alessandro Cescatti and is performed in close coordination.

PROPOSED SITES TO BE INVOLVED

All sites containing at least one year of flux and respective meteorological data will be considered for this analysis.

PROPOSED RULES FOR CO-AUTHORSHIP

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