

PROPOSAL FOR FLUXNET SYNTHESIS PUBLICATION



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TITLE OF PAPER AND OUTLINE

Towards a better representation of drought effects in diagnostic biogeochemical models

In this study we want to explore to which extent optical remote sensing data can be used to enhance the performance of diagnostic biogeochemical models during drought events. We focus on ecosystems with seasonal drought, in particular the Mediterranean, as this region is likely to be increasingly affected by droughts in the course of the ongoing climate change.

Questions to be addressed include:

- To which degree can computationally simple spectral indices derived from MODIS satellite data (such as the Photochemical Reflectance Index) empirically explain the temporal patterns of Light Utilization Efficiency (LUE) in seasonally dry ecosystems? How does the explanatory power differ between different vegetation types?
- - How does a diagnostic productivity model based on this new representation of LUE compare to other diagnostic models (e.g. MOD17 in which temporal variation of productivity is based on meteorological variables and fAPAR only)?
- - Can spectral indices relating to vegetation water content (e.g. Moisture Stress Index, Normalized Difference Water Index) and soil moisture (e.g. Temperature-Vegetation Dryness Index) improve the accuracy of diagnostic productivity models in drought-prone regions?

We will apply the regression model at a regional scale. Eddy Covariance data will be employed for model calibration and validation at a point scale, including statistical analysis of time series.

PROPOSED SITES TO BE INVOLVED

All seasonally dry sites containing at least one drying period 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. In addition to site PIs of seasonally dry sites, exchange and joint effort with colleagues working on similar topic is welcome, e.g. Drolet/Margolis.