



Extrapolation of parameters of a general light use efficiency model for gross primary production

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To capture the spatial and temporal variability of the gross primary production as a key component of the global carbon cycle, the light use efficiency modeling approach in combination with remote sensing data has shown to be well suited. Typically, the model parameters such as the maximum light use efficiency are either set to a universal constant or to land class dependent values stored in look-up tables. In this study, we exploit the machine learning technique support vector regression to explicitly relate the model parameters of a light use efficiency model calibrated at several FLUXNET sites to specific characteristics obtained by meteorological, ecological and remote sensing data. An automatic procedure which selects the relevant characteristics leads to an individual set of features for each parameter. The extrapolation scheme is evaluated with a cross-validation approach which shows the methodology to be well suited to recapture the variability of gross primary production across the study sites. The promising outcomes suggest a further validation with a larger data set of FLUXNET sites.