Geophysical Research Abstracts, Vol. 8, 09346, 2006
SRef-ID: 1607-7962/gra/EGU06-A-09346

Ecosystem Production Modelling in the Iberian Peninsula

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The main research goal of this work is to assess the regional vegetation dynamics in the Iberian Peninsula (IP). For such purpose, estimates of net ecosystem production (NEP) from a productivity ecosystem model, the Carnegie Ames Stanford Approach (CASA) model (Potter et al., 1993; Friedlingstein et al., 1999), were compared with several local CO2 flux measurements, representing different IP ecosystem types. The CASA model was driven by local weather stations climate inputs as well as by remotely sensed normalized difference vegetation index (NDVI), fraction of photosynthetically active radiation (FPAR) and leaf area index (LAI), from the MODIS TERRA platform. The remote sensing products were pre-processed for outliers' identification and correction, and data gaps filling based on previous studies (Sellers et al., 1996, Myneni et al., 1997b, Asrar et al., 1992). Aiming the carbon fluxes time series quality assessment, flux tower measurements were gap filled according to Reichstein's methodology (Reichstein et al., 2004). The CASA calibration process focused the tuning of efficiency scalars directly related to net primary productivity and soil respiration calculations: maximum light use efficiency and temperature effect on soil fluxes, respectively. Such assessment was performed independently for each site as well as at different temporal resolutions, ranging from monthly to daily time steps, in order to assess the impact of temporal scales on productivity estimates.

NEP estimates for the IP domain were calculated based on previous calibration and validation results. NEP spatial and temporal patterns were compared with climate fields (temperature, precipitation and solar radiation) and relationships established. Current results show that maximum light use efficiency and temperature effect on soil fluxes scalars were able to be set within previously published ranges (Ruimy et al., 1994; Kirschbaum, 1995). At daily time steps the model behaviour tends to ex-

plain less flux variability, although from eight days to monthly time steps its accuracy reveals a significant increase in statistical confidence. Observed differences in the parameterization results imply further research on the discrimination of ecosystem type and ecosystem development stage as source of the causes for such diversity. The NEP simulation results analysis for the IP show positive trends mainly related to solar radiation positive trends. Presently, NEP negative trends analysis results require further investigation.