



COMBINING CO₂ FLUX MEASUREMENTS AND MODELLING TO EVALUATE FOOTPRINT PREDICTIONS AT A HETEROGENEOUS SITE

Aubinet M., Heinesch B., Moureaux C.

Unité de Physique des Biosystèmes, Faculté Universitaire des Sciences Agronomiques de Gembloux, Belgium

A model predicting the net CO₂ flux measured by a system placed in a heterogeneous forest was devised. The forest was supposed to be covered by up to three different vegetation types that were unevenly distributed all around the measurement point. For each vegetation type, the model considered the response of leaf assimilation to light, air temperature and air saturation deficit and the response of ecosystem respiration to soil temperature and water content. The measured net flux was then computed as a weighted sum of the fluxes of each vegetation type. The weighing factors were supposed to depend on wind direction but weren't fixed a priori.

The model was calibrated by comparison with a 6 years continuous data set obtained at the Vielsalm site (Belgian Ardennes, CarboEuroflux network). The forest at this site is composed mainly by beech, Douglas fir and Norway spruce.

For each vegetation type, the parameters describing the flux response to the climate and the weighing factor distribution according to the wind direction were obtained by calibration of the model. An iterative procedure was used.

The vegetation type weighing fractions obtained by the model calibration were compared with these obtained a priori by combining a footprint model with a land use map. The results of this comparison will be discussed and an evaluation of footprint predictions will be given.