



Impact of drought on European ecosystem carbon and water balance

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Recent widespread droughts in Europe during 2003 and 2005 have had the effect of reducing the capacity of plants to fix atmospheric CO₂. This response can be partly identified by inspecting remote sensing data linked to the biophysical state of the vegetation. Lower carbon assimilation rates should partly induce lower respiration rates. High temperature generally associated to drier conditions may accentuate respiratory CO₂ emissions to the atmosphere, whereas in drier soils, microbial activity is reduced. Thus, there is no simple way to predict how the net carbon balance of ecosystems responds to drought. Also, a key question is the ability of plants to resist to drought, e.g. by increasing their water use efficiency.

Eddy covariance flux towers of the CARBOEUROPE programme are used to determine relationships between ecosystem CO₂ fluxes and climate conditions associated to drought. The ability of a process driven model of ecosystem CO₂ fluxes to realistically reproduce or not these relationships will be analyzed. Using that model applied at the scale of the European continent, the legacy of soil moisture conditions from the former year on the carbon and water balance during the following growing season will be investigated.