THE CONTEMPORARY EUROPEAN CARBON BALANCE: COMPETING ROLES OF RISING CO2 AND CLIMATE CHANGE

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There is significant political interest in being able to quantify and understand regional scale carbon budgets. Here we present simulations of the carbon balance of the European continent, and its contribution to the global carbon cycle using the land surface model, JULES (Joint UK Land Environment Simulator; www.jchmr.org/jules/).

Coupled climate carbon-cycle simulations with GCMs from many different modelling centres have now shown a significant sensitivity of the global carbon cycle to changes in climate, resulting in reduced terrestrial carbon storage and accelerated climate change (Friedlingstein et al., 2006). Here, we use the and surface and carbon cycle model from one such study driven by observed climate to simulate the carbon balance of the European domain and examine its causes.

Both rising CO_2 levels and changing climate might be expected to affect the terrestrial carbon cycle. Here, we investigate the separate impact of these factors on the net carbon balance of the European land surface. We find increased productivity and carbon storage due to elevated CO_2 generally exceeds any reduction in carbon storage due to climate change. The impact of rising CO_2 is greatest in the south of the continent where water limited ecosystems benefit most from increased water use efficiency.

Friedlingstein, P. et al, (2006), Climate-carbon cycle feedback analysis, results from the C4MIP model intercomparison, *J. Clim*., **19**, 3337-3353.