



Impact of soil carbon dynamics on climate-carbon cycle feedbacks

Chris Jones(1), Claire McConnell(2), Peter Cox(1), **Pete Falloon**(1), Kevin Coleman(3), David Powlson(3) & David Jenkinson(3).

(1)Met Office - Hadley Centre for Climate Prediction and Research, Fitzroy Road, Exeter, Devon, EX1 3PB UK (Chris.d.jones@metoffice.gov.uk, pete.falloon@metoffice.gov.uk)

(2)Department of Meteorology, University of Reading, Reading RG6 6BB, UK. (3)Agriculture & Environment Division, Rothamsted Research, Harpenden, Herts UK AL5 2JQ

Enhanced release of CO₂ from soils due to increased temperatures may lead to a positive feedback between climate change and the carbon cycle, resulting in much higher CO₂ levels and accelerated global warming. However, the magnitude of this effect is uncertain and critically dependent on the response of soil respiration to changes in climate. Previous studies with the Hadley Centre's coupled climate-carbon cycle GCM (HadCM3LC) have used a simple, single-pool soil carbon model to simulate the response. Here we present results from experiments which use the more sophisticated "RothC" multi-pool soil carbon model driven with the same climate data. The results show strong similarities in the behaviour of the two models, although RothC tends to simulate smaller changes to global soil carbon amounts for the same forcing. We conclude that the projection of a positive feedback between climate and carbon cycle is robust to using these very different representations of soil carbon dynamics but the magnitude of the feedback is dependent on the form of the soil carbon model.