



Sensitivity of soil carbon storage and global climate-carbon cycle feedbacks to soil moisture

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Globally, soils contain nearly twice as much carbon as is stored in the atmosphere, and hence could make a major contribution to a positive climate-carbon cycle feedback. The sensitivity of soil carbon storage to temperature has been widely researched and although soil carbon storage is also highly sensitive to changes in moisture, little information is available on its impact, particularly at the global scale. We have recently incorporated the RothC multi-pool dynamic soil carbon model into the Hadley Centre GCM. In RothC, and other similar soil C cycle models commonly used in global dynamic vegetation models, the sensitivity of soil carbon to moisture is commonly defined using a function relating soil moisture status to decomposition rate or microbial activity. In this paper, we have tested a range of soil moisture-decomposition rate functions from different models, in the Hadley Centre GCM and used these functions to assess the importance of soil moisture for the global climate-carbon cycle feedback.