24) POSTER

The use of a GCM analogue model to assess the impact of uncertainty in Amazônian land surface parameterisation on future atmospheric CO_2 concentrations.

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Based on Hadley Centre GCM simulations, propagating patterns exist in the way that surface climatology is predicted to vary within a changing climate. Such patterns are observed for surface temperature, humidity, solar forcing and rainfall, which all influence land-surface response. The derived spatial patterns are indexed by the global mean land temperature, which, within the resultant "GCM analogue model", depends upon modelled atmospheric concentrations of greenhouse gases. The analogue model has been extended to incorporate an interactive global carbon cycle. The model generates a surface climate, consistent with atmospheric CO_2 concentration, which is used to drive a land-surface scheme (MOSES) coupled to a dynamic terrestrial carbon cycle model (TRIFFID). Changes in terrestrial carbon are allowed to feedback onto atmospheric CO_2 concentration, and a "single point" sub-model represents global atmosphere-ocean CO_2 fluxes. Such inclusion of land and ocean carbon dioxide feedbacks means that a model is available that may be driven by a range of carbon emissions scenarios, is based upon the latest GCM simulations and places high physical representation within the land surface component. Using this computationally quick methodology, the sensitivity of the global carbon cycle to uncertainty in the land-surface parameterisation for Amazônia is investigated. Such uncertainty is directly related to the trajectory in atmospheric CO_2 concentration for a "business as usual" emissions scenario. As such, some measure of "error bars" on predictions of future climate change can be related directly to uncertainty in Amazônian land-surface response.