



A dynamical systems approach to land-atmosphere coupling.

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In order to investigate the coupling of land and atmosphere a particular land surface model is investigated, the MOSES2-TRIFFID land surface model, which includes dynamic global vegetation. MOSES2-TRIFFID is currently used in the HadUM3 General Circulation model (GCM) and has been important in the IPCC reports. A number of assumptions built into the model will be reviewed, including the low-pass filter hypothesis. The structure of MOSES2-TRIFFID dynamics are then analyzed, focusing on the dynamic vegetation component (TRIFFID). This work shows that in TRIFFID the low-pass filter frequency may change, in effect coupling or decoupling the land surface response to a given atmospheric variability. By modulating its own response to climate variability TRIFFID incorporates a new spectral mechanism for the coupling of land and atmosphere, and raises the question of whether this occurs in the real world.