



Modelling river flow in a GCM - evaluation with measured data and climate impacts analysis

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Realistic representation of river flow is an important component of Global Circulation Models for several reasons. Firstly, reliable estimates of the contribution of freshwater to the ocean are necessary for accurate prediction of the thermohaline circulation. Secondly, fully integrated models of the earth system are also the only way in which water cycle feedbacks in the climate-land-ocean continuum can be truly analysed. In addition, climate change may alter the availability of freshwater resources for human consumption, and coupled climate-hydrological models can assist in assessing likely impacts. The latest version of the Hadley Centre Global Circulation Model, HadGEM1, includes a detailed land surface water and energy balance scheme, MOSES. In the previous generation model, HadCM3, river flow was simply represented by basin aggregate runoff output to the ocean, which neglects seasonal flow. This has been replaced in HadGEM1 with the TRIP dynamic river routing scheme, which advects runoff from the MOSES land surface scheme along prescribed river channels at embedded 1 degree by 1 degree resolution. We will present results from the validation of the TRIP river routing model embedded in HadCM3 and HadGEM1 against measured river flow data from the Global Runoff Data Centre. Transient runs of HadGEM1 will be used to demonstrate potential changes in river flow predicted by TRIP for different climate change scenarios.