Geophysical Research Abstracts
Vol. 13, EGU2011-9851, 2011
EGU General Assembly 2011

Hydrological sensitivity to radiative forcing and global temperature change in the CESM model

Bjorn H. Samset, Maria M. Kvalevåg, and Gunnar Myhre
Center for International Climate and Environmental Research – Oslo (CICERO), Norway

Radiative forcing (RF) is often used to quantify expected changes in global equilibrium temperature. Another important climate variable, the hydrological sensitivity or change in precipitation per unit of temperature change, is however not so easy to predict from RF alone. This is because precipitation is strongly linked to the atmospheric and surface energy budgets, which in turn depend on the exact mechanisms behind the temperature change.

Recently there has been some interest in establishing a link between RF and hydrological sensitivity using global circulation models. We here present a set of experiments using the NCAR Community Earth System Model (CESM). Simulations with changes in the CO2 and CH4 concentrations, aerosol levels and the solar insolation were performed, and the resulting change in precipitation was analyzed using a set of RF analysis techniques to find the global hydrological sensitivities. We compare the results to a similar study using the Hadley Centre climate model HadGEM1, recently published by Andrews et Al.