



How EC-EARTH simulates the Earth's climate and it's variabilities

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Recently an Earth system named EC-Earth has been developed at KNMI in collaboration with a number of EU country's meteorological institutes. It is a coupled model with IFS (Integrated Forecasting System) from ECMWF as the atmospheric model, NEMO as ocean model. H-Tessel land scheme is used as land model and LIM as thermodynamic ice model. It will be shown that the model produces the mean climate better or equal to the CMIP3 mean climate models and the major climate variabilities are reproduced by the model fairly well. In particular the ENSO and NAO are very well simulated. Just as most climate models have difficulties to simulate variabilities in the Atlantic, EC-Earth simulates well North Tropical Atlantic SST both for seasonal cycle and variability, it simulates less good equatorial SST variabilities. The SST seasonal cycle is correctly simulated but the equatorial cold tongue is too weak comparing to the observation, up to 3 degrees. Nevertheless the model simulates reasonably good west African monsoon distribution and seasonal cycle although it's a bit to week and not penetrating north enough compare to CMAP data. Experiment with future CO₂ concentration shows that the rainfall at the coastal area of Guinea increased as result of increasing CO₂ concentration while no or little change in the Sahel area.