International workshop on seasonal to decadal prediction
Toulouse, France, 13-16 May, 2013

Response of the CNRM-CM5 coupled model to an enhanced Greenland ice melting.

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We investigate the transient response of the CNRM-CM5 coupled Ocean-Atmosphere model to a strong freshwater forcing around the Greenland coasts. We perturb a 50-year long ensemble of simulations with high-emission of Greenhouse gas (GHG) scenario (RCP8.5). The 5 members of the reference simulation are compared to 5 members of a similar simulation in which the freshwater perturbation is applied. We add 0,00275 Sv to the freshwater fluxes at the Ocean-Atmosphere interface representing 5 times the estimated recent melting of the Greenland ice. We highlight that such a freshwater forcing has significant impacts only in the north Atlantic basin where a rapid increase of the sea level occurs in the first 30 years, followed by a stagnation period. In the others areas, we point out that the effects of the perturbation is not significant compared to the regional variability. We show relations between sea-level and the meridional overturning circulation (MOC), and attempt to characterize the mechanisms at stake in the CNRM-CM5 model. We thus focus on the effects of the freshwater forcing on the oceanic processes in the North Atlantic basin, especially on the temperature and salinity variability in the subpolar gyre.