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1500-2100 A. D. Forcing Impacts on the Global Freshwater Balance

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Despite the scientifically consistent picture of climate change, a comprehensive understanding of the hydrological cycle, which is of fundamental importance for the climate system, is still missing. To assess large-scale changes in the hydrological cycle between 1500 and 2100 A.D. we used a series of simulations (four ensembles, one control) with the Community Climate System Model version 3 (CCSM3) from NCAR and the IPCC SRES A2 scenario. We investigated freshwater budgets and transport terms on regional to hemispheric scale and found future changes to be significantly larger than simulated changes during the pre-industrial period. While the high latitudes on both hemispheres tend to receive increasingly more freshwater from runoff and precipitation-evaporation the changes are larger in the high northern latitudes. This implies the possibility of a global re-distribution of major water masses through atmospheric, oceanic or terrestrial pathways. We will tackle this hypothesis in an integral view of the freshwater cycle and discuss potential consequences for other climate parameters such as the AMOC.