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# Melting of the Greenland ice sheet and its climate impact over the next centuries

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Rapid mass loss of the Greenland Ice Sheet (GrIS) has been observed in the last decades, which is attributed to the anthropogenic induced global warming. During the melting of the GrIS, the albedo effect and the elevation effect have strong positive feedback on the temperature change, both locally and globally. Its melting brings huge amount of freshwater into the North Atlantic, contributing to the global sea level rise and potentially changing the ocean circulation. Considering that the greenhouse gas will keep increasing as indicated by the IPCC emission scenarios, it is crucial to investigate the mass balance of the GrIS over the next centuries and its possible climate influence. In this study, we perform the IPCC AR5 scenarios using the Earth system model COSMOS with and without dynamic ice sheets. The results will allow us to predict the future GrIS mass balance and give both temporal and spatial evolution of the GrIS over the next centuries under different greenhouse gas concentrations. Comparison between different setups can be served as a constraint for the current IPCC runs to estimate their biases of various climate parameters when there is no dynamic ice sheet included. Meanwhile, the potential impact of the GrIS melting on the global climate will be presented.