Geophysical Research Abstracts, Vol. 7, 02246, 2005 SRef-ID: 1607-7962/gra/EGU05-A-02246 © European Geosciences Union 2005



How ice and rain may influence the MOC

B. Marzeion (1)

(1) Nansen Environmental and Remote Sensing Center Bjerknes Center for Climate Research (ben.marzeion@nersc.no)

Perturbations of the northern hemisphere freshwater flux have become a standard experiment to test a climate model's sensitivity to climate change, both for future and past climate scenarios. There are two very different processes that determine the strength of the freshwater forcing: The hydrological cycle, which does not change the volume of the ocean, and melting (or accumulation) of inland ice and snow, representing a net volume flux into (out of) the ocean.

A 4-box model system for the meridional overturning circulation of the Atlantic Ocean is presented. The system is strictly conserving salt and has an adjustable volume, implying that perturbations in the freshwater flux can be specified as to arise from changes in the hydrological cycle or from changes in the volume of water stored on land. An esemble of simple climate scenarios is presented, and the differences that are caused by the different forcing mechanisms are analysed in terms of the volume, salt and heat fluxes between the different boxes, and the thickness of the mean thermocline.