Geophysical Research Abstracts,
Vol. 10, EGU2008-A-00914, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-00914
EGU General Assembly 2008

Modelling the climatic impact of the glacial Barents Ice Sheet collapse

C. L. Jones, and G. R. Bigg
Department of Geography, University of Sheffield, UK (ggp05cj@sheffield.ac.uk)

Iceberg scour marks on Lomonosov Ridge imply that bergs with drafts exceeding 800m once existed in the Arctic. It has been suggested that these icebergs originated from the disintegration of the Barents ice sheet during Marine Isotope Stage 6 (c. 140,000 years BP). Similar erosion patterns observed on the Yermak Plateau imply that the icebergs exited the Arctic through the Fram Strait into the Nordic Seas, where the northern arm of the thermohaline circulation currently forms. An Ocean-atmosphere-ice model is used to simulate collapse of the Barents Ice Sheet during Marine Isotope Stage 6, with the purpose to investigate if a mass input of freshwater from the collapse, and from the melting of deep-draft icebergs, had an impact on convection and deep-water formation in the North Atlantic. Results have shown that the overturning in the North Atlantic is sensitive to a freshwater, as opposed to iceberg, surge originating from the collapse. Freshwater perturbations equivalent to 0.05 Sv from the Barents ice sheet cause variability in the overturning, and the overturning ceases for fluxes greater than 0.09 Sv. Simulations of iceberg flow paths from the Barents ice sheet and the associated meltwater production show different results, with icebergs surges greater than 2 Sv required for an effect on the strength of the Atlantic Overturning to be seen. The model indicates that, during their lifetime, a proportion of deep-keeled icebergs are carried to the central Arctic and eventually traverse the Fram Strait, supporting observational findings reported elsewhere.