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### **RESPONSE OF THE ARCTIC FRESHWATER BUDGET TO EXTREME NAO FORCING**

Freshwater release from the Arctic to the deepwater convective regions of the North Atlantic is understood to play an important role in steering decadal global climate variability. An observed freshening of the North Atlantic since the mid-1960s appears to be related to changes in the export of freshwater from the Arctic, and the persistence of a high North Atlantic Oscillation (NAO) during this period. To investigate the response of the arctic to changes in the NAO we use a high resolution regional version of the ocean-only MITgcm forced with daily NCEP reanalysis data from 1992-2001. After creating a control simulation, we performed two calculations with repeated wind fields of two contrasting NAO years for the extreme negative and positive NAO phases of 1969 and 1989, respectively. Our results highlight a clear response in the Arctic freshwater budget to NAO forcing. Repeat NAO negative wind forcing results in virtually all freshwater being retained in the Arctic. In contrast, repeat NAO positive forcing increases the freshwater export out of the Arctic, primarily via the Fram Strait (54%) and Canadian Archipelago (29%), and results in a total loss of freshwater storage of 14000 km<sup>3</sup>. We find that the freshwater export via these two pathways increases by virtually the same amount (~700 km<sup>3</sup>/yr) between the two forcing scenarios, highlighting the important role that the Canadian Archipelago plays in redistributing the freshwater of the Arctic.

Poster presentation

Presentation is given by student: No

Session #:034

Date: 03-04-2008

Time: 17:30 - 19:30

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