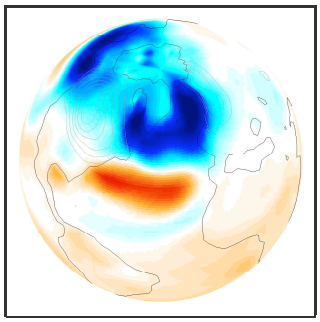
Caltech Researcher Proposes New Explanation for Younger Dryas Cold Period

August 20, 2009



The Younger Dryas cold period, which punctuated the transition from glacial to interglacial conditions about 12,000 years ago, is usually attributed to glacial meltwater pouring into the North Atlantic Ocean. But research done by Caltech postdoc Ian Eisenman and colleagues shows that rising precipitation may actually have been to blame.

Arguably the most dramatic incident of abrupt climate change reconstructed from paleoclimate proxy records, the Younger Dryas cold period occurred when the surface of the North Atlantic rapidly freshened, slowing down overturning circulation and cooling much of the Northern Hemisphere.

Eisenman and collaborators Cecilia Bitz and Eli Tziperman used a general circulation model to assess the impacts of the melting North American ice sheet on atmospheric circulation. The simulation revealed that mean winds and the jet stream would shift northward, bringing more rain to the North Atlantic and freshening the ocean surface enough to slow overturning circulation.

The resultant cooling simulated by the model agrees with proxy reconstructions from the Northern Hemisphere, leading the authors to conclude that higher precipitation is a viable trigger for the Younger Dryas cooling.

A highlight of this research can be read in the September issue of ***Nature Geoscience***. A complete article on the research is currently in press in the journal ***Paleoceanography***.

Image caption: *Shrinking the glacial ice sheets in a general circulation model causes more North Atlantic rain, which leads to weakened ocean overturning circulation, extended sea ice, and widespread cooling of about 10 degrees Celsius. Eisenman and coauthors suggest that this mechanism could have contributed to the Younger Dryas cold period during the last deglaciation.*