

# Oceanic seesaw links Northern and Southern hemisphere during abrupt climate change

February 25 2009

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Very large and abrupt changes in temperature recorded over Greenland and across the North Atlantic during the last Ice Age were actually global in extent, according to an international team of researchers led by Cardiff University.

New research, published in the journal *Nature* today, supports the idea that changes in ocean circulation within the Atlantic played a central role in abrupt climate change on a global scale.

Using a sediment core taken from the seafloor in the South Atlantic, the team were able to create a detailed reconstruction of ocean conditions in the South Atlantic during the final phases of the last ice age.

Dr Stephen Barker, Cardiff University's School of Earth and Ocean Sciences and lead author on the paper, said: "During this period very large and abrupt changes in temperature were observed across the North Atlantic region. However, evidence for the direct transmission of these shifts between the northern and southern hemispheres has so far been lacking".

The new study suggests that abrupt changes in the north were accompanied by equally abrupt but opposite changes in the south. It provides the first concrete evidence of an immediate seesaw connection between the North and South Atlantic. The data shows, for example, that an abrupt cooling in the north would be accompanied by a rapid southerly shift of ocean fronts in the Southern Ocean, followed by more

gradual warming across the south.

Dr Barker explains: "The most intuitive way to explain these changes is by varying the strength of ocean circulation in the Atlantic. By weakening the circulation, the heat transported northwards would be retained in the south."

Climate physicist, Dr Gregor Knorr, co-author of the study and now based at the Alfred Wegener Institute in Germany, said: "Our new results agree with climate models that predict a rapid transmission of climate signals between the two hemispheres as a consequence of abrupt changes in ocean circulation."

The study has wide implications for our understanding of abrupt climate change. Dr Ian Hall, School of Earth and Ocean Sciences, said: "While it is unlikely that an abrupt change in climate, related to changes in ocean circulation, will occur in the near future, our results suggest that if such an extreme scenario did occur, its effects could be felt globally within years to decades."

More information: 'Interhemispheric Atlantic seesaw response during the last deglaciation' is published in *Nature* on 26 February 2009.

Source: Cardiff University

Citation: Oceanic seesaw links Northern and Southern hemisphere during abrupt climate change (2009, February 25) retrieved 26 April 2024 from <https://phys.org/news/2009-02-oceanic-seesaw-links-northern-southern.html>

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