# Interruption of the Gulf Stream may lead to large cooling in Europe

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A new record of past climate change shows that a warm climate in northern Europe can be hit by a sudden cooling associated with an interruption of the North Atlantic Ocean circulation and the Gulf Stream. This is shown in a new study published in *Quaternary Science Reviews*, investigating the development of northern European climate about 120 thousand years ago.

The investigated time interval, called the Eemian, occurred before the last Ice Age and was characterized by warmer-than-present temperatures in large parts of the globe. The Eemian climate evolution can therefore serve as an analogue for a future warmer climate.

The study of fossil remains, such as plants and insects, preserved in geological deposits in northern Finland revealed an abrupt climatic cooling event that happened in an otherwise warmer climate. During this event the temperatures dropped 2–4°C and remained low for a period of 500–1000 years. Comparison with seafloor sediment records from the Norwegian Sea and the North Atlantic indicates that the rapid cooling was associated with a sudden slowdown in North Atlantic deep water formation and a reduction in the northward extension of the Gulf Stream that transports heat to northern Europe.

The new evidence shows that the last time when temperatures were significantly warmer than today, climate instability occurred.

"This may have been caused by melt water coming from the Greenland

Ice Sheet, disrupting the North Atlantic Ocean circulation. While the exact mechanism behind the sudden cooling still remains uncertain, the study illustrates the potential for major climatic instability in and around the North Atlantic regionunder future global warming", says Karin Helmens at the Department of Physical Geography, Stockholm University.

**More information:** "Major cooling intersecting peak Eemian Interglacial warmth in northern Europe," *Quaternary Science Reviews*, Available online 3 June 2015, ISSN 0277-3791, dx.doi.org/10.1016/j.quascirev.2015.05.018

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