

Tracking down abrupt climate changes

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In an article in the scientific magazine *Nature Geosciences*, the geoscientists Achim Brauer, Peter Dulski and Jörg Negendank, (emeritus Professor) from the GFZ German Research Centre for Geosciences, Gerald Haug from the DFG-Leibniz Center for Surface Processes and Climate Studies at the University of Potsdam and the ETH in Zurich, and Daniel Sigman from the Princeton University prove, for the first time, an extremely fast climate change in Western Europe. This took place long before man-made changes in the atmosphere, and is causatively associated with a sudden change in the wind systems.

The proof of an extreme cooling within a short number of years 12 700 years ago was attained in sediments of the volcanic lake "Meerfelder Maar" in the Eifel, Germany. The seasonally layered deposits allow to precisely determine the rate of climate change.

With a novel combination of microscopic research studies and modern geochemical scanner procedures the scientists were able to successfully reconstruct the climatic conditions even for individual seasons. And so it was particularly the changes in the wind force and direction during the winter half-year, which caused the climate to topple over into a completely different mode within one year after a short instable phase of a few decades.

Up to now one assumed that it was the attenuation of the Gulf Stream alone that was responsible for the strong cooling in Western Europe.

The examined lake deposits show however that the atmospheric

circulation, probably in connection with the spreading of sea-ice, probably played a very important role. At the same time, these new results also show that the climate system is long not understood, and that especially the mechanisms of short-term change and the time of occurrence still hold many puzzles. Micro-layered lake deposits represent particularly suitable geological archives, with which scientists want to track down climate change.

Scientists from the Helmholtz Centre Potsdam – German Research Centre for Geosciences (GFZ) and other institutions are in search of such archives worldwide, so as to also, in the future, obtain area-wide information on the dynamics of climate and possible regional variations.

Citation: "An abrupt wind shift in Western Europe at the onset of the Younger Dryas cold period", Achim BRAUER, Gerald H. HAUG, Peter DULSKI, Daniel M. SIGMAN, Jörg F.W. NEGENDANK, *Nature Geoscience* 8, 520 – 523

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