

No simultaneous warming of Northern and Southern hemispheres as a result of climate change for 20,000 years

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However, Svante Björck, a climate researcher at Lund University in Sweden, has now shown that global warming, i.e. simultaneous warming events in the northern and southern hemispheres, have not occurred in the past 20 000 years, which is as far back as it is possible to analyse with sufficient precision to compare with modern developments.

Svante Björck's study thus goes 14 000 years further back in time than previous studies have done.

"What is happening today is unique from a historical geological perspective", he says.

Svante Björck has gone through the global climate archives, which are presented in a large number of research publications, and looked for evidence that any of the climate events that have occurred since the end of the last Ice Age 20 000 years ago could have generated similar effects on both the northern and southern hemispheres simultaneously.

It has not, however, been possible to verify this. Instead, he has found that when, for example, the temperature rises in one hemisphere, it falls or remains unchanged in the other.

"My study shows that, apart from the larger-scale developments, such as the general change into warm periods and ice ages, climate change has previously only produced similar effects on local or regional level", says Svante Björck.

As an example, let us take the last clear [climate change](#), which took place between the years 1600 and 1900 and which many know as the Little Ice Age. Europe experienced some of its coldest centuries. While the extreme cold had serious consequences for agriculture, state economies and transport in the north, there is no evidence of corresponding simultaneous temperature changes and effects in the southern hemisphere.

The climate archives, in the form of core samples taken from marine and lake sediments and glacier ice, serve as a record of how temperature, precipitation and concentration of atmospheric gases and particles have varied over the course of history, and are full of similar examples.

Instead it is during 'calmer' climatic periods, when the climate system is influenced by external processes, that the researchers can see that the climate signals in the archives show similar trends in both the northern and southern hemispheres.

"This could be, for example, at the time of a meteorite crash, when an asteroid hits the earth or after a violent volcanic eruption when ash is spread across the globe. In these cases we can see similar effects around the world simultaneously", says Svante Björck.

Professor Björck draws parallels to today's situation. The levels of greenhouse gases in the atmosphere are currently changing very rapidly. At the same time, global warming is occurring.

"As long as we don't find any evidence for earlier [climate](#) changes leading to similar simultaneous effects on a global scale, we must see today's [global warming](#) as an exception caused by human influence on the earth's carbon cycle", says Svante Björck, continuing:

"this is a good example of how geological knowledge can be used to understand our world. It offers perspectives on how the earth functions without our direct influence and thus how and to what extent human activity affects the system."

Svante Björck's results were published this summer in the scientific journal [Climate Research](#).

Provided by Lund University

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