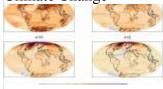
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Greenland Glaciers Shrink Fast and Grow Fast

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July 15, 2011 in Climate Change, Global Warming, Science

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According to geologists at the University at Buffalo, marine-calving glaciers have the ability to not only shrink rapidly during periods of global warming, but to grow as quickly during periods of global cooling.



Nicolas Young, a UB PhD student, investigates glacier sediments in the Glacial Lake Morten basin, Greenland. Photo credit: Jason Briner

Geologists from the University at Buffalo who have been working on Jakobshavn Isbrae – also known as the Jakobshavn Glacier and one of the world's fastest-flowing glaciers – studied adjacent lake sediments and plant fossils to determine that the glacier expanded outward approximately 200 years ago during a period of global cooling known as the Little Ice Age.

Jakobshavn Isbrae has retreated about 40 kilometres inland between 1850 and 2010 due to the continual increase in global temperatures. However the researchers also found that it had expanded at a similar rate of increase during the Little Ice Age.



Shanna Losee, a UB master's student, measures sediment properties in the Glacial Lake Morten lake basin, Greenland. Photo credit: Jason Briner

"We know that Jakobshavn Isbrae has retreated at this incredible rate in recent years, and our study suggests that it advanced that fast, also," said Jason Briner, the associate professor of geology who led the research. His team included master's and PhD students from UB and Brown University.

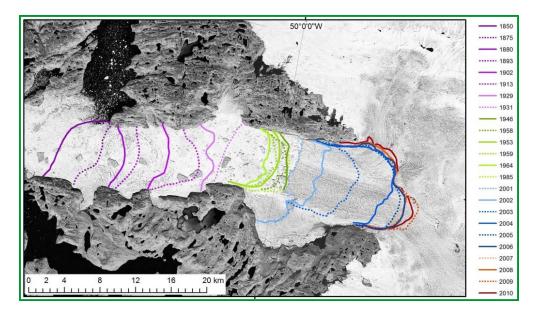
"Our results support growing evidence that calving glaciers are particularly sensitive to climate change."

The researchers reconstructed the glacier's advance from east to west by examining sediment samples from Glacial Lake Morten and Iceboom lake; two lakes which are fed by the glacier and sit along the path of its historical expansion.

At Glacial Lake Morten, the researchers counted annual layers of overlying glacial sediments and used radiocarbon dating to analyse plant fossils at the lake bottom. Scientists already knew that Jakobshavn Isbrae had expanded seaward, damming one side of Glacial Lake Morten with ice and filling the previously tundra-covered valley with meltwater. Now the scientists know that Glacial Lake Morten formed between 1795 and 1800.

Moving on to Iceboom Lake, the researchers analysed sediment layers from the bottom of the lake, and showed that Jakobshavn Isbrae reached Iceboom approximately 20 to 25 years after Glacial Lake Morten, around 1820.

The researchers found that Jakobshavn Isbrae's rate of expansion matches its rate of retreat almost exactly, draining Iceboom lake around 1965 and then draining Glacial Lake Morten between 1986 and 1991.



Jakobshavn Isbrae, a Greenland glacier, has retreated rapidly between 1850 and 2010. A new UB study shows that its rate of advance during cooler times was just as fast. Photo Credit: Bea Csatho

Studies such as these help scientists understand the enormous impact glaciers are having on the global sea level. Jakobshavn Isbrae has been the focus of such scientific attention for a while now, as it is one of the world's fastest-flowing glaciers which means that it is putting a lot of ice into the oceans.

Source: <u>University at Buffalo</u>

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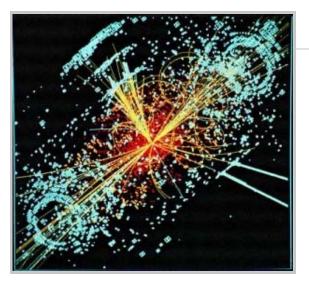
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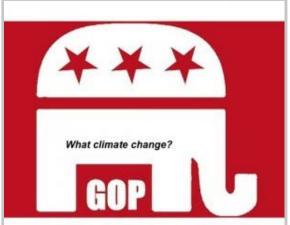
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