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Sea change: why global warming could leave Britain feeling the cold

- No new ice age yet, but Gulf Stream is weakening
- Atlantic current came to halt for 10 days in 2004

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Scientists have uncovered more evidence for a dramatic weakening in the vast ocean current that gives Britain its relatively balmy climate by dragging warm water northwards from the tropics. The slowdown, which climate modellers have predicted will follow global warming, has been confirmed by the most detailed study yet of ocean flow in the Atlantic.

Most alarmingly, the data reveal that a part of the current, which is usually 60 times more powerful than the Amazon river, came to a temporary halt during November 2004.

The nightmare scenario of a shutdown in the meridional ocean current which drives the Gulf stream was dramatically portrayed in The Day After Tomorrow. The climate disaster film had Europe and North America plunged into a new ice age practically overnight.

Although no scientist thinks the switch-off could happen that quickly, they do agree that even a weakening of the current over a few decades would have profound consequences.

Warm water brought to Europe's shores raises the temperature by as much as 10C in some places and without it the continent would be much colder and drier.

Researchers are not sure yet what to make of the 10-day hiatus. "We'd never seen anything like that before and we don't understand it. We didn't know it could happen," said Harry Bryden, at the National Oceanography Centre, in Southampton, who presented the findings to a conference in Birmingham on rapid climate change.

Is it the first sign that the current is stuttering to a halt? "I want to know more before I say that," Professor Bryden said.

Lloyd Keigwin, a scientist at the Woods Hole Oceanographic Institution, in Massachusetts, in the US, described the temporary shutdown as "the most abrupt change in the whole [climate] record".

He added: "It only lasted 10 days. But suppose it lasted 30 or 60 days, when do you ring up the prime minister and say let's start stockpiling fuel? How can we rule out a longer one next year?"

Prof Bryden's group stunned climate researchers last year with data suggesting that the flow rate of the Atlantic circulation had dropped by about 6m tonnes of water a second from 1957 to 1998. If the current remained that weak, he predicted, it would lead to a 1C drop in the UK in the next decade. A complete shutdown would lead to a 4C-6C cooling over 20 years.

The study prompted the UK's Natural Environment Research Council to set up an array of 16 submerged stations spread across the Atlantic, from Florida to north Africa, to measure flow rate and other variables at different depths. Data from these stations confirmed the slowdown in 1998 was not a "freak observation" - although the current does seem to have picked up slightly since.

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