

Linking Climate Change in Siberia and Britain

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(PhysOrg.com) -- Scientists have for first time demonstrated a critical link between the Siberian climate and the circulation of the major current system which gives us our mild winters here in the UK. This new understanding of what is happening, made by Bangor University scientists working on a Natural Environment Research Council research programme led by University College London, is explained in the prestigious American journal, *Geophysical Research Letters*.

The link is sensationalised in the Hollywood blockbuster 'The Day After Tomorrow', which dramatises what might happen if the northern branch of the Gulf Stream were to cease- plunging us into the grip of Arctic winters.

Oceanographer Dr Tom Rippeth explains that it's this northern branch that travels up the Western coast of the UK and then on into the [Arctic Ocean](#), that keeps our winters mild.

Scientists had speculated that this current was at risk from increasing freshwater from both the melting of the [Greenland ice sheet](#) and increased flow from Siberian rivers. The record-breaking shrinkage of the Arctic ice in summer 2007 gave the team of international scientists a unique opportunity to study the processes involved in driving changes in the Arctic Ocean.

Using the data collected in 2007, Bangor University's scientists have now found an important link between the river flow into the continental shelf

seas off Eurasia and the dilution of the North [Atlantic water](#) as it passes through the Arctic Ocean. This change in temperature and salinity in turn, potentially impacts on the flow of the northern part of the Gulf Stream.

"Whilst the Arctic Ocean is in nobody's backyard, it plays a major role in determining UK [climate](#) through its influence on the major ocean current systems," said Dr Tom Rippeth, who leads Bangor University's team at the School of Ocean Sciences.

"The Arctic is also being hit hard by [climate change](#). Average temperatures globally have risen by less than 1 degree C. But in the Arctic, average temperatures have risen by 3 degrees C in the last few decades. Rivers flow has increased as a result, both through thawing of the permafrost and increased rainfall."

"What we have shown is that the changes we've seen in the Atlantic water as it passes through the Arctic Ocean can only be attributed to the dilution of this water by water from the shallower continental seas. A result which links the continent to global ocean circulation," adds Rippeth.

These important new results highlight the climatic importance of the Eurasian shelf seas and will help improve climate models and so contribute to better forecasts of future impacts of climate change.

More information: The paper Vertical Mixing at intermediate depth in the Arctic boundary current Authors YD Lenn, PJ Wiles, S Torres-Valdes, EP Abraham TP Rippeth, JH Simpson, S Bacon, SW Laxon, I Poluakov, V Ivanon and S Kirillov published in *Geophysical Research Letters* L05601, doi:10.1029/2008GL036792.

Provided by Bangor University

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