Geophysical Research Abstracts,
Vol. 11, EGU2009-4531, 2009
EGU General Assembly 2009

A Link Between Reduced Arctic Sea Ice and Cold Winter Extremes over Northern Continents

V.A. Semenov (1,2) and V. Petoukhov (3)

(1) Leibniz Institute for Marine Sciences, Kiel, Germany (vsemenov@ifm-geomar.de), (2) A.M. Oboukhov Institue of Atmospheric Physics RAS, Moscow, Russia, (3) Potsdam Institute for Climate Impact Research, Potsdam, Germany

The recent overall Northern Hemisphere warming was accompanied by several severe northern continental winters, in particular extremely cold winter 2005/2006 in Europe and northern Asia. Here we show that these cold extremes might be favored by anomalous sea ice reduction in the Barents and Kara Seas in the Eastern Arctic. Atmospheric general circulation model simulations demonstrate that strong anti-cyclonic circulation over the Polar Ocean and easterly advection over northern continents may arise as a response to anomalous atmospheric heating. This brings about a continental-scale winter cooling reaching 1.5˚C, with more than three times increased probability of cold winter extremes. Our results imply that several recent harsh winters do not conflict the global warming picture but rather supplement it, being in agreement with the large-scale atmospheric circulation response to Arctic sea ice reduction.