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The North Atlantic Oscillation and greenhouse-gas forcing

S. Kuzmina (1), L. Bengtsson (2,4), O. Johannessen (4,5), H. Drange (4,6), L. Bobylev (1,4), M. Miles (6,7)

(1) Nansen International Environmental and Remote Sensing Center, St. Petersburg, Russia, (2) Max Planck Institute for Meteorology, Hamburg, Germany, (3) Environmental Systems Science Centre, University of Reading, UK, (4) Nansen Environmental and Remote Sensing Center, Bergen, Norway, (5) Geophysical Institute, University of Bergen, Norway, (6) Bjerknes Centre for Climate Research, Bergen, Norway, (7) Environmental Systems Analysis Research Center, Boulder, Colorado, USA (sveta@niersc.spb.ru / Fax: +7 812 234 38 65 / Phone: +7 812 234 39 24)

The results of 12 coupled climate models participating in the Coupled Model Intercomparison Project (CMIP2) are compared together with observational data in order to investigate: 1) How the current generation of climate models reproduce the major features of the winter North Atlantic Oscillation (NAO), and 2) How the NAO intensity and variability may change in response to increasing atmospheric CO_2concentration. Long-term changes in the intensity and spatial position of the NAO nodes (Icelandic Low and Azores High) are investigated, and different definitions of the NAO index and the Arctic Oscillation (AO) are considered. The observed temporal trend in the NAO in recent decades lies beyond the natural variability found in the model control runs. For the majority of the models, there is a significant increase in the NAO trend in the forced runs relative to the control runs,suggesting that the NAO may intensify with further increases in greenhouse-gas concentrations.