Geophysical Research Abstracts
Vol. 13, EGU2011-8178, 2011
EGU General Assembly 2011

Local temperature response to winter-time atmospheric blocking

Hylke de Vries, Reindert Haarsma, and Wilco Hazeleger
KNMI, KS-MK (Global Climate), De Bilt, Netherlands (hylke.de.vries@knmi.nl)

On average once every 5 years western central Europe experiences a cold spell lasting more than 12 days. Such prolonged cold periods require anomalous flow conditions in which the prevailing westerly circulation is blocked. However, not all winter-time "blocking events" also produce long-lasting cold spells. Persistence of the blocked situation is crucial, of course, but details of the spatial location and spatial extent of the blocked region are also important. Therefore, even small future changes in the preferred geographical location and persistence of blocking, caused by e.g. the northward migration of the atmospheric jet, can regionally lead to a significant amplification or reduction of the effect of a change of the global mean temperature associated with climate change.

While many studies demonstrate the impact of atmospheric blocking on extreme European winter-mean temperatures, only few studies examine the local response of atmospheric blocking on the temperature evolution. In this study we adopt this second more local view point. Using both reanalysis (present-day) and climate-model data (future scenarios), composite life-cycles and corresponding temperature time-series are shown for blocking events that meet certain criteria (e.g., geographical location, minimal lifetime and longitudinal extent). Results indicate that blocking over the Atlantic (60W-0W) has a stronger impact on the temperature in western central Europe than blocking over Russia (0W-60E), although the intensities of the blocks over Russia are generally higher.