



European Cold Winters and the Persistence of Atmospheric Blocking

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

Cold winters over Western Europe can often be related to the existence of anomalous circulation patterns that involve prolonged easterly flow. Persistence of these anomalous conditions is crucial, for it takes several days to transport the cold air from Northern and Eastern Europe towards Western Europe. In a few historic cases these anomalous circulation conditions, in which the prevailing westerlies are temporarily 'blocked', existed for more than a month, thereby impacting significantly on regional climate.

Climate models are known to have problems representing both frequency and persistence of these so-called blocking events. It is not clear whether increased resolution will solve this problem completely. Here we study the evolution and in particular the persistence of blocking episodes from a potential vorticity perspective. An analysis in terms of potential vorticity is attractive because of its lagrangian conservation properties under adiabatic conditions. Enhanced insight in the blocking dynamics may in turn increase or decrease confidence in current climate models.