



## **Reproduction of links between circulation types and precipitation in Central Europe in regional climate model simulations**

Eva Plavcová (1), Jan Kyselý (1), and Petr Štěpánek (2)

(1) Institute of Atmospheric Physics AS CR, Prague, Czech Republic (plavcova@ufa.cas.cz), (2) Global Change Research Center AS CR, Brno, Czech Republic

The study evaluates relationships between large-scale atmospheric circulation (represented by circulation indices and circulation types derived from gridded mean sea level pressure) and daily precipitation amounts over three regions in the Czech Republic (Central Europe) with different precipitation regimes. We examine how ENSEMBLES regional climate model (RCM) simulations driven by re-analysis reproduce the observed links and capture differences in the links between the regions (lowlands vs. highlands) and seasons. We study the links of circulation to (i) mean precipitation over the regions, (ii) probability of wet days, and (iii) probability of extreme daily precipitation (exceeding threshold defined by a high quantile of precipitation distribution in a given season). Relatively strong links between atmospheric circulation and the precipitation characteristics are found in the observed data. The links are generally more pronounced for highland than lowland regions. More wet days and higher precipitation amounts are found for cyclonic and stronger flows, and for westerly and north-easterly flows. The RCMs are generally able to capture basic features of the links; nevertheless, they have difficulties to reproduce some more specific features and differences in the links between the regions. The results also suggest that good performance in some precipitation characteristics may be due to compensating errors rather than model's perfection.

### Reference:

Plavcová E., Kyselý J., Štěpánek P., 2014: Links between circulation types and precipitation in Central Europe in the observed data and regional climate model simulations. *International Journal of Climatology*, doi 10.1002/joc.3882.