Hydrol. Earth Syst. Sci. Discuss., 10, C6678–C6680, 2013
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Hydrology and Earth System Sciences
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Discussions

Interactive comment on "Variability of extreme precipitation over Europe and its relationships with teleconnection patterns" *by* A. Casanueva et al.

Anonymous Referee #2

Received and published: 10 December 2013

This is a very interesting and well written paper. A sound scientific approach has been followed. I recommend publication in HESS after minor revision.

Some remarks and suggestions:

A number of times throughout the paper precipitation extremes were referred to as "hydrological extremes" (e.g. page 12347 lines 2, 16, 28; page 12349 line 5). I suggest to replace hydrological extremes by precipitation extremes, given that hydrological variables are affected by other meteorological variables, such as temperature and evapotranspiration, next to precipitation.

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Page 12349 lines 10-11: ". . . especially with regards to crops.": This is just one example. Few more (even more relevant?) examples can be given: e.g. floods, erosion, water supply.

Page 12339 lines 17-18: OK but do these associations remain stable under changing climatic conditions? What about the increase in precipitation intensities due to the increase in water holding capacity of the atmosphere when temperature rises? This is an example of a physical process controlling the change, which is not related to teleconnections.

The readers should add and refer also to the most recent literature on similar investigations that also detected north-south variations in precipitation changes and changes in hydrological extremes across Europe. Next to the changes, (multi)decadal oscillations in precipitation and hydrological extremes exist. This suggests that the (trend) results as reported in this paper might be strongly affected by the period selected (1950-2010 in this study). Some suggested references:

Willems, P., 2013. Multidecadal oscillatory behaviour of rainfall extremes in Europe. Climatic Change, 120(4), 931–944

Hannaford, J., Buys, G., Stahl, K., Tallaksen, L.M., 2012. The influence of decadal-scale variability on trends in long European streamflow records. Hydrology and Earth System Sciences Discussions, 10, 1859-1896

Stahl, K., Hisdal, H., Hannaford, J., Tallaksen, L.M., van Lanen, H.A.J., Sauquet, E., Demuth, S., Fendekova, M., Jódar, J., 2010. Streamflow trends in Europe: evidence from a dataset of near-natural catchments. Hydrology and Earth System Sciences, 14, 2367–2382

Stahl, K., Tallaksen, L.M., Hannaford, J., van Lanen, H.A.J., 2012. Filling the white space on maps of European runoff trends: estimates from a multi-model ensemble. Hydrology and Earth System Sciences, 16, 2035–2047

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10, C6678–C6680, 2013

Some minor comments:

Page 12337 line 8: typo “below”

Page 12341 line 20: change “significant level” to “significance level”

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 12331, 2013.