

## ***Interactive comment on “The European 2015 drought from a groundwater perspective: estimation in absence of observed groundwater data” by Anne F. Van Loon et al.***

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General comments The problem of groundwater level drought evaluation is still less often studied in comparison to meteorological or streamflow droughts. Evaluation of groundwater drought is complicated because of many factors influencing its development and persistence even within relatively small areas. Therefore the paper of authors van Loon et al. is highly appreciated. The paper is well structured, based on the present-day knowledge of the meteorological and hydrological drought evaluation, and techniques of groundwater drought assessment. The input data, methods and results are well described. The discussion and conclusions are clear, well understandable. The concept of accumulation period estimation and its relation to SPI and SPEI

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indices led to adequate results within two different areas (southern Germany, Netherlands). Use of satellite-based GRACE-TWS and GRACE-GLDAS showed that because of coarse resolution the models were not able to simulate groundwater anomalies realistically.

Scientific questions/comments: 1/ Did the authors think about looking at other groundwater parameters, as baseflow or spring yield from the point of drought occurrence? 2/ Hydrogeological conditions and recharge-discharge relationships of an aquifer are more purely represented by spring yields and their changes during the meteorological drought periods. Therefore, maybe the next step in groundwater drought research should be the spring yields drought study. However, in some hydrogeological conditions (as in the Netherlands) the data availability might be very limited. 3/ Do the authors recommend the use of SPI index which calculation is easier than the SPEI index giving the comparable good results?

Technical comments: Despite of the reference to Kumar et al. (2016) I would appreciate at least the very short description of major differences in hydrogeological conditions of both areas used in the study. There are not comments to the English language which is excellent, and to figures quality.

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