

Hydrol. Earth Syst. Sci. Discuss., referee comment RC2
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Comment on hess-2022-10

Anonymous Referee #2

Referee comment on "Influence of low-frequency variability on high and low groundwater levels: example of aquifers in the Paris Basin" by Lisa Baulon et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2022-10-RC2>, 2022

This work investigates the effect of low-frequency variability on low and high groundwater levels extremes measured in the Paris basin. To my understanding, all methods have been applied correctly and lead to results which allow a thorough analysis of the "low-frequency variability induced extremes".

I have some minor questions and remarks.

L11 - At first reading it is not very clear what is meant by "sensitive". Maybe use "low GWLs are stemming/resulting from such low-frequency..".

L16 - consisted in

L41 - I would say "in the context of global change"

L42 - for our societies.

L50 - Hydrological droughts

L56 - " et rates, that cause low soil moisture content.. " I am not too familiar with this, but here I do not see a difference of gw droughts compared to hydrological droughts.

L65 - according to the type of aquifer and GWL variation.

L69 - I would say that a water level higher than the soil surface is no groundwater anymore.

L86 - "However, although these indices are useful tools to describe droughts, their principal limit arises from the standardisation allowing for spatial comparison but therefore hindering to keep the variance notion in time series" You are stating important facts here, but especially the second part is difficult to follow. I suggest to split the sentence in 2 and explain better what you mean.

L89 - dependent on

L107 - .. highlighted, using a composite analysis with Sea Level Pressure (SLP), that the.. (comma insertions)

L119 - I don't understand. Please rephrase.

L122 - except the 1975 drought.

L126 - delete "to", replace "in supporting" with "on"

L132 - high- and low-freuquency

L134 - Why exacty where these 7 and 17 year variabilies chosen? I think this needs explaining.
.. consists in evaluating

140 - Rephrase please

L145 - Boreholes were selected from a BRGM database and were required to be

undisturbed from human activities. We selected the boreholes by following the three steps below.

L149 - the removal of pre-selected..

L170 - Do you mean sub-monthly?

L190 - were -> was

L214 - for that purpose

L245 - But isn't this also a consequence of the initial amplitude of exceedance?

Fig3 - I prefer the term variance, but this is a matter of preference.

Fig9 - Why not splitting the period exactly in half, doing the analysis for both periods and the complete period 1903-2019?

P23 - 28 : I wonder how the results are sensitive to the choice of 7/17 and 7&17 year variability. I think this has to be discussed or at least commented on.

L582 - typo

L584 - linked to -> resulting from

L589 - dating back to

L595 - Which aperiodic behaviour? I don't understand this sentence

L601 - largely -> generally

