Comment on hess-2022-10

Anonymous Referee #1

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-RC1, 2022

The manuscript is overall quite clear and well written. Giving more details about the novelty of the (quantitative) approach compared to the existing literature (indicated as rather qualitative) would highlight the significance of this work.

Below are list of items requiring some clarification and some suggestions.

Abstract

Line 10: what do you mean by 'groundwater droughts and floods'? Droughts and floods refer to surface phenomenon. Do you mean the impact of drought and flood variability on groundwater levels?

Lines 19 to 22: missing verb or part of the sentence, reformulate.

Introduction

Line 55: it would be interesting to recall briefly the definitions of the other type of draughts and highlight how they are linked to each other or at least to the GW draught.

Line 65-66: this sentence is not clear. Can you reformulate?

Effective precipitation and groundwater data

Lines 183 to 185: I do not understand what is meant by mesh or SAFRAN mesh (temporal, spatial, spatio-temporal), and to which aim it will be used (to model which process or quantity of interest?). What is SAFRAN?

Section 3.1

An illustration of the variability or energy level of the MODWT approximation might be insightful, e.g on fig 2a.

Would a graphical or table presentation of the MODWT and CWT results help in understanding how the variability is quantified?

Section 3.2

Are the 0.2 and 0.8 percentiles unique/determined for the whole dataset or by aquifer group or borehole, and over which time period?

Multi-timescale variability...

Fig. 3: it might be good to recall that the energy level is a result from the MODWT.

Fig.4 caption: explain what the contour lines mean

For fig 5, 6, 10 & 11 it might facilitate the reading of the results if there was an identification of the hyrdogeol entity types (iD, iMD, cAM, cA) instead of displaying the coloured hydrogeological entities.

Discussion

Could you discuss the possibility of assessing the current LFV state and its short term evolution, given a type of aquifer, as it might be helpful for short term predictions of GWE ?