

Interactive comment on “Comparative analysis of hydrologic signatures in two agricultural watersheds in east-central Illinois: legacies of the past to inform the future” by M. A. Yaeger et al.

Anonymous Referee #1

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This manuscript describes how historical landscape developments formed the current hydrology of 2 watersheds in Illinois. The manuscript relates hydrograph characteristics to catchment properties such as size, reservoirs, precipitation variation and landuse. I found this an interesting and informative manuscript as it clarified several questions I had when I looked at US discharge datasets. For example: why is evapotranspiration decreasing in central Midwestern US during the past 50 years? A drawback of the manuscript are the relative short time series (20 years) used for this analysis, which prevents studying actual changes in the time series. Instead, a place for time substitution is used (in total 12 subwatersheds within the 2 main watersheds are analyzed)

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to infer the influence of historical landscape development on river discharge. Furthermore, in the conclusions the contribution of the results presented in this manuscript to an improved understanding of the relation between historical changes and the current hydrology (objective) does not become clear. Overall, this manuscript presents a comprehensive overview of past and current landuse developments and how they influence hydrology in central Midwestern US. Therefore I recommend this paper for publication after revisions.

Major comments: Your objective states: “The purpose of this study is to examine the legacy of past changes in two typical Corn Belt watersheds to gain a deeper understanding of the watershed response in order to better predict the response under the proposed changes” When I read your conclusions I don’t clearly see the new contribution of your work. You mostly refer to other studies or make recommendations: In your results you don’t show that ET decreased: you don’t show Miscanthus uses more water than row crops. In the conclusion I would like to read how your results contributed to a deeper understanding, instead of what others already found. I find your conclusion too general.

Page 6518: Because your historical overview is comprehensive I propose to make section 1.1 section 2. A literature overview of historical impacts also fits well with your objectives.

In your conclusions, you finish with a very ambitious outlook to include in hydrological models human adaptation to changes caused by humans in the first place. Do we not first need our models to see what we can do about the current problems? To me page 6539 lines 5 to 10 are too vague.

Minor comments: Page 6524 lines 11 to 20: This overview section of the paper is unexpected. I expected it after the objectives.

In Figs 5 and 7 you show W_midway and SE Where are these? They have not been mentioned before

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Figs 8 and 9: Why is fig 8 in monthly water yield (mm) and figure 9 in daily water yield (mm). In addition the dimensions should then be mm/month and mm/day

Figure 10: what does the circle mean?

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