



Interactive comment on “Effects of surface wind speed decline on hydrology in China” by X. Liu et al.

Anonymous Referee #2

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The paper examines potential influences of a significant wind speed decline in the second-half of the 20th century on hydrological properties of ten major Chinese river basins. Two experiment runs are performed with the Variable Infiltration Capacity (VIC) land surface model. Each model run is forced by observed temperature and precipitation interpolated from more than 750 stations together with (i) observed wind speed and (ii) detrended wind speed. By comparing both experiments, the particular influence of decreasing wind speed on evapotranspiration, runoff and soil moisture is analysed.

In general, the study provides an interesting contribution to the impacts of atmospheric stilling. The methodology is clearly stated and well described. The results are comprehensively analysed and supported by coherent figures. Nevertheless, some general and specific points should be addressed

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General Comments

1: It would be nice to discuss the interpolation technique in more detail, as this is a crucial part of your study. Looking at Fig. 1, there seems to be some inconsistency as some individual stations show positive trends, whereas all neighbouring stations show strong negative trends (especially in the NW regions and along the border between HUAL and CJ). Does the interpolation technique account for altitude differences between the stations (which is of great importance, especially for wind speed)?

2: Related to point 1, there are some references missing in the references list, in particular those of the interpolation algorithm (Shepard et al., 1984 and Maurer et al., 2006). Please double-check all the references.

3: The topic of atmospheric stilling has gained a lot of attention in recent years. Maybe you could add a more comprehensive introduction to this topic, including also other studies and not just those dealing with impacts on pan-evaporation.

4: Considering the fact, that you just need temperature, precipitation and wind speed as forcing data, potential evaporation and in consequence also evapotranspiration are possibly estimated via crude parametrizations. Please add some information on this.

5: In general, the paper is well written. Nevertheless, there are some phrasing issues. Maybe, it would be beneficial to get some input from an English native speaker.

Specific Comments

P.11294, l.14: 'wind speed decline' instead of 'Wind speed decline'

P.11294, l.19: 'except' instead of 'expect'

P.11294, l.20-21: You could provide more updated references here, like e.g. 'Sheffield J, Wood E and Roderick M 2012 Little change in global drought over the past 60 years Nature 491 435–8'

P.11294, l.21-22: What do you mean by 'soil moisture based on land surface models'?

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Do you mean soil moisture estimates derived from land surface models or something else?

P11296, l. 9: Confusing phrasing of the sentence: 'Total 756 stations data are used,...'

P11306, Fig. 1: Actually, you do not need the box on the lower right. As there are anyway no values for all these small southern Chinese islands, there is no added value in displaying them separately. (Same for Fig. 4). Further, there seem to be some offshore stations (along the coast of PR and HUA, possibly at small islands). Are these stations also considered in the interpolation procedure and how?

P11308, Fig. 3: I don't quite understand, why there is a general increase of variability with time. The time series are almost perfectly linear in the 60s and 70s and highly variable afterwards.

P11308, caption of Fig. 3: I guess there is something missing in front of 'is relative change magnitude.'

P11308, Fig. 3: Maybe you could add a little space between each panel like in Fig. 2. Right now, it's rather difficult to distinguish between individual panel plots and their corresponding labels.

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