

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

### **Anonymous Referee #1**

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This paper explores the consequences of a decrease in wind speed on the hydrology on the main hydrological basins in China. It does so with help of a hydrological model which is fed with long-term observations of temperature, precipitation and wind speed at more than 700 stations in China. The methodology is clearly described: A long spin-up of the hydrological model; a run with observed wind speed and a run with detrended wind speeds.

The set-up of the model experiment is simple and clearly written (however, some check on the English wording is needed). Still I have some points that needs clarification.

P11295 All examples given in the introduction of studies that show an impact of wind speed on evaporation are based on pan-evaporation. But pan-evaporation is known

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to be a poor proxy to actual evaporation, especially in dry environments. A word of caution is needed here, and are there any studies on this topic using other reference than pan-evaporation?

P11296 L16 The model is calibrated against stream flow data at the major basins of China. Please describe in more detail what has been done. What exactly is adapted in the model to arrive at the observed stream flows?

Table 1: The SHJ basin has a particularly large difference between E1 and E2, amounting to 2.6%. According to Figure 3 this basin has the same wind speed trend as basin NW which only show a difference between E1 and E2 of 1.1%. Can the authors explain this discrepancy? This may show that the same wind speed trend applied at different hydrological conditions gives a significant difference in evaporation response. The question then is can we understand this, is the model sufficiently accurate to represent the impact of the wind speed on the hydrological components correct in a quantitative way?

In the light of the previous remark it is important that all the relevant processes are incorporated well in the model. Describe the parameterization of evaporation in the hydrological model. Radiation is not in the observational data set (P11296,L7). Yet, it is a main driver for evaporation, how is radiation incorporated in the model?

Observed wind speed decrease is in general partly attributed to a change of exposure of the meteorological stations in developing urban areas. Such a trend will have no relation to a change in evaporation due to changing wind speed. Could the authors reflect on this? Table 1: Although trends in individual components are often not significant, it could well be that trends in the difference between EXP1 and EXP2 are significant.

Minor points:

P11294 L19 expect -> except

P11296 L14 Maurer et al. (2006) is not in the reference list

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P11296 L16 unclear word: naturalized

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 10, 11293, 2013.

**HESD**

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