

Interactive comment on "Runoff simulation by SWAT model using high-resolution gridded precipitation in the upper Heihe River Basin, Northeastern Tibetan Plateau" by Hongwei Ruan et al.

Anonymous Referee #2

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The manuscript "Runoff simulation by SWAT model using high-resolution gridded precipitation in the upper Heihe River Basin, Northeastern Tibetan Plateau" by Ruan et al. is about the application of a SWAT model for the respective basin. I am not happy with the manuscript as it lacks of some important evidences about major conclusions. The applied method, to derive the precipitation data may be sufficient, but in the context of SWAT I could not find any comparison between the "past" and "present", how the data set really improves the SWAT modelling. Further more questions can be found in my detailed comments.

C1

Comments:

P1L12 "in inland river basins" is to general, add something like 'Tibet'

P1L15 What kind of RCM is used, maybe better use "a" than "the", as there are many RCM out there.

P1L18 "upscale(d)"?

P1L24 I expected at monthly scale larger NSEs

P2L10 Again what kind of RCM?, better "a" than "the"

P2L12 "depict"?

P2L12 "A Soil and..", this sentence sounds like SWAT can only be applied in this basin

 $\mathsf{P2L45}$ "change trend" sounds strange to me , what is meant by a changing trend: the change of a change is no change?

P3L31 Your data is good? No Outliers? Did you check anything?

P4L8 At this point I asked myself about calibration and validation, you gave some answers to that later in chapter 4.4

P4L12 "Shepard interpolation" I had to google that, better known as "Inverse distance weighting"

P4L13 where these station coming from, you said in chapter 2.2. that you only have 4 met. Station.

P4L15 "RCM was calibrated" How did you do this? Normally there are precipitation parametrisation schemes in RCMs, which more or less adequate model convective processes.

P4L17 "optimal interpolation" who decided how what is optimal?

P4L18 So at the end you did a residual correction, which means to me that at a pixel,

which has a station in it, the observed value is matched by the simulated one? Am I right? Some kind of unbiasedness.

P5L21 "a" is the offset at 0m above ground, as precipitation will not be 0mm at this altitude

P5L27 and L32 "Thus,.." and "Given the.." is unnecessarily doubling of sentences

P5L28 Was this cross validation done by you? Did you really ensure that the two stations have not been used to interpolate the precipitation grids?

P5L38 How did you compare the data? One pixel to one station? Or a mean of 3x3 pixels?

P6L2 "relatively high correlation" I cannot agree with that, there is no correlation at all. Your regression line is defined only by 0mm values, as they are obviously not excluded by this analysis. Tab1. The RMSE for daily precipitation is very large compared to the annual precipitation!!

P6L8 These are not the real correlations, please exclude 0mm values.

P6L24 "was relatively overestimated" by your data? To which reference?

P7L30 " most hydrological models (have)"

P7L31 "Thus, this ..: " sounds not correct

P7L36ff this sentence is not necessary, as I expected that from you

P7L39 Why didn't you apply some auto calibration tool?

P8L13 "typical normal year..." that sounds strange to me

P8L26 "improve the accuracy.." I did not see any proof of that, you did not compare anything only one simulation and a observed time series. That is one of the main problems of your study I cannot judge your results to a former results as there is no comparison.

СЗ

P8L33 "This finding..." that is the character of a balance, I did not expect something different, maybe you skip that.

P9L38 "mean annual change trends" what is meant by that. FIGURE 13 is unclear to me, what is shown there. How do you define a change trend?

P10L13 "Thus,.." I could not follow you logic how is the simple precipitation connected to the drainage threshold?

P10L24 "superiority.." I couldn't see such a superiority of your daily data set! That was not shown in the manuscript sorry!

P10L29 "The temperature..." The RCM should deliver these variables to, they are even more reliable than precipitation from RCMs, so why didn't you use them?

P11L3 and L9 " exhibits high time series accuracy" and "superiority" that was not shown!

P11L25 "trends" In terms of climatology the 14 years you investigated are too short for a trend analysis. You need at least >30a as your observed trends maybe only caused by natural climate variability.

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