Response to comments for Reviewer

Comments and Suggestions for Authors

Comments (and questions to be clarified in the text):
Thank you for your comments and suggestion towards making this manuscript a success, all comments and suggestions were taken in due considerations and has ben added and clarified in the text.

Abstract: It should be explained in parenthesis what GCM means.

(General Circulation models)

Figure 2a: Apart from the "observed " and "simulated" lines, what exactly are the other two lines?
The two dotted lines in Figure (2a) are the optimal parameters obtained from the SUFI-2 algorithm which shows the relationship and how well the simulation match the observation. Propagation of the uncertainties in the parameters leads to uncertainties in the model output variables which are expressed as 95% prediction uncertainty, or 95PPU. These 95PPUs are model outputs in a stochastic calibration approach. In the SWAT-CUP model (95PPU) envelops most of the observation, Observation is important because it is the culmination of all the processes taking place in the region of study. This is quantified by fitting between simulation expressed as 95PPU.

Line 135: To what exactly do the 19 optimized parameters refer?
These are uncertainty parameters related to the flow simulation to best fit the model, expressed as ranges (uniform distributions), accounts for all sources of uncertainty such as uncertainty in driving variable (example, rainfall). These optimal parameters and their fitted values are as follows are as : CN2 is 56.741997, ALPHA_BF is 0.153, GW_DELAY is 292.5, GWQMN is 565, GW_REVAP is 0.18938, ESCO is 0.731, CHN2 is -0.00039, SOL_K is 790, SOL_AWC is 0.747, CHK2 is 89.491791, SOL_AWC 0.975, REVAPMN is 490.5, RCHRG_DP is 0.531, OV_N is 5.43819, SLSUBBSN is 32.259998, SMFMX is 1.06, SMTMP is11.559999, ALPHA_BNK is 0.005 and SFTMP is -11.400001. Table 1. Shows the 19 optimized parameters.

Table 1. Flow optimized parameters and their fitted values

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Fitted value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: R__CN2.mgt</td>
<td>56.741997</td>
</tr>
<tr>
<td>2: V__ALPHA_BF.gw</td>
<td>0.153</td>
</tr>
<tr>
<td>3: V__GW_DELAY.gw</td>
<td>292.5</td>
</tr>
<tr>
<td>4: V__GWQMN.gw</td>
<td>565</td>
</tr>
<tr>
<td>5: V__GW_REVAP.gw</td>
<td>0.18938</td>
</tr>
<tr>
<td>6: V__ESCO.hru</td>
<td>0.731</td>
</tr>
<tr>
<td>7: V__CH_N2.rte</td>
<td>-0.00039</td>
</tr>
<tr>
<td>8: R__SOL_K(..).sol</td>
<td>790</td>
</tr>
</tbody>
</table>
Yes, the time basis is Averaged mean annual

Please, check again Equations (1), (2), (3) and (4)! Both symbols p and P are used. In which equation does the symbol p’ appear?

It was an error in writing the equations, it has been corrected in the text. Equation (3) has the operator $\tilde{A}$ which denotes REA averaging.

$$\Delta P = \frac{1}{N} \sum_{i=1}^{N} \Delta P_i$$

(1)

$$\delta_{\Delta P} = \frac{1}{N} \left[ \sum_{i=1}^{N} N(\Delta P_i - \bar{\Delta P})^2 \right]^{1/2}$$

(2)

$$\bar{\Delta P} = \tilde{A}(\Delta P) = \frac{\sum_i R_i \Delta P_i}{\sum_i R_i}$$

(3)

Lines 288–289 and 299–300: It is referred twice what Table 2 shows. Table 2 is valid for the same emission scenario RCP 4.5.

This has been edited and the duplicate has been omitted in the text as it explains the same thing.

Lines 290–291: $R^2$ cannot be negative. These lines should be explained in a more understandable way.

The Coefficient of determination ($R^2$) is negative, indicating that the models were weakly
correlated. This may be due to poor model behaviour and outliers in model simulation results from software. This also demonstrates the limited value of $R^2$ alone for model performance quantification, however, these negative values do not affect the objective of this study as the performance evaluation were based almost entirely in the bias and RMSE weighting for model uncertainty prediction.

The response of the authors to the comment 9 of the previous review should be incorporated in the text.

The response of the authors to comment 8 of the previous review had already been added in the text and highlighted.

Figures 7 and 8: Which is the mathematical definition of weight? "Inverse value of RMSE"?

The mean weights derived from the model performance criterion (bias and the inverse values of the RMSE) for the three-thirty-year periods are presented in Figure 7 and 8 respectively.

See annotated manuscript for "editorial" errors!

The manuscript has been edited based on your comments.

Thank you