Responses to Reviewer #1

Point #1

A good and interesting manuscript about the evaluation of streamflow simulations based on different reservoir operations and irrigation management. The manuscript is well written, and the scientific topic is valid. The watershed-scale SWAT irrigation studies are limited in the scientific community. To me, it is necessary to include more publications like this manuscript in the peer-reviewed journals.

Response: We much appreciate the positive comments and provide responses to each comment in the following.

Point #2

Line 74: please include a space between "ca." and "30%"

Response: We added the missing space**.**

Point #3

Line 96: please indicate the unit for the location information

Response: We revised the location information and added the missing unit as follows:

45.98 ~47.60° N, 121.53~119.20° W.

Point #4

Line 97: please use the SI unit for temperature

Response: We converted the unit of the winter temperature to Celsius.

Point #5

Line 98: please include a space between "675" and "mm"

Response: We added the missing space in this line.

Point #6

Line 101: please revise the citation

Response: We corrected the typo.

Point #7

Line 177: please remove the additional period

Response: We removed the extra period.

Point #8

Line 178: missing space between citations

Response: We added the missing space here.

Point #9

As for the reservoir operations in this study, is there any observed reservoir release data available in the watershed? The observed data may be used as the SWAT model input.

Response: One reason we adopted RiverWare to simulate water release from reservoirs is that observational water release data from reservoirs are not readily available. In addition, RiverWare has been used to provide guidance for reservoir operations at multiple temporal scales in the study area (https://wa.water.usgs.gov/projects/yakimawarsmp/warsmp/riverware.htm), and water release calculated by RiverWare is used to determine water discharge from reservoirs.

We agree that using actual water release from reservoirs as model input will contribute to improving streamflow simulations. We added following contents to the section 4.3 of the manuscript to highlight importance of including observed reservoir release in future streamflow modeling.

"To better investigate hydrological consequences of water management, future studies should further constrain uncertainties in streamflow simulations by incorporating additional reservoir management and irrigation information. Including of observed reservoir release will help improve model representations water discharge from reservoirs."

Point #10

To me, there is no meaning to compare SWAT simulated ET (no calibration against actual ET) with MODIS ET according to the algorithm of Mu et al. (2011). Both of them cannot be treated as observed

actual ET, which means they both have substantial uncertainties. For your information, MODIS ET is the maximum crop ET requirement. In some cases, the producers do not have enough water to meet that.

Response: Thank you for your suggestion and we acknowledge that there are intrinsic uncertainties in the MODIS ET product. We removed the comparison of MODIS ET magnitudes with model simulations in Figure 9, and move the evaluation of ET interannual variability to the supplementary material.

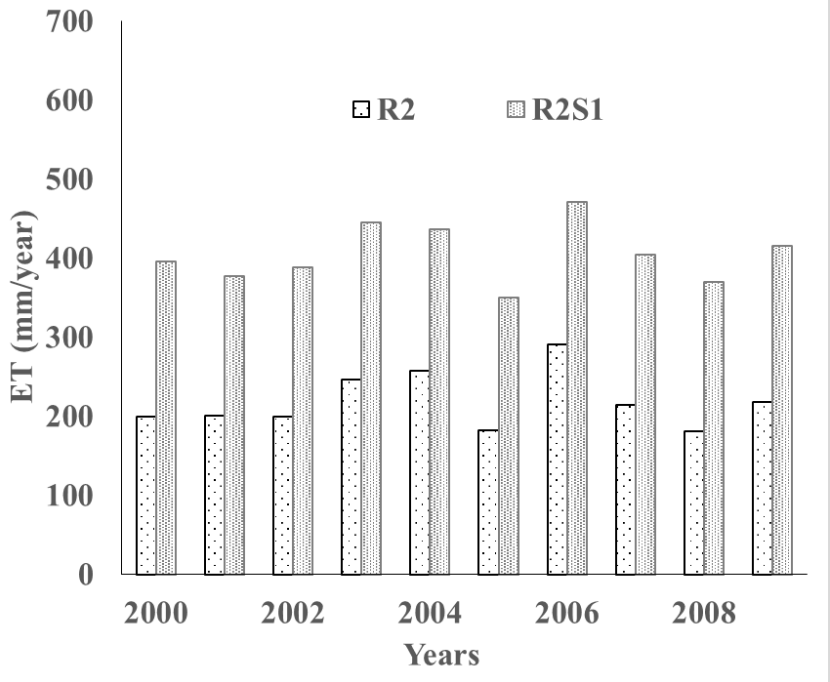

Figure 9 Comparison of ET simulations for cropland during 2000-2009 under the R2 and R2S1scenarios

We also updated description of this figure as follows:

"We further compared simulated annual ET in the R2S1 and R2 scenarios (Figure 9). We observed low cropland ET in the R2 scenario relative to the R2S scenario. Specifically, when irrigation was included in our simulation, SWAT ET estimates increased by ca. 85%. The comparison demonstrated that inclusion of irrigation schemes achieved better estimates of water losses during irrigation, and contributed to enhancing streamflow simulations (Figure 6). In addition to magnitude, the irrigation scenario (R2S1) also simulated well interannual variability of ET, as evidenced by the high coefficient of determination in the scatter plot against ET estimates based on remote sensing data (Supplementary Material Figure S2)."

Point #11

It will be more interesting if the authors can distinguish the irrigated and dryland agricultural land uses in the watershed. Hope this suggestion may help in your future studies.

Response: We agree with the reviewer that more irrigation information should be included in our future work to constrain uncertainties in this work. We added following information to section 4.3 to highlight this point.

"…..incorporating additional reservoir management and irrigation information. …. In addition, model representation of water use for irrigation should be improved in the future. Note that model performances of the R2S1 scenario were not substantially improved relative to the R2 scenario. The irrigation operation scheme that used surface water as the single source may have introduced uncertainties to streamflow simulations, since groundwater is also an important water source for irrigation, particularly in dry years in the YRB. Future simulations need to incorporate explicit irrigation information about irrigated areas, the source, amount, and timing of groundwater withdrawals into hydrologic modeling to better simulate agricultural hydrology**"**