Reviewer's Comments on

Simulation of hydrological processes in the Zhalong Wetland within a river basin, Northeast China (X. Q. Feng, G.X. Zhang, and Y. Jun Xu)

General comment: This paper presents a hydrological modelling application. The emphasis is mainly on results rather than describing the modelling approach of wetlands and although there seems to be a fair amount of calibration parameters they are unfortunately not adequately discussed. Morevover, the paper does not provide enough information on the calibration procedure. Although it is a relevant paper, it would greatly benefit of an upgrade based on the following comments.

Abstract :

1 Introduction :

The introduction is clear, but I am not sure the authors can say that hydrological modelling is the only way to understand wetlands (line 20 p.14037), they should never forget that field data is always welcome to corrborate the concepts supporting the modelling exercise (line 15 p.14038)…

2 Zhalong Wetland

2.1 Description of the study area

Is the word « rolling » (ligne 4 p. 14039) appropriate? Please substantiate the following statement with numbers: « Annual streamflow of the study area decreased since 1970s, affected by the climate change and the human activities ».

2.2 Hydrological characteristics of the Zhalong Wetland

This section is complete, I have no comments.

3 Materials and methods

3.1 Data acquisition

(Ligne 3 p. 14041): Can a 30-m resolution DEM be qualified as a « High resolution Digital Elevation Model »? I do not think so.

3.2 Development of the wetland module in SWAT

(Ligne 15 p.14042): Is the modelling work inspired by other studies? As we know SWAT provides a modelling framework for wetlands.

3.2.1 Partition of the hydrological units

No comment.

3.2.2 Treatment with wetlands

There is not any reference citations in this section, this is strange, Do the authors use the wetland equivalent concept to conduct their modelling exercise? I would assume they do, but unfortunately there are silent about it.

How do you estimate the depth of a wetland (ligne 15 p. 14043) (« Individual wetland water area, water depth and storage were determined by the DEM and ArcGIS analyses »). This is too vague, please further detail your modelling approach and parameterization framework.

(ligne 21 p. 14043) « A parameter was used to determine the proportion of the open wetland and closed wetland in the RHU wetland », How did you determine this parameter?

(ligne 22 p.14043) " The open wetland was defined as having an outlet and would spill when the storage of the open wetland exceeded a spillage threshold that was equal to a fraction of total storage without an outlet". How did you estiamte this fraction?

3.2.3 Water balance calculation

(ligne 12 p.14044) « Water flows were routed into wetlands through drainage channels, using a user-defined fraction of inflows ». How did you estiamte this fraction?

(ligne 5 p.14045) How did you calculate the « outflow coefficient »?

4 Model calibration and validation

(Ligne 15 p.14045) What do you mean by : « and the confirmations of wetland-related parameters »?

(Ligne 19 p14045) « confirmed by ARCGIS spatial analysis of high resolution DEM ». How did you do that?

The rest of this section is fine.

5 Results and discussion

5.1 Goodness of fit of the model

(Ligne 10 p.14047) « Overall, the model better simulated the streamflow in the Zhalong Wetland, and would be a useful tool for the hydrological study in data-limited wetlands ». Better than what?

(p. 14047 dernier paragraphe) The authors refer to one or other applications. This is not clear, please provide further explanations and/or details…

There is not any figure supporting the validation exercise, this is a weakness of the paper. Please provide this figure.

5.2 Temporal change of open water area and storage

(Ligne 1 p.14048) « Comparing the simulated water area with the results of image interpretation (Zhao et al., 2009; Gong et al., 2010; Tong et al., 2008), there were less differences in the water area ». This is not clear, please provide more information. Is there a satellite image backing up this statement, please provide further details.

5.3 Dynamics of outflow in the Zhalong Wetland

No comment.

5.4 Variation of water depth in wetlands

Figure 7, I think there is a need to comment the variaitons between subwatersheds. Why are not the results of SUB8 as good as the others?

6 Conclusion

(ligne 14 p.14050) « In this study, a wetland module was developed and incorporated with the SWAT model… ». Please provide a figure illustrating the flowchart of the wetland module. This description falls short and leave the readers with too many unfulfilled descriptions that strongly weakens the paper.

(ligne 20 p.14050) « The simulation results show that model with the modified module has a good performance in simulating wetland hydrological processes ». The authors should also specify that the model did not perform well for the validation exercise.