

Interactive comment on “Simulation of hydrological processes in the Zhalong Wetland within a river basin, Northeast China” by X. Q. Feng et al.

Anonymous Referee #1

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GENERAL COMMENTS:

The paper describes a model simulating hydrological processes in Zhalong wetland, Northeast China. The model takes into account flow exchanges between wetlands and its riverine network, and uses a modified module in the SWAT model to describe further processes within wetlands in the simulation. At the present state the paper represents a fair contribution to the scope of HESS, a good scientific approach and use of available methods, and a fair presentation of the scientific results. Given the scope of HESS, this paper will greatly benefit from a clear and concise discussion of how

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the hydrological processes studied interacts with some physical, chemical, biological and/or societal processes. Also, some specific and technical details should be revised before publication of the final manuscript.

SPECIFIC COMMENTS:

In the abstract open water should not be presented as a key hydrologic process. In the introduction and conclusions the authors claim that: “..the modeling system provides the basis for future assessment of ecological water requirements and effective river water diversion..”. It is not clear from the results and discussion section how or why. This point should be addressed by the authors in a more concise way. This will help to improve the manuscript considerably and will help it make more compatible with the HESS scope.

Paragraphs 1, 2 and 3 in the introduction are not connected properly making it hard for a fluid reading. The use of appropriate transitions with connective on words is suggested. In section 2.1 authors mention the importance of Zhalong wetlands in the well being of some endangered crane and waterfowl species. It would be important to mention some examples and if possible references that link the well being of these species with the wetland habitat. That will help to build a stronger case supporting the ecological management of the area.

It's not clear in section 2.1 what is Z_c ; It is not properly defined anywhere. Furthermore, it should be considered the importance of presenting that value given that the references from where these values were taken are already in the text.

In section 3.2.1 the authors claim that some inconsistencies between actual manual defined boundaries did no significantly influenced the hydrological simulation. This point should be explained better. It's not clear why or how.

In section 3.2.2 at the end of the second paragraph, it is stated that open and closed wetland gain and lose water in the same manner. However, previously it is stated that

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closed wetlands do not have outlets, meaning that there are no outflows. Then, this last sentence is somehow confusing.

In section 4, second paragraph authors talk about the sensitive parameters used in the model. These are presented as notations and are only defined in table 1. They should be also defined in the text or be mentioned right at the start of that sentence that they are defined in table 1.

In section 5.1 it is stated that: "...the model better simulated the stream flow in the Zhalong wetland, and would be a useful tool for the hydrological study in data limited wetlands". It is not clear how this can be useful. Some explanation and some references may help support this claim better. In addition, the connection between second and third paragraph can benefit from a better transition.

In section 5.2 author's state: "...Time synchronization of the maximums reveals that the closed wetlands play a key role in the expansion of open water area and storage". This claim should be explained in more depth.

In section 5.2 in the last sentence, the authors make reference to the 21st century as a particular point in time. It is recommended to mention a specific year, since 21st century could be very subjective.

Throughout different passages on different sections the authors make reference to the rainy season and make important statements explaining the hydrological behavior of the system. A proper definition of the rainy season (perhaps in section 2.1), in terms of quantity and timing would help to back those claims.

The conclusions are well structured and presented. However, attention should be paid to the claims suggesting the importance of the results in the sustainable management of the wetland. This again should be discussed in more depth in order to properly conclude in this subject.

There are some references missing that will help to support some important claims

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made by the authors: - First line in intro (p. 14036) - First line in section 5.4 (p. 14049)
- Third sentence in second paragraph, section 2.1 (p.14039): "Soils in the Zhalong Wetland is..."

- Before last sentence in third paragraph, section 2.1 (p.14039): "Multi-annual means evaporation..."

TECHNICAL CORRECTIONS:

- Last line, third paragraph of introduction: a useful.../ better use: an useful. - Before last sentence, third paragraph, section 2.1: Multi-annual means evaporation.../better use: Multi-annual mean evaporation.

- Last line, third paragraph, section 2.1: affected by the climate.../ better use: affected by climate.

- Fourth sentence, first paragraph, section 3.2.1: inconsistency/ better use: inconsistency.

- Last sentence, first paragraph, section 3.2.2: attributing/ better use attributed. - Before last sentence, first paragraph, section 4: Parameters...was determined/ better use: Parameters...were determined.

- Last sentence, first paragraph, section 5.1: ...be a useful tool/ better use: be a useful tool.

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