

## ***Interactive comment on “Assessing water footprint of wheat production in China using a crop-model-coupled-statistics approach” by X. C. Cao et al.***

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The authors are grateful to you for your useful review on our manuscript. The following text gives point to point responses to your comments.

Response 1: Two reasons determine that it is impossible to get the location of all irrigated wheat accurately. Firstly, obtaining the latest and high-precision map of the irrigated land is quite difficult; secondly, and which is more important, crops cultivated in the land equipped irrigation may not be irrigated crop. We have investigated almost all of irrigation districts possessing statistical data. Other irrigated areas have no reliable

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first-hand information. In addition, the typical irrigation districts investigated are the largest irrigation districts in each province and most of the cereals were produced in these districts. So we use data collected from typical irrigation districts to present all the irrigated wheat in every province. Weather data of irrigated and rain-fed land is conducted separately. The location of irrigated weather stations is determined by the location of irrigation districts. And the rain-fed crop is assumed to be distributed randomly. Weather data is used by arithmetic average method.

Response 2: Actually, we haven't assumed that the irrigated wheat grows with no water stress. If that were the case, there was no need for collecting the irrigation amount from irrigation districts. Instead, both the cases (with water stress and without water stress) are considered and actual water consumption estimated in this study. The computational process is illustrated by equation (1) to (10) in the manuscript.

Response 3: 1) We don't agree with the sentence 'the green water footprint is controlled by potential ET and effective precipitation, so the green water footprint should be similar'. The green water footprint does not always be similar due to the spatial difference of precipitation, effective precipitation and crop yield.

2) About Figure 5. Figure 5 describes water footprint for per kg of wheat product. Green water footprint for per kg of wheat product is determined by green water (GW) and crop yield. The precipitation in southwest provinces (such as Yunnan, Guangxi and Guizhou) is rich, while crop yield is only about 1.0 to 1.5 ton/ha. National crop yield is 4.7 ton/ha in the study.

Response 4: Many thanks for your advice! We apologize for the poor quality of the language. The new version of the paper will be revised by a specialized scientific translator in order to reach the HESS quality standard.

Response 5: Many thanks for your suggestion. Agree with you. We also deem that the title should be changed.

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Response 6: Thank you very much for your approval of the method to estimate blue water footprint in this study.

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