

Interactive comment on “A dataset of distributed global water withdrawal from 1960 to 2017” by Denghua Yan et al.

Denghua Yan et al.

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Comments and Suggestions for Authors I carefully read the paper by Yan et al.. This paper appeared to be particularly clear, well written and easy to follow. Scope and objectives are stated clearly, the description of method is systematically, and the presentation of results is rather straightforward. They describe the method of obtaining the water withdrawal with high resolution in the world from 1960 to 2017, also provide the first global water withdrawal data set that would hopefully be applied in future. I appreciate this kind of study on the relationships between global water withdrawal and land use. The authors highlight the following points from their results: 1) The need and importance of water withdrawal in the world; 2) The product set enhance the accuracy and spatial variability of water withdrawal data; 3) The product set can reflect the

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space-apace changes of water withdrawal. Overall, I consider that, after revisions, this paper has the potential to become a timely and welcome addition to the literature.

Point 1: Line 16-17: I think it is necessary to indicate the resolution of the dataset in abstract. Response 1: The spatial resolution of the dataset is $1\text{km} \times 1\text{km}$. Based on the comments, we will introduce the resolution in abstract in subsequent amendments.

Point 2: Line 23: Please refine the definition of water withdrawal and unify the use of 'water withdrawal' in the manuscript. Response 2: Based on the comments, we added the definition of the water withdrawal. According to the comments, we have added the definition of water withdrawal, which refers to the amount of water used by water users. Water is usually provided by the water supply unit or it can be obtained by water users directly from rivers, lakes, reservoirs (ponds) or underground

Point 3: Line 30: Change the word "account" to "accounts". Response 3: We have modified it based on comments.

Point 4: Line 38-41: Please rewrite this sentence to clarify the disadvantages of traditional methods. Response 4: The traditional water withdrawal evaluation usually takes the country as the minimum administrative unit and fails to reflect the exact geographic location where the water withdrawal occurred.

Point 5: Line 45-46: In abstract: "... regional or national governments and interpolating and extending them to specific land uses will maximize data accuracy", this sentence is the premise of the manuscript, should explain it in detail in the introduction.

Response 5: Traditional data often only considers administrative units, and this study considers not only administrative units but also actual land use. Therefore, appropriate methods are needed to modify the data and distribute them to the corresponding spatial location. Thank you for your comments, we will explain it in detail in the subsequent amendments

Point 6: Line 47-48: There are some speculations in these sentences. Please add relevant references.

Response 6: Based on comments, we have added relevant references. Point 7: Line 71-72: "...using EXCEL or MATLAB", please describe briefly the difference between the two software. Also, the version of the software should be mentioned.

Response 7: In the study, the version of EXCEL is 2013 and the version of MATLAB is 2018. In the study, we used two kinds of software. We converted the data processing methods to



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EXCEL, and uploaded it to the database. Point 8: Line 87: The source of Globeland30 should be mentioned in the manuscript. Response 8: The Globeland30 data is provided by the National Geographic Information Center. We have also uploaded specific artificial surface and cultivated land data to the database. Point 9: Line 95-101: Also, there are some speculations in these sentences. They should be supported by reference. Response 9: Based on comments, we have added relevant references. Point 10: Line 102: This part is the key to the manuscript. I recommend to add it to Figure 1, which could facilitate further understanding of the choice of data interpolation method. Response 10: In fact, these data processing methods are all reflected in Figure 1, but Figure 1 is too simple at present, and we will enrich Figure 1 according to your comments. Point 11: Line 174: If I get through it well, the artificial surface part represents industrial and domestic water, and cultivated land represents most agricultural water, while this part still needs to add references to support your manuscript. Response 11: Based on comments, we have added relevant references. Point 12: Line 192-205: The comparison is not intuitive between the two pictures. I recommend keeping the division interval of the two figures consistent, so that the reader can intuitively learn the advantages of the new spreading method. Response 12: Thank you for your comments. We will modify the division interval of the legend according to the comments. Point 13: Line 204-212: In this part, I can't distinguish whether the author only verified these two countries or use these two countries as examples for research. Response 10: In this section, we mainly verify our data processing methods. In fact, we have carried out detailed data calculations for each country. Due to the excessive number of countries, we have uploaded specific data processing files to the database. Point 14: Line 220: Also, I'm not sure if the units in Figure 4 are correct. The manuscript mentions that the fitted water withdrawal differs from the official data by less than 10%, but it looks less than 0.25% in the figure. Response 14: We have mistaken the ordinate unit in the first draft. The unit should be "1", not "%". Actually, the fitted water withdrawal differs from the official data by less than 10%.

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