

Interactive comment on “Multi-source global wetland mapping: combining surface water imagery and groundwater constraints” by Ardalan Tootchi et al.

Anonymous Referee #2

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This manuscript develops several candidate global wetland maps by combining various published maps as well as a few new Topographic (Wetness) Index based maps. It finds that the total wetland extent varies widely depending on the combination chosen.

Main comment:

I commend the authors on a great deal of GIS data processing, but I struggled to identify a hypothesis or main insight from this study. This study appears not so much intended as a scientific study but rather a mapping effort. In that case, there should be an independent validation effort to determine the accuracy of the derived product.

Evaluation of the mapped wetlands is done using the maps produced by Lehner & Döll

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(2004) and Hu et al. (2017). It is not explained why it would be reasonable to put more faith into those mapping efforts than in any of the other, in other words, why they would be a suitable reference ‘truth’. If all their data is of better quality, then why not just use it instead?

This study does need more robust validation using higher quality wetland mapping. One possibility is that some of the data used in the Lehner & Döll (2004) mapping are of much higher quality than the candidate data sets, but this is not discussed. If so, then validation and accuracy assessment may be possible for those selected regions where such more accurate mapping is available.

Another possibility would be to create generate a stratified randomised sample of locations in different probability classes and use very high-resolution imagery (e.g. Google Earth) to visually develop a validation data set. This type of validation effort is fairly standard for mapping studies, but it may not always be easy to identify wetlands from high-resolution imagery or even photos.

Using the results from such a validation, you might be able to assign a qualitative weighting to the candidate maps and merge them into a single global map of wetland probability.

In summary, as a data production effort, this manuscript does not help to reduce inconsistencies between existing mapping efforts. Without a thorough validation and accuracy assessment, it does not provide a demonstrable advance.

Other comments:

1) I don’t understand the meaning of the word ‘scattered’ groundwater wetlands. P3, l38 suggests the two classes are complementary yet intersect. This cannot both be correct in the formal sense, and indeed they are not complementary. What about irregularly flooded wetlands, flooded groundwater wetlands, contiguous groundwater wetlands, scattered flooded wetlands, etc? In other words, the conceptual classification

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framework needs more thought. A broader distinction between surface water- and groundwater-dominated wetlands might work better, for example.

2) The language needs more work. It is sometimes incorrect, sometimes imprecise or ambiguous. Incorrectly used or imprecise words used include: massive, detecting, pretty, players, popular, believed, replica, patches. The grammar is also lacking in places and needs checking (e.g., “in the high end”, “In latter”, “Back to”

3) P4,l18 – pls describe what data sets there are and how you know that they are not significantly different.

4) p4,l30 - Pls describe what method is used to delineate wetlands in the ESA-CCI product.

5) p4,l35 and further on – journal may not accept a reference in a section header, even less so if you don't repeat it in the main text.

6) p9,l34 – sound circular to me, pls explain if it isn't.

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