Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2018-48-RC1, 2018

Hydrology and Earth System Sciences
Discussions
Open Access
EGU

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

Anonymous Referee #1

Received and published: 9 March 2018

The manuscript by Tootchi et al describes a series of methodologies used to develop a global wetland dataset to be used for hydrologic and biogeochemical studies. The manuscript and methodology is presented in some detail and is thus straightforward to follow. The challenge of mapping wetland area comes down to inadequacy of a single dataset, problems with definitions, and the issue of double counting, see (Poulter et al. 2017). The authors address the first challenge by using the state of art datasets, although they miss the important contribution of SWAMPS (Schroeder et al. 2015), which should be referenced for completeness. However, I have concerns on the definition of wetland and whether their final product may continue the issue of double counting.

Printer-friendly version

Discussion paper

The main confusion I have is on the author's use of the JRC inland waters dataset. It appears that the authors have used the JRC inland waters to add in these features that are between 30 meters and 10 hecatares in size, and with HydroLakes being used to mask inland waters larger than 10 ha. Thus the authors final product includes rivers, ponds and small lakes. These are not vegetation wetlands and have a very different hydrologic and biogeochemical role than vegetated wetlands. The author's objective described in the Introduction is to map vegetated wetlands, and thus the inclusion of JRC inland waters was a source of confusion to me and seems inappropriate.

Thus the author's wetland area estimate is far higher than most of the existing literature except one recent paper (Hu 2017) which claims 'wetland potential' is $\sim$ 29.8 Mkm2. It is difficult to be convincing that there are > 10 Mkm2 land areas has not been detected and captured by previous studies from satellite observations and inventories unless the authors provide regional validations, especially for the regions that are not covered by previous studies.

Minor The Introduction should not cite Prigent in the discussion of L-band applications of radar – their products are C band or short wavelengths.

A regional validation for Amazonia is needed as this is the largest wetland regions in the world and there are several regional datasets can be used for validation, e.g., work of Melack, Hess and others using PALSAR

The Hu (2017) map in Figure 10 seems has some artificial barriers. Why is that? Have you considered it in your comparison or validation?

Poulter, B., P. Bousquet, J. G. Canadell, P. Ciais, A. Peregon, M. Saunois, V. K. Arora, D. Beerling, V. Brovkin, C. D. Jones, F. Joos, N. Gedney, A. Ito, T. Kleinen, C. Koven, K. McDonald, J. R. Melton, C. Peng, S. Peng, C. Prigent, R. Schroder, W. Riley, M. Saito, R. Spahni, H. Tian, L. Taylor, N. Viovy, D. Wilton, A. Wiltshire, X. Xu, B. Zhang, Z. Qiuan, and Z. Zhang. 2017. Global wetland contribution to 2000-2012 atmospheric methane growth rate dynamics. Environmental Research Letters 12:094013.

Schroeder, R., K. C. McDonald, B. D. Chapman, K. Jensen, E. Podest, Z. D. Tessler, T. J. Bohn, and R. Zimmermann. 2015. Development and Evaluation of a Multi-Year Fractional Surface Water Data Set Derived from Active/Passive Microwave Remote Sensing Data. Remote Sensing 7:16688-16732.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2018-48, 2018.

Printer-friendly version

Discussion paper