Comment on essd-2022-138

Anonymous Referee #1

Referee comment on "GLOBMAP SWF: a global annual surface water cover frequency dataset during 2000–2020 for change analysis of inland water bodies" by Yang Liu et al., Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2022-138-RC1, 2022

Interesting paper with an approach to surface water detection globally. In general, the method works and generates results that are compelling enough to consider. However there are many significant holes in the logic that were not tested (or not proven) by the authors which could have significant impacts on their results and conclusions. Overall, much more detail is needed in the descriptions of how conditions (I noted several specific things in my comments below) were handled and tested for validity. While I accept the premise that frequent MODIS observations are an advantage compared to frequency products using Landsat, which was stated by the authors in the introduction, it is still necessary to compare the frequency results from GLOBMAP to one or more of the frequency maps from Landsat (Pekel or Pickens at the very least). The comparisons that were done were with other MODIS derived products. This is ok for a first look but if you are trying to claim that you have a better approach than the Landsat products you must test this and show the results so the reader can decide for themselves. For this paper to be published in context these evaluations must be performed and reported. Beyond that it is important to clarify for the reader how the following things were handled so that the reader can trust the results. How did you delineate the oceans? Where did you cut off rivers where they meet the oceans? How did you handle extensive burned areas globally which would effect your low NIR values?

Line   Comment

50   "Surface water was also mapping" needs revision for English grammar

99   determinate should be determine

101   why did you not use the finer resolution GMTED which was designed for use with MODIS data?

116   the sentence starting with "The cloud, ice…" appears to end abruptly or otherwise be an incomplete sentence

136   all of your validation sites are in the tropics, this is not a best practice. For a global product you need to have validation from northern latitudes as well as mid latitudes to assess performance everywhere

173   If you use MOD09A1 you have a total of 46 possible observations in a year. In most cases at least half (probably more) are not usable due to clouds or other data problems. Using the "six lowest NIR" values, could be that you only have six total observations for a pixel. This is a questionable method for a global product.

194   less than 15 percent or less than 15 count? What do you do in the frequent case where Nland is < 15? In northern latitudes you won't get that many snow free observations, the method seems to ignore the typical case of snow surrounding ice covered lakes.

230   does your definition of intermittent include the fact that high latitude lakes are frozen for a large part of the year? Much more clarity is needed on your definitions.

308   this statement confirms my earlier comments. Many of your assumptions about the availability of clear sky observations are invalid for many places in the world. Unless you provide a companion product describing the per pixel reliability (based on the number of observations available) users are likely to draw incorrect conclusions in many cases.

352   should be Carroll not Carrell

378   for these evaluations to be understood it is essential to know how many clear observations there were in each year. How can the reader know that the variation you are reporting is not simply due to differences in the number of observations for a given year?

395   largest variation by total area or by percent change? Total area would limit this to only very large lakes…