

Earth Syst. Sci. Data Discuss., referee comment RC3
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Comment on essd-2021-140

Anonymous Referee #3

Referee comment on "The Boreal–Arctic Wetland and Lake Dataset (BAWLD)" by David Olefeldt et al., Earth Syst. Sci. Data Discuss.,
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The manuscript addresses the very important topic of estimating the extent of different wetland types in northern latitude regions. As the authors mention, these regions are particularly affected by climate change and accurately estimating the extent of wetland types can help reduce the uncertainty associated with methane emissions, which is currently very high. In summary, the authors produce a state-of-the-art dataset that can be readily used by experimental scientists and modelers from various disciplines. The paper is also well structured and overall easy to follow. I recommend publication after minor revisions, especially given the impact of the work.

The only major point that I suggest the authors is to discuss more thoroughly is the spatial resolution of the dataset. 0.5x0.5 is relatively coarse, while land surface models are now moving towards much finer resolutions. So, I think it would be beneficial to discuss more what were the limiting factors for having to work with this resolution. This might inform next steps that can be taken in order one day have a finer resolution gridded dataset.

I also suggest expanding Table 1. More information could be included in this Table, such as the spatial and temporal resolution of the data sources.

One aspect that could be made clearer is how the expert assessment was integrated with the overall procedure to derive the dataset. How was this information used? For example, it was not clear (at least to me) whether this information was integrated into the modeling or not. The authors could expand a bit section 2.3 and provide more details in the introduction.

Lastly, I wonder what the authors think of other machine learning approaches that can take advantage of relatively high-resolution satellite images (computer visions tasks using

convolution neural networks) and whether these approaches might prove useful to improve spatial resolution and details of BAWLD or similar databases.