

Hydrol. Earth Syst. Sci. Discuss., referee comment RC1  
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## **Comment on hess-2021-330**

Anonymous Referee #1

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Referee comment on "Monitoring surface water dynamics in the Prairie Pothole Region of North Dakota using dual-polarised Sentinel-1 synthetic aperture radar (SAR) time series" by Stefan Schlaffer et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-330-RC1>, 2021

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The authors mapped the open water body in the PPR using SAR images and high-resolution DTM data. Time series of water body maps were obtained and the dynamics of open water bodies were analyzed. Generally, this manuscript is well prepared with good structures and figures. However, I have some major concerns about the current work, as:

- 1) The validation (or accuracy evaluation) of the method. Currently, the authors evaluate the accuracy from a viewpoint of classification, using user accuracy and produce accuracy for the pixels selected. However, as the authors analyzed in section 3.2, what the hydrologist cares about is the number and area of the water body. So, the authors are suggested to validate (evaluate) their method by comparing the area and number estimated from SAR with those from NAIP.
- 2) L332-345, the authors explained the different performances of different polarization combinations. However, this work can be done more physically by introducing the Radar functions. Actually, the authors can start from the radar functions and then build their algorithm on the basis of microwave radiative transfer theory.
- 3) the abstract is too long, please shorten it.
- 4) some figures, like figure 5, are suggested to add scales and the compass. Since not all readers are familiar with UTM(zone 14)
- 5) The authors are suggested to pay attention to the usage of abbreviations, for example, please define GRASS and dual-pol.