

Interactive comment on “Monitoring small reservoirs storage from satellite remote sensing in inaccessible areas” by Nicolas Avisse et al.

Anonymous Referee #1

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The manuscript by Avisse et al. presents a novel approach to derive water level and water storage of small reservoirs based on optical images and DEMs. The methodology is a potentially valuable supplement to satellite altimetry, which traditionally is used for water level estimation and the results presented in the manuscript are promising. The paper is generally well written and well organized. I have some comments that are specified below.

General comments:

Section 2.2.2 that describes the elevation-area relationship needs to be more detailed possibly supplemented with illustrations in the same way as section 2.1 and figure 4 to enhance the understanding. E.g. r^2 is not explained and step 3 is quite vague.

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Please quantify or at least discuss the error on your estimated water levels/volumes.

specific comments:

P 2, l 10-16: The authors mention satellite altimetry. The authors could here mention the newer SAR missions CryoSat-2 and Sentinel-3, which have an along-track resolution of 300 m. The CryoSat-2 mission in SAR mode has demonstrated the potential of monitoring small lakes. Altimetry is not just limited to a few 100 lakes.

Eqn (3): As pointed out in the short comment Eqn (3) does not make sense and yes NRMSE is a good solution.

P 13, l 8-10: "We can see coherent storage variations through the presence of drawdown-refill cycles, which means that the 2D enhancement and 3D reconstruction steps have improved the detection of water and helped to overcome the low Landsat repeat cycle of 16 days." I do not see this connection. How do you see that you improved the water detection when you are not comparing to anything?

P 14, l 1-2. "Some of the differences between our estimates and measured data might then come from the inaccuracy regarding the data collection date". Is this because the in situ data are not daily?

Conclusion/Discussion: You could also mention the potential of Sentinel-1 and 2, which have a much higher resolution than Landsat.

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