

## ***Interactive comment on “Effect of Water Surface Area on the Remotely Sensed Water Quality Parameters of Baysh Dam Lake, Saudi Arabia” by Mohamed Elhag et al.***

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This study develops potentially strong relationships between water surface area and satellite derived water quality indices in a reservoir. However, before the quality of this work can be properly assessed, the manuscript needs a thorough rewrite. There are numerous spelling mistakes and typos throughout the manuscript as well as the frequent use of ambiguous terminology within sentences making it difficult for a reader to follow the study. Acknowledged and improved The authors need to provide additional details, particularly in the methodology and results sections, to demonstrate the importance of this study’s findings as, currently, it appears to be an extension of a previous

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journal publication (Water 2019, <https://doi.org/10.3390/w11030556>). This is exemplified by Figure 1, which is directly referenced from this publication, and the reliance on field measurements collected in the previous study. Suggested areas for additional details are provided in the following sections. Methodology considerations. Were any additional field measurements collected for this study, surface turbidity measurements across multiple sites within a single day would be of particular interest to support any spatial patterns observed in satellite imagery? Please could the authors provide the location of field sampling sites in Figure 1. It will be hard to show 120 sampling sites over the study area, we tried to layover the sampling sites over the study area but the result was a clumping figure of points. If any catchment inflows occurred, data such as particle size distribution, total suspended solids concentration or turbidity of inflow waters would be of great value to support any spatial patterns observed. There was no considerable catchment inflow Please could the authors provide a timeline of changes in reservoir surface area across the image collection period, noting times of any inflow events during this period. There was no considerable inflow Were any water column light profiles collected from this reservoir during the image collection period, this would assist readers understand the variability in the underwater light field. These suggestions are totally irrelevant to the study objectives. The current investigation tackles the changes in the surface area. Results considerations. The central finding of increasing turbidity with decreasing surface area is a little difficult to reconcile with traditional reservoir behaviour where turbid inflows result in riverine sections of reservoirs experiencing higher turbidity during increases in surface area. Were any inflows captured by the satellite imagery, if so what spatial patterns in turbidity were observed? Again, there was not any considerable inflow to support your argument. Besides the dam supports the downward farms regardless of the dam inflow which led to extensive water withdrawn from the dam. Water shortage extends the degradation of the dam water quality. There is no spatial information provided in this work yet this seems to be an important advantage in using remote sensing of water quality, were any spatial water quality patterns observed over the image collection period? There wasn't a significant

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spatial variation to be mentioned, the lake is small to express a spatial trend. Kindly bear in mind that most of the lake now is under siege because of the running war in the south of Saudi Arabia. What are the potential drivers of surface turbidity in this reservoir, in systems that experience extended drawdown conditions wind driven re-suspension of sediments in the shallow edges can be of importance in driving turbidity, could this be a possibility in this reservoir? Along the time frame of the current study, the lake of the dam didn't receive any remarkable inflows which significantly affect the dam water quality. Moreover, the dam supports the downward farms regardless of the dam inflow which led to extensive water withdrawn from the dam. Water shortage extends the degradation of the dam water quality. Please could the authors provide the range of surface nitrogen, turbidity and chlorophyll concentrations observed in the field data, this would help readers that are not familiar with water quality in the study region. Acknowledged and added

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