Earth Syst. Sci. Data Discuss., referee comment RC2
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# Comment on essd-2022-264

Anonymous Referee #2

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Referee comment on "A global long-term, high-resolution satellite radar backscatter data record (1992–2022+): merging C-band ERS/ASCAT and Ku-band QSCAT" by Shengli Tao et al., Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2022-264-RC2, 2022

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This work extended the C-band data set to the previously missing period by rescaling the QSCAT Ku-band dataset during 2001-2007. Data-rescaling was used to unify the backscatter values from different sensors and then the machine learning method was used to address the monthly values differences. This is a quite useful dataset for further detecting forest structure and resilience dynamics. I have some minor comments as below:

To compare the linear regression, CDF and new data rescaling method, the author should compare their performances at global scale, i.e. a map showing the pearson r and RMSE pixel by pixel.

Similar for Fig 4, the author can show the spatial map of the performance of scaled Ku-band and corrected Ku-band pixel by pixel.

It seems that such rescaling method can also apply to other merging tasks. Can you discuss a bit of its potential usage to benefit the big data environmental science field?

The author could include a table mentioning the specific information of available microwave dataset, i.e. their time and spatial coverage, time and spatial resolution, etc, to prove the uniqueness of constructing the time series over non-overlapped period with QSCAT Ku-band data.

As you used the decision tree regression, have you checked whether the over-fit issue exist or not?

For Fig 8, there is large overlap between type 1 and type 2 pixels. If the author just compared the corresponding pearson r values between corrected Ku-band and C-band values to find the appropriate regressor, the type of each pixel can be determined. Why are some pixels assigned by two type?