



Supplement of

A global long-term, high-resolution satellite radar backscatter data record (1992–2022+): merging C-band ERS/ASCAT and Ku-band QSCAT

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Supplementary materials

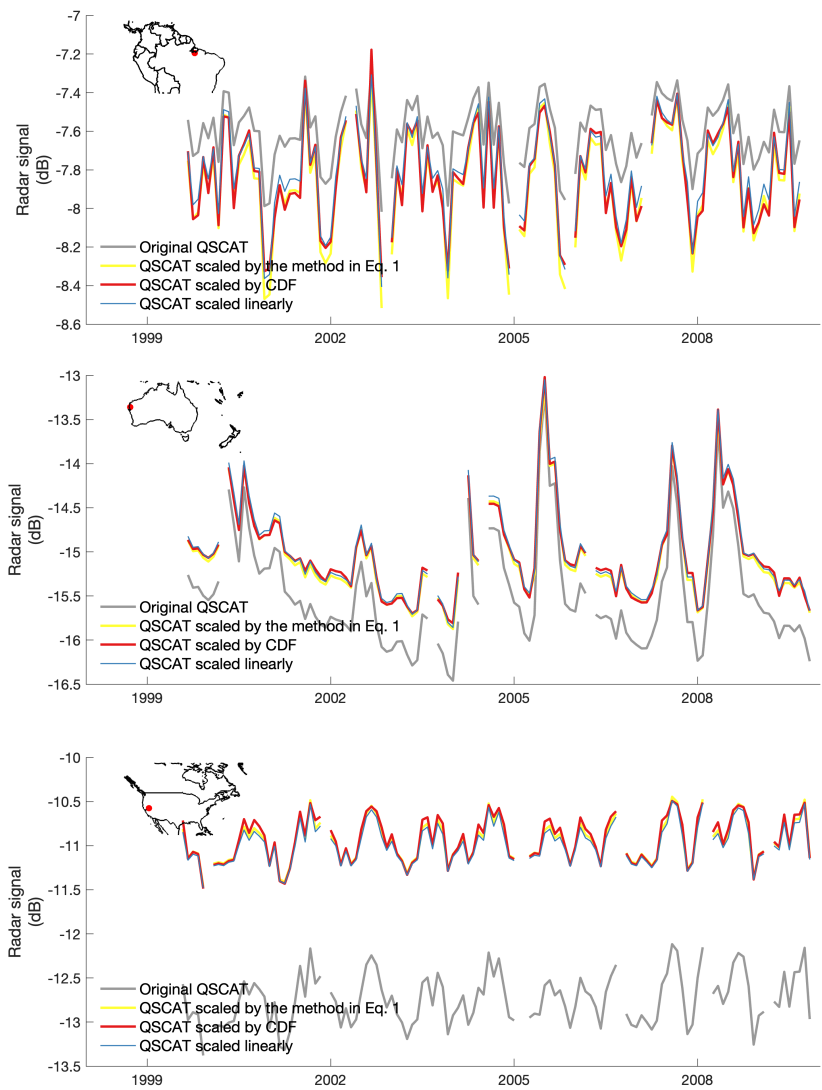
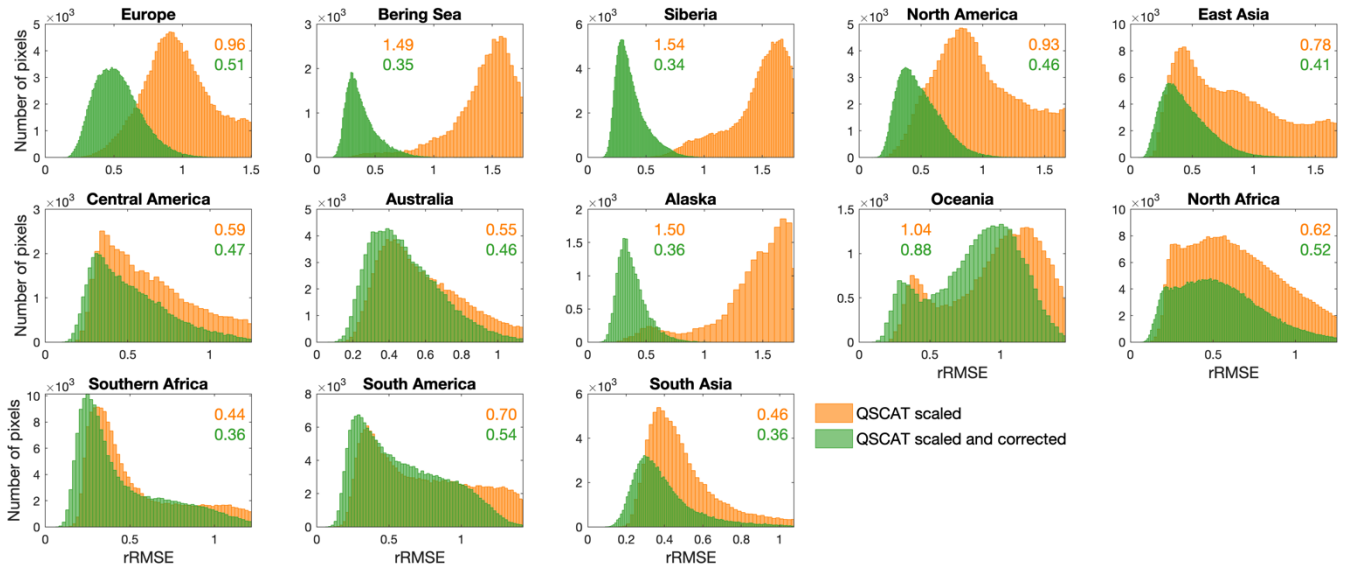
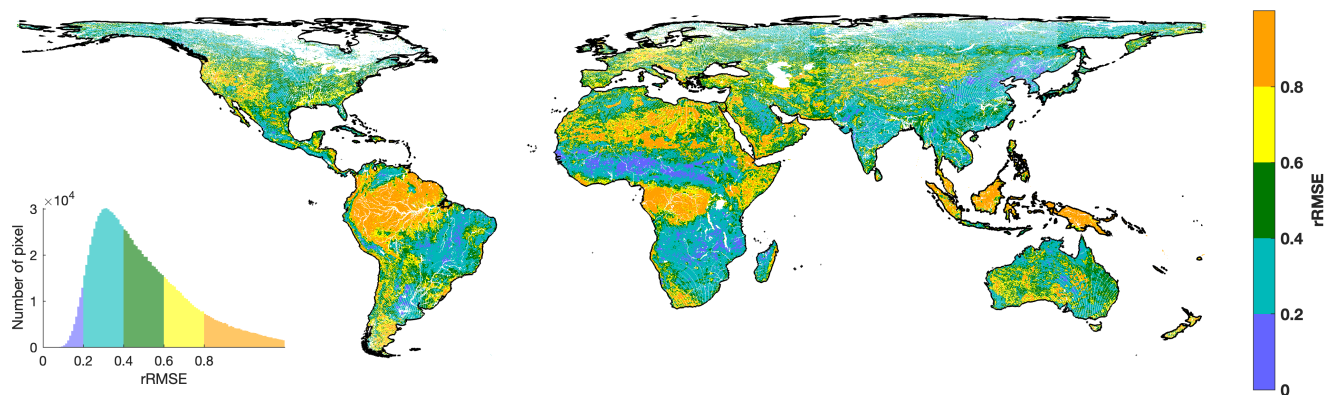


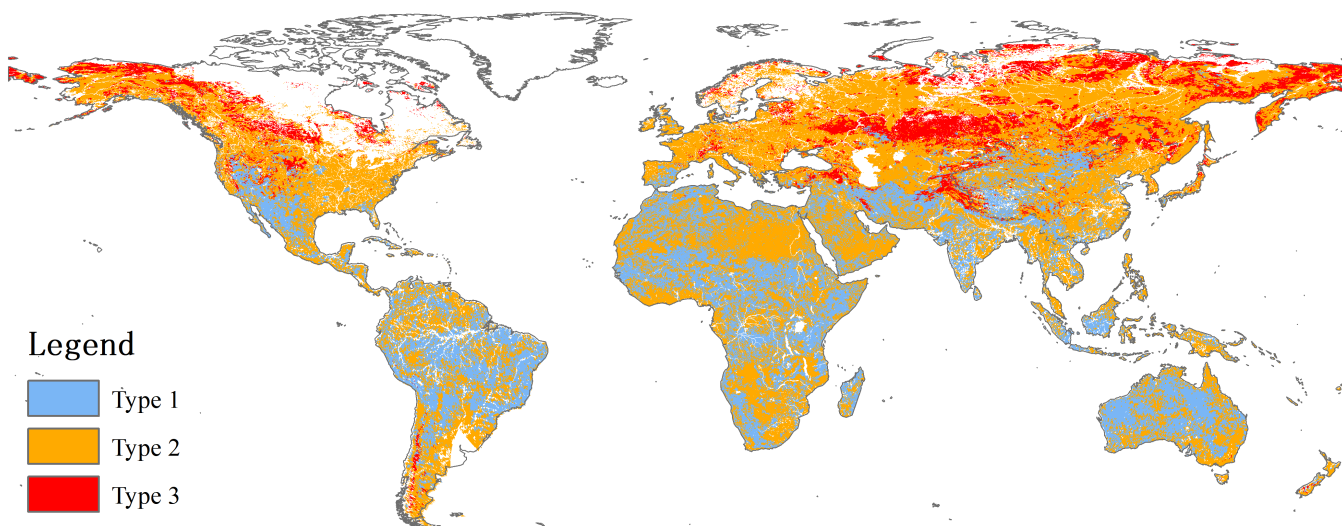
Figure S1. QSCAT signals rescaled by different methods in different locations. In the upper-left corner of each panel, the location of the pixel was shown as a red dot.



10 **Figure S2. rRMSE-based quality assessment of the CScat data set at the pixel level.** Each panel shows the result of one region. Inside each panel, the rRMSE values between the C-band and the scaled Ku-band signals in the overlapping years (1999-2001 and 2007-2009) were calculated for all the pixels in this region and colored in orange. As a comparison, the rRMSE values between the C-band and the corrected Ku-band signals in the overlapping years were also calculated and colored in green. The medians of the rRMSE values are labelled inside each panel.



20 **Figure S3. Spatial pattern and histogram of the rRMSE values between the C-band and the final corrected Ku-band signals in the overlapping years (1999-2001 and 2007-2009).**



25 **Figure S4. Spatial distribution of variable importance for predicting the signal differences between the C-band and the scaled Ku-band signals in the overlapping years (1999-2001, 2007-2009).** The variable importance was calculated from the decision tree regression model by checking the sequence of the predictors used to split the decision tree. For Types 1, 2, and 3 pixels, the most important variables are monthly precipitation, skin temperature, and snow depth, respectively.

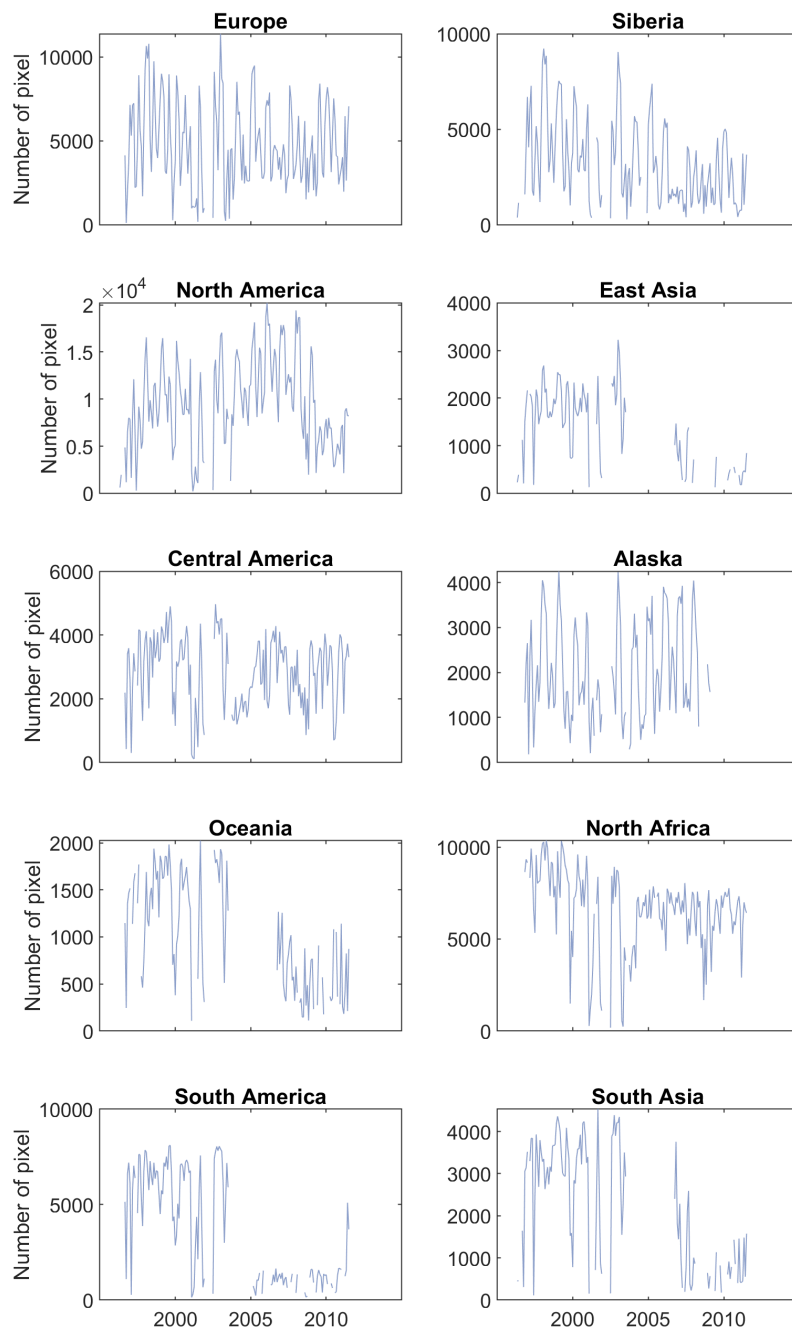


Figure S5. Temporal changes in the number of ESA ERS-2 pixels in different regions.