Supporting Information for Constraining the ocean's biological pump with in situ optical observations and supervised learning. Part 2: Carbon Flux

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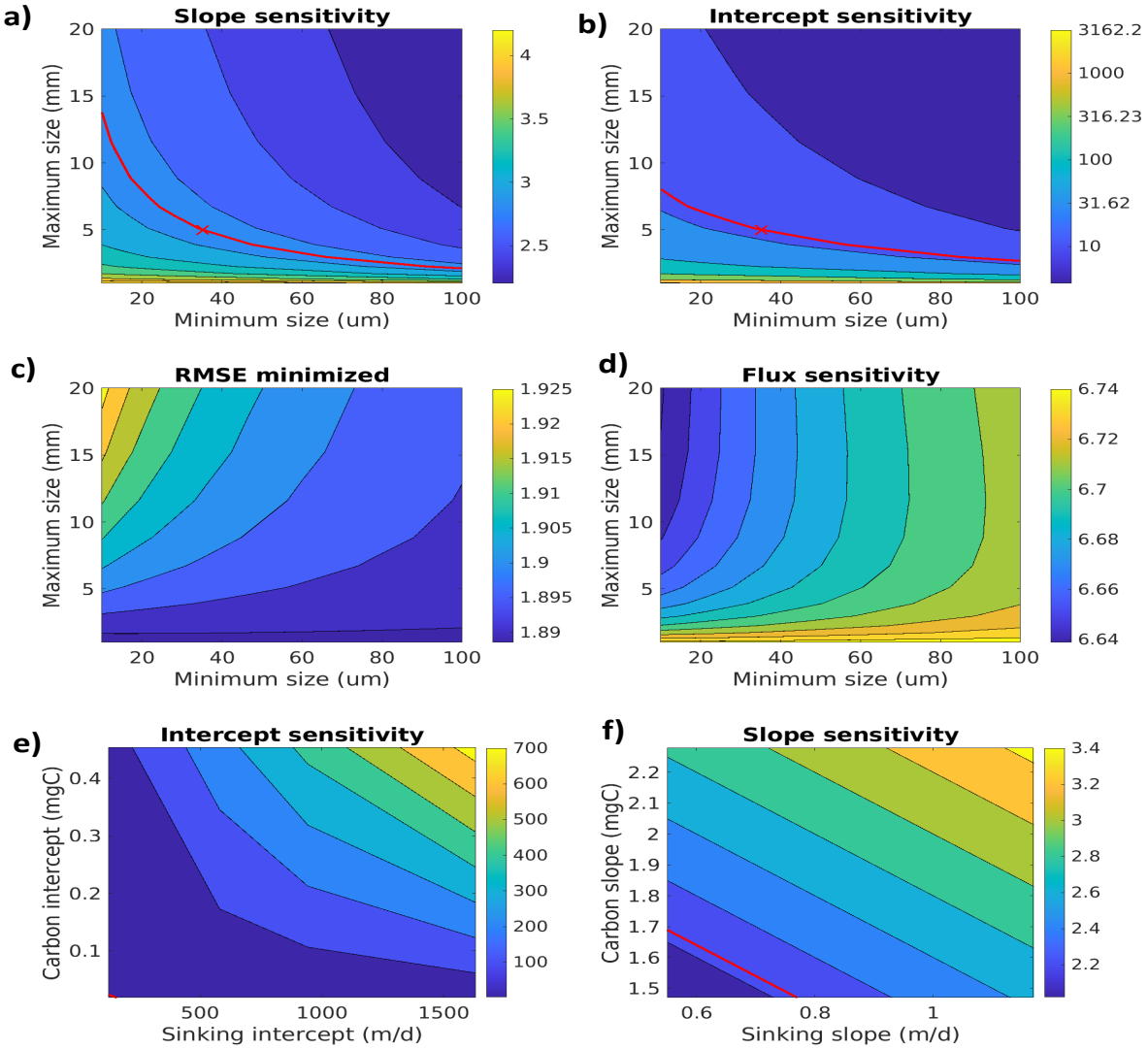

Figure S1. Sensitivity of the sinking carbon parameters based on the selection of the minimum size. (A) Sensitivty of the intercept parameter, red line indicates the value used by this study. (B) Sensitivty of the slope parameter, red line indicates the value used by this study. (C) Contour map showing the changes in the sum of the squared error which set the parameters chosen. (D) Contour map showing the changes in the resulting flux based on the optimized parameters chosen for a given size pair. E-F shows the range of slope and intercept values possible for this size range indicated in Kriest et al. (2002). Red line indicates the values chosen by Kiko et al. (2017)

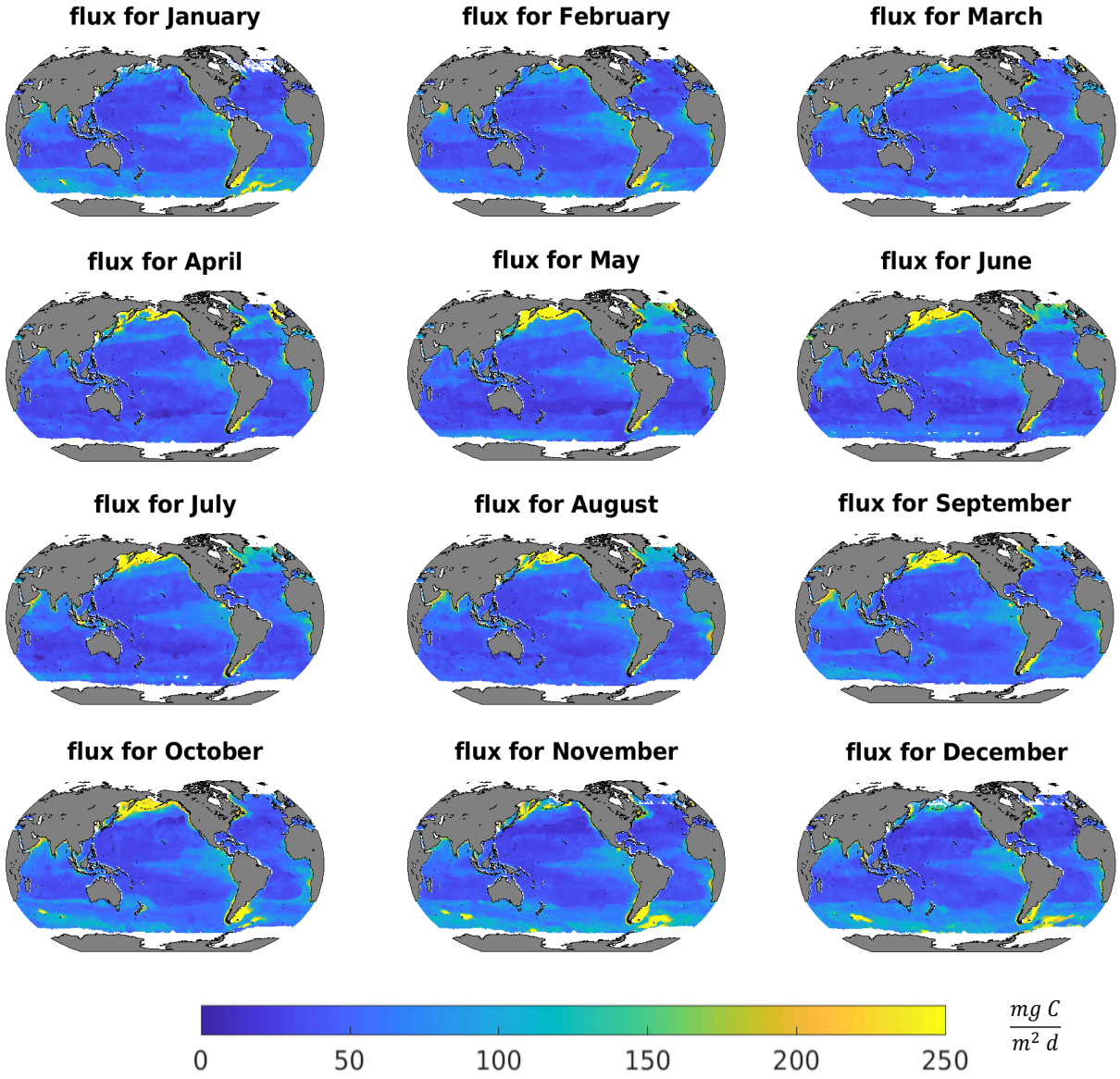

Figure S2. Particulate carbon flux from the euphotic zone reconstructed from the random forest calculations, showing monthly climatologies.

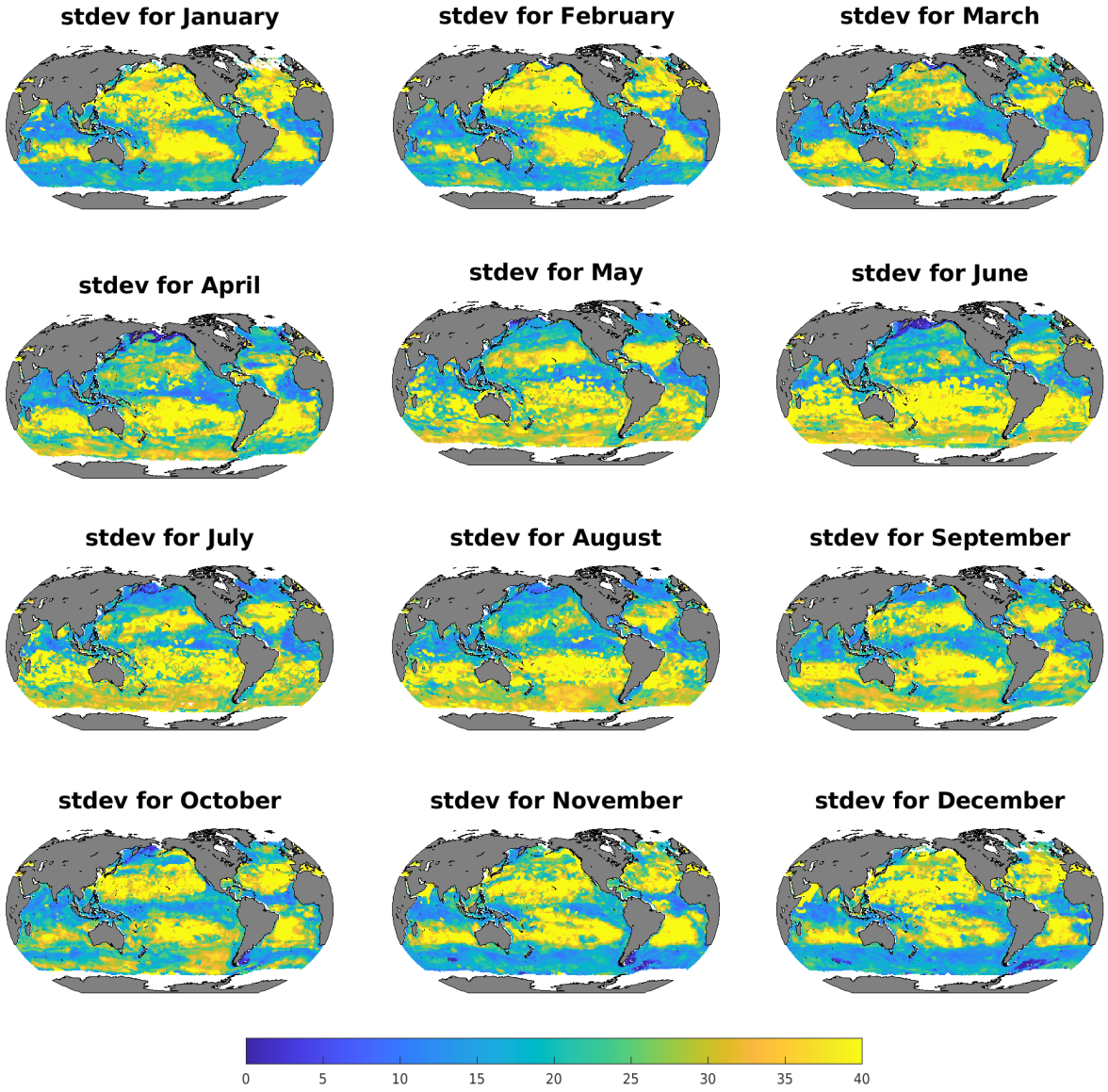

Figure S3. Particulate carbon flux standard deviation from the euphotic zone reconstructed from the random forest calculations, showing monthly climatologies of error. Color bar denotes percentage of error (error/flux).

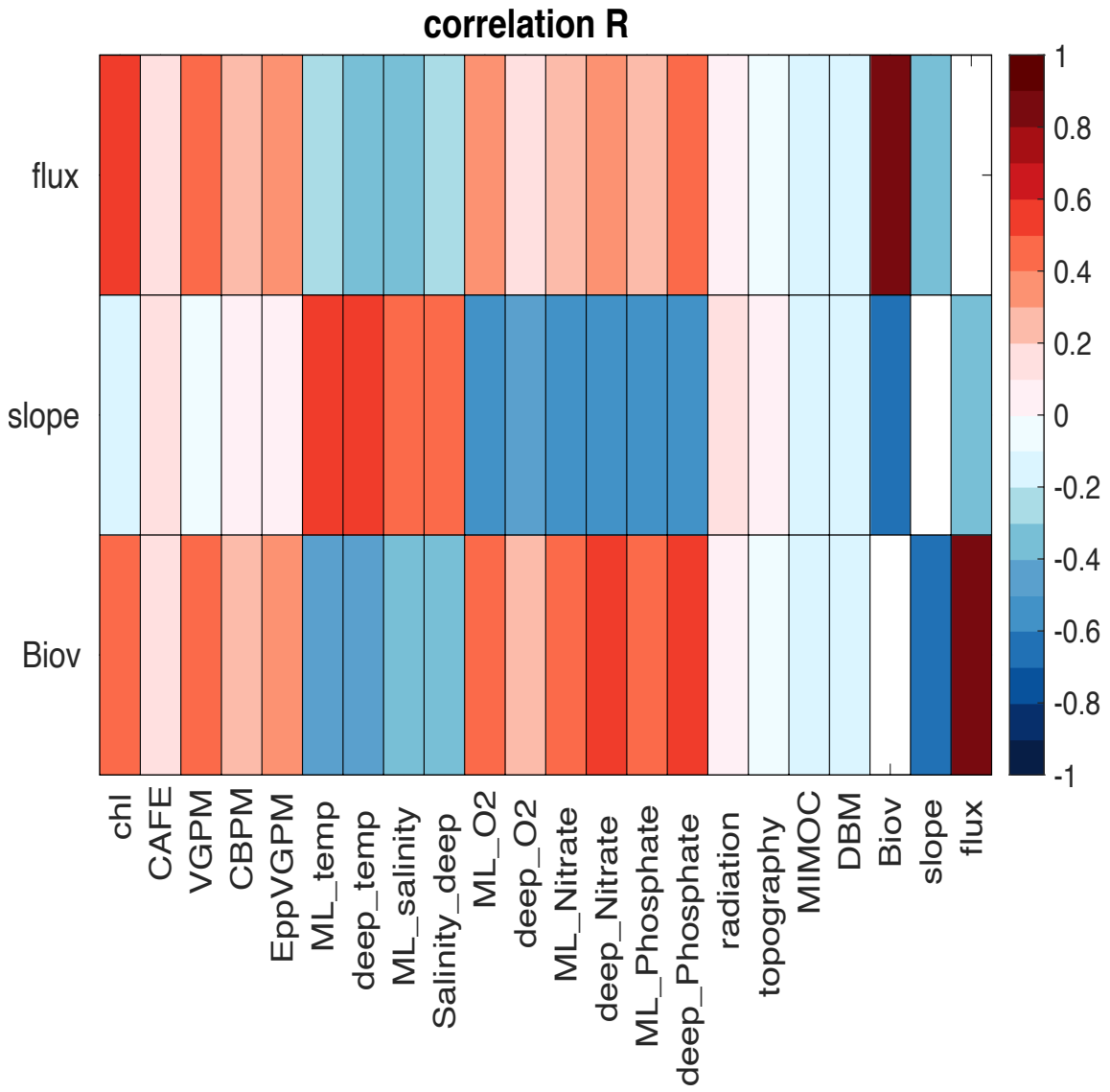

Figure S4. A correlation matrix showing the correlation coefficients (R^2) between each predictor and our three reconstructed variable, the slope biovolume, and flux.

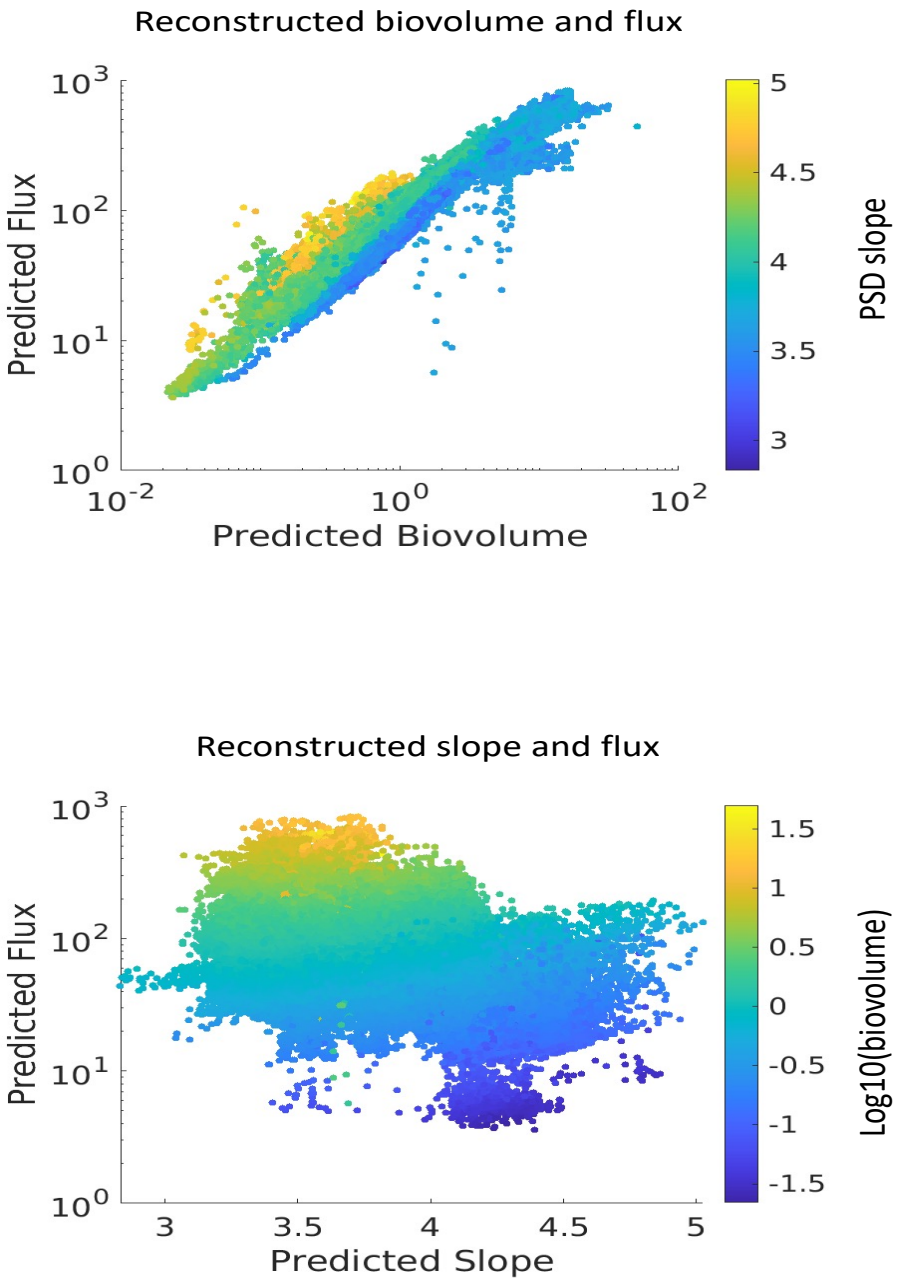

Figure S5. Scatter plots showing the correlation between flux, and the PSD parameters. A) shows the log-log relationship between biovolume and flux, the colorbar shows the associated slope. B) shows the relationship between the log of flux and slope. The colorbar shows the log of biovolume.

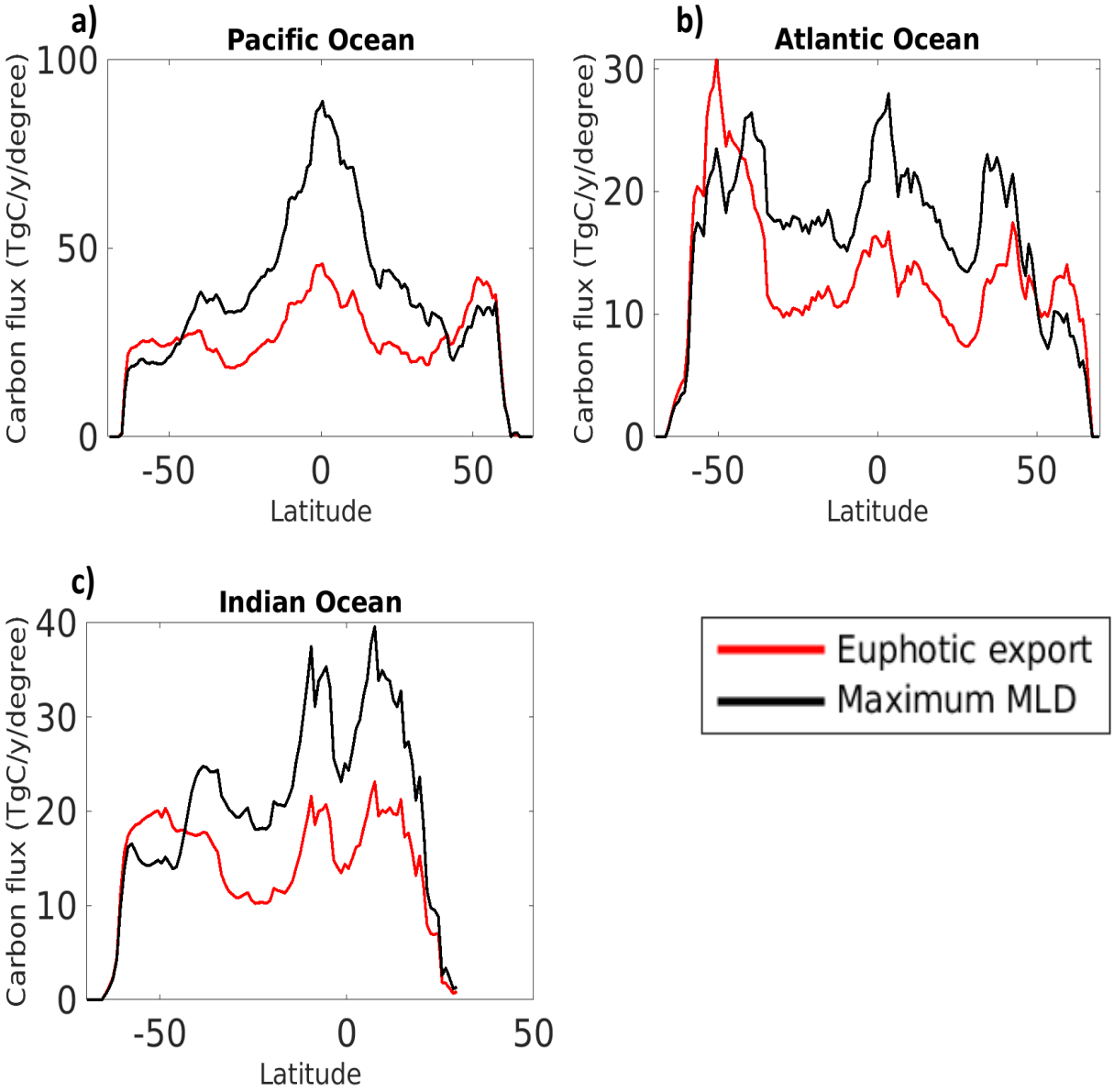

Figure S6. Meridionally averaged export of carbon for each of the three main ocean basins. Black indicated the export from the maximum mixed layer. The red line indicates the flux from the euphotic zone.