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Supplementary Materials

Preferential preservation of pre-aged terrestrial organic carbon by reactive iron in estuarine particles and coastal sediments of a large river-dominated estuary

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Supplementary figures:

Supplemental figures include distributions of salinity and suspended particulate matter concentration (Figure S1), Mössbauer spectra (Figure S2), correlations of the reactive iron and different iron phases (Figure S3), distributions of the fraction of different iron phases (Figure S4), distributions of lignin phenols and lignin degradation indices (Figure S5), correlation of organic carbon versus reactive iron (Figure S6), correlations of the reactive iron with lignin degradation indices (Figure S7) and correlations of the ratio of hematite to (super) paramagnetic Fe^{3+} versus $\Delta^{13}C_{bulk}$ and $\Delta^{13}C_{OC\text{-}FeR}$ (Figure S8).

Supplementary tables (in the supplementary Excel file):

Supplementary tables include bulk parameters (Tables S1 and S2), parameters of OC-Fe_R (Table S3), Mössbauer parameters (Table S4), and lignin phenols and related parameters (Table S5) in suspended particulate matter (SPM) and surface sediment in the Changjiang Estuary and adjacent East China Sea (ECS) shelf.

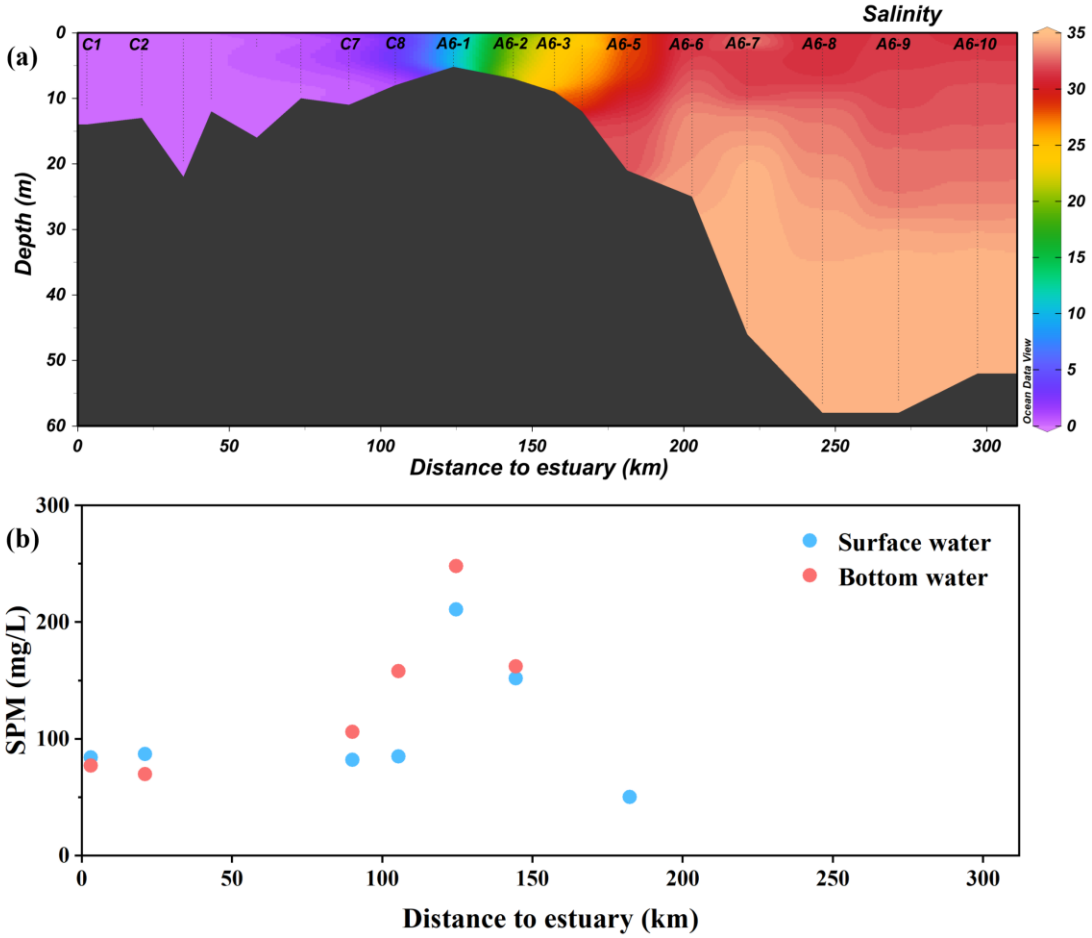

Figure S1. Vertical distributions of (a) salinity and suspended particulate matter concentration (SPM, mg/L) (b) along the river-estuary-shelf transect in the Changjiang Estuary.

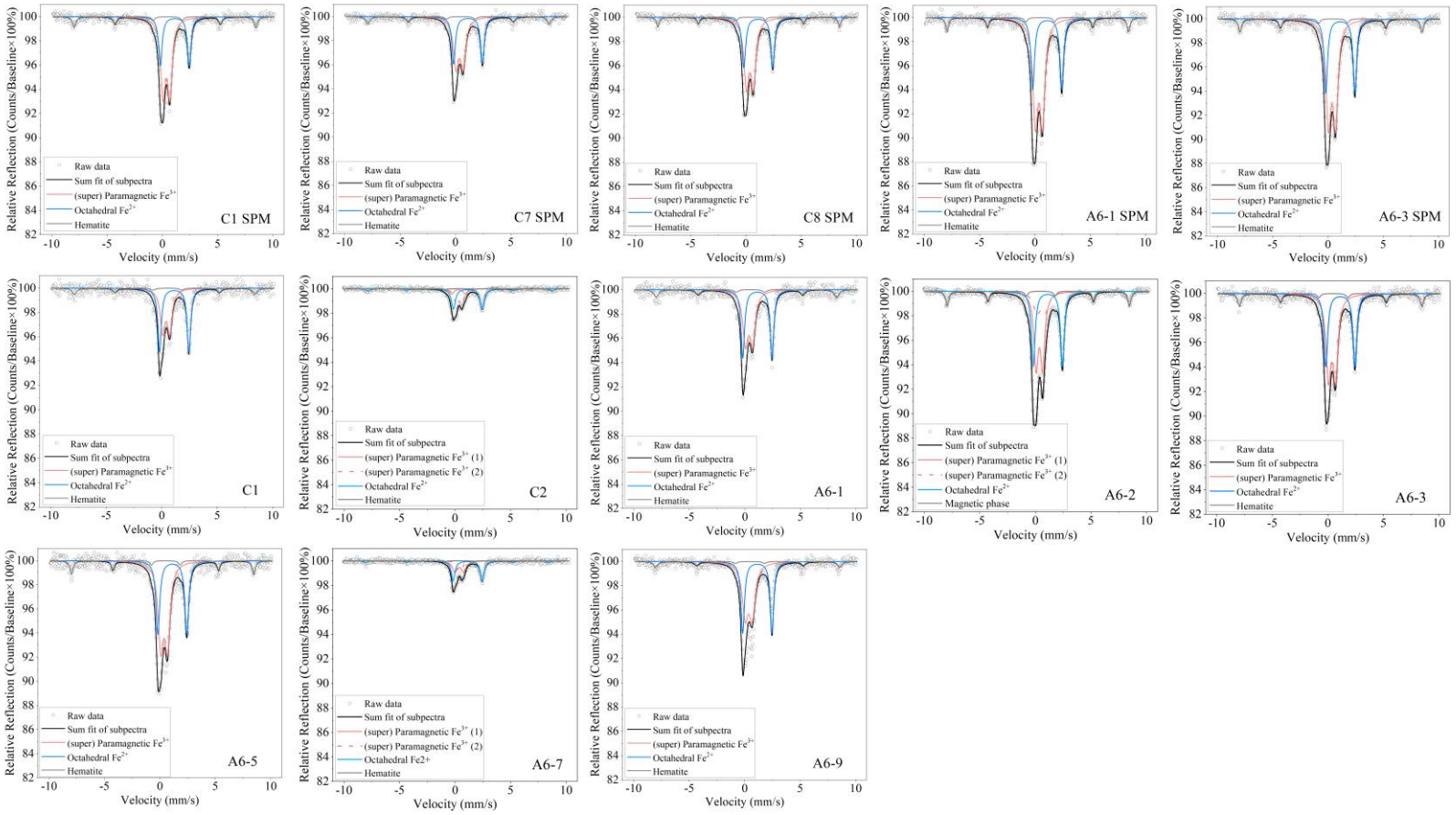

Figure S2. Mössbauer spectra of selected SPM samples and surface sediment in the Changjiang Estuary. Open circles are the data. The solid line is the sum fit of subspectra for total iron (black), (super) Paramagnetic Fe^{3+} (red), ferrous iron in octahedral coordination (blue), and Fe^{3+} in hematite (grey).

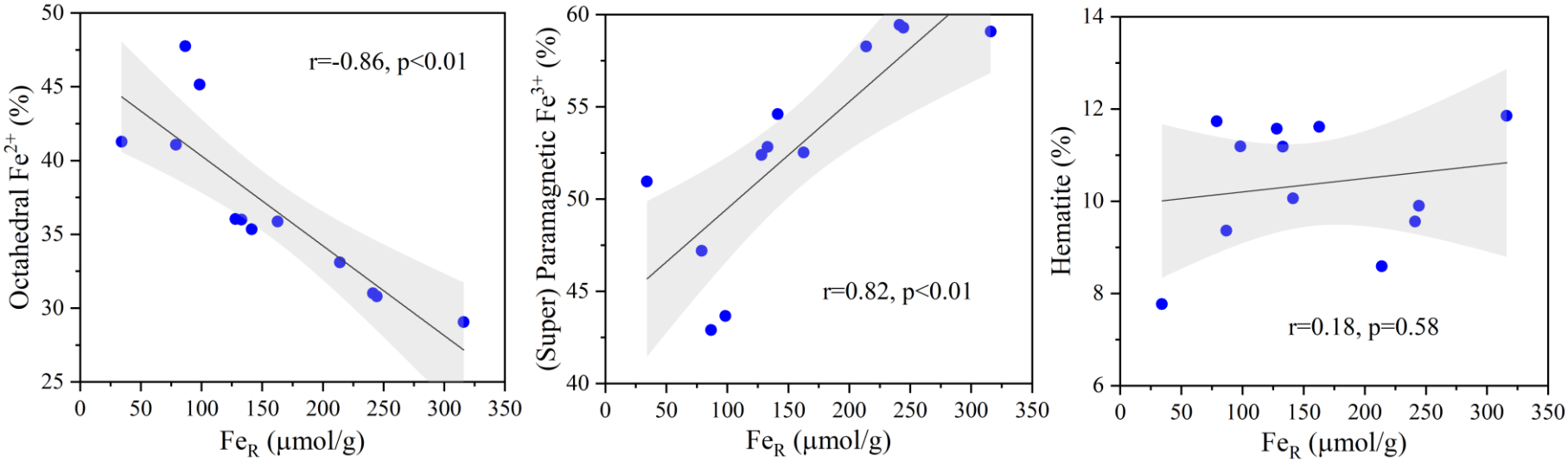

Figure S3. Correlations of the reactive iron (Fe_R) and Octahedral Fe^{2+}, (super) paramagnetic Fe^{3+} and magnetic Fe^{3+} in suspended particulate matter (SPM) and surface sediments in the Changjiang Estuary and adjacent East China Sea (ECS) shelf.

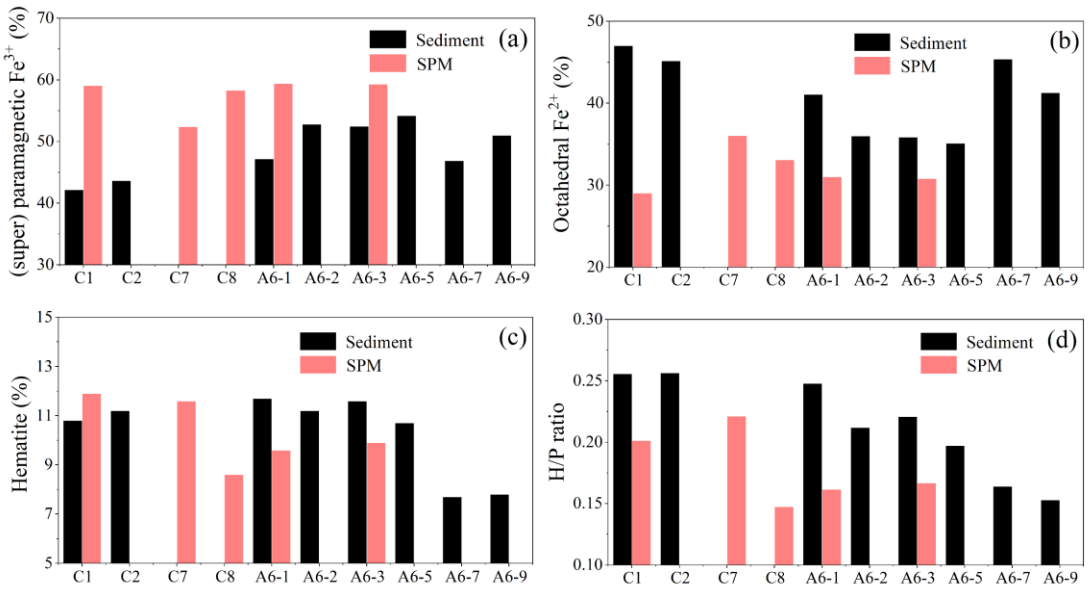

Figure S4. The distributions of the fraction of (super) paramagnetic Fe^{3+} (%) (a), octahedral Fe^{2+} (%) (b), hematite (%) (c), and H/P ratio (d) in suspended particulate matter (SPM) and surface sediments in the Changjiang Estuary and adjacent East China Sea (ECS) shelf.

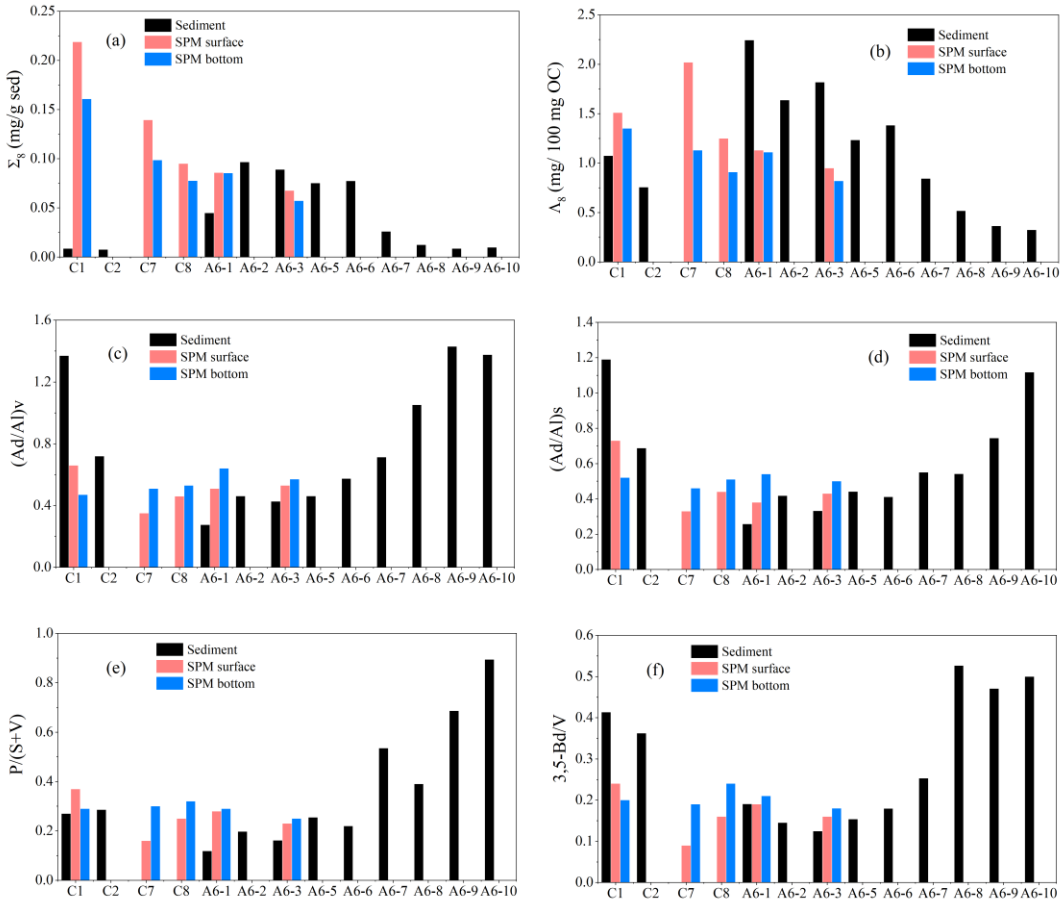

Figure S5. The distributions of Σ_8 (a), Λ_8 (b), $(Ad/Al)_V$ (c), $(Ad/Al)_S$ (d), P/(S+V) (e), and 3,5-Bd/V (f) in suspended particulate matter (SPM) and surface sediments in the Changjiang Estuary and adjacent East China Sea (ECS) shelf.

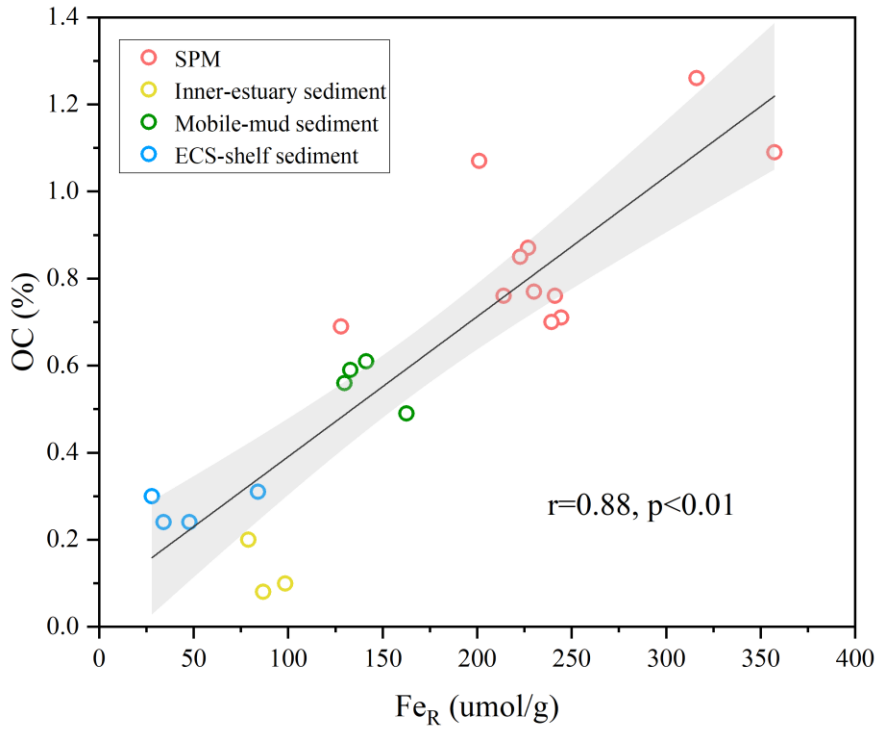

Figure S6. Correlation of OC versus Fe_R in suspended particulate matter (SPM) and surface sediments in the Changjiang Estuary and adjacent East China Sea (ECS) shelf.

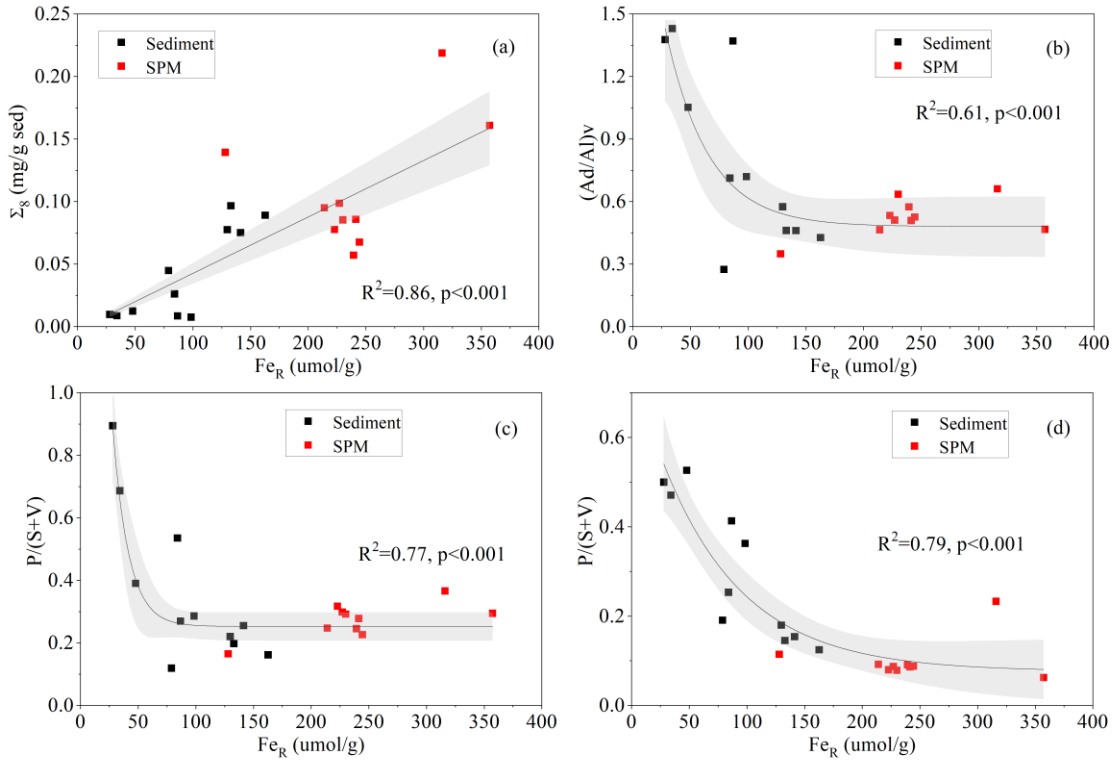

Figure S7. Correlations of the reactive Fe (Fe_R) with Σ_8 (a), $(Ad/Al)_V$ (b), P/(S+V) (c), and 3,5-Bd/V (d) in suspended particulate matter (SPM) and surface sediments in the Changjiang Estuary and adjacent East China Sea (ECS) shelf.

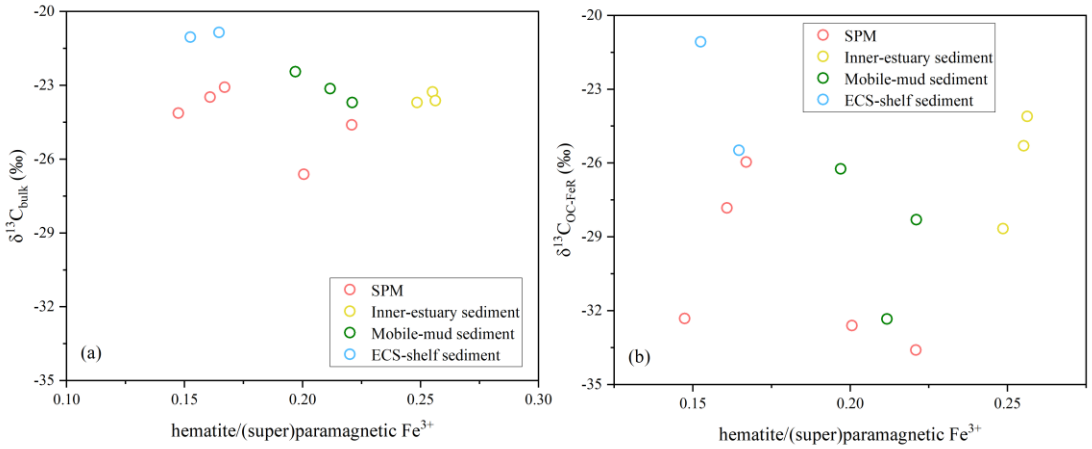

Figure S8. Correlations of the ratio of hematite to (super) paramagnetic Fe^{3+} versus $\Delta^{13}C_{bulk}$ (a), and $\Delta^{13}C_{OC\text{-}FeR}$ (b) in suspended particulate matter (SPM) and surface sediments in the Changjiang Estuary and adjacent East China Sea (ECS) shelf.