Supplement of Biogeosciences, 22, 2541–2567, 2025
https://doi.org/10.5194/bg-22-2541-2025-supplement
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Biogeosciences Open Access EGU

Supplement of

Depositional controls and budget of organic carbon burial in fine-grained sediments of the North Sea – the Helgoland Mud Area as a natural laboratory

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Literature compilation

The literature compilation in and around the HMA is accessible for geographic information systems (e.g., ArcMap, QGIS) via the PANGAEA repository (https://doi.org/10.1594/PANGAEA.968994; Müller and Kasten, 2024). The search items in the metadata of the shape file include author (main), year of publication, title of publication, respective core ID, location (longitude and latitude), bulk sediment properties (e.g., Al, Ca, Cu, Fe), physical properties (e.g., grain size), radionuclides (e.g., ^{210}Pb, ^{137}Cs, ^{14}C), carbon content (TIC, TOC), organic carbon composition (e.g., δ^{13}C-TOC, C/N ratio, n-alkanes) and more.

Supplementary figures

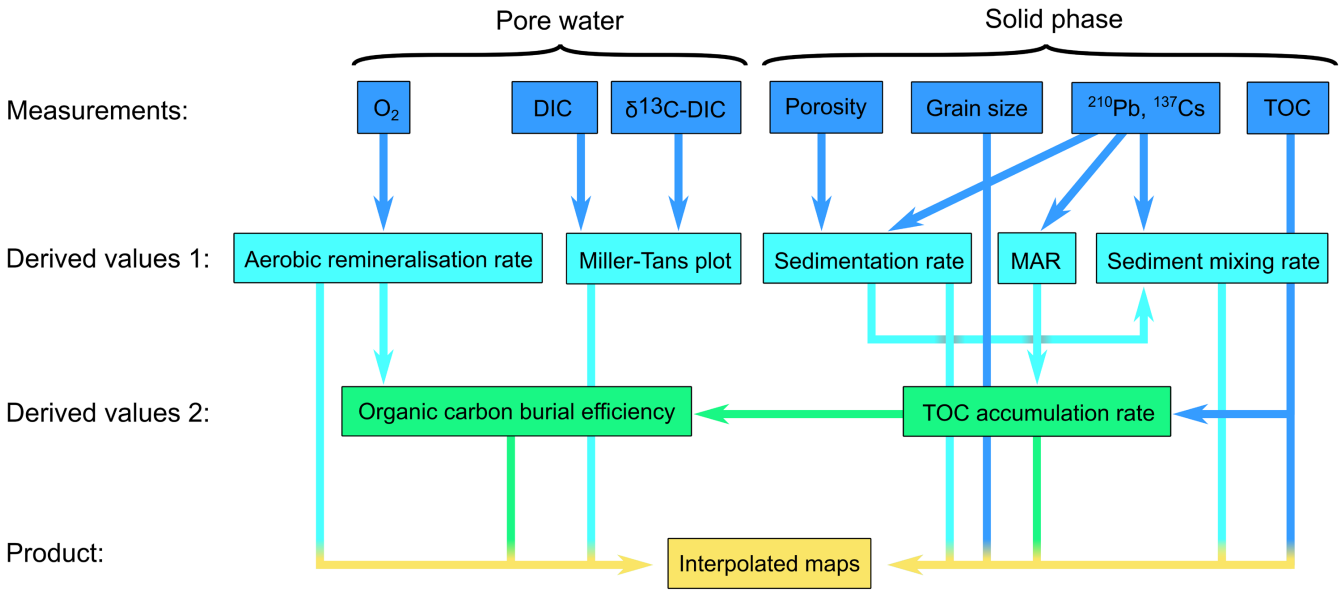

Figure S1: Flow chart of the measured parameters oxygen (O_2), dissolved inorganic carbon (DIC), stable carbon isotopic composition of DIC (δ^{13}C-DIC), porosity, grain size, ^{210}Pb and ^{137}Cs and total organic carbon (TOC). Measurements are used to calculate the derived values 1: aerobic remineralisation rate, Miller-Tans plot, sedimentation rate, sediment mass accumulation rate (MAR) and sediment mixing rates. Further, the derived values 2: TOC accumulation rate and organic carbon burial efficiency are calculated. The final products are interpolated maps of selected parameters.

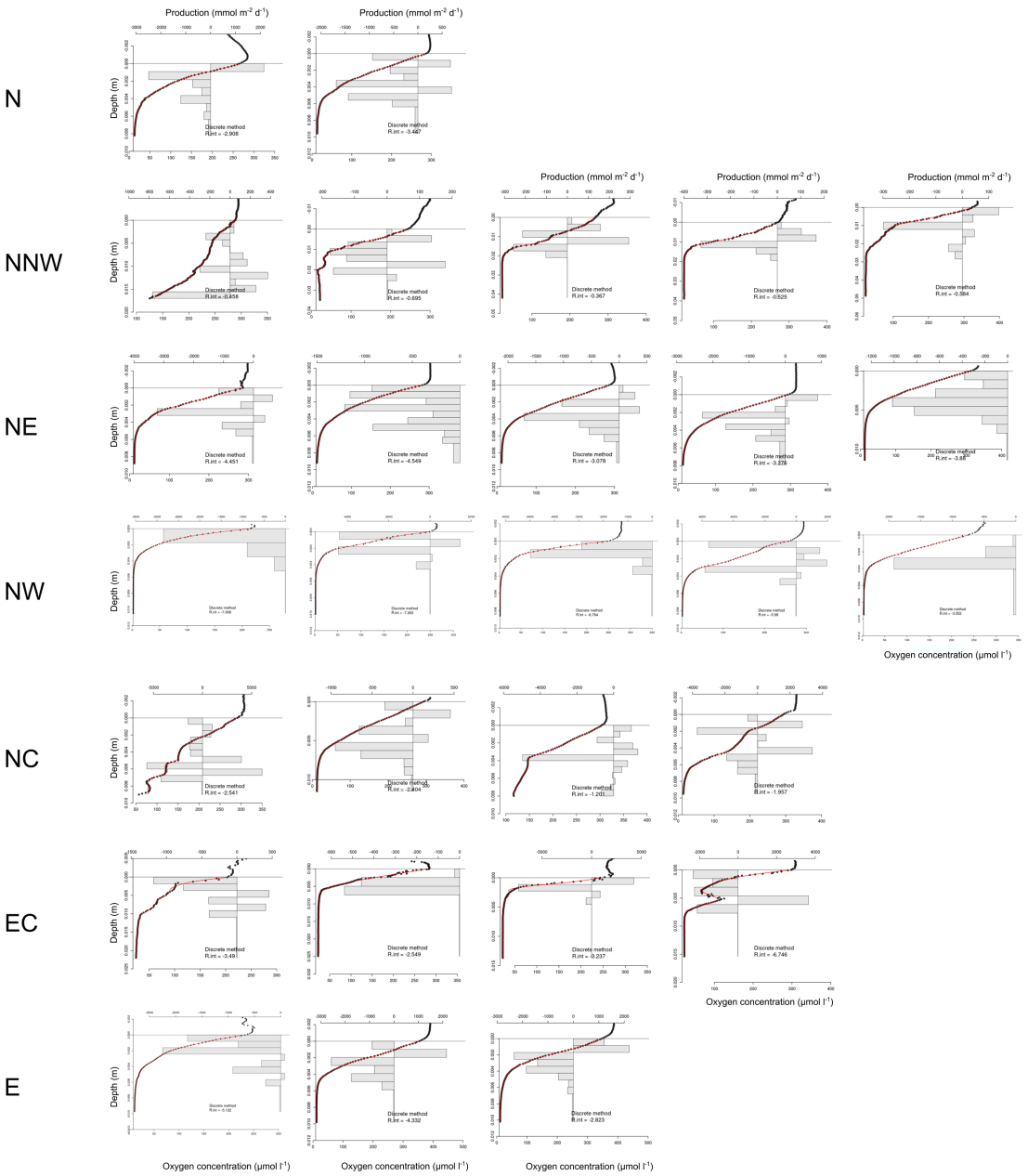

Figure S2: Zoom in for visibility. Oxygen measurements (black dots) and modelled aerobic remineralisation rates (red line, bars) for sites N, NNW, NE, NW, NC, EC and E after Berg et al. (1998) following the R script of van de Velde et al. (2022). Integrated aerobic remineralisation rates are presented in the respective plots (R.int). See Table 1 for site abbreviations.

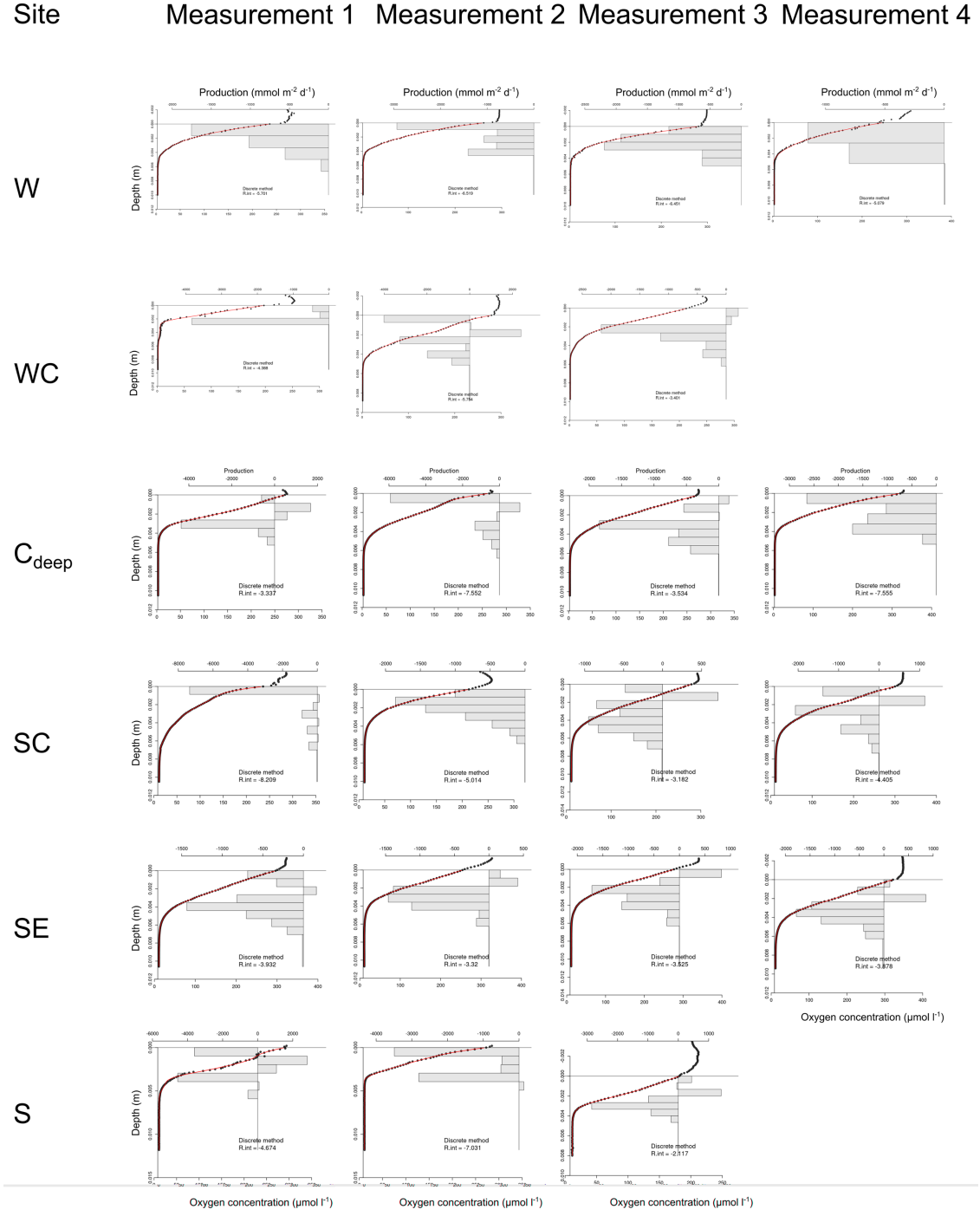

Figure S3: Zoom in for visibility. Oxygen measurements (black dots) and modelled aerobic remineralisation rates (red line, bars) for sites W, WC, C_{deep}, SC, SE and S after Berg et al. (1998) following the R script of van de Velde et al. (2022). Integrated aerobic remineralisation rates are presented in the respective plots (R.int). See Table 1 for site abbreviations.

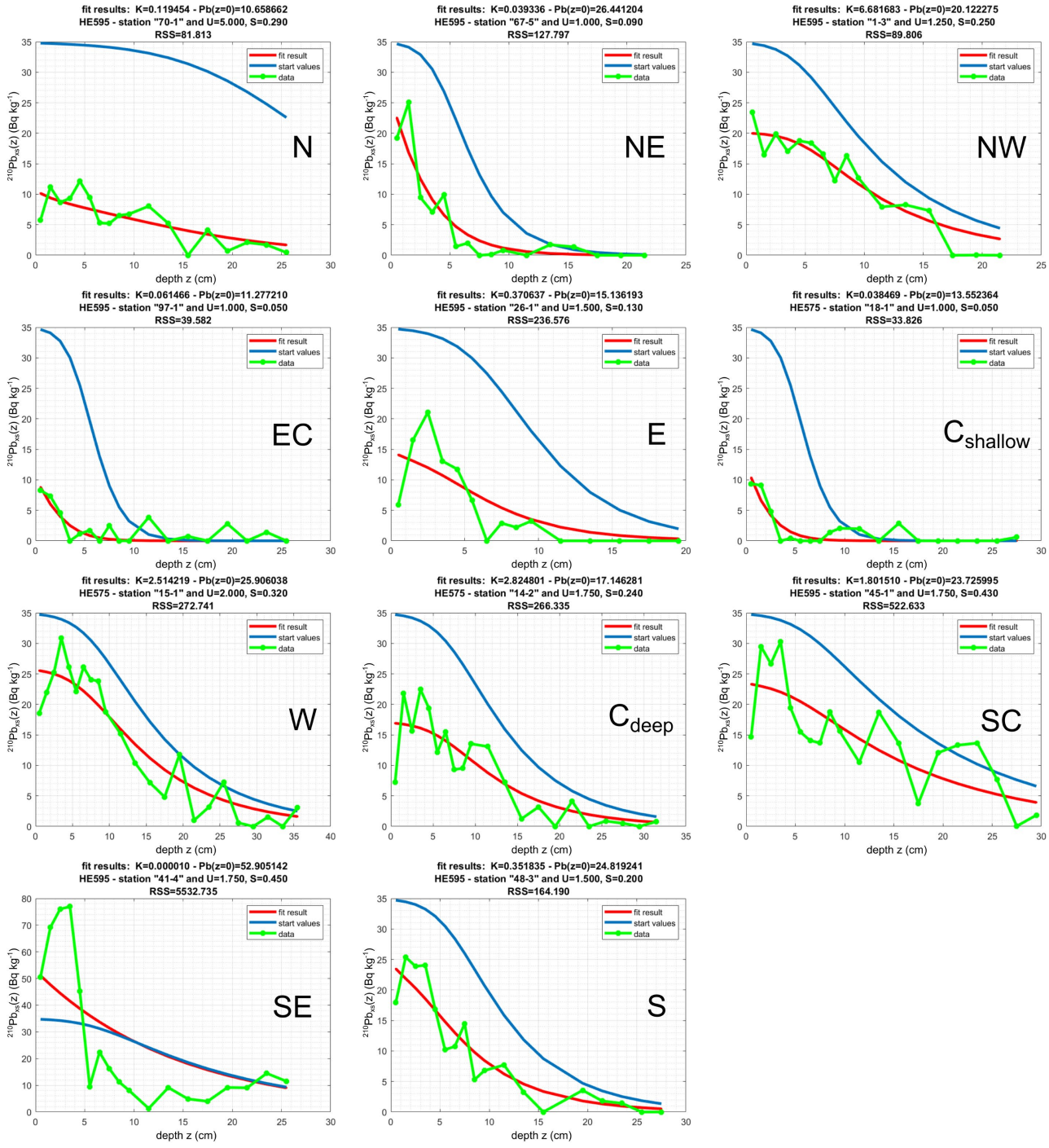

Figure S4: Zoom in for visibility. Model results (red lines) for the steady state sedimentation rates and sediment mixing rates after Gardner et al. (1987). The green dots and lines represent the measurements and start values for the model before optimisation are the blue lines. See Table 1 for site abbreviations.

Supplementary references

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