Supplement of

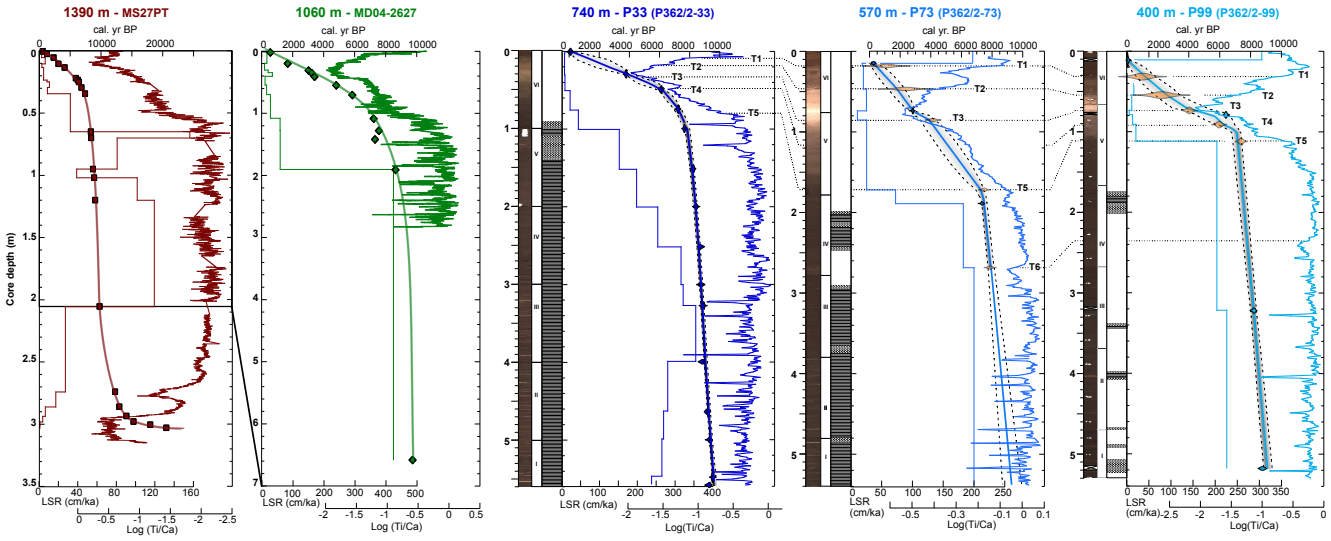
"Deoxygenation dynamics above the western Nile deep-sea fan during sapropel S1 at seasonal to millennial time-scales"

Cécile L. Blanchet et al.

Correspondence to: Cécile L. Blanchet (blanchet@gfz-potsdam.de)

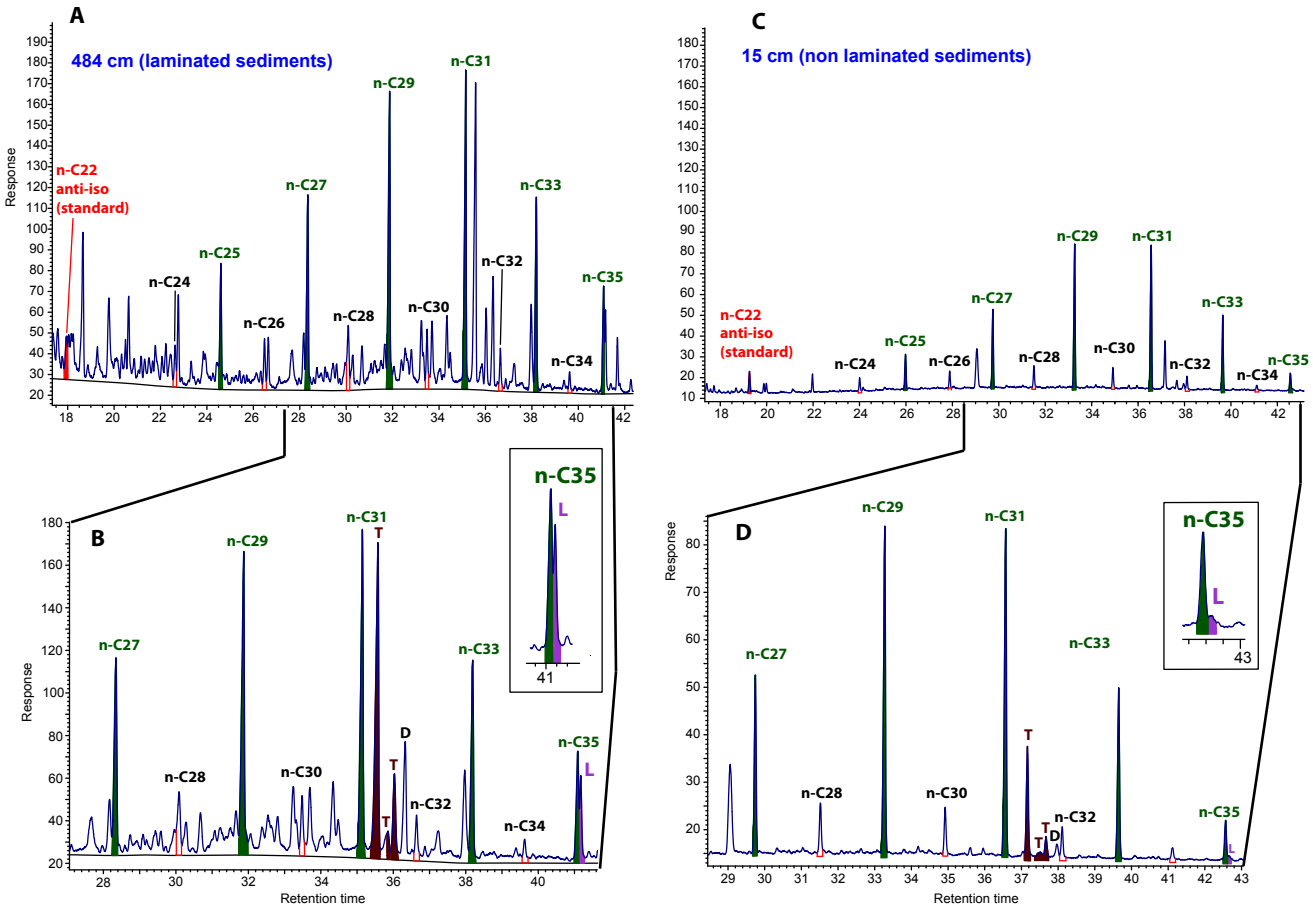
S1. Sedimentary patterns on the western Nile deep-sea fan

Supplementary Figure 1. Age models and depth-to-age transformations for cores on the western Nile deep-sea fan. Cores MD27PT and MD04-2627: sedimentation rates (step curves), dating (diamonds) and Ti/Ca profiles (continuous lines) from Ménot et al. (2020) and Revel et al. (2015). Cores P33, P73 and P99: half-core surface images (for core P99, realised after sampling with empty parts shown as crosses), section number (roman numbers), schematic lithologic log (white: bioturbated, dashed: faint laminations, hatched: laminations), linear sedimentation rates (cm/ka, step curves), tie-points and age-depth relationship as computed by the Bacon software (V2.3, Blaauw and Christen, 2011), with age uncertainty envelope as dashed lines (blue violin distribution dots: radiocarbon ages, orange violin distribution dots: tie points determined by aligning Ti/Ca ratios T1-T6), Log(Ti/Ca) ratios from XRF scanning with tie-points T1 to T6 determined on each record and used to improve the age models for cores P73 and P99. See text and table 2 for more details.



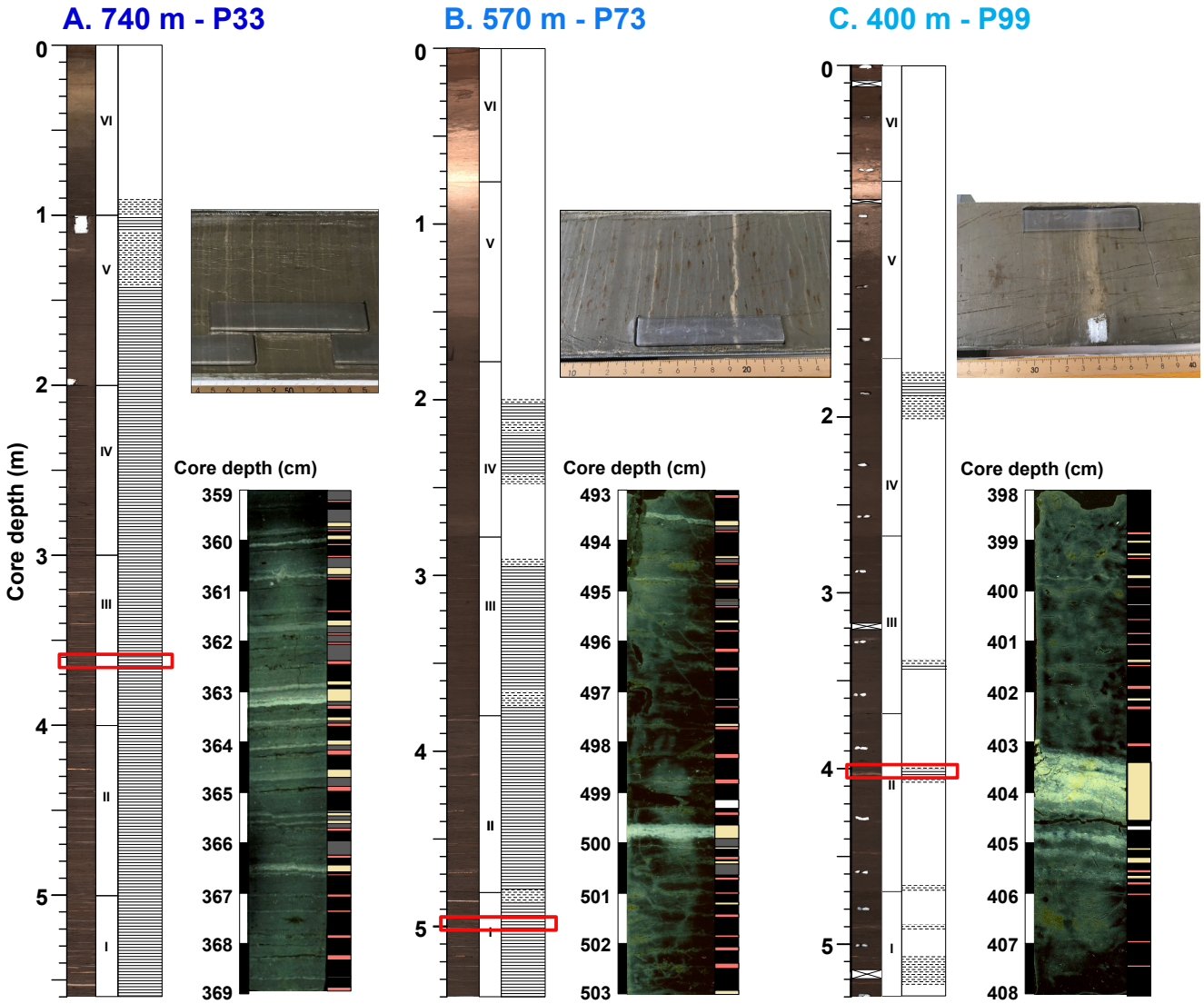
S2. Identification of biomarkers on a gas chromatograph

Supplementary Figure 2. Gas chromatograms from the apolar fraction of sedimentary lipids. A: Sample collected at 484 cm in the laminated interval (sapropel S1) that shows a high concentration in long-chain odd n-alkanes (n-C_{25}-n-C_{35}), tracers of terrestrial organic matter. B: Close up from A that shows the presence of triterpenoids (T) and lycopane (L) (see text for details). C: Sample collected at 15 cm in non-laminated sediments, which has a lower content in n-alkanes. D: Close-up from C, which also shows lower concentrations in triterpenoids and lycopane. In A and C: the n-C_{22} anti-iso is the internal standard used (in both cases 10 µl injected).



S3. Lamination patterns in cores from the Nile DSF

Supplementary Figure 3. Comparison of laminations in core P33, P73 and P99 showing the presence of LL2 in all cores. From right to left for each core: Location of thin section on the lithologic logs (red box, legend similar as in Supplementary Figure 1); Core picture in natural light with sampling slab (above) and scanned 10 cm-long thin sections in cross-polarised light (below); Microfacies interpretations, with colour codes similar as in the main text: red: LL1, grey: DL1, yellow: LL2 and black: DL2. The different texture in thin sections of cores P73 and P99 is due to air bubbles, which got trapped in the resin during the process.



S4. Additional microscopic observations

Supplementary Figure S4. A: partly-polarised (up) and directly (down) transmitted light microscope images of a foraminifera filled with iron sulfides (deposited at the bottom of the shell). B: Backscatter SEM image of a grain of iron sulphide, probably pyrite.