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*Supplement of*

## **Carbon and nitrogen turnover in the Arctic deep sea: in situ benthic community response to diatom and coccolithophorid phytodetritus**

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Supplementary Information

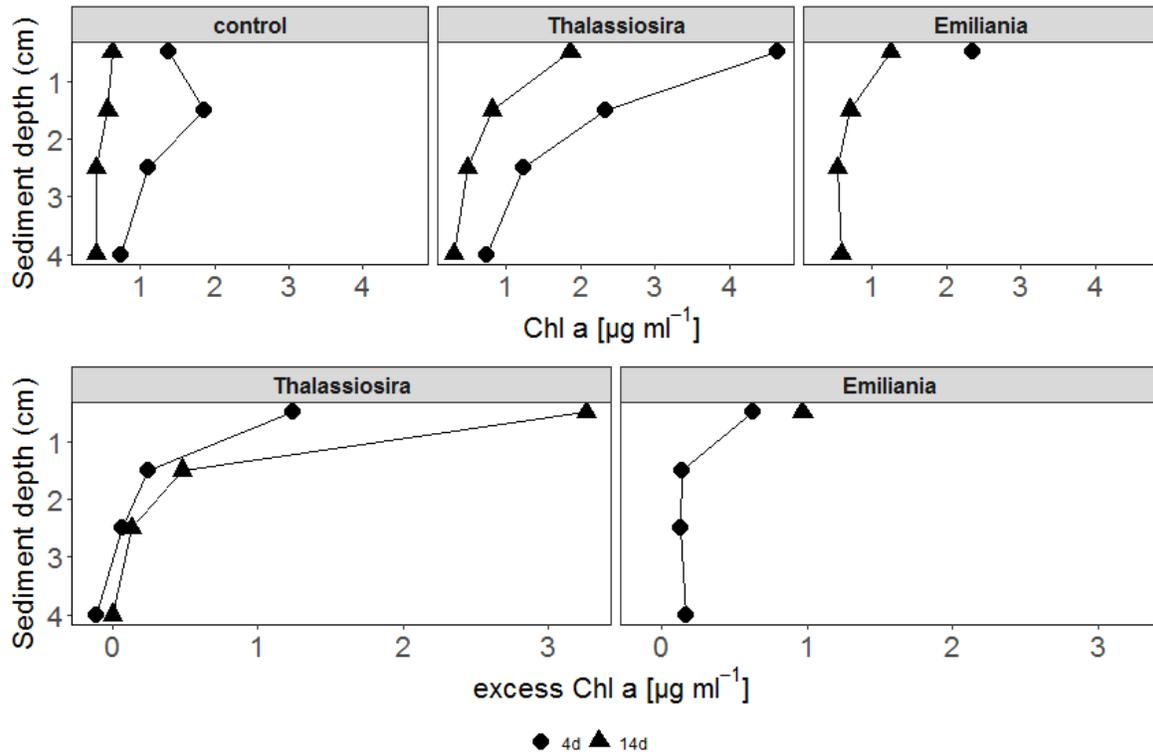


Figure S1: Chlorophyll-*a* concentration in the sediment (upper panel: absolute concentrations and lower panel: excess concentrations compared to control). In the 4 d *Emiliana* experiment, only the top cm of sediment could be retrieved and sampled.

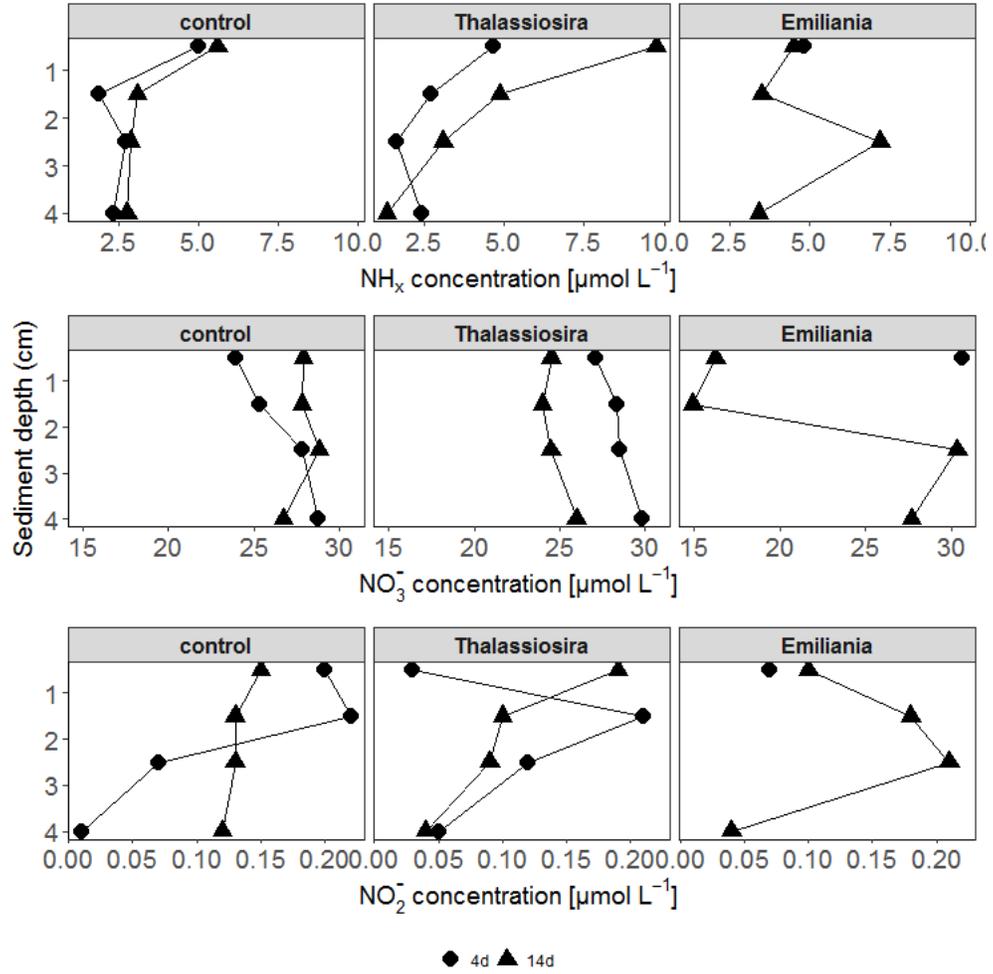


Figure S2: Concentrations of total  $\text{NH}_x$ ,  $\text{NO}_3^-$  and  $\text{NO}_2^-$  in the pore water of all experiments. In the 4 d *Emiliana* experiment, only the top cm of sediment could be retrieved and sampled.

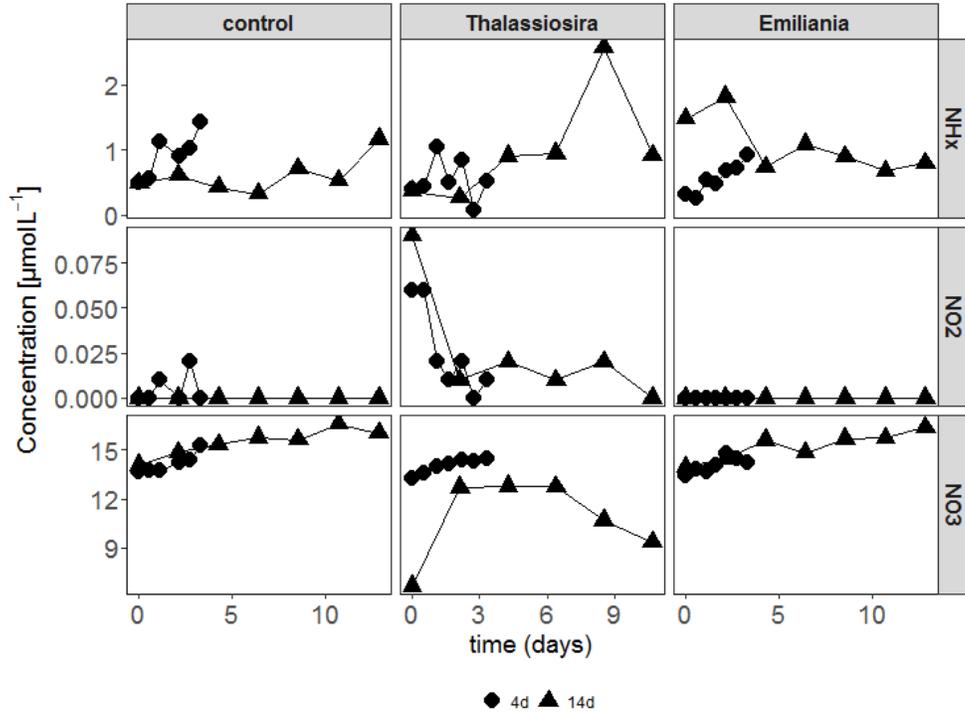


Figure S3: Concentrations of total  $\text{NH}_x$ ,  $\text{NO}_3^-$  and  $\text{NO}_2^-$  in the overlying water of all experiments.

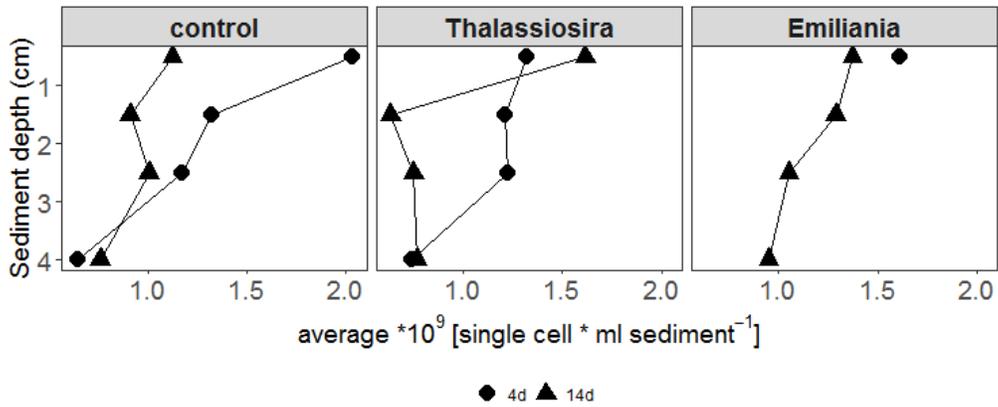
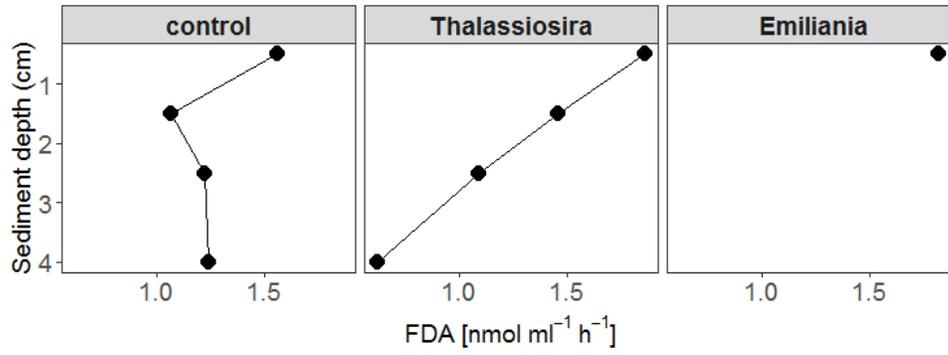
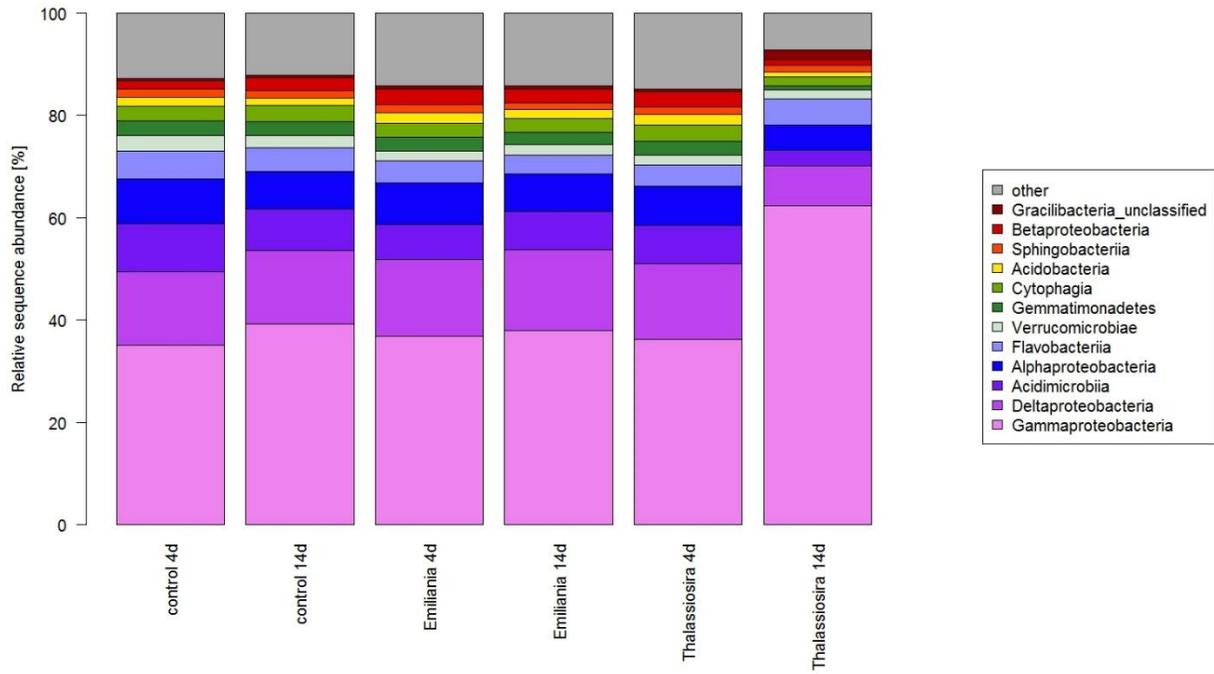


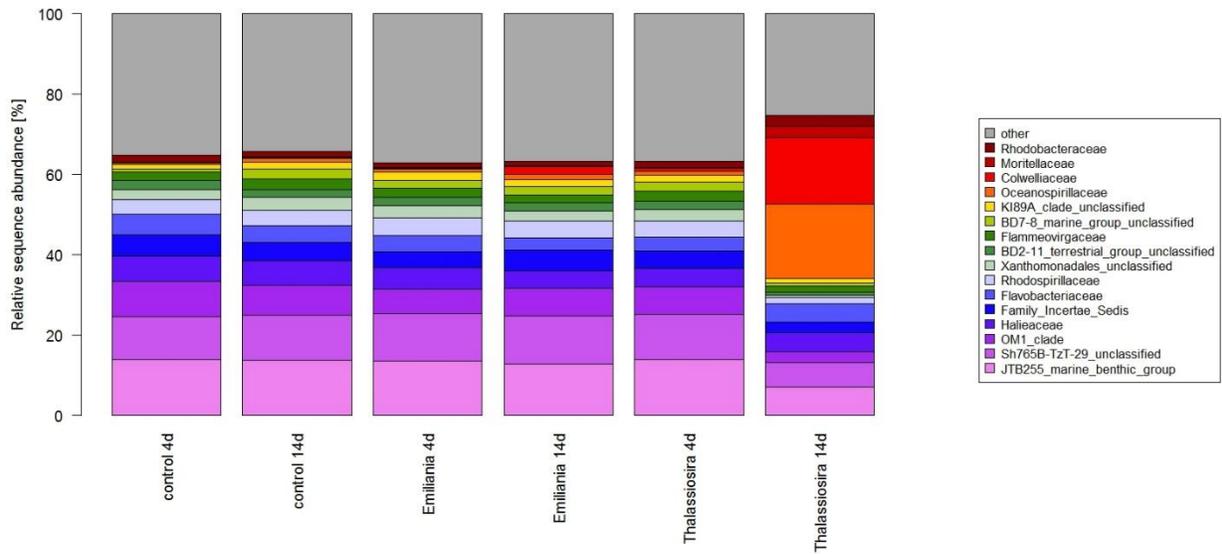
Figure S4: Microbial abundances in the sediment in the 4 d control, *Emiliaia* and *Thalassiosira* experiments. In the 4 d *Emiliaia* experiment, only the top cm of sediment could be retrieved and sampled.



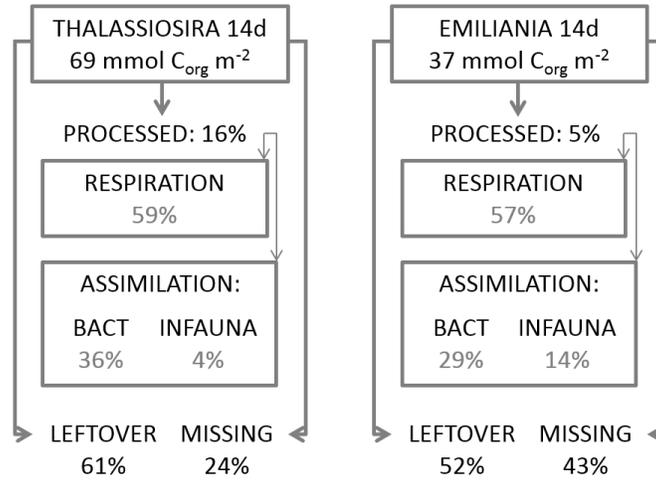
**Figure S5: Bacterial esterase enzymatic activity (FDA) in the sediment in the 4 d control, *Emiliana* and *Thalassiosira* experiments. In the 4 d *Emiliana* experiment, only the top cm of sediment could be retrieved and sampled.**



**Figure S6: Dominant classes of the total bacterial community in the different experiments.**



**Figure S7: Dominant families of the total bacterial communities in the different experiments.**



**Figure S8: Carbon inventory of the 14 d experiments, divided over processed pools (Respiration as the summed DIC production in overlying water and pore water and assimilation by bacteria and infauna). Leftovers of the non-processed phytodetritus in the sediment and the missing carbon to close the budget are presented at the bottom. Respiration and assimilation given in grey numbers to represent percentages of the total processed pool.**

**Table S1: Observed numbers of bacterial OTUs (nOTU), chao1 richness estimates (chao1) and inverse Simpson indices (invSimpson) for the different experiments/treatments/samples.**

	nOTU	chao1	invSimpson
<b>control 4 d</b>	863	1675	151
<b>control 14 d</b>	937	1948	162
<i>Emiliana 4 d</i>	989	2126	194
<i>Emiliana 14 d</i>	1063	2360	208
<i>Thalassiosira 4 d</i>	1010	2204	191
<i>Thalassiosira 14 d</i>	726	1494	69

**Table S2: Overview of measured  $^{15}\text{N-NO}_x^-$  accumulation in the overlying water, the calculated labelling fraction of pore water  $\text{NH}_4^+$  and the algae-derived  $\text{NO}_x^-$  accumulation in the overlying water.**

	<i>Thalassiosira 4 d</i>	<i>Emiliana 4 d</i>	<i>Thalassiosira 14 d</i>	<i>Emiliana 14 d</i>
$^{15}\text{N-NO}_x^-$ accumulation [ $\mu\text{mol m}^{-2} \text{d}^{-1}$ ]	0.56	0.00	0.38	0.35
Labelling fraction ( $^{15}\text{N-NH}_4^+$ / total $\text{NH}_4^+$ ) in the pore water	0.14	0.04	0.47	0.18
Algae derived $\text{NO}_x^-$ accumulation [ $\mu\text{mol m}^{-2} \text{d}^{-1}$ ]	4.00	0.00	0.74	2.11