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Supplement of

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Alison L. Webb et al.

Correspondence to: Alison L. Webb (a.l.webb@rug.nl)

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Supplementary Figures

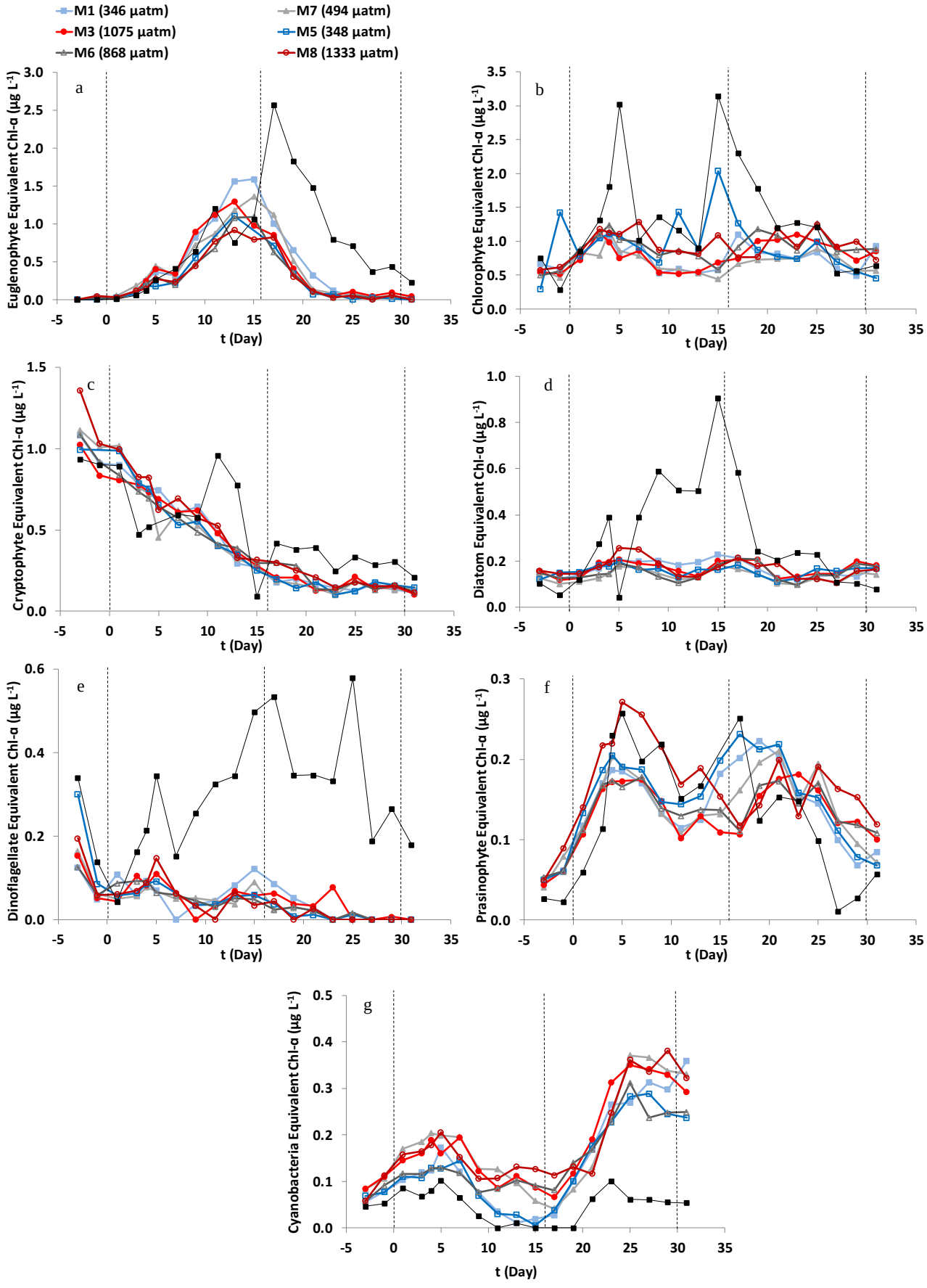

Figure S1. Temporal development of equivalent Chlorophyll-α concentrations (μg L^{-1}) for (a) Euglenophytes, (b) Chlorophytes, (c) Cryptophytes, (d) Diatoms, (e) Dinoflagellates (f) Prasinophytes and (g) cyanobacteria identified using HPLC and calculated using the CHEMTAX algorithm. Concentrations are the mean of a sample integrated over the total 17m of the mesocosms Dashed lines show the different phases of the experiment, fCO_2 shown in the legend are mean fCO_2 across the duration of the experiment. Data from Paul *et al.* (2015).

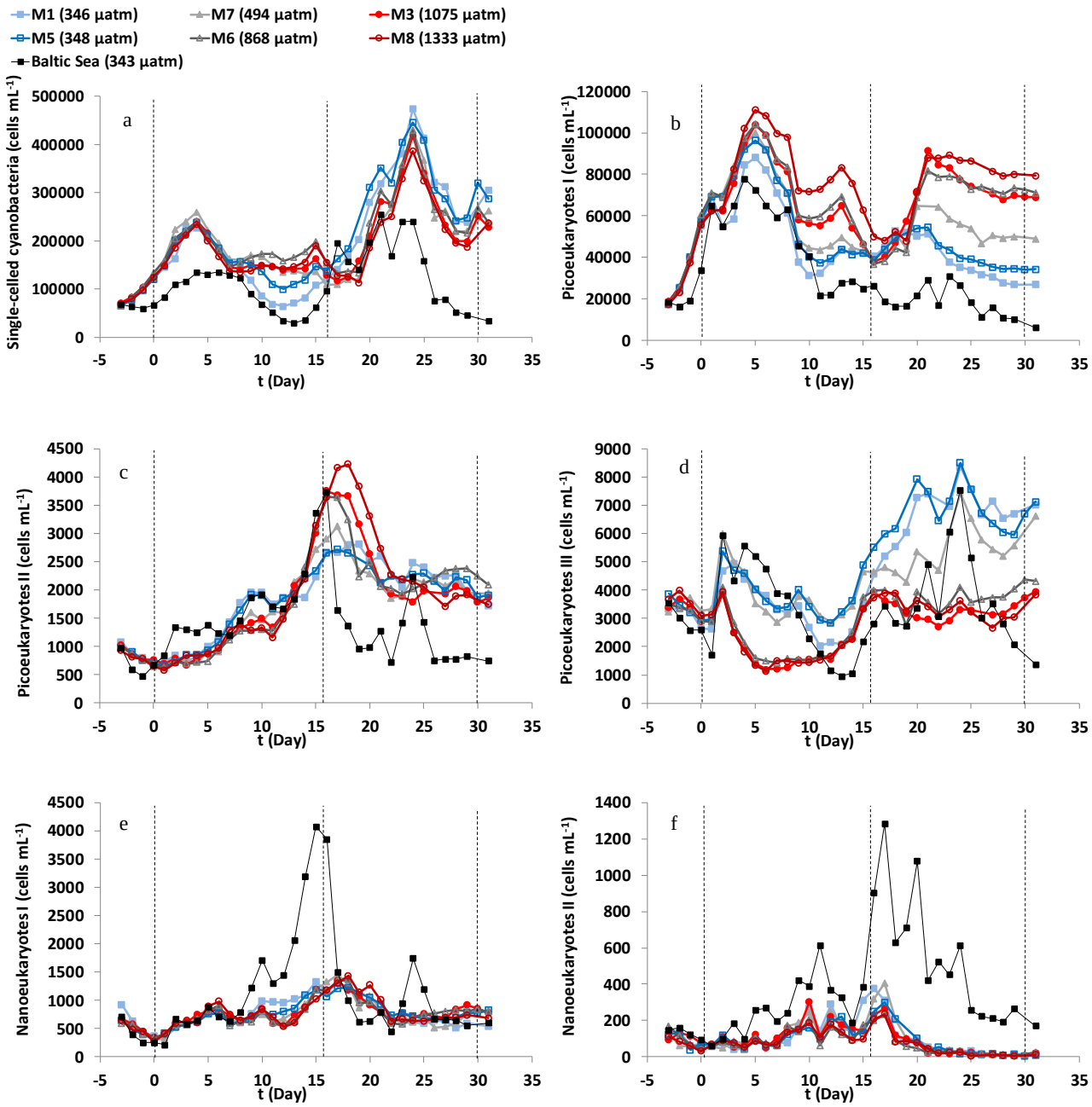

Figure S2. Cell enumeration (cells mL^{-1}) by flow cytometry for identified groupings in the mesocosms: (a) single-celled cyanobacteria, (b) picoeukaryotes I, (c) picoeukaryotes II, (d) picoeukaryotes III, (e) nanoeukaryotes I, and (f) nanoeukaryotes II from an integrated sample from the surface 10m of the mesocosms. Dashed lines show the different phases of the experiment, fCO_2 shown in the legend are mean fCO_2 across the duration of the experiment. Data from Crawfurd *et al.* (2016).

Table S1. Spearman's Rank Correlation Coefficients for all trace gases measured in the mesocosms compared to total Chl-*a* (Paul *et al*., 2015), CHEMTAX analysis of derived Chl-*a* (Paul *et al.*, 2015) and phytoplankton abundance (Crawfurd *et al.*, 2016). Coefficients are significant at 99% confidence limits, except where highlighted (*) which are significant at 95%. NC: non-correlated.

	DMS	CH_3I	CH_2I_2	C_2H_5I	CH_2ClI	$CHBr_3$	CH_2Br_2	$CHBr_2Cl$
Chlorophyll-*a* (µg L^{-1})	-0.604	-0.224	-0.406	0.405	-0.521	-0.209*	0.518	NC
Phytoplankton Taxonomy (Equivalent Chl-*a* µg L^{-1})								
Total Equivalent Chl-*a*	-0.607	-0.324	-0.601	0.418	-0.465	-0.373	0.337	NC
Cyanobacteria	0.424	NC	0.379	NC	0.230*	NC	-0.379	-0.229*
Prasinophytes	NC	NC	NC	0.375	NC	-0.307	NC	NC
Euglenophytes	NC	NC	-0.351	0.287	NC	NC	NC	NC
Dinoflagellates	-0.618	-0.459	-0.499	0.276	-0.517	NC	0.652	NC
Diatoms	-0.243*	NC	NC	NC	-0.264*	-0.235*	NC	NC
Chlorophytes	NC	NC	NC	NC	NC	-0.330	NC	NC
Cryptophytes	-0.695	-0.513	-0.672	0.454	-0.582	-0.222*	0.864	NC
Small Phytoplankton (<10 µm) abundance (cells mL^{-1})								
Cyanobacteria	0.575	NC	0.520	-0.276	0.314	NC	-0.519	NC
Picoeukaryotes I	-0.256	-0.293	NC	NC	-0.339	-0.443	NC	NC
Picoeukaryotes II	0.502	0.586	0.621	-0.441	0.335	0.222	-0.752	NC
Picoeukaryotes III	0.603	0.234	0.466	-0.208*	0.376	0.223	-0.262	NC
Nanoeukaryotes I	NC	0.367	0.346	-0.274	NC	NC	-0.477	NC
Nanoeukaryotes II	-0.512	NC	-0.375	0.323	-0.297	NC	0.342	NC

Table S2. Spearman's Rank Correlation Coefficients for trace gases measured in the Baltic Sea compared to total Chl-*a* (Paul *et al.*, 2015), CHEMTAX analysis of derived Chl-*a* (Paul *et al.*, 2015) and phytoplankton abundance (Crawfurd *et al.*, 2016). Coefficients are significant at 99% confidence limits, except those highlighted (*) at being significant at 95%. NC denoted non-correlated parameters.

* 95% significance level.

Compound	DMS	CH_3I	CH_2I_2	C_2H_5I	CH_3ClI	$CHBr_3$	CH_2Br_2	$CHBr_2Cl$
Chlorophyll-*a* (µg L^{-1})	0.842	NC	NC	NC	NC	0.654*	NC	NC
Phytoplankton Taxonomy (Equivalent Chlorophyll µg L^{-1})								
Total Equivalent Chlorophyll-*a*	0.860	NC	NC	NC	NC	NC	NC	NC
Cyanobacteria	-0.746	-0.725	NC	NC	NC	NC	NC	NC
Prasinophytes	NC	NC	NC	NC	NC	NC	NC	NC
Euglenophytes	0.888	NC	0.629*	NC	0.678	NC	NC	0.622*
Dinoflagellates	0.608*	NC	NC	NC	0.769	NC	NC	0.671*
Diatoms	NC	NC	NC	NC	NC	NC	-0.615*	NC
Chlorophytes	NC	NC	NC	NC	NC	NC	NC	NC
Cryptophytes	NC	NC	NC	NC	-0.671*	NC	-0.734	NC
Small Phytoplankton (<10 µm) abundance (cells mL^{-1})								
Cyanobacteria	NC	NC	NC	NC	0.653	0.605	NC	NC
Picoeukaryotes I	NC	-0.800	-0.731	NC	-0.489*	NC	-0.510*	NC
Picoeukaryotes II	NC	NC	NC	NC	NC	NC	NC	NC
Picoeukaryotes III	NC	NC	NC	NC	NC	NC	NC	NC
Nanoeukaryotes I	NC	NC	NC	NC	NC	NC	NC	NC
Nanoeukaryotes II	0.880	0.463*	0.527	NC	0.577	0.563	NC	NC

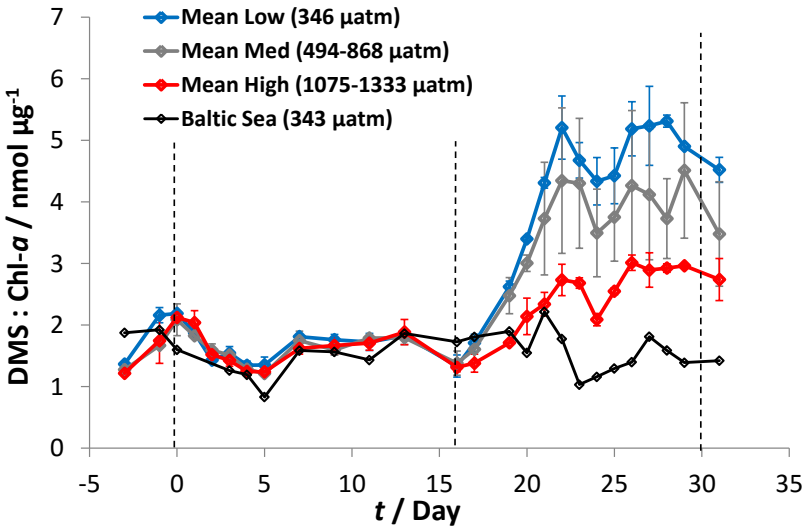

Figure S3. Ratios of DMS: total Chl-*a* (nmol μg^{-1}) plotted as means for the different fCO_2 concentrations with error bars denoting the standard deviation. Chl-*a* data from Paul *et al*. (2015)