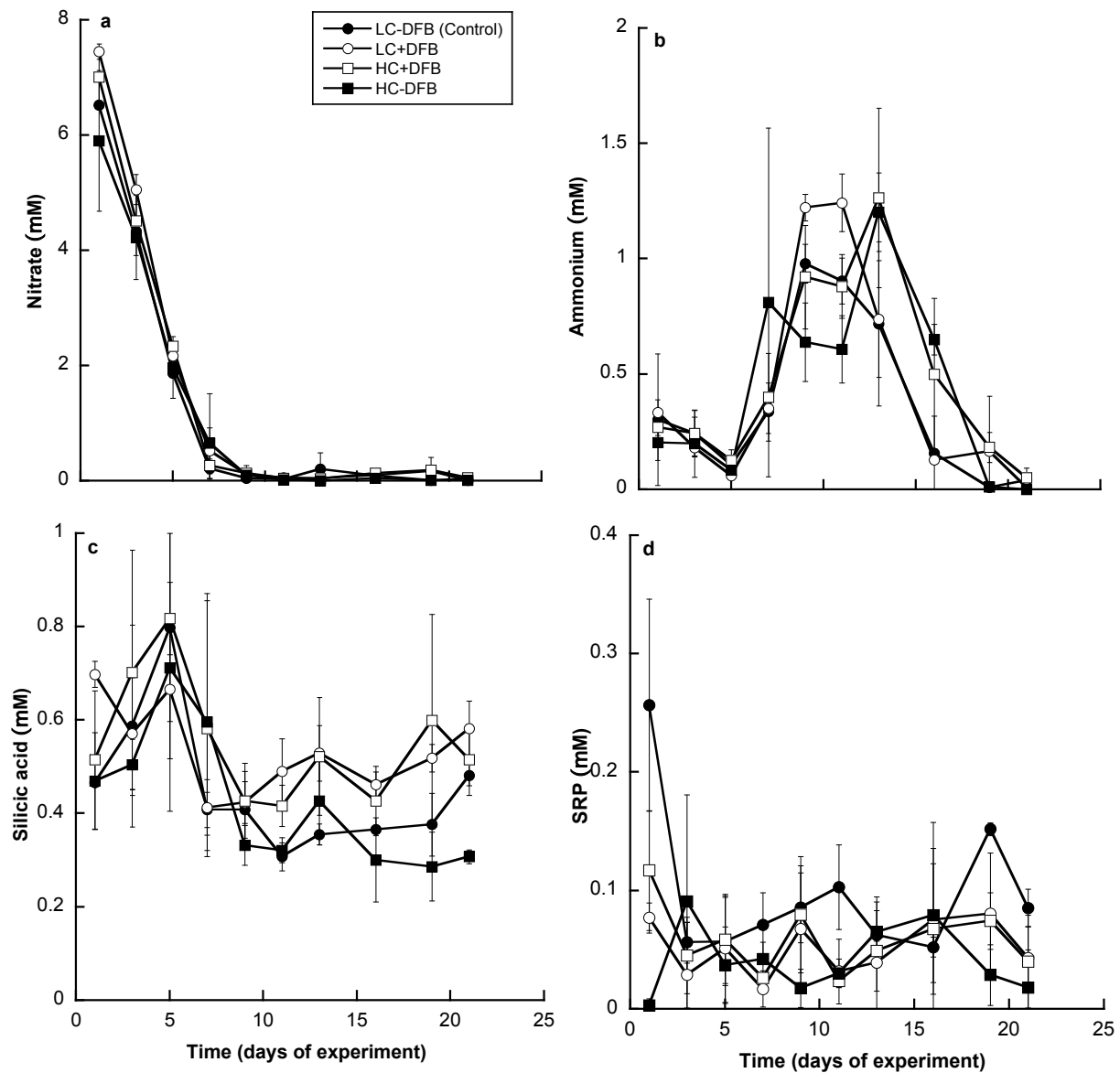


Supplemental Material

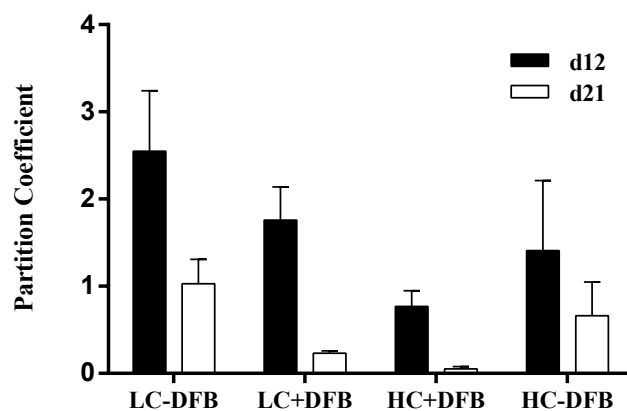
Particulate trace metal dynamics in response to increased CO₂ and iron availability in a coastal mesocosm experiment

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Supplemental Figure S1. Temporal development of major nutrient concentrations within the mesocosms in the different treatments (LC: ambient CO₂ (390 μ atm); HC: increased CO₂ (900 μ atm); -DFB: no DFB addition; +DFB: with a 70 nM DFB addition): (a) nitrate, (b) ammonium, (c) silicic acid, (d) soluble reactive phosphate (SRP).



Supplemental Figure S2. The Fe partition coefficients (the molar ratio between particulate and dissolved concentrations) in the different mesocosm treatments; LC: ambient CO₂ (390 µatm); HC: increased CO₂ (900 µatm); -DFB: no DFB addition; +DFB: with a 70 nM DFB addition; on day 12 and day

Supplemental Table S1. Instrumental conditions of ICP-MS and measurement parameters used during determination of trace elements concentrations.

Instrument conditions		
Instrument type	ELEMENT XR	
Torch	Fassel type	
Spray chamber	Glass cyclonic spray chamber	
Nebuliser	ESI microflow ST nebuliser (selfaspirating)	
Cones	Standard Ni sampler and skimmer	
RF Power (W)	1120	
Cooling gas flow rate (L min ⁻¹)	16	
Auxiliary gas flow rate (L min ⁻¹)	0.9	
Sample gas flow rate (L min ⁻¹)	1.2	
Sample matrix	1% nitric acid	
Method acquisition parameters		
Scan type	E-scan	
Spectral resolution	Low (nominal m/Δm~300)	
Isotopes of interes	⁹⁵ Mo ⁹⁸ Mo ¹¹¹ Cd ¹¹⁴ Cd ²⁰⁶ Pb ²⁰⁸ Pb	Medium (nominal m/Δm~3000) ²⁷ Al ³¹ P ⁴⁷ Ti ⁴⁹ Ti ⁵⁵ Mn ⁵⁶ Fe ⁵⁹ Co ⁶³ Cu ⁶⁵ Cu ⁶⁶ Zn ⁶⁸ Zn
Internal standard	¹¹⁵ In	¹¹⁵ In
Mass window (%)	40	125
Samples/peak	10	20
Samples time (ms)	10	10
Runs	3	3
Passes	10	10

Supplemental Table S2. The concentration of particulate metals (without oxalate wash) in seawater (nM) in the different mesocosm treatments (LC: ambient CO₂; HC: increased CO₂ (900 µatm); -DFB: no DFB addition; +DFB: with a 70 nM DFB addition) during the development of a bloom of *Emiliana huxleyi* (especially in treatment LC+DFB). Data are means of measurements in 3 independent mesocosms (n = 3) except for LC-DFB where n = 2. Error bars indicate SD. Data is plotted in Figure 3. Note that the concentrations of Co, Pb and Cd were much lower than the rest of the metals, so their values were multiplied by either (10) or (100) in the table (e.g. Co, Cd, and Pb concentrations on d12 in LC-DFB were 0.01, 0.0028 and 0.025 nmol L⁻¹, respectively).

Treatment	Al	Ti	P	Fe	Cu	Co (· 10)	Zn	Cd (· 100)	Mn	Mo	Pb (· 10)
<i>d12</i>											
LC-DFB	9.16 (3.16)	1.30 (0.27)	131.8 (27.05)	13.5 (0.88)	0.24 (0.04)	0.10 (0.06)	3.24 (0.15)	0.28 (0.06)	0.24 (0.06)	0.08 (0.01)	0.25 (0.01)
LC+DFB	29.2 (6.00)	3.16 (0.52)	329.3 (107.8)	14.8 (1.78)	0.30 (0.01)	0.22 (0.05)	14.81 (2.69)	0.91 (0.22)	0.54 (0.14)	0.09 (0.02)	0.56 (0.05)
HC+DFB	11.0 (7.04)	1.23 (0.54)	120.1 (45.49)	7.29 (0.41)	0.32 (0.09)	0.07 (0.01)	3.13 (0.55)	0.26 (0.23)	0.17 (0.06)	0.04 (0.02)	0.12 (0.05)
HC-DFB	18.1 (8.53)	1.28 (0.53)	193.7 (66.43)	11.2 (4.43)	0.29 (0.08)	0.11 (0.07)	4.48 (0.38)	0.23 (0.03)	0.29 (0.13)	0.07 (0.01)	0.85 (0.51)
<i>d17</i>											
LC-DFB	27.1 (14.8)	0.27 (0.14)	171.6 (20.1)	17.1 (8.08)	0.10 (0.04)	0.07 (0.00)	2.87 (1.23)	0.45 (0.32)	0.20 (0.04)	0.08 (0.05)	0.28 (0.11)
LC+DFB	29.2 (19.2)	4.63 (2.84)	972.8 (563)	12.2 (9.14)	1.02 (0.56)	0.68 (0.42)	62.7 (38.2)	2.38 (0.87)	2.36 (1.49)	0.37 (0.08)	0.77 (0.41)
HC+DFB	5.94 (4.38)	0.59 (0.34)	134.1 (47.7)	1.98 (0.76)	0.13 (0.07)	0.05 (0.02)	2.53 (0.49)	0.19 (0.03)	0.14 (0.04)	0.06 (0.03)	0.14 (0.05)
HC-DFB	35.4 (17.9)	4.11 (1.86)	372.7 (253)	9.34 (7.29)	0.50 (0.06)	0.19 (0.02)	5.88 (3.78)	0.98 (0.65)	0.56 (0.42)	0.09 (0.06)	1.42 (0.37)
<i>d21</i>											
LC-DFB	19.2 (1.01)	2.95 (0.06)	341.9 (20.1)	5.83 (1.81)	0.48 (0.02)	0.35 (0.03)	15.5 (0.97)	1.13 (0.26)	0.66 (0.06)	0.10 (0.02)	2.07 (0.26)
LC+DFB	9.18 (5.35)	1.53 (0.55)	380.9 (45.3)	2.52 (0.35)	0.44 (0.06)	0.37 (0.07)	26.2 (2.96)	1.41 (0.25)	0.88 (0.09)	0.20 (0.05)	1.23 (0.75)
HC+DFB	2.64 (1.58)	0.49 (0.40)	95.9 (12.5)	0.53 (0.32)	0.15 (0.06)	0.09 (0.04)	3.24 (1.96)	0.30 (0.16)	0.14 (0.05)	0.05 (0.01)	0.19 (0.05)
HC-DFB	8.22 (2.05)	0.87 (0.20)	134.7 (22.1)	3.19 (1.21)	0.26 (0.05)	0.12 (0.02)	3.47 (0.97)	0.27 (0.13)	0.22 (0.08)	0.08 (0.03)	0.58 (0.18)

Supplemental Table S3. The concentration of particulate metals (with oxalate wash) in seawater (nmol L⁻¹) in the different mesocosm treatments; (LC: ambient CO₂; HC: increased CO₂ (900 µatm); -DFB: no DFB addition; +DFB: with a 70 nM DFB addition) during the development of a bloom of *Emiliana huxleyi* (especially in treatment LC+DFB). Data are means of measurements in 3 independent mesocosms (n = 3) except for LC-DFB where n = 2. Error bars indicate SD. Note that the concentrations of Co, Pb and Cd were much lower than the rest of the metals, so their values were multiplied by either (10) or (100) in the table (e.g. Co, Cd, and Pb concentrations on d12 in LC-DFB were 0.007, 0.0009 and 0.01 nmol L⁻¹, respectively). The percentage (%) indicates the mean quantity of metal remaining after the oxalate wash. Statistically significant differences are indicated with asterisk (* if $p < 0.05$; ** if $p < 0.01$ and *** if $p < 0.001$; ns: not significant).

Treatment	Al	Ti	P	Fe	Cu	Co (·10)	Zn	Cd (·100)	Mn	Mo	Pb (·10)
<i>d12</i>											
LC-DFB	11.6 (2.8)	1.32 (0.34)	117 (3.27)	12.52 (0.78)	0.16 (0.03)	0.07 (0.00)	1.92 (0.86)	0.09 (0.06)	0.15 (0.02)	0.02 (0.00)	0.10 (0.00)
LC+DFB	28.3 (12)	4.49 (1.91)	258 (46.1)	14.67 (3.35)	0.23 (0.08)	0.19 (0.00)	7.16 (1.29)	0.51 (0.14)	0.41 (0.06)	0.03 (0.01)	0.20 (0.11)
HC+DFB	15.9 (2.3)	2.52 (0.66)	139 (14.2)	8.05 (1.08)	0.22 (0.06)	0.09 (0.01)	2.39 (0.93)	0.20 (0.09)	0.21 (0.07)	0.03 (0.01)	0.11 (0.06)
HC-DFB	11.6 (8.8)	1.66 (0.68)	178 (66.3)	9.79 (3.75)	0.19 (0.08)	0.08 (0.03)	2.84 (0.52)	0.22 (0.06)	0.28 (0.08)	0.02 (0.01)	0.19 (0.08)
<i>d17</i>											
LC-DFB	6.42 (2.9)	0.85 (0.35)	97 (41.6)	1.23 (0.56)	0.11 (0.07)	0.09 (0.05)	2.86 (1.45)	0.26 (0.09)	0.18 (0.07)	0.03 (0.00)	0.09 (0.05)
LC+DFB	7.53 (4.7)	1.85 (0.63)	245 (136)	1.28 (0.68)	0.24 (0.11)	0.22 (0.08)	12.1 (3.78)	1.20 (0.69)	0.54 (0.29)	0.05 (0.03)	0.18 (0.09)
HC+DFB	4.48 (0.2)	1.29 (0.01)	131 (5.31)	1.55 (0.19)	0.14 (0.01)	0.07 (0.00)	3.03 (0.90)	0.21 (0.06)	0.14 (0.02)	0.03 (0.00)	0.10 (0.05)
HC-DFB	12.8 (2.7)	1.98 (0.74)	233 (162)	5.31 (0.99)	0.29 (0.11)	0.18 (0.06)	5.03 (3.06)	0.35 (0.13)	0.43 (0.33)	0.06 (0.01)	0.24 (0.02)
<i>d21</i>											
LC-DFB	13.9 (3.2)	1.54 (0.48)	257 (20.9)	3.76 (0.75)	0.29 (0.06)	0.26 (0.01)	8.59 (0.69)	0.74 (0.31)	0.35 (0.04)	0.05 (0.02)	0.21 (0.08)
LC+DFB	4.36 (0.4)	1.01 (0.41)	253 (47.6)	2.04 (0.63)	0.23 (0.02)	0.20 (0.01)	14.3 (1.32)	0.67 (0.09)	0.43 (0.05)	0.05 (0.01)	0.09 (0.02)
HC+DFB	2.49 (0.9)	0.62 (0.17)	79 (19.6)	0.33 (0.07)	0.11 (0.02)	0.07 (0.03)	2.36 (1.38)	0.09 (0.06)	0.09 (0.03)	0.01 (0.00)	0.03 (0.01)
HC-DFB	2.56 (1.2)	0.98 (0.30)	74 (20.7)	1.03 (0.18)	0.12 (0.03)	0.05 (0.01)	1.01 (0.35)	0.05 (0.02)	0.07 (0.01)	0.02 (0.00)	0.13 (0.01)
%	ns	ns	80*	75*	60*	70*	55**	45***	55**	35***	30***