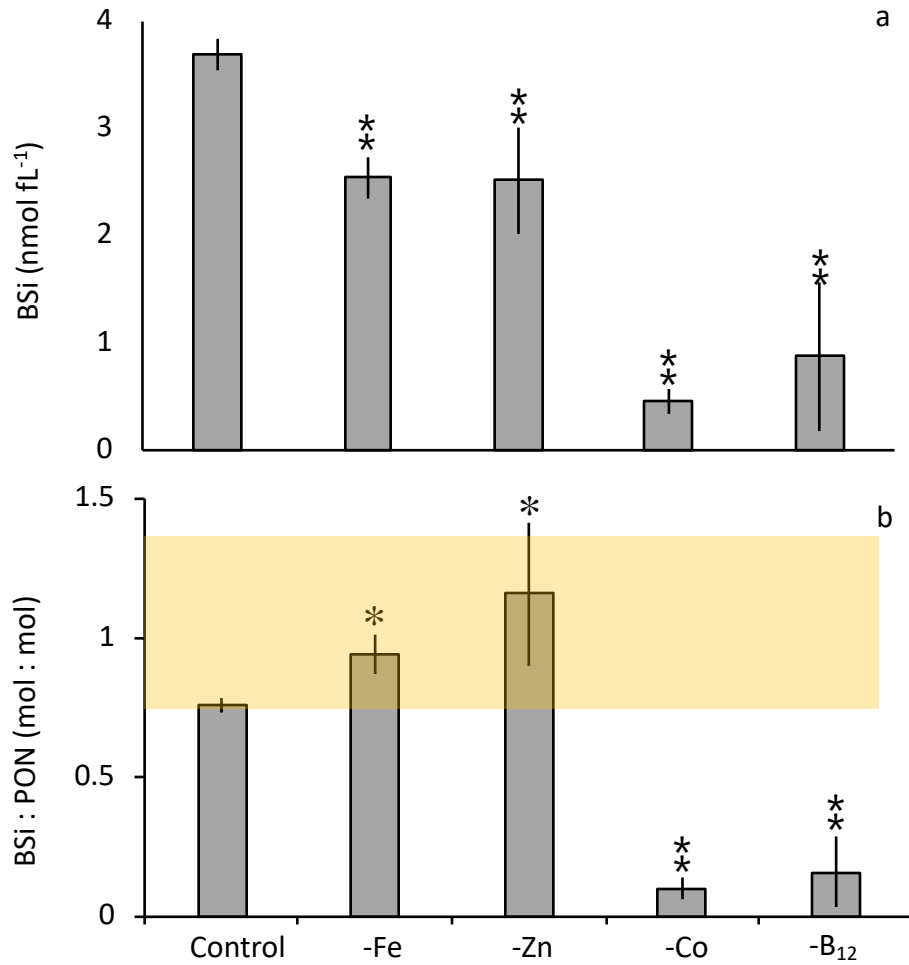


Suppl. Table 1. Concentrations of dissolved trace metals in the chelexed, modified Aquil media before addition of the macronutrients, trace metals and vitamins (left column). Fe, Zn and Co stand for iron, zinc and cobalt, respectively and Mn, Cu and Mo denote manganese, copper and molybdate, respectively. Concentrations were sufficiently low, confirming that the chelexing had effectively removed most trace metals. The right column shows the final concentrations of trace metals, vitamins and macro nutrient following the standard Aquil recipe additions. This full strength Aquil media was used as the control and the different treatments were obtained by eliminating either a TM or vitamin B₁₂ from the Control. A * denotes pmol L⁻¹ concentrations while a ‡ shows concentrations in $\mu\text{mol L}^{-1}$. The range of concentrations for the modified Aquil represents the lowest and highest measured concentrations of the different prepared batches. A detailed description of the media preparation is given in the methods. † = 36 $\mu\text{mol L}^{-1}$ of the total NO₃⁻ was added due to the HNO₃ content of the trace metal standards used.

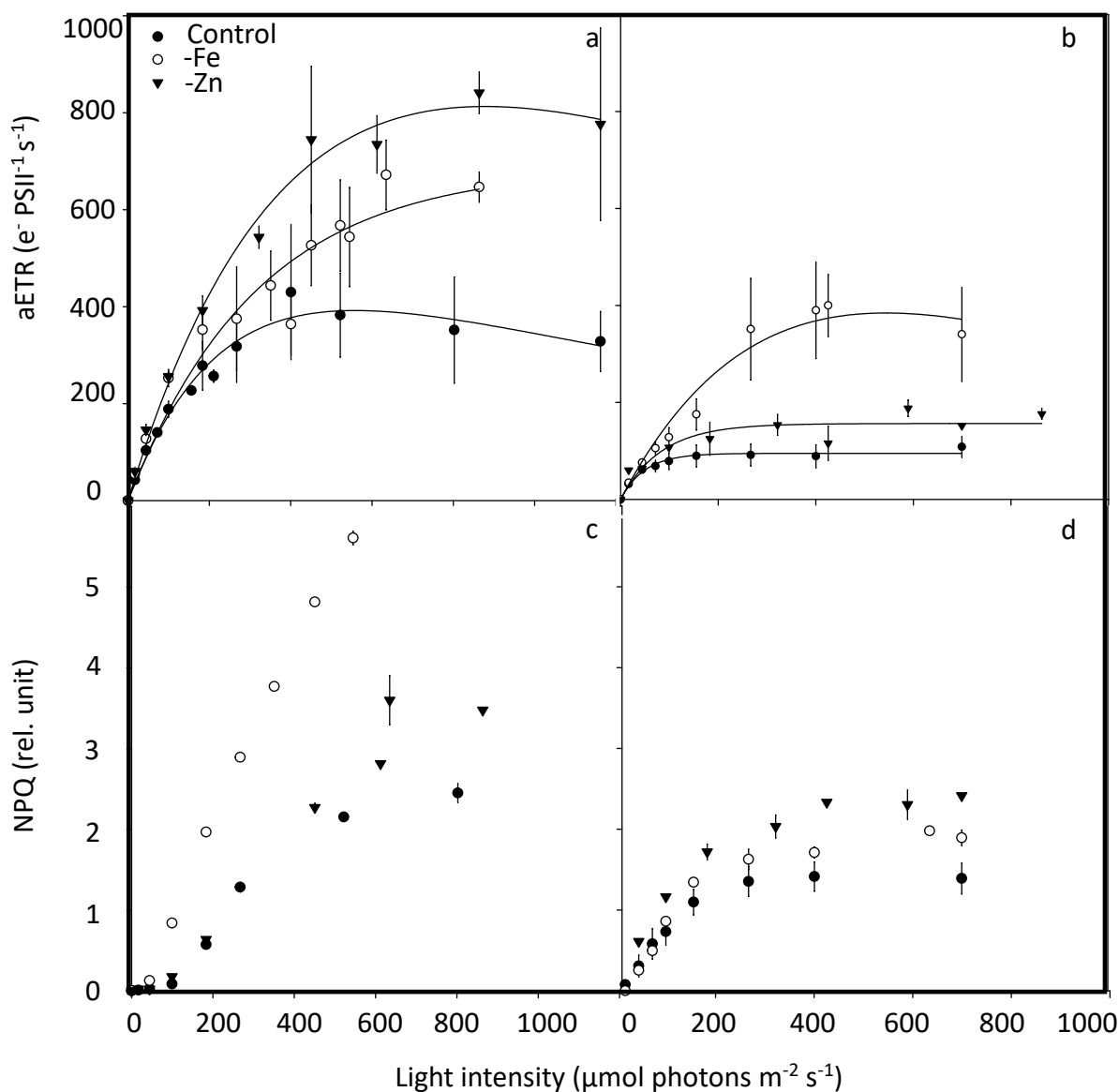
	Modified Aquil nmol L ⁻¹	Control nmol L ⁻¹
Fe	0.27-0.38	2000
Zn	0.44-1.51	600
Co	1.56-2.88*	100
Mn	11.69-12.36	135
Cu	0.02-0.03	12
Mo	1.76-5.82	10
B ₁₂		369*
B ₁		296
B ₇		2.05
NO ₃ ⁻		336*†
PO ₄ ³⁻		10‡
Si(OH) ₄		100‡

Suppl. Table 2. Recovery, uncertainty and means of certification of the certified reference material BCR-414 (n=11). Fe, Zn, Cu, Mn and Co stand for iron, zinc, copper, manganese and cobalt, respectively. BCRI and BCRC denote indicative and certified values of BCR-414, respectively.

Element	Fe	Zn	Cu	Mn	Co
% recovery	97.6	94.8	100.0	90.5	93.7
% RSD BCR-414	10.3	2.2	4.4	4.3	4.2
Certification	BCRI	BCRC	BCRC	BCRC	BCRI



Supplementary Figure 1. Biovolume-normalized biogenic silicate (BSi) and the ratio of BSi to particulate organic nitrogen (PON) for *Chaetoceros simplex* grown under trace metal replete (Control), iron- (-Fe), zinc- (-Zn), cobalt- (-Co), and B₁₂-limited (-B₁₂) conditions. Values represent mean \pm standard deviation (n=3). Significant differences (ANOVA) for each parameter relative to the control are denoted by * (p<0.01) and * (p<0.001). The yellow rectangle represents the 1.05 ± 0.33 (mol:mol; mean \pm standard deviation) of the BSi : PON ratio of 45 diatom species grown under optimal conditions described by Brzezinski (1985).



Supplementary Figure 2. Effects of iron (Fe) and zinc (Zn) limitation on the absolute electron transport rates (aETR, $\text{e}^- \text{PSII}^{-1} \text{s}^{-1}$; a, b) and nonphotochemical quenching (NPQ, relative units; c, d) for *C. simplex* (a, c) and *G. cryophila* (b, d) in response to increasing instantaneous irradiance. Cells were grown under trace metal replete (Control, black circles), iron- (-Fe, open circles) and zinc-limited (-Zn, black triangles) conditions. Data represent mean \pm standard deviation ($n \geq 4$).