

Supplementary Information belonging to:

## **Dissolved trace metals in the Ross Sea**

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**Table S1:** Pearson correlations and parameters of linear regression between nutrient and the dissolved metal concentrations of Cd, Co, Cu and Zn per defined water layer of water mass.  $\text{NO}_3^-$ ,  $\text{Si(OH)}_4$ ,  $\text{PO}_4^{3-}$  in  $\mu\text{M}$  and trace metals in nM except Co, which is in pM.

	area	N	slope	intercept	adjRsqr	pearson corr
<b>y-axis:</b>						
<b>axis:</b>						
<b>axis</b>						
N:P	all	357	12.11	4.81	0.96	0.98
	AASW	102	11.55	5.62	0.90	0.95
	not AASW	255	13.89	1.00	0.73	0.85
	Y	73	11.87	5.28	0.91	0.95
	no	284	12.65	3.66	0.94	0.97
N:Si	all	357	0.40	-2.03	0.75	0.87
	AASW	102	2.87	0.31	0.46	0.68
	not AASW	253	0.15	19.24	0.32	0.56
	Y	73	0.32	2.76	0.47	0.68
Si:P	all	357	24.13	28.49	0.83	0.91
	AASW	102	21.66	32.19	0.67	0.82
	not AASW	255	44.15	-14.76	0.49	0.70
	Y	73	21.88	31.57	0.66	0.82
Zn:P	all	348	4.99	-5.09	0.75	0.87
	AASW	100	3.04	-2.32	0.54	0.68
	not AASW	248	8.27	-12.07	0.30	0.55
	Y	71	2.87	-2.01	0.43	0.66
	no	277	5.70	-6.55	0.66	0.81
Zn:Si	all	348	0.18	-8.53	0.68	0.83
	AASW	100	0.09	-3.61	0.33	0.58
	not AASW	248	0.12	-3.69	0.23	0.48
	Y	71	0.09	-3.22	0.32	0.57
	no	277	0.18	-9.00	0.57	0.76
<b>Zn:N</b>	all	348	0.40	-6.80	0.75	0.87
	AASW	100	0.24	-3.308	0.4572	0.6762
	not AASW	248	0.49	-9.398	0.274	0.5234
	Y	71	0.23	-2.91	0.41	0.65
	no	277	0.438	-7.810	0.666	0.82
Cd:P	all	352	0.55	-0.46	0.92	0.96
	AASW	102	0.48	-0.37	0.74	0.86
	not AASW	250	0.38	-0.1	0.42	0.65
	Y	72	0.47	-0.33	0.76	0.88

Cd:Si	no	280	0.62	-0.61	0.91	0.96
	all	352	0.02	-0.77	0.75	0.87
	AASW	102	0.01	-0.46	0.41	0.64
	noAASW	250	0.01	0.27	0.36	0.60
Cd:N	all	352	0.04	-0.63	0.91	0.95
	AASW	102	0.04	-0.52	0.73	0.85
	noAASW	250	0.02	0.01	0.40	0.63
Zn:Cd	all	348	9.09	-0.89	0.82	0.91
Cd:Zn	all	344	0.09	0.19	0.82	0.91
Co:P	all	344	19.48	0.84	0.70	0.84
	AASW	99	17.00	4.52	0.56	0.75
	not AASW	243	31.45	-25.00	0.20	0.45
	Y	71	18.00	3.95	0.62	0.79
	no	273	23.48	-7.81	0.59	0.77
Co:Si	AASW	99	0.39	5.27	0.23	0.48
	not AASW	243	0.52	1.13	0.21	0.46
Co-N	AASW	99	1.45	-3.27	0.65	0.81
	not AASW	243	1.70	-9.69	0.15	0.39
Cu:Si	all	352	0.03	0.27	0.48	0.69
	AASW	102	0.02	0.84	0.29	0.54
	not AASW	350	0.04	-0.46	0.24	0.49
	HSSW	127	0.04	-0.95	0.27	0.52
Cu:P	all	352	0.71	0.92	0.45	0.67
	AASW	102	0.59	1.11	0.39	0.63
	not AASW	350	1.97	-1.80	0.18	0.43
	HSSW	127	3.00	-4.04	0.44	0.19
Cu:N	all	352	0.06	0.68	0.67	0.46
	AASW	102	0.05	0.90	0.63	0.40
	not AASW	350	0.10	-0.74	0.36	0.13
	HSSW	127	0.26	-5.74	0.43	0.19

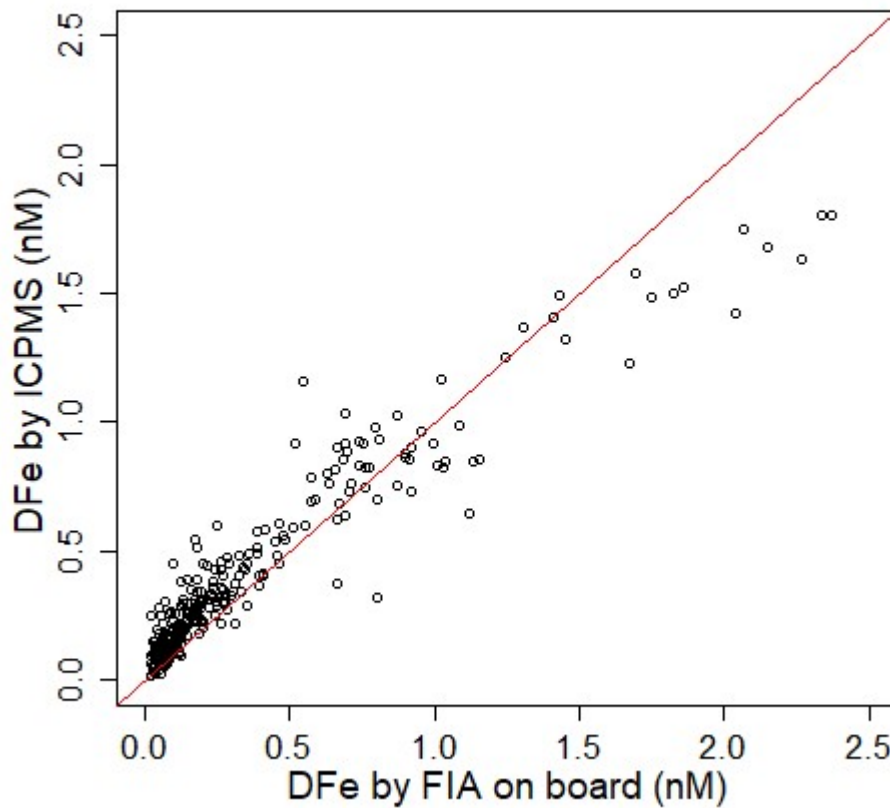
**Figure S1:** Dissolved Fe, measured by FIA on board, and measured in the home laboratory at NIOZ with ICPMS. In red the 1:1 line is given. Statistics done with R for three concentration ranges of DFe. Pearson correlation  $r$  is given. The average offset for low DFe concentrations is 0.055 nM higher when analysed by ICPMS after the cruise (averaged for FIA DFe<0.1, N=146, the offset is 0.075 nM averaged for FIA DFe<0.5, N=278).

The DFe measured with FIA was used to set these boundaries:

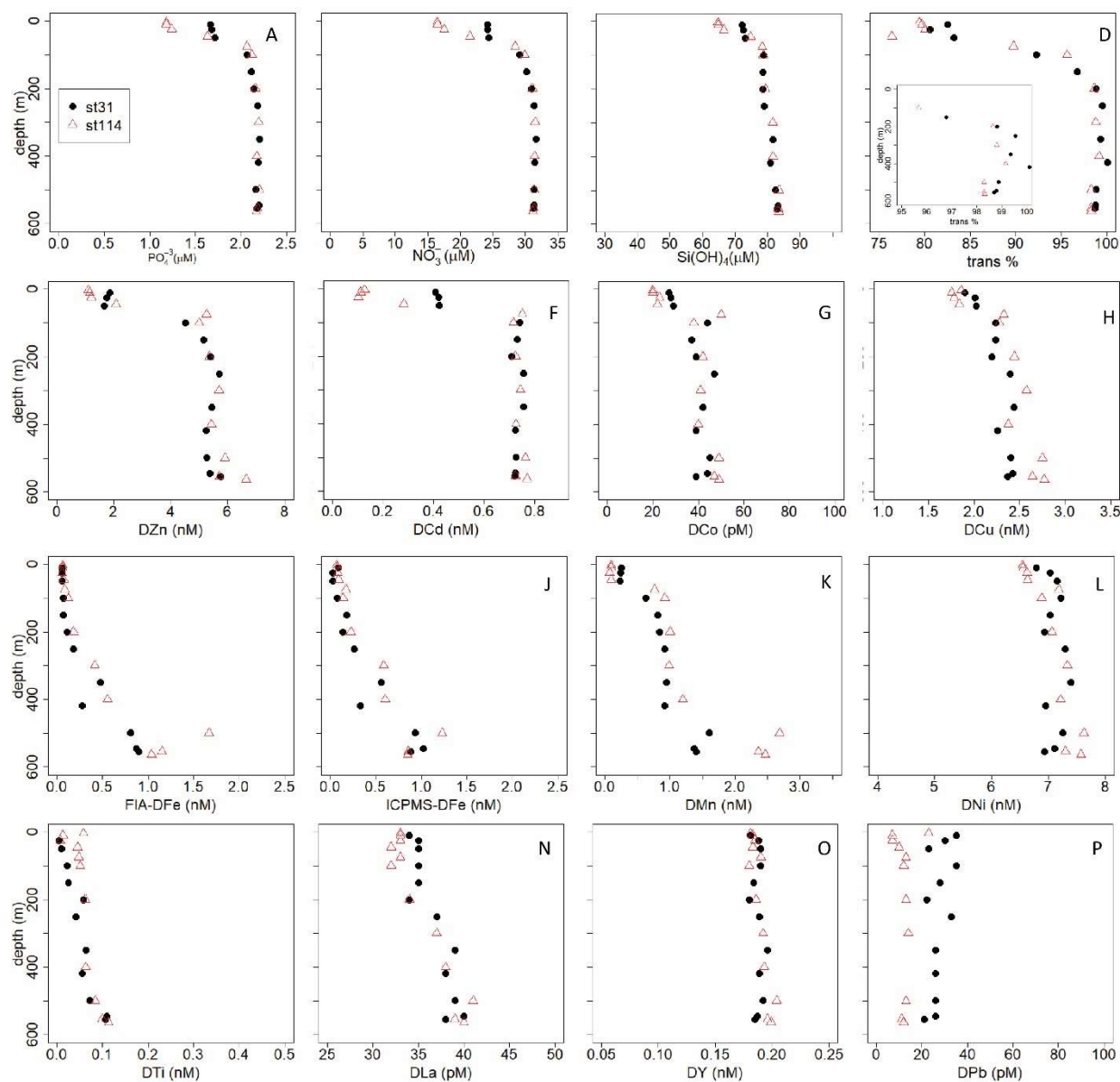
DFe FIA<0.5 nM: N=264, slope=1.1 intercept 0.06 nM,  $r=0.86$ ;

DFe FIA <1 nM: N=304, slope=0.99, intercept= 0.08 nM,  $r=0.93$ ;

DFe FIA>1 nM: N=25, slope=0.73, intercept=0.17 nM,  $r=0.91$



**Figure S2:** Depth profiles of macro-nutrients ( $\mu\text{M}$ ), transmission (%) and trace metals (nM and pM) of St. 31 and 114. Note there are two figures for DFe one with FIA (FIA DFe), one with ICPMS obtained data (ICPMS Fe). A:  $\text{PO}_4^{3-}$ , B:  $\text{NO}_3^-$ , C:  $\text{Si(OH)}_4$ , D: Transmission, E: Zn, F: Cd, G: Co, H: Cu, I: FIA Fe, J: ICPMS Fe, K: Mn, L: Ni, M: Ti, N: La, O: Y, P: Pb.



**Figure S3:** Depth profiles of macro-nutrients ( $\mu\text{M}$ ) and dissolved metals (nM and pM) at St. 60-65. The station sequence in the legend is the sequence from E to W, and is from Pennell Bank into the Joides Trough, featuring mCDW between approximately 150 and 300 m (**Figures 1 and 2**).

