Supplement of Biogeosciences, 17, 917–943, 2020
https://doi.org/10.5194/bg-17-917-2020-supplement

Biogeosciences
Open Access

Supplement of

Dissolved iron in the North Atlantic Ocean and Labrador Sea along the GEOVIDE section (GEOTRACES section GA01)

Manon Tonnard et al.

Correspondence to: Géraldine Sarthou (geraldine.sarthou@univ-brest.fr) and Hélène Planquette (helene.planquette@univ-brest.fr)

Figure S1: Section plot of Total Chlorophyll-a (TChl-*a*) concentrations (mg m^{-3}) measured for the GA01 voyage. The black contour lines highlight the TChl-*a* concentrations and the white contour lines highlight the dissolved iron (DFe) concentrations. The red dashed line indicates the depth of the Surface Mixed Layer (SML) (see text for details). (Ocean Data View (ODV) software, version 4.7.6, R. Schlitzer, http://odv.awi.de, 2016, last(access: Jan 30 2020).

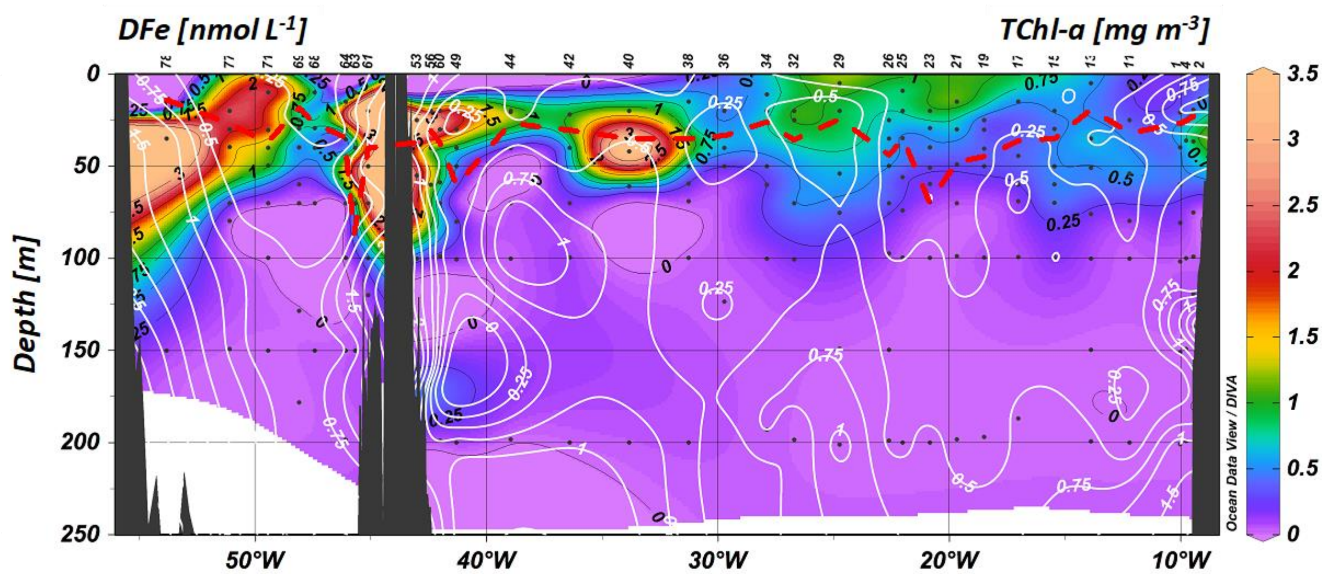


Figure S2: Mean profiles of dissolved iron (Fe) along the North Atlantic section in the West European Basin (purple), Iceland Basin (blue), Irminger Sea (green) and Labrador Sea (red) over the depth intervals: 0-100 m, 100-250 m, 250-500 m, 500-1000 m, 1000-1500 m, 1500-2000 m, 2000-3000 m, 3000-4000 m, 4000-5500 m without considering stations located above the continental plateau.

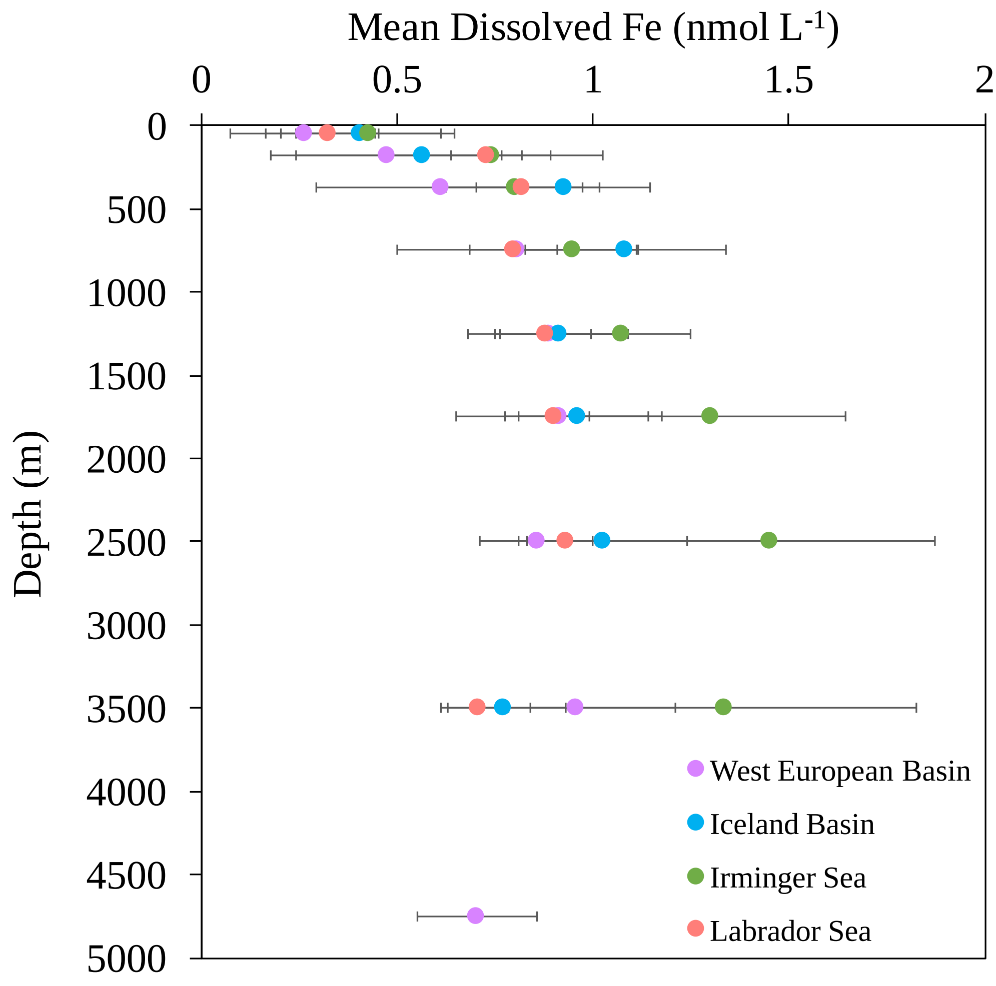


Figure S3: Box and whisker plot of dissolved iron (DFe) in nmol L^{-1} per water mass and basin. Color coding representing from West to East: the Labrador Sea (red), the Irminger Sea (green), the Iceland Basin (blue) and the West European Basin (purple). Note that stations 1 and 17 were not considered in this plot. SAIW: Sub-Arctic Intermediate Water, ENACW: East North Atlantic Central Water, IrSPMW: Irminger Sub-Polar Mode Water, IcSPMW: Iceland Sub-Polar Mode Water, MOW: Mediterranean Overflow Water, LSW: Labrador Sea Water, ISOW: Iceland-Scotland Overflow Water, DSOW: Denmark Strait Overflow Water, NEADW: North East Atlantic Deep Water. The red dotted line represents the DFe median value (0.77 nmol L^{-1}).

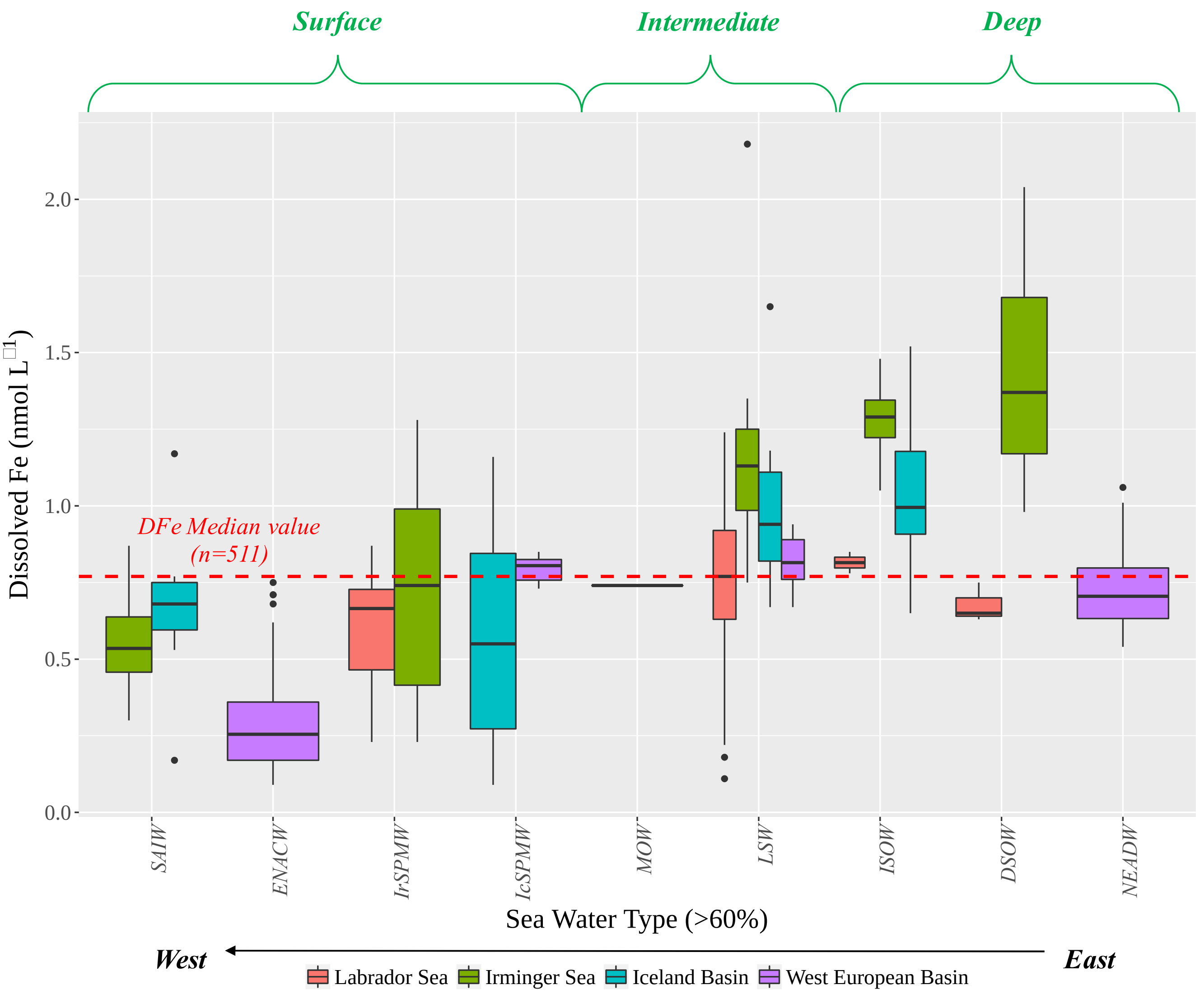


Figure S4: Surface layer of DFe concentrations, new measurements are shown in red dots (GEOVIDE voyage), while previous studies are displayed in black (Achterberg et al., 2018; Bergquist et al., 2007; Blain et al., 2004; Boye et al., 2006, 2003; de Jong et al., 2007; Gledhill et al., 1998; Hatta et al., 2015; Klunder et al., 2012; Laës et al., 2003; Martin et al., 1993; Measures et al., 2008; Mills et al., 2008; Mohamed et al., 2011; Nédélec et al., 2007; Nielsdóttir et al., 2009; Pohl et al., 2011; Rijkenberg et al., 2014; Sarthou et al., 2007, 2003; Sedwick et al., 2005; Ussher et al., 2013; Witter and Luther III, 1998; Wu and Boyle, 2002; Wu and Luther III, 1996, 1994; Wu et al., 2001).

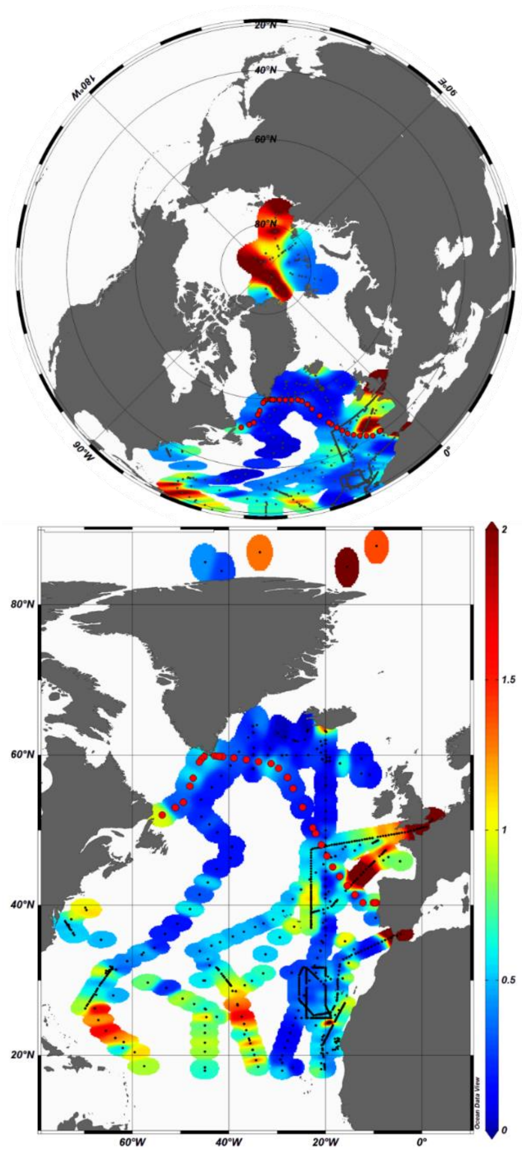


Figure S5: A) Plot of dissolved iron (DFe) concentrations as a function of the percentage of Polar Intermediate Water (PIW) contribution for open-ocean stations (stations 44, 49, 60, 63, 68, 69, 71 and 77). Station 44 highlighted in green and dashed-line representing the linear regression line between DFe concentrations and percentage of PIW contribution for all stations except station 44. B) Plot of dissolved (DFe, black dots) and particulate iron (PFe, open dots, Gourain et al., in prep.) for station 44 (from 2220 m depth to the bottom) as a function of the percentage of mixing between Iceland-Scotland Overflow Water (ISOW) as opposed to Polar Intermediate Water (PIW) and Denmark Strait Overflow Water (DSOW) (Garcia-Ibanez et al., 2015) with polynomial (DFe) and exponential (PFe) regression equations.

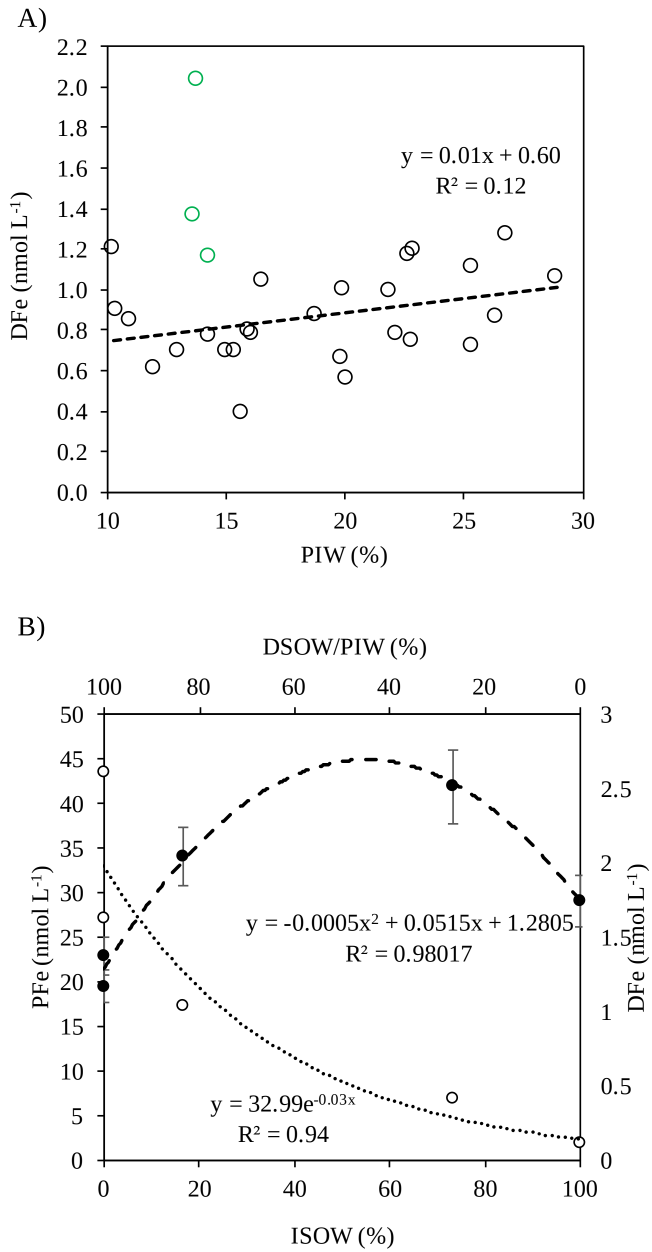


Figure S6: Plots of the first two dimensions of a Principal Component Analysis (PCA) performed on A) the following variables: Apparent Oxygen Utilization (AOU), dissolved aluminium (DAl, Menzel Barraqueta et al., 2018), particulate iron, aluminum and manganese oxides (PFe, PAl and MnO_2, Gourain et al., in prep.) and B) for samples which presented a transmissometry lower than 99% and below 500 m depth to avoid surface processes. Note that the color coding corresponds to different water masses (contribution >60% of the whole water mass pool) with the Denmark Strait Overflow Water (DSOW) in grey, the East North Atlantic Central Water (ENACW) in yellow, the Irminger Sub-Polar Mode Water (IrSPMW) in blue, the Iceland-Scotland Overflow Water (ISOW) in green, the Labrador Sea Water (LSW) in red, the Mediterranean Overflow Water (MOW) in orange, the North East Atlantic Deep Water (NEADW) in pink and mixing of multiple water masses (NA) in white. Plots of dissolved iron (DFe) plotted as a function of distance height above the seafloor for C) the first dimension of the PCA and D) the second dimension of the PCA. Note that positive and negative values are represented in blue and red, respectively and that dot size are function of the particulate iron and manganese oxide ratios ($PFe:MnO_2$, mol mol^{-1}).

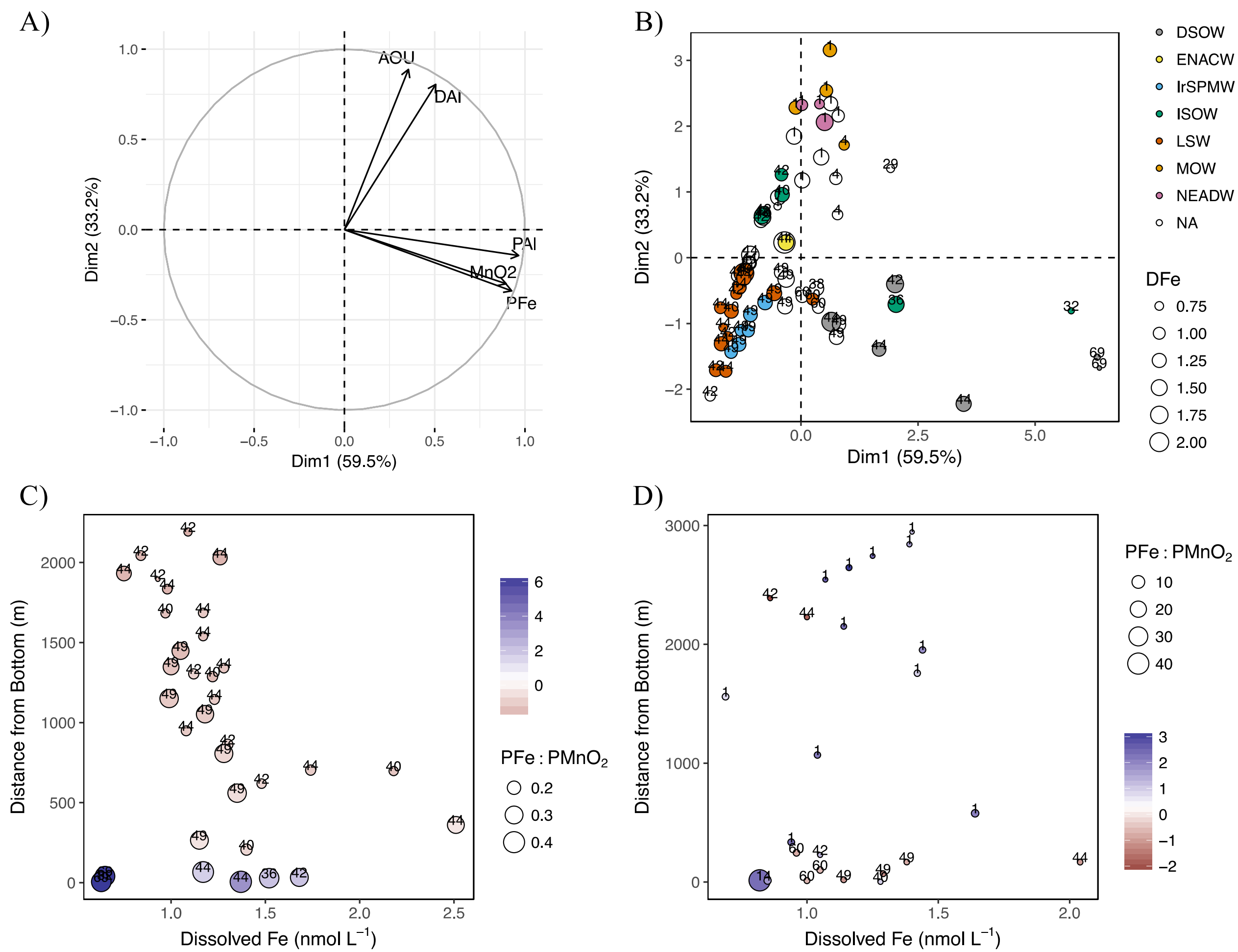


Figure S7: Vertical profiles of the DFe:NO3 ratio over the upper 200 m of the water column along the GEOVIDE section. Profiles from the West European Basin are plotted in black, from the Iceland Basin in grey, from the Irminger Sea in green and from the Labrador Sea in red. Stations located above the continental Plateau (stations 1, 2 and 4 from the Iberian Margin; stations 53 and 61 from the Greenland shelf; station 78 from the Newfoundland Margin) are represented with dotted lines. The vertical dashed lines (light blue) indicate lower and upper limits 5 of phytoplankton cellular DFe:NO3 ratios under Fe replete conditions Ho et al., 2003; Sunda and Huntsman, 1995; Twining et al., 2004.

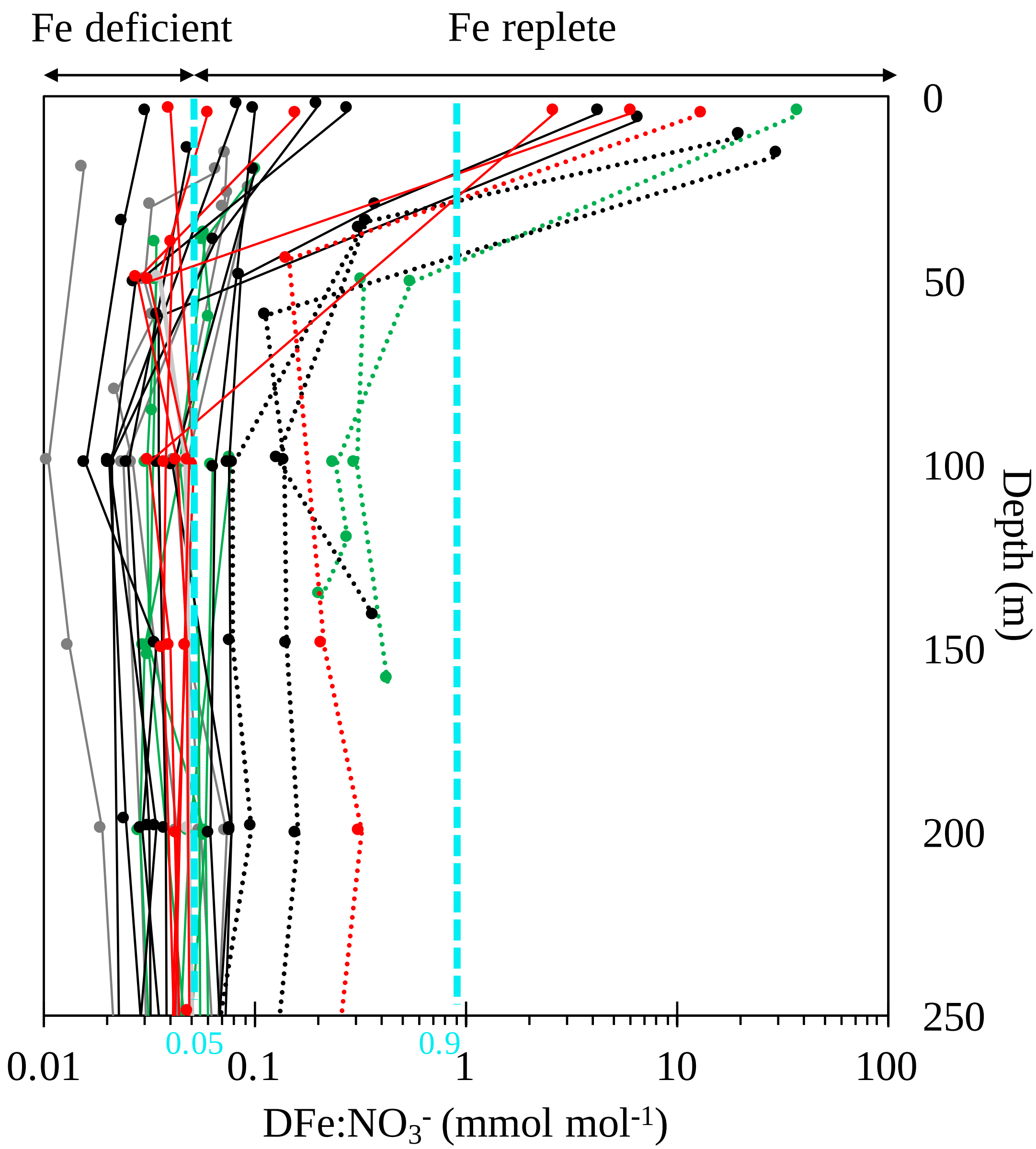
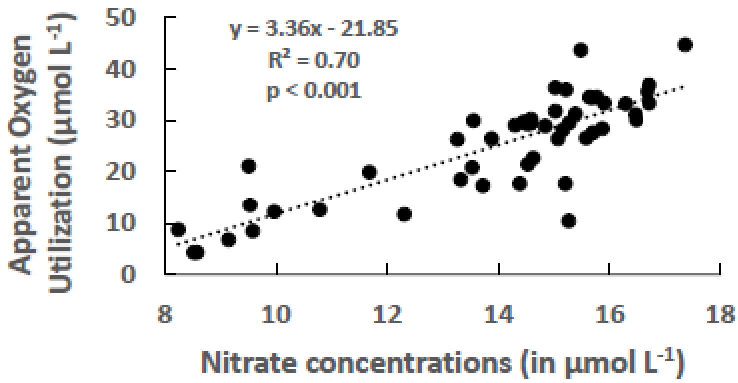
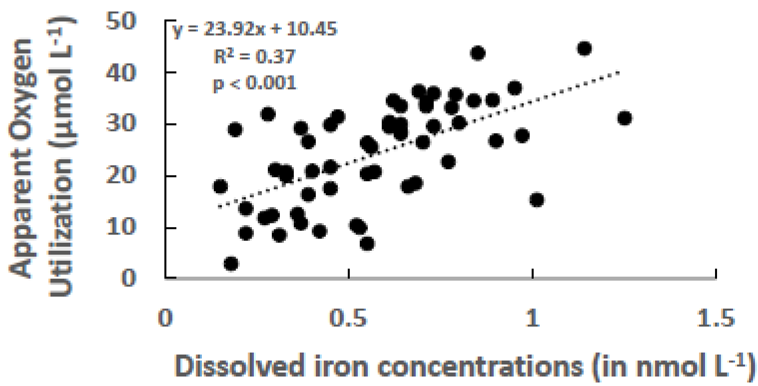


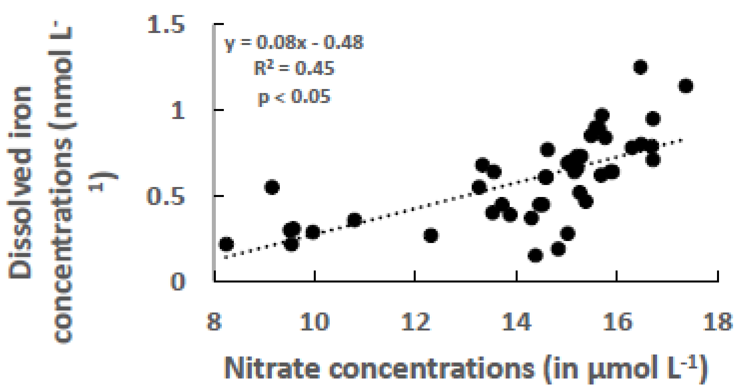
Figure S8: (A) Apparent Oxygen Utilization (AOU) vs. NO_3, (B) AOU vs. DFe, and (C) DFe vs. NO_3 in the subpolar gyre between 50 m and 250 m at station (29-49, 56, 60, 63-77).



(A)



(B)



(C)

Figure S9: Surface map of the $DFe:NO_3^-$ ratios along the GEOVIDE section.

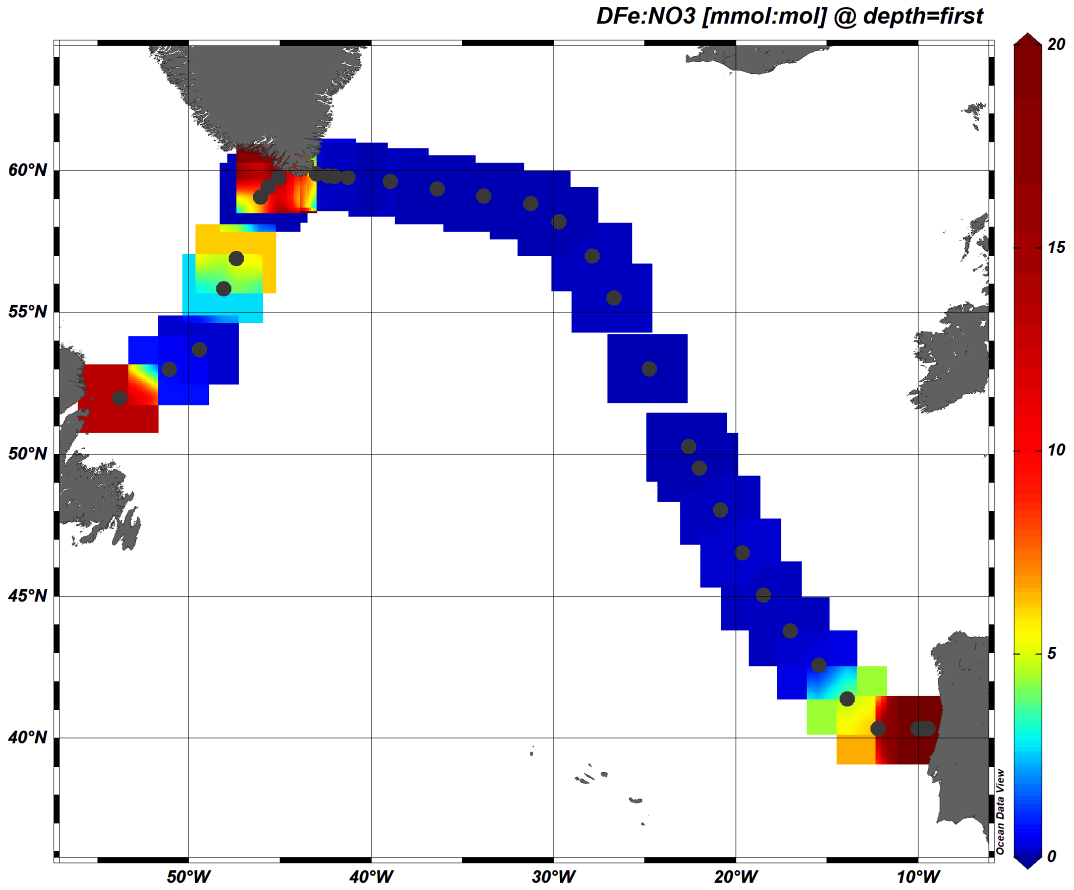


Figure S10: Section plot of the Fe* tracer in the North Atlantic Ocean with a remineralization rate ($R_{Fe:N}$) of 0.05 mmol mol^{-1} from 100 m depth to bottom waters. A contour line of 0 separates areas of negative Fe* from areas with positive Fe*. Positive values of Fe* imply there is enough iron to support complete consumption of NO_3^- when this water is brought to surface, and negative Fe* imply a deficit. See text for details.

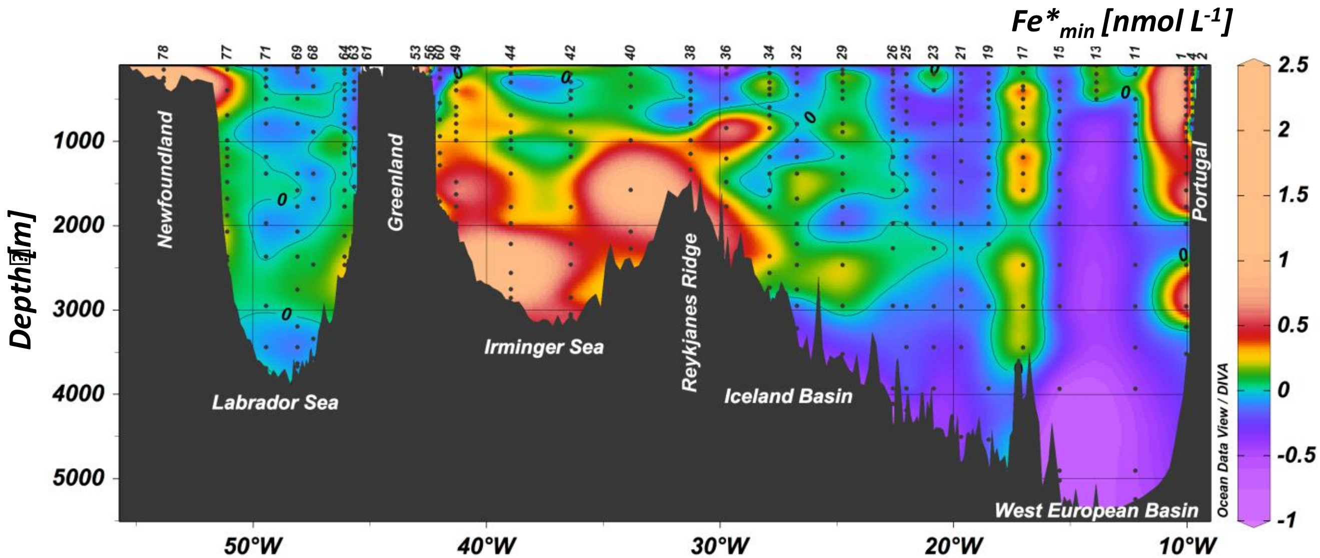


Figure S11: Box and whisker plot of Fe* in units of nmol L^{-1} as determined per water mass and basin with a Fe:N uptake rate of 0.05. Color coding representing from West to East, the Labrador Sea (red), the Irminger Sea (green), the Iceland Basin (blue) and the West European Basin (purple). Abbreviation referring to SAIW: Sub-Arctic Intermediate Water, ENACW: East North Atlantic Central Water, IrSPMW: Irminger Sub-Polar Mode Water, IcSPMW: Iceland Sub-Polar Mode Water, MOW: Mediterranean Overflow Water, LSW: Labrador Sea Water, ISOW: Iceland-Scotland Overflow Water, DSOW: Denmark Strait Overflow Water, NEADW: North East Atlantic Deep Water.

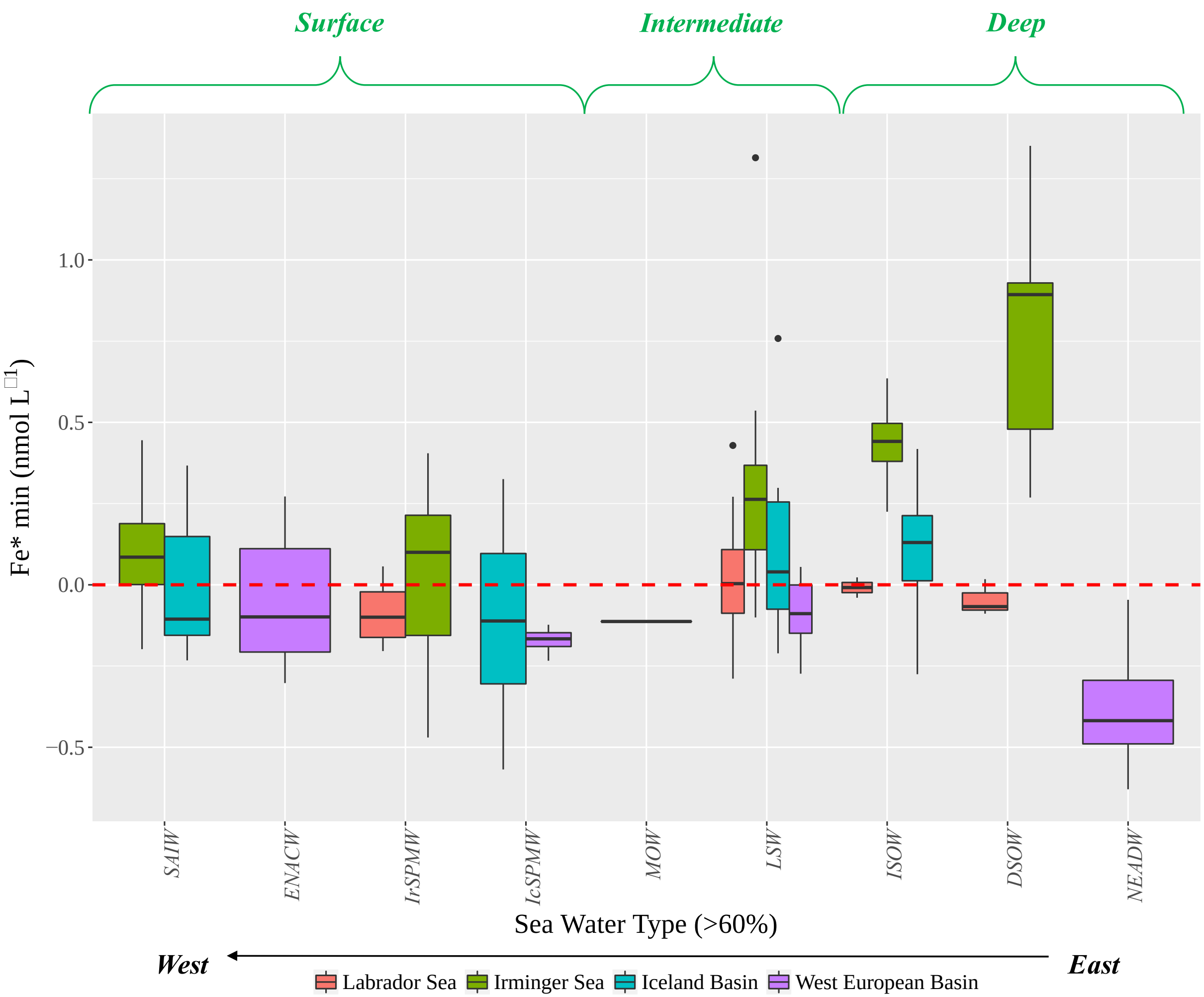


Table S1: Table of dissolved iron (DFe) data for the whole GEOVIDE section. Bold characters denote stations located above the shelves. Note that QC refers to the data quality (1 = good data, 2 = questionable, 3 = bad data, were removed).

Station (#)	Lat (°N)	Lon (°E)	Bottle (#)	Depth (m)	DFe (nmol kg-1)	DFe (nmol L-1)		SD	QC (#)
1	40.333	-10.036	24	21	1.04	1.07	±	0.12	2
			22	60	0.50	0.51	±	0.06	1
			21	81	0.72	0.74	±	0.09	1
			20	102	0.82	0.84	±	0.10	1
			19	151	0.94	0.96	±	0.11	1
			18	201	1.23	1.26	±	0.15	2
			17	300	1.05	1.08	±	0.13	1
			16	387	1.28	1.31	±	0.15	1
			15	501	1.40	1.44	±	0.17	1
			14	589	1.37	1.40	±	0.16	1
			13	693	1.36	1.39	±	0.16	1
			12	792	1.22	1.25	±	0.15	1
			11	889	1.13	1.16	±	0.14	1
			10	990	1.04	1.07	±	0.12	1
			9	1185	1.18	1.21	±	0.14	1
			8	1384	1.11	1.14	±	0.13	1
			7	1582	1.40	1.44	±	0.17	2
			6	1778	1.39	1.42	±	0.17	2
			5	1976	0.67	0.69	±	0.08	1
			4	2466	1.01	1.04	±	0.12	1
			3	2957	1.60	1.64	±	0.19	2
			2	3201	0.92	0.94	±	0.11	1
			1	3521	0.80	0.82	±	0.10	1
2	40.333	-9.46	21	19	0.99	1.01	±	0.04	1
			19	37	0.36	0.37	±	0.01	1
			14	50	0.46	0.47	±	0.02	1
			13	75	0.61	0.63	±	0.02	1
			9	99	0.73	0.75	±	0.03	1
			5	119	0.56	0.57	±	0.02	1
			1	137	2.97	3.04	±	0.12	1
4	40.333	-9.767	23	21	0.71	0.73	±	0.03	2

			21	39	0.33	0.34	±	0.01	1
			19	71	0.51	0.52	±	0.02	1
			15	149	0.59	0.60	±	0.02	1
			13	200	0.87	0.89	±	0.03	2
			11	300	0.55	0.56	±	0.02	1
			9	398	0.72	0.74	±	0.03	1
			7	496	0.79	0.81	±	0.03	1
			5	596	0.84	0.86	±	0.03	1
			3	694	1.00	1.03	±	0.04	1
			1	792	0.83	0.85	±	0.03	1
11	40.333	-12.219	24	15	0.12	0.12	±	0.01	1
			23	25	0.27	0.28	±	0.02	3
			22	54	0.19	0.19	±	0.01	1
			21	80	0.18	0.18	±	0.01	1
			20	100	0.23	0.24	±	0.02	1
			19	199	0.28	0.29	±	0.02	1
			16	497	0.55	0.56	±	0.04	1
			14	695	0.74	0.76	±	0.05	1
			13	793	0.79	0.81	±	0.06	1
			12	991	0.76	0.78	±	0.05	1
			11	1188	0.72	0.74	±	0.05	1
			9	1582	0.80	0.82	±	0.06	1
			8	1779	0.75	0.77	±	0.05	1
			7	1976	0.76	0.78	±	0.05	1
			6	2466	0.73	0.75	±	0.05	1
			5	2954	0.85	0.87	±	0.06	1
			4	3445	0.77	0.79	±	0.05	1
			3	3933	0.68	0.70	±	0.05	1
			2	4904	0.63	0.65	±	0.04	1
			1	5241	0.61	0.63	±	0.04	1
13	41.383	-13.888	24	11	0.22	0.23	±	0.02	1
			23	30	0.26	0.27	±	0.03	1
			22	51	0.25	0.26	±	0.02	1
			21	75	0.35	0.36	±	0.03	1
			20	100	0.50	0.51	±	0.05	1
			19	150	0.29	0.30	±	0.03	3

			16	199	0.59	0.60	±	0.06	1
			15	298	0.60	0.62	±	0.06	1
			14	397	0.69	0.71	±	0.07	1
			13	496	0.69	0.71	±	0.07	1
15	42.581	-15.461	24	20	0.24	0.25	±	0.02	1
			23	30	0.19	0.19	±	0.02	1
			22	49	0.14	0.14	±	0.01	1
			21	60	0.32	0.33	±	0.03	2
			20	70	0.25	0.26	±	0.02	2
			19	99	0.17	0.17	±	0.02	1
			16	298	0.26	0.27	±	0.03	1
			15	397	0.34	0.35	±	0.03	1
			14	496	0.44	0.45	±	0.04	1
			13	644	0.65	0.67	±	0.07	1
			12	793	0.65	0.67	±	0.06	1
			11	989	0.74	0.76	±	0.07	1
			10	1089	0.72	0.74	±	0.07	1
			9	1384	0.60	0.62	±	0.06	1
			8	1581	0.68	0.70	±	0.07	1
			7	1779	0.70	0.72	±	0.07	1
			6	1975	0.65	0.67	±	0.06	1
			5	2466	0.71	0.73	±	0.07	1
			4	2956	0.73	0.75	±	0.07	1
			3	3932	0.56	0.57	±	0.06	1
			2	4904	0.53	0.54	±	0.05	1
			1	5020	0.57	0.58	±	0.06	1
17	43.78	-17.032	24	15	0.17	0.17	±	0.01	1
			23	30	0.88	0.91	±	0.06	3
			22	44	0.52	0.53	±	0.04	1
			21	60	0.54	0.55	±	0.04	1
			20	69	0.56	0.57	±	0.04	1
			19	99	0.54	0.55	±	0.04	1
			16	199	0.56	0.57	±	0.04	1
			15	348	0.76	0.78	±	0.05	1
			14	396	1.04	1.07	±	0.07	1
			13	496	0.96	0.98	±	0.07	1

			12	595	1.03	1.06	±	0.07	1
			11	792	1.21	1.24	±	0.08	1
			10	990	1.08	1.11	±	0.08	1
			9	1188	1.35	1.38	±	0.09	1
			8	1385	1.23	1.26	±	0.09	1
			7	1581	1.31	1.34	±	0.09	1
			4	2465	1.25	1.28	±	0.09	1
			3	2955	1.27	1.30	±	0.09	1
			2	3444	1.31	1.34	±	0.09	1
19	45.05	-18.505	24	20	0.09	0.09	±	0.01	1
			23	30	0.31	0.32	±	0.03	3
			22	40	0.17	0.17	±	0.02	1
			21	50	0.10	0.10	±	0.01	1
			20	99	0.17	0.17	±	0.02	1
			19	200	0.31	0.32	±	0.03	1
			16	298	0.23	0.24	±	0.02	1
			15	397	0.36	0.37	±	0.04	1
			14	496	0.48	0.49	±	0.05	1
			13	595	0.53	0.54	±	0.05	1
			12	793	0.71	0.73	±	0.07	1
			11	991	0.74	0.76	±	0.07	1
			10	1188	0.78	0.80	±	0.08	1
			9	1386	0.68	0.70	±	0.07	1
			8	1582	0.77	0.79	±	0.08	1
			7	1779	0.78	0.80	±	0.08	1
			6	1975	0.80	0.82	±	0.08	1
			5	2221	0.86	0.88	±	0.09	1
			4	2466	1.13	1.16	±	0.11	3
			3	2955	0.87	0.89	±	0.09	1
			2	3930	0.99	1.01	±	0.10	1
			1	4538	0.99	1.01	±	0.10	1
21	46.544	-19.672	24	19	0.17	0.17	±	0.01	1
			23	30	0.28	0.29	±	0.02	2
			22	49	0.20	0.21	±	0.01	1
			21	79	0.14	0.14	±	0.01	1
			20	99	0.17	0.17	±	0.01	1

			19	198	0.24	0.25	±	0.02	1
			16	297	0.34	0.35	±	0.02	1
			15	397	0.35	0.36	±	0.02	1
			14	496	0.35	0.36	±	0.02	1
			13	594	0.35	0.36	±	0.02	1
			12	693	0.53	0.54	±	0.04	1
			11	792	0.83	0.85	±	0.06	1
			10	989	0.79	0.81	±	0.06	1
			9	1236	0.76	0.78	±	0.05	1
			8	1482	0.74	0.76	±	0.05	1
			7	1976	0.81	0.83	±	0.06	1
			6	2269	0.88	0.90	±	0.06	1
			5	2759	0.70	0.72	±	0.05	1
			4	2955	0.88	0.90	±	0.06	1
			3	3442	0.78	0.80	±	0.05	1
			2	4417	1.29	1.32	±	0.09	3
			1	4506	0.71	0.73	±	0.05	1
23	48.039	-20.848	24	20	0.17	0.17	±	0.01	1
			23	29	0.18	0.18	±	0.01	1
			22	40	0.15	0.15	±	0.01	1
			21	50	0.18	0.18	±	0.01	1
			20	60	0.25	0.26	±	0.02	1
			19	70	0.28	0.29	±	0.02	1
			16	100	0.34	0.35	±	0.02	1
			15	199	0.73	0.75	±	0.05	1
			14	397	0.66	0.68	±	0.05	1
			13	594	0.32	0.33	±	0.02	3
			12	792	0.73	0.75	±	0.05	1
			10	1187	0.65	0.67	±	0.05	1
			9	1384	0.69	0.71	±	0.05	1
			8	1581	0.75	0.77	±	0.05	1
			7	1778	0.70	0.72	±	0.05	1
			6	1974	0.77	0.79	±	0.05	1
			5	2269	0.92	0.94	±	0.06	1
			4	2954	0.79	0.81	±	0.06	1
			3	3443	0.80	0.82	±	0.06	1

			2	3930	0.62	0.64	±	0.04	1
			1	4442	0.75	0.77	±	0.05	1
25	49.529	-22.017	24	14	0.19	0.19	±	0.02	1
			23	25	0.13	0.13	±	0.01	1
			21	49	0.14	0.14	±	0.01	1
			20	74	0.19	0.19	±	0.02	1
			19	99	0.23	0.24	±	0.02	1
			16	198	0.34	0.35	±	0.03	1
			15	346	0.38	0.39	±	0.04	1
			14	495	0.44	0.45	±	0.04	1
			13	643	0.58	0.59	±	0.06	1
			12	792	0.78	0.80	±	0.08	1
			11	990	0.92	0.94	±	0.09	1
			10	1187	0.76	0.78	±	0.08	1
			9	1386	0.87	0.89	±	0.09	1
			8	1580	0.87	0.89	±	0.09	1
			7	1778	0.79	0.81	±	0.08	1
			6	1974	0.87	0.89	±	0.09	1
			5	2563	1.07	1.10	±	0.11	3
			4	2955	0.84	0.86	±	0.08	1
			3	3441	0.83	0.85	±	0.08	1
			2	3930	1.03	1.06	±	0.10	1
			1	4191	0.69	0.71	±	0.07	1
26	50.278	-22.603	22	20	0.18	0.18	±	0.02	1
			21	34	0.15	0.15	±	0.01	1
			20	50	0.15	0.15	±	0.02	1
			19	69	0.15	0.15	±	0.02	1
			18	97	0.18	0.18	±	0.02	1
			17	150	0.43	0.44	±	0.04	1
			16	199	0.39	0.40	±	0.04	1
			15	297	0.57	0.58	±	0.06	1
			14	396	0.62	0.64	±	0.06	1
			13	496	0.82	0.84	±	0.08	1
			12	594	0.80	0.82	±	0.08	1
			11	742	0.76	0.78	±	0.08	1
			10	891	0.74	0.76	±	0.07	1

			9	989	0.83	0.85	±	0.08	1
			8	1186	0.89	0.91	±	0.09	1
			7	1384	0.83	0.85	±	0.08	1
			6	1580	0.92	0.94	±	0.09	1
			5	1974	0.90	0.92	±	0.09	1
			4	2268	0.87	0.89	±	0.09	1
			3	2953	0.75	0.77	±	0.08	1
			2	3929	0.61	0.63	±	0.06	1
			1	4116	0.63	0.65	±	0.06	1
29	53.019	-24.752	22	15	0.17	0.17	±	0.02	1
			21	25	0.75	0.77	±	0.08	2
			20	50	0.66	0.68	±	0.07	2
			19	75	0.52	0.53	±	0.05	1
			18	99	0.64	0.66	±	0.06	1
			17	149	0.71	0.73	±	0.07	1
			16	198	1.14	1.17	±	0.11	1
			15	298	1.02	1.05	±	0.10	1
			14	397	0.98	1.00	±	0.10	1
			13	495	0.95	0.97	±	0.09	1
			11	791	0.98	1.00	±	0.10	1
			10	890	1.10	1.13	±	0.11	1
			9	1087	0.99	1.01	±	0.10	1
			8	1185	0.85	0.87	±	0.09	1
			7	1382	0.92	0.94	±	0.09	1
			6	1581	0.93	0.95	±	0.09	1
			5	1776	0.71	0.73	±	0.07	1
			4	1973	0.65	0.67	±	0.06	1
			3	2464	1.09	1.12	±	0.11	1
			2	2953	0.98	1.00	±	0.10	1
			1	3522	0.69	0.71	±	0.07	1
32	55.506	-26.71	22	16	0.52	0.53	±	0.05	1
			21	26	0.64	0.66	±	0.06	1
			20	51	0.18	0.18	±	0.02	1
			19	101	0.22	0.23	±	0.02	1
			18	198	0.39	0.40	±	0.04	1
			17	298	0.49	0.50	±	0.05	1

			16	376	1.99	2.04	±	0.20	3
			15	446	0.84	0.86	±	0.08	1
			14	596	1.43	1.47	±	0.14	3
			13	691	2.02	2.07	±	0.20	3
			12	793	0.82	0.84	±	0.08	1
			11	990	0.71	0.73	±	0.07	1
			10	1186	0.67	0.69	±	0.07	1
			9	1383	1.08	1.11	±	0.11	2
			8	1532	2.53	2.60	±	0.25	3
			7	1680	1.11	1.14	±	0.11	2
			6	1974	0.92	0.94	±	0.09	1
			5	2218	0.92	0.94	±	0.09	1
			4	2464	0.97	0.99	±	0.10	1
			3	2758	1.02	1.05	±	0.10	1
			2	2952	0.71	0.73	±	0.07	1
			1	3217	0.63	0.65	±	0.06	1
34	57.004	-27.879	22	11	2.23	2.28	±	0.16	3
			21	29	0.54	0.55	±	0.04	1
			20	46	0.28	0.29	±	0.02	1
			19	60	0.53	0.54	±	0.04	1
			18	100	0.55	0.56	±	0.04	1
			17	199	0.85	0.87	±	0.06	1
			16	298	1.06	1.09	±	0.07	1
			15	377	1.01	1.04	±	0.07	1
			14	445	1.13	1.16	±	0.08	1
			13	595	0.83	0.85	±	0.06	1
			12	693	1.01	1.04	±	0.07	1
			11	841	1.15	1.18	±	0.08	1
			9	1186	0.79	0.81	±	0.06	1
			8	1383	0.87	0.89	±	0.06	1
			7	1580	0.80	0.82	±	0.06	1
			6	1777	0.88	0.90	±	0.06	1
			4	2364	1.19	1.22	±	0.08	1
			3	2561	0.91	0.93	±	0.06	1
			2	2562	0.88	0.90	±	0.06	1
			1	2733	0.97	0.99	±	0.07	1

36	58.207	-29.725	20	20	0.12	0.12	±	0.02	1
			19	39	0.09	0.09	±	0.01	1
			18	69	0.15	0.15	±	0.02	1
			16	124	0.19	0.19	±	0.03	1
			14	247	0.28	0.29	±	0.04	1
			12	494	0.69	0.71	±	0.10	1
			10	839	1.61	1.65	±	0.24	2
			8	1204	1.15	1.18	±	0.17	1
			6	1480	0.89	0.91	±	0.13	1
			4	1775	1.23	1.26	±	0.18	1
			2	2212	1.48	1.52	±	0.22	1
38	58.843	-31.267	21	20	0.46	0.47	±	0.07	2
			20	30	0.24	0.25	±	0.04	2
			19	49	0.26	0.27	±	0.04	2
			17	59	0.31	0.32	±	0.05	2
			16	69	0.27	0.28	±	0.04	2
			14	100	0.37	0.38	±	0.06	2
			12	199	0.61	0.63	±	0.09	2
			11	297	0.62	0.64	±	0.09	2
			10	397	0.62	0.64	±	0.09	2
			9	495	0.93	0.95	±	0.14	2
			8	569	0.69	0.71	±	0.10	2
			7	644	0.78	0.80	±	0.12	2
			6	792	0.69	0.71	±	0.10	2
			5	940	1.12	1.15	±	0.17	2
			4	990	1.21	1.24	±	0.18	2
			3	1149	1.08	1.11	±	0.16	2
			2	1285	0.74	0.76	±	0.11	2
			1	1337	1.23	1.26	±	0.19	2
40	59.102	-33.828	22	20	0.38	0.39	±	0.05	1
			20	37	0.56	0.57	±	0.08	1
			18	68	0.66	0.68	±	0.09	1
			16	149	0.84	0.86	±	0.12	1
			14	346	0.89	0.91	±	0.12	1
			12	593	0.95	0.97	±	0.13	1
			10	988	1.19	1.22	±	0.17	1

			8	1282	3.30	3.38	±	0.46	3
			6	1578	2.13	2.18	±	0.30	2
			4	2069	1.37	1.40	±	0.19	1
			2	2273	1.25	1.28	±	0.17	1
42	59.363	-36.397	22	20	0.35	0.36	±	0.05	1
			21	35	0.69	0.71	±	0.10	3
			20	50	0.37	0.38	±	0.05	1
			19	70	0.57	0.58	±	0.08	1
			18	99	0.97	0.99	±	0.14	1
			17	199	0.95	0.97	±	0.13	1
			16	297	0.71	0.73	±	0.10	1
			15	397	0.85	0.87	±	0.12	1
			14	495	0.78	0.80	±	0.11	1
			13	693	0.84	0.86	±	0.12	1
			12	890	1.06	1.09	±	0.15	1
			11	1038	0.82	0.84	±	0.11	1
			10	1186	0.91	0.93	±	0.13	1
			9	1383	1.69	1.73	±	0.24	3
			8	1580	2.39	2.45	±	0.34	3
			7	1777	1.09	1.12	±	0.15	1
			6	1973	1.93	1.98	±	0.27	3
			5	2217	1.27	1.30	±	0.18	1
			4	2462	1.44	1.48	±	0.20	1
			3	2854	1.02	1.05	±	0.14	1
			2	3048	1.64	1.68	±	0.23	1
			1	3078	0.96	0.98	±	0.13	1
44	59.623	-38.954	22	21	1.33	1.37	±	0.13	3
			21	31	0.54	0.55	±	0.05	1
			20	40	0.50	0.51	±	0.05	1
			19	50	1.01	1.04	±	0.10	1
			18	100	1.25	1.28	±	0.12	2
			17	198	0.80	0.82	±	0.08	1
			16	299	0.65	0.67	±	0.06	1
			15	496	2.08	2.13	±	0.21	1
			14	693	0.98	1.00	±	0.10	1
			13	891	1.23	1.26	±	0.12	1

			12	990	0.73	0.75	±	0.07	1
			11	1087	0.96	0.98	±	0.10	1
			10	1236	1.14	1.17	±	0.11	1
			9	1382	1.14	1.17	±	0.11	1
			8	1581	1.25	1.28	±	0.12	1
			7	1776	1.20	1.23	±	0.12	1
			6	1972	1.05	1.08	±	0.11	1
			5	2218	1.70	1.74	±	0.17	2
			4	2560	2.45	2.51	±	0.25	2
			3	2754	1.99	2.04	±	0.20	2
			2	2854	1.14	1.17	±	0.11	1
			1	2915	1.34	1.37	±	0.13	2
49	59.773	-41.297	22	19	0.25	0.26	±	0.02	1
			21	40	0.33	0.34	±	0.02	1
			20	61	0.42	0.43	±	0.03	1
			19	80	0.45	0.46	±	0.03	1
			18	101	0.45	0.46	±	0.03	1
			17	198	0.89	0.91	±	0.06	1
			16	297	0.96	0.98	±	0.07	1
			15	396	1.18	1.21	±	0.08	1
			14	544	1.75	1.80	±	0.12	3
			13	593	1.02	1.05	±	0.07	1
			12	693	0.98	1.00	±	0.07	1
			11	792	1.17	1.20	±	0.08	1
			10	891	0.97	0.99	±	0.07	1
			9	989	1.15	1.18	±	0.08	1
			8	1088	1.78	1.82	±	0.12	3
			7	1235	1.25	1.28	±	0.09	1
			6	1482	1.32	1.35	±	0.09	1
			5	1629	1.53	1.57	±	0.11	1
			4	1776	1.12	1.15	±	0.08	1
			3	1873	1.35	1.38	±	0.09	1
			2	1972	1.26	1.29	±	0.09	1
			1	2022	1.11	1.14	±	0.08	1
53	59.902	-43.015	16	55	1.17	1.20	±	0.12	1
			12	70	1.43	1.47	±	0.14	1

			8	100	1.93	1.98	±	0.19	1
			4	129	1.85	1.90	±	0.19	1
			1	164	2.99	3.06	±	0.30	1
56	59.823	-42.399	22	20	0.85	0.87	±	0.06	1
			20	40	0.50	0.51	±	0.03	1
			16	60	0.55	0.56	±	0.04	1
			14	119	1.84	1.89	±	0.13	3
			10	168	0.29	0.30	±	0.02	1
			6	246	0.33	0.34	±	0.02	1
			2	296	0.42	0.43	±	0.03	1
60	59.799	-42.004	22	19	0.24	0.25	±	0.02	1
			21	28	0.22	0.23	±	0.02	1
			20	38	0.84	0.86	±	0.08	3
			19	59	0.36	0.37	±	0.04	1
			18	77	0.39	0.40	±	0.04	1
			17	99	0.40	0.41	±	0.04	1
			16	149	0.45	0.46	±	0.05	1
			15	199	0.71	0.73	±	0.07	1
			14	248	0.69	0.71	±	0.07	1
			13	297	0.62	0.64	±	0.06	1
			12	345	0.79	0.81	±	0.08	1
			11	445	0.77	0.79	±	0.08	1
			10	543	0.73	0.75	±	0.07	1
			9	642	0.77	0.79	±	0.08	1
			8	741	0.86	0.88	±	0.09	1
			6	938	1.02	1.05	±	0.10	1
			5	1137	1.09	1.12	±	0.11	1
			4	1284	1.04	1.07	±	0.10	1
			3	1480	0.94	0.96	±	0.09	1
			2	1625	1.02	1.05	±	0.10	1
			1	1714	0.98	1.00	±	0.10	1
61	59.753	-45.112	12	23	0.77	0.79	±	0.12	1
			9	50	1.21	1.24	±	0.18	1
			7	70	0.56	0.57	±	0.08	1
			5	100	1.72	1.76	±	0.26	1
			3	120	2.21	2.27	±	0.33	1

			1	137	1.73	1.77	±	0.26	1
63	59.434	-45.666	12	20	0.39	0.40	±	0.03	1
			10	70	1.39	1.43	±	0.10	3
			9	99	0.68	0.70	±	0.05	1
			8	198	0.64	0.66	±	0.04	1
			7	297	0.61	0.63	±	0.04	1
			6	396	0.69	0.71	±	0.05	1
			5	495	0.64	0.66	±	0.05	1
			4	840	0.65	0.67	±	0.05	1
			3	1083	0.71	0.73	±	0.05	1
			2	1284	0.85	0.87	±	0.06	1
			1	1537	0.78	0.80	±	0.05	1
64	59.068	-46.083	22	15	0.30	0.31	±	0.04	1
			21	25	0.22	0.23	±	0.03	1
			20	35	0.26	0.27	±	0.03	1
			19	50	0.40	0.41	±	0.05	1
			18	100	0.70	0.72	±	0.08	1
			17	150	0.78	0.80	±	0.09	1
			16	198	0.79	0.81	±	0.09	1
			15	317	0.89	0.91	±	0.11	1
			14	397	0.85	0.87	±	0.10	1
			13	496	0.79	0.81	±	0.09	1
			12	693	0.81	0.83	±	0.10	1
			11	792	0.75	0.77	±	0.09	1
			10	890	0.95	0.97	±	0.11	1
			9	1038	1.03	1.06	±	0.12	1
			8	1137	0.96	0.98	±	0.11	1
			7	1383	0.93	0.95	±	0.11	1
			6	1580	0.99	1.01	±	0.12	1
			5	1776	0.92	0.94	±	0.11	1
			4	1973	2.10	2.16	±	0.25	3
			3	2120	0.98	1.00	±	0.12	1
			2	2365	0.99	1.01	±	0.12	1
			1	2464	1.05	1.08	±	0.13	1
68	56.916	-47.422	13	20	0.21	0.22	±	0.01	1
			12	29	0.11	0.11	±	0.01	1

			10	35	0.26	0.27	±	0.02	1
			9	50	0.30	0.31	±	0.02	1
			8	100	0.73	0.75	±	0.05	1
			7	345	0.62	0.64	±	0.04	1
			6	891	0.69	0.71	±	0.05	1
			5	1382	0.61	0.63	±	0.04	1
			4	1677	0.71	0.73	±	0.05	1
			3	2463	0.85	0.87	±	0.06	1
			2	3342	0.68	0.70	±	0.05	1
			1	3574	0.68	0.70	±	0.05	1
69	55.842	-48.093	22	14	0.23	0.24	±	0.02	1
			21	26	0.18	0.18	±	0.01	1
			20	30	0.22	0.23	±	0.02	1
			19	40	0.35	0.36	±	0.02	1
			18	60	0.64	0.65	±	0.04	3
			17	90	0.47	0.48	±	0.03	1
			16	128	0.62	0.64	±	0.04	1
			15	178	0.64	0.66	±	0.04	1
			14	495	0.86	0.88	±	0.06	1
			13	792	0.74	0.76	±	0.05	1
			12	1087	1.10	1.13	±	0.08	2
			10	1381	0.79	0.81	±	0.06	1
			9	1580	0.90	0.92	±	0.06	1
			8	1776	0.84	0.86	±	0.06	1
			7	2071	0.78	0.80	±	0.05	1
			6	2365	0.95	0.97	±	0.07	1
			5	2757	0.95	0.97	±	0.07	1
			4	3196	0.76	0.78	±	0.05	1
			3	3440	0.60	0.62	±	0.04	1
			2	3635	0.63	0.65	±	0.04	1
			1	3669	0.61	0.63	±	0.04	1
71	53.692	-49.433	22	20	0.28	0.29	±	0.02	1
			21	30	0.34	0.35	±	0.02	1
			20	40	0.53	0.54	±	0.04	1
			19	50	0.22	0.23	±	0.02	1
			18	60	0.33	0.34	±	0.02	1

			17	100	0.61	0.63	±	0.04	1
			16	149	0.64	0.66	±	0.04	1
			15	248	0.73	0.75	±	0.05	1
			14	347	0.79	0.81	±	0.05	1
			13	496	0.81	0.83	±	0.06	1
			12	792	0.67	0.69	±	0.05	1
			10	1187	0.81	0.83	±	0.06	1
			9	1383	0.84	0.86	±	0.06	1
			8	1678	2.17	2.23	±	0.15	3
			7	1974	0.72	0.74	±	0.05	1
			6	2366	0.78	0.80	±	0.05	1
			5	2709	1.02	1.04	±	0.07	3
			4	2952	0.83	0.85	±	0.06	1
			2	3440	0.68	0.70	±	0.05	1
			1	3689	0.73	0.75	±	0.05	1
77	53	-51.1	22	15	0.28	0.29	±	0.02	1
			21	30	0.26	0.27	±	0.02	1
			20	40	0.31	0.32	±	0.02	1
			19	60	0.55	0.56	±	0.04	1
			18	80	0.56	0.57	±	0.04	1
			17	100	0.77	0.79	±	0.05	1
			16	149	0.90	0.92	±	0.06	1
			15	396	1.21	1.24	±	0.09	2
			14	693	0.96	0.98	±	0.07	1
			13	989	0.83	0.85	±	0.06	1
			12	1088	0.87	0.89	±	0.06	1
			10	1186	0.96	0.98	±	0.07	1
			9	1285	0.95	0.97	±	0.07	1
			8	1482	0.90	0.92	±	0.06	1
			7	1679	0.95	0.97	±	0.07	1
			6	1875	0.92	0.94	±	0.06	1
			5	2072	1.01	1.04	±	0.07	1
			4	2366	0.94	0.96	±	0.07	1
			2	2415	0.93	0.95	±	0.07	1
			1	2506	0.88	0.90	±	0.06	1
78	51.989	-53.817	12	12	0.77	0.79	±	0.05	1

9	36	1.15	1.18	±	0.08	1
7	139	2.36	2.42	±	0.17	1
5	248	4.02	4.12	±	0.28	1
4	288	3.23	3.31	±	0.23	1
1	368	7.64	7.83	±	0.53	1

Table S2: Compilation of median dissolved iron (DFe) concentrations (min, max) for Surface (> 200 m depth), Intermediate (from 200 to 1000 m depth) and Deep (>1000 m depth) Waters in the four distinct basins of the GA01 transect and in the Arctic Ocean (data from: the British Oceanographic Data Center website http://www.amt-uk.org/Data, PANGAEA website http://doi.pangaea.de/10.1594/PANGAEA.609968, Clivar & Carbon Hydrographic Data Office website https://cchdo.ucsd.edu/search?bbox=-75,-60,20,65 and GEOTRACES intermediate data product 2017 www.bodc.ac.uk/geotraces/data/idp2017/ and https://webodv.awi.de/geotraces). Bold values indicated for each depth range represent the median DFe concentrations all studies considered per basin.

Area	**Time period**		**Fe (nmol L^{-1})**		**Filtration**	**Cruise**	**Reference**
	Months	**Year**	**range**	**median**	**µm**	**Name**	
West European basin							
surface (<200m)				**0.27**			
	May-June	2014	0.09 - 3.0	0.24	0.2/0.45	GEOVIDE	*this study*
	May	2013	0.01 - 0.45	0.05	0.2	GA04	*Gerringa et al., 2017*
	October-November	2010	0.06 - 0.98	0.49	0.2	GA03	*Hatta et al., 2015*
	June	2005	0.35 - 0.76	0.57	0.2	AMT16	*Ussher et al., 2013*
	September	2004	0.33 - 2.6	0.49	0.2	AMT15	*Ussher et al., 2013*
	June-August	2003	0.02 - 0.25	0.08	0.4	CLIVAR-CO2	*Measures et al., 2008*
	July	2003	0.05 - 5.4	0.7	0.4	JR98	*Nedelec et al., 2007*
	October	2002	0.07 - 7.0	0.35	0.2	IRONAGE III	*Sarthou et al., 2007*
	March	2002	0.23 - 0.47	0.34	0.2	IRONAGES	*Laes et al., 2003*
	February-March	2001	0.22 - 0.64	0.4	0.2/0.45	POMME	*Blain et al., 2004*
	June	1998	0.10 - 1.5	0.71	unfiltered	AMT6	*Bowie et al., 2002*
	March	1998	0.48 - 1.6	0.82	0.2	MERLIM	*Boye et al., 2006; 2003*
	March	1998	0.34 - 5.9	1	0.2	64PE114	*de Jong et al., 2007*
	May	1989	0.08 - 0.27	0.19	0.4	Atlantis II	*Martin et al., 1993*
intermediate (200-1000)				**0.71**			
	May-June	2014	0.23 - 1.4	0.73	0.2/0.45	GEOVIDE	*this study*
	May	2013	0.10 - 0.72	0.42	0.2	GA04	*Gerringa et al., 2017*
	October-November	2010	0.38 - 1.0	0.61	0.2	GA03	*Hatta et al., 2015*
	July	2003	0.35 - 2.2	1.2	0.4	JR98	*Nedelec et al., 2007*
	March	2002	0.57 - 0.86	0.64	0.2	IRONAGES	*Laes et al., 2003*
	June	1998	0.72 - 0.83	0.81	0.2	AMT6	*Bowie et al., 2002*
	March	1998	1.1 - 1.6	1.4	0.2	MERLIM	*Boye et al., 2006; 2003*

	March	1998	1.3 - 1.9	1.6	0.2	64PE114	*de Jong et al., 2007*
	May	1989	0.26 - 0.57	0.35	0.4	Atlantis II	*Martin et al., 1993*
deep (>1000)				**0.76**			
	May-June	2014	0.53 - 1.6	0.78	0.2/0.45	GEOVIDE	*this study*
	May	2013	0.44 - 0.87	0.61	0.2	GA04	*Gerringa et al., 2017*
	October-November	2010	0.46 - 1.1	0.75	0.2	GA03	*Hatta et al., 2015*
	July	2003	1.2 - 4.4	1.6	0.4	JR98	*Nedelec et al., 2007*
	March	2002	0.67 - 1.2	0.82	0.2	IRONAGES	*Laes et al., 2003*
	June	1998	0.57 - 0.94	0.76	0.2	AMT6	*Bowie et al., 2002*
	March	1998	1.3 - 1.6	1.4	0.2	MERLIM	*Boye et al., 2006; 2003*
	March	1998	1.3 - 2.0	1.7	0.2	64PE114	*de Jong et al., 2007*
	May	1989	0.54 - 0.66	0.6	0.4	Atlantis II	*Martin et al., 1993*
Iceland Basin							
surface (<200m)				**0.22**			
	May-June	2014	0.09 - 0.75	0.34	0.2/0.45	GEOVIDE	*this study*
	July-August	2010	0.03 - 2.6	0.25	0.2	D354	*Achterberg et al., 2018*
	April-May	2010	0.11 - 2.6	0.3	0.2	D350	*Achterberg et al., 2018*
	June	2009	0.08 - 0.87	0.24	0.2	D340	*Mohamed et al., 2011*
	August-September	2007	0.04 - 0.34	0.14	0.2	D321	*Mohamed et al., 2011*
	July-September	2007	0.02 - 0.41	0.06	0.2		*Nielsdottir et al., 2009*
	June-August	2003	0.02 - 0.30	0.1	0.4	CLIVAR-CO2	*Measures et al., 2008*
	May	1989	0.06 - 0.23	0.12	0.4	Atlantis II	*Martin et al., 1993*
intermediate (200-1000)				**0.71**			
	May-June	2014	0.28 - 1.6	0.94	0.2/0.45	GEOVIDE	*this study*
	July-August	2010	0.21 - 2.7	0.73	0.2	D354	*Achterberg et al., 2018*
	April-May	2010	0.21 - 2.7	0.74	0.2	D350	*Achterberg et al., 2018*
	June	2009	0.24 - 2.23	0.63	0.2	D340	*Mohamed et al., 2011*
	August-September	2007	0.2 - 0.85	0.46	0.2	D321	*Mohamed et al., 2011*
	July-September	2007	0.07 - 0.80	0.4	0.2		*Nielsdottir et al., 2009*
	May	1989	0.17 - 0.54	0.37	0.4	Atlantis II	*Martin et al., 1993*
deep (>1000)				**0.87**			

	May-June	2014	0.63 - 1.5	0.92	0.2/0.45	GEOVIDE	*this study*
	July-August	2010	0.47 - 167	0.92	0.2	D354	*Achterberg et al., 2018*
	April-May	2010	0.47 - 1.9	0.77	0.2	D350	*Achterberg et al., 2018*
	June	2009	1.42 - 2.6	1.51	0.2	D340	*Mohamed et al., 2011*
	August-September	2007	0.08 - 1.5	0.71	0.2	D321	*Mohamed et al., 2011*
	May	1989	0.53 - 0.79	0.59	0.4	Atlantis II	*Martin et al., 1993*
Irminger Basin							
surface (<200m)				**0.18**			
	May-June	2014	0.22 - 3	0.55	0.2/0.45	GEOVIDE	*this study*
	July-August	2010	0 - 3.3	0.15	0.2	D354	*Achterberg et al., 2018*
	April-May	2010	0.03 - 0.97	0.11	0.2	D350	*Achterberg et al., 2018*
	April-May	2010	0.08 - 0.55	0.15	0.2	GA02	*Rijkenberg et al., 2014*
intermediate (200-1000)				**0.47**			
	May-June	2014	0.33 - 1.2	0.86	0.2/0.45	GEOVIDE	*this study*
	July-August	2010	0.03 - 1.21	0.42	0.2	D354	*Achterberg et al., 2018*
	April-May	2010	0.03 - 0.63	0.29	0.2	D350	*Achterberg et al., 2018*
	April-May	2010	0.28 - 0.69	0.48	0.2	GA02	*Rijkenberg et al., 2014*
deep (>1000)				**0.78**			
	May-June	2014	0.82 - 2.5	1.14	0.2/0.45	GEOVIDE	*this study*
	July-August	2010	0.39 - 1.01	0.7	0.2	D354	*Achterberg et al., 2018*
	April-May	2010	0.50 - 1.0	0.71	0.2	D350	*Achterberg et al., 2018*
	April-May	2010	0.65 - 0.99	0.75	0.2	GA02	*Rijkenberg et al., 2014*
Labrador Basin							
surface (<200m)				**0.33**			
	May-June	2014	0.11 - 2.4	0.55	0.2/0.45	GEOVIDE	*this study*
	April-May	2010	0.05 - 0.58	0.17	0.2	GA02	*Rijkenberg et al., 2014*
intermediate (200-1000)				**0.67**			
	May-June	2014	0.61 - 7.6	0.8	0.2/0.45	GEOVIDE	*this study*
	April-May	2010	0.35 - 0.87	0.55	0.2	GA02	*Rijkenberg et al., 2014*
deep (>1000)				**0.69**			
	May-June	2014	0.60 - 1.1	0.85	0.2/0.45	GEOVIDE	*this study*

	April-May	2010	0.47 - 0.66	0.59	0.2	GA02	*Rijkenberg et al., 2014*
Arctic Ocean							
surface (<200m)	July	2008	2.1 - 16		0.22		*Nishimura et al., 2012*
	September	2008	0.5 - 3.2		0.22	MR 08-04	*Nakayama et al., 2011*
	August - September	2007	0.10 - > 10	0.6	0.2	ARK XXII/2	*Klunder et al., 2012*
	July	2007	5.7 - 23		unfiltered	ATOS-Arctic	*Tovar-Sanchez et al., 2010*
	April-May	2007	0.8 - 3.1	1.5	0.4		*Aguilar-Islas et al., 2008*
intermediate (200-1000)	August - September	2007	0.20 - 1.4	0.5	0.2	ARK XXII/2	*Klunder et al., 2012*
deep (>1000)	August - September	2007	0.18 - 1.7	0.56	0.2	ARK XXII/2	*Klunder et al., 2012*