Table 1: The median and standard deviation of LPT and SPT dipped blanks (db). The detection limit (DL) was defined as three times the standard deviation of the dipped blanks. The active filter area is 125 cm^2.

Derived parameters:

- Particulate organic matter (POM): Particulate organic matter (POM) was calculated from POC by multiplying a weight ratio of 1.88 g POM/g POC (Lam et al., 2011; Lam et al., 2017; Lam et al., 2015b), determined by Nuclear Magnetic Resonance (NMR) measurements of the phytoplankton biochemical composition (Hedges et al., 2002).

  POM [ug/L] = POC [uM] * 12 [ug POC/umol POC] * 1.88 [g POM/g POC]

- Calcium carbonate (CaCO3): The mass concentration of $CaCO3$ was calculated from PIC using a constant weight ratio:

  $CaCO3$ [ug/L] = PIC [uM] * 100.08 [ug $CaCO3$/umol PIC]

- Opal: A hydrated form of silica as $SiO2.(0.4H2O)$ was assumed in order to calculate the mass concentrations of opal (Mortlock and Froelich, 1989):

  Opal [ug/L] = bSi [uM]*67.2 [ug opal/umol bSi]

- Lithogenic particles (Litho): Aluminum (Al) is highly abundant in the crust and relatively invariant between two main lithogenic sources, upper continental crust (UCC Al = 8.04 wt%) and bulk continental crust (BCC Al = 8.41 wt%) (Taylor and McLennan, 1995), serving as an appropriate tracer for lithogenic particles. We assumed that most of particulate Al originates from lithogenic sources and use UCC Al wt% to calculate concentrations of lithogenic particles.

  Litho [ug/L] = Al [nmol/L]*27e-3 [ug/nmol]/0.0804[ug Al/ug UCC]

- Fe and Mn (oxy)hydroxide (Fe(OH)3 & MnO2): These were calculated from the leachable Fe and Mn concentrations using the “Berger Leach” (Berger et al., 2008). Fe oxyhydroxides are treated as $Fe(OH)3$ (ferrihydrite approximation) and Mn oxides are as $MnO2$ (birnessite approximation). We apply the formula weights of 106.9 g Fe(OH)3/mol Fe and 86.9 g $MnO2$/mol Mn, respectively.
  Fe(OH)3 [ug/L] = leachFe [nM] * 106.9 [ng Fe(OH)3/nmol Fe] * 1e-3 ug/ng

  MnO2 [ug/L] = leachMn [nM] * 86.9 [ng MnO2/nmol/Mn] *1e-3 ug/ng

- SPM: Direct comparisons between gravimetric and chemical dry weight have been made in the equatorial Atlantic, and they were found to be quite similar to each other (Bishop et al., 1977). The chemical dry weight is used to estimate SPM for each size fraction in this paper, as the sum of all major particle composition, which is the sum of POM, CaCO3, opal, lithogenic material (Litho), and Fe and Mn (oxyhydr)oxides.

  Note that the resolution of this data is dictated by the lowest resolution of the component parts.
  SPM [ug/L] = POM [ug/L] + CaCO3 [ug/L] + opal [ug/L] + Litho [ug/L] + Fe(OH)3 [ug/L] + MnO2 [ug/L]

  Errors in derived parameters are calculated based on rules of error propagation.

	db unit	LPT filter type	SPT filter type	LPT median db				LPT stdev db				SPT median db	SPT stdev db		
Trace element				G1: stns 1-3	G2: stns 4-16	G3: stns 18-23	G4: stns 25-39	G1: stns 1-3	G2: stns 4-16	G3: stns 18-23	G4: stns 25-39	all stns	all stns		
Ag	pmol/filter	Qp	Supor	0.66	1.06	0.41	0.56	0.16	2.60	1.33	0.61	**2.68**	7.82		
Al	pmol/filter	Qp	Supor	43,175.64	19,835.51	19,333.65	6,264.24	5,295.70	8,889.21	5,297.56	2,153.25	**18,167.74**	36,376.40		
Ba	pmol/filter	Qp	Supor	218.44	105.64	62.81	39.61	31.41	125.39	25.07	22.95	**472.21**	1,876.54		
Cd	pmol/filter	Qp	Supor	3.21	2.16	1.93	1.30	2.12	1.84	2.34	1.26	**17.23**	65.54		
Co	pmol/filter	Qp	Supor	13.50	2.94	-	2.83	1.81	9.03	1.44	5.01	**9.04**	18.36		
Cu	pmol/filter	Qp	Supor	214.32	114.81	67.39	60.60	93.78	46.25	40.76	117.17	**652.28**	1,828.97		
Fe	pmol/filter	Qp	Supor	10,491.15	3,918.74	2,901.62	1,086.06	670.58	2,156.89	1,300.70	1,050.48	**5,969.97**	17,492.95		
Mn	pmol/filter	Qp	Supor	715.96	144.35	99.81	61.93	111.05	104.44	85.86	44.50	**362.36**	1,277.63		
Mo	pmol/filter	Qp	Supor	97.56	64.79	55.94	60.82	32.07	19.46	5.38	6.50	**337.23**	314.18		
Nd	pmol/filter	Qp	Supor	2.75	1.51	0.78	1.32	0.05	0.94	0.37	0.39	**5.52**	7.68		
Ni	pmol/filter	Qp	Supor	201.25	72.18	84.29	53.14	224.29	874.30	94.19	650.03	**428.84**	1,336.69		
P	pmol/filter	Qp	Supor	38,804.97	15,429.28	5,794.19	3,541.60	1,272.98	7,307.98	3,151.84	1,143.93	**79,368.94**	125,147.32		
Pb	pmol/filter	Qp	Supor	12.41	4.98	3.49	3.46	7.96	2.52	2.80	8.51	**14.63**	35.88		
Sc	pmol/filter	Qp	Supor	3.10	2.13	1.21	0.44	0.75	2.36	2.43	1.02	**1.77**	5.76		
Th	pmol/filter	Qp	Supor	0.12	0.05	-	-	0.01	0.13	0.11	0.14	**0.16**	0.78		
Ti	pmol/filter	Qp	Supor	3,153.38	1,655.21	1,191.87	1,572.42	749.30	579.83	337.14	522.32	**1,751.02**	3,591.70		
V	pmol/filter	Qp	Supor	157.86	67.84	37.63	19.13	14.79	28.97	8.82	8.37	**166.95**	347.44		
Zn	pmol/filter	Qp	Supor	5,657.50	2,128.45	1,760.69	1,402.52	2,718.09	2,168.05	1,401.11	1,915.52	**6,569.96**	12,104.84		
bSi				**shelf: stns 1-6**		**open: stns 8-39**		**shelf: stns 1-6**		**open: stns 8-39**		**shelf: stns 1-6**	**open: stns 8-39**	**shelf: stns 1-6**	**open: stns 8-39**
bSi	nmol/filter	Qp	Supor	742.00		225.00		434.00		147.00		165.00	69.00	100.00	85.00
PIC				**all stns**				**all stns**				**all stns**	**all stns**		
PIC	nmol/filter	Qp	QMA	220.83				119.17				969.17	546.67		
CN				**all stns**				**all stns**				**all stns**	**all stns**		
POC	umol/filter	Sp	QMA	2.55				0.57				68.71	14.09		
PN	umol/filter	Sp	QMA	0.24				0.08				7.58	6.52		