

Abbreviations

	SeaBASS and current report abbreviation	SeaHARRE and/or previous report abbreviation	full name	notes
Primary Pigments	Allo	Allo	alloxanthin	
	alpha-beta-Car	Caro	carotenes	alpha (beta, epsilon) + beta (beta, beta) carotene. Unresolved and therefore undifferentiated
	But-fuco	But fuco	19'-butanoyloxyfucoxanthin	
	Diadino	Diad	diadinoxanthin	
	Diato	Diato	diatoxanthin	
	Fuco	Fuco	fucoxanthin	
	Hex-fuco	Hex fuco	19'-hexanoyloxyfucoxanthin	
	Perid	Perid	Peridinin	
	Tot_ChI_a	TChI a	total chlorophyll a	DV_ChI_a + MV_ChI_a + Chlide_a + ChI_a allomers + ChI_a epimers
	Tot_ChI_b	TChI b	total chlorophyll b	DV_ChI_b + MV_ChI_b + ChI_b epimers
Secondary Pigments	Tot_ChI_c	TChI c	total chlorophyll c	ChI_c3 + ChI_c1c2
	Zea	Zea	Zeaxanthin	

Secondary Pigments	ChI_c3	ChI c3	Chlorophyll c3	
	Chlide_a	Chlide a	chlorophyllide a	
	DV_ChI_a	DVChI a	divinyl chlorophyll a	
	DV_ChI_b	DVChI b	divinyl chlorophyll b	
	MV_ChI_a	ChI a	monovinyl chlorophyll a	
	MV_ChI_b	ChI b	monovinyl chlorophyll b	
	ChI_c1c2	ChI c12	Chlorophyll c2 + chlorophyll c1 + MGDVP	
		MGDVP	Mg-2,4-divinyl pheoporphyrin a5 monomethyl ester	

Tertiary Pigments	Lut	Lut	Lutein	
	Neo	Neo	Neoxanthin	
	Phide_a	Phide a	total pheophorbide	multiple peaks
	Phytin_a	Phytin a	total pheophytin a	pheophytin a + pheophytin a'
	Pras	Pras	Prasinoxanthin	
	Viola	Viola	Violaxanthin	

Ancillary Pigment	Gyro	Gyr diester	Gyroxanthin diester
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SeaBASS abbreviation	description	notes
DP	total diagnostic pig	PSC + allo + zea + Tot_ChI_b
PPC	photoprotective ca	allo + diadino + diato + zea + alpha-beta-car
PPC_TCar	ratio of photprotect	[PPC]/[Tcar]
PPC_TPg	ratio of photoprote	[PPC]/[TPg]
PSC	photosynthetic car	but-fuco + fuco + hex-fuco + perid
PSC_TCar	ratio of photsynthe	[PSC]/[TCar]
PSP	phosynthetic pigm	PSC + TChI
PSP_TPg	ratio of photsynthe	[PSP]/[TPg]
TAcc	total accessory pig	PPC + PSC + Tot_ChI_b + Tot_ChI_c
TAcc_TChIa	ratio of total acces	[Tacc]/[TchIa]
TCar	total carotenoids	PPC + PSC
TChI	total chlorophylls	Tot_ChI_a +Tot_ChI_b +Tot_ChI_c
TChI_TCar	ratio of total chloro	[TChI]/[TCaro]
TChIa_Tpg	raito of total chloro	[TChIa]/[TPg]
TPg	total pigments	TAcc + Tot_ChI_a

Replicate filters

The replicate filter precision page summarizes our results for any replicate filters you submitted. On both the replicate filter and analysis precision page, pairs with precision worse than 10% (15% for degradation products) are flagged in yellow. If a simple reason can be determined (ex. Concentration is below the effective LOQ), it is noted in a comment.

Replicate injections

The analysis precision page summarizes our results for the same sample extract injected twice. Typically, we reinject the first sample analyzed on a given at the end of the day (the ".5" injection). For example, sample 03-0001 and 03-0001.5 are replicate injections of the same extract, injected approximately 24 hours apart (all samples extracted on a particular day require about 24 hours to complete the HPLC analyses). We do this to measure our analysis precision and any effects caused by a sample's residence time in the refrigerated autosampler compartment. Please note that individual results with very large CV% are usually caused by pigments present in very low concentrations. On both the replicate filter and analysis precision page, pairs with precision worse than 10% (15% for degradation products) are flagged in yellow. If a simple reason can be determined (ex. Concentration is

below the effective LOQ), it is noted in a comment.

Effective Limit of Quantitation

On the effective LOQ page, we calculate an effective limit of quantitation based on our calculated LOQs (calculated in ng/injection), our typical extraction volume for this sample set, and the various filtration volumes used with your samples. We make these calculations because our LOQ information is most useful to the data user if it is available in units of concentration (ug/L seawater). The same LOQ can end up looking very different for different filtration volumes. For example, the LOQ of 0.25 ng will result in very different effective LOQs when carried through our calculation equation to represent the ug/L seawater. For an extraction volume of 2.5 ml and a filtration volume of 2800 ml, the calculated effective LOQ would be 0.002 ug/L. However, if the filtration volume were only 100 ml, the effective LOQ would calculate to be 0.042 ug/L. Without these calculations, the end user has no way of knowing that both of these concentrations were acquired at detection-limited concentrations.

Zeros/Missing data

Instead of including zeros, pigments that were "not found" (not detected) are noted with a replacement value of **-8888 (NEW VALUE AS OF MARCH 2016)**. Pigments that were "not found" are considered to be below detection limits. For pigments that have a replacement value in the respective cell, the pigment was investigated and determined to be "not found" (this is different than a "missing" value, which would imply that the measurement was not performed).

We have also adopted **(NEW PROCEDURE AS OF JUNE 2017)** the use of -9999 to fill any cells for which we are missing information.

Client sample information spreadsheet

The sample information sheet sent by the research group is included with results, on the "SS from clients" page. Any necessary clarifying comments are made using the comment function. Information that needs to be checked is highlighted in yellow. Information that was added or changed by GSFC is recorded with red text. The information for any samples that were listed in the original spreadsheet but were not received is moved to the bottom of the spreadsheet.

Analysis method description

The HPLC analysis method can be cited as Van Heukelem and Thomas (2001), further described in Hooker et al. (2005). For a more detailed description, please see below; contact Crystal for a tailored description.

The HPLC used for pigment analysis is an Agilent RR1200 with a programmable autoinjector (900 ul syringe head), refrigerated autosampler compartment, thermostatted column compartment, quaternary pump with in-line vacuum degasser, and photo-diode array detector with deuterium and tungsten lamps. The HPLC is controlled by Agilent Chemstation software.

The 4.6 x 150 mm HPLC Eclipse XDB column (Agilent Technologies, Palo Alto, CA) is filled with a C8 stationary phase (3.5 um stationary phase); the mobile phase consists of a linear gradient from 5-95% solvent B over 27 minutes, for which solvent A is 70 parts methanol, 30 parts 28 mM tetrabutylammonium acetate (pH 6.5) and solvent B is methanol. The column temperature is 60 C and the photo diode array detector is set to plot chromatograms at 450, 665, and 222 nm to acquire visible absorbance spectra between 350 and 750 nm.

Vitamin E acetate is used as the internal standard (ISTD) for determining extraction volumes. Its absorbance is monitored at 222 nm; it has negligible absorbance at 450 nm and none at 665 nm. Therefore, it does not interfere at wavelengths used to quantify pigments and can be used in very high concentrations with S:N ratios much higher than are possible with pigments. The high signal:noise ratio contributes to excellent analysis precision, for which injection repeatability averages 0.6%. It is stable under conditions of extraction and analysis.

Calibration is performed with individual pigment standards, whose concentrations have been determined spectrophotometrically using absorption coefficients in common with those used by most other laboratories (Hooker et al. 2005) and the commercial vendor, DHI Water and Environment (Horsholm, Denmark). Standards are either purchased from DHI (in solution with concentrations provided) or purchased in solid form and suspended in solvent at GSFC. Thirty-six peaks are individually quantified by HPLC, from which 26 pigments are reported (some pigments contain individual components that are summed and reported as one pigment).

SeaBASS submission

Please refer to the "Contribute Data" menu on the SeaBASS website for information on how to prepare your data files for submission.

https://seabass.gsfc.nasa.gov/wiki/Data_Submission

Data contained in this worksheet should be reviewed for quality assurance by the PI **BEFORE** being submitted to the SeaBASS data archive.

Data deemed satisfactory for science and reporting by the PI must then be converted into the SeaBASS data format (see above link) either manually, or using this web tool **(NEW, as of June 2017)**:

<https://seabass.gsfc.nasa.gov/hplc2sb/>

Please ensure that each row of data on the Report sheet has all relevant columns and fields of metadata filled in, and please add comments to your SeaBASS file(s) header section indicating who and where your HPLC analysis was run:

! Comments

!

! HPLC analysis was run at NASA GSFC by Crystal Thomas.

!

If your data file contains measurements that were below detection limits ("not found", see Zeros section), those values were set to -8888, and the following information should be included in your metadata headers:

/below_detection_limit=-8888

/missing=-9999

[illegible]

CV%
TChl a = 0.20%
Ppig = 1.86%
n = 8

GSFC Lab sample code	PI	Sample Label	Cruise ID	Indicate if filters are replicates	Volume filtered (ml)	Station	Bottle Number	Sampling Depth (meters)	Primary pigments											
									ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
									[TChl a]	[TChl b]	[TChl c]	[Car]	[But fuco]	[Hex fuco]	[Allo]	[Diad]	[Diato]	[Fuco]	[Perid]	[Zea]
07-2234	Subramaniam, Ajit	AS2001	EN614	S	2150	01-01	8	98.583	0.237	0.207	0.058	0.047	0.037	0.049	0.002	0.004	-8888.000	0.012	0.002	0.024
07-2234.5	Subramaniam, Ajit	AS2001	EN614	S	2150	01-01	8	98.583	0.234	0.193	0.052	0.046	0.037	0.049	0.002	0.004	-8888.000	0.012	0.002	0.023
									0.236	0.200	0.055	0.047	0.037	0.049	0.002	0.004	-8888.000	0.012	0.002	0.024
									0.002	0.010	0.004	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
									0.85%	5.00%	7.27%	2.13%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.17%
07-2262	Subramaniam, Ajit	AS2031	EN614	S	1050	17-03	17	8.821	0.366	0.011	0.064	0.022	0.003	0.012	0.006	0.010	-8888.000	0.134	0.003	0.044
07-2262.5	Subramaniam, Ajit	AS2031	EN614	S	1050	17-03	17	8.821	0.366	0.011	0.063	0.022	0.003	0.012	0.006	0.010	-8888.000	0.134	0.003	0.044
									0.366	0.011	0.064	0.022	0.003	0.012	0.006	0.010	-8888.000	0.134	0.003	0.044
									0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
									0.00%	0.00%	1.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
07-2296	Subramaniam, Ajit	AS2066	EN614	S	3200	25-03	6	34.693	0.755	0.103	0.176	0.057	0.027	0.110	0.009	0.017	-8888.000	0.176	0.022	0.057
07-2296.5	Subramaniam, Ajit	AS2066	EN614	S	3200	25-03	6	34.693	0.756	0.104	0.180	0.057	0.027	0.109	0.009	0.018	-8888.000	0.176	0.021	0.057
									0.756	0.104	0.178	0.057	0.027	0.110	0.009	0.018	-8888.000	0.176	0.022	0.057
									0.001	0.001	0.003	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.001	0.000
									0.13%	0.96%	1.69%	0.00%	0.00%	0.91%	0.00%	5.56%	0.00%	0.00%	4.55%	0.00%
07-2305	Subramaniam, Ajit	AS2075	EN614	S	3200	31-03	14	21.714	0.325	0.022	0.041	0.026	0.012	0.050	-8888.000	0.006	-8888.000	0.024	0.008	0.068
07-2305.5	Subramaniam, Ajit	AS2075	EN614	S	3200	31-03	14	21.714	0.325	0.023	0.042	0.026	0.012	0.050	-8888.000	0.006	-8888.000	0.024	0.008	0.068
									0.325	0.023	0.042	0.026	0.012	0.050	-8888.000	0.006	-8888.000	0.024	0.008	0.068
									0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
									0.00%	4.35%	2.38%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
07-2324	Subramaniam, Ajit	AS2095	EN614	S	3200	33-02	14	17.136	0.297	0.030	0.047	0.026	0.014	0.054	-8888.000	0.011	0.001	0.033	0.009	0.091
07-2324.5	Subramaniam, Ajit	AS2095	EN614	S	3200	33-02	14	17.136	0.298	0.031	0.049	0.026	0.014	0.054	-8888.000	0.011	0.001	0.033	0.009	0.091
									0.298	0.031	0.048	0.026	0.014	0.054	-8888.000	0.011	0.001	0.033	0.009	0.091
									0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
									0.34%	3.23%	2.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
07-2352	Subramaniam, Ajit	011 10m	M145	S	3500	012	20	12.4	0.339	0.073	0.086	0.026	0.033	0.070	0.006	0.014	0.001	0.050	0.012	0.043
07-2352.5	Subramaniam, Ajit	011 10m	M145	S	3500	012	20	12.4	0.340	0.071	0.085	0.026	0.032	0.069	0.006	0.014	-8888.000	0.050	0.012	0.045
									0.340	0.072	0.086	0.026	0.033	0.070	0.006	0.014	-4444.000	0.050	0.012	0.044
									0.001	0.001	0.001	0.000	0.001	0.001	0.000	0.000	6284.766	0.000	0.000	0.001
									0.29%	1.39%	1.16%	0.00%	3.03%	1.43%	0.00%	0.00%	-141.42%	0.00%	0.00%	2.27%
07-2379	Subramaniam, Ajit	13 M145 60	M145	S	3500	047	17	58	0.763	0.212	0.180	0.075	0.081	0.239	0.007	0.018	-8888.000	0.030	0.011	0.110
07-2379.5	Subramaniam, Ajit	13 M145 60	M145	S	3500	047	17	58	0.763	0.209	0.181	0.075	0.081	0.239	0.006	0.018	-8888.000	0.030	0.011	0.111
									0.763	0.211	0.181	0.075	0.081	0.239	0.007	0.018	-8888.000	0.030	0.011	0.111
									0.000	0.002	0.001	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001
									0.00%	0.95%	0.55%	0.00%	0.00%	0.00%	14.29%	0.00%	0.00%	0.00%	0.00%	0.90%
07-2407	Subramaniam, Ajit	73 M145 10	M145	S	3500	075	20	9.5	0.031	0.003	0.003	0.003	0.002	0.008	-8888.000	0.003	-8888.000	0.001	0.001	0.023
07-2407.5	Subramaniam, Ajit	73 M145 10	M145	S	3500	075	20	9.5	0.031	0.003	0.005	0.004	0.002	0.008	-8888.000	0.003	-8888.000	0.002	0.001	0.022
									0.031	0.003	0.004	0.004	0.002	0.008	-8888.000	0.003	-8888.000	0.002	0.001	0.023
									0.000	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.001
									0.00%	0.00%	25.00%	25.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%	4.35%

									Secondary pigments							Tertiary pigments							Ancillary
									ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
GSFC Lab sample code	PI	Sample Label	Cruise ID	Indicate if filters are replicates	Volume filtered (ml)	Station	Bottle Number	Sampling Depth (meters)	[Chl a]	[DVChl a]	[Chlide a]	[Chl b]	[DVChl b]	[Chl c1c2]	[Chl c3]	[Lu]	[Neo]	[Viola]	[Phytin a]	[Phide a]	[Pras]	[Gyr diester]	
07-2234	Subramaniam, Ajit	AS2001	EN614	S	2150	01-01	8	98.583	0.144	0.091	0.002	0.040	0.167	0.026	0.032	-8888.000	0.003	0.001	0.009	0.004	0.004	-8888.000	
07-2234.5	Subramaniam, Ajit	AS2001	EN614	S	2150	01-01	8	98.583	0.142	0.089	0.003	0.038	0.155	0.026	0.026	-8888.000	0.003	0.001	0.009	0.004	0.004	-8888.000	
									0.143	0.090	0.003	0.039	0.161	0.026	0.029	-8888.000	0.003	0.001	0.009	0.004	0.004	-8888.000	
									0.001	0.001	0.001	0.001	0.008	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
									0.70%	1.11%	33.33%	2.56%	4.97%	0.00%	13.79%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	
07-2262	Subramaniam, Ajit	AS2031	EN614	S	1050	17-03	17	8.821	0.351	-8888.000	0.015	0.011	-8888.000	0.041	0.023	-8888.000	-8888.000	-8888.000	0.006	0.024	-8888.000	-8888.000	
07-2262.5	Subramaniam, Ajit	AS2031	EN614	S	1050	17-03	17	8.821	0.351	-8888.000	0.015	0.011	-8888.000	0.041	0.022	-8888.000	-8888.000	-8888.000	0.007	0.022	-8888.000	-8888.000	
									0.351	-8888.000	0.015	0.011	-8888.000	0.041	0.023	-8888.000	-8888.000	-8888.000	0.007	0.023	-8888.000	-8888.000	
									0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	
									0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.35%	0.00%	0.00%	0.00%	14.29%	4.35%	0.00%	0.00%	
07-2296	Subramaniam, Ajit	AS2066	EN614	S	3200	25-03	6	34.693	0.675	0.075	0.005	0.077	0.026	0.074	0.102	-8888.000	0.006	0.002	0.012	0.020	-8888.000	-8888.000	
07-2296.5	Subramaniam, Ajit	AS2066	EN614	S	3200	25-03	6	34.693	0.676	0.075	0.005	0.078	0.026	0.076	0.104	-8888.000	0.006	0.002	0.012	0.021	-8888.000	-8888.000	
									0.676	0.075	0.005	0.078	0.026	0.075	0.103	-8888.000	0.006	0.002	0.012	0.021	-8888.000	-8888.000	
									0.001	0.000	0.000	0.001	0.000	0.001	0.001	0.000	0.000	0.000	0.001	0.001	0.000	0.000	
									0.15%	0.00%	0.00%	1.28%	0.00%	1.33%	0.97%	0.00%	0.00%	0.00%	0.00%	4.76%	0.00%	0.00%	
07-2305	Subramaniam, Ajit	AS2075	EN614	S	3200	31-03	14	21.714	0.303	0.019	0.003	0.018	0.004	0.021	0.020	0.001	0.001	0.001	0.005	0.021	-8888.000	-8888.000	
07-2305.5	Subramaniam, Ajit	AS2075	EN614	S	3200	31-03	14	21.714	0.303	0.019	0.003	0.019	0.004	0.022	0.020	0.001	0.001	0.001	0.005	0.021	-8888.000	-8888.000	
									0.303	0.019	0.003	0.019	0.004	0.022	0.020	0.001	0.001	0.001	0.005	0.021	-8888.000	-8888.000	
					</																		

CV%
TChl a = 0.20%
Ppig = 1.86%
n = 8

									Pigment Sums								Pigment ratios								CV%	CV%							
GSFC Lab sample code	PI	Sample Label	Cruise ID	Indicate if filters are replicates	Volume filtered (ml)	Station	Bottle Number	Sampling Depth (meters)	[TChl]	[PPC]	[PSC]	[PSP]	[TCar]	[TAcc]	[TPg]	[DP]	[TAcc]/[Tc hia]	[PSC]/[TC ar]	[PPC]/[TC ar]	[TChl]/[TC ar]	[PPC]/[TP g]	[PSP]/[TP g]	[TChl a]/[TPg]	TChl a	PPIG								
07-2234 07-2234.5	Subramaniam, Ajit Subramaniam, Ajit	AS2001	EN614	S	2150	01-01	8	98.583	0.502	0.077	0.100	0.602	0.177	0.442	0.679	0.333	1.860	0.560	0.440	2.840	0.110	0.890	0.350										
		AS2001	EN614	S	2150	01-01	8	98.583	0.479	0.075	0.100	0.579	0.175	0.420	0.654	0.318	1.790	0.570	0.430	2.740	0.110	0.890	0.360										
									0.491	0.076	0.100	0.591	0.176	0.431	0.667	0.326	1.83	0.57	0.44	2.79	0.11	0.89	0.36										
									0.02	0.00	0.00	0.02	0.00	0.02	0.02	0.01	0.05	0.01	0.01	0.07	0.00	0.00	0.01										
07-2262 07-2262.5	Subramaniam, Ajit Subramaniam, Ajit	AS2031	EN614	S	1050	17-03	17	8.821	3.32%	1.86%	0.00%	2.75%	0.80%	3.61%	2.65%	3.26%	2.71%	1.25%	1.63%	2.53%	0.00%	0.00%	1.99%	0.85%	1.62%								
		AS2031	EN614	S	1050	17-03	17	8.821	0.441	0.082	0.152	0.593	0.234	0.309	0.675	0.213	0.840	0.650	0.350	1.880	0.120	0.880	0.540										
									0.440	0.082	0.152	0.592	0.234	0.308	0.674	0.213	0.840	0.650	0.350	1.880	0.120	0.880	0.540										
									0.441	0.082	0.152	0.593	0.234	0.309	0.675	0.213	0.84	0.65	0.35	1.88	0.12	0.88	0.54										
									0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
									0.16%	0.00%	0.00%	0.12%	0.00%	0.23%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.13%
									1.034	0.140	0.335	1.369	0.475	0.754	1.509	0.504	1.000	0.710	0.290	2.180	0.090	0.910	0.500										
									1.040	0.141	0.333	1.373	0.474	0.758	1.514	0.503	1.000	0.700	0.300	2.190	0.090	0.910	0.500										
07-2296 07-2296.5	Subramaniam, Ajit Subramaniam, Ajit	AS2066	EN614	S	3200	25-03	6	34.693	1.037	0.141	0.334	1.371	0.475	0.756	1.512	0.504	1.00	0.71	0.30	2.19	0.09	0.91	0.50										
		AS2066	EN614	S	3200	25-03	6	34.693	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00									
									0.41%	0.50%	0.42%	0.21%	0.15%	0.37%	0.23%	0.14%	0.00%	1.00%	2.40%	0.32%	0.00%	0.00%	0.00%	0.13%	1.15%								
									0.388	0.100	0.094	0.482	0.194	0.257	0.582	0.184	0.790	0.480	0.520	2.000	0.170	0.830	0.560										
07-2305 07-2305.5	Subramaniam, Ajit Subramaniam, Ajit	AS2075	EN614	S	3200	31-03	14	21.714	0.390	0.100	0.094	0.484	0.194	0.259	0.584	0.185	0.800	0.480	0.520	2.010	0.170	0.830	0.560										
		AS2075	EN614	S	3200	31-03	14	21.714	0.389	0.100	0.094	0.483	0.194	0.258	0.583	0.185	0.80	0.48	0.52	2.01	0.17	0.83	0.56										
									0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00										
									0.36%	0.00%	0.00%	0.29%	0.00%	0.55%	0.24%	0.38%	0.89%	0.00%	0.00%	0.35%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.56%					
07-2324 07-2324.5	Subramaniam, Ajit Subramaniam, Ajit	AS2095	EN614	S	3200	33-02	14	17.136	0.374	0.129	0.110	0.484	0.239	0.316	0.613	0.231	1.060	0.460	0.540	1.560	0.210	0.790	0.480										
		AS2095	EN614	S	3200	33-02	14	17.136	0.378	0.129	0.110	0.488	0.239	0.319	0.617	0.232	1.070	0.460	0.540	1.580	0.210	0.790	0.480										
									0.376	0.129	0.110	0.486	0.239	0.318	0.615	0.232	1.07	0.46	0.54	1.57	0.21	0.79	0.48										
									0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00									
07-2352 07-2352.5	Subramaniam, Ajit Subramaniam, Ajit	011 10m	M145	S	3500	012	20	12.4	0.75%	0.00%	0.00%	0.58%	0.00%	0.67%	0.46%	0.31%	0.66%	0.00%	0.00%	0.90%	0.00%	0.00%	0.00%	0.34%	0.47%								
		011 10m	M145	S	3500	012	20	12.4	0.498	0.090	0.165	0.663	0.255	0.414	0.753	0.287	1.220	0.650	0.350	1.950	0.120	0.880	0.450										
									0.496	0.091	0.163	0.659	0.254	0.410	0.750	0.285	1.210	0.640	0.360	1.950	0.120	0.880	0.450										
									0.497	0.091	0.164	0.661	0.255	0.412	0.752	0.286	1.22	0.65	0.36	1.95	0.12	0.88	0.45										
07-2379 07-2379.5	Subramaniam, Ajit Subramaniam, Ajit								0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00										
									0.28%	0.78%	0.86%	0.43%	0.28%	0.69%	0.28%	0.49%	0.58%	1.10%	1.99%	0.00%	0.00%	0.00%	0.00%	0.29%	0.87%								
		13 M145 60	M145	S	3500	047	17	58	1.155	0.210	0.361	1.516	0.571	0.963	1.726	0.690	1.260	0.630	0.370	2.020	0.120	0.880	0.440										
		13 M145 60	M145	S	3500	047	17	58	1.153	0.210	0.361	1.514	0.571	0.961	1.724	0.687	1.260	0.630	0.370	2.020	0.120	0.880	0.440										
07-2407 07-2407.5	Subramaniam, Ajit Subramaniam, Ajit								1.154	0.210	0.361	1.515	0.571	0.962	1.725	0.689	1.26	0.63	0.37	2.02	0.12	0.88	0.44										
									0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
									0.12%	0.00%	0.00%	0.09%	0.00%	0.15%	0.08%	0.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.39%						
		13 M145 10	M145	S	3500	075	20	9.5	0.037	0.029	0.012	0.049	0.041	0.047	0.078	0.038	1.510	0.290	0.710	0.900	0.370	0.630	0.400										
07-2407.5	Subramaniam, Ajit Subramaniam, Ajit	13 M145 10	M145	S	3500	075	20	9.5	0.039	0.029	0.013	0.052	0.042	0.050	0.082	0.038	1.610	0.310	0.690	0.930	0.360	0.640	0.380										
									0.038	0.029	0.013	0.051	0.042	0.049	0.080	0.038	1.56	0.30	0.70	0.92	0.37	0.64	0.39										
									0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.01	0.01	0.02	0.01	0.01	0.01										
									3.72%	0.00%	5.66%	4.20%	1.70%	4.37%	3.54%	0.00%	4.53%	4.71%	2.02%	2.32%	1.94%	1.11%	3.63%	0.00%	8.70%								

CV% TChl a = 4.78%
 Ppig = 7.18%
 n = 3

GSFC Lab sample code	PI	Sample Label	Cruise ID	Indicate if filters are replicates	Volume filtered (ml)	Station	Bottle Number	Sampling Depth (meters)	Total Water Depth (meters)	Name of Water Body	Year	Month	Day of Gregorian Month	Sequentia l Day of Year	GMT Time	Longitude	Latitude	Filter type	Filter Diameter (mm)	Filter storage before shipping to GSFC	Primary pigments ug/l		
																					[TChl a]	[TChl b]	[TChl c]
07-2243	ubramaniam, A	AS2011	EN614	D	3200	06-04	22	2.108	0	Tropical Atlantic Ocaen	2018	May	11	131	21:35:12	-55.5911	7.32858	GF/F	25 mm	Liquid N2	0.42	0.005	0.056
07-2244	ubramaniam, A	AS2012	EN614	D	3200	06-04	22	2.108	0	Tropical Atlantic Ocaen	2018	May	11	131	21:35:12	-55.5911	7.32858	GF/F	25 mm	Liquid N2	0.477	0.005	0.063
																				AVG	0.449	0.005	0.060
																				S.D.	0.040	0.000	0.005
																				CV%	8.91%	0.00%	8.33%
07-2259	ubramaniam, A	AS2027	EN614	D	3200	10-02	23	4.287	0	Tropical Atlantic Ocaen	2018	May	13	133	20:02:13	-50.8897	7.36568	GF/F	25 mm	Liquid N2	0.174	0.021	0.028
07-2260	ubramaniam, A	AS2028	EN614	D	3200	10-02	23	4.287	0	Tropical Atlantic Ocaen	2018	May	13	133	20:02:13	-50.8897	7.36568	GF/F	25 mm	Liquid N2	0.175	0.02	0.029
																				AVG	0.175	0.021	0.029
																				S.D.	0.001	0.001	0.001
																				CV%	0.57%	4.76%	3.45%
07-2317	ubramaniam, A	AS2088	EN614	D	2150	31-14	9	3.495	0	Tropical Atlantic Ocaen	2018	May	27	147	15:34:18	-55.3108	14.67932	GF/F	25 mm	Liquid N2	0.178	0.009	0.016
07-2318	ubramaniam, A	AS2089	EN614	D	2150	31-14	9	3.495	0	Tropical Atlantic Ocaen	2018	May	27	147	15:34:18	-55.3108	14.67932	GF/F	25 mm	Liquid N2	0.191	0.01	0.018
																				AVG	0.185	0.010	0.017
																				S.D.	0.009	0.001	0.001
																				CV%	4.86%	10.00%	5.88%

CV% TChl a = 4.78%
 Ppig = 7.18%
 n = 3

									Secondary pigments															
GSFC Lab sample code	PI	Sample Label	Cruise ID	Indicate if filters are replicates	Volume filtered (ml)	Station	Bottle Number	Sampling Depth (meters)	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
									[Car]	[But fuco]	[Hex fuco]	[Allo]	[Diad]	[Diato]	[Fuco]	[Perid]	[Zea]	[Chl a]	[DVChl a]	[Chlide a]	[Chl b]	[DVChl b]	[Chl c1c2]	[Chl c3]
07-2243	ubramaniam, A	AS2011	EN614	D	3200	06-04	22	2.108	0.013	0.001	0.009	0.001	0.022	0.003	0.194	0.003	0.002	0.418	-8888	0.002	0.005	-8888	0.051	0.005
07-2244	ubramaniam, A	AS2012	EN614	D	3200	06-04	22	2.108	0.014	0.001	0.009	0.001	0.025	0.003	0.22	0.003	0.003	0.475	-8888	0.002	0.005	-8888	0.058	0.005
									0.014	0.001	0.009	0.001	0.024	0.003	0.207	0.003	0.003	0.447	-8888.000	0.002	0.005	-8888.000	0.055	0.005
									0.001	0.000	0.000	0.000	0.002	0.000	0.018	0.000	0.001	0.040	0.000	0.000	0.000	0.005	0.000	
									7.14%	0.00%	0.00%	0.00%	8.33%	0.00%	8.70%	0.00%	33.33%	8.95%	0.00%	0.00%	0.00%	0.00%	9.09%	0.00%
07-2259	ubramaniam, A	AS2027	EN614	D	3200	10-02	23	4.287	0.021	0.013	0.029	-8888	0.007	0.001	0.01	0.002	0.089	0.108	0.065	0.001	0.012	0.009	0.014	0.014
07-2260	ubramaniam, A	AS2028	EN614	D	3200	10-02	23	4.287	0.024	0.015	0.032	0.001	0.009	0.001	0.01	0.003	0.096	0.11	0.064	0.001	0.012	0.008	0.014	0.015
									0.023	0.014	0.031	-4444.000	0.008	0.001	0.010	0.003	0.093	0.109	0.065	0.001	0.012	0.009	0.014	0.015
									0.002	0.001	0.002	6284.766	0.001	0.000	0.000	0.001	0.005	0.001	0.001	0.000	0.000	0.001	0.000	0.001
									8.70%	7.14%	6.45%	-141.42%	12.50%	0.00%	0.00%	33.33%	5.38%	0.92%	1.54%	0.00%	0.00%	11.11%	0.00%	6.67%
07-2317	ubramaniam, A	AS2088	EN614	D	2150	31-14	9	3.495	0.017	0.005	0.021	-8888	0.005	0.001	0.01	0.003	0.076	0.165	0.011	0.002	0.007	0.002	0.008	0.008
07-2318	ubramaniam, A	AS2089	EN614	D	2150	31-14	9	3.495	0.017	0.006	0.026	-8888	0.006	0.001	0.011	0.003	0.093	0.177	0.013	0.001	0.008	0.002	0.009	0.009
									0.017	0.006	0.024	-8888.000	0.006	0.001	0.011	0.003	0.085	0.171	0.012	0.002	0.008	0.002	0.009	0.009
									0.000	0.001	0.004	0.000	0.001	0.000	0.001	0.000	0.012	0.008	0.001	0.001	0.001	0.000	0.001	0.001
									0.00%	16.67%	16.67%	0.00%	16.67%	0.00%	9.09%	0.00%	14.12%	4.68%	8.33%	50.00%	12.50%	0.00%	11.11%	11.11%

CV% TChl a = 4.78%
 Ppig = 7.18%
 n = 3

GSFC Lab sample code	PI	Sample Label	Cruise ID	Indicate if filters are replicates	Volume filtered (ml)	Station	Bottle Number	Sampling Depth (meters)	Tertiary pigments						Ancillary r Pigment Sums						Pigment r			
									[Lut] ug/l	[Neo] ug/l	[Viola] ug/l	[Phytin a] ug/l	[Phide a] ug/l	[Pras] ug/l	[Gyr diester] ug/l	[TChl] ug/l	[PPC] ug/l	[PSC] ug/l	[PSP] ug/l	[TCar] ug/l	[TAcc] ug/l	[TPg] ug/l	[DP] ug/l	[TAcc]/[TChl]
07-2243	ubramaniam, A	AS2011	EN614	D	3200	06-04	22	2.108	-8888	-8888	-8888	0.009	0.002	-8888	-8888	0.481	0.041	0.207	0.688	0.248	0.309	0.729	0.215	0.74
07-2244	ubramaniam, A	AS2012	EN614	D	3200	06-04	22	2.108	-8888	-8888	-8888	0.008	0.002	-8888	-8888	0.545	0.046	0.233	0.778	0.279	0.347	0.824	0.242	0.73
									-8888.000	-8888.000	-8888.000	0.009	0.002	-8888.000	-8888.000	0.513	0.044	0.220	0.733	0.264	0.328	0.777	0.229	0.74
									0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.045	0.004	0.018	0.064	0.022	0.027	0.067	0.019	0.01
									0.00%	0.00%	0.00%	11.11%	0.00%	0.00%	0.00%	8.77%	9.09%	8.18%	8.73%	8.33%	8.23%	8.62%	8.30%	1.35%
07-2259	ubramaniam, A	AS2027	EN614	D	3200	10-02	23	4.287	-8888	0.001	0.001	0.005	0.005	0.001	-8888	0.223	0.118	0.054	0.277	0.172	0.221	0.395	0.164	1.27
07-2260	ubramaniam, A	AS2028	EN614	D	3200	10-02	23	4.287	-8888	0.001	0.001	0.006	0.008	0.001	-8888	0.224	0.131	0.06	0.284	0.191	0.24	0.415	0.177	1.37
									-8888.000	0.001	0.001	0.006	0.007	0.001	-8888.000	0.224	0.125	0.057	0.281	0.182	0.231	0.405	0.171	1.32
									0.000	0.000	0.000	0.001	0.002	0.000	0.000	0.001	0.009	0.004	0.005	0.013	0.013	0.014	0.009	0.07
									0.00%	0.00%	0.00%	16.67%	28.57%	0.00%	0.00%	0.45%	7.20%	7.02%	1.78%	7.14%	5.63%	3.46%	5.26%	5.30%
07-2317	ubramaniam, A	AS2088	EN614	D	2150	31-14	9	3.495	-8888	-8888	0.001	0.002	0.014	-8888	-8888	0.203	0.099	0.039	0.242	0.138	0.163	0.341	0.124	0.92
07-2318	ubramaniam, A	AS2089	EN614	D	2150	31-14	9	3.495	-8888	-8888	0.001	0.002	0.013	-8888	-8888	0.219	0.117	0.046	0.265	0.163	0.191	0.382	0.149	1
									-8888.000	-8888.000	0.001	0.002	0.014	-8888.000	-8888.000	0.211	0.108	0.043	0.254	0.151	0.177	0.362	0.137	0.96
									0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.011	0.013	0.005	0.016	0.018	0.020	0.029	0.018	0.06
									0.00%	0.00%	0.00%	0.00%	7.14%	0.00%	0.00%	5.21%	12.04%	11.63%	6.30%	11.92%	11.30%	8.01%	13.14%	6.25%

CV% TChl a = 4.78%
 Ppig = 7.18%
 n = 3

									ratios						CV%	CV%
GSFC Lab sample code	PI	Sample Label	Cruise ID	Indicate if filters are replicates	Volume filtered (ml)	Station	Bottle Number	Sampling Depth (meters)	[PSC]/[TC ar]	[PPC]/[TC ar]	[TChl]/[TC ar]	[PPC]/[TP g]	[PSP]/[TP g]	[TChl a]/[TPg]	TChl a	PPIG
07-2243	ubramaniam, A	AS2011	EN614	D	3200	06-04	22	2.108	0.83	0.17	1.94	0.06	0.94	0.58		
07-2244	ubramaniam, A	AS2012	EN614	D	3200	06-04	22	2.108	0.84	0.16	1.95	0.06	0.94	0.58		
									0.84	0.17	1.95	0.06	0.94	0.58		
									0.01	0.01	0.01	0.00	0.00	0.00		
									1.19%	5.88%	0.51%	0.00%	0.00%	0.00%	8.91%	6.23%
07-2259	ubramaniam, A	AS2027	EN614	D	3200	10-02	23	4.287	0.31	0.69	1.3	0.3	0.7	0.44		
07-2260	ubramaniam, A	AS2028	EN614	D	3200	10-02	23	4.287	0.31	0.69	1.17	0.32	0.68	0.42		
									0.31	0.69	1.24	0.31	0.69	0.43		
									0.00	0.00	0.09	0.01	0.01	0.01		
									0.00%	0.00%	7.26%	3.23%	1.45%	2.33%	0.57%	7.48%
07-2317	ubramaniam, A	AS2088	EN614	D	2150	31-14	9	3.495	0.28	0.72	1.47	0.29	0.71	0.52		
07-2318	ubramaniam, A	AS2089	EN614	D	2150	31-14	9	3.495	0.28	0.72	1.34	0.31	0.69	0.5		
									0.28	0.72	1.41	0.30	0.70	0.51		
									0.00	0.00	0.09	0.01	0.01	0.01		
									0.00%	0.00%	6.38%	3.33%	1.43%	1.96%	4.86%	7.83%

Effective LOQ for ~2.78 mL extraction volume

