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Table S1. Information on phytoplankton sampling stations and sampling depths.

No	Station Name	Water Type	Coastal Water Body (CWB)	Locality	Latitude (decimal degrees)	Longitude (decimal degrees)	Maximum Depth (m)
1	TRK1	Coastal	KAR01	İğneada and Danube Waters	41° 52’ 20.280”	028° 03’ 39.600”	21
					41° 52’ 15.600”	028° 03’ 39.240”	20
2	TRK7	Coastal	KAR01	Şile	41° 11’ 31.200”	029° 35’ 17.880”	23
					41° 11’ 17.880”	029° 35’ 10.320”	18
3	TRK10	Coastal	KAR02	Sakarya River (2nd Line)	41° 08’ 43.080”	030° 37’ 48.000”	21
					41° 08’ 44.880”	030° 37’ 39.360”	21
4	TRKE1	Coastal	KAR03	Karadeniz Ereğlisi	41° 16’ 25.680”	031° 23’ 55.320”	13
					41° 16’ 24.960”	031° 23’ 53.880”	16
5	TRK13	Coastal	KAR03	Zonguldak	41° 27’ 35.280”	031° 46’ 21.720”	18
					41° 27’ 37.800”	031° 46’ 21.360”	24
6	TRK13A	Transition	KAR04	Filyos (Yenice) River Delta	41° 35’ 06.000”	032° 01’ 52.320”	20
					41° 35’ 12.120”	032° 01’ 40.440”	26
7	TRK19	Coastal	KAR05	Cide	41° 54’ 47.520”	032° 55’ 37.920”	43
					41° 54’ 00.720”	032° 55’ 46.920”	45
8	TRK22	Coastal	KAR05	İnebolu	41° 59’ 08.880”	033° 47’ 08.880”	19
					41° 59’ 13.560”	033° 47’ 05.640”	26
9	TRK25	Coastal	KAR05	Sinop 2	42° 03’ 51.120”	034° 55’ 00.480”	20
					42° 04’ 00.840”	034° 54’ 55.440”	28
10	TRK28	Coastal	KAR06	Sinop 1	42° 01’ 01.200”	035° 09’ 24.120”	24
					42° 01’ 00.480”	035° 09’ 16.920”	21
11	TRK32	Coastal	KAR07	Kızılırmak	41° 44’ 44.520”	035° 57’ 20.520”	92
					41° 44’ 44.160”	035° 56’ 46.680”	70
12	TRK34Y	Coastal	KAR08	Samsun	41° 19’ 03.000”	036° 21’ 36.000”	21
					41° 19’ 01.920”	036° 21’ 36.720”	24
13	TRK37	Coastal	KAR10	Yeşilırmak	41° 23’ 36.600”	036° 39’ 15.480”	8
					41° 23’ 40.560”	036° 39’ 25.920”	14
14	TRK43	Coastal	KAR12	Ordu	41° 00’ 09.720”	037° 53’ 39.480”	11
					41° 00’ 11.880”	037° 53’ 39.480”	15
15	TRK44	Coastal	KAR12	Ordu	41° 01’ 13.080”	037° 54’ 29.520”	51
					41° 01’ 09.480”	037° 54’ 31.680”	53
16	TRK46	Coastal	KAR12	Giresun	40° 55’ 21.000”	038° 24’ 18.720”	22
					40° 55’ 24.600”	038° 24’ 24.480”	29

Continued

Table S1 continued

No	Station Name	Water Type	Coastal Water Body (CWB)	Locality	Latitude (decimal degrees)	Longitude (decimal degrees)	Maximum Depth (m)
17	SYB13Y1	Coastal	KAR13	Akçaabat	41° 01’ 25.680”	038° 50’ 57.480”	20
					41° 01’ 29.640”	038° 50’ 58.920”	25
18	TRK53	Coastal	KAR14	Trabzon	41° 01’ 02.280”	039° 43’ 34.680”	55
					41° 01’ 00.480”	039° 43’ 37.200”	60
19	TRK55	Coastal	KAR15	Rize	41° 02’ 07.080”	040° 32’ 31.920”	24
					41° 02’ 08.160”	040° 32’ 18.960”	35
20	TRK61	Coastal	KAR16	Hopa	41° 30’ 50.400”	041° 30’ 52.920”	70
					41° 30’ 48.960”	041° 30’ 57.240”	73

Station	2014-Sum		Station	2015-Win		Station	2015-Sum		Station	2016-Win		Station	2016-Sum		Station	2017-Sum	
	SD (m)	L		SD (m)	L		SD (m)	L		SD (m)	L		SD (m)	L		SD (m)	L
TRK1	0,5	S	TRK1	0,5	S	TRK1	0,5	S	TRK1	0,5	S	TRK1	0,5	S	TRK1	0,5	S
TRK1	20	C-M	TRK1	20	B	TRK1	14	C-M	TRK1	18	B	TRK1	19	C-M	TRK1	15	C-M
TRK7	0,5	S	TRK7	0,5	S	TRK7	0,5	S	TRK7	0,5	S	TRK7	0,5	S	TRK1	20	B
TRK7	20	C-M	TRK7	20	B	TRK7	20	C-M	TRK7	10	10 m	TRK7	21	C-M	TRK7	0,5	S
TRK10	0,5	S	TRK10	0,5	S	TRK10	0,5	S	TRK10	0,5	S	TRK10	0,5	S	TRK7	10	10 m
TRK10	15	C-M	TRK10	15	B	TRK10	15	B	TRK10	17	B	TRK10	8	8 m	TRK7	15	C-M
TRKE1	0,5	S	TRKE1	0,5	S	TRKE1	0,5	S	TRKE1	0,5	S	TRK10	18	C-M	TRK10	0,5	S
TRK13	0,5	S	TRK13	0,5	S	TRK13	0,5	S	TRKE1	12	B	TRKE1	0,5	S	TRK10	10	10 m
TRK13	18	C-M	TRK13	17	B	TRK13	16	C-M	TRK13	0,5	S	TRK13	0,5	S	TRKE1	0,5	S
TRK13A	0,5	S	TRK13A	0,5	S	TRK13A	0,5	S	TRK13	10	10 m	TRK13	9	C-M	TRKE1	12	C-M
TRK13A	19	C-M	TRK13A	18	B	TRK13A	15	B	TRK13A	0,5	S	TRK13A	0,5	S	TRK13	0,5	S
TRK19	0,5	S	TRK19	0,5	S	TRK19	0,5	S	TRK13A	10	10 m	TRK13A	18	C-M	TRK13	10	10 m
TRK22	0,5	S	TRK22	0,5	S	TRK22	0,5	S	TRK19	0,5	S	TRK19	0,5	S	TRK13	15	C-M
TRK22	20	C-M	TRK22	20	B	TRK22	17	C-M	TRK19	10	10 m	TRK22	0,5	S	TRK13A	0,5	S
TRK25	0,5	S	TRK25	0,5	S	TRK25	0,5	S	TRK19	20	20 m	TRK22	20	C-M	TRK13A	17	C-M
TRK28	0,5	S	TRK28	0,5	S	TRK28	0,5	S	TRK22	0,5	S	TRK25	0,5	S	TRK19	0,5	S
TRK28	17	C-M	TRK28	17	B	TRK28	16	C-M	TRK22	18	B	TRK28	0,5	S	TRK19	10	10 m
TRK32	0,5	S	TRK32	0,5	S	TRK32	0,5	S	TRK25	0,5	S	TRK28	15	C-M	TRK19	26	C-M
TRK32	10	10 m	TRK32	10	10 m	TRK32	10	10 m	TRK25	16	B	TRK32	0,5	S	TRK22	0,5	S
TRK32	20	C-M	TRK32	20	20 m	TRK32	30	C-M	TRK28	0,5	S	TRK32	10	10 m	TRK22	10	10 m
TRK34Y	0,5	S	TRK34Y	0,5	S	TRK34Y	0,5	S	TRK28	18	B	TRK32	32	C-M	TRK22	23	C-M
TRK34Y	5	C-M	TRK34Y	5	5 m	TRK34Y	17	C-M	TRK32	0,5	S	TRK34Y	0,5	S	TRK25	0,5	S
TRK37	0,5	S	TRK37	0,5	S	TRK37	0,5	S	TRK32	30	30 m	TRK34Y	12	C-M	TRK25	10	10 m
TRK37	7	C-M	TRK37	7	B	TRK37	7	C-M	TRK34Y	0,5	S	TRK37	0,5	S	TRK28	0,5	S
TRK43	0,5	S	TRK43	0,5	S	TRK43	0,5	S	TRK34Y	18	B	TRK37	7	B	TRK28	10	10 m
TRK44	0,5	S	TRK44	0,5	S	TRK44	0,5	S	TRK37	0,5	S	TRK43	0,5	S	TRK28	22	C-M
TRK44	10	10 m	TRK44	10	10 m	TRK44	10	10 m	TRK37	7	B	TRK44	0,5	S	TRK32	0,5	S
TRK44	30	C-M	TRK44	30	30 m	TRK44	33	C-M	TRK43	0,5	S	TRK44	25	C-M	TRK32	10	10 m
TRK46	0,5	S	TRK46	0,5	S	TRK46	0,5	S	TRK44	0,5	S	TRK44	47	B	TRK32	19	C-M
TRK46	10	10 m	TRK46	10	10 m	TRK46	17	C-M	TRK44	10	10 m	TRK46	0,5	S	TRK34Y	0,5	S
SYB13Y1	0,5	S	SYB13Y1	0,5	S	SYB13Y1	0,5	S	TRK44	48	B	TRK46	27	C-M	TRK34Y	16	C-M
SYB13Y1	17	C-M	SYB13Y1	18	B	SYB13Y1	17	C-M	TRK46	0,5	S	SYB13Y1	0,5	S	TRK37	0,5	S
TRK53	0,5	S	TRK53	0,5	S	TRK53	0,5	S	TRK46	18	B	SYB13Y1	19	C-M	TRK37	5	C-M
TRK53	10	10 m	TRK53	10	10 m	TRK53	10	10 m	SYB13Y1	0,5	S	TRK53	0,5	S	TRK43	0,5	S
TRK53	30	C-M	TRK53	30	30 m	TRK53	25	C-M	SYB13Y1	20	B	TRK53	26	C-M	TRK44	0,5	S
TRK55	0,5	S	TRK55	0,5	S	TRK55	0,5	S	TRK53	0,5	S	TRK53	36	36 m	TRK44	10	10 m

Continued

Table S1 continued

Station	2014-Sum		Station	2015-Win		Station	2015-Sum		Station	2016-Win		Station	2016-Sum		Station	2017-Sum	
	SD (m)	L		SD (m)	L		SD (m)	L		SD (m)	L		SD (m)	L		SD (m)	L
TRK55	6	C-M	TRK55	6	6 m	TRK55	20	C-M	TRK53	10	10 m	TRK55	0,5	S	TRK44	22	C-M
TRK61	0,5	S	TRK61	0,5	S	TRK61	0,5	S	TRK53	30	30 m	TRK55	23	B	TRK46	0,5	S
TRK61	10	10 m	TRK61	10	10 m	TRK61	10	10 m	TRK55	0,5	S	TRK61	0,5	S	TRK46	10	10 m
TRK61	20	C-M	TRK61	20	20 m	TRK61	23	C-M	TRK55	10	10 m	TRK61	25	C-M	TRK46	25	B
									TRK61	0,5	S	TRK61	45	45 m	SYB13Y1	0,5	S
									TRK61	10	10 m				SYB13Y1	10	10 m
									TRK61	30	30 m				TRK53	0,5	S
															TRK53	10	10 m
															TRK53	20	C-M
															TRK55	0,5	S
															TRK55	10	10 m
															TRK61	0,5	S
															TRK61	18	C-M
															TRK61	27	C-M

(SD: Sampling Depth, L: Layer, S: Surface, C-M: Chl-Max, B: Bottom)

Table S2. Sampling methods utilized for different parameters.

Matrix	Parameter	Sampling Method	Storage Method	Reference
Sea Water	Temperature (T), Salinity (S), Density (D)	In-situ Measurement	-	CTD Manual –Software MMG (2017)
	Dissolved Oxygen (DO)	In-situ Measurement / Sample is taken from the rosette to the bottle, and the reagent is added immediately, without allowing it to come into contact with air.		Grasshoff, 1983 CTD Manual -Software / MTS 163 MMG (2017)
	Secchhi Disc Depth (SDD)	In-situ Measurement / 30 cm diameter white/black disc	-	-
	Chl-*a*	Rosette sampling, GF/F filtration	in a deep freezer (-20 ^{0}C)	UNEP/MAP, 2005 MMG (2017)
	PO_4^+	Sample is taken from the rosette to the bottle	Seawater samples are stored in HDPE bottles in a deep freezer (-20 ^{0}C) or measured immediately	
	TP, TN			
	SiO_2			
	NO_3+NO_2-N			
	NH_4-N			

References

MMG, 2017. Marine Monitoring Guidelines. Ministry of Environment and Urbanization of the Republic of Turkey, Directorate General Environmental Impact Assessment, Permit and Inspection, TÜBİTAKMAM Press. ISBN: 978-605-5294-84-7, p. 442. (in Turkish)

UNEP/MAP, 2005. Sampling and Analysis techniques for the Eutrophication Monitoring Strategy of MED POL. Technical Reports Series No: 163

Table S3. Measurement and analysis methods utilized for different parameters.

Matrix	Parameter	Method	Instrument	Reference	LOD/LOQ	Unit	Laboratory
Sea Water	T,S,D	In-situ Measurement	CTD prop	CTD Manual –Software MMG (2017)	-	-	R/V TÜBİTAK MARMARA
	DO	Iodometric Method (Winkler Method)	Titrator	S.M. 4500 B:2005 Grasshoff, 1983	-	mg/L	R/V TÜBİTAK MARMARA
	SDD	In-situ Measurement	Secchi disk	MMG (2017)	-	m	R/V TÜBİTAK MARMARA
	Chl-*a*	Spectrophotometric Method-Extraction with Aceton	UV–Vis Spectrophotometer	S.M 10200 H. Parsons et al., 1984	0.05	µg/L	R/V TÜBİTAK MARMARA
	PO_4^+	Method of Determination of Orthophosphate	QuAAtro autoanalyzer (SEAL)	S.M. 4500-P: 2005 G MMG (2017)	0.02/0.07	µM	R/V TÜBİTAK MARMARA
	TP, TN	Persulfate Method for Simultaneous Determination of Total Nitrogen and Total Phosphorus	UV–Vis Spectrophotometer, Autoclave	S.M. 4500- P J. MMG (2017)	0.055/0.183	µM	TÜBİTAK Marmara Research Center, Climate Change and Sustainability Vice Presidency, Marine Research and Technologies Research Group*
	SiO_2	Colorimetric method	QuAAtro autoanalyzer (SEAL)	SM 4500-SiO2- :2005 F MMG (2017)	0.06 /0.19	µM	R/V TÜBİTAK MARMARA
	NO_3+NO_{2-}N	Cadmium Reduction Method	QuAAtro autoanalyzer (SEAL)	S.M. 4500-NO3-I:2005 MMG (2017)	0.05/0.17	µM	R/V TÜBİTAK MARMARA
	NH_{4-}N	Flow Injection Method	QuAAtro autoanalyzer (SEAL)	S.M. 4500-NH3 H:2005 MMG (2017)	0.041/0.14	µM	R/V TÜBİTAK MARMARA

*All methods have been duly validated in accordance with the guidelines of TS EN ISO/IEC 17025:2017

References

Grasshoff, K., 1983. Determination of Oxygen. Methods of Seawater Analysis, pp. 61–72.

MMG, 2017. Marine Monitoring Guidelines. Ministry of Environment and Urbanization of the Republic of Turkey, Directorate General Environmental Impact Assessment, Permit and Inspection, TÜBİTAKMAM Press. ISBN: 978-605-5294-84-7, p. 442. (in Turkish)

Parsons, T.R., Maika, Y., Lalli, C.M., 1984. A Manual of Chemical and Biological Methods for Seawater Analysis. Pergamon Press, p. 173.

Dissolved Oxygen

The dissolved oxygen content of water samples was measured using the iodometric Winkler test method. The iodometric test is the most sensitive and reliable titrimetric method. According to this method, seawater was transferred from the Niskin bottle to 100 ml Winkler bottles without aeration using a tygon tube. During this process, the end of the hose was brought to the bottom of the oxygen bottle and slowly filled. Care was taken to prevent the formation of air bubbles by ensuring that the water overflows from the bottle (about 2-3 times the volume of the bottle). Manganese sulfate and then alkali iodate acid solution were then added on top.

The bottles were shaken for about a minute or 10-15 times to ensure that the solutions inside were completely mixed. After waiting at least 20 minutes in the dark for the precipitation to complete, the titration process was performed. The iodometric test is based on the principle of adding a two-valent manganese solution and then a strong alkali to the sample in the glass sampling bottle. The existing dissolved oxygen oxidizes an equivalent amount of two-valent manganese to form a hydroxide precipitate. With the addition of iodine ions and under acidic conditions, the oxidized manganese returns to the two-valent state and at this time, an equivalent amount of iodine is released from the sample. The released iodine is titrated potentiometrically with a standard thiosulfate solution (S.M. 4500 B:2005). Dissolved oxygen was measured at all stations by selecting sampling depths according to CTD profiles.

Nutrients

Seawater samples for nutrient elements were collected from all stations at different depths along the water column (representing characteristic depths such as the thermocline, intermediate cold water layer, and fluorescence maximum) using a 10-liter niskin bottle with a Seabird CTD-Rosette system, according to the CTD profile. The samples were collected in 100-ml polyethylene bottles that had been rinsed with dilute acid. The bottles were shaken before filling during sampling.

The dissolved inorganic nitrogen (NO3+NO2-N and NH4-N), dissolved inorganic phosphorus (PO4-P), and silicate (Si) parameters were analyzed using a QuAAtro brand autoanalyzer device on board the R/V TÜBİTAK Marmara on the day the sample was collected. The samples taken for total nitrogen and total phosphorus analyses were kept at -20 ºC until analysis and transferred to the ÇTÜE laboratories of the TÜBİTAK Marmara Research Center for analysis.

Ammonium (NH_4-N)

The concentration of ammonium nitrogen was measured using the S.M. 4500-NH3 H. (Flow Injection Analysis) method on a QuAAtro brand autoanalyzer device. The method is based on the principle of the automatic measurement of the modified Berthelot reaction method. Ammonia that has been chlorinated with monochloramine reacts with phenol. After oxidation, a green-colored complex is formed that is oxidatively bound. The reaction is catalyzed by nitroprusside. Sodium hypochlorite is used for chlorination. The absorption of this complex form is measured at 630 nm.

Nitrite+Nitrate (NO_2+NO_3-N)

The concentrations of nitrite+nitrate were measured using the cadmium reduction method (S.M. 4500-NO3-I:2005) on a QuAAtro brand autoanalyzer device. This method is a method that includes the determination of nitrate and nitrite by the cadmium reduction method. It is based on the principle of reducing nitrate to nitrite by passing the sample through a column containing copper cadmium. Nitrite (found in the original sample+reduced nitrate) is converted to a dark-colored azo dye form by diazotization with sulfanilic acid bound with α-naphthylethylenediamine dihydrochloride and measured at 540 nm.

Ortho-Phosphate (PO_4-P)

The concentrations of ortho-phosphate were measured using the ortho-Phosphate determination (S.M. 4500-P: 2005 G) method on a QuAAtro brand autoanalyzer device. In water samples, phosphate is reacted with ammonium molybdate and potassium antimonyl tartarate to form a complex acid. This complex acid is reduced by ascorbic acid to form a blue-colored complex. This color is measured at a wavelength of 880 nm.

Total Phosphorus (TP)

The total phosphorus determination was carried out using the basic persulfate oxidation method (Grasshoff et al., 1983). In this method, the total phosphorus contained in a 50 ml seawater sample to which 5 ml of oxidation reagent containing potassium persulfate buffered with boric acid-NaOH mixture is added is converted to the inorganic form by applying a constant temperature (115 ºC) in an autoclave for 2 hours. The pH values of the samples, which fall to 4-5 as a result of oxidation, are raised to 7.5-8. Following this procedure, the total phosphorus values contained in the samples are determined by applying the ortho-phosphate determination method in the spectrophotometer.

Reactive Silicate (SiO_2)

The concentrations of silicate were measured using the SM 4500-SiO2-:2005 F (Colorimetric Method) method on a QuAAtro brand autoanalyzer device. In the medium, silicate reacts with ammonium molybdate in acidic medium to form molybdosilicate acid. This complex is reduced to a blue-colored molybdenum complex with ascorbic acid. This color is measured at 810 nm. The addition of oxalic acid prevents phosphate from interfering.

Chlorophyll-*a*

Chlorophyll-*a* concentrations are measured using the acetone extraction (extraction) method on a spectrophotometer device (S.M 10200 H.). It is based on the principle of filtering water samples collected from the field through GF/F filter papers with a pore size of 0.7 mm and then extracting the filter with a solvent and measuring the absorbance of the resulting color in the spectrophotometer.
In the laboratory, the filters were transferred to centrifuge tubes and 10 ml of 90% diluted analytical grade acetone was added and the extraction process was carried out by shaking. The filters were kept at +4 °C for 12 hours to effectively separate chlorophyll-*a*. After the period, the samples were brought to room temperature and centrifuged at 3000 rpm for 10 minutes. Then, readings were taken at different wavelengths on the spectrophotometer and the results were calculated.

Table S4. The physicochemical parameters were examined at stations during the period of 2014 to 2017.

	Temperature (ºC)	Salinity (‰)	DO (mg/L)	Chl-a (µg/L)	PO4-P (µM)	TP (µM¹)	NO_3+NO_2-N (µM)	NH_4-N (µM¹)	SiO_2 (µM)	SDD (m)	Year	Season
Min	14.26	15.75	7.53	0.109	0.015	0.112	0.020	0.140	0.324	1.80	2014	Summer
Max	26.25	18.38	10.14	1.722	0.164	0.357	0.550	2.604	3.854	12.00		
Mean	23.00	17.68	8.53	0.665	0.052	0.183	0.089	0.780	1.398	7.97		
± Conf. Int. (%95)	1.14	0.19	0.19	0.127	0.010	0.018	0.032	0.143	0.243	0.87		
Min	4.42	15.66	10.03	0.306	0.004	0.052	0.098	0.305	0.950	0.70	2015	Winter
Max	9.89	18.21	12.05	1.609	0.828	1.395	6.358	6.699	19.390	12.00		
Mean	8.00	17.56	10.91	0.899	0.101	0.237	1.130	1.326	3.359	6.75		
± Conf. Int. (%95)	0.45	0.22	0.14	0.109	0.091	0.053	0.415	0.343	0.934	0.97		
Min	17.15	14.21	7.18	0.200	0.033	0.095	0.001	0.041	0.267	2.20	2015	Summer
Max	25.11	18.47	8.83	3.300	0.422	0.472	7.007	1.529	9.710	11.00		
Mean	22.80	17.59	8.09	0.800	0.085	0.211	0.385	0.613	1.453	7.05		
± Conf. Int. (%95)	0.48	0.24	0.10	0.185	0.020	0.036	0.354	0.145	0.479	0.86		
Min	9.42	15.46	7.90	0.109	0.019	0.050	0.546	0.041	2.410	0.50	2016	Winter
Max	11.49	18.54	9.96	2.338	0.619	0.662	8.227	2.379	31.680	10.00		
Mean	10.64	17.96	9.32	0.784	0.135	0.213	1.990	0.457	5.556	5.25		
± Conf. Int. (%95)	0.15	0.17	0.11	0.137	0.041	0.036	0.497	0.120	1.670	0.78		
Min	10.08	17.29	4.65	0.198	0.020		0.050	0.040	2.213	4.00	2017	Summer
Max	26.58	18.47	10.19	4.945	0.072		0.178	0.509	4.978	9.00		
Mean	21.42	18.11	7.93	0.752	0.027		0.061	0.075	3.574	6.43		
± Conf. Int. (%95)	1.41	0.07	0.33	0.200	0.004		0.008	0.025	0.187	0.37		

Table S5. Phytoplankton species identified during the 2014-2017 sampling period.

Species List	Sampling Seasons					
	14-S	15-W	15-S	16-W	16-S	17-S
Empire: Eukaryota / Kingdom: Chromista						
Phylum: Dinoflagellata						
Class: Dinophyceae						
Akashiwo sanguinea (K.Hirasaka) Gert Hansen & Moestrup 2000	1	1	1	-	1	1
Alexandrium minutum Halim 1960	-	-	1	1	1	1
Amphidinium sp. 1	1	-	1	-	-	-
Amphidinium sp. 2	1	-	-	-	-	-
Dinophysis acuminata Claparède & Lachmann 1859	1	1	1	-	1	1
Dinophysis acuta Ehrenberg 1839	1	1	1	-	-	-
Dinophysis amandula (Balech) Sournia 1973	-	-	1	1	-	-
Dinophysis caudata Kent 1881	1	1	1	1	1	1
Dinophysis cuneiformis Meunier 1910	1	-	-	-	-	-
Dinophysis fortii Pavillard 1924	1	1	1	1	1	1
Dinophysis hastata F.Stein 1883	-	-	-	1	-	-
Dinophysis odiosa (Pavillard) Tai & Skogsberg 1934	1	-	-	-	1	-
Dinophysis ovum F.Schütt 1895	1	1	-	1	1	1
Dinophysis sacculus F.Stein 1883	1	1	1	1	1	1
Dinophysis vertex Meunier 1910	-	-	-	1	-	-
Diplopsalis lenticula Bergh 1881	1	1	1	1	1	1
Glenodinium sp. 1	1	1	1	-	-	-
Glenodinium sp. 2	-	1	-	-	-	-
Gonyaulax monacantha Pavillard 1916	1	1	1	1	1	1
Gonyaulax polygramma F.Stein 1883	1	1	1	1	1	-
Gonyaulax scrippsae Kofoid 1911	1	-	1	1	1	-
Gonyaulax spinifera (Claparède & Lachmann) Diesing 1866	1	-	1	-	-	1
Gymnodinium wulffii J.Schiller 1932	1	-	-	-	-	-
Gymnodinium sp. 1	1	-	1	-	-	1
Gymnodinium sp. 2	1	-	-	-	-	-
Gyrodinium fusiforme Kofoid & Swezy 1921	1	1	1	1	1	1
Gyrodinium fusus (Meunier) Akselman 1985	-	1	1	1	1	-
Gyrodinium lacryma (Meunier) Kofoid & Swezy 1921	-	-	-	1	-	1
Heterocapsa rotundata (Lohmann) Gert Hansen 1995	1	1	1	-	1	1
Karenia mikimotoi (Miyake & Kominami ex Oda) Gert Hansen & Moestrup 2000	-	-	1	-	-	-
Karenia sp.	1	1	-	-	-	-
Kapelodinium vestifici (Schütt) Boutrup, Moestrup & Daugbjerg 2016	1	-	1	1	-	-
Kryptoperidinium triquetrum (Ehrenberg) Tillmann, Gottschling, Elbrächter, Kusber & Hoppenrath 2019	1	1	1	1	1	1
Lingulodinium polyedra (F.Stein) J.D.Dodge 1989	1	1	1	1	1	1
Oblea rotunda (Lebour) Balech 1964	-	-	1	1	-	-
Phalacroma rotundatum (Claparéde & Lachmann) Kofoid & J.R.Michener 1911	1	1	1	1	1	1
Polykrikos kofoidii Chatton 1914	1	1	1	1	-	-
Polykrikos schwartzii Bütschli 1873	1	1	1	1	1	1
Prorocentrum balticum (Lohmann) Loeblich III 1970	-	-	1	-	-	-
Prorocentrum cordatum (Ostenfeld) J.D.Dodge 1976	1	1	1	1	1	1
Prorocentrum lima (Ehrenberg) F.Stein 1878	-	-	-	1	-	-

Continued

Table S5 continued

Species List	Sampling Seasons					
	14-S	15-W	15-S	16-W	16-S	17-S
Prorocentrum micans Ehrenberg 1834	1	1	1	1	1	1
Prorocentrum scutellum B.Schröder 1900	-	-	-	-	1	1
Protoperidinium bipes (Paulsen) Balech 1974	1	1	-	1	1	1
Protoperidinium brevipes (Paulsen) Balech 1974	1	1	-	-	1	-
Protoperidinium brochii (Kofoid & Swezy) Balech 1974	1	1	-	-	-	-
Protoperidinium cerasus (Paulsen) Balech 1973	1	-	1	1	-	-
Protoperidinium claudicans (Paulsen) Balech 1974	1	1	1	1	-	1
Protoperidinium conicum (Gran) Balech 1974	1	1	1	1	1	1
Protoperidinium crassipes (Kofoid) Balech 1974	1	1	1	1	-	1
Protoperidinium curtipes (Jørgensen) Balech 1974	1	1	1	1	1	1
Protoperidinium depressum (Bailey) Balech 1974	1	1	1	1	1	1
Protoperidinium diabolus (Cleve) Balech 1974	1	1	-	1	1	-
Protoperidinium divergens (Ehrenberg) Balech 1974	1	1	1	1	1	1
Protoperidinium elegans (Cleve) Balech 1974	1	1	1	-	-	-
Protoperidinium grande (Kofoid) Balech 1974	1	1	1	1	-	-
Protoperidinium granii (Ostenfeld) Balech 1974	1	1	1	1	1	1
Protoperidinium latidorsale (P.J.L.Dangeard) Balech 1974	-	-	1	-	-	-
Protoperidinium leonis (Pavillard) Balech 1974	1	1	1	1	1	1
Protoperidinium oblongum (Aurivillius) Parke & Dodge 1976	1	1	1	-	-	-
Protoperidinium obtusum (Karsten) Parke & J.D.Dodge 1976	-	1	-	-	-	-
Protoperidinium pallidum (Ostenfeld) Balech 1973	1	1	1	1	-	-
Protoperidinium pellucidum Bergh 1881	1	1	1	1	-	-
Protoperidinium pentagonum (Gran) Balech 1974	1	1	-	-	-	-
Protoperidinium pyriforme subsp. *breve* (Paulsen) Balech 1988	1	-	-	-	-	-
Protoperidinium steinii (Jørgensen) Balech 1974	1	1	1	1	1	1
Pyrophacus horologium F.Stein 1883	-	1	1	1	-	1
Pyrocystis robusta Kofoid 1907	1	-	-	-	-	-
Scrippsiella acuminata (Ehrenberg) Kretschmann, Elbrächter, Zinssmeister, S.Soehner, Kirsch, Kusber & Gottschling 2015	1	1	1	1	1	1
Sourniaea diacantha (Meunier) H.Gu., K.N.Mertens, Zhun Li & H.H.Shin 2020	1	-	1	-	-	-
Torodinium robustum Kofoid & Swezy 1921	1	1	1	1	1	1
Tripos candelabrum (Ehrenberg) F.Gómez 2013	-	1	-	1	-	-
Tripos extensus (Gourret) F.Gómez 2021	-	1	-	-	-	-
Tripos furca (Ehrenberg) F.Gómez 2013	1	1	1	1	1	1
Tripos fusus (Ehrenberg) F.Gómez 2013	1	1	1	1	1	1
Tripos longipes (Bailey) F.Gómez 2021	1	-	-	-	-	-
Tripos muelleri Bory 1826	1	1	1	1	1	1
Tripos pentagonus (Gourret) F.Gómez 2021	1	-	-	-	-	-
Class: Noctilucophyceae						
Pronoctiluca pelagica Fabre-Domergue 1889	-	-	-	1	-	-
Phylum: Heterokontophyta						
Class: Bacillariophyceae						
Achnanthes adnata Bory 1822	-	-	-	1	-	-
Achnanthes armillaris (O.F.Müller) Guiry 2019	-	1	-	1	-	-
Amphora ovalis (Kützing) Kützing 1844	-	-	1	-	-	-

Continued

Table S5 continued

Species List	Sampling Seasons					
	14-S	15-W	15-S	16-W	16-S	17-S
Amphora sp. 1	1	1	1	1	-	1
Amphora sp. 2	1	-	-	-	-	-
Asterionellopsis glacialis (Castracane) Round 1990	-	1	-	-	-	-
Bacillaria paxillifera (O.F.Müller) T.Marsson 1901	-	1	-	-	-	-
Cylindrotheca closterium (Ehrenberg) Reimann & J.C.Lewin 1964	1	1	1	1	-	1
Diatoma vulgaris Bory 1824	-	-	-	1	-	-
Entomoneis alata (Ehrenberg) Ehrenberg 1845	1	-	-	-	-	-
Fragilaria crotonensis Kitton 1869	-	1	1	1	-	-
Grammatophora marina (Lyngbye) Kützing 1844	-	1	-	1	-	-
Gyrosigma fasciola (Ehrenberg) J.W.Griffith & Henfrey 1856	-	-	-	-	-	1
Gyrosigma sp.	1	-	-	-	-	-
Halamphora holsatica (Hustedt) Levkov 2009	-	1	-	-	-	-
Licmophora abbreviata C.Agardh 1831	-	1	1	1	1	-
Licmophora ehrenbergii (Kützing) Grunow 1867	1	-	-	-	-	-
Licmophora flabellata (Greville) C.Agardh 1831	1	1	1	1	1	1
Nitzschia holsatica Hustedt 1924	-	1	-	1	-	-
Nitzschia longissima (Brébisson ex Kützing) Grunow 1862	-	-	-	1	-	-
Pinnularia sp.	-	-	-	1	-	-
Pleurosigma angulatum (J.T.Quekett) W.Smith 1852	-	-	-	1	-	-
Pleurosigma elongatum W.Smith 1852	1	1	1	1	1	1
Pseudo-nitzschia delicatissima (Cleve) Heiden 1928	1	1	1	1	1	1
Pseudo-nitzschia pungens (Grunow ex Cleve) Hasle 1993	-	1	1	1	1	-
Striatella unipunctata (Lyngbye) C.Agardh 1832	-	1	-	-	-	-
Thalassionema nitzschioides (Grunow) Mereschkowsky 1902	1	1	1	1	1	1
Thalassiothrix heteromorpha var. *mediterranea* (Pavillard) Hallegraeff 1986	-	1	-	-	-	-
Tryblionella compressa (Bailey) Poulin 1990	1	1	1	1	1	1
Class: Coscinodiscophyceae						
Coscinodiscus centralis Ehrenberg 1839	1	1	-	1	1	1
Coscinodiscus granii L.F.Gough 1905	1	1	1	1	1	1
Coscinodiscus perforatus Ehrenberg 1844	-	1	1	1	-	-
Coscinodiscus radiatus Ehrenberg 1840	-	-	1	-	-	1
Dactyliosolen fragilissimus (Bergon) Hasle 1996	1	1	1	-	-	1
Guinardia flaccida (Castracane) H.Peragallo 1892	1	-	-	-	-	-
Guinardia striata (Stolterfoth) Hasle 1996	1	-	1	-	-	-
Melosira moniliformis C.Agardh 1824	-	1	-	1	-	-
Melosira nummuloides C.Agardh 1824	-	1	-	-	-	-
Pseudosolenia calcar-avis (Schultze) B.G.Sundström 1986	1	1	1	1	1	1
Rhizosolenia styliformis T.Brightwell 1858	1	1	-	-	1	1
Sundstroemia setigera (Brightwell) Medlin 2021	1	-	-	1	-	1
Class: Mediophyceae						
Bacteriastrum delicatulum Cleve 1897	-	1	-	1	-	-
Bacteriastrum furcatum Shadbolt 1853	-	1	-	1	-	-
Bacteriastrum hyalinum Lauder 1864	1	-	-	-	-	-
Cerataulina pelagica (Cleve) Hendey 1937	1	1	-	1	-	-

Continued

Table S5 continued

Species List	Sampling Seasons					
	14-S	**15-W**	**15-S**	**16-W**	**16-S**	**17-S**
Chaetoceros affinis Lauder 1864	1	1	1	1	1	1
Chaetoceros atlanticus Cleve 1873	-	-	1	-	-	-
Chaetoceros borealis Bailey 1854	-	1	-	-	-	-
Chaetoceros compressus Lauder 1864	-	1	1	1	-	-
Chaetoceros constrictus Gran 1897	-	1	-	-	-	-
Chaetoceros costatus Pavillard 1911	-	1	1	1	-	-
Chaetoceros curvisetus Cleve 1889	1	1	1	1	1	1
Chaetoceros danicus Cleve 1889	-	-	-	1	-	-
Chaetoceros debilis Cleve 1894	-	1	1	-	-	-
Chaetoceros decipiens Cleve 1873	1	1	1	1	1	1
Chaetoceros didymus Ehrenberg 1845	1	1	-	1	1	-
Chaetoceros laciniosus F.Schütt 1895	-	1	1	-	-	-
Chaetoceros lorenzianus Grunow 1863	-	1	-	-	-	-
Chaetoceros peruvianus Brightwell 1856	1	1	-	1	-	-
Chaetoceros proschkinae Gogorev 2006	-	1	-	1	-	-
Chaetoceros pseudocurvisetus Mangin 1910	-	1	-	-	-	-
Chaetoceros rostratus Ralfs 1864	-	1	-	-	-	-
Chaetoceros similis Cleve, 1896	1	1	1	1	1	1
Chaetoceros simplex Ostenfeld 1902	1	1	1	1	1	-
Chaetoceros socialis H.S.Lauder, 1864	-	1	1	-	1	-
Chaetoceros tenuissimus Meunier 1913	-	1	-	1	-	-
Chaetoceros tetrastichon Cleve 1897	-	-	-	1	-	-
Ditylum brightwellii (T.West) Grunow 1885	-	1	-	1	1	1
Hemiaulus hauckii Grunow ex Van Heurck 1882	-	-	-	-	1	1
Lennoxia faveolata H.A.Thomsen & K.R.Buck 1993	1	1	-	1	-	-
Leptocylindrus danicus Cleve 1889	1	1	1	1	1	1
Planktoniella sol (G.C.Wallich) Schütt 1892	1	-	-	-	-	-
Proboscia alata (Brightwell) Sundström 1986	1	1	1	1	1	1
Skeletonema costatum (Greville) Cleve 1873	1	1	-	1	-	-
Thalassiosira angustelineata (A.W.F.Schmidt) G.Fryxell & Hasle 1977	-	-	-	1	-	-
Thalassiosira eccentrica (Ehrenberg) Cleve 1904	1	1	1	1	1	1
Thalassiosira gravida Cleve 1896	-	1	-	-	-	-
Thalassiosira parva Proshkina-Lavrenko 1955	-	1	-	1	-	-
Thalassiosira sp.	1	-	-	-	-	-
Trieres mobiliensis (Bailey) Ashworth & E.C.Theriot 2013	-	-	-	1	-	-
Empire: Eukaryota / Kingdom: Chromista						
Phylum: Bigyra						
Class: Bicosoecophyceae						
Bicosoeca mediterranea Pavillard 1916	-	1	-	-	-	-
Phylum: Cercozoa						
Class:Thecofilosea						
Ebria tripartita (Schumann) Lemmermann 1899	1	1	1	1	1	1
Phylum: Cryptista						
Class: Cryptophyceae						

Continued

Table S5 continued

Species List	Sampling Seasons					
	14-S	15-W	15-S	16-W	16-S	17-S
Chroomonas sp.	1	1	-	1	-	-
Hillea fusiformis (J.Schiller) J.Schiller 1926	-	1	1	1	-	-
Phylum: Heterokontophyta						
Class: Dictyochophyceae						
Dictyocha fibula Ehrenberg 1839	1	1	-	-	-	-
Octactis octonaria (Ehrenberg) Hovasse 1946	-	1	-	1	-	1
Octactis speculum (Ehrenberg) F.H.Chang, J.M.Grieve & J.E.Sutherland 2017	1	1	1	1	-	-
Phylum: Haptophyta						
Class: Coccolithophyceae						
Emiliania huxleyi (Lohmann) W.W.Hay & H.Mohler 1967	1	1	1	1	1	1
Kingdom: Plantae						
Phylum: Charophyta						
Class: Zygnematophyceae						
Staurastrum smithii Teiling 1946	-	1	-	1	-	-
Phylum: Chlorophyta						
Class: Chlorophyceae						
Monoraphidium sp. 1	1	-	1	-	-	-
Monoraphidium sp. 2	1	-	-	-	-	-
Scenedesmus sp.	-	-	1	1	-	-
Kingdom: Protozoa						
Phylum: Euglenophyta						
Class: Euglenophyceae						
Euglena viridis (O.F.Müller) Ehrenberg 1830	-	-	-	1	-	-
Eutreptia lanowii Steuer, nom. inval. 1904	-	-	1	-	-	-
Empire: Prokaryota / Kingdom: Eubacteria						
Phylum: Cyanobacteria						
Class: Cyanophyceae						
Anabaena sp.	1	1	-	-	-	1
Oscillatoria sp.	-	1	1	1		-

Table S6. Frequency values of species observed "constantly" at stations and between seasons, according to the results of frequency index analysis.

Species List	Frequency index value (Stations)						Frequency index value (Seasons)
	2014 Summer	2015 Winter	2015 Summer	2016 Winter	2016 Summer	2017 Summer	
Akashiwo sanguinea					85	70	83
Alexandrium minutum							67
Dinophysis acuminata			70				83
Dinophysis caudata	80		80		70	85	100
Dinophysis fortii			80	70	75		100
Dinophysis ovum							83
Dinophysis sacculus							100
Diplopsalis lenticula	85		75		95		100
Gonyaulax monacantha			95		90		100
Gonyaulax polygramma							83
Gonyaulax spinifera	90						
Gonyaulax scrippsae				70	90		67
Gyrodinium fusiforme	95	95	100	90	100	95	100
Gyrodinium fusus		75		70	80		67
Heterocapsa rotundata		90	80				83
Karenia mikimotoi			80				
Kapelodinium vestifici	80		70				
Kryptoperidinium triquetrum		85	75				100
Lingulodinium polyedra			95	90	90	70	100
Phalacroma rotundatum	100		100	100	100	100	100
Polykrikos kofoidii							67
Polykrikos schwartzii	70		95		65	80	100
Prorocentrum cordatum	100		100	95	85		100
Prorocentrum micans	100	90	100	100	100	100	100
Protoperidinium bipes					75		83
Protoperidinium claudicans			100			85	83
Protoperidinium conicum			70	80	95		100
Protoperidinium crassipes	65						83
Protoperidinium curtipes		70				95	100
Protoperidinium depressum	75	100		90	95	95	100
Protoperidinium diabolus					85		67
Protoperidinium divergens	95		100	75	90	100	100
Protoperidinium grande			90				67
Protoperidinium granii	90	80	95	95	95	100	100
Protoperidinium leonis							100

Continued

Table S6 continued

Species List	Frequency index value (Stations)						Frequency index value (Seasons)
	2014 Summer	2015 Winter	2015 Summer	2016 Winter	2016 Summer	2017 Summer	
Protoperidinium oblongum			80				
Protoperidinium pallidum							67
Protoperidinium pellucidum			65				67
Protoperidinium steinii	100		100	100	100	100	100
Pyrophacus horologium							67
Scrippsiella acuminata	85	85	100	80	90	95	100
Torodinium robustum		70	85	95	65		100
Tripos furca	100	90	100	95	100	100	100
Tripos fusus	95	70	100	95	95	90	100
Tripos muelleri	100	85	100	90	90	100	100
Amphora sp.							83
Chaetoceros affinis	95	95	95	100	95	65	100
Chaetoceros curvisetus	75	75	75	90			100
Chaetoceros decipiens							100
Chaetoceros didymus							67
Chaetoceros similis			70	85			100
Chaetoceros simplex							83
Coscinodiscus centralis						70	83
Coscinodiscus granii	65			75		80	100
Cylindrotheca closterium		90		90			83
Dactyliosolen fragilissimus						95	67
Ditylum brightwellii		70					67
Leptocylindrus danicus						75	100
Licmophora abbreviata							67
Licmophora flabellata							100
Pleurosigma elongatum			65	100		85	100
Proboscia alata							100
Pseudo-nitzschia delicatissima	70			80	80	100	100
Pseudo-nitzschia pungens		65		75			67
Pseudosolenia calcar-avis	100		100		100	100	100
Rhizosolenia styliformis						70	67
Skeletonema costatum		90		80			
Thalassionema nitzschioides	100	90	100	100			100
Thalassiosira angustelineata				70			
Thalassiosira eccentrica				75			100

Continued

Table S6 continued

Species List	Frequency index value (Stations)						Frequency index value (Seasons)
	2014 Summer	2015 Winter	2015 Summer	2016 Winter	2016 Summer	2017 Summer	
Thalassiosira parva				70			
Tryblionella compressa	100		100	100	100	100	100
Emiliania huxleyi	100	100	100	100	100	100	100
Hillea fusiformis		100					
Octactis octonaria				70			
Octactis speculum		90		90			67
Ebria tripartita		65		70			100

Table S7. The relative contributions of dominant species to the total abundance and group abundances at the surface, chlorophyll maximum depth, and in the water column (S: Summer, W: Winter, Blue highlighted: Species only in surface layer, Yellow highlighted: Species only in Chl-Max layer).

SURFACE						
Phytoplankton Groups	**SEASONS**					
	14-S	**15-W**	**15-S**	**16-W**	**16-S**	**17-S**
Diatom	**Percentage (%) in total abundance (group abundance)**					
Cylindrotheca closterium		3.4 (5.5)		3.3 (9.5)		
Pseudosolenia calcar-avis	7.1 (28.9)				**47.0 (77.9)**	
Pseudo-nitzschia delicatissima		**49.1 (79.2)**		5.2 (15.0)		**91.1 (96.7)**
Pseudo-nitzschia pungens				4.8 (13.6)		
Thalassionema nitzschioides	8.3 (33.9)		**32.3 (82.3)**	3.1 (8.8)		
Tryblionella compressa	4.4 (17.9)		3.0 (7.4)	5.0 (14.3)	4.6 (7.6)	
Dinoflagellates						
Akashiwo sanguinea					2.5 (9.5)	
Gyrodinium fusiforme		2.4 (20.5)		3.2 (7.1)		
Heterocapsa rotundata		3.9 (33.0)	3.9 (8.9)			
Kryptoperidinium triquetrum		2.5 (21.7)	2.8 (6.4)			
Prorocentrum cordatum	11.6 (49.2)		**22.1 (50.6)**	8.3 (18.7)	4.4 (16.0)	
Prorocentrum micans	3.2 (13.6)		2.3 (5.2)	**19.5 (43.8)**	6.7 (24.3)	
Scrippsiella acuminata			2.0 (4.7)			
Others						
Emiliania huxleyi	**51.9 (99.8)**	4.0 (15.1)	**15.6 (96.6)**	9.2 (44.5)	**11.9 (99.9)**	2.5 (98.7)
Hillea fusiformis		20.8 (79.0)		8.0 (38.8)		

CHL-MAX				
Phytoplankton Groups	**SEASONS**			
	14-S	**15-S**	**16-S**	**17-S**
Diatom	**Percentage (%) in total abundance (group abundance)**			
Pseudosolenia calcar-avis	4.0 (25.9)		**23.9 (69.4)**	
Pseudo-nitzschia delicatissima				**91.1 (95.8)**
Thalassionema nitzschioides	4.6 (29.6)	**28.8 (80.2)**		
Tryblionella compressa	4.2 (27.1)	3.8 (10.7)	6.5 (18.8)	
Dinoflagellates				
Heterocapsa rotundata		6.1 (11.3)		
Kryptoperidinium triquetrum		3.8 (6.9)		
Prorocentrum cordatum	**13.3 (43.1)**	**28.9 (53.2)**	7.1 (11.6)	
Prorocentrum lima		2.2 (4.0)		
Prorocentrum micans	2.6 (8.5)		**15.3 (25.0)**	
Scrippsiella acuminata		2.3 (4.2)		
Tripos furca			5.0 (8.1)	
Tripos fusus			**14.1 (23.0)**	
Tripos muelleri			2.5 (4.2)	
Others				
Emiliania huxleyi	**53.0 (100.0)**	9.4 (95.2)	4.4 (100.0)	2.5 (100.0)

Continued

Table S7 continued

Phytoplankton Groups	TOTAL					
	SEASONS					
	14-S	**15-W**	**15-S**	**16-W**	**16-S**	**17-S**
Diatom	**Percentage (%) in total abundance (group abundance)**					
Cylindrotheca closterium		3.5 (4.9)		3.1 (7.9)		
Pseudosolenia calcar-avis	5.6 (26.8)				**39.0 (76.0)**	
Pseudo-nitzschia delicatissima		**58.1 (82.3)**		6.1 (15.6)		**91.5 (96.7)**
Pseudo-nitzschia pungens				5.3 (13.6)		
Thalassionema nitzschioides	7.0 (33.1)		**32.3 (82.2)**	3.3 (8.3)		
Tryblionella compressa	4.6 (21.7)		3.2 (8.1)	6.3 (16.0)	5.3 (10.3)	
Dinoflagellates						
Gyrodinium fusiforme				2.9 (7.1)		
Heterocapsa rotundata		3.1 (35.0)	4.1 (9.2)			
Kryptoperidinium triquetrum			2.8 (6.4)			
Prorocentrum cordatum	**11.7 (45.8)**		**23.1 (51.6)**	8.7 (21.6)	5.3 (13.3)	
Prorocentrum micans	3.0 (11.6)			**15.6 (38.6)**	9.7 (24.6)	
Prorocentrum lima			2.1 (4.7)			
Scrippsiella acuminata			2.0 (4.5)			
Tripos furca					2.8 (7.0)	
Tripos fusus					6.0 (15.2)	
Others						
Emiliania huxleyi	**53.1 (99.5)**	3.6 (17.8)	**15.6 (97.3)**	9.9 (48.1)	9.2 (99.9)	2.3 (98.9)
Hillea fusiformis		**15.7 (76.9)**		8.0 (38.7)		

Table S8. Dominance values (*Y*) of the dominant phytoplankton species (S: Summer, W: Winter).

Phytoplankton Groups	SEASONS					
	14-S	**15-W**	**15-S**	**16-W**	**16-S**	**17-S**
Diatom	***Y* values**					
Cylindrotheca closterium		0.031		0.024		
Pseudosolenia calcar-avis	0.054				**0.380**	
Pseudo-nitzschia delicatissima		**0.392**		0.044		**0.860**
Pseudo-nitzschia pungens				0.036		
Thalassionema nitzschioides	0.070		**0.307**	0.032		
Tryblionella compressa	0.046		0.031	0.063	0.053	
Dinoflagellates						
Gyrodinium fusiforme				0.023		
Heterocapsa rotundata		0.028	0.031			
Kryptoperidinium triquetrum			0.020			
Prorocentrum cordatum	**0.117**		**0.231**	0.083	0.039	
Prorocentrum micans	0.030			**0.152**	0.097	
Prorocentrum lima			0.021			
Scrippsiella acuminata			0.020			
Tripos furca					0.027	
Tripos fusus					0.050	
Others						
Emiliania huxleyi	**0.531**	0.036	**0.156**	0.099	0.092	0.023
Hillea fusiformis		**0.157**		0.041		

$$Y = \frac{n_i}{n} f_i$$

where Y is the value of dominance,
n_i is the individual number of the *i*th phytoplankton species,
n is the total individual number of the phytoplankton species,
f_i is the frequency of the ith species
The species with Y ≥ 0.02 represents the dominant species, and Y > 0.1 represents the absolute dominant species (Wu et al., 2021)

Table S9. The list of species with abundance value exceeding 10.000 cell/L threshold (St: Number of stations, L: Layer, MA: Maximum abundance (cell L^{-1}), S: Surface, B: Bottom, C: Chlorophyll-*a* maximum).

	2014-Summer			2015-Winter			2015-Summer			2016-Winter			2016-Summer			2017-Summer		
	St	**MA**	**L**	**St**	**MA**	**L**	**St**	**MA**	**L**	**St**	**MA**	**L**	**St**	**MA**	**L**	**St**	**MA**	**L**
Diatom																		
Cylindrotheca closterium				1	16400	B												
Pseudo-nitzschia delicatissima				6	**465000**	S										18	**235000**	10 m
Pseudosolenia calcar-avis	1	11960	S										10	23250	S	1	12500	S
Thalassionema nitzschioides	3	14950	S				12	95000	S									
Dinoflagellates																		
Amphidinium extensum							1	11000	S									
Gyrodinium fusiforme				1	10780	S	1	14000	S									
Heterocapsa rotundata				1	10800	S	1	24500	S									
Kryptoperidinium triquetrum							1	17500	S									
Prorocentrum cordatum	5	29475	C				15	**47500**	S				1	14450	C			
Prorocentrum micans				1	24000	S				2	24000	S						
Scrippsiella acuminata							1	15000	S									
Tripos fusus													1	24300	C			
Others																		
Emiliania huxleyi	20	**92000**	10 m	1	10300	S	8	40300	S									
Hillea fusiformis				10	30950	S												

Table S10. Three-way PerMANOVA testing significance of the phytoplankton composition and abundance among years (fixed), seasons (fixed) and layers (fixed). Triangle matrix of Bray-Curtis similarity index solving $\log_{10}$(abundance+1) was subjected to PerMANOVA. Bold P values (P(perm): P value of PerMANOVA, and P(MC): Monte Carlo test) denote that the difference was significant at $p < 0.05$. PerMANOVA solution was iterated 999 times. The df is degrees of freedom.

		Abundance		Biomass	
Source	**df**	**P(perm)**	**P(MC)**	**Source**	**df**
Year	3	**0.001**	**0.001**	**0.001**	**0.001**
Season	1	**0.001**	**0.001**	**0.001**	**0.001**
Layer	3	**0.005**	**0.003**	**0.002**	**0.001**
Year x Season	1	**0.001**	**0.001**	**0.001**	**0.001**
Year x Layer	8	0.076	0.057	0.112	0.085
Season x Layer	2	0.446	0.467	0.193	0.162
Year x Season x Layer	2	0.169	0.15	0.078	0.075
Residuals	233				
Total	253				

Table S11. SIMPER analysis to determine the contributor species in season. Avg. Sim: Average similarity in season, Av. Abn: log10-averaged abundance, Av. Sim, average similarity of the species, Sim/SD: average similarity/standard deviation of similarity for the species, Cum%: cumulative percent contribution in similarity in season. * is contributor species in season.

Species, summer, Avg. Sim: 53.52	Av.Abn	Av.Sim	Sim/SD	Cum.%
*Emiliania huxleyi**	8.06	5.14	4.12	9.61
*Tryblionella compressa**	6.17	3.71	3.69	16.55
Pseudosolenia calcar-avis	6.16	3.48	2.08	23.04
Tripos furca *	5.09	3.09	3.23	28.82
*Protoperidinium steinii**	5.13	3.06	3.19	34.55
*Phalacroma rotundatum**	4.81	2.99	3.26	40.14
Gyrodinium fusiforme	4.91	2.73	2.17	45.24
Prorocentrum micans	4.69	2.30	1.09	49.54
Species, winter, Avg. Sim: 51.45				
*Emiliania huxleyi**	6.97	4.15	3.80	8.07
Thalassionema nitzschioides	5.13	2.46	1.81	12.84
Hillea fusiformis	5.98	2.38	1.02	17.46
*Chaetoceros affinis**	4.62	2.36	2.19	22.05
Cylindrotheca closterium	5.25	2.26	1.34	26.43
Prorocentrum micans	4.82	2.15	1.51	30.61
Gyrodinium fusiforme	4.67	2.04	1.50	34.57

Table S12. SIMPER analysis to determine the discriminator species in pairwise seasons. Avg. Dis.: Average dissimilarity between pairwise seasons, Av. Abn: log10-average abundance for pairwise seasons, Av. Diss, average dissimilarity of the species, Diss/SD: average dissimilarity/standard deviation of similarity for the species, Cum%: cumulative percent contribution in dissimilarity between seasons. * is discriminator species between seasons.

Species, summer vs winter, Avg. Dis: 58.93	**Av.Abn summer**	**Av.Abn Winter**	**Av.Diss**	**Diss/SD**	**Cum.%**
*Hillea fusiformis**	0.16	5.98	1.94	1.45	3.30
*Cylindrotheca closterium**	0.52	5.25	1.65	1.62	6.09
Pseudo-nitzschia delicatissima	4.77	5.15	1.59	1.19	8.79
Pseudosolenia calcar-avis	6.16	2.09	1.53	1.38	11.40
*Skeletonema costatum **	0.26	4.26	1.42	1.42	13.81
Prorocentrum cordatum	5.41	3.64	1.41	1.30	16.21
*Thalassionema nitzschioides**	3.86	5.13	1.40	1.57	18.58
Kryptoperidinium triquetrum	1.51	4.05	1.25	1.22	20.70
Pseudo-nitzschia pungens	0.39	4.09	1.25	1.29	22.82
Heterocapsa rotundata	2.23	3.07	1.14	0.99	24.76
*Octactis speculum **	0.12	3.56	1.13	1.63	26.68
Prorocentrum micans	4.69	4.82	1.01	1.25	28.39
Phalacroma rotundatum	4.81	2.21	0.99	1.34	30.07
Tryblionella compressa	6.17	4.04	0.98	1.13	31.73
*Protoperidinium divergens**	3.59	1.05	0.98	1.56	33.39
Protoperidinium steinii	5.13	2.56	0.97	1.37	35.04
Chaetoceros curvisetus	2.62	3.92	0.96	1.29	36.66

Table S13. SIMPER analysis to determine the contributor species in years. Avg. Sim: Average similarity in year, Av. Abn: log10-averaged abundance, Av. Sim, average similarity of the species, Sim/SD: average similarity/standard deviation of similarity for the species, Cum%: cumulative percent contribution in similarity in year. * is contributor species in year.

Species, 2014 Avg. Sim 63.55	**Av.Abn**	**Av.Sim**	**Sim/SD**	**Cum.%**
Emiliania huxleyi *	10.22	6.08	5.90	9.57
Prorocentrum cordatum	8.28	4.64	3.80	16.87
Thalassionema nitzschioides	7.83	4.44	3.62	23.86
Tryblionella compressa *	7.60	4.35	4.43	30.71
Prorocentrum micans *	7.16	4.06	4.32	37.10
Pseudosolenia calcar-avis	7.44	4.06	2.57	43.49
Tripos furca *	5.62	3.07	4.69	48.32
Phalacroma rotundatum	5.28	2.85	3.51	52.80
Protoperidinium steinii	5.43	2.84	3.61	57.28
Species, 2015, Avg. Sim. 48.82				
*Emiliania huxleyi**	7.84	4.32	4.13	8.85
*Gyrodinium fusiforme**	5.44	2.59	2.40	14.15
Thalassionema nitzschioides	6.24	2.47	1.62	19.20
Heterocapsa rotundata	5.81	2.42	1.35	24.16
*Chaetoceros affinis**	4.83	2.25	2.11	28.77
Kryptoperidinium triquetrum	5.26	2.09	1.20	33.05
Scrippsiella acuminata	4.67	1.98	1.70	37.10
Species, 2016, Avg. Sim 53.63				
*Emiliania huxleyi**	6.92	4.63	3.63	8.64
*Prorocentrum micans**	6.46	3.98	3.03	16.07
*Tryblionella compressa**	5.97	3.72	3.93	23.00
*Tripos furca**	4.87	2.70	2.14	28.03
Prorocentrum cordatum	5.15	2.56	1.45	32.79
Gyrodinium fusiforme	4.61	2.47	1.64	37.39
*Protoperidinium steinii**	4.20	2.34	2.34	41.75
Phalacroma rotundatum	3.93	2.17	1.93	45.80
Chaetoceros affinis	4.00	2.11	1.68	49.73
Species, 2017, Avg. Sim. 66.8				
Pseudo-nitzschia delicatissima *	9.57	7.23	2.42	10.82
Emiliania huxleyi *	6.80	5.88	4.26	19.63
*Phalacroma rotundatum**	4.83	3.78	4.55	25.29
*Tryblionella compressa**	4.74	3.75	3.91	30.91
*Prorocentrum micans**	4.65	3.62	3.84	36.33
Protoperidinium steinii	4.62	3.48	2.88	41.54
Pseudosolenia calcar-avis	4.92	3.42	2.19	46.66
Tripos furca *	4.44	3.40	3.32	51.76
Tripos muelleri *	3.63	2.94	3.02	56.16
Protoperidinium granii	3.93	2.86	2.15	60.44

Table S14. SIMPER analysis to determine the discriminator species in pairwise years. Avg. Dis.: Average dissimilarity between pairwise years, Av. Abn: log10-average abundance for pairwise years, Av. Diss, average dissimilarity of the species, Diss/SD: average dissimilarity/standard deviation of similarity for the species, Cum%: cumulative percent contribution in dissimilarity between years. * is discriminator species between years.

Species, 2014 vs 2015, Avg. Dis: 54.87	Av.Abn 2014	Av.Abn 2015	Av.Diss	Diss/SD	Cum.%
Prorocentrum micans *	7.16	1.75	1.69	2.03	3.08
Kryptoperidinium triquetrum *	0.12	5.26	1.52	1.73	5.86
Hillea fusiformis	0.00	4.64	1.42	1.04	8.44
Heterocapsa rotundata	2.49	5.81	1.37	1.37	10.94
Pseudosolenia calcar-avis *	7.44	3.58	1.36	1.60	13.41
Prorocentrum cordatum	8.28	5.21	1.31	1.12	15.80
Kapelodinium vestifici	4.79	1.99	1.29	1.25	18.16
Species, 2014 vs 2016, Avg. Dis: 50.25	**2014**	**2016**			
Thalassionema nitzschioides *	7.83	2.91	1.72	1.46	3.43
Kapelodinium vestifici *	4.79	0.14	1.52	1.35	6.45
Pseudosolenia calcar-avis	7.44	4.73	1.30	1.26	9.04
Gonyaulax spinifera *	3.93	0.00	1.26	1.71	11.56
Prorocentrum cordatum	8.28	5.15	1.19	1.16	13.93
Pseudo-nitzschia delicatissima	3.35	3.90	1.14	1.20	16.20
Emiliania huxleyi *	10.22	6.92	1.10	2.62	18.37
Scrippsiella acuminata	5.00	3.84	1.01	1.19	20.38
Tripos fusus	4.00	3.95	0.94	1.26	22.25
Lingulodinium polyedra	1.16	3.10	0.93	1.33	24.09
Species, 2014 vs 2017, Avg. Dis: 51.31	**2014**	**2017**			
Prorocentrum cordatum *	8.28	0.95	2.77	2.55	5.40
Thalassionema nitzschioides *	7.83	0.59	2.71	2.83	10.68
Pseudo-nitzschia delicatissima *	3.35	9.57	2.45	1.77	15.45
Kapelodinium vestifici	4.79	0.00	1.71	1.37	18.78
Scrippsiella acuminata	5.00	2.65	1.31	1.43	21.33
Emiliania huxleyi *	10.22	6.80	1.28	2.71	23.83
Chaetoceros affinis	4.14	1.16	1.26	1.48	26.29
Gonyaulax spinifera	3.93	0.84	1.26	1.67	28.75
Pseudosolenia calcar-avis	7.44	4.92	1.22	1.42	31.12
Dactyliosolen fragilissimus	1.02	3.47	1.20	1.70	33.45
Protoperidinium curtipes *	0.28	3.23	1.13	1.90	35.66
Species, 2015 vs 2016, 56.33	**2015**	**2016**			
Heterocapsa rotundata *	5.81	0.45	1.75	1.75	3.10
Prorocentrum micans *	1.75	6.46	1.61	1.84	5.97
Hillea fusiformis	4.64	1.82	1.49	1.03	8.61
Kryptoperidinium triquetrum *	5.26	1.61	1.43	1.40	11.14
Thalassionema nitzschioides *	6.24	2.91	1.42	1.38	13.66
Prorocentrum cordatum *	5.21	5.15	1.37	1.39	16.10
Pseudo-nitzschia delicatissima	3.80	3.90	1.35	1.27	18.48
Pseudosolenia calcar-avis	3.58	4.73	1.24	1.29	20.68
Species, 2015 vs 2017, 59.94	**2015**	**2017**			
Pseudo-nitzschia delicatissima *	3.80	9.57	2.45	1.48	4.09
Thalassionema nitzschioides *	6.24	0.59	2.01	1.85	7.44

Continued

Table S14 continued

Heterocapsa rotundata *	5.81	0.69	1.91	1.70	10.63
Prorocentrum cordatum	5.21	0.95	1.79	1.19	13.62
Kryptoperidinium triquetrum *	5.26	0.67	1.74	1.57	16.52
Hillea fusiformis	4.64	0.00	1.72	1.02	19.38
Chaetoceros affinis *	4.83	1.16	1.38	1.85	21.68
Prorocentrum micans *	1.75	4.65	1.26	1.83	23.78
Cylindrotheca closterium	3.38	0.21	1.24	0.89	25.85
Chaetoceros curvisetus	3.96	1.30	1.15	1.47	27.76
Species, 2016 vs 2017, 52.25	**2016**	**2017**			
*Pseudo-nitzschia delicatissima**	3.90	9.57	2.55	1.58	4.89
Prorocentrum cordatum *	5.15	0.95	1.78	1.60	8.30
Pseudosolenia calcar-avis	4.73	4.92	1.47	1.36	11.12
Dactyliosolen fragilissimus *	0.00	3.47	1.34	1.85	13.68
Chaetoceros affinis	4.00	1.16	1.26	1.51	16.10
Leptocylindrus danicus	0.42	2.93	1.11	1.06	18.23
Scrippsiella acuminata	3.84	2.65	1.11	1.18	20.36
Thalassionema nitzschioides	2.91	0.59	1.10	1.04	22.47
Protoperidinium curtipes	0.97	3.23	1.08	1.45	24.53

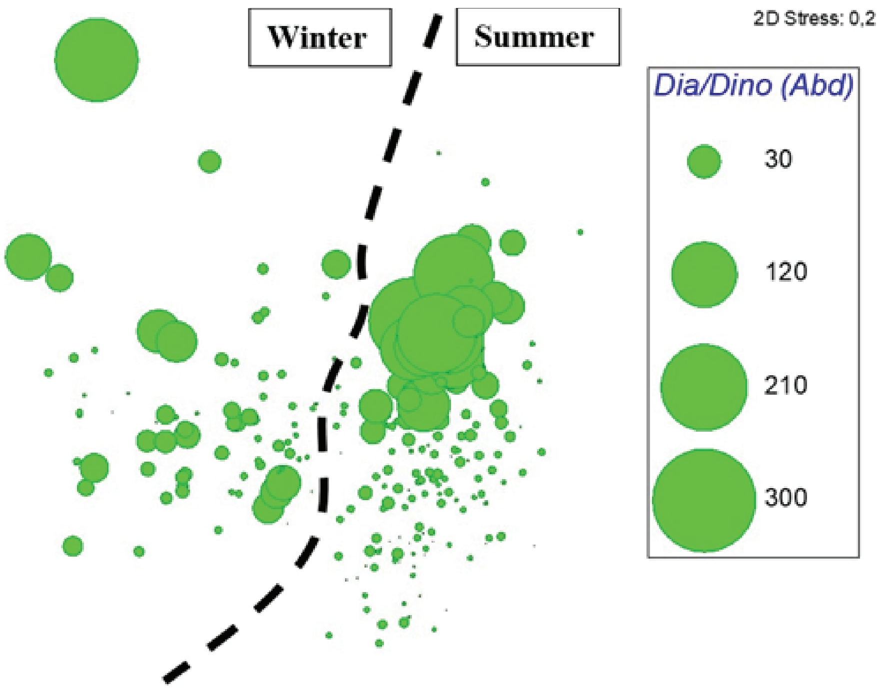

Fig. S1: Ratio of diatom to dinoflagellates abundance overlapping on nMDS configuration (given in Fig 4).