Supplentary Material

Table S1. Environmental variables at the sampling sites in the different Kara Sea regions and in the Laptev Sea in August – September 2018. I – Southwestern region; II – River runoff region; III – Eastern region; IV – Laptev Sea; V – Western region. Latitude (φ) and longitude (λ) are presented in decimals. *H* – the depth of a sampling site; *T* – surface water temperature; *S* – surface salinity; PO_4, $Si(OH)_4$, NO_2+NO_3, NH_4 and DIN – surface concentrations of phosphates, dissolved silicon, sum of nitrites and nitrates, ammonium and dissolved inorganic nitrogen, respectively. The dashes mean no data

Date	Sampling points	Region	φ	λ	*H* (m)	*T* (°C)	*S*	PO_4 (μM)	$Si(OH)_4$ (μM)	NO_2+NO_3 (μM)	NH_4 (μM)	DIN (μM)
20.08.	72-07	I	70.8	58.6	156	6.2	29.9	0.22	0.05	0.03	–	–
20.08.	72-08		71.3	59.2	139	6.0	27.9	0.21	0.34	0.13	–	–
20.08.	72-09		71.8	59.7	122	7.0	27.5	0.25	0.83	0.06	–	–
20.08.	72-10		72.3	60.4	139	4.6	28.2	0.18	0.10	0.12	–	–
20.08.	5942		73.1	61.3	92	5.4	29.4	0.08	0.15	0.06	0.02	0.08
21.08.	72-11		73.2	63.0	118	5.3	30.5	0.22	0.19	0.07	–	–
21.08.	72-12		73.4	65.3	78	4.9	29.8	0.16	0.15	0.06	–	–
13.09.	5942_2		73.1	61.3	90	3.1	31.3	0.01	0.24	0.14	0.09	0.23
21.08.	72-14	II	73.7	69.1	20	6.1	13.8	0.29	38.43	0.04	–	–
21.08.	72-15		73.8	71.1	18	6.5	11.2	0.11	54.00	0.29	–	–
21.08.	5943		73.9	73.0	31	6.1	15.8	0.09	38.82	0.09	0.38	0.47
21.08.	72-16		74.1	75.7	28	7.0	12.9	0.12	62.56	0.22	–	–
22.08.	72-17		74.2	77.7	28	7.3	11.8	0.05	46.31	0.11	–	–
22.08.	72-18		74.3	79.8	22	8.2	5.9	0.05	43.25	0.33	–	–
22.08.	72-19		74.4	81.9	44	7.4	14.5	0.01	42.42	0.12	–	–

22.08.	72-20		74.8	83.3	49	7.7	13.0	0.07	47.48	0.14	–	–
22.08.	72-21		75.2	84.7	49	6.7	21.7	0.02	34.35	0.11	–	–
22.08.	72-22		75.7	86.1	50	7.3	16.2	0.01	38.34	0.21	–	–
07.09.	5943_2		73.9	73.0	31	3.9	23.0	0.19	24.42	0.16	0.74	0.90
22.08.	72-23	III	76.1	87.6	50	4.1	27.8	0.06	18.00	0.06	–	–
23.08.	72-25		76.6	92.0	42	4.3	27.6	0.13	7.44	0.03	–	–
23.08.	72-26		76.9	94.2	59	5.4	26.9	0.05	14.98	0.12	–	–
23.08.	72-27		77.2	96.4	87	4.8	25.3	0.08	7.39	0.60	–	–
23.08.	72-29		77.8	100.7	135	1.9	25.8	0.05	7.69	0.03	–	–
24.08.	5944	IV	78.0	105.3	215	1.1	29.5	0.10	2.63	0.09	0.71	0.80
24.08.	5945		77.6	115.6	182	2.5	27.4	0.13	3.75	0.06	0.62	0.68
25.08.	5946		77.2	114.7	65	4.1	29.3	0.12	2.97	0.21	0.17	0.38
26.08.	5947		76.8	125.8	73	4.8	30.8	0.13	2.68	0.12	0.00	0.12
26.08.	5948		77.0	125.8	100	3.4	31.4	0.16	2.87	0.09	0.16	0.26
26.08.	5949		77.1	125.8	552	3.0	31.2	0.16	2.97	0.10	0.24	0.33
27.08.	5950		77.2	125.8	1068	3.6	31.8	0.17	2.87	0.12	0.19	0.30
28.08.	5952		77.1	125.9	804	3.6	31.6	0.24	2.72	0.02	0.91	0.93
28.08.	5954		77.4	125.8	1545	3.6	31.8	0.18	2.58	0.09	0.17	0.27
29.08.	5956		78.1	125.8	2387	2.7	31.7	0.15	1.95	0.03	0.32	0.35
29.08.	5958		78.9	125.8	2923	1.2	32.3	0.16	0.83	0.07	0.32	0.40
31.08.	5946_2		77.2	114.7	65	3.4	29.2	0.14	2.92	0.21	0.12	0.33

31.08.	5945_2		77.6	115.6	185	2.6	27.0	0.16	5.11	0.09	0.61	0.70
31.08.	5960		77.8	115.8	357	2.8	28.2	0.31	2.53	0.18	0.17	0.35
31.08.	5961		78.0	116.1	766	2.7	29.0	0.14	1.90	0.15	0.67	0.82
01.09.	5962		78.1	116.3	1108	2.5	29.4	0.22	0.83	0.09	0.30	0.39
01.09.	5963		78.2	116.7	1498	2.0	30.5	0.20	1.22	0.18	0.04	0.21
02.09.	5964		78.8	117.6	2459	1.3	31.1	0.22	0.88	0.06	0.12	0.18
02.09.	5965		78.4	117.1	1991	2.0	30.0	0.17	1.36	0.09	1.07	1.16
03.09.	5966		78.4	114.5	715	1.0	31.5	0.11	0.78	0.05	0.61	0.66
03.09.	5967		78.3	114.0	429	1.2	31.2	0.09	0.97	0.06	0.61	0.67
03.09.	5968		78.1	112.6	350	1.6	30.8	0.12	1.56	0.08	0.12	0.20
03.09.	5969		77.8	110.2	277	1.6	30.2	0.18	2.53	0.10	1.48	1.58
04.09.	5970		77.9	107.8	240	1.0	31.2	0.21	2.43	0.22	0.58	0.80
04.09.	5944_2		78.0	105.4	208	0.9	30.8	0.14	1.41	0.11	0.41	0.52
08.09.	5976	V	76.4	71.4	170	0.1	33.2	0.18	1.26	0.91	0.38	1.29
09.09.	5977		75.6	63.7	92	-0.4	33.1	0.34	3.02	4.20	0.09	4.29
11.09.	5988		75.4	64.3	311	2.0	32.6	0.18	0.92	0.80	0.14	0.94

Table S2. Spearman`s rank correlation matrix between the abiotic variables. *R* – coefficient of correlation; *p* value – statistical significance of *R*; *N* – the number of data. *T* – surface water temperature; *S* – surface salinity; PO_4, $Si(OH)_4$ and DIN – surface concentrations of phosphates, dissolved silicon and dissolved inorganic nitrogen, respectively. The asterisks indicate significant correlations ($p < 0.05$)

Parameter	Statistics	*T*	*S*	PO_4	$Si(OH)_4$	DIN
T	*R*	1.00				
	p	0.0004				
	N	52				
S	*R*	–0.71*	1.00			
	p	0.0004	0.0004			
	N	52	52			
PO_4	*R*	–0.32*	0.44*	1.00		
	p	0.022	0.001	0.0004		
	N	52	52	52		
$Si(OH)_4$	*R*	0.43*	–0.64*	–0.46*	1.00	
	p	0.002	0.0004	0.001	0.0004	
	N	52	52	52	52	
DIN	*R*	–0.44*	0.05	0.30	0.20	1.00
	p	0.011	0.794	0.092	0.278	0.0004
	N	32	32	32	32	32

Table S3. Surface carbon biomass of picoeucaryotes (B_{euk}) and cyanobacteria (B_{cyan}) in the Kara and Laptev seas and the contribution of cyanobacteria to the picophytoplankton biomass. Dashes mean no data

Region	Sampling point	B_{euk} (mgC m^{-3})	B_{cyan} (mgC m^{-3})	Contribution of cyanobacteria (%)
Kara Sea	72-07	2.61	0.09	3.5
	72-08	0.69	0.09	12.1
	72-09	1.03	0.13	10.9
	72-10	1.40	0.16	10.1
	5942	1.85	0.04	2.2
	72-11	0.97	0.09	8.9
	72-12	2.33	0	0
	72-14	2.60	0.05	1.8
	72-15	10.27	0	0
	5943	1.27	0	0
	72-16	10.99	0	0
	72-17	20.42	0.04	0.2
	72-18	5.39	0	0
	72-19	5.09	0	0
	72-20	2.64	0	0
	72-21	1.90	0	0
	72-22	1.20	0	0
	72-23	1.47	0	0
	72-25	2.06	0	0
	72-26	–	–	–
	72-27	2.06	0	0
	72-29	7.47	0	0
	5943_2	2.65	0.09	3.4
	5976	2.76	0	0
	5977	2.23	0	0
	5988	5.03	0	0
	5942_2	2.98	0.04	1.3
Laptev Sea	5944	12.80	0	0
	5945	10.38	0	0
	5946	9.67	0	0
	5947	2.09	0	0
	5948	4.71	0	0
	5949	3.46	0	0
	5950	5.72	0	0
	5952	–	–	–
	5954	3.58	0	0
	5956	4.18	0	0
	5958	8.63	0	0

	5946_2	9.26	0	0
	5945_2	10.52	0	0
	5960	7.88	0	0
	5961	3.86	0	0
	5962	3.61	0	0
	5963	2.33	0	0
	5964	5.84	0	0
	5965	9.57	0	0
	5966	11.65	0	0
	5967	5.82	0	0
	5968	1.81	0	0
	5969	6.71	0	0
	5970	11.73	0	0
	5944_2	5.21	0	0

Table S4. Surface carbon biomass (B), chlorophyll *a* concentration (Chl *a*) and primary production (PP) of micro- (>20 µm), nano- (3–20 µm) and picophytoplankton (<3 µm) in the Kara Sea. Σ B, Σ Chl *a* and Σ PP – the sum of B, Chl *a* and PP of all phytoplankton size groups. The dashes mean no data. The asterisks indicate the stations where filtration of picophytoplankton to determine Chl *a* concentration was carried out according to Belevich et al. 2019b

Sampling points	B (mgC m^{-3})				Chl *a* (mg m^{-3})				PP (mgC m^{-3} d^{-1})			
	> 20 µm	3–20 µm	< 3 µm	Σ B	> 20 µm	3–20 µm	< 3 µm	Σ Chl *a*	> 20 µm	3–20 µm	< 3 µm	Σ PP
72-07	8.5	2.58	2.71	13.79	–	–	0.09*	0.12	–	–	–	–
72-08	5.55	3.89	0.78	10.22	–	–	0.08*	0.15	–	–	–	–
72-09	6.74	6.45	1.15	14.34	0.03	0.06	0.13	0.22	0.56	1.39	3.57	5.52
72-10	1.36	1.72	1.56	4.64	–	–	0.08*	0.12	–	–	–	–
5942	0.09	0.83	1.89	2.81	0.01	0.02	0.05	0.08	0.08	0.57	3.94	4.59
72-11	1.35	0.59	1.06	3.00	–	–	0.04*	0.06	–	–	–	–
72-12	6.29	1.63	2.33	10.25	–	–	0.06*	0.11	–	–	–	–
72-14	51.72	14.89	2.65	69.26	–	–	0.34*	1.34	–	–	–	–
72-15	342.3	35.45	10.27	388.02	–	–	0.76*	4.37	–	–	–	–
5943	20.74	6.05	1.27	28.06	0.29	0.46	0.23	0.98	8.81	12.77	19.99	41.57
72-16	52.03	53.86	10.99	116.88	–	–	0.51*	1.58	–	–	–	–
72-17	9.02	9.95	20.46	39.43	–	–	0.63*	1.21	–	–	–	–
72-18	13.87	29.58	5.39	48.84	–	–	0.50*	1.30	–	–	–	–
72-19	3.34	1.33	5.09	9.76	0.22	0.42	0.48	1.12	4.40	8.30	22.13	34.83
72-20	20.19	11.39	2.64	34.22	–	–	0.36*	1.08	–	–	–	–
72-21	22.4	13.3	1.90	37.60	–	–	0.18*	0.50	–	–	–	–
72-22	13.34	9.2	1.20	23.74	–	–	0.29*	0.67	–	–	–	–
72-23	21.88	0.78	1.47	24.13	0.10	0.06	0.11	0.27	5.07	0.91	1.62	7.60
72-25	4.85	2.26	2.06	9.17	–	–	0.09*	0.28	–	–	–	–
72-26	–	–	–	–	0.07	0.07	0.15	0.29	3.00	1.26	2.49	6.75
72-27	34.5	2.36	2.06	38.92	–	–	0.12*	0.34	–	–	–	–
72-29	0.88	8.94	7.47	17.29	–	–	0.30*	0.59	–	–	–	–
5943_2	52.07	32.51	2.65	87.23	1.48	0.52	0.82	2.82	49.25	6.96	7.59	63.80
5976	2.23	2.1	2.76	7.09	0.09	0.20	0.13	0.42	0.72	2.15	2.73	5.60
5977	0.27	0.4	2.23	2.90	0.01	0.09	0.03	0.13	0.22	1.25	0.13	1.60
5988	1.06	15.41	5.03	21.50	0.03	0.54	0.45	1.02	0.99	5.47	12.25	18.71
5942_2	0.88	1.43	3.02	5.33	0.02	0.03	0.12	0.17	0.04	0.11	2.46	2.61

Table S5. Surface carbon biomass (B), chlorophyll *a* concentration (Chl *a*) and primary production (PP) of micro- (>20 µm), nano- (3–20 µm) and picophytoplankton (<3 µm) in the Laptev Sea. Σ B, Σ Chl *a* and Σ PP – the sum of B, Chl *a* and PP of all phytoplankton size groups. The dashes mean no data

Sampling points	B (mgC m^{-3})				Chl *a* (mg m^{-3})				PP (mgC m^{-3} d^{-1})			
	> 20 µm	3–20 µm	< 3 µm	Σ B	> 20 µm	3–20 µm	< 3 µm	Σ Chl *a*	> 20 µm	3–20 µm	< 3 µm	Σ PP
5944	2.09	4.39	12.80	19.28	0.02	0.22	0.34	0.58	0.26	5.05	7.07	12.37
5945	2.05	4.82	10.38	17.25	0.03	0.15	0.11	0.29	0.96	2.73	4.40	8.08
5946	0.43	3.13	9.67	13.23	0.01	0.05	0.09	0.15	0.12	0.85	2.67	3.65
5947	4.16	1.38	2.09	7.63	0.06	0.05	0.08	0.19	2.22	0.55	3.53	6.30
5948	5.70	3.10	4.71	13.51	0.03	0.09	0.16	0.28	–	–	–	5.32
5949	0.50	1.80	3.46	5.76	0.02	0.07	0.17	0.26	0.14	2.15	4.39	6.68
5950	0.43	1.54	5.72	7.69	0.02	0.10	0.08	0.20	0.40	1.64	3.87	5.91
5952	1.45	1.33	–	–	0.01	0.06	0.08	0.15	0.25	1.21	5.87	7.33
5954	0.57	0.25	3.58	4.40	0.03	0.05	0.12	0.20	0.27	1.35	1.32	2.94
5956	0.05	0.64	4.18	4.87	0.01	0.10	0.20	0.31	0.10	1.03	1.80	2.94
5958	0.04	1.49	8.63	10.16	0.01	0.07	0.10	0.18	0.08	1.93	4.42	6.43
5946_2	2.17	0.59	9.26	12.02	0.02	0.08	0.19	0.29	1.17	2.65	7.09	10.91
5945_2	1.09	2.85	10.52	14.46	0.02	0.18	0.23	0.43	–	–	–	10.09
5960	5.7	4.16	7.88	17.74	0.05	0.14	0.23	0.42	1.95	3.02	5.74	10.71
5961	6.31	3.93	3.86	14.10	0.05	0.11	0.19	0.35	2.53	2.25	3.78	8.56
5962	6.44	4.21	3.61	14.26	0.04	0.12	0.18	0.34	1.77	3.84	5.64	11.25
5963	0.6	2.55	2.33	5.48	0.03	0.09	0.13	0.25	–	–	–	2.46
5964	0.64	2.16	5.84	8.64	0.02	0.12	0.17	0.31	–	–	–	5.99
5965	0.64	0.13	9.57	10.34	0.05	0.18	0.23	0.46	–	–	–	4.27
5966	0.01	2.14	11.65	13.80	0.01	0.13	0.19	0.33	–	–	–	5.82
5967	0.38	2.66	5.82	8.86	0.01	0.20	0.25	0.46	–	–	–	3.18
5968	0.1	1.08	1.81	2.99	0.03	0.13	0.18	0.34	0.25	0.46	3.63	4.34
5969	2.07	0.41	6.71	9.19	0.03	0.14	0.29	0.46	1.27	5.18	3.18	9.63
5970	9.27	2.69	11.73	23.69	0.04	0.27	0.39	0.70	0.91	3.75	12.11	16.76
5944_2	0.16	1.26	5.21	6.63	0.04	0.26	0.31	0.61	0.10	4.27	8.35	12.72

Table S6. The statistical significance of differences between surface carbon biomass (B), chlorophyll *a* concentration (Chl *a*), primary production (PP), chlorophyll specific carbon fixation rate (P^b), specific growth rate (μ) and carbon to chlorophyll *a* ratio (θ) of micro- (>20 μm), nano- (3–20 μm) and picophytoplankton (<3 μm) in Kara and Laptev seas according to the Mann-Whitney *U*-test. The asterisks indicate the statistical significance ($p < 0.05$)

Variables		Kara Sea	Laptev Sea
		Mann-Whitney value	Mann-Whitney value
PP_{micro}	PP_{pico}	42	7*
PP_{micro}	PP_{nano}	49	49*
PP_{nano}	PP_{pico}	38	59*
P^b_{micro}	P^b_{pico}	57	133.5
P^b_{micro}	P^b_{nano}	39	155
P^b_{nano}	P^b_{pico}	39	96*
Chl_{micro}	Chl_{pico}	80*	0*
Chl_{micro}	Chl_{nano}	146	6*
Chl_{nano}	Chl_{pico}	53*	175*
B_{micro}	B_{pico}	218*	100.5*
B_{micro}	B_{nano}	294	239.5
B_{nano}	B_{pico}	266	86*
θ_{micro}	θ_{pico}	211	251
θ_{micro}	θ_{nano}	31	173.5*
θ_{nano}	θ_{pico}	156	161*
μ_{micro}	μ_{pico}	15*	119
μ_{micro}	μ_{nano}	38	77.5*
μ_{nano}	μ_{pico}	34	114

Table S7. Surface chlorophyll specific carbon fixation rate (P^b), specific growth rate (μ) and carbon to chlorophyll *a* ratio (θ) of micro- (>20 μm), nano- (3–20 μm) and picophytoplankton (<3 μm) in the Kara Sea. P^b_{tot}, μ_{tot} and θ_{tot} – P^b, μ and θ of all phytoplankton community. The dashes mean no data

Sampling points	P^b (mg C(mg chl a)$^{-1}$ h^{-1})				μ (d^{-1})				θ (g : g)			
	> 20 μm	3–20 μm	< 3 μm	P^b_{tot}	> 20 μm	3–20 μm	< 3 μm	μ_{tot}	> 20 μm	3–20 μm	< 3 μm	θ_{tot}
72-07	–	–	–	–	–	–	–	–	–	–	30	110
72-08	–	–	–	–	–	–	–	–	–	–	10	67
72-09	0.99	1.29	1.60	1.42	0.08	0.20	1.41	0.33	209	105	9	65
72-10	–	–	–	–	–	–	–	–	–	–	20	39
5942	0.83	1.55	3.96	3.14	0.66	0.52	1.13	0.97	16	41	35	35
72-11	–	–	–	–	–	–	–	–	–	–	29	53
72-12	–	–	–	–	–	–	–	–	–	–	41	97
72-14	–	–	–	–	–	–	–	–	–	–	8	52
72-15	–	–	–	–	–	–	–	–	–	–	14	89
5943	1.65	1.50	4.64	2.29	0.35	1.13	2.82	0.91	72	13	5	28
72-16	–	–	–	–	–	–	–	–	–	–	21	74
72-17	–	–	–	–	–	–	–	–	–	–	32	33
72-18	–	–	–	–	–	–	–	–	–	–	11	38
72-19	1.06	1.07	2.50	1.68	0.84	1.98	1.68	1.52	15	3	11	9
72-20	–	–	–	–	–	–	–	–	–	–	7	32
72-21	–	–	–	–	–	–	–	–	–	–	11	75
72-22	–	–	–	–	–	–	–	–	–	–	4	36
72-23	2.67	0.78	0.77	1.47	0.21	0.78	0.74	0.27	224	13	14	91
72-25	–	–	–	–	–	–	–	–	–	–	22	33
72-26	2.27	0.94	0.81	1.18	–	–	–	–	–	–	–	–
72-27	–	–	–	–	–	–	–	–	–	–	17	114
72-29	–	–	–	–	–	–	–	–	–	–	25	29
5943_2	2.27	0.91	0.63	1.54	0.67	0.19	1.35	0.55	35	63	3	31
5976	0.50	0.69	1.38	0.86	0.28	0.71	0.69	0.58	24	10	21	17
5977	1.24	0.91	0.28	0.80	0.59	1.42	0.06	0.44	23	4	73	21
5988	2.20	0.72	1.92	1.30	0.66	0.30	1.23	0.63	33	29	11	21
5942_2	0.17	0.25	1.45	1.10	0.04	0.08	0.60	0.40	54	43	24	31

Table S8. Surface chlorophyll specific carbon fixation rate (P^b), specific growth rate (μ) and carbon to chlorophyll *a* ratio (θ) of micro- (>20 μm), nano- (3–20 μm) and picophytoplankton (<3 μm) in the Laptev Sea. P^b_{tot}, μ_{tot} and θ_{tot} – P^b, μ and θ of all phytoplankton community. The dashes mean no data

Sampling points	P^b (mg C(mg chl a)$^{-1}$ h^{-1})				μ (d^{-1})				θ (g : g)			
	> 20 μm	3–20 μm	< 3 μm	P^b_{tot}	> 20 μm	3–20 μm	< 3 μm	μ_{tot}	> 20 μm	3–20 μm	< 3 μm	θ_{tot}
5944	0.79	1.06	0.96	1.00	0.12	0.77	0.44	0.50	137	20	37	33
5945	1.87	0.91	2.05	1.43	0.38	0.45	0.35	0.38	81	33	98	62
5946	0.92	0.91	1.51	1.28	0.25	0.24	0.24	0.24	62	65	106	90
5947	1.97	0.57	2.49	1.79	0.43	0.33	0.99	0.60	69	27	27	41
5948	–	–	–	1.00	–	–	–	0.33	204	33	30	48
5949	0.48	1.68	1.39	1.41	0.25	0.79	0.82	0.77	33	27	21	23
5950	1.18	0.86	2.40	1.54	0.66	0.73	0.52	0.57	25	16	70	39
5952	0.90	1.05	3.81	2.47	0.16	0.65			99	22	–	
5954	0.50	1.40	0.62	0.81	0.39	1.86	0.31	0.51	20	5	31	22
5956	0.68	0.55	0.46	0.49	1.12	0.96	0.36	0.47	6	7	21	16
5958	0.82	1.35	2.31	1.87	1.13	0.83	0.41	0.49	7	20	86	56
5946_2	3.98	1.90	2.09	2.15	0.43	1.70	0.57	0.65	129	7	48	41
5945_2	–	–	–	1.29	–	–	–	0.53	48	15	45	33
5960	2.11	1.23	1.41	1.44	0.29	0.55	0.55	0.47	110	30	35	42
5961	3.02	1.19	1.13	1.41	0.34	0.45	0.68	0.47	135	37	21	42
5962	2.33	1.78	1.79	1.85	0.24	0.65	0.94	0.58	150	34	20	41
5963	–	–	–	0.55	–	–	–	0.37	21	29	17	22
5964	–	–	–	1.10	–	–	–	0.53	28	18	35	28
5965	–	–	–	0.54	–	–	–	0.35	14	1	41	23
5966	–	–	–	1.01	–	–	–	0.35	1	16	60	41
5967	–	–	–	0.40	–	–	–	0.31	43	13	23	19
5968	0.57	0.21	1.21	0.78	1.27	0.35	1.10	0.90	4	9	10	9
5969	2.56	2.18	0.66	1.25	0.48	2.61	0.39	0.72	70	3	23	20
5970	1.21	0.82	1.86	1.42	0.09	0.87	0.71	0.53	207	10	30	33
5944_2	0.16	0.99	0.96	1.25	0.49	1.48	0.96	1.07	4	5	17	11

Table S9. The Spearman`s rank correlation matrix between contribution (%) of surface carbon biomass (B), chlorophyll *a* concentration (Chl *a*), primary production (PP) to the total values, chlorophyll specific carbon fixation rate (P^b), specific growth rate (μ), carbon to chlorophyll *a* ratio (θ) of microphytoplankton (>20 μm) and abiotic factors. *R* –coefficient of correlation; *p* value – statistical significance of *R*; *N* – the number of data. *T* – surface water temperature; *S* – surface salinity; PO_4, $Si(OH)_4$ and DIN – surface concentrations of phosphates, dissolved silicon and dissolved inorganic nitrogen, respectively. The asterisks indicate significant correlations ($p < 0.05$)

Parameter	Statistics	*T*	*S*	PO_4	$Si(OH)_4$	DIN
% PP_{micro}	*R*	0.40*	–0.49*	0.10	0.58*	0.22
	p	0.022	0.004	0.576	0.000	0.260
	N	32	32	32	32	28
P^b_{micro}	*R*	0.35*	–0.49*	0.12	0.45*	0.28
	p	0.048	0.005	0.526	0.010	0.151
	N	32	32	32	32	28
% Chl_{micro}	*R*	0.54*	–0.39*	0.07	0.33*	–0.07
	p	0.001	0.019	0.668	0.046	0.692
	N	36	36	36	36	32
% B_{micro}	*R*	0.63*	–0.53*	0.04	0.33*	0.15
	p	0.000	0.000	0.794	0.017	0.414
	N	51	51	51	51	32
θ_{micro}	*R*	0.29	–0.38*	0.14	0.26	0.15
	p	0.093	0.025	0.426	0.136	0.414
	N	35	35	35	35	32
μ_{micro}	*R*	0.14	0.02	–0.03	0.24	–0.08
	p	0.467	0.924	0.890	0.202	0.700
	N	31	31	31	31	28

Table S10. The Spearman`s rank correlation matrix between contribution (%) of surface carbon biomass (B), chlorophyll *a* concentration (Chl *a*), primary production (PP) to the total values, chlorophyll specific carbon fixation rate (P^b), specific growth rate (μ), carbon to chlorophyll *a* ratio (θ) of nanophytoplankton (>3–20 μm) and abiotic factors. *R* –coefficient of correlation; *p* value – statistical significance of *R*; *N* – the number of data. *T* – surface water temperature; *S* – surface salinity; PO_4, $Si(OH)_4$ and DIN – surface concentrations of phosphates, dissolved silicon and dissolved nitrogen, respectively. The asterisks indicate significant correlations ($p < 0.05$)

Parameter	Statistics	*T*	*S*	PO_4	$Si(OH)_4$	DIN
% PP_{nano}	*R*	–0.53*	0.34	0.24	–0.06	0.48*
	p	0.002	0.058	0.184	0.745	0.009
	N	32	32	32	32	28
P^b_{nano}	*R*	0.22	–0.31	0.16	0.10	0.10
	p	0.221	0.086	0.381	0.575	0.598
	N	32	32	32	32	28
% Chl_{nano}	*R*	–0.57*	0.33*	0.20	–0.06	0.46*
	p	0.000	0.047	0.238	0.730	0.008
	N	36	36	36	36	32
% B_{nano}	*R*	0.17	–0.19	–0.04	0.01	–0.08
	p	0.223	0.180	0.758	0.925	0.670
	N	51	51	51	51	32
θ_{nano}	*R*	0.37*	–0.22	0.05	–0.20	–0.29
	p	0.030	0.199	0.797	0.244	0.112
	N	35	35	35	35	32
μ_{nano}	*R*	–0.17	0.11	0.01	0.33	0.18
	p	0.353	0.544	0.972	0.074	0.352
	N	31	31	31	31	28

Table S11. The Spearman`s rank correlation matrix between contribution (%) of surface carbon biomass (B), chlorophyll *a* concentration (Chl *a*), primary production (PP) to the total values, chlorophyll specific carbon fixation rate (P^b), specific growth rate (μ), carbon to chlorophyll *a* ratio (θ) of picophytoplankton (>3 μm) and abiotic factors. *R* –coefficient of correlation; *p* value – statistical significance of *R*; *N* – the number of data. *T* – surface water temperature; *S* – surface salinity; PO_4, $Si(OH)_4$ and DIN – surface concentrations of phosphates, dissolved silicon and dissolved nitrogen, respectively. The asterisks indicate significant correlations ($p < 0.05$)

Parameter	Statistics	*T*	*S*	PO_4	$Si(OH)_4$	DIN
% PP_{pico}	*R*	0.00	0.25	–0.10	–0.43*	–0.53*
	p	0.994	0.166	0.599	0.014	0.003
	N	32	32	32	31	28
P^b_{pico}	*R*	0.35*	–0.13	–0.05	–0.02	–0.31
	p	0.048	0.469	0.792	0.907	0.114
	N	32	32	32	32	28
% Chl_{pico}	*R*	–0.22	0.42*	0.13	–0.64*	–0.39*
	p	0.115	0.002	0.354	0.000	0.025
	N	52	52	52	52	32
% B_{pico}	*R*	–0.63*	0.63*	0.09	–0.34*	–0.01
	p	0.000	0.000	0.533	0.015	0.938
	N	50	50	50	50	31
θ_{pico}	*R*	–0.44*	0.45*	0.16	–0.29*	0.00
	p	0.002	0.001	0.282	0.044	0.990
	N	50	50	50	50	31
μ_{pico}	*R*	0.45*	–0.43*	–0.07	0.03	–0.16
	p	0.013	0.018	0.705	0.893	0.433
	N	30	30	30	30	27