

# Supplementary Materials for

## Phytoplankton of the High-Latitude Arctic: Intensive Growth Large Diatoms *Porosira glacialis* in the Nansen Basin

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Figure S1

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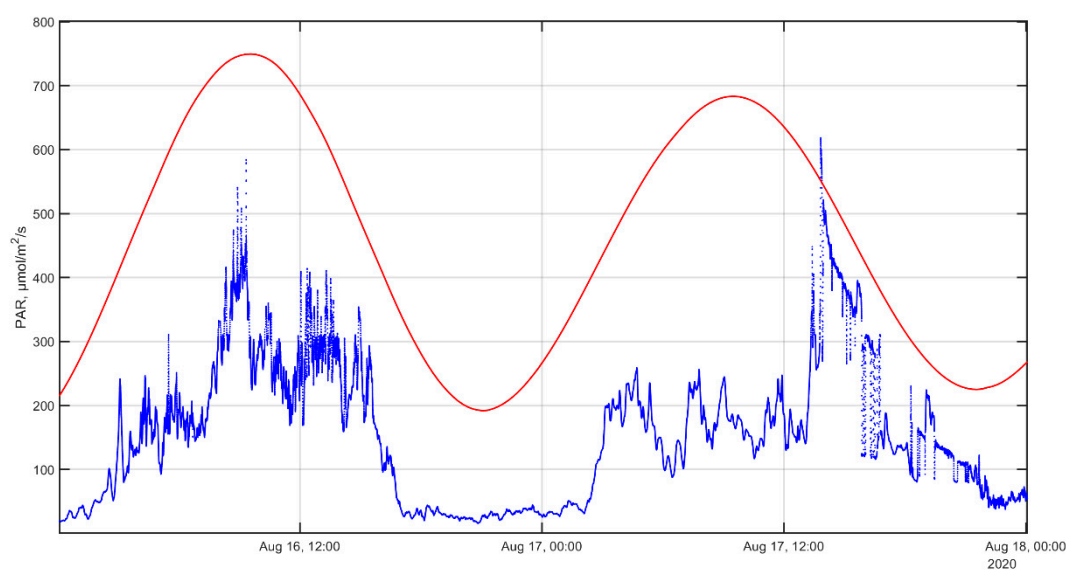


Figure S1. PAR values along the R/V track. The red line shows the estimated values for the case of a cloudless sky. August 16–17, 2020

Table S1. The location of stations, time of sampling, depth of the thermocline, the halocline and the pycnocline.

Station	Latitude	Longitude	Day	Month	Year	Time	Depth of		
							Thermo cline	Halo cline	Pycno cline
A-1	83.26784	38.24809	17	Aug	2020	7:28:44	8.80	8.80	8.80
A-2	83.28076	38.18286	17	Aug	2020	13:23:28	8.00	8.00	8.00
B-1	83.07206	34.76428	18	Aug	2020	3:05:04	13.00	8.40	8.40
B-2	83.06986	34.57684	18	Aug	2020	7:05:57	3.40	3.20	3.20
C	82.26038	36.54452	18	Aug	2020	15:02:59	10.2	10.2	10.2
D	81.55444	37.86584	16	Aug	2020	10:01:24	14.20	15.40	15.40
E	81.69192	40.87944	16	Aug	2020	15:11:53	15.60	17.80	16.80
F	80.98374	40.76701	19	Aug	2020	8:54:27	22.80	21.40	21.40
G	80.26804	42.97324	19	Aug	2020	17:21:48	30.80	27.80	27.80

Table S2. Temperature, salinity and density at mPSW, at the score of PSW and AW and the depth where temperature equal 0 and 1 °C at all sampling station.

Depth	Temperature	Salinity	Density
<b>A-1</b>			
3.6	-1.49	30.91	24.85
40.4	-1.77	34.15	27.49
89	0.00	34.49	27.70
102.4	1.02	34.65	27.77
213	2.55	34.92	27.86
<b>A-2</b>			
2.4	-1.43	30.72	24.69
55.8	-1.77	34.19	27.52
88.4	0.00	34.49	27.70
102	1.00	34.63	27.75
165.6	2.53	34.89	27.84
184	2.56	34.91	27.85
<b>B-1</b>			
2.6	-1.42	31.17	25.06
3.8	-1.44	31.09	25.00
62.6	-1.77	34.20	27.53
92.8	0.02	34.52	27.72
101.4	1.03	34.67	27.77
174.8	2.66	34.90	27.83
<b>B-2</b>			
0.6	-1.44	31.28	25.15
58.2	-1.79	34.17	27.51
94.2	-0.01	34.51	27.71
110.8	0.98	34.63	27.75
173.2	2.51	34.89	27.84
186.6	2.54	34.90	27.85

209.4	2.54	34.92	27.86
<b>C</b>			
0.6	2.70	32.98	26.30
7.8	2.73	32.99	26.30
41.6	-1.42	34.20	27.52
68	-0.02	34.60	27.78
84.8	1.04	34.72	27.82
123.8	2.00	34.83	27.84
138.2	2.22	34.87	27.85
<b>D</b>			
1.2	2.99	32.82	26.14
2.4	3.00	32.91	26.21
40	-1.31	34.22	27.53
61.8	0.01	34.58	27.77
78.2	1.01	34.70	27.80
133.2	2.01	34.87	27.86
<b>E</b>			
1.6	1.8684	32.0951	25.6543
6.2	1.8736	32.0923	25.6515
10.2	1.1831	32.4042	25.9472
10.8	0.837	32.5204	26.0613
13.6	-0.0413	32.7441	26.2871
19.6	-1.0001	33.5059	26.9424
43.2	-1.7309	34.0791	27.4304
76.4	-1.0021	34.3567	27.6321
86	-0.0166	34.5144	27.7151
96.2	1.0029	34.6465	27.7611
248.8	2.4324	34.9231	27.8743
<b>F</b>			
1	3.31	33.01	26.27
24	-0.05	33.55	26.94
40.6	-1.43	34.17	27.49
66.6	0.00	34.62	27.80
80.4	0.99	34.76	27.85
115.2	1.77	34.84	27.86
<b>G</b>			
2.2	3.72	33.69	26.77
2.4	3.72	33.69	26.77
13.6	3.72	33.69	26.77
26	1.05	33.90	27.15
27.4	0.01	33.80	27.13
74.8	-1.10	34.56	27.80

Table S3. The concentration of silicates, phosphates and nitrates at various depths at all the stations studied.

Date	Time	Station	Depth on station m	Depth m	Temp ° C	Sal psu	Si μM	PO <sub>4</sub> <sup>3-</sup> μM	NO <sub>3</sub> <sup>-</sup> μM
08.17	9:10	A	3703	5	-1.39	31.85	0.00	0.09	0.00
				11	-1.35	33.32	0.16	0.39	0.18
				22	-1.58	34.04	1.56	0.32	3.82
				75	-1.15	34.33	2.92	0.60	7.25
				100	1.22	34.64	3.97	0.63	10.01
08.18	8:05	B	3670	9	-1.41	32.48	1.19	0.20	1.51
				35	-1.74	34.12	2.24	0.40	5.01
				73	-1.70	34.23	2.29	0.42	5.79
				100	0.28	34.52	3.44	0.58	9.01
08.18	16:30	C	2162	13	-0.17	32.90	0.21	0.03	0.00
				31	-1.64	34.06	0.42	0.29	1.05
				46	-1.69	34.12	1.88	0.59	8.29
				100	1.27	34.68	4.18	0.72	9.54
08.16	14:32	D	426	2	2.89	32.95	0.57	0.06	0.00
				8	2.78	32.97	1.14	0.06	0.00
				13	2.32	32.90	0.88	0.07	0.00
				21	-1.08	33.79	0.68	0.10	0.05
				28	-1.29	34.02	1.30	0.24	0.05
				37	-1.37	34.23	1.15	0.49	3.83
				100	1.63	34.77	5.07	0.73	10.87
08.16	16:59	E	409	5	2.97	32.92	0.16	0.00	0.00
				16	-0.32	33.78	0.36	0.21	0.00
				41	-1.27	34.24	0.94	0.42	5.14
				87	1.64	34.77	4.60	0.61	10.59
				141	1.92	34.86	4.70	0.70	11.67
08.19	10:21	F	593	5	3.30	33.00	0.36	0.07	0.00
				21	1.58	33.36	0.47	0.11	0.00
				47	-1.37	34.31	2.71	0.63	7.36
				112	1.77	34.84	4.65	0.73	9.86
08.21	19:01	G	403	21	3.67	33.69	0.47	0.13	0.00
				114	-0.02	34.72	3.39	0.66	8.13

Table S4. Total biomass of the phytoplankton, temperature and salinity at sampling stations in the Nansen Basin and the Barents Sea in August 2020

Stations	Depth	Total biomass		Temp	Salinity
		wet weight, mg/m <sup>3</sup>	mg C/m <sup>3</sup>	°C	psu
A	0 m	141.3	8.03		
	5 m	296.83	8.46	-1.4805	30.9972
	10 m	29876.19	799.07	-1.3295	33.2066

	15 m	25.1	0.89	-1.4308	33.7272
	20 m	20.46	0.95	-1.5568	34.0193
	25 m	25.47	0.75	-1.6499	34.0808
	30 m	10.84	0.37	-1.7063	34.114
	35 m	8.95	0.26	-1.7516	34.1387
	40 m	2.76	0.13	-1.7699	34.1535
	74 m	0.61	0.02	-1.4459	34.2892
	100 m	1.78	0.12	0.7753	34.5904
	200 m	1.17	0.04	2.4652	34.897
	800 m	2.84	0.12		
	3000 m	0.92	0.04		
B	0 m	8.59	0.26	-1.4386	31.2834
	3 m	30.6	1.00	-1.4242	31.6468
	8 m	21.64	0.64	-1.3419	33.3614
	15 m	7.48	0.21	-1.4798	33.7293
	24 m	1.64	0.09	-1.6183	34.0548
	34 m	2.92	0.13	-1.695	34.1069
	46 m	8.49	0.24	-1.764	34.1449
	72 m	1.83	0.08	-1.7452	34.2303
	91 m	0.72	0.03	-0.3702	34.4591
	100 m	0.39	0.02	0.4794	34.5755
	185 m	0.56	0.02	2.5298	34.9011
C	0 m	10.78	0.96		
	2 m	9.33	0.87	1.8683	32.0958
	6 m	18.1	1.78	1.8736	32.0923
	10 m	13.19	1.28	1.1831	32.4042
	16 m	31.03	2	-0.6714	33.0373
	22 m	67.5	4.32	-1.2469	33.7712
	30 m	166.58	7.05	-1.5493	34.0188
	38 m	556.64	25.74	-1.6836	34.0559
	45 m	109.08	3.42	-1.7291	34.0978
	100 m	48.01	1.44	1.2283	34.6737
	245 m	12.94	0.4	2.4104	34.9171
D	0 m	64.3	4.28	2.6994	32.9765
	2.5 m	4.97	0.39	2.6744	32.9942
	7 m	50.52	3.68	2.7315	32.9891
	12 m	28.03	2.1	2.5314	33.0144
	20 m	19.28	1.28	-0.9675	33.6585
	27 m	38.22	2.57	-1.2498	33.9695
	38 m	71.99	3.22	-1.3784	34.1833
	100 m	11.07	0.34	1.5718	34.7719
	200 m	10.53	0.36	2.0405	34.8907
	403 m	5.88	0.23	-0.519	34.7846
E	0 m	7.17	0.54		

	3.5 m	7.09	0.63	2.9939	32.9095
	10 m	2.88	0.21	2.9455	32.9214
	16 m	41.33	3.29	1.4203	33.1612
	26 m	18.76	1.16	-1.0479	33.896
	40 m	51.5	2.47	-1.3128	34.2206
	50 m	109.73	3.19	-0.8716	34.4029
	86 m	12.26	0.54	1.5698	34.7757
	100 m	21.64	0.81	1.6276	34.7893
	140 m	2.68	0.1	1.9933	34.8707
F	0 m	37.39	3.29	3.307	33.0067
	4 m	9.26	0.84	3.3052	33.0067
	12 m	12.62	0.94	3.303	33.0087
	20 m	34.23	1.76	2.9701	33.0789
	31 m	21.24	1.02	-1.1057	33.9841
	46 m	3.96	0.17	-1.381	34.2842
	60 m	7.04	0.34	-0.5104	34.5445
	100 m	1.87	0.08	1.4213	34.7897
	111 m	1.32	0.07	1.7229	34.8308
G	0 m	3.37	0.21		
	4 m	1.65	0.1	3.7179	33.6875
	12 m	2.27	0.14	3.7178	33.6886
	20 m	4.63	0.32	3.127	33.9058
	33 m	1.38	0.06	-0.1043	34.1763
	49 m	1.62	0.08	-0.8245	34.3731
	64 m	0.88	0.03	-0.9476	34.4859
	80 m	2.56	0.11	-1.0851	34.572
	113 m	1.54	0.07	-0.0071	34.7174
	250 m	2.33	0.13	-1.3975	34.7192
	384 m	1.44	0.08	-1.3401	34.8

Table S5. Maximal phytoplankton biomass, temperature, salinity, nutrients concentrations and dominant species.

Station	Maximal phytoplankton biomass,		Depth of B <sub>max</sub>	°C	Salinity	Nutrients			Dominant species, % of total biomass
	mg weight weight·m <sup>-3</sup>	mgC m <sup>-3</sup>	m			Si, μM	PO <sub>4</sub> <sup>3-</sup> , μM	NO <sub>3</sub> <sup>-</sup> , μM	
(A) *	29855	799	10	-1.35	33.18	0.16	0.36	0.18	<i>Porosira glacialis</i> , 99 %
B *	30.60	1.00	3	-1.41	31.30	-	-	-	<i>Porosira glacialis</i> , 93%
C	166.6	7.05	30	-1.64	34.02	0.42	0.29	1.05	<i>Eucampia groenlandica</i> +

	556.6	25.74	38	-1.68	34.05	-	-	-	<i>Thalassiosira</i> spp., 85%  <i>Chrysophyta</i> , 80%
D	71.59	3.22	38	-1.37	34.23	1.15	0.49	3.83	<i>Eucampia</i> <i>groenlandica</i> + <i>Thalassiosira</i> spp., 61%
E	109.73	3.19	50	-1.27	34.24	0.94	0.42	5.14	<i>Porosira glacialis</i> , 99%
F	37.4	3.29	0	3.30	33.00	0.36	0.07	0	<i>Gymnodinium</i> spp.+ <i>Gyrodinium</i> spp., 76%
G	4.63	0.32	20	3.67	33.69	0.47	0.13	0	<i>Gymnodinium</i> spp. + <i>Protoperidinium</i> <i>breve</i> + <i>Prorocentrum</i> <i>minimum</i> , 53%

\* - stations in MIZ, Nansen Basin