



Supplement of

Significant nutrient consumption in the dark subsurface layer during a diatom bloom: a case study on Funka Bay, Hokkaido, Japan

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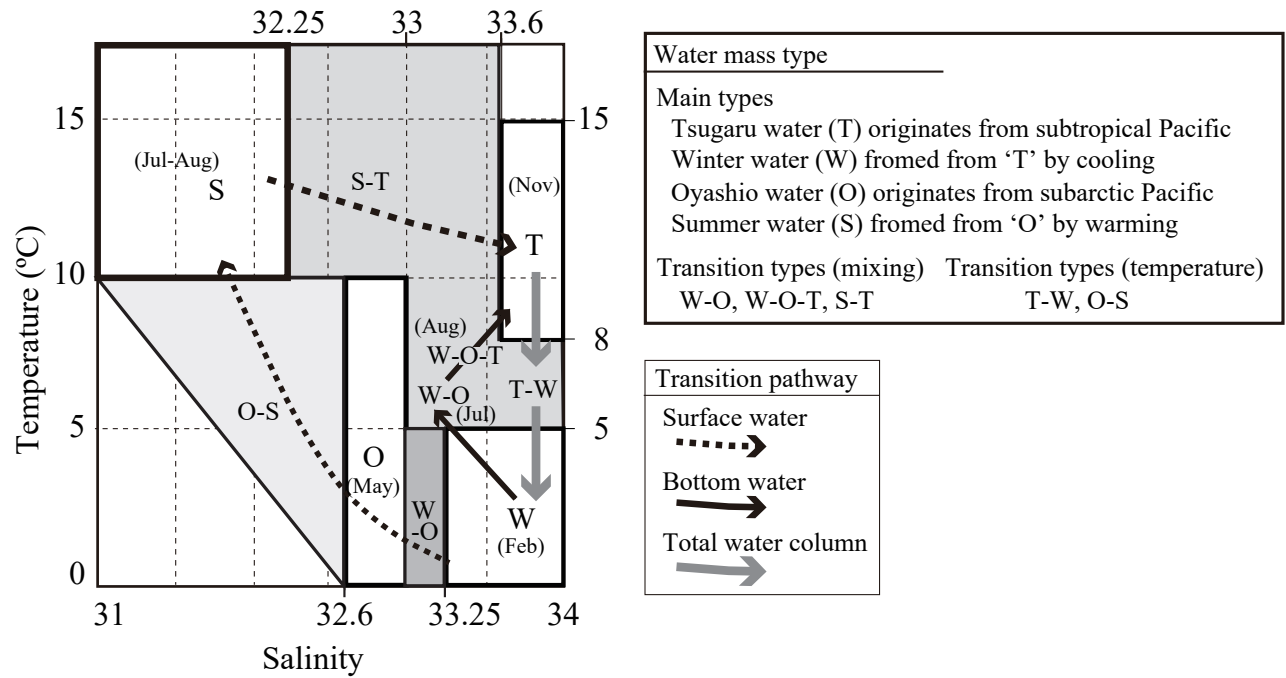


Fig. s1 Temperature–salinity ranges of water masses in Funka Bay, Japan (from Ooki et al. 2019).

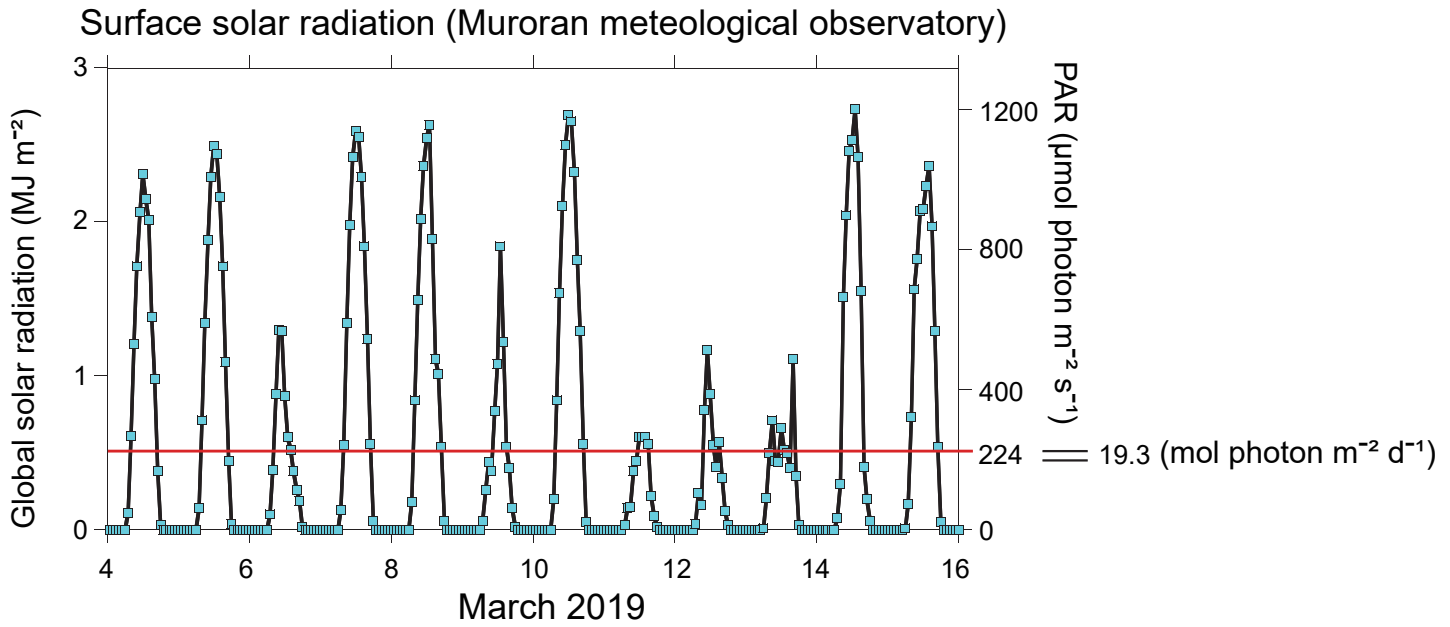


Fig. s2 Hourly global solar radiation observed at the Muroran meteorological observatory from 4 March to 15 March. Photosynthetically active radiation (PAR) was calculated by multiplying the global solar radiation by a coefficient 440 (Ooki et al., 2019). Red solid line indicates the average of radiations during the period of spring bloom. The daily average of PAR was 19.3 (mol photon m⁻² d⁻¹).

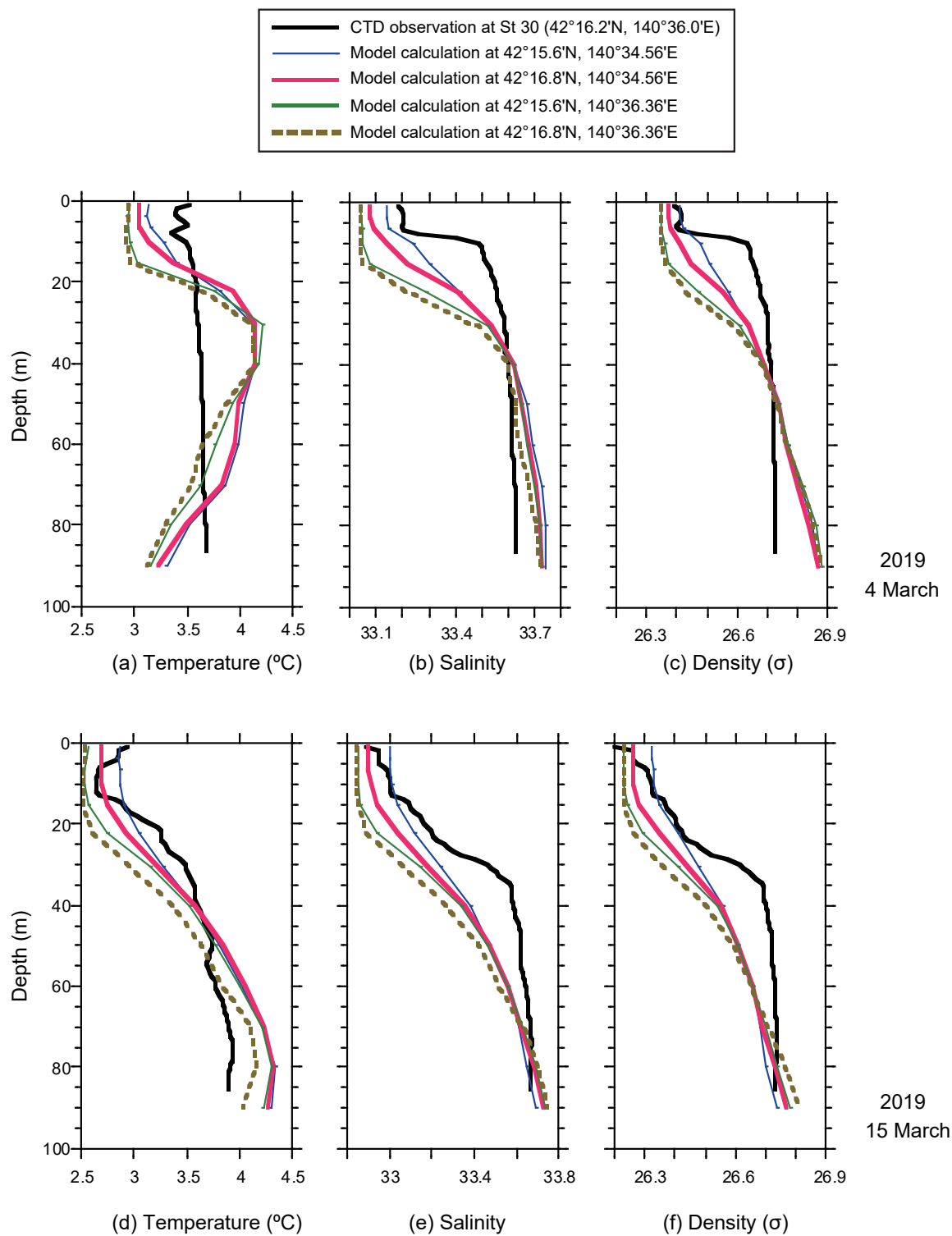


Fig. s3 Profiles of temperature, salinity, and density for CTD observation and model results on 4 March (a–c) and 15 March (d–f) 2019. Model calculations were done for 4 locations around the station 30.

Time	Depth (m)	NO2+NO3 ($\mu\text{mol/L}$)	NO2 ($\mu\text{mol/L}$)	NO3 ($\mu\text{mol/L}$)	PO4 ($\mu\text{mol/L}$)	NH4 ($\mu\text{mol/L}$)	Si(OH)4 ($\mu\text{mol/L}$)	Chl-a ($\mu\text{g/L}$)	AOU ($\mu\text{mol/L}$)
2019/2/15	0.00	9.53	0.32	9.20	0.90	0.31	19.85	0.78	11.05
2019/2/15	5.00	9.43	0.32	9.11	0.79	0.28	19.82	0.69	-1.30
2019/2/15	10.00	9.35	0.32	9.03	0.88	0.29	19.71	0.77	23.75
2019/2/15	20.00	9.24	0.33	8.92	0.85	0.30	19.75	0.80	4.81
2019/2/15	30.00	9.14	0.33	8.81	0.85	0.17	19.54	0.95	10.62
2019/2/15	40.00	9.07	0.33	8.74	0.76	0.28	19.59	0.73	13.55
2019/2/15	50.00	8.97	0.33	8.64	0.91	0.30	19.54	0.69	3.05
2019/2/15	60.00	8.90	0.33	8.57	0.74	0.26	19.55	0.65	4.13
2019/2/15	65.00	8.83	0.33	8.50	0.83	0.22	19.52	0.69	-3.04
2019/2/15	70.00	8.77	0.29	8.48	0.72	0.24	19.75	1.35	4.35
2019/2/15	75.00	8.71	0.29	8.41	0.76	0.23	19.63	0.00	NaN
2019/2/15	80.00	8.75	0.30	8.44	0.82	0.28	19.77	0.00	3.88
2019/2/15	85.00	8.75	0.31	8.44	0.78	0.24	19.77	0.00	4.15
2019/2/15	95.00	9.48	0.34	9.15	0.80	0.11	19.92	0.00	2.07
2019/2/15	96.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2019/3/4	0.00	0.20	0.05	0.15	0.45	0.10	6.43	29.71	-92.73
2019/3/4	5.00	0.65	0.05	0.60	0.45	0.10	7.01	27.23	-74.46
2019/3/4	10.00	0.33	0.05	0.28	0.39	0.10	3.32	21.43	-63.07
2019/3/4	20.00	1.24	0.05	1.19	0.43	0.10	5.64	12.05	-50.15
2019/3/4	30.00	3.54	0.14	3.40	0.58	0.10	9.64	14.06	-31.84
2019/3/4	40.00	5.01	0.20	4.81	0.66	0.12	12.49	12.09	-20.86
2019/3/4	50.00	6.20	0.24	5.96	0.74	0.16	15.02	8.47	-14.19
2019/3/4	60.00	6.06	0.23	5.83	0.74	0.17	15.10	7.98	-12.89
2019/3/4	65.00	4.69	0.18	4.50	0.66	0.29	13.48	10.66	-18.20
2019/3/4	70.00	4.30	0.17	4.13	0.64	0.33	13.15	NaN	-17.28
2019/3/4	75.00	5.31	0.20	5.11	0.74	0.31	14.72	8.92	NaN
2019/3/4	80.00	5.71	0.21	5.50	0.79	0.30	15.50	6.04	-11.29
2019/3/4	85.00	5.70	0.21	5.49	0.81	0.31	15.42	8.84	-6.77
2019/3/4	95.00	5.35	0.20	5.15	0.74	0.33	14.89	11.21	-41.88
2019/3/4	96.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2019/3/15	0.00	0.44	0.05	0.39	0.38	0.10	4.80	14.73	-61.43
2019/3/15	5.00	0.50	0.05	0.46	0.37	0.10	4.26	16.20	-63.87
2019/3/15	10.00	0.82	0.04	0.79	0.36	0.10	4.36	11.01	-50.95
2019/3/15	20.00	2.18	0.06	2.12	0.47	0.31	6.09	7.04	-28.80
2019/3/15	30.00	1.72	0.08	1.64	0.43	0.44	3.82	6.24	-27.74
2019/3/15	40.00	3.01	0.17	2.85	0.53	0.57	9.14	5.91	-17.97
2019/3/15	50.00	3.82	0.22	3.60	0.64	0.60	13.14	6.65	-11.63
2019/3/15	60.00	4.92	0.27	4.65	0.70	0.66	17.25	2.82	1.76
2019/3/15	65.00	5.19	0.29	4.90	0.72	0.76	19.15	2.29	9.25
2019/3/15	70.00	5.45	0.31	5.14	0.85	0.90	21.42	2.29	16.67
2019/3/15	75.00	5.59	0.31	5.28	0.84	0.98	22.01	3.50	17.72
2019/3/15	80.00	5.55	0.31	5.24	0.92	0.95	22.22	4.97	19.32
2019/3/15	85.00	5.62	0.31	5.31	0.88	0.93	22.21	6.49	22.45
2019/3/15	95.00	5.54	0.31	5.23	0.87	0.95	22.41	7.75	20.94
2019/3/15	96.00	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
2019/4/14	0.00	0.05	0.05	0.05	0.33	0.15	0.20	0.04	-41.16
2019/4/14	5.00	0.05	0.15	0.05	0.40	0.10	0.20	0.16	-43.81
2019/4/14	10.00	0.05	0.05	0.05	0.31	0.10	0.20	0.19	-43.15
2019/4/14	20.00	0.05	0.05	0.05	0.32	0.10	0.20	0.14	-42.38
2019/4/14	30.00	0.05	0.05	0.05	0.34	0.10	0.20	0.17	-45.34
2019/4/14	40.00	1.41	0.05	1.36	0.57	0.49	0.20	1.56	-20.07
2019/4/14	50.00	3.00	0.06	2.94	0.78	1.37	0.26	4.60	0.77
2019/4/14	60.00	4.38	0.13	4.25	0.90	1.92	6.00	2.41	16.18
2019/4/14	65.00	5.07	0.16	4.91	0.93	1.71	6.47	1.75	14.39
2019/4/14	70.00	6.06	0.22	5.84	1.02	1.84	12.19	1.43	28.66
2019/4/14	75.00	6.86	0.27	6.59	1.35	2.91	23.52	0.85	NaN
2019/4/14	80.00	6.88	0.27	6.61	1.43	3.08	24.62	0.94	57.43
2019/4/14	85.00	6.88	0.27	6.60	1.44	3.07	24.69	1.13	56.52

