

718 **Supplementary**

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**Table S1a.** Correlation coefficient matrix of PCA in October 2014

		Temperature (T)	Salinity (S)	DIN	DIP	DSi	MLD	Chl a	$\Delta(O_2/Ar)$	NCP
Correlation coefficient	Temperature (T)	1.000	0.190	-0.536	-0.305	0.539	0.267	-0.162	-0.524	-0.757
	Salinity (S)	0.190	1.000	0.098	-0.337	-0.492	0.352	0.145	-0.295	-0.359
	DIN	-0.536	0.098	1.000	0.000	-0.132	0.176	0.125	0.574	0.706
	DIP	-0.305	-0.337	0.000	1.000	-0.264	-0.494	-0.267	-0.075	0.135
	DSi	0.539	-0.492	-0.132	-0.264	1.000	0.098	0.051	-0.024	-0.171
	MLD	0.267	0.352	0.176	-0.494	0.098	1.000	0.068	0.202	-0.037
	Chl a	-0.162	0.145	0.125	-0.267	0.051	0.068	1.000	0.397	0.323
	$\Delta(O_2/Ar)$	-0.524	-0.295	0.574	-0.075	-0.024	0.202	0.397	1.000	0.906
	NCP	-0.757	-0.359	0.706	0.135	-0.171	-0.037	0.323	0.906	1.000
Statistical significance	Temperature (T)		0.288	0.044	0.181	0.043	0.214	0.317	0.049	0.003
	Salinity (S)	0.288		0.388	0.155	0.062	0.144	0.335	0.189	0.139
	DIN	0.044	0.388		0.500	0.350	0.302	0.358	0.032	0.008
	DIP	0.181	0.155	0.500		0.216	0.061	0.214	0.413	0.346
	DSi	0.043	0.062	0.350	0.216		0.387	0.441	0.473	0.307
	MLD	0.214	0.144	0.302	0.061	0.387		0.422	0.275	0.457
	Chl a	0.317	0.335	0.358	0.214	0.441	0.422		0.113	0.167
	$\Delta(O_2/Ar)$	0.049	0.189	0.032	0.413	0.473	0.275	0.113		0.000
	NCP	0.003	0.139	0.008	0.346	0.307	0.457	0.167	0.000	

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**Table S1b.** Component matrix of variables in  
October 2014

	Factor 1	Factor 2
Temperature (T)	-0.847	0.264
Salinity (S)	-0.259	0.521
DIN	0.741	0.259
DIP	0.189	-0.817
DSi	-0.288	0.156
MLD	-0.065	0.793
Chl a	0.343	0.456
$\Delta(O_2/Ar)$	0.858	0.276
NCP	0.979	0.026

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**Table S2a.** Correlation coefficient matrix of PCA in June 2015

	Temperature (T)	Salinity (S)	DIN	DIP	DSi	MLD	Chl a	pCO <sub>2</sub>	DO	Δ(O <sub>2</sub> /Ar)	NCP		
Correlation coefficient	Temperature (T)	1.000	-0.128	0.217	0.150	-0.239	-0.244	-0.156	-0.189	-0.313	0.060	-0.224	
	Salinity (S)	-0.128	1.000	-0.873	0.163	0.301	0.614	-0.921	0.859	-0.831	-0.816	-0.787	
	DIN	0.217	-0.873	1.000	-0.067	-0.260	-0.594	0.754	-0.705	0.736	0.910	0.747	
	DIP	0.150	0.163	-0.067	1.000	-0.222	-0.017	-0.349	0.165	-0.355	-0.172	-0.195	
	DSi	-0.239	0.301	-0.260	-0.222	1.000	0.474	1.000	-0.275	0.443	-0.241	-0.361	-0.276
	MLD	-0.244	0.614	-0.594	-0.017	0.474	1.000	-0.593	0.816	-0.541	-0.507	-0.518	
	Chl a	-0.156	-0.912	0.754	-0.349	-0.275	-0.593	1.000	-0.867	0.948	0.793	0.884	
	pCO <sub>2</sub>	-0.189	0.859	-0.705	0.165	0.443	0.816	-0.867	1.000	-0.762	-0.701	-0.767	
	DO	-0.313	-0.831	0.736	-0.355	-0.241	-0.541	0.948	-0.762	1.000	0.839	0.946	
	Δ(O <sub>2</sub> /Ar)	0.060	-0.816	0.910	-0.172	-0.361	-0.507	0.793	-0.701	0.839	1.000	0.846	
	NCP	-0.224	-0.787	0.747	-0.195	-0.276	-0.518	0.884	-0.767	0.946	0.846	1.000	
Statistical significance	Temperature (T)		0.331	0.228	0.305	0.205	0.200	0.297	0.259	0.138	0.420	0.220	
	Salinity (S)	0.331		0.000	0.288	0.148	0.010	0.000	0.000	0.000	0.000	0.000	
	DIN	0.228	0.000		0.410	0.185	0.013	0.001	0.002	0.001	0.000	0.001	
	DIP	0.305	0.288	0.410		0.223	0.477	0.111	0.286	0.106	0.279	0.252	
	DSi	0.205	0.148	0.185	0.223		0.043	0.170	0.056	0.203	0.102	0.170	
	MLD	0.200	0.010	0.013	0.477	0.043		0.013	0.000	0.023	0.032	0.029	
	Chl a	0.297	0.000	0.001	0.111	0.170	0.013		0.000	0.000	0.000	0.000	
	pCO <sub>2</sub>	0.259	0.000	0.002	0.286	0.056	0.000	0.000		0.001	0.003	0.001	
	DO	0.138	0.000	0.001	0.106	0.203	0.023	0.000	0.001		0.000	0.000	
	Δ(O <sub>2</sub> /Ar)	0.420	0.000	0.000	0.279	0.102	0.032	0.000	0.003	0.000		0.000	
	NCP	0.220	0.000	0.001	0.252	0.170	0.029	0.000	0.001	0.000	0.000		

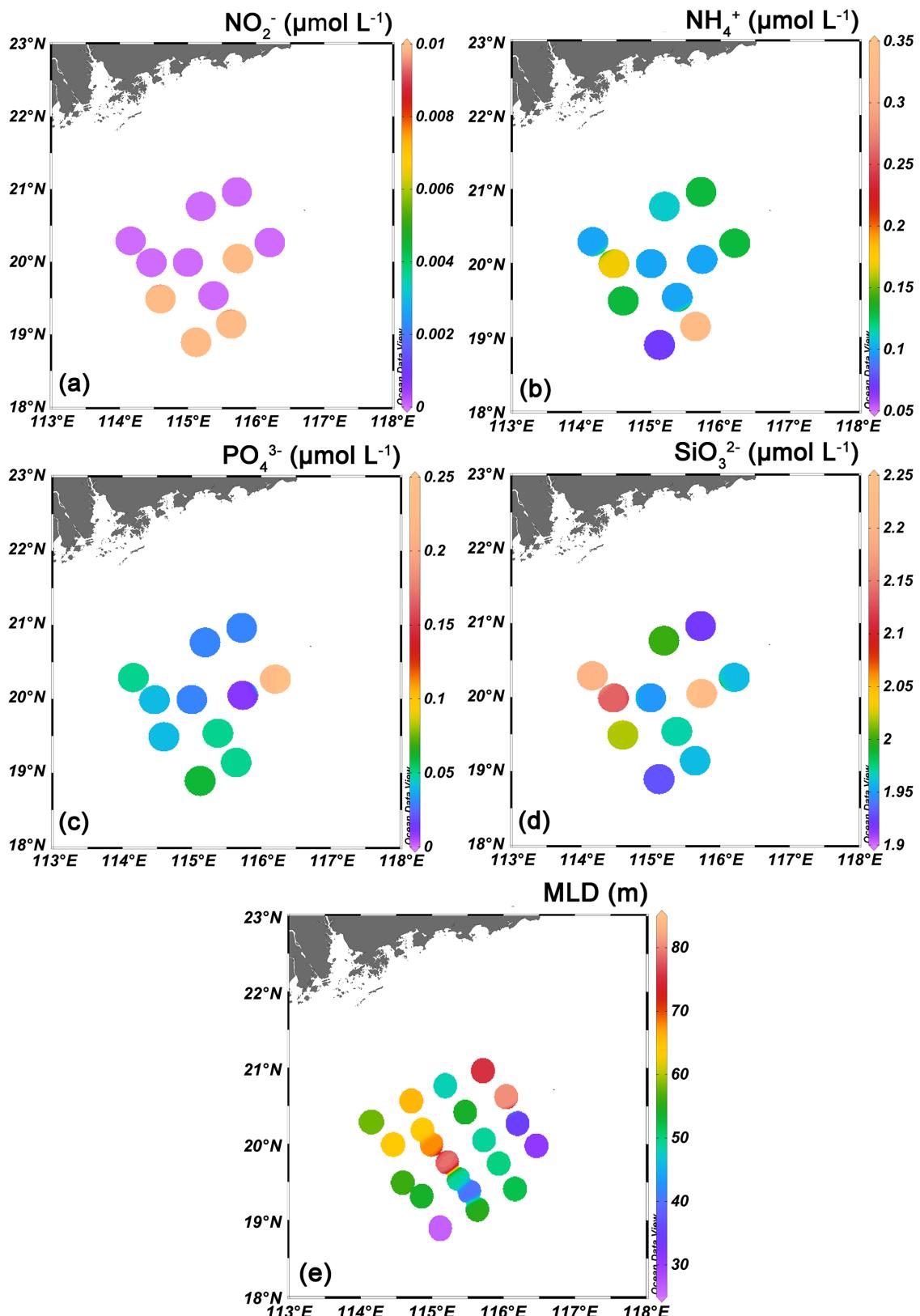
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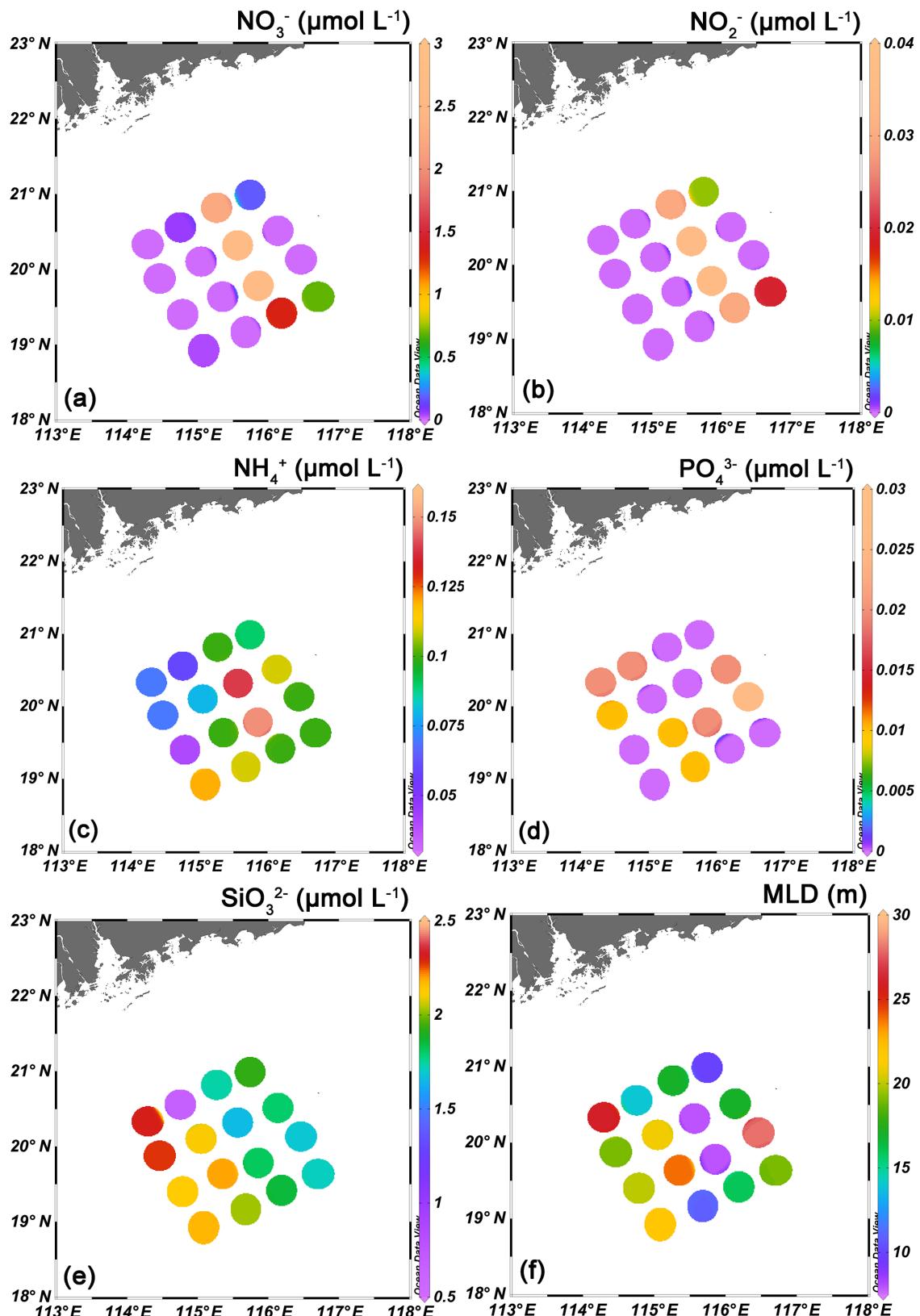
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**Table S2b.** Component matrix of variables  
in June 2015

	Factor 1	Factor 2
Temperature (T)	0.024	-0.786
Salinity (S)	-0.936	0.043
DIN	0.876	-0.132
DIP	-0.223	-0.601
DSi	-0.405	0.582
MLD	-0.718	0.402
Chl a	0.950	0.217
pCO <sub>2</sub>	-0.908	0.186
DO	0.927	0.340
Δ(O <sub>2</sub> /Ar)	0.902	0.008
NCP	0.909	0.227



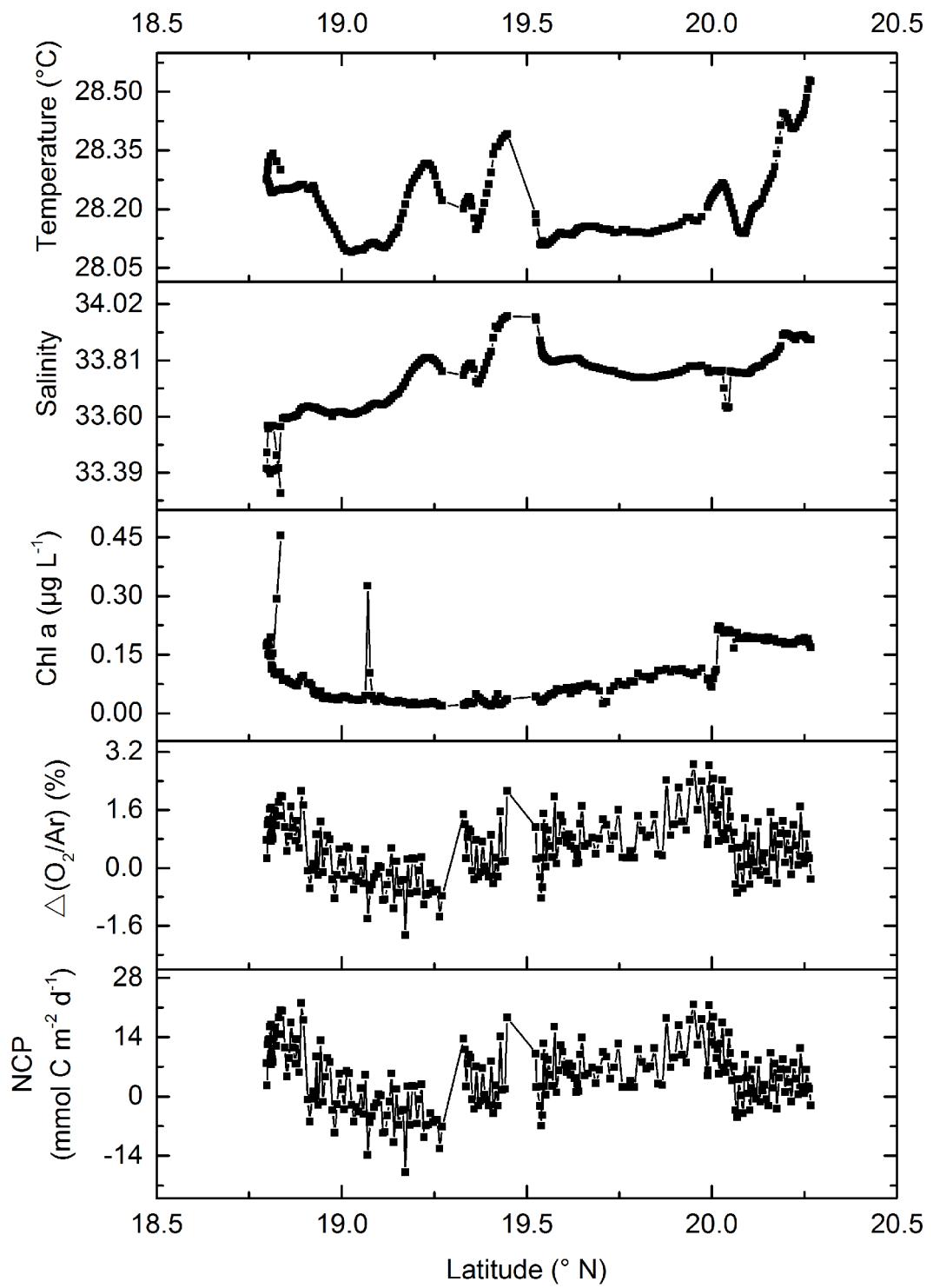
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735 **Figure S1.** Surface distributions of (a) nitrite ( $\text{NO}_2^-$ ), (b) ammonium ( $\text{NH}_4^+$ ), (c) phosphate ( $\text{PO}_4^{3-}$ ), (d) silicate ( $\text{SiO}_3^{2-}$ )  
736 and (e) mixed layer depth (MLD) in October 2014. The surface concentration of nitrate ( $\text{NO}_3^-$ ) at all sampling stations was  
737 below the detection limit during this cruise. We regarded the nutrients data that were below the detection limit as “0” when  
738 make these plots.  
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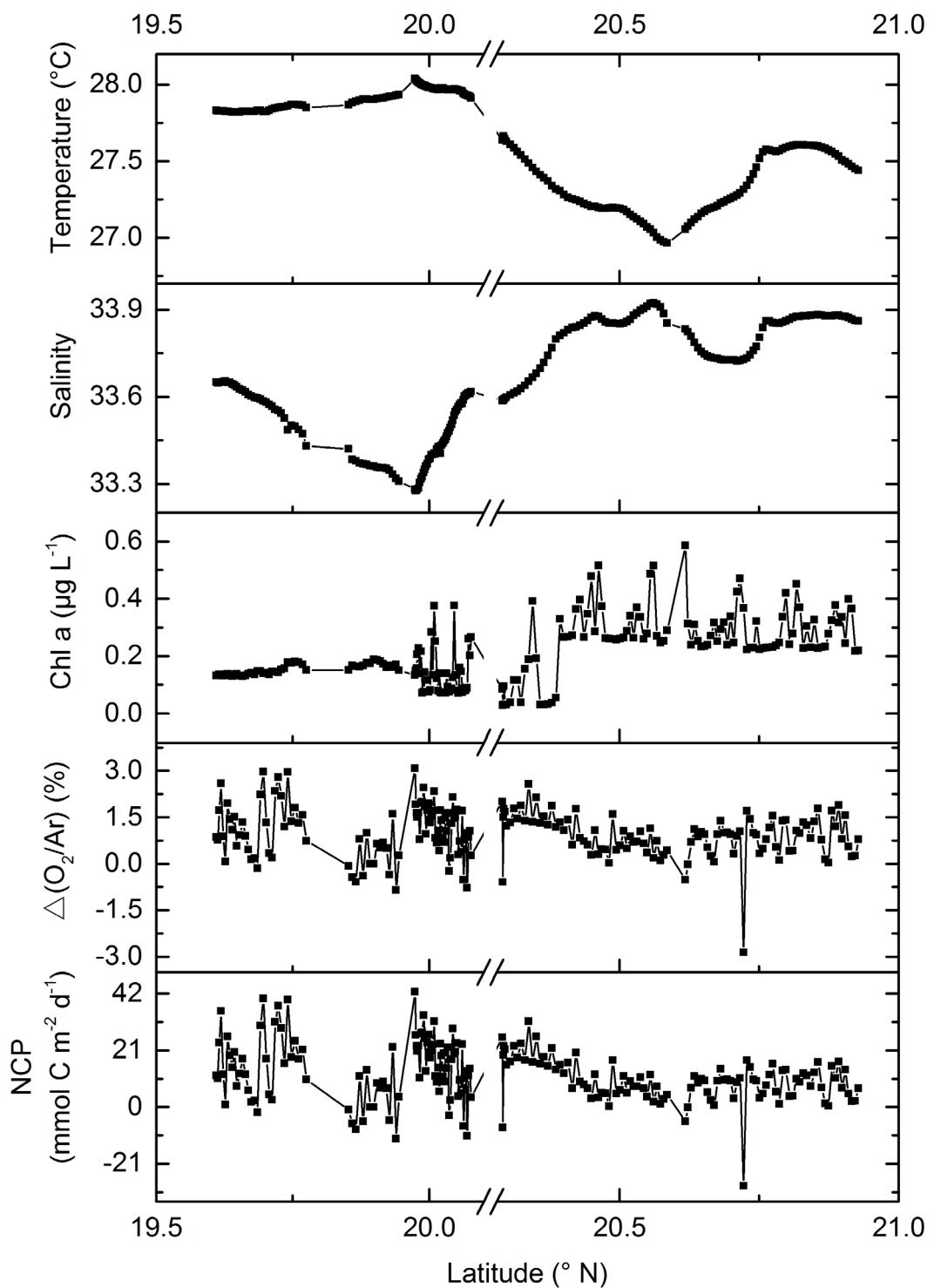
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743 **Figure S2.** Surface distributions of (a) nitrate ( $\text{NO}_3^-$ ), (b) nitrite ( $\text{NO}_2^-$ ), (c) ammonium ( $\text{NH}_4^+$ ), (d) phosphate ( $\text{PO}_4^{3-}$ ), (e)  
744 silicate ( $\text{SiO}_3^{2-}$ ) and (f) mixed layer depth (MLD) in June 2015. We regarded the nutrients data that were below the  
745 detection limit as “0” when make these plots.

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 748 **Figure S3.** Meridional variations in temperature, salinity, Chl a,  $\Delta(\text{O}_2/\text{Ar})$  and NCP along Transect 1 in October 2014.  
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 751 **Figure S4.** Meridional variations in temperature, salinity, Chl a,  $\Delta(\text{O}_2/\text{Ar})$  and NCP along Transect 4 in October 2014.  
 752 Transect 2 and 3 were not complete or continuous, thus we didn't make this figure for them.  
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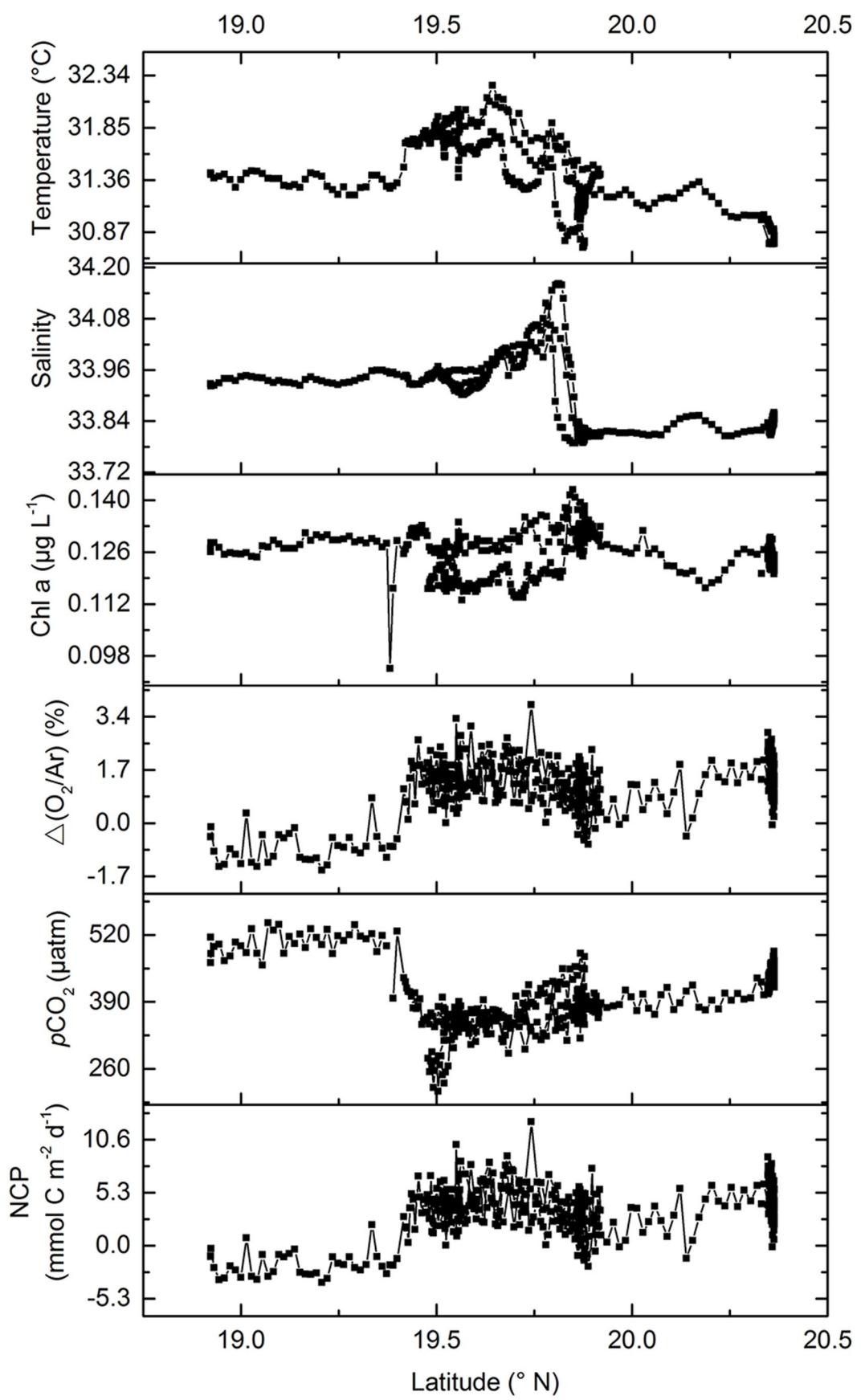
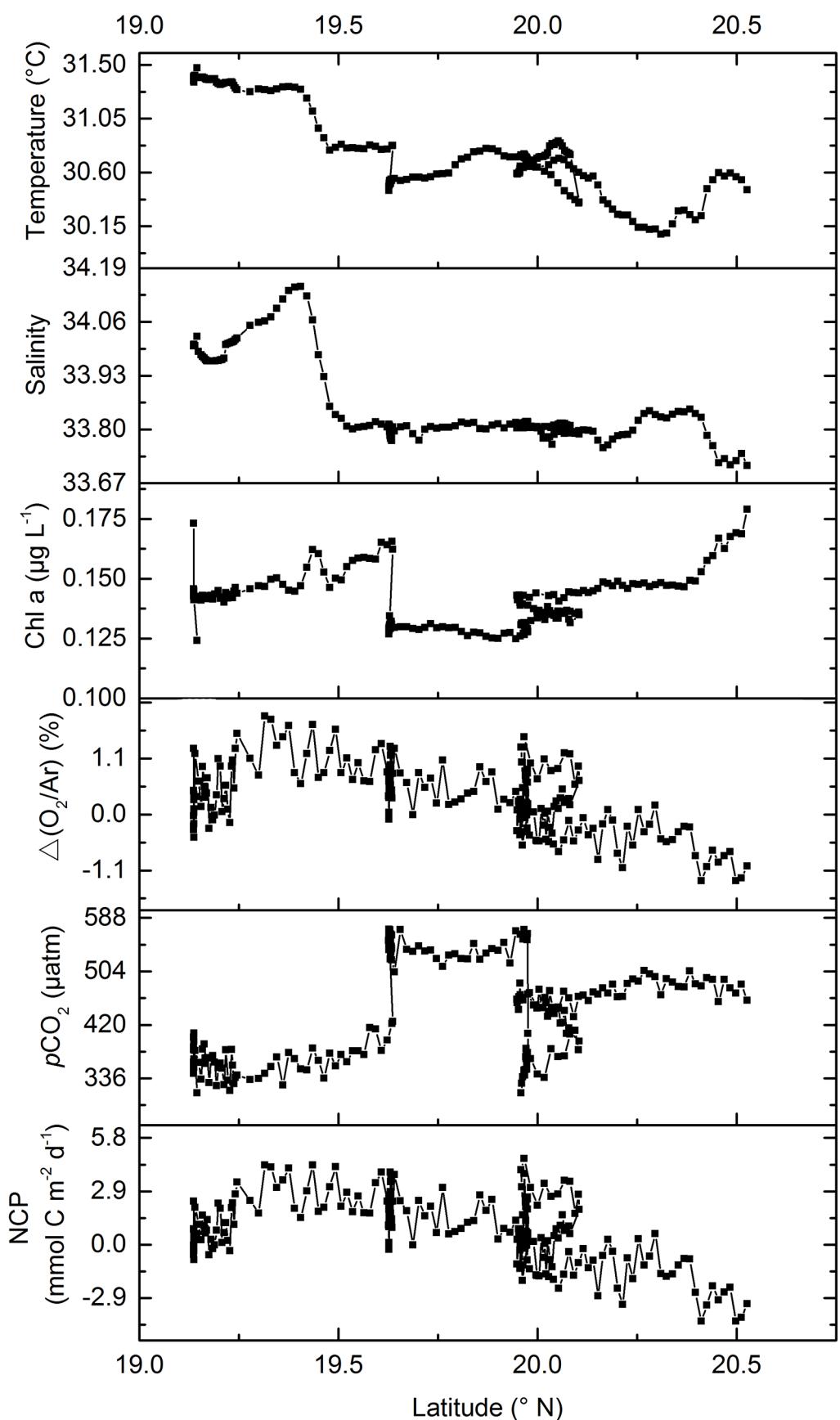


Figure S5. Meridional variations in temperature, salinity, Chl a,  $\Delta(\text{O}_2/\text{Ar})$ ,  $p\text{CO}_2$  and NCP along Transect 1 in June 2015.

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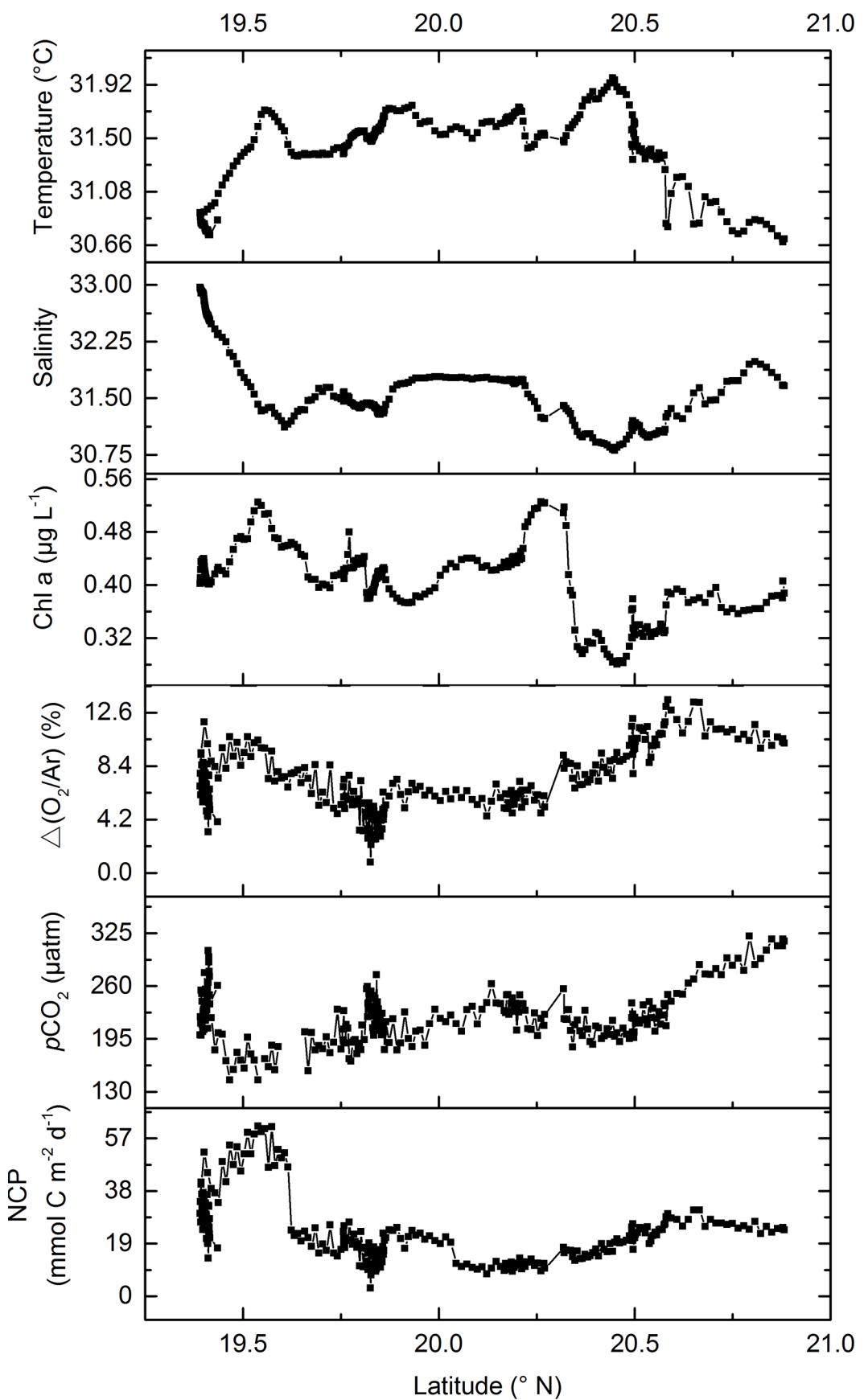


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**Figure S6.** Meridional variations in temperature, salinity, Chl a,  $\Delta(\text{O}_2/\text{Ar})$ ,  $p\text{CO}_2$  and NCP along Transect 2 in June 2015.



**Figure S7.** Meridional variations in temperature, salinity, Chl a,  $\Delta(\text{O}_2/\text{Ar})$ ,  $p\text{CO}_2$  and NCP along Transect 3 in June 2015.

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