

Figure S1

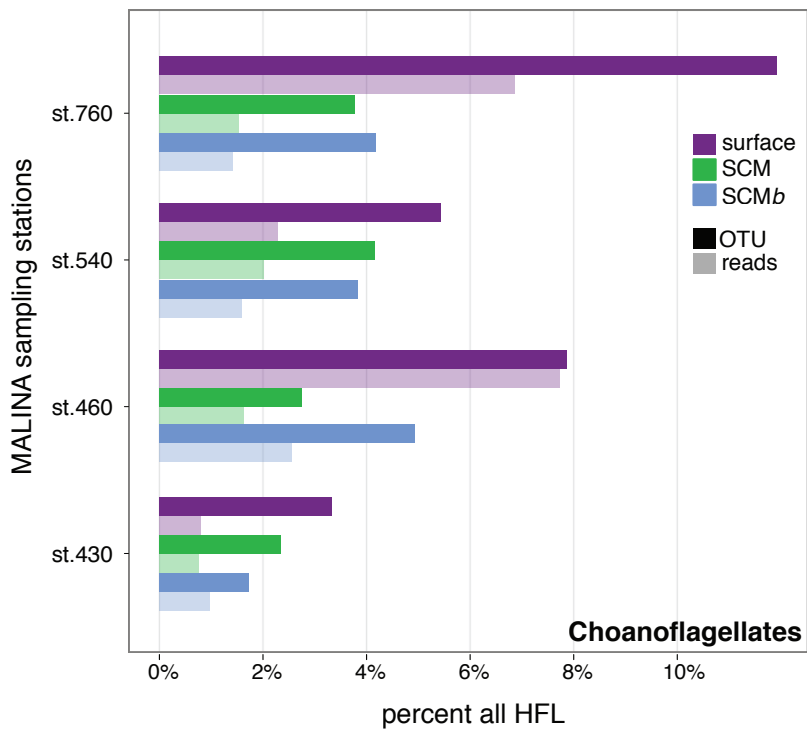


Figure S2

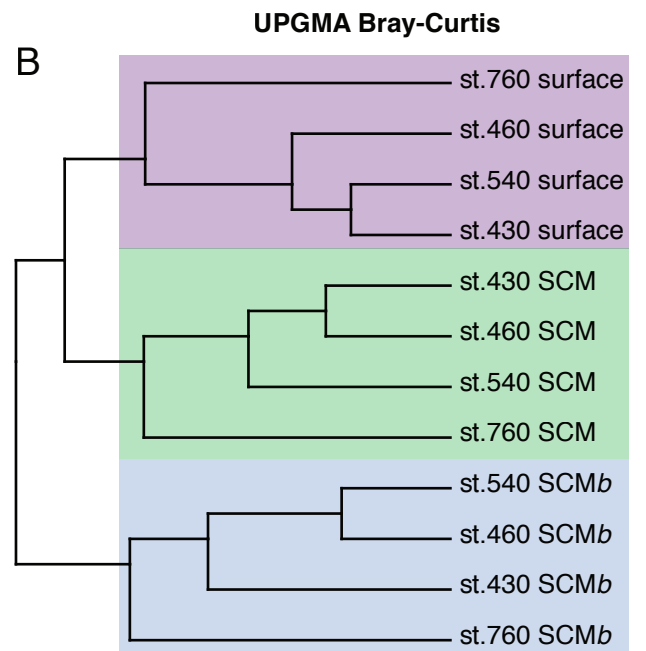
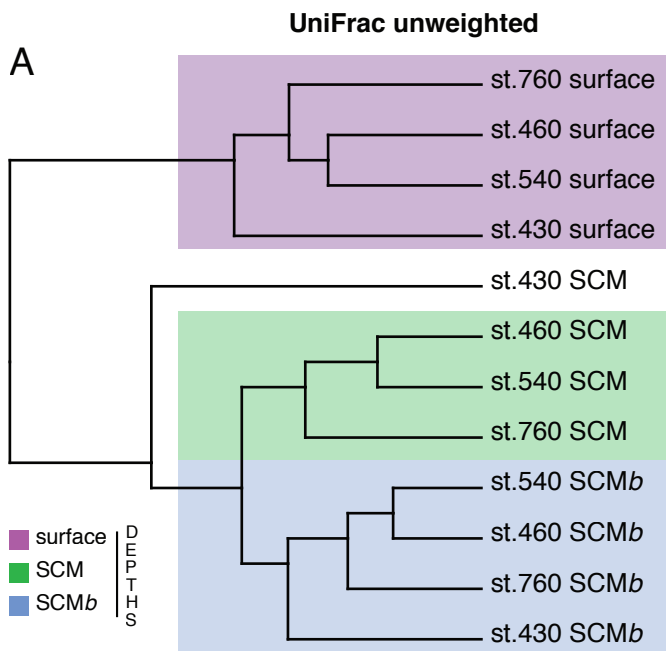
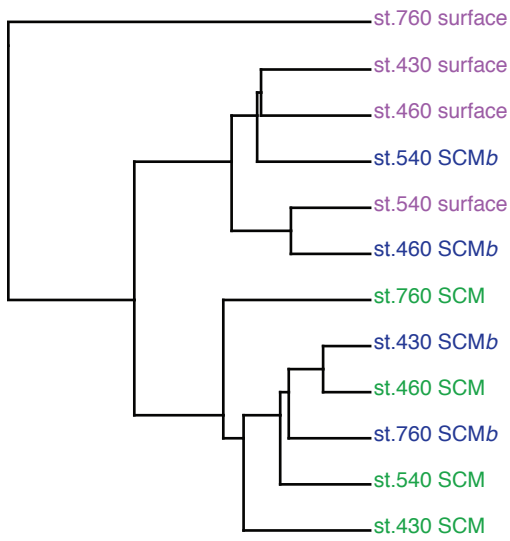
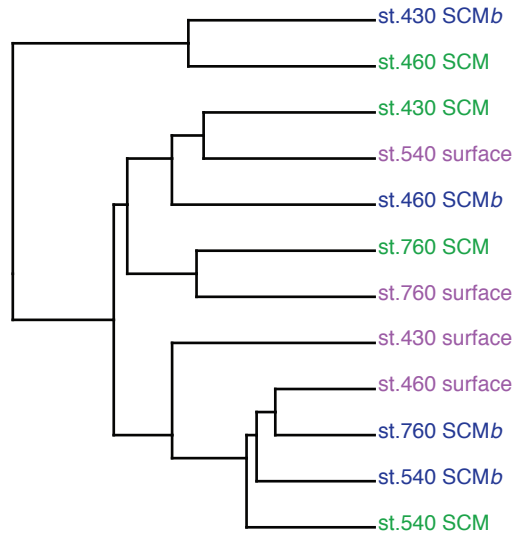


Figure S3

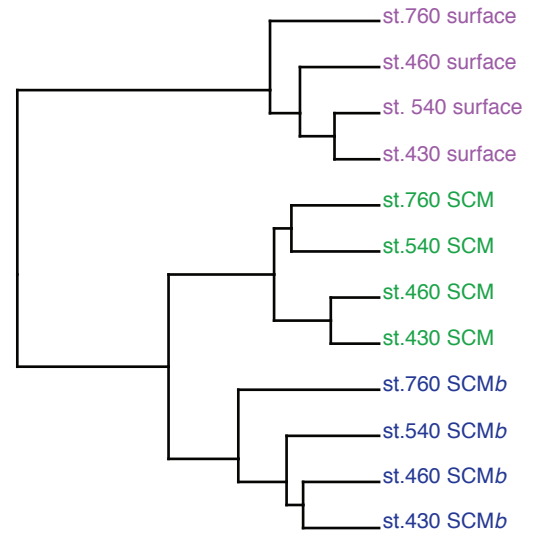
Picozoa



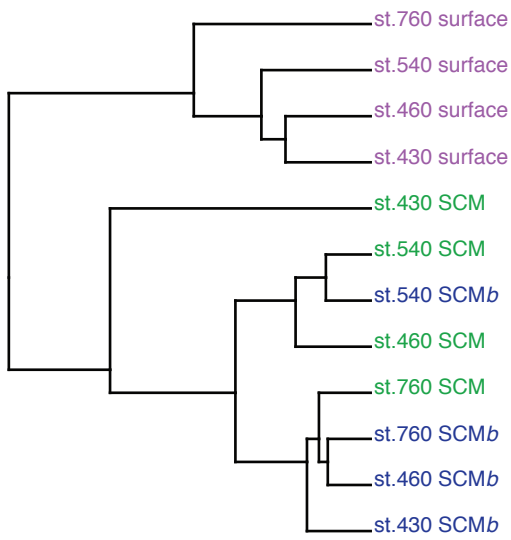
Choanoflagellates



MASTs



Rhizaria



Telonemia

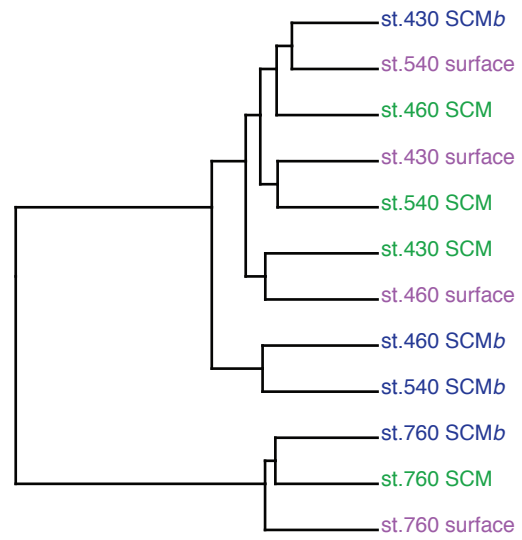


Figure S4

Table S1. Additional metadata for the sampled Beaufort Sea stations and depths.

Station	Depth	Chl <i>a</i> total ($\mu\text{g.l}^{-1}$)	Chl <i>a</i> small ($\mu\text{g.l}^{-1}$)	Bacterial Abundance (cell.ml^{-1})	DOC ($\mu\text{mol.l}^{-1}$)	POC (μM)
430	Surface	0.075	0.069	238,830	68.2	1.762
430	SCMa	0.765	0.647	360,052	n.a.	3.109
430	SCM	0.604	0.552	447,085	68.4	2.384
430	SCMb	0.073	0.059	169,411	n.a.	n.a.
460	Surface	0.071	0.062	n.a.	67.0	2.823
460	SCMa	0.069	0.061	n.a.	n.a.	1.176
460	SCM	0.577	0.505	n.a.	68.8	2.823
460	SCMb	0.161	0.119	n.a.	n.a.	1.882
540	Surface	0.079	0.068	193,087	65.8	1.679
540	SCMa	0.121	0.112	266,374	n.a.	1.399

540	SCM	0.612	0.548	221,987	69.1	1.772
540	SCM ^b	0.216	0.194	137,003	n.a.	0.840
760	Surface	0.107	0.093	395,137	78.3	3.552
760	SCM ^a	0.105	0.092	366,178	n.a.	n.a.
760	SCM	0.396	0.355	306,567	70.4	1.375
760	SCM ^b	0.104	0.088	162,854	n.a.	0.687

Table S2. Overall pyroread and OTU statistics.

Station	Depth	Raw Pyroreads	QC Pyroreads*	Final OTUs	HFL reads (%)	HFL OTUs (%)
430	Surface	5630	4231	843	17.25	21.47
430	SCM	11260	8134	1299	6.33	13.09
430	SCM <i>b</i>	5630	3672	1058	13.81	16.35
460	Surface	5630	3741	897	14.84	18.39
460	SCM	11260	8035	1456	7.55	12.43
460	SCM <i>b</i>	5630	3563	1067	25.26	22.77
540	Surface	5630	4075	890	20.67	17.08
540	SCM	11260	8136	1661	17.34	12.14
540	SCM <i>b</i>	5630	3494	1083	23.18	21.61
760	Surface	5630	3521	822	21.93	21.41
760	SCM	11260	5874	1357	13.21	17.54
760	SCM <i>b</i>	5630	2933	1038	28.74	23.03

*: Quality-controlled pyroreads; removal of chimeras, sequences shorter than 300 nucleotides, metazoan-like sequences and sequences from singleton OTUs.

Table S3. Overall HFL pyroread and OTU statistics.

Station	Depth	HFL		Picoz		Choano		MASTs		Rhizaria		Telo	
		R#	O#	R%	O%	R%	O%	R%	O%	R%	O%	R%	O%
430	Surface	730	181	16.1	19.8	0.8	3.3	35.8	30.3	4.1	7.7	42.7	37.5
430	SCM	515	170	20.1	25.8	0.7	2.3	47.9	28.8	5.2	11.7	25.4	31.1
430	SCM _b	507	173	1.7	3.4	0.9	1.7	21.7	18.7	55.8	53.7	19.7	23.1
460	Surface	555	165	10.6	14.5	7.7	7.8	50	33.9	5.5	10.9	25.9	32.7
460	SCM	607	181	16.8	17.6	1.6	2.7	40.2	29.2	9.3	20.9	31.9	29.2
460	SCM _b	900	243	4.4	6.9	2.5	4.9	9.6	11.9	74.3	62.5	9	13.5
540	Surface	696	184	18.1	23.9	2.2	5.4	35.4	27.7	3.3	8.6	40.8	34.2
540	SCM	988	288	34.2	24.3	2	4.1	26	21.5	15.5	24.6	22.1	25.3
540	SCM _b	810	234	3.9	7.2	1.6	3.8	7.2	10.2	77.1	60.6	9.8	17.5
760	Surface	772	176	5.3	10.8	6.8	11.9	48.7	31.8	0.4	9	34.9	35.8
760	SCM	776	238	25.7	21	1.5	3.7	20.4	15.1	22.2	33.1	29.7	26.4
760	SCM _b	843	239	3.4	7.5	1.4	4.1	7.5	11.3	77.7	61.9	9.7	14.6

R#: pyroread number; O#: OTU number; R%: pyroread percent (out of total HFL pyroreads); O%: OTU percent (out of total HFL OTUs); Picoz: Picozoa; Choano: Choanoflagellates; Telo: Telonemia.