

Fig. S1. Total abundance (ind m⁻²) and relative stage composition of *C. glacialis* and *C. hyperboreus* in 2011 in the Arctic Basin (for station locations, see Figure 1)

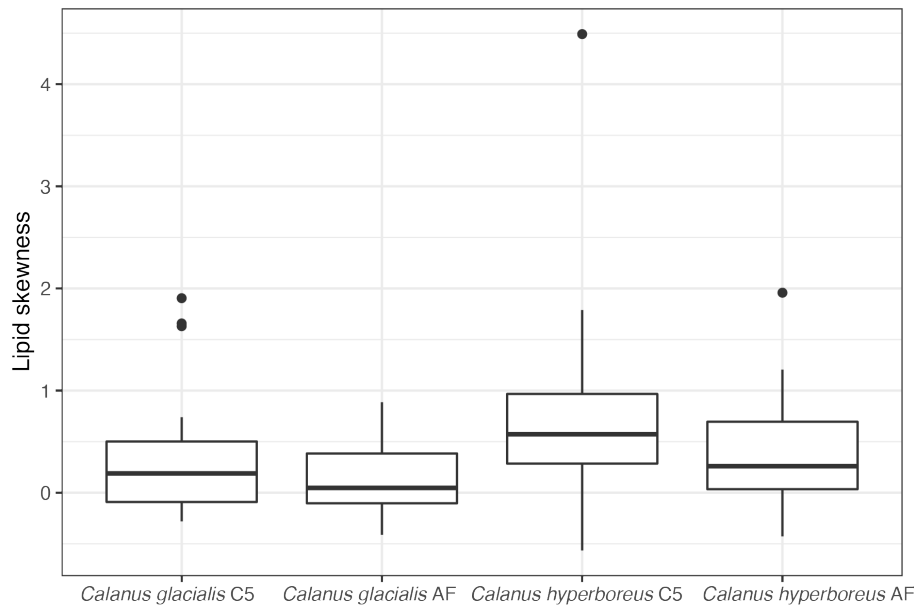


Fig. S2. Skewness of lipid values at all examined stations in C5 copepodites and adult females (AF) of *Calanus glacialis* and *C. hyperboreus*. A skewness value of 0 indicates a normal distribution; values > 0 indicate right-skewed data and < 0 – left-skewed data. Both C5 and AF of *C. hyperboreus* were significantly ($p < 0.05$) higher than 0.

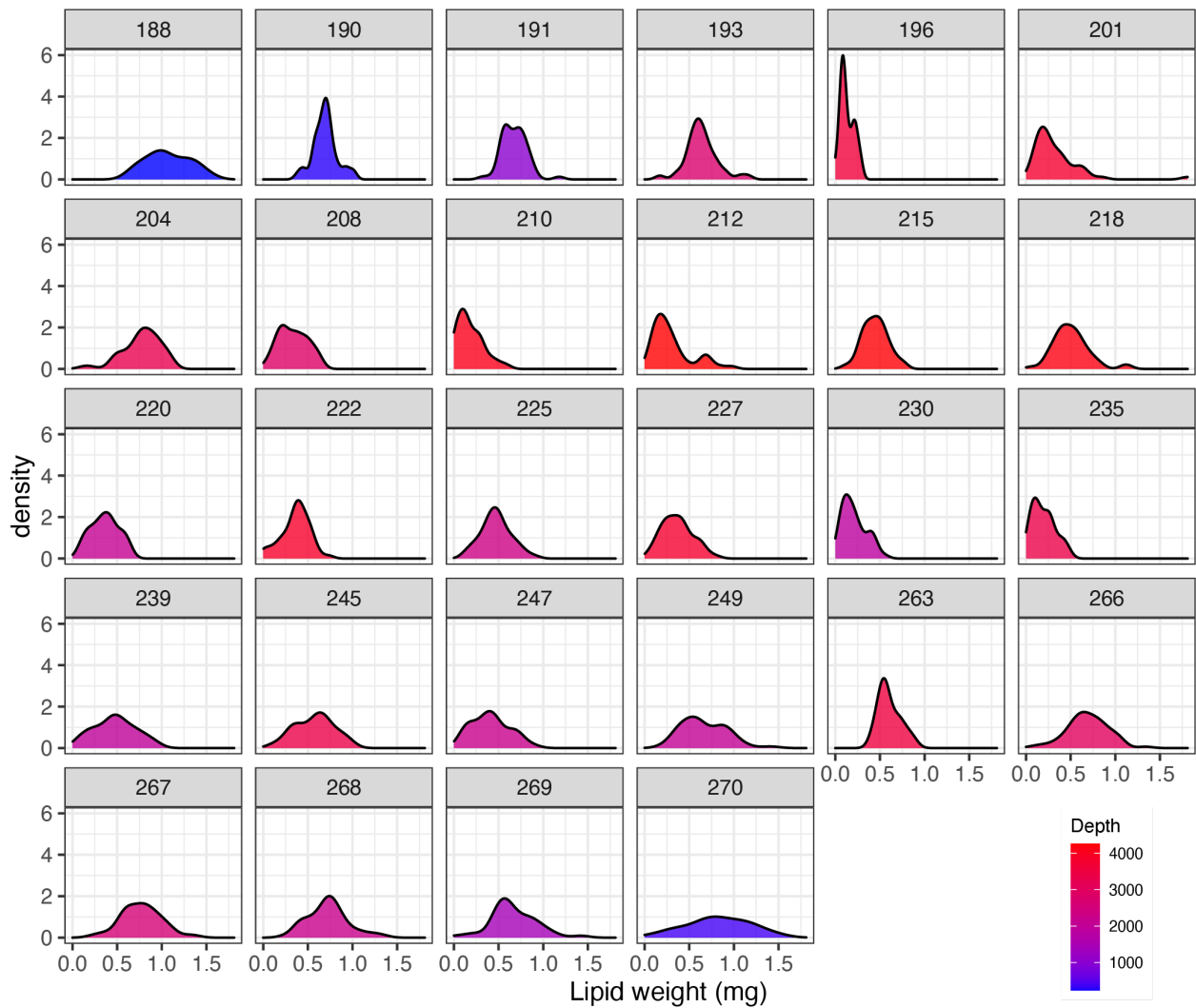


Fig. S3. Density plots of individual lipid weight in C5 stage of *Calanus hyperboreus* at each examined station. For station locations, see Figure 1.

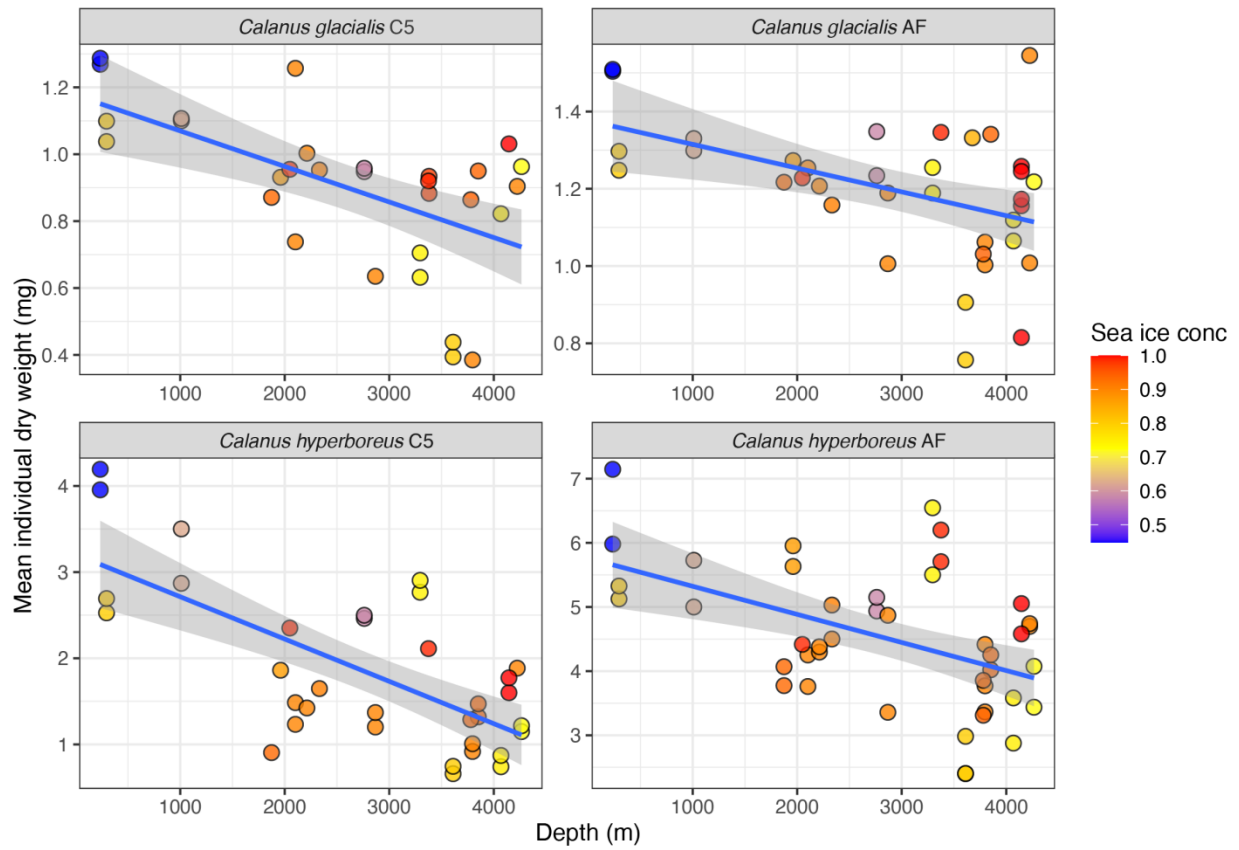


Fig. S4. Mean individual dry weight vs. depth for C5 copepodites and adult females (AF) of *Calanus glacialis* and *C. hyperboreus* across the study area

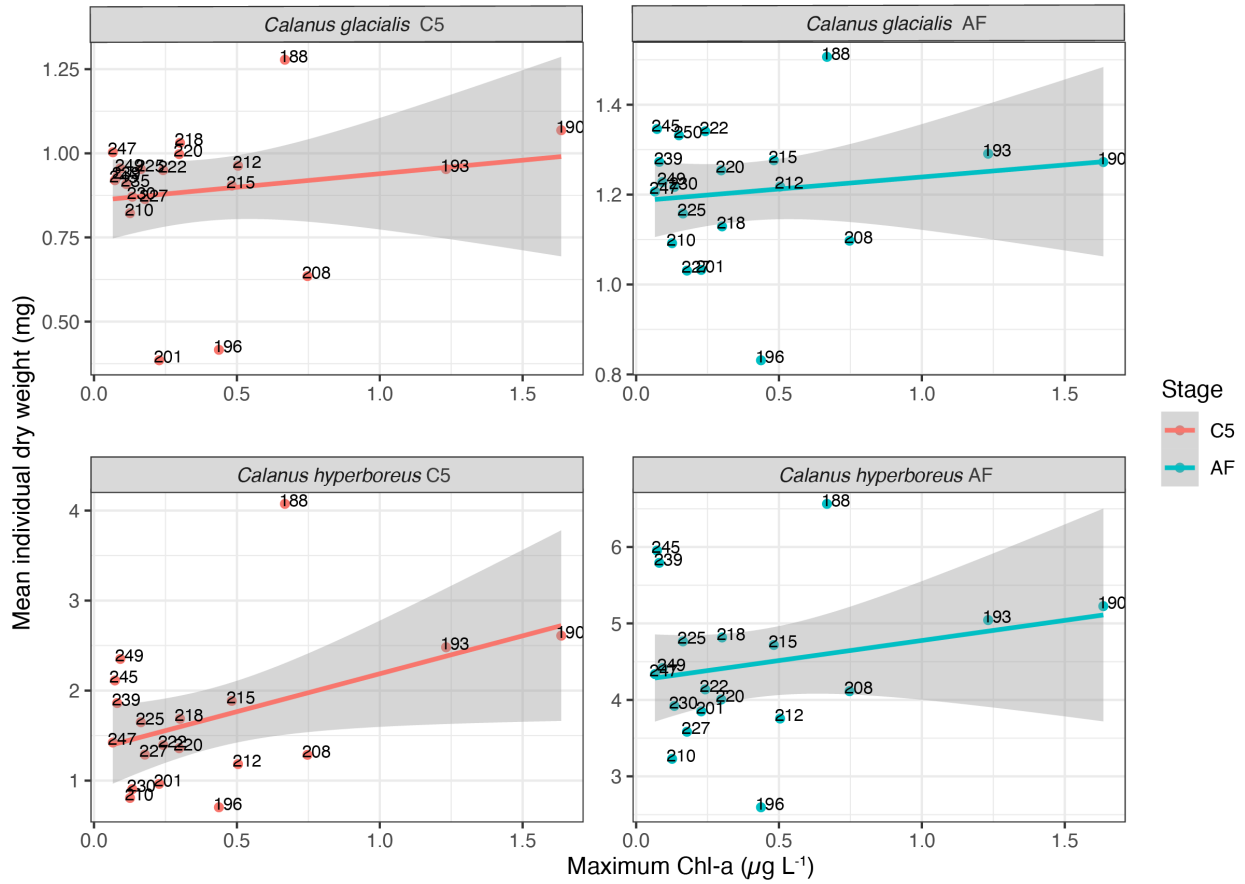


Fig. S5. Mean individual lipid weight vs. chlorophyll-a concentration for C5 copepodites and adult females (AF) of *Calanus glacialis* and *C. hyperboreus* across the study area. The relationship is statistically significant only for C5 of *C. hyperboreus*.

Table S1. Zooplankton station list, ARK 26/3 (August-September 2011). EP – egg production experiments; DW – dry weight measurements; Lip – Lipid volume measurements; FJL – Franz Josef Land; LS – Laptev Sea

Stn	Date	Time	Lat. (N)	Long.	Depth (m)	Depth/#nets	Bongo depth (m)	EP	DW	Lip	Chl <i>a</i>	Geography
188	9 Aug	00:05	82°10′	60°E	237	220/5	200	x	x	x	x	FJL shelf
190	9 Aug	00:08	82°36′	59°55′E	295	270/5	200	x	x	x		FJL slope
191	10 Aug	00:02	82°50′	60°E	980	960/7	300	x	x	x		Nansen Basin
193	10/11 Aug	00:01	83°08′	59°58′E	3046	3000/9	300	x	x	x	x	Nansen Basin
196	11 Aug.	00:10	83°52′	60°28′E	3610	3570/9	1500	x	x	x		Nansen Basin
201	13/14 Aug	00:00	85°31′	59°53′E	3940	3900/9	500	x	x	x	x	Nansen Basin
204	15 Aug	00:03	86°14′	59°23′E	3200	3160/9	300	x	x	x		Nansen Basin
208	17 Aug	00:01	86°51′	60°11′E	2990	2850/9	300	x	x	x		Amundsen Basin
210	18 Aug	00:08	87°17′	59°57′E	4229	4180/9	300	x	x	x		Amundsen Basin
212a	19 Aug	00:07	88°01′	59°30′E	4320	4320/8	300	x	x	x	x	Amundsen Basin
212b	20 Aug	00:00	88°01′	59°25′E	4265	760/7						Amundsen Basin
215	21 Aug	00:07	89°11′	61°04′E	4386	4325/9	300	x	x	x		Amundsen Basin
218	23 Aug	00:01	89°53′	54°07′E	4291	4250/9	300	x	x	x	x	North Pole
220	24 Aug	00:03	89°16′	117°03′W	2102	2050/8	300	x	x	x	x	Lononosov Ridge
222	26 Aug	00:07	88°45′	128°19′W	4000	3900/9	300	x	x	x	x	Makarov Basin
225	28 Aug	00:07	87°39′	157°37′W	2400	2350/7	300	x	x	x	x	Makarov Basin
227	29 Aug	00:00	86°52′	155°06′W	3890	3815/9	300	x	x	x	x	Makarov Basin
230	01 Sep	00:10	85°04′	137°11′W	1870	1800/8	300	x	x	x	x	Alpha-Mendelev Ridge
235	03 Sep	00:10	83°01′	129°59′W	3450	3400/9	300	x	x	x	x	Canada Basin
239	06 Sep	00:06	84°05′	164°13′W	1960	1900/8	300	x	x	x	x	Alpha-Mendelev Ridge
245	09 Sep	00:03	84°48′	166°31′W	3375	3350/9	300	x		x	x	Makarov Basin
247	10 Sep	00:05	84°44′	155°36′W	2212	2180/9		x	x	x		Makarov Basin
249	11 Sep	00:06	84°31′	144°37′E	2050	1980/9		x	x	x		Makarov Basin
250	11 Sep	00:01	84°22′	139°50′E	3674	3650/9		x	x		x	Lononosov Ridge

263	15 Sep	00:02	82°36′	108°24′E	3549	3525/9	x	x	Amundsen Basin
266	16 Sep	13:00	81°39′	104°1′E	3009	2980/9		x	Amundsen Basin
267	17 Sep	02:40	81°29′	103°10′E	2570	2530/9		x	Amundsen Basin
268	17 Sep	14:38	81°16′	102°39′E	2205	2120/9		x	Amundsen Basin
269	17 Sep	20:09	81°07′	102°15′E	1428	1385/9		x	Amundsen Basin
270	18 Sep	00:24	80°58′	101°51′E	396	370/5		x	LS shelf

Table S2. Abundance (ind m⁻²) and stage composition of *Calanus glacialis* and *C. hyperboreus* during August-September 2011 (ARK26). C1-C5 – copepodite stages; F- adult females, M – adult males

Station/stage	C1	C2	C3	C4	C5	AF	AM	Sum
<i>C. glacialis</i>								
188	40522	30162	28037	1646	6847	1713	0	108926
191	20	2	0	3	941	245	4	1215
193	38	246	200	150	1224	310	0	2167
204	18	19	28	126	223	781	0	1195
210	38	21	0	0	41	600	0	700
212	2	2	0	2	42	508	0	556
215	0	6	0	25	159	607	3	801
218	0	0	0	2	132	837	0	972
220	0	0	0	4	161	667	0	832
222	0	0	0	0	136	617	0	753
225	0	0	2	4	139	562	0	708
227	56	8	0	4	214	964	2	1248
230	2	48	15	8	564	358	0	995
235	0	0	15	4	708	303	0	1030
239	88	471	6	11	316	442	2	1336
250	148	92	6	22	211	1658	6	2143
263	15	2	0	2	75	477	2	572
<i>C. hyperboreus</i>								
188	0	2	924	2031	917	155	2	4031
191	2	112	472	125	396	171	0	1278
193	0	52	2262	285	481	189	0	3269
204	4017	183	146	644	109	238	0	5337
210	0	0	34	375	536	627	0	1572
212	0	2	48	345	231	319	0	946
215	0	0	96	480	549	378	0	1504
218	0	4	125	679	703	592	0	2103
220	0	8	31	461	612	681	0	1793
222	6	29	140	450	692	717	0	2035
225	0	0	128	432	226	321	0	1108
227	0	0	82	439	510	618	0	1649
230	0	7	49	528	961	621	2	2169
235	0	0	72	639	860	711	0	2281
239	0	27	111	324	210	263	0	934
250	0	10	31	1019	1443	744	0	3246
263	0	12	86	227	123	322	0	770

Table S3. Average depth distribution of different stages (% of total) of *Calanus glacialis* and *C. hyperboreus* during August-September 2011 (ARK26)

Depth (m)	<i>Calanus glacialis</i>							<i>C. hyperboreus</i>						
	C1	C2	C3	C4	C5	AF	Mean	C1	C2	C3	C4	C5	AF	Mean
4000-3000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.0
3000-2000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.8	7.0	4.1	2.5
2000-1000	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	8.2	18.6	22.2	15.6	10.8
1000-500	0.0	0.0	0.0	0.2	0.2	0.0	0.1	0.0	0.0	13.2	14.0	9.0	8.9	7.5
500-200	5.0	7.8	1.5	0.7	1.0	1.5	2.9	0.0	5.4	13.0	15.4	9.6	13.6	9.5
200-100	10.7	14.0	7.6	7.9	25.5	14.7	13.4	0.0	7.1	17.7	10.0	13.9	17.7	11.0
100-50	27.5	35.4	38.8	32.8	31.9	37.7	34.0	0.0	10.9	12.4	6.0	7.9	13.3	8.4
50-0	56.7	42.7	52.1	58.3	41.4	45.9	49.5	100.0	76.6	35.1	32.2	30.4	26.8	50.2

Table S4. GLMM (tweedie family with a log link) results for individual lipid weight vs. depth/Chl-a for adult females (AF) and C5 copepodites of *Calanus glacialis* (A, B) and *C. hyperboreus* (C, D). Standardized parameters were obtained by fitting the model on a standardized version of the dataset. 95% Confidence Intervals (CIs) and p-values were computed using a Wald z-distribution approximation.

Parameter	Coefficient	95% CI	z	p	Effects	Std	Std 95% CI
A) <i>Calanus glacialis</i> AF							
Intercept	-0.18	[-0.34, -0.02]	-2.22	0.03	Fixed	-0.32	[-0.39, -0.26]
Depth	-0.05	[-0.1, 0]	-1.83	0.07	Fixed	-0.06	[-0.12, 0]
Station (group)	0.16				Random		
AIC	-267.78						
R² (conditional)	0.26						
R² (marginal)	0.03						
Sigma	0.07						
B) <i>Calanus glacialis</i> C5							
Intercept	-0.06	[-0.43, 0.31]	-0.30	0.76	Fixed	-0.46	[-0.88, -0.45]
Depth	-0.16	[-0.28, -0.03]	-2.47	0.01	Fixed	-0.19	[-0.57, -0.14]
Station (group)	0.56				Random		
AIC	222.09						
R² (conditional)	0.52						
R² (marginal)	0.11						
Sigma	0.12						
C) <i>Calanus hyperboreus</i> AF							
Intercept	1.38	[1.13, 1.64]	10.54	0.00	Fixed	0.96	[0.85, 1.06]
Depth	-0.15	[-0.24, -0.07]	-3.46	0.00	Fixed	-0.17	[-0.27, -0.07]
Station (group)	0.26				Random		
AIC	4060.83						
R² (conditional)	0.35						
R² (marginal)	0.11						
Sigma	0.38						
D) <i>Calanus hyperboreus</i> C5							
Intercept	-0.16	[-0.8, 0.49]	-0.48	0.63	Fixed	-0.65	[-0.85, -0.44]
Depth	-0.25	[-0.44, -0.07]	-2.74	0.01	Fixed	-0.29	[-0.5, -0.08]
Max chl	0.42	[-0.1, 0.93]	1.59	0.11	Fixed	0.18	[-0.04, 0.39]
Station (group)	0.53				Random		
AIC	430.73						
R² (conditional)	0.60						
R² (marginal)	0.22						
Sigma	0.24						