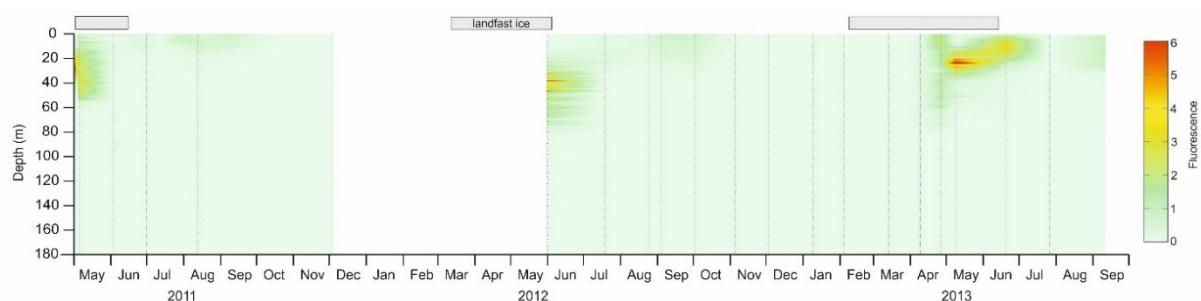
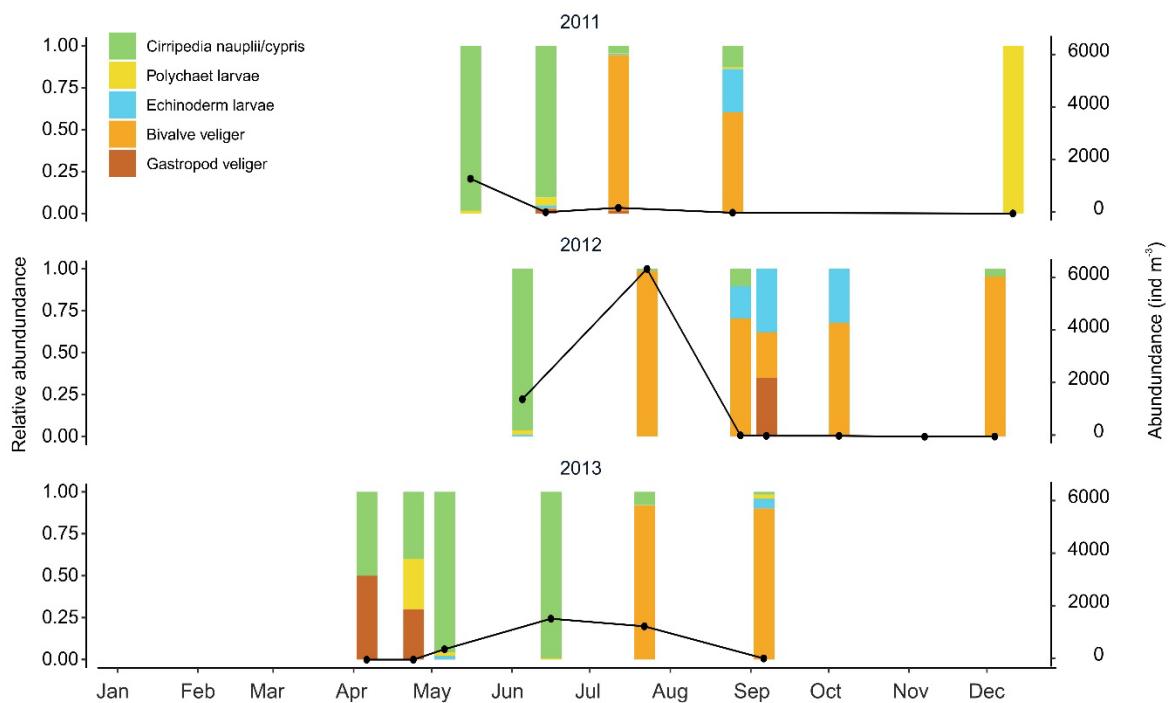


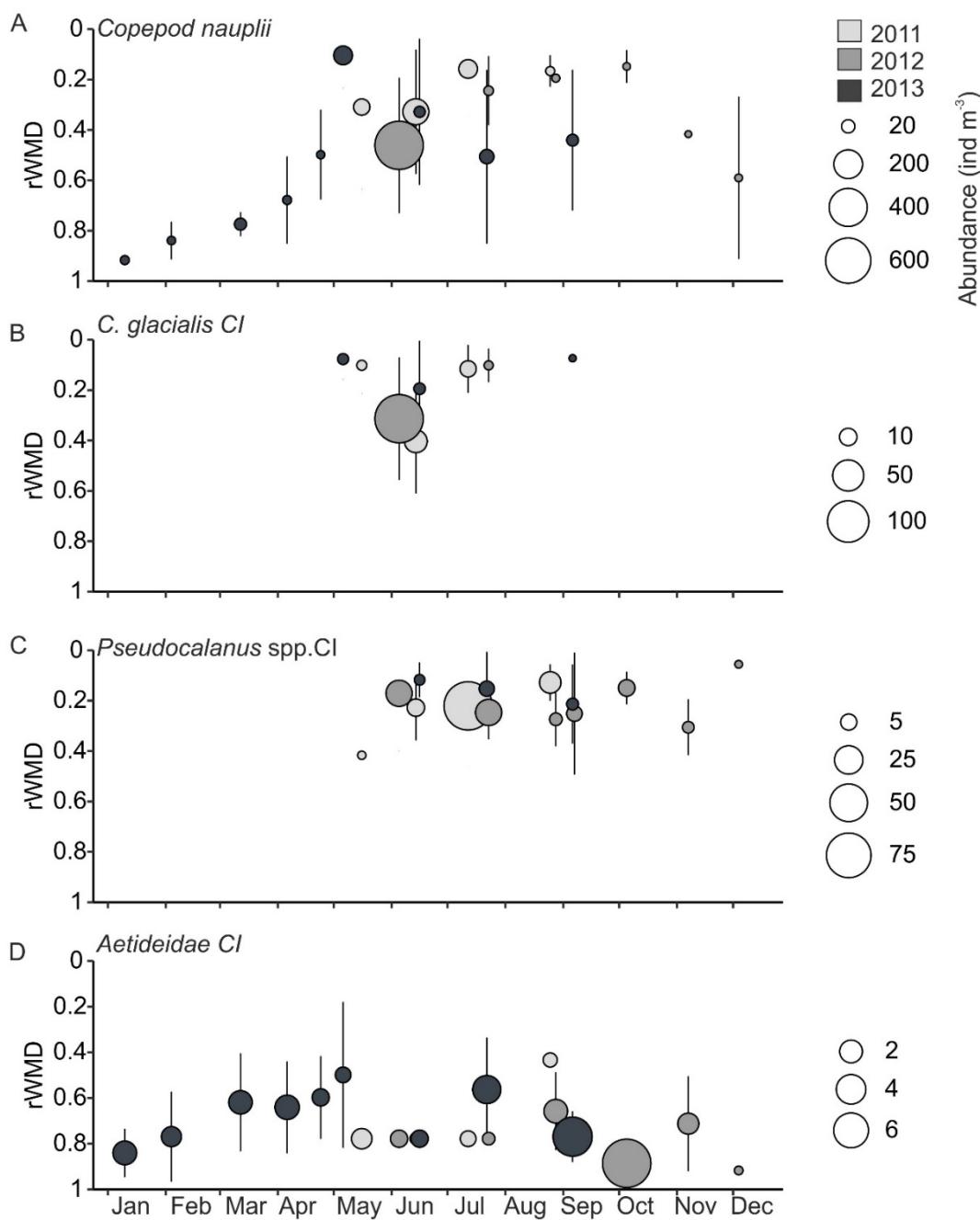
Supplementary material



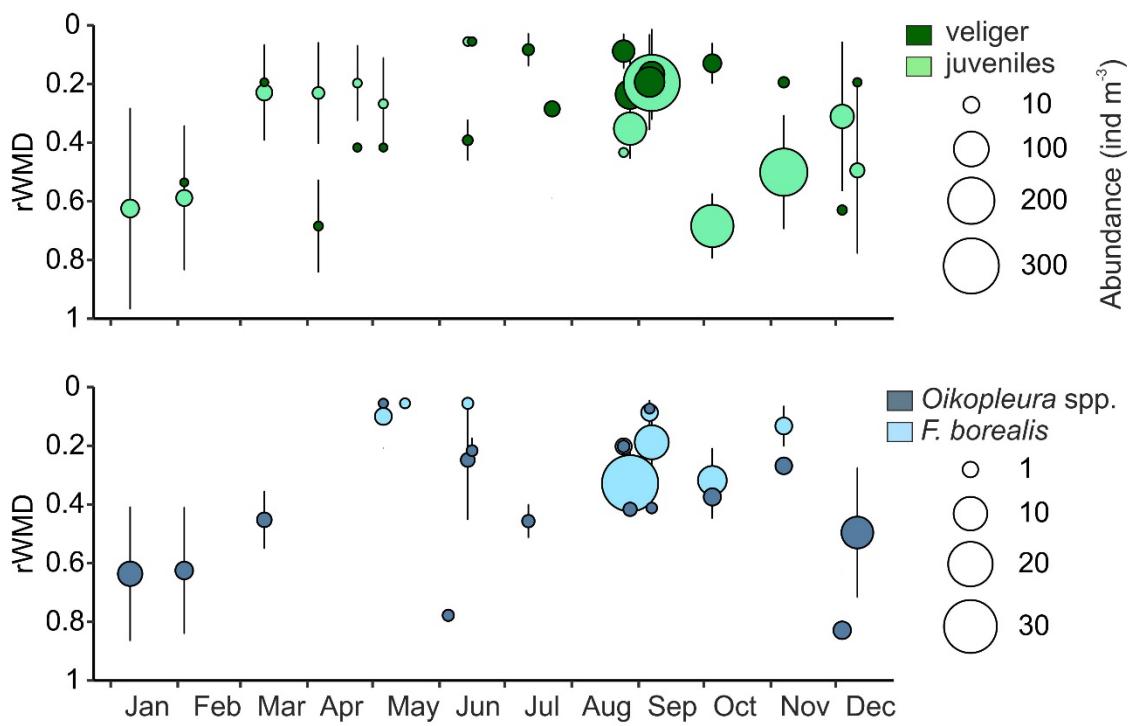
Supplementary Figure 1. Seasonal variability in fluorescence in the water column based on vertical profiles taken with a fluorometer attached to the CTD at each sample event (indicated by vertical lines) in Billefjorden, Svalbard (Stn. BAB) in years 2011-2013. Gray bars on top indicate periods of ice cover and white field indicate missing data due to no sampling.



Supplementary Figure 2. Relative and absolute (black line) abundance of meroplankton taxa in the upper 50 m (integrated ind. m⁻³) in Billefjorden, Svalbard (Stn. BAB) in years 2011-2013.



Supplementary Figure 3. Relative Weighted mean depth (rWMD) and integrated abundances (ind. m⁻³) of A) copepod nauplii, mainly comprising of *Calanus glacialis* and some *Pseudocalanus* spp., and copepodite stage 1 of B) *C. glacialis*, C) *Pseudocalanus* spp. and D) Aetideidae (primarily *Bradyidius similis*) in Billefjorden, Svalbard (Stn. BAB) in years 2011-2013. Relative WMD was used to account for the variability in bottom and sampling depth between our main station BAB (bottom depth 180 m, sample depth 170-182 m) and the station in the outer basin sampled in February 2013 (bottom depth 150 m, sample depth 140 m) (see Table 1 for sampling details). The relative WMD is the ratio of WMD to the total sample depth, i.e. a WMD of <0.5 indicates that the taxa was centred in the upper half of the water column, a WMD closer to 1 indicates that the distribution was centred in the deepest part of the water column.



Supplementary Figure 4. Relative Weighted mean depth (rWMD) and integrated abundances (ind. m⁻³) of A) Veliger and Juveniles of *Limacina helicina*; B) Appendicularians *Oikopleura* spp. and *Fritillaria borealis* in Billefjorden, Svalbard (Stn. BAB) in years 2011-2013. The relative WMD was used to account for the variability in bottom and sampling depth between our main station BAB (bottom depth 192 m, sample depth 170-182 m) and the station in the outer basin sampled in February 2013 (bottom depth 150 m, sample depth 140 m) (see Table 1 for sampling details). The relative WMD is the ratio of WMD to the total sample depth, i.e. a WMD of <0.5 indicates that the taxa was centred in the upper half of the water column, a WMD closer to 1 indicates that the distribution was centred in the deeper part of the water column.

Supplementary Table S1. Overview of main zooplankton taxa in Billefjorden, Svalbard, years 2011-2013, sorted according to their overall numerical contribution and frequency of occurrence. Annual 3-years mean with maximum (max.) and minimum (min.) zooplankton abundances (ind. m⁻²), followed by annual mean density of occurrence (ind. m⁻³) and % contribution (in brackets) per depth layer with maximum density (ind. m⁻³) observed across all sample depths and years. Capital letters refer to which season, and number to which depth, max. density was observed. Seasons: (W) winter, (S) spring, (SU) summer and (A) autumn and depths 1) 180-100 m, 2) 100-50 m, 3) 50-20 m and 4) 20-0 m. Main feeding mode is based on ^aBlachowiak-Samolyk et al. (2007): Herbivore (H), Omnivore (O), Carnivore (C).

Taxon (main feeding mode)	Integrated (180-0 m) abundance [ind. m ⁻²]				Mean density per depth layer [ind. m ⁻³]				Max density [ind. m ⁻³]
	Contribution %	Frequency (%)	Mean	Max – Min.	Surface 0-20 m	Sub-surface 20-50 m	Intermediate 50-100 m	Deep 100-180 m	
<i>Microcalanus</i> spp. (O)	28.27	100	94737	304 540 - 15 760	84 (3.4%)	130 (9%)	369 (28%)	897 (44%)	3 527 W1
<i>Pseudocalanus</i> spp. (H)	18.14	100	59315	266 050 - 2 313	333 (13%)	341 (24%)	348 (26%)	315 (15%)	1984 W2
<i>Calanus glacialis</i> (H)	17.00	100	55558	171 673 - 1 156	405 (15%)	132 (9%)	173 (13%)	539 (21%)	3 100 A1
<i>Oithona similis</i> (O)	16.25	100	52609	170 194 - 9 360	485 (18%)	347 (25%)	250 (19%)	267 (12%)	3 040 A4
Bivalvia veliger (O)	5.73	71	27 144	320 640 - 20	2191 (25%)	133 (4.5%)	22 (0.8%)	8.5 (0.2%)	14 140 SU4
Cirripedia larvae (H)	3.96	67	20 110	92 227 - 8	635 (12%)	254 (9%)	22 (0.6%)	39 (0.9%)	2 953 S4
Calanoida nauplii (H)	2.78	90	10 410	125 920 - 27	163 (3%)	108 (5.1%)	85 (3.4%)	54 (1.8%)	1 040 S3
<i>Limacina helicina</i> vel/juv. (O/C)	2.77	86	10 956	64 735 - 40	65 (2%)	155 (9%)	57 (3.3%)	52 (1.3%)	1 973 A2
<i>Calanus finmarchicus</i> (H)	1.82	100	6 167	57 988 - 84	236 (7%)	25 (1.7%)	16 (1.1%)	4.4 (0.1%)	2 704 SU4
<i>Metridia longa</i> (O)	1.01	100	3285	11 940 - 404	5.7 (0.3%)	5 (0.3%)	12 (0.9%)	30 (1.5%)	124.0 W1
<i>Triconia borealis</i> (O)	0.50	100	1656	4120- 347	4.6 (0.1%)	4.1 (0.2%)	11 (0.7%)	13 (0.6%)	66.7 W2
<i>Acartia longiremis</i> (O)	0.34	100	1104	3 660 - 80	10 (0.4%)	6.2 (0.4%)	5.3 (0.3%)	9.7 (0.3%)	66.7 W1
Aetideidae CI-CIV (O)	0.25	100	836	3 213 - 160	4.2 (0.0%)	1.2 (0.0%)	4.3 (0.1%)	21.5 (0.4%)	97.8 A1
Echinodermata larvae (H/O)	0.20	52	1 311	8 853 - 40	10 (0.1%)	92 (0.3%)	50 (0.7%)	0.5 (0%)	160.0 S2
<i>Oithona atlantica</i> (O)	0.16	86	553	4187 - 27	8.3 (0.2%)	17 (0.6%)	6 (0.1%)	3.1 (0%)	84.4 A3
<i>Calanus hyperboreus</i> (H)	0.16	100	508	2 930 - 60	6.1 (0.2%)	3.1 (0.2%)	3.7 (0.3%)	2.4 (0.1%)	41.3 S4
<i>Fritillaria borealis</i> (H/O)	0.15	43	1140	6 213 - 20	8.1 (0.1%)	22 (0.5%)	23 (0.3%)	82.7 A3	
<i>Parasagitta elegans</i> (C)	0.11	100	373	996 - 36	5.1 (0.2%)	3.2 (0.2%)	1.7 (0.1%)	1.3 (0.1%)	31.5 SU4
Polychaeta larvae (O/H)	0.10	67	503	3 227 - 20	18.4	4.0	1.4	4.8	76.0 S4
<i>Oikopleura</i> spp. (H/O)	0.06	76	251	1 560 - 12	1.4	2.6	2.8	3.1	16.0 W3
Euphausiacea larvae (H/O)	0.05	19	929	3 360 - 4	19	34	4.5	0.4	66.7 S3
Isopoda Bopyridae	0.04	90	148	354 - 8	0.5	0.8	1.2	1.7	5.3 A1
Ctenophora larvae (C)	0.04	52	238	760 - 4	2.3	2.7	2.5	1.7	8.8 W3
Hydrozoa indet. (C)	0.02	76	107	210 - 9	0.6	0.2	0.9	1.1	3.2 S1
Gastropoda veliger (H/O)	0.02	52	104	520 - 16	7.0	3.7	1.1	1.1	13.3 A3
<i>Bradyidius similis</i> CIV-VI (O)	0.01	76	48	133 - 4	0.1	1.6	1.0	1.2	2.0 SU1
<i>Mertensia ovum</i> (C)	0.01	43	41	140 - 4	1.3	0.3	0.4	0.3	4.4 SU4
<i>Beroë cucumis</i> (C)	<0.01	57	29	119 - 4	0.2	0.4	0.5	0.3	1.1 W2

Taxon (main feeding mode)	Integrated (180-0 m) abundance [ind. m ⁻²]				Mean density per depth layer [ind. m ⁻³]				Max density [ind. m ⁻³]
	Contribution %	Frequency (%)	Mean	Max – Min.	Surface 0-20 m	Sub-surface 20-50 m	Intermediate 50-100 m	Deep 100-180 m	
<i>Clione limacina</i> (C)	<0.01	38	30	80 - 4	0.3	1.2	0.6	0.2	2.7 A ³
<i>Thysanoessa inermis</i> (H/O)	<0.01	52	20	48 - 4	0.2	0.1	0.2	0.2	1.2 A ⁴
<i>Neoscolecithrix farrani</i> (O)	<0.01	43	17	68 - 4			0.1	0.2	0.8 SU ¹
<i>Limacina retroversa</i> (O/C)	<0.01	19	35	80 - 13		0.7	0.8		1.6 A ²
<i>Eukrohnia hamata</i> (C)	<0.01	48	14	48 - 4		0.1	0.2	0.1	1.0 A ²
Harpacticoida (O)	<0.01	24	27	80 - 8	0.7	0.7	0.9		1.6 S ²
<i>Paraecheta norvegica</i> (C)	<0.01	48	13	32 - 4	0.4		0.1	0.2	0.4 W ¹
Bryozoa larvae (O)	<0.01	10	60	80 - 40	2.0	2.7			2.7 A ³
<i>Themisto abyssorum</i> (C)	<0.01	43	10	36 - 4	0.2	0.1	0.1	0.2	0.7 A ²
<i>Scolecithricella minor</i> (O)	<0.01	24	15	20 - 10		0.3	0.2	0.2	0.4 A ³
<i>Hyas</i> larvae (O)	<0.01	24	10	24 - 4	0.6			0.1	1.2 SU ⁴
<i>Themisto libellula</i> (C)	<0.01	24	5	10 - 4	0.2	0.2	0.1		0.4 A ⁴
<i>Eupagurus zoea</i> (O)	<0.01	14	8	12 - 4	0.3	0.3			0.4 S/SU ⁴
<i>Aglantha digitale</i> (C)	<0.01	14	7	12 - 4	0.1		0.1	0.1	0.4 A ⁴
<i>Metridia lucens</i> (O)	<0.01	10	6	8 - 4			0.1		0.2 A ²
<i>Evadne nordmanni</i> (H)	<0.01	5	9	9 - 9				0.1	0.1 A ¹
<i>Meganyctiphanes norvegica</i> (H/O)	<0.01	10	4	4 - 4				0.1	0.1 W/S ¹
<i>Pelagobia</i> sp. (O)	<0.01	5	8	8 - 8				0.1	0.1 S ¹
Ostracoda (O)	<0.01	5	4	4 - 4				0.1	0.1 S ¹
<i>Thysanoessa longicaudata</i> (H/O)	<0.01	5	4	4 - 4				0.1	0.1 W ¹
<i>Tomopteris helgolandica</i> (O)	<0.01	5	4	4 - 4				0.1	0.1 W ¹
<i>Bougainvilla superciliaris</i> (C)	<0.01	5	4	4 - 4	0.1				0.1 W ³
TOTAL		330 438	529 878 - 168 673		2948.2	1404.5	1314.9	2177.6	17252 SU⁴

^aBlachowiak-Samolyk, K., Kwasniewski, S., Dmoch, K., Hop, H., and Falk-Petersen, S. (2007). Trophic structure of zooplankton in the Fram Strait in spring and autumn 2003. Deep Sea Research Part II: Topical Studies in Oceanography 54, 2716-2728. doi:0.1016/j.dsr2.2007.08.004

Data:

Mesozooplankton data, Billefjorden (Stn. BAB), Svalbard, years 2011-2013 are currently being prepared for storage in PANGAEA (<https://pangaea.de/>).