Conversion Type	Equation	Reference
For COPEPOD database biomass		
Displacement Volume (DV) to Carbon Mass (CM)	log CM = (log DV + 1.434)/0.820	Wiebe (1988)
Wet Mass (WM) to CM	log CM = (log WM + 1.537)/0.852	Wiebe (1988)
Dry Mass (DM) to CM	log CM = (log DM − 0.499)/0.991	Wiebe (1988)
Settled Volume (SV) to DM	log DM = 0.843 · log SV + 1.417	Balvay (1987)
Ash-free Dry Mass (AFDM) to CM	log CM = (log AFDM − 0.410)/0.963	Bode et al. (1998)
For COPEPOD database mesh size – Converted to 333um mesh equivalant		
CM sampled with 200um net	Log CMM333 = 0.6195 · log CMM200	O'Brien (2005)
CM sampled with 505um net	Log CMM333 = 1.2107 · log CMM505	O'Brien (2005)
For Continuous Plankton Recorder – Abundance x TL to DM/WM conversions		
Total Length (TL) to WM Copepoda & Ostracoda	$WM = 0.08*TL^{2.1}$	Richardson et al., (2006)
TL to DM Amphipod	log DM = 2.71 · Log TL+0.76	Yamada (2002)
TL to DM Chaetognatha	log DM = 2.80 · Log TL-0.6	Imao (2005)
TL to DM Annelida	log DM = 1.53 · Log TL+1.49	Imao (2005)
TL to DM Euphausiacea		
Euphausia spp.	log DM = 2.64 · Log TL+0.92	Lindley et al., (1999)
Nyctiphanes spp.	log DM = 2.23 · Log TL+1.12	Lindley et al., (1999)
Thysonoessa spp.	log DM = 2.73 · Log TL+0.881	Lindley et al., (1999)
Calyptopes (All)	log DM = 1.40 · Log TL+1.194	Lindley et al., (1999)
TL to DM Appendicularia	DM = 2.47 · log TL - 6.1	Hopcroft et al., (1998)
TL to DM Pteropoda	$DM = 0.1365 \cdot TL^{1.501}$	Bednarsek et al., (2012)

Supplementary Table 1: The list of conversion equations for transforming the various methods for calculating zooplankton biomass into a standard unit of Carbon mass. Also shown are the mesh size conversions where the carbon mass measured from 200um and 505um mesh size nets were standardised to a 333um mesh size equivalent. The final lists of equations are the length-weight relationships for the dominant groups within the Continuous Plankton Recorder database. The total biomass within a sample is obtained by multiplying the total number of individuals by the mass of the individuals within a sample.

Group	Species	Length (mm)	Reference
Amphipod	Hyperiella sp.	6	See notes[1]
Amphipod	Hyperiidae indet	12	McHardy 1970 [2]
Amphipod	*Primno macropa*	12	Bowman 1978
Amphipod	*Primno spp.*	12	McHardy 1970 [2]
Annelida	*Tomopteris sp.*	20	See notes[3]
Appendicularia	Appendicularia	0.8	Uye & Ichino, 1995[4]
Appendicularia	*Oikopleura sp.*	0.8	Uye & Ichino, 1995[4]
Chaetognatha	Chaetognatha indet	3	Bainbridge 1963 [5]
Chaetognatha	*Eukrohnia hamata*	10.2	Bielecka et al., 2016
Chaetognatha	*Pseudosagitta gazellae*	20.1	Bielecka et al., 2016
Chaetognatha	*Serratosagitta tasmanica*	13.3	Sotelo et al., 2018
Copepoda	*Acartia danae*	1.08	Brun et al., 2017
Copepoda	*Acartia negligens*	1.04	Brun et al., 2017
Copepoda	*Acartia spp.*	1.04	Brun et al., 2017
Copepoda	*Acartiura tranteri*	1.03	Brun et al., 2017
Copepoda	*Acrocalanus spp.*	1	Brun et al., 2017
Copepoda	*Aetideus armatus*	1.73	Brun et al., 2017
Copepoda	*Alteutha spp*	0.95	Brun et al., 2017
Copepoda	*Anomalocera patersoni*	3.3	Brun et al., 2017
Copepoda	Calanidae	2	Brun et al., 2017
Copepoda	*Calanoides acutus*	4.1	Brun et al., 2017
Copepoda	*Calanoides carinatus*	1.74	Brun et al., 2017
Copepoda	*Calanoides spp.*	3.5	Brun et al., 2017
Copepoda	*Calanus australis*	2.62	Brun et al., 2017
Copepoda	*Calanus finmarchicus*	2.7	Brun et al., 2017
Copepoda	*Calanus glacialis*	4.6	Brun et al., 2017
Copepoda	*Calanus helgolandicus*	2.68	Brun et al., 2017
Copepoda	*Calanus hyperboreus*	6.95	Brun et al., 2017
Copepoda	*Calanus* IV	1.65	Brun et al., 2017
Copepoda	*Calanus propinquus*	5.1	Brun et al., 2017
Copepoda	*Calanus simillimus*	3.1	Brun et al., 2017
Copepoda	*Calocalanus pavo*	0.74	Brun et al., 2017
Copepoda	*Calocalanus sp*	0.84	Brun et al., 2017
Copepoda	*Calocalanus spp*	0.75	Brun et al., 2017
Copepoda	*Calocalanus spp.*	0.75	Brun et al., 2017
Copepoda	*Candacia armata*	2.18	Brun et al., 2017
Copepoda	Candacia IV	1.4	Brun et al., 2017
Copepoda	*Candacia maxima*	2.15	Brun et al., 2017
Copepoda	*Candacia spp.*	1.95	Brun et al., 2017
Copepoda	Canthocalanus pauper	1.32	Brun et al., 2017
Copepoda	Centropages australiensis	1.12	Brun et al., 2017
Copepoda	Centropages bradyi	1.85	Brun et al., 2017
Copepoda	Centropages chierchiae	3.25	Brun et al., 2017
Copepoda	*Centropages furcatus*	1.5	Brun et al., 2017

Copepoda	*Centropages gracilis*	1.74	Brun et al., 2017
Copepoda	*Centropages hamatus*	1.3	Brun et al., 2017
Copepoda	*Centropages spp.*	1.63	Brun et al., 2017
Copepoda	*Centropages typicus*	1.55	Brun et al., 2017
Copepoda	*Centropages violaceus*	1.8	Brun et al., 2017
Copepoda	*Clausocalanus brevipes*	1.15	Brun et al., 2017
Copepoda	*Clausocalanus laticeps*	1.15	Brun et al., 2017
Copepoda	*Clausocalanus spp.*	1.15	Brun et al., 2017
Copepoda	*Clausocalanus spp.*	0.68	Brun et al., 2017
Copepoda	Copepod nauplius	0.04	Brun et al., 2017
Copepoda	*Corycaeus spp.*	0.65	Brun et al., 2017
Copepoda	*Cosmocalanus darwinii*	2.12	Brun et al., 2017
Copepoda	*Ctenocalanus citer*	0.8	Brun et al., 2017
Copepoda	*Ctenocalanus vanus*	0.78	Brun et al., 2017
Copepoda	*Eucalanus elongatus*	5	Brun et al., 2017
Copepoda	*Eucalanus hyalinus*	3.4	Brun et al., 2017
Copepoda	*Euchaeta acuta*	3.84	Brun et al., 2017
Copepoda	*Euchaeta marina*	2.7	Brun et al., 2017
Copepoda	*Euchaetidae*	4	Brun et al., 2017
Copepoda	*Euchirella spp.*	2	Brun et al., 2017
Copepoda	*Haloptilus oxycephalus*	8	Brun et al., 2017
Copepoda	*Heterorhabdus norvegicus*	2.49	Brun et al., 2017
Copepoda	*Heterorhabdus papilliger*	2.5	Brun et al., 2017
Copepoda	*Isias clavipes*	1.25	Brun et al., 2017
Copepoda	*Labidocera spp.*	1.95	Brun et al., 2017
Copepoda	*Labidocera wollastoni*	3	Brun et al., 2017
Copepoda	*Lubbockia spp.*	1.2	Brun et al., 2017
Copepoda	*Lucicutia spp.*	5.2	Brun et al., 2017
Copepoda	*Lucifer spp.*	1.3	Brun et al., 2017
Copepoda	*Macrosetella spp.*	0.98	Brun et al., 2017
Copepoda	*Mecynocera clausi*	1	Brun et al., 2017
Copepoda	*Mecynocera spp.*	0.84	Brun et al., 2017
Copepoda	*Mesocalanus spp.*	1.75	Brun et al., 2017
Copepoda	*Mesocalanus tenuicornis*	1.95	Brun et al., 2017
Copepoda	*Metridia gerlachei*	0.9	Brun et al., 2017
Copepoda	*Metridia IV*	0.93	Brun et al., 2017
Copepoda	*Metridia longa*	4.1	Brun et al., 2017
Copepoda	*Metridia lucens*	3.5	Brun et al., 2017
Copepoda	*Metridia sp*	2.27	Brun et al., 2017
Copepoda	*Microsetella sp*	2	Brun et al., 2017
Copepoda	*Microsetella spp*	0.55	Brun et al., 2017
Copepoda	*Nannocalanus minor*	1.71	Brun et al., 2017
Copepoda	*Nauplii Rhincalanus*	3	Brun et al., 2017
Copepoda	*Neocalanus spp.*	7	Brun et al., 2017
Copepoda	*Neocalanus tonsus*	0.5	Brun et al., 2017
Copepoda	*Odontacartia pacifica*	1.15	Brun et al., 2017
Copepoda	*Oithona nana*	0.71	Brun et al., 2017

Copepoda	*Oithona similis*	0.5	Brun et al., 2017
Copepoda	*Oithona spp.*	0.68	Brun et al., 2017
Copepoda	*Oncaea clevei*	0.86	Brun et al., 2017
Copepoda	*Oncaea media*	0.86	Brun et al., 2017
Copepoda	*Oncaea scottodicarloi*	0.86	Brun et al., 2017
Copepoda	*Oncaea spp.*	0.86	Brun et al., 2017
Copepoda	*Oncaea venusta*	0.86	Brun et al., 2017
Copepoda	*Para Pseudocalanus*	0.75	Brun et al., 2017
Copepoda	*Paracalanus indicus*	0.75	Brun et al., 2017
Copepoda	*Paracalanus spp.*	0.75	Brun et al., 2017
Copepoda	*Paraeuchaeta exigua*	0.7	Brun et al., 2017
Copepoda	*Paraeuchaeta hebes*	2.4	Brun et al., 2017
Copepoda	*Paraeuchaeta norvegica*	7	Brun et al., 2017
Copepoda	*Paraeuchaeta spp.*	7	Brun et al., 2017
Copepoda	*Pareucalanus spp.*	5.89	Brun et al., 2017
Copepoda	*Pleuromamma abdominalis*	2.67	Brun et al., 2017
Copepoda	*Pleuromamma borealis*	1.97	Brun et al., 2017
Copepoda	*Pleuromamma gracilis*	1.76	Brun et al., 2017
Copepoda	*Pleuromamma piseki*	1.73	Brun et al., 2017
Copepoda	*Pleuromamma robusta*	1.73	Brun et al., 2017
Copepoda	*Pleuromamma spp.*	2.56	Brun et al., 2017
Copepoda	*Pleuromamma xiphias*	4.13	Brun et al., 2017
Copepoda	*Pseudocalanus spp*	1.2	Brun et al., 2017
Copepoda	*Rhincalanus gigas*	15	Brun et al., 2017
Copepoda	*Rhincalanus nasutus*	3.99	Brun et al., 2017
Copepoda	*Rhincalanus spp.*	4.5	Brun et al., 2017
Copepoda	*Scolecithricella minor*	3	Brun et al., 2017
Copepoda	*Scolecithricella spp*	1.4	Brun et al., 2017
Copepoda	*Scolecithrix danae*	1.16	Brun et al., 2017
Copepoda	Small Calanoid	1.34	Brun et al., 2017
Copepoda	*Subeucalanus crassus*	1.1	Brun et al., 2017
Copepoda	*Subeucalanus longiceps*	1	Brun et al., 2017
Copepoda	*Subeucalanus sp*	4.1	Brun et al., 2017
Copepoda	*Subeucalanus subcrassus*	2.2	Brun et al., 2017
Copepoda	*Temora discaudata*	2	Brun et al., 2017
Copepoda	*Temora longicornis*	0.75	Brun et al., 2017
Copepoda	*Temora spp.*	1.5	Brun et al., 2017
Copepoda	*Temora stylifera*	1.45	Brun et al., 2017
Copepoda	*Temora turbinata*	1.3	Brun et al., 2017
Copepoda	*Themisto gaudichaudii*	14	Brun et al., 2017
Copepoda	*Tortanus spp.*	0.72	Brun et al., 2017
Copepoda	*Triconia conifera*	0.65	Brun et al., 2017
Copepoda	*Undeuchaeta plumosa*	3.18	Brun et al., 2017
Copepoda	*Undinula vulgaris*	1.76	Brun et al., 2017
Euphausiid	Euphausia	9	Lindley 1977 [6]
Euphausiid	*Euphausia frigida*	15	Siegel 1987
Euphausiid	*Euphausia longirostris*	20	Gurney et al., 2002

Euphausiid	*Euphausia superba*	33.9	Färber -Lora, 1994
Euphausiid	*Euphausia vallentini*	15	Siegel 1987
Euphausiid	*Euphausiacea* calyptopis	2	Lindley 1977[7]
Euphausiid	*Nyctiphanes australis*	12	Ritz and Hosie, 1982
Euphausiid	*Thysanoessa* calyptopis	3	Wallis 2018[8]
Euphausiid	*Thysanoessa gregaria*	15	Croxhall et al,. 1985
Euphausiid	*Thysanoessa macrura*	17.2	Färber -Lora, 1994
Euphausiid	*Thysanoessa spp.*	15	T. gregaria
Ostracoda	*Evadne spp*	0.75	Richardson et al., 2006
Ostracoda	Ostracoda indet	0.7	Podon/Evadne sp.
Ostracoda	*Penilia avirostris*	1.1	Richardson et al., 2006
Ostracoda	*Podon* spp.	0.65	Richardson et al., 2006
Pteropoda	*Clio pyramidata*	7.43	Iersel et al., 1982
Pteropoda	Limacina sp.	1.5	Richardson et al., 2006[9]

Supplementary table 2: A list of the species and taxonomic groups used for the length-weight conversions within the Continuous Plankton Recorder dataset. All Copepoda lengths are taken from the trait database of marine copepods compiled by (Brun et al., 2017). The sizes are the mean lengths recorded for adult females. Notes: For broader taxonomic groups or life stages we assume that these belong to the more common species belonging to that group within the area. [1.] *Hypierella dilatata* [2]. *Parathemisto gaudichaudii & Primno macropa.* [3.] *Tompteris helgolandica.* [4.] Mean trunk length of the cosmopolitan species *Oikopleura dioica*. [5.] *Sagitta setosa stage I* [6.] *T longicaudata* is most commonly found in samples of the North Atlantic CPR (Lindley, 1977) [7.] *T. longicaudata calyptosis stage III* [8.] *T. macrura calyptosis stage III.* [9.] *Limacina retroversa*

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