

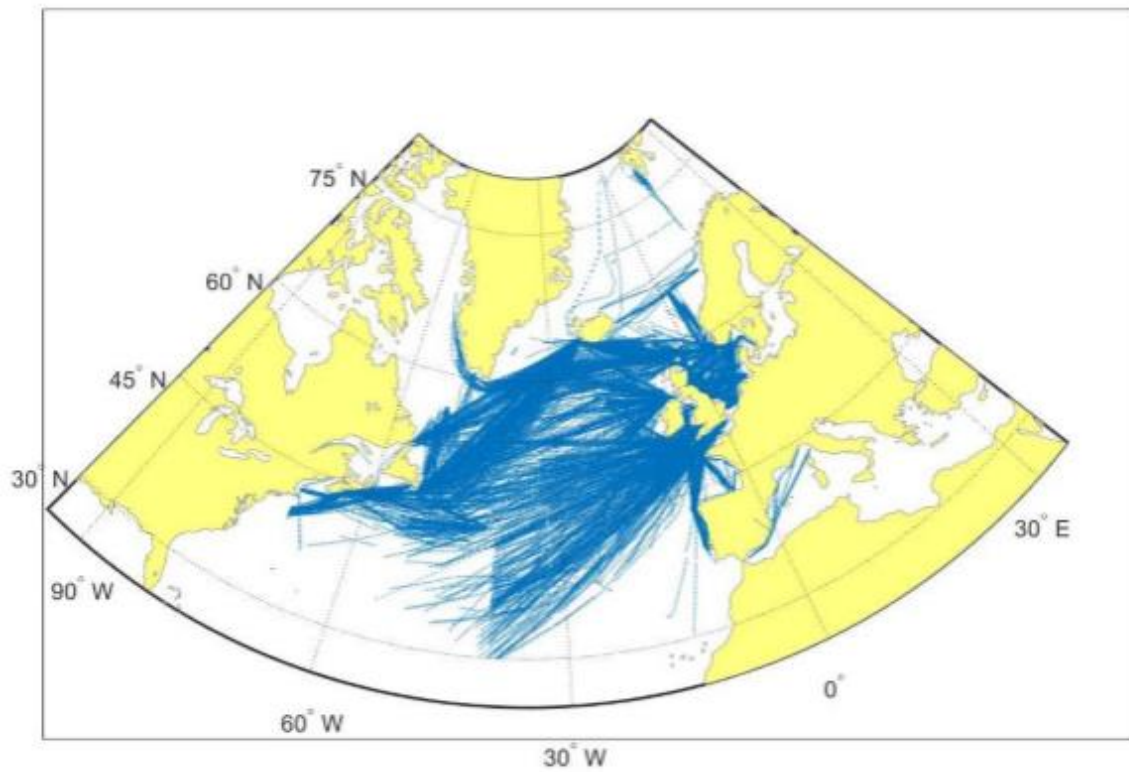
## SUPPLEMENTARY MATERIAL

**Supplementary Table 1.** A list of all copepod species considered in the study and their body size measurements recorded from Rose (1933).

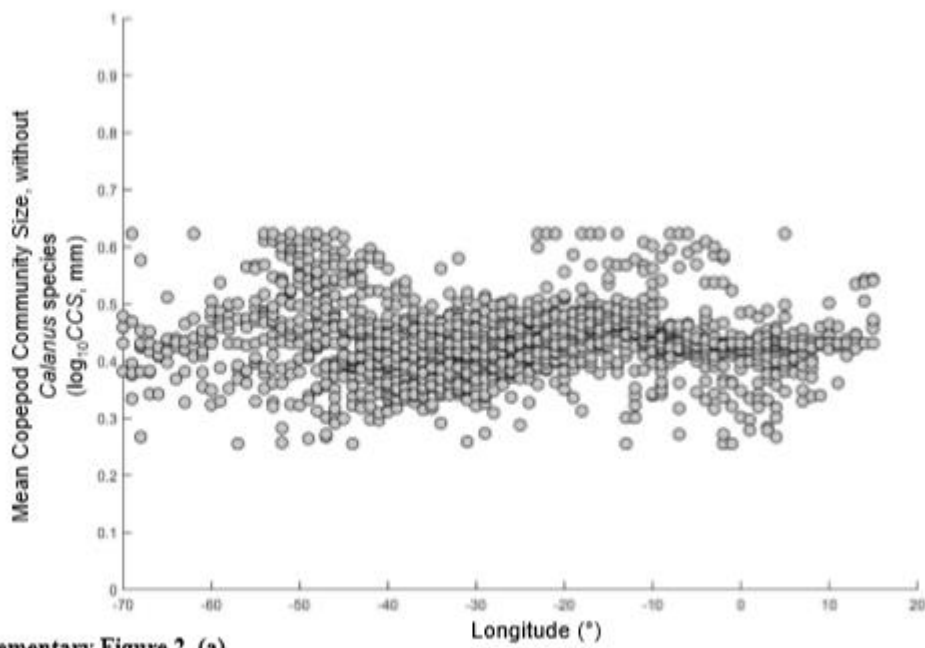
<b>Copepod species</b>	<b>Female prosome length (mm)</b>	<b>Copepod species</b>	<b>Female prosome length (mm)</b>
<i>Calanus finmarchicus</i>	4.05	<i>Euchirella messinensis</i>	5.4
<i>Calanus helgolandicus</i>	3.0	<i>Euchirella pulchra</i>	4.4
<i>Calanus glacialis</i>	2.4	<i>Gaetanus minor</i>	2.25
<i>Calanus hyperboreus</i>	8.0	<i>Haloptilus longicornis</i>	2.3
<i>Neocalanus gracilis</i>	2.4	<i>Haloptilus spiniceps</i>	4.05
<i>Nannocalanus minor</i>	1.8	<i>Heterorhabdus abyssalis</i>	2.4
<i>Calanoides carinatus</i>	2.55	<i>Heterorhabdus norvegicus</i>	3.5
<i>Rhincalanus nasutus</i>	4.5	<i>Heterorhabdus papilliger</i>	2.0
<i>Euchirella rostrata</i>	3.0	<i>Paracandacia bispinosa</i>	1.82
<i>Euchaeta acuta</i>	4.2	<i>Phaenna spinifera</i>	1.95
<i>Metridia lucens</i>	2.7	<i>Pleuromamma piseki</i>	1.78
<i>Metridia longa</i>	4.2	<i>Pleuromamma xiphias</i>	4.5
<i>Pleuromamma robusta</i>	3.65	<i>Rhincalanus cornutus</i>	3.6
<i>Pleuromamma abdominalis</i>	2.7	<i>Scolecithrix bradyi</i>	1.3
<i>Pleuromamma borealis</i>	2.25	<i>Scolecithrix danae</i>	2.2
<i>Pleuromamma gracilis</i>	2.0	<i>Scottocalanus persecans</i>	5.28
<i>Candacia armata</i>	2.3	<i>Undeuchaeta major</i>	5.0
<i>Labidocera wollastoni</i>	2.3	<i>Undeuchaeta plumosa</i>	3.7
<i>Miracia efferata</i>	1.85	<i>Undinula vulgaris</i>	3.25
<i>Pontellina plumata</i>	1.73	<i>Neocalanus robustior</i>	4.41
<i>Scaphocalanus echinatus</i>	1.92	<i>Paracandacia simplex</i>	1.93
<i>Heterorhabdus spinifer</i>	1.72	<i>Candacia varicans</i>	2.3
<i>Aetideus armatus</i>	1.87	<i>Heterostylites longicornis</i>	3.0

<i>Anomalocera patersoni</i>	3.65	<i>Labidocera aestiva</i>	2.05
<i>Candacia bipinnata</i>	2.43	<i>Scottocalanus securifrons</i>	4.7
<i>Candacia curta</i>	2.7	<i>Heterorhabdus clausi</i>	2.4
<i>Candacia ethiopica</i>	2.48	<i>Haloptilus acutifrons</i>	2.9
<i>Candacia longimana</i>	3.75	<i>Labidocera acutifrons</i>	3.78
<i>Candacia norvegica</i>	3.2	<i>Oculosetella gracilis</i>	1.3
<i>Candacia pachydactyla</i>	2.5	<i>Pontellopsis regalis</i>	4.2
<i>Candacia tenuimana</i>	2.31	<i>Corycaeus speciosus</i>	2.03
<i>Centropages bradyi</i>	2.25	<i>Heterorhabdus oikoumenikis</i>	2.48
<i>Centropages chierchiae</i>	1.85	<i>Mesocalanus tenuicornis</i>	1.8
<i>Centropages violaceus</i>	1.84	<i>Aetideus giesbrechti</i>	2.12
<i>Eucalanus hyalinus</i>	6.92	<i>Subeucalanus crassus</i>	3.7
<i>Euchaeta marina</i>	3.1	<i>Subeucalanus monachus</i>	2.2
<i>Euchaeta media</i>	3.5	<i>Subeucalanus mucronatus</i>	3.3
<i>Euchaeta pubera</i>	4.0	<i>Subeucalanus pileatus</i>	2.5
<i>Euchaeta spinosa</i>	6.4	<i>Paraeuchaeta glacialis</i>	10.0
<i>Euchirella amoena</i>	4.0	<i>Paraeuchaeta gracilis</i>	6.8
<i>Euchirella curticauda</i>	4.4	<i>Paraeuchaeta tonsa</i>	6.5
		<i>Parathalestris croni</i>	2.3

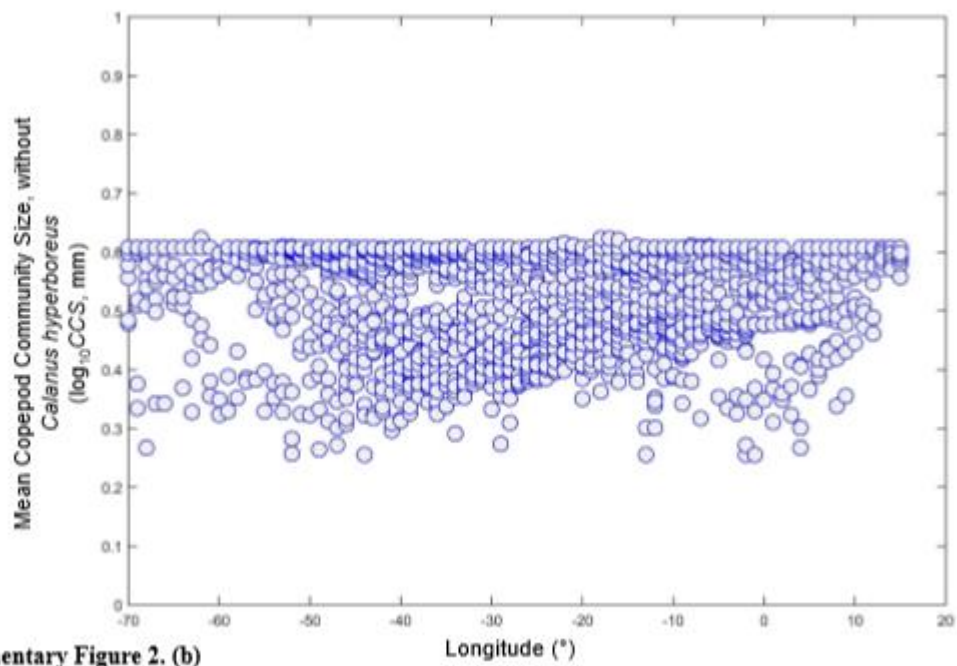
---



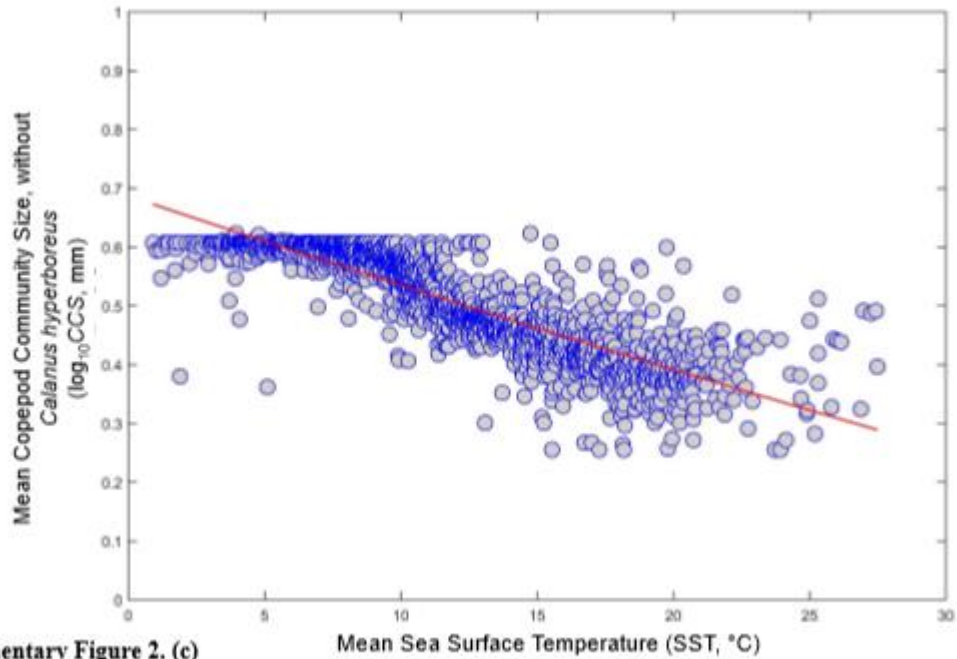
**Supplementary Figure 1.** A spatial distribution of zooplankton samples collected by ‘Ships of Opportunity’ and used to construct the CPR dataset across the time period 1957 and 2014 and the North Atlantic.



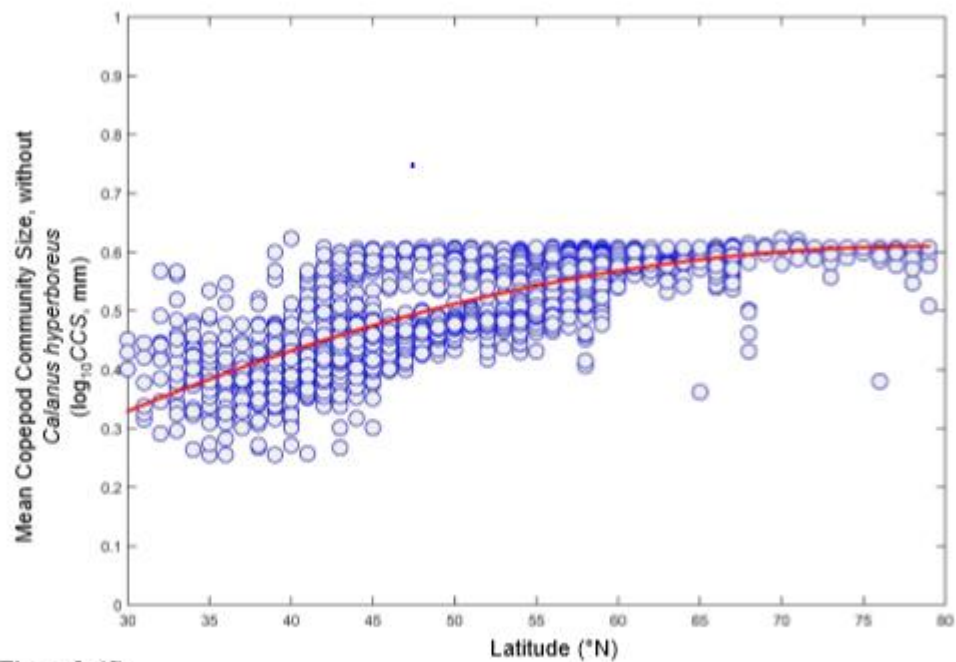
Supplementary Figure 2. (a)



Supplementary Figure 2. (b)



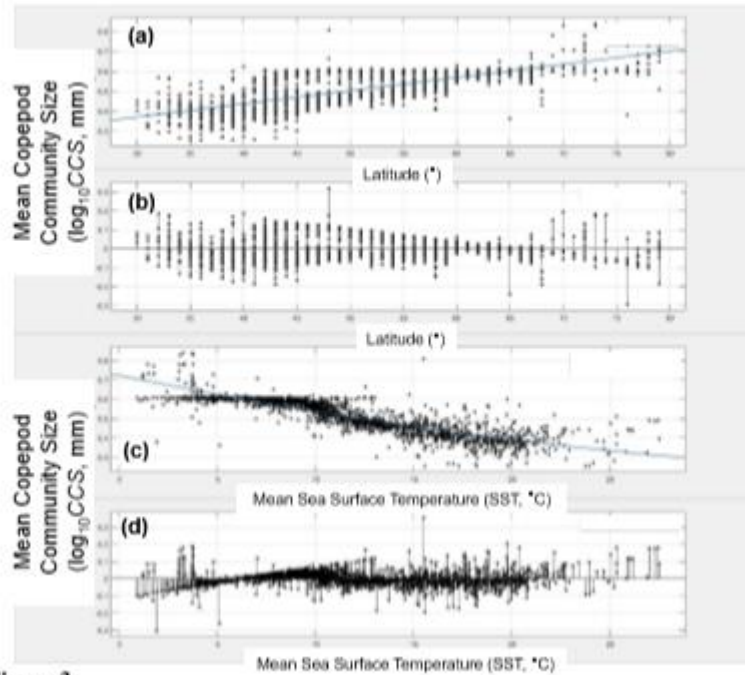
Supplementary Figure 2. (c)



Supplementary Figure 2. (d)

**Supplementary Figure 2.** The relationship between copepod community body size (*CCS*) and longitude (°N) per  $1^{\circ} \times 1^{\circ}$  grid cell in the North Atlantic between 1958 and 2014 with (a) *Calanus* species removed in grey data points and (b) *Calanus hyperboreus* species removed in grey blue data points. There is no significant correlation between body size (*CCS*, mm)

and longitude ( $^{\circ}$ ) for **(a)** *Calanus* species removed ( $R^2 = 0.0004$ ,  $p > 0.05$ ,  $n = 4300$ ) and **(b)** with *Calanus hyperboreus* removed ( $R^2 = 0.0001$ ,  $p > 0.05$ ,  $n = 4300$ ). There is a significant negative correlation between community body size (CCS) and temperature (SST) for **(c)** all species with *Calanus hyperboreus* removed ( $R^2 = 0.73$ ,  $p < 0.0001$ ,  $n = 4300$ ,  $CCS = 3.971e-05 T^2 - 0.02T + 0.7$ ). There is a significant correlation between body size (CCS, mm) and latitude (lat,  $^{\circ}$ N) for **(d)** all species with *Calanus hyperboreus* removed ( $R^2 = 0.56$ ,  $p < 0.0001$ ,  $n = 4300$ ,  $CCS = -0.00011lat^2 + 0.02lat - 0.12$ ).



**Supplementary Figure 3.**

**Supplementary Figure 3.** Residual plots highlighting the relationships between CCS and SST under different scenarios: (a) latitude with CCS for all species, (b) latitude with CCS for data with *Calanus* species removed, (c) SST with CCS for all species, (d) SST with CCS for data with *Calanus* species removed. The residuals for all different scenarios indicate an even spread of data on both sides of the line.