Supplementary Material for

**Mesozooplankton biomass distribution in the West Spitsbergen Current (2001-2014)**

Jacob Carstensen1\*, Anna Olszewska2, Slawomir Kwaśniewski2

1 Dept of Bioscience, Aarhus University, Frederiksborgvej 399, DK-4000 Roskilde, Denmark

2 Institute of Oceanology, Polish Academy of Sciences, Powstanców Warszawy 55, 81-712 Sopot, Poland

\* Corresponding author: [jac@bios.au.dk](mailto:jac@bios.au.dk)

**TABLE S1 | Standard errors of the random variations in Eq. (1).** Standard errors are expressed as absolute errors for temperature and salinity, and as relative errors for total zooplankton biomass since this variable was log-transformed in the statistical analysis. Note that zero values imply that the standard error of the random factor could not be estimated separately and that random variation from the factor is included in other sources of random variation.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| WSC branch | Variable | SE[] | SE[] | SE[] | SE[] |
| Western | Temperature | 0.28 | 0.74 | 0.00 | 0.61 |
|  | Salinity | 0.018 | 0.102 | 0.000 | 0.090 |
|  | Total biomass | 0.0% | 0.0% | 89.8% | 0.0% |
| Eastern | Temperature | 0.46 | 0.14 | 0.26 | 0.29 |
|  | Salinity | 0.024 | 0.010 | 0.033 | 0.018 |
|  | Total biomass | 18.5% | 35.1% | 91.0% | 31.9% |
| Coastal | Temperature | 1.01 | 0.64 | 0.00 | 0.68 |
|  | Salinity | 0.197 | 0.080 | 0.000 | 0.203 |
|  | Total biomass | 0.0% | 64.7% | 66.0% | 40.7% |

**TABLE S2 | List of species, genera and higher rank taxa identified in the zooplankton of the studied upper layer (0-60 m) of the West Spitsbergen Current.** Presence of each of the distinguished taxa in individual WSC branches (west – w, east – e and coastal – c) indicated by “+” sign in individual column.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Species/taxon name | | Order/Superorder | Class/Subclass | | Phylum/Subphylum | w | e | c | |
| *Calanus finmarchicus* | |  |  | |  | + | + | + | |
| *Calanus glacialis* | |  |  | |  | + | + | + | |
| *Calanus hyperboreus* | |  |  | |  | + | + | + | |
| *Microcalanus* spp. | |  |  | |  | + | + | + | |
| *Pseudocalanus* spp. | |  |  | |  | + | + | + | |
| *Metridia longa* | |  |  | |  | + | + | + | |
| *Paraeuchaeta norvegica* | |  |  | |  | + | + | + | |
| *Acartia longiremis* | |  |  | |  | + | + | + | |
| *Aetideopsis minor* | |  |  | |  | + |  |  | |
| *Aetideus armatus* | |  |  | |  |  |  | + | |
| *Chiridius obtusifrons* | |  |  | |  | + |  |  | |
| *Gaetanus tenuispinus* | |  |  | |  | + | + |  | |
| *Paraeuchaeta glacialis* | |  |  | |  | + | + |  | |
| *Heterorhabdus norvegicus* | |  |  | |  | + | + | + | |
| *Metridia lucens* | |  |  | |  | + | + | + | |
| *Pleuromamma robusta* | |  |  | |  |  | + | + | |
| *Rhincalanus nasutus* | |  |  | |  |  | + |  | |
| *Scaphocalanus magnus* | |  |  | |  |  | + |  | |
| *Scolecithricella minor* | |  |  | |  | + | + | + | |
| *Anomalocera patersoni* | |  |  | |  |  | + |  | |
| *Temora longicornis* | |  |  | |  |  | + | + | |
| *Paracalanus parvus* | |  |  | |  | + | + |  | |
| *Eucalanus hyalinus* | |  |  | |  |  | + |  | |
| Calanoida small indet. | | Calanoida |  | |  |  | + |  | |
| *Microsetella norvegica* | |  |  | |  | + | + | + | |
| Harpacticoida indet. | | Harpacticoida |  | |  |  | + | + | |
| *Oithona atlantica* | |  |  | |  | + | + | + | |
| *Oithona similis* | |  |  | |  | + | + | + | |
| *Oithona nana* | |  |  | |  | + | + |  | |
| *Triconia borealis* | |  |  | |  | + | + | + | |
| *Triconia conifera* | |  |  | |  |  | + | + | |
| *Oncaea* spp. | | Cyclopoida |  | |  | + | + | + | |
| *Hyalopontius typicus* | | Siphonostomatoida | Copepoda | |  |  | + |  | |
| *Evadne nordmanni* | |  |  | |  |  | + | + | |
| *Bosmina coregoni* | |  |  | |  |  | + |  | |
| *Podon leuckarti* | | Cladocera | Branchiopoda | |  |  | + |  | |
| Ostracoda | | Halocyprida | Ostracoda | |  | + | + | + | |
| Cirripedia larvae | | Cirripedia |  | |  | + | + | + | |
| Cirripedia Facetotecta | | Facetotecta | Theostraca | |  |  | + | + | |
| *Hyperia galba* | |  |  | |  |  | + |  | |
| *Hyperoche medusarum* | |  |  | |  |  |  | + | |
| *Themisto abyssorum* | |  |  | |  | + | + | + | |
| *Themisto libellula* | |  |  | |  | + | + | + | |
| *Gammarus wilkitzkii* | |  |  | |  |  | + | + | |
| *Hyperia medusarum* | |  |  | |  | + |  |  | |
| Gammaridae | | Amphipoda |  | |  |  |  | + | |
| Isopoda Bopyridae | |  |  | |  | + | + | + | |
| Isopoda indet. | | Isopoda |  | |  | + | + |  | |
| *Meganyctiphanes norvegica* | |  |  | |  |  | + |  | |
| *Thysanoessa inermis* | |  |  | |  | + | + | + | |
| *Thysanoessa longicaudata* | |  |  | |  | + | + | + | |
| *Thysanoessa raschii* | | Euphausiacea |  | |  | + | + |  | |
| *Pagurus pubescens* | |  |  | |  |  | + | + | |
| *Hyas araneus* | |  |  | |  |  | + | + | |
| *Pandalus borealis* | |  |  | |  |  | + | + | |
| *Sergestes groenlandicus* | |  |  | |  |  | + |  | |
| *Munida* spp. zoea | |  |  | |  |  | + |  | |
| *Pontophilus norvegicus* | |  |  | |  |  | + |  | |
| Decapoda larvae | | Decapoda | Malacostraca | | Arthropoda/Crustacea |  | + | + | |
| *Aglantha digitale* | |  |  | |  | + | + | + | |
| *Euphysa flammea* | |  |  | |  |  |  | + | |
| *Halitholus cirratus* | |  |  | |  |  | + | + | |
| *Sarsia* spp. | |  |  | |  |  |  | + | |
| *Halopsis ocellata* | |  |  | |  | + | + | + | |
| Hydromedusae indet. | | Hydromedusae |  | |  | + | + | + | |
| *Dimophyes arctica* | |  |  | |  |  | + | + | |
| *Nanomia cara* | |  |  | |  |  | + |  | |
| Siphonophora indet. | | Siphonophora | Hydrozoa | |  |  | + |  | |
| Hydrozoa anthipatula | | not identified | Anthozoa | | Cnidaria |  | + | + | |
| *Beroe cucumis* | | Beroida | Nuda | |  | + | + | + | |
| *Mertensia ovum* | | Cyddipida | Tentaculata | | Ctenophora | + | + | + | |
| Nemertea pilidium | | not identified | not identified | | Nemerta |  | + | + | |
| *Clione limacina* | |  |  | |  | + | + | + | |
| *Limacina helicina* | |  |  | |  | + | + | + | |
| *Limacina retroversa* | | Pteropoda |  | |  | + | + | + | |
| Gastropoda veliger | | not identified | Gastropoda | |  | + | + | + | |
| Bivalvia veliger | | not identified | Bivalvia | | Mollusca | + | + | + | |
| *Pelagobia longicirrata* | |  |  | |  |  | + |  | |
| *Tomopteris* spp. | | Phyllodocida |  | |  |  | + | + | |
| Polychaeta indet. | | not identified | Polychaeta | | Annelida | + | + | + | |
| Echinodermata larvae | | not identified | not identified | | Echinodermata | + | + | + | |
| Bryozoa larvae | | not identified | not identified | | Ectoprocta |  | + | + | |
| Hemichordata tornaria larvae | | not identified | not identified | | Hemichordata |  | + |  | |
| *Eukrohnia hamata* | | Phragmophora |  | |  | + | + | + | |
| *Parasagitta elegans* | | Aphragmophora | Sagittoidea | | Chaetognatha | + | + | + | |
| *Fritillaria borealis* | |  |  | |  | + | + | + | |
| *Oikopleura* spp. | | Copelata | Appendicularia | | Chordata/Tunicata | + | + | + | |
| Pisces larvae | | not identified | Pisces | | Chordata/Vertebrata | + | + | + | |
|  | |  |  | |  |  |  |  | |
| Operational Taxonomic Units | |  |  | |  |  |  |  | |
| Aetideidae CI-CIII | |  |  | |  | + | + | + | |
| Copepoda nauplii | |  |  | |  | + | + | + | |
| Euphausiacea larvae | |  |  | |  | + | + | + | |
| Ctenophora larvae | |  |  | |  |  | + | + | |
| Polychaeta larvae | |  |  | |  | + | + | + | |
|  | | |  | | | | |
|  | | |  | | | | |
|  | | |  | | | | |
| **FIGURE S1 | Temperature versus salinity for zooplankton samples for the six transects in the West Spitsbergen Current categorized into western, eastern and coastal branches.** | | | | | | | |

|  |
| --- |
|  |
|  |
|  |
| **FIGURE S2 | Variability of spatial trends in zooplankton biomass across years for the three WSC branches.** |