

Plan 9: Research

Benthic Invertebrate
Community Monitoring &
Indicator Development for
the Barnegat Bay-Little Egg
Harbor Estuary -

Barnegat Bay Diatom
Nutrient Inference Model

Hard Clams as
Indicators of Suspended
Particulates in Barnegat Bay

Assessment of Fishes &
Crabs Responses to
Human Alteration
of Barnegat Bay

Assessment of Stinging Sea
Nettles (Jellyfishes) in
Barnegat Bay

Baseline Characterization
of Phytoplankton and
Harmful Algal Blooms

Multi-Trophic Level
Modeling of Barnegat
Bay

Ecopath with Eco

Ecological Evaluation of Sedge
Island Marine Conservation
Zone

Tidal Freshwater &
Salt Marsh Wetland
Studies of Changing
Ecological Function &
Adaptation Strategies

Barnegat Bay— Year 1

Zooplankton

Baseline Characterization of
Zooplankton in Barnegat Bay

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**BASELINE SURVEY OF
ZOOPLANKTON OF BARNEGAT BAY**

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Sponsored by NJDEP Office of Science
Monmouth University
Urban Coast Institute

Final Report
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NOAA research scientist J. Hare facilitated shipment of samples to Poland for sorting, as well as the QA/QC of the samples.

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4.0 EXECUTIVE SUMMARY

The goal of this project was to gather information on the status of zooplankton populations in Barnegat Bay and to determine the distribution, abundance, and species composition of important plankters. This project was a cooperative venture between Monmouth University and the James J. Howard Marine Sciences Lab at Sandy Hook, NJ (SHL) which is part of the NOAA/NMFS Northeast Fisheries Science Center.

Zooplankton populations are subject to change due to natural and anthropogenic variations in environmental conditions. Biological conditions, physical conditions and environmental degradation in estuaries exert control over the composition, abundance, and distribution of zooplankton in estuaries and zooplankters must adapt to varying stresses associated with changing conditions. The environment of Barnegat Bay has changed considerably over the three decades since previous studies were conducted. According to the Barnegat Bay Estuary Program's Characterization Report, this back-bay ecosystem has been affected by an array of human impacts that potentially threaten its ecological integrity including

Assessing zooplankton populations in Barnegat Bay will provide updated information on the status of this important component of the bay's living resources that can be added to the bay's natural resource inventory and provide scientific information which could serve as an indicator of trends that may have taken place within the living resources of the bay. As such, this project is consistent with the overall goals and objectives of the monitoring program plans established for the BBNEP and will address a data gap identified in the Characterization Report prepared for the Bay.

Zooplankton samples were collected from the upper meter of the water column with horizontal surface net tows using bongo plankton nets. Samples were conducted monthly during the winter, and twice a month during spring, summer, and fall. Sites were located along a longitudinal transect in the bay, and corresponded with NJDEP water quality testing sites. Data were collected on the zooplankton community in the bay, including ichthyoplankton, gelatinous macrozooplankton, and important groups such as copepods, decapods, and bivalves. Results and recommendations for future work are presented in this report.

5.0 INTRODUCTION/PROBLEM STATEMENT

Plankton are organisms that live floating or suspended in marine and estuarine waters. Plankton range in size from very small microbes less than 0.05 mm to jellyfish and other gelatinous species that can exceed 1 m in diameter and have tentacles extending over 10 m (Kingsford and Battershill 2000). Phytoplankton include microscopic unicellular, colonial, or filamentous forms of primary producing algae. Zooplankton include both unicellular and multicellular planktonic animals. Zooplankton are typically categorized by life style and size. Zooplankton that spend their entire lives as plankton are known as holoplankton. Others, such as the larval stages of

many benthic invertebrates, only spend part of their lives as plankton. These species are known as meroplankton (Johnson and Allen 2005, Kingsford and Battershill 2000).

In terms of classifying zooplankton by size, three categories are generally described – microzooplankton, mesozooplankton, and macrozooplankton. Microzooplankton are organisms that are classified as being approximately 20 to 202 μm in length, being at the smaller end of the size spectrum for zooplankton. The predominant microzooplankton include ciliate, flagellate, and amoeboid protozoa and copepod nauplii which float passively in the water column due to their limited abilities to move. Zooplankton in the 0.2 to 2.0 mm size range dominate the group known as mesozooplankton. Copepods are typically the most commonly encountered mesozooplankton. Other common mesozooplankton include rotifers, larval barnacles, crab zoeae, and mollusk veligers. The largest zooplankton are classified as macrozooplankton. Macrozooplankton include shrimps, larval fishes, and other large, mobile planktonic animals as well as ctenophores and jellyfish (Johnson and Allen 2005).

The most recent definitive studies of zooplankton in Barnegat Bay were conducted in the 1970's and summarized by Sandine (1984) and Kennish (2001). These studies indicate that, in general, macrozooplankton abundance peaks in the spring and summer months in response to phytoplankton food supply. In terms of species composition, as reported in Sandine (1984) and summarized by Kennish (2001), common macrozooplankton in the bay include hydromedusae (*Rathkea octopunctata*), shrimps (*Neomysis americana*, *Crangon septemspinosa*), larval crabs (*Neopanope texana*, *Panopeus herbstii*, *Rhithropanopeus harrisii*), amphipods (*Jassa falcata*), arrowworms (*Sagitta* spp.) and hydroids (*Sarsia* spp.). Ctenophores (*Mnemiopsis leidyi* and *Beroe* sp.) are also sometimes common, especially from summer to fall.

As the main herbivorous component of marine ecosystems, zooplankton play an important role in estuarine food webs. Macrozooplankton are particularly important because they are intermediaries in estuarine food chains, forming a link between smaller zooplankton and higher trophic levels, including many commercially and recreationally valuable fishes (Gewant and Bollens 2005). However, despite their importance in filling this niche, little is known about the distribution, abundance, and ecology of macrozooplankton in many coastal regions (Wilson et al. 2003). This is the case in the Barnegat Bay ecosystem. As noted by Kennish (2001), there has not been a detailed survey of zooplankton in the Barnegat Bay estuary since the 1970's. Furthermore, the most detailed of those studies (Tatham et al. 1977, 1978) focused on the central bay from Cedar Creek (Lanoka Harbor) south to Double Creek (Barnegat) (Sandine 1984).

Typically, in Mid-Atlantic and northeastern estuaries, short but intense blooms of ctenophores, primarily *Mnemiopsis leidyi*, occur in late summer and early fall (Kremer 1994); however, several recent studies have documented an expansion in ctenophore abundance and seasonal distribution to include spring and early summer blooms. This shift appears to be related to increasing average water temperatures (Sullivan et al. 2001, McNamara et al. 2009). If such a shift in the seasonal pattern and abundance of ctenophores is occurring in Barnegat Bay, it could

have an impact on the abundance of other planktonic assemblages, as ctenophores are voracious predators on a variety of zooplankton, including bivalve veligers, copepods, and nauplii (Sullivan et al. 2001, McNamara et al. 2009).

Sea nettles (*Chrysaora quinquecirrha*) are becoming more abundant in Mid-Atlantic estuaries including Barnegat Bay, reaching peak numbers in mid to late summer. This phenomenon has apparently resulted from warmer summer water temperatures and increased eutrophication. Due to their severe sting, sea nettles are a nuisance and pose a hazard to recreational users of the bay. In Barnegat Bay, high summer concentrations of sea nettles have been observed north of the Toms River, which is included in the study area for this project, for several summers (BBNEP 2006). Documentation of the seasonal patterns of sea nettle distribution and abundance could also serve as an indicator of the health of the bay.

Updated information on ctenophore and sea nettle distribution and abundance may also assist scientists attempting to understand fishery declines in the bay since sea nettles, as well as some species of ctenophores such as *Mnemiopsis leidyi*, are known to prey on fish eggs and larval fishes (Purcell undated, Mills 2009).

6.0 PROJECT DESIGN AND METHODS

Zooplankton were collected from the upper meter of the water column with horizontal surface net tows using bongo plankton nets, with one 500 μ and one 202 μ paired sample. Nets were rigged with a flow meter to determine the volume of flow in order to calculate catch per unit effort (CPUE). Abiotic parameters were collected using a YSI meter and Secchi disc. Gelatinous macrozooplankton disintegrate when stored in a fixative, so they were processed fresh in the laboratory. Ichthyoplankton were removed before the zooplankton sample was preserved, and stored in 95% ethanol. Ichthyoplankton were retained at Monmouth University, and were identified with the assistance of the ichthyoplankton laboratory at Rutgers University Marine Field Station, Tuckerton, NJ. The remaining zooplankton were preserved in 5% formalin. The 202 μ samples were separated in the laboratory with a 500 μ and a 202 μ sieve to produce a 200 – 500 μ fraction. This was designated the “200 μ ” sample. One each of a 500 μ and 200 μ sample for each site at each sampling event was selected randomly for transport to a sorting laboratory, Morski Instytut Rybacki - Państwowy Instytut Badawczy (MIR), Zakład Sortowania i Oznaczania Planktonu (ZSIOP) in Poland. This laboratory has sorted plankton as a NOAA contractor for almost 40 years.

Data collected on the ctenophores *Mnemiopsis leidyi* and *Beroe ovata* included total volume per tow, total count per tow, and lengths of 20 haphazardly selected individuals from each sample. Catch per unit effort (CPUE) was calculated by incorporating volume of flow collected from the flow meters attached to the plankton nets. Length of the bell was measured longitudinally from apex to the top of the lobes; length was not measured to the bottom of the lobes as the lobes may

break off during collection and handling. Data collected on sea nettle *Chrysaora quinquecirrha* included total volume per tow, total count per tow, and bell width.

One sample set was collected at each of the three sites, 2, 5a, and 12 from May 2012 through the first sampling event in September 2012. Sites 7a and 10 were added beginning at the second sampling event in September 2012. These two additional sites provided a more comprehensive north/south transect of the bay. A sample set was defined as a pair of 500 μm and a pair of 202 μm plankton samples collected at a site, accompanied by the abiotic parameters water temperature, salinity, conductivity, dissolved oxygen (DO) mg/l, DO %saturation (%sat), pH, Secchi depth, and water depth. A sampling event was the collection of sample sets at all sites, typically over a two-day period. Sampling events occurred twice monthly during April – October, and once monthly during November – March.

Sampling was conducted at all five sites on October 24 – 25, 2012, a few days before Superstorm Sandy arrived in New Jersey on October 29, 2012. Sampling at all sites resumed on November 29 – 30, 2012. Two 24 hour sampling events occurred, one in July 2012 and one in October 2012.

7.0 QUALITY ASSURANCE

A Quality Assurance Project Plan was approved by NJDEP for this study. NOAA conducted a QA/QC protocol on plankton samples returned from the sorting laboratory (Appendix 1).

8.0 RESULTS AND DISCUSSION

A total of 19 regular sampling events took place at Sites 2, 5a, and 12 during May 2012 – May 2013, and Sites 7a and 10 during late September 2012 – May 2013. Two intensive sampling events were conducted in July and October 2012 at Site 5a. During the July sampling event, samples were collected every six hours during a 24 hr period. During the October sampling event, samples were collected every four hours during a 24 hr period. Abiotic data were collected during all regular and intensive sampling events. Microzooplankton were collected during all sampling events and were subsequently processed for shipment to the sorting lab. Gelatinous macrozooplankton were collected at all regular sampling events and during the October intensive sampling event.

Field sampling began in late May 2012 at Sites BB2, BB5a, and BB12. Sites BB7a and BB10 were added in late September to provide a more comprehensive sampling regime. In December 2012 tow duration was increased from 2 min to 4 min. Although 2 min was originally planned due to anticipated problems with nets clogging with ctenophores, this did not occur frequently. In order to increase the volume of water sampled and the biovolume of microzooplankton, tow duration was doubled. However, increasing tow duration increases the incidence of collecting rare species and skewing the results when comparing 2 min and 4 min tows. This was considered

an acceptable risk in order to provide a more comprehensive assessment of zooplankton community dynamics.

8.1 Abiotic Data

Water temperature followed trends expected with seasonal changes. Water temperature trends were similar across all five stations (Fig 1a), with a marked dip in temperature at BB10 during April 2013. Salinity was higher at BB7a, 10, and 12 throughout most of Year 1. Salinity is lower in the northern bay (BB2 and 5a) due to riverine input. Salinity dipped at all stations in September 2012, possibly due to a rain event causing input of fresh water into the bay (Fig 1b). Dissolved oxygen (DO) levels were very high in winter 2012-2013. A dramatic increase was seen after the October 2012 sampling event, but it is unclear whether the increase in DO was due to mixing of the water column by Superstorm Sandy, or only due to a decrease in temperature, as cold water holds more oxygen than warm water. A comparison with temperature and dissolved oxygen level in Year 2 may help to resolve the reasons for this trend (Fig 1c). Secchi transparency (water clarity) was very high at BB7a and 10 in October 2012, but decreased dramatically the following month, possibly due to increased particulate matter in the water due to Superstorm Sandy (Fig 1d).

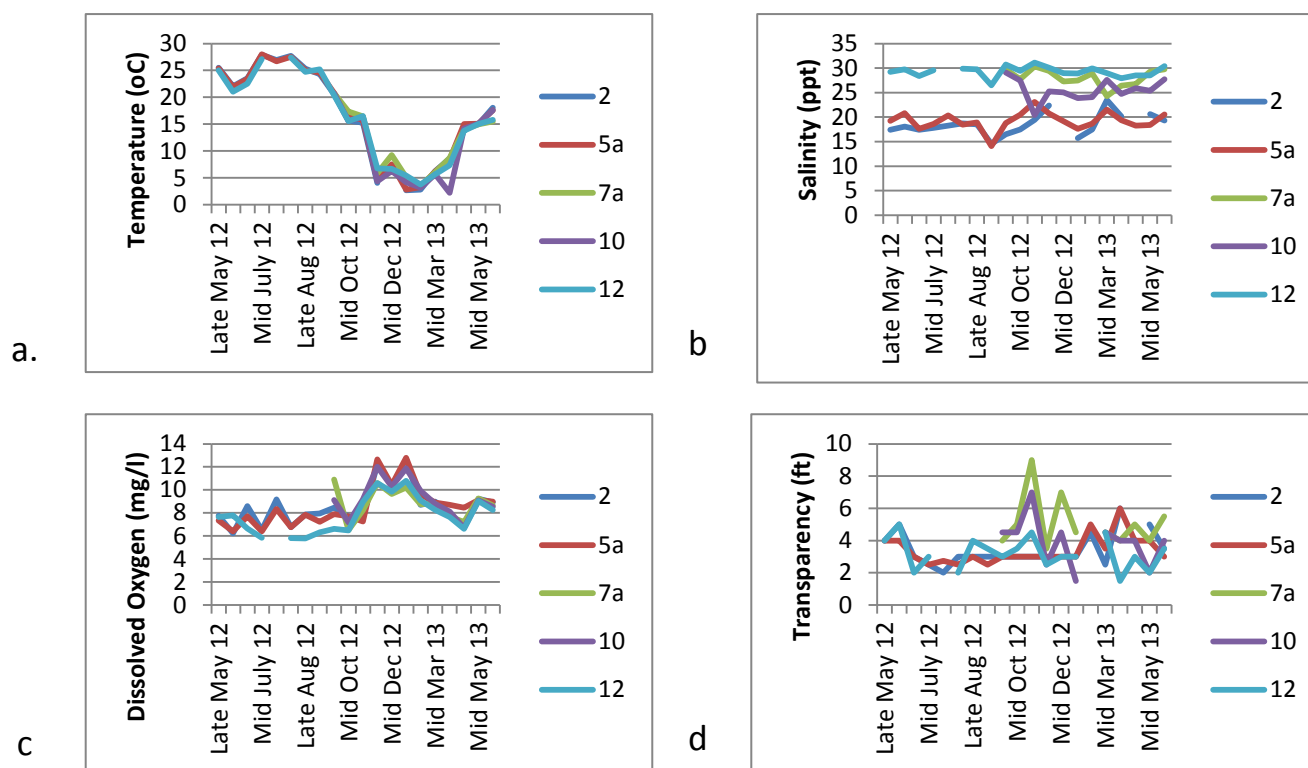


Figure 1. Abiotic data collected at Sites BB2, BB5a, BB7a, BB10, and BB12 in May 2012 – May 2013. a. temperature (°C); b. salinity (ppt); c. dissolved oxygen (mg/l); Secchi transparency (ft). Sites 7a and 10 were added in late September 2012.

Water temperature increased slightly during the 24 hour sampling event at BB5a in July (Fig 2a). Water temperature was colder at Site BB5a for the second intensive sampling event in October 2012 (Fig 2b). Salinity was similar between the two sampling events, and changed slightly with tidal cycles. Dissolved oxygen was similar between the two events.

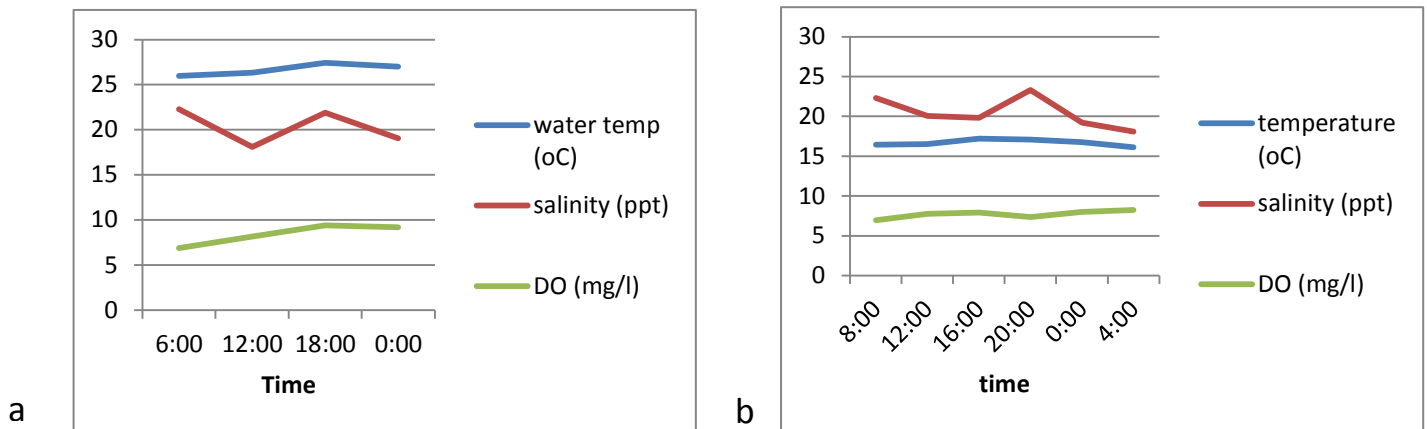


Figure 2. Abiotic data (temperature, salinity, dissolved oxygen) collected at Site BB-5a during intensive sampling events in a) July 2012 and b) October 2012. Samples were collected every 6 hr in July, and every 4 hr in October.

8.2 Zooplankton

Zooplankton samples were sent to a NOAA contractor laboratory for identification and enumeration. There was a large bloom of large zooplankton (over 500 microns) in the fall of 2012 in the southern part of the bay, and a spring bloom in that size class throughout the bay Feb - March 2013 (Fig 3a). A more protracted spring bloom of smaller zooplankton (200-500 micron) occurred Jan – May 2013, with the date of the bloom varying with location (Fig 3b). A large bloom in this size class also occurred during the early summer in the northern bay. A large bloom occurred throughout the bay at the end of November 2012, one month after Superstorm Sandy occurred (Fig 3b).

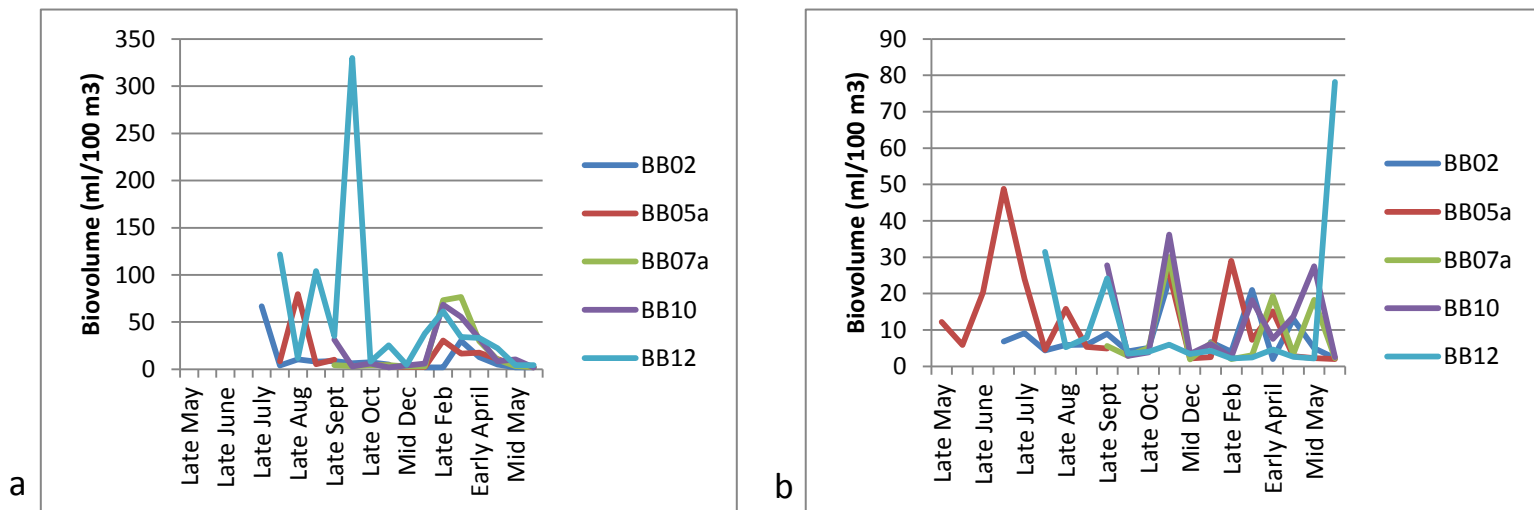


Figure 3. Biovolume collected in 500 µ and 202 µ nets at Sites BB2, BB5a, BB7a, BB10, and BB12 in May 2012 – May 2013. a. Samples from 500 µ net. b. Samples from 202 µ net, which were filtered to separate and process the 200 – 500 µ fraction.

The large bay-wide bloom in biovolume that occurred in November 2012 (Fig 3b) corresponded with a large copepod (*Acartia* spp.) bloom (Fig 4a and 5a). Copepods are an important component of the holoplankton. NOAA monitors several common coastal species in the mid-Atlantic bight, including *Temora longicornis*, *Calanus finmarchicus*, *Pseudocalanus minutus*, *Centropages hamatus*, and *Centropages typicus*. Although these species are common along the coast, they are not as abundant in Barnegat Bay. When they do occur, it is most often associated with the spring bloom (Fig 4 b – f, 5 b - f). The estuarine genus *Acartia* is very abundant throughout the bay, especially associated with the spring and fall blooms. There was an extremely large bloom of *Acartia* spp. one month after Superstorm Sandy occurred. *Acartia* life cycles are approximately four weeks long. The strong surge occurring in the bay may have resuspended copepod resting cysts from bottom sediment. A concomitant increase in POM and nutrients from storm surge runoff may have led to the plankton bloom.

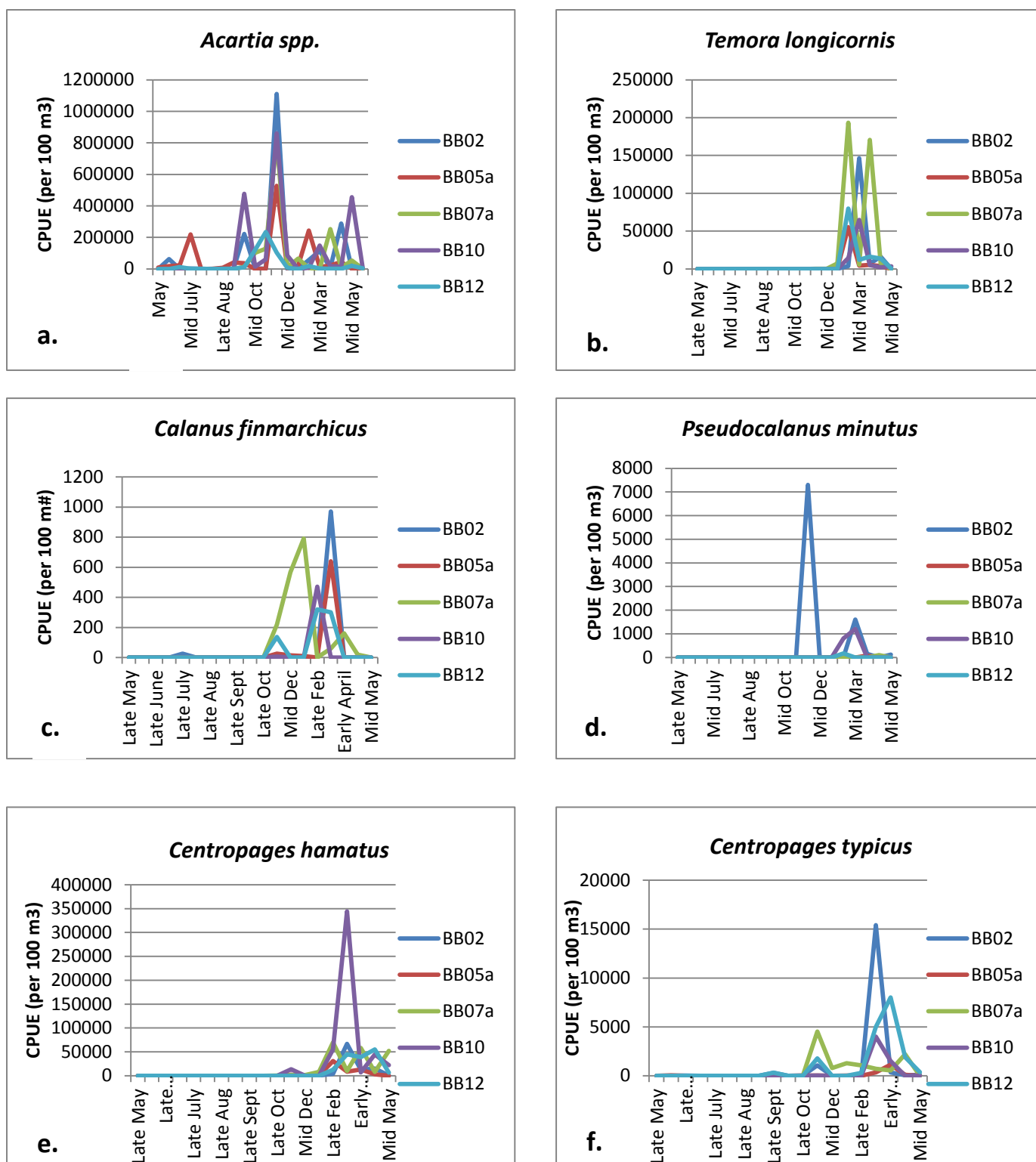


Figure 4. Abundance of copepod species collected at Sites BB2, BB5a, BB7a, BB10, and BB12 in May 2012 – May 2013. Sites BB7a and BB10 were added in late September 2012. a) *Acartia* spp. b) *Temora longicornis*. c) *Calanus finmarchicus* d) *Pseudocalanus minutus* e) *Centropages hamatus* f) *Centropages typicus*.

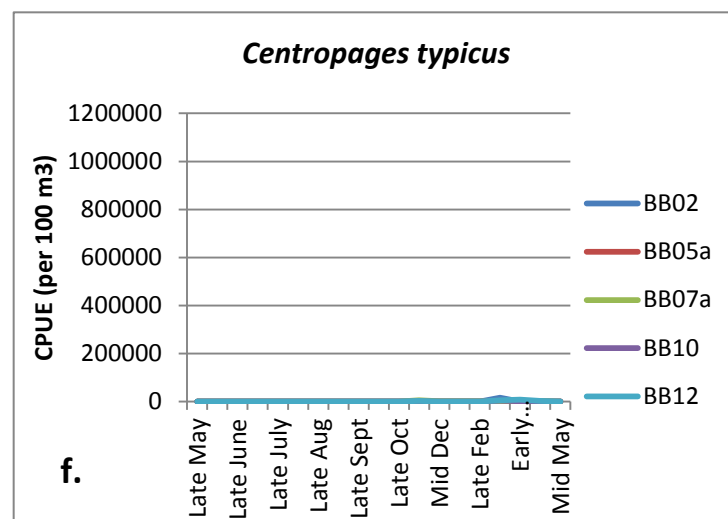
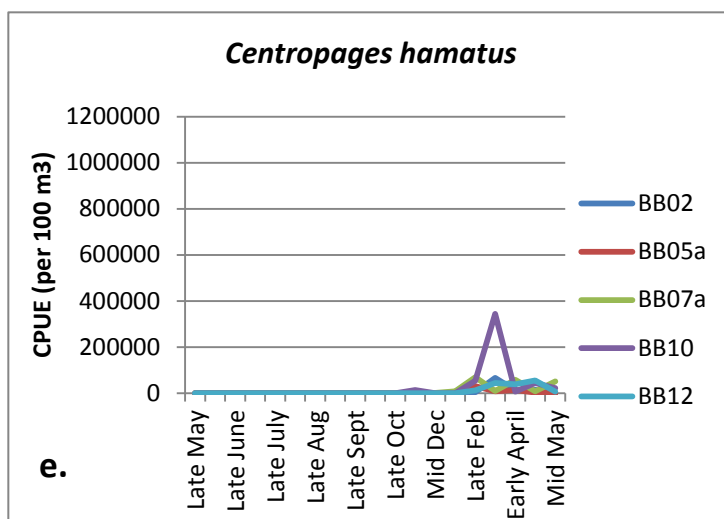
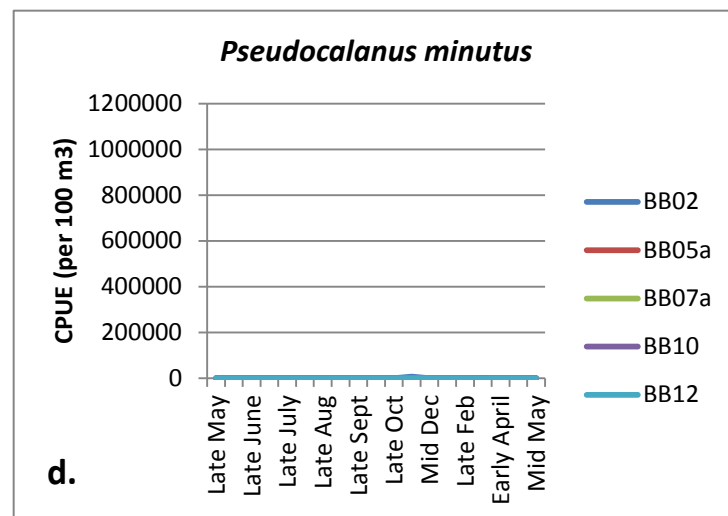
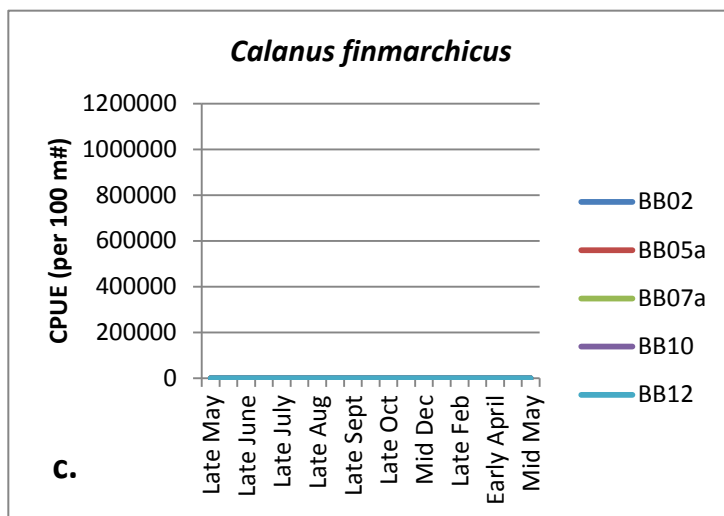
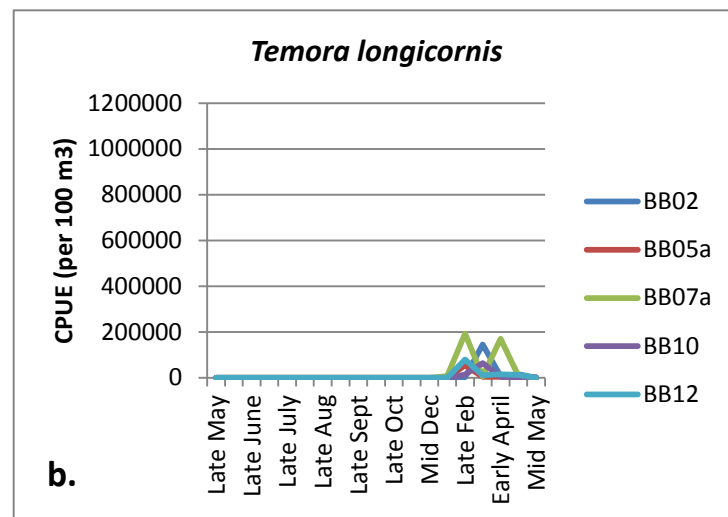
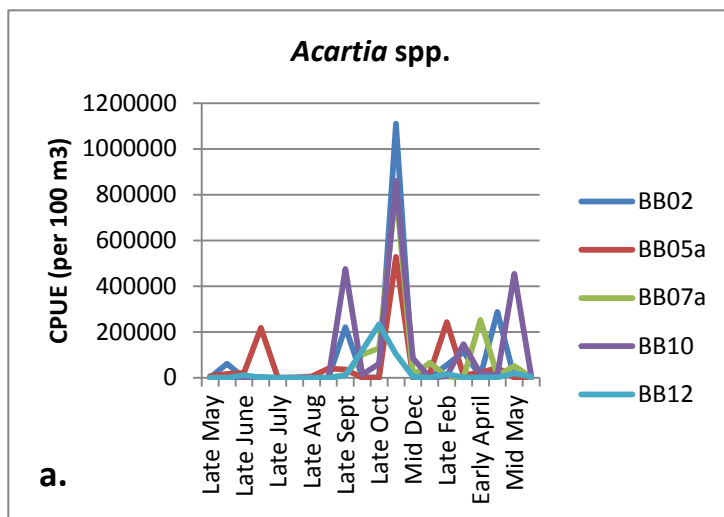


Figure 5. Abundance of copepod species collected at Sites BB2, BB5a, BB7a, BB10, and BB12 in May 2012 – May 2013. Sites BB7a and BB10 were added in late September 2012. Y axis is standardized to the *Acartia* figure for comparison. a) *Acartia* spp. b) *Temora longicornis*. c) *Calanus finmarchicus* d) *Pseudocalanus minutus* e) *Centropages hamatus* f) *Centropages typicus*.

Although decapod and bivalve specimens have not been identified to species, the overall trend in both taxonomic groups shows highest abundances in the spring and fall (Figs 6 and 7). Peak abundance of decapod larvae occurred in the June 2012, Fall 2012, and May 2013. Greatest abundance of bivalve larvae occurred one month after Superstorm Sandy, with an extremely large bloom evident in November, and a smaller one in January. This bloom was at the station closest to Barnegat Inlet, so it is unclear whether these bivalve larvae are from the bay or from coastal populations.

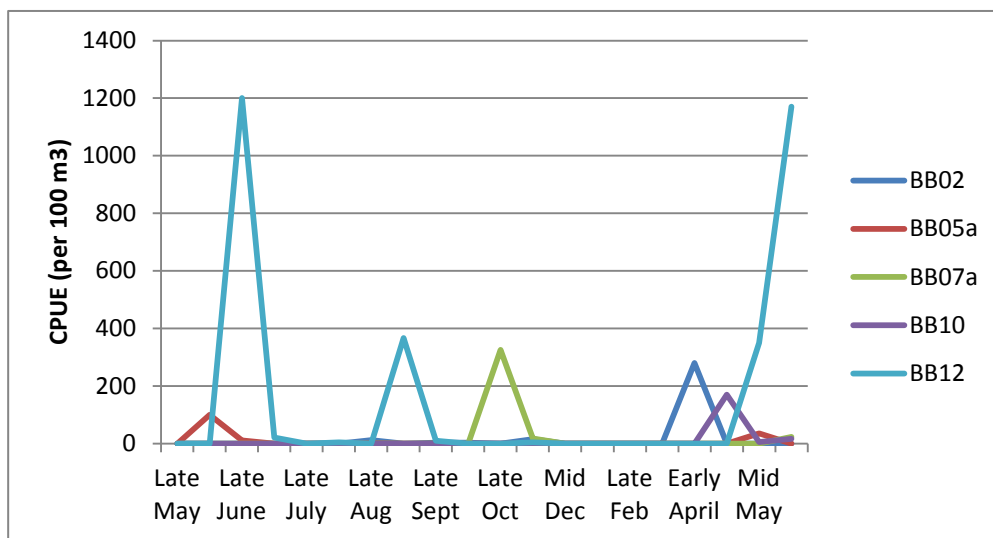


Figure 6. Abundance of decapod larvae (zoeae and megalopae) collected at Sites BB2, BB5a, BB7a, BB10, and BB12 in May 2012 – May 2013. Sites BB7a and BB10 were added in late September 2012.

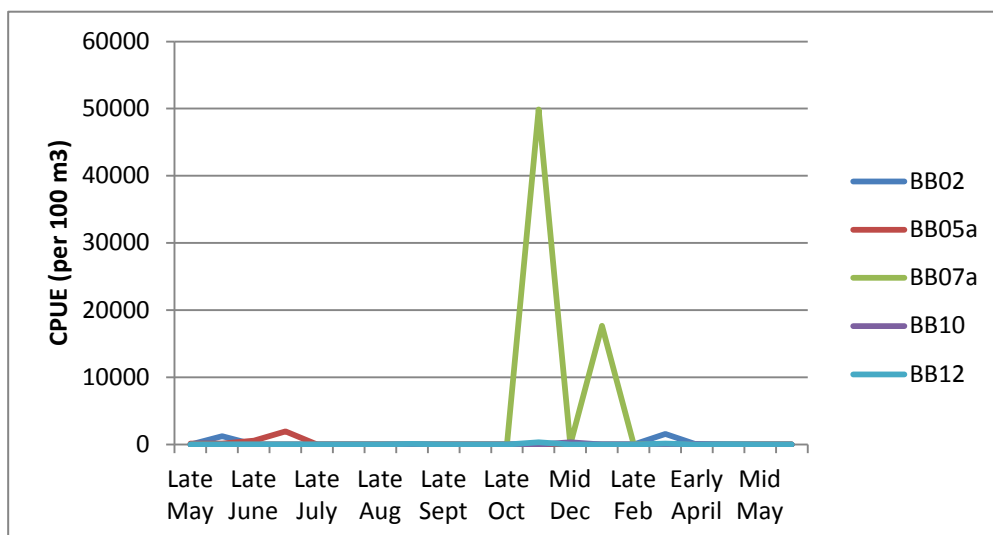


Figure 7. Abundance of pelecypod (bivalve) veliger larvae collected at Sites BB2, BB5a, BB7a, BB10, and BB12 in May 2012 – May 2013. Sites BB7a and BB10 were added in late September 2012.

8.3 Gelatinous Macrozooplankton

Gelatinous macrozooplankton were collected during almost all regular sampling events. They were not processed during the intensive sampling event at Site 5a in July. The ctenophore *Mnemiopsis leidyi* exhibited seasonal trends in abundance (Fig 8), with greatest numbers collected in the northern bay (Sites 2 and 5a) in late spring (May – June 2012) and in the fall (October 2012). Few *M. leidyi* were collected in the northern bay during the summer of 2012, which differs from historical trends in distribution and abundance (J. Tiedemann, pers. comm.). In fact, highest numbers during the summer of 2012 were collected in the southern part of the bay, associated with higher salinities. As *M. leidyi* prefers lower salinity water, this trend is therefore surprising and may be due to prevailing wind patterns. Abundance of *M. leidyi* was lower in May 2013 than in May 2012, but the species was more broadly distributed across the bay during May 2013.

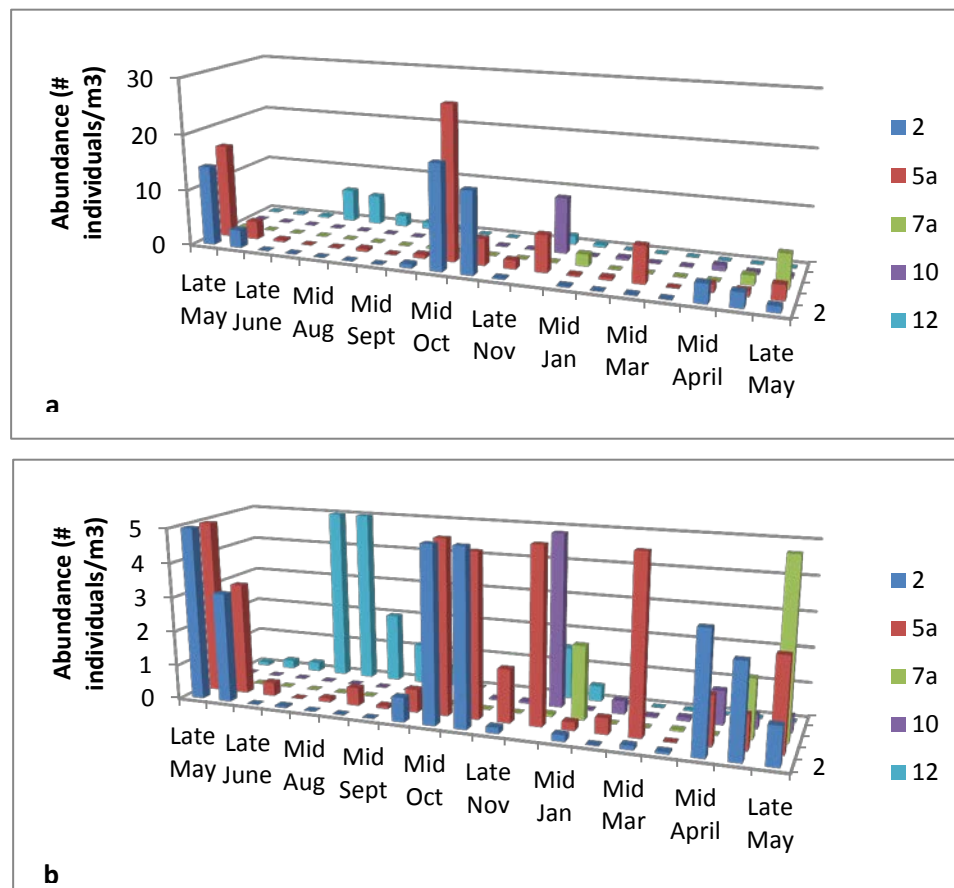


Figure 8. Abundance of *Mnemiopsis leidyi* collected at Sites BB2, BB5a, BB7a, BB10, and BB12 in May 2012 – May 2013. Sites BB7a and BB10 were added in late September 2012. Graphs are presented at two resolutions as the large values prevent a finer-scale assessment of lower abundances. a. coarse resolution. b. fine resolution (note differences in y axis between the two graphs).

The ctenophore predator on *M. leidyi*, *Beroe ovata*, occurred rarely in the bay, but was collected in the northern bay at its highest abundance during spring 2012, probably associated with the *M. leidyi* bloom occurring there at that time (Fig 9). Only a small number of *B. ovata* was associated with the larger fall bloom of *M. leidyi*. Another predator of *M. leidyi*, the sea nettle *Chrysaora quinquecirrha* was abundant only in the northern bay and only in late spring (June), again probably associated with the large *M. leidyi* bloom that occurred there at the same time (Fig 10). *C. quinquecirrha* did not occur with the fall bloom of *M. leidyi*.

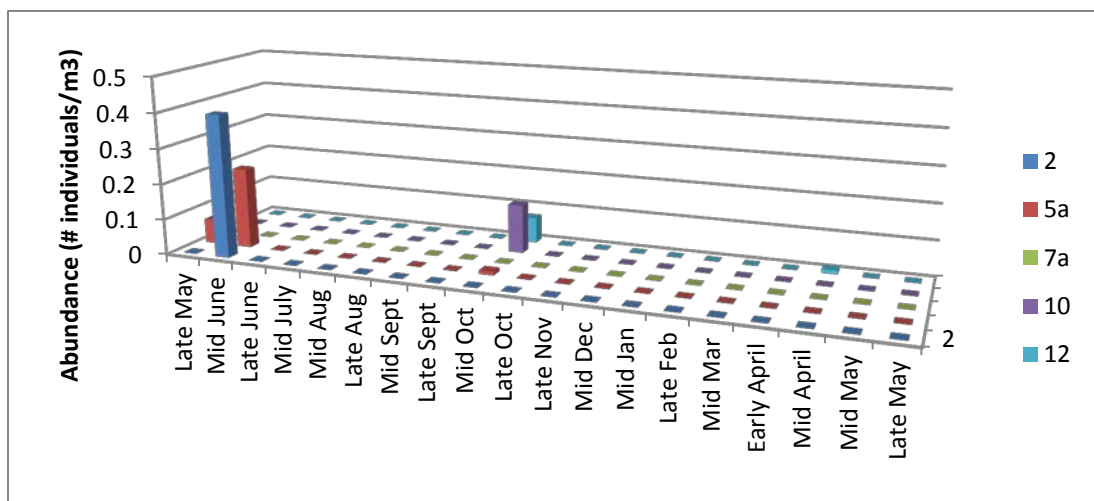


Figure 9. Abundance of *Beroe ovata* collected at Sites BB2, BB5a, BB7a, BB10, and BB12 in May 2012 – May 2013. Sites BB7a and BB10 were added in late September 2012.

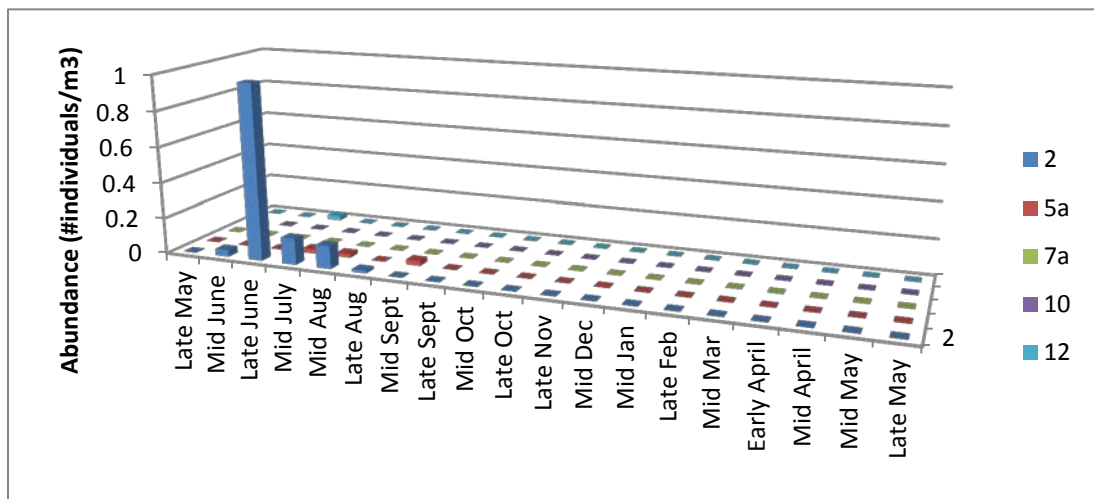


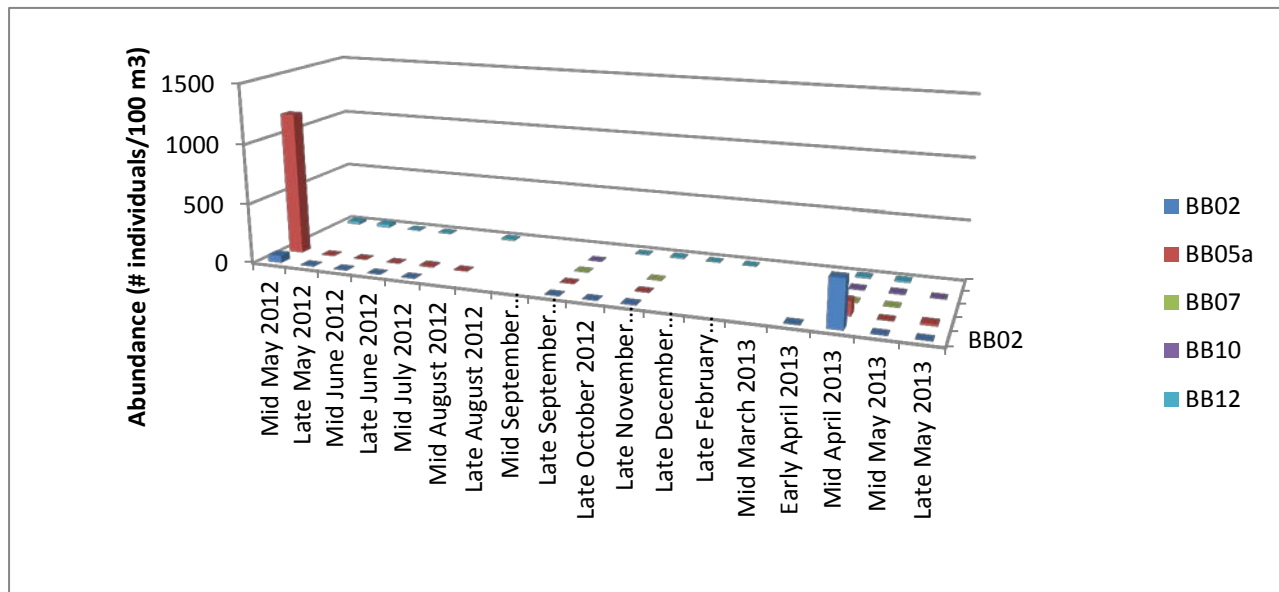
Figure 10. Abundance of *Chrysaora quinquecirrha* collected at Sites BB2, BB5a, BB7a, BB10, and

8.4 Ichthyoplankton

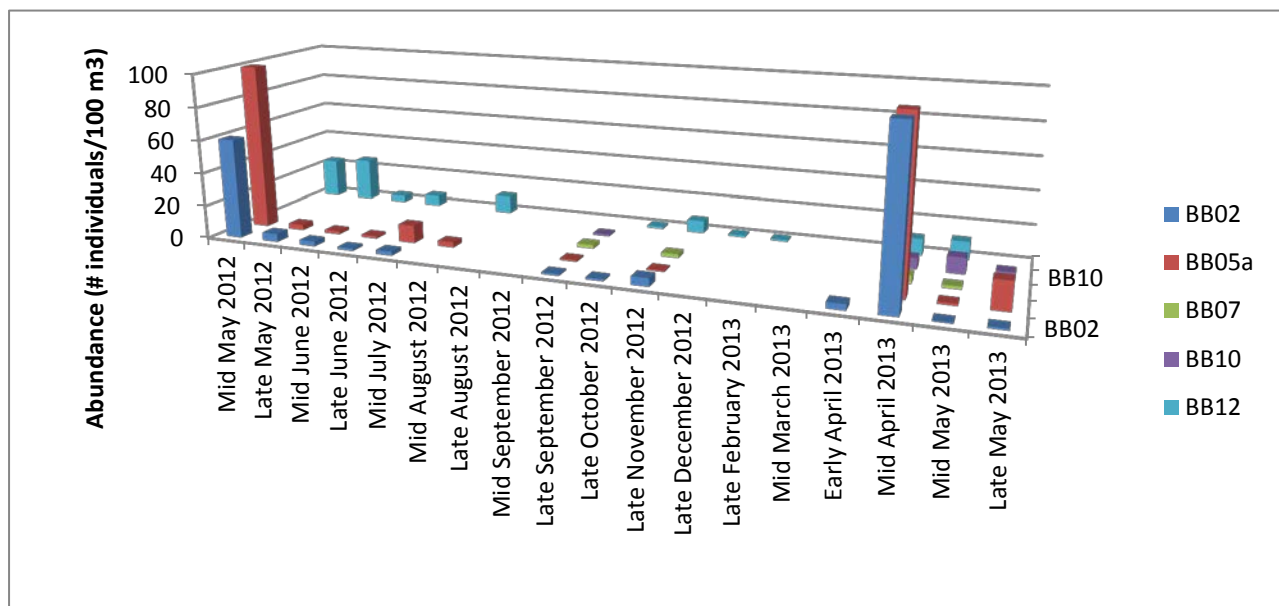
A total of 18 species of fish larvae were collected in Year 1, with a grand total of 1830 specimens collected (Table 1). Some specimens were not identified due to damage (N = 23). The majority of specimens (56%) were Atlantic silverside *Menidia menidia*, an important prey species in the bay. All species collected were mid-Atlantic estuarine and coastal species, indicating that the bay is a nursery for these species. Abundance (CPUE) was highest in May 2012 and April 2013 in the northern bay, with most of the *M. menidia* collected during these sampling events (Fig 11a). Other species were more evenly distributed at lower abundances in the spring and summer, especially in the lower bay (Fig 11b).

Table 1. Ichthyoplankton species list, with total number of each species collected. Data are not standardized to volume of water sampled.

Common Name	Scientific Name	Number
Atlantic Silverside	<i>Menidia menidia</i>	1019
Winter Flounder	<i>Pseudopleuronectes americanus</i>	470
Northern Pipefish	<i>Syngnathus fuscus</i>	115
Bay Anchovy	<i>Anchoa mitchilli</i>	88
Lined Seahorse	<i>Hippocampus erectus</i>	40
Striped Anchovy	<i>Anchoa hepsetus</i>	34
Sand Eels	<i>Ammodytes sp.</i>	9
Atlantic Menhaden	<i>Brevoortia tyrannus</i>	9
Atlantic croaker	<i>Micropogonias undulatus</i>	7
Feather Blenny	<i>Hypsoblennius hentzi</i>	4
Northern Pufferfish	<i>Sphoeroides maculatus</i>	3
Black Sea Bass	<i>Centropristis striata</i>	2
Atlantic Needlefish	<i>Strongylura marina</i>	2
American Eel	<i>Anguilla rostrata</i>	1
Striped Mullet	<i>Mugil cephalus</i>	1
Summer Flounder	<i>Paralichthys dentatus</i>	1
Window Pane	<i>Scophthalmus aquosus</i>	1
Tautog	<i>Tautoga onitis</i>	1
Unknown		23
Total		1830



a.



b

Figure 11. Total abundance of all ichthyoplankton (CPUE, per 100 m³) at Sites BB2, BB5a, BB7a, BB10, and BB12 in May 2012 – May 2013. Sites BB7a and BB10 were added in late September 2012. Data for each sampling event were averaged across the four nets used at each event. a) abundance per 100 m³ b) abundance per 100 m³, with y axis limited to 100 individuals.

Diversity was highest from Barnegat Inlet (Site 7a) to the southern stations (Fig 12). Ingress of coastal species most likely occurs at the inlet, while the southern stations are located in more pristine, higher salinity habitats with SAV, which likely provides optimal habitat for larval fish. Diversity was highest in the spring and fall of 2012, and late spring and throughout the summer of 2013 (Fig 13).

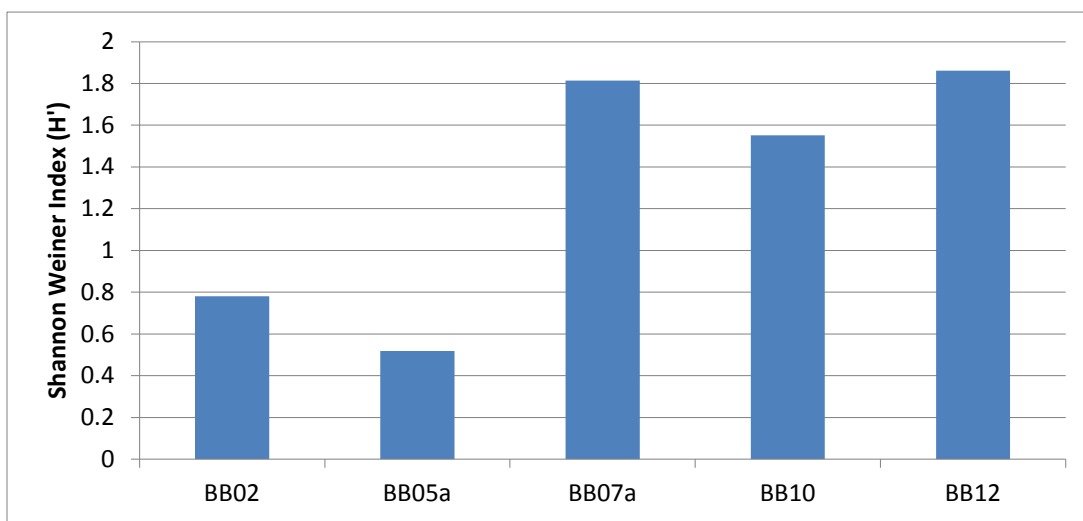


Figure 12. Shannon Weiner diversity index of all ichthyoplankton collected at Sites BB2, BB5a, BB7a, BB10, and BB12 in May 2012 – May 2013. Sites BB7a and BB10 were added in late September 2012. Data at each site was pooled across sampling events (dates).

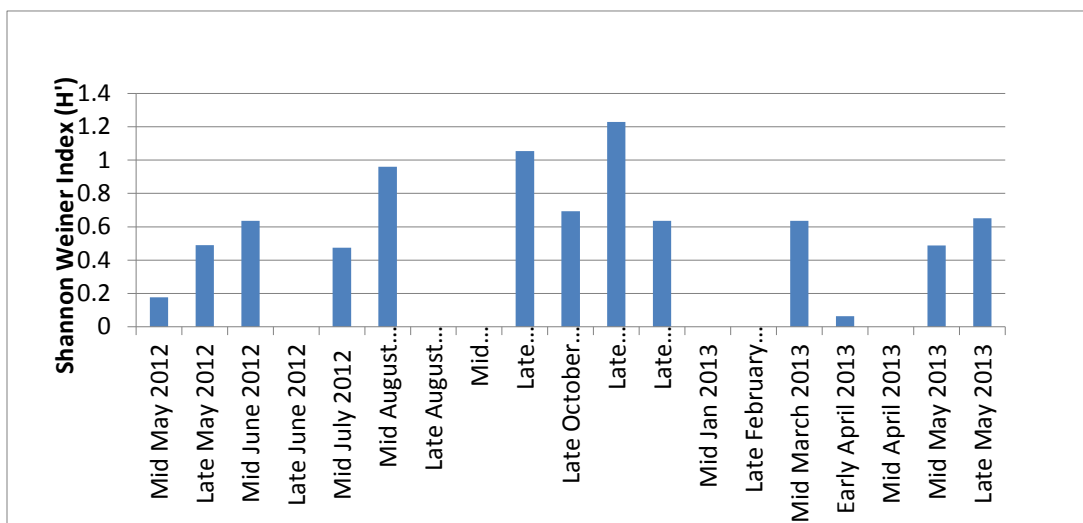


Figure 13. Shannon Weiner diversity index of all ichthyoplankton collected at Sites BB2, BB5a, BB7a, BB10, and BB12 in May 2012 – May 2013. Sites BB7a and BB10 were added in late September 2012. Data on each sampling event (date) was pooled across site locations.

9.0 CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

Temporal and spatial trends in Barnegat Bay zooplankton community structure were characterized in a year-long study. Zooplankton such as copepods are important components of the zooplankton during spring and fall blooms throughout the bay. Groups such as decapods (crabs) and bivalves exhibit discrete spawning pulses during certain times of the year, and are almost absent from the plankton otherwise. Ctenophores were abundant in this sampling year, but sea nettles were not. Both species exhibited few obvious trends in distribution and abundance, although ctenophores were most abundant in the fall. Ichthyoplankton were most abundant in the spring, and species diversity was highest in the southern part of the bay.

The most important impact from Superstorm Sandy in October 2012 was a large increase in copepod abundance throughout the bay, probably due to the resuspension of dormant cysts located in the sediment due to the extreme storm surge from the storm.

Although a number of trends in distribution and abundance of Barnegat Bay zooplankton were observed in this study, some species did not exhibit obvious patterns. Information on abiotic and biotic factors not examined in this study could help to discern subtle trends and linkages between communities. As herbivorous zooplankton abundance is tied to phytoplankton production, evaluating phytoplankton community structure in conjunction with that of zooplankton will undoubtedly be important. Zooplankton may be subject to transport due to currents, tides, and wind, so examining a hydrodynamic model of the bay in conjunction with this study may help to further elucidate patterns in zooplankton distribution and abundance.

10.0 RECOMMENDATIONS AND APPLICATION AND USE BY NJDEP

NJDEP is currently providing funding for studies on phytoplankton, larger –sized ichthyoplankton, a trophic model, and a hydrodynamic model. Communication has already been established with all of these groups, and zooplankton data have been provided to the group modeling trophic structure. It is recommended that NJDEP continues to facilitate communication among these groups and provide a platform (such as the annual workshop) for ongoing results to be discussed.

11.0 REFERENCES

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Appendix 1: NOAA Quality Assurance/Quality Control Documentation

To: Ursula Howson, Monmouth University

From: Jon Hare, Northeast Fisheries Science Center

Cc: Jennifer Samson, Northeast Fisheries Science Center
Thomas Noji, Northeast Fisheries Science Center

Subject: QA/QC Results for Barneget Bay Cruises MU and MU2/12

Date: 11 March 2014

Overall the QA/QC performed at the NOAA Narragansett Laboratory confirmed that the data reported by the Zakład Sortowania i Oznaczania Planktonu w Szczecinie (ZSIOP)¹ are of excellent quality. The level of certainty in the data is greater than 99% relative to the total number of individuals identified. There were discrepancies in ~70% of the samples, but a majority of these were differences in individual counts by 1 or 2 organisms for individual taxa (a very small percentage of the total organisms in a sample). Some of the numerical discrepancies can be attributed to loss of individual organisms during handling for the initial identification or the QA/QC process. Very few taxonomic issues were identified and those that were generally involved the level of identification (genus to family) not a misidentification.

A subset of stations from MU and MU2/12 were selected for QA/QC (10% of stations randomly selected from each of the two cruises). Taxa were initially identified and counted by the ZSIOP using the Northeast Fisheries Science Center zooplankton protocol². The ZSIOP has an almost 40 year history identifying zooplankton from the Northeast U.S. shelf. The zooplankton data and identified and enumerated taxa were then returned to the NOAA Narragansett Laboratory, which also has a 40+ year history conducting zooplankton studies on the Northeast U.S. shelf. Electronic data were sent to Monmouth University. A random sub-set of stations (10%) were chosen for QA/QC at the NOAA Narragansett Laboratory, which involved checking all identifications and enumerations for the sub-set of stations. Standard identification references were used, as was in-house zooplankton identification expertise at the Narragansett Laboratory.

Two types of differences were found between the original data and the QA/QC data: differences in the counts of individual taxa and changes in the identification of individual taxa. No systematic errors were found (e.g., mis-identification of a entire taxa, large differences in the counts of individuals).

Regarding differences in counts, approximately 7% of the QA/QC identifications had fewer individuals than noted on the datasheet. This could have resulted from a miscount upon initial identification or a loss of a specimen during initial identification or during the QA/QC procedure. In three instances, the identified taxa could not be found in the returned samples and these were presumed lost. Approximately 4% of the QA/QC identifications had more individuals than noted on the datasheet. Overall, a majority of differences in counts was 1 specimen; the maximum difference in counts was 3 specimens. Given the size of the organisms and the required handling, a majority of these differences in counts are likely attributed to loss of specimens not an error in counting.

¹ http://www.mir.gdynia.pl/?page_id=62

² <http://nefsc.noaa.gov/publications/tm/pdfs/tmfnc21.pdf>

Regarding differences in identification, six identification changes are suggested. Three involved raising the identification to higher taxonomic level because the lower level identification could not be confirmed (Calanoida to Unidentified, *Sagitta* spp to Chaetognatha, *Temora turbinata* to *Temora* spp. or *Temora longicornus*). Three involved what appears to be an echinoderm larva that was mis-identified as a Coelenterate, Polychaeta, and unidentified in different samples. These specimens are clearly the same, and they are identified as Echinodermata.

On the accompanying datasheets, all changes are made in red ink. The electronic copies are in black and white; the originals with red ink will be sent via regular mail. Red check marks mean the ID was confirmed. A red number in the ZOOCNT column means a change in count is suggested. "Missing?" written in red in the PLKTAX NAM column means the specimen could not be found in the vial, so the identification could not be confirmed. A red line through all columns means an identification change is suggested, check for new numbers in red in the Vial No and ZOOCNT columns. Conversely, red numbers in the Vial No and ZOOCNT columns with no black print indicate an identification change or addition. "Damaged" or "Head" written in red in the PLKTAX NAM column describes why the identification is to a higher taxonomic level.

Overall, we conclude that the data from the ZSIOP for MU and MU2/12 can be used as is. Some caution should be used with the Coelenterate, Polychaeta, and Unidentified taxa and if these are to be the focus of analysis, additional targeted QA/QC might be warranted to check for misidentified Echinodermata.

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

Page 1 of 2

CRUCOD (Cruise Code)	CRUNAM (Cruise Name)	STA (Station #)	GERCOD (Gear Code)	BONNUM (Haul #)
	MU	4	6B3Z	1

VOLSML (ml)	ALQFCTR	TOTCNT
21	16	548

"MAJOR COPEPODA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	024 (Cop5)	023 (Cop4)	022 (Cop3)	021 (Cop2)	020 (Cop1)	999 (Unknown)	ZOOCNT
0101	Calanus finmarchicus									0
0109	Centropages hamatus									0
0103	Centropages typicus									0
0157	Clausocalanus arcuicornis									0
0105	Metridia lucens									0
0143	Nannocalanus minor									0
0135	Paracalanus parvus									0
0102	Pseudocalanus minutus									0
0104	Temora longicornis									0

"EUPHAUSIACEA TAXA"

PLKTAX NUM	PLKTAXNAM NAM	ZOOSTG-> Vial No.	000 (Adult)	030 (Cryptopia)	029 (Furcilia)	028 (Calypptis)	013 (Nauplius)		999 (Unknown)	ZOOCNT
2006	Euphausia krohnii									0
2002	Meganyctiphanes norvegica									0
2019	Nematoscelis megalops									0
2012	Thysanoessa gregaria									0
2001	Thysanoessa inermis									0
2004	Thysanoessa longicaudata									0
2003	Thysanoessa raschii									0

"FISH TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	054 (Juvenile)	051 (Larvae)	050 (Egg)		999 (Unknown)	ZOOCNT
3500	Fish	3			2	216			218

"ORGANISMS > 2.5 cm"

PLKTAX NUM	PLKTAX NAM	VOLLRG (ml)	LENLRG (mm)	CNTLRG

Recorded By: ___ BL
Analysis Date: ___ 27.03.13

Comments:

Notes: 1. Column headings in uppercase are oracle data base column names.

Notes:2 Make no entries in shaded cells. They are either inappropriate, or will be filled in via excel formulae.

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

Page 2 of 2

CRUCOD	CRUNAM	STA	GERCOD	BONNUM
	MU	4	6B3Z	1

"NON-MAJOR COPEPODA TAXA"

"OTHER ZOOPLANKTON TAXA"

PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT	PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT
0148	Acartia danae			0400	Amphipoda	3	1
0107	Acartia longiremis			0700	Appendicularia		
4027	Acartia spp.	1	32	2101	Balanidae		
4195	Acrocalanus longicornis			1000	Brachyura	2	257
4061	Aetideidae			0900	Bryozoa		
0192	Alteutha depressa	1	1	0554	Caridea		
0142	Calanoida			0200	Chaetognatha		
0178	Calanus spp.			2350	Coelenterata		
0156	Calocalanus pavo			0567	Crangonidae		
4129	Calocalanus spp.			2700	Ctenophora		
0117	Candacia armata			1700	Cumacea		
4042	Candacia spp.			0500	Decapoda-Arthropoda	3	8
4020	Centropages bradyi			1500	Echinodermata		
4112	Centropages furcatus			2000	Euphausiacea		
0133	Centropages spp.			0607	Evadne nordmanni		
4064	Clausocalanus furcatus			0605	Evadne spp.		
4098	Clausocalanus spp.			3900	Foraminifera		
0100	Copepoda			0895	Gammaridea	3	4
4045	Corycaeidae			1100	Gastropoda	3	1
0130	Cyclopoida			3300	Heteropoda		
0180	Eucalanus spp.			0457	Hyperidea		
0169	Euchaeta marina			2200	Isopoda		
0116	Euchaeta norvegica			0568	Lucifer spp.		
4062	Euchaetidae			2800	Mysidacea		
0132	Eurytemora spp.	1	2	2801	Mysidopsis bigelowi		
0131	Harpacticoida	1	17	1801	Nanomia cara		
4030	Heterorhabdidae			2802	Neomysis americana		
0159	Labidocera aestiva			0701	Oikopleura spp.		
4025	Labidocera spp.			3600	Ostracoda		
4007	Lucicutia spp.			3209	Paguridea		
0146	Mecynocera clausi			1300	Pelecypoda	3	4
0149	Metridia spp.			0555	Penaeidae		
0150	Microcalanus pusillus			0611	Penilia avirostris		
4125	Microcalanus spp.			5101	Phoronis spp.		
4108	Neocalanus spp.			0601	Podon spp.		
0106	Oithona similis			2500	Polychaeta	3	1
0114	Oithona spinirostris			0202	Sagitta elegans		
0138	Oithona spp.	1	1	0203	Sagitta enflata		
0191	Oncaea spp.			0201	Sagitta serratodentata		
4118	Paracalanus spp.			0218	Sagitta spp.		
4002	Pleuromamma abdominalis			3403	Salpidae		
0176	Pleuromamma borealis			1800	Siphonophora		
4057	Pleuromamma spp.			0305	Spiratella spp.		
4058	Pontellidae missing?	1	0 1	3400	Thaliacea		
4013	Pseudocalanidae			0300	Thecosomata		
0175	Rhincalanus cornutus			2502	Tomopteris helgolandica		
0125	Rhincalanus nasutus			2501	Tomopteris spp.		
4100	Rhincalanus spp.			0002	Unidentified zooplankton		
4066	Scolecithricidae						
4033	Scolecithrix bradyi						
0162	Scolecithrix danae						
4059	Temora spp.			Comments:			
0153	Temora stylifera						
4094	Temora turbinata						
0108	Tortanus discaudatus						
4019	Undinula vulgaris						

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

Page 1 of 2

CRUCOD (Cruise Code)	CRUNAM (Cruise Name)	STA (Station #)	GERCOD (Gear Code)	BONNUM (Haul #)
	MU	14	6B3Z	1

VOLSML (ml)	ALQFCTR	TOTCNT
2	1	530

"MAJOR COPEPODA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	024 (Cop5)	023 (Cop4)	022 (Cop3)	021 (Cop2)	020 (Cop1)	999 (Unknown)	ZOOCNT
0101	Calanus finmarchicus									0
0109	Centropages hamatus									0
0103	Centropages typicus									0
0157	Clausocalanus arcuicornis									0
0105	Metridia lucens									0
0143	Nannocalanus minor									0
0135	Paracalanus parvus									0
0102	Pseudocalanus minutus									0
0104	Temora longicornis									0

"EUPHAUSIACEA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	030 (Crytopia)	029 (Furcilia)	028 (Calypptis)	013 (Nauplius)		999 (Unknown)	ZOOCNT
2006	Euphausia krohnii									0
2002	Meganyctiphanes norvegica									0
2019	Nematoscelis megalops									0
2012	Thysanoessa gregaria									0
2001	Thysanoessa inermis									0
2004	Thysanoessa longicaudata									0
2003	Thysanoessa raschii									0

"FISH TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	054 (Juvenile)	051 (Larvae)	050 (Egg)		999 (Unknown)	ZOOCNT
3500	Fish	1/2			10	450			460

"ORGANISMS > 2.5 cm"

PLKTAX NUM	PLKTAX NAM	VOLLRG (ml)	LENLRG (mm)	CNTLRG

Recorded By: ___ MH
Analysis Date: ___ 28.03.13

Comments:

Notes: 1. Column headings in uppercase are oracle data base column names.

Notes:2 Make no entries in shaded cells. They are either inappropriate, or will be filled in via excel formulae.

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

CRUCOD	CRUNAM	STA	GERCOD	BONNUM
	MU	14	6B3Z	1

Page 2 of 2

"NON-MAJOR COPEPODA TAXA"

"OTHER ZOOPLANKTON TAXA"

PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT	PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT
0148	Acartia danae			0400	Amphipoda		
0107	Acartia longiremis			0700	Appendicularia		
4027	Acartia spp.			2101	Balanidae		
4195	Acrocalanus longicornis			1000	Brachyura	2	39 ✓
4061	Aetideidae			0900	Bryozoa		
0192	Alteutha depressa			0554	Caridea	2	28 ✓
0142	Calanoida			0200	Chaetognatha		
0178	Calanus spp.			2350	Coelenterata	2	1 ✓
0156	Calocalanus pavo			0567	Crangonidae		
4129	Calocalanus spp.			2700	Ctenophora		
0117	Candacia armata			1700	Cumacea		
4042	Candacia spp.			0500	Decapoda-Arthropoda		
4020	Centropages bradyi			1500	Echinodermata		
4112	Centropages furcatus			2000	Euphausiacea		
0133	Centropages spp.			0607	Evadne nordmanni		
4064	Clausocalanus furcatus			0605	Evadne spp.		
4098	Clausocalanus spp.			3900	Foraminifera		
0100	Copepoda			0895	Gammaridea		
4045	Corycaeidae			1100	Gastropoda		
0130	Cyclopoida			3300	Heteropoda		
0180	Eucalanus spp.			0457	Hyperidea		
0169	Euchaeta marina			2200	Isopoda		
0116	Euchaeta norvegica			0568	Lucifer spp.		
4062	Euchaetidae			2800	Mysidacea		
0132	Eurytemora spp.			2801	Mysidopsis bigelowi		
0131	Harpacticoida			1801	Nanomia cara		
4030	Heterorhabdidae			2802	Neomysis americana		
0159	Labidocera aestiva			0701	Oikopleura spp.		
4025	Labidocera spp.			3600	Ostracoda		
4007	Lucicutia spp.			3209	Paguridea		
0146	Mecynocera clausi			1300	Pelecypoda		
0149	Metridia spp.			0555	Penaeidae		
0150	Microcalanus pusillus			0611	Penilia avirostris		
4125	Microcalanus spp.			5101	Phoronis spp.		
4108	Neocalanus spp.			0601	Podon spp.		
0106	Oithona similis			2500	Polychaeta	2	32 ✓
0114	Oithona spinirostris			0202	Sagitta elegans		
0138	Oithona spp.			0203	Sagitta enflata		
0191	Oncaea spp.			0201	Sagitta serratodentata		
4118	Paracalanus spp.			0218	Sagitta spp.		
4002	Pleuromamma abdominalis			3403	Salpidae		
0176	Pleuromamma borealis			1800	Siphonophora		
4057	Pleuromamma spp.			0305	Spiratella spp.		
4058	Pontellidae			3400	Thaliacea		
4013	Pseudocalanidae			0300	Thecosomata		
0175	Rhincalanus cornutus			2502	Tomopteris helgolandica		
0125	Rhincalanus nasutus			2501	Tomopteris spp.		
4100	Rhincalanus spp.			0002	Unidentified zooplankton		
4066	Scolecithricidae						
4033	Scolecithrix bradyi						
0162	Scolecithrix danae						
4059	Temora spp.			Comments:			
0153	Temora stylifera			Fish larvae-10 v. 2			
4094	Temora turbinata			9 Engraulidae			
0108	Tortanus discaudatus			1 Blunnioides			
4019	Undinula vulgaris						

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

Page 1 of 2

CRUCOD (Cruise Code)	CRUNAM (Cruise Name)	DATE	STATION	GEAR
	MU-2	09.06.12	200D/12	6B3Z

VOLSML (ml)	ALQFCTR	TOTCNT
1	1	134

"MAJOR COPEPODA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	024 (Cop5)	023 (Cop4)	022 (Cop3)	021 (Cop2)	020 (Cop1)	999 (Unknown)	ZOOCNT
0101	Calanus finmarchicus									0
0109	Centropages hamatus									0
0103	Centropages typicus									0
0157	Clausocalanus arcuicornis									0
0105	Metridia lucens									0
0143	Nannocalanus minor									0
0135	Paracalanus parvus									0
0102	Pseudocalanus minutus									0
0104	Temora longicornis									0

"EUPHAUSIACEA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	030 (Crytopia)	029 (Furcilia)	028 (Calypsis)	013 (Nauplius)		999 (Unknown)	ZOOCNT
2006	Euphausia krohnii									0
2002	Meganyctiphanes norvegica									0
2019	Nematoscelis megalops									0
2012	Thysanoessa gregaria									0
2001	Thysanoessa inermis									0
2004	Thysanoessa longicaudata									0
2003	Thysanoessa raschii									0

"FISH TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	054 (Juvenile)	051 (Larvae)	050 (Egg)		999 (Unknown)	ZOOCNT
3500	Fish								0

"ORGANISMS > 2.5 cm"

PLKTAX NUM	PLKTAX NAM	VOLLRG (ml)	LENLRG (mm)	CNTLRG

Recorded By: ___ MK
Analysis Date: ___ 25.04.13

Comments:

Notes: 1. Column headings in uppercase are oracle data base column names.

Notes:2 Make no entries in shaded cells. They are either inappropriate, or will be filled in via excel formulae.

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

CRUCOD	CRUNAM	DATE	STATION
	MU-2	09.06.12	200D/12

Page 2 of 2

"NON-MAJOR COPEPODA TAXA"

"OTHER ZOOPLANKTON TAXA"

PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT	PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT
0148	Acartia danae			0400	Amphipoda		
0107	Acartia longiremis			0700	Appendicularia		
✓ 4027	Acartia spp.	7	116	2101	Balanidae	2	6.8 ✓
4195	Acrocalanus longicornis			1000	Brachyura	2	1 ✓
4061	Aetideidae			0900	Bryozoa		
0192	Alteutha depressa			0554	Caridea		
0142	Calanoida			0200	Chaetognatha		
0178	Calanus spp.			2350	Coelenterata		
0156	Calocalanus pavo			0567	Crangonidae		
4129	Calocalanus spp.			2700	Ctenophora		
0117	Candacia armata			1700	Cumacea		
4042	Candacia spp.			0500	Decapoda-Arthropoda		
4020	Centropages bradyi			1500	Echinodermata		
4112	Centropages furcatus			2000	Euphausiacea		
0133	Centropages spp.			0607	Evadne nordmanni		
4064	Clausocalanus furcatus			0605	Evadne spp.		
4098	Clausocalanus spp.			3900	Foraminifera		
0100	Copepoda			0895	Gammaridea		
4045	Corycaeidae			1100	Gastropoda	2	11.8 ✓
0130	Cyclopoida			3300	Heteropoda		
0180	Eucalanus spp.			0457	Hyperidea		
0169	Euchaeta marina			2200	Isopoda		
0116	Euchaeta norvegica			0568	Lucifer spp.		
4062	Euchaetidae			2800	Mysidacea		
0132	Eurytemora spp.			2801	Mysidopsis bigelowi		
0131	Harpacticoida			1801	Nanomia cara		
4030	Heterorhabdidae			2802	Neomysis americana		
0159	Labidocera aestiva			0701	Oikopleura spp.		
4025	Labidocera spp.			3600	Ostracoda		
4007	Lucicutia spp.			3209	Paguridea		
0146	Mecynocera clausi			1300	Pelecypoda		
0149	Metridia spp.			0555	Penaeidae		
0150	Microcalanus pusillus			0611	Penilia avirostris		
4125	Microcalanus spp.			5101	Phoronis spp.		
4108	Neocalanus spp.			0601	Podon spp.		
0106	Oithona similis			2500	Polychaeta		
0114	Oithona spinirostris			0202	Sagitta elegans		
0138	Oithona spp.			0203	Sagitta enflata		
0191	Oncaea spp.			0201	Sagitta serratodentata		
4118	Paracalanus spp.			0218	Sagitta spp.		
4002	Pleuromamma abdominalis			3403	Salpidae		
0176	Pleuromamma borealis			1800	Siphonophora		
4057	Pleuromamma spp.			0305	Spiratella spp.		
4058	Pontellidae			3400	Thaliacea		
4013	Pseudocalanidae			0300	Thecosomata		
0175	Rhincalanus cornutus			2502	Tomopteris helgolandica		
0125	Rhincalanus nasutus			2501	Tomopteris spp.		
4100	Rhincalanus spp.			0002	Unidentified zooplankton		
4066	Scolecithricidae						
4033	Scolecithrix bradyi						
0162	Scolecithrix danae						
4059	Temora spp.			Comments:			
0153	Temora stylifera						
4094	Temora turbinata						
0108	Tortanus discaudatus						
4019	Undinula vulgaris						

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

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CRUCOD (Cruise Code)	CRUNAM (Cruise Name)	DATE	STATION	GEAR
	MU-2	09.21.12	500A/15	6B3Z

VOLSML (ml)	ALQFCTR	TOTCNT
2	1	84

"MAJOR COPEPODA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	024 (Cop5)	023 (Cop4)	022 (Cop3)	021 (Cop2)	020 (Cop1)	999 (Unknown)	ZOOCNT
0101	Calanus finmarchicus									0
0109	Centropages hamatus									0
0103	Centropages typicus	1		2	1					3
0157	Clausocalanus arcuicornis									0
0105	Metridia lucens									0
0143	Nannocalanus minor	1		1						1
0135	Paracalanus parvus									0
0102	Pseudocalanus minutus									0
0104	Temora longicornis									0

"EUPHAUSIACEA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	030 (Cryptop)	029 (Furcilia)	028 (Calyptopis)	013 (Nauplius)		999 (Unknown)	ZOOCNT
2006	Euphausia krohnii									0
2002	Meganyctiphanes norvegica									0
2019	Nematoscelis megalops									0
2012	Thysanoessa gregaria									0
2001	Thysanoessa inermis									0
2004	Thysanoessa longicaudata									0
2003	Thysanoessa raschii									0

"FISH TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	054 (Juvenile)	051 (Larvae)	050 (Egg)		999 (Unknown)	ZOOCNT
3500	Fish								0

"ORGANISMS > 2.5 cm"

PLKTAX NUM	PLKTAX NAM	VOLLRG (ml)	LENLRG (mm)	CNTLRG

Recorded By: ___ HK
Analysis Date: ___ 24.04.12

Comments:

Notes: 1. Column headings in uppercase are oracle data base column names.

Notes: 2. Make no entries in shaded cells. They are either inappropriate, or will be filled in via excel formulae.

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

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CRUCOD	CRUNAM	DATE	STATION
	MU-2	09.21.12	500A/15

"NON-MAJOR COPEPODA TAXA"

"OTHER ZOOPLANKTON TAXA"

PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT	PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT
0148	Acartia danae			0400	Amphipoda		
0107	Acartia longiremis			0700	Appendicularia		
✓ 4027	Acartia spp.	1	57	2101	Balanidae	2	1 ✓
4195	Acrocalanus longicornis			1000	Brachyura		
4061	Aetideidae			0900	Bryozoa		
0192	Alteutha depressa			0554	Caridea	2	8 ✓
0142	Calanoida	1	1	0200	Chaetognatha		
0178	Calanus spp.			2350	Coelenterata	2	1 ✓
0156	Calocalanus pavo			0567	Crangonidae		
4129	Calocalanus spp.			2700	Ctenophora		
0117	Candacia armata			1700	Cumacea		
4042	Candacia spp.			0500	Decapoda-Arthropoda	2	1 ✓
4020	Centropages bradyi			1500	Echinodermata	2	1 ✓
4112	Centropages furcatus			2000	Euphausiacea		
✓ 0133	Centropages spp.	1	1	0607	Evadne nordmanni		
4064	Clausocalanus furcatus			0605	Evadne spp.		
4098	Clausocalanus spp.			3900	Foraminifera		
✓ 0100	Copepoda* <i>Damaged</i>	1	1	0895	Gammaridea	2	2 ✓
4045	Corycaeidae			1100	Gastropoda		
0130	Cyclopoida			3300	Heteropoda		
✓ 0180	Eucalanus spp.	1	1	0457	Hyperidea	2	2 ✓
0169	Euchaeta marina			2200	Isopoda	2	1 ✓
0116	Euchaeta norvegica			0568	Lucifer spp.		
4062	Euchaetidae			2800	Mysidacea		
0132	Eurytemora spp.			2801	Mysidopsis bigelowi		
✓ 0131	Harpacticoida	1	1	1801	Nanomia cara		
4030	Heterorhabdidae			2802	Neomysis americana		
0159	Labidocera aestiva			0701	Oikopleura spp.		
4025	Labidocera spp.			3600	Ostracoda		
4007	Lucicutia spp.			3209	Paguridea		
0146	Mecynocera clausi			1300	Pelecypoda		
0149	Metridia spp.			0555	Penaeidae		
0150	Microcalanus pusillus			0611	Penilia avirostris		
4125	Microcalanus spp.			5101	Phoronis spp.		
4108	Neocalanus spp.			0601	Podon spp.		
0106	Oithona similis			2500	Polychaeta		
0114	Oithona spinirostris			0202	Sagitta elegans		
0138	Oithona spp.			0203	Sagitta enflata		
0191	Oncaea spp.			0201	Sagitta serratodentata		
✓ 4118	Paracalanus spp.	1	2	0218	Sagitta spp.		
4002	Pleuromamma abdominalis			3403	Salpidae		
0176	Pleuromamma borealis			1800	Siphonophora		
4057	Pleuromamma spp.			0305	Spiratella spp.		
4058	Pontellidae			3400	Thaliacea		
4013	Pseudocalanidae			0300	Thecosomata		
0175	Rhincalanus cornutus			2502	Tomopteris helgolandica		
0125	Rhincalanus nasutus			2501	Tomopteris spp.		
4100	Rhincalanus spp.			0002	Unidentified zooplankton	2	2
4066	Scolecithricidae						
4033	Scolecithrix bradyi						
0162	Scolecithrix danae						
4059	Temora spp.			Comments: <i>Siphonostomatoidea (Caligoida)</i>			
0153	Temora stylifera					1	1
4094	Temora turbinata						
0108	Tortanus discaudatus						
4019	Undinula vulgaris						

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

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CRUCOD (Cruise Code)	CRUNAM (Cruise Name)	DATE	STATION	GEAR
	MU-5	10.10.12	200D/50	6B3Z

VOLSML (ml)	ALQFCTR	TOTCNT
<1	1	408

"MAJOR COPEPODA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	024 (Cop5)	023 (Cop4)	022 (Cop3)	021 (Cop2)	020 (Cop1)	999 (Unknown)	ZOOCNT
0101	Calanus finmarchicus									0
0109	Centropages hamatus									0
0103	Centropages typicus									0
0157	Clausocalanus arcuicornis									0
0105	Metridia lucens									0
0143	Nannocalanus minor									0
0135	Paracalanus parvus									0
0102	Pseudocalanus minutus									0
0104	Temora longicornis									0

"EUPHAUSIACEA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	030 (Cryptopis)	029 (Furcilia)	028 (Calypptopis)	013 (Nauplius)	999 (Unknown)	ZOOCNT
2006	Euphausia krohnii								0
2002	Meganyctiphanes norvegica								0
2019	Nematoscelis megalops								0
2012	Thysanoessa gregaria								0
2001	Thysanoessa inermis								0
2004	Thysanoessa longicaudata								0
2003	Thysanoessa raschii								0

"FISH TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	054 (Juvenile)	051 (Larvae)	050 (Egg)	999 (Unknown)	ZOOCNT
3500	Fish							0

"ORGANISMS > 2.5 cm"

PLKTAX NUM	PLKTAX NAM	VOLLRG (ml)	LENLRG (mm)	CNTLRG

Recorded By: ___ BL
Analysis Date: ___ 25.04.13

Comments:

Notes: 1. Column headings in uppercase are oracle data base column names.

Notes:2. Make no entries in shaded cells. They are either inappropriate, or will be filled in via excel formulae.

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

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CRUCOD	CRUNAM	DATE	STATION
	MU-5	10.10.12	200D/50

"NON-MAJOR COPEPODA TAXA"

"OTHER ZOOPLANKTON TAXA"

PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT	PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT
0148	Acartia danae			0400	Amphipoda		
0107	Acartia longiremis			0700	Appendicularia		
✓ 4027	Acartia spp.	1	322	2101	Balanidae	3	73 ✓
4195	Acrocalanus longicornis			1000	Brachyura		
4061	Aetideidae			0900	Bryozoa		
0192	Alteutha depressa			0554	Caridea		
0142	Calanoida			0200	Chaetognatha		
0178	Calanus spp.			2350	Coelenterata	4	1 ✓
0156	Calocalanus pavo			0567	Crangonidae		
4129	Calocalanus spp.			2700	Ctenophora		
0117	Candacia armata			1700	Cumacea		
4042	Candacia spp.			0500	Decapoda-Arthropoda		
4020	Centropages bradyi			1500	Echinodermata		
4112	Centropages furcatus			2000	Euphausiacea		
0133	Centropages spp.			0607	Evadne nordmanni		
4064	Clausocalanus furcatus			0605	Evadne spp.		
4098	Clausocalanus spp.			3900	Foraminifera		
0100	Copepoda			0895	Gammaridea		
4045	Corycaeidae			1100	Gastropoda	4	2 ✓
0130	Cyclopoida			3300	Heteropoda		
0180	Eucalanus spp.			0457	Hyperidea		
0169	Euchaeta marina			2200	Isopoda		
0116	Euchaeta norvegica			0568	Lucifer spp.		
4062	Euchaetidae			2800	Mysidacea		
0132	Eurytemora spp.			2801	Mysidopsis bigelowi		
0131	Harpacticoida			1801	Nanomia cara		
4030	Heterorhabdidae			2802	Neomysis americana		
0159	Labidocera aestiva			0701	Oikopleura spp.		
4025	Labidocera spp.			3600	Ostracoda		
4007	Lucicutia spp.			3209	Paguridea		
0146	Mecynocera clausi			1300	Pelecypoda		
0149	Metridia spp.			0555	Penaeidae		
0150	Microcalanus pusillus			0611	Penilia avirostris		
4125	Microcalanus spp.			5101	Phoronis spp.		
4108	Neocalanus spp.			0601	Podon spp.	4	2 ✓
0106	Oithona similis			2500	Polychaeta	4	4 ✓
0114	Oithona spinirostris			0202	Sagitta elegans		
✓ 0138	Oithona spp.	2	4	0203	Sagitta enflata		
0191	Oncaea spp.			0201	Sagitta serratodentata		
4118	Paracalanus spp.			0218	Sagitta spp.		
4002	Pleuromamma abdominalis			3403	Salpidae		
0176	Pleuromamma borealis			1800	Siphonophora		
4057	Pleuromamma spp.			0305	Spiratella spp.		
4058	Pontellidae			3400	Thaliacea		
4013	Pseudocalanidae			0300	Thecosomata		
0175	Rhincalanus cornutus			2502	Tomopteris helgolandica		
0125	Rhincalanus nasutus			2501	Tomopteris spp.		
4100	Rhincalanus spp.			0002	Unidentified zooplankton		
4066	Scolecithricidae						
4033	Scolecithrix bradyi						
0162	Scolecithrix danae						
4059	Temora spp.			Comments:			
0153	Temora styliifera						
4094	Temora turbinata						
0108	Tortanus discaudatus						
4019	Undinula vulgaris						

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

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CRUCOD (Cruise Code)	CRUNAM (Cruise Name)	DATE	STATION	GEAR
	MU-5	10.11.12	200D/56	6B3Z

VOLSML (ml)	ALQFCTR	TOTCNT
1	16	586

"MAJOR COPEPODA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	024 (Cop5)	023 (Cop4)	022 (Cop3)	021 (Cop2)	020 (Cop1)	999 (Unknown)	ZOOCNT
0101	Calanus finmarchicus									0
0109	Centropages hamatus									0
0103	Centropages typicus									0
0157	Clausocalanus arcuicornis									0
0105	Metridia lucens									0
0143	Nannocalanus minor									0
0135	Paracalanus parvus									0
0102	Pseudocalanus minutus									0
0104	Temora longicornis									0

"EUPHAUSIACEA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	030 (Crypota)	029 (Furcilia)	028 (Calypotis)	013 (Nauplius)		999 (Unknown)	ZOOCNT
2006	Euphausia krohnii									0
2002	Meganyctiphanes norvegica									0
2019	Nematoscelis megalops									0
2012	Thysanoessa gregaria									0
2001	Thysanoessa inermis									0
2004	Thysanoessa longicaudata									0
2003	Thysanoessa raschii									0

"FISH TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	054 (Juvenile)	051 (Larvae)	050 (Egg)		999 (Unknown)	ZOOCNT
3500	Fish								0

"ORGANISMS > 2.5 cm"

PLKTAX NUM	PLKTAX NAM	VOLLRG (ml)	LENLRG (mm)	CNTLRG

Recorded By: ____ KM
Analysis Date: ____ 24.04.13

Comments:

Notes: 1. Column headings in uppercase are oracle data base column names.

Notes: 2 Make no entries in shaded cells. They are either inappropriate, or will be filled in via excel formulae.

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

CRUCOD	CRUNAM	DATE	STATION
	MU-5	10.11.12	200D/56

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"NON-MAJOR COPEPODA TAXA"

"OTHER ZOOPLANKTON TAXA"

PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT	PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT
0148	Acartia danae			0400	Amphipoda		
0107	Acartia longiremis			0700	Appendicularia		
✓ 4027	Acartia spp.	1	497	2101	Balanidae	4	20 ✓
4195	Acrocalanus longicornis			1000	Brachyura		
4061	Aetideidae			0900	Bryozoa		
0192	Alteutha depressa			0554	Caridea		
✓ 0142	Calanoida*	2	49	0200	Chaetognatha		
0178	Calanus spp.			2350	Coelenterata		
0156	Calocalanus pavo			0567	Crangonidae		
4129	Calocalanus spp.			2700	Ctenophora		
0117	Candacia armata			1700	Cumacea		
4042	Candacia spp.			0500	Decapoda-Arthropoda		
4020	Centropages bradyi			1500	Echinodermata		
4112	Centropages furcatus			2000	Euphausiacea		
0133	Centropages spp.			0607	Evadne nordmanni		
4064	Clausocalanus furcatus			0605	Evadne spp.		
4098	Clausocalanus spp.			3900	Foraminifera		
0100	Copepoda			0895	Gammaridea		
4045	Corycaeidae			1100	Gastropoda	4	1 ✓
✓ 0130	Cyclopoida	3	2	3300	Heteropoda		
0180	Eucalanus spp.			0457	Hyperidea		
0169	Euchaeta marina			2200	Isopoda		
0116	Euchaeta norvegica			0568	Lucifer spp.		
4062	Euchaetidae			2800	Mysidacea		
0132	Eurytemora spp.			2801	Mysidopsis bigelowi		
✓ 0131	Harpacticoida	3	14	1801	Nanomia cara		
4030	Heterorhabdidae			2802	Neomysis americana		
0159	Labidocera aestiva			0701	Oikopleura spp.		
4025	Labidocera spp.			3600	Ostracoda		
4007	Lucicutia spp.			3209	Paguridea		
0146	Mecynocera clausi			1300	Pelecypoda		
0149	Metridia spp.			0555	Penaeidae		
0150	Microcalanus pusillus			0611	Penilia avirostris		
4125	Microcalanus spp.			5101	Phoronis spp.		
4108	Neocalanus spp.			0601	Podon spp.		
0106	Oithona similis			2500	Polychaeta	4	3 ✓
0114	Oithona spinirostris			0202	Sagitta elegans		
0138	Oithona spp.			0203	Sagitta enflata		
0191	Oncaea spp.			0201	Sagitta serratodentata		
4118	Paracalanus spp.			0218	Sagitta spp.		
4002	Pleuromamma abdominalis			3403	Salpidae		
0176	Pleuromamma borealis			1800	Siphonophora		
4057	Pleuromamma spp.			0305	Spiratella spp.		
4058	Pontellidae			3400	Thaliacea		
4013	Pseudocalanidae			0300	Thecosomata		
0175	Rhincalanus cornutus			2502	Tomopteris helgolandica		
0125	Rhincalanus nasutus			2501	Tomopteris spp.		
4100	Rhincalanus spp.			0002	Unidentified zooplankton		
4066	Scolecithricidae						
4033	Scolecithrix bradyi						
0162	Scolecithrix danae						
4059	Temora spp.			Comments:			
0153	Temora stylifera			*-Pseudodiaptomus spp. - 49 ✓			
4094	Temora turbinata						
0108	Tortanus discaudatus						
4019	Undinula vulgaris						

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

Page 1 of 2

CRUCOD (Cruise Code)	CRUNAM (Cruise Name)	DATE	STATION	GEAR
	MU-7	11.28.12	500B/74	6B3Z

VOLSML (ml)	ALQFCTR	TOTCNT
1	4	507

"MAJOR COPEPODA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	024 (Cop5)	023 (Cop4)	022 (Cop3)	021 (Cop2)	020 (Cop1)	999 (Unknown)	ZOOCNT
✓ 0101	Calanus finmarchicus	4	4	2	3	2			1	12
✓ 0109	Centropages hamatus	2	80	2						82
✓ 0103	Centropages typicus	1	143	105						248
0157	Clausocalanus arcuicornis									0
0105	Metridia lucens									0
0143	Nannocalanus minor									0
0135	Paracalanus parvus									0
0102	Pseudocalanus minutus									0
✓ 0104	Temora longicornis	4	3							3

"EUPHAUSIACEA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	030 (Crypota)	029 (Furcilia)	028 (Calyptra)	013 (Nauplius)		999 (Unknown)	ZOOCNT
2006	Euphausia krohnii									0
2002	Meganyctiphanes norvegica									0
2019	Nematoscelis megalops									0
2012	Thysanoessa gregaria									0
2001	Thysanoessa inermis									0
2004	Thysanoessa longicaudata									0
2003	Thysanoessa raschii									0

"FISH TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	054 (Juvenile)	051 (Larvae)	050 (Egg)		999 (Unknown)	ZOOCNT
3500	Fish								0

"ORGANISMS > 2.5 cm"

PLKTAX NUM	PLKTAX NAM	VOLLRG (ml)	LENLRG (mm)	CNTRLG

Recorded By: BL
Analysis Date: 29.04.13

Comments:

Notes: 1. Column headings in uppercase are oracle data base column names.

Notes:2 Make no entries in shaded cells. They are either inappropriate, or will be filled in via excel formulae.

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

Page 2 of 2

CRUCOD	CRUNAM	DATE	STATION
	MU-7	11.28.12	500B/74

"NON-MAJOR COPEPODA TAXA"

"OTHER ZOOPLANKTON TAXA"

PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT	PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT
0148	Acartia danae			0400	Amphipoda		
0107	Acartia longiremis			0700	Appendicularia		
✓ 4027	Acartia spp.	3	123	2101	Balanidae	5	3 ✓
4195	Acrocalanus longicornis			1000	Brachyura		
4061	Aetideidae			0900	Bryozoa		
0192	Alteutha depressa			0554	Caridea		
0142	Calanoida			0200	Chaetognatha	5	24 ✓
0178	Calanus spp.			2350	Coelenterata		
0156	Calocalanus pavo			0567	Crangonidae		
4129	Calocalanus spp.			2700	Ctenophora		
0117	Candacia armata			1700	Cumacea		
✓ 4042	Candacia spp.	4	1	0500	Decapoda-Arthropoda	5	3 ✓
4020	Centropages bradyi			1500	Echinodermata	5	1 ✓
4112	Centropages furcatus			2000	Euphausiacea		
0133	Centropages spp.			0607	Evadne nordmanni		
4064	Clausocalanus furcatus			0605	Evadne spp.		
4098	Clausocalanus spp.			3900	Foraminifera		
0100	Copepoda			0895	Gammaridea		
4045	Corycaeidae			1100	Gastropoda		
0130	Cyclopoida			3300	Heteropoda		
✓ 0180	Eucalanus spp.	4	3	0457	Hyperidea		
0169	Euchaeta marina			2200	Isopoda		
0116	Euchaeta norvegica			0568	Lucifer spp.		
4062	Euchaetidae			2800	Mysidacea		
0132	Eurytemora spp.			2801	Mysidopsis bigelowi		
0131	Harpacticoida			1801	Nanomia cara		
4030	Heterorhabdidae			2802	Neomysis americana		
0159	Labidocera aestiva			0701	Oikopleura spp.		
4025	Labidocera spp.			3600	Ostracoda		
4007	Lucicutia spp.			3209	Paguridea		
0146	Mecynocera clausi			1300	Pelecypoda		
0149	Metridia spp.			0555	Penaeidae		
0150	Microcalanus pusillus			0611	Penilia avirostris		
4125	Microcalanus spp.			5101	Phoronis spp.		
4108	Neocalanus spp.			0601	Podon spp.		
0106	Oithona similis			2500	Polychaeta	5	28 ✓
0114	Oithona spinirostris			0202	Sagitta elegans		
0138	Oithona spp.			0203	Sagitta enflata		
0191	Oncaea spp.			0201	Sagitta serratodentata		
4118	Paracalanus spp.			0218	Sagitta spp.		
4002	Pleuromamma abdominalis			3403	Salpidae		
0176	Pleuromamma borealis			1800	Siphonophora		
4057	Pleuromamma spp.			0305	Spiratella spp.		
✓ 4058	Pontellidae	4	1	3400	Thaliacea		
4013	Pseudocalanidae			0300	Thecosomata		
0175	Rhincalanus cornutus			2502	Tomopteris helgolandica		
0125	Rhincalanus nasutus			2501	Tomopteris spp.		
4100	Rhincalanus spp.			0002	Unidentified zooplankton		
4066	Scolecithricidae						
4033	Scolecithrix bradyi						
0162	Scolecithrix danae						
4059	Temora spp.			Comments:			
0153	Temora stylifera						
4094	Temora turbinata						
✓ 0108	Tortanus discaudatus	4	1				
4019	Undinula vulgaris						

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

Page 1 of 2

CRUCOD (Cruise Code)	CRUNAM (Cruise Name)	DATE	STATION	GEAR
	MU-7	12.19.12	500A/76	6B3Z

VOLSML (ml)	ALQFCTR	TOTCNT
1	2	586

"MAJOR COPEPODA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	024 (Cop5)	023 (Cop4)	022 (Cop3)	021 (Cop2)	020 (Cop1)	999 (Unknown)	ZOOCNT
✓ 0101	Calanus finmarchicus	1	3	37	51	6				97
✓ 0109	Centropages hamatus	2	212	1						213
✓ 0103	Centropages typicus	3	44	84						128
0157	Clausocalanus arcuicornis									0
0105	Metridia lucens									0
✓ 0143	Nannocalanus minor	4		11					1	12
0135	Paracalanus parvus <i>missing?</i>	4	1							1
0102	Pseudocalanus minutus									0
✓ 0104	Temora longicornis <i>see back</i>	4	7	5						12

"EUPHAUSIACEA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	030 (Crytopia)	029 (Furcilia)	028 (Calyptopis)	013 (Nauplius)		999 (Unknown)	ZOOCNT
2006	Euphausia krohnii									0
2002	Meganyctiphanes norvegica									0
2019	Nematoscelis megalops									0
2012	Thysanoessa gregaria									0
2001	Thysanoessa inermis									0
2004	Thysanoessa longicaudata									0
2003	Thysanoessa raschii									0

"FISH TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	054 (Juvenile)	051 (Larvae)	050 (Egg)		999 (Unknown)	ZOOCNT
3500	Fish								0

"ORGANISMS > 2.5 cm"

PLKTAX NUM	PLKTAX NAM	VOLLRG (ml)	LENLRG (mm)	CNTLRG

Recorded By: ___ MK
Analysis Date: ___ 26.04.13

Comments:

Notes: 1. Column headings in uppercase are oracle data base column names.

Notes: 2. Make no entries in shaded cells. They are either inappropriate, or will be filled in via excel formulae.

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

CRUCOD	CRUNAM	DATE	STATION
	MU-7	12.19.12	500A/76

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"NON-MAJOR COPEPODA TAXA"

"OTHER ZOOPLANKTON TAXA"

PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT	PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT
0148	Acartia danae			0400	Amphipoda		
0107	Acartia longiremis			0700	Appendicularia		
✓ 4027	Acartia spp.	4	57	2101	Balanidae	5	30 ✓
4195	Acrocalanus longicornis			1000	Brachyura		
4061	Aetideidae			0900	Bryozoa		
0192	Alteutha depressa			0554	Caridea		
0142	Calanoida			0200	Chaetognatha		
✓ 0178	Calanus spp. <i>heaci</i>	4	1	2350	Coelenterata		
0156	Calocalanus pavo			0567	Crangonidae		
4129	Calocalanus spp.			2700	Ctenophora		
0117	Candacia armata			1700	Cumacea		
✓ 4042	Candacia spp.	4	2	0500	Decapoda-Arthropoda		
✓ 4020	Centropages bradyi	4	1	1500	Echinodermata	5	4 ✓
4112	Centropages furcatus			2000	Euphausiacea		
0133	Centropages spp.			0607	Evadne nordmanni		
4064	Clausocalanus furcatus			0605	Evadne spp.		
4098	Clausocalanus spp.			3900	Foraminifera		
0100	Copepoda			0895	Gammaridea		
4045	Corycaeidae			1100	Gastropoda		
0130	Cyclopoida			3300	Heteropoda		
✓ 0180	Eucalanus spp.	4	1	0457	Hyperidea		
0169	Euchaeta marina			2200	Isopoda		
0116	Euchaeta norvegica			0568	Lucifer spp.		
4062	Euchaetidae			2800	Mysidacea		
0132	Eurytemora spp.			2801	Mysidopsis bigelowi		
0131	Harpacticoida			1801	Nanomia cara		
4030	Heterorhabdidae			2802	Neomysis americana		
0159	Labidocera aestiva			0701	Oikopleura spp.		
4025	Labidocera spp.			3600	Ostracoda		
4007	Lucicutia spp.			3209	Paguridea		
0146	Mecynocera clausi			1300	Pelecypoda		
0149	Metridia spp.			0555	Penaeidae		
0150	Microcalanus pusillus			0611	Penilia avirostris		
4125	Microcalanus spp.			5101	Phoronis spp.		
4108	Neocalanus spp.			0601	Podon spp.		
0106	Oithona similis			2500	Polychaeta		
0114	Oithona spinirostris			0202	Sagitta elegans		
0138	Oithona spp.			0203	Sagitta enfiata		
0191	Oncaea spp.			0201	Sagitta serratodentata		
4118	Paracalanus spp.			0218	Sagitta spp.	5	3 ✓
4002	Pleuromamma abdominalis			3403	Salpidae		
0176	Pleuromamma borealis			1800	Siphonophora		
4057	Pleuromamma spp.			0305	Spiratella spp.		
4058	Pontellidae			3400	Thaliacea		
4013	Pseudocalanidae			0300	Thecosomata		
0175	Rhincalanus cornutus			2502	Tomopteris helgolandica		
0125	Rhincalanus nasutus			2501	Tomopteris spp.		
4100	Rhincalanus spp.			0002	Unidentified zooplankton		
4066	Scolecithricidae						
4033	Scolecithrix bradyi						
0162	Scolecithrix danae						
✓ 4059	Temora spp. <i>immature</i>	4	1	Comments:			
0153	Temora stylifera						
4094	Temora turbinata <i>cannot confirm spec.</i>	4	3	<i>can't see difference from T. longicornis</i>			
0108	Tortanus discaudatus						
4019	Undinula vulgaris						

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

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CRUCOD (Cruise Code)	CRUNAM (Cruise Name)	DATE	STATION	GEAR
	MU-7	01.09.13	200D/77	6B3Z

VOLUME (ml)	ALQFCTR	TOTCNT
2.5	128	522

"MAJOR COPEPODA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	024 (Cop5)	023 (Cop4)	022 (Cop3)	021 (Cop2)	020 (Cop1)	999 (Unknown)	ZOOCNT
0101	Calanus finmarchicus									0
0109	Centropages hamatus									0
0103	Centropages typicus									0
0157	Clausocalanus arcuicornis									0
0105	Metridia lucens									0
0143	Nannocalanus minor									0
0135	Paracalanus parvus									0
0102	Pseudocalanus minutus									0
0104	Temora longicornis	3		2						2

"EUPHAUSIACEA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	030 (Cryptop)	029 (Furcilia)	028 (Calyptopis)	013 (Nauplius)		999 (Unknown)	ZOOCNT
2006	Euphausia krohnii									0
2002	Meganyctiphanes norvegica									0
2019	Nematoscelis megalops									0
2012	Thysanoessa gregaria									0
2001	Thysanoessa inermis									0
2004	Thysanoessa longicaudata									0
2003	Thysanoessa raschii									0

"FISH TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	054 (Juvenile)	051 (Larvae)	050 (Egg)		999 (Unknown)	ZOOCNT
3500	Fish								0

"ORGANISMS > 2.5 cm"

PLKTAX NUM	PLKTAX NAM	VOLLRG (ml)	LENLRG (mm)	CNTLRG

Recorded By: ___ MH
Analysis Date: ___ 26.04.13

Comments:

Notes: 1. Column headings in uppercase are oracle data base column names.

Notes:2 Make no entries in shaded cells. They are either inappropriate, or will be filled in via excel formulae.

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

CRUCOD	CRUNAM	DATE	STATION
	MU-7	01.09.13	200D/77

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"NON-MAJOR COPEPODA TAXA"

"OTHER ZOOPLANKTON TAXA"

PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT	PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT
0148	Acartia danae			0400	Amphipoda		
0107	Acartia longiremis			0700	Appendicularia		
✓ 4027	Acartia spp.	1	193	2101	Balanidae	6	21 ✓
4195	Acrocalanus longicornis			1000	Brachyura		
4061	Aetideidae			0900	Bryozoa		
0192	Alteutha depressa			0554	Caridea		
✓ 0142	Calanoida	3	21	0200	Chaetognatha		
0178	Calanus spp.			2350	Coelenterata		
0156	Calocalanus pavo			0567	Crangonidae		
4129	Calocalanus spp.			2700	Ctenophora		
0117	Candacia armata			1700	Cumacea		
4042	Candacia spp.			0500	Decapoda-Arthropoda		
4020	Centropages bradyi			1500	Echinodermata		
4112	Centropages furcatus			2000	Euphausiacea		
✓ 0133	Centropages spp.	2	122	0607	Evadne nordmanni		
4064	Clausocalanus furcatus			0605	Evadne spp.		
4098	Clausocalanus spp.			3900	Foraminifera		
0100	Copepoda			0895	Gammaridea		
4045	Corycaeidae			1100	Gastropoda		
0130	Cyclopoida			3300	Heteropoda		
0180	Eucalanus spp.			0457	Hyperidea		
0169	Euchaeta marina			2200	Isopoda		
0116	Euchaeta norvegica			0568	Lucifer spp.		
4062	Euchaetidae			2800	Mysidacea		
0132	Eurytemora spp.			2801	Mysidopsis bigelowi		
✓ 0131	Harpacticoida	3	3	1801	Nanomia cara		
4030	Heterorhabdidae			2802	Neomysis americana		
0159	Labidocera aestiva			0701	Oikopleura spp.		
4025	Labidocera spp.			3600	Ostracoda		
4007	Lucicutia spp.			3209	Paguridea		
0146	Mecynocera clausi			1300	Pelecypoda	4	55 84 ✓
0149	Metridia spp.			0555	Penaeidae		
0150	Microcalanus pusillus			0611	Penilia avirostris		
4125	Microcalanus spp.			5101	Phoronis spp.		
4108	Neocalanus spp.			0601	Podon spp.		
0106	Oithona similis			2500	Polychaeta	5	55 ✓
0114	Oithona spinirostris			0202	Sagitta elegans		
✓ 0138	Oithona spp.	3	30	0203	Sagitta enflata		
0191	Oncaea spp.			0201	Sagitta serratodentata		
4118	Paracalanus spp.	3	1	0218	Sagitta spp.		
4002	Pleuromamma abdominalis			3403	Salpidae		
0176	Pleuromamma borealis			1800	Siphonophora		
4057	Pleuromamma spp.			0305	Spiratella spp.		
4058	Pontellidae			3400	Thaliacea		
4013	Pseudocalanidae			0300	Thecosomata		
0175	Rhincalanus cornutus			2502	Tomopteris helgolandica		
0125	Rhincalanus nasutus			2501	Tomopteris spp.		
4100	Rhincalanus spp.			0002	Unidentified zooplankton		
4066	Scolecithricidae						
4033	Scolecithrix bradyi						
0162	Scolecithrix danae						
✓ 4059	Temora spp.	3	21 18	Comments:			
0153	Temora stylifera						
4094	Temora turbinata						
✓ 0108	Tortanus discaudatus	3	1 2				
4019	Undinula vulgaris						

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

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CRUCOD (Cruise Code)	CRUNAM (Cruise Name)	DATE	STATION	GEAR
	MU-7	01.09.13	500A/78	6B3Z

VOLSML (ml)	ALQFCTR	TOTCNT
1	8	797

"MAJOR COPEPODA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	024 (Cop5)	023 (Cop4)	022 (Cop3)	021 (Cop2)	020 (Cop1)	999 (Unknown)	ZOOCNT
✓ 0101	Calanus finmarchicus	5	13	14	3				1	31
✓ 0109	Centropages hamatus	1	307	10						317
✓ 0103	Centropages typicus	2	48	1					1	50
0157	Clausocalanus arcuicornis									0
0105	Metridia lucens									0
0143	Nannocalanus minor									0
0135	Paracalanus parvus									0
0102	Pseudocalanus minutus									0
✓ 0104	Temora longicornis	3	254	1					2	257

"EUPHAUSIACEA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	030 (Crytopia)	029 (Furcilia)	028 (Calyptopis)	013 (Nauplius)		999 (Unknown)	ZOOCNT
2006	Euphausia krohnii									0
2002	Meganyctiphanes norvegica									0
2019	Nematoscelis megalops									0
2012	Thysanoessa gregaria									0
2001	Thysanoessa inermis									0
2004	Thysanoessa longicaudata									0
2003	Thysanoessa raschii									0

"FISH TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	054 (Juvenile)	051 (Larvae)	050 (Egg)		999 (Unknown)	ZOOCNT
3500	Fish								0

"ORGANISMS > 2.5 cm"

PLKTAX NUM	PLKTAX NAM	VOLLRG (ml)	LENLRG (mm)	CNTLRG

Recorded By: MK
Analysis Date: 25.04.13

Comments:

Notes: 1. Column headings in uppercase are oracle data base column names.

Notes: 2 Make no entries in shaded cells. They are either inappropriate, or will be filled in via excel formulae.

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

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CRUCOD	CRUNAM	DATE	STATION
	MU-7	01.09.13	500A/78

"NON-MAJOR COPEPODA TAXA"

"OTHER ZOOPLANKTON TAXA"

PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT	PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT
0148	Acartia danae			0400	Amphipoda		
0107	Acartia longiremis			0700	Appendicularia		
✓ 4027	Acartia spp.	4	109	2101	Balanidae	6	6
4195	Acrocalanus longicornis			1000	Brachyura		
4061	Aetideidae			0900	Bryozoa		
0192	Alteutha depressa			0554	Caridea		
0142	Calanoida			0200	Chaetognatha	6	5
0178	Calanus spp.			2350	Coelenterata		
0156	Calocalanus pavo			0567	Crangonidae		
4129	Calocalanus spp.			2700	Ctenophora		
0117	Candacia armata			1700	Cumacea		
4042	Candacia spp.			0500	Decapoda-Arthropoda		
4020	Centropages bradyi			1500	Echinodermata	6	2
4112	Centropages furcatus			2000	Euphausiacea		
0133	Centropages spp.			0607	Evadne nordmanni		
4064	Clausocalanus furcatus			0605	Evadne spp.		
4098	Clausocalanus spp.			3900	Foraminifera		
0100	Copepoda			0895	Gammaridea		
4045	Corycaeidae			1100	Gastropoda		
0130	Cyclopoida			3300	Heteropoda		
✓ 0180	Eucalanus spp.	5	2	0457	Hyperidea		
0169	Euchaeta marina			2200	Isopoda		
0116	Euchaeta norvegica			0568	Lucifer spp.		
4062	Euchaetidae			2800	Mysidacea		
0132	Eurytemora spp.			2801	Mysidopsis bigelowi		
0131	Harpacticoida			1801	Nanomia cara		
4030	Heterorhabdidae			2802	Neomysis americana		
0159	Labidocera aestiva			0701	Oikopleura spp.		
4025	Labidocera spp.			3600	Ostracoda		
4007	Lucicutia spp.			3209	Paguridea		
0146	Mecynocera clausi			1300	Pelecypoda		
0149	Metridia spp.			0555	Penaeidae		
0150	Microcalanus pusillus			0611	Penilia avirostris		
4125	Microcalanus spp.			5101	Phoronis spp.		
4108	Neocalanus spp.			0601	Podon spp.		
0106	Oithona similis			2500	Polychaeta		
0114	Oithona spinirostris			0202	Sagitta elegans		
0138	Oithona spp.			0203	Sagitta enflata		
0191	Oncaea spp.			0201	Sagitta serratodentata		
4118	Paracalanus spp.			0218	Sagitta spp.	6	5
4002	Pleuromamma abdominalis			3403	Salpidae		
0176	Pleuromamma borealis			1800	Siphonophora		
4057	Pleuromamma spp.			0305	Spiratella spp.		
4058	Pontellidae			3400	Thaliacea		
4013	Pseudocalanidae			0300	Thecosomata		
0175	Rhincalanus cornutus			2502	Tomopteris helgolandica		
0125	Rhincalanus nasutus			2501	Tomopteris spp.		
4100	Rhincalanus spp.			0002	Unidentified zooplankton	6	2
4066	Scolecithricidae						
4033	Scolecithrix bradyi						
0162	Scolecithrix danae						
4059	Temora spp.			Comments:			
0153	Temora stylifera						
4094	Temora turbinata						
✓ 0108	Tortanus discaudatus	5	18				
4019	Undinula vulgaris						

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

Page 1 of 2

CRUCOD (Cruise Code)	CRUNAM (Cruise Name)	DATE	STATION	GEAR
	MU-10	11.28.12	500A/86	6B3Z

VOLSML (ml)	ALQFCTR	TOTCNT
1	1	779

"MAJOR COPEPODA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	024 (Cop5)	023 (Cop4)	022 (Cop3)	021 (Cop2)	020 (Cop1)	999 (Unknown)	ZOOCNT
✓ 0101	Calanus finmarchicus	3	1	1	1					3
✓ 0109	Centropages hamatus	2	413	22						435
✓ 0103	Centropages typicus	3	6	2						8
0157	Clausocalanus arcuicornis									0
0105	Metridia lucens									0
0143	Nannocalanus minor									0
0135	Paracalanus parvus									0
0102	Pseudocalanus minutus									0
0104	Temora longicornis									0

"EUPHAUSIACEA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	030 (Cryptop)	029 (Furcilia)	028 (Calypsis)	013 (Nauplius)		999 (Unknown)	ZOOCNT
2006	Euphausia krohnii									0
2002	Meganyctiphanes norvegica									0
2019	Nematoscelis megalops									0
2012	Thysanoessa gregaria									0
2001	Thysanoessa inermis									0
2004	Thysanoessa longicaudata									0
2003	Thysanoessa raschii									0

"FISH TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	054 (Juvenile)	051 (Larvae)	050 (Egg)		999 (Unknown)	ZOOCNT
3500	Fish								0

"ORGANISMS > 2.5 cm"

PLKTAX NUM	PLKTAX NAM	VOLLRG (ml)	LENLRG (mm)	CNTLRG

Recorded By: ___ MP
Analysis Date: ___ 28.04.13

Comments:

Notes: 1. Column headings in uppercase are oracle data base column names.

Notes: 2. Make no entries in shaded cells. They are either inappropriate, or will be filled in via excel formulae.

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

Page 2 of 2

CRUCOD	CRUNAM	DATE	STATION
	MU-10	11.28.12	500A/86

"NON-MAJOR COPEPODA TAXA"

"OTHER ZOOPLANKTON TAXA"

PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT	PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT
0148	Acartia danae			0400	Amphipoda		
0107	Acartia longiremis			0700	Appendicularia		
✓ 4027	Acartia spp.	2	329	2101	Balanidae		
4195	Acrocalanus longicornis			1000	Brachyura		
4061	Aetideidae			0900	Bryozoa		
0192	Alteutha depressa			0554	Caridea		
✓ 0142	Calanoida*	3	1	0200	Chaetognatha		
0178	Calanus spp.			2350	Coelenterata		
0156	Calocalanus pavo			0567	Crangonidae		
4129	Calocalanus spp.			2700	Ctenophora		
0117	Candacia armata			1700	Cumacea		
4042	Candacia spp.			0500	Decapoda-Arthropoda		
4020	Centropages bradyi			1500	Echinodermata		
4112	Centropages furcatus			2000	Euphausiacea		
0133	Centropages spp.			0607	Evadne nordmanni		
4064	Clausocalanus furcatus			0605	Evadne spp.		
4098	Clausocalanus spp.			3900	Foraminifera		
0100	Copepoda			0895	Gammaridea		
4045	Corycaeidae			1100	Gastropoda		
0130	Cyclopoida			3300	Heteropoda		
0180	Eucalanus spp.			0457	Hyperidea		
0169	Euchaeta marina			2200	Isopoda		
0116	Euchaeta norvegica			0568	Lucifer spp.		
4062	Euchaetidae			2800	Mysidacea		
0132	Eurytemora spp.			2801	Mysidopsis bigelowi		
0131	Harpacticoida			1801	Nanomia cara		
4030	Heterorhabdidae			2802	Neomysis americana		
0159	Labidocera aestiva			0701	Oikopleura spp.		
4025	Labidocera spp.			3600	Ostracoda		
4007	Lucicutia spp.			3209	Paguridea		
0146	Mecynocera clausi			1300	Pelecypoda		
0149	Metridia spp.			0555	Penaeidae		
0150	Microcalanus pusillus			0611	Penilia avirostris		
4125	Microcalanus spp.			5101	Phoronis spp.		
4108	Neocalanus spp.			0601	Podon spp.		
0106	Oithona similis			2500	Polychaeta		
0114	Oithona spinirostris			0202	Sagitta elegans		
0138	Oithona spp.			0203	Sagitta enflata		
0191	Oncaea spp.			0201	Sagitta serratodentata		
4118	Paracalanus spp.			0218	Sagitta spp.		
4002	Pleuromamma abdominalis			3403	Salpidae		
0176	Pleuromamma borealis			1800	Siphonophora		
4057	Pleuromamma spp.			0305	Spiratella spp.		
4058	Pontellidae			3400	Thaliacea		
4013	Pseudocalanidae			0300	Thecosomata		
0175	Rhincalanus cornutus			2502	Tomopteris helgolandica		
0125	Rhincalanus nasutus			2501	Tomopteris spp.		
4100	Rhincalanus spp.			0002	Unidentified zooplankton	4	3 ✓
4066	Scolecithricidae						
4033	Scolecithrix bradyi						
0162	Scolecithrix danae						
4059	Temora spp.			Comments:			
0153	Temora stylifera			*-Pseudodiaptomus spp. - 1			
4094	Temora turbinata			Acartia spp. = A. tonsa			
0108	Tortanus discaudatus						
4019	Undinula vulgaris						

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

Page 1 of 2

CRUCOD (Cruise Code)	CRUNAM (Cruise Name)	DATE	STATION	GEAR
	MU-10	10.01.13	500A/90	6B3Z

VOLSML (ml)	ALQFCTR	TOTCNT
2	2	557

"MAJOR COPEPODA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	024 (Cop5)	023 (Cop4)	022 (Cop3)	021 (Cop2)	020 (Cop1)	999 (Unknown)	ZOOCNT
✓ 0101	Calanus finmarchicus	3				3				3
✓ 0109	Centropages hamatus	1	178	3						181
✓ 0103	Centropages typicus	3	23	3	1					27
0157	Clausocalanus arcuicornis									0
0105	Metridia lucens									0
0143	Nannocalanus minor									0
0135	Paracalanus parvus									0
0102	Pseudocalanus minutus									0
✓ 0104	Temora longicornis	3	25							25

"EUPHAUSIACEA TAXA"

PLKTAX NUM	PLKTAXNAM NAM	ZOOSTG-> Vial No.	000 (Adult)	030 (Cryptopis)	029 (Furcilia)	028 (Calypptopis)	013 (Nauplius)		999 (Unknown)	ZOOCNT
2006	Euphausia krohnii									0
2002	Meganyctiphanes norvegica									0
2019	Nematoscelis megalops									0
2012	Thysanoessa gregaria									0
2001	Thysanoessa inermis									0
2004	Thysanoessa longicaudata									0
2003	Thysanoessa raschii									0

"FISH TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	054 (Juvenile)	051 (Larvae)	050 (Egg)		999 (Unknown)	ZOOCNT
3500	Fish								0

"ORGANISMS > 2.5 cm"

PLKTAX NUM	PLKTAX NAM	VOLLRG (ml)	LENLRG (mm)	CNTLRG

Recorded By: ___ DS.
Analysis Date: 30.04.13

Comments:

Notes: 1. Column headings in uppercase are oracle data base column names.

Notes: 2 Make no entries in shaded cells. They are either inappropriate, or will be filled in via excel formulae.

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

Page 2 of 2

CRUCOD	CRUNAM	DATE	STATION
	MU-10	10.01.13	500A/90

"NON-MAJOR COPEPODA TAXA"

"OTHER ZOOPLANKTON TAXA"

PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT	PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT
0148	Acartia danae			0400	Amphipoda		
0107	Acartia longiremis			0700	Appendicularia		
✓ 4027	Acartia spp.	3	25	2101	Balanidae	4	1 ✓
4195	Acrocalanus longicornis			1000	Brachyura		
4061	Aetideidae			0900	Bryozoa		
0192	Alteutha depressa			0554	Caridea		
0142	Calanoida			0200	Chaetognatha		
✓ 0178	Calanus spp.	3	1	2350	Coelenterata	4	7 6 ✓
0156	Calocalanus pavo			0567	Crangonidae		
4129	Calocalanus spp.			2700	Ctenophora		
0117	Candacia armata			1700	Cumacea		
4042	Candacia spp.			0500	Decapoda-Arthropoda		
4020	Centropages bradyi			1500	Echinodermata		
4112	Centropages furcatus			2000	Euphausiacea		
0133	Centropages spp.			0607	Evadne nordmanni		
4064	Clausocalanus furcatus			0605	Evadne spp.		
4098	Clausocalanus spp.			3900	Foraminifera		
0100	Copepoda* missing?	3	1	0895	Gammaridea		
4045	Corycaeidae			1100	Gastropoda		
0130	Cyclopoida			3300	Heteropoda		
0180	Eucalanus spp.			0457	Hyperidea		
0169	Euchaeta marina			2200	Isopoda		
0116	Euchaeta norvegica			0568	Lucifer spp.		
4062	Euchaetidae			2800	Mysidacea	4	6 ✓
✓ 0132	Eurytemora spp.	2	261	2801	Mysidopsis bigelowi		
0131	Harpacticoida			1801	Nanomia cara		
4030	Heterorhabdidae			2802	Neomysis americana		
0159	Labidocera aestiva			0701	Oikopleura spp.		
4025	Labidocera spp.			3600	Ostracoda		
4007	Lucicutia spp.			3209	Paguridea		
0146	Mecynocera clausi			1300	Pelecypoda		
0149	Metridia spp.			0555	Penaeidae		
0150	Microcalanus pusillus			0611	Penilia avirostris		
4125	Microcalanus spp.			5101	Phoronis spp.		
4108	Neocalanus spp.			0601	Podon spp.		
0106	Oithona similis			2500	Polychaeta		
0114	Oithona spinirostris			0202	Sagitta elegans	4	1 ✓
0138	Oithona spp.			0203	Sagitta enflata		
0191	Oncaea spp.			0201	Sagitta serratodentata		
4118	Paracalanus spp.			0218	Sagitta spp.		
4002	Pleuromamma abdominalis			3403	Salpidae		
0176	Pleuromamma borealis			1800	Siphonophora		
4057	Pleuromamma spp.			0305	Spiratella spp.		
4058	Pontellidae			3400	Thaliacea		
4013	Pseudocalanidae			0300	Thecosomata		
0175	Rhincalanus cornutus			2502	Tomopteris helgolandica		
0125	Rhincalanus nasutus			2501	Tomopteris spp.		
4100	Rhincalanus spp.			0002	Unidentified zooplankton	4	19 ✓
4066	Scolecithricidae						
4033	Scolecithrix bradyi						
0162	Scolecithrix danae						
4059	Temora spp.			Comments:			
0153	Temora stylifera			*-C.nauplii			
4094	Temora turbinata						
0108	Tortanus discaudatus						
4019	Undinula vulgaris						

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

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CRUCOD (Cruise Code)	CRUNAM (Cruise Name)	DATE	STATION	GEAR
	MU-12	08.22.12	500B/99	6B3Z

VOL _{ML} (ml)	ALQFCTR	TOTCNT
2	1	24

"MAJOR COPEPODA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	024 (Cop5)	023 (Cop4)	022 (Cop3)	021 (Cop2)	020 (Cop1)	999 (Unknown)	ZOOCNT
0101	Calanus finmarchicus									0
0109	Centropages hamatus	1	1							1
0103	Centropages typicus									0
0157	Clausocalanus arcuicornis									0
0105	Metridia lucens									0
0143	Nannocalanus minor									0
0135	Paracalanus parvus									0
0102	Pseudocalanus minutus									0
0104	Temora longicornis									0

"EUPHAUSIACEA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	030 (Cryptopia)	029 (Furcilia)	028 (Calyptopis)	013 (Nauplius)		999 (Unknown)	ZOOCNT
2006	Euphausia krohnii									0
2002	Meganyctiphanes norvegica									0
2019	Nematoscelis megalops									0
2012	Thysanoessa gregaria									0
2001	Thysanoessa inermis									0
2004	Thysanoessa longicaudata									0
2003	Thysanoessa raschii									0

"FISH TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	054 (Juvenile)	051 (Larvae)	050 (Egg)		999 (Unknown)	ZOOCNT
3500	Fish	2			4	5			5

"ORGANISMS > 2.5 cm"

PLKTAX NUM	PLKTAX NAM	VOLLRG (ml)	LENLRG (mm)	CNTLRG

Recorded By: ___ MP
Analysis Date: ___ 28.04.13

Comments:

Notes: 1. Column headings in uppercase are oracle data base column names.

Notes: 2 Make no entries in shaded cells. They are either inappropriate, or will be filled in via excel formulae.

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

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CRUCOD	CRUNAM	DATE	STATION
	MU-12	08.22.12	500B/99

"NON-MAJOR COPEPODA TAXA"

"OTHER ZOOPLANKTON TAXA"

PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT	PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT
0148	Acartia danae			0400	Amphipoda		
0107	Acartia longiremis			0700	Appendicularia		
✓ 4027	Acartia spp.	1	1	2101	Balanidae		
4195	Acrocalanus longicornis			1000	Brachyura	2	5 ✓
4061	Aetideidae			0900	Bryozoa		
0192	Alteutha depressa			0554	Caridea	2	6 ✓
0142	Calanoida			0200	Chaetognatha		
0178	Calanus spp.			2350	Coelenterata	2	3 ✓
0156	Calocalanus pavo			0567	Crangonidae		
4129	Calocalanus spp.			2700	Ctenophora		
0117	Candacia armata			1700	Cumacea		
4042	Candacia spp.			0500	Decapoda-Arthropoda		
4020	Centropages bradyi			1500	Echinodermata		
4112	Centropages furcatus			2000	Euphausiacea		
0133	Centropages spp.			0607	Evadne nordmanni		
4064	Clausocalanus furcatus			0605	Evadne spp.		
4098	Clausocalanus spp.			3900	Foraminifera		
0100	Copepoda			0895	Gammaridea		
4045	Corycaeidae			1100	Gastropoda		
0130	Cyclopoida			3300	Heteropoda		
0180	Eucalanus spp.			0457	Hyperidea		
0169	Euchaeta marina			2200	Isopoda		
0116	Euchaeta norvegica			0568	Lucifer spp.		
4062	Euchaetidae			2800	Mysidacea		
0132	Eurytemora spp.			2801	Mysidopsis bigelowi		
0131	Harpacticoida			1801	Nanomia cara		
4030	Heterorhabdidae			2802	Neomysis americana		
0159	Labidocera aestiva			0701	Oikopleura spp.		
4025	Labidocera spp.			3600	Ostracoda		
4007	Lucicutia spp.			3209	Paguridea		
0146	Mecynocera clausi			1300	Pelecypoda		
0149	Metridia spp.			0555	Penaeidae		
0150	Microcalanus pusillus			0611	Penilia avirostris		
4125	Microcalanus spp.			5101	Phoronis spp.		
4108	Neocalanus spp.			0601	Podon spp.		
0106	Oithona similis			2500	Polychaeta		
0114	Oithona spinirostris			0202	Sagitta elegans		
0138	Oithona spp.			0203	Sagitta enflata		
0191	Oncaea spp.			0201	Sagitta serratodentata		
4118	Paracalanus spp.			0218	Sagitta spp.		
4002	Pleuromamma abdominalis			3403	Salpidae		
0176	Pleuromamma borealis			1800	Siphonophora		
4057	Pleuromamma spp.			0305	Spiratella spp.		
✓ 4058	Pontellidae	1	2	3400	Thaliacea		
4013	Pseudocalanidae			0300	Thecosomata		
0175	Rhincalanus cornutus			2502	Tomopteris helgolandica		
0125	Rhincalanus nasutus			2501	Tomopteris spp.		
4100	Rhincalanus spp.			0002	Unidentified zooplankton		
4066	Scolecithricidae			3200	Anomura	2	1 ✓
4033	Scolecithrix bradyi						
0162	Scolecithrix danae						
4059	Temora spp.			Comments:			
0153	Temora stylifera						
4094	Temora turbinata						
0108	Tortanus discaudatus						
4019	Undinula vulgaris						

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

Page 1 of 2

CRUCOD (Cruise Code)	CRUNAM (Cruise Name)	DATE	STATION	GEAR
	MU-12	10.10.13	500B/105	6B3Z

VOLSML (ml)	ALQFCTR	TOTCNT
115	1	145

"MAJOR COPEPODA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	024 (Cop5)	023 (Cop4)	022 (Cop3)	021 (Cop2)	020 (Cop1)	999 (Unknown)	ZOOCNT
0101	Calanus finmarchicus									0
0109	Centropages hamatus									0
0103	Centropages typicus									0
0157	Clausocalanus arcuicornis									0
0105	Metridia lucens									0
0143	Nannocalanus minor									0
0135	Paracalanus parvus									0
0102	Pseudocalanus minutus									0
0104	Temora longicornis									0

"EUPHAUSIACEA TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	030 (Cryptop)	029 (Furcilia)	028 (Calypptopis)	013 (Nauplius)		999 (Unknown)	ZOOCNT
2006	Euphausia krohnii									0
2002	Meganyctiphanes norvegica									0
2019	Nematoscelis megalops									0
2012	Thysanoessa gregaria									0
2001	Thysanoessa inermis									0
2004	Thysanoessa longicaudata									0
2003	Thysanoessa raschii									0

"FISH TAXA"

PLKTAX NUM	PLKTAX NAM	ZOOSTG-> Vial No.	000 (Adult)	054 (Juvenile)	051 (Larvae)	050 (Egg)		999 (Unknown)	ZOOCNT
3500	Fish	3			1				1

"ORGANISMS > 2.5 cm"

PLKTAX NUM	PLKTAX NAM	VOLLRG (ml)	LENLRG (mm)	CNTLRG

Recorded By: ____ DS.
Analysis Date: ____ 30.04.13

Comments:

Notes: 1. Column headings in uppercase are oracle data base column names.

Notes: 2. Make no entries in shaded cells. They are either inappropriate, or will be filled in via excel formulae.

MARMAP ZOOPLANKTON IDENTIFIER'S WORKSHEET (ZIW)

CRUCOD	CRUNAM	DATE	STATION
	MU-12	10.10.12	500B/105

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"NON-MAJOR COPEPODA TAXA"

"OTHER ZOOPLANKTON TAXA"

PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT	PLKTAX NUM	PLKTAX NAM	Vial No.	ZOOCNT
0148	Acartia danae			0400	Amphipoda		
0107	Acartia longiremis			0700	Appendicularia		
✓ 4027	Acartia spp.	1	58	2101	Balanidae		
4195	Acrocalanus longicornis			1000	Brachyura	3	13 ✓
4061	Aetideidae			0900	Bryozoa		
0192	Alteutha depressa			0554	Caridea	3	36 ✓
✓ 0142	Calanoida*	2	1	0200	Chaetognatha		
0178	Calanus spp.			2350	Coelenterata	3	2 ✓
0156	Calocalanus pavo			0567	Crangonidae		
4129	Calocalanus spp.			2700	Ctenophora		
0117	Candacia armata			1700	Cumacea		
4042	Candacia spp.			0500	Decapoda-Arthropoda		
4020	Centropages bradyi			1500	Echinodermata		
4112	Centropages furcatus			2000	Euphausiacea		
0133	Centropages spp.			0607	Evadne nordmanni		
4064	Clausocalanus furcatus			0605	Evadne spp.		
4098	Clausocalanus spp.			3900	Foraminifera		
0100	Copepoda			0895	Gammaridea		
4045	Corycaeidae			1100	Gastropoda		
✓ 0130	Cyclopoida	2	1	3300	Heteropoda		
0180	Eucalanus spp.			0457	Hyperidea		
0169	Euchaeta marina			2200	Isopoda		
0116	Euchaeta norvegica			0568	Lucifer spp.		
4062	Euchaetidae			2800	Mysidacea		
0132	Eurytemora spp.			2801	Mysidopsis bigelowi		
0131	Harpacticoida			1801	Nanomia cara		
4030	Heterorhabdidae			2802	Neomysis americana		
✓ 0159	Labidocera aestiva	2	33	0701	Oikopleura spp.		
4025	Labidocera spp.			3600	Ostracoda		
4007	Lucicutia spp.			3209	Paguridea		
0146	Mecynocera clausi			1300	Pelecypoda		
0149	Metridia spp.			0555	Penaeidae		
0150	Microcalanus pusillus			0611	Penilia avirostris		
4125	Microcalanus spp.			5101	Phoronis spp.		
4108	Neocalanus spp.			0601	Podon spp.		
0106	Oithona similis			2500	Polychaeta		
0114	Oithona spinirostris			0202	Sagitta elegans		
0138	Oithona spp.			0203	Sagitta enflata		
0191	Oncaea spp.			0201	Sagitta serratodentata		
4118	Paracalanus spp.			0218	Sagitta spp.		
4002	Pleuromamma abdominalis			3403	Salpidae		
0176	Pleuromamma borealis			1800	Siphonophora		
4057	Pleuromamma spp.			0305	Spiratella spp.		
4058	Pontellidae			3400	Thaliacea		
4013	Pseudocalanidae			0300	Thecosomata		
0175	Rhincalanus cornutus			2502	Tomopteris helgolandica		
0125	Rhincalanus nasutus			2501	Tomopteris spp.		
4100	Rhincalanus spp.			0002	Unidentified zooplankton		
4066	Scolecithricidae						
4033	Scolecithrix bradyi						
0162	Scolecithrix danae						
4059	Temora spp.			Comments:			
0153	Temora stylifera			*-Pseudodiaptomus spp.			
4094	Temora turbinata						
0108	Tortanus discaudatus						
4019	Undinula vulgaris						

Appendix 2

Sampling information for each sample number

sample number	Date	Station	Net	Time	Biovolume m ³
1	5/31/2012	BB02	200D	10:46	
2			200C	10:46	0.1423
3	5/31/2012	BB05a	200C	10:15	0.121506683
4	6/13/2012	BB02	200C	10:36	0.10273
5	6/13/2012	BB05a	200D	10:07	0.0588
6	6/13/2012	BB12	200D	10:55	
7	6/27/2012	BB02	500A	14:34	0.1511
8	6/27/2012	BB05a	500B	10:55	0.5624
9			200C	10:42	0.2027
10	6/26/2012	BB12	500A	10:32	1.26518
11	7/9/2012	BB02	200D	11:03	
12	7/9/2012	BB05a	500B	10:23	0.2375
13			200D	10:40	0.4881
14	7/9/2012	BB12	200D	11:42	0.05741
15	7/24/2012	BB02	500B	15:25	0.7173
16			200D	15:07	0.09699
17	7/24/2012	BB05a	500A	6:00	0.046992481
18			200D		0.046728972
19	7/24/2012	BB05a	500A	12:00	0.08813161
20			200C		0.059031877
21	7/24/2012	BB05a	500B	18:00	0.065245759
22			200C		0.039277298
23	7/24/2012	BB05a	500B	23:45	0.051124744
24			200C		0.142450142
25	8/7/2012	BB02	500B	10:52	0.0451
26			200C	11:04	
27	8/7/2012	BB05a	500B	10:30	0.0846
28			200C	10:21	0.0456
29	8/8/2012	BB12	500B	11:22	1.288
30			200D	10:58	0.3268
31	8/22/2012	BB02	500B	15:38	0.1116
32			200C	15:49	0.0615
33	8/22/2012	BB05a	500B	14:54	0.79533
34			200C	14:36	0.1582
35	8/23/2012	BB12	500B	10:24	0.12384
36			200C	10:24	0.05559
37	9/6/2012	BB02	500A	11:52	0.0865
38			200D	11:40	0.0617
39	9/6/2012	BB05a	500A	11:00	0.05461
40			200C	11:15	0.05312
41	9/7/2012	BB12	500B	9:21	1.1116
42			200D	9:44	0.0832
43	9/21/2012	BB02	500A	10:10	0.0953
44			200C	10:24	0.095
45	9/21/2012	BB05a	500B	9:38	0.10025
46			200D	9:19	0.04887
47	9/20/2012	BB07a	500B	15:15	
48			200C	15:03	0.0583
49	9/20/2012	BB10	500B	12:12	0.3045
50			200D	12:00	0.2838
51	9/20/2012	BB12	500B	10:50	0.3706
52			200D	11:08	0.2586
53	10/10/2012	BB02	500A	9:21	0.0679
54			200C	9:33	0.0436
55	10/10/2012	BB05a	500B	8:00	0.021290185

Sampling information for each sample number

sample number	Date	Station	Net	Time	Biovolume m^3
56			200C	8:00	
57	10/10/2012	BB05a	500A		0.030988534
58			200D	12:00	
59	10/10/2012	BB05a	500A		0.159574468
60			200D	16:00	
61	10/10/2012	BB05a	500A		0.050403226
62			200C	20:00	
63	10/11/2012	BB05a	500B		0.058479532
64			200D	0:00	0.046403712
65	10/11/2012	BB05a	500B		0.075872534
66			200D	4:00	0.051387461
67	10/12/2012	BB07a	500A	11:35	
68			200D	11:20	0.0313
69	10/12/2012	BB10	500B	13:35	0.0319
70			200C	13:23	0.0314
71	10/12/2012	BB12	500B	12:41	3.5803
72			200C	12:52	0.0378
73	10/24/2012	BB02	500A	9:20	0.0777
74			200C	9:30	0.0532
75	10/24/2012	BB05a	500A	8:55	
76			200C	8:40	
77	10/25/2012	BB07a	500B	10:20	
78			200C	10:00	0.0538
79	10/25/2012	BB10	500A	11:10	0.0648
80			200C	11:20	
81	10/25/2012	BB12	500A	11:55	0.0849
82			200D	12:10	0.0429
83	11/30/2012	BB02	500B	9:35	0.054
84			200C	9:22	0.2381
85	11/30/2012	BB05a	500B	10:00	
86			200D	10:00	0.23474
87	11/29/2012	BB07a	500B	11:45	0.04852
88			200C	11:30	0.3221
89	11/29/2012	BB10	500A	13:50	0.0236
90			200D	13:35	0.3846
91	11/29/2012	BB12	500B	12:33	0.2672
92			200C	12:45	0.062
93	12/19/2012	BB05a	500A	9:25	0.0247
94			200D	9:02	
95	12/20/2012	BB07a	500A	9:01	0.0306
96			200D	8:53	0.0204
97	12/20/2012	BB10	500A	11:41	0.041208791
98			200C	11:27	0.0331
99	12/20/2012	BB12	500B	10:38	0.0492
100			200C	10:49	0.0348
101	1/9/2013	BB02	500A	9:34	0.0216
102			200D	9:18	0.0702
103	1/9/2013	BB05a	500B	10:02	0.02556
104			200C	10:15	0.0263
105	1/10/2013	BB07a	500A	9:41	0.0331
106			200D	9:28	0.0675
107	1/10/2013	BB10	500A		0.047585058
108			200C		0.063714559
109	1/10/2013	BB12	500B	11:53	0.4045
110			200C	11:40	0.0433
111	2/26/2013	BB02	500B	8:30	0.02289
112			200D	8:48	0.04001
113	2/26/2013	BB05a	500A	9:30	0.305
114			200D	9:14	0.2949
115	2/25/2013	BB07a	500A	9:29	0.7335

Sampling information for each sample number

sample number	Date	Station	Net	Time	Biovolume m ³
116			200D	9:10	0.0232
117	2/25/2013	BB10	500A	12:39	0.6854
118			200D	12:24	0.0256
119	2/25/2013	BB12	500B	11:51	0.6126
120			200D	11:34	0.0218
121	3/12/2013	BB02	500B	11:03	0.30303
122			200D	10:54	0.2149
123	3/12/2013	BB05a	500B	9:41	0.1667
124			200C	9:30	0.0729
125	3/11/2013	BB07a	500A	9:50	0.7657
126			200C	9:31	0.0332
127	3/11/2013	BB10	500A	12:35	0.5558
128			200D	12:50	0.1821
129	3/11/2013	BB12	500B	12:02	0.3415
130			200C	11:48	0.0243
131	4/1/2013	BB02	500B	10:40	0.13292
132			200D	10:29	0.0239
133	4/1/2013	BB05a	500B	9:30	0.1771
134			200D	9:14	0.1511
135	4/3/2013	BB07a	500A	8:58	0.2996
136			200C	8:50	0.1935
137	4/3/2013	BB10	500B	13:17	0.326
138			200D	12:53	0.0749
139	4/3/2013	BB12	500A	11:12	0.3332
140			200C	11:03	0.046
141	4/18/2013	BB02	500B	10:16	0.05265
142			200C	10:35	0.1318
143	4/18/2013	BB05a	500A	9:05	0.1048
144			200D	9:14	0.028
145	4/17/2013	BB07a	500B	13:00	0.1021
146			200C	12:48	0.0337
147	4/17/2013	BB10	500B	10:21	0.0842
148			200C	10:40	0.1368
149	4/17/2013	BB12	500A	9:23	0.2244
150			200C	9:38	0.0259
151	5/14/2013	BB02	500A	10:14	0.0215
152			200D	10:04	0.0524
153	5/14/2013	BB05a	500B	9:10	0.0398
154			200C	8:57	0.0227
155	5/15/2013	BB07a	500B	13:30	0.0336
156			200D	13:45	0.183
157	5/15/2013	BB10	500A	11:15	0.1036
158			200D	11:08	0.2754
159	5/15/2013	BB12	500A	10:18	0.0452
160			200D	10:10	0.0216
161	5/29/2013	BB02	500A	10:12	0.0208
162			200C	10:05	0.0225
163	5/29/2013	BB05a	500A	8:57	0.0203
164			200C	9:06	0.0203
165	5/28/2013	BB07a	500B	12:53	0.0231
166			200C	13:08	0.0225
167	5/28/2013	BB10	500B	10:35	0.0212
168			200C	10:42	0.0251
169	5/28/2013	BB12	500B	9:38	0.0436
170			200D	9:57	0.782

Taxa codes

MARMAP Taxonomic codes	Column name	Taxonomic name
0101	calfin	<i>Calanus finmarchicus</i>
0109	cham	<i>Centropages hamatus</i>
0103	ctyp	<i>Centropages typicus</i>
0157	clauso	<i>Clausocalanus arcuicornis</i>
0105	mlucens	<i>Metridia lucens</i>
0143	nanno	<i>Metridia lucens</i>
0135	para	<i>Paracalanus parvus</i>
0102	pseudomin	<i>Paracalanus parvus</i>
0104	tlong	<i>Temora longicornis</i>
2006	euphkro	<i>Euphausia krohnii</i>
2002	megan	<i>Meganyctiphanes norvegica</i>
2019	nematmeg	<i>Nematoscelis megalops</i>
2012	thygreg	<i>Thysanoessa gregaria</i>
2001	thyine	<i>Thysanoessa inermis</i>
2004	thylong	<i>Thysanoessa longicaudata</i>
2003	thyras	<i>Thysanoessa raschii</i>
3500	fish	<i>Fish</i>
0148	acarda	<i>Acartia danae</i>
0107	acarlong	<i>Acartia longicornis</i>
4027	acarspp	<i>Acartia spp.</i>
4195	acrolong	<i>Acrocalanus longicornis</i>
4061	aetid	<i>Aetideidae</i>
0192	altdep	<i>Alteutha depressa</i>
0142	calan	<i>Calanoida</i>
0178	calspp	<i>Calanus spp.</i>
0156	calopav	<i>Calocalanus pavo</i>
4129	calocalspp	<i>Calocalanus spp.</i>
0117	canarm	<i>Candacia armata</i>
4042	canspp	<i>Candacia spp.</i>
4020	cbrad	<i>Centropages bradyi</i>
4112	cfur	<i>Centropages furcatus</i>
0133	cspp	<i>Centropages spp.</i>
4064	clausfur	<i>Clausocalanus furcatus</i>
4098	claus spp	<i>Clausocalanus spp.</i>
0100	copepoda	<i>Copepoda</i>
4045	cory	<i>Corycaeidae</i>
0130	cyclo	<i>Cyclopoida</i>
0180	eucspp	<i>Eucalanus spp.</i>
0169	euchmar	<i>Euchaeta marina</i>
0116	euchnor	<i>Euchaeta norvegica</i>
4062	euch	<i>Euchaetidae</i>
0132	euryspp	<i>Eurytemora spp.</i>
0131	harp	<i>Harpacticoida</i>
4030	heterhab	<i>Heterorhabdidae</i>
0159	labaest	<i>Labidocera aestiva</i>
4025	labspp	<i>Labidocera spp.</i>
4007	luc spp	<i>Lucicutia spp.</i>
0146	mclausi	<i>Mecynocera clausi</i>
0149	met spp	<i>Metridia spp.</i>
0150	micropus	<i>Microcalanus pusillus</i>
4125	micro spp	<i>Microcalanus spp.</i>
4108	neospp	<i>Neocalanus spp.</i>
0106	oitsim	<i>Oithona similis</i>
0114	oit spin	<i>Oithona spinirostris</i>

Taxa codes

MARMAP Taxonomic codes	Column name	Taxonomic name
0138	oitspp	<i>Oithona spp.</i>
0191	oncspp	<i>Oncaea spp.</i>
4118	paraspp	<i>Paracalanus spp.</i>
4002	pleuroabd	<i>Pleuromamma abdominalis</i>
0176	pleurobor	<i>Pleuromamma borealis</i>
4057	pleurospp	<i>Pleuromamma spp.</i>
4058	pont	<i>Pontellidae</i>
4013	pseudocal	<i>Pseudocalanidae</i>
0175	rhincorn	<i>Rhincalanus cornutus</i>
0125	rhinnas	<i>Rhincalanus nasutus</i>
4100	rhinspp	<i>Rhincalanus spp.</i>
4066	scol	<i>Scolecithricidae</i>
4033	scolbrad	<i>Scolecithrix bradyi</i>
0162	scoldan	<i>Scolecithrix danae</i>
4059	temspp	<i>Temora spp.</i>
0153	tstyl	<i>Temora stylifera</i>
4094	tturb	<i>Temora turbinata</i>
0108	tordis	<i>Tortanus discaudatus</i>
4019	unvul	<i>Undinula vulgaris</i>
0400	amph	<i>Amphipoda</i>
0700	append	<i>Appendicularia</i>
2101	bal	<i>Balanidae</i>
1000	brach	<i>Brachyura</i>
0900	bry	<i>Bryozoa</i>
0554	car	<i>Caridea</i>
0200	chaeto	<i>Chaetognatha</i>
2350	coelen	<i>Coelenterata</i>
0567	crango	<i>Crangonidae</i>
2700	cteno	<i>Ctenophora</i>
1700	cumacea	<i>Cumacea</i>
0500	dec	<i>Decapoda</i>
1500	echino	<i>Echinodermata</i>
2000	euph	<i>Euphausiacea</i>
0607	evadnor	<i>Evadne nordmanni</i>
0605	evadspp	<i>Evadne spp.</i>
3900	foram	<i>Foraminifera</i>
0895	gamma	<i>Gammaridea</i>
1100	gastro	<i>Gastropoda</i>
3300	heter	<i>Heteropoda</i>
0457	hyper	<i>Hyperidea</i>
2200	iso	<i>Isopoda</i>
0568	lucsp	<i>Lucifer spp.</i>
2800	mys	<i>Mysidacea</i>
2801	mysbig	<i>Mysidopsis bigelowi</i>
1801	nancara	<i>Nanomia cara</i>
2802	neoam	<i>Neomysis americana</i>
0701	oikospp	<i>Oikopleura spp.</i>
3600	ostra	<i>Ostracoda</i>
3209	pag	<i>Paguridea</i>
1300	pelecy	<i>Pelecypoda</i>
0555	penae	<i>Penaeidae</i>
0611	penav	<i>Penilia avirostris</i>
5101	phospp	<i>Phoronis spp.</i>
0601	podsp	<i>Podon spp.</i>

Taxa codes

MARMAP Taxonomic codes	Column name	Taxonomic name
2500	poly	<i>Polychaeta</i>
0202	sagel	<i>Sagitta elegans</i>
0203	sagen	<i>Sagitta enflata</i>
0201	sagser	<i>Sagitta serratodentata</i>
0218	sagspp	<i>Sagitta spp.</i>
3403	salps	<i>Salpidae</i>
1800	siphon	<i>Siphonophora</i>
0305	spirspp	<i>Spiratella spp.</i>
3400	thal	<i>Thaliacea</i>
0300	thec	<i>Thecosomata</i>
2502	tomhel	<i>Tomopteris helgolandica</i>
2501	tomspp	<i>Tomopteris spp.</i>
0002	unid	<i>Unidentified</i>
Additional taxa (non-MARMAP):		
9000	nem	<i>Nematoda</i>
9001	pseudocalspp	<i>Pseudocalanus spp.</i>
9002	scyph	<i>Scyphozoa</i>
9003	ano	<i>Anomura</i>
9004	pseudodiapspp	<i>Pseudodiaptomus spp.</i>
9005	paracal	<i>Paracalanidae</i>
9006	ann	<i>Annelida</i>
9007	anomura	<i>Anomura</i>
9008	cap	<i>Caprellidae</i>
9009	stom	<i>Stomatopoda</i>
9010	pyc	<i>Pycnogonida</i>

Number of individuals/m³

SAMPLE NUMBER	0101 calfin	0109 cham	0103 ctyp	0157 clauso	0105 mlucens	0143 nanno	0135 para	0102 pseudomi	0104 tlong	2006 euphkro	2002 megan	2019 nematmeg	2012 thygreg	2001 thyine	2004 thylong	2003 thyras	3500 fish	0148 acarda	0107 acarlong
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0.251	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0.06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14.78	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0.264	0	0	0	0.0378	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.12	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.234	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.043	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.119	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0.047	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.254	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.258	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	0	0.062	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.31	0	0
36	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Number of individuals/m³

SAMPLE NUMBER	0101 calfin	0109 cham	0103 ctyp	0157 clauso	0105 mlucens	0143 nanno	0135 para	0102 pseudomi	0104 tlong	2006 euphkro	2002 megan	2019 nematmeg	2012 thygreg	2001 thyine	2004 thylong	2003 thyras	3500 fish	0148 acarda	0107 acarlong
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.133	0	0
42	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	0	0	0.143	0	0	0.0477	0	0	0	0	0	0	0	0	0	0	0	0	0
44	0	0	3.039	0	0	0	3.04	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.087	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
51	0	0.053	0.476	0	0	0	0	0	0	0	0	0	0	0	0	0	0.106	0	0
52	0	0	2.759	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05	0	0
62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
64	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	0	0.036	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.031	0	0
72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	0	0	0.052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0.05	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	0	3.441	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Number of individuals/m³Number of individuals/m³[illegible]

Zooplankton data for each sample number

Number of individuals/m³

SAMPLE NUMBER	4027	4195	4061	0192	0142	0178	0156	4129	0117	4042	4020	4112	0133	4064	4098	0100	4045	0130	0180
	acarspp	acrolong	aetid	altdep	calan	calspp	calopav	calocalsp	canarm	canspp	cbrad	cfur	cspp	clausfur	clausssp	copepoda	cory	cyclo	euc spp
40	408.71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	0.66696	0	0	0	0.089	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	112.257	0	0	0	70.11	0	0	0	0	0	0	0	0	0	0	0.88741	0	3.106	0
43	2.71687	0	0	0	0.048	0	0	0	0	0	0	0	0.048	0	0	0.04766	0	0	0.04766
44	2349.1	0	0	0	21.27	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	0.90226	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	368.328	0	0	0	3.128	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	0.43124	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	135.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	0.26098	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	5073.45	0	0	0	215.3	0	0	0	0	0	0	0	0	0	0	29.0909	0	0	0
51	1.5352	0	0	0	0.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0.15881
52	1288.28	0	0	0	460.7	0	0	0	0	0	0	0	0	0	0	11.0345	2.7586	19.31	0
53	0.27174	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	41.1867	0	0	0	0.087	0.0873	0	0	0	0	0	0	0	0	0	0	0	0	0
55	0.02129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	120.852	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	0.09297	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.031	0
58	215.112	0	0	0	2.026	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	0.21277	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	15.692	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	0.0504	0	0	0	0.252	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	106.306	0	0	0	2.703	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	0.35088	0	0	0	0.175	0	0	0	0	0	0	0	0	0	0	0.05848	0	0	0
64	103.202	0	0	0	3.898	0	0	0	0	0	0	0	0	0	0	0	0	0	0
65	0.15175	0	0	0	0.051	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	408.633	0	0	0	40.29	0	0	0	0	0	0	0	0	0	0	0	0	1.644	0
67	0.0713	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	1105.73	0	0	0	14.02	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	1.33929	0	0	0	0	0	0	0	0	0	0	0	0.383	0	0	0	0	0	0
70	161.555	0	0	0	0.502	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	1.80573	0	0	0	0.031	0	0	0	0	0	0	0	0	0	0	0	0	0.031	0
72	2518.35	0	0	0	48.43	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	0.62144	0	0	0	0.052	0	0	0	0	0	0	0	0.052	0	0	0	0	0	0.05179
74	14.9095	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	1.75703	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	60.3282	0	0	0	0.905	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	1355.7	0	0	0	6.882	0	0	0	0	0	0	0	0	0	0	6.88172	0	0	0

Zooplankton data for each sample number

Number of individuals/m³

SAMPLE NUMBER	4027	4195	4061	0192	0142	0178	0156	4129	0117	4042	4020	4112	0133	4064	4098	0100	4045	0130	0180
	acarspp	acrolong	aetid	altdep	calan	calspp	calopav	calocalsp	canarm	canspp	cbrad	cfur	cspp	clausfur	clausssp	copepoda	cory	cyclo	euc spp
120	1.35047	0	0	0	3.006	0	0	0	0	0	0	0	9.932	0	0	0.26138	0	0	0
121	6.46465	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	1131.84	0	0	0	23.58	0	0	0	0	0	0	0	330.1	0	0	15.72	0	7.86	0
123	14.9333	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
124	104.449	0	0	0	0	0	0	0	0	0	0	0	2.334	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
126	1.06136	0	0	0	0.531	0	0	0	0	0	0	0	58.91	0	0	3.71476	0	0	0
127	177.86	0	0	0	0	0	0	0	0	0	0	0	11.86	0	0	0	0	0	0
128	1297.87	0	0	0	11.66	0	0	0	0	0	0	0	349.7	0	0	77.7171	0	3.886	0
129	14.0522	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	6.99878	0	0	0	0	0	0	0	0	0	0	0	92.15	0	0	1.94411	0	0	0
131	9.21577	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	61.1855	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
133	9.20965	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
134	214.354	0	0	0	1.612	0	0	0	0	0	0	0	0	0	0	1.61168	0	0.806	0
135	3.196	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
136	2526.56	0	0	0	0	0	0	0	0	0	0	0	2725	0	0	0	0	0	0
137	6.0853	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
138	179.075	0	0	0	6.588	0	0	0	0	0	0	0	78.46	0	0	0	0	0.599	0
139	11.995	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0.09191	0	0	0	0.023	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141	1.89524	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
142	2883.79	0	0	0	5.621	0	0	0	0	0	0	0	101.2	0	0	5.62143	0	0	0
143	3.77161	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.095	0
144	428.339	0	0	0	0	0	0	0	0	0	0	0	45.7	0	0	0	0	0	0
145	0.40848	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
146	1297.87	0	0	0	11.66	0	0	0	0	0	0	0	349.7	0	0	77.7171	0	3.886	0
147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
148	126.984	0	0	0	1.752	0	0	0	0	0	0	0	0	0	0	0	0	0	0
149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	11.5882	0	0	0	34.97	0	0	0	0	0	0	0	27.73	0	0	0.6208	0	0.207	0
151	4.64316	0	0	0	0	0	0	0	0	0	0	0	0.129	0	0	0	0	0	0
152	3.35079	0	0	0	0	0	0	0	0	0	0	0	2.513	0	0	0.41885	0	0.838	0
153	0.29827	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
154	4.72405	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.999	0
155	6.0853	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
156	179.075	0	0	0	6.588	0	0	0	0	0	0	0	78.46	0	0	0	0	0.599	0
157	2.58906	0	0	0	0	0	0	0	0	0	0	0	0.062	0	0	0	0	0	0
158	4546.67	0	0	0	0	0	0	0	0	0	0	0	364.2	0	0	0	0	0	0
159	0.27094	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	195.763	0	0	0	8.993	0	0	0	0	0	0	0	85.78	0	0	0	0	0.692	0

Zooplankton data for each sample number

Number of individuals/m³

SAMPLE NUMBER	4027	4195	4061	0192	0142	0178	0156	4129	0117	4042	4020	4112	0133	4064	4098	0100	4045	0130	0180
	acarspp	acrolong	aetid	altdep	calan	calspp	calopav	calocalsp	canarm	canspp	cbrad	cfur	cspp	clausfur	clausssp	copepoda	cory	cyclo	eucssp
161	0.24958	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
162	0.53933	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
163	0.16267	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
164	0.97502	0	0	0	0.488	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	1.296	0	0	0	0	0	0	0	0	0	0	0	0.093	0	0	0	0	0	0
166	12.3312	0	0	0	0.63	0	0	0	0	0	0	0	2.88	0	0	0	0	0	0
167	20.3175	0	0	0	0.254	0	0	0	0	0	0	0	0.508	0	0	0	0	0	0
168	35.9618	0	0	0	2.612	0	0	0	0	0	0	0	5.826	0	0	0	0	0	0
169	14.401	0	0	0	0.087	0	0	0	0	0	0	0	0.524	0	0	0	0	0.087	0
170	28.1415	0	0	0	1.173	0	0	0	0	0	0	0	0	0	0	0.15634	0	0	0

Number of individuals/m³

SAMPLE NUMBER	0169	0116	4062	0132	0131	4030	0159	4025	4007	0146	0149	0150	4125	4108	0106	0114	0138	0191
	euchmar	euchnor	euch	euryspp	harp	heterhab	labaest	labspp	lucsp	mcclus	metssp	micropus	microspp	neosp	oitsim	oitspin	oitssp	oncssp
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	0	0	0	0	0.044	0	0	0.1334	0	0	0	0	0	0	0	0	0.0445	0
42	0	0	0	0	0.444	0	0	0	0	0	0	0	0	0	0	0	0	0
43	0	0	0	0	0.048	0	0	0	0	0	0	0	0	0	0	0	0	0
44	0	0	0	0	6.078	0	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.564	0
47	0	0	0	0	0	0	0	0.2875	0	0	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2332	0
49	0	0	0	0	0	0	0	0.0435	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	17.45	0	0	0	0	0	0	0	0	0	0	0	98.909	0
51	0	0	0	0	0	0	0	0.1059	0	0	0	0	0	0	0	0	0	0.0529
52	0	0	0	0	8.276	0	0	0	0	0	0	0	0	0	0	0	2.7586	0
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	0	0	0	0	1.571	0	0	0	0	0	0	0	0	0	0	0	0.349	0
55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1522	0
57	0	0	0	0	0.031	0	0	0	0	0	0	0	0	0	0	0	0	0
58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6754	0
59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1949	0
61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	0	0	0	0	0.225	0	0	0	0	0	0	0	0.67568	0	0	0	0.9009	0
63	0	0	0	0	0.058	0	0	0	0	0	0	0	0	0	0	0	0	0
64	0	0	0	0	1.299	0	0	0	0	0	0	0	0	0	0	0	0.1856	0
65	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	0	0	0	0	11.51	0	0	0	0	0	0	0	0	0	0	0	0	0
67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	0	0	0	0	0.064	0	0	0	0	0	0	0	0	0	0	0	0.0319	0
70	0	0	0	0	1.003	0	0	0	0	0	0	0	0	0	0	0	1.2543	0
71	0	0	0	0	0	0	1.0274	0	0	0	0	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0518
74	0	0	0	0.05325	0.106	0	0	0	0	0	0	0	0	0	0	0	0.1597	0
75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
76	0	0	0	0	0.113	0	0	0	0	0	0	0	0	0	0	0	0.1132	0
77	0	0	0	0.0461	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17.204	0

Number of individuals/m³

SAMPLE NUMBER	0169 euchmar	0116 euchnor	4062 euch	0132 euryspp	0131 harp	4030 heterhab	0159 labaest	4025 labspp	4007 luc spp	0146 mclaus	0149 metspp	0150 micropus	4125 micro spp	4108 neospp	0106 oitsim	0114 oit spin	0138 oit spp	0191 oncspp
79	0	0	0	0	0.432	0	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	1.31363	21.02	0	0	0	0	0	0	0	0	0	0	0	10.509	0
81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	0	0	0	0	10.98	0	0	0	0	0	0	0	0	0	0	0	8.2368	0
83	0	0	0	0.10805	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	0	0	0	170.667	0	0	0	0	0	0	0	0	0	0	0	0	219.43	0
85	0	0	0	0.17715	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20.031	0
87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
88	0	0	0	0	41.22	0	0	0	0	0	0	0	0	0	0	0	618.36	0
89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.308	0
91	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
92	0	0	0	0	1.24	0	0	0	0	0	0	0	0	0	0	0	2.2319	0
93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
94	0	0	0	1.9617	0.654	0	0	0	0	0	0	0	0	0	0	0	0.2802	0
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	0	0	0	0	0.652	0	0	0	0	0	0	0	0	0	0	0	0.6516	0
97	0	0	0	0.32967	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	0	0	0	82.5943	0	0	0	0	0	0	0	0	0	0	0	0	2.1178	0
99	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0.55652	5.287	0	0	0	0	0	0	0	0	0	0	0	10.574	0
101	0	0	0	1.36128	0	0	0	0	0	0	0	0	0	0	0	0	0.0216	0
102	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
103	0	0	0	0.409	0	0	0	0	0	0	0	0	0	0	0	0	0	0
104	0	0	0	12.1945	0	0	0	0	0	0	0	0	0	0	0	0	1.2615	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	0	0	0	0	10.37	0	0	0	0	0	0	0	0	0	0	0	103.73	0
107	0	0	0	0	1.019	0	0	0	0	0	0	0	0	0	0	0	0	0
108	0	0	0	12.4197	0	0	0	0	0	0	0	0	0	0	0	0	0	0
109	0	0	0	0	0.477	0	0	0	0	0	0	0	0	0	0	0	0.1733	0.0433
110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
111	0	0	0	12.6374	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	0	0	0	242.411	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	0	0	0	253.762	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	0	0	0	656.797	0	0	0	0	0	0	0	0	0	0	0	0	181.19	0
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30.662
117	0	0	0	2305.37	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	0	0	0	7.37138	0	0	0	0	0	0	0	0	0.05119	0	0	0	0.1536	0
119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Zooplankton data for each sample number

Number of individuals/m³

SAMPLE NUMBER	0169 euchmar	0116 euchnor	4062 euch	0132 euryspp	0131 harp	4030 heterhab	0159 labaest	4025 labspp	4007 lucsp	0146 mclaus	0149 metspp	0150 micropus	4125 microsp	4108 neospp	0106 oitsim	0114 oitspin	0138 oitspp	0191 oncspp
120	0	0	0	0.30494	0.044	0	0	0	0	0	0	0	0	0	0	0	3.1801	0
121	0	0	0	297.374	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	0	0	0	1328.34	7.86	0	0	0	0	0	0	0	0	0	0	0	188.64	0
123	0	0	0	125.333	0	0	0	0	0	0	0	0	0	0	0	0	0	0
124	0	0	0	202.48	0	0	0	0	0	0	0	0	0	0	0	0	4.0846	0
125	0	0	0	14.7014	0	0	0	0	0	0	0	0	0	0	0	0	0	0
126	0	0	0	13.5323	0	0	0	0	0	0	0	0	0	0	0	0	32.106	0
127	0	0	0	1920.89	0	0	0	0	0	0	0	0	0	0	0	0	0	0
128	0	0	0	341.955	7.772	0	0	0	0	0	0	0	0	0	0	0	139.89	0
129	0	0	0	248.256	0	0	0	0	0	0	0	0	0	0	0	0	1.5614	0
130	0	0	0	12.0535	0	0	0	0	0	0	0	0	0	0	0	0	50.547	0
131	0	0	0	301.994	0	0	0	0	0	0	0	0	0	0	0	0	0	0
132	0	0	0	133.843	0.382	0	0	0	0	0	0	0	0	0	0	0	0	0
133	0	0	0	296.834	0	0	0	0	0	0	0	0	0	0	0	0	0	0
134	0	0	0	49.9622	4.029	0	0	0	0	0	0	0	0	0	0	0	10.476	0
135	0	0	0	139.026	0	0	0	0	0	0	0	0	0	0	0	0	0	0
136	0	0	0	3368.75	0	0	0	0	0	0	0	0	0	0	0	0	1585.3	0
137	0	0	0	112.143	0	0	0	0	0	0	0	0	0	0	0	0	0	0
138	0	0	0	238.368	1.198	0	0	0	0	0	0	0	0	0	0	0	3.5935	0
139	0	0	0	203.915	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	5.49173	0.253	0	0	0	0	0	0	0	0	0	0	0	0.1608	0
141	0	0	0	0	0.211	0	0	0	0	0	0	0	0	0	0	0	0	0
142	0	0	0	44.9715	0	0	0	0	0	0	0	0	0	0	0	0	0	0
143	0	0	0	0	0.419	0	0	0	0	0	0	0	0	0	0	0	0	0
144	0	0	0	10.7533	0	0	0	0	0	0	0	0	0	0	0	0	0.8961	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2042	0
146	0	0	0	341.955	7.772	0	0	0	0	0	0	0	0	0	0	0	139.89	0
147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
148	0	0	0	13.1363	0	0	0	0	0	0	0	0	0	0	0	0	0.8758	0
149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	3.10398	0	0	0	0	0	0	0	0	0	0	0	0	5.3802	0
151	0	0	0	0.12898	0	0	0	0	0	0	0	0	0	0	0	0	0	0
152	0	0	0	0	1.675	0	0	0	0	0	0	0	0	0	0	0	0	0
153	0	0	0	0.17896	0	0	0	0	0	0	0	0	0	0	0	0	0	0
154	0	0	0	0.18169	0	0	0	0	0	0	0	0	0	0	0	0	0.9085	0
155	0	0	0	112.143	0	0	0	0	0	0	0	0	0	0	0	0	0	0
156	0	0	0	238.368	1.198	0	0	0	0	0	0	0	0	0	0	0	3.5935	0
157	0	0	0	0.02071	0	0	0	0	0	0	0	0	0	0	0	0	0	0
158	0	0	0	11.7485	364.2	0	0	0	0	0	0	0	0	0	0	0	11.749	0
159	0	0	0	0.09031	0	0	0.4064	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0.692	0	0	0	0	0	0	0	2.07523	0	0	0	8.9927	0

Number of individuals/m³[illegible]

Number of individuals/m³[illegible]

Number of individuals/m³[illegible]

Number of individuals/m³

SAMPLE NUMBER	4118	4002	0176	4057	4058	4013	0175	0125	4100	4066	4033	0162	4059	0153	4094	0108	4019
	parasp	pleuroabd	pleurobor	pleurospp	pont	pseudocal	rhincorn	rhinnas	rhinspp	scol	scolbrad	scoldan	temssp	tstyl	tturb	tordis	unvul
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
122	0	0	0	0	0	0	0	0	0	7.86	0	0	0	0	0	0	0
123	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
124	2.33406	0	0	0	0	1.1670314	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4084	0
126	1.59204	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11.857	0
128	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
129	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.6841	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.5553	0
131	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.4178	0
132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
133	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.1253	0
134	0	0	0	0	0	0	0	0	0	0	0	0	133.77	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.196	0
136	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
137	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8693	0
138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
139	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.3328	0
140	0.11489	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4212	0
142	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5.6214	0
143	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.2572	0
144	1.79222	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.4297	0
146	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
148	8.75753	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
149	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.8725	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
151	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
152	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
153	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0199	0
154	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8693	0
156	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
157	0	0	0	0	0.021	0	0	0	0	0	0	0	0	0	0	0	0
158	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.3999	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Number of individuals/m³[illegible]

Zooplankton data for each sample number

Number of individuals/m³

SAMPLE NUMBER	0400 amph	2101 bal	1000 brach	0900 bry	0554 car	0200 chaeto	2350 coelen	0567 crango	2700 cteno	1700 cumacea	0500 dec	1500 echino	2000 euph	0607 evadnor	0605 evadspp	3900 foram	0895 gamma	1100 gastro
40	0	191.2	0	0	0	0	1.69942	0	0	0	0	0	0	0	0	0	0	0
41	0	0	2.1787	0	0.7559	0	5.29124	0	0.0889	0	3.9129	0	0	0	0	0	0	0
42	0	3.993	0	0	0.4437	0	1.77482	0	0	0	0	0	0	0	0	0	0	36.3838
43	0	0.048	0	0	0.3813	0	0.04766	0	0	0	0.0477	0	0	0	0	0	0.09533	0
44	0	36.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0.05	0	0	0.2005	0	0.05013	0	0	0	0	0	0	0	0	0	0.15038	0
46	0	27.37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.78201
47	0	0	1.0062	0	0.4792	0	0.9104	0	0	0	0	0	0	0	0	0	0	0
48	0	0.933	0	0	0	0	0.23324	0	0	0	0	0	0	0	0	0	0	0.46647
49	0	0	0	0	1.2614	0	1.17442	0	0	0	0	0	0	0	0	0	0	0
50	0	5.818	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81.4545
51	0.1588	0	1.2705	0	1.3764	0	1.05876	0	0	0	0.1059	0	0	0	0.05294	0	0	0.10588
52	0	8.276	0	0	0	0	2.75862	0	0	0	0	0	0	0	2.75862	0	0	22.069
53	0	0	0	0	0	0	0	0	0	0	0.0453	0	0	0	0	0	0	0
54	0	10.21	0	0	0.0873	0	0	0	0	0	0	0	0	0	0	0	0	0
55	0	0	0.0426	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	0	5.632	0	0	0	0	0.15221	0	0	0	0	0	0	0	0	0	0	0
57	0	0.434	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	0	19.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
59	0	0.053	0	0	0	0	0	0	0.1064	0	0	0	0	0	0	0	0	0
60	0	3.558	0	0	0	0	0.04873	0	0	0	0	0	0	0	0	0	0	0.09747
61	0	0	5.3931	0	0	0	0.0504	0	0	0	0	0	0	0	0	0	0.20161	0
62	0	7.207	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.45045
63	0	1.696	0.4094	0	0	0	0.05848	0	0	0	0	0	0	0	0	0	0.40936	0
64	0	18.93	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.55684
65	0	0.051	0.2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	0	16.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8222
67	0	0	0	0	0	0	0	0	0	0	0.0713	0	0	0	0	0	0	0
68	0	12.02	0	0	2.0031	0	0	0	0	0	0	0	0	0	0	0	0	0
69	0	0.159	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	0	0	0.4047	0	1.1208	0	0.06227	0	0	0	0	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	0	0.052	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.05179	0
74	0	5.218	0	0.05	0	0	0.05325	0	0	0	0	0	0	0	0	0	0	0
75	0.0502	0.151	0	0	0	0	0	0	0	0	0	0.0502	0	0	0	0	0	0
76	0	15.39	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
77	0	0	0	0	0.0461	0.0461	0	0	0	0	0	0	0	0	0	0	0	0
78	0	6.882	0	0	0	3.44086	0	0	0	0	3.4409	3.44086	0	0	0	0	0	0

Zooplankton data for each sample number

Number of individuals/m³

SAMPLE NUMBER	0400 amph	2101 bal	1000 brach	0900 bry	0554 car	0200 chaeto	2350 coelen	0567 crango	2700 cteno	1700 cumacea	0500 dec	1500 echino	2000 euph	0607 evadnor	0605 evadspp	3900 foram	0895 gamma	1100 gastro
120	0	0.044	0	0.09	0	0	0	0	0	0	0	0	0	0	0	0	0	0
121	0	3.232	0	0	0	0	3.23232	0	0	0	0	0	0	0	3.23232	0	0	0
122	0	70.74	0	0	0	0	0	0	0	0	0	0	0	0	39.3	0	0	0
123	0	2.667	0	0	0	0	9.06667	0	0	0	0	0	0	0	0.53333	0	0	0
124	0	2.334	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0.204	0.2042	0	0	0	0	0	0	0	0	0	0	0	0.20419	0	0	0
126	0	10.88	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127	0	23.71	0	0	0	0	94.8587	0	0	0	0	0	0	0	0	0	0	0
128	0	23.32	0	0	0	0	3.88585	0	0	0	0	0	0	0	0	3.8859	0	0
129	0	21.86	0	0	0	0	15.6136	0	0	0	0	0	0	0	1.56136	0	0	3.12271
130	0	12.44	0	0	0	0	0.38882	0	0	0	0	0	0	0	0	0	0	0
131	0	1.418	0	0	0	0	2.12672	0	0	0	2.8356	0	0	0	2.12672	0	0	0
132	0	1.147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
133	0	0	0	0	0.7084	0	26.2121	0	0	0	0	0	0	0	0.70843	0	0	0
134	0	16.12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	1.598	0	0	0	0	0	0	0	3.196	0	0	0
136	0	1090	0	0	0	0	0	0	0	0	0	0	0	0	49.5404	24.77	0	24.7702
137	0	0	0	0	0.8693	0	255.583	0	0	0	0	0	0	0	0	0	0	0
138	0	0.599	0	0	0	0	5.98914	0	0	0	0	0	0	0	1.19783	0.5989	0	0.59891
139	0	1.333	0	0	2.6656	0	15.9933	0	0	0	0	0	0	0	0	0	0	0
140	0	0.184	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1379	0	0
141	0	0.421	0	0	2.1058	0	91.1819	0	0	0	0	0	0	0	0	0	0	0
142	0	393.5	0	0	0	0	241.722	0	0	0	0	0	0	0	89.9429	0	0	0
143	0	0.838	0	0	3.3525	0	144.159	0	0	0	0	0	0	0	2.09534	0	0	0
144	0	68.1	0	0	0.8961	0	12.5455	0	0	0	0	0	0	0	18.8183	0	0	0.89611
145	0	0	0.2042	0	4.6975	0	3.88052	0	0	0	0	0	0	0	0.61271	0	0	0
146	0	23.32	0	0	0	0	3.88585	0	0	0	0	0	0	0	0	3.8859	0	0
147	1.0105	0	0	0	0	0	129.347	0	0	0	1.6842	0	0	0	0.33684	0	0	0
148	0	5.255	0	0	0	0	66.5572	0	0	0	0	0	0	0	1.75151	0	0	0
149	0	0	0	0	2.8725	0	63.1957	0	0	0	0	0	0	0	2.87253	0	0	0
150	0	0.207	0	0	0	0	0	0	0	0	0	0	0	0	0.20693	0.4139	0	0
151	0	1.053	0	0	0	0	0.5804	0	0	0.021496	0.4084	0	0	0	0.0215	0	0	0.04299
152	0	173.4	0	0	0	0	0	0	0	0	0	0	0	0	1.67539	1.2565	0	34.7644
153	0	0.06	0	0	0.2187	0	0.05965	0	0	0.019885	0	0	0	0	0	0	0	0
154	0	85.58	0	0	0	0	0	0	0	0	0.3634	0	0	0	0	0	0	0.90847
155	0	0	0	0	0.8693	0	255.583	0	0	0	0	0	0	0	0	0	0	0
156	0	0.599	0	0	0	0	5.98914	0	0	0	0	0	0	0	1.19783	0.5989	0	0.59891
157	0.145	0.104	0	0	0.4764	0	0	0	0	0.041425	0.0621	0	0	0	0	0	0.1657	0
158	0	70.49	0	0	0	0	0	0	0	0	0	0	0	0	0	23.497	0	563.928
159	0.1355	0.271	0.1355	0	4.1093	0	0	0	0	0	3.4771	0	0	0	0	0	0	0
160	0	7.609	0	0	0	0	0	0	0	0	0	0	0	0	0.69174	0	0	0

Zooplankton data for each sample number

Number of individuals/m³

SAMPLE NUMBER	0400 amph	2101 bal	1000 brach	0900 bry	0554 car	0200 chaeto	2350 coelen	0567 crango	2700 cteno	1700 cumacea	0500 dec	1500 echino	2000 euph	0607 evadnor	0605 evadspp	3900 foram	0895 gamma	1100 gastro
161	0	0	0	0	0	0	0	0	0	0.083195	0	0	0	0	0	0	0	0
162	0	0.539	0	0	0	0	59.4157	0	0	0	0	0	0	0	0	0	0	0
163	0.0813	0.163	0.8133	0	0.3253	0	0.16267	0	0	0.162668	0	0	0	0	0	0	0	0
164	0	0.488	0	0	0	0	89.8639	0	0	0	0	0	0	0	0.08125	0	0	0
165	0	0.185	8.0537	0	0	0	0.09257	0	0	0	0.2777	0	0	0	0.74057	0	0	0.18514
166	0	0.36	0	0	0	0	21.9622	0	0	0	0	0	0	0	19.622	0	0	0.27003
167	0	0.339	26.836	0	0	0	0	0	0	0	0.1693	0	0	0	0.08466	0	0	0.67725
168	0	2.411	0	0	0	0	1.60723	0	0	0	0	0	0	0	0	0.1005	0	1.40633
169	0.3491	0.262	7.6806	0	0	0	0	0	0	0	11.695	0	0	0	0.17456	0	0.08728	1.30919
170	0	0.235	0	0	0	0	0.15634	0	0	0	0	0	0	0	0.15634	0	0	2.73598

Zooplankton data for each sample number

Number of individuals/m³

SAMPLE NUMBER	3300 heter	0457 hyper	0568 luc spp	2800 mys	2801 mysbig	1801 nancara	2802 neoam	0701 oikospp	3600 ostra	3209 pag	1300 pelecy	0555 penae	0611 penav	5101 phospp	0601 pod spp	2500 poly	0202 sagel	0203 sagen	0201 sagser
40	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7.6474	0	0	0
41	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0	0	0	0.8874	0	0	0	0	7.543	0	0	0
43	0	0.0953	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0.0501	0	0	0	0	0.0501	0	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.1281	0	0	0
47	0	0	0	0	0	0	0	0	0	0	0	0	0.0479	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.5948	1.3994	0	0	0
49	0	0	0	0	0	0	0	0	0	0.043	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	5.8182	0	0	0	0	0	0	5.8182	0	0	0
51	0	0	0	0	0	0	0	0	0	0	0	0	0.4764	0	0	0.1059	0	0	0
52	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.75862	8.2759	0	0	0
53	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	0	0	0	0	0	0	0	0	0	0	0	0	0.0873	0	0	0.7853	0	0	0
55	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.97869	0.3044	0	0	0
57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.01309	1.3508	0	0	0
59	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0532	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.09747	0.1949	0	0	0
61	0	0	0	0.1512	0.45363	0	0.1008	0	0.504	0	0	0	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0	0	0	0	0.9009	0	0	0	0	1.8018	0.4505	0	0
63	0	0	0	0.0585	0	0	0	0	0.5848	0	0.0585	0	0	0	0	0	0	0	0
64	0	0	0	0.1856	0	0	0	0	0	0	0	0	0	0	0.37123	0	0	0	0
65	0	0	0	0	0	0	0	0	0.2529	0	0	0	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.4666	0	0	0
67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30.0469	0	0	0	0
69	0	0	0	0	0	0	0	0	0	0	0.287	0	0	0	0	0.4145	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0	0	0.426	0	0	0	0	0	0.15974	0.0532	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1506	0	0	0
76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.81098	0	0	0	0
77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41.2903	10.323	0	0	0

Number of individuals/m³

SAMPLE NUMBER	3300 heter	0457 hyper	0568 lucsp	2800 mys	2801 mysbig	1801 nancara	2802 neoam	0701 oikospp	3600 ostra	3209 pag	1300 pelecy	0555 penae	0611 penav	5101 phospp	0601 podsp	2500 poly	0202 sagel	0203 sagen	0201 sagser
79	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.04318	0.0432	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3.94089	0	0	0	0
81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.7456	0	0	0	0
83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
84	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2413.7	0	0	0
85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
86	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1322.1	0	0	0
87	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.5822	0	0	0
88	0	0	0	0	0	0	0	0	0	0	535.91	0	0	0	0	82.448	0	0	0
89	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12.308	0	0	0
91	0	0	0	0.1069	0	0	0	0	0	0	0	0	0	0	0	0.0534	0	0	0
92	0	0	0	0	0	0	0	0	0	0	3.7198	0	0	0	0	1.3639	0	0	0
93	0	0	0	0	0	0	0	0	0	0	0.0247	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.28024	0.2802	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0	0	0	3.5838	0	0	0	0	0.3258	0	0	0
97	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0	0	0	0.197	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	2.7826	0	0	0	0.55652	0	0	0	0
101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
102	0	0	0	0	0	0	0	0	1.3191	0	0	0	0	0	0	0	0	0	0
103	0	0	0	0	0	0	0	0	0.0256	0	0	0	0	0	0	0	0	0	0
104	0	0	0	0	0	0	0	0	0.4205	0	0	0	0	0	0.841	1.682	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
106	0	0	0	0	0	0	0	0	0	0	186.71	0	0	0	0	190.17	0	0	0
107	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.0389	0	0	0
108	0	0	0	0.2855	0	0	0	0	0	0	0	0	0	0	0	0	0.048	0	0
109	0	0	0	0	0	0	0	0	0	0	0.6932	0	0	0	0	1.1698	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0.8089	0	0	0	0	0	0	0	0
111	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
112	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
114	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
116	0	0	0	0	0	0	0	0	0	0	0.4646	0	0	0	0	0	0	0	0
117	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0512	0	0	0
119	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19.6	0	0

Number of individuals/m³Number of individuals/m³[illegible]

Number of individuals/m³Number of individuals/m³[illegible]

Number of individuals/m³Number of individuals/m³[illegible]

Number of individuals/m³Number of individuals/m³[illegible]