

## ***Interactive comment on “Biogeography of key mesozooplankton species in the North Atlantic, by manual counting methods, and egg production of *Calanus finmarchicus*” by W. Melle et al.***

**W. Melle et al.**

webjorn@imr.no

Received and published: 13 May 2015

Final author comments First we would like to thank the two reviewers for taking time to read and evaluate our data publication manuscript. This type of publication is new to most of the authors and we may not have arrived at the best format or structure for the article. We note that this publication of data is companion to another research paper, (Melle, W., Runge, J., Head, E., Plourde, S., Castellani, C., Licandro, P., Pierson, J., Jonasdottir, S., Johnson, C., Broms, C., Debes, H., Falkenhaus, T., Gaard, E., Gislason, A., Heath, M., Niehoff, B., Nielsen, T.G., Pepin, P., Stenevik, E.K., Chust, G., 2014. The North Atlantic Ocean as habitat for *Calanus finmarchicus*: Environmental

C390

factors and life history traits. *Progress in Oceanography*, 129, Part B, 244-284), which provides extensive analysis and interpretation of the data. It is therefore not our intention to present data analyses or discussion in the present article. This determines to a large part our answers to the reviewers' comments.

Reviewer #1: General comments: The reviewer suggests that the article should include actual results of analyses of the data and a discussion of the results reported. We fully agree with the reviewer that a complete analysis of the data set is not presented in the present article. However, this was not our intention. As this is a data publication, we understand that reporting results of analyses is not the main purpose of this kind of publications. We find it encouraging that the reviewer asks for the results and can inform that the research paper based on the current data is published as Melle et al. 2014, in *Progress in Oceanography*.

The reviewer may have misunderstood our mission. We collected data from a range of sources, with the responsible scientists for the data sets as co-authors of a research paper that was published in *PiO*, and this combined data set was submitted to *PANGEA*, instead of the other way around. We agree with the reviewer that the CPR data are limited with respect to sampling depth. However, it was our decision not to present seasonal data or demography of *Calanus* based on the CPR. In any event, the youngest stages of *Calanus* would be missing due to mesh size.

Specific comments and Technical corrections: Title: The reviewer suggests to change the title into: “Biogeography of *Calanus finmarchicus* in the North Atlantic”. This is justifiable and we agree to do so. In the abstract the reviewer would like to change pan-Atlantic to North Atlantic. We suggest that it is changed to pan-North Atlantic since investigation of data sets across the entire North Atlantic was a main goal of the project, which originated from Euro-Basin (see acknowledgments). The reviewer points to the fact that only 8 taxa are represented by the CPR data. This will be changed in the text. The reviewer suggests that we only deal with *Calanus finmarchicus*, but we find that giving out data on the other taxa is worthwhile since only the data are presented

C391

here, not the analyses. The reviewer suggests highlighting that the *C. finmarchicus* data comes from single stations. However, some of the data sets represent standard sections or parts of such, so our suggestion is to keep the text unchanged. Introduction: The reviewer would like to expand the Introduction with an overview of published results to comply with the format of a "normal manuscript", and also indicate what is new with the present compilation of data. We think the first is outside the scope of this data publication. We have indicated what is new with this data set in the text and furthermore we believe that the data should be made available, regardless of whether or not they bring something new to the field. The reviewer would like to have a discussion of what might influence on distribution of *C. finmarchicus*. We provide interpretation in Melle et al. (2014) and think that further discussion is outside the scope of the present publication. Material and Methods: The reviewer would like us to mention further use of the CTD data. We think that is up to future users of the data. The reviewer points to the lack of description of averaging and integration methods of temperature and chlorophyll in the figure captions. We write: "Temperatures (C) were averaged over various depth ranges, while chlorophyll concentrations were either integrated (mg/m<sup>2</sup>) or averaged (mg/m<sup>3</sup>) over various depth ranges, as indicated in figure captions." This sentence refers to the Progress in Oceanography research paper and should be deleted.

The reviewer suggests how to improve the structure of presentation of temperature and chlorophyll data. We agree that it is a bit confusing having temperature and/or chlorophyll related to net, egg production and CPR data. Still we find that the structure chosen is understandable and justifiable as the way of obtaining and treating the data is different. We suggest to leave it as is, and point to the PANGEA data base for a better format.

The reviewer suggests extracting monthly data for the CPR. We agree that it would be better but to do this rather extensive extraction and compilation of data was outside the range of the current project (Euro-Basin).

The reviewer asks why CPR data are restricted to the older stages of *C. finmarchicus*.

C392

That is due to the coarse mesh size of the CPR, and we agree with the reviewer that neither *Oithona* is fully retained by this mesh size.

The reviewer suggests that the information of sampling routines in the Norwegian Sea should be moved to the discussion section as it does not refer to the utilised dataset. As we do not have a Discussion section except whatever discussion of the data we present in the Material and Methods section, we are not able to comply with this request.

The reviewer would like to have a proper description of the methods of obtaining the PCI in the CPR. The text includes references to publications describing this and we do not find it necessary to be repeated in the present article.

The reviewer suggests showing the CPR data along sampling lines instead of by 2x2 degrees grids and finds that the interpolation is too wide over data poor areas. This could be done, but then potential users in the future must extract data again from SAHFOS databases, as the data submitted to PANGEA was treated as described for use in the research article mentioned above.

The reviewer would like to see interannual variability. Again, this was not the objective of the research article from which the data set origin.

Net samples:

The reviewer would like to see a short summation of net sampling methods in addition to Table 1. The methods used are simple, but we have to accept that the data sets contains "local adjustments" beyond what are given in Table 1 and would like to point to data owners given in Table 1 for details.

The reviewer would like to have standard error of 14 day averages. We agree that this would be a nice addition to the dataset. However, this was not part of the data analysed by Melle et al. (2014) and we will conform to the analyses presented in that paper.

The reviewer can not find transects in Table 1. That is correct because transect data were averaged to a single value before adding it to the data set.

C393

The reviewer points to the fact that Table 1 shows that data were used for mortality and dormancy analyses, but the results are not shown. That is correct. Table 1 shows how data were used in Melle et al. (2014), but analyses are not shown here. That should have been made clear in the table heading.

The reviewer thinks that discussion of methods is too detailed and comparison with other studies could be reduced. Also this fits better in the introduction or Discussion. We think that discussion of material and methods is important in the present kind of articles and suggest to leave this as it is.

The reviewer point to the fact that in page 230, line 12-13, it is stated that egg production rates are compared. The word should have been compiled. We thank the reviewer and will change this.

The reviewer would like to have more information on methodology, like incubation duration and number of females. We think that there is good information about this in the original studies cited in Melle et al. (2014).

The reviewer finds reference to Table 3 which is not in the article. This is right and the reference to the table will be deleted.

The reviewer would like to see *C. finmarchicus* demography and CPR data grouped into season like the EPR. To some extent this can be done for the demography data in retrospect, but we do not see that as part of the data delivery described in the present article.

The reviewer is concerned about the variability in results of EPRs. We agree and this is discussed in the Material and Methods, as well as by Melle et al. (2014). We present the data as is for the benefit of other users.

Reviewer #2:

General comments:

C394

The reviewer: This paper reports efforts on compilation of large datasets on key zooplankton taxa in the North Atlantic with aims to build the foundation for ongoing and future research on the influence of habitat change, including climate forcing, on the distribution and abundance of the species. As we know compiling large datasets with various sources across broad geographic regions over years is a challenge mainly due to the methodological differences on data collection that can be an issue for further study of biogeography of the species and spatial variations in abundance and distribution in response to climate forcing. Overall, this study is important potentially with broad impacts and can be a useful contribution to the field. However, there are a couple of things that were a little too briefly presented in this paper except for the description on egg production of *C. finmarchicus*. The paper seems like a data manual, rather than a research article and simply concentrates on data compilation with little effort to help readers make sense of the data and the relevance. I feel that detailed description on pros and cons on methodologies in data collection will improve the manuscript, for instance, how representative could be for the abundance data sampled by CPR for *C. finmarchicus* given the strong seasonal patterns and doing diapause of the species, the potential implications of this study and cautions suggested to the readers to take when applying the data. Not sure if the word file of the paper I reviewed is complete or not, because there is no discussion. Additionally the paper seems not well organized and jumped from 2. Materials and Methods (Line 66) to 4. Acknowledgment (Line 231).

We understand the concern about the format of the manuscript. However, this is intended as a publication of data and not a research paper. The value of CPR data, also when it comes to the biology, distribution and demography of *C. finmarchicus* is well established. We are of the opinion that users should know and understand the pos and cons of various sampling methods, in particular when it comes to vertical net hauls and CPR sampling. Instead of writing a Discussion section we included a discussion of the data in Material and Methods. Other discussion of methodology, for example in measuring egg production rates, can be found in Melle et al. 2014.

C395

Specific comments:

The reviewer: Abstract: Line 35, why “possible”? *C. finmarchicus* is almost for sure the most important copepod in north Atlantic. Line 38, there is very little information presented on demography compared to egg production in the manuscript. The potential implications of the study to the field should be highlighted in introduction. Actually the authors stated the objectives in line 62-64.

We agree that *C. finmarchicus* is important, but other copepods may be more abundant at least. “Possible” could have been deleted. We agree that the use of the data in the future is manifold. However, in the present manuscript we publish the data.

The reviewer: Introduction: It is a very brief introduction. The manuscript could be benefited with a relatively complete literature review to highlight the importance of the key zooplankton taxa in the north Atlantic.

We see that the Introduction lacks a background to the taxa in addition to *C. finmarchicus*. We will include a brief summary of the general knowledge of the other taxa if space allows us to do so.

The reviewer: Materials and methods: Line 75, Unit of Temperature should be (°C), not 0C? Line 77, I didn't see something about Temperature and Chl-a indicated in figure captions. Line 89-90, only late developmental stages of couple *Calanus* species were caught using CRP. Is it a general pattern across entire north Atlantic? or seasonal, and regional, and which region and season? , It's not clear how CRP (only sampling 6 m depth) can catch CVI of *C. finmarchicus*, since the species conduct annual diapause in deep water at late stage. Line 104-110, this paragraph can be little bit detailed since the seasonal patterns of demography of the species is highly valuable to achieve the stated objectives of the study. Line 113-230, this section is well written and very detailed on egg production and female size. Other sections could be written like this one. Line 125, a full name should be given before PANGEA. Line 184-188, as the authors said, methodological differences can be a problem for further comparison of the data.

C396

We could not find 0C instead of °C in the final pdf and this has probably been corrected. “as indicated in figure captions” refers to figures in Melle et al. (2014) not shown here, and will be deleted. The CPR does only sample late stages of *C. finmarchicus* quantitatively due to the coarse mesh size. We agree that CPR does not sample *C. finmarchicus* at other depths than approximately 6 m. The section on egg production became very detailed as it occurred to us that there is a great deal of variability in methods between investigations. The implications of this were discussed and we are glad that the reviewer appreciated this. However, we are not sure if we should go into a similar discussion of the other methods used. The full name of PANGEA has been added to the text.

The reviewer: Figures: Both figures were not made in high resolutions.

We will see to that figures are given in high resolution in the final version.

---

Interactive comment on Earth Syst. Sci. Data Discuss., 7, 225, 2014.

C397