**Climate
of the Past**
Discussions

Interactive comment on "Central Arctic Ocean
paleoceanography from ∼ 50 ka to present, on the
basis of ostracode faunal assemblages from
SWERUS 2014 expedition" *by* Laura Gemery et al.

Anonymous Referee #3

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The paper by Gemery and colleagues represents an interesting study that illustrates
how the analysis of ostracod fauna can shed new light on the paleoceanographic
changes occurred in the central Arctic Ocean during the Late Quaternary (ca. the last
50 ka). This study can be particularly welcomed by teams involved in the reconstruc-
tion of recent past sea-ice conditions and relative strength of Atlantic Water influx to
the Arctic Ocean during periods of climate variations. The Authors also put into ques-
tion the possibility to use peaks in ostracod species (i.e. Rabilimis mirabilis) commonly
recorded at shallow water-depths (<200 m) as proxy for abrupt changes in paleoceano-
graphic conditions. In my opinion, the most interesting elements of the paper are (i)
the potential paleoceanographic significance of R. mirabilis migration events, (ii) the

comparison among relatively high-resolution ostracod data from several cores and (iii)
the effort to reconstruct a robust chronological framework for the 2 studied cores (32-
GC and 32-MC). However, there are some aspects, concerning the interpretation of
ostracod data and text organization, that could be improved:

1. I have the impression that the paper, in its present state, doesn't fully emphasize
all the new results derived by the analysis of ostracodfauna (cores 32-GC and 32-
MC). In particular, the discussion section (section 5.) only focuses on the distribution
of R. mirabilis, while it should also include the reconstruction of paleoceanographic
conditions from ca. 50 ka to present (according to the scope and title of the paper),
emphasizing the novelty in respect to previous studies undertaken in the same area
(e.g.,higher sampling resolution). On the other hand, results concerning R. mirabilis
distribution patterns are poorly described in section 4. Moreover, I suggest to describe
in more detail the stratigraphic/temporal patterns of ostracod indicator species from
the 2 new cores (section 4.2) and more clearly distinguish data interpretation from the
discussion and conclusions, based on the comparision among several cores.

2. The ostracod zones could be a little bit refined, highlighting the occurrence of a
"transitional" ostracod fauna zone, between ca. 42-35 ka, dominated by Polycope spp.,
but also characterized by remarkable percentages of A. arcticum and Krithe spp.. I
think that the ostracod data (Fig. 3) show interesting faunal turnover that could be
investigated in depth using a statistical approach. Did the Authors perform multivariate
analysis (e.g., DCA) to improve the identification of the main faunal turnover through
the core succession/time and the comprehension of the main controlling parameters?
Moreover, it could be useful a more detailed explaination of the main turnover in terms
of paleoenvironmental conditions: what do the two peaks in P. caudata (between ca.
35-30 ka and 20-12 ka) mean? I also wonder why the percentages of A. arcticum are
higher during the mid-late Holocene in respect to the LGM.

3. The Authors state that the R. mirabilis peaks are composed by in-situ populations
because of the presence of well-preserved adult and juvanile valves. I agree with the

Authors that this is a good autochthonity indicator, however I wonder if there are other data that can support this interpretation and/or other analyses can be performed to exclude the possibility of resedimentation events.

4. In Mendeleev Ridge area, the visual inspection of ostracod data seems to show a low degree of correlation among cores. Maybe, it could be useful to compare cores ostracod data (Figs. 4, 5) using statistical methods. How much the ostracod patterns are really similar as stated by the Authors (e.g., in the abstract "Comparisons with faunal records from other cores from the Mendeleev and Lomonosov Ridges suggest generally similar patterns, ...")?

5. The construction of the age-depth model for the 2 new cores deserves a more detailed explaination and discussion. In particular, I'd like to see how ostacod data help to depth align the 2 cores.

Minor comments: a) Cytheropteron spp. should be added in the abstract along with the other ostracod indicator species. b) In the introduction, I suggest to more clearly state the aims of the paper and highlight the novelty of this study in respect to previous works dealing with ostracod fauna from nearby cores. c) An entire sub-section (5.1.) focused on foraminiferal fauna events is a little bit too much for a paper dealing with ostracodfauna. d) Paleoenvironmental changes documented by ostacodfauna should be reported in conclusions. e) Figure 3: please replace Krithe sp. with Krithe spp.