

Interactive comment on “Planktic foraminifera and structure of surface water masses at the SW Svalbard margin in relation to climate changes during the last 2000 years” by Katarzyna Zamelczyk et al.

Anonymous Referee #1

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The paper present novel data on modern and fossil planktic foraminifera in the south-western Svalbard margin. Planktic foraminifers can be sensitive indicators of the changing Arctic environments. Living planktic foraminifera were collected at different vertical depth-sampling intervals in October 2012 and July 2014 at the coring site. The short (30.5 cm length sampled at 0.5 cm intervals) sediment core was collected in Storfjorden Fan at 1520 m water depth in October 2012 for fossil foraminifers studying. The environmental reconstructions (first of all sea surface temperatures) over the SW Svalbard margin are within the scope of CP. The paper is technically sound. The paper

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contains the novel and interesting research of the planktic foraminifera and structure of surface water masses at the SW Svalbard margin in relation to climate changes during the last 2000 years. Conclusions in the paper correspond to the objectives stated in the Introduction. The claims fully supported by the experimental data. The research was carried out at a sufficiently high scientific level. The authors provided sufficient methodological details that the methods could be reproduced. I think the phrase “Trace element ratios of Mg/Ca and Al/Ca...” on the page 7 may be replaced by “Elemental ratios of Mg/Ca and Al/Ca...” There are enough data for providing the age model based on six ¹⁴C dates and ²¹⁰Pb and ¹³⁷Cs dating as well. The authors clearly indicate their own original contribution into relevant scientific questions. The list of references is quite huge. But I would like to see author’s comments about their own sedimentation rates data and climatic inferences in the focus of previous related papers on Svalbard margin (Winkelmann, Knies, 2005; Pathirana et al., 2014, 2015; Vare et al., 2010 and so on). The authors made their paleoceanographical reconstructions based on one short core collected in Storfjorden Fan (SW Svalbard margin). More than 40 short cores were collected west off Svalbard and on the adjacent shelf to the south. I think the results of these studies should be reflected in the Introduction and in the Discussion of the paper. Cited papers: 1. Pathirana, I., Knies, J., Felix, M., Mann, U. (2014) Towards an improved organic carbon budget for the western Barents Sea shelf, *Clim. Past*, 10, 569-587, <https://doi.org/10.5194/cp-10-569-2014>. 2. Pathirana I, Knies J, Felix M, Mann U, Ellingsen I (2015) Middle to late Holocene paleoproductivity reconstructions for the western Barents Sea: a model-data comparison, *Arktos* (2015) 1:20. doi: 10.1007/s41063-015-0002-z 3. Winkelmann D., Knies J. (2005) Recent distribution and accumulation of organic carbon on the continental margin westoff Spitsbergen, *Geochem. Geophys. Geosyst.*, 6, Q09012, doi:10.1029/2005GC000916. 4. Vare LL, Masse G, Belt ST (2010) A biomarker-based reconstruction of sea ice conditions for the Barents Sea in recent centuries. *Holocene* 20:637–643. doi:10.1177/0959683609355179 The title of the paper reflects the researches results and the contents of the paper. I think the abstract provide a concise

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and complete summary. I suppose the presentation is well structured and clear. The language is quite fluent but sometimes probably not precise. Please bear in mind that I am not a native English speaker. The figures and graphs are effective. But I recommend improving Fig. 1. I would like to see the schematic map of Svalbard margin contains the position of short sediment core (probably some short sediment cores from related papers which will be discussed by authors), and surface circulation pattern, bathymetry. The amount and quality of supplementary material is quite appropriate.

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