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Discussions

Interactive comment on "Holocene sub centennial evolution of Atlantic water inflow and sea ice distribution in the western Barents Sea" *by* S. M. P. Berben et al.

J. Müller (Referee)

juliane.mueller@awi.de

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This is a nice and mature paper by Berben et al. presenting foraminifer and biomarker data of a sediment core from the western Barents Sea to reconstruct the palaeoceanographic evolution in the study area throughout the Holocene. Planktic foraminifera and stable isotope (d18O, d13C) analyses have been tied to biomarker studies (sea ice proxy IP25, phytoplankton biomarkers) to generate a comprehensive data set that provides information about changes in the sea (sub)surface and sea ice conditions in the study area. Further, foraminifer shell weight and fragmentation data are considered - an important point with regard to the dissolution of foraminiferal tests in the subpolar North

Atlantic. The authors provide adequate background information about the regional setting and the methods used and also the results are put into reasonable context with the published literature. However, a comparison of the results with the foraminifer, stable isotope and ice rafted detritus data published by Werner et al. (2013; Paleoceanography) would be convenient. Regarding the biomarker part of the manuscript the meaning and thus the use of 24-methylenecholesterol should be explained in more detail. Previously, Knies et al. (2005; Geochimica et Cosmochimica Acta) and Cabedo-Sanz et al. (2012; Quaternary Science Reviews) used this biomarker as an indicator of sea ice cover (during the Younger Dryas) in the southern Barents Sea - this should be briefly compared to own data. With regard to the use of IP25, the paper by Müller et al. (2012; Quaternary Science Reviews) about Holocene sea ice variations in eastern Fram Strait could be addressed as well. The IP25 and phytoplankton biomarker data by Berben et al. also enable the calculation of the semiquantitative PIP25 index. And though Müller et al. (2011, 2012) point out that the palaeoenvironmental interpretation of IP25 and phytoplankton biomarker data should be mainly based on the individual biomarker records, the calculation of the PIP25 index for this study could contribute to the evaluation of the applicability of this novel approach. Finally - this is just a suggestion - it would be great if the data are made available for other scientists (e.g. via the PANGAEA data repository or a similar archive).

Some minor issues: Page 4895, lines 11-13: reference to modelling is unclear; maybe provide examples for Holocene model experiments Page 4895, lines 19-20: Spielhagen et al. 2011(Science) could be cited here Page 4896, lines 7-10: which kind of reconstructions? depth habitat of what? Page 4896, line 18: shortly explain 'Scandinavian pattern' Page 4897, line 9: Brown et al., 2011 (Polar Biology) should be cited as well Page 4902, line 7: resolution (not time scale) Page 4903, lines 26-27: provide reference for identification of sterols Page 4909, lines 10-12: explain possible meaning of high sterol and TOC contents Page 4912, lines 18-19: could the drop in d13C at about 8.5 ka relate to the 8 ka event? Page 4915, lines 13-17: similar sea ice fluctuations have been described by Müller et al., 2012 Fig. 3: Sedimentation rate (not

sedimentation accumulation rate)

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