

***Interactive comment on* “Short Commentary on Marine Productivity at Arctic Shelf Breaks: Upwelling, Advection and Vertical Mixing” by Achim Randelhoff and Arild Sundfjord**

Anonymous Referee #2

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Review of “Short Commentary on Marine Productivity at Arctic Shelf Breaks: Upwelling, Advection and Vertical Mixing” by Achim Randelhoff and Arild Sundfjord

The authors discuss shelf break upwelling in the Arctic Ocean and argue that it should have different characteristics in different parts of the Arctic Ocean and not necessarily will be pronounced phenomena in the Atlantic sector of the Arctic Ocean in general and on the Barents shelf break in particular as a result of the climate change.

Major comments

It seems that authors try to argue with the opinion expressed in some of the recently published papers, that in the future conditions for the shelf break upwelling in the At-

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lantic sector of the Arctic will become more favourable. However, from the introduction (or rather “Upwelling in the Arctic” section) it is not clear what are the arguments authors fighting against. They mention personal communications and reference several papers, but did not provide any details.

The counter argumentation is very weak. It is basically a collection of statements that are not supported by any evidence. It is just author’s speculations on the topic with ideas that may or may not be true.

I have a hard time to define the type of this article and the purpose it is written for. The topic of the shelf break upwelling in Atlantic sector is very interesting and it would make a great contribution to our understanding of the Arctic Ocean when investigated properly through numerical modelling or data analysis. Unfortunately, this manuscript lacks any scientific novelty supported by evidence. I also believe it is too shallow to be a review. I do not recommend this manuscript for publishing in “Ocean Science”.

Minor comments

P 2, L 2 It would be nice to provide references, showing that it “received increased attention”. Now after the sentence you make a reference to the figure, which seem strange and out of place.

Fig. 1. Why you illustrate Atlantic Water inflow by snapshot from the model, that can be pretty far from reality (Hattermann et al., 2016 do not use data assimilation)? Why not from climatology or some reanalysis product (e.g. MERCATOR OCEAN)?

P3, L5-7 You should really provide more evidence that this is now a “universal paradigm” and that the paper you mention above are actually directly and unconditionally transfer results obtained for the Pacific sector to the Atlantic Sector.

P3, L21 Gradients of what?

Fig. 2 Why you use this transect? Is it typical? Why not climatology or reanalysis?

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P4, L4-9 It is not clear to me why any reader familiar with Arctic Ocean hydrography must think that Fig. 2 show typical upwelling situation? P4, L13 Ivanov et al., 2016 show that under certain conditions heat from the Atlantic Water can mix up to the surface, but this process is not constant and over the northern Barents Sea shelf the thermal stratification in the upper 100 meters is actually still quite strong most of the time.

P5 L3-15 Statements in this section need supporting evidence. Now it is pure speculations.

P5, L 17 No, we haven't. You just claim it to be true earlier, but you did not show anything to support this claim.

I am sorry but most of the rest of the analysis is again just pure speculations and to my opinion have no value as a review.

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