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Comment

## ***Interactive comment on “Halocline water modification and along slope advection at the Laptev Sea continental margin” by D. Bauch et al.***

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Received and published: 13 January 2014

Reply to reviewer comments

We thank Bob Newton and Peter Schlosser for their efforts in reviewing and giving detailed comments. Both reviewers recommend publication after minor revisions. And as both reviewers also kindly provided annotated manuscripts these minor revisions are easily identified and achievable. Nevertheless both reviewers also give general comments that are less easily to account for. While both reviewers point out that those general comments are mostly intended as suggestions for future efforts we nevertheless tried to acknowledge at the least the need for further work within a revised version of the manuscript. We have complied with all minor corrections and suggestions given by both reviewers within the commented manuscript. No detailed account is given for

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these minor changes. Answers to the reviewer's general comments are given below. We hope that we also have been able to account for the reviewer's general comments to your satisfaction. Kind Regards, Dorothea Bauch and co-authors

Referee 1: B. Newton

Again we like to thank for corrections in wording and grammar and sometimes also preciseness. We did some work on the figures and slightly enlarged captions and changed coloring as suggested. While the review concludes that the work is publishable with minor revisions two general comments or suggestions for future work are made. First it is pointed out that not much focus is put on the time scales over which the features they describe are evolving. Secondly, it is pointed out that it would be very interesting to see this data analyzed in the context of the literature on river/coastal/shelf freshwater plumes (analytical work of e.g. Yankovsky, Gararkiewicz and Chapman). We do take the suggestions as encouragement and challenges for future work. Time scales are an interesting topic and at this point a lot of speculation would be inherent as the review also indicates. To avoid mere speculation a more dynamical view, e.g. as suggested by the second remark, may be helpful. Simple dynamical approaches (considering wind forcing only) are already published in Guay et al. (JGR 2001) and in Bauch et al. (Polar Res. 2011). Both studies consider riverwater inventories in the basin near the shelfbreak and somewhat ignore (or simplify) residence times on the shelf. Clearly at this point a more sophisticated approach is called for. Also the analysis of the whole shelf datasets would be necessary in this case (in this publication the south eastern shelf is not included). But it is important to point out that the current study is the first to present detailed tracer data at the shelf break. The review summarizes: "The latest installment is a more synthetic article than some of their earlier contributions." Yes we think our study is indeed more synthetic in combining both shelf data and data from the continental slopes and basin. But it is also entirely new as it is the first study to show and discuss the horizontal and vertical structure of the upper water column along the continental slope in respect to tracer distribution (and not only riverwater inventories).

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Therefore we do aspire to the next step, but we also see the need to first document and discuss the observed features for the first time in full as done in this manuscript. We gratefully acknowledge the general comments and include the need for further studies more specifically within the outlook of the manuscript.

Referee 2: P. Schlosser The commented manuscript has been very helpful and is gratefully acknowledged. Corrections were included and additional literature by Newton et al., 2013 considered. Again, the review concludes that only these minor corrections are recommended for publication but points out that “One area that could benefit from further elaboration in future studies is the quantitative interpretation of the presented data.” This comment is indeed very much in sink with the comments given also by B. Newton. And we do agree. Also, the review points out that “ The manuscript is very descriptive . . .”. Yes indeed it is, we do agree. We do think that this is justified at this time as this is the first study that discusses the horizontal and vertical structure of the upper water column along the continental slope in respect to tracer distribution, while earlier studies only considered freshwater inventory values of the upper water column (Guay et al., JGR 2001 and Bauch et al., Polar Res. 2011). The identified features in the tracer distribution that indicates an oceanographic frontal system is an entirely new feature that indeed calls for a dynamical and numerical approach as suggested in the review as a next new study. We gratefully acknowledge this comment and include this suggestion more specifically within the outlook of the manuscript.

Please also note the supplement to this comment:

<http://www.ocean-sci-discuss.net/10/C797/2014/osd-10-C797-2014-supplement.pdf>

Interactive comment on Ocean Sci. Discuss., 10, 1581, 2013.

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