

Interactive comment on “Inorganic carbon fluxes on the Mackenzie Shelf of the Beaufort Sea” by Jacoba Mol et al.

Anonymous Referee #1

Received and published: 6 September 2017

Overall Statements

The manuscript “Inorganic carbon fluxes on the Mackenzie Shelf of the Beaufort Sea” by J. Mol, H. Thomas, P.G. Myers, X. Hu, and A. Mucci presents the status of the carbonate system on a high latitude shelf sea in summer 2014. With the use of (surely intricate) measurements and a hydrodynamic model the authors describe the fluxes of the carbonate system relevant tracers. They discuss the significant consequences of an on-shore transport of low pH water masses.

The manuscript is well structured, is equipped with significant figures, and includes substantial conclusions. Despite a growing amount of flaws with higher page numbers I agree publishing the manuscript after minor revisions.

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Detailed remarks

The wording “excess DIC” is used in excess. Please use it either for DIC/TA limits or for the Burt approach.

P4 L20 ff: Define UHL-ATL (see Fig. 3)

P4 L27: should be ≤ 33.1

P4 L20 ff: The described layering of PML and UHL is a bit misleading when looking at Fig. 5, where the ratio of UHL water is on the shelf $> 90 \%$

P6 L3: use “33 km horizontal ..”

P6 L13: This transformation is hard to understand. What about a self-explaining sketch?

P7 L9: Which figure is meant?

P8 L 24: Give an explanation for the expected pattern.

P9 L7: MW fraction is still $< 10 \%$ there.

P9 L18: Show location in Fig. 1

P9 L25: “easterly”? I see rather north and south winds.

P9 L25: “wind speeds were comparable low”

P12 L8: You mean along-shelf here?

P12 L10: Fig. 9b

P12 L20: Fig. 10

P12 L20: per square meter: which along-shore distance was used?

P12 L32: in P8 L3 excess DIC/TA ratio was indicated for values > 1 .

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P13 L7 please refer here to Fig. 8d

P13 L9: Add “Table 2”.

P13 L11: It should be mentioned that you use a “railway” approach for the transport of biogeochemical tracers. Please write something like: “Even though no results of a coupled physical – biogeochemical model was available the following arguments could be made ..”

P13 L14 and L16: give start- and end-day.

P13 L13 Did you analyze the wind fields or the hydrodynamic results? Please add: “From the analysis of .., there are two ..”

P13 L22: Fig. 11d

P13 L24 Two times “km”

P13 L31: Fig. 11c

P14 L10: Fig. 11e

P14 L16: “Table 2 last column”

P14 L25: Use space “ofCaCO₃”

P20 Display the Amundsen Gulf and use white color for text within the continent.

P25: Also indicate 16-20 August and 5-9 September.

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