

Interactive comment on “The silicon stable isotope distribution along the GEOVIDE section of the North Atlantic Ocean” by Jill N. Sutton et al.

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Thank you for the detailed comments, they are very useful and will help with the revision of our manuscript.

I want to clarify a few questions/comments made by the reviewer, since I am not sure if I understood them correctly.

Firstly, under the sub-header Discussion, a comment was made about providing further discussion on why we see light $d_{30}\text{Si}$ values. I agree that we can provide more discussion here, and I like your suggestions. To quickly answer, due to the formation history of NEADW, we can pick up the light $30d\text{Si}$ signature from water masses from Iceland, since NEADW derives from ISOW. We briefly touched on this in the manuscript (p5

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L31-p6 L2): "NEADW is formed as a result of entrainment events that occur along the journey of ISOW through the Iceland Basin (van Aken, 2000). NEADW recirculates in the West European Basin and mixes with the surrounding waters, including the Antarctic Bottom Water (AABW) (van Aken and Becker, 1996), resulting in the formation of LDW". We can expand in further detail again in the discussion. Also, the circulation within the West European Basin is slow, and NEADW is a relatively old water mass (see attached paper Fleischmann et al., 2001).

Secondly, for the comment P11 L25 regarding DSi in NEADW. I can understand the confusion but we had included some text in the manuscript to try to clarify this point (see P9 L29 : "The OMP results of García-Ibáñez et al. (2017; this issue) shown in Fig. 5d nicely illustrate that LDW (which they denote as NEADWL) is the dominant contributor to the DSi inventory of the deep eastern Atlantic"). As answered in the previous comment, NEADW is derived from ISOW so it is consistent to have similar $d_{30}\text{Si}$ in both ISOW and NEADW. And, you are correct, NEADW is the dominant water mass for the deep Eastern area of OVIDE. However, as mentioned above (and in the text), NEADW recirculates in the West European Basin and mixes with the surrounding waters, including the Antarctic Bottom Water (AABW) (van Aken and Becker, 1996), resulting in the formation of LDW. The concentration of DSi in the NEADW is not very high (i.e. 15 μM) but the LDW does have a higher concentration (25-45 μM) since it mixes with AABW. So, I think the main point of confusion is this: Garcia-Ibanez et al. refer to the LDW as the NEADWL. We decided to avoid using the NEADWL for two reasons: (1) to clearly separate NEADW and NEADWL (in our text we describe it as LDW), and (2) because most people refer to the second water mass as LDW.

Please also note the supplement to this comment:

<https://www.biogeosciences-discuss.net/bg-2018-165/bg-2018-165-SC2-supplement.pdf>

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