

Interactive comment on “Hadal water biogeochemistry over the Izu-Ogasawara Trench observed with a full-depth CTD-CMS” by Shinsuke Kawagucci et al.

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We are very sorry to miss a Referee #2 comment about interpretations of N and O isotopic composition of nitrate and nitrate+nitrite. We were aware that the original manuscript describe insufficient information about the isotope analyses. For all the samples collected for "nitrate" isotope compositions through the depths, we used the denitrification method without nitrite removal processing and thus obtained $\delta^{15}\text{N}(\text{NO}_3+\text{NO}_2)$ and $\delta^{18}\text{O}(\text{NO}_3+\text{NO}_2)$ values. In addition to this, we conducted additional isotope analyses for surface seawater in which nitrite was detected significantly at the AA analysis. For these samples, acid injection to removal of nitrite was applied

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to obtain $\delta^{15}\text{N}(\text{NO}_3)$ and $\delta^{18}\text{O}(\text{NO}_3)$ values. For the selected surface samples, we thus obtained the isotopic compositions of both nitrate+nitrite and nitrate(only). All of our analyses for $\delta^{15}\text{N}(\text{NO}_3+\text{NO}_2)$, $\delta^{18}\text{O}(\text{NO}_3+\text{NO}_2)$, $\delta^{15}\text{N}(\text{NO}_3)$, and $\delta^{18}\text{O}(\text{NO}_3)$ is available at a revised Table S1. As discussed previously in literatures (e.g., Casciotti and McIlvin, 2007; Kemeny et al., 2016), the $\delta^{15}\text{N}(\text{NO}_3+\text{NO}_2)$ and $\delta^{18}\text{O}(\text{NO}_3+\text{NO}_2)$ values of nitrite-rich samples should be interpreted with caution due to the analytical artifacts. Although Referee #2 provides a suggestion to interpret these isotopic compositions for understandings of N cycle (as a specific comment), it is difficult to expand discussion about nitrogen dynamics due to rough sampling intervals for the surface seawater as stated in the first reply. The revised manuscript includes detailed information about our sample processing and caution for the data interpretation.

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