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Interactive comment on "Biogeochemical protocols and diagnostics for the CMIP6 Ocean Model Intercomparison Project (OMIP)" *by James C. Orr et al.*

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Response to Short Comment by N. Swart

We are grateful to Neil Swart for providing these comments that will help improve the manuscript and facilitate participation in OMIP. His short comment is repeated below in gray; our response follows in black.

Firstly, thanks to the authors for coordinating the OMIP-BGC effort and putting together this very comprehensive documenting paper. I have a few comments, which I think will

be relevant to modelling centres trying to perform the simulations and diagnostics you describe:

- For the diagnostic output (section 3 and tables 9 to 14), no indication is given on which variables are expected only for the OMIP-BGC ocean model runs; and which variables are expected from the Earth System Models doing the "full" CMIP6 runs (historical etc), unless I missed this somewhere. It would be good to mark clearly if there are variables expected only for OMIP-BGC runs, but not the rest of CMIP6.

Conceptually there is no difference in output requirements for the forced ocean simulations made for OMIP and the coupled simulations made with the Earth System Models that are participating in CMIP6. These simulations differ in forcing but not in the types of output requested. However, we will further consider this point and clarify when distinguishing the two types of simulations in the revised manuscript.

- Table 5 and 9 mark all variables as "priority 1". My understanding of a priority 1 variable is from the CMIP6 data request: "all participating groups must commit to supplying all priority 1 variables". Thus, priority 1 variables should be the lowest common denominator that all groups can provide. In tables 5 and 9, there are multiple variables (like 13C, and all the "abiotic" terms) which are not carried in all (or even most) BGC models. Thus, groups face the significant coding and computation expense of adding 7+ new tracers if they are "required" to provide all these terms to participate in OMIP-BGC. If these variables are not indeed "required", please mark them as priority 2, in which case it is clear they can be provided optionally, if available. Otherwise, as I understanding it, any group not providing all these variables will end up not "participating" [at least officially].

These are excellent points. Priorities will be clarified following the CMIP6 data request for OMIP that has been refined since the original manuscript was submitted. Priorities will be adjusted and explained in detail, following the CMIP6 guidelines.

In the revised manuscript we will make it clearer that δ^{13}C simulations are recommended only for those who already have experience modeling this tracer. The abiotic tracers are highly recommended but not required for participation in OMIP. Fortunately, many modeling groups already have experience simulating abiotic dissolved inorganic carbon and radiocarbon, and for those that do not, their addition as new tracers is straightforward.

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