

Interactive comment on “Distribution and rates of nitrogen fixation in the western tropical South Pacific Ocean constrained by nitrogen isotope budgets” by Angela N. Knapp et al.

Anonymous Referee #2

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The manuscript by Knapp and colleagues estimates the input of N via N₂ fixation using a biogeochemical approach in the western south Pacific Ocean. The manuscript is well-written, and explains the conclusions well, addressing the relevant references. However, this reviewer considers that a few minor changes need to be addressed before publication.

Specific comments.

I do agree with Reviewer 1 in two points. First, though it is clear that this manuscript is related to many other publications coming from OUTPACE probably showing a map of station, having the map here will be useful for readers beginning from this work, instead

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Discussion paper



of having to look for the geographical context on their own.

Second, it will be useful to extend a bit the context of the sediment traps, maybe adding an additional line in Fig 1 showing either the mixed layer depth or the 1

The units of Average PN_{sink} flux in Table 1 and in the Results section are not the same. The text is in $\mu\text{mol N}$, and the table in mmol N . I recommend units in agreement in both parts.

Some parts of section 3.2 could be moved to the Methods section, while others seem to fit better in the Discussion, as a first subsection 4.1. My suggestion is that P7 L25 to P8 L14 and P9 L4 to P11 L7 move to the Discussion, while P8 L15 to L23 up to “of the source NO_3 ” move to the Methods. This way the Results subsection is reduced to the description of the results themselves (P8 L23 to P9 L3).

P3 L26. Just curiosity, but is there a reason for using the term Oxygen Deficient Zones instead of the mosth widely used Oxygen Minimun Zones (OMZs)?

P5-P6. The description of the geochemical tools could be moved to the Methods section. And it could be more intuitive to begin the name of the variables by $\delta^{15}\text{N}$ -xx. It is a bit confusing reading NO_3+NO_2 $\delta^{15}\text{N}$, for instance.

P7 L16. What do the authors mean with “thermocline NO_3+NO_2 ”? Do they refer to subsurface NO_3+NO_2 as in section 3.2, or NO_x produced in the thermocline?

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