

The authors thank the reviewer for the very helpful comments and below are how we have improved the manuscript (ms) in response to these comments.

**Comments:** P.12L16 'preventing' -> 'prevent'.

**Response:** This has been corrected in the ms.

**Comments:** In the figures where WOA values are shown it could be an idea to also show the range of WOA values within each box (for example as a light blue dotted line in figure 2).

**Response:** Figures 2 and 3 have been improved by adding shadings to show the 95% confidence intervals of the WOA2009 data. The captions of Figures 2 and 3 have also been modified accordingly.

**Comments:** P13L8 'tracer' -> 'the tracer'.

**Response:** This has been corrected in the ms.

**Comments:** P14L8 'dose' -> 'does'.

**Response:** This has been corrected in the ms.

**Comments:** If the y-axis are anyway different between the panels, why are some of the panels scaled so that the bars are barely visible (e.g.  $NPP_{NES}$ )?

**Response:** Figure 4 has been improved by rescaling the y-axis to resolve all the bars.