

## ***Interactive comment on “The Oligotrophy to the UTRa-oligotrophy PACific Experiment (OUTPACE cruise, Feb. 18 to Apr. 3, 2015)” by Thierry Moutin et al.***

### **Anonymous Referee #1**

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Moutin et al. present this overview paper on OUTPACE cruise. It is a well written manuscript and the objectives of the cruise are discussed clearly. But I feel there is a need to list the major findings of this cruise. Results can be discussed in individual manuscripts of the special issue separately, but important findings reported in each manuscript can just be listed (with references) here. I have some minor suggestions as follows:

Page 2: line 32, oligotrophic itself means low concentration so the ‘oligotrophic’ word is redundant here.

Page 3: line 9, This 60% is only the surface area (not the volume), so ‘ocean’ could be replaced by ‘surface ocean’ to make explicitly clear.

Page 4: lines 3-5: “A d15N budget. . . . . export production”. Please check the recent work done in the Arabian Sea by (Gandhi et al. 2011; Kumar et al. 2017), who showed that the contribution of N<sub>2</sub> fixation to export production can be up to 92%.

Page 4: line 9, ‘significant contribution’, provide the quantitative estimate. I am not sure though if nanoSIMS could provide that. Since the authors mentioned ‘significant’, it becomes important to know the quantitative amount.

Page 4: line 15, ‘this question’, which question?

Page 4: line 16-21, “While average. . . . . New Caledonia”. Again see (Gandhi et al. 2011; Kumar et al. 2017), who observed the highest ever rates anywhere in the world ocean. Particularly check the table (2) in (Kumar et al. 2017) that has listed all and compared all the rates – updated after (Benavides and Voss 2015).

Page 5: line 18, satisfactory does not sound proper here. It is subjective – it could be satisfactory to one person but not to others.

Page 6:, lines 5-6, revise the sentence for grammar

Page 7: line 16, Marine Video Profiler does not acronym to UVP. Do the authors mean Underwater Vision Profiler?

Table 1: (deg, min) data are just converted to degrees in the next columns, which is redundant.

Fig. 1: N<sub>2</sub> fixation is discussed several times in the manuscript. It would be helpful to represent this process in this schematic diagram.

#### References

Benavides, Mar, and Maren Voss 2015 Five Decades of N<sub>2</sub> Fixation Research in the North Atlantic Ocean. *Frontiers in Marine Science* 2: 1–20.

Gandhi, Naveen, Arvind Singh, S Prakash, et al. 2011 First Direct Measurements

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of N<sub>2</sub> Fixation during a Trichodesmium Bloom in the Eastern Arabian Sea. Global Biogeochemical Cycles 25(4).

Kumar, PK, A Singh, R Ramesh, and T Nallathambi 2017 N<sub>2</sub> Fixation in the Eastern Arabian Sea: Probable Role of Heterotrophic Diazotrophs. Frontiers: Marine Science 4: 80.

Please also note the supplement to this comment:

<http://www.biogeosciences-discuss.net/bg-2017-50/bg-2017-50-RC1-supplement.pdf>

Interactive comment on Biogeosciences Discuss., doi:10.5194/bg-2017-50, 2017.

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