

Interactive comment on “Biogeochemical and biological impacts of diazotroph blooms in a Low Nutrient Low Chlorophyll ecosystem: synthesis from the VAHINE mesocosm experiment (New Caledonia)” by S. Bonnet et al.

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bg-2015-668 reviewJC GENERAL COMMENTS This paper constitutes an overview of the results of the VAHINE project; a multidisciplinary mesocosm field experiment designed to elucidate transport mechanisms and eventual fate of nitrogen fixed by diazotrophs in the tropical ocean surface following phosphorus addition. This is a question of great current interest to allow further insight into the role of this process in fueling biogeochemical turnover over great expanses of the world ocean where phosphorus availability is limiting to phytoplankton growth. In the context of global change, it can

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provide better understanding of the role of N cycling in C sequestration in the deep ocean. Overall, this is a well written manuscript that succinctly conveys the salient results of this complex experiment. SPECIFIC COMMENTS p.16: 19-20 – Authors argue that detritus and DON . . . “likely provided” the balance of bacterial N demand unaccounted by DDN since concentrations of these two components “decreased during the 23 days of the experiment”. A couple of rapid calculations can easily dispel this doubt providing a better view of relative magnitudes and revealing gaps in this budget if at all. p. 17:7-28 - The review of the role of Trichodesmium in N export, while pertinent to the discussion, is beyond the scope of the mesocosm experiment and should thus be abbreviated considerably

TECHNICAL CORRECTIONS Abstract: 9 – delete “potential” p.7 11-23 – It is preferable to pose your objectives as statements rather than questions. Indeed, objective iii is posed as a statement but provided with an erroneous question mark! The same for the first line in objective iv. 27 – consider changing “stable” for “unique” p.8 14 – change “has been” to “was”. (The experiment is not ongoing; it was terminated after 23 days). 16 change “harbouring” to “exhibiting” p.13 21 – refrain from citing your work as the “first”. If it really is, others will identify it as such. 26 – Change “way” to “pathway” p.14 1- Change “the one” to “that” 15- Change “The export” to “Export”; change “has not” to “was” 26 – Rephrase to eliminate inappropriate question mark. 28 – Eliminate redundancy; change second “UCYN-C” to “these” p.6 15 – Rephrase to avoid “first”. Perhaps, “We thus demonstrate that UCYN blooms may result in substantial DDN release.”

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