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Biogeosciences Discussions

Interactive comment on "Influence of the Amazon River on dissolved and intra-cellular metal concentrations in *Trichodesmium* colonies along the western boundary of the sub-tropical North Atlantic Ocean" *by* A. Tovar-Sanchez and S. A. Sañudo-Wilhelmy

Anonymous Referee #2

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General comments: This manuscript by Torvar-Sanchez and Sanudo-Wilhelmy is a follow up on a previous work in the same region (Tovar-Sanchez et al. 2006 Limnology and Oceanography 51:1755), although the work in the current manuscript conveys a different message than the previous manuscript. In the current manuscript, the authors' main conclusions are: 1. Dissolved trace element concentrations in the western tropical North Atlantic were strongly influenced by the freshwater discharge from the Amazon river. 2. Dissolved trace metal concentrations are not good predictors of Tri-

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chodesmium intracellular metal quotas. 3. Carbon fixation in Trichodesmium seems to be influenced by the internal content of Fe, Co, Cu, Mn, while N2 fixation is influenced by the internal content of Mo, Ni, V and P

The author's first and second conclusions are not new findings but are supported by the data presented in the manuscript. However, it is not clear why the authors do not present the entire data set as scatter plots of salinity vs various trace metals but only use 6 points from a temporal series, in the insets of figure 2. The authors should explain why they have chosen only a few data points to present in the scatter plots. The third point however is not readily obvious from the data presented in the manuscript as pointed out also by Reviewer 1 and Dr. Twining. The arguments for the PCA analysis are confusing and need to be clarified. Fig 3 and Figure 4 also give conflicting results regarding the importance of trace elements for Trichodesmium. The authors need to explain more clearly how they reach the conclusion that Fe is not important for N2 fixation but V is. The study of Tovar-Sanchez et al 2006 published in Limnology and Oceanography is located in the same area and even appears to have been sampled at some of the same stations. If this is the case, given that both studies relate to N2 fixation and Trichodesmium, one would expect a bit more discussion of the previous work in the current manuscript indicating what is in common between the two studies, and more importantly, what are the new findings presented in this manuscript. Specific comments: Abstract. 'Whereas total metal composition of field-collected Trichodesmium colonies have been reported (Tovar-Sanchez et al., 2006), their internal metal pool and its relation to both the Amazon River plume and bloom dynamics are still unknown.' Please define in terms of analytical methods the difference between total metal composition of field collected Trichodesmium colonies vs internal metal pools. Is the difference related only to the oxalate wash?

The method section should include a bit more details on the cruises, field sampling, ships etc. Were some or all of the samples collected on the same cruises described in Tovar-Sanchez et al 2006? If so this should be clearly stated. In agreement with the

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7, C3802–C3804, 2010

first reviewer, there should be additional details in the method section.

Supplemental material: The supplemental table presented in this manuscript seems to have some overlap with the supplemental table presented in Tovar-Sanchez et al. 2006, at least with the sampling coordinates, although some of the additional data includes the intracellular metal quotas for Trichodesmium. If this is really the case, it is important to clarify this point and indicate the similarities and differences in the two tables, as this can be valuable to other investigators.

Interactive comment on Biogeosciences Discuss., 7, 6523, 2010.