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Comment

***Interactive comment on “Factors controlling the temporal variability of mass and trace metal downward flux at 1000 m depth at the DYFAMED site (Northwestern Mediterranean Sea)” by L.-E. Heimbürger et al.***

**E. P. Achterberg (Referee)**

eric@noc.soton.ac.uk

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The submitted manuscript deals with total trace metal fluxes and mass fluxes for 1000 m depth traps deployed in the northwestern Mediterranean Sea. The manuscript is succinct, and lacks a good deal of detail, additional data and interpretation approaches. The paper lacks data on POC and mineral fluxes, in addition there is no effort made to compare the TM sedimentation fluxes to atmospheric inputs. No effort is made to compare the composition of the trap material to sources. This greatly limits the importance of the paper and leaves the reader with more questions than answers. The

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use of scientific English requires improvements in places. The key message of the paper is not clear. What is the biogeochemical importance of the findings on TM and mass fluxes?

The data is nice, and I would recommend publication after significant revision.

Specific comments: Page 2551 Line 20: is trace metal pollution in the study region a critical issue. Are there reports of toxic effects of enhanced trace metal levels? Page 2551 Line 25: ...as the superimposition of Saharan inputs.... this is awkwardly phrased.

Page 2552 Line 26: provide evidence for the relatively enhanced trace metal levels in the Mediterranean surface waters (citations and values). Page 2552 Line 10-16: argumentation to be improved. Page 2553 Line 13. Sentence on NW Med coastline draining 60% of pollutants.... is not relevant to this manuscript 2553 LINE 28- How was the sample desalted. Also, did the authors consider a weak leach to remove more labile (often anthropogenic TMs from particulate material).

2554 Line 14- what is MQ water? 2554 Line 16-17. I would suggest to keep in the data from 2005-2006. The ratio's will still be relevant and the sampling period may provide a good contrast. 2555 Line 7. Better define what a net flux means. 2555 Line 14-15. Atmospheric inputs are an important input of TM to the surface waters, but riverine and sedimentary TM fluxes are important as well to surface and deep waters. 2556 line 1-11. An alternative possible explanation for the good correlation between the TMs could be a dominant source, which obscures any smaller more variable sources. The Saharan dust could be this dominant source, obscuring European anthropogenic sources. To verify this, a comparison between atmospheric inputs to the study region with the sediment trap material fluxes is required. In addition, a comparison between the trap material and Saharan dust material (from appropriate source regions) is required. An assessment of the relative enrichment of the trap material relative to crustal and Saharan dust material would be beneficial in assessing the anthropogenic contribution to

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the observed trap TMs.

Page 2558 Line 12-15. This is awkwardly phrased

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Interactive comment on Biogeosciences Discuss., 7, 2549, 2010.

**BGD**

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