

Interactive comment on “Large clean mesocosms and simulated dust deposition: a new methodology to investigate responses of marine oligotrophic ecosystems to atmospheric inputs” by C. Guieu et al.

Anonymous Referee #3

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I find this MS interesting, as the first study describing a larger/close-to-ecosystem-scale of approach to investigate effects of dust deposition in a low-nutrient low-chlorophyll (LNLC) system. However, the MS is an unusual combination of review and material and methods description without presenting much direct results. In accordance with the 'Referee comment' RC C975: Anonymous Referee #1, 13 May 2010, I think this MS may be of interest to the readers of BG, if it is accompanied by MS^Oes also showing the results, since they are needed to fully evaluate the usefulness of this design, and thus the complete MS. Assuming that the Editor agrees that this MS is of interest to the

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readers of BG, I think it still would have to be subjected to a thorough revision before this could be done. First the entire MS needs to be edited by a native English speaker, or equivalent. I started to note language corrections in the margin of this MS, however they are too many to list here. I will just give a few examples when the language use is so peculiar it may be even difficult to understand what the authors exactly mean. Page 2685, line 5 "using spaceborne chlorophyll and dust data" do the authors mean satellite data? Page 2697, lines 21-24: "The filling of the bags is a crucial step", it was performed by large volume pumps this sentence may give the wrong impression that the authors filled their mesocosms with pumps, and first on line 26 and on it is explain that this was not the case. Page 2697, line 28: "At the extremity of" - do the authors mean: At the end? Page 2698, line 9: "sector" and "sectors" do the authors mean wind "direction"? Page 2698, line 18: "Such part had two functions" do the authors mean "This part" ? As I stated above, I think this MS needs a complete revision of language and formulations.

The MS is also rather lengthy and should be shortened. I suggest e.g. removing unnecessary text such as: Page 2686, lines 15-16: The motor boat ride lasts 20 min in good meteorological conditions. Such information is superfluous when e.g. sampling time is given in other places.

There are also further unclear points beyond what is already pointed out by previous reviewers, e.g: Page 2698, lines 24-26: "Measurements of the absorption spectrum" indicate that PVC absorbs in the UV domain but not in the visible domain. I both find this peculiar since the PVC I have been working with has shown absorption also in the visible part of the spectrum. In any case I would rather see data on this than a pers comn, especially since this is a method MS.

I also have some concerns about the scientific part of the introduction. On page 2685, lines 7-11, I get the impression that the authors expect that an increase in dust deposition should result in increased ocean color data? Although input of nutrients is expected to increase production in the system, but does that necessarily mean that the

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phytoplankton (=color/chlorophyll?) standing stock is expected to increase? There are alternative explanations such as published in Thingstad et al (2005) Nature of P limitation in the ultraoligotrophic Eastern Mediterranean. Science 309: 1068–1071, and a series of related papers in the Deep Sea Research Part I: Oceanographic Research Papers volume 54. I recommend the authors to consider these alternative approaches when evaluating the data. In any case it should be referred to that an increase in ocean color is not always found (neither expected b/c of trophic interactions) during such dust events.

Another scientific concern is about the lack of close coherence between expected sedimentation and measured. Adequately quantifying sedimentation is to my mind one of the most critical, and yet seldom successfully measured parameters in mesocosms. Although this is no exception, it may still be among the smaller discrepancies I have seen. However, there still appears to be a significant discrepancy. I think it would be interesting to the readers of BG if the sedimentation would be more thorough documented and discussed. Besides that a small fraction may indeed have been stuck on the small rim around the opening (as suggested on page 2699, lines 4-6), what about material possibly stuck to the comparably large funnel area of the mesocosm? Especially to the possible fold around the sealing between the upper and lower parts of the mesocosm? Was the comparably large area of the funnel part of the mesocosms sampled? I would lastly like to know how the lower part was removed and closed w/o spilling a significant part of the material? To me it seems this would be very difficult while diving.

Interactive comment on Biogeosciences Discuss., 7, 2681, 2010.

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