Review of Ballantyne et al. for Biogeosciences

Ballantyne et al. present an interesting paper to Biogeosciences readers. This paper presents evidences on how changes in dust deposition in two alpine lakes, with contrasting catchments, affect mineral nutrient ratios (N:P) with consequences for diatoms community. They discuss their results exclusively in the context of the increasing dust deposition in the western US. In my opinion, this paper presents valuable results to be published in Biogeosciences, although the authors should revise the literature in more detail and discuss their results beyond San Juan Mountains. The increasing of dust deposition is not just a regional issue, on the contrary, it is a major change at a global scale (see for instance Prospero & Lamb (2003) and Mulitza et al. (2010)). I think the authors should discuss their results in this broader context. My only major objection of this paper is that the literature revision performed by the authors was very limited and local.

Minor objections:

1) Page 8726 lines 3-4. I disagree completely with the authors. There are very detailed works about changes in P and N deposition and how N and P deposition affected both phytoplankton and bacteria, especially in high mountain lakes. I recommend the authors that read at least the literature for other high mountain lakes (e.g. Morales-Baquero et al. 2006 and Reche et al. 2009).
2) Page 8730 lines1-2. The authors should state the first time that appear Sr, Sm, and Nd their corresponding element denomitations (Strontium, Samarium, Neodymium). They can also explain, briefly, the Samarium-neodymium dating for determining the age of rocks and meteorites. These knowledges are no familiar for everyone, even if they are readers of Biogeosciences.
3) Page 8733 lines 9-16. This paragraph should be moved to discussion section
4) Page 8734, lines 9-10. The mechanisms driving increases in organic matter in sediments can derive from: 1) direct increases of organic matter deposition linked to dust (see for instance Mladenov et al. 2009) and 2) indirect increases in primary and bacterial production due to fertilization by mineral nutrients carried by dust (see for instance Morales-Baquero et al. 2006 and Reche et al. 2009).
5) Page 8734 last line, page 8735 lines 1-7. I think this paragraph is more appropriate in the method section.
6) Page 8736 lines 25, 28. Change Fig. 7 for Fig. 8.
7) Page 8737 lines 2, 4, 8, 9,18. Change Fig. 7 for Fig. 8.
8) Page 8738, discussion. Please see the budgets performed by Mladenov et al. (2009) for organic carbon and Pulido-Villena et al. (2006) for Ca. Both papers included catchment´s area.

9) Page 8739, discussion. Please see Morales-Baquero et al. (1999, 2006) for N and P deposition and their ratios and catchment influences.
10) Page 8740, lines 19-20 (please see the paper by Pulido-Villena et al. 2006 about Ca deposition).
11) Page 8741, lines 10-11. This sentence is meaningless and unnecessary.Please delete it.
12) Page 8742, line 14. Lawrence´s reference is incomplete.

Figures:

I want also to point out that quality of Figures was poor. Numbering and titles were too small-

List of references suggested:

-Prospero & Lamb. 2003. African droughts and dust transport to the Caribbean: climate change implications. Science 302: 1024-1027.

-Mulitza et al. 2010. Increase in African dust flux at the onset of the commercial agriculture in the Sahel region. Nature 466: 226-228.

-Morales-Baquero et al. 2006. Atmospheric inputs of phosphorus and nitrogen to the southwest Mediterranean region: Biogeochemical responses of high mountain lakes. Limnology and Oceanography 51: 830-837.

-Reche et al. 2009. Effect of Saharan dust inputs on bacterial activity and community composition in Mediterranean lakes and reservoirs. Limnology and Oceanography 54: 869-879.

-Mladenov et al. 2009. Alpine lake optical properties as sentinels of dust deposition and global change. Limnology and Oceanography 54: 2386-2400.

-Pulido-Villena et al. 2006. Significance of atmospheric inputs of calcium over the southwestern Mediterranean region: High mountain lakes as tools for detection. Global Biochemical cycles 20: doi:10.1029/2005GB002662.

- Morales-Baquero et al. 1999. The nitrogen : phosphorus relationship in high mountain lakes: Effects of the size of catchment basins. Can. J. Fish. Aquat. Sci. 56: 1809–1817.