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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Sediment records of highly variable mercury inputs to mountain lakes in Patagonia during the past millennium" *by* S. Ribeiro Guevara et al.

Anonymous Referee #1

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This is a very interesting paper regarding variations in mercury (Hg) accumulation in high altitude lakes in the Andes. There seem to be two principal conclusions of this work: 1) depositional fluxes in the pre-industrial past were relatively high compared to other lake records from remote systems and 2) there was a lot of variation in the pre-industrial past that was most likely tied to nearby volcanic eruption and/or forest fires. Regarding issue #1, the authors do not appear to have made any attempt to normalize their fluxes to the substantial watershed:lake area ratios as others have done (see especially Swain et al.). This could go a long way to explaining the differences between to the two lakes as well as place these Andean lakes in the wider world context. I suggest graphing these fluxes, or range of fluxes, versus watershed/lake area ratio along

with other published data...and see if they lie way above the line or not. Regarding point number 2, i suspect the authors are right, but they seem to dismiss geothermal inputs using similar arguments used to bolster the inclusion of forest fires as a possible source. Clearly, there is not enough information here to describe the systems definitely (and that's ok), so i suggest that the authors be a bit more reserved in their estimation of the sources of Hg to these lakes.

minor suggestions...figures 4 and 5 have the two lakes reversed in their panel order (in figure 4, Toncek is on the left...in figure 5, Toncek is on the right). Perhaps make these the same.

There are a number of elements that were listed in the methods as being analyzed for using NAA, but we do not see that data...and no ancillary elemental data from Lake Moreno. Perhaps there is no correlation, but would be interesting to see all the data.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 25885, 2009.