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Biogeosciences Discussions

Interactive comment on "Mercury concentrations and pools in four Sierra Nevada forest sites, and relationships to organic carbon and nitrogen" *by* D. Obrist et al.

Anonymous Referee #2

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This paper reports and interprets measurements of Hg concentrations in soil and litter in four Sierra Nevada forest sites. The study also includes estimates of Carbon and Nitrogen and demonstrates stochiometric relationships between Hg and C/N pools on local and ecosystem scales. I feel that the authors have put together a solid piece of work here, which Biogeosciences should accept for publication. I see no major technical or analytical flaws in their measurements or presentation and their interpretation of data seems sound, even where speculative. They have put their results in appropriate context by citing many key studies related to their work and their data support the conclusions of some previous studies of Hg variation in soil and litter layers. The comparison of Hg/C relationships at various soil and litter horizons is probably more

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detailed than any study to date, and the inverse relationship of Hg and C among various horizons, as well as the strong and consistent Hg:N relationship across sites are particularly interesting. It seems that experimental and long-term studies will be needed to assess (if possible) the fate of Hg stored in soil in terms of the balance between deposition, loss to solution, and re-emission.

I have only a few minor comments. I did not participate in the technical review for BGD, but the paper could use a careful readover by the authors and/or editorial staff for grammatical/typographical errors (for example, misspelling of Truckee, p.1792 line 25; unnecessary “to” on p.1786, line 28).

p.1782, section 2.2 – should indicate here the size of the replicate plots and how far apart they were. Some previous studies of Hg in soil and litter have indicated significant variation among plots that are fairly close together (e.g., 10-15 m) largely due to variation in Hg content in the organic layer.

Also, the samples were taken in October and November. Can the authors address how this might bias or impact their interpretations, or do they expect little seasonal variation in factors which could influence litter and soil Hg, Carbon and Nitrogen (ie, deposition, throughfall rate, variation in precipitation type or frequency, radiation and temperature)?

p.1786 – Results and discussion should probably be a new section (section 3) rather than a continuation of section 2 (materials and methods).

p.1786, line 24 – it is interesting that bole wood concentrations, while of course small compared to other above-ground compartments, are smaller than those reported previously for the same Truckee site. Any speculation for the difference – did the studies collect and analyze samples using the same techniques?

Interactive comment on Biogeosciences Discuss., 6, 1777, 2009.