

Interactive comment on “Atmospheric deposition of mercury and major ions to the Pensacola Bay (Florida) watershed: spatial, seasonal, and inter-annual variability” by J. M. Caffrey et al.

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General comments of Reviewer 1 and 2 This is a companion paper to Landing et al. and draws on the same dataset. However, each paper has a very different emphasis. In this paper, the focus is on seasonal and spatial trends in the deposition of mercury and major ions. This is one of the few long term, event based records at sites influenced by a coal fired power plant. The Landing et al. paper examines the relationship between mercury and trace metal deposition and potential sources of mercury in rain water.

Specific comments of reviewer 1 are addressed below.

The references have been modified and added as suggested. While there are natural
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sources of nitrogen in rainwater, nitrate or ammonium coming from combustion (production of NO_x) or animal feedlots (via NH₃ volatilization) can overwhelm background N in rainwater.

Mercury analyses from this study have shown consistently good agreement between replicate bottles (see Landing et al. paper, this volume). In addition, the Landing lab at FSU participated in two mercury round robin inter-laboratory comparisons organized by FDEP for low level mercury samples. The analyses performed by FSU had excellent precision and accuracy, with FSU results coming out very close to the FDEP lab and Frontier Geosciences, two laboratories which have set the standards for mercury analysis.

Analysis of variance is a standard statistical test and does not need a reference.

Mercury and major ion deposition values are reported in the text, these are calculated by multiplying the concentration times the amount of rain collected during each rain event. The wording in the text was changed to clarify this.

The reviewer is correct that nitrate and ammonium fluxes should be compared on a molar basis, so that ammonium fluxes represent about 29% of the total N deposition at the sites. We have corrected the text.

We have revised the figures and tables as suggested: removing Fig 7 and Table 1, only including Hg versus Rain in Fig 2, adding seasonal plots of sulfate:sodium ratio to Fig 6, and adding plots of Hg deposition versus H⁺ and sulfate deposition.

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