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Biogeosciences Discussions

Interactive comment on "Iodine speciation and cycling in limnic systems: observations from a humic rich headwater lake (Mummelsee)" *by* B. S. Gilfedder et al.

Anonymous Referee #1

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Gilfedder et al., use carefully collected and analyzed water and sediment samples from a small humic-rich lake to examine iodine speciation and cycling. Some interpretations are extrapolated to freshwater systems in general. Both the amount of data and quality of the data are quite high, and as such, the paper is worth publishing. The overall scientific significance of the research is, however, not nearly as high, and the organization of the paper and writing style can be substantially improved.

Technical: The main findings are: 1) most of the (total, dissolved) iodine cannot be accounted for through the analysis of iodide and iodate, and is therefore presumed to be organically-bound (corroborated by organic C analyses in the sediment core, but

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not by organic C analyses in the water column), 2) a significant decrease in iodate is accompanied by a large increase in iodide (but not nearly in mass balance), with depth in summer and fall, and 3) iodine concentrations are much higher in the sediments than in the water column.

Although superlatives are used to express the significance of examining iodine speciation in freshwater systems, the reader is not given a reason for this scientific pursuit, other than it has not been done in detail since Jones and Truesdale, 1984. A short discussion of the importance of iodine as a trace element in biogeochemical cycles should be included in the introduction. Also, the most defensible conclusion, regarding the building evidence for the prevalence of organo-I in this (and possibly other) freshwater systems, needs to be 8216;front and center8217;. Clearly, biological activity dominates the iodine cycle in the lake water and near the sediment/water interface, and likely gives rise directly or indirectly to all of the observed variation in inorganic forms in addition to the formation of organo-I in the water column. The whole paper can be shortened if the discussion is around these central ideas.

Can we see a (propagated) error on the organic I concentrations (at least one example) on Fig. 3a?

It would have been interesting to see DOC (and possibly POC) analyses for the water column. It might also have been interesting to look at filtered and unfiltered samples for I measurements to examine whether or not POI is present.

The overall organization does not flow well. Perhaps organo-I should be discussed first, then iodide flux from sediments in the hypoliminion, then possible biological reactions that give rise to the patterns of iodate and iodide in the epilimnion. If the discussion of variations in the sediment (section 3.4) is not enhanced, it should be deleted.

p. 36: Discuss the reason(s) for the prevalence of iodate in the infow water.

p. 37, lines 9, 10: explain this point in greater detail or leave it out altogether if no

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insight is to be gained in the observed pattern.

p. 40 The work of Amachi, 2005 is not properly characterized 8211; i.e., not simple 8216;absorbtion of iodide8217;.

Grammar, spelling, readability: Need more paragraph breaks - e.g., p.32, 38, 43.

Some examples of typographical/word choice errors are listed here, but this list is not exhaustive: p. 30 line 2 8220;lake8217;s8221;

p. 34 line 16 replace 8220;profound8221; with 8220;significant8221; or 8220;more than five-fold8221;

p. 35 line 22 what is 8220;pe8221;?

p. 36 line 22 8220;rate8221;

p. 40 line 12 8220;alternative8221;

p. 41 line 24 reword 8220;One method can be calculated8230;8221;?

p. 42 definition of 1/t 8211; reword to make sense

p. 43 lines 10-17 multiple errors in wording

Interactive comment on Biogeosciences Discuss., 5, 25, 2008.