Biogeosciences Discuss., 10, C6982–C6985, 2013
www.biogeosciences-discuss.net/10/C6982/2013/

Biogeosciences
Discussions
Open Access

Interactive comment on "Long-term trends of water chemistry in mountain streams in Sweden – slow recovery from acidification" *by* H. Borg and M. Sundbom

H. Borg and M. Sundbom

hans.borg@itm.su.se

Received and published: 2 December 2013

Dear Referee #2,

Thank you for your comments and constructive critisism of our ms.

Based on the comments we have taken the following actions to improve the manuscript.

English weak in places:

Besides fixing minor errors we have rephrased and clarified the text in numerous places where we thought the wording and grammar could be improved

Some elements not clearly explained:

We have taken care to define introduced concepts better and in a timely manner as they are introduced in the text.

Confusing..regarding time frame. . .:

The data cover a very long time frame and for different reasons (changes in personnel, funding, liming strategies etc.) the different types of data does not always overlap completely, and we understand that this can be confusing.

To improve the ms in this area we have 1) revised text in places appropriate time reference was missing, 2) fused several graphs into multi-pane figures with a common time scale, as you suggested: Fig 2 In the revised ms now shows time-series for annual precipitation (new!), air temperature, deposition (SO4, Ca, NO3), Snow pH, and unlimed streamwater pH in tiled graphs, allowing for easy comparison and an more instant understanding of the time frames we are dealing with. Likewise, the new Fig. 10 shows the concurrent changes in winter (Nov-Mar) precipitation, temp., sulphate deposition, sulphate concentration in prec. Alongside high-flow pH in the streams after snowmelt. We think this is an improvement that both reduces the total number of figures and facilitates the interpretation of data. (Fig 10 is attached here as an preview example)

surprised to read that snow pH in 1975 was universally around 5.4 but had fallen dramatically by 1978:

We have clarified our description and interpretation of the time series of snow pH. We have also tried to explain the pattern by a including wider array of weather monitoring data (Air temperature, precipitation and prevailing wind direction).

climate effects..: As already mentioned we have now more emphasis on climate. Complete time-series of representative air temperature and precipitation data has been obtained and used in the manuscript.

Other comments: We have corrected all the specific and technical comments and a revised ms is about to be uploaded.

Thanks again, Hans Borg & Marcus Sundbom, ITM, Stockholm University

---

Interactive comment on Biogeosciences Discuss., 10, 12849, 2013.

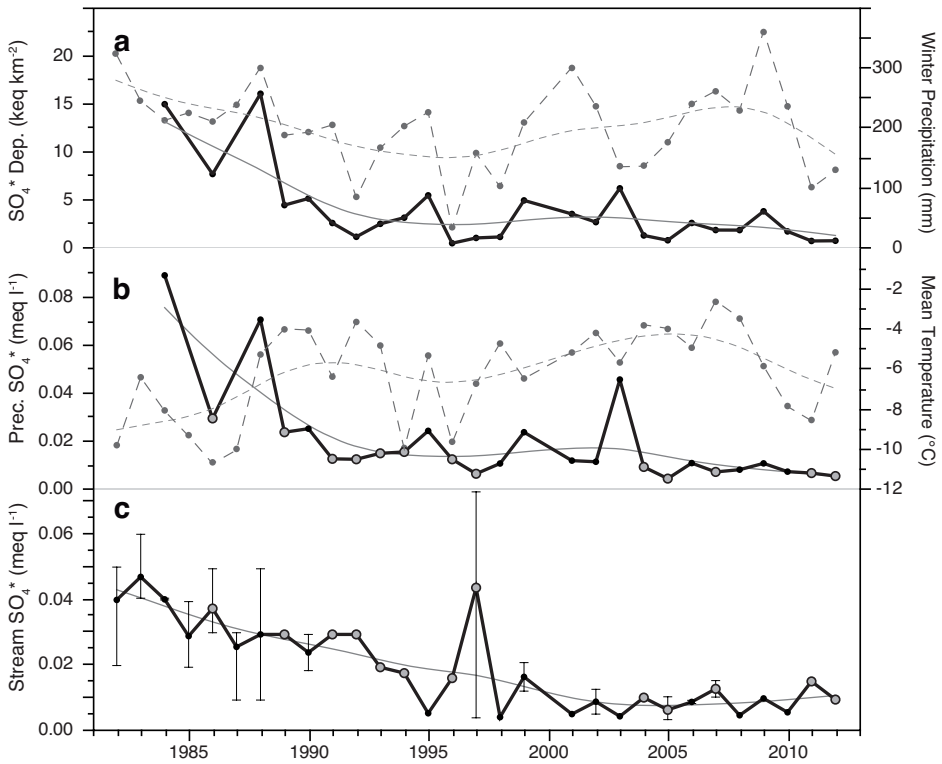

Fig. 1. Fig.10. Comparison of winter climate and deposition with non-marine sulphate (SO4*) concentration in stream water after snow melt over 30 years: a) Total SO4*-deposition and precipitation (dashed line