

Interactive
Comment

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

Anonymous Referee #2

Received and published: 4 November 2013

My review is as follows:

This is an interesting account of recovery from acidification in a region of Sweden which is significantly far north for some to be surprised how marked the impact of air pollutants has been. The authors draw on a high quality long-term hydrochemical dataset to illustrate the main tendencies since monitoring began in the 1980s. The interpretation of the various trends would appear sound.

My only real concerns are that the English is a little weak in places, with some elements not very clearly explained, and that some of the description of results was a little confusing, particularly with respect to the time frame of the different observations.

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I was surprised to read that snow pH in 1975 was universally around 5.4 but had fallen dramatically by 1978. Can the authors explain what might have caused this abrupt change? The account of changes in snow pH is quite confusing. Snow pH seems to reach 4.0 by 1978 and is on a downward trend but we are later told that it doesn't reach below 4.0 until 1987. Can the authors be a little clearer about this?

The last sentence in this section which refers to pH of streamwater should really be in 3.3. On a similar note, we are told that SO₄ in deposition decreased during the 1980s (85-90). However the pH of snow fell until 1987. Perhaps it would help to bring together the deposition, snow and stream water records together in one figure so the temporal relationship between S deposition and pH responses is a little clearer than is described in this section.

Finally, I was surprised that climate effects were not introduced until the discussion section. It would have been helpful to present some climate data in the results if this is available. Also, while temperature is considered, there is no mention of patterns in precipitation.

Other comments as follows:

Page 12850. Line 6. change "begun" to "began". Line 7. Change sentence to begin "Stream water sulphate concentration. Line 8. remove "The" before "Sulphate" Line 13. From when "up to 2000"? Line 17. Add "during episodes" after ANC. Line 18. The concepts of dilution from base cations are completely separate from the contribution of organic acids, so these two things should not be linked using "with". Change "with" to "in addition to an enhanced contribution from..."

Page 12851. Line 2. Acidification has also been a big problem in the UK. Line 25. Change "yr" to "years"

Page 12852 Line 8. Change "to" to "of" Line 20. Start sentence with "We could not exclude the possibility that liming influenced...."

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Page 12853. How were the snow samples collected - as cores/surface scrapes?? Line 4. Remove "The" before "Sampling". Line 18. Change "The" to "Water"

Page 12854 Line 11. Remove "the" before "precipitations" and change this word to "precipitation".

Page 12856. Line 5. The pH increased from 1994 to when?

Line 13. Consider moving the sentence beginning "During" to the beginning of the paragraph./

Page 12857 Change opening sentence to read "Some differences in seasonal variation in major ions is evident...." Line 16. what is the particular significance of this period (1994-2010) that you pull out? and similarly 1998-2005?

Page 12858. Line 8. Inconsistent naming of sites?

Line 11. chnage "for stabilising" to "in stabilising" Line 16. "brook Djursvasslan" - more inconsistency in naming of sites. Line 20. Chnage "at" to "during"

Page 12862. Line 20. What has been happening to temperature over the period of reversal in SO₄ concentration?

Line 19. Explain the meaning of BC in text before using abbreviation.

Page 12863 Line 22-23.. As before, seperate these to effects more clearly.

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

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