

## ***Interactive comment on “Temporal and spatial trends for trace metals in streams and rivers across Sweden (1996–2009)” by B. J. Huser et al.***

### **Anonymous Referee #1**

Received and published: 18 April 2011

GENERAL COMMENTS: The paper presents and discuss long term data series of trace metals measured in various watersheds from Sweden. The main focus of the authors is to look at any increasing or decreasing trends and to interpret these trends based on complementary data including TOC, pH, SO<sub>4</sub> and Fe. The paper is precise and well written. The dataset discussed is a very nice compilation which give an idea of both spatial and temporal trend of trace metal concentrations and few data like this have been published until now. The authors used appropriate statistics to interpret the trends and they show the importance of discarding some data when necessary. The references are correct and up to date. Their main results (increases of V, As and Pb, decreases of Zn and Cr) appear coherent since significant trends are demonstrated, but the reasons of these trends are less clear. Authors mainly compare these trends with those of major chemical drivers and find some positive correlations, but for most

metals the relations are not so obvious. They also try to relate all these variations to climate changes able to influence groundwater and soil temperature or degradation processes, but this part of the discussion is only based on hypotheses and is subject to caution (as already underlined by the authors). I wondering if any changes in biological processes could explain the observed trends, since the positive trends relate mainly to non essential metals. Even if the driving factors that could explain the trends are not evidenced, this paper presents a unique dataset and results on a geochemical evolution that could be published by Biogeosciences. I include hereunder few minor comments.

**SPECIFIC COMMENTS :** Data correspond to total concentrations and give not any idea of the proportions of dissolved or particulate concentrations. This should be given even from litterature review because one question not treated here is the possible role of particulate inputs in these temporal trends. the criteria choose to separate north and south regions in unclear for me. I understand that it is based on ecosystem but why in this context ? Why don't they used geology for example ? What are the main factors expected to change with this limit: temperature, soil degradation...? p813 : Co has a higher affinity for MnO<sub>2</sub> rather than Fe-oxyhydroxydes. Unfortunately Mn concentrations are not available here and cannot be discussed.

**TECHNICAL CORRECTIONS** I do not notice any necessary technical corrections. All papers cited in the text are given in the reference list

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Interactive comment on Biogeosciences Discuss., 8, 801, 2011.

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