

Interactive comment on “Metal contamination budget at the river basin scale: a critical analysis based on the Seine River” by L. Lestel et al.

Anonymous Referee #1

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Comments on “Metal contamination budget at the river basin scale : a critical analysis based on the Seine River” by Lestel, L., Meybeck, M., Thévenot, D.R.

General comments

This article deals with complex exchanges of potentially toxic trace elements between the anthroposphere and the environment (atmosphere, soils and rivers). It uses a tremendous number of data, trying to homogenize spatial and time variations in order to describe several indicators (the per capita excess load and the leakage ratio) based on the flux-flow analysis.

This study is carried out at a basin scale, in the Seine River Basin (France) as it has been so much documented in the 1989-2005 Piren Seine Program. Because of the

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multiple and various sources of information, of downscaling and upscaling methods, calculations seem difficult to redo and to apply to another river basin. Error bars should at least be estimated in the different figures and events like huge floods, transporting 90% of flood sediments and 99% of particulate metals should be discussed.

Check list 1-does the paper adress relevant scientific questions within the scope of HESSD ? YES 2- Does the paper present novel concepts, ideas, tools or data ? YES but make clear what it is already done in the literature about the F2A methodology 3- Are substantial conclusions reached ? YES 4- Are the results sufficient to support the conclusions ? YES but try to estimate error bars 5- Is the description of experiments and calculations sufficiently complete ? NO, try to clarify some calculations (see specific comments), to homogeneize results about metal transfer and to avoid references like in Table 1 “data provider : calculated from miscellaneous sources” 6- Do the authors give proper credit to related work and clearly indicate their own new contribution ? see comment below 7- Does the title clearly reflect the content of the paper ? You may want to use the F2A method in the title 8- Does the abstract provide a concise and complete summary ? YES 9-Is the overall presentation well structured and clear ? YES 10 Are the number and quality of references appropriate ? YES 11- Is the amount and quality of supplementary material appropriate ? YES

Specific comments

The F2A methodology and vocabulary The different meaning between flux and flow may be clarified earlier than line 3-4 page 1799 in order to better understand the F2A methodology. If it is common, please reference it. You can also better enhance that the F2A methodology is an original procedure. Why do you reference Steffen et al (2004) in the conclusion : do they already use this method ?

The contamination budget of Cd, Cu, Cr, Pb and Zn The description of metal transfer is done with different indicators, one metal with one parameter, another metal with another parameter. It appears difficult to obtain a clear image of Cd, Cu, Cr, Pb and Zn

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transfers, specially without figures. You may describe one or two distinct metals.

Calculations How is the total metal output calculated from natural sources (line 26 page 1805) ? Calculations of the “per capita excess load” and “leakge ratio” indicators should be more detailed than line 24-29 page 1806. Can you make clearer how you calculate the percentage of unknown sources (Fig. 6) ?

Editorial / Technical comments

Page 1796 line 21-22 : “considered” twice Page 1797 line 14 :give references for ECA studies Page 1801 line 5 : why is METOX unusable for MFA ? Page 1803 line 22 : replace “approaches” by “studies” Page 1803 line 28 : what does PbEt4 mean ? Page 1804 line 23 : why do you use parameters such as T1A, T1F, P7... in the text and not in the figure 4. Values, cited in the text, appear difficult to find in the figure 4. Page 1805 line 21 : aeolian and not Aeolian Page 1806 line 1-6 : put all the explanations about domestic inputs to page 1805 line 27

Figure 2 : why do you not use only S for storage ? what do the different arrows mean ? What is the difference between SR3 and SR4 ? what does “scrap” mean ? Identify the anthroposphere Figure 4 : why are the boxes different from Figure 2 ? Figure 5 : This figure is already published in Thevenot et al, 2007 in the exact same way so you can delete it in this article Figure 6 : delete “sources” in the legend Figure 7 : add the symbols \bar{T} and \bar{S} ; in the legends for A and B. A readings on the left or on the right ?

Table 1 : what is a miscellaneous source ? why do you use P8B ? P8A exists in figure 2 but it is not explained. Why do you use P2 and P3, it seems similar ? In the figure 2, P1A + P1B exist but they are not explained in Table 1 Table 2 : Grosbois instead of Grobois. In figure 2, T2F, T2A, T1U exist but they are not explained in Table 2 Table 3 : L3A/L5 seem to be different data with similar symbols : why ?

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 4, 1795, 2007.