

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 #2

Received and published: 26 July 2007

Review comments

MS-NR: hessd-2007-0066 Version: 1 Received: 23 May 2007, 9:17 CET Title: Metal contamination budget at the river basin scale: a critical analysis based on the Seine river Author(s): L. Lestel, M. Meybeck, and D. Thévenot

General comments The paper gives a flux-flow analysis of contaminants in the Seine River basin, illustrated by the example of Cd and Zn. The estimates are based on a variety of sources describing metal flows in the anthroposphere, as well as in the natural environment. The indicators used are the per capita excess load at the river outlet ('how much do we waste per person in the entire catchment') and the leakage ratio ('how much do we waste per ton metal we use'). The study involves tremendous

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data integration in time, space and in indicator to achieve basin-wide flux and budget estimates over 5-year periods. For this purpose the authors have undertaken a huge effort in collection and processing data - although many parts were done already in previous related studies. In spite of the large uncertainties in the estimates, the resulting picture seems meaningful. The results provide good measures of basin scale pollution history, as well as efficiency in resources use and sanitation. Such studies are of great importance e.g. within the EU WFD, and large-scale assessments of river basin contamination.

Check list: 1) Does the paper address relevant scientific questions within the scope of HESS? YES 2) Does the paper present novel concepts, ideas, tools, or data? YES 3) Are substantial conclusions reached? YES 4) Are the scientific methods and assumptions valid and clearly outlined? YES 5) Are the results sufficient to support the interpretations and conclusions? YES 6) Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? INEVITABLY POOR, BUT REFERENCE USED 7) Do the authors give proper credit to related work and clearly indicate their own new/original contribution? GIVE REFERENCE TO RESULTS FROM OTHER RIVERS 8) Does the title clearly reflect the contents of the paper? YES 9) Does the abstract provide a concise and complete summary? YES 10) Is the overall presentation well structured and clear? YES 11) Is the language fluent and precise? YES 12) Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? YES - see comment below 13) Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? NO 14) Are the number and quality of references appropriate? GIVE CREDIT TO PAPERS DEALING WITH OTHER RIVERS FOR COMPARISON 15) Is the amount and quality of supplementary material appropriate? YES

Specific comments: Overall the paper is well written, in spite of the fact that the authors had to summarise a complex chain of processes of data collection and re-scaling into

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a concise paper. Some minor points deserve attention: 1. It would be helpful to further explain briefly the exact difference (including the units) of the concepts of flux and flow. 2. To what extent do peak flows have contributed to the total transport of pollutants in the basin, and how can we be sure that these large fluxes that occur during short periods of time have been included in the estimates? 3. There seems a risk in circular reasoning when expressing output per capita after the output has been rescaled proportionally to the number of inhabitants. I presume this has not happened. 4. The meaning of ‘recycling’ (p1808, l. 26): is it truly re-using of the material, or does it also include storage of waste or contaminated sewage sludge, such that it does no longer leach into the environment. 5. The authors mention that similar studies should be undertaken for other rivers, such as the Rhine, Elbe, Scheldt or Humber (p1808, l.25). At least they could give reference to studies on those rivers that have attempted to reconstruct their pollution history. Although these do not give estimates of the indicators of the present study, it is interesting to compare the pollution trends among rivers.

Editorial / technical comments: 1. Methods section (chpt 3, p 1799 -): use past tense (were, instead of ‘is’ or ‘have been’), unless other tense are truly appropriate. 2. p1800, l.15 replace ‘as examples’ by ‘for example’ 3. p1800, l. 24 ‘estimated from (i) nominal E’ and do not repeat ‘from’ in subsequent items 4. p1801 l. 16,17: use: ‘such as’ 5. p1801 l.18: replace ‘prorated to the proportion of’ by ‘scaled proportionally to’ 6. p1805, l. 17: place ‘;’ at the end of this line 7. p1806, l. 23: replace ‘the proposition of’ by ‘proposing’

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

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