Hydrol. Earth Syst. Sci. Discuss., 4, S1684–S1685, 2007
www.hydrol-earth-syst-sci-discuss.net/4/S1684/2007/

Hydrology and Earth System Sciences Discussions

Interactive comment on "Statistical distribution of series of 12 monthly concentration samples for environmental classification of rivers" *by* J. Eliasson and T. Thordarson

Anonymous Referee #2

Received and published: 10 December 2007

This paper deals with an important issue: how do we classify the water quality for streams where only limited data are available. However, I have fundamental concerns with the study:

1) The authors want to answer the question which distribution is most suitable to describe concentrations in streams. The data used in this study is not suitable to answer this question! If we want to derive the correct distribution we need a data set with more than 12 concentration values. Especially to investigate the tails of the distributions one would need a larger sample. It would also be necessary to look on data from different

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years to support the general conclusions found in the abstract.

2) The authors treat concentration as a purely random variable. The authors claim that there was no seasonal pattern (no results shown). Even if we accept this, I still would expect clear correlations of at least some of the concentrations with runoff. If we want to make progress with classification in the case of limited data we need to consider such correlations! Obviously ignoring runoff at the time of sampling is a severe limitation.

3) I do not agree that it is reasonable to compile one distribution from the concentrations of different constitutes like done in Figure 6. Even if these concentrations are normalized before this seems like comparing apples and pears.

Minor comments:

What is the correlation coefficient in Table 1? May be correlation with air temperature? In that case the correlations actually would indicate some seasonal variations of concentrations.

How where probability values (0-1) assigned to the ranks (1-12)?

A cumulative frequency curve should be monotonic. Some of the curves in figures 2-4, however, show some increases with increasing rank (where the curves should be expected to decrease monotonically). The reason for this must be that the authors used Excels smoothing function when preparing the plots (in this case the figures provide a good example why one NOT should use this function!)

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 4, 2561, 2007.