**Hydrology and
Earth System
Sciences
Discussions**

Interactive comment on "Variation in turbidity with precipitation and flow in a regulated river system – River Göta Älv, SW Sweden" *by* G. Göransson et al.

Anonymous Referee #1

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This paper presents results from a monitoring study of turbidity in the Göta Älv, an important drinking water supply river in southern Sweden. The paper is well written and clearly presented. I believe the approach used in this paper has broad applicability to other regions where drinking water is supplied from surface waters.

The authors note that turbidity data were collected every minute and averaged to give the daily data used in this analysis (p261, l 23-24). At several points throughout the paper, the authors make the assertion that the daily variability is small and will not have a large effect on daily values (p263, l10, etc.) I believe the authors, but I would really like to see some evidence in support of their claim. Perhaps an estimate of the

coefficient of variation for 10 minute samples, or some sort of best and worst case for variability within a day?

How confident are the authors that there were no problems with sensor fouling (p262 l5)? Any turbidity work I have been involved in has had problems with fouling of the sensors, which needed fairly careful post-processing. I am prepared to believe the authors have dealt successfully with any possible problems, but would like more details on how this was accomplished.

I had the most trouble with the ANOVA presented by the authors. I agree with the conclusions presented on p271 lines 10-25 but I do not believe they are supported by the ANOVA analysis.

My understanding of repeated measures ANOVA is very different than that of the authors. They state that repeated measures ANOVA is appropriate when more than two variables are measured simultaneously. My understanding is that repeated measures ANOVA is appropriate when individuals are measured multiple times. I do not think ANOVA is appropriate when the variances within the groups are unequal, as seems to be the case from Figure 9. I've struggled with what advice to give about the ANOVA, I've thought about transforming the data, or using a multiple linear regression instead of ANOVA, but none of my proposals are completely satisfactory to me. I believe Figure 9 stands on its own. The authors do not need to present any statistical analysis to support the points they make on p271. For me, the Figure 9 is convincing enough. Inappropriate statistical analyses only detract from the story.

Most of my comments are minor:

p256 l14 – should be "bases"

p258 l26 – should be "coliforms"

p263 l23 – what is meant by "unbiased data" – this sentence is not clear to me.

Figure 3 caption – there seems to be an extra "and", could state . . . "Göta Älv for the

. . .”

Figure 4: consider presenting runoff (mm/d) and precipitation. Then it would not be necessary to rescale the flow axis

Figure 7 is a little confusing, perhaps it could be separated into two panels, one for daily and the other for monthly lags? I've enjoyed reading this paper, it has been most informative and useful.

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