Author response to RC2 on “Technical note: A time-integrated sediment trap to sample diatoms for hydrological tracing” by Jasper Foets et al.

Jasper Foets on behalf of all co-authors

We are very grateful to the referee for the constructive and valuable comments. Below we reply on the suggestions/comments.

1) We will adjust some sentences in the text, so that we will be more careful with our conclusions. Previous studies already suggested that comparing time-integrated methods with point samples is rather difficult as barely any statistical analyses were involved (Doriean et al., 2019; Martin et al., 2003; Phillips et al., 2000; Smith and Owens, 2014).

2) To counteract for potential temporal auto-correlation, we will run a NMDS analysis (figure will be added in appendix or text) and compare the position of the centroids in the geometric framework of the NMDS plot using PERMANOVA.

3) We removed rare taxa because occurrences of rare species are likely a matter of chance rather than an ecological meaning. Besides, diatom community data is very variable. We recognize that rare species can have valuable information, but here we were looking for the general patterns and therefore we decided to remove them. In addition, removal of rare species does not affect indices such as Shannon-Wiener or Pielou’s evenness index according to (Yu et al., 2017).

4) There is a great mismatch in the number of samples collected with the two methods. However, we do not agree with pooling the data, since we then do not have replicates, even though our analysis is susceptible to pseudo-replication. As an alternative approach, we will specify nestedness in the PERMANOVA model. If there would be a significant effect of treatments (i.e. sampling methods), we will test for dispersion as well. In addition, we will do SIMPER tests on the community data. The statistical analysis of the study will now involve NMDS analysis, PERMANOVA, cluster analysis, ANOSIM, SIMPER and comparison of species relative abundances and derived indices using weighted t-tests or Mann-Withney U test. Below, we attached the outcome of the NMDS, which does not seem to deviate much from the dendrogram approach.

In addition to the changes requested by both reviewers, we will change “Foets et al. in review” since it has been published in the meantime.

Doriean, N.J.C., Teasdale, P.R., Welsh, D.T., Brooks, A.P., Bennett, W.W., 2019. Evaluation of a simple, inexpensive, in situ sampler for measuring time-weighted average concentrations of suspended sediment in rivers and streams. Hydrol. Process. 33, 678–686. https://doi.org/10.1002/hyp.13353

Martin, H., Patterson, B.M., Davis, G.B., Grathwohl, P., 2003. Field trial of contaminant groundwater monitoring: Comparing time-integrating ceramic dosimeters and conventional water sampling. Environ. Sci. Technol. 37, 1360–1364. https://doi.org/10.1021/es026067z

Phillips, J.M., Russell, M.A., Walling, D.E., 2000. Time-integrated sampling of fluvial suspended sediment: A simple methodology for small catchments. Hydrol. Process. 14, 2589–2602. https://doi.org/10.1002/1099-1085(20001015)14:14<2589::AID-HYP94>3.0.CO;2-D

Smith, T.B., Owens, P.N., 2014. Flume- and field-based evaluation of a time-integrated suspended sediment sampler for the analysis of sediment properties. Earth Surf. Process. Landforms 39, 1197–1207. https://doi.org/10.1002/esp.3528

Yu, Z., Wang, H., Meng, J., Miao, M., Kong, Q., Wang, R., Liu, J., 2017. Quantifying the responses of

biological indices to rare macroinvertebrate taxa exclusion: Does excluding more rare taxa cause more error? Ecol. Evol. 7, 1583–1591. https://doi.org/10.1002/ece3.2798