Earth Syst. Sci. Data Discuss., author comment AC2
https://doi.org/10.5194/essd-2021-350-AC2, 2022

Reply on RC2

Hugo Lepage et al.

Author comment on "Concentrations and fluxes of suspended particulate matter and associated contaminants in the Rhône River from Lake Geneva to the Mediterranean Sea" by Hugo Lepage et al., Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2021-350-AC2, 2022

Dear RC2,

Thank you for your feedback. Please find below the first elements of a response. The manuscript will be revised to take into account the first comments especially on the abstract, introduction and conclusion.

For the turbidity part, we will add a table with the equations of the turbidity-SPM rating curve and the number of calibration data used. For some stations (Gardon, Durance, Andancette), the number of calibration data being insufficient, the conversion has not yet been performed. Sampling collection is carried out regularly - and never stopped - to ensure there is no change in the relationship between turbidity and SPM. A new turbidity-SPM rating curve is systematically begun when a turbidity probe is replaced. We can also add one or more curves as an example if it is of interest ?

For the water discharge, the data are produced by others (private and public companies - mentionned in the BDOH database) and provided to us for data storage and flux computation. Water levels are measured using pressure sensors, pneumatic probes (bubblers) or radar gauges, and the stage records are converted to discharge using a stage-discharge rating curve or a stage-fall-discharge rating curve for stations affected by the variable backwater upstream of a dam. Hourly averaged water discharge data are generally calculated by conversion of water level measurements through stage-discharge rating curves. At Jons, the closest hydrometric station is relatively far upstream, and two tributaries bring significant amounts of water between the hydrometric and the turbidity station. Therefore, a 1-D hydrodynamic model (Dugué et al., 2015; Launay et al., 2019) is used to compute the discharge time series at Jons from the three discharge times series measured upstream on the Rhône River (at Lagnieu) and on the two tributaries (Ain and Bourbre Rivers).
Discharge-SPM rating curves are too uncertain to allow the detection of potential temporal changes. We therefore assume that they are constant over the monitoring period.

Dugué, V., Walter, C., Andries, E., Launay, M., Le Coz, J., Camenen, B., and Faure, J. B.: Accounting for hydropower schemes' rules in the 1-D hydrodynamic modeling of the Rhône River from Lake Geneva to the Mediterranean sea., in: 36th IAHR World Congress, 2015.
Launay, M., Dugué, V., Faure, J. B., Coquery, M., Camenen, B., and Le Coz, J.: Numerical

modelling of the suspended particulate matter dynamics in a regulated river network, Sci. Total Environ., 665, 591–605, https://doi.org/10.1016/j.scitotenv.2019.02.015, 2019.²

Concerning the sampling by particle traps, they are immersed near the riverbank avoiding dead zones or effluents so that the sampling is representative of the river cross-section. For Andancette and the Saône river monitoring stations, the PT are kept submerged with chains at a depth of 0.5 - 1 m while at the other stations the PT are attached to the riverbed at an average depth of 0.5 m (except during flood events). At Arles, the PT and CFC are located inside the SORA monitoring station (Eyrolle et al., 2010) and supplied by a pipe. In average, one sample by station is collected every month, but this number might be higher due to the occurence of flood events, or lower due to logistic constraints or vandalism.
The BDOH database tool allow the possibility to visualise both the sampling period of a contaminant (regarding its concentration) and the water discharge (see the picture enclosed as example).
We are aware that the PT is not designed here to evaluate the variation within an extrem event. The purpose of the PT is to obtain an integrative response of the event. In case we need to study a specific event, the centrifugation might be used to investigate the temporal variation within. Modeling might also be used to study fast variation within our sampling stations. We added additionnal information in the manuscript to clarify this part. Regarding the completion of the missing values, it is also true that the variation is not taken account, we will clarify this part in the manuscript.

I cannot find the publication you mentionned for the introduction (https://doi.org/10.1016/j.geomorph.2007.06.00), this link is not working. And I cannot access to this one https://doi.org/10.1017/cbo9781139136853.026 (it is okay for the two others).

Sincerely,

The Authors