

## Comment on **essd-2021-350**

Anonymous Referee #2

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Referee 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-RC2>, 2022

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The paper is interesting and present significant effort in comprehensive sediment-related studies – very outstanding Rhône Sediment Observatory (OSR) operated along Rhone river basin. I would expect that it can be published after revision. The main concern regarding various parts of the manuscript are presented below.

Abstract. In the present form is too vague. It contains extensive general information (e.g. "suspended particulate matters (SPM) have been involved in the fate of hydrophobic contaminants such as polychlorobiphenyls (PCB), mercury (Hg) and other trace metal elements (TME), and radionuclides for decades") which are not in line with manuscript subject. Key results of the study should be additionally presented in the abstract.

Introduction. The overview of the sediment-related studies over Rhine basin are not fully substantive. Sediment budget studies and long-term changes in sediment budget along Rhone river and changes in sediment contamination due to environmental practices (is worth to discuss. Floods impact on sediment transport (<https://doi.org/10.1016/j.geomorph.2007.06.00>) was also well-known over Rhone river. It is quite important to illustrate them to emphasize gaps of knowledge and needs to maintain observatory. The temporal resolution of the observations should be mentioned here.

At the end of the Introduction section it is worth to present the main challenges of the OSR. How does OSR expands to the existed sediment monitoring network? What additional knowledge this monitoring network provides?

**3.2. Suspended Solid Concentration.** It is important to demonstrate site-specific turbidity-SPM rating curves (for each station – both significance of the relationships and

explain possible spatial (and temporal differences). How often the relationships are recalibrated for each station? What is Relative uncertainty on SPM concentrations (9%) – how does estimate was received?

3.3 Sampling of SPM for analysis. This section do not clearly demonstrate the frequency of the sampling. How many samples per year are taken? It is work to depict sampling periods charted on the hydrograph of representative station.

Explain how PT is installed into the flow.

It is not clear how the sampling procedure and frequency reflect high temporal variability of sediment contamination during floods (see **3.5.2 Completion of missing values of contaminant**). This topic should be significantly elaborated.

3.5 Data completion and flux calculation. It is know clear the procedure of water discharge calculation. What data is used to count stage-discharge rating curves, how does water level observations are operated. What is numerical modelling used to count water discharges?

The possible temporal changes in sediment rating curves should be explained. How often relationships presented in table 4 are recalibrated?

The study should at the end compare the OSR network and system with similar initiatives Worldwide which provide comprehensive hydrogeochemical studies of large rivers sediment transport (e.g. ArcticGRO – see e.g. <https://doi.org/10.1017/cbo9781139136853.026> ; ArcticFLUX – see <https://doi.org/10.5194/acp-19-1941-2019> and <https://doi.org/10.24057/2071-9388-2018-11-1-6-19> ;