

Answer to reviewers	
Reviewer 1	
<i>Reviewer's comments</i>	<i>Replies</i>
Major comments	
The findings of this study are particularly pertinent, offering a substantial contribution to understanding contemporary challenges related to the evolution of hydropower production and, more generally, reservoir functionality throughout the 21st century.	The authors are grateful to the reviewer for providing this general positive evaluation.
Furthermore, subsection 4.2 would benefit from a more comprehensive explanation of the ^{137}Cs peak attribution. The reported dating of the Chernobyl peak at 1989, based on the calculated age-model, introduces some ambiguity; a clearer exposition of how this aligns with the model's inherent uncertainty would enhance clarity.	Actually, the 1986 Chernobyl accident ^{137}Cs peak is included in the uncertainty range of the age-depth model [1983;1989].
Minor comments	
My comments are primarily minor and pertain to formatting. I encourage the authors to undertake a detailed proofreading to rectify small inconsistencies such as "Fig.??" (§ 430) and to ensure consistent formulations, for example, with phrases like "5 presents..." (§ 365).	We thank the reviewer for carefully checking the manuscript and pointing out some inconsistencies. We will thoroughly proofread the revised version and implement all the necessary corrections
Reviewer 2	
<i>Reviewer's comments</i>	<i>Replies</i>
This papers introduced an interesting and original study on the sedimentation of a dam reservoir based on three cores analysis completed with an analysis of precipitation and dam regulation data	Many thanks for sharing this overall positive appreciation.
<i>Major comments</i>	
In general, the main weakness of this paper is the lack of links made between the three types of data analysed: core analysis, precipitation analysis and hydropower generation analysis. Ultimately, the lack of clear results linking these data leads to speculation rather than discussion.	<p>We agree with the reviewer about the fact that the lack of correlation between the sediment core and precipitation analysis can represent a weakness in the study. The age model uncertainties led us to remain careful when attempting associating sediment core sedimentation episodes detected and precipitation data.</p> <p>Indeed, the lack of correlation between sedimentation,</p>

	<p>precipitation and hydropower production led us to propose a site-dependent explanation. The correlation of hydropower production with a water level variation from operation setpoint provided a way to see what may explain better this lack of link between the environmental variables and hydropower production.</p>
<p>My feeling is that an analysis of the sediment dynamics in the dam reservoir is missing. Additional data on water discharge (apparently available from BRL) and suspended sediment concentration would be very useful. It is a pity not to have an estimation of the sediment yield, including a discussion of its temporal variability.</p>	<p>We fully agree that continuous hydro-sedimentary data would have been extremely valuable to reinforce the link between precipitation, hydrology, and reservoir sedimentation. In our case, however, such datasets were unfortunately not available at a suitable temporal resolution or during a sufficient time range.</p> <p>Discharge. Inflows were not directly measured but reconstructed instead by the dam operator from water-level variations between 1996–2005 (the only period available /provided to us). These values are therefore not independent from the water-level series already used in our analyses of hydropower generation, and their temporal coverage is too limited to be integrated consistently with the sediment core record.</p> <p>Suspended sediment concentrations. Measurements were performed only sporadically (about three times per year). Furthermore, the report itself acknowledged that such measurements may not capture flood events, water spills, or reservoir mixing episodes. Additional sediment quality data were collected during the last partial drawdown of the dam in 2000, but again without sufficient temporal resolution to meet our purpose.</p>

<p>From my point of view, one objective would be to determine the origin of the 27 events observed for the ORB09 core and explain why other significant hydrological events were not captured by the core.</p>	<p>This was one of the tasks we tried to achieve through a time-lag correlation. However, the propagation of model uncertainties resulted in an increasing misalignment of events along the sediment core, making the approach unreliable. Therefore, to overcome this limitation, we tested a Dynamic Time Warping algorithm to evaluate potential similarities between precipitation peaks (for various thresholds) and normalized annual sediment fluxes. Nevertheless, this analysis did not yield exploitable results. For transparency, we can provide the graphs along with a revised version of the manuscript if we are allowed to do so by the editor.</p>
<p>Possibly, a numerical modelling of the dam reservoir could also provide some interesting information.</p>	<p>We acknowledge that numerical modelling of the reservoir would indeed provide valuable additional insights, particularly regarding the interactions between hydrology, sediment dynamics, and dam operation. However, such modelling was beyond the scope and resources of the present study, which focused on reconstructing past hydro-sedimentary dynamics from sediment cores and available hydrometeorological data. We therefore consider numerical modelling as a highly relevant direction for future research, complementary to the present reconstruction.</p>
<p>There are too many figures in appendix and in the supplementary materials that are discussed in the text making the reading quite difficult. First, I suggest to use supplementary materials only (no appendix); Second, do refer to the supplementary materials (or appendix) only for additional information, not for to provide additional arguments for your study.</p>	<p>We agree with this suggestion. Accordingly, we will move the figures previously located in the appendix to the supplementary materials. We will also make sure that figures placed in the supplementary materials are referred to in the main text only to provide additional information, and not to introduce new arguments.</p>

There are still many typos, which shows that the article has not been proofread very well. I have made some corrections in the “minor comments” section, but I may have missed many	We thank the reviewer for carefully checking the text and pointing out several typographical and style issues. We will thoroughly proofread the revised manuscript and correct the citation style, operator name formatting, and other minor inconsistencies as suggested
Minor comments	
Reviewer 2 provided a list of minor comments	We sincerely thank the reviewer for the careful proofreading. The detailed response to each of the minor comments will be provided along with the revised version of the manuscript if the editor gives us this opportunity.