Response to Reviewers:

We thank the Reviewers for the constructive evaluation of our manuscript. We appreciate the recognition of the value of the dataset, the rapid post-event sampling strategy, and the relevance of the multidisciplinary approach. Below, we address minor comments in the order raised by the Reviewers and describe how manuscript and figures have been revised accordingly.

Dear Editor,

I would like to thank Pellegrini and colleagues for their careful revision. Overall, I am satisfied with the authors' responses and the improvements made to the manuscript. That said, some figure details still require further refinement. I list my suggestions below for the authors' consideration. In addition, unifying the overall visual style of the figures (e.g., consistent color schemes and symbol sizes for scatter plots, box plots, etc.) would further improve the readability and coherence of the manuscript.

Best,

Mengfan Chu & Rui Bao

Figure-specific comments:

Fig. 1: This figure has been substantially improved and is much clearer than in the previous version.

We thank the reviewer for the positive feedback and are pleased to hear that the revised Figure 1 is now clearer and more effective in conveying the spatial context of the study area

Fig. 3: In Fig. 3A, what does the color scale represent? If it is consistent with the other panels (e.g., indicating lithological changes), this should be clearly stated in panel A itself. In addition, I suggest that Fig. 3B explicitly mark the depth/positions of the analyzed samples within the core (e.g., surface sediments vs. pre-flood deposits), to help readers better understand the sampling context.

We appreciate the reviewer's observation. A color scale has now been added to Fig. 3A, providing explicit clarification of the lithological information and ensuring full consistency with the other panels. In the revised figure, we added a red box to clearly indicate the 2022 flood-derived surface sediments within the core. The pre-flood samples are shown at the bottom of the cores.

Fig. 6: I noticed that the authors added descriptions of the geochemical indicators for each province in the figure caption. While this information is useful, it may be clearer to indicate these distinctions directly within the figure itself. Additionally, placing the legend for stars and diamonds within the scatter plots (rather than in the map) might improve clarity.

We thank the reviewer for this helpful suggestion. In the revised version of Fig. 6, we opted not to duplicate the symbol legend within each scatter plot, as this would have resulted in unnecessary repetition. Instead, we added a unified legend panel in the lower part of the figure, which clearly indicates that the symbol definitions apply to all three scatter plots. This solution improves clarity while maintaining a clean and uncluttered layout

Fig. 10: The color scale representing "distance from coast" does not appear to be displayed in any of the panels. In panel B, the labeling could be more precise. For example, "clay" and "silt" should include percentage symbols.

We thank the reviewer for this useful comment. In the revised version of Fig. 6, we replaced the 'distance from coast' color scale with a directional arrow, which we believe provides a clearer indication of the offshore gradient. We also enlarged the labels in panel B to improve readability. We opted not to include percentage symbols directly in the figure to avoid overcrowding the panels, as the detailed grain-size percentages are already provided in the Supplementary Material

Fig. 11: I generally agree that introducing a framework would improve clarity of the followed discussion. However, in the Discussion section, the proposed framework is introduced rather briefly, whereas the figure itself already integrates several conclusions of the manuscript. The combination of a concise textual introduction and a relatively complex schematic makes the flow somewhat abrupt. It may help to briefly outline the key components of the framework (e.g., the main elements corresponding to the subsection headings) before presenting the figure. This would provide readers with a clearer conceptual roadmap.

We thank the reviewer for this very helpful comment. Following the suggestion, we expanded the textual introduction to the conceptual framework in the Discussion section. We now briefly outline the key components of the framework (corresponding to the main subsections on sediment dynamics, contaminant behavior, and microbial responses) before presenting Fig. 11. This provides readers with a clearer conceptual roadmap and ensures a smoother transition between the discussion and the schematic figure.