

This manuscript presents the Italian Fluvial Sediment Transport Database (ISTD), bringing together a large amount of historical and recent hydro-sedimentary information within a common database and web platform. Overall, I find this a useful and timely contribution. Sediment transport data are often scattered across different institutions, projects, and monitoring periods, so having these datasets brought together in one place could become a very useful resource for researchers working on rivers, sediment transport, and river management.

I also appreciate that the manuscript is quite open about the limitations of the current database, particularly the differences in instrumentation, temporal coverage, spatial coverage, and metadata quality. These are not necessarily weaknesses of the database itself, but rather reflect the reality of long-term sediment monitoring. Overall, I am supportive of publication. I do not see major issues with the concept or overall contribution. Most of my comments below are relatively minor and are mainly intended to make the database structure, data processing, and figures easier for future users to understand.

We sincerely thank Reviewer 2 for the positive assessment of the manuscript and for recognising the usefulness and timeliness of the Italian Fluvial Sediment Transport Database. We are pleased that the reviewer appreciates both the contribution of bringing together fragmented hydro-sedimentary datasets within a common database and web platform, and the transparent discussion of the limitations related to instrumentation, temporal and spatial coverage, and metadata quality.

We also thank the reviewer for the constructive comments aimed at improving the clarity of the database structure, data-curation workflow, validation procedures, and figures. We have revised the manuscript accordingly, with the goal of making the database easier to understand and use for future users.

The Methods section gives quite a lot of detail about PostgreSQL and the web platform, but relatively less about how the datasets themselves were collected and prepared before being added to the database. It would be useful to briefly explain the data-curation workflow. For example, how were datasets selected, were units and parameter names standardized, and how were missing metadata or duplicated observations handled? A short paragraph or simple workflow diagram would probably be enough.

We thank the reviewer for this useful suggestion. We agree that, although the manuscript already described the data call, the standardisation strategy, and the database validation logic, the data-curation workflow before upload was not presented clearly enough in a single place. We have therefore added a dedicated paragraph in the Material and Methods section, before the description of the PostgreSQL database. In the revised text, we now explain how candidate datasets were selected, how parameter names were harmonised using the internal database vocabulary, how measurement units were checked and converted when necessary, and how missing metadata were recorded as missing or unknown rather than being reconstructed without supporting information. We also clarify that potential duplicated observations were checked before upload using combinations of station, parameter, date/time, value, and source information. This addition should make the preparation and integration of heterogeneous datasets more transparent for future users of the database.

Related to this, the manuscript mentions that data validation is carried out during upload, but I was not entirely clear about what this validation includes. It would be useful to briefly explain whether this involves checking dates, units, coordinates, data types, unrealistic values, duplicate records, etc.

This would help future users understand how much quality control has already been done before downloading the data.

We thank the reviewer for this helpful comment. We agree that the previous wording did not sufficiently specify what the upload-validation procedure includes. We have therefore expanded the description of the data-entry process in the Web application section.

In the revised manuscript, we now clarify that upload validation includes checks on the structure of the input file, the presence and format of required fields, date readability, numeric data types, and consistency between the uploaded data and the acquisition metadata selected by the editor, including parameter, unit, river, monitoring station, and geographic coordinates. We also specify that records with missing dates or missing values are not uploaded and that potential duplicated observations are flagged using the combination of acquisition, date, and value.

We further clarified that these checks represent a first-level validation aimed at preserving database consistency and preventing structural errors during upload. They should not be interpreted as a complete scientific quality-control procedure, because the identification of unrealistic values, sensor drift, method-specific bias, or errors inherited from historical sources may require additional expert assessment and comparison with the original monitoring documentation.

Figure 1 was not very easy for me to follow in its current form. I understand the general database structure from the text, but the relationships between the different tables are difficult to understand directly from the figure. Perhaps the authors could simplify the figure slightly, make the main pathway from watershed/river to acquisition and then to data more visually obvious, and explain the symbols or relationship types. Grouping the tables into broad categories such as geographic information, measurements, and users may also help.

We thank the reviewer for this useful suggestion. We agree that the previous version of Figure 1 did not make the main relational pathway sufficiently clear. We therefore revised the figure by grouping the tables into functional categories and by making the pathway from watershed and river information to acquisition records and measured data more visually explicit. The caption was also revised to clarify the role of the main table groups and the meaning of the connecting lines.

It may also be useful to provide a simple summary table of the database contents. There are many parameters, instruments, time series, and measurement frequencies discussed throughout the Results. A table showing the main parameters, units, number of records or time series, and approximate temporal coverage would allow readers to understand the database much more quickly.

We thank the reviewer for this helpful suggestion. We agree that a concise summary table can help readers understand the database contents more quickly before moving to the detailed analyses of instruments, sampling frequency, temporal coverage, and spatial distribution.

We have therefore added a new table at the beginning of the Data Records section (Table 1). The table summarises the parameters currently populated in the database and reports, for each parameter and measurement unit, the number of records, number of time series, number of rivers, number of measurement sites, and temporal coverage.

We also clarified in the table caption how time series are defined in this summary, namely according to unique combinations of river, instrument, parameter, measurement unit, coordinates, metadata, measurement type, watershed, reference, and availability information. This table now provides a compact overview of the database contents and complements the more detailed figures presented later in the Results section.

I also noticed that the numbers shown in the web-interface screenshot in Figure 2 are different from those reported later in the Results. For example, the screenshot shows different numbers of records, stations, and rivers from those described in the manuscript. This may simply be because the online database has continued to grow while the manuscript analyses a frozen version, which is completely understandable. If so, I suggest adding one sentence to make this clear.

We thank the reviewer for noticing this issue. The difference is due to the fact that the web interface shows the continuously updated online version of the database, whereas the analyses reported in the manuscript refer to the frozen database version used for the results and archived for reproducibility.

We have added a clarification in the manuscript to avoid confusion. The revised text now states that the web platform is continuously updated and that the numbers displayed in the interface may therefore differ from those reported in the Results, which refer to the fixed version of the database analysed in this study.

Figure 6 contains useful information, but I found it somewhat difficult to interpret quickly. The combination of modal frequency, minimum–maximum range, and cumulative percentage makes the figure quite busy, and the individual parameters cannot easily be identified. Perhaps the authors could simplify the presentation or label the parameters more clearly. The same information could potentially also be separated into two simpler plots.

We thank the reviewer for this helpful observation. We agree that the previous version of the figure combined too many elements in a single plot, making it difficult to interpret quickly.

We have therefore revised Figure 6 by separating the information into two panels. The first panel now shows the modal sampling frequency and its variability range, while the second panel shows the cumulative distribution of modal sampling frequencies. We also revised the axis labels and caption to clarify the meaning of the modal frequency, variability range, and cumulative percentage. These changes make the figure easier to read while preserving the information on the heterogeneity of sampling frequencies in the database.

Figure 7 is also informative, but some panels become very dense and almost completely black because many time series overlap. It may help to explain more clearly what each horizontal row represents and how the time series are ordered. A slightly simplified visualization may also make the temporal gaps and differences among parameters easier to see.

We thank the reviewer for this helpful comment. We agree that the previous version of the figure was difficult to interpret in panels containing many time series, where the annual presence/absence matrix could appear almost completely black.

To improve readability, we revised the figure by adopting an aggregated representation. Instead of displaying each individual time series as a separate horizontal row, each panel now shows the number of active time series per year for each parameter. An active time series is defined as a time series with at least one available record in a given year. Time series are still defined according to the same metadata-based criterion used in the database summary table.

We also revised the caption and the related text to clarify that the number in square brackets indicates the total number of time series available for each parameter, whereas the bars indicate annual data availability. This revised visualisation reduces overplotting and makes temporal gaps, periods of higher data availability, and differences among parameters easier to identify.

Figures 8 and 9 are generally useful, although some additional geographic context would help readers who are not familiar with Italian river basins. Adding labels for a few of the major basins discussed in the text, such as the Po, Adige, or Arno, would make the figures easier to follow. For Figure 9, it would also be useful to make very clear that the colour scales differ among panels and what exactly the mapped values represent.

We thank the reviewer for this useful suggestion. We agree that additional geographic context can help readers who are not familiar with Italian river basins.

We revised Figures 9 and 10 by adding labels for selected major basins discussed in the manuscript, including the Po, Adige, Tagliamento, Arno, and Ombrone basins, while avoiding excessive map clutter. These labels should make the spatial distribution of the data easier to interpret for non-Italian readers.

For Figure 10, we also revised the caption and related text to clarify that colour scales are defined independently for each panel and should not be directly compared across parameters. We now explicitly state that the mapped colours represent the number of available records for the corresponding sediment-related parameter within each basin.

The database includes not only sediment transport variables but also hydrological and physico-chemical variables such as discharge, temperature, pH, and electrical conductivity. I actually see this as a strength, because these variables can be important for understanding sediment dynamics. However, perhaps the authors could explain this broader scope a little more clearly when introducing the database.

We thank the reviewer for this positive and useful comment. We agree that the inclusion of hydrological and physicochemical variables is an important strength of the database and that this broader scope needed to be stated more clearly when the database is introduced.

We have revised the Introduction to clarify that, although the database is primarily focused on sediment transport, it was designed with a broader hydro-sedimentary perspective. We now explicitly state that the database also includes associated hydrological and physicochemical variables, such as flow rate, flow height, temperature, pH, electrical conductivity, and major ions. These variables are included because they provide essential context for interpreting sediment dynamics and support integrated analyses of the relationships between river flow conditions, water properties, and sediment transport processes.

The manuscript would also benefit from one final careful proofreading. There are several small grammatical and formatting issues throughout the text, as well as some duplicated DOI formatting in the reference list. These are minor and should be straightforward to correct.

We thank the reviewer for pointing this out. We have carefully proofread the manuscript to correct grammatical, typographical, and formatting issues throughout the text. We also checked the reference list and corrected duplicated DOI formatting and other minor inconsistencies.