

Reviewer 2

I commend the authors on compiling and presenting this highly valuable and timely dataset of aquatic carbon parameters across Australia. The study addresses a significant gap in the global carbon cycle research, particularly for the under-sampled Australian continent. The collection of a harmonized dataset of Australian rivers, is a substantial achievement and represents a commendable effort. The manuscript is well-structured, the methodology for data collection and quality control appears robust, and the potential utility of this dataset is immense. It will undoubtedly serve as a critical benchmark and foundational resource for the modeling community, ecologists, and climate scientists. The authors have done an excellent job in making this dataset accessible, interoperable, and reusable) and the provision of detailed metadata and a data descriptor paper is highly appreciated. I therefore recommend a minor revision before it can be accepted for publication in ESSD.

We thank reviewer #2 for their evaluation of this work. Our responses to their comments are in green below.

Line-to-line comments:

Figure 1 and 4: since this manuscript mainly talk about riverine carbon, can you put major rivers in the maps.

We will add the major river networks to Figure 1 and Figure C1 for geographic and climatic context. However, we prefer not to include them in Figure 4 to not overload the figure with too much information.

Also can you pub climate zone here or in the supplementary information.

Climatic zones are already represented in Figure 4. Nevertheless, we are happy to add a new Figure C3 in Appendix C showing the climatic zones across Australia.

You also need to plot figures for POC observations as well. Can you put the information about POC in the SI?

Agreed. We will include POC in Table 2, and add Figure C2 in Appendix C showing the spatial and temporal distribution of POC, similar to Figures 1 and 2, and POC violin and box plots (similar to Figure 5). A short description will also be added to the end of Sections 3.1 and 3.3 referencing these figures.

For the dataset, the ID is very strange. You have something like "AC, AF", you also have something as river names, numbers ("113006A"). Can you set a rule for your ID.

As OzRiCa compiles data from multiple sources, including government databases, literature, and our own field campaigns, we prefer to retain the original site IDs. This is important for traceability, as many IDs (e.g. "113006A") correspond to established monitoring stations within state databases. Keeping these original site IDs will allow users to link each record back to its original source. To improve clarity, we have added a 'River.Name' column to data tables A and B, which reports the stream or river name for all sites where this information is available (i.e. > 5,300 rows).

Additionally, it can be very easy for you to get the catchment information for each site. Can you link your data to global hydrograph dataset or national hydrograph datasets, such as Hydrosheds?

Thank you for this suggestion. We did consider linking OzRiCa to national or global hydrographic datasets such as HydroSHEDS. However, to do so accurately, each site must first be associated with a delineated catchment. From our own experience delineating all sites we sampled directly, this process involves much more than simply overlaying a DEM, it requires multiple QA/QC steps to ensure the correct catchment outlet and boundary, particularly for small or low-relief streams. To maintain data integrity, we chose not to include catchment information unless it could be verified with high confidence as we did with the sites from our sampling campaigns.