Comment on essd-2022-10
Arwyn Edwards (Referee)


This paper describes a large and unique collection of microbial abundance, DOC, nitrogen and phosphorus data across a globally-relevant region of glacial ecosystems. It will provide a valuable resource. Overall, my recommendation is to provide enhanced discussion of ecological insights, comparison with other studies, including in other regions and to provide a cautious treatment of the analytical methodologies used.

Key areas for improvement

(1) While this is a data description paper, some additional context in the discussion on the ecological insights which might be permitted from these datasets would be valuable

(2) How does the dataset compare with other studies of microbial abundance and biogeochemical parameters in the Tibetan Plateau glaciers and beyond?

(3) Flow cytometry is a key method in the paper and has been used for over a decade to enumerate microbes in glacial samples. It has advantages, but also some limitations, for example in the discrimination between biological cells and inorganic particulates, which may also fluoresce. The manuscript would benefit from a discussion of the pros and cons of flow cytometry in this context, and whether potential sources of interference were mitigated in this study.
L31: microorganisms
L35: Egge et al., 2021 - this marine-based paper seems at odds with the claims around glacial microbes and carbon cycles, and is formatted incorrectly in the references. I suggest that more relevant citations are provided to support this claim.
L126: Considering the range of sites, conditions and sample types, is one overall mean value appropriate?
L127: The range of these measurements was consistent with the results of existing researches using the flow cytometer method - how do they compare with flow cytometric analyses from other regions, e.g. Svalbard, Greenland, Antarctica?