

Earth Syst. Sci. Data Discuss., referee comment RC1
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Comment on **essd-2022-346**

Yuanzhi Yao (Referee)

Referee comment on "GRiMeDB: The global river database of methane concentrations and fluxes" by Emily H. Stanley et al., Earth Syst. Sci. Data Discuss.,
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The manuscript entitled "GRiMeDB: The global river database of methane concentrations and fluxes" proposes a comprehensive database for riverine CH₄ and the associated drivers. The proposed database is based on the earlier work by Stanley et al. (2016). The authors present the flow chart for generating the database, and also the data analysis.

The topic of the manuscript is interesting and relevant to the earth system science community, as methane emission is a potent source of greenhouse gas. Overall, this is a well-written manuscript without any apparent flaws. I can recommend the publication of this manuscript with minor revisions.

I also have a minor remark about the 'first database' stated in the abstract. I must confess, though, that I did not quite understand the difference between this database and the previous one (MethDB). I think MethDB is the first comprehensive database for river CH₄. This work is an extension with significant efforts.

Figs. 5 and 6: Can you differentiate the sites for ebullitive and diffusive flux, respectively. It is very important for modelers.

The figures are very nice and useful. Not all of them need to be in color, though. I also struggled a little bit with the legends: I think Figures 11, 12 and 13 should have legends to show the meaning of the colors.