Review of revised manuscript egusphere-2022-196

Most of my comments have been addressed, but there are still a few points that need some attention:

- The other reviewer mentioned that some explanation of how to read heatmaps would be useful and I certainly found this to be the case when I looked at them again; it took me a moment to remember that the Y axis represented simulation year. Day of year is on the X axis which seems obvious to me, but it is still worth mentioning. All these figures have colour bars so an explanation of what the colours mean was less important, at least for me. In any case please say what the axes tickmark values represent, either in the text or (preferably) in the caption of the first heatmap figure, e.g.:
  - Figure 6. Time-series heatmaps (X axes: day of year, Y axes: simulation year) ...
- Please provide a reference for the laboratory rates being considered in the following revised text. One good possibility would be Bandstra et al. 2008 (in Brantley, Kubicki and White *Kinetics of Mineral Dissolution*):

  > "The order of magnitude of weathering rates provided by our model is more typical of the field environment with respect to those achieved in laboratory conditions (e.g., Bandstra et al. 2008)."

- The immediately-following revised text stating that the modelled rates are "similar" to those of Amann et al. (2020) is misleading because the modelled weathering rates are an order of magnitude faster than those of Amann et al. Your rates are a lot more similar to those of Renforth et al. (2015, you already cite them), although their study used soil without plants. It is best to state that both the modelling and mesocosm studies achieved rates that are slower than those observed in the laboratory, and then give all the values for readers to see for themselves, e.g.

  > "This was also the case for the mesocosm studies of Renforth et al. (2015) and Amann et al. (2020). Our rates (10^-11.67 Iowa, 10^-11.79 California, 10^-12.50 Padan and 10^-12.32 Sicily, mol Olivine/m2/s) are comparable to theirs: 10^-12.7 to 10^-11.8 mol Olivine/m2/s (Renforth et al 2015), 10^-13.12 and 10^-13.75 mol Olivine/m2/s (Amann et al. 2020)."

Note that the spread of dissolution rates observed at similar pH can approach or exceed an order of magnitude even at the same experimental scale, as can be seen in the laboratory data shown for olivine by Bandstra et al. (figure on page 809 in the Appendix of Brantley, Kubicki and White 2008).