

Response to the second review comments

RC2: Anonymous Referee #2 reply

This is a second review of "Impact of high-resolution soil erodibility datasets on dust simulations in WRF-Chem with the GOCART scheme". The authors responded well to the first round of feedback and made the necessary corrections to the manuscript. The results show a clear benefit of using the higher resolution dataset with additional information on the soil from the SOILHD erodibility dataset.

1. There is however still some work to be done regarding the organization of Section 2:

- **The information in subsection 2.4 is duplicated in subsection 2.6.**
- **The forcing data used for WRF is currently introduced before the WRF setup**
- **The figures showing the differences in the soil erodibility for the different regions are shown before the regions are introduced in the model configuration section and Figure 4.**

Also, perhaps I missed it but I think LI2023 in the figure caption is not introduced before the figure.

Thank you for this suggestion. We have reorganized Section 2 to improve its structure and avoid unnecessary repetition.

Former Section 2.4 has been removed, and all information related to the ERA5 meteorological initial and boundary conditions is now included in the "Model configuration and experimental design" subsection. This subsection, previously numbered 2.6, has been moved to Section 2.1 so that the model domains, simulation setup, and all experiments, including LI2023, are introduced before they are referenced elsewhere in the manuscript.

Consequently, the figures comparing the soil erodibility datasets now appear after the description of the model configuration and study domains, providing a more logical progression of the methodology. The numbering of the remaining subsections has been updated accordingly.

2. I am also a little confused regarding the captions for figures 2, 3, 5, and 6 since it says soil erodibility for both but there are two different variables being plotted here.

Thank you for pointing this out. We have revised the captions of Figures 2, 3, 5, and 6 to clearly distinguish between the two types of maps. Specifically, we now differentiate between 3-band composite maps (Figs 2, 3, and 4), which simultaneously display the three soil-type erodibility values (sand, silt, and clay), and single-erodibility maps (Figs. 5 and 6), which show the erodibility of a single soil fraction (sand) using a monochromatic color scale.

Additionally a red and a blue box have been added to the CTRL panel of former Fig. 2 (now Fig. 3) to represent domains d02 and d03, respectively.

We believe this clarification removes the previous ambiguity and makes the figure captions easier to interpret.