

Comment on gmd-2021-198

David Topping (Editor)

Editor comment on "Downscaling of air pollutants in Europe using uEMEP_v6" by Qing Mu et al., Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2021-198-EC1>, 2021

This paper presents work around downscaling of the EMEP model. Such tools are extremely valuable for personal exposure estimates. The authors present a concise narrative of the background of the work conducted and discuss wider needs. I recommend the paper is published after the following discussion points are acted on.

Section 1, page 2 line 31 'where access to good quality emission data is available'. Can you please add more details and/or a reference? This is obviously important to understand. How is the quality and, presumably, density better in Norway? I can see this is covered in section 5.4 so please summarise and reference that section. You comment on accessibility in the proceeding sentence so is this an issue of data access?

Lines 35-40. I wonder how you could add an estimation of relative error on the downscaling predictions. Have you looked at mapping error as a function of land-use? I ask because another way to arrive at annual means is through land use regression. Can you clarify the differences?

Section 2 Methodology.

- Why focus on annual means and not seasonal differences? Presumably across most of Europe this changes significantly?
- Please can you clarify 'EMEP local fractions' – I think some of this information is provided in section 2.2 so you may wish to consider re-ordering some of the information.
- may I suggest a schematic illustrating all of the steps might help the reader?

Line 49, page 2 – '2 x 2 EMEP grids' to clarify, is this independent of the resolution of the EMEP simulations?

Table 1, page 3 – can you please clarify, are these parameters for all primary pollutants? If so, why? Please also clarify this with respect to the weight factors displayed in figure 2. It might be useful to reference section 5 at this point.

Section 5.1, line 216 'when calculating at station positions..'-'- calculating concentrations?

Figure 10 please use black font for all axes, I found the text a little hard to read.

Page 21, line 340 – 'the largest contributor to PM is residential heating'. Please clarify whether you are referring to model outcomes or compiled data across Europe. I would like to see more references to support wider known trends in measured PM properties.

Code and data availability – please can you also add links to the EMEP and IFS version used, with relevant configuration files.

Title – please change uEMEP_v6 to uEMEP v6. I would also consider adding the year, since there will be variation during periods of large scale change?