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Geoscientific Model Development Discussions
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Interactive comment on "Influence of Geographic Coordinate System on Weather Simulations of Atmospheric Emissions" *by* Yanni Cao et al.

Anonymous Referee #2

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General comments: This paper examines the impacts/errors of using varying coordinate systems on the model output. Specifically, WRF model simulations scenarios with geographic coordinate system (GCS) and role the role and importance of reprojecting GIS layers. Since significant errors could be introduced using different project systems, it would be very useful to quantify such impact. Therefore, this study is very needed and relevant to GIScience and Earth Science fields. The paper is clear and well written.

Specific comments:

Some improvements are suggested as below.

1. The development of a tool for WRF output and GIS layers is considered as one of the study goals. Therefore, the authors are encouraged to have a section/paragraph to indicate the motivation and the state-of-art works on developing GIS tools for processing,

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mapping and visualizing atmospheric model output.

2. The section Study area is numbered 1.1, and there is no 1.2, etc. Therefore, you can directly change it to section 2, or merge it to next Data section as Study area and Data.

3. The title of the current Section 4 “Instructions of using R code” is too technical. Perhaps change to something more scientific, e.g., “WRF model input and output processing”?

4. Page 9, Line 18, it would be useful to cite or provide the link for NASA tool.

5. Current Section 4.1 and 4.2 focusing on introducing the program function and associated parameters, do not contain too much useful information for the audiences. The authors could remove or condense these two sections, put detailed codes as appendix instead, and discuss the (re-)projection tool and development in more details to match your study goal.

6. The temperature difference between HR and HR_RESHIT in Figure 10 is quite interesting. It seems like the impact is more significant in the areas close to the border. At the same time, the simulation results by atmospheric modelling could also be less accurate at these areas. Is the any linkage?

7. Right now, Figure 4 about elevation ranges is difficult to interpret for general readers. Instead, a reference map (e.g., google map?) showing the major geographic features (e.g., Finger lakes) and landmarks for the domain 3 could be more helpful for us to understand the results in Figure 10, 13 etc.?

8. Is it possible to use any ground truth data (e.g., from monitoring stations or remote sensing) to compare them with the simulation results (for one more parameter(s), e.g., temperature)? Correspondingly, more meaningful conclusion can be drawn.

Typos: 1. Page 6, line 3 NOAH -> NOAA 2. Page 9, line 16, reproject MODIS -> reprojecting MODIS 3. Page 20, line 3, it is -> It is

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