

Responses to the Reviewers

We would like to express our sincere gratitude to the editor and all reviewers for their constructive and insightful comments. Their valuable suggestions have been extremely helpful in improving both the clarity and scientific quality of our manuscript. In this revision, we have carefully addressed every comment raised and provided detailed, point-by-point responses in the following sections.

In addition, during a workflow check, we identified a time misalignment in the processing of meteorological station observations used for aerodynamic roughness length estimation and model evaluation. This issue has now been corrected. After reprocessing the data, we found that the correction caused minor numerical differences in several evaluation metrics and figures, but the conclusions remain unchanged.

Our replies to reviewers' comments are highlighted in blue, and the corresponding revisions in the manuscript are marked in red. We hope that these revisions satisfactorily address all concerns and meet the expectations of the editor and reviewers.

Editor:

Line 26: “a latest gridded z_0 dataset”: change to “a latest gridded z_0 dataset from Peng et al. (2022)”

Line 196: “The cumulus parameterization scheme was exclusively activated in the d02 domain”: the d02 resolution is about 3km. Do you mean no CU schemes for D02? Or CU only applies to d01?

Response: Thank you for your suggestions. We have revised both parts accordingly. Regarding the clarification on the cumulus parameterization scheme, we apologize for the typos in the original manuscript. The scheme was activated only in the d01 domain and switched off in the d02 domain. The text has been revised accordingly to: “The cumulus parameterization scheme was activated only in the d01 domain and switched off in the d02 domain.”

Reviewer #1:

Thank you to the authors for responding to all of my comments. I appreciate all of the revisions they made and believe this manuscript to be publishable.

I noticed a couple of small typos that I assume will eventually be handled but figured to mention them here:

- line 49: spell out ECMWF.
- line 142: remove “actually”.
- Section 2.5: the overbar for some variables includes the subscript. I believe the correct notation is for the overbar to be only over the variable itself and not the subscript.

Response: We thank you for your positive feedback and for pointing out these typos.

We have implemented all the suggested corrections:

On line 49, “ECMWF” has been spelled out.

On line 142, the word “actually” has been removed.

In Section 2.5, the overbar notation has been corrected to appear only over the variable itself, not the subscript.