Geoscientific Model Development Discussions

Geosci. Model Dev. Discuss., referee comment RC3
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Comment on gmd-2022-213

Anonymous Referee #3

Referee comment on "Customized deep learning for precipitation bias correction and downscaling" by Fang Wang et al., Geosci. Model Dev. Discuss., https://doi.org/10.5194/gmd-2022-213-RC3, 2022

The paper entitled "Customized Deep Learning for Precipitation Bias Correction and Downscaling" developed a customized deep learning model for precipitation downscaling and tested the advantages of incorporating a weighted loss function, multitask learning, and accounting for physically relevant covariates. The manuscript is generally well structured and clearly presented. I have a few minor comments regarding the explanations of the training processes.

Line 88: (Chen, 2020)

Section 2.2.4 How many training steps (iterations) do you have for each scenario? It would be nice to see the learning curve for each scenario.

Line 172: Please explain why you specifically developed the weighted mean absolute error (MAE) loss function rather than using the regular MAE.

Line 211: How are these covariates chosen? I wonder if the authors have tested if all covariates are necessary for precipitation downscaling or if other covariates are necessary (for example, convective available potential energy).

Line 240: Can you show the data distribution during the training period (2002-2015) and the test period (2019-2021)? It is hard to tell if the methods have extrapolation capability

without seeing the differences in precipitation distribution. Are the increases in annual precipitations caused by a systematic increase each timestep or an increase in extreme precipitations?

Line 244: Briefly describe how QDM is applied in this study

Line 302: There is no section 3.1