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Response to reviewer # 1

**General comments:** In general, this study evaluated sub-daily and daily precipitation data from a WRF simulation over CONUS against NCEP and PRISM datasets. This paper is well-written and logically flows well. The findings and caveats in WRF simulations are comparable to earlier studies. I have one major comment and several minor comments and hope the authors can address them.

**Response:** We sincerely thank the reviewer for the positive review. We have thoroughly revised the manuscript in response to your comments. Our responses to your comments are given below. In addition, we have also included a file (Srivastava\_marked-difference) with the revised submission, indicating changes in the manuscript in blue color.

**Comment #1:** The second paragraph in Summary and Discussion is way too dense and hard to read. I would recommend the authors split it into two or even three paragraphs and reorganize it to increase readability.

**Response:** We have reduced the size of the second paragraph in the Summary and Discussion section. We have also reorganized the section in response to another reviewer's comments. Please refer to the revised Summary and Discussion section in lines 308-372 of the revised manuscript.

**Specific comments:**

**Comment #2. L65:** Please simply use the regional climate model instead of RCM since this is the only time that the abbreviation was used in this manuscript.

**Response:** “regional climate model” is used instead of RCM in line 65 of the revised manuscript.

**Comment #3. Figure 1:** can the authors please 1) highlight the domain for this study, 2) add a topography layer, and 3) add the NCA region boundaries and names to this map for better illustration purposes?

**Response:** The revised Figure 1 includes the domain, topography, and NCA region boundaries.

**Comment #4. L163:** The selection of the 0.25mm threshold seems random. Please justify it.

**Response:** We have added the following text to justify 0.25mm and 1mm thresholds used in the study. Please refer to lines 110-118 of the revised manuscript:

L110-118: In this study, we estimate precipitation metrics that characterize the frequency, total amount, intensity, and timing of the mean and extreme precipitation. The metrics are summarized in Table 1. We calculate the mean precipitation amount for 3- and 24-hr durations using all precipitation values, including zeros. We use 0.25mm and 1mm thresholds for estimating the frequency and mean precipitation during wet 3-hr and 24-hr

periods, respectively. We use these thresholds to minimize the effect of excessive drizzle being present in regional climate models and reanalyses (e.g., Frei et al., 2006; Rajczak et al., 2013), and also to account for observational constraints (Schär et al., 2016). The differences between the mean precipitation amount and the mean wet-3-hr/ wet-24-hr precipitation highlight the biases that result from excessive drizzle in the dataset. The precipitation thresholds in the study are consistent with those in previous studies (e.g., Rajczak et al., 2013; Rajczak and Schär, 2017; Xiao et al., 2018; Kooperman et al., 2022)

**Comment #5. L193-198: can the authors please explain why WRF improves less on capturing extreme precipitation values in the NGP and SGP regions?**

**Response:** Please refer to the following text in lines 233-236 of the revised manuscript.

L 233-236: A detailed investigation of biases in WRF is out of the scope of this paper, but we suspect that WRF biases in the Great Plains may be attributed to underestimated MCS frequencies (Prein et al., 2020), imperfect cumulus parameterization scheme and biases in the representation of intensity, location, and diurnal cycle of the low-level jet in 12-km WRF simulation (Lee et al., 2017).

**Comment #6. L201: Please justify the selection of 1mm and add references if any.**

**Response:** Please refer to our response to your comment #4 above.

**Comment #7. L233:** Should it be “For example, it shows wet biases during winter and spring, but a mix of wet and dry biases during summer and fall?”

**Response:** Thank you for the comment. We use the following text in lines 297-298 of the revised manuscript:

L297-298: For example, it shows wet biases during winter and spring but a mix of wet and dry biases (SGP and MW) during summer and fall.