

Dear Editor and Anonymous Reviewer

We use text **in blue** to respond to the review comments and text **in green** to show revised text. Please review our response below:

Reviewer#2

The manuscript evaluates NOAA CPC 3-month precipitation outlooks skills at 0.5-month lead for two basins in west-central Florida basins over 25 years. It then proposes two simple non-parametric methods, Proportional Tercile Sampling (PTS) and Dominant Tercile Sampling (DTS), to translate CPC tercile probabilities into basin-scale ensemble rainfall realizations using an existing stochastic rainfall simulation dataset. The results show the strongest categorical and probabilistic skill during late fall and winter, particularly for above-normal precipitation forecast and in El Niño Years. A hybrid recommendation is suggested (DTS during high-skill seasons and PTS otherwise). Overall, the study offers a coherent and potentially transferable approach, but a few edits to terminology and methodology are needed.

Below are several specific comments

1. Line 65: The basin location mentioned as ‘Southwest Florida’ conflicts with the title. Please use one term consistently.

Response: We thank the reviewer for identifying this inconsistency. The terminology has been revised in the manuscript to ensure consistency with the title.

In the revised manuscript, “Southwest Florida” in the Introduction (Line 65) was changed to “west-central Florida.”

2. The Equal Chances (EC) category is defined clearly; however, it is unclear how EC cases are handled in the categorical verification framework when building 2×2 tables (e.g., whether they are excluded or pooled into the “non-event” category). This should be clarified in the methodology.

Response: We thank the reviewer for this important comment. We agree that the treatment of Equal Chances (EC) cases in the categorical verification framework should be stated more explicitly. The methodology has been revised to clarify how EC forecasts are handled when constructing the 2×2 contingency tables for categorical verification and mentioned that EC cases were grouped into the non-event category.

In the revised manuscript, Section 2.5.1 was updated as follows: **Separate contingency tables were constructed for wet events (above-normal) and dry events (below-normal) for each basin to enable a more detailed evaluation, with Equal Chances (EC) forecasts classified as non-events.**

3. FAR is labeled as “False Alarm Rate” in the figure caption, but Equation (10) and the following text define FAR as “False Alarm Ratio.” Consistent terminology for FAR is needed throughout.

Response: We thank the reviewer for noting this inconsistency. The terminology for FAR has been revised throughout the manuscript to ensure consistency. It is now referred to consistently as False Alarm Rate in the text, equations, and figure captions.

In the revised manuscript, Section 2.5.1 was revised accordingly, and the Figure 3 caption was also updated to use “false alarm rate (FAR)” consistently.

4. Equation (15) requires correction.

Response: We thank the reviewer for identifying this error. The typo mistake in Equation (15) has been corrected in the revised manuscript.

5. Section 2.4 describes how ensemble rainfall forecasts are generated using tercile probabilities, but it is unclear how the method is applied when the CPC outlook is classified as Equal Chances. The handling of EC cases in the ensemble-generation step should be stated explicitly.

Response: We thank the reviewer for this helpful comment. We agree that the treatment of Equal Chances (EC) cases in the ensemble-generation step should be stated explicitly. Section 2.4 has been revised to clarify how EC forecasts are handled in the generation of rainfall ensembles. For EC forecasts, realizations were sampled without tercile preference to reflect climatological conditions.

In the revised manuscript, Section 2.4.2 was updated by adding the sentence: For EC forecasts, realizations were sampled equally from the below-normal, near-normal, and above-normal tercile pools for each method.

6. The manuscript references the wrong equation: it states that the “above-normal” pool is defined by Equation (6), but Equation (6) defines the below-normal (BN) category. Please correct this citation.

Response: We thank the reviewer for identifying this incorrect equation reference. The citation has been corrected in the revised manuscript so that the above-normal pool now refers to the appropriate equation.

In the revised manuscript, Section 2.4.1 now states: “...50% of the ensemble members are randomly drawn from the pool defined by Equation (8), 30% from Equation (7), and 20% from Equation (6).”

7. Please correct the panel label in the Figure 5 caption: the Alafia River Basin panel should be labeled “(a)” (not “(b)”).

Response: We thank the reviewer for noting this labeling error. The Figure 5 caption has been corrected in the revised manuscript.

In the revised manuscript, the Figure 5 caption still reads: “...in the Alafia River Basin (a) and Hillsborough River Basin (b).”

8. In the section on performance of sampling schemes, qualitative comparisons should be complemented (or replaced) with quantitative improvements (e.g., the decrease in RMSE of one sampling method relative to another).

Response: We thank the reviewer for this suggestion. We agree that quantitative comparisons provide a clearer basis for evaluating the relative performance of the sampling schemes. In response, we revised the corresponding section to include more explicit quantitative comparisons between PTS and DTS, including relative improvement in RMSE and correlation.

In the revised manuscript, Section 3.3 was expanded to include the following interpretation: Across both sub-basins, a consistent performance pattern emerged for RMSE and correlation. When all seasons were included, the PTS approach produced only modest improvements, typically reducing RMSE by approximately 3–4% relative to climatology, whereas DTS performed worse than both comparison methods. This finding suggests that PTS provides a relatively stable advantage under mixed-skill conditions. In contrast, when the analysis was restricted to skillful seasons ($RPSS > 0$), DTS became clearly superior. Under these conditions, DTS reduced RMSE by approximately 12% relative to PTS and by 17–18% relative to climatology, while PTS still outperformed climatology by about 7%. Correlation

patterns were consistent with these results, with DTS yielding the highest correlation coefficients during skillful seasons, followed by PTS and climatology.

9. The typo in the data availability statement (“sis”) should be corrected.

Response: We thank the reviewer for identifying this typographical error. The typo in the data availability statement has been corrected in the revised manuscript.