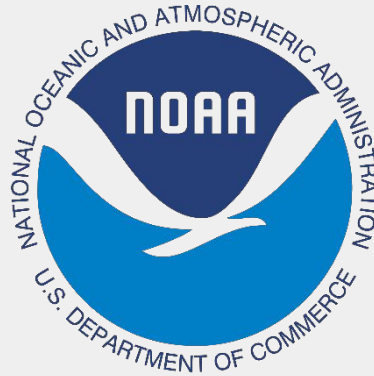# Evaluation of operational CFSv2 ensemble seasonal forecasts and comparison with CWRF downscaling predictions for spring season over the United States

9th NOAA ensemble users workshop

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❖ CFSv2 operational seasonal predictions are downscaled using CWRF for spring (March-April-May or MAM) season.

❖ CWRF consist of 10 (5 different cumulus and radiation schemes x 2 initial conditions) ensemble members whereas CFSv2 has two forecast initializations.

❖ The forecasts start from 00Z of every 1st day of a month.

❖ Simulation Period: 2013-2022.

❖ GridMet observations are used for evaluation.

❖ Selected variables: daily AT2M (2m mean temperature), TMAX (2m maximum temperature), TMIN (2m minimum temperature), and PRAVG (daily mean precipitation)

❖ The skill of the predicted results are assessed using mean bias, inter annual anomaly correlation (ACC), root mean square error (RMSE), and equitable threat score (ETS).
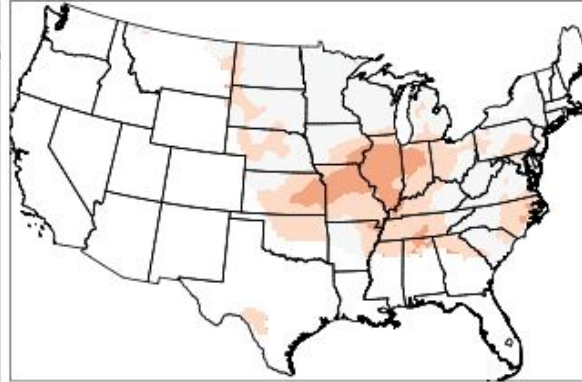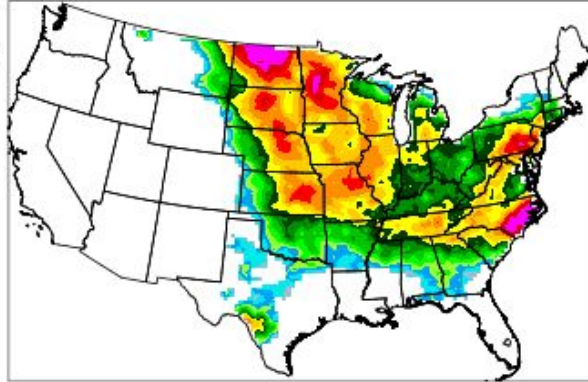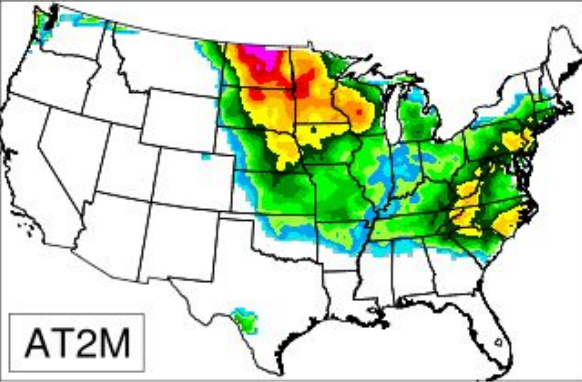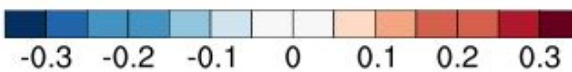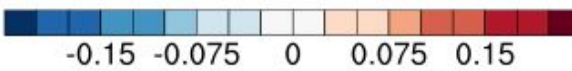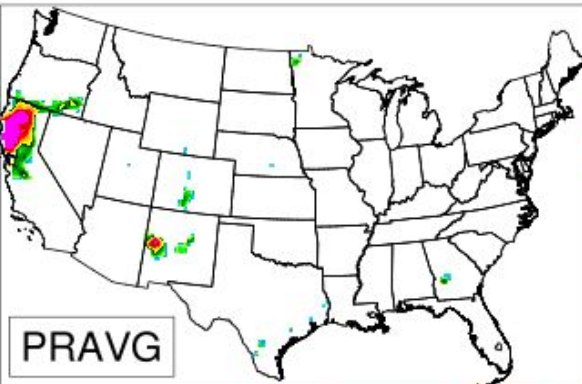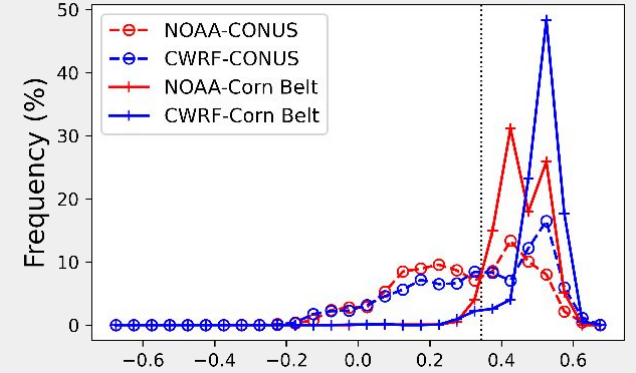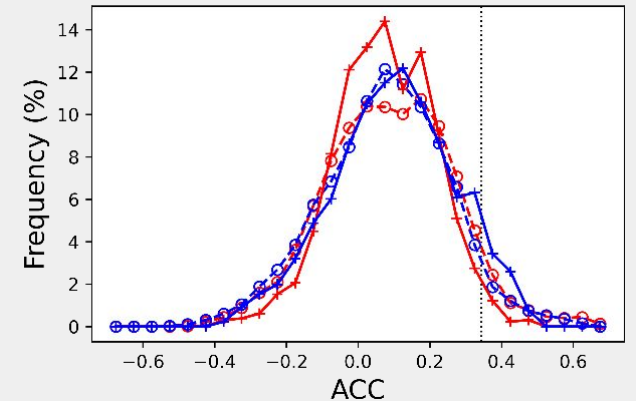
- Only correlation above 95% confidence level is shown.
- Substantial improvement in Mean temperature correlation.
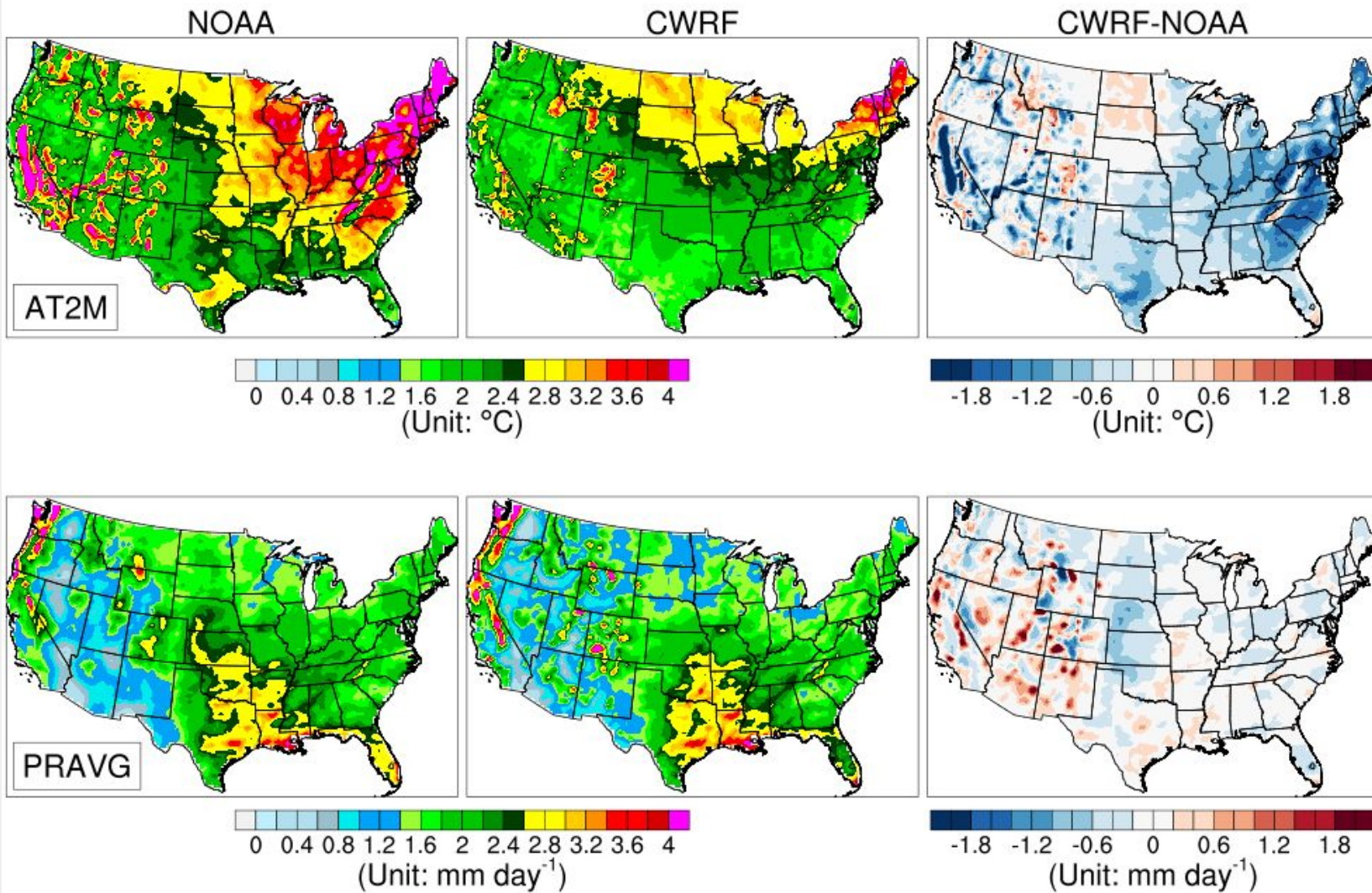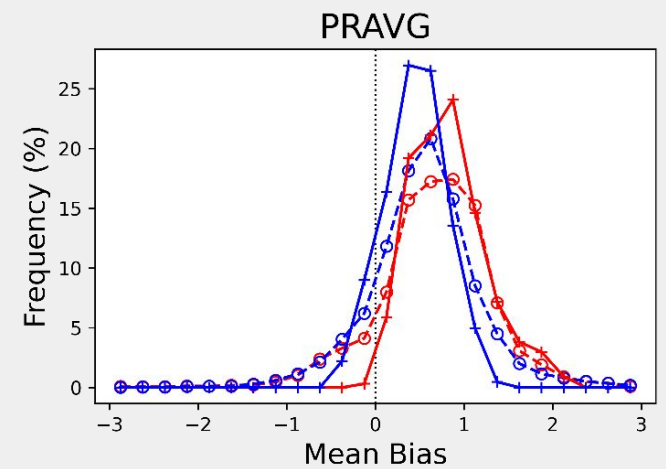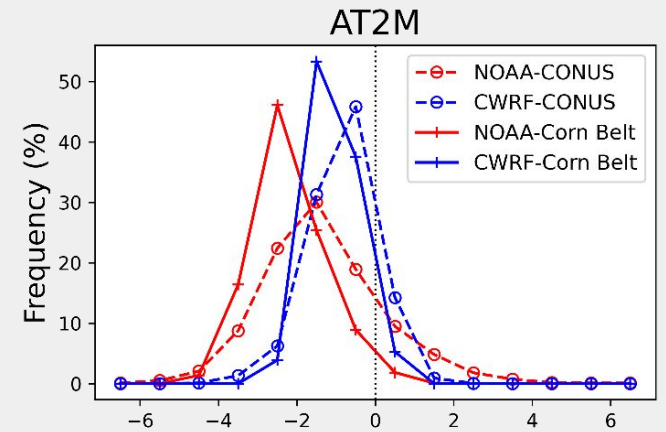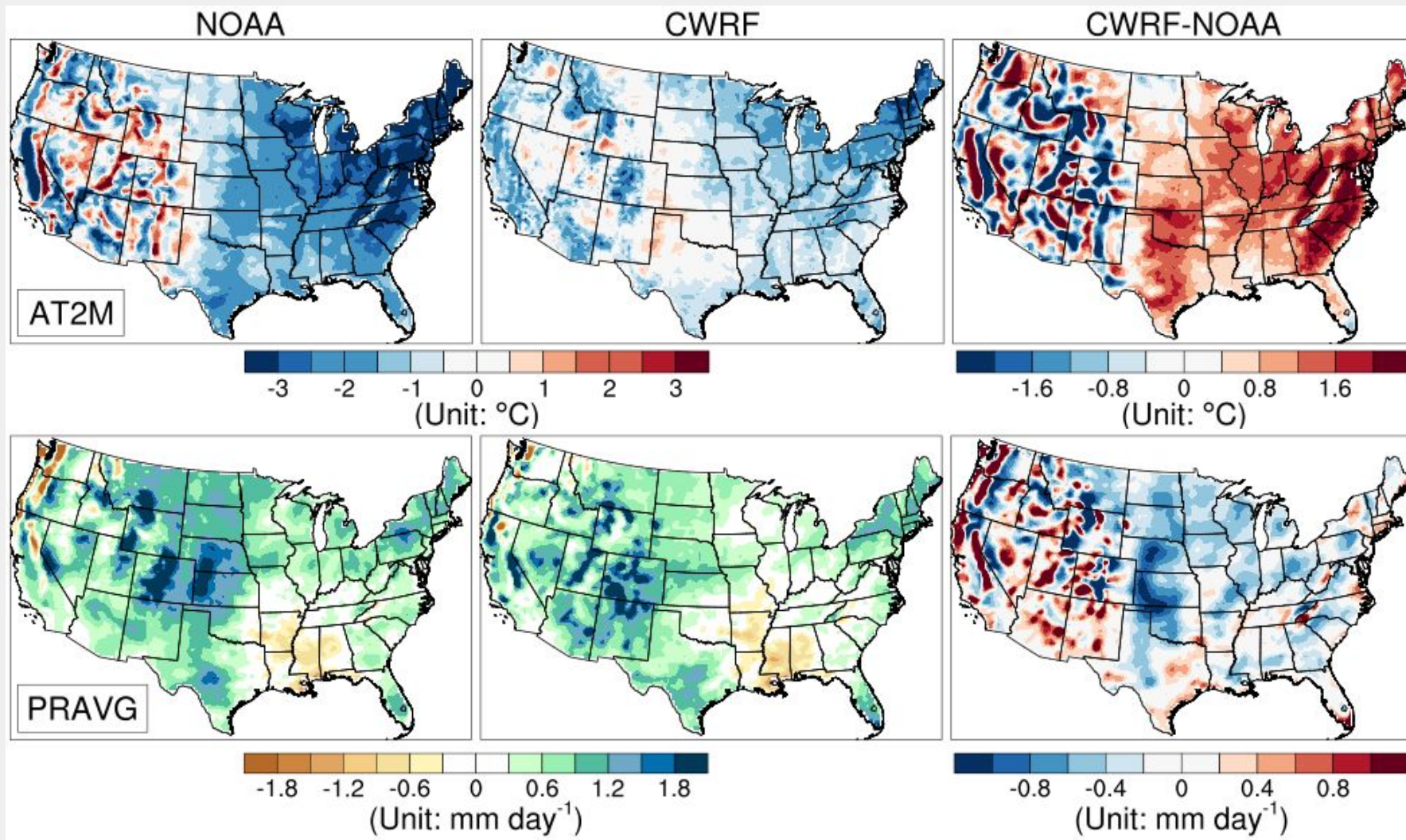
Root Mean Square Error
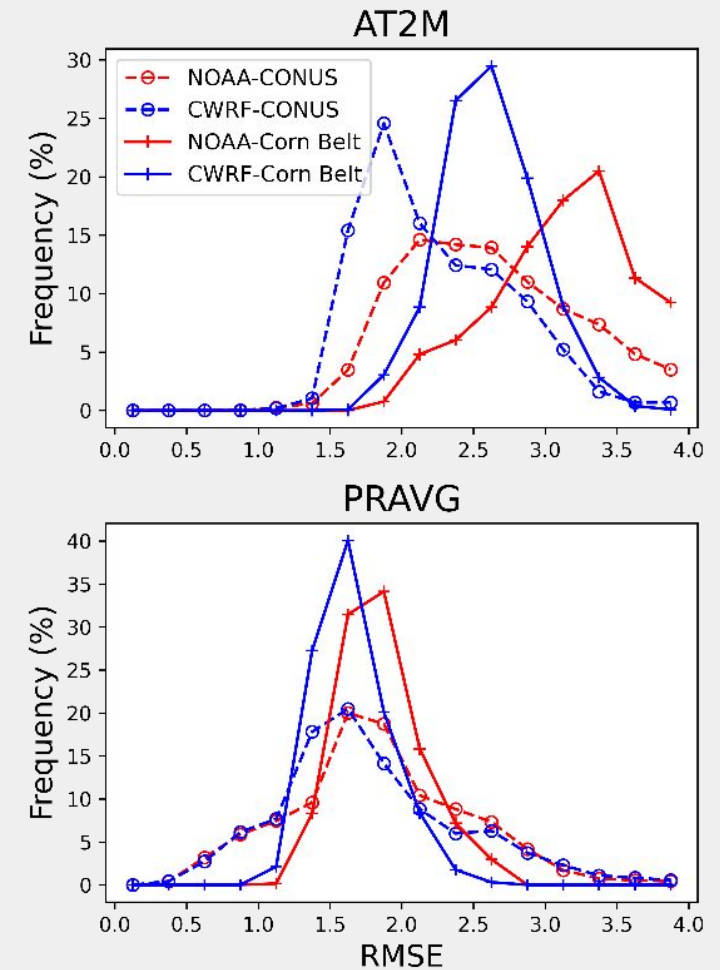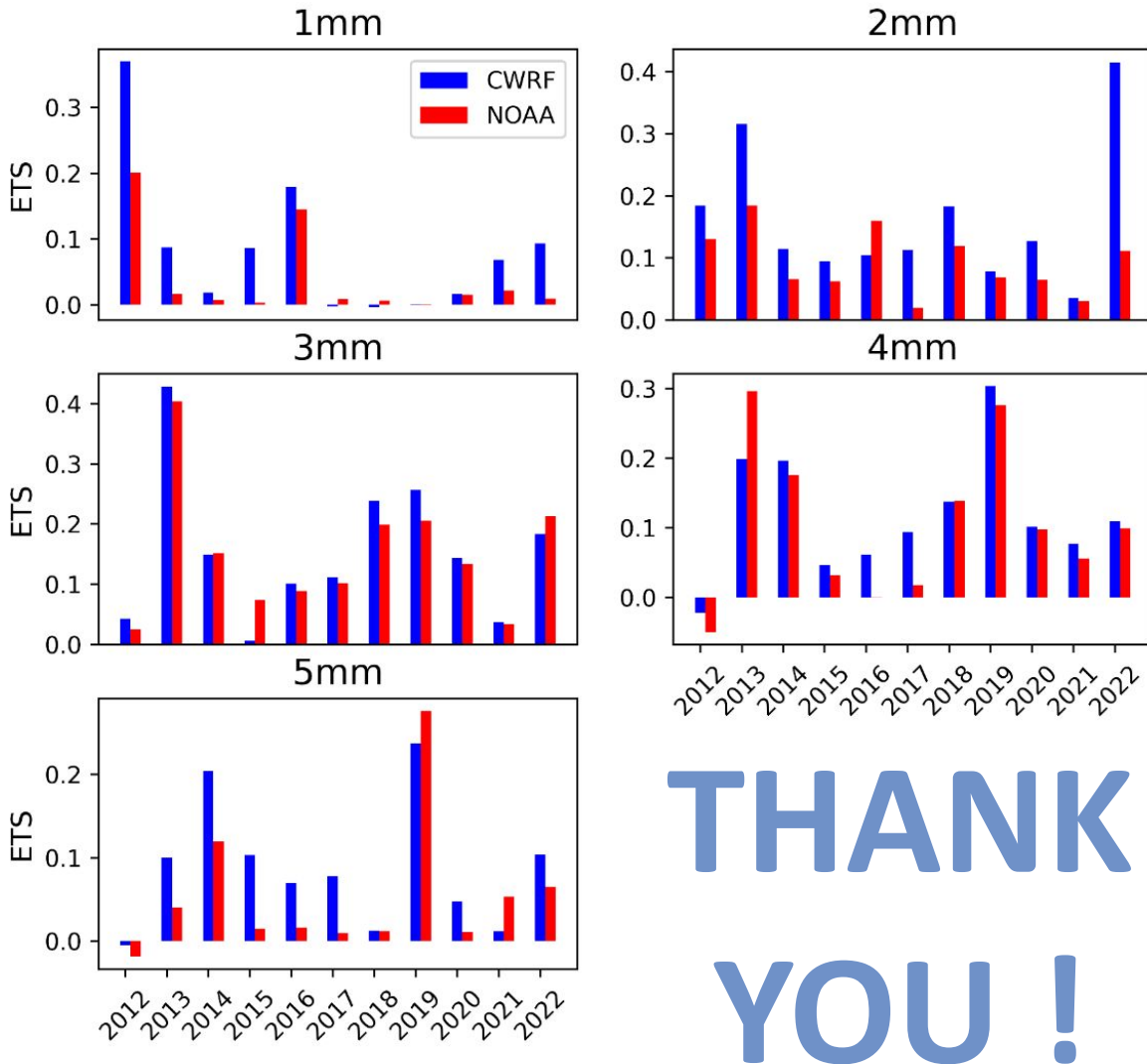

- CWRF drastically reduces the RMSE of CFSv2 especially in the eastern US.

- CWRF reduces these cold and wet biases, although notable regional biases persist.

CWRF has better ETS than CFSv2 except for one year.

Conclusion:

✔ The CFSv2 operational forecasts are downscaled using CWRF for Spring seasonal predictions for 2012-2022.

✔ The ensemble mean was prepared using the best performing individual members.

✔ For spring, CWRF showed better performance than CFSv2 in all statistical metrics except for precipitation especially over corn belt.

✔ CWRF climate predictions will be used to drives standalone and coupled crop models for crop growth forecasts.

✔ We are working on designing better ensemble methods, more physics, and bias corrections method to further improved the predictions.

THANK YOU !