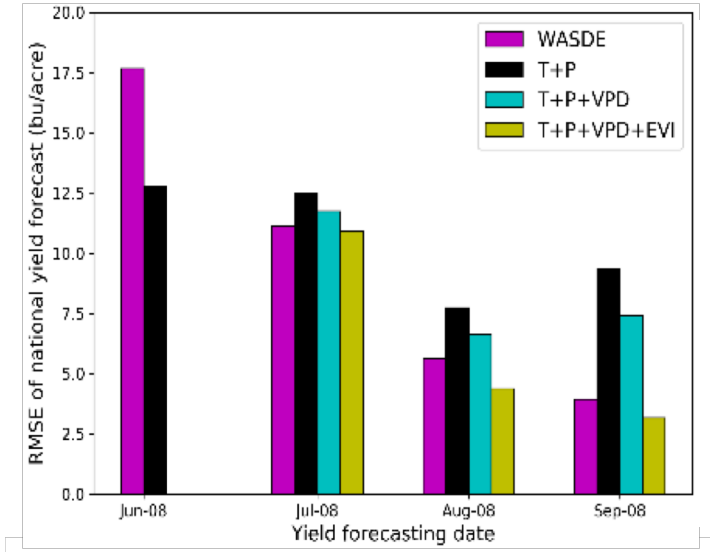
Benefits of seasonal climate prediction and satellite data for forecasting US maize yield

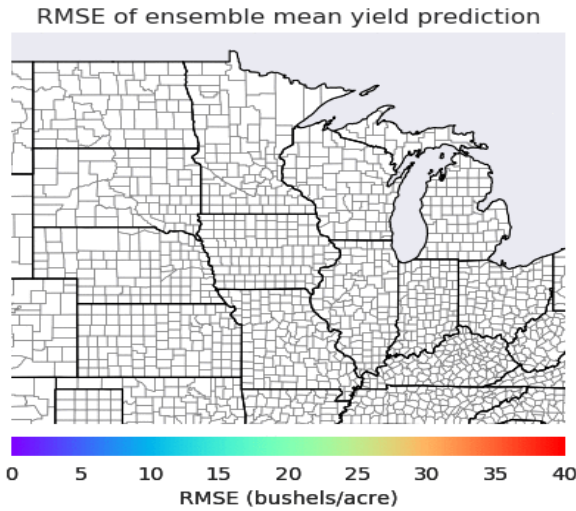
Bin Peng & Kaiyu Guan et al., 2018. Geophysical Research Letters (doi: 10.1029/2018GL079291)

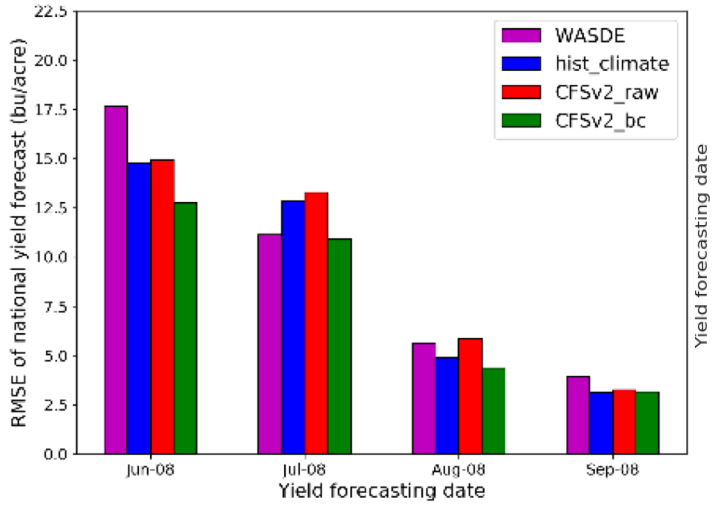
Backgroud: Seasonal agricultural production forecasting is essential for agricultural supply chain and economic prediction. However, to what extent seasonal climate prediction and remote sensing observations can improve crop yield forecasting at regional scale remains unknown. Rigorous benchmarking of various configurations in crop yield forecasting systems is also lacking.

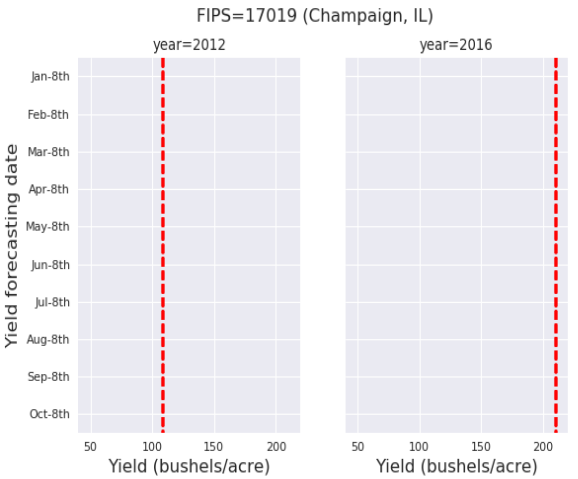
Approach: In this work, we presented a newly developed seasonal yield forecasting system for U.S. maize by bridging a statistical crop yield model, seasonal climate prediction from NOAA CFSv2, and satellite data from MODIS. The yield forecasting was achieved at county-level and then aggregated to national level and benchmarked with USDA survey-based WASDE forecast.

Major findings: (1) We can beat USDA WASDE forecast only when we incorporated satellite data; (2) The bias-corrected climate prediction from the CFSv2 showed better yield forecasting performance than the historical climate ensemble.









Sponsor: NASA New Investigator Award (NNX16AI56G), NASA Carbon Monitoring System (80NSSC18K0170)

Media: U. of I., phys.org, Eurek/AAAS, ScienceDaily.