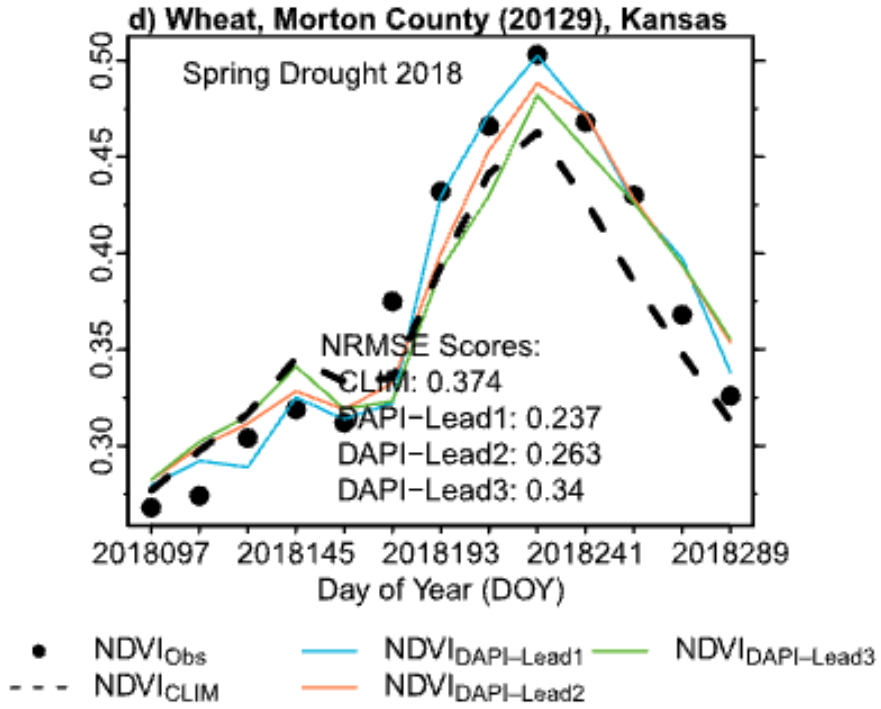
On the Use of SMAP Soil Moisture for Forecasting NDVI Over CONUS Cropland Regions

Problem: Soil Moisture conditions can impact vegetation health and crop productivity. Monitoring the dynamics of vegetation health during the growing season informs decision-makers about potential yield productivity.



Finding:

- Develop a satellite-based soil moisture Dynamic Agricultural Productivity Indicator (DAPI).
- SMAP-based root zone soil moisture is a useful predictor for improving NDVI-based crop forecasting
- Compared to climatology-based NDVI forecasts, the largest improvements are found in water-limited regions.

Impact: Our data driven DAPI approach is useful for estimating future vegetation health conditions, identifying potential food-insecure areas, predicting crop price changes, and projecting expected commodities market trends.

Le, M.-H., Bolten, J. D., Whitney, K. M., Johnson, D. M., Mueller, R., & Mladenova, I. E. (2024). On the use of SMAP soil moisture for forecasting NDVI over CONUS cropland regions. *Geophysical Research Letters*, 51, e2024GL111187. https://doi.org/10.1029/2024GL111187