

# Surface observational data requirements from high-resolution modeling perspectives

*Qi Tang, Shaocheng Xie, and Yunyan Zhang*

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## Acknowledgments

DOE ARM program and E3SM program



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# Warm season LAC at SGP: ARM observations

Tang et al., 2018

Journal of Geophysical Research: Atmospheres

2014

RESEARCH ARTICLE

## Land-atmosphere coupling manifested in warm-season observations on the U.S. southern great plains

10.1002/2013JD020492

**Key Points:**

- Statistically significant SGP land-atmosphere interactions occur
- Atmospheric forcings predominate

Thomas J. Phillips<sup>1</sup> and Stephen A. Klein<sup>1</sup>

Geophysical Research Letters

RESEARCH LETTER

10.1002/2015GL066305

## Vegetation controls on surface heat flux partitioning, and land-atmosphere coupling

**Key Points:**

- Evaporative fraction is often better

Ian N. Williams<sup>1</sup> and Margaret S. Torn<sup>1</sup>

Journal of Geophysical Research: Atmospheres

2017

RESEARCH ARTICLE

10.1002/2017JD026740

**Key Points:**

- Wheat and its harvest timing impact regional surface energy partitioning and land-atmosphere coupling in the Southern Great Plains
- Leaf area has the greatest influence on evaporative fraction at sites in the U.S.

## The influence of land cover on surface energy partitioning and evaporative fraction regimes in the U.S. Southern Great Plains

Justin E. Bagley<sup>1</sup> , Lara M. Kueppers<sup>1,2</sup> , Dave P. Billesbach<sup>3</sup> , Ian N. Williams<sup>1</sup> , Sébastien C. Biraud<sup>1</sup> , and Margaret S. Torn<sup>1,2</sup> 

Journal of Geophysical Research: Atmospheres

2018

RESEARCH ARTICLE

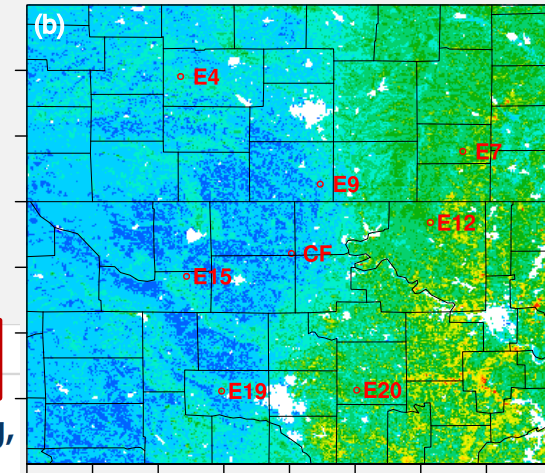
10.1029/2018JD028463

**Key Points:**

- Observations show moderate to weak terrestrial segment L A coupling

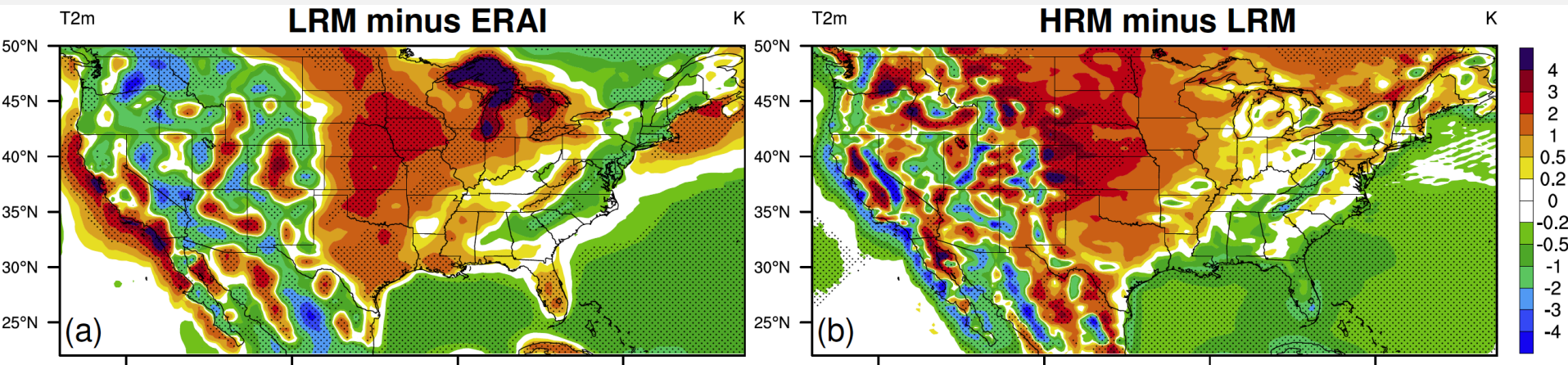
## Heterogeneity in Warm-Season Land-Atmosphere Coupling Over the U.S. Southern Great Plains

Qi Tang<sup>1</sup> , Shaocheng Xie<sup>1</sup> , Yunyan Zhang<sup>1</sup>, Thomas J. Phillips<sup>1</sup> , Joseph A. Santanello<sup>2</sup> , David R. Cook<sup>3</sup> , Laura D. Riihimaki<sup>4</sup> , and Krista L. Gaustad<sup>4</sup> 

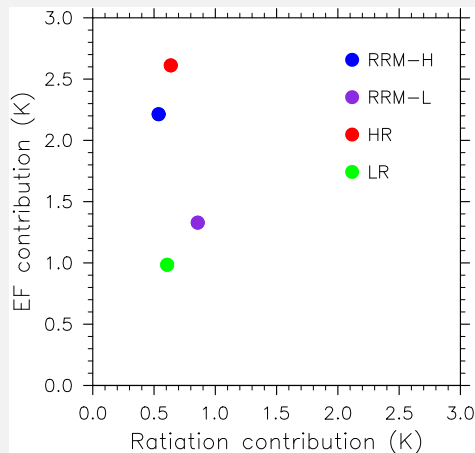


# Remaining high-res model biases related to LAC

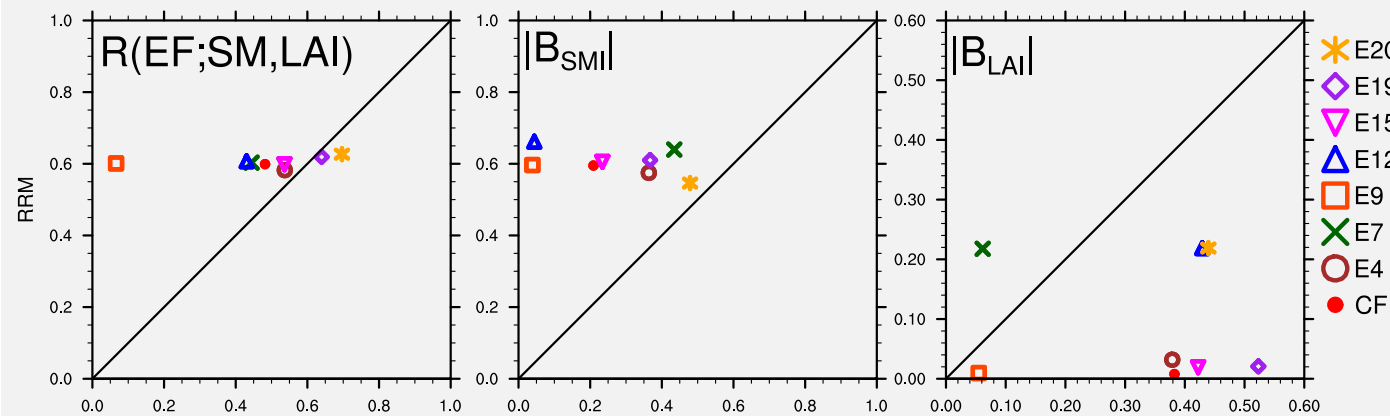
Tang et al., 2019



## DOE E3SM V1



## DOE E3SM V1 nudged RRM



# What surf. obs data are needed for high-res model?

- Long-term, co-located measurements.
- High-res LAI data
- ...