

Interactive comment on “Exploring seasonal and regional relationships between the Evaporative Stress Index and surface weather and soil moisture anomalies across the United States” by J. A. Otkin et al.

Anonymous Referee #2

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The manuscript presents a straightforward, correlation-based analysis of the linear relationship between the Evaporative Stress Index and a variety of land and atmosphere variables. The methods are simple and robust, and the results and conclusions of the paper are relevant and impactful, particularly for the drought monitoring/forecasting community. I have a few questions and issues with the manuscript in its current form, but I recommend accepting the paper for publication once these issues are addressed.

Specific Comments: 1) The main issue I have with the study is the use of CFSR without ample justification. Because the atmospheric variables are a key part of

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the study, more details are needed for CFSR. Which of the variables used are observations that are assimilated into CFSR and which are modeled. Did you perform any kind of data verification or comparison with actual observations to ensure data fidelity? NCAR's CFSR data page (<https://climatedataguide.ucar.edu/climate-data/climate-forecast-system-reanalysis-cfsr>) actually lists "performance not well-known" as a key limitation of CFSR. This is in contrast to well-validated reanalysis datasets like ERA-Interim and NARR, or observation-based products like PRISM and the GHCN gridded products. Therefore, I recommend the authors either undertake a limited CFSR data validation with observations of TEMP, WSPD, etc., or repeat the correlation analyses using a dataset independent of CFSR, to ensure the results presented here are robust.

- 2) I'm left a little confused by the correlation method description. How many individual (e.g.,) ESI-SPI or ESI-WSPD points were included in the correlation for each month/year? For example, were there 4 pairs of ESI-SPI data points for May, 2008 or just 1 pair of points for May, 2008?
- 3) The correlation maps/figures have no indication of statistical significance. Could you perhaps show any area in which the correlation was not significant at (e.g.,) 90% or 95% confidence level as white instead of red or blue? Or maybe contour around areas in which the correlations are significant at some predetermined confidence level?

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