ECAS 2020

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Conference Proceedings Paper

The Interannual and Interdecadal Variability of Soil Moisture and Recent Tornado Activity (F2 or greater) in the Central USA

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Received: 12 November 2020; Accepted: date; Published: date

Abstract: Previous studies have demonstrated that El Nino and Southern Oscillation (ENSO) have a distinct impact on the occurrence of severe weather and the attendant environment in the eastern two thirds of the USA. Typically, La Nina years have been shown to be more active in the central USA. Here, a previous study of tornado activity in Missouri from 1948 – 1999, as well as the neighboring states of Iowa, Nebraska, and Kansas, is updated to included the most recent two decades. The datasets used in this study were the National Centers for Environmental Prediction / National Center for Atmospheric Research (NCEP / NCAR) re-analyses and the National Oceanic and Atmospheric Administration (NOAA) Storm Prediction Center (SPC) event archive were used. The results demonstrated that recently tornado activity in this region was higher than that of the late 20th century suggesting interdecadal variability in the time series. The interannual variability for the latest two decades is similar to that of the last half of the 20th century. Finally, these results will show that there is a correlation between the in-season soil moisture and tornado activity, but it is not clear whether the correlation was a lead or lag.

Keywords: Interannual variability; interdecadal variability; ENSO; tornadoes; soil moisture.