Public Abstract

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Title:AN INDEX FOR ANTICIPATING EXCESSIVE PRECIPITATION WITH ELEVATED THUNDERSTORMS

Previous work during the Program for Research on Elevated Convection with Intense Precipitation (PRECIP) highlighted certain composite meteorological fields, which featured significant mean values with minimal spread (as quantified by low interquartile ranges). The key variables in question are the precipitable water (PWAT), the K Index (KINX), and the 250-mb divergence (DIVG), all widely-known and accepted metrics or proxies for assessing moisture, instability, and lifting, respectively. The statistical origin of the composite means and ranges has allowed us to construct an empirical index to anticipate heavy rainfall during other similar elevated thunderstorm events. Dubbed the Excessive Precipitation with Elevated Convection (EPEC) Index, it is easy to compute. The simplest of its forms is [EPEC = PWAT + KINX + DIVG], with PWAT expressed in mm, KINX using degrees C, and DIVG being the value preceding (x 10**-5 s**-1). Preliminary testing in our daily forecasting practice shows that EPEC values have some skill in identifying regions where heavy rainfall from elevated convection may occur, especially for time ranges of 12-36 hours. Patterns in EPEC tend to be along, and sometimes displaced to the south of the actual, observed, precipitation swath. Statistical testing of EPEC’s usefulness showed that there is a positive linear relationship between the EPEC index and the 6-hour Stage IV precipitation data. This research is to help forecasters identify areas of heavy rainfall associated with elevated convection.