# Assessment of CFSv2 forecasts of parameters associated with U.S. monthly tornado activity

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The analysis of observations in the vicinity of severe thunderstorms and tornadoes has led to empirical associations between the likelihood of tornado occurrence and local synoptic environmental variables such as convective available potential energy and vertical shear. These relations provide guidance in the production of probabilistic convective outlooks. We have recently used relations between monthly averaged environmental parameters from the North American Regional Reanalysis (NARR) and monthly tornado activity from the NCDC Storm Event database to construct an empirical “tornado index.” The index is a function of atmospheric parameters and is designed to represent the expected monthly tornado activity conditional on the monthly averaged local environment. The index represents climatological features such as the spatial distribution and annual cycle of tornado occurrence as well as some aspects of interannual tornado activity variability. Here we assess the ability of the CFSv2 to forecast the index and the parameters that appear in it. We use NARR and Climate Forecast System Reanalysis data to examine systematic and conditional biases in zero-lead forecasts of the index and of its constituent parameters. We evaluate the skill of continental and regional scale tornado activity forecasts and examine the factors that affect skill.