Is Tornado Alley Migrating?

Team Tornado Alleycats

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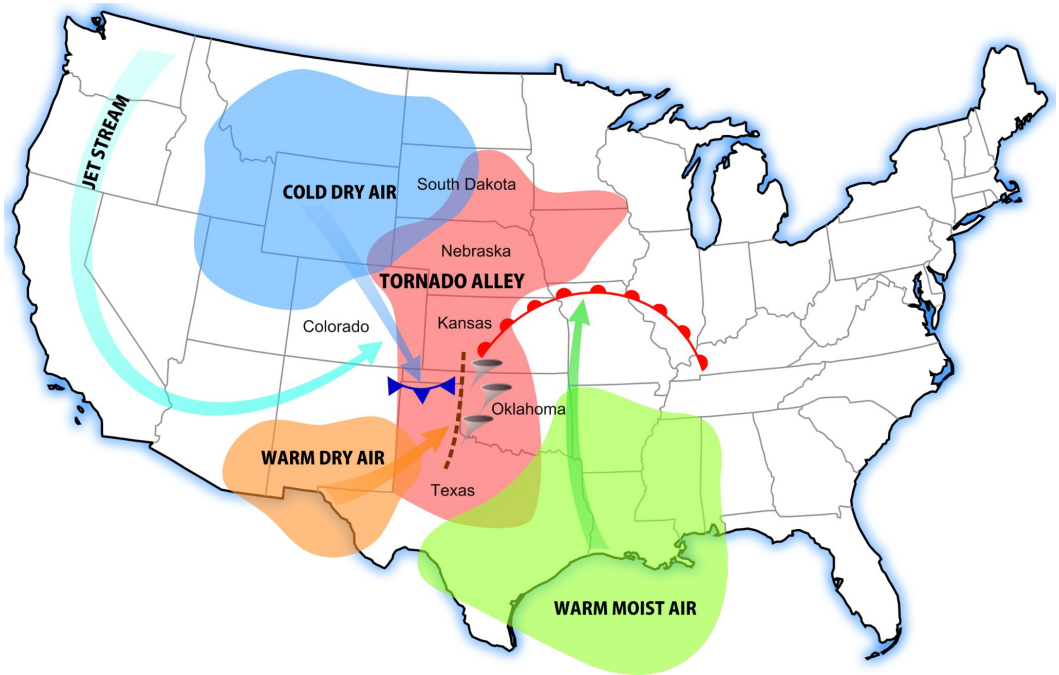
Background



Area in the Midwest with the highest share of Tornadoes on Earth

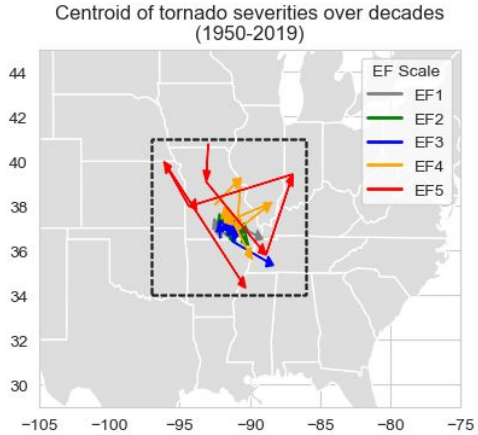
Fed by the US' unique geography and collision of several powerful weather systems

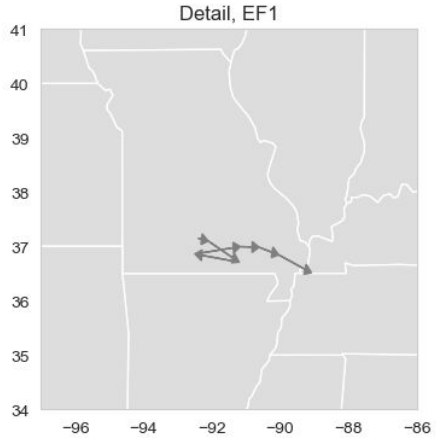
Historically over central US, but has it shifted?

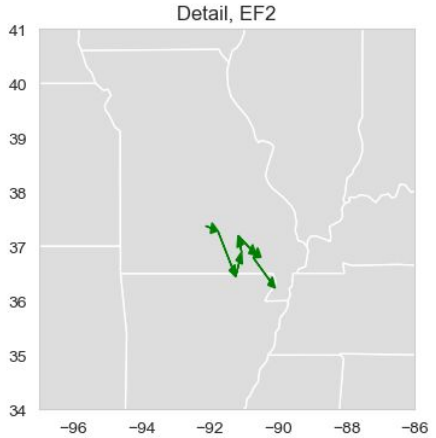
YES

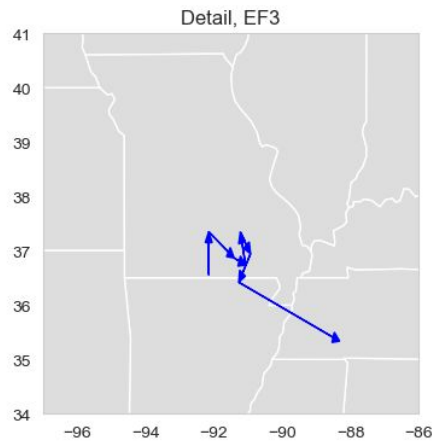
But in a very interesting way

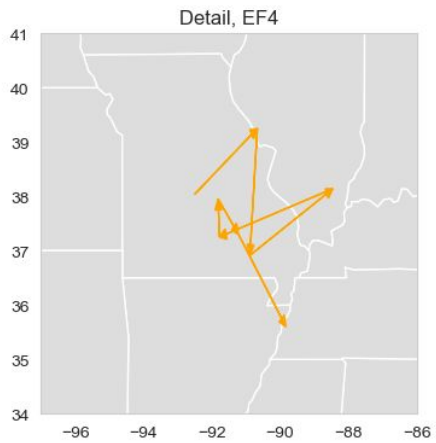
The migration of Tornado Alley: ESE

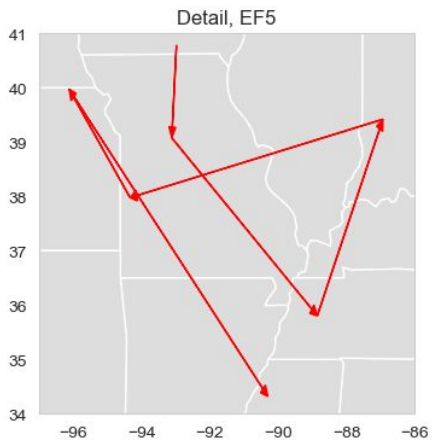




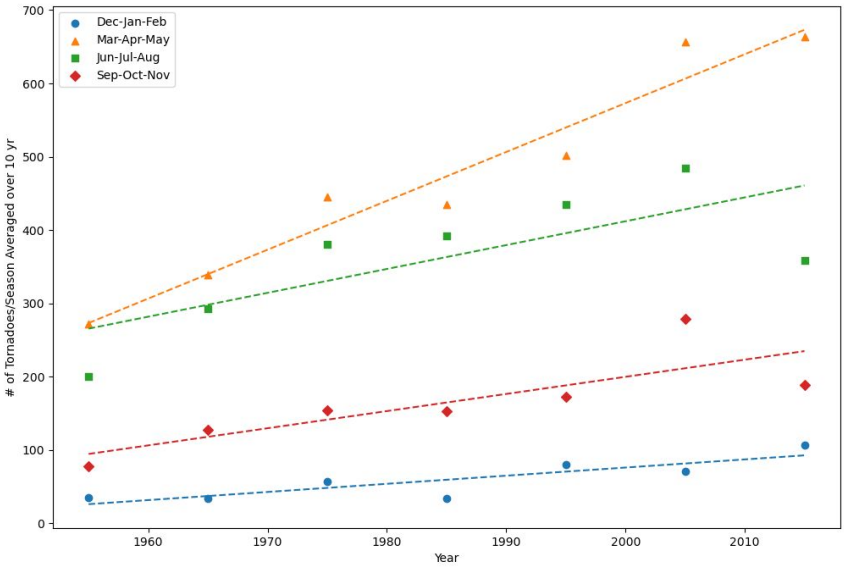


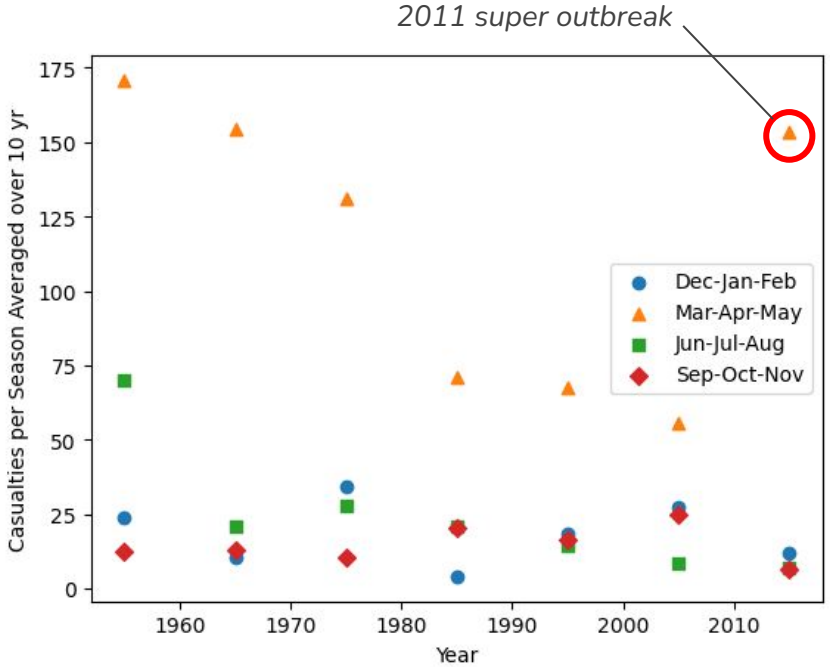






The changing nature of Tornado Alley



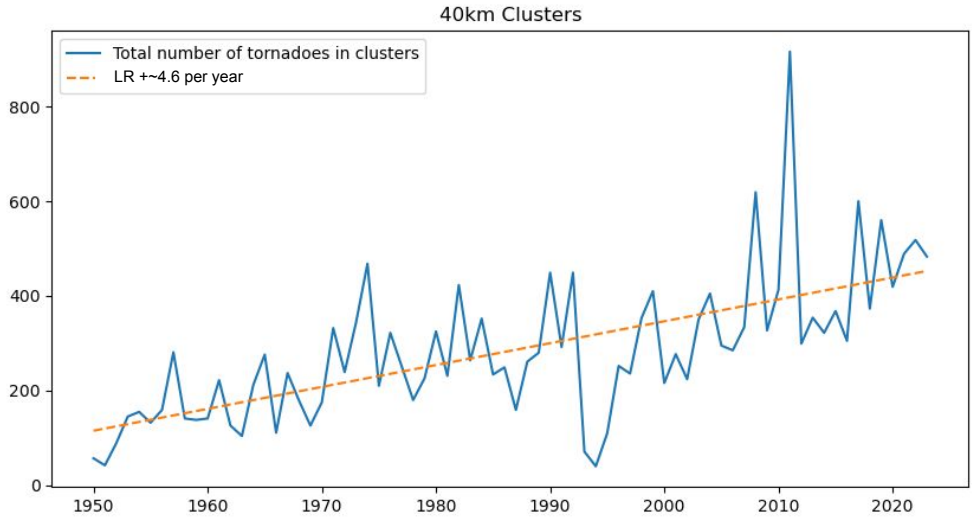


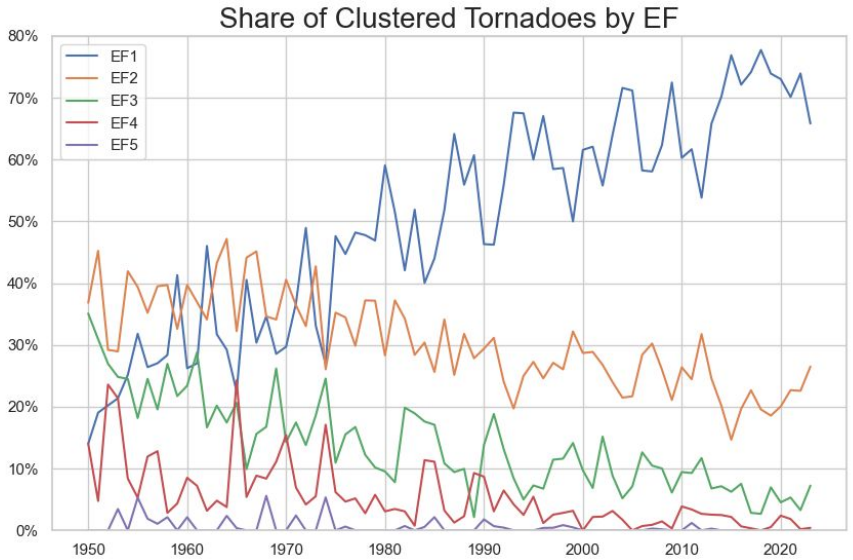
The Spring Season (Mar-May) is strengthening faster than other seasons, and tornado counts are increasing, but casualties are dropping

Our hypothesis:

Tornado Alley is shifting, and producing more tornadoes, but something is forcing them to “shatter” into weaker “clusters”

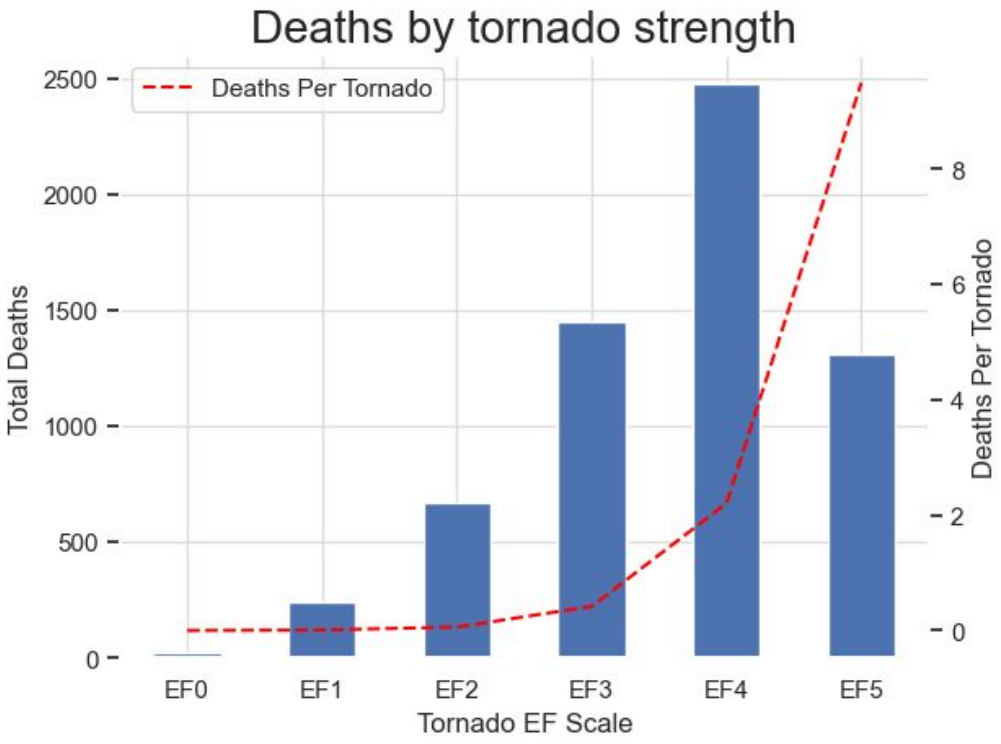
Tornado Alley Clustering

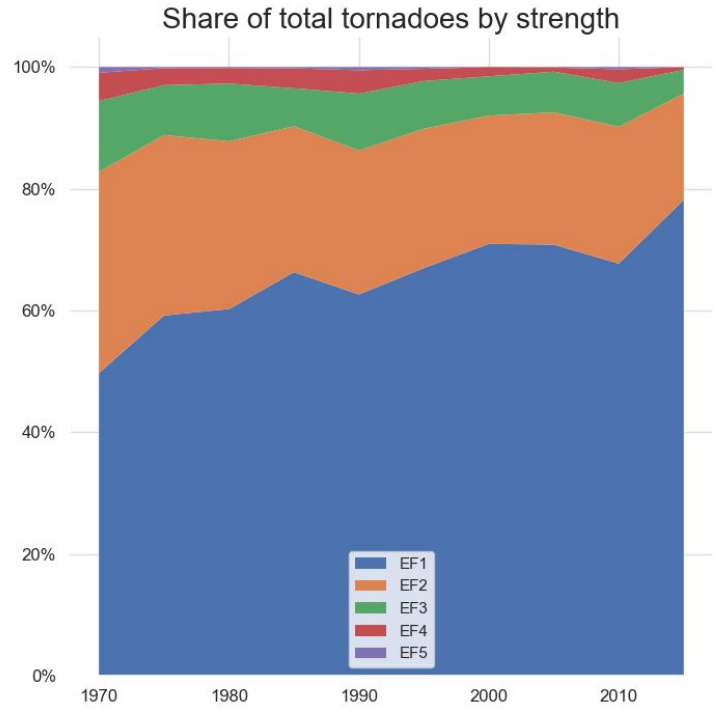




*40km buffer derived from "**AN ANALYSIS OF CLUSTERED TORNADO EVENTS**", Andrew Dean*

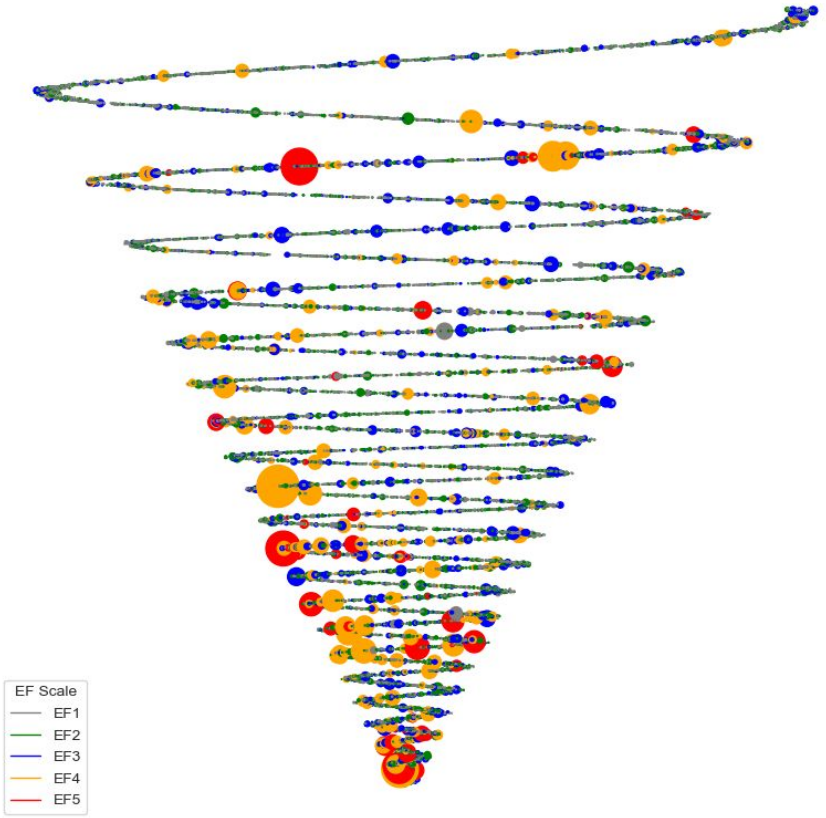
Tornado Alley's "shatter and cluster" effects





Summary

- Tornado Alley is moving ESE at roughly 6.7km / 4.2 miles per year
- Producing more tornadoes
- These tornadoes are both more clustered and weaker than non-clustered tornadoes
- This hypothetical “shattering” of the energy that builds tornadoes would lower casualties and damage exponentially
- Tornadoes are still extremely dangerous!



Visualization of every tornado since 1950. Size is casualties, color is severity, higher dots are more recent events. Included for illustrative purposes only.

APPENDIX

Sources

Storms and Tornadoes:
https://www.ncei.noaa.gov/pub/data/swdi/stormevents/csvfiles/
We have written a custom script to scrape the data from this NOAA source and compile the last 70 or so years of storm data into one master file.

Census:
https://www.census.gov/
We will be using the US Census data to map population densities of affected areas

FEMA National Risk profile:
https://www.fema.gov/sites/default/files/documents/fema_national-risk-index_technical-documentation.pdf
This document captures FEMA's research and classification of risks to life and property as well as county preparedness due to extreme weather events

An Analysis Of Clustered Tornado Events:
https://www.spc.noaa.gov/publications/dean/tcluster.pdf
We leverage Andrew Dean's prior research on tornado clustering