Toward Quantifying the Overlap Between Severe Weather & Hurricane Season in the Southeast United States

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Introduction

- Severe convective storms are most common in the Southeast United States from mid-Winter into early Spring. [1]
- Meanwhile, tropical storms & hurricanes are most common from late Spring to mid-Fall. [2]
- However, there appears to be an **increasing overlap** between these seasons in the mid-to-late Spring due to a trend for earlier starting hurricane seasons. [3] [4]
- The **potential** increasing overlap between these seasons may hinder peoples' ability to adequately prepare for hurricanes, severe weather, and their associated hazards.
- This study uses severe weather & tropical cyclone occurrences to attempt to quantify the potential overlap in severe weather & hurricane season across the Southeast United States.

Data and Methods

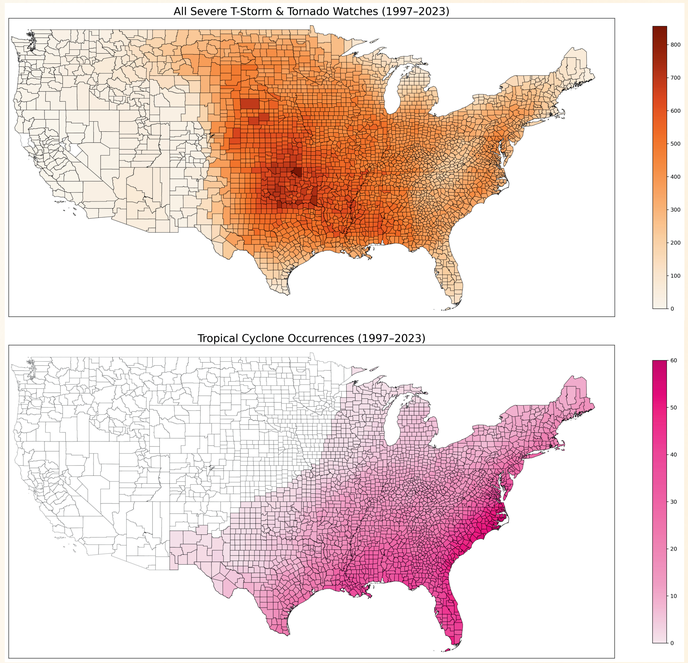
- **Severe weather data:** Storm Prediction Center (SPC) severe thunderstorm & tornado watch data sourced from the Iowa State Mesonet (1997-2023).
- **Hurricane data:** National Hurricane Center best track data sourced from the International Best Track Archive for Climate Stewardship (IBTrACS; 1997-2023). [5] [6]
  - A 2° buffer is applied to these tracks to encompass the typical extent of the most severe tropical cyclone hazards.
- **Methods:** Hazard occurrence data are interpolated by county & parsed by month and type (severe weather vs. tornado; tropical storm vs. hurricane).

Future Work

- Using these results to expand on previous studies in the atmospheric sciences by adding a psychological & sociological explanation to the physical sciences
- We are interested in understanding how people in the Southeast United States can prepare for hurricane season while recovering from severe weather threats.

Preliminary Results

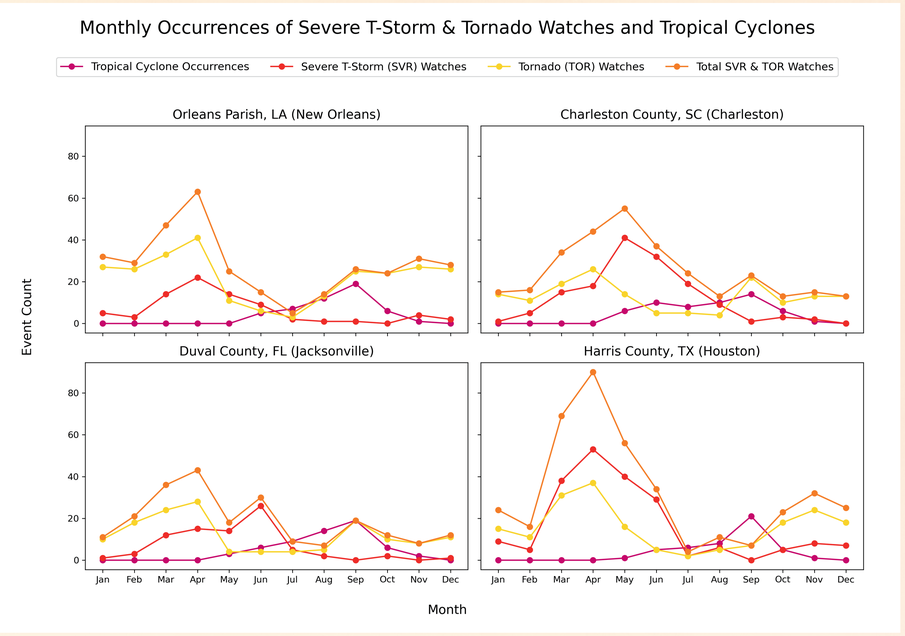
All Severe Watches vs. All Tropical Cyclones



The total peak severe weather watches in the United States is approximately 14x greater than the peak tropical cyclone occurrences.

- The South-central United States has seen the most severe weather watches.
- A peak in severe weather watches in the Carolinas correlates to a peak in tropical cyclone occurrences in the same region.

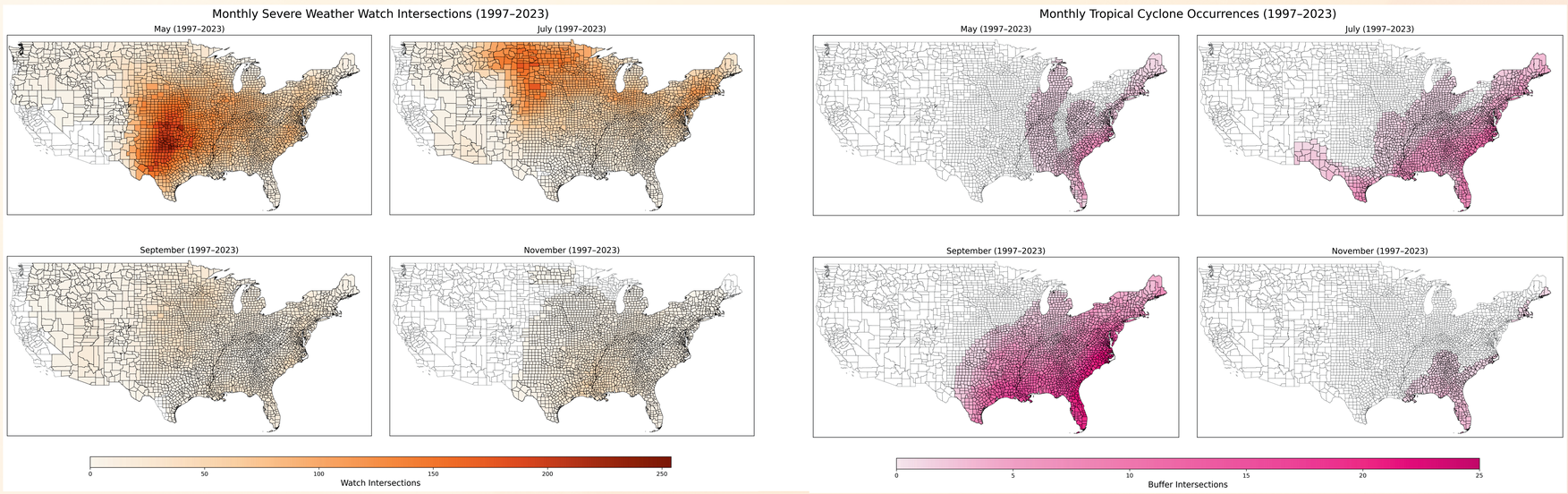
Severe Weather & Tropical Cyclone Events by Month & Type



An observed secondary peak in tornado season in & near North Atlantic coastal counties corresponds with the peak of tropical cyclone season. [7] [8]

- Peak tornado season trends to occur earlier than peak severe thunderstorm season across the Southeast United States.
- The peak in total severe weather watches occurs one month later in Charleston County, SC than in the other counties pictured.

Monthly Climatologies of Severe Watches & Hurricane Intersections



Severe weather & hurricane seasons shift and expand regionally, impacting different portions of the United States seasonally.

- Severe weather season shifts from the south to the north throughout the Summer.
- As tropical cyclone & hurricane season peaks in September, the impacts expand from the Atlantic & Gulf coasts to the west.

References

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