Mapping Tornado Risk: The Scientization of Tornado Alley and Dixie Alley

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INTRODUCTION

Tornado Alley and Dixie Alley are concepts coined by members of the meteorological community: Tornado Alley by Fawbush & Miller in 1952 and Dixie Alley by Dr. Allen Pearson in 1971. (Fig. 2 & 3)

➤ No universal definition of either concept exists; they shift, expand, and shrink with different publications, authors, and purposes. They are sociopolitical rather than scientific concepts. (Fig. 1 & 6)

➤ **Scientization** transforms sociopolitical concepts, ideas, and other phenomena into metrics that can be standardized and measured.

   Ex: Boundaries of a country are not scientific but social and political; however, they are transformed into metrics (e.g latitude/longitude) so that the geography can be taxed, assessed, and managed by authorities.

ARGUMENT

This research explores how the meteorological community frames and classifies tornado risk. I argue that meteorologists scientize key concepts in ways that maintain Tornado Alley as the standardized area of risk and establish scientific authority over the risk discourse itself.

Why this matters: What role does the meteorological community's framing of this conversation play in shaping public perceptions of tornado vulnerability and risk?

In this case, scientization happens through the following processing:

➤Expertise: A way of demarcating between science and non-science to preserve the cognitive authority of science (Guston 2000)
➤Co-production: The interconnectedness of social processes and structures (e.g. institutions) and knowledge production (e.g. science) (Jasanoff 2004)
➤Classification: A scaffolding of information infrastructures embedded with sociopolitical struggles; created via abstraction, simplification, & standards (Bowker & Star 2000)

METHODOLOGY

Discourse Analysis: A rigorous deconstruction of the way that language works in a document, including the cultural, historical, and political contexts in which words exist.

It is a widely used method of analysis in the social sciences and often reveals not only unintended meanings but those that are hidden or masked by dominant discourses.

Text Examined:
Gagan, J.P, Gerard A., and Gordon, J. (2010). "Historical and Statistical Comparison of 'Tornado Alley' to 'Dixie Alley.'" *National Weather Digest, 34(2)*, 146-155. (Fig. 1)

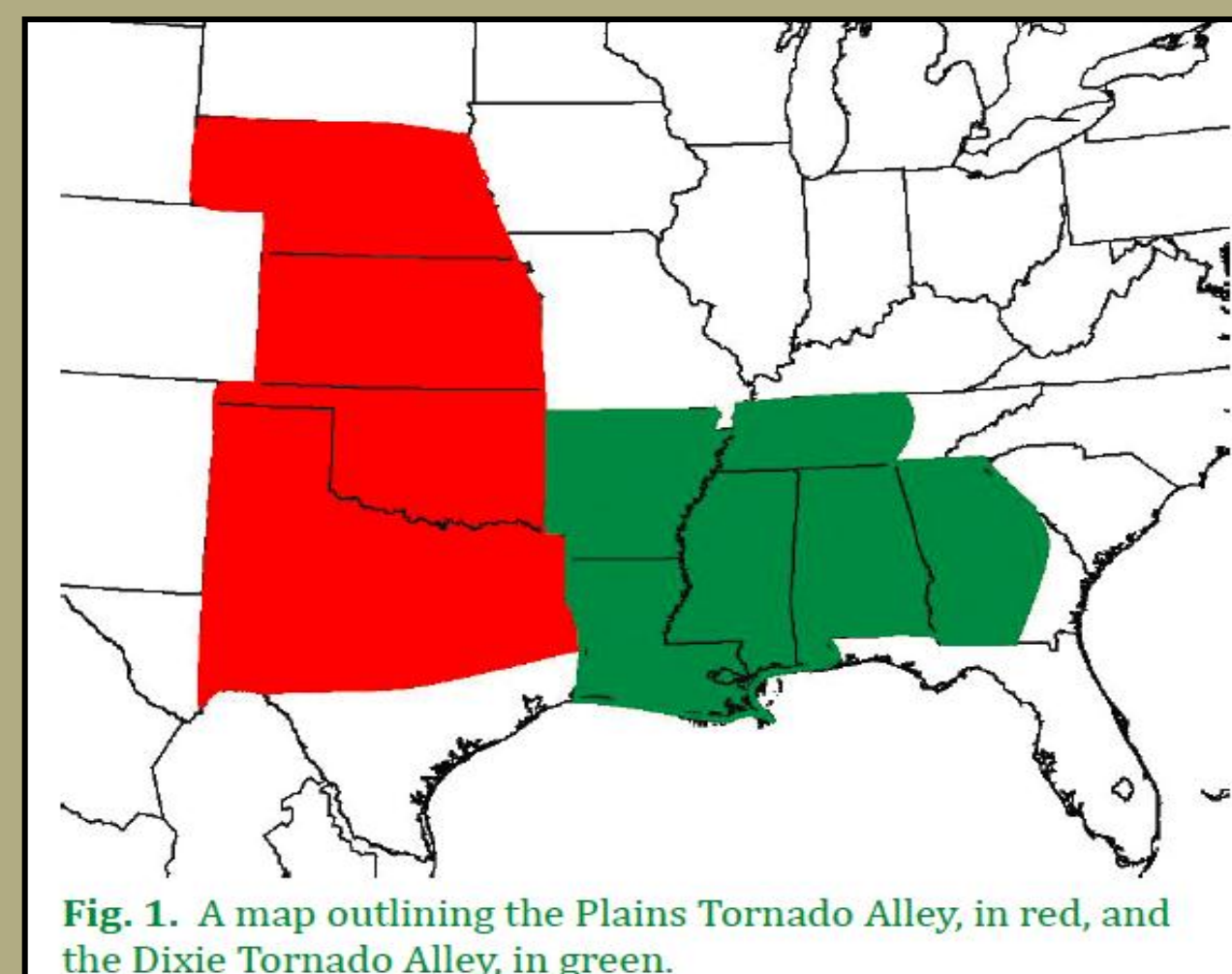➤This is the first meteorological publication to analyze and compare the two alleys.

Fig. 1 Tornado Alley and Dixie Alley (Gagen, et al. 2010)

Fig. 2 Miller & Fawbush, Tornado Alley, 1952

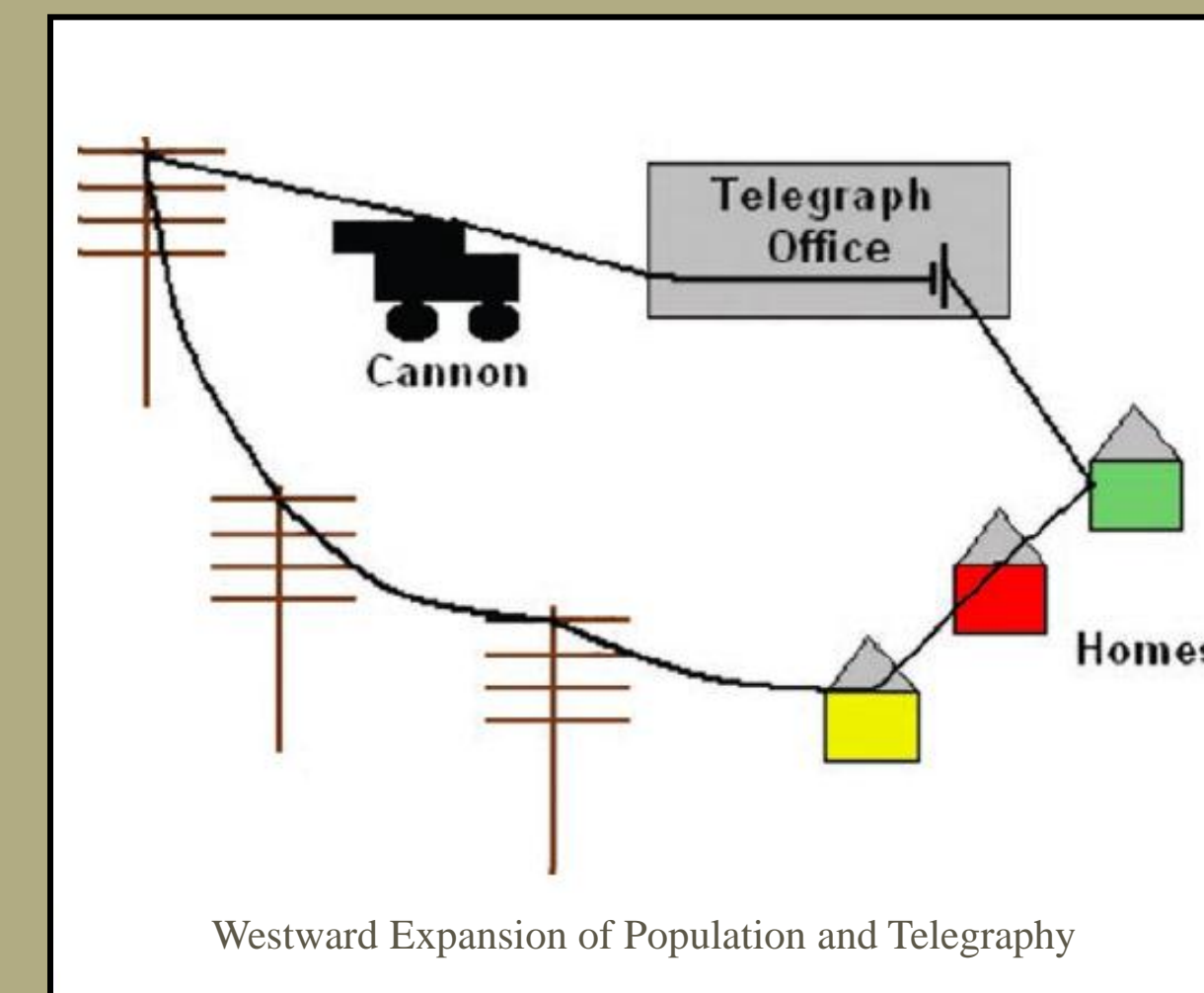Fig. 3 Dr. Allen Pearson, Dixie Alley, 1971

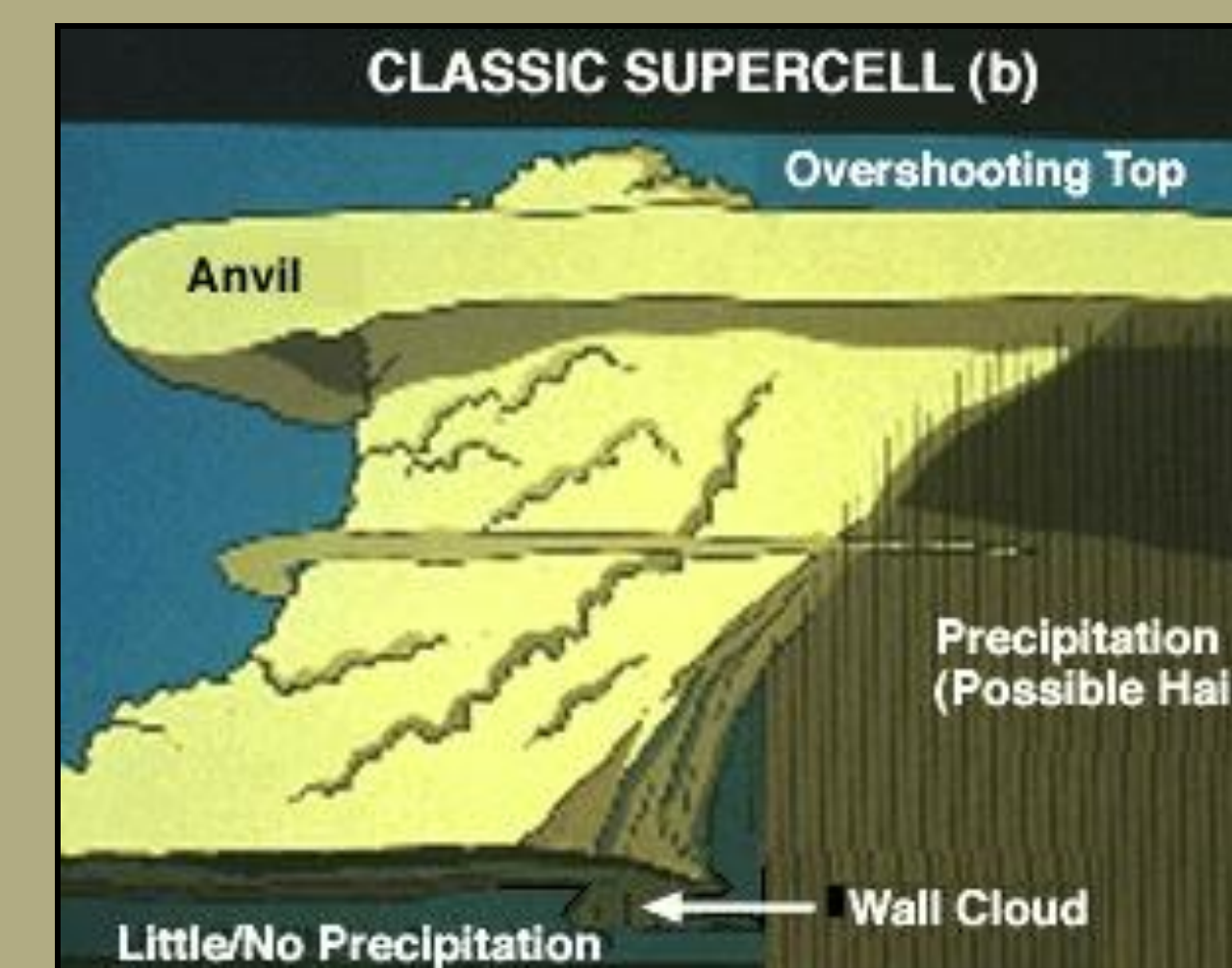Fig. 4 Holden's Tornado Warning Circuit, 1883
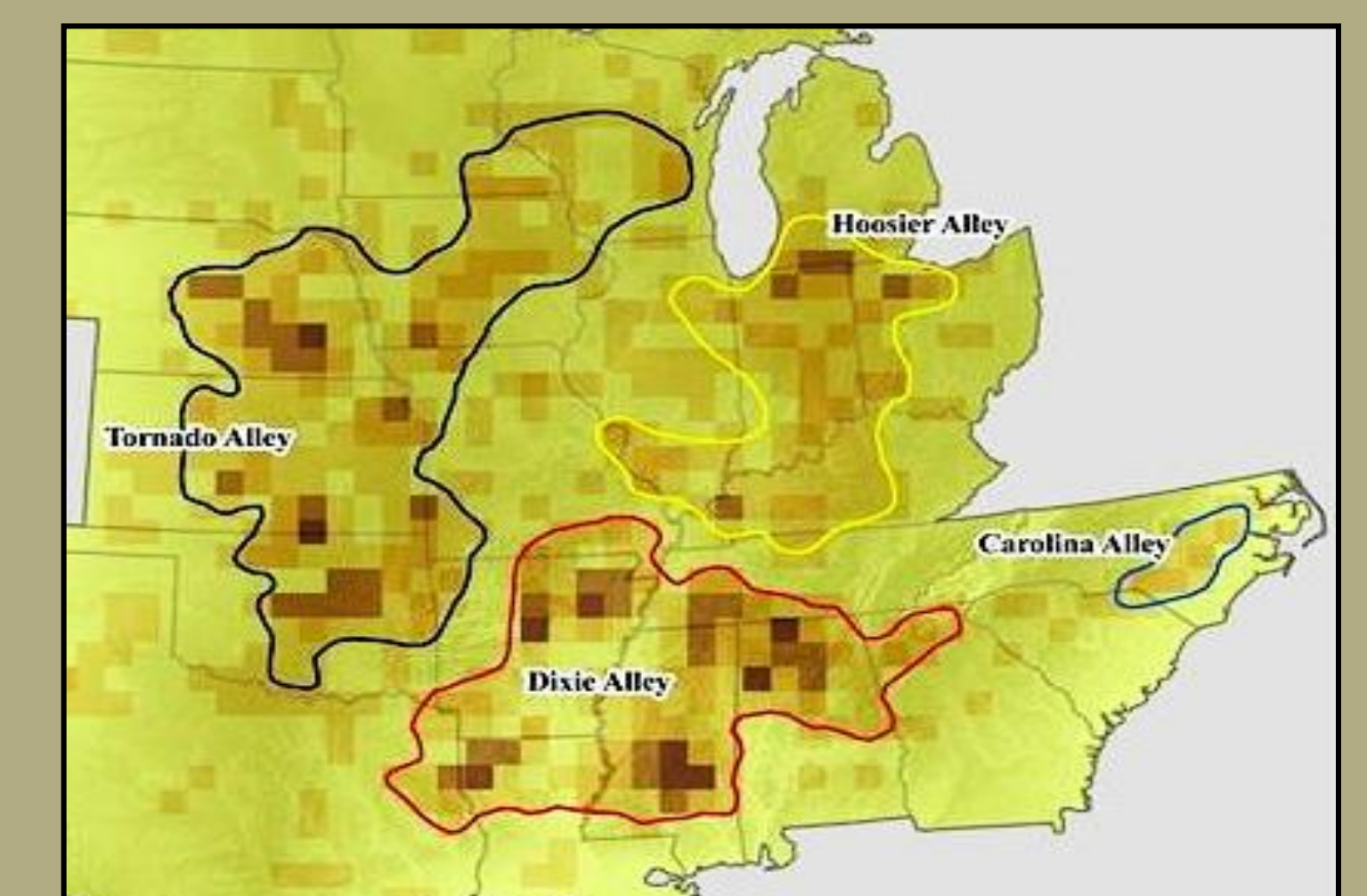

Fig. 5 Classic Supercell in the Great Plains

Fig. 6 Four Alleys of Risk, Frates 2011

EXPERTISE

First Half: Historical Etymology & Comparison

The authors differentiate between public perception (non-science) & views of reality (science) through strategies of **expertise**.

"The purpose of this work is not to provoke scholarly arguments over the 'champion' area as far as tornado incidence. Rather, it is to show that public and media perception is just that, perception, and that reality is often more complicated." (154)

What their historical search reveals:
➤"The existence of 'Tornado Alley' has been *widely accepted* by the meteorological community for decades, though…its exact spatial extent has had numerous interpretations." (147, italics added)
➤"The first statistical analysis suggesting the *validity* of a [Dixie Alley] was provided by Brooks et al. (2003)…" (148, italics added)

CO-PRODUCTION

Second Half: Statistical Analysis & Comparison

The authors frame Tornado Alley as the standard against which all other alleys must be measured. It is naturalized, in large part, because its emergency as a concept is **co-produced** alongside meteorological history itself. (Figures 2, 4, and 5)

"This paper will bridge the gap between perception and reality by offering a basic statistical analysis of the frequency of tornadoes in the 'Dixie Alley.' In an effort *to support the validity* of a 'Dixie Alley,' these statistics will *be compared to* those from 'Tornado Alley.'" (147, italics added)
   ➤ Tornado Alley is "second to none when it comes to overall tornado frequency" and it "outpaces" Dixie Alley in terms of tornadoes per area of land. (148)

Other examples of co-production:
   • Tornado structures that appear most often in Tornado Alley are "classic."
   • Technology and science about tornadoes is created based on storms in Tornado Alley.
   • Most research conducted about tornadoes occurs in and around Tornado Alley.

CLASSIFICATION

Conclusions

The authors suggest an increased effort to understand "public response" through social science; "public and government officials" should discuss "significant risk from tornadoes to [their] regions." (154)

   ➤ However: What is taken for granted in this discussion?
   ➤ Why alleys of risk? What do these **classifications** ignore?

Regional socioeconomic differences in housing choices, accessibility to technology, available shelter, education levels, and even perceptions about tornadoes themselves.

   ➤ What are the consequences of legitimizing alleys in terms of resources, public perception of risk, forecaster challenges?
   ➤ How we define and frame the problem of tornado risk matters.