From “Tornado updates: At least 32 dead, dozens injured across 9 states” by Aaron Border, ABC News, 2 April, 2023 (https://abcnews.go.com/US/violent-tornado-outbreak-major-storm-leaves-millions-alert/story?id=98263258)

# Students Behaviors During the March 31, 2023, Arkansas Severe Weather Events

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# Weather Ready Research Award Program: Special Call: Tornado Ready Research

# A Tale of Two Tornadoes on March 31, 2023

## LITTLE ROCK

EF3 (165mph)

Path width: 600 yards

Path length- 34.4 miles

54 injuries

1 fatality

(National Weather Service Memphis, 2023)

## NORTHEAST ARKANSAS

EF3 (150mph)

Path width: 1600 yards

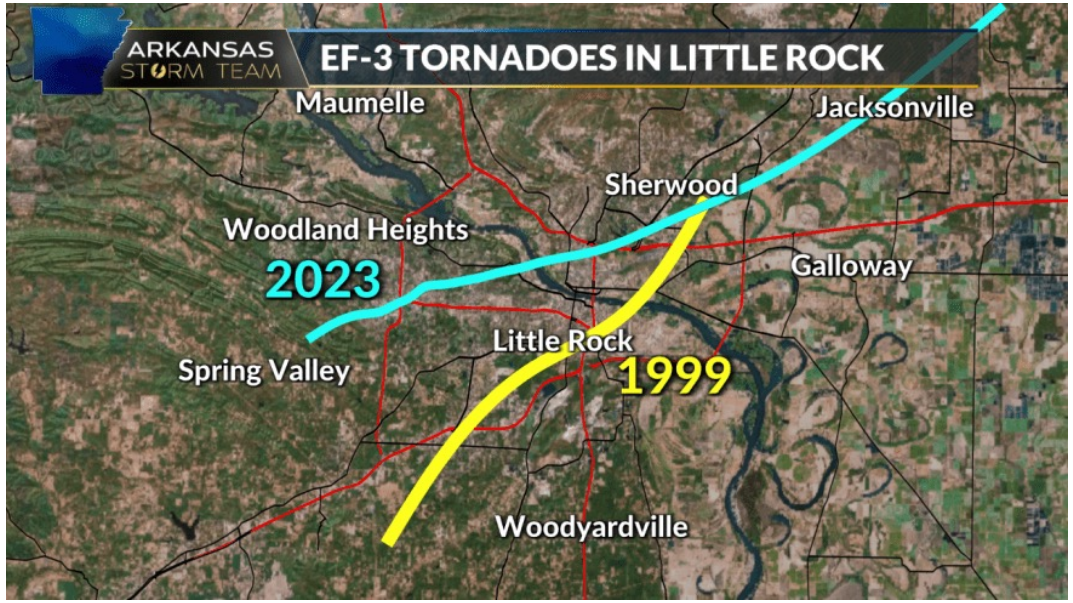
Path length: 73 miles

26 injuries

4 fatalities

(National Weather Service Little Rock, 2023)

# Little Rock Tornado




From "National Service confirms five tornadoes from Friday's storms" by Ringo et al., 4 April, 2023 (https://www.kark.com/severe-weather-coverage/national-weather-service-confirms-path-and-damage-information-for-two-tornadoes-that-hit-arkansas/). In the public domain

From "Tornado updates: At least 32 dead, dozens injured across 9 states" by El-Bawab, ABC News, 2 April, 2023 (https://abcnews.go.com/US/violent-tornado-outbreak-major-storm-leaves-millions-alert/story?id=98263258)

# Northeast Arkansas Tornado


NASA Earth Observatory images by Lauren Dauphin

(Shepherd, 2023)

# How we spun into this research project…

1. College Student Vulnerability to Disasters.

2. Individual Risk Perception and Experiences.


# Research Questions

1. What are the differences in risk perception between student groups from different geographic areas?

2. What are the differences in protective action behavior between various student groups?

# Research Design

Study Site and Access

- IRB Process and Ethical Considerations

Quantitative

- Online Survey

Sampling Strategy

- College students currently enrolled in higher education institutions in the Little Rock Metro Area or Northeast Arkansas Area

# Instrumentation & Data Analysis

The instrument adapted from three existing surveys:

- NOAA Tornado Post-Event Survey
- Risk perception/hazard adjustments from Greer et al. (2018) and Huang et al. (2012)

Survey Measures

- Home Region
- Risk Assessment
- Risk Perception of Home Region
- Tornado Hazard Knowledge
- Tornado Experience
- Warning Sources

# Survey Distribution and Respondent Demographics

| Variable Description | | f | % |
|---|---|---|---|
| Gender | Male | 139 | 27.9 |
| | Female | 321 | 64.5 |
| | Prefer not to answer | 22 | 4.4 |
| | Total | 482 | 96.8 |
| Race | Hispanic/Latino | 19 | 3.8 |
| | Native American/Alaskan | 3 | 0.6 |
| | Asian | 21 | 4.2 |
| | Black/African American | 60 | 12.0 |
| | White | 337 | 67.7 |
| | Two or more races | 30 | 6.0 |
| | Prefer not to answer | 14 | 2.8 |
| | Total | 484 | 97.2 |
| Age | 18-22 Years | 173 | 34.7 |
| | 23-27 Years | 127 | 25.5 |
| | 28-32 Years | 53 | 10.6 |
| | 33-37 Years | 42 | 8.4 |
| | 38 Years & Older | 71 | 14.3 |
| | Total | 466 | 93.6 |

# Survey Distribution and Respondent Demographics

| Variable Description | | f | % | Valid % | Cum % |
|---|---|---|---|---|---|
| Status | Domestic Origin | 456 | 91.6 | 96.4 | 96.4 |
| | International Origin | 17 | 3.4 | 3.6 | 100 |
| | Total | 473 | 95.0 | 100.0 | |
| Missing | System | 25 | 5.0 | | |
| Total | | 498 | 100.0 | | |
| Region | In Region (Dixie Alley) | 356 | 71.5 | 75.7 | 75.7 |
| | Out Region | 114 | 22.9 | 24.3 | 100.0 |
| | Total | 470 | 94.4 | 100.0 | |
| Missing | System | 28 | 5.6 | | |
| Total | | 498 | 100.0 | | |
| Institution | University of Arkansas | 392 | 78.7 | 81.0 | 81.0 |
| | Arkansas State University | 88 | 17.7 | 18.2 | 99.2 |
| | Other Institution | 4 | 0.8 | 0.8 | 100.0 |
| | Total | 484 | 97.2 | 100.0 | |
| Missing | System | 14 | 2.8 | | |
| Total | | 498 | 100.0 | | |

# Data Analysis Procedures


Respondents were grouped by their home region.

Descriptive statistics were used to examine demographics and other questions asked in the survey.

A comparison of means was used to examine the differences between college groups based on their home region.

# Results: Risk Perception and Home Origin

Out-region students perceived tornado risk in their home states or country as “moderate,” on average.

In-region students perceived higher tornado risk, rating their states as at “enhanced risk” for tornados.

The mean ranked difference between these groups was statistically significant.

# Results: Tornado Experience and Prior Knowledge

Out-region respondents tended to have less experience with tornadic events when compared to in-region respondents.

- The difference between these groups on the hazard experience variable was statistically significant.

Out-region respondents had slightly less prior knowledge about tornadic events when compared to in-region respondents.

- The mean rank difference between these groups was statistically significant.

# Discussion

Out-region students were found to have a lower risk perception for their home region than in-region students.

- This suggests that students who move from a lower-risk tornado regions might have lower overall tornado risk perceptions even after moving to a high-tornado-risk region.
- Risk perception has been found to influence protective actions (Savoia et al., 2017).
- Our study found no difference between protective actions between student groups.
  - Emergency alert systems
  - Media
  - Live in Arkansas long enough to experience tornado recently

# Discussion

Out-region students were found to have less experience with tornados compared to in-region students.

- Experience is often an antecedent to risk perception (Demuth, 2018).
- It could be argued that out-region students also had lower tornado risk perceptions prior to the March 31 event.

Out-region respondents had less knowledge about tornadic events compared to in-region respondents.

- Knowledge about tornados has been found to influence protective actions in past studies (Jauernic & Van Den Broeke, 2016).

# Policy and Practice

Implement a local natural hazards educational component into First Year Experience or Orientation courses.

Promote local warning system enrollment.

Gather more information on student demographics related to hazard knowledge and experience to tailor messages and plans for your campus.

# Future Directions

Examine higher institution campuses from multiple regions to gain a deeper understanding of how hazard experience plays a role in college student groups' risk perception and protective action behavior.

Gather a larger number of international respondents in a future study to gain more insight into how international students view tornadic risks and their knowledge of protective action behaviors.

# Wrapping up because we’re out of wind…

Questions?

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