Tornado Tales: 2025 Reference Report

Taylor Maciag[1,2], Makenzie Krocak[2], Holly Obermeier[1,2], David Hogg[1,2,3], Miranda Silcott[1,2]

[1]Cooperative Institute for Severe and High-Impact Weather Research and Operations, The University of Oklahoma, Norman, Oklahoma

[2]NOAA/OAR/National Severe Storms Laboratory, Norman, Oklahoma

[3]University of Oklahoma Institute for Public Policy Research and Analysis

ABSTRACT

In general, very few tornado events in the United States are studied from a social science perspective, where data are collected about the information used to make decisions during these short-fuse, highly impactful events. In an effort to collect data about individual experiences during tornado events, the University of Oklahoma and the NOAA National Severe Storms Laboratory field the Tornado Tales survey, a post-tornado-event survey where people can report their tornado experiences anonymously and asynchronously. The 2025 survey was in the field from May 20th, 2024 to June 30th, 2025 and collected 480 responses. Responses to the survey show that most people were concerned in the hours and minutes before the tornado event and received a tornado watch. Furthermore, most people received a tornado warning, generally from automated phone notifications, sirens, social media, and television. Finally, respondents reported being confident in their ability to protect themselves from the tornado, and most are likely to take similar actions in the future. Understanding how people use tornado forecasts and products during real events is a key step to ensuring high-quality, consistent services.

1. Introduction

a. Background

Each year, hundreds of tornadoes affect communities across the United States, but very few of those individual tornadoes are studied. When they are, most of the data collected are physical-science based, like radar observations of the parent thunderstorm or near-surface wind measurements, for example. Very little data are collected about what individuals experienced immediately before and during tornado events. As such, little is known about how individuals receive, interpret, and respond to tornado forecasts and products.

To more fully evaluate the tornado information environment, researchers need data from individuals who experience these events, including information about reception, decision making, and behavioral response. While efforts to study tornado events from a social science perspective via post-event interviews are increasing, it is unreasonable to expect every event to be evaluated in this way. Furthermore, some individuals may be unable or unwilling to speak to researchers in person, preferring a more anonymous or asynchronous form of data collection. In an effort to address these challenges, a team of physical and social science researchers from the NOAA National Severe Storms Laboratory (NSSL) and the University of Oklahoma Cooperative Institute for Severe and High-Impact Weather Research and Operations (CIWRO) field a web-based survey that individuals can take after they were in or near a tornadic storm (or a storm that had the potential to be tornadic).

The goal of this survey is to collect information about an individual's experience with tornado forecast and warning information. For example, from what source or sources did they get forecast and warning information? Did they receive a watch or warning? If so, through what channels? Did they take action in response to the watch or warning? If so, what did they do? These questions can be evaluated in aggregate or across multiple dimensions, like geographic area, time of year, demographic characteristics, etc. The survey instrument can be found at this link. The data from this survey will be used to contextualize individual experiences and evaluate how information is propagating from the National Weather Service (NWS) to communities, allowing for more tailored, equitable, and effective messaging. With sufficient response numbers, individual events can be evaluated on a community level, enabling NWS offices to customize messaging to their communities.

Only the date, time, and zip code of the tornado event is required, allowing users the ability to share as much or as little information about their experience as they wish to.

The full survey takes 5-10 minutes to complete and the instrument has been approved by the Office of Management and Budget (OMB, approval number 0648-0797) and by the University of Oklahoma Institutional Review Board (IRB, approval number 16808) to ensure compliance with human subjects research ethics and the Paperwork Reduction Act.

b. Sampling

The Tornado Tales survey is 100% voluntary, meaning recruitment consists of offering the survey link as a way for participants to share their experience with no expectation of participation. Additionally, there is no compensation provided for filling out the survey. Recruitment primarily consisted of media exposure with broadcast meteorologists, partners, and National Weather Service offices, primarily on their social media pages. NWS forecasters had access to business cards with the survey link on them to hand out during community events and on tornado damage surveys, as well as social media posts on NWS Facebook and X pages. The 2025 survey was in the field from 20 May 2024 until 30 June 2025. There were a total of 480 responses collected. One hundred ninety three (193) of the 480 responses were collected from three events: 25 April 2025 in the Texas Panhandle; 16 May 2025 in Missouri, Illinois, Indiana, Michigan, and Kentucky; and 3 June 2025 in Oklahoma.

c. Data analysis

All data collected via the Tornado Tales survey tool are completely anonymous. If a participant shares personal information (like addresses) in the open-ended question boxes, researchers trained in human subjects research remove those pieces of information, creating a completely anonymous final data set.

Each year, an annual report of survey responses will be created and posted to the NSSL Social Science webpage (https://www.nssl.noaa.gov/research/social/) in the late summer summarizing how people responded to each question. Long-term research using this dataset will evaluate the evolution of forecast and warning sources, differences in event notification timeframes, and differences in warning reception, understanding, and response across segments of the population. Understanding how people are using NWS forecasts and products during real events is a key step to ensuring high-quality, consistent services.

2. Survey Instrument and Frequency Report

This section provides a reproduction of the Tornado Tales survey instrument with frequencies for the questions that elicited numeric responses, and general themes for

open ended responses [shown in blue]. Selected questions also show bar graph visualizations of the responses.

zip: Please enter the 5-digit zip code where the tornado event occurred: [require 5-digit number]

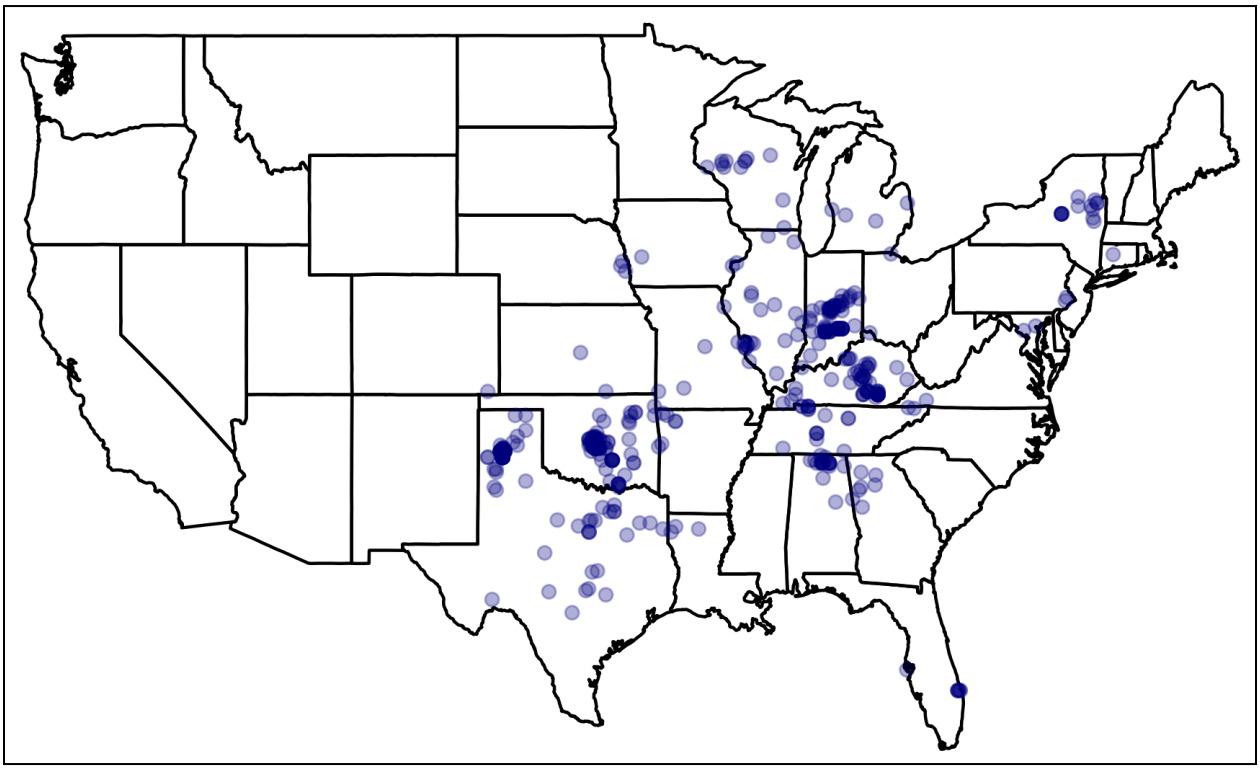

Figure 1: *A map of survey respondent locations.*

storm_date: Please enter the date when the tornado event occurred: [calendar input]

storm_time: Please enter the time when the tornado event happened: (in the local timezone) [dropdown menu]

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loc_event: Where were you when the tornado event occurred?

1. At home [n=400, 83%]
2. At work [n=23, 5%]
3. At school [n=1, 0.2%]
4. At a business (such as a store or restaurant) [n=6, 1%]
5. In a vehicle (such as a car, truck, bus) [n=29, 6%]
6. Somewhere else (please specify) [n=20, 4%]
7. I don't recall [n=1, 0.2%]

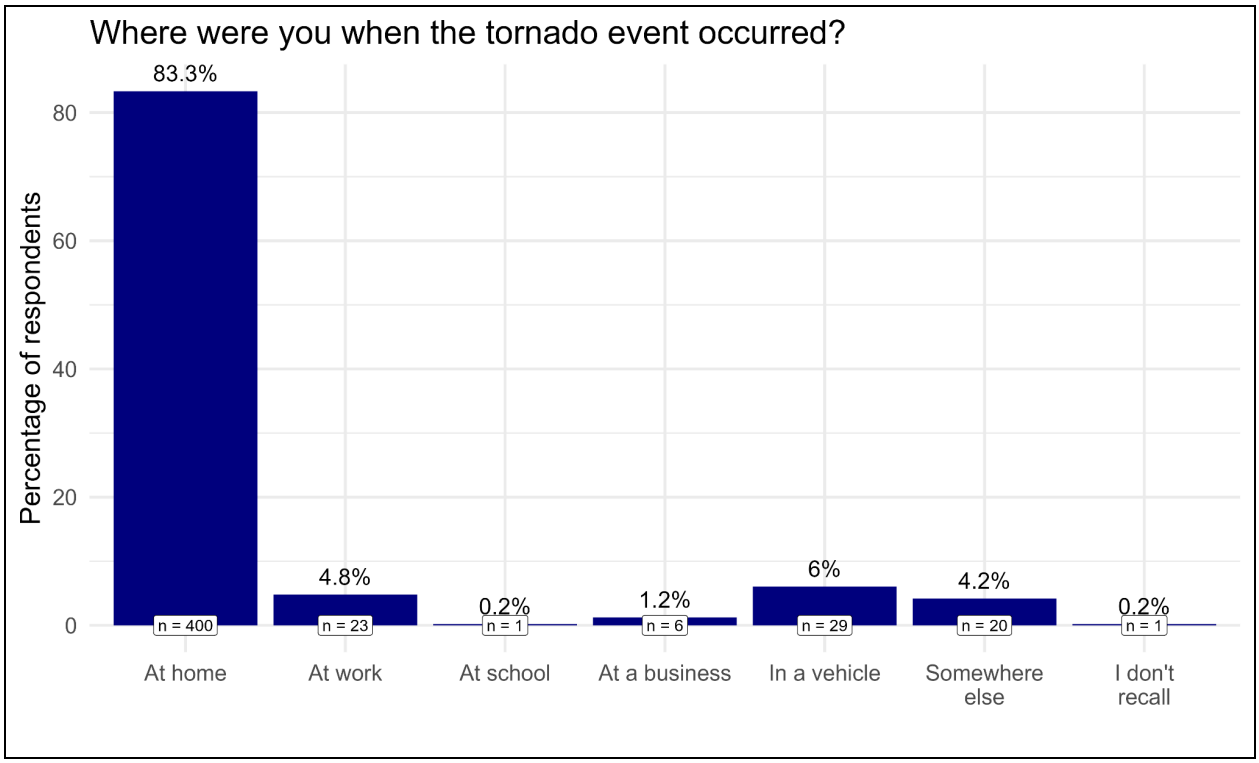

Figure 2: *a bar graph showing the responses to the question: Where were you when the tornado event occurred?*

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[SHOW ONLY IF **loc_event** == 6]

loc_event_spec: Please describe where you were when the event occurred: [VERBATIM]

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[SHOW ONLY IF **loc_event** == 1]

home: Which of the following categories best describes your current primary residence?

1. Stand-alone (detached) permanent structure such as a house [n=321, 80%]
2. Condominium, town-house, or duplex that is attached to another structure [n=24, 6%]
3. Apartment or dormitory room that is part of a larger residential complex [n=22, 6%]
4. Mobile home (whether placed on a permanent foundation or not) [n=27, 7%]
5. Boat, boathouse, ship, dock, or other floating structure [n=0, 0%]
6. Other type [n=6, 1%]

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[SHOW ONLY IF **loc_event** == 2]

work: Which of the following categories best describes your work setting?

1. Single-story Building [n=7, 30%]
2. Multi-story Building [n=7, 30%]
3. Big Box Store (e.g., Lowes, Home Depot, Walmart) [n=2, 9%]
4. Shopping mall [n=1, 4%]
5. Industrial or Construction setting [n=1, 4%]
6. Outdoor setting (e.g., agricultural) [n=1, 4%]
7. Other type [n=4, 17%]

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[SHOW ONLY IF **loc_event** == 3]

school: Which of the following categories best describes the school?

1. Single-story K-12 school building [n=0, 0%]
2. Multi-story K-12 school building [n=0, 0%]
3. Single-story college campus building [n=0, 0%]
4. Multi-story college campus building [n=1, 100%]
5. Other type of school setting [n=0, 0%]

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[SHOW ONLY IF **loc_event** == 4]

business: Which of the following categories best describes the business you were at when the tornado event occurred?

1. Single-story building [n=1, 17%]
2. Multi-story building [n=2, 33%]
3. Big Box Store (e.g., Lowes, Home Depot, Walmart) [n=, 0%]
4. Shopping mall [n=2, 33%]
5. Industrial or construction setting [n=1, 17%]
6. Other type [n=0, 0%]

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For the next few questions, we would like you to think about **right before** and **when** the tornado event occurred.

right_conc: How concerned were you about the weather right before the tornado event occurred? Mean = 3.35
1 - Not at all concerned [n=43, 9%]
2 - Not very concerned [n=72, 15%]
3 - Somewhat concerned [n=136, 28%]
4 - Very concerned [n=130, 27%]
5 - Extremely concerned [n=99, 21%]

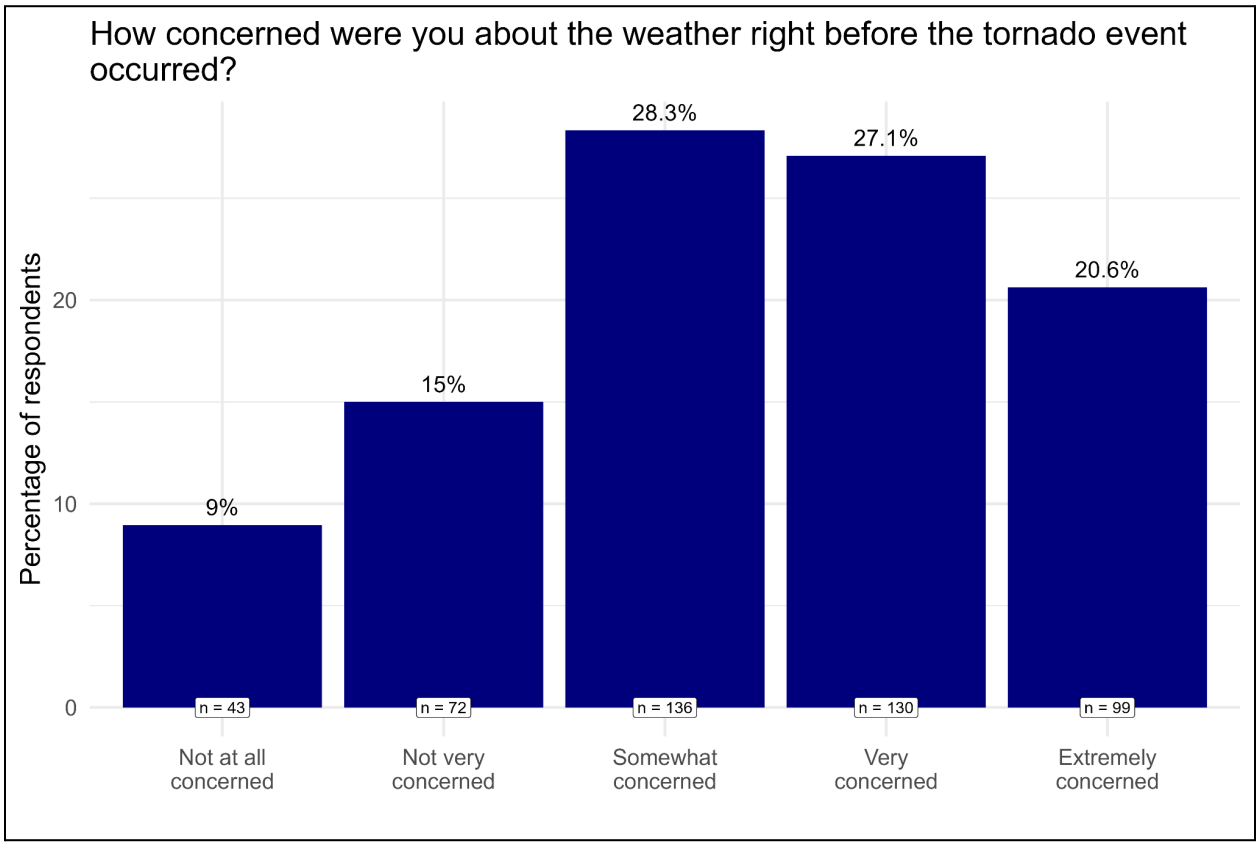

Figure 3: *a bar graph showing the responses to the question: How concerned were you about the weather right before the tornado event occurred?*

right_act: Did you take any action to protect yourself right before or when the tornado event occurred?
1 - Yes [n=379, 80%]
2 - No [n=97, 20%]

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[SHOW ONLY IF **right_act** = 1]

right_act_desc: Can you briefly describe what you did to protect yourself right before or when the tornado event occurred? [VERBATIM] [n=375]

Name	Example	Total n	Percentage
Took protective action/shelter	“Took shelter in the most interior room of our home, our pantry.”	324	86%
Gathered family, friends, pets	“Grabbed my kids and went to inner most room.”	98	26%
Monitor	“Watched local weather broadcast and had radarscope app on phone.”	90	24%
Gathered emergency supplies/important items	“Went into the middle of the house where there were no windows, got shoes on and grabbed backpack with emergency things (ID, $, backup battery, etc)”	69	18%

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Now, please think about the hours leading up to the tornado event.

hours_conc: How concerned were you about the weather in the hours leading up to the tornado event? Mean = 2.83
1 - Not at all concerned [n=74, 15%]
2 - Not very concerned [n=110, 23%]
3 - Somewhat concerned [n=168, 35%]
4 - Very concerned [n=78, 16%]
5 - Extremely concerned [n=50, 10%]

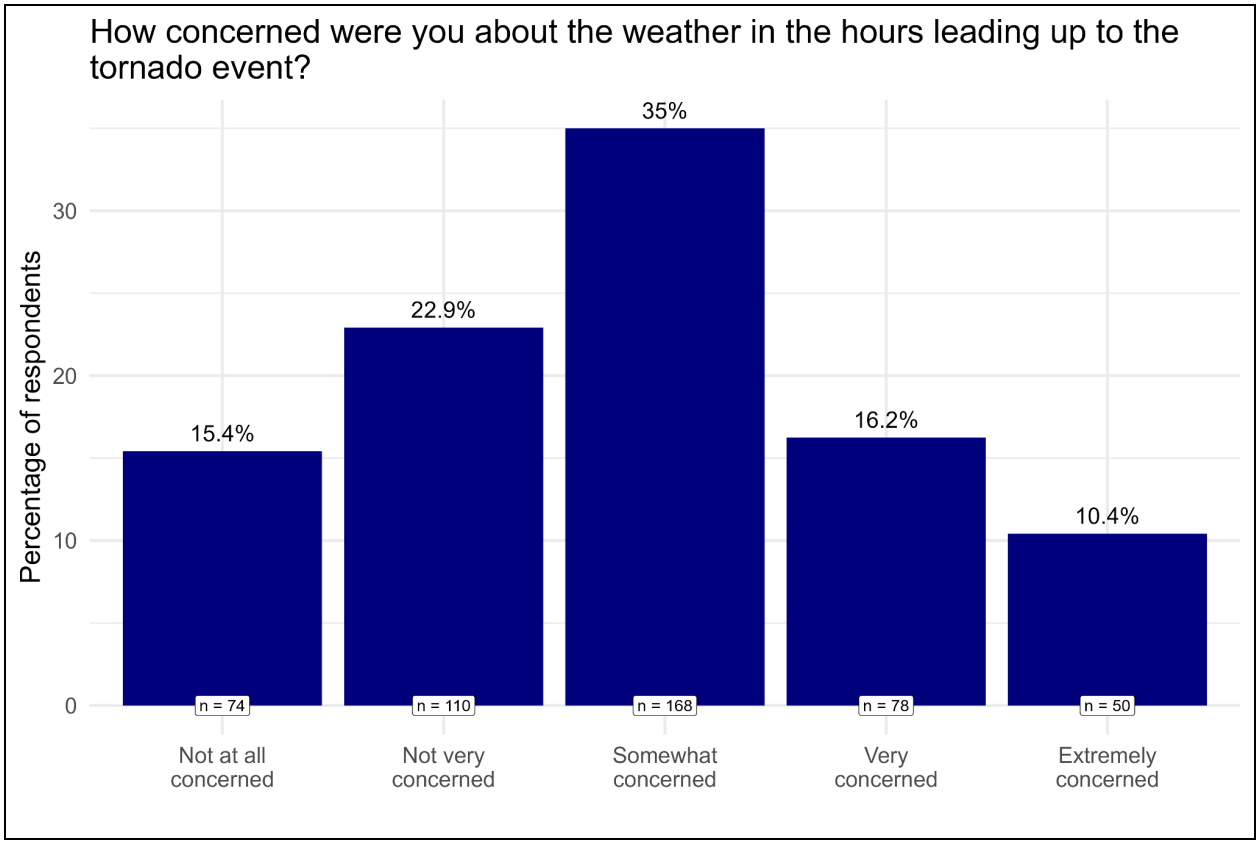

Figure 4: *a bar graph showing the responses to the question: How concerned were you about the weather in the hours leading up to the tornado event?*

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[SHOW ONLY IF **hours_conc** > 2]

hours_conc_what: Please describe what made you concerned in the hours leading up to the tornado event: [VERBATIM] [n = 286]

Top themes:

Name	Example	Total n	Percentage
General forecast	“Weather forecast for severe weather”	64	22%
Environmental cues	“It's usually dry here, but it was humid and warm.”	62	22%
Local TV stations	“[Station name] had been broadcasting the danger all day”	50	17%
SPC risk level	“I checked the SPC convective outlook and it showed a moderate risk for my area”	41	14%

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hours_act: Did you take any action in the hours leading up to the tornado event?
1 - Yes [n=226, 47%]
2 - No [n=253, 53%]

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[SHOW ONLY IF **hours_act** = 1]

hours_act_desc: Can you briefly describe what you did in the hours leading up to the tornado event? [VERBATIM]

hours_act_time: About what time did you take those actions? [DROP DOWN MENU]

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Finally, please think about the day before the tornado event.

day_conc: How concerned were you about the weather the day before the tornado event? Mean = 2.13
1 - Not at all concerned [n=181, 38%]
2 - Not very concerned [n=122, 26%]
3 - Somewhat concerned [n=125, 26%]
4 - Very concerned [n=34, 7%]
5 - Extremely concerned- [n=16, 3%]

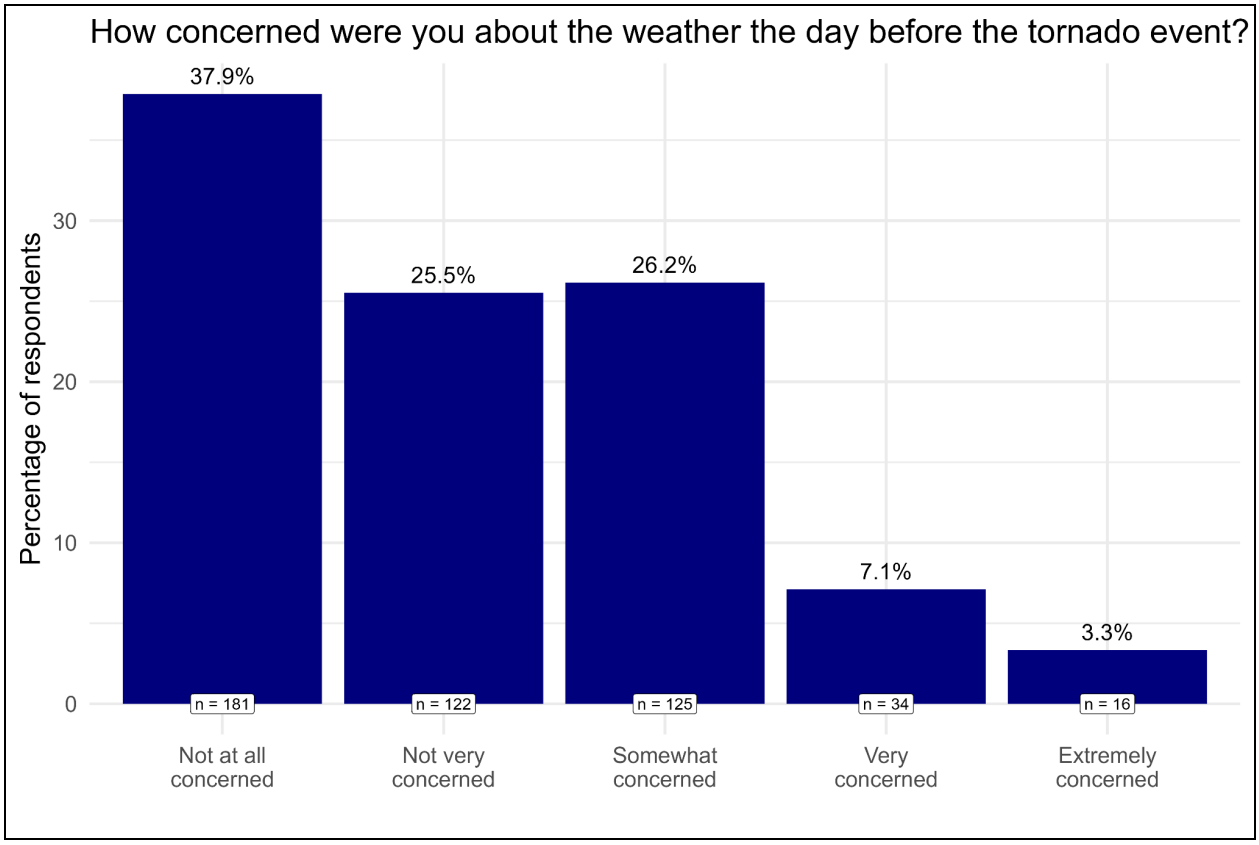

Figure 5: *a bar graph showing the responses to the question: How concerned were you about the weather the day before the tornado event?*

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[SHOW ONLY IF **day_conc** > 2]

day_conc_what: Please describe what made you concerned the day before the tornado event: [VERBATIM] [n = 163]

Top themes:

Name	Example	Total n	Percentage
General forecast	"Forecasts for conditions expected on Friday"	72	44%
SPC risk level	"We were in an enhanced risk for severe weather that included the chance of tornadoes"	39	24%
Local TV stations	"Had heard severe weather was forecast when I turned on tv meteorological report"	23	14%

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day_act: Did you take any action the day before the tornado event?

1 - Yes [n=58, 12%]
2 - No [n=420, 88%]

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[SHOW ONLY IF **day_act** = 1]

day_act_desc: Can you briefly describe what you did the day before the tornado event? [VERBATIM]

day_act_time: About what time did you take those actions the day before the tornado event? [VERBATIM]

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Now we have some questions about alerts from the National Weather Service that you may have received on the day of the tornado event.

A tornado watch is issued by the National Weather Service when tornadoes are possible in and near the watch area.

torn_watch: Did you receive a tornado watch for your area on the day of the event?
1 - Yes [n=331, 69%]
0 - No [n=104, 22%]
2 - I don't recall [n=45, 9%]

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[SHOW ONLY IF **torn_watch** == 1**]**

How did you learn about the tornado watch for your area? Please check all that apply. [CHECK ALL THAT APPLY]
watch_brad: Broadcast radio [n=26, 8%]
watch_wxrad: Weather radio (National Weather Service radio) [n=76, 23%]
watch_tv: Television [n=143, 43%]
watch_int: Internet web pages focused on weather forecasts (such as weather.gov) [n=141, 43%]
watch_soc: Social media (such as Facebook or Twitter) [n=196, 59%]
watch_notif: Emergency notifications on your phone [n=207, 63%]
watch_apps: Weather applications on your phone (such as The Weather Channel or a local news station app) [n=167, 51%]

watch_wom: Word-of-mouth (including telephone calls or texts) from family, friends, neighbors, employers, co-workers, etc. [n=68, 21%]
watch_sirens: Outdoor sirens [n=63, 19%]
watch_env: Environmental cues (like looking at the sky or hearing thunder) [n=85, 26%]
watch_other: Some other source [n=25, 8%]
watch_dk: I don't recall [n=0, 0%]

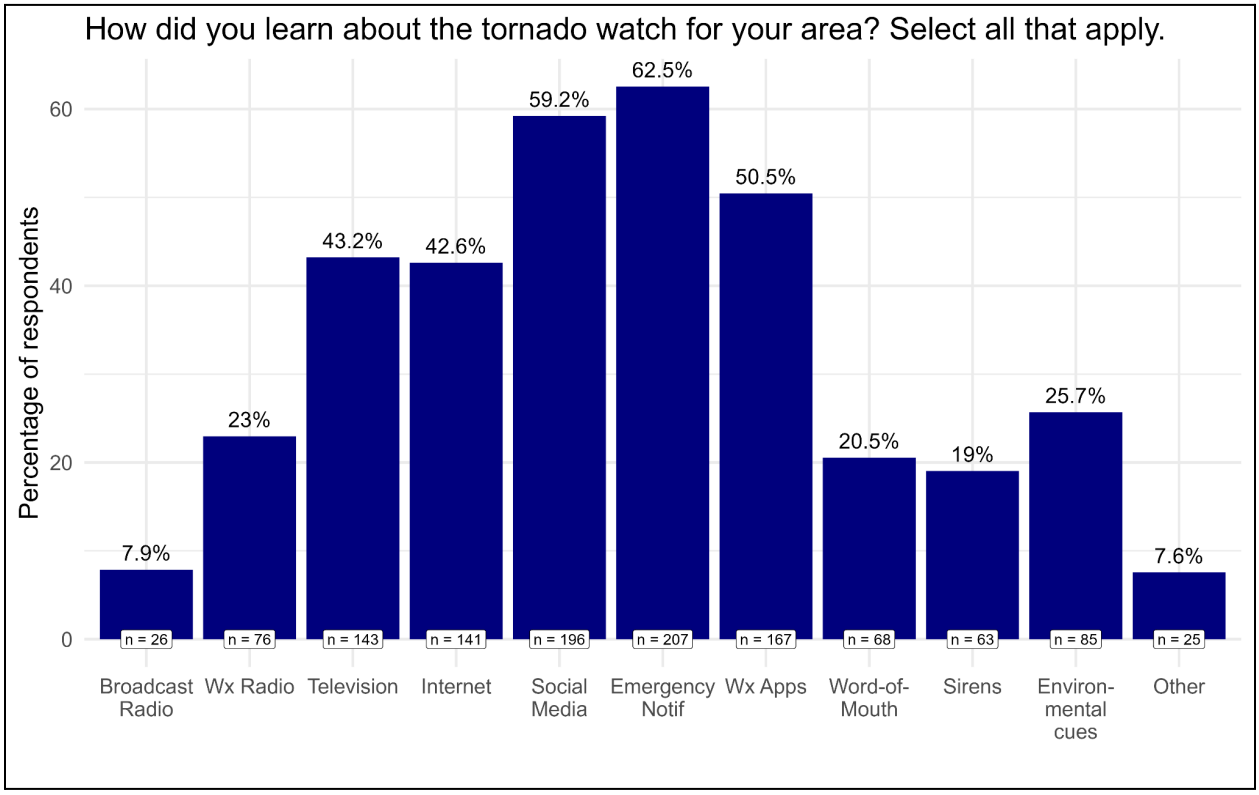

Figure 6: *a bar graph showing the responses to the question: How did you learn about the tornado watch for your area? Note that this was a check all that apply question, so respondents could select more than one source.*

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[SHOW ONLY IF **torn_watch_source** == 11]

torn_watch_source_spec: Where else did you learn about the tornado watch? [VERBATIM]

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torn_watch_action: Did you do anything after learning about the tornado watch for your area?
0 - No, I continued on with my activities [n=174, 53%]
1 - Yes [n=149, 45%]

2 - I don't recall [n=8, 2%]

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[SHOW ONLY IF **torn_watch_action** == 0]

torn_watch_noaction: Can you tell us why you didn't do anything after you learned about the watch for your area? [VERBATIM]

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[SHOW ONLY IF **torn_watch_action** == 1]

torn_watch_action_type: Please briefly describe what you did after you learned about the tornado watch for your area: [VERBATIM] [n = 144]

Top themes:

Name	Example	Total n	Percentage
Monitor	"Watched weather forecast and radar. Watched local YouTube live stream."	72	50%
Prepare	"Made sure the bags were in the shelter before we got the warning."	36	25%
Inform others	"I told as many people as possible about the tornado watch."	30	21%

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torn_warn: A **tornado warning** is issued by the National Weather Service when a tornado is imminent. Did you receive a tornado warning for your area on the day of the tornado event?

1 - Yes [n=410, 85%]

0 - No [n=55, 11%]

2 - I don't recall [n=15, 3%]

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[SHOW ONLY IF **torn_warn** == 1]

How did you learn about the tornado warning for your area? Please check all that apply. [CHECK ALL THAT APPLY]

warn_brad: Broadcast radio [n=36, 9%]

warn_wxrad: Weather radio (National Weather Service radio) [n=91, 22%]

warn_tv: Television [n=165, 40%]

warn_int: Internet web pages focused on weather forecasts (such as weather.gov) [n=123, 30%]

warn_soc: Social media (such as Facebook or Twitter) [n=176, 43%]
warn_notif: Emergency notifications on your phone [n=347, 85%]
warn_apps: Weather applications on your phone (such as The Weather Channel or a local news station app) [n=164, 40%]
warn_wom: Word-of-mouth (including telephone calls or texts) from family, friends, neighbors, employers, co-workers, etc. [n=106, 26%]
warn_sirens: Outdoor sirens [n=202, 49%]
warn_env: Environmental cues (like looking at the sky or hearing thunder) [n=108, 26%]
warn_other: Some other source [n=31, 8%]
warn_dk: I don't recall [n=0, 0%]

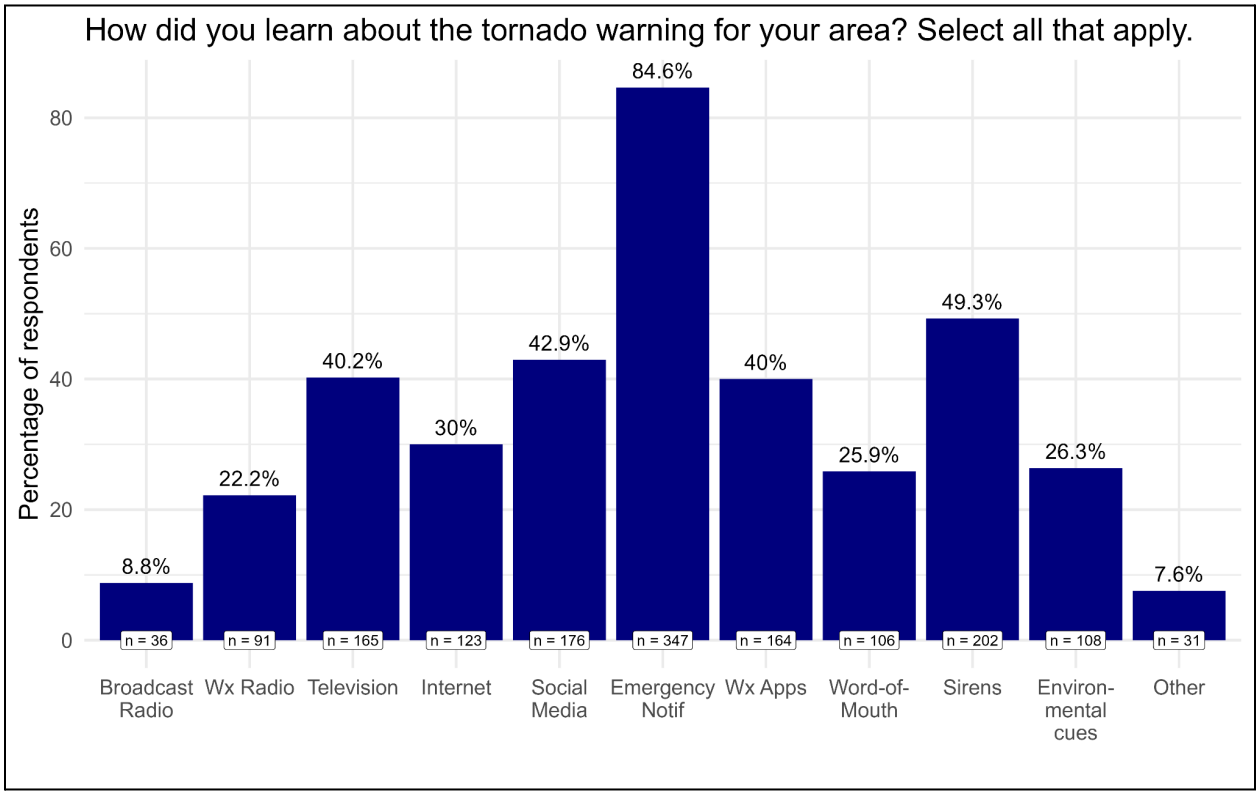

Figure 7: *a bar graph showing the responses to the question: How did you learn about the tornado warning for your area? Note that this was a check all that apply question, so respondents could select more than one source.*

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[SHOW ONLY IF **torn_warn_source** == 11]

torn_warn_source_spec: Where did you first hear about the tornado warning? [VERBATIM]

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torn_action: Did you do anything after learning about the tornado warning for your area?
0 - No, I continued on with my activities [n=35, 9%]
1 - Yes [n=370, 90%]
2 - I don't recall [n=5, 1%]

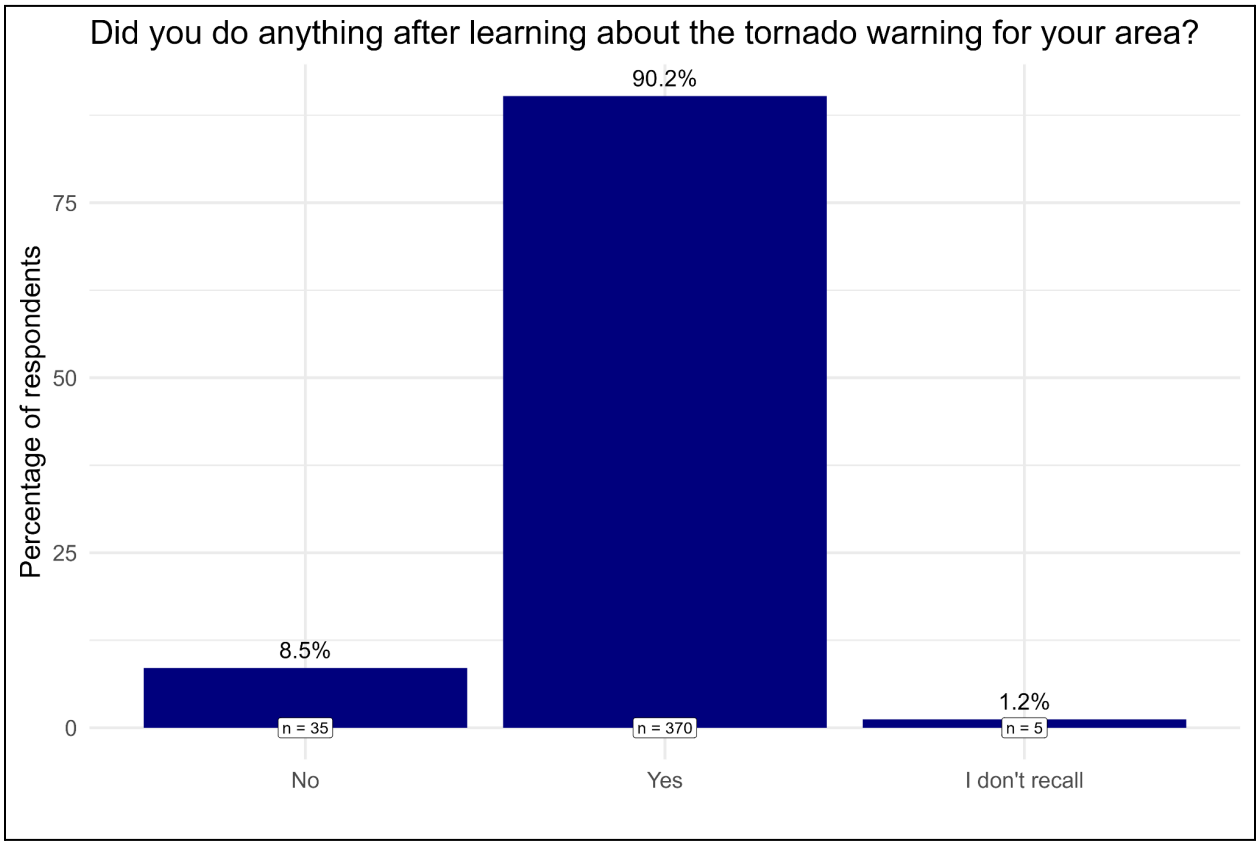

Figure 8: *a bar graph showing the responses to the question: Did you do anything after learning about the tornado warning for your area?*

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[SHOW ONLY IF **torn_action** == 0]

torn_noaction: Can you tell us why you didn't do anything after you learned about the watch for your area? [VERBATIM]

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[SHOW ONLY IF **torn_action** == 1]

torn_act_desc: Please briefly describe what you did after learning about the tornado warning for your area: [VERBATIM] [n=368]

Top themes:

Name	Example	Total n	Percentage
Shelter	“Went upstairs to wake the kids and grandkids and then we all went to the basement.”	230	63%
Monitor	“Watched for updates on phone and tv.”	131	36%
Gather family, friends, or pets	“Gathered the kids and the dogs to seek shelter when the storm was headed towards us.”	97	26%
Inform others	“I texted friends to make sure they were aware of a possible tornado.”	84	23%

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Now we have a few questions about the event overall.

tor_conf: Looking back, how confident were you that you could protect yourself from the tornado if you needed to? Mean = 3.19

1. Not at all confident [n=41, 9%]
2. Not very confident [n=72, 15%]
3. Somewhat confident [n=185, 39%]
4. Very confident [n=118, 25%]
5. Extremely confident [n=63, 13%]

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last_act_again: How likely is it that you would do the same things again if another tornado event were to happen? Mean = 4.18

1 - Very unlikely [n=29, 6%]
2 - Somewhat unlikely [n=28, 6%]
3 - Neither likely nor unlikely [n=36, 8%]
4 - Somewhat likely [n=120, 25%]
5 - Very likely [n=266, 56%]

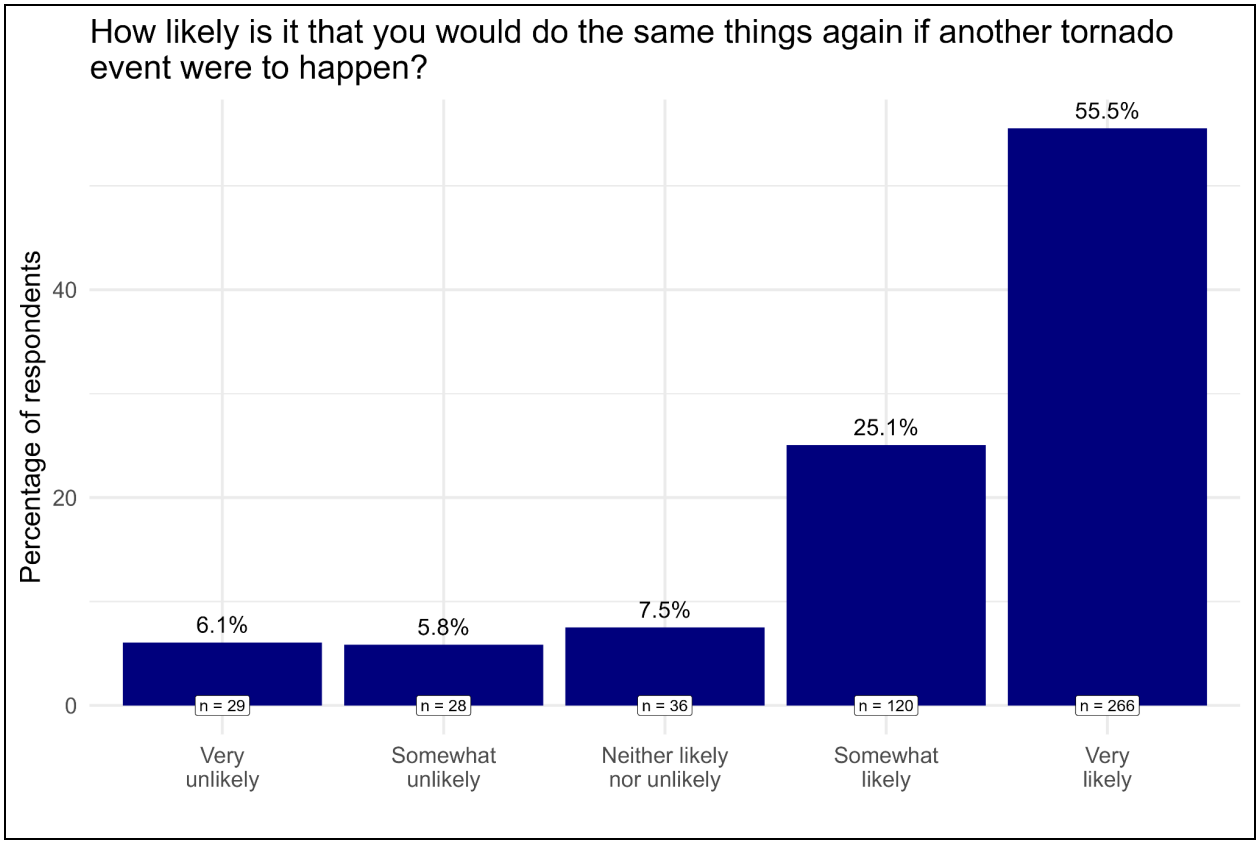

Figure 9: *a bar graph showing the responses to the question: How likely is it that you would do the same things again if another tornado event were to happen?*

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torn_info: How much do you agree or disagree with the following statement?
Looking back, I had enough information in advance of the tornado event to make a decision about protecting myself and those around me. Mean = 3.49
1 - Strongly disagree [n=64, 13%]
2 - Disagree [n=69, 14%]
3 - Neither disagree nor agree [n=59, 12%]
4 - Agree [n=140, 29%]
5 - Strongly agree [n=147, 31%]

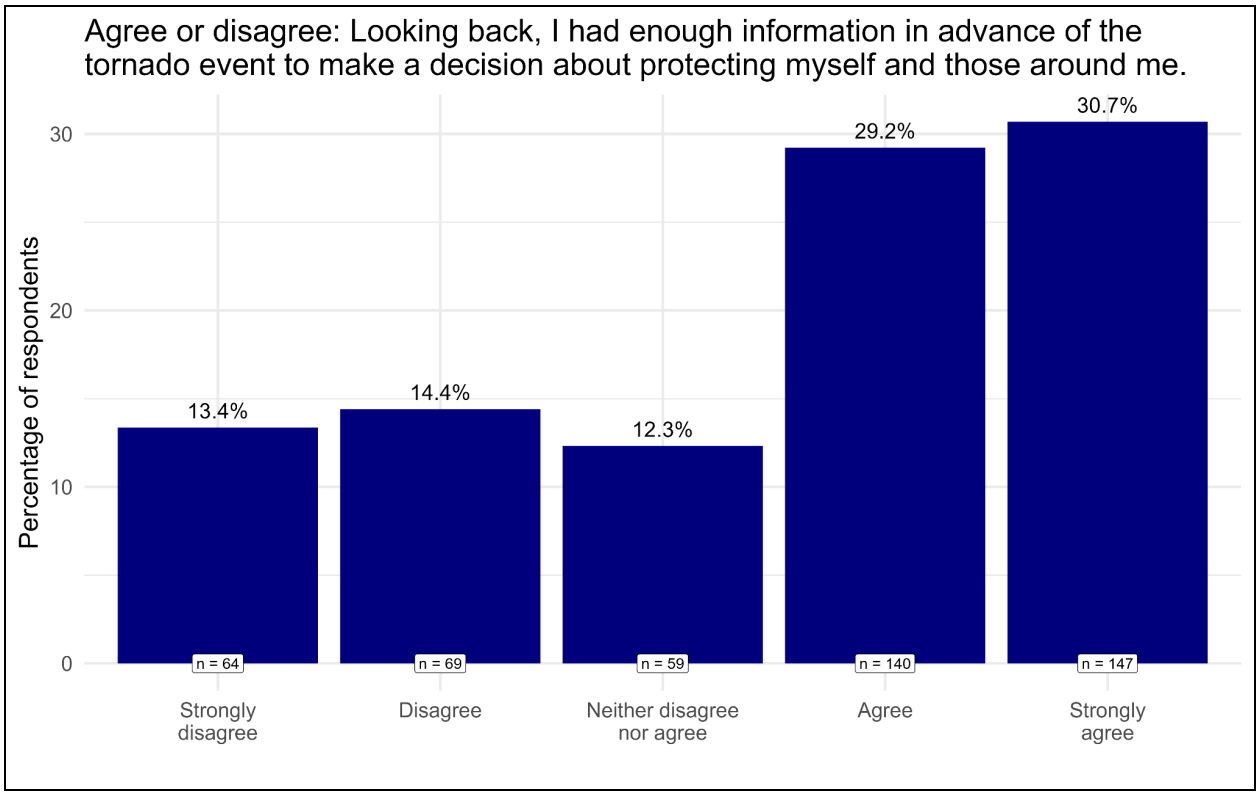

Figure 10: *a bar graph showing survey respondent agreement or disagreement with the following statement: Looking back, I had enough information in advance of the tornado event to make a decision about protecting myself and those around me.*

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torn_cmmt: Is there any other information you would like us to know about this tornado event? [VERBATIM]

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The next few questions are about weather in general. How much do you agree or disagree with the following statements? [RANDOM ORDER]

follow: I follow the weather very closely. Mean = 4.46
1 - Strongly disagree [n=2, 0.4%]
2 - Disagree [n=7, 1%]
3 - Neither disagree nor agree [n=42, 9%]
4 - Agree [n=144, 30%]
5 - Strongly agree [n=285, 59%]

plan_around: I plan my daily routine around the weather. Mean = 3.86

1 - Strongly disagree [n=11, 2%]
2 - Disagree [n=33, 7%]
3 - Neither disagree nor agree [n=102, 21%]
4 - Agree [n=201, 42%]
5 - Strongly agree [n=132, 28%]

und_weather: I don't understand what causes extreme weather events like thunderstorms, tornadoes, and hurricanes.Mean = 1.89
1 - Strongly disagree [n=202, 42%]
2 - Disagree [n=182, 38%]
3 - Neither disagree nor agree [n=53, 11%]
4 - Agree [n=28, 6%]
5 - Strongly agree [n=14, 3%]

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The survey is almost complete, we just have a few more questions. Thank you for your responses thus far.

age: How old are you? [VERBATIM; require numeric]

Age group	Total n	Percentage
18-29	104	23%
30-39	133	29%
40-49	100	22%
50-59	55	12%
60-69	48	10%
70+	17	4%

gend: What is your gender? [options 2 and 3 were removed on March 3rd, 2025]
0 - Male [n=148, 31%]
1 - Female [n=326, 68%]
2 - Transgender, Non-binary, or another gender
3 - Prefer not to answer

What is your race and/or ethnicity? Select all that apply. [CHECK ALL THAT APPLY]
race_AmInd=American Indian or Alaska Native [n=31, 6%]
race_asian=Asian – Provide details below. [n=6, 1%]
race_baa=Black or African American [n=2, 0.4%]
race_hisp=Hispanic or Latino [n=18, 4%]
race_ME=Middle Eastern or North African [n=2, 0.4%]

race_PI=Native Hawaiian or Pacific Islander [n=1, 0.2%]
race_white=White [n=447, 93%]

income: What was the estimated annual income for your household last year?
1 - Less than $30,000 [n=33, 7%]
2 - At least $30,000 but less than $60,000 [n=78, 17%]
3 - At least $60,000 but less than $90,000 [n=84, 18%]
4 - At least $90,000 but less than $120,000 [n=82, 17%]
5 - At least $120,000 but less than $150,000 [n=58, 12%]
6 - $150,000 or more [n=62, 13%]
7 - Prefer not to answer [n=75, 16%]

edu: What is the highest degree or level of school you have completed?
1 - Less than high school [n=8, 2%]
2 - High school / GED [n=51, 11%]
3 - Vocational or Technical Training [n=16, 3%]
4 - Some College; NO degree [n=82, 17%]
5 - 2-year College / Associate's degree [n=60, 13%]
6 - Bachelor's Degree [n=122, 26%]
7 - Master's Degree [n=98, 21%]
8 - PhD / JD (Law) / MD [n=16, 3%]
9 - Prefer not to answer [n=23, 5%]

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Thank you for completing the Tornado Tales survey, your response has been recorded.

3. Summary of Select Results

a. Storm date and location during the event

The 2025 fielding of the Tornado Tales survey had the largest sample size to date with 480 total respondents. Most of those respondents were located in the Southern Plains (mainly Oklahoma and Texas) and the Ohio Valley (mainly Illinois, Indiana, Kentucky, and Tennessee, Figure 1). About 193 of the 480 responses were from three events: 25 April 2025 in the Texas Panhandle; 16 May 2025 in Missouri, Illinois, Indiana, Michigan, and Kentucky; and 3 June 2025 in Oklahoma. In total, 389 (81%) of the events occurred in 2025, 52 (11%) occurred in 2024, and 39 (8%) occurred prior to 2024. Most people reported being at home when the tornado occurred (83%, Figure 2) and 80% of those respondents reported being in a stand-alone structure like a single family home.

b. Concern leading up to the event

The survey first asks respondents to rate their level of concern “right before” the tornado occurred. The answer choices included a 5-point likert scale ranging from “Not at all concerned” to “Extremely concerned”, with 48% of respondents choosing one of the top two choices (“extremely” or “very” concerned) during the time period right before the tornado occurred (Figure 3). Next, respondents were asked about their concern level in the hours leading up to the tornado event. During this time period a little under 27% of respondents said they were “very” or “extremely” concerned (Figure 4). After rating their concern level, respondents who reported a concern level of “somewhat” concerned or higher were asked to briefly describe what made them concerned in the hours before the event. About 97% of the respondents (or 286 of 296 who were shown the question) wrote something in the answer box. The most common answer was some general form of “the weather forecast” for the day (mentioned by 22% or 64 of the 286 respondents). Many respondents also mentioned environmental cues (like the humidity, cloud structures, or the sky in general, 22% or 62 respondents), their local TV station weather forecast (17%, 50 respondents), or the SPC categorical level (14%, 41 respondents) made them concerned.

Finally, respondents were asked the same question but for the day before the event. This time, a little over 10% reported being “very” or “extremely” concerned (Figure 5). When asked to briefly describe what made them concerned, 163 (or 93% of those who saw the question) wrote something in the response box. Of those 163, 72 (or 44%) reported the forecast in general made them concerned. Another 39 (24%) noted something about the SPC outlook, like the categorical level of the risk, the tornado probabilities, or the discussions made them concerned. Twenty three (23, or 14%) said that the forecast from local broadcast meteorologists made them concerned.

Based on the results from the closed-ended concern questions, the total percentage of people who report being “very” or “extremely” concerned about the weather doubled from the day before the event to the day of, and again from a few hours before the event until right before the tornado occurred.

c. Tornado watch and warning reception

After walking respondents through a short timeline of the tornado event, the survey then asked questions about what National Weather Service products they received. Beginning with tornado watches, 69% of respondents reported getting a watch for their area on the day of the tornado event. Of those respondents, the top sources for watch

information were generally related to phones, social media, and television (Figure 6). Sixty three percent (63%) reported getting the watch from emergency notifications on their phone (perhaps from apps or subscription services, though respondents were not asked for that level of specificity), 59% reported seeing watch information on social media, 51% from weather apps on their phone, and about 43% reported getting the watch from television or internet websites. Next, respondents were asked to report what they did after getting the watch. About half (45% or 149 respondents) said they took some kind of action after getting the watch. From the open-ended question, the most common themes were monitoring the weather (72 respondents, or 50% of those who provided a response), securing items and preparing for storms (36 respondents, 25%), and informing others about the potential for bad weather (30 respondents, 21%).

Next, respondents were asked very similar questions about tornado warnings. In total, 410 or 85% of respondents reported receiving a tornado warning, which is very similar to the results from the version 1 survey report. Also similar to the version 1 report, most people got the warning from emergency phone notifications (85%, Figure 7). Besides those notifications, people also reported getting the warning from outdoor sirens (49%), social media (43%), television (40%), and weather apps (40%). After receiving the warning, 90% of respondents took some type of action. From the open-ended responses, common themes included taking shelter (230 respondents, 63%), monitoring the weather or gathering more information (131 respondents, 36%), gathering family, friends, or pets together (97 respondents, 26%), and informing others about the tornado threat (84 respondents, 23%).

d. Weather awareness and future intended response

Finally, after asking about NWS products, the survey asked respondents to reflect on the event and future tornado events. When asked how confident they were in protecting themselves from the tornado, a majority (366 total respondents, 76%) of the respondents chose that they felt “somewhat” (185 respondents, 39%), “very” (118 respondents, 25%) or “extremely” (63 respondents, 13%) confident. Themes from previous short answer responses from those that were “not at all” (41 respondents, 9%) or “not very” (72 respondents, 15%) confident included feeling like they did not have adequate shelter, feeling like they didn’t have enough time to shelter, not knowing where the tornado/tornadic storm was located, not being able to hear outdoor sirens, or having general storm anxiety. After they rated their confidence in protective actions, respondents were asked about how likely they were to take the same actions again in a future tornado event (Figure 9). Just over 80% (386) of respondents noted that they would be “somewhat” or “very” likely to take the same actions in the future. When asked how much they agreed with a statement about having enough information to take

protective actions, over half of the respondents said that they “agree” (140 respondents, 29%) or “strongly” agree (147, 31%) with the statement (Figure 10). These results indicate that in general, people are confident they know what to do in a tornado warning, but some face barriers to taking their preferred response.

e. Concluding thoughts

Overall, these survey results show that members of the public are generally aware of and responsive to tornado forecasts and warnings. They have a variety of sources to get those forecasts and warnings (with emergency phone notifications being most prevalent), and most are confident in their ability to protect themselves from a tornado event. Given these results, it’s important to note that this survey utilized a convenience sampling method, whereby those in the weather enterprise (e.g., National Weather Service forecasters, broadcast meteorologists, and emergency managers) helped spread the word about the survey and solicit responses. This likely led to a more weather-savvy sample of respondents compared to the general population. It would be a fruitful endeavor to collect a broader sample of survey respondents, which could result in a more representative evaluation of risk communication for tornado events.