



TEXAS TRENDS 2024

Special Report on
Outage
Experiences and
Preparedness
in the Shadow of
Hurricane Beryl



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Special Report on Outage Experiences and Preparedness in the Shadow of Hurricane Beryl

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Introduction

Power outages in the Houston metro area have become one of the main sources of uncertainty in post-disaster recovery for millions, especially for the most vulnerable. Two months before Hurricane Beryl hit the area, a long-lived windstorm, a *derecho*, knocked out power for close to a million residents. Close to 900,000 residents in the Houston area went with out power for several days, and thousands of residents remained without power for a week. Most recently, Hurricane Beryl knocked out power for 3 million homes and businesses.¹ Eight days after the storm's Texas landfall, 237,000 customers of CenterPoint Energy, the utility company in charge of power distribution for most of the greater Houston area, are still without electricity.² With two mass power outage events within the span of two months, and government officials and customers increasingly critical of CenterPoint, the debate about the ways to improve the resiliency of the power grid and distribution becomes more relevant.³

Based on responses to the fourth wave of the Texas Trends Survey, we analyze Texans' past experiences with power outages caused by natural disasters and their preparedness for such extreme weather events. We cannot directly assess the impact of Hurricane Beryl, as our survey was fielded in the weeks prior to the storm's Texas landfall. Yet, our findings show that a large number of Texas households have experienced the negative effects, namely blackouts, from numerous natural disasters in recent years.

We start by looking at the power outages experienced by respondents during the main FEMA-declared disasters in recent years, and highlight the areas most affected by Hurricane Beryl. We also examine the ways in which Texans prepared for the 2024 hurricane season and respondents' level of preparedness along and outside of Hurricane Beryl's wind swath. Most Texans took measures to prepare for the 2024 storm season, particularly those residing in areas more likely to be affected by severe weather. However, our results suggest that a large number of households remain vulnerable and exposed to the impacts of natural disasters.

This study is part of the Texas Trends Survey, a five-year research project launched in 2021 by the Hobby School of Public Affairs at the University of Houston and the Executive Master of Public Administration Program at the Barbara Jordan – Mickey Leland School of Public Affairs at Texas Southern University. This fourth wave of the study explores the changing public attitudes among Texans, including the upcoming 2024 general election,

¹Vancleave, M., & Lozano, J. A. (2024, July 8). Beryl weakens to tropical depression after slamming into Texas as Category 1 hurricane. AP News. <https://apnews.com/article/hurricane-beryl-texas-7dfd5353671ee30d0c6d11518ea5a370>.

²As of July 15 around 237,000 customers remained without electricity according to CenterPoint's webpage: https://gisoutagetracker.azurewebsites.net/?_ga=2.80396372.250799149.1721156136-511491802.1721156136.

³See <https://www.houstonchronicle.com/news/houston-weather/hurricanes/article/beryl-houston-outage-updates-19573622.php>.

housing, school vouchers, extreme weather, and border security and immigration.

Wave 4 of the Texas Trends Survey is a representative sample of 2,257 Texas residents aged 18 and older, including an oversample of Black Texans to ensure an impartial and statistically sound depiction of varied perspectives. The survey was fielded by YouGov on behalf of the Hobby School and Jordan-Leland School research consortium between June 20 and July 1, 2024 in English and Spanish. Respondents were matched with a sample frame based on demographics including gender, age, ethnicity, and educational background, making them representative of the adult population in Texas. The findings from the 2024 statewide survey will be presented in five reports.

This special report discusses the experience of Texans with extreme weather in light of a succession of natural disasters to befall the Texas Gulf Coast area, including the recent tornadoes caused by a *derecho* in May 2024. We inquired about the impact of these storms on Texans, experiences with blackouts, and measures taken to prepare for the 2024 hurricane season. Texans' recent experiences with extreme weather events provide a good benchmark to understand the impact of Hurricane Beryl which struck Texas on July 8, 2024.

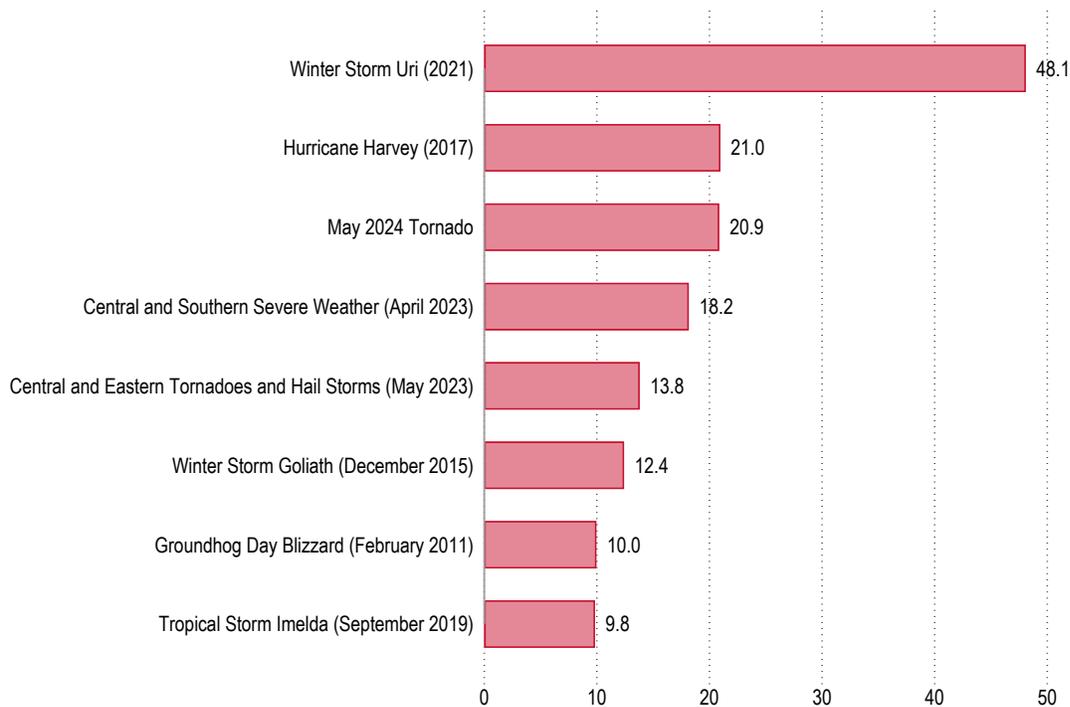
Natural Disasters and Blackouts

As extreme weather events become more frequent, blackouts continue to affect Texans (see Figure 1), especially those near the coast and the Houston metro area (Austin, Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller counties). Recent events like the tornadoes on May 16, 2024 and Hurricane Beryl that hit the Texas coastline near Matagorda Bay on July 8, 2024 are some examples. During May's tornado, it is estimated that nearly 1 million people lost power, and just under two months later, more than 2 million people experienced power outages due to Hurricane Beryl.

To examine respondents' experiences with blackouts, we look at Texas counties during previous extreme weather events. The maps in Figure 2 show the percentage of respondents in each county that experienced blackouts during the different natural disasters listed in Figure 1. As a reference, we have highlighted on the maps the path of Hurricane Beryl's wind swath in Texas.⁴

⁴https://www.nhc.noaa.gov/refresh/graphics_at2+shtml/115434.shtml?swath

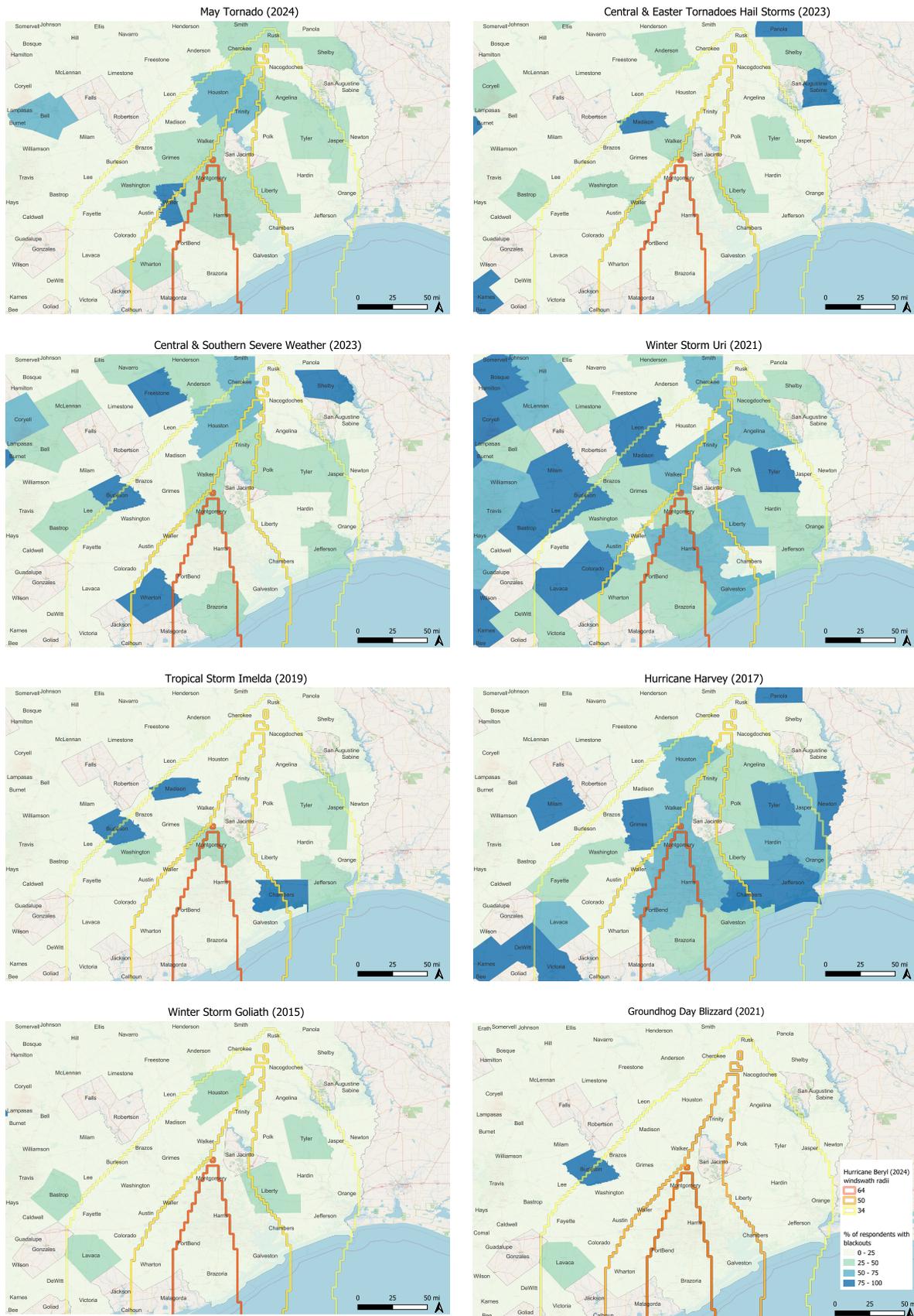
Figure 1: Percentage of respondents with blackouts during recent natural disasters



The maps highlight that for counties in Beryl’s wind swath, most respondents experienced blackouts during Hurricane Harvey, Winter Storm Uri, and the Central and Southern Severe Weather of 2023. In Harris County, more than 50% of respondents experienced blackouts during Winter Storm Uri (2021) and Hurricane Harvey (2017). On the other hand, less than 25% of respondents experienced blackouts during extreme weather events in 2023.

During the May 2024 *derecho*, northern counties in the Houston metro area had a higher percentage of respondents experiencing outages compared to those in the southern and eastern parts. In terms of spatial patterns of blackouts as a result of extreme weather events, the survey found that the Houston metro area (Austin, Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller counties) has consistently experienced more blackouts compared to the rest of Texas.

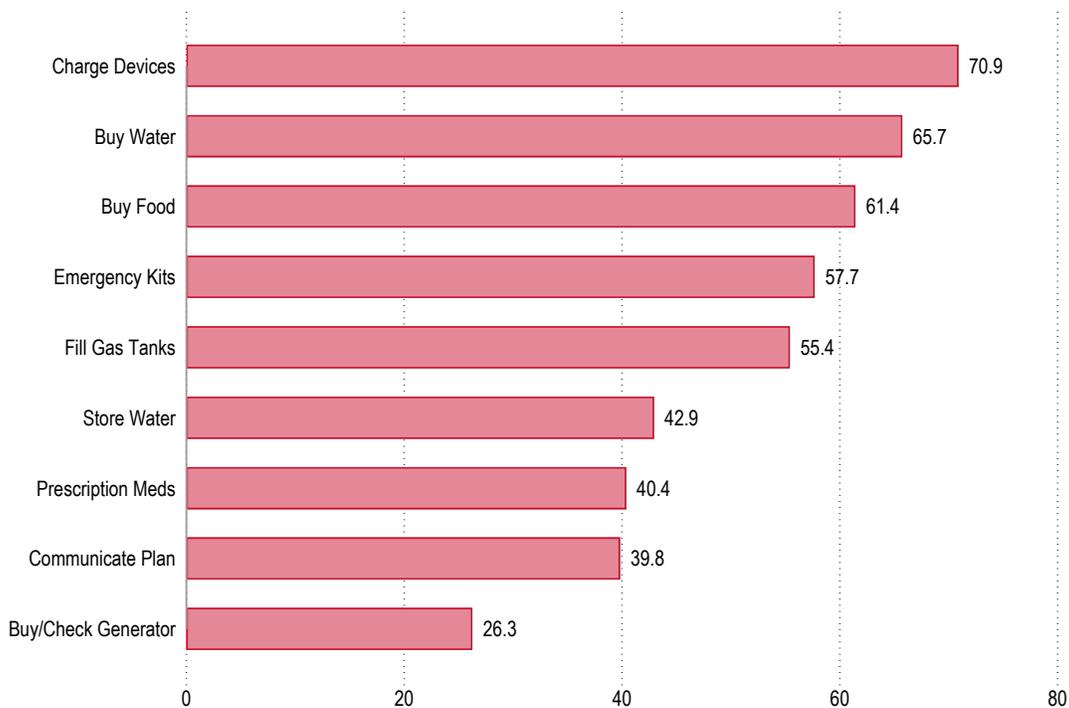
Figure 2: Percentage of respondents with blackouts during different natural disasters by county and Hurricane Beryl wind swath



Preparedness for the 2024 Hurricane Season

In addition to experiences with blackouts, the survey asked respondents about the measures they took to prepare for the 2024 hurricane season (see Figure 3). The preparedness measures included in the survey were: *charge all electronic devices, buy bottled or canned water, purchase non-perishable food items (e.g., canned food, dry goods), buy or prepare emergency kits (flashlights, batteries, first aid supplies), fill up gas tanks in vehicles, store water in buckets or other containers, ensure there is an adequate supply of prescription medications, communicate with family and neighbors to establish a plan, and purchase or check the functionality of a generator.*

Figure 3: Preparedness measures adopted for the 2024 hurricane season (% of respondents)

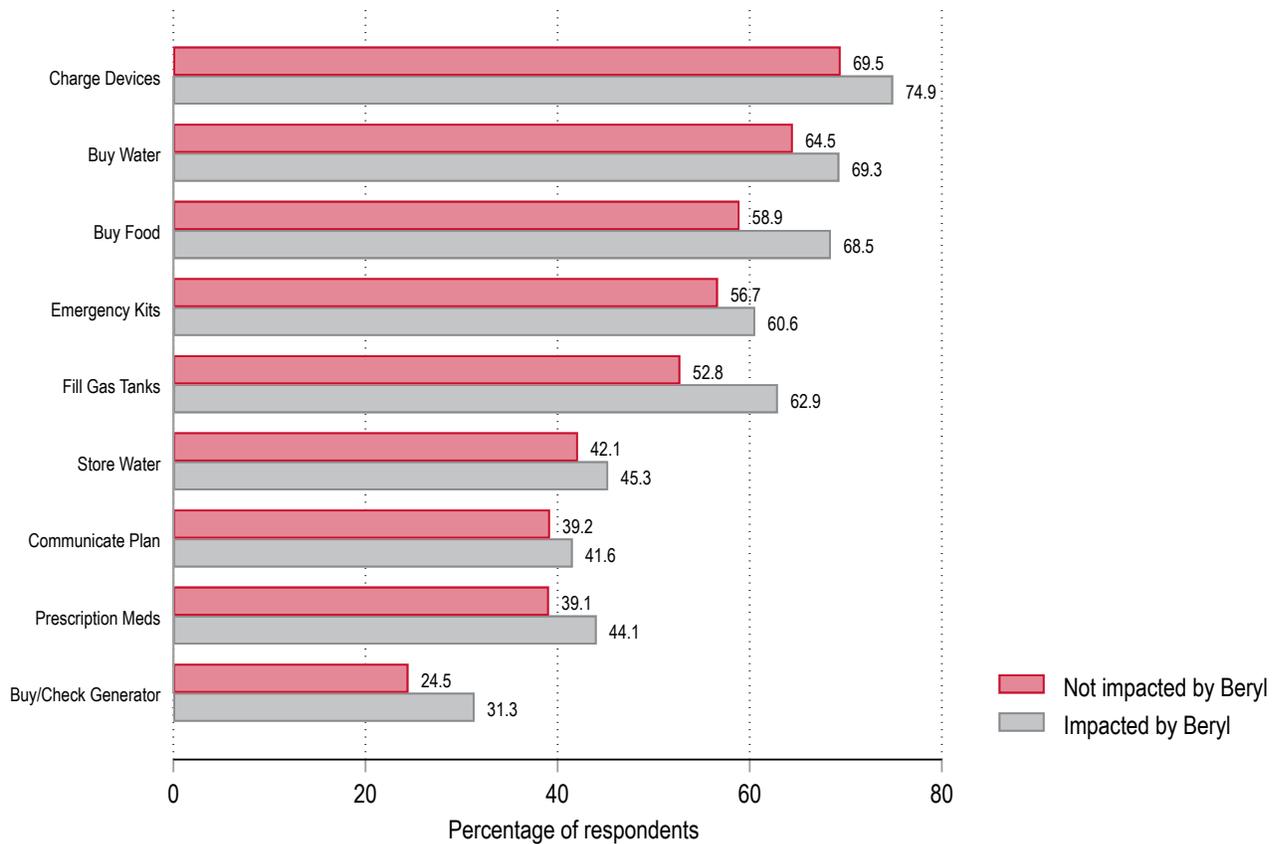


In general, Texas residents took steps to prepare for the 2024 season. Out of the 2,257 respondents, only three (0.13%) did not take any steps to prepare for this year's hurricane season. The most common measure of preparedness was charging electronics (71% of respondents) followed by buying drinking water (66%) and non-perishable food (61%). The least common way of preparing for the hurricane season was buying a generator, with only 26% of respondents reporting they had purchased a generator or checked the functionality of one previously purchased.

Figure 4 shows how preparedness varied by whether respondents were in Beryl's path. On average, even before Beryl made landfall in Texas, respondents residing in zip codes

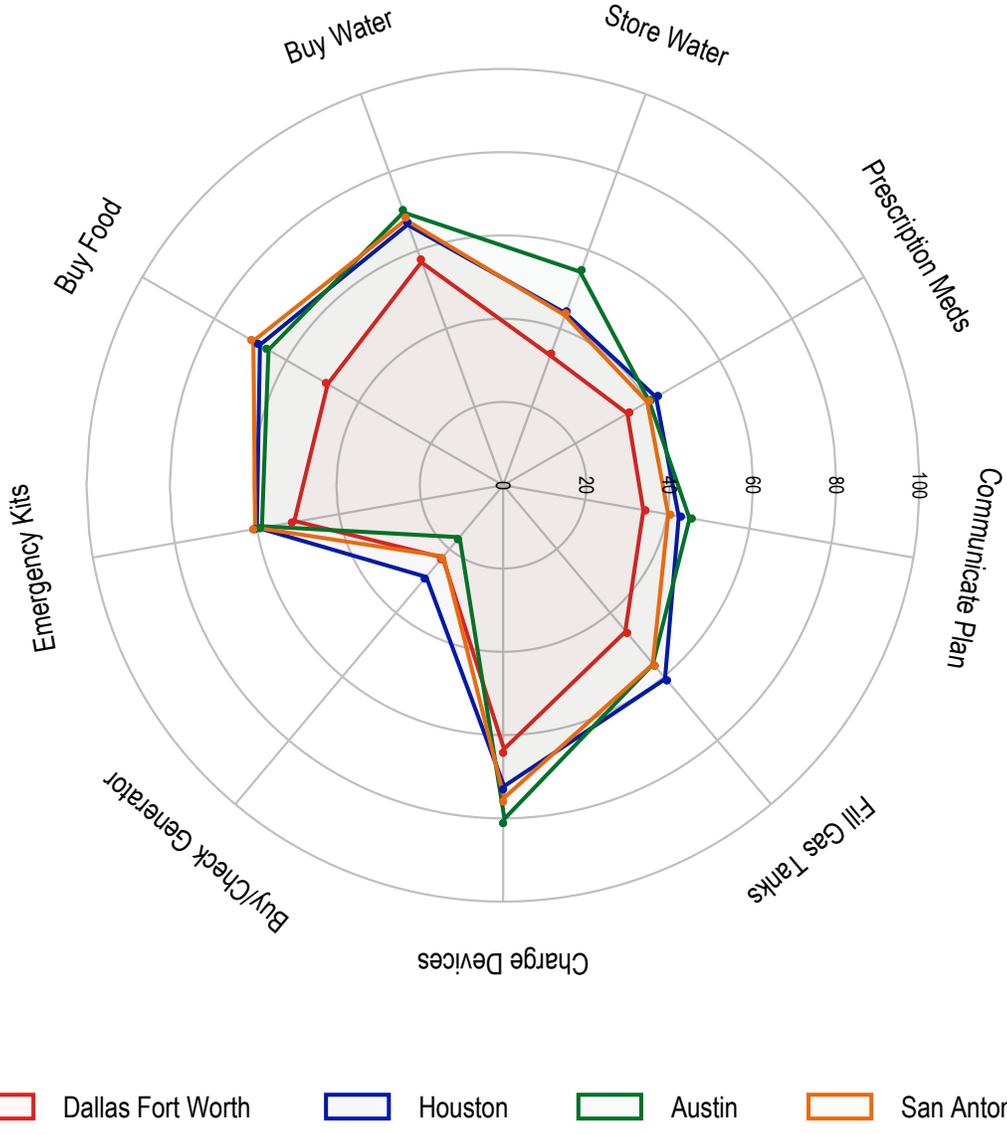
in Beryl’s wind swath took more steps to prepare for the 2024 season. For instance, respondents in Beryl’s path were more likely to fill up on gas and purchase non-perishable food, with ten percentage point gaps each between respondents in Beryl’s path and those elsewhere.

Figure 4: Preparedness measures adopted by whether in Hurricane Beryl’s path (% of respondents)



The ways in which the Texans prepared varied by region. Figure 5 shows a radar graph with the percentage of respondents who took each measure in the four most populous metropolitan areas in Texas. Each circle represents a 20% increment, and each point on the exterior of the graph corresponds to a specific preparedness measure. The **red** line shows the percentages for the Dallas Metropolitan Area, the **blue** line for Houston, the **green** line for Austin, and the **orange** line for San Antonio.

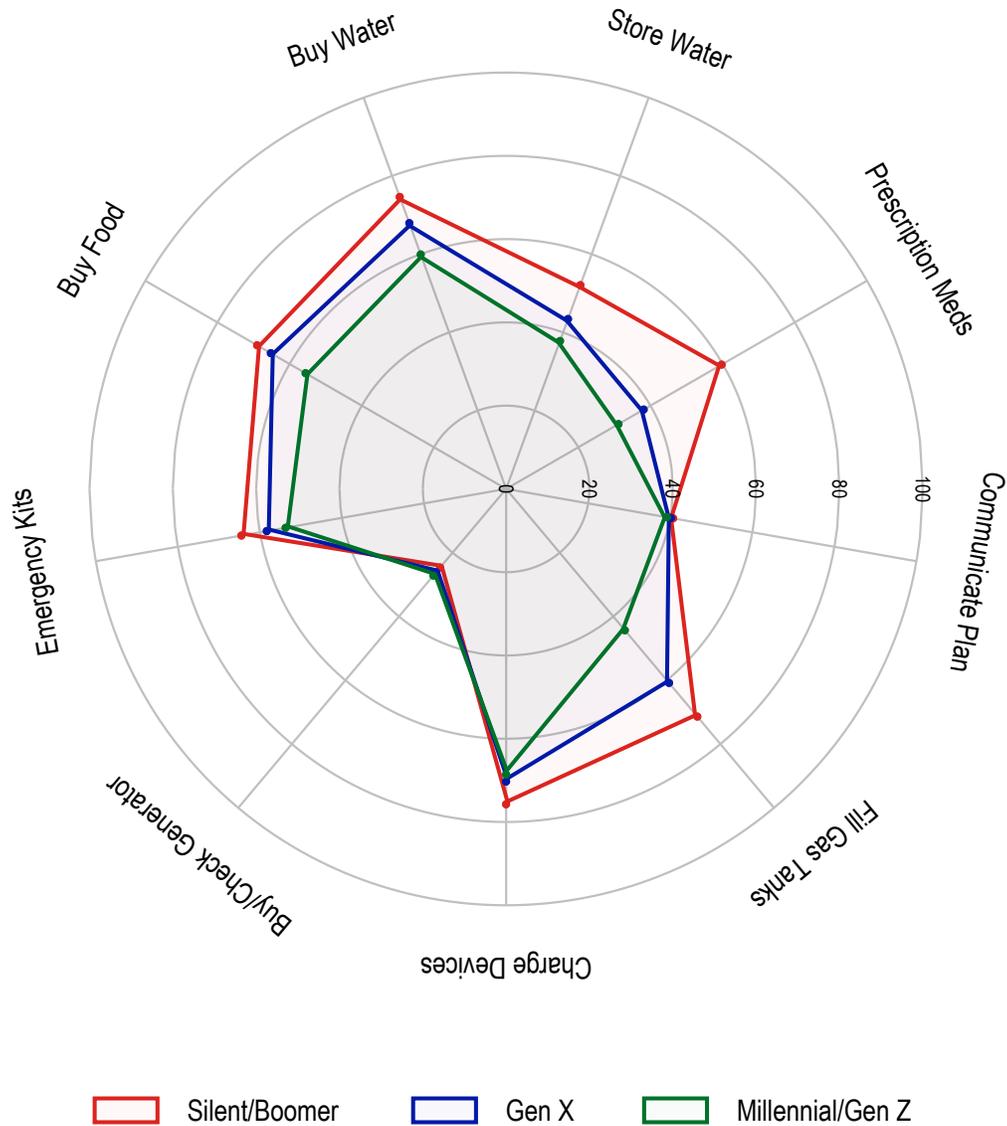
Figure 5: Preparedness measures adopted for the 2024 hurricane season by metropolitan area (% of respondents)



While the Houston, Austin, and San Antonio metropolitan areas presented similar aggregated numbers in how respondents prepared for the hurricane season, respondents from the Dallas metro area systematically reported fewer measures of preparedness, as indicated by the smaller red line in Figure 5. On average, each respondent from Houston, Austin, and San Antonio reported adopting 5, 4.9, and 4.7 measures of preparedness, respectively. In contrast, respondents from Dallas reported taking an average of 4.1

steps to prepare for the hurricane season.

Figure 6: Preparedness measures adopted for the 2024 hurricane season by generation (% of respondents)



The largest gap in preparedness between metropolitan areas was storing water. While 55% of residents in the Austin area responded affirmatively, only 34% did so in Dallas. The other two metropolitan areas fell in the middle: 44% of respondents from San Antonio and Houston reported storing water for the 2024 hurricane season. Some other notable differences in preparedness were: (1) *buying water* (DFW: 58%, HTX: 67%, ATX: 70%,

STX: 68%); (2) *purchasing non-perishable food* (DFW: 69%, HTX: 67%, ATX: 65%, STX: 70%); and (3) *buying a generator* (DFW: 23%, HTX: 29%, ATX: 16%, STX: 22%).

In addition to variation across Texas regions, we also see differences in preparedness by generation (Figure 6). Overall, older respondents, those in the Silent or Boomer generations, took the most steps, while younger respondents were the least likely to take any of the steps in preparation for the 2024 hurricane season. The least common steps taken by all respondents were buying a generator and preparing emergency kits. The younger generations were slightly more likely to say that they purchased or checked a generator - 27% compared to 25% of the Silent/Boomer generations and 26% of Gen X - but the difference is not statistically significant. Filling up on gas and ensuring an adequate supply of prescription medications saw the biggest gap between the oldest and youngest respondents. While 60% of Silent/Boomer respondents made sure to have an adequate supply of prescription medications, 38% of Gen X and 31% of Millennial/Gen Z respondents did so. Similarly, 71% of the Silent/Boomer respondents reported filling up on gas compared to 61% of Gen X and 44% of the Millennial/Gen Z respondents.

Conclusion

The findings from the Texas Trends Survey 2024, especially in the context of Hurricane Beryl, highlight critical lessons on the impacts of natural disasters and the preparedness of Texans for extreme weather. This report, fielded before Hurricane Beryl struck, offers insights into how past experiences with blackouts and natural disasters shape current and future preparedness strategies.

Texans have faced significant disruptions due to natural disasters, with power outages being a recurrent issue. The survey indicates that blackouts are not isolated incidents but rather a frequent consequence of severe weather events. This persistent issue underscores the vulnerability of the power infrastructure in Texas, particularly in the Houston metropolitan area and other coastal regions. The Houston metro area, including counties like Harris, Galveston, and Fort Bend, consistently experiences higher rates of blackouts during extreme weather events. This trend suggests a need for targeted interventions to bolster infrastructure resilience in high-risk areas.

While a substantial number of Texans take steps to prepare for hurricane seasons, significant gaps remain. The most common preparedness measures include charging electronic devices and purchasing essential supplies like water and non-perishable food. In response to the low resiliency of the electricity grid and the increasing frequency of long-lasting blackouts affected by extreme weather events and natural disasters have led some Texans to purchase power generators. While this is a natural response for a household, especially for those who can afford the investment, the measure is far from optimal for the community. Reliance on gasoline or natural gas-powered generators is

inefficient and results in higher air and noise pollution.

While our survey was conducted before Hurricane Beryl's landfall, the storm's aftermath aligns with our findings: it caused extensive power outages, affecting over two million residents in the Houston area alone. Moreover, the response to Beryl, marked by delays in power restoration and ongoing criticism of service providers and their communication strategies, underscores the importance of proactive measures and robust disaster response strategies, emergency preparedness, and infrastructure resilience. In a subsequent survey we will assess the impacts of Hurricane Beryl and Texans' willingness to pay for interventions aimed at reducing blackouts and making Texas more resilient to extreme weather events.

Technical Appendix

The Texas Trends Survey is a five-year survey project to study Texas's changing population launched in 2021 by the Hobby School of Public Affairs at the University of Houston and the Executive Master of Public Administration Program in the Barbara Jordan – Mickey Leland School of Public Affairs at Texas Southern University.

This is fourth survey in the series and fielded between June 20 and July 1, 2024. The survey was conducted in English and Spanish, with 2,257 YouGov respondents 18 years of age and older (including an oversample of Black Texans), resulting in a confidence interval of +/-2.1 for the overall survey population and +/- 2.5 for the sub-population of 1,484 likely voters.

Survey respondents were matched to a sampling frame on gender, age, race/ethnicity, and education and are representative of the Texas adult population. The results of this 2024 statewide survey will be presented in five separate reports: the November 2024 election, school vouchers, housing, immigration, and climate challenges. This special report examines respondents' experiences with natural disasters and extreme weather events and preparedness for the 2024 hurricane season.