

# TEXAS TRENDS 2023

## IMPACT OF SUMMER HEAT WAVE



Hobby School of Public Affairs  
UNIVERSITY OF HOUSTON



TEXAS SOUTHERN UNIVERSITY  
Barbara Jordan – Mickey Leland  
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## Acknowledgments

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# Executive Summary

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- Texans overwhelmingly found Summer 2023 to be hot, extremely and very hot.
  - 75.8% of Texans said Summer 2023 was hotter compared to previous ones; 20.5% found it to be about the same as previous ones.
  - Texans older 65 were the most likely to say the summer was hotter than previous ones, while those 18 to 29 were least likely.
  - No respondents over 65 years old said the summer was cooler than previous ones.
- The extreme heat waves this summer impacted Texans' monthly electricity bills.
  - 66.3% of respondents reported their summer electricity bills increased compared to the previous summer; 22.6% said their monthly electricity bills stayed about the same.
  - Hispanic respondents had the highest proportion reporting higher bills with 72.3% saying their bills increased compared to 2022.
  - 61.2% of white, 64.7% of Black, 70.6% of Asian, Native American, Middle Eastern, mixed and other respondents reported the same.
  - Older age groups were also more likely to report higher bills compared those 18 to 29 years old.
- Higher electricity bills in June, July, and August of 2023 were a result of higher usage and higher prices according to respondents.
  - 35.5% reported that the combination of higher usage and price per kWh was the reason for higher electricity bills; 32.4% reported that it was higher electricity usage alone.
  - 45.9% of respondents older than 65 said it was a combination, whereas only 23.7% of those 18-29 did so.
  - The youngest age group (18-29) was the only age group in which a plurality of respondents said it was higher usage alone with 35.9% attributing higher bills to increased usage.
- Texans took a variety of measures to reduce energy usage this summer.
  - The most common measure was turning off lights when not in use (74.9% of respondents).

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- 40.2% of Texans reported raising their thermostats by a degree or several degrees, and 38.8% said they used energy efficient light bulbs.
  - More than one-fifth of respondents (22.2%) said they bought additional fans.
  - Respondents reported experiencing and perceiving impacts of extreme weather.
    - 31.3% of respondents reported being affected by droughts and 28.7% said that droughts had affected people they know.
    - A third of respondents (32.6%) said that people they know had experienced health impacts from heat waves; 19.3% said they themselves experienced such health impacts.
    - 41.6% of respondents said the number of people concerned about extreme weather was increasing in their communities; 33.8% said the number of people protecting their homes from extreme weather was also increasing.

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# Introduction

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According to NASA's Goddard Institute of Space Studies (GISS), the summer of 2023 marked Earth's highest recorded temperature since global records began in 1880. The temperatures for June, July, and August were 0.41 degrees Fahrenheit higher than any other summer in NASA's records and 2.1 degrees Fahrenheit above the average for summers between 1951 and 1980.<sup>1</sup>

This latest record arrives amid unprecedented heat affecting various parts of the globe. Extreme heat has intensified destructive wildfires in Canada and Hawaii, as well as scorching heatwaves in South America, Japan, Europe, and the United States.

Texas did not escape recording breaking heat. According to Honghai Zhang, Assistant Professor in Earth and Atmospheric Sciences at the University of Houston, "This summer, Texas saw record heat and severe droughts across the entire state (and some wildfires). This summer has been the hottest summer for Houston, and the severe drought conditions have forced several big cities in the state, including Houston and Austin, to impose restrictions on water usage. These extreme weather events might get more frequent and severe as the climate warms up. Texas needs to be prepared and ensure enough supplies of electricity and water when these extreme weather conditions strike."<sup>2</sup>

As part of a five-year research project to examine evolving demographics and public attitudes in Texas called "The Texas Trends", 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 launched the Texas Trends Survey in 2021. The third wave of this state-wide survey of Texans covered local and primary elections, political attitudes, attitudes toward electric vehicles, and experiences and attitudes of Texans during the summer of 2023.

Texas Trends Survey Wave 3 is a representative sample of Texas residents. Alongside a cross-section of all Texans, the 2023 survey incorporates an oversample of Black Texans to ensure an impartial and statistically sound depiction of varied perspectives. Wave 3 was conducted from October 6 to October 18, 2023 in English and Spanish, with 1,914 YouGov participants aged 18 and above. The respondents were matched with a sample frame based on gender, age, ethnicity, and educational background, making them representative of the adult population in Texas. The findings from the 2023 statewide survey will be presented in six distinct reports covering state propositions, vouchers, and school choice, the 2024 primary elections, electric vehicles, extreme

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<sup>1</sup><https://www.nasa.gov/news-release/nasa-announces-summer-2023-hottest-on-record>

<sup>2</sup>Interview with Honghai Zhang, 10/29/2023.

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weather, and climate change.

This is the fourth report which delves into public attitudes regarding extreme weather conditions encountered during Summer 2023. We inquired about Texans' impressions of the weather compared to prior summers, changes in their electricity usage, various steps they took to mitigate the impact on high temperatures on energy consumption, and perceived attitudes within their community regarding extreme weather conditions. Overall, we find that Texans are concerned about extreme weather events and are taking steps to mitigate their impact and costs. Moreover, older respondents, especially those over 65, and Hispanic respondents reported the toughest experiences with the extreme heat this past summer.

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# The Summer of 2023 according to Texans

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What did respondents think about the summer of 2023 in Texas? The survey first asked respondents about the first thing that comes to their minds when thinking about Summer 2023. Respondents were not limited in their choice of words and there were no restrictions on the length of their responses.

We employed a text analysis method to identify the most frequently occurring words and phrases in their answers. Figure 1 illustrates the most prevalent words in the form of a "word cloud," where the size of each word indicates how often it was used to describe the 2023 Summer. The most commonly used words included "hot" with 1,114 mentions (out of 1,1914), "heat" (143 mentions), "dry" (113 mentions), "extremely" (96 mentions), and, of course, "summer" (314 mentions).

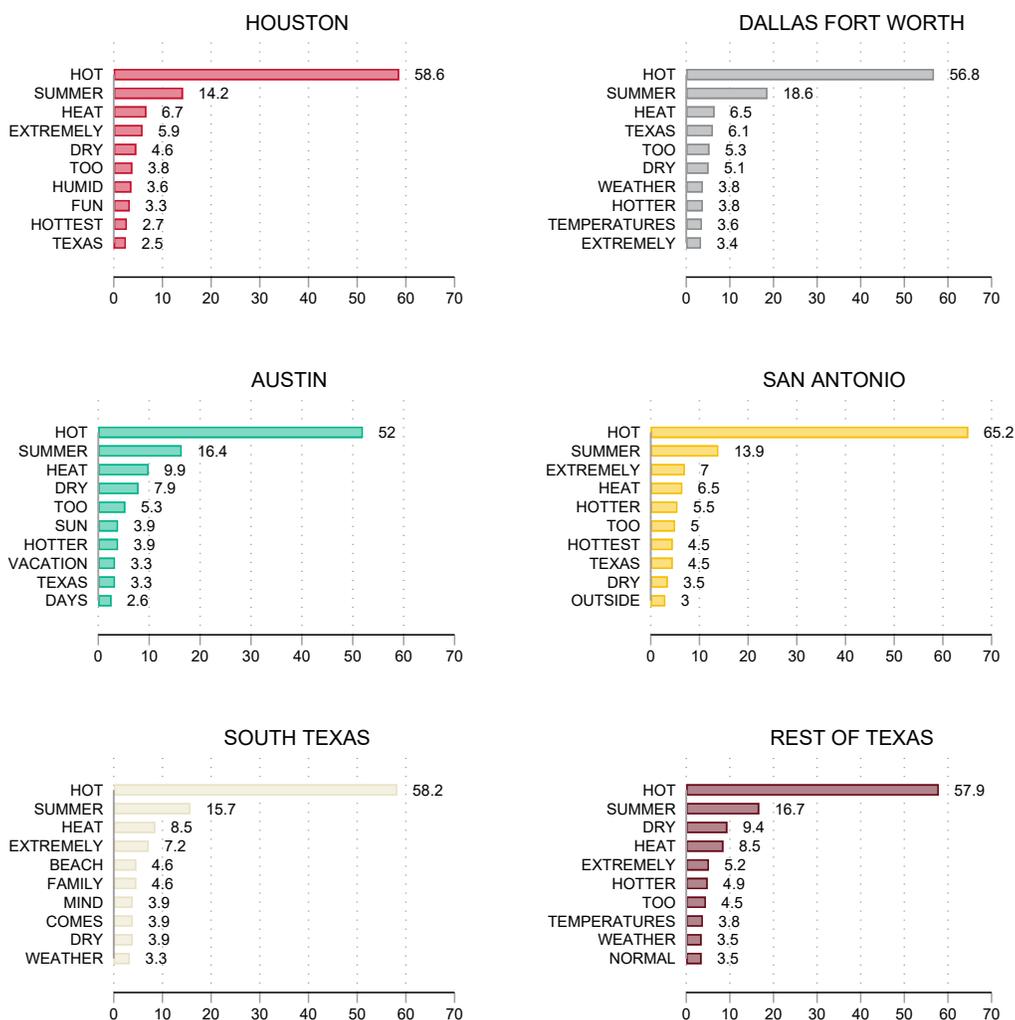
**Figure 1:** How would you describe the summer? What is the first thing that comes to mind when you think about it?



Response patterns were similar regardless of the metropolitan area where respondents live. Figure 2 shows the most frequent words people used to describe the summer as a percentage of total respondents in six geographical areas in Texas: Houston, Dallas-Fort Worth, Austin, San Antonio, South Texas, and the rest of Texas. For all the areas, the most common word respondents used to describe the summer was "hot." The San Antonio area showed the highest

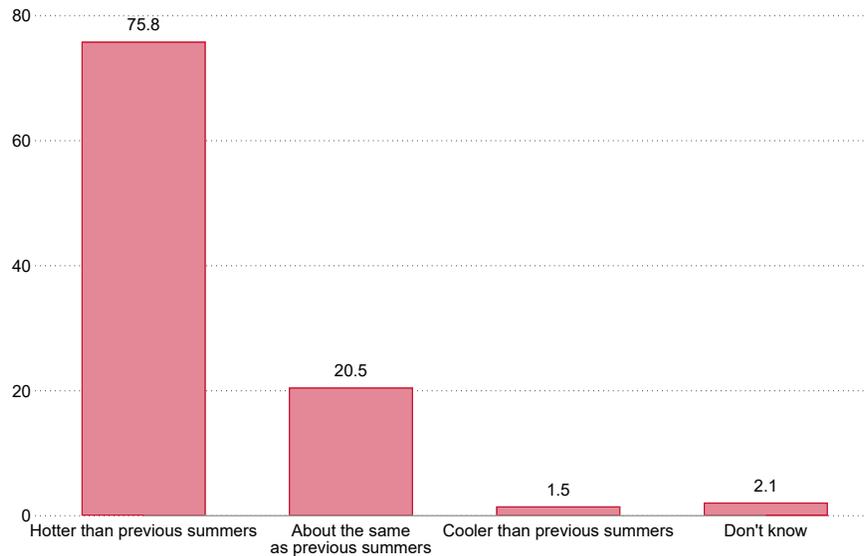
use of the word "hot," with 65.2% of respondents using it to describe the summer. In all areas, more than half of the respondents used "hot" to describe the past summer. The other most frequently used words were also related to the extreme heat experienced last summer, such as "heat," "extremely," "dry," and "sun."

**Figure 2:** How would you describe the Summer? What is the first thing that comes to mind when you think about it? (By Metro Area)



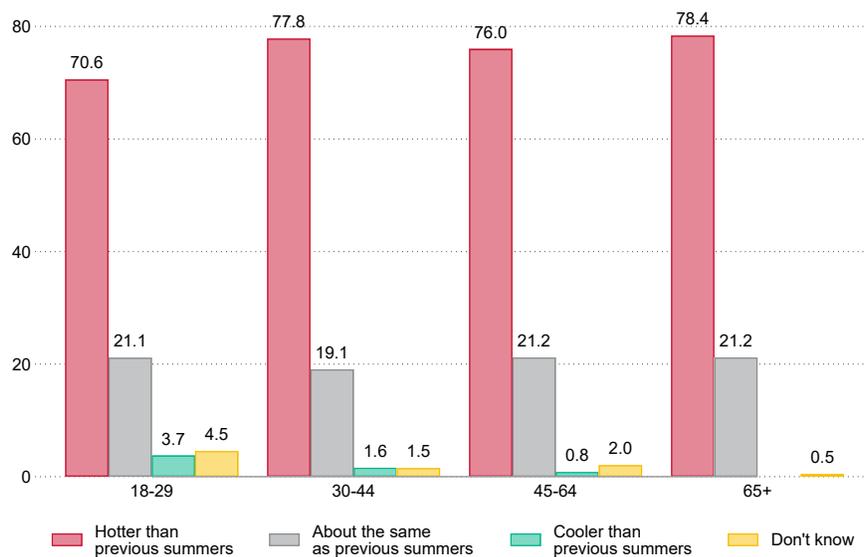
We also asked the respondents about their perception of 2023 summer temperatures in Texas compared to previous years. Figure 3 shows the distribution of their responses. More than three-quarters of respondents (75.8%) indicated that the summer of 2023 was hotter than previous summers. Just one-fifth (20.5%) of respondents reported Summer 2023 was about the same as previous summers, while only 1.5% stated it was cooler compared to other ones.

**Figure 3:** How would you describe the temperature of this most recent summer in Texas compared to previous ones?



While the majority of respondents across age groups perceived Summer 2023 to be hotter compared to previous ones, Figure 4 reveals interesting differences. First, the youngest age group (those between 18 and 29 years old) has the lowest proportion (70.6%) of respondents saying Summer 2023 was hotter, while those older than 65 most intensely perceived the summer to be hotter (78.4%), an eight percentage point difference with the youngest age group. Notably, no respondents in this older age group indicated that the summer was cooler than previous ones. The other two groups, aged 30 to 44, and 45 to 54, reported similar proportions to the oldest group, with 77.8% and 76.0%, respectively, stating that this summer was hotter than previous ones.

**Figure 4:** Perception of temperature during most recent summer in Texas by age group



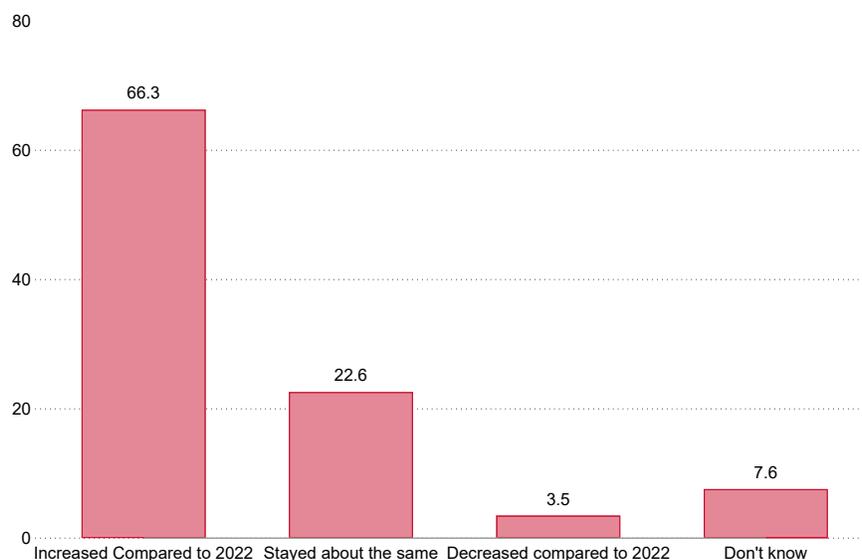
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# Extreme Heat and Energy Consumption

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The survey asked about respondents' electricity consumption this summer compared to the previous one in 2022. As shown in Figure 4, higher temperatures were accompanied by increased energy consumption. Approximately two-thirds of respondents (66.3%) reported an increase in their monthly electricity bill compared to 2022. About 22.6% stated that their bills remained the same, while only 3.5% mentioned a decrease.

**Figure 4:** Compared to July, August, and September of 2022, have your monthly electricity bills this year increased, decreased, or stayed about the same?



When examining demographics, we observed heterogeneous response rates based on race, ethnicity, and age. Figure 5 shows that the race/ethnic group that reported the highest increase in their electricity bills compared to 2022 was Hispanics at 72.3%. Seventy percent of respondents in the 'Other' category, which includes Asian, Native American, Mixed, Middle Eastern, and other respondents, reported higher electricity bill. Nearly 65% of Black respondents (64.7%) said their electricity bills were higher in 2023 compared to 2022, while 61.2% of white respondents reported

similarly, more than ten percentage points lower than Hispanic respondents.

**Figure 5: Change in monthly electricity bills by race**

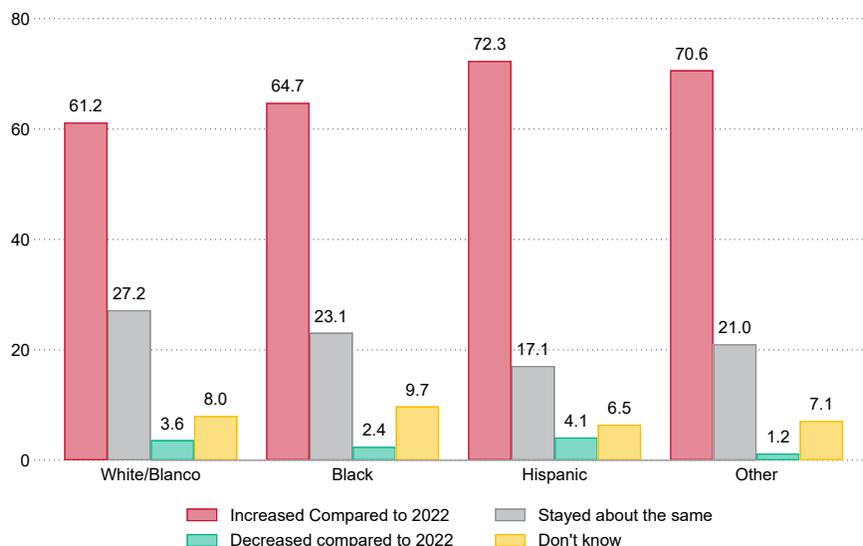
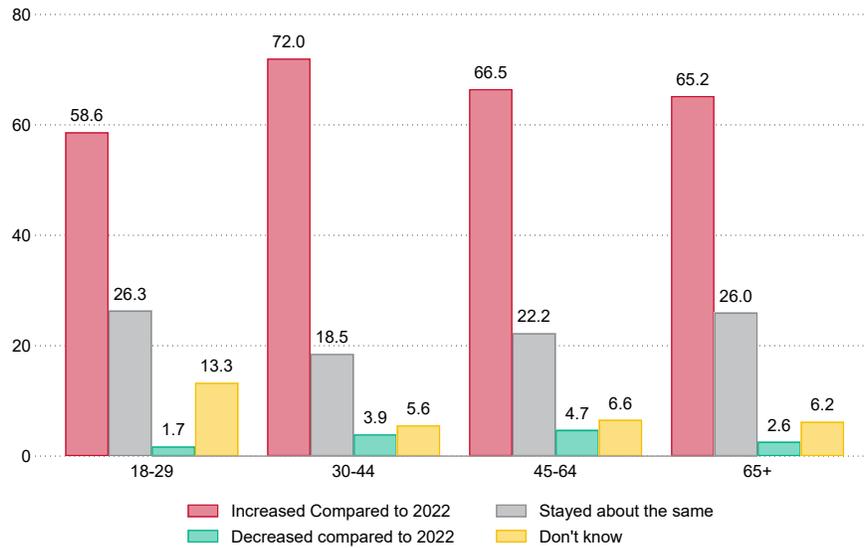


Figure 6 illustrates the variation in respondents' responses regarding changes in monthly electricity bills by age groups. The age group that predominantly reported an increase in their monthly electricity bills compared to 2022 were those aged 30 to 44, at 72%. Those aged 54 to 64 and those aged 65 or older reported rates of 66.5% and 65.2%, respectively. In contrast, the youngest age group, while still the majority, reported at a lower rate, with only 58.6% indicating an increase in their monthly electricity bills compared to 2022, nearly 15 percentage points lower than those between 30 and 44 years old.

**Figure 6:** Change in monthly electricity bills by age groups



The increase in the monthly electricity bills reported by two-thirds of respondents in Figure 4 could be attributed to different reasons: an increase in their electricity plan's price per kWh, higher electricity usage, or a combination of both; therefore, we asked respondents about the reasons for their higher electricity bills. Figure 7 shows that the plurality of respondents reported a combination of higher price per kWh and higher consumption as the cause of higher electricity bills. Nearly a third of respondents (32.4%) said that their higher bills were a result of only increased consumption compared to a quarter (25.5%) who said it was because of higher price per kWh.

**Figure 7: Reasons for higher electricity bills in 2023 compared to 2022**

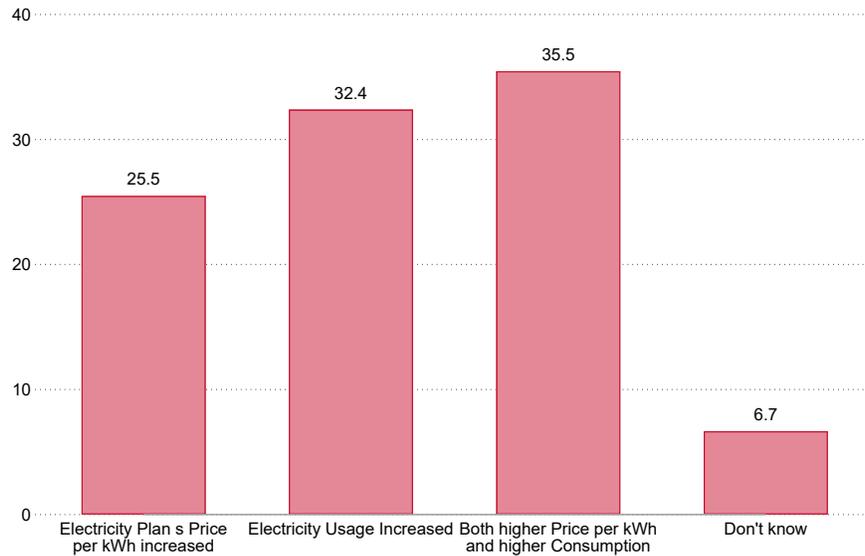
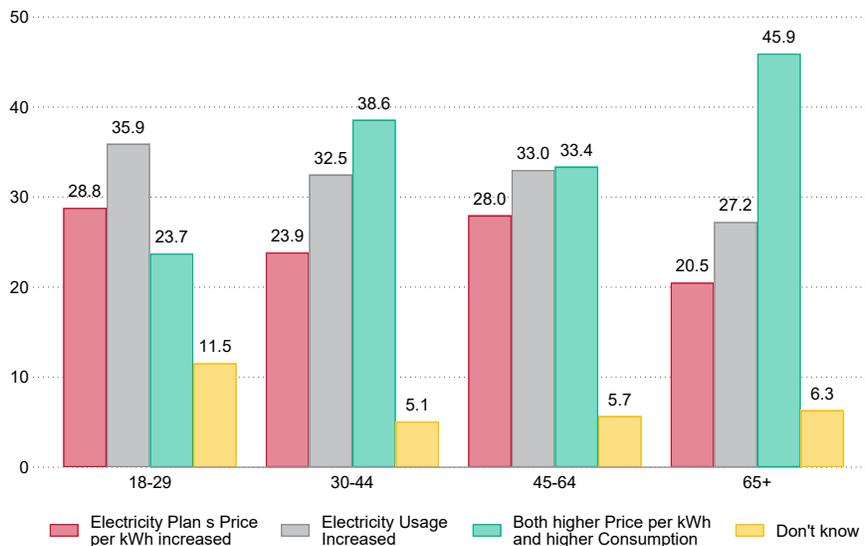


Figure 8 shows how reported reasons for higher electricity bills varied by age groups. There is a significant generational contrast in responses, especially between those aged 18 to 29 and those aged 65 or older. Among the youngest group, the most commonly chosen reason was an increase in usage (35.9%). By contrast, for the other three age groups, the most frequently chosen option was the combination of increased usage and higher price per kWh. The gap in choosing the combination of increased usage and price per kWh between the oldest and youngest age group is over twenty percentage points (45.9% compared to 23.7%).

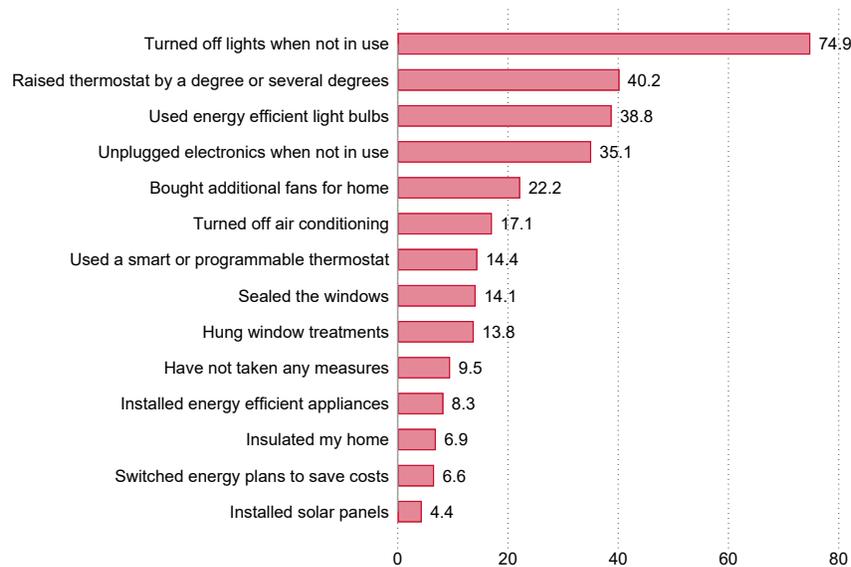
**Figure 8: Reasons for increase in monthly electricity bills by age**



Finally, we inquired whether respondents took measures to reduce their household energy consumption during the past summer season. Figure 9 displays the results. Three-quarters of

respondents indicated that they turned off the lights when not in use, making this option the most popular choice. Four out of ten respondents mentioned that they raised the thermostat by a degree or several degrees to save energy. Similar proportions of respondents (14%) reported using smart thermostats and sealing windows to reduce their energy use this summer. Around 10% of respondents said they did not take any measures to reduce their energy use and less than 10% reporting insulating homes, installing energy efficient appliances, or installing solar panels.

**Figure 9:** Which of the following measures, if any, did you take to reduce your household's energy use during this past summer season? Please select all that apply



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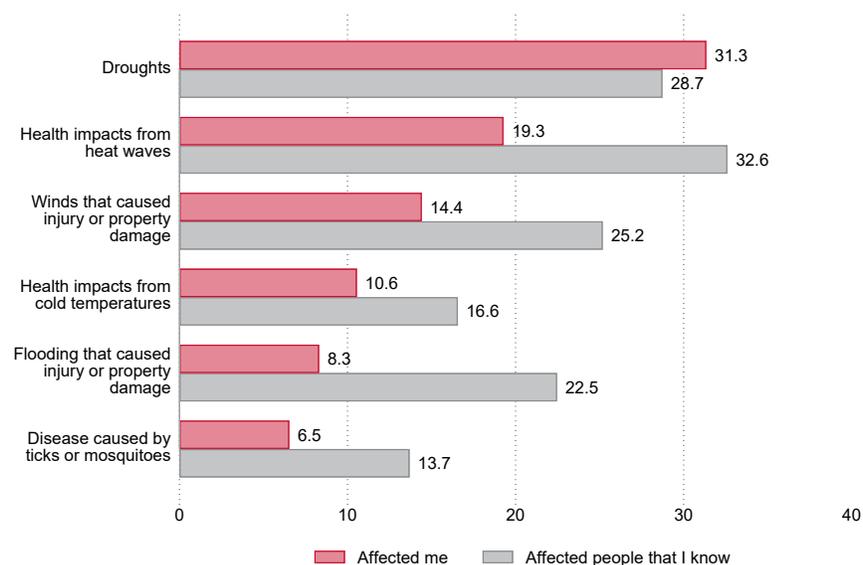
# Impact of Extreme Weather Conditions

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How did extreme weather conditions affect the lives of Texans? The survey gauged the impact of extreme weather on the lives of Texans by asking respondents about whether they or people they know had been affected by extreme weather. We did not restrict the answers to the most recent summer, and the list of events included occurrences unrelated to high temperatures, such as health impacts from cold temperatures or wind-related injuries or property damage.

Figure 9 shows that the most common extreme weather event that affected the respondents themselves was droughts, with 31.3% of respondents reporting experiencing droughts personally. Close to one-fifth of respondents reported experiencing health impacts from heatwaves and 14.4% of respondents reported being personally affected by winds that caused injury or property damage. Only 6.5% of respondents reported being personally affected by mosquito or tick-borne diseases.

**Figure 9:** Below are some of the impacts of extreme weather events. Have they affected you or people that you know? Please select all that apply for each row



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Health impacts from heatwaves was the most frequently selected impact of extreme weather that affected people the respondents know, with 32.6% respondents reporting heat waves impacted people they know. Droughts was the second most common impact affecting people that respondents know (28.7%), followed by wind and flooding. The percentage of respondents reporting that extreme weather impacts affected people they know was more than double than the percentages being affected personally for flooding and mosquito and tick-borne diseases.

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# Changes among Texans

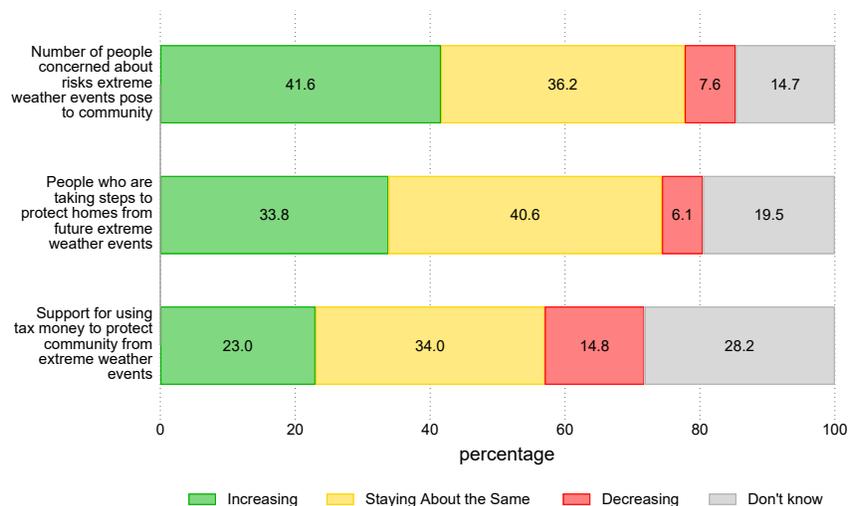
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Lastly, we asked respondents whether they observed changes in their community regarding attitudes toward extreme weather events. Figure 11 illustrates that 41.6% of respondents said that the number of people concerned about the risks extreme weather events pose to their community had increased, while 36.2% said it remained about the same, and 7.6% reported a decrease.

About a third of respondents (33.8%) said the number of people in their communities who are taking steps to protect their homes from future extreme weather events increased. Two-fifths reported that the number stayed about the same, whereas only 6.1% reported a decrease.

Finally, 23% of the respondents said that support for using tax money to protect the community from extreme weather event was increasing, while 34% said it remained about the same, and 14.8% perceived a likely decrease.

**Figure 11:** In your opinion, how would you say the following are changing in your community?



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# Survey Sample Demographics

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The weighted survey population is split relatively equally between women (51.2%) and men (48.8%). White Texans make up 44.5% of the sample, Latino and Hispanic Texans 35.9%, Black Texans 12.5%, and other race and ethnic groups account for 7.15%. Regarding age groups, 20.9% of respondents fall between 18 and 29 years old, 30.3% belong to the group aged 30 to 44 years old, 31.4% are in the 45 to 64-year-old age group, and 17.5% are over 65. Respondents with lower family income (earning less than \$30,000 per year) comprise 34% of this population. Respondents with lower family income (earning less than \$30,000 per year) make up 34% of respondents, while 39% of respondents have family incomes between \$30,000 and \$80,000. Respondents earning more than \$80,000 represent 26.5% of respondents in the sample. Nearly 26% of respondents live in the Dallas Fort Worth metro area (25.9%), 22.4% live in the Houston metro area, while, 7.8% live in the Austin Area, 11.7% live in the metropolitan area of San Antonio, 9.8% live in the South Texas Area, and 22.3% live in the rest of Texas.