**FINAL REPORT**

# Public Survey on the National Hurricane Center's Arrival of Tropical-Storm-Force-Winds Product

**February 2018**

**Responsive Management**
**Harrisonburg, Virginia**

Written under contract for the
NOAA Office for Coastal Management
*www.coast.noaa.gov*


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Established in 1990, Responsive Management has conducted survey research regarding public attitudes toward fish and wildlife, natural resource, and outdoor recreation issues for 27 years. The firm's mission is to help resource management agencies and organizations better understand and work with their constituents and the public. Utilizing an in-house, full-service multi-modal survey center, Responsive Management's research associates have conducted more than 1,000 telephone, mail, and online surveys, focus groups, and personal interviews exclusively on fish and wildlife, natural resource, and outdoor recreation issues. Learn more at *www.responsivemanagement.com.*


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## NOAA's National Weather Service

The National Weather Service (NWS) provides weather, water and climate data, forecasts and warnings for the protection of life and property and enhancement of the national economy. The provision of these services supports a "Weather-Ready Nation," wherein society is prepared for and responds to weather-dependent events. NWS offices in communities across the United States and its territories, supported by regional and national centers, provide the authoritative information needed by Americans, including national, regional, state, tribal, and local authorities, to plan, prepare, mitigate, and respond to natural and human-caused events. Similarly, the National Hurricane Center (NHC) works to save lives, mitigate property loss, and improve economic efficiency by issuing the best watches, warnings, forecasts, and analyses of hazardous tropical weather and by increasing understanding of these hazards.

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# Executive Summary

The National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) has been increasingly integrating social science with products to communicate forecasts and warnings to improve communication and the impact of products and services. Specifically, the Hurricane Forecast Improvement Program (HFIP) socio-economic research and recommendations report (Link) provided recommendations to help the NWS continue to improve its communication of tropical cyclone conditions and extra-tropical storms. This report is focused on the National Hurricane Center's (NHC) experimental arrival of tropical-storm-force winds (ATSFW) graphics and findings from a survey of public perception. This information is important for coastal community preparedness activities, which become difficult once winds reach tropical storm force.

The NHC has developed a number of iterations for graphics and associated data sets depicting the potential time of arrival of sustained winds of tropical-storm-force that have largely been reviewed by emergency managers, broadcast meteorologists, and local NWS Weather Forecast Offices. This new product accounts for forecast uncertainty and can better prepare communities with timing the completion of preparations before a storm. Prior decision-based information has been based upon deterministic forecasts of wind arrival timing that does not account for a number of various forecast uncertainties. Timing information that incorporates forecast uncertainty has been made available but within the NHC Wind Speed Probability text product.

This study consisted of design, implementation, and analysis of an online survey of a representative sample of the public on an experimental version of the arrival of tropical storm force winds graphics during the 2017 hurricane season. Specifically, this study focused on the general public and their use of the ATSFW graphic that will be available online. Key focus areas of the survey include the publics' interpretation and understanding of the prototypes, how the public will act on this information, and their rating of the product's potential usefulness and suggestions for improvement.

## Study Design

The area of interest includes the states of the Eastern Seaboard, the Gulf Coast, and Hawaii. Puerto Rico and the U.S. Virgin Islands were to be included in the survey; however, the islands were damaged by Hurricanes Irma and Maria and the survey could not be administered during the survey period. The survey was administered within coastal counties as well as inland counties, with a total response rate of approximately 2,100. The survey questions were developed across four key topics:

1. Storm preparations that study area residents have taken in past events.
2. Their knowledge levels regarding advisories and warnings, as well as the importance that they place on advisories and warnings.
3. Their opinions of the graphics that they are shown in the survey. This section shows the ratings that they give to various aspects of the graphics.
4. The sources of information that study area residents use, including their use of any NOAA websites such as the National Hurricane Center's website.

The NHC developed four regional graphics based on historical storms for survey respondents to examine and use in the survey. Two primary aspects of the graphics were tested: color vs. no-color (with regards to depicting the cumulative probability of sustained tropical-storm-force winds), and depiction of the earliest reasonable arrival time vs. the most likely arrival time of tropical-storm-force winds (ES 1).

This report provides an analysis of the public perception of the graphic, with results cross tabulated by the four regions. Results are also included in tabular format at the state level in Appendix A for each of the survey questions. However, the sampling error at the state level is relatively high due to the large number of states across the 2,180 total responses. The report also includes compilations of open-ended responses.

## General Findings

Overall, approximately 60% of respondents rated the graphic as excellent (on a scale of excellent, good, fair, poor and don't know). Feedback from less than excellent ratings indicate that respondents felt the graphic too busy and confusing, with some requesting a map key to help explain the graphic or more detailed maps to pinpoint locations. For those who saw a color graphic, respondents commonly stated that the colors are hard to see through the below map layer. Compared to other sources of information, the experimental graphic was consistently rated higher than information that they had seen in general.

**ES 1: Matrix for Testing Elements of the Graphics**

| | Color | No-color |
|---|---|---|
| **Earliest reasonable arrival time** | Color, earliest arrival time | No-color, earliest arrival time |
| **Most likely arrival time** | Color, most likely arrival time | No-color, most likely arrival time |
| *Color Example* |   |   |

# Introduction and Methodology

This project was undertaken for the National Oceanic and Atmospheric Administration (NOAA) to obtain public attitude data as part of an assessment of the graphics used in advisories and warnings of tropical storms and hurricanes, hereinafter referred to as *arrival of tropical-storm-force-winds graphics*. The National Hurricane Center (NHC) developed the experimental graphics that show the potential time of arrival of sustained tropical-storm-force winds. These graphics had been previously vetted with broadcast meteorologists and emergency managers, but will also be made available online for coastal and inland communities' use in their preparedness activities. Such information is essential for public preparedness activities, which become difficult once winds reach tropical storm force. This study entailed an online survey of a representative sample of the public in which respondents could see and use the experimental graphics, about which they answered questions. The questions were designed to assess respondents' typical behaviors in prior and recent storm events, their understanding of and ability to use one of the four graphics (described below, Table 1), and their preferences regarding various aspects of the graphic. Notably, this public survey was conducted during the 2017 hurricane season.

Two primary aspects of the graphics were tested: color vs. no-color, and depiction of the earliest reasonable arrival time vs. the most likely arrival time of tropical-storm-force winds (Table 1). The earliest arrival time graphic uses a threshold based on a 10-percent chance of seeing the onset of sustained tropical-storm-force winds before the indicated time. The second graphic shows the most likely arrival time, which is the time before or after which the onset of tropical-storm force winds is equally likely. Additionally, users will be able to overlay color depictions of the standard wind speed probabilities. Based on these two variables (color and timing), there were four groups tested in the survey, as shown in Table 1.

**Table 1: Matrix for Testing Elements of the Graphics**

| | **Color** | **No-color** |
|---|---|---|
| **Earliest reasonable arrival time** | Color, earliest arrival time | No-color, earliest arrival time |
| **Most likely arrival time** | Color, most likely arrival time | No-color, most likely arrival time |
| *Color Example* |  |  |

## Use of Online Surveying Methodology

The experimental versions of the graphic available on the internet will primarily serve the needs of the broader public audiences. An online survey was selected as the most appropriate mechanism to allow respondents to see and comment on the graphics. Additionally, a comprehensive online survey platform allows for both contacting respondents, tracking response numbers by geography, and linking respondents to the questionnaire. This platform further allowed for robust sampling within the project timeline.

## Study Area and Sampling Plan

The area of interest was the states of the Eastern Seaboard, the Gulf Coast states, and Hawaii. (Originally, Puerto Rico and the U.S. Virgin Islands were to be included in the survey; however, prior to the administration of the survey, the islands were so damaged by hurricanes Irma and Maria that the survey could not be

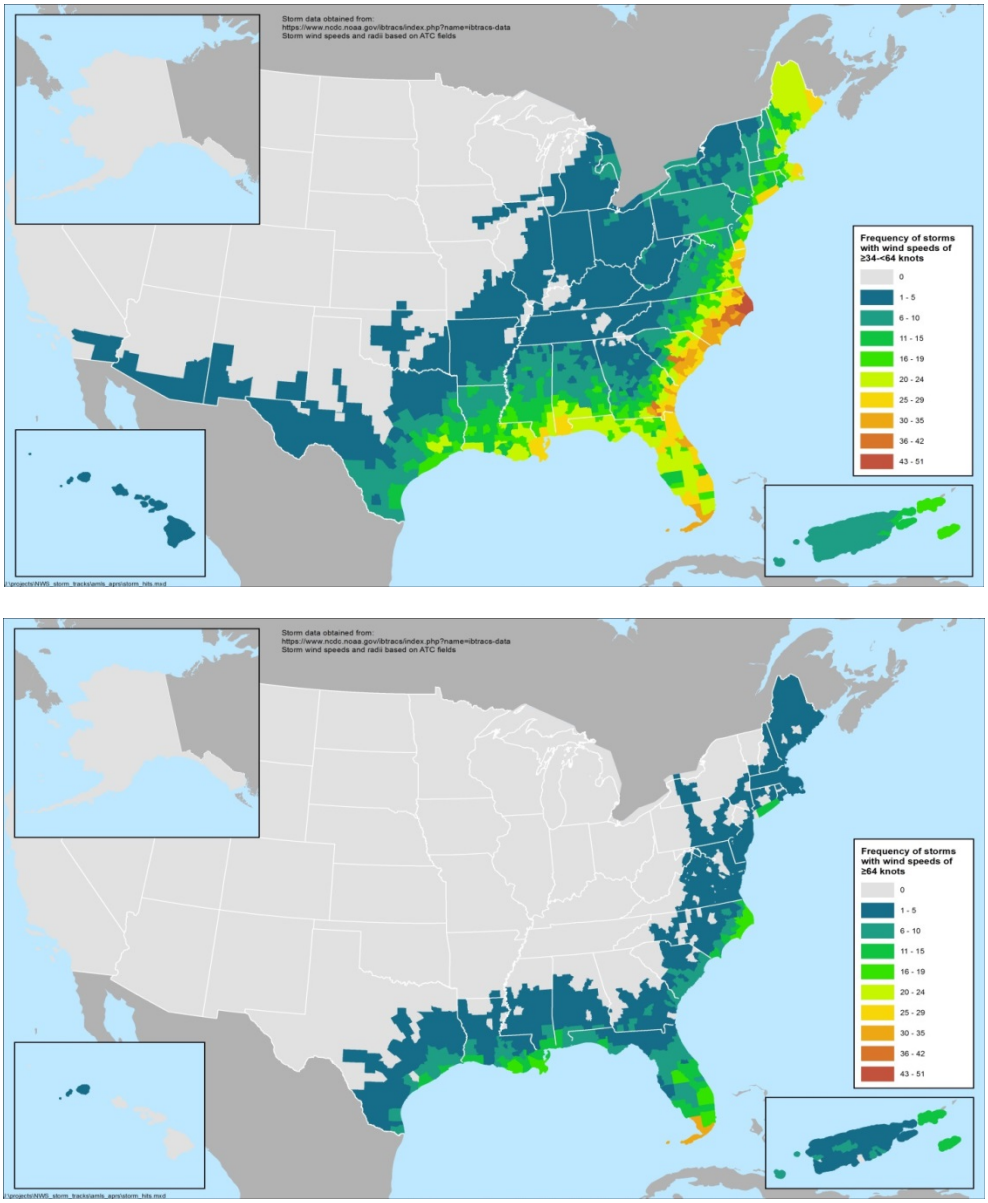
administered during the survey period.) For purposes of the survey, residents were classified based on their state of residence into one of four regions (Northeast, Southeast, Gulf, and Hawaii in its own region). Graphics in the survey were tailored to each region, wherein the NHC developed four graphics for each region based on historical storms. Analyses, as discussed below, were also conducted by region. The states that made up each region are shown in Table 2.

**Table 2: States Making Up Each Region**

| Region | States in Region |
|---|---|
| Northeast | Connecticut |
| | Delaware |
| | Maine |
| | Massachusetts |
| | New Hampshire |
| | New Jersey |
| | New York |
| | Pennsylvania |
| | Rhode Island |
| Southeast | Florida |
| | Georgia |
| | Maryland |
| | North Carolina |
| | South Carolina |
| | Virginia |
| | Washington, DC |
| Gulf | Alabama |
| | Louisiana |
| | Mississippi |
| | Texas |
| Hawaii | (The state makes up the entire region in this study.) |

Within the 21 states that encompassed the study area (with the District of Columbia counted as one of these states), both coastal and near-inland counties were included; however, all counties in Delaware, Hawaii, and Rhode Island were included, and the District of Columbia in its entirety was included. The counties (and parishes) in the study area are shown in Table 3.

The sample size by state was assessed based on shoreline length, county and state population, and historic storm path winds. The frequency of historic storm occurrences at US counties was assessed using historical storm track data (Link), specifically the “ATC”/ NOAA NHC(ATCF). Counts of historical storms that intersect some portion of a county at 34 knots, great than 34 knots, and 64 knots were tallied to inform the identification of counties to include in the sampling. This was compared to our general assumption of including the two inland counties adjacent to a coastal county.




The frequency of storms with speeds greater than 34 knots and less than 64 knots (top) and greater than 64 knots (bottom).

**Table 3: List of Counties and Parishes in the Study Area States**

| Region | State | Length[1] | County or Parish |
|---|---|---|---|
| Gulf | Texas | 4,562 | Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Harris, Jackson, Jefferson, Kenedy, Kleberg, Matagorda Nueces, Refugio, San Patricio, Victoria, Willacy |
| | Louisiana | 7,806 | Cameron, Iberia, Jefferson, Lafourche, Orleans, Plaquemines, St. Bernard, St. Mary, St. Tammany, Terrebonne, Vermillion |
| | Mississippi | 308 | Hancock, Harrison, Jackson, George |
| | Alabama | 437 | Baldwin, Mobile |
| Southeast | Florida | 11,295 | Bay, Brevard, Broward, Charlotte, Citris, Collier, Dixie, Duval, Escambia, Flagler, Franklin, Gulf, Hendry, Hernando, Highlands, Hillsborough, Indian River, Jefferson, Lee, Levy, Manatee, Martin, Miami-Dade, Monroe, Nassau, Okaloosa, Okeechobee, Orange, Osceola, Palm Beach, Pasco, Pinellas, Polk, Santa Rosa, Sarasota, St. Johns, St. Lucie, Taylor, Volusia, Wakulla, Walton |
| | Georgia | 742 | Bryan, Camden, Chatham, Glynn, Liberty, McIntosh |
| | South Carolina | 1,616 | Beaufort, Berkeley, Charleston, Colleton, Georgetown, Horry, Jasper |
| | North Carolina | 4,870 | Beaufort, Bertie, Brunswick, Camden, Carteret, Chowan, Craven, Currituck, Dare, Gates, Hertford, Hyde, Jones, New Hanover, Onslow, Pamlico, Pasquotank, Pender, Perquimans, Tyrrell, Washington |
| Northeast | Maryland | 4,289 | Anne Arundel, Baltimore City, Baltimore County, Calvert, Caroline, Cecil, Charles, Dorchester, Harford, Kent, Prince George's, Queen Anne's, Somerset, St. Mary's, Talbot, Wicomico, Worcester |
| | Virginia | 4,252 | Accomack, Alexandria, Arlington, Botetourt, Charles City, Chesapeake (City), Essex, Fairfax (City), Fairfax County, Falls Church (City), Gloucester, Hampton, Hopewell, Isle of Wight, James City, King and Queen, King George, King William, Lancaster, Manassas (City), Manassas Park (City), Mathews, Middlesex, New Kent, Newport News, Norfolk, Northampton, Northumberland, Poquoson, Portsmouth, Prince George, Prince William, Richmond County, Stafford, Suffolk, Surry, Virginia Beach, Westmoreland, Williamsburg (City), York |
| | DC | 38 | District-wide |
| | Delaware | 412 | Statewide |
| | Pennsylvania | 35 | Delaware, Philadelphia |
| | New Jersey | 1,706 | Atlantic, Bergen, Burlington, Camden, Cape May, Cumberland, Essex, Gloucester, Hudson, Middlesex, Monmouth, Ocean, Salem, Union |
| | New York | 2,011 | Bronx, Kings, Nassau, New York, Orange, Putnam, Queens, Richmond, Rockland, Suffolk, Westchester |
| | Connecticut | 581 | Fairfield, Middlesex, New Haven, New London |
| | Rhode Island | 437 | Statewide |
| | Massachusetts | 1,621 | Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Plymouth, Suffolk |
| | New Hampshire | 155 | Rockingham, Strafford |

| | | | |
|---|---|---|---|
| | Maine | 4,123 | Cumberland, Hancock, Knox, Lincoln, Sagadahoc, Waldo, Washington, York |
| Hawaii | Hawaii | 1,277 | Statewide |
| [1]Coastal shoreline length in miles sourced from the NOAA Composite medium resolution coastline. | | | |

The sampling plan called for at least 100 completed surveys in the study area in each state, proportional to the population of the study area within that state (in other words, more populous counties in a state's study area had higher numbers of respondents); the exception is Hawaii, which makes up its own region in this study, in which the goal was 200 completed surveys. This makes a total of 2,200 completed surveys, which is 200 more than the original proposal called for (the original proposal was for 2,000 completed surveys). For regional results, the states in that region were properly weighted to be proportional to the population in the study area in that region as a whole (in other words, if a state made up a fifth of the population of the study area in a region, then that state's respondents were weighted to be a fifth of the entire region's respondents). Likewise, overall results were weighted so that each state's respondents were properly proportioned to the overall study area.

The number of surveys obtained in each state is shown in Table 4. Subsequent quality control reviews found 28 un-usable surveys that were removed (most commonly because the review of their open-ended responses showed that they simply hit keys on the keyboard, e.g., "dfjkladfljf," which suggested that they did not take the survey seriously). Similarly, a criterion for inclusion in the survey was that the respondent either live full-time in the study area or, if not a full-time resident, live in the study area during the hurricane season, which is June to November. Table 4 also shows the final number of completed surveys that were used in the analysis, which in some states was slightly below 100.

**Table 4: Completed and Useable Surveys in Each State**

| State | Number of Completed Surveys | Number of Useable Surveys |
|---|---|---|
| Alabama | 100 | 99 |
| Connecticut | 100 | 98 |
| Delaware | 100 | 98 |
| District of Columbia | 100 | 100 |
| Florida | 100 | 100 |
| Georgia | 100 | 99 |
| Hawaii | 200 | 198 |
| Louisiana | 100 | 99 |
| Maine | 100 | 99 |
| Maryland | 100 | 99 |
| Massachusetts | 100 | 97 |
| Mississippi | 100 | 98 |
| New Hampshire | 100 | 100 |
| New Jersey | 100 | 100 |
| New York | 106 | 104 |
| North Carolina | 102 | 102 |
| Pennsylvania | 100 | 96 |
| Rhode Island | 100 | 97 |
| South Carolina | 100 | 99 |
| Texas | 100 | 98 |
| Virginia | 100 | 100 |
| **Total** | **2,208** | **2,180** |

## Questionnaire Design

The questionnaire was designed cooperatively by staff at NOAA with the survey partners, Responsive Management and Abt Associates. The survey was coded for online surveying and included graphics that were examined and used by the respondents.

A more detailed look at the survey, in particular the graphics that were presented, is discussed in the section of the report, "Opinions on and Ratings of Aspects of the Graphics." This section that details the testing of and attitudes toward the graphic that was presented to each respondent.

The National Hurricane Center developed the four regional graphics, which were developed for historical storms. The color and timing graphics (four) for each of the regions are provided in Appendix B.

## Data Analysis

The analysis of data was performed using IBM SPSS Statistics as well as proprietary software developed by Responsive Management.

As part of the analysis, all results (where practicable) were cross tabulated by the region of residence, based on the four regions in the study (Northeast, Southeast, Gulf, and Hawaii). Enough samples were obtained in each region for a reasonable sampling error. The sampling errors of all four regions and overall are provided in Table 5. The sampling error for the overall results was plus or minus 2.10%.

**Table 5: Sampling Error by Region**

| Region | Sample | Adult Population of Study Area in the Region | Sampling Error Percentage |
|---|---|---|---|
| Northeast | 889 | 31,930,819 | 3.29 |
| Southeast | 699 | 25,254,700 | 3.71 |
| Gulf | 394 | 8,541,984 | 4.94 |
| Hawaii | 198 | 1,309,580 | 6.96 |
| Entire Study Area | 2,180 | 67,037,083 | 2.10 |

Results are included at the state level in Appendix A. Note, however, that the sampling error at the state level is relatively high.

Terms used in the findings that follow are defined as shown below.

- *Study area residents.* The study area includes all the Gulf of Mexico states and the Atlantic seaboard states in the eastern United States; in the west, the study area includes Hawaii. All counties that have a coast are included, as well as near-inland counties that have experienced 64+ knot winds at least 10 times. They were previously shown in Table 3.
- *Color graphic.* Refers to any graphic that has colors differentiating overall probabilities of receiving sustained tropical-storm-force winds.
- *No-color graphic.* Refers to any graphic in which the timing information is shown without colors differentiating overall probabilities of receiving sustained tropical-storm-force winds; rather, it simply outlines with black lines the area that could be affected.
- *Earliest arrival time graphic.* Refers to any graphic that shows the earliest reasonable time of arrival.
- *Most likely arrival time graphic.* Refers to any graphic that shows the most likely time of arrival, which is later than the earliest arrival time.

Additionally, the following acronyms are used in the report:

- NHC - National Hurricane Center
- NOAA - National Oceanic and Atmospheric Administration

The survey questions were developed across four key topics, and results are accordingly presented in four

report sections:

5. Storm preparations that study area residents have taken in past events.
6. Their knowledge levels regarding advisories and warnings, as well as the importance that they place on advisories and warnings.
7. Their opinions of the graphics that they are shown in the survey. This section shows the ratings that they give to various aspects of the graphics.
8. The sources of information that study area residents use, including their use of any NOAA websites, including the National Hurricane Center's website.

A final section shows demographic data from the survey. It has no discussion of findings as do the previous four sections.

## Storm Preparations Taken by Respondents

Just under two-thirds of residents in the study area (excluding Florida and Texas residents, who received different question wording as discussed below) indicated that they made special preparations prior to being hit by the last major tropical storm or hurricane to hit their area (62% indicated making special preparations, as shown in Figure 1). Gulf Region residents have the highest percentage who made special preparations (Figure 2). Graphs are also included regarding how far in advance they started making preparations (Figures 3 and 4).

Residents of Florida and Texas were asked specifically about Hurricanes Irma and Harvey, respectively. Before Hurricane Irma struck Florida, 80% of residents in the study area in that state made special preparations (Figure 5); likewise, before Hurricane Harvey, 70% of applicable Texas residents made special preparations (Figure 6).

Commensurate with the results discussed above, 71% of study area residents say that they typically make special preparations when their area is threatened by a tropical storm or hurricane (Figure 7). Gulf Region residents have the highest percentage who typically make special preparations (Figure 8).

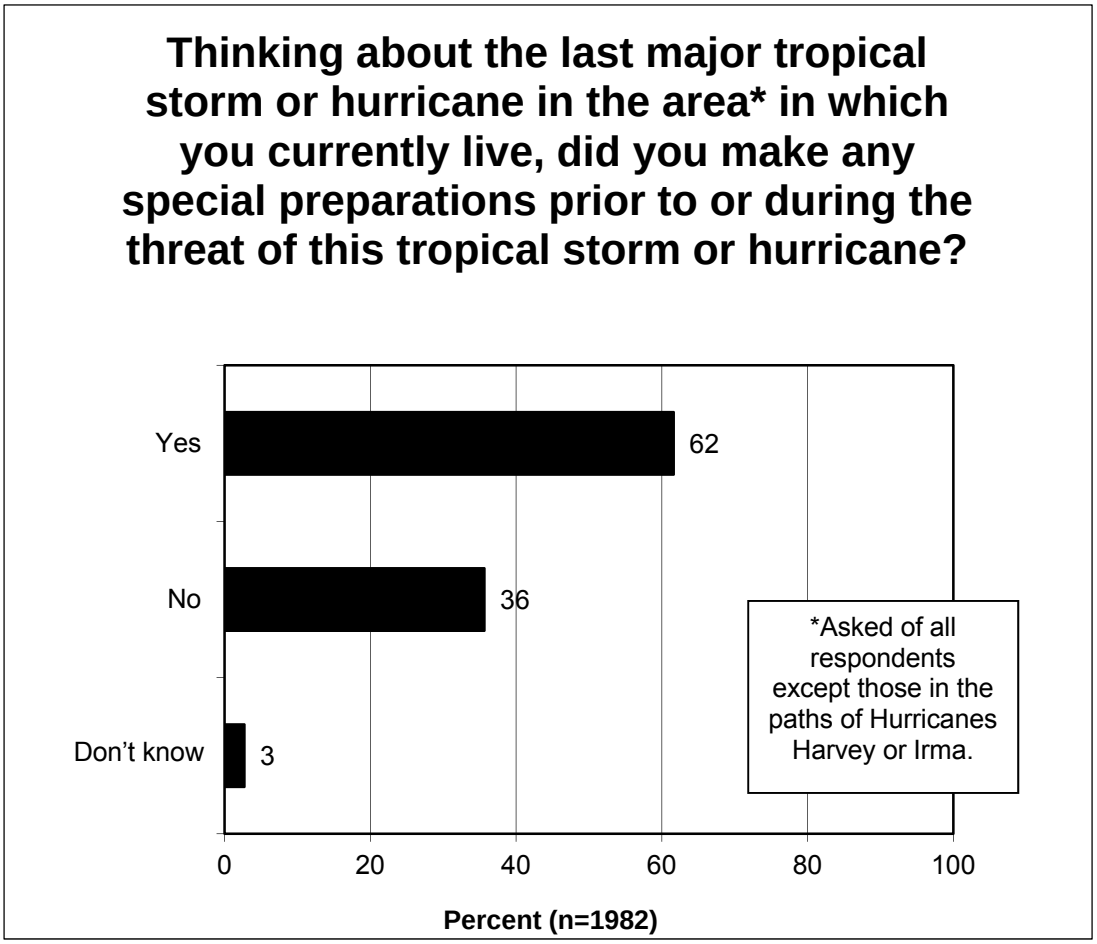



**Figure 1: Percentage Making Special Preparations for Tropical Storms or Hurricanes**

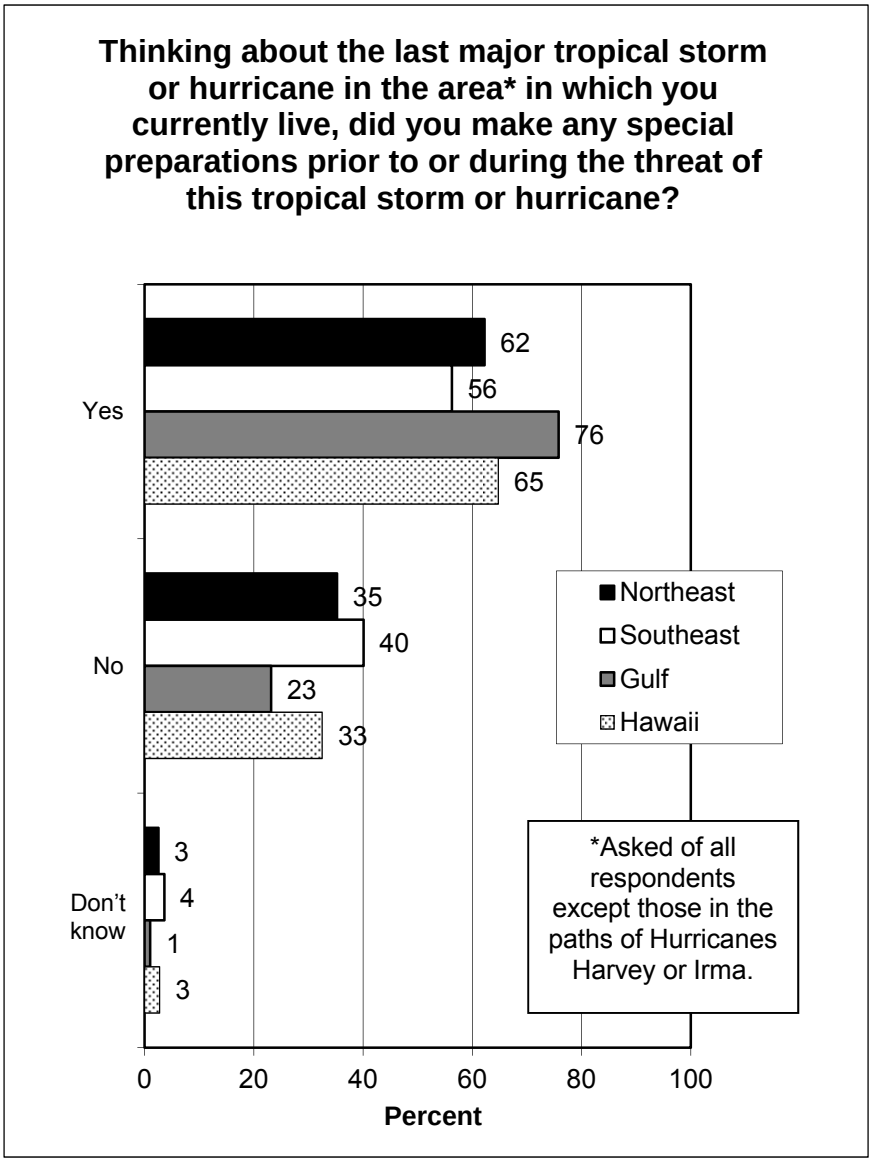



**Figure 2: Percentages by Region Making Special Preparations for Tropical Storms or Hurricanes**

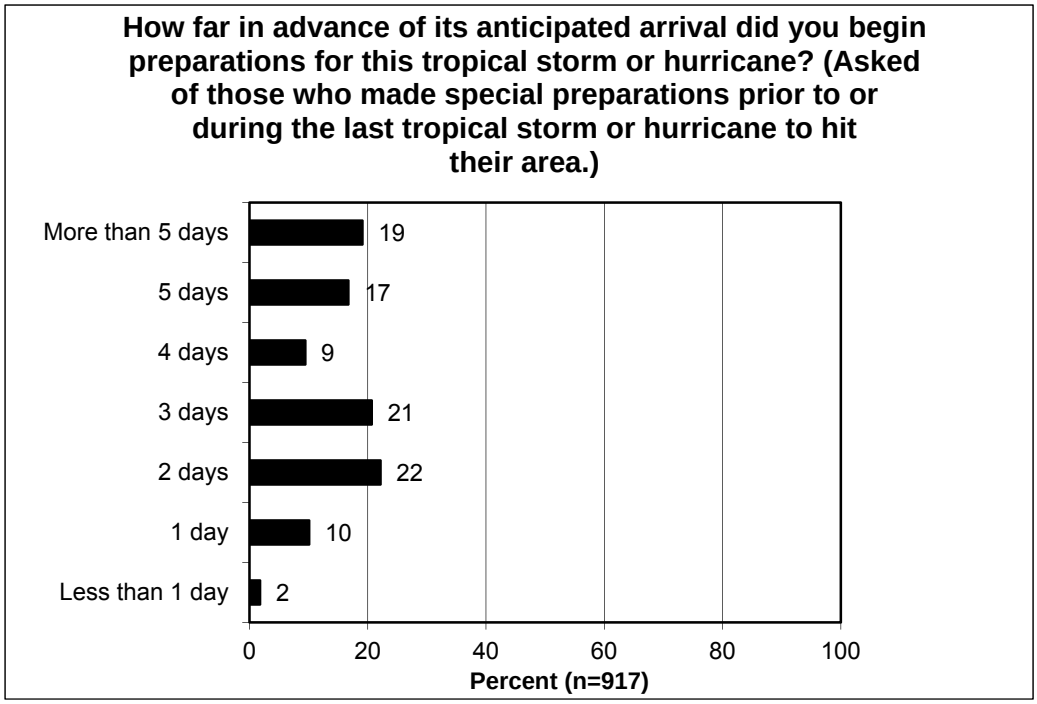



**Figure 3. Timing of Special Preparations**

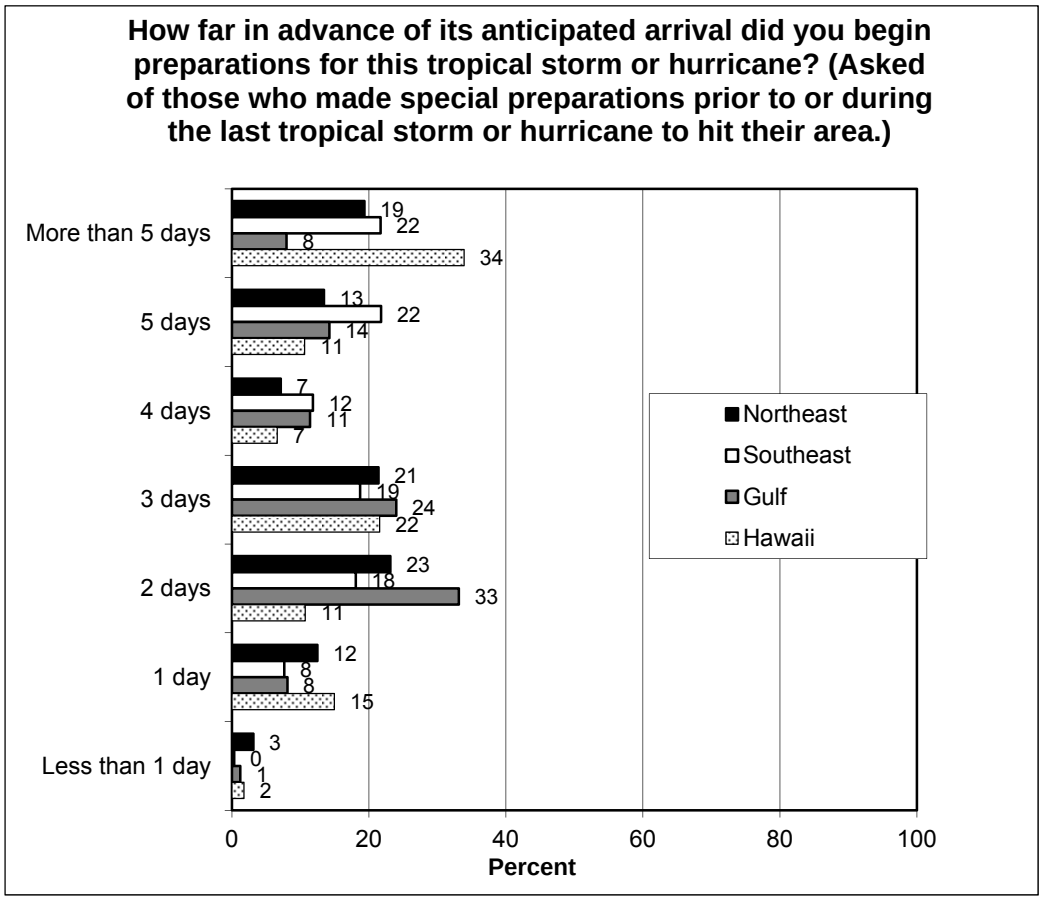



**Figure 4. Timing of Special Preparations by Region**

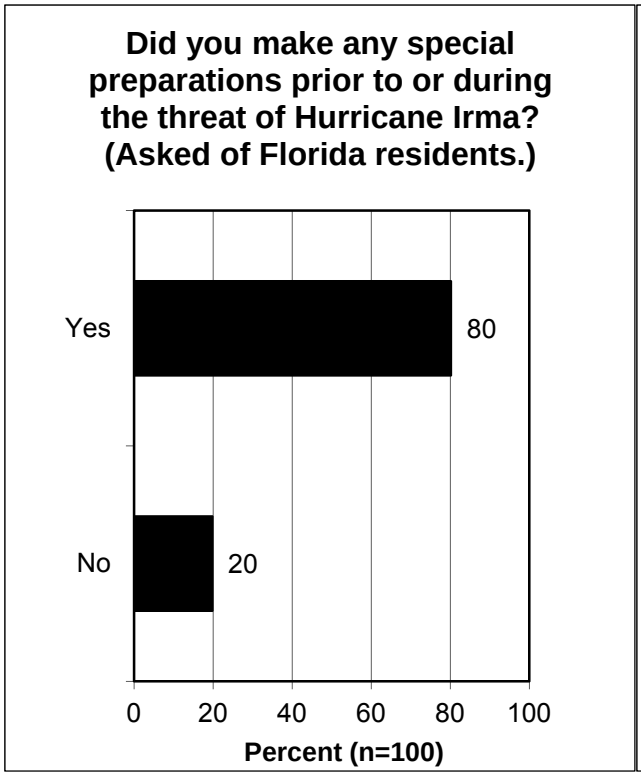



**Figure 5: Percentage Making Special Preparations for Hurricane Irma**

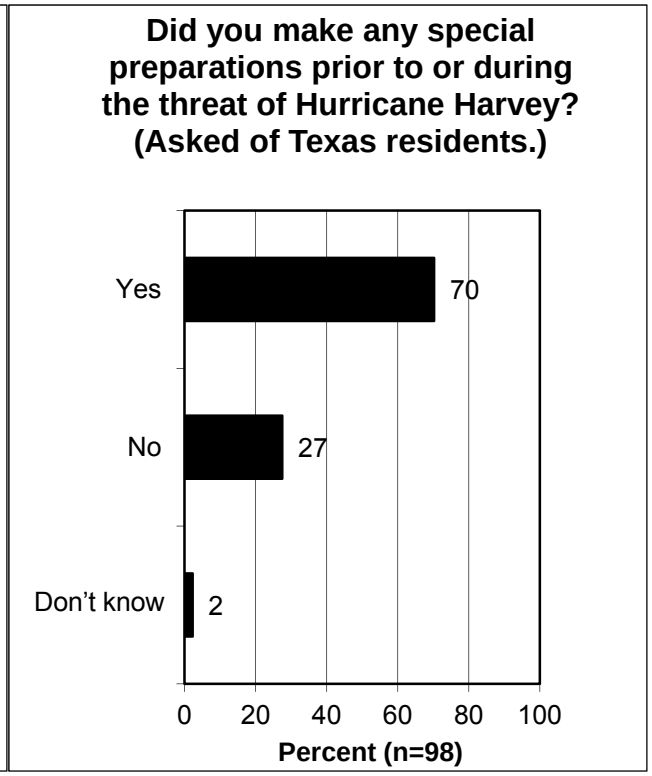



**Figure 6: Percentage Making Special Preparations for Hurricane Harvey**

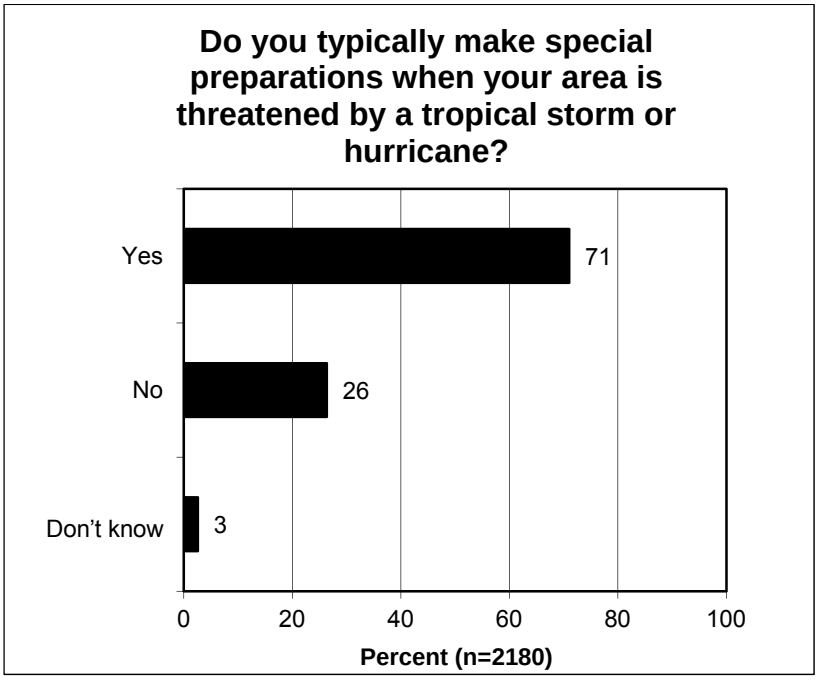



**Figure 7. Percentage Who Typically Make Preparations**

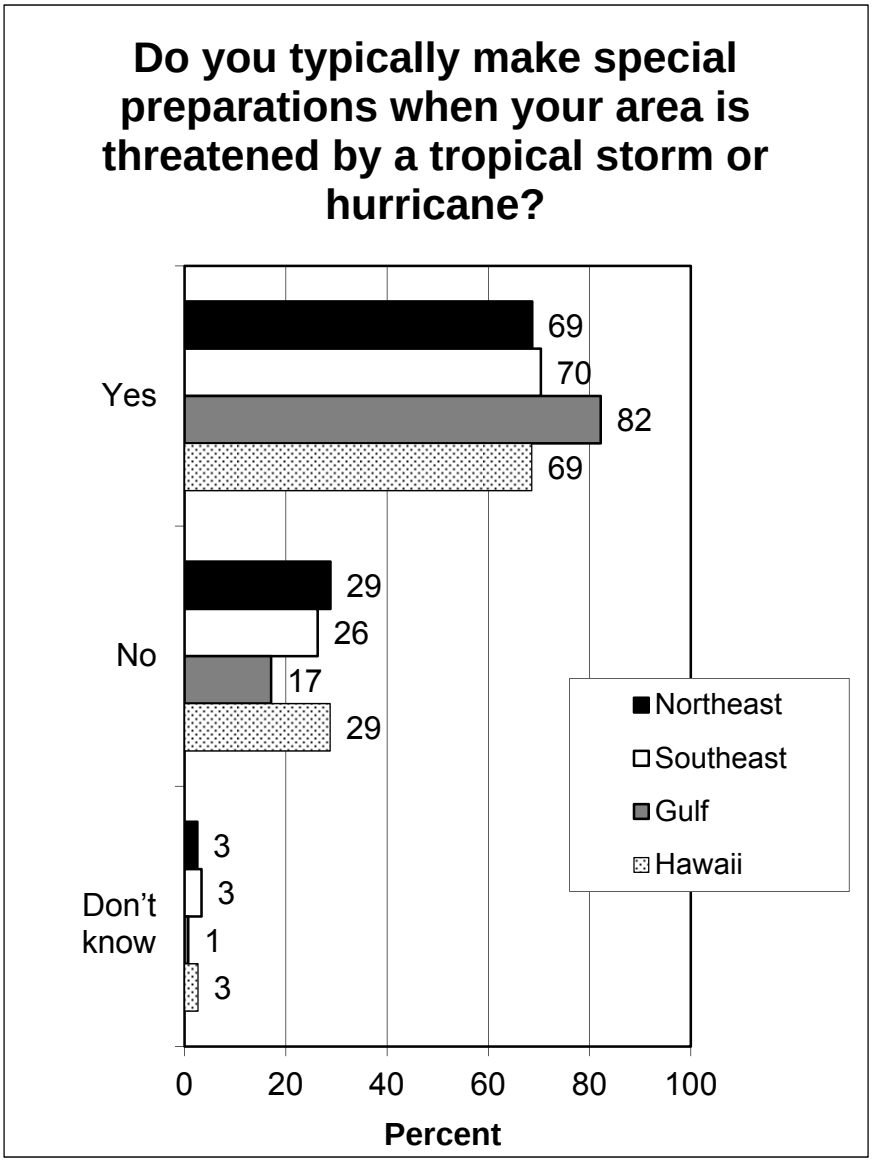



**Figure 8. Percentages by Region Who Typically Make Preparations**

Although a large majority of the states made special preparations, only 21% indicated that they evacuated their area (Figure 9). If ordered to evacuate, however, 65% say that they would leave their area (Figure 10). The Northeast, Southeast, and Gulf Regions are about the same regarding whether they evacuated prior to the last storm to hit their area (Figure 11), and Gulf Region residents have the highest percentage saying that they would definitely leave if ordered to do so (Figure 12). Graphs are included showing how far in advance residents evacuated, among those who did so (Figures 13 and 14).

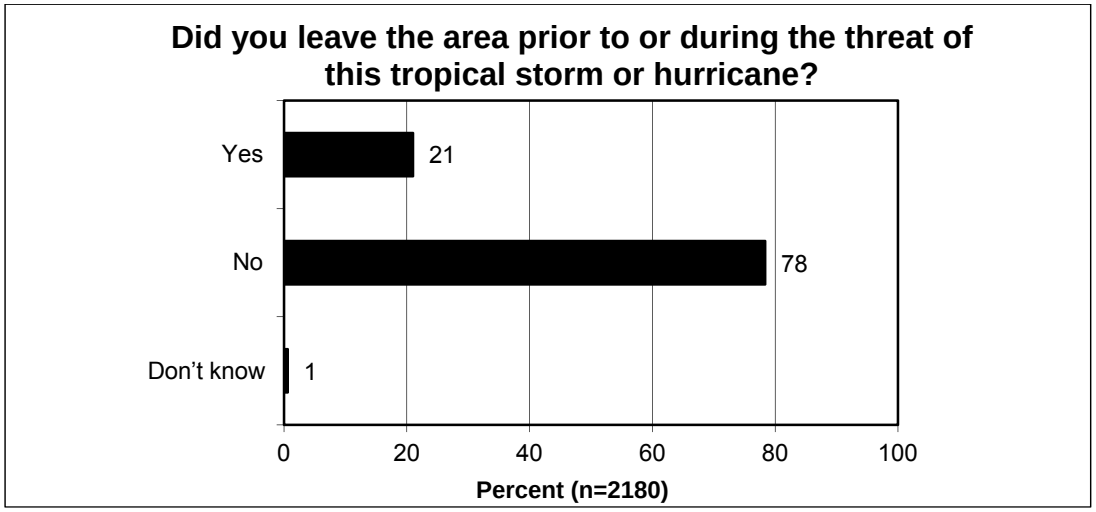



**Figure 9: Percentage Who Evacuated Prior to the Most Recent Tropical Storm or Hurricane**

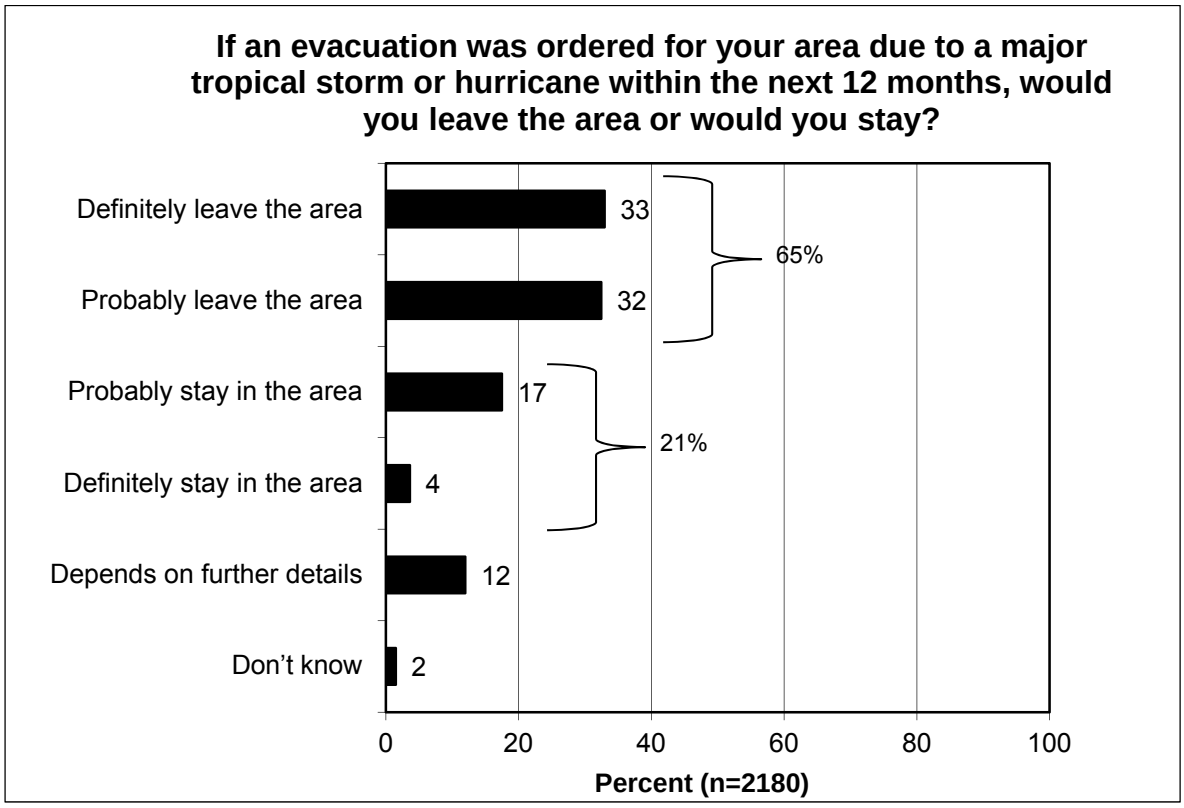



**Figure 10. Likelihood to Evacuate**

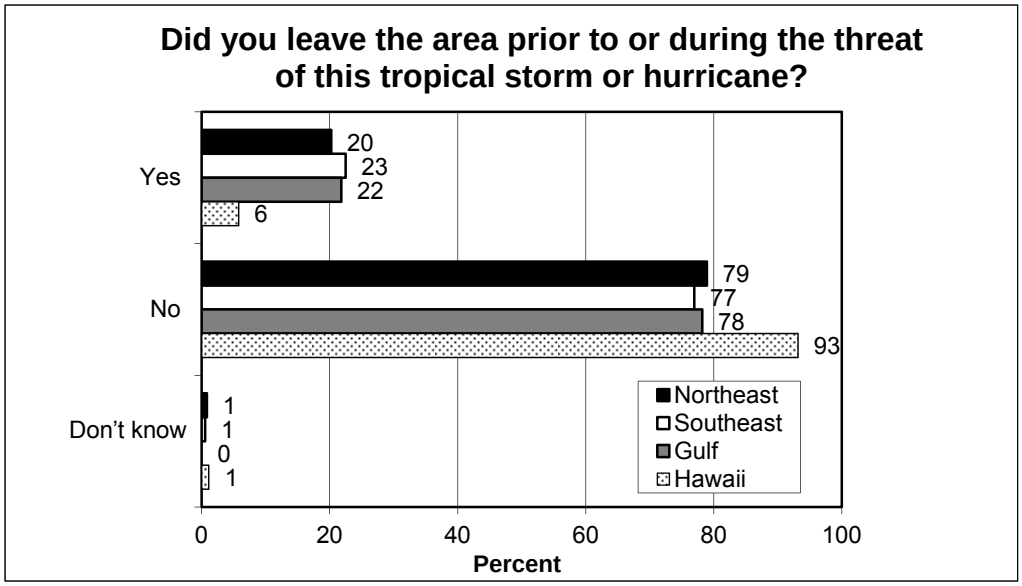



**Figure 11: Percentages by Region Who Evacuated Prior to the Most Recent Tropical Storm or Hurricane**

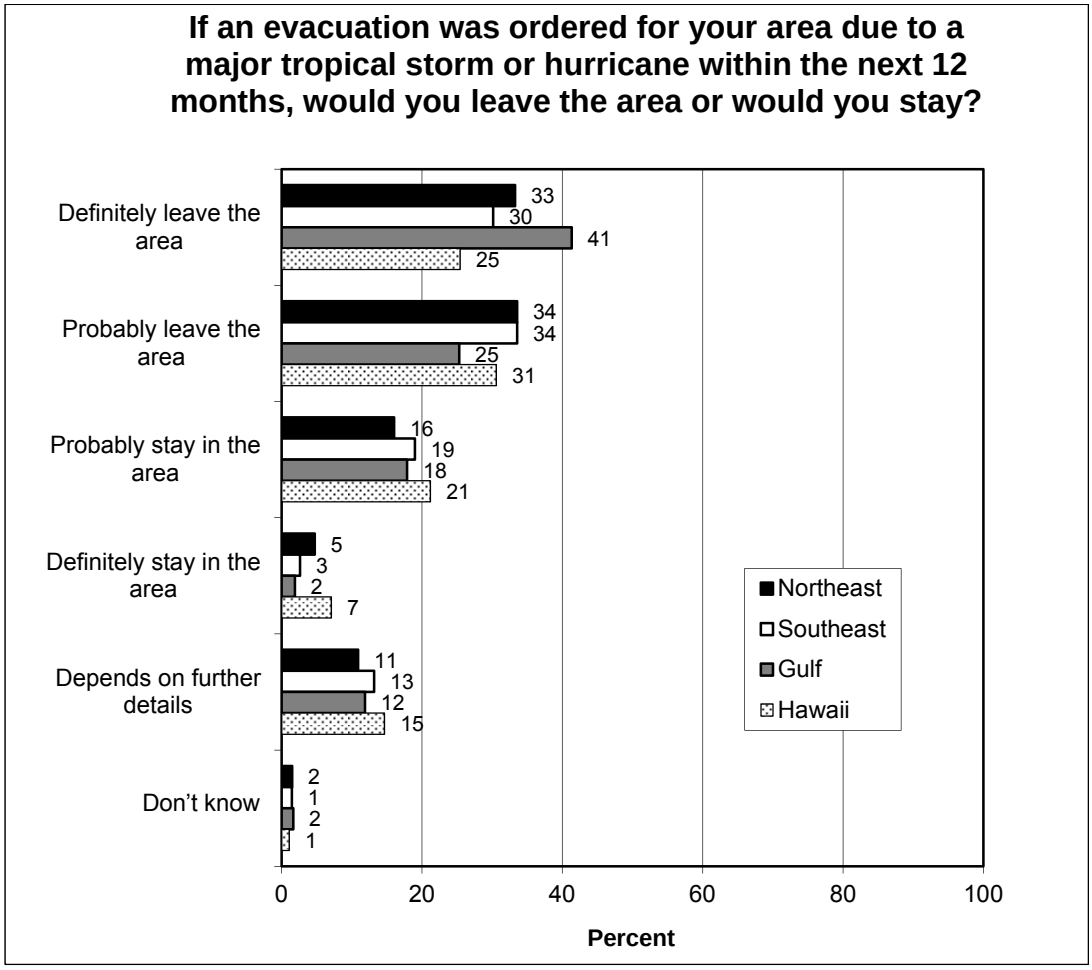



**Figure 12. Likelihood to Evacuate by Region**

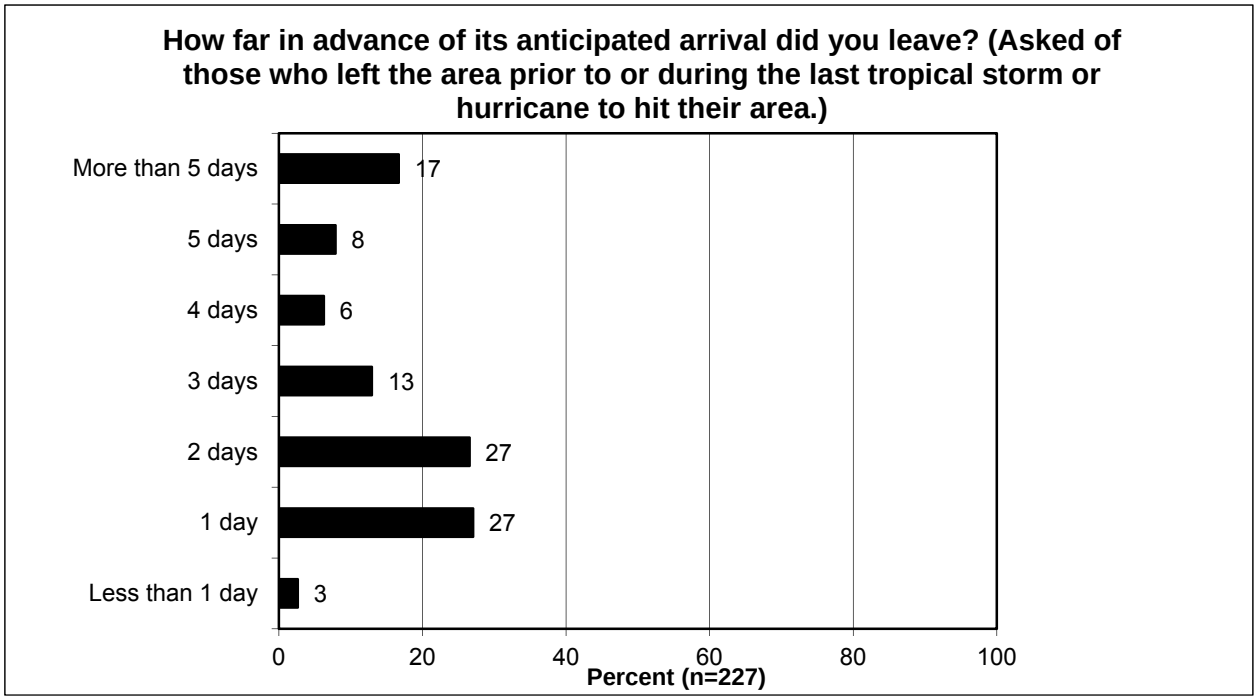



**Figure 13. Timing of Evacuation**

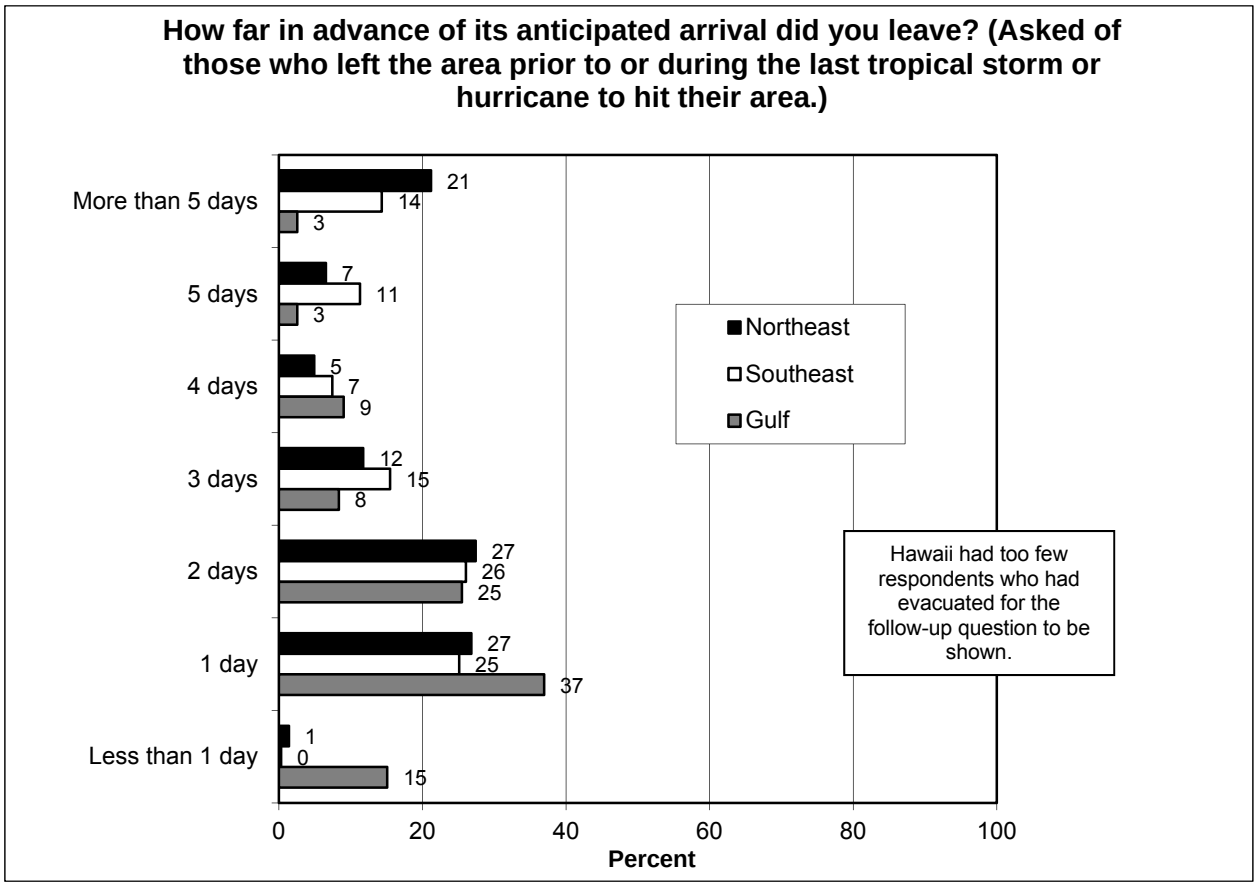



**Figure 14. Timing of Evacuation Regionally**

## Knowledge of and Perceived Importance of Advisories and Warnings

Most commonly, study area residents choose the middle ground regarding how much they know about tropical storms or hurricanes: 48% say that they know *a moderate amount* (Figure 15). Similar percentages are on either side of this middle response, with 21% saying that they know *a great deal*, and 28% saying that they know *a little*. Likewise, the results are about the same regarding knowledge of official advisories and warnings (Figure 16). Gulf Region residents have the highest percentage knowing a great deal in both questions (Figures 17 and 18).

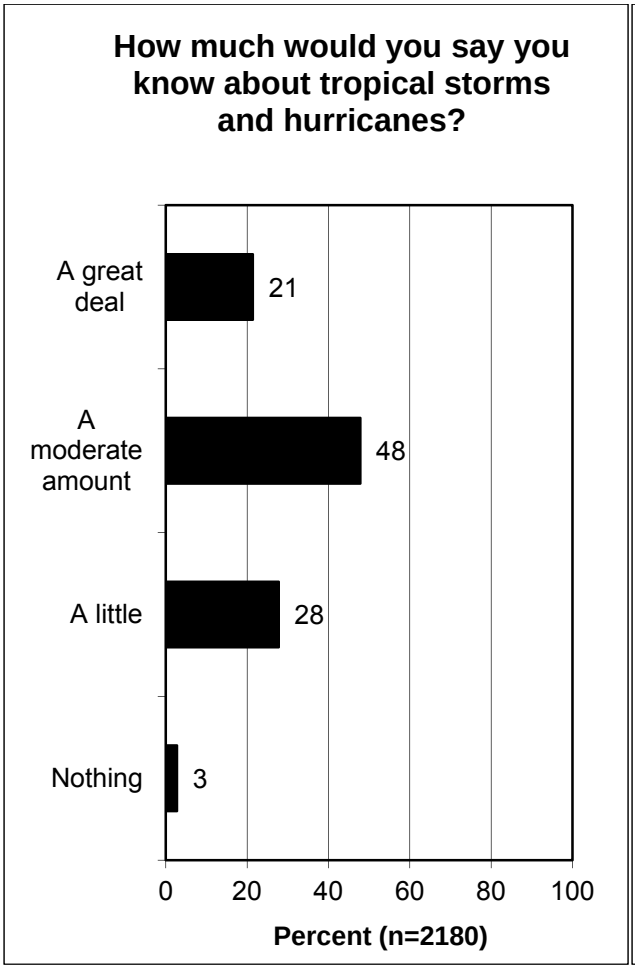



**Figure 15: Self-Professed Knowledge of Tropical Storms and Hurricanes**


**Figure 16: Self-Professed Knowledge of Advisories and Warnings**

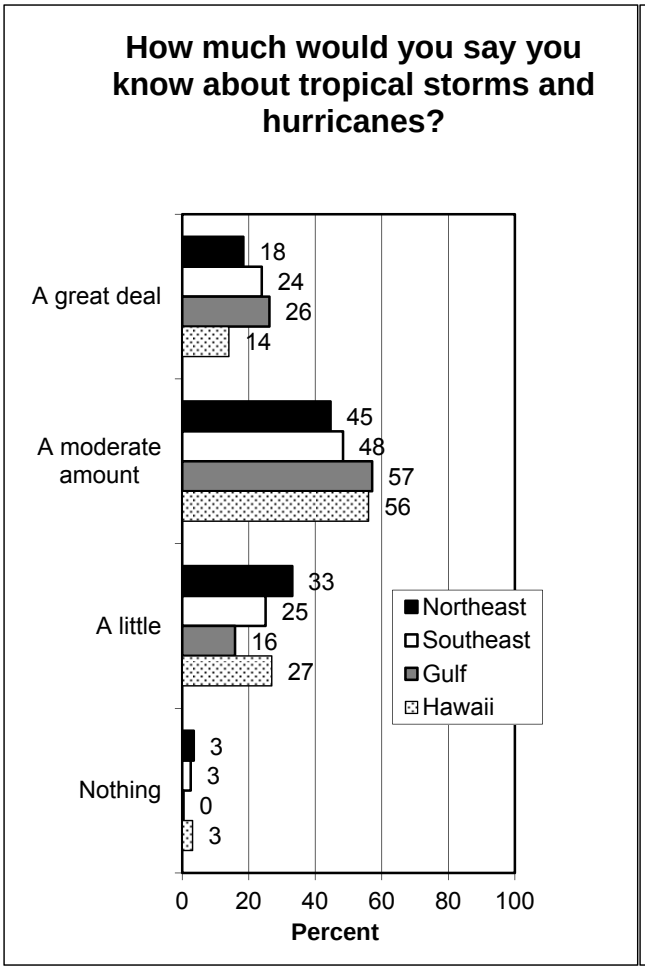



**Figure 17: Self-Professed Knowledge of Tropical Storms and Hurricanes by Region**

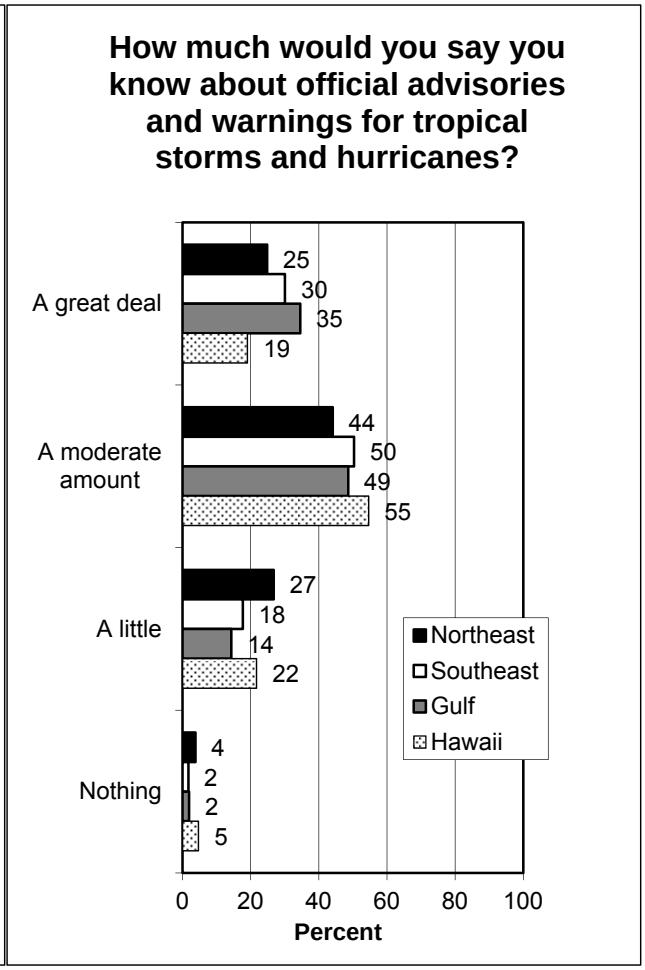



**Figure 18: Self-Professed Knowledge of Advisories and Warnings by Region**

Regardless of any preparations they may make, the large majority of study area residents feel that advisory and warning information is important: from 80% to 85% say that the advisories and warning information is *extremely* or *very* important (Figures 19 and 20). At the other end, only 1% of study area residents say that the advisories and warnings are *not at all* important. Regionally, Gulf Region residents have the highest percentages on both questions saying *extremely* important (Figures 21 and 22).

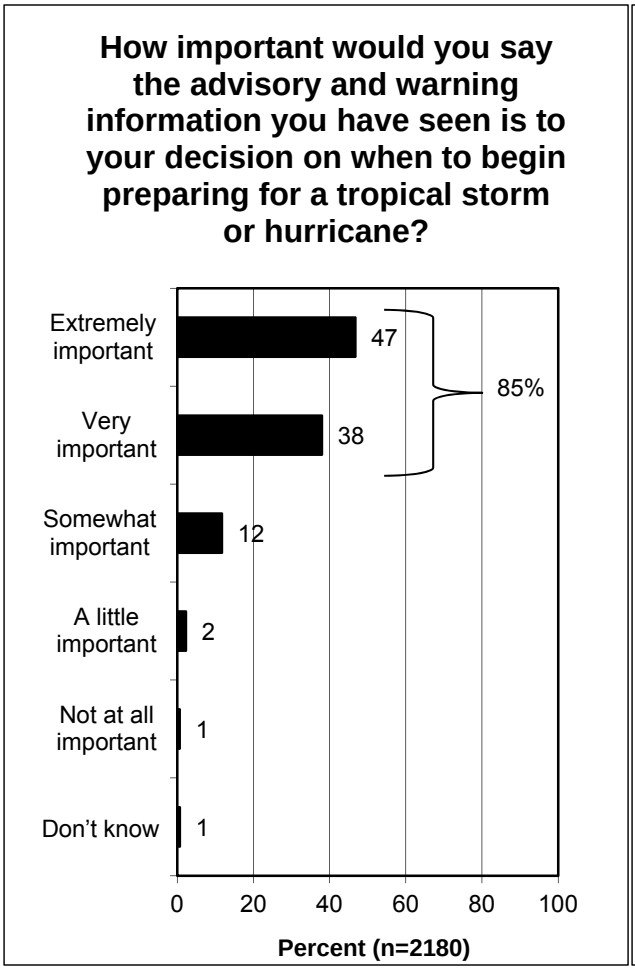



**Figure 19. Importance of Advisories and Warnings on Timing of Preparations**

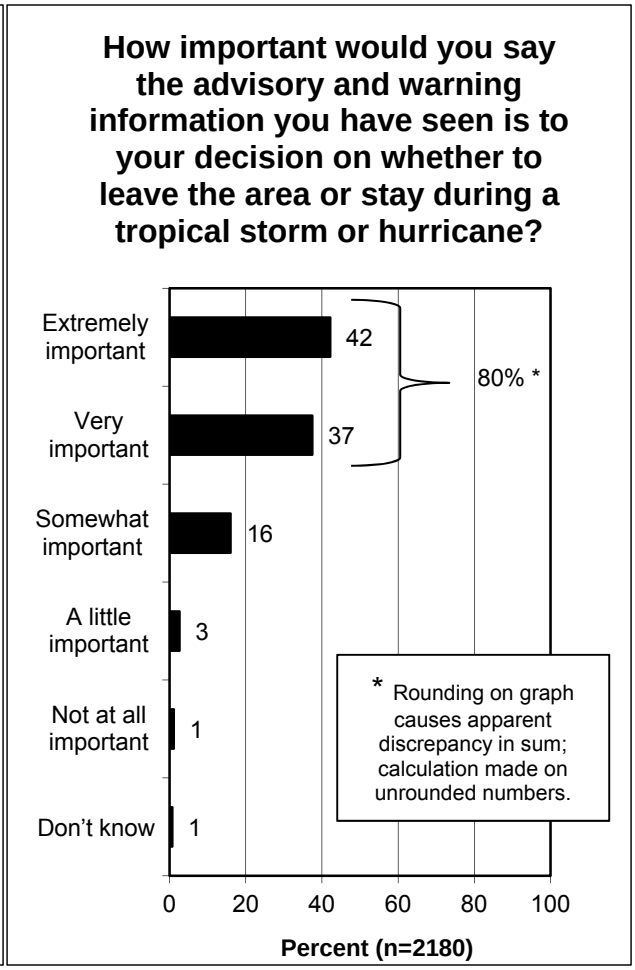



**Figure 20. Importance of Advisories and Warnings on Evacuation Decisions**

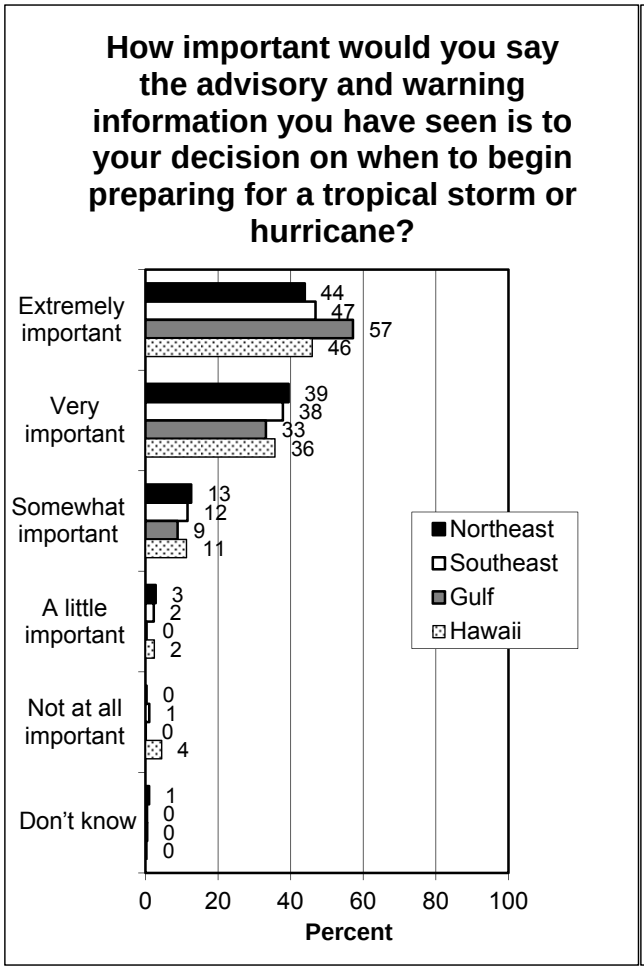



**Figure 21. Importance of Advisories and Warnings on Timing of Preparations by Region**

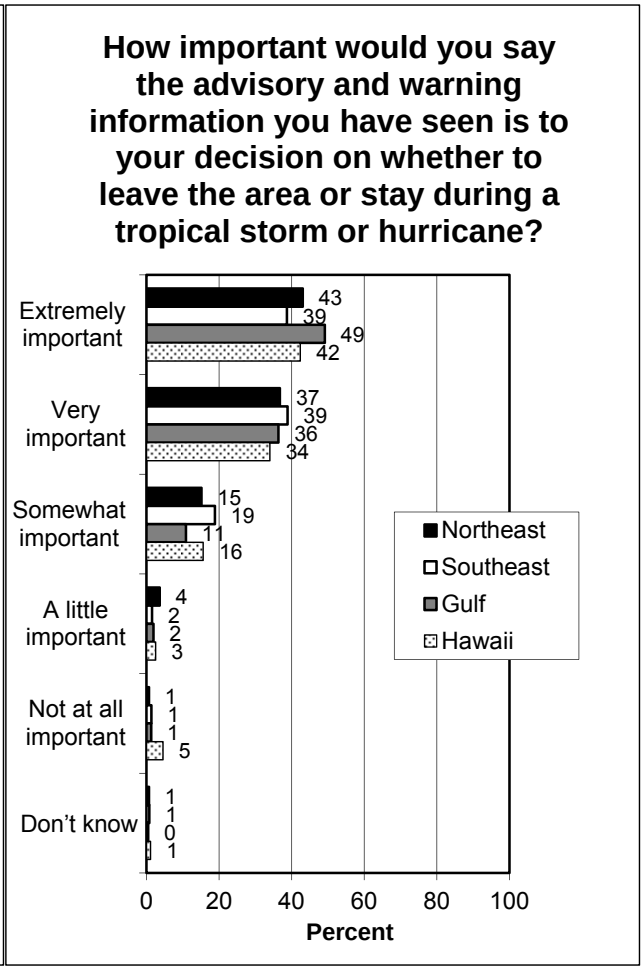



**Figure 22. Importance of Advisories and Warnings on Evacuation Decisions by Region**

One other way to assess the importance placed on advisories and warnings is to examine who would be a prime target audience for the advisories and warnings. Just slightly more than two-thirds of study area residents (68%) are very or somewhat worried that a major tropical storm or hurricane will hit their area during the next 12 months (Figure 23). The most worry is among Gulf Region residents (Figure 24).

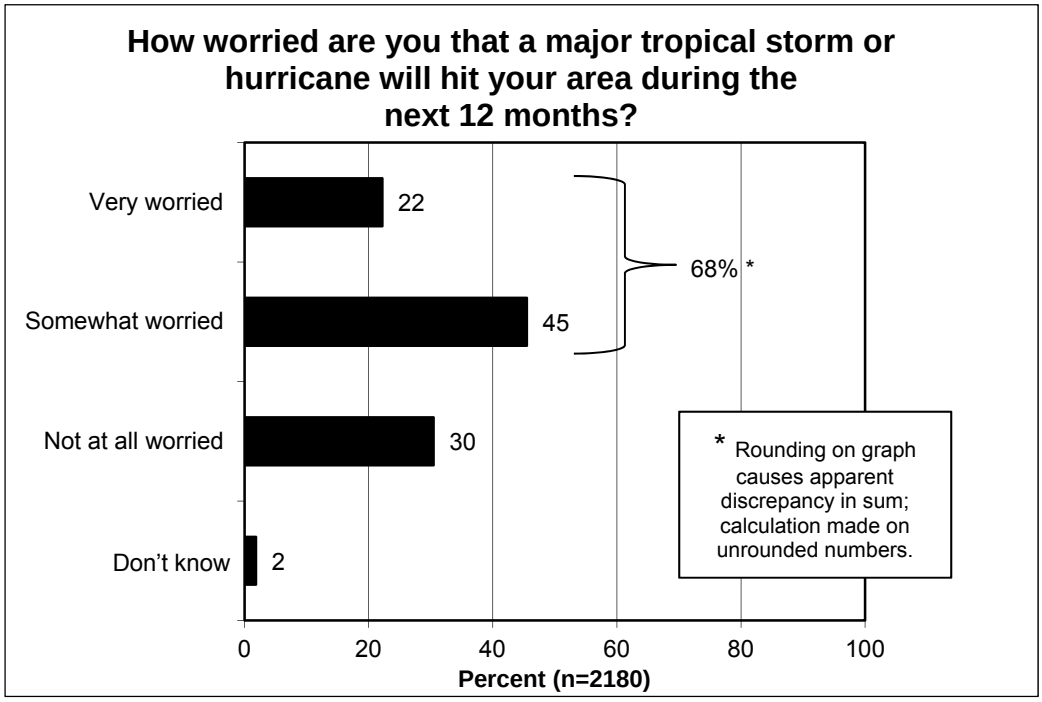



**Figure 23. Worry About Future Tropical Storms or Hurricanes**

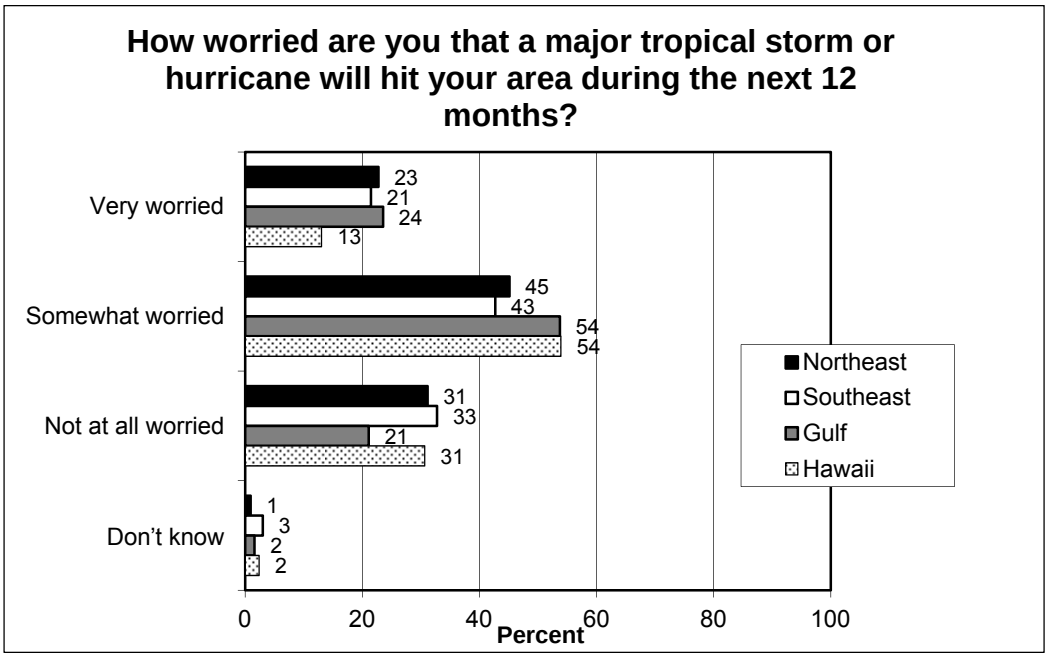



**Figure 24. Worry About Future Tropical Storms or Hurricanes by Region**

## Opinions on and Ratings of Aspects of the Graphics

At a certain point in the survey, respondents were shown one of four graphics, with the particular graphic shown being randomly determined. The graphics were either *color* or *no-color*, and the graphics showed either the *earliest reasonable* arrival time or the *most likely* arrival time. Based on this matrix (previously shown in this report, but repeated here for the reader's convenience as Table 6), respondents were randomly put into one of the four groups.

**Table 6: Matrix for Testing Elements of the Graphics**

| | **Color** | **No-color** |
|---|---|---|
| **Earliest reasonable arrival time** | Color, earliest arrival time | No-color, earliest arrival time |
| **Most likely arrival time** | Color, most likely arrival time | No-color, most likely arrival time |

Each region in the survey had a different set of four graphics, with the event primarily affecting the given region. For instance, study area residents in the Northeast Region were shown one of four graphics for Hurricane Ryan (Figures 25 through 28); note that only the Northeast Region graphics are shown here as the example. The graphics shown to residents of the Southeast Region, the Gulf Region, and Hawaii are included in Appendix B.

After the respondents had seen the graphic, the survey asked several questions about various aspects of the graphic. For each of these questions, the graphic was displayed for the respondent to see. The graphics in Figures 25 through 28 are shown at the approximate size they were shown in the survey and the size that they would show up on a user's computer screen when visiting the NOAA website (if this PDF is viewed at full size, i.e., 100% zoom).

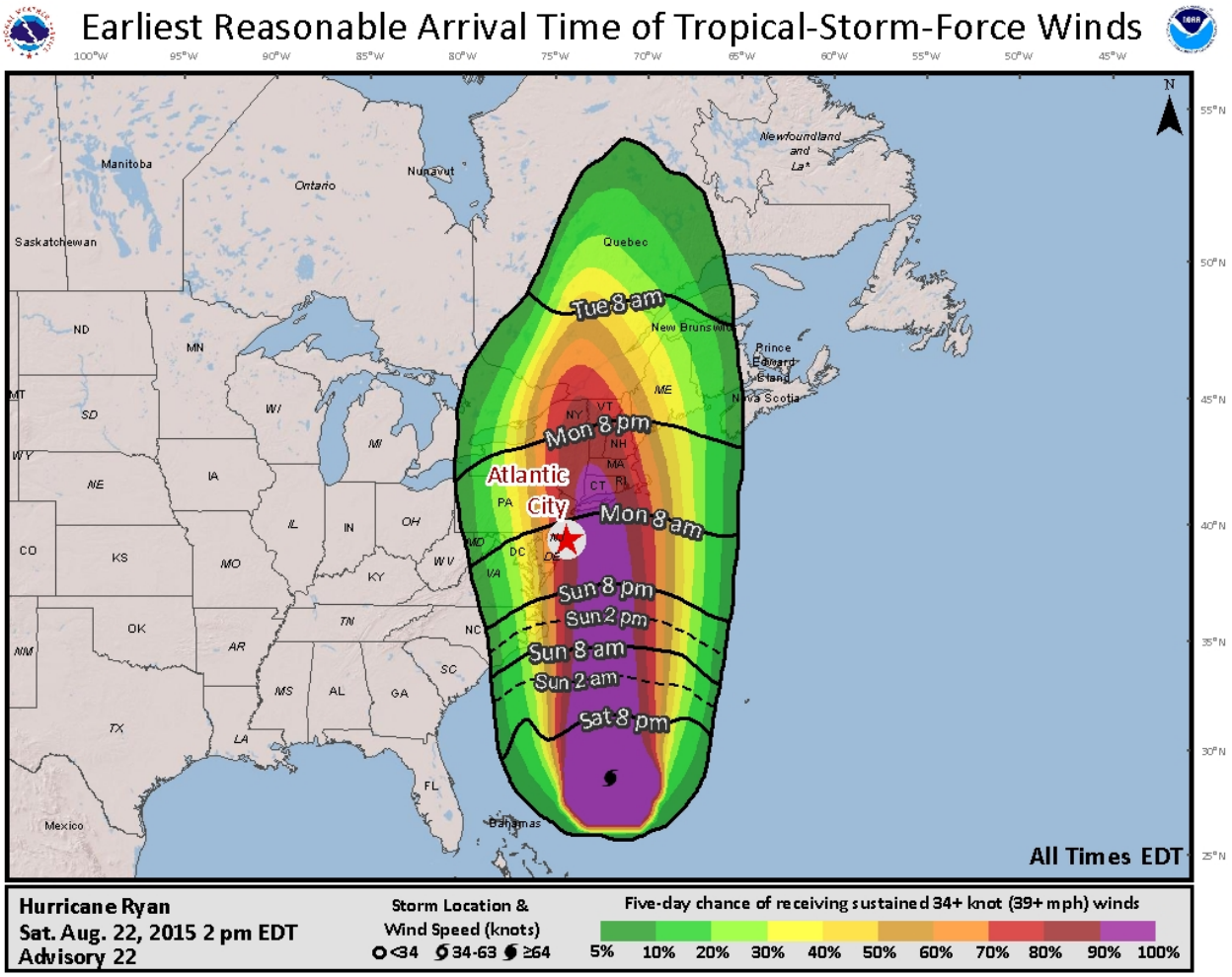



**Figure 25. Color, Earliest Arrival Time Graphic for Hurricane Ryan Shown to Study Area Residents in the Northeast Region**

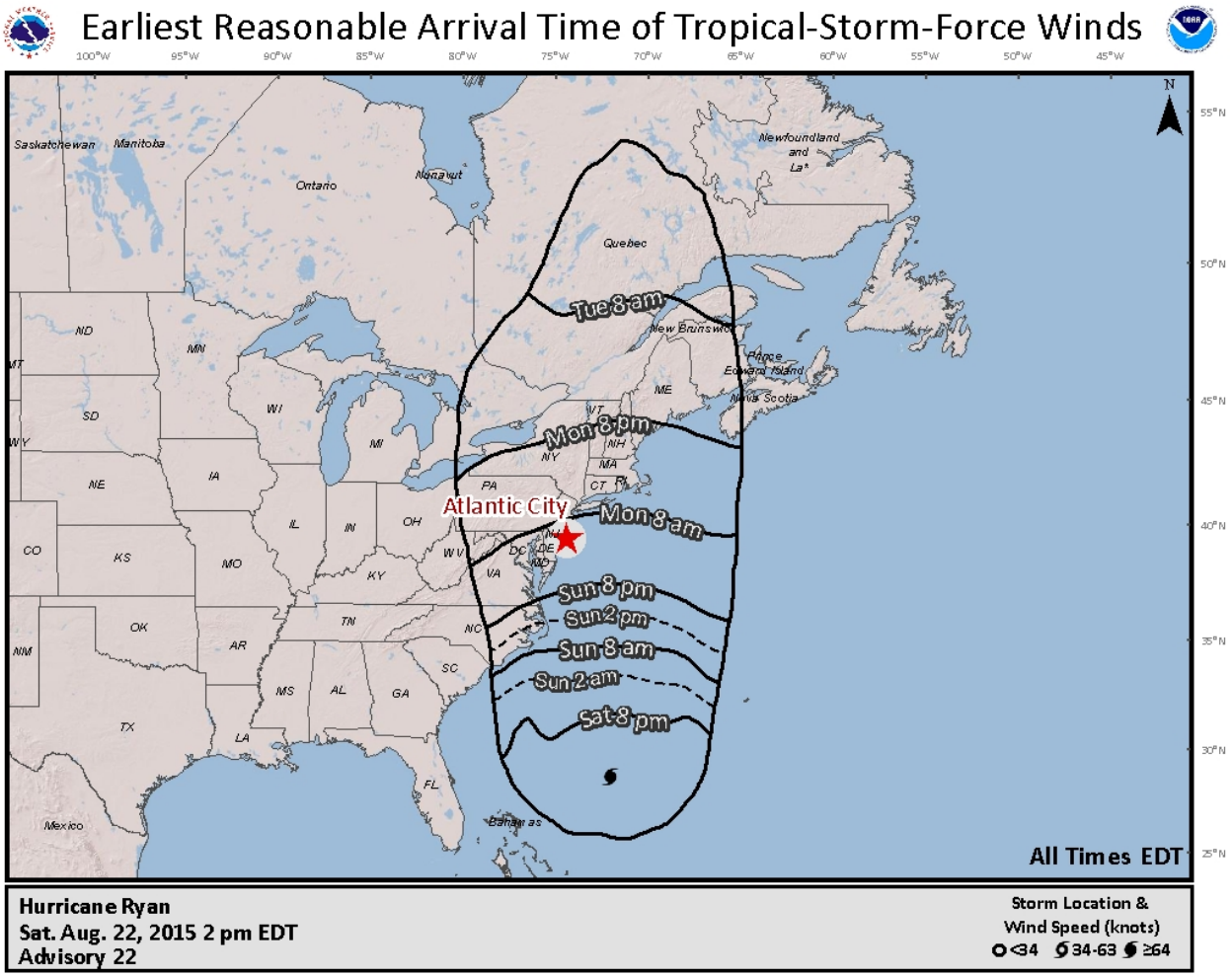



**Figure 26. No-Color, Earliest Arrival Time Graphic for Hurricane Ryan Shown to Study Area Residents in the Northeast Region**

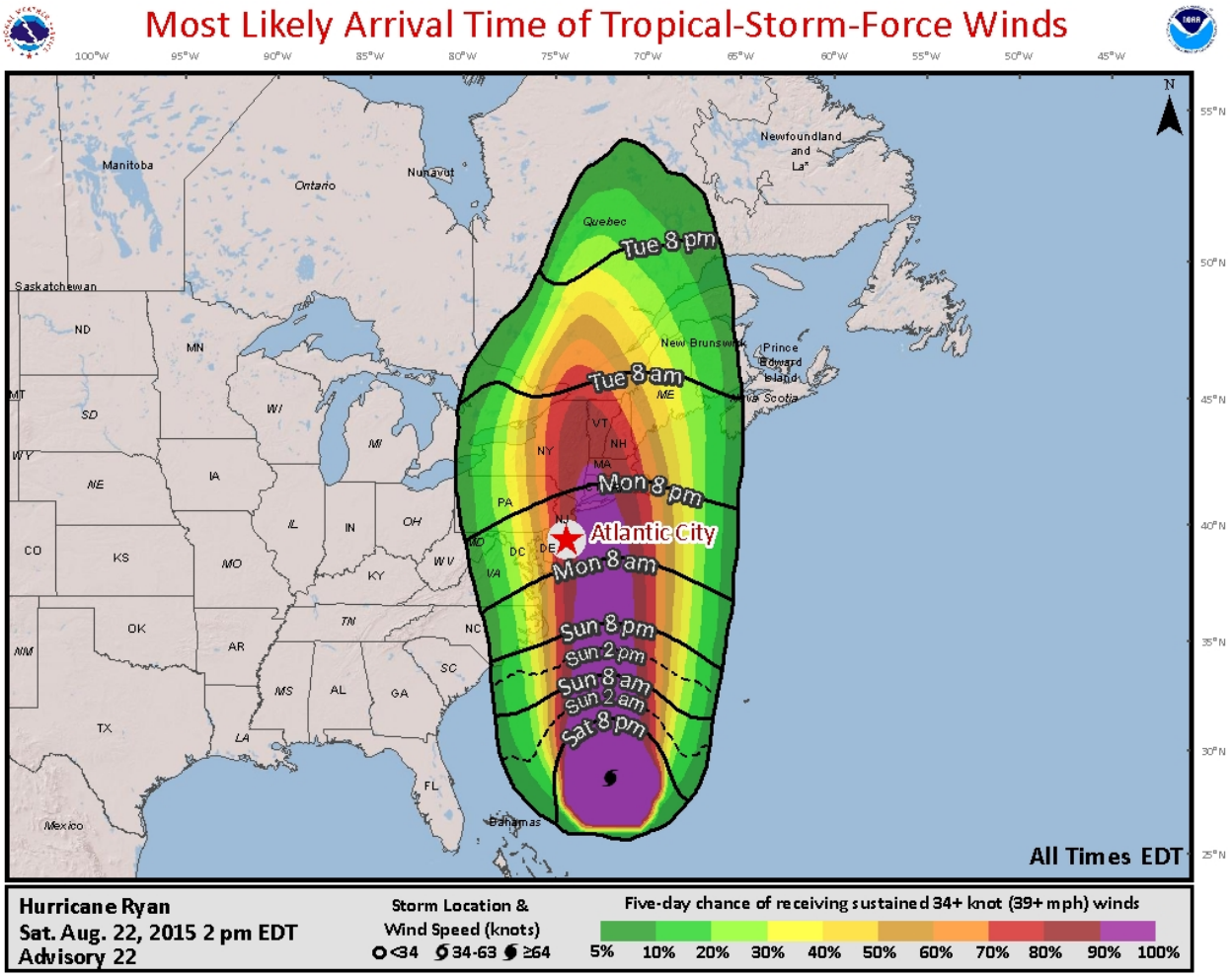



**Figure 27. Color, Most Likely Arrival Time Graphic for Hurricane Ryan Shown to Study Area Residents in the Northeast Region**

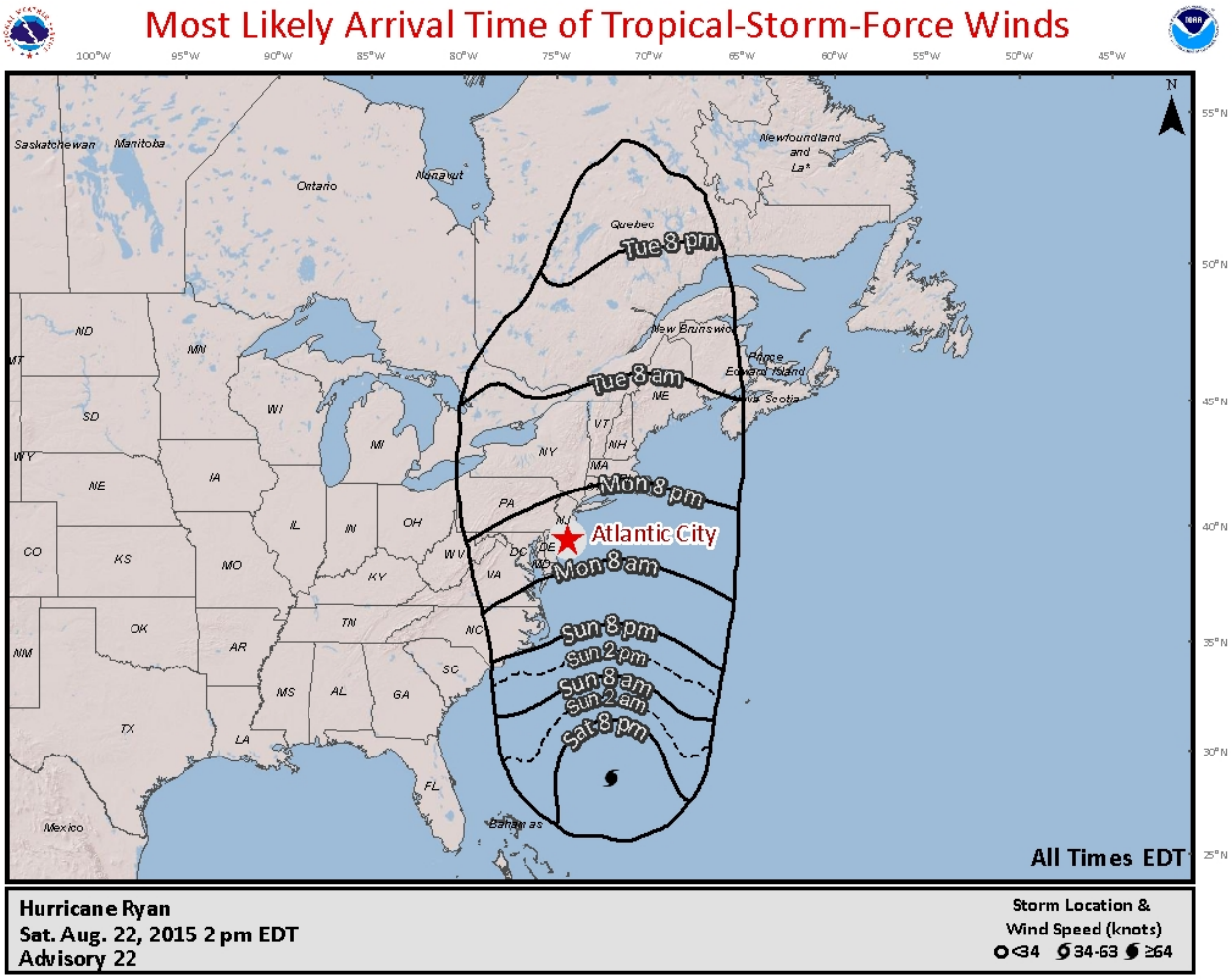



**Figure 28. No-Color, Most Likely Arrival Time Graphic for Hurricane Ryan Shown to Study Area Residents in the Northeast Region**

A series of questions asked study area residents to rate various aspects of the graphic that was presented to them. The survey asked them to rate the following:

1. Readability (i.e., how easy it is for them to read)
2. Understandability (i.e., how easy it is for them to understand)
3. Usefulness (i.e., how useful it is to them)
4. (Perceived) Reliability (i.e., how reliable they think it is)
5. Effectiveness (i.e., how effective they think it is at communicating the information)

For each of the aspects, respondents rated it as excellent, good, fair, or poor. Additionally, as a baseline, respondents had previously rated the information that they had seen in general (i.e., not just graphics that they may have seen produced by NOAA). Study area residents rated the same aspects and used the same excellent-good-fair-poor scale in both sets of ratings questions.

The analysis examines this in two ways. The first looks just at the results of the ratings of the graphics themselves; the second analysis looks at the ratings of the graphics compared to ratings of information in general that study area residents have seen (i.e., including information from all sources that they have seen, not just NOAA sources). All items but one have from 60% to 63% rating it excellent; only perceived reliability is notably different, with 53% giving a rating of excellent to reliability (Figure 29).

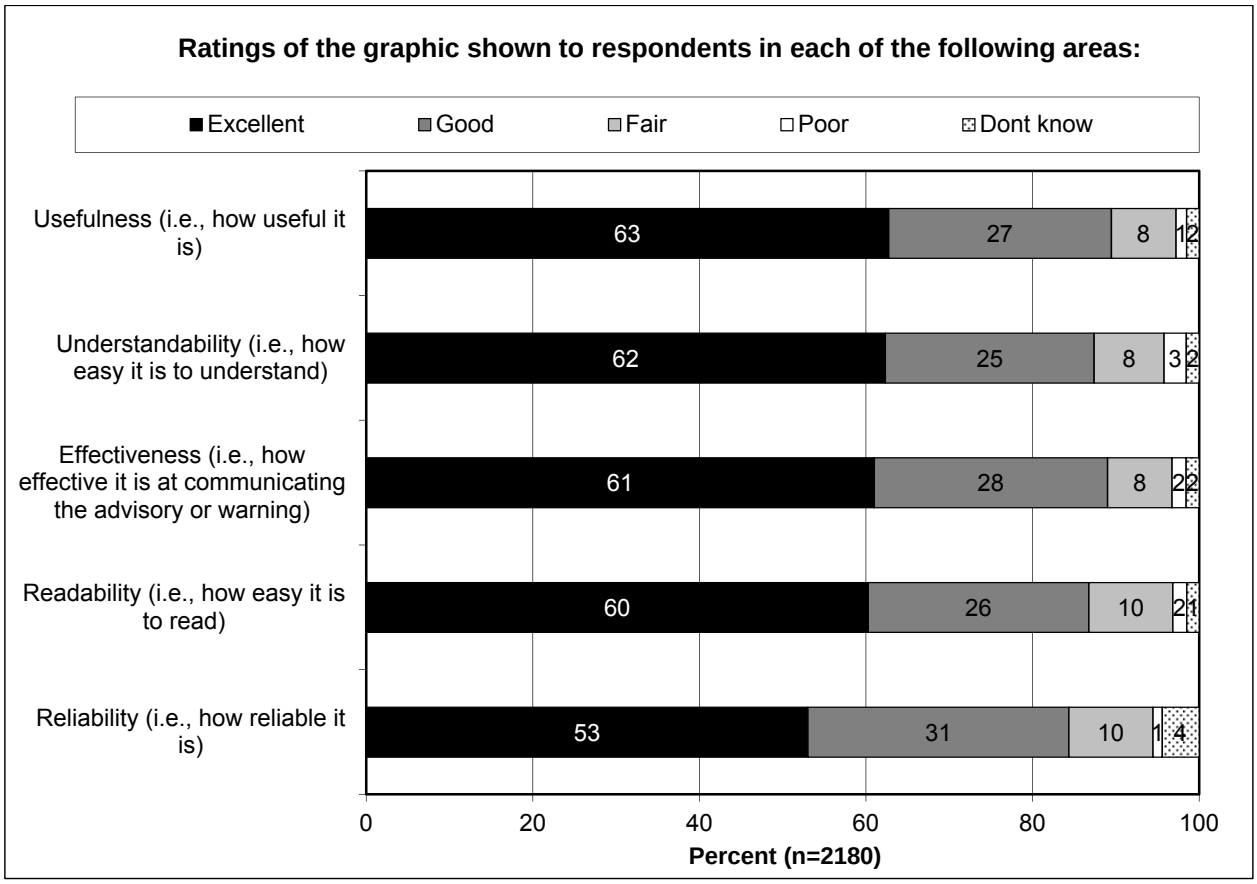



**Figure 29. Ratings of the Graphic Presented to Respondents**

The graphic presented to respondents was consistently rated higher than information that they had seen in general, as shown by the percentages giving ratings of *excellent* (Figure 30). In this graph, the values for "don't know" responses are shown to the right of the bar to improve readability of the graph. Figure 31 highlights the difference by showing just the ratings of *excellent*.

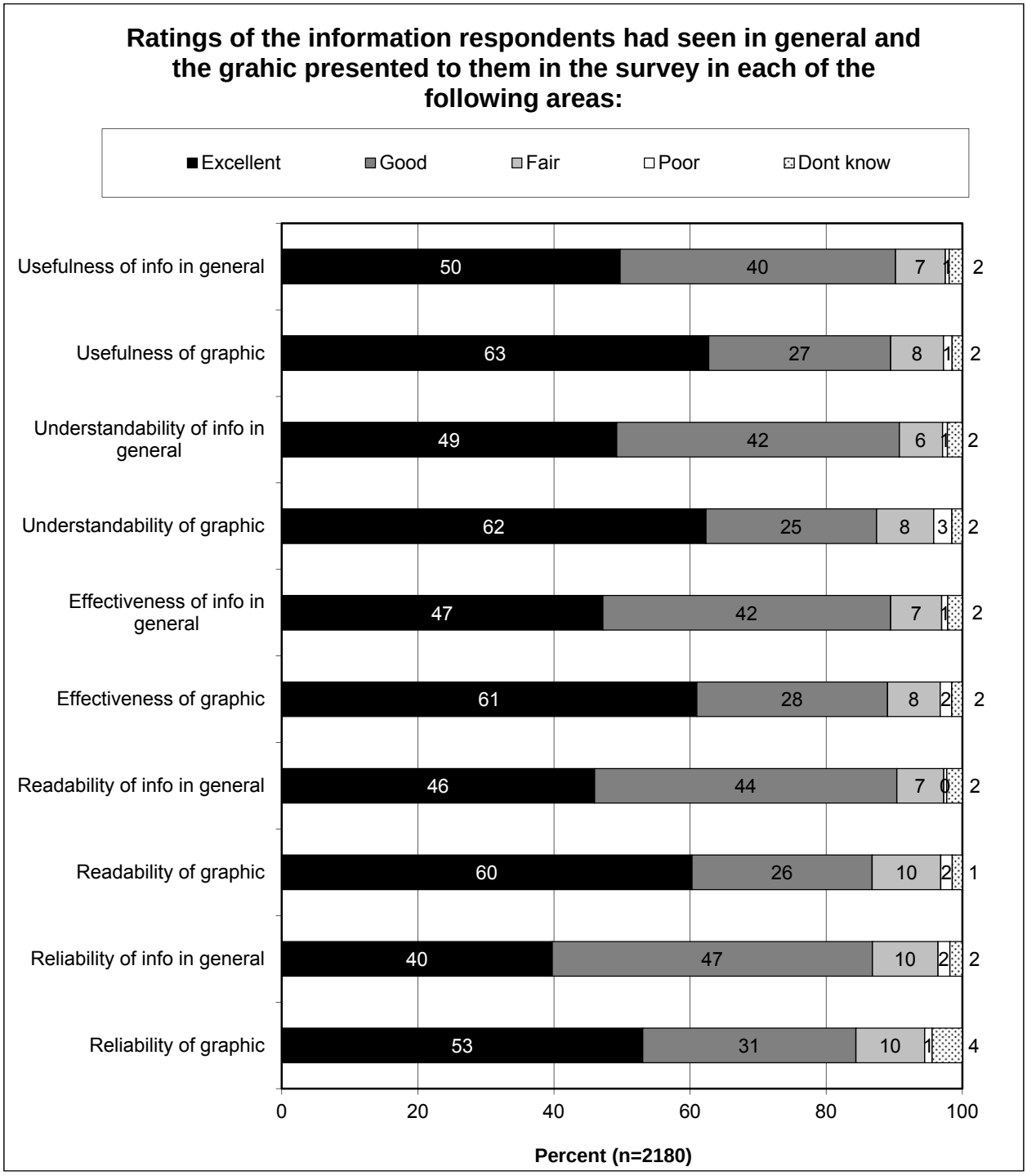



**Figure 30. Ratings of the Information in General and the Graphic Presented to Respondents**

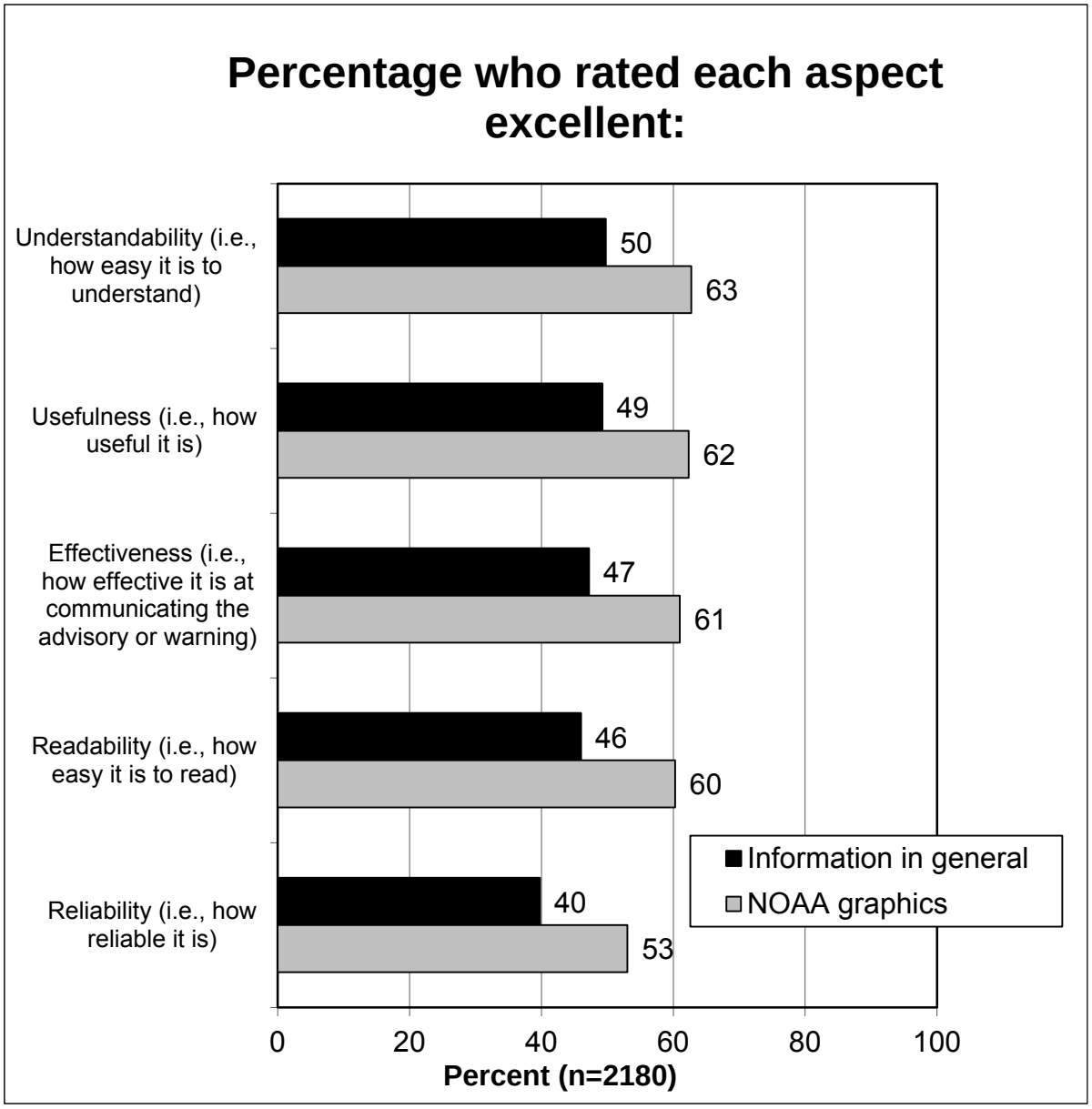



**Figure 31. Excellent Ratings of the Information in General and the Graphic**

Those who did not rate an aspect as excellent were asked a follow-up question about why they did not rate the aspect higher. These were open-ended questions in which respondents could write anything that came to mind. As such, the responses are quite varied, and they are analyzed qualitatively rather than quantitatively. Tables 7 through 11 show a sampling of the verbatim comments as written by respondents (edited only to correct misspellings, punctuation, and capitalization).

Among those who gave a less-than-excellent rating to any aspect of the graphic, responses to these follow-up questions indicated that respondents felt the graphic to be confusing and busy. Some respondents wanted more information in a map key that would help explain the graphic. Another common complaint (of those who saw a color graphic) is that the colors were hard to see through to the map layer below. Some indicated that the maps lacked enough detail to allow a location to be ascertained or that the maps were too faint. There were complaints that the time periods on the graphic were large, as well. A few wanted an interactive map that would show their location based on their Zip Code or a map that could be zoomed into more detail.

**Table 7: Sampling of Reasons Readability Was Not Rated Higher**

| **What are the specific reasons you did not rate the readability of (i.e., how easy it is to read) this graphic higher?** |
|---|
| It's hard to make out the state boundaries beneath the colors of the wind chance bands. Also, major cities are not identified. |
| It would help to have the midday times included throughout graphic. |
| There is not enough of a color contrast between adjacent zones. |
| All the days and times blend. |
| States aren't labeled, and larger cities in the path of the storm aren't marked. |
| I focused on difficulty of determining where my town was in relation to time lines. Perhaps map should include at least some major cities or towns in each state shown on map to make time line clearer for viewers areas. |
| A lot of lines, numbers and colors to sort through. And actually the script is very small and hard for me to read. |
| Although the graph with its colors and dates and times are clear enough, there could be a text chart that more fully explains what the graph means beyond just the corresponding numbers and colors—the way that a weatherman would explain what the graphics on the weather screen mean. |
| At first it was difficult to determine the placement of the day and time and what area it pertained to. I was assuming it was the space BELOW each day and time listed. |
| It's tough to read a certain town closely because the graph isn't zoomed in enough. |
| As I live in Maryland, there is a 12-hour gap in the time frame. That's not very useful. |
| I would make the coastline a bolder line and allow users to expand or drill down to get more specifics on an area. On the other hand, making the color definition areas more translucent or transparent might also improve the readability. |
| The 12-hour gap leaves too much room for anticipation. |
| I had to keep looking to make sure I was reading the correct time of when the winds would reach the particular areas. |
| I couldn't see where I lived. Too much color on Massachusetts. |
| Where Atlantic City is, there is a big space left for the time between Monday 8AM and Monday 8PM. It would be helpful if there was a 1PM line in there somewhere to see specifically when the areas between Monday 8AM and Monday 8PM will occur. |
| It's hard to predict speed of travel of the storms, and the 12-hour lines are big chunks of time. It's hard to pinpoint when exactly you are predicting my area will be affected. |
| I would like to be able to zoom in and get local details or details for areas I have friends and family in. |
| It doesn't specify major metropolitan areas. |

**Table 8: Sampling of Reasons Understandability Was Not Rated Higher**

| **What are the specific reasons you did not rate the understandability of (i.e., how easy it is to understand) this graphic higher?** |
|---|
| Needs a legend explaining how to interpret what and where the text and lines refer to. |
| Again, I wasn't sure about the placement of the day and time and what area on the map it was referring to. |
| It would be a lot easier to understand if the lines with the date and times were made so that it was easier to see the island they are overlapping. |
| It shows when it will hit Atlantic City but not Pennsylvania. |
| The tropical storm colors, in my opinion, should be more transparent around the coastlines, so that the depth at which the storm will protrude past the actual coastline can be easier to see. In a place like Moss Point (where I live), that would be crucial information. |
| I had to look around the map to see why Atlantic City was emphasized. |
| Difficult estimating time between lines. |
| A little too complicated at times. Had to read it several times. |
| How am I supposed to prepare for something that could happen anywhere within 12 hours? Will I be able to zoom in to my state and get a more accurate time? |
| How many people know how fast a knot is? I sure don't. |
| Bands over the map make the map difficult to read; not sure if the wind remains strong for the entirety of the storm's movement. |
| Your average consumer doesn't think in knots. You need to include MPH for us to understand the true speed of the wind. Also a key for the wind speed and what represents hurricane v. tropical storm wind speed would be helpful to include as well to truly understand the threat. |
| Cluttered. |
| I did not rate understandability higher because all of the times listed are for the Eastern Standard Time zone. The area in which I live is the Central Standard Time zone. |
| Dotted lines mean? |
| It is small. Maybe if zooming in is possible, it would be easier to see the areas under the colored portion. |
| Large time frame. |
| Meaning of dotted lines and 'five day chance' unclear. |
| Need to know exactly where my area is on the map. Could be more helpful if there are a few more location pinpoints. |
| There are different time zones in this map. Have to figure out my time zone. |
| It doesn't have any notes that can help to understand the symbols. |
| Possibly some arrows to show the direction of the winds could make it easier to see what's going on more quickly. |
| I can't tell the difference between the reds or even know if there is two shades of red on the graph compared to the key below. |
| The colors overlap, so it is a bit hard to see exactly what level of wind will impact my area. |
| Too much compressed information into a small space. |

**Table 9: Sampling of Reasons Usefulness Was Not Rated Higher**

| What are the specific reasons you did not rate the usefulness of (i.e., how useful it is) this graphic higher? |
|---|
| The twelve-hour span between 8 am and 8 pm is too long for those in those areas. For example, what time is it hitting Boston? |
| If I'm not confident of my interpretation, then I would question the usefulness of the information. |
| Again the wide, large area covered by the encircled area. A narrowed area would be more useful. |
| Again the wind speeds could be notated. |
| You only have one city marked on the map. |
| Because it's too vague, and I don't like the percentage terms used, and I can't pinpoint my area of interest (i.e., Hawaii Kai). |
| A 40% chance doesn't really give me a solid read on whether or not I should be preparing. |
| I did not find this graphic useful in planning my preparation because it is only for one specific city—Atlantic City—and I don't live there. |
| I think radio and TV are more useful. |
| Think that the outward areas of the 'circle' shouldn't be so clearly defined, it might give people living outside of the circle border false security that the tropical force winds won't reach their area. |

**Table 10: Sampling of Reasons Reliability Was Not Rated Higher**

| What are the specific reasons you did not rate the reliability of (i.e., how reliable it is) this graphic higher? |
|---|
| I did rate it as good, but it covers a large area. Perhaps if there was some shading within the circled area to show how far the worst damage might be would be helpful. |
| Again time is a huge factor in planning, and not being able to accurately estimate the time is difficult. |
| Because all storm graphics change as the storm comes on, especially on shore. |
| From experience I know that these maps always have very large errors. It is a graph in a very general way. |
| There is a huge range of hours that it could hit my area. |
| I lived along the coast of the Carolinas for 40+ years. Nearly every storm's intensity is over estimated. For example, we were told Hugo had winds of 135+ at the time of landfall, but the highest winds were closer to 100 mph, and only a single gust measurement. Many of my friends and family are beginning to question the validity of the NHC's storm-intensity forecasts. |
| Graphics that are not moving tend to be old right away, for you're seeing something not moving not current. It's more of a picture of a time before you went to site, so I don't think it's too reliable for the current information, thus not too current so not too reliable. |
| Because I don't know where this graph came from. Reliability to me means over time it has given me correct information. |
| I gave this a rating of 'good' for reliability. I am not sure how much I can rely on this as I am not familiar with the National Hurricane Center. So, that is why I gave it a rating of 'good' instead of 'excellent.' |
| I know that a lot can happen between Saturday at 2 pm and Monday at 8 pm, so I would want to see updated graphics to see if the storm shifts its projected course. |

**Table 11: Sampling of Reasons Effectiveness Was Not Rated Higher**

| **What are the specific reasons you did not rate the effectiveness of (i.e., how effective it is at communicating the information) this graphic higher?** |
|---|
| Could be broken down in to smaller geographic areas in addition to the larger overview. |
| It is only partial. It does not include wind direction or storm track. Both are important. |
| Doesn't specifically state the strength of the hurricane or how hard the wind is blowing. 40 mph isn't that bad, and there is a huge difference between that and 80 mph. I wish I knew the category of the hurricane. Will it have weakened by the time it gets to me? |
| Extremely few people in Hawaii have the necessary skills, time, or perception to understand your map, and most of the ones that do will still mis-translate the data you are showing. |
| Needs more written text, for me, I'm a more visual type person. |
| You (and TWC, Weatherunderground) are loosing the public's trust with regard to intensity. You typically get the storm track close to accurate, but the intensity always seems WAY over blown. |
| I don't think people would be drawn to this particular image as an effective warning. |
| Rather hear from reporter. |
| Because it doesn't show local info, it only gives one type of data, and the storm will likely change over the period of time represented on the graphic. |
| The graphic is very effective at communicating the most likely time of arrival of the storm winds, but the question asked about how effective it was at communicating 'the advisory or warning.' I don't have a lot of information from this graphic about the strength and severity of the storm (hard for me to visualize knots). So if that's what the question is specifically asking about, then this graphic isn't great at communicating that. If you're asking specifically about the effectiveness of the graphic in regards to meeting the goal set out by the graphic title, then I would upgrade it to excellent. |
| If you can't read or decipher the graph, you can't use the information to prepare. |
| There's no accompanying statement for the area with wind speed estimate or ways one should prepare, etc. Yes it communicates winds, but not the reality of the severity. |
| Because I think there could be a simpler way to communicate this or just a better overall design. |
| It's difficult to make out the state boundaries due to the colored bands. |
| I don't think it would be particularly clear to most people. |
| Knowing the high and low tide hours would be helpful to determine how bad the storm surge would be, depending again on wind strength. |
| Not sure how effective this will be in a true weather situation. |
| Prefer to watch The Weather Channel. |
| So should the people of Baltimore leave at midnight? Perhaps the timeframe should be modified to include only times when people would be awake. |

The survey asked about the font size and the color coding (only those who were shown the color graphic were asked the latter question). The large majority of study area residents (86%) agree that the fonts are large enough (Figure 32), and a similarly large majority (87%) agree that the color coding is understandable (Figure 33). Regional graphs are shown, with only small differences in overall agreement (Figures 34 and 35).

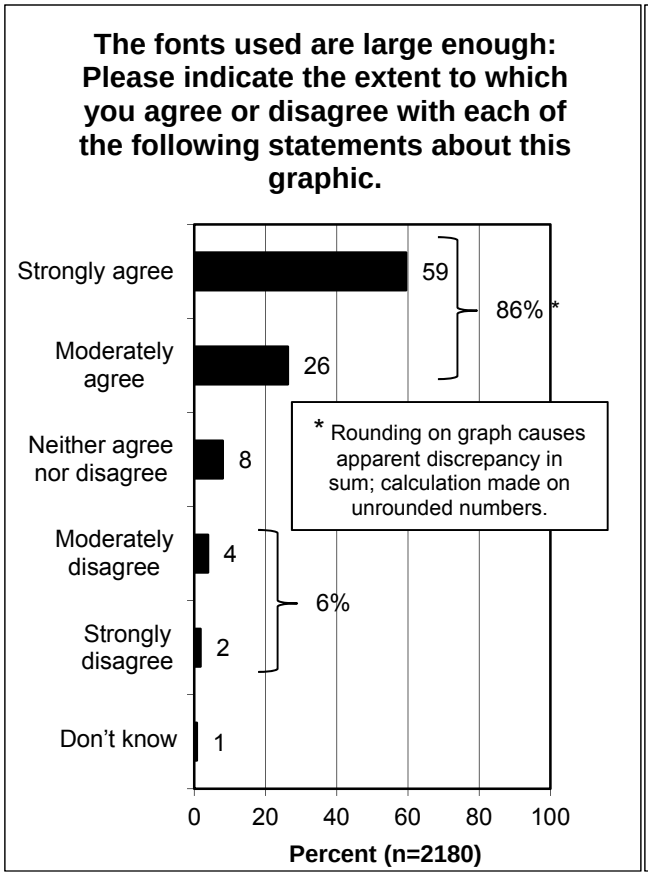



**Figure 32. Opinion on Font Size**

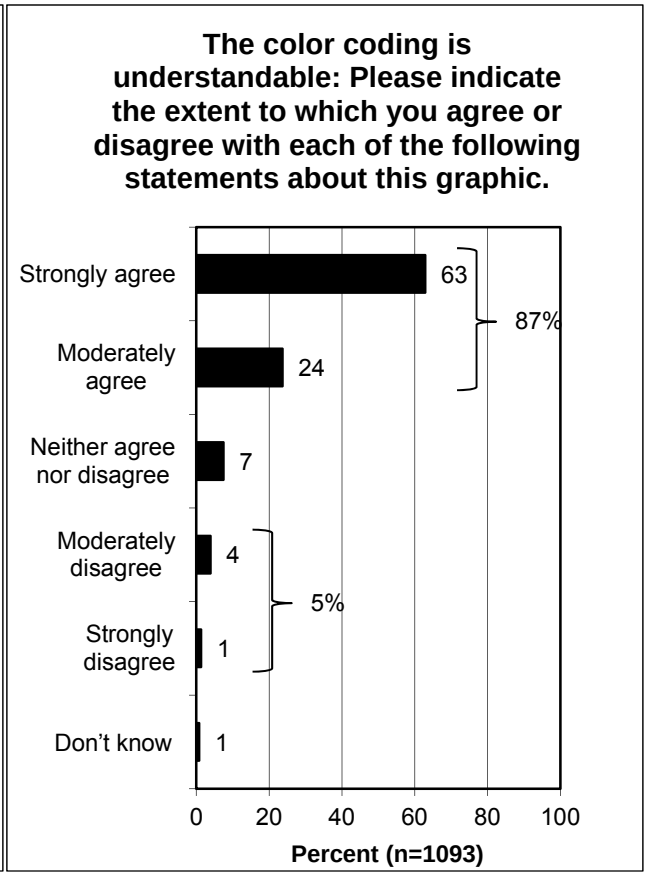



**Figure 33. Opinion on Color Coding**

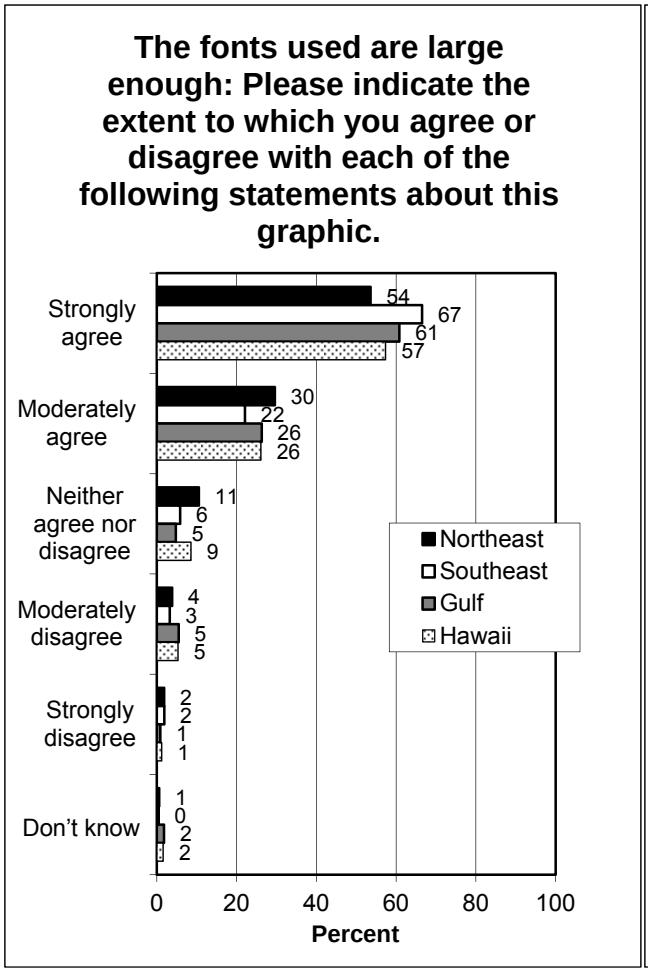



**Figure 34. Opinion on Font Size by Region**

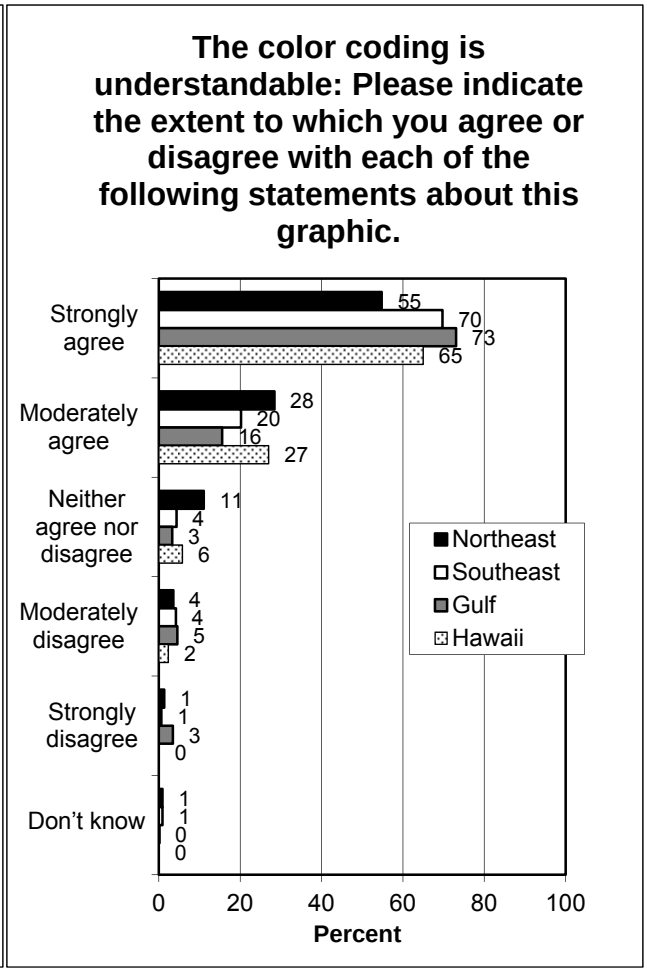



**Figure 35. Opinion on Color Coding by Region**

Another line of questioning asked about anything that might be unclear or confusing (in one question) or anything that might be missing from the graphic (in another question): 15% felt that something was unclear or confusing (Figure 36), and 17% felt that something was missing (Figure 37). Regionally, Hawaii residents have the highest percentage saying that something is unclear or confusing and the highest percentage saying that something is missing (Figures 38 and 39). Open-ended questions explored the perceived confusing or missing elements. Most commonly, respondents in the follow-up question about what exactly was missing want to see more information about wind speed, storm surge, and rainfall amounts (the follow-up question was analyzed qualitatively rather than quantitatively, so no graph is presented for this question).

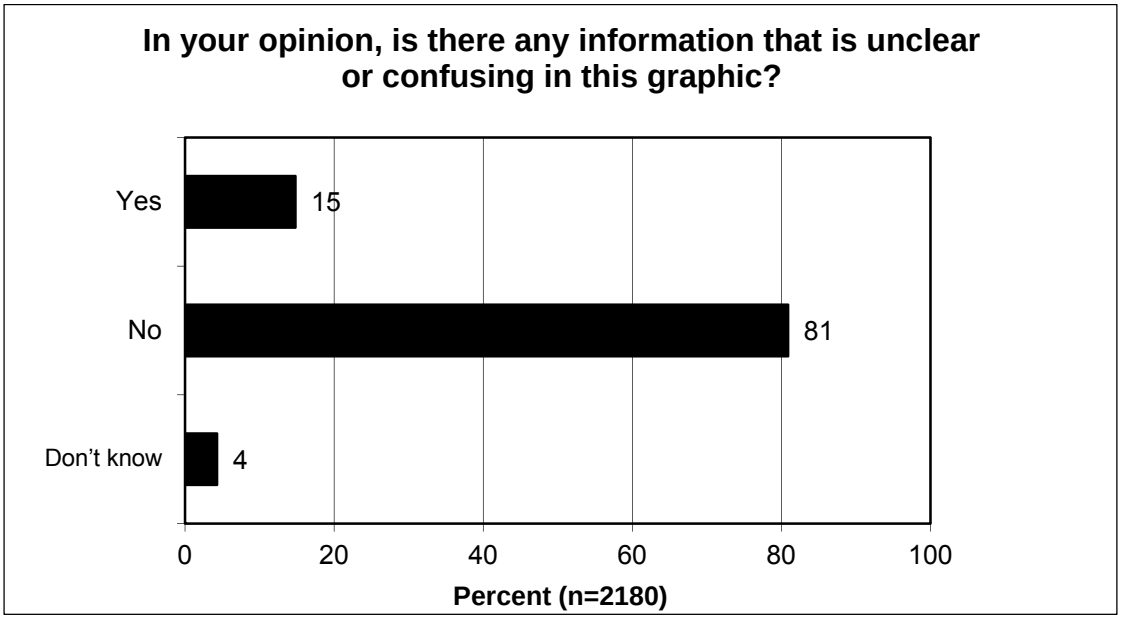



**Figure 36. Opinion on Whether Graphic Is Unclear or Confusing**

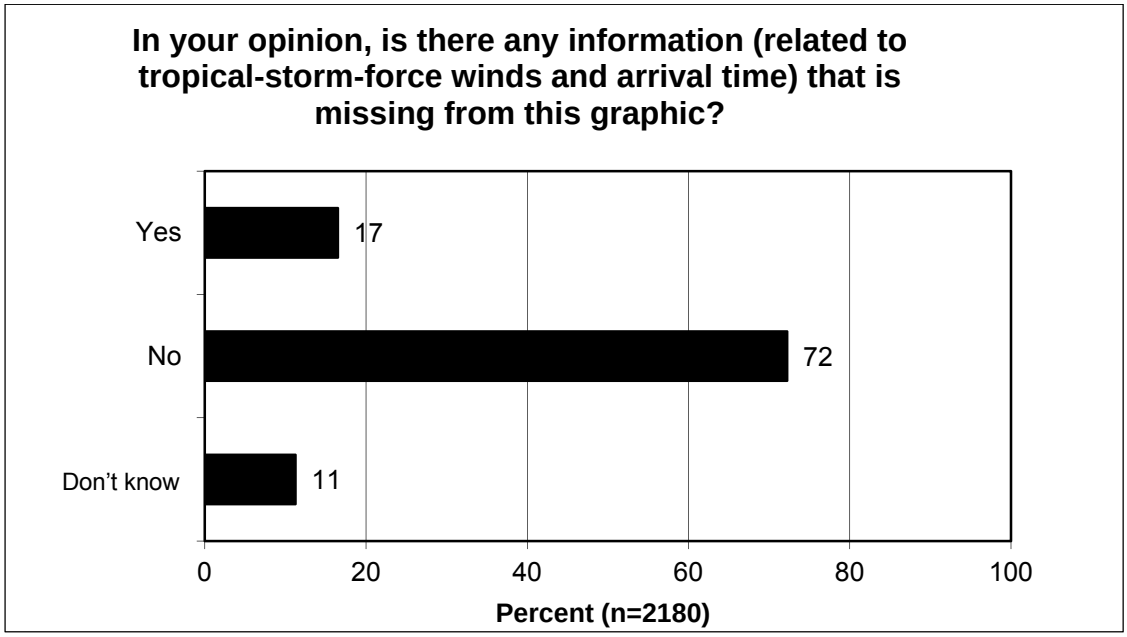



**Figure 37. Opinion on Whether Graphic Is Missing Any Information**

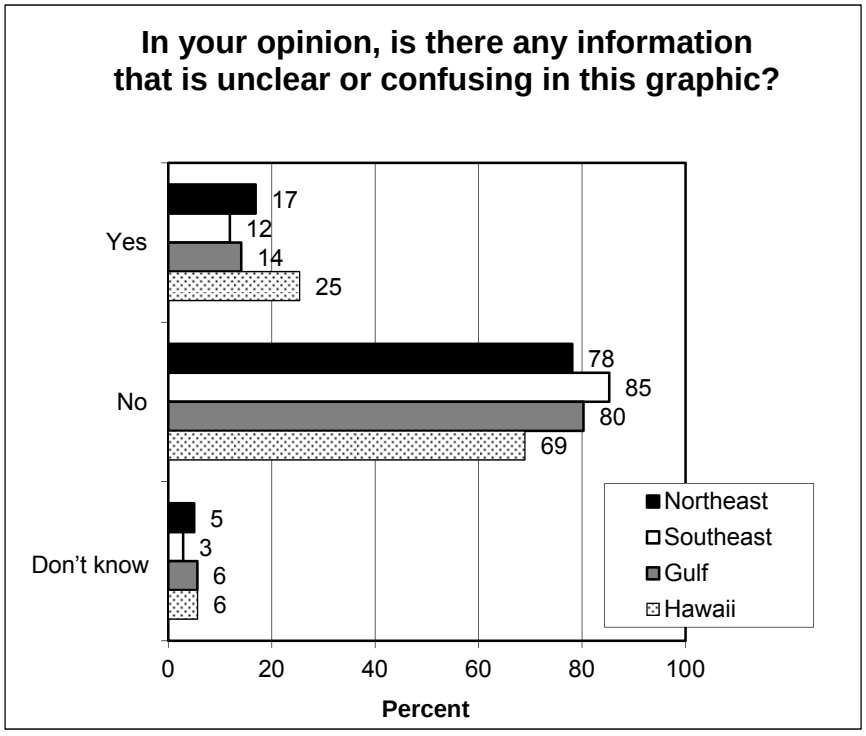



**Figure 38. Opinion by Region on Whether Graphic Is Unclear or Confusing**

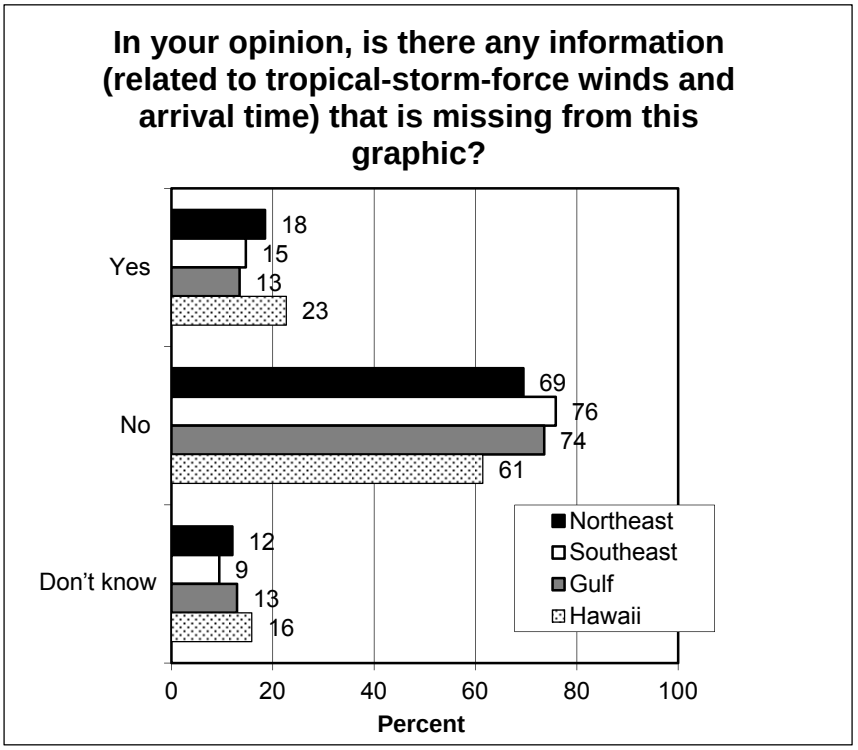



**Figure 39. Opinion by Region on Whether Graphic Is Missing Any Information**

An important aspect of the graphic is that it convey the needed information. A large majority of study area residents (85%) say that they know, from the graphic, if their home is in the area that is within the zone of potential affects (Figure 40). Also, a large majority (82%) say that they know, from the graphic, the potential areas affected by winds (Figure 41). The primary regional differences are that Hawaii residents have a lower percentage agreeing with either question, relative to residents of the other regions (Figures 42 and 43).

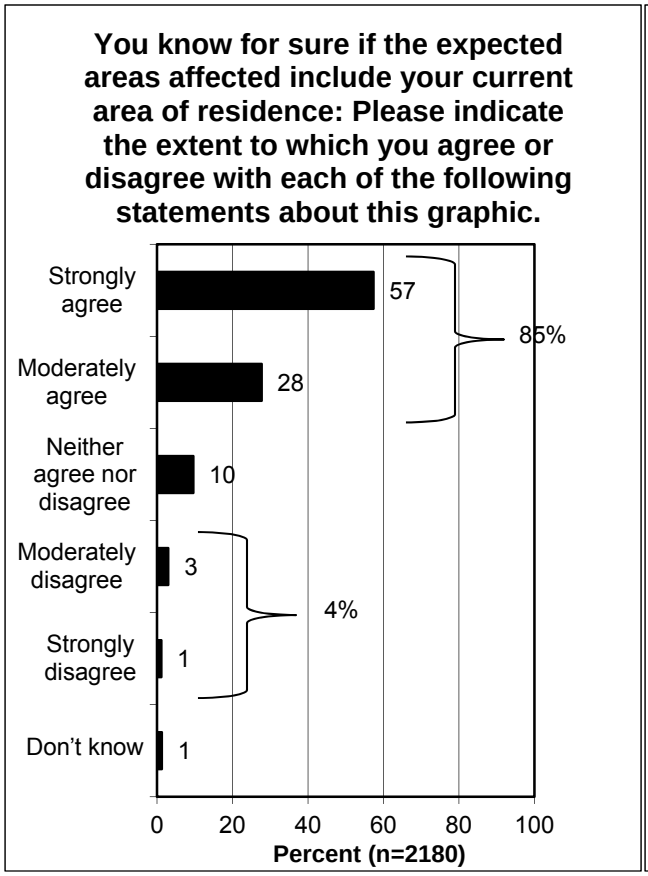



**Figure 40. Knowing Expected Area Affected**

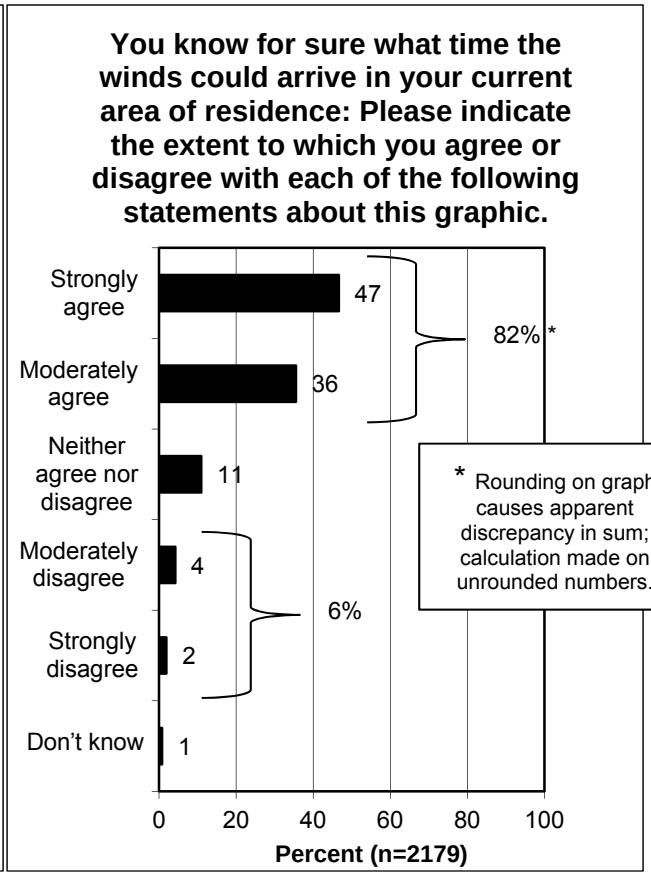



**Figure 41. Knowing Time Winds Are Expected to Arrive**

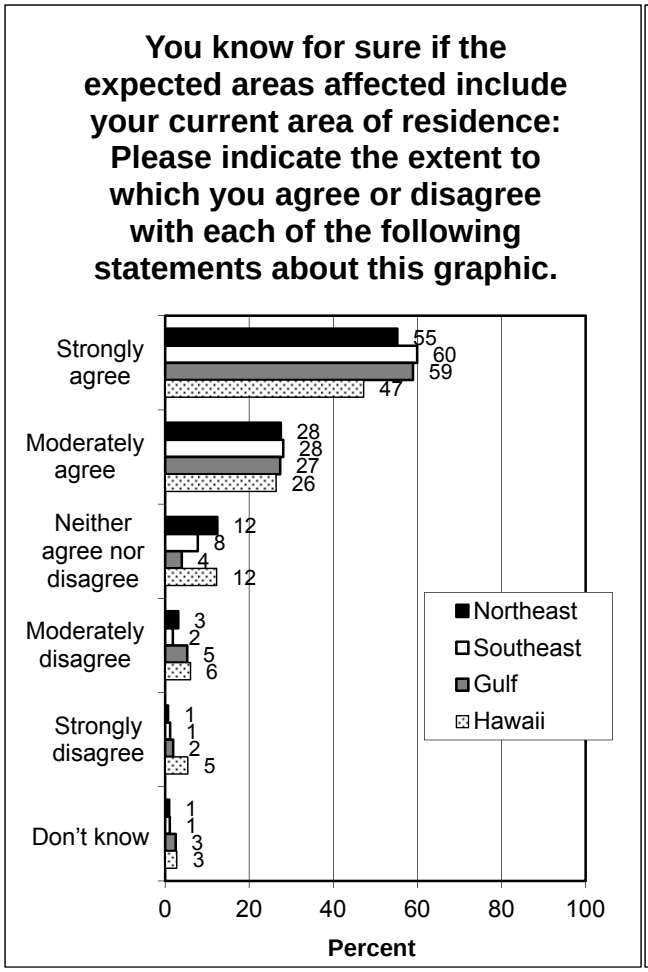



**Figure 42. Knowing Expected Area Affected by Region**

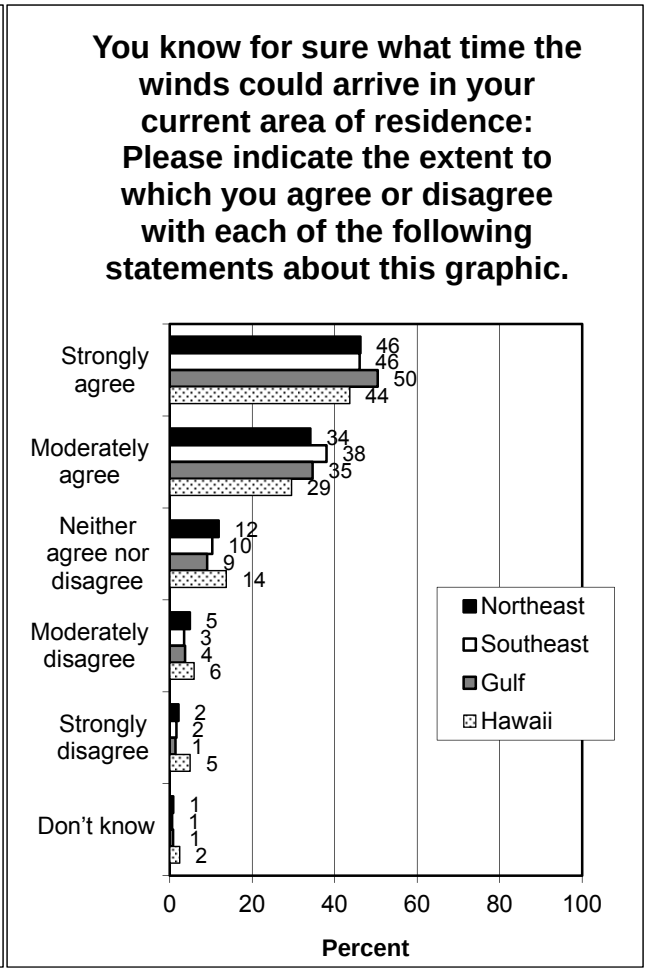



**Figure 43. Knowing Time Winds Are Expected to Arrive by Region**

The survey also tested respondents' ability to correctly determine the time that tropical-storm-force winds would arrive in various locations, based on the four permutations of the graphics. The threshold chosen was within 3 hours—a response within 3 hours is considered correct. In general, the no-color graphics produced higher rates of correct responses (Figures 44 through 47), and the color/no-color status had a more consistent effect than did whether the graphic showed the earliest or most likely arrival time.

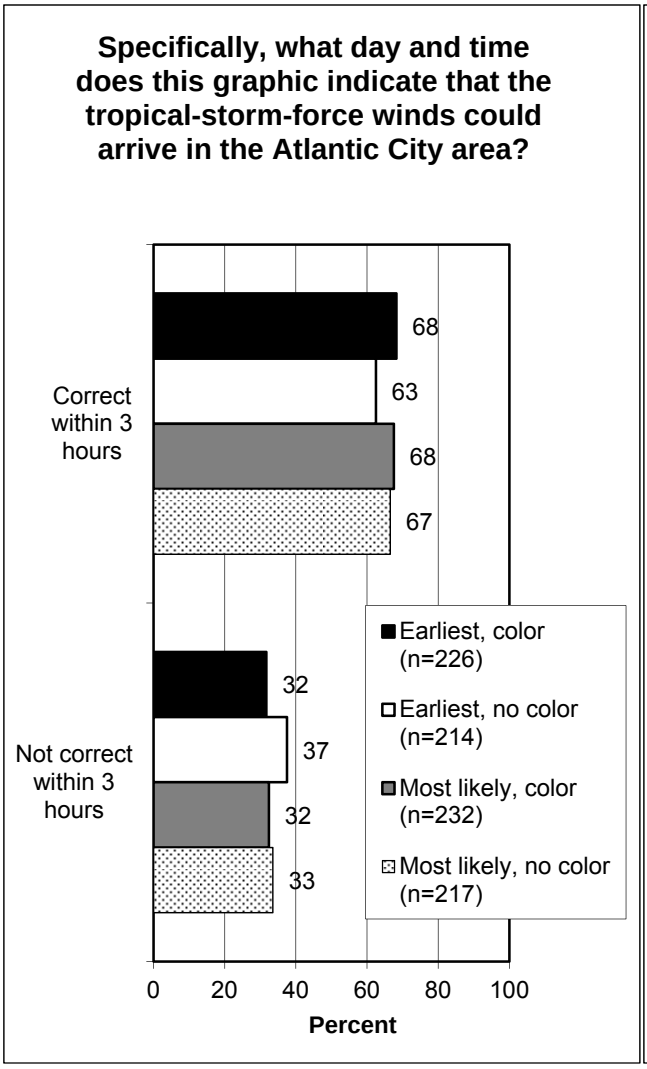



**Figure 44. Correct Reading of Graphic for Atlantic City**

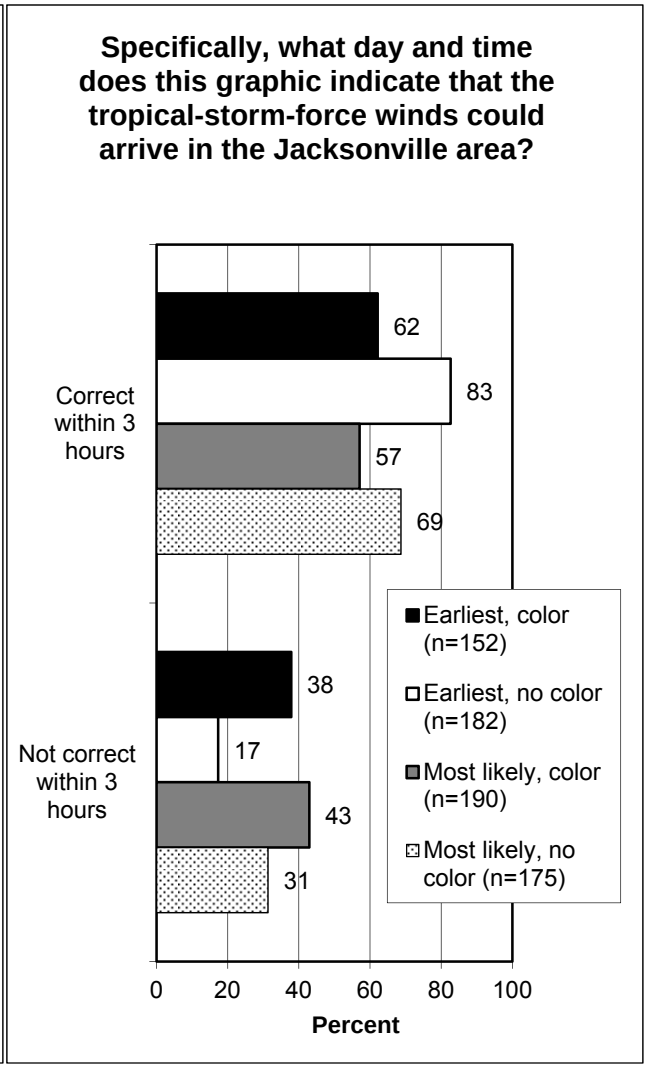



**Figure 45. Correct Reading of Graphic for Jacksonville**

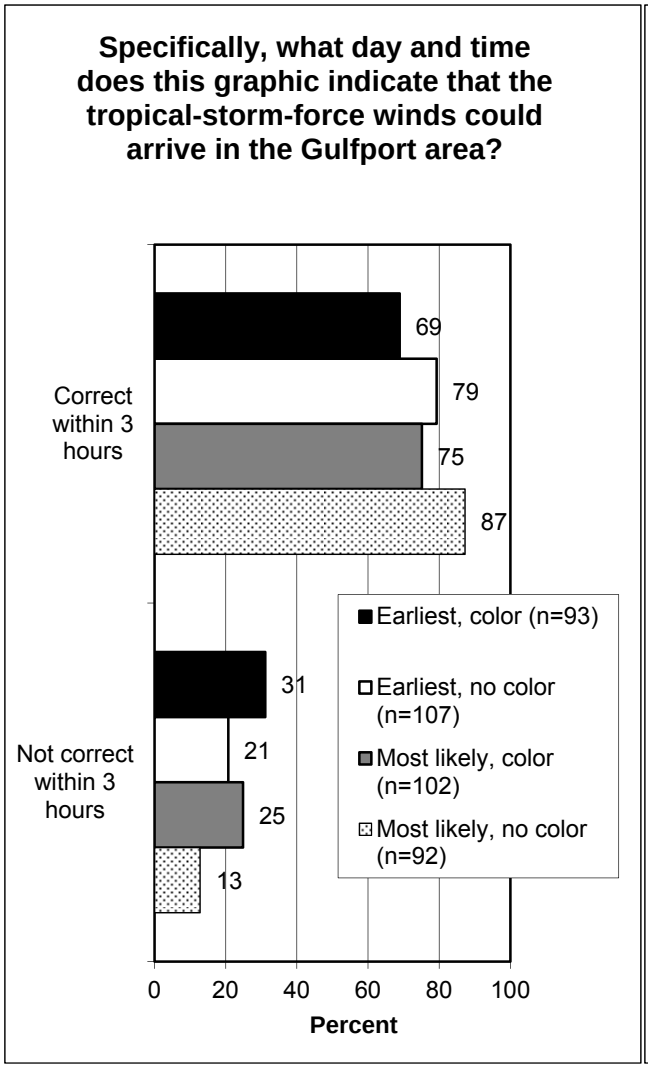



**Figure 46. Correct Reading of Graphic for Gulfport**

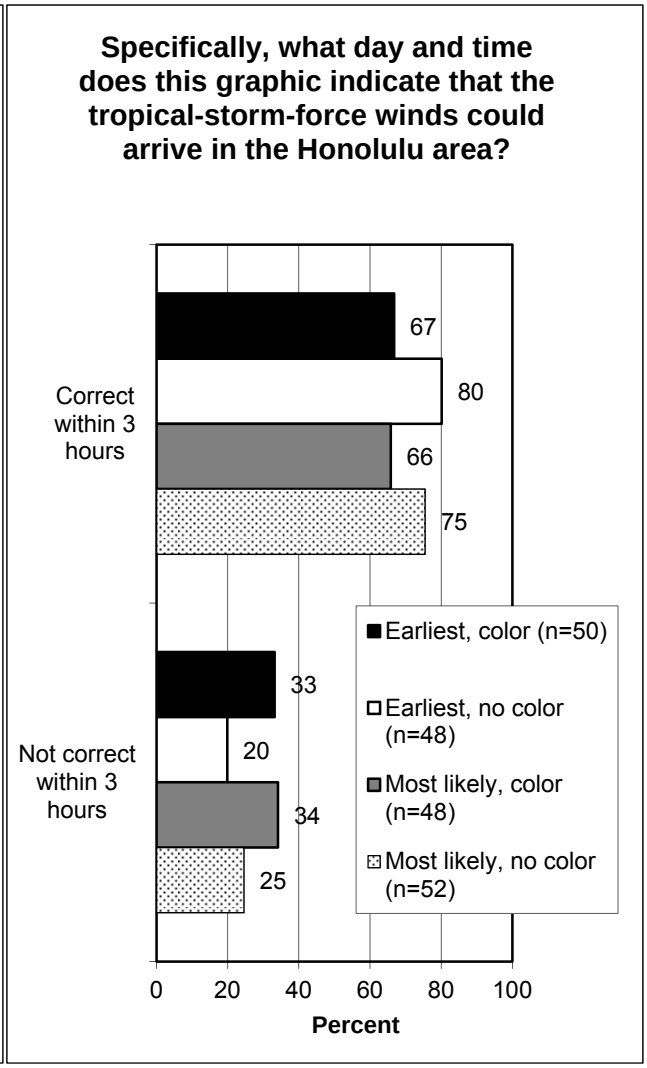



**Figure 47. Correct Reading of Graphic for Honolulu**

After being shown the graphic, study area residents were asked for their likelihood to use the same type of graphic to determine if and when they should begin preparations for a pending tropical storm or hurricane. The large majority of them (92%) indicate that they would be *very* or *somewhat* likely to use it (Figure 48). Additionally, the graphic also prompted 87% to say that they would be *very* or *somewhat* likely to make preparations for a tropical storm or hurricane event (Figure 49). Two-thirds of study area residents say that they would check the graphic at least every 3 hours (with some saying more frequently) (Figure 50).

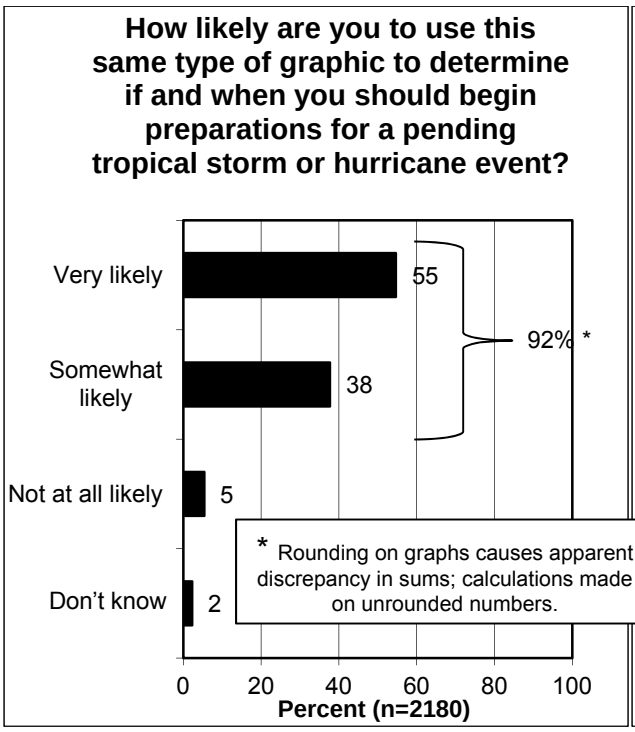



**Figure 48. Likelihood to Use Graphic**

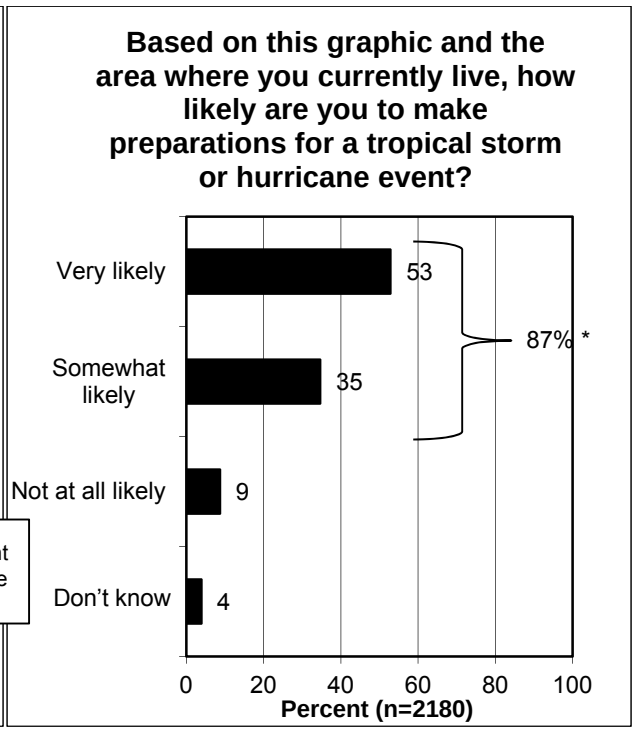



**Figure 49. Likelihood to Make Preparations Based on Graphic**

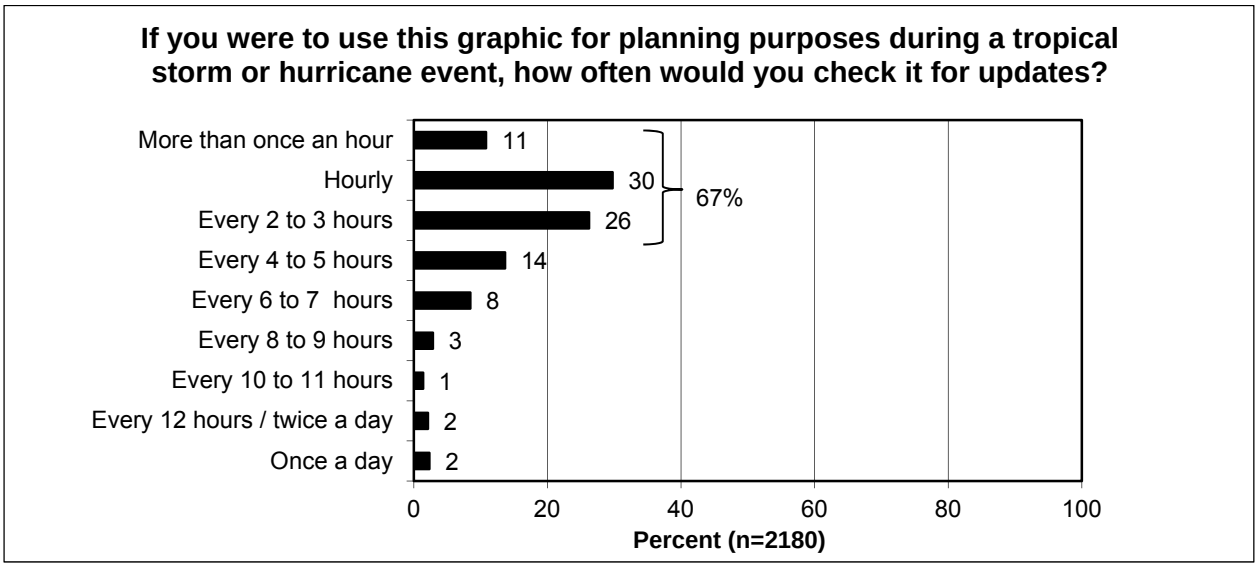



**Figure 50. Frequency of Use of the Graphic**

In looking at regional data, the differences are not marked, with the primary difference being that Gulf Region and Hawaii residents have a slightly higher percentage, compared to the overall data, being *very* likely to make preparations for a tropical storm or hurricane event based on the graphic shown (Figures 51 and 52). Figure 53 shows the regional data regarding frequency of checking for updates.

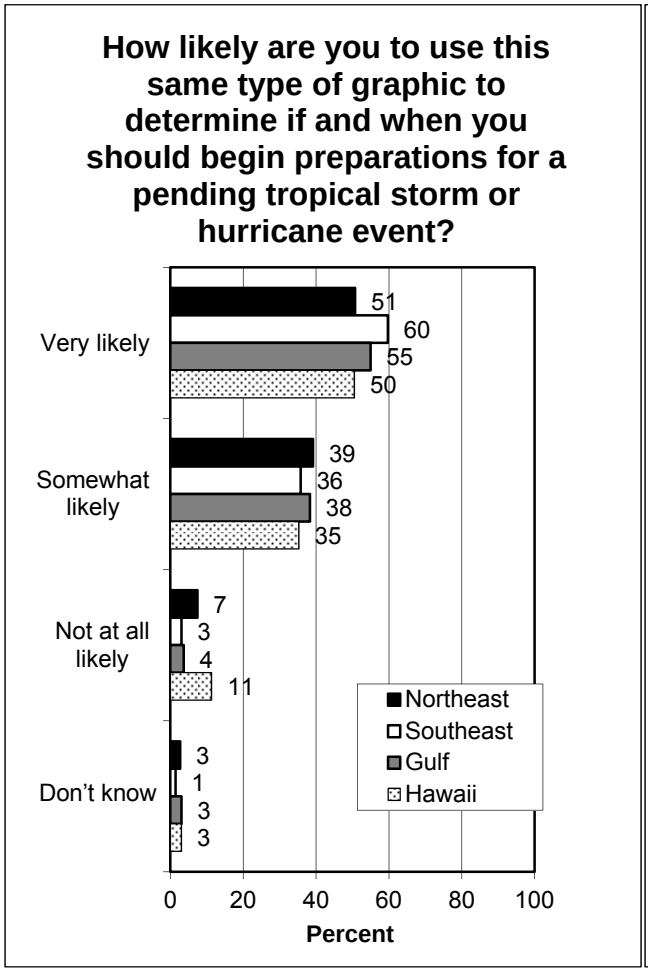



**Figure 51. Likelihood to Use Graphic by Region**

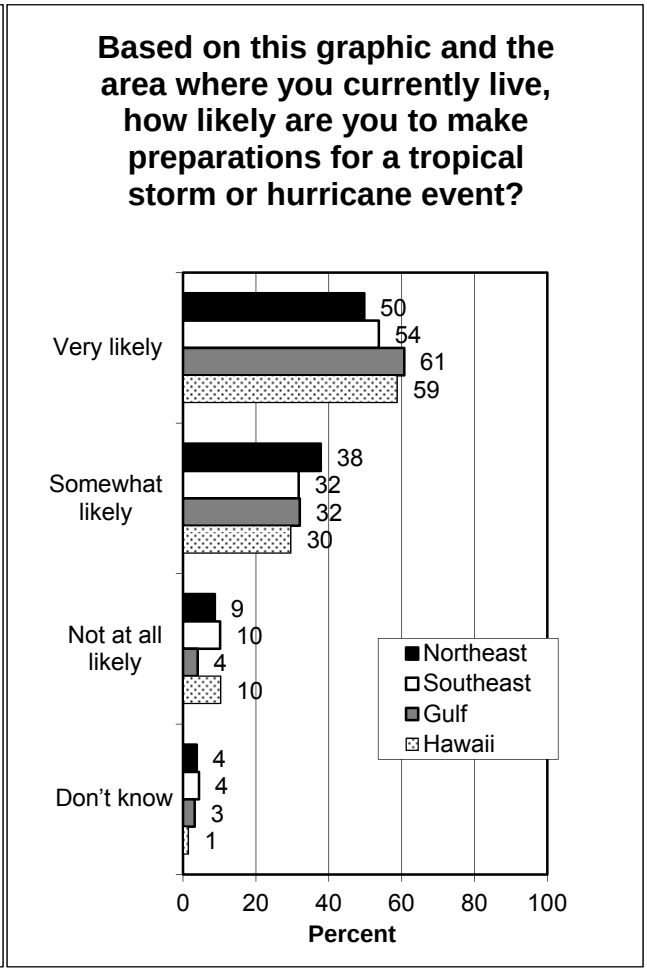



**Figure 52. Likelihood to Make Preparations Based on Graphic by Region**

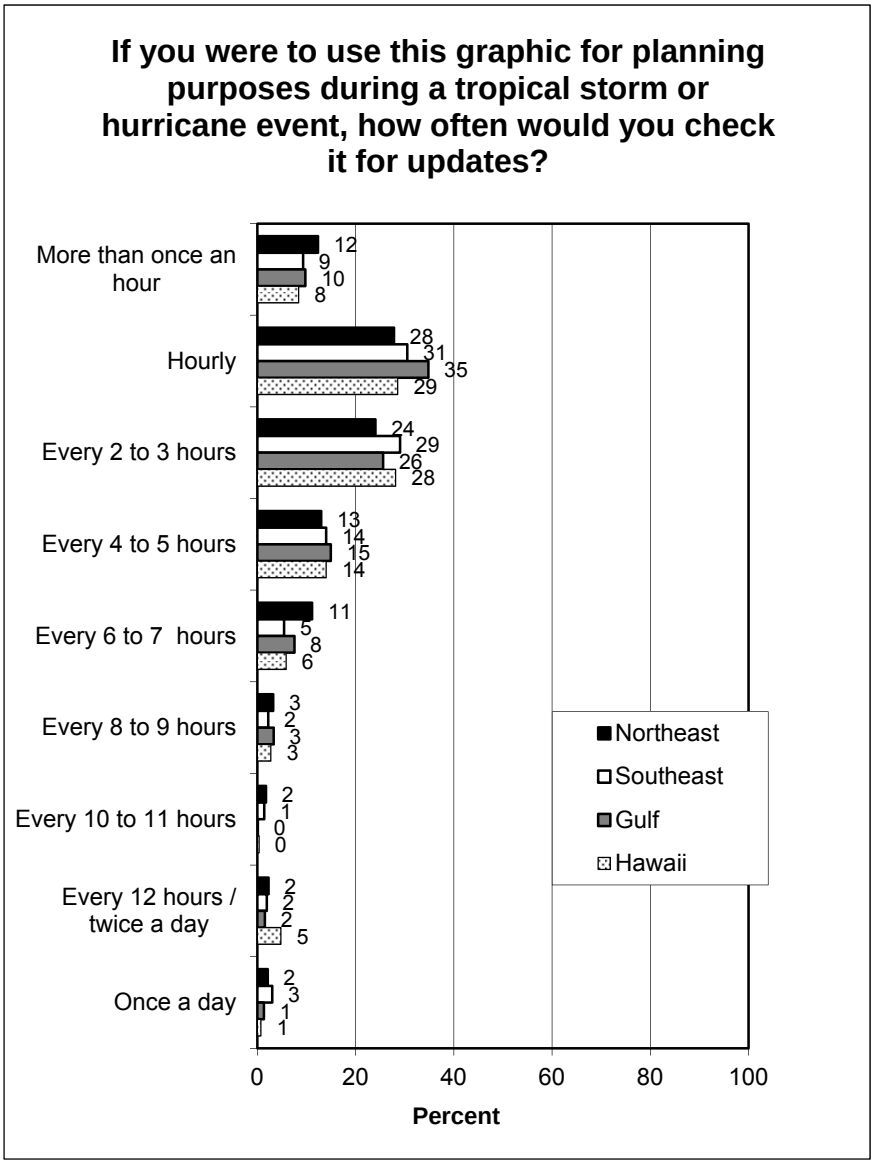



**Figure 53. Frequency of Use of the Graphic by Region**

The survey asked respondents, after they had examined the graphic, to say when they would begin preparing for the winds. Most commonly, they begin in the 2 days prior to the storm (Figures 54 and 55).

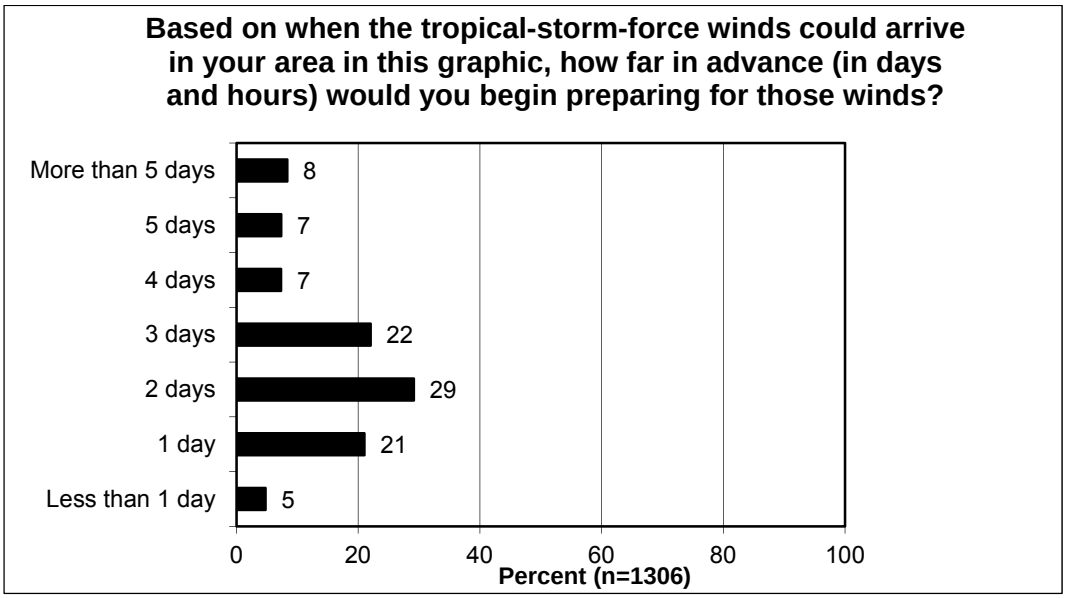



**Figure 54. Advanced Preparation Based on Graphic**

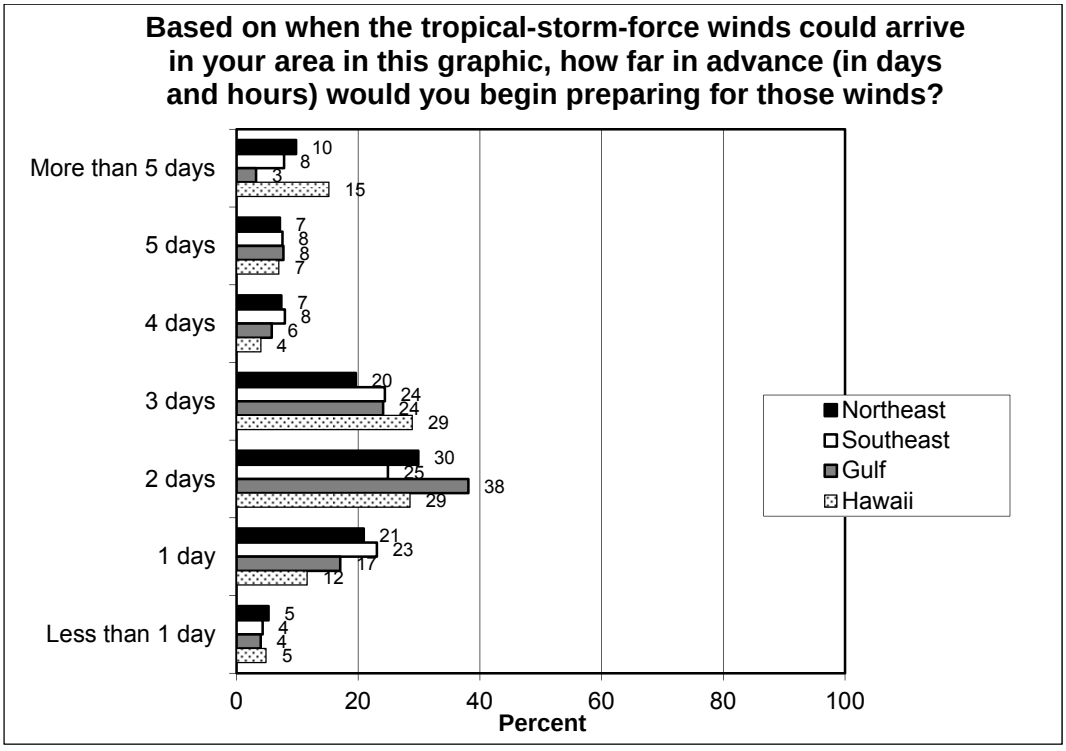



**Figure 55. Advanced Preparation Based on Graphic by Region**

The survey tested graphics that showed the *earliest* storm arrival time and the *most likely* storm arrival time, and the survey tested *color* or *gray-shaded* graphics, as well. The sample was randomly divided into fourths, with each getting one of the combinations (earliest arrival time, color; earliest arrival time, no-color; most likely arrival time, color; and most likely arrival time, no-color). Also, depending on the region of residence, respondents were given graphics that concerned the Atlantic City area, the Jacksonville area, the Gulfport area, and the Honolulu area.

Table 12 shows the percentage of respondents who would begin preparations in 1 day or less time according to the graphic that they were shown; these people are considered "late starters" for the purposes of this analysis. Color and no-color graphics are about the same in whether people make a late start in preparing (i.e., they begin no more than 1 day in advance). On the other hand, the data suggest that there are more people making late starts in preparing based on the graphics that show the *most likely* arrival time, although only in Jacksonville is the difference large (with 22% beginning preparations within only 1 day upon being shown the *earliest* arrival time, but 33% beginning preparations within only 1 day upon being shown the *most likely* arrival time). The data on which the table was made are shown in Figures 56 through 59.

**Table 12: Percentage Beginning Preparations Within 1 Day**

| City | Type of graphic | Percentage who would begin preparations within only 1 day or less (the mean of the two percentages for each type*) |
|---|---|---|
| Atlantic City | Color | 26 |
| | No-color | 22 |
| | Earliest arrival time | 23 |
| | Most likely arrival time | 25 |
| Jacksonville | Color | 25 |
| | No-color | 30 |
| | Earliest arrival time | 22 |
| | Most likely arrival time | 33 |
| Gulfport | Color | 31 |
| | No-color | 35 |
| | Earliest arrival time | 32 |
| | Most likely arrival time | 35 |
| Honolulu | Color | 17 |
| | No-color | 19 |
| | Earliest arrival time | 15 |
| | Most likely arrival time | 20 |

* For instance, in the Atlantic City graph at the top of the next page, the sum of the "1 day" and "Less than 1 day" is 21% for "earliest, color" and 31% for "most likely, color"; the mean of 21% and 31% is 26%, as shown in the first data row in the table above.

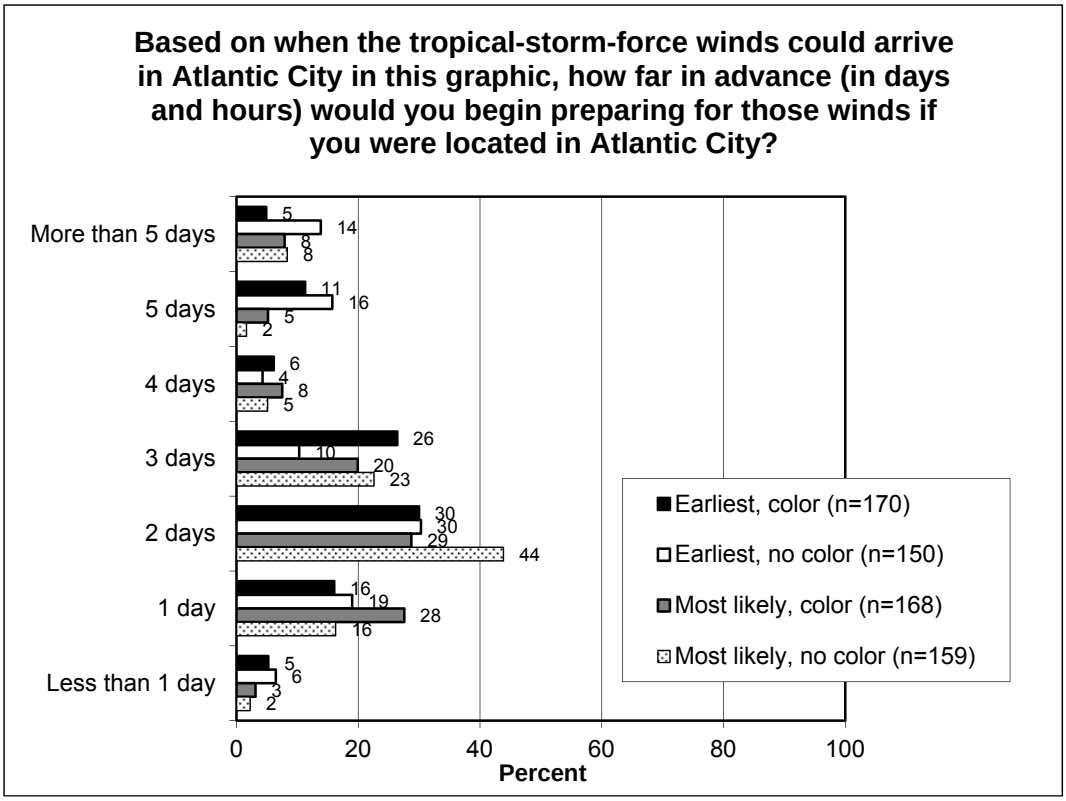



**Figure 56. Advanced Preparation Based on Graphic (Atlantic City)**

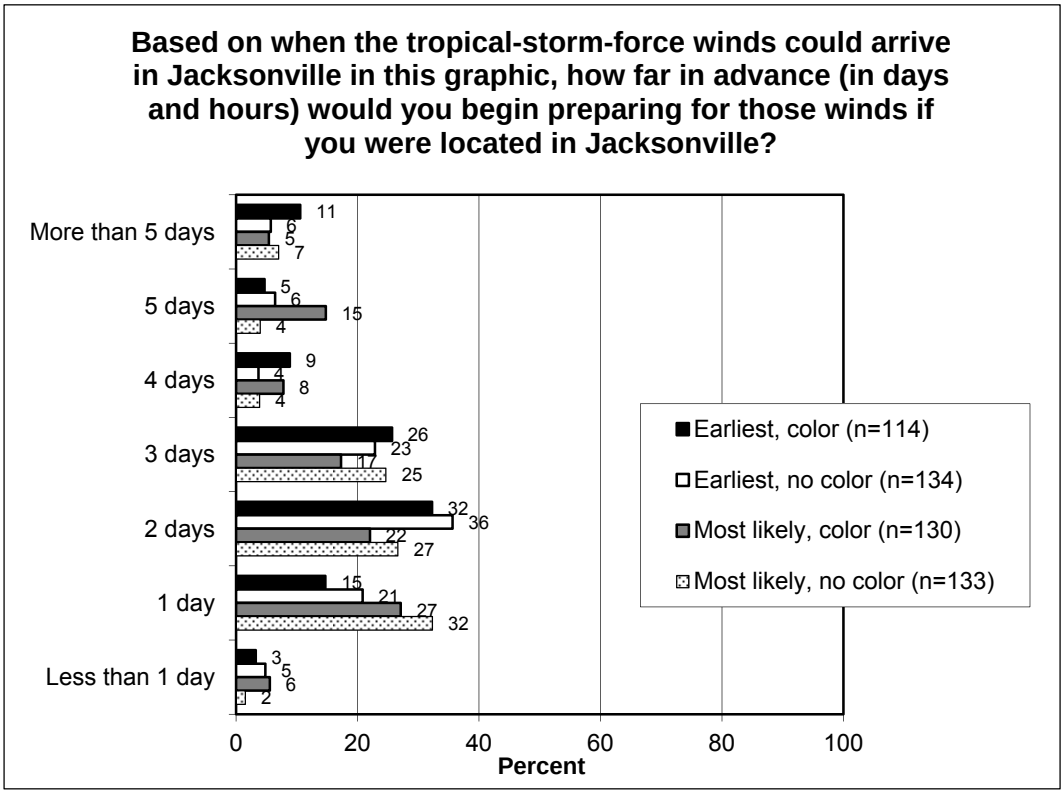



**Figure 57. Advanced Preparation Based on Graphic (Jacksonville)**

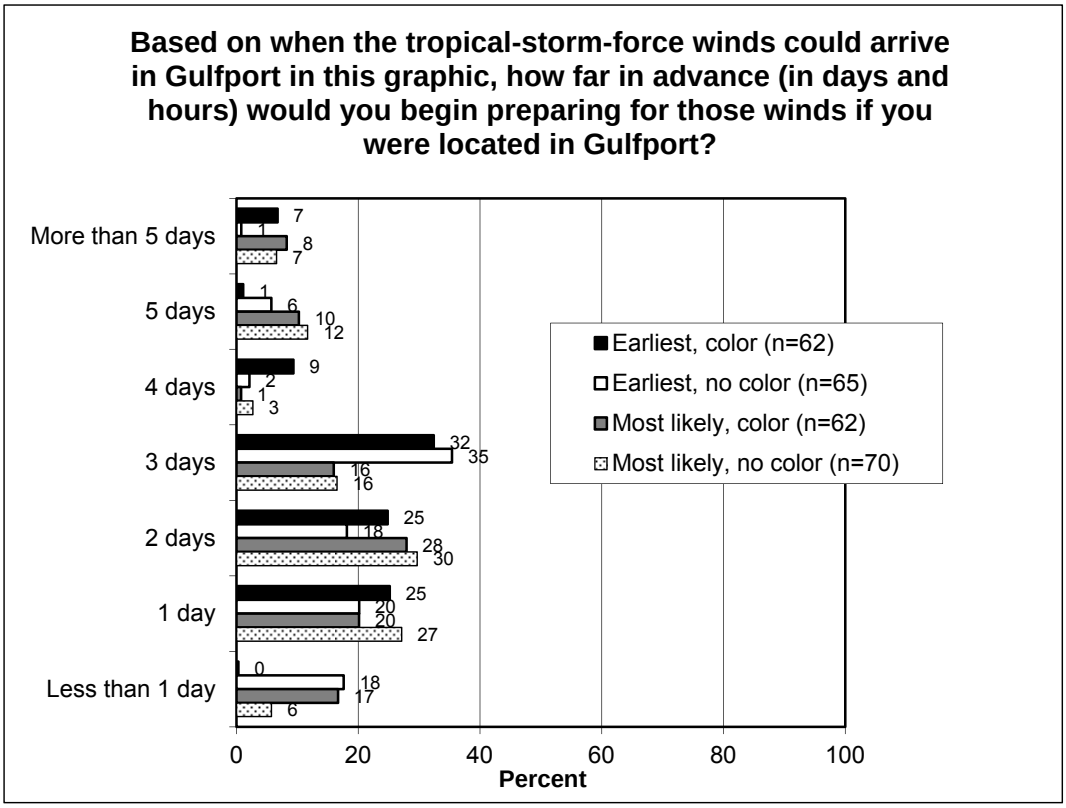



**Figure 58. Advanced Preparation Based on Graphic (Gulfport)**

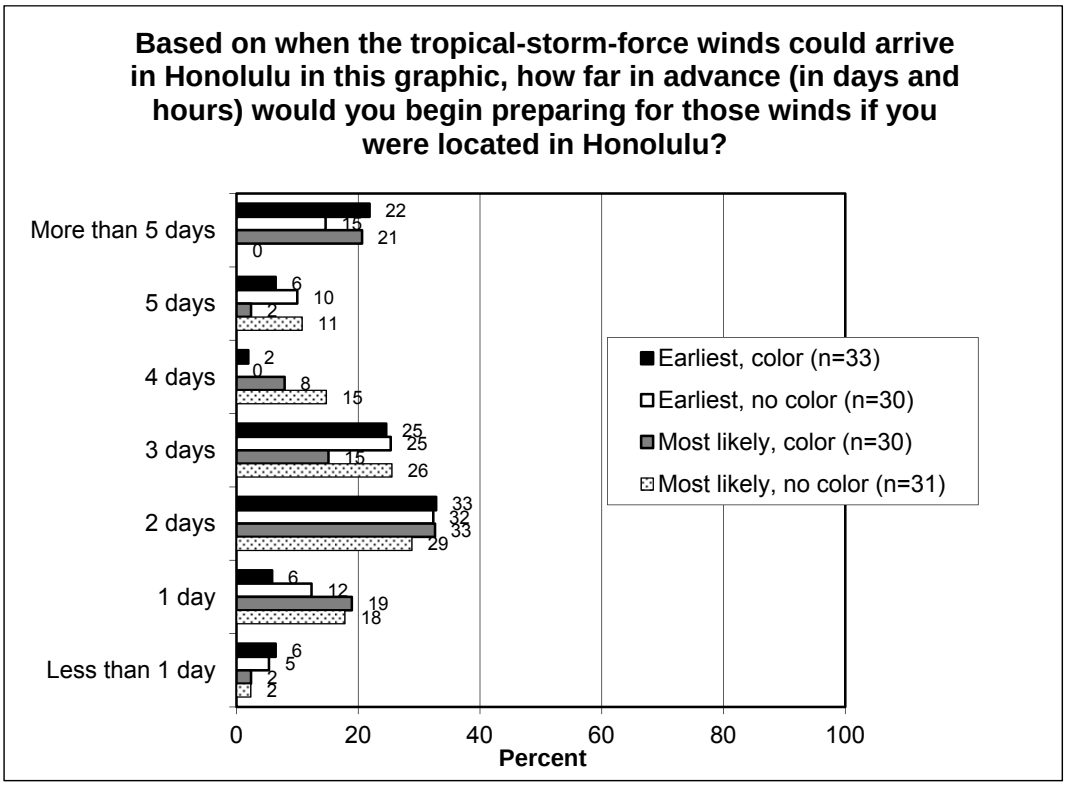



**Figure 59. Advanced Preparation Based on Graphic (Honolulu)**

The survey also asked whether study area residents would like to see the *earliest* arrival time or the *most likely* arrival time, but residents are almost exactly split: 43% would like to see the graphic show the earliest arrival time, while 44% would like to see the most likely arrival time on the graphic (Figure 60). Regionally, Hawaii residents and Gulf Region residents have the highest percentages preferring the earliest arrival time (Figure 61).

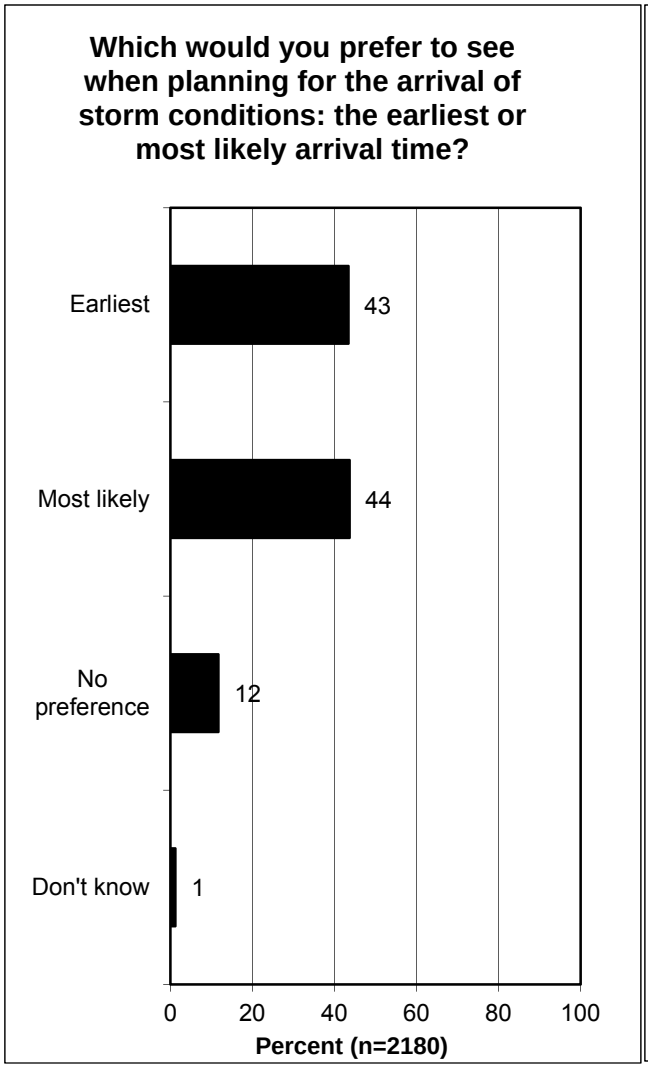



**Figure 60. Opinion on the Choice Between Showing Earliest or Most Likely Arrival Time**

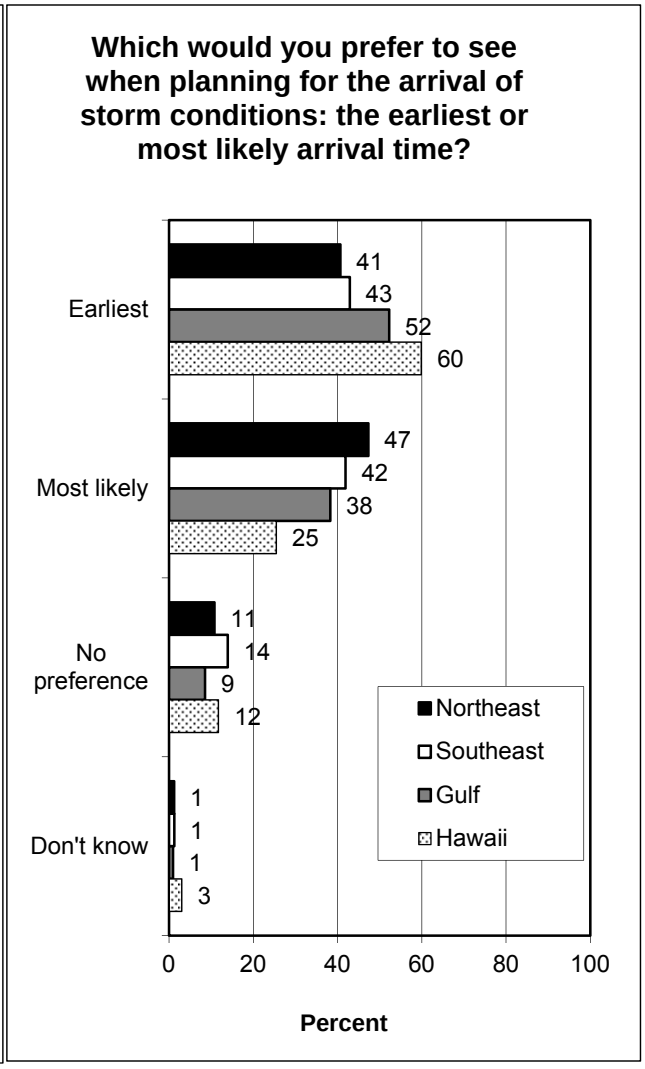



**Figure 61. Opinion on the Choice Between Showing Earliest or Most Likely Arrival Time by Region**

Finally in this section, the study also examined constraints to making preparations for tropical storms and hurricanes. Those who indicated being *not at all* likely to make preparations for a tropical storm or hurricane event were asked for their reasons, with the most common responses to this open-ended question being related to their perception that the event will not be bad in their area (Figures 62 and 63).

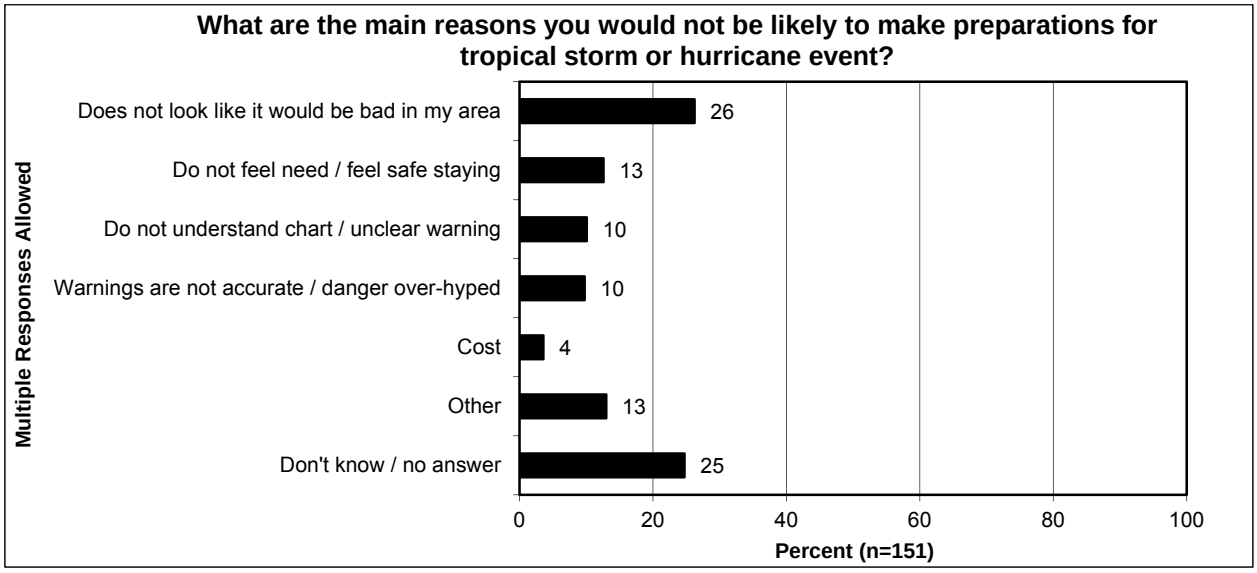



**Figure 62. Reasons for Not Making Preparations**

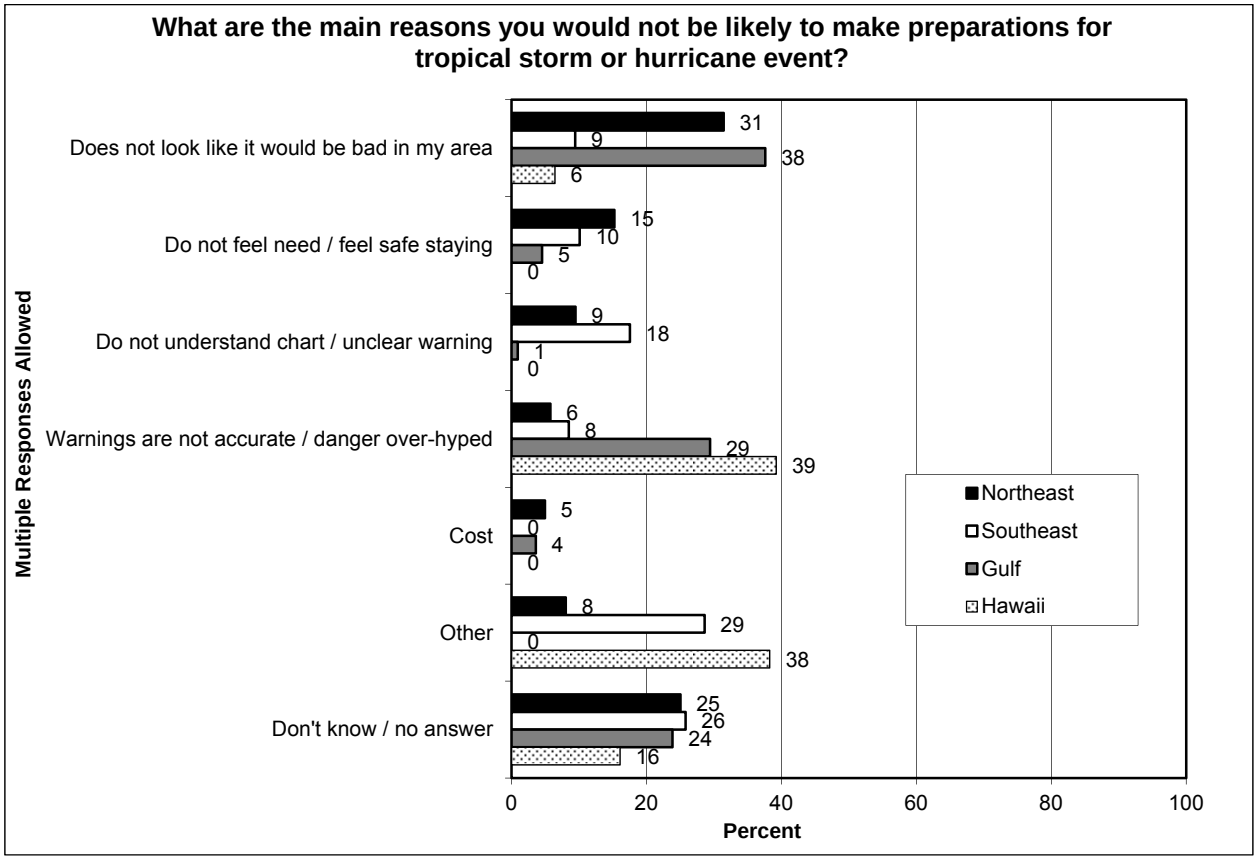



**Figure 63. Reasons for Not Making Preparations by Region**

## Sources of Information

Most commonly, television is the typical source that study area residents use for information about pending tropical storms and hurricanes (Figure 64). A large majority (84%) use television. Also with a majority using it is the Internet (other than social media): 58% use this. Results are fairly consistent across the regions (Figure 65).

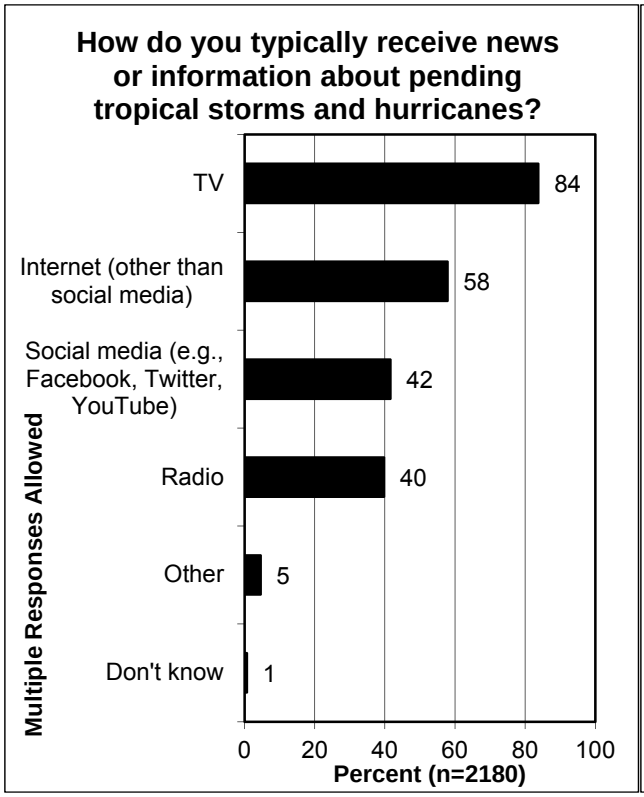



**Figure 64. Sources of Information**

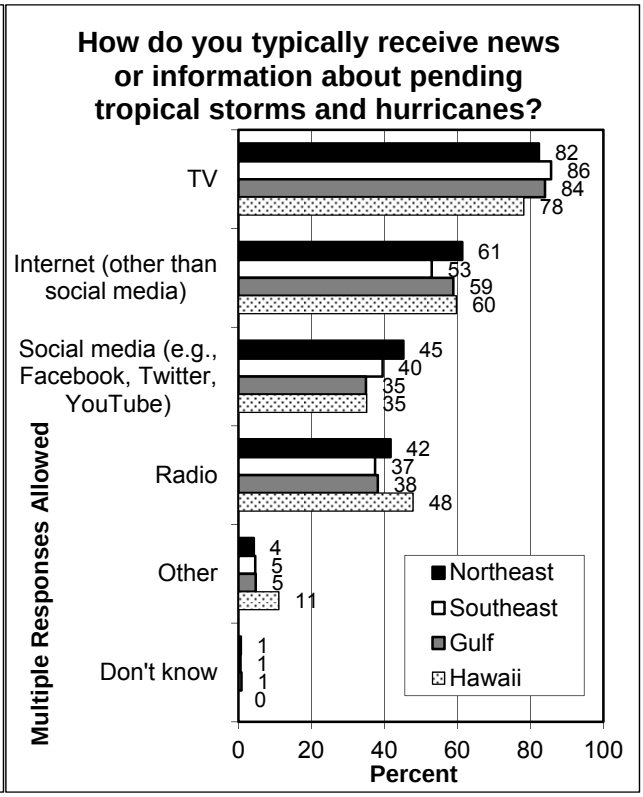



**Figure 65. Sources of Information by Region**

Those respondents who indicated using the Internet were asked to name the websites that they typically use for news and information about pending tropical storms and hurricanes. Most commonly, they use the Weather Channel's website or they use the website of their local media (usually television) station, distantly followed by use of CNN's site or NOAA's site (including the National Hurricane Center) (Figures 66 and 67).

In assessing use of the NOAA sites, however, it is worth noting that some of the people who said that they visited the "NOAA" site could have been saying that they went to the "Noah" site. In instances when "NOAA" is replaced with "Noah" in Internet searches, at least two media sites have taken advantage. One search of "Noah weather" produces a top hit on a page on The Weather Channel's site that is titled, "Noah Weather." Simply inserting "noahweather.com" into the URL field leads to a different site (i.e., not a page on The Weather Channel's site) titled, "Noah Weather" that is simply a conduit to paid links for the myriad weather-related websites that on the Internet. It may be that some of the respondents who responded that they visited the NOAA site may have actually visited a different site.

Additionally in the data regarding websites used, "Weather Underground" is the name of a show presented on The Weather Channel; however, the website for Weather Underground is not obviously shown as a website affiliated with The Weather Channel, so it is shown separately in Figures 66 and 67.

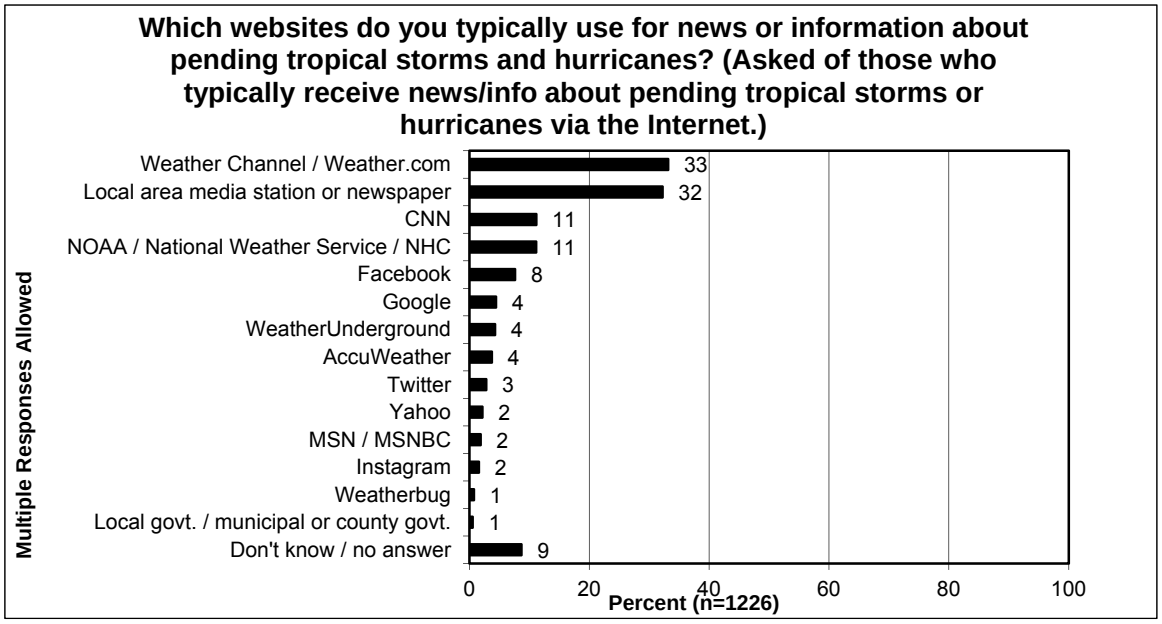



**Figure 66. Websites Used for Information**

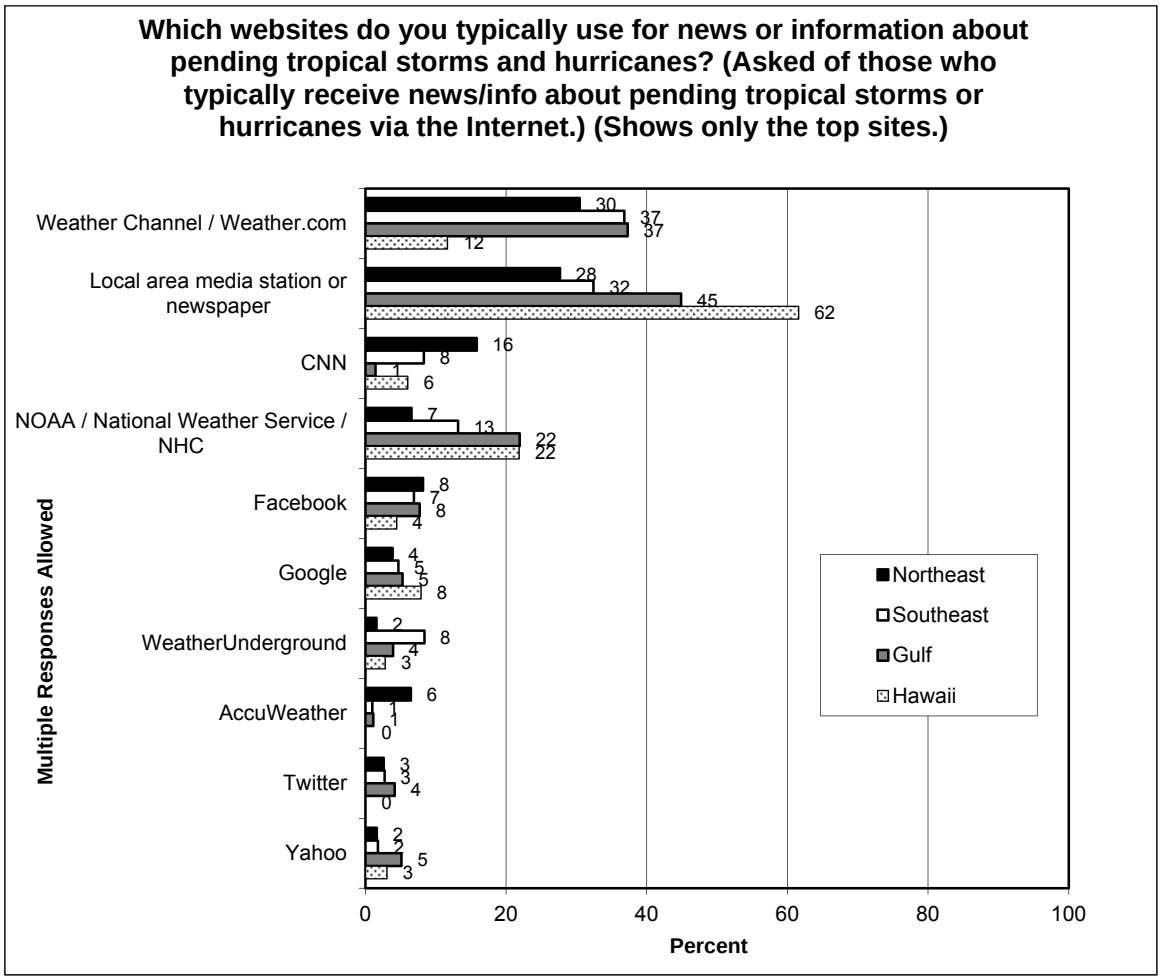



**Figure 67. Websites Used for Information by Region**

Just over half of study area residents (54%) say that they use the National Hurricane Center's website to get information, when they become aware that a tropical storm or hurricane may potentially affect their area (Figure 68). Northeast Region residents have the lowest percentage using the site (Figure 69).

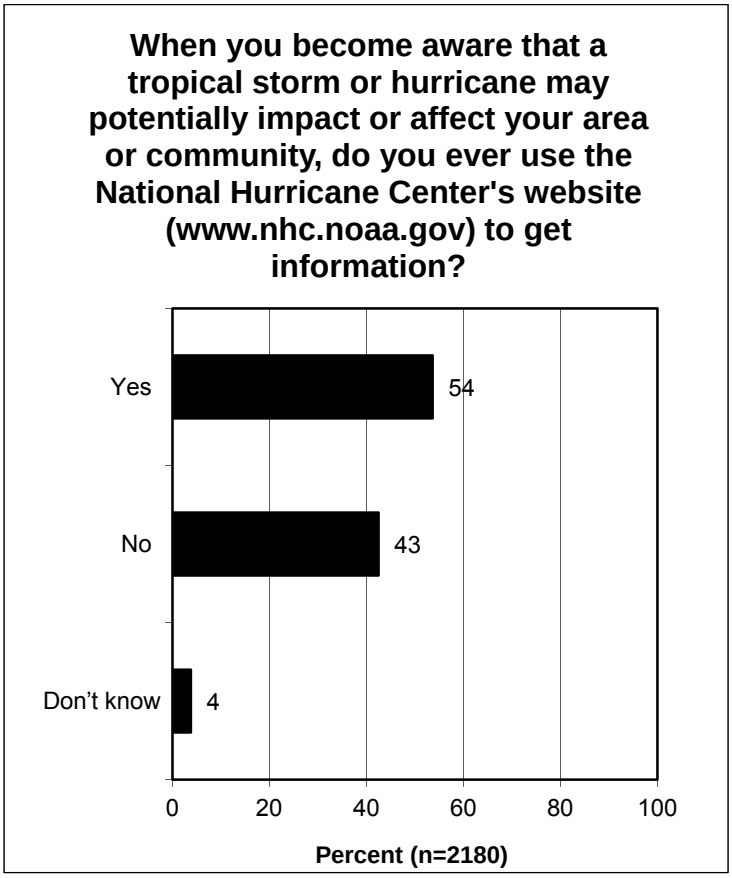



**Figure 68. Use of National Hurricane Center's Website**

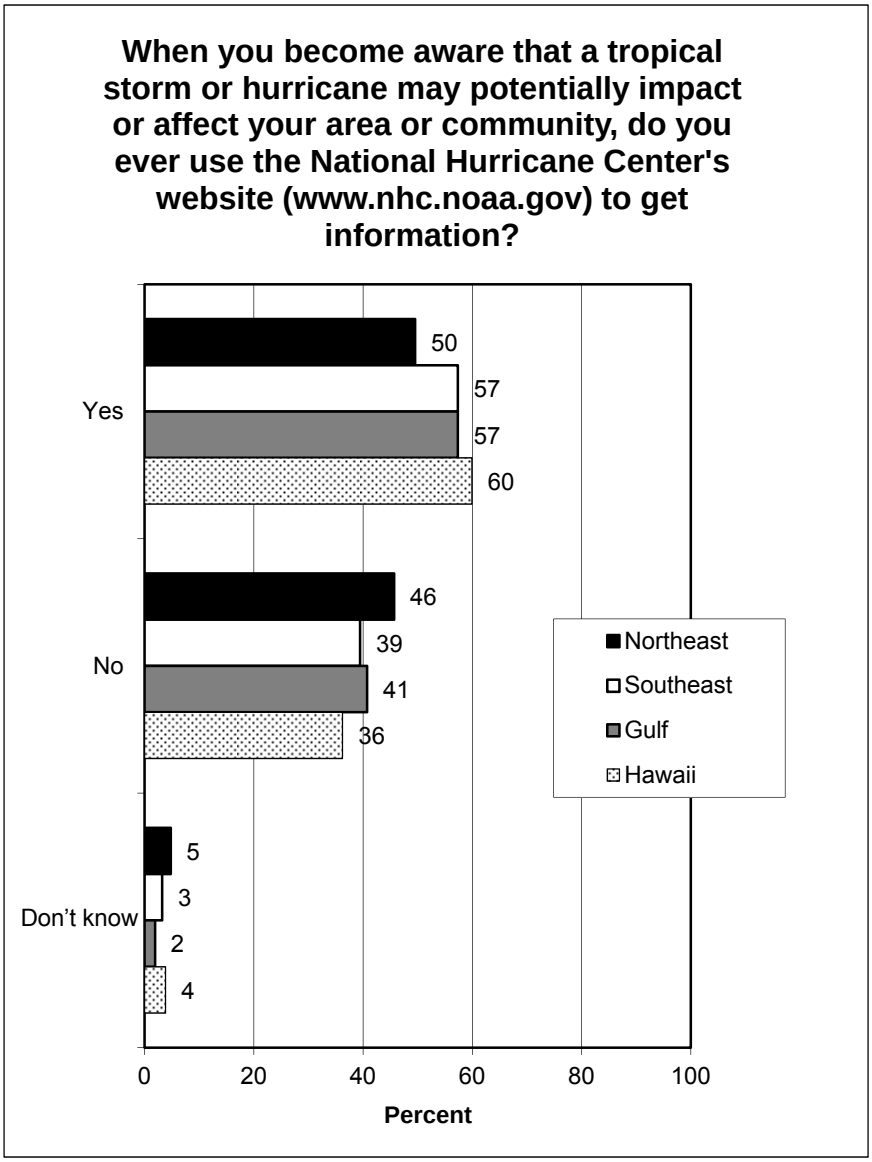



**Figure 69. Use of National Hurricane Center's Website by Region**

## Demographic Information

In the survey, 21 states are represented (with the District of Columbia counted as one of these states) (Figure 70). Within most of the states, only coastal and near-inland counties were included, as shown in the graphs (all counties in Delaware, Hawaii, and Rhode Island were included, and the District of Columbia in its entirety was included) (Figures 71 through 90). Nearly all of these respondents were full-time residents (98% were, as shown in Figure 91). Among those respondents who were not full-time residents, all of them were part-time residents in the study area during the hurricane season, which is June to November, as required to participate in the survey.

Additional demographic information includes ethnicity (Figures 92 and 93 showing the percentage of Latino descent, and Figures 94 and 95 showing ethnic background), education (Figures 96 and 97), the type of residential area of respondents (Figures 98 and 99), age (Figures 100 and 101), and gender (Figures 102 and 103).

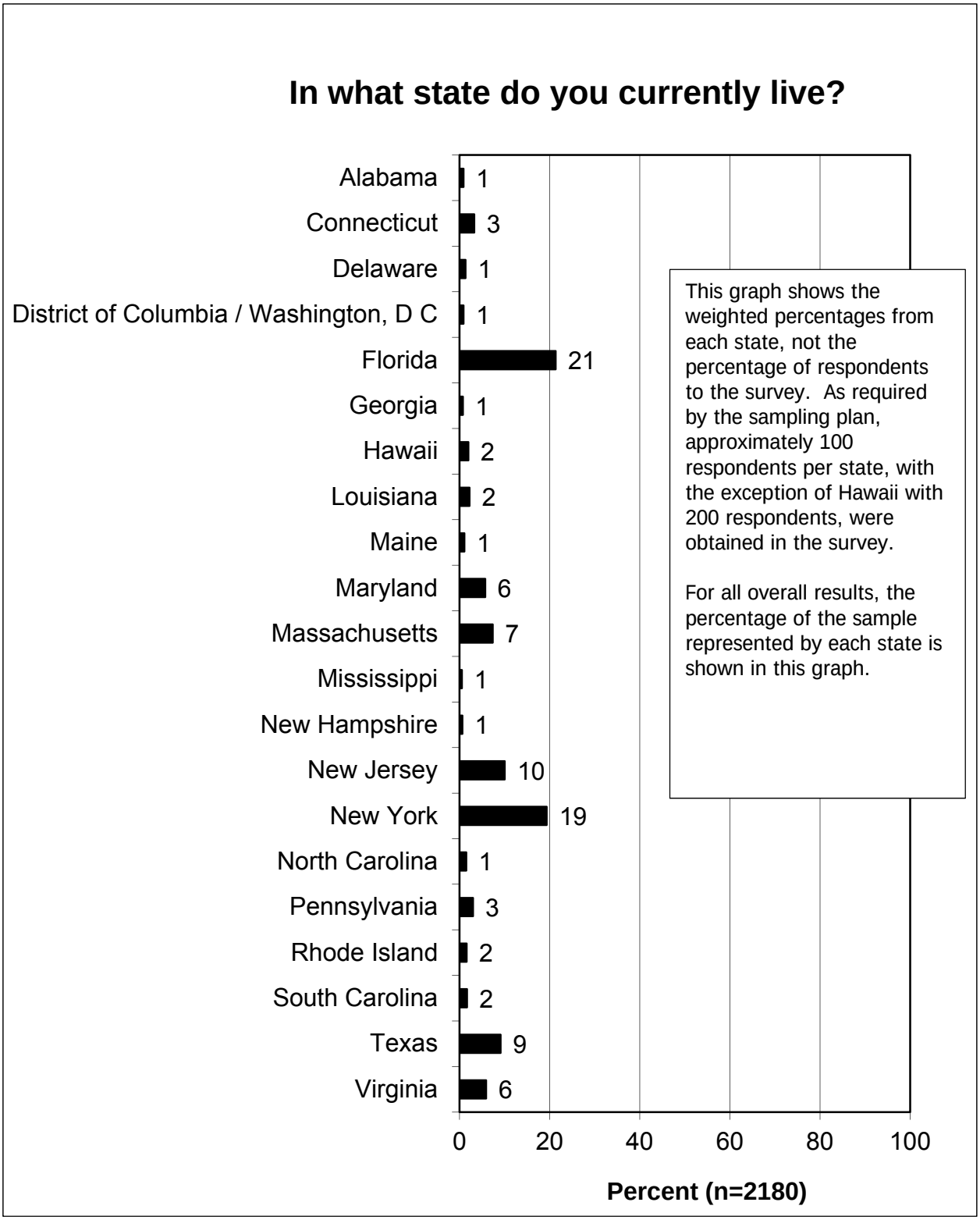



**Figure 70: State of Residence**

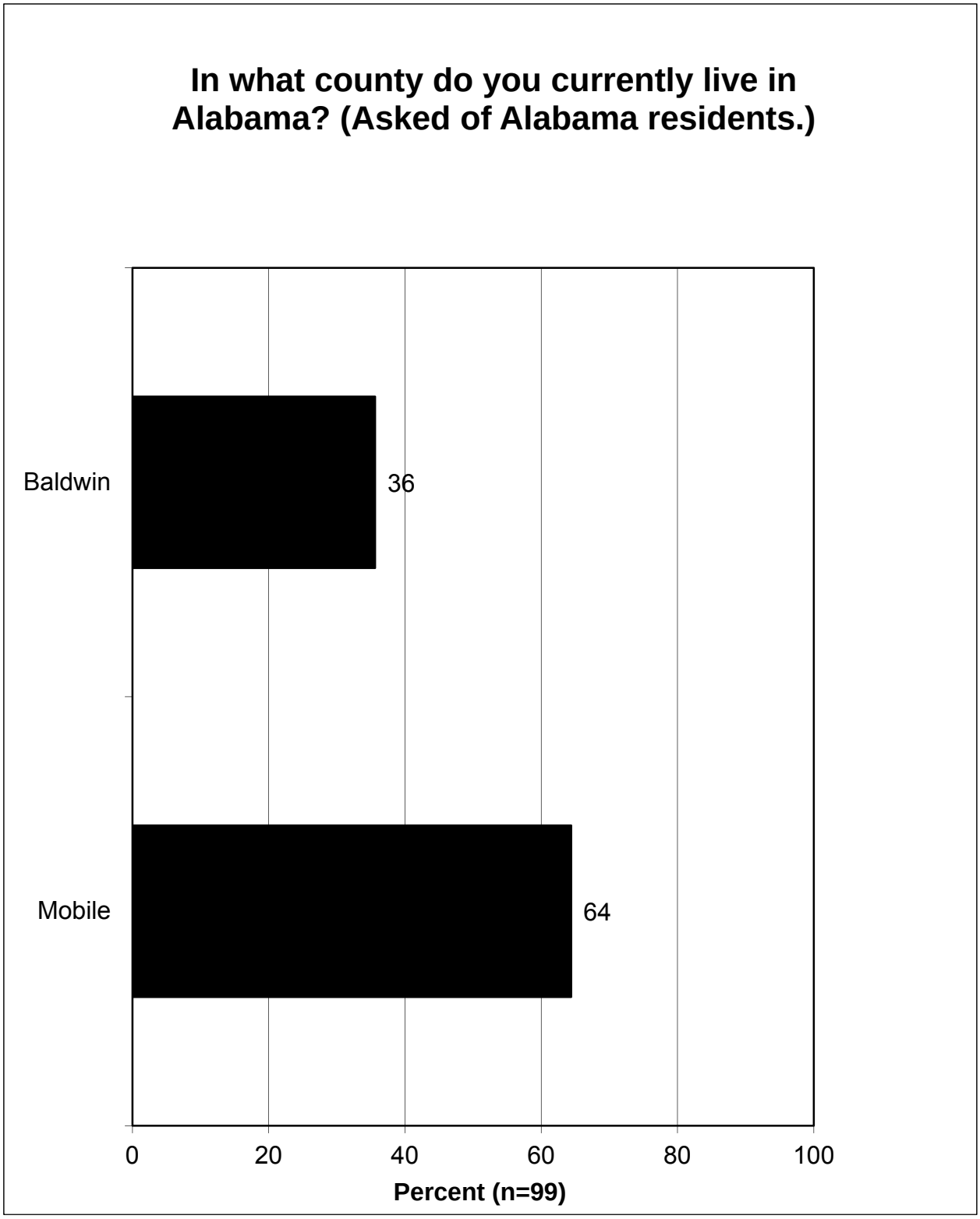



**Figure 71: County of Residence (Alabama)**

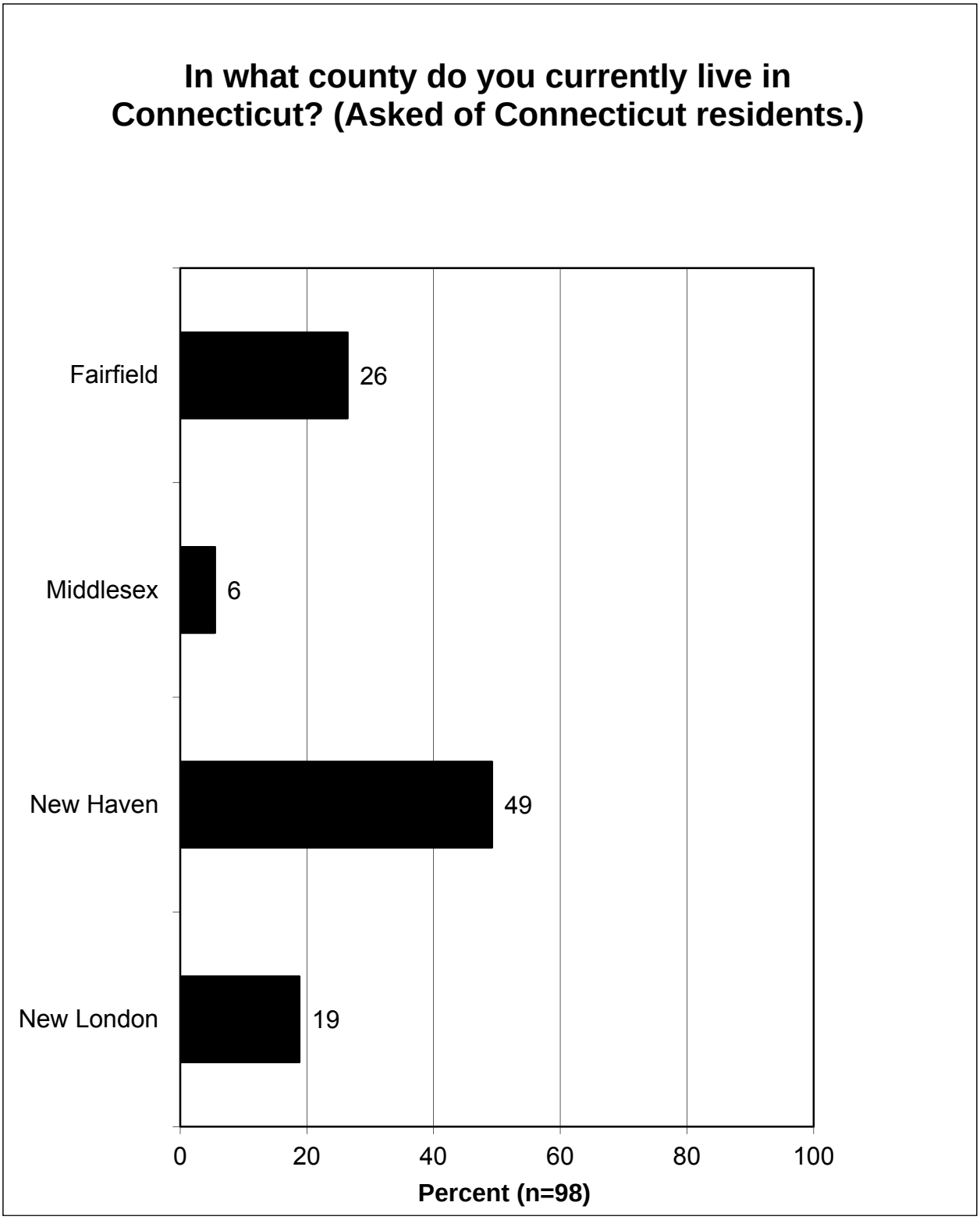



**Figure 72: County of Residence (Connecticut)**

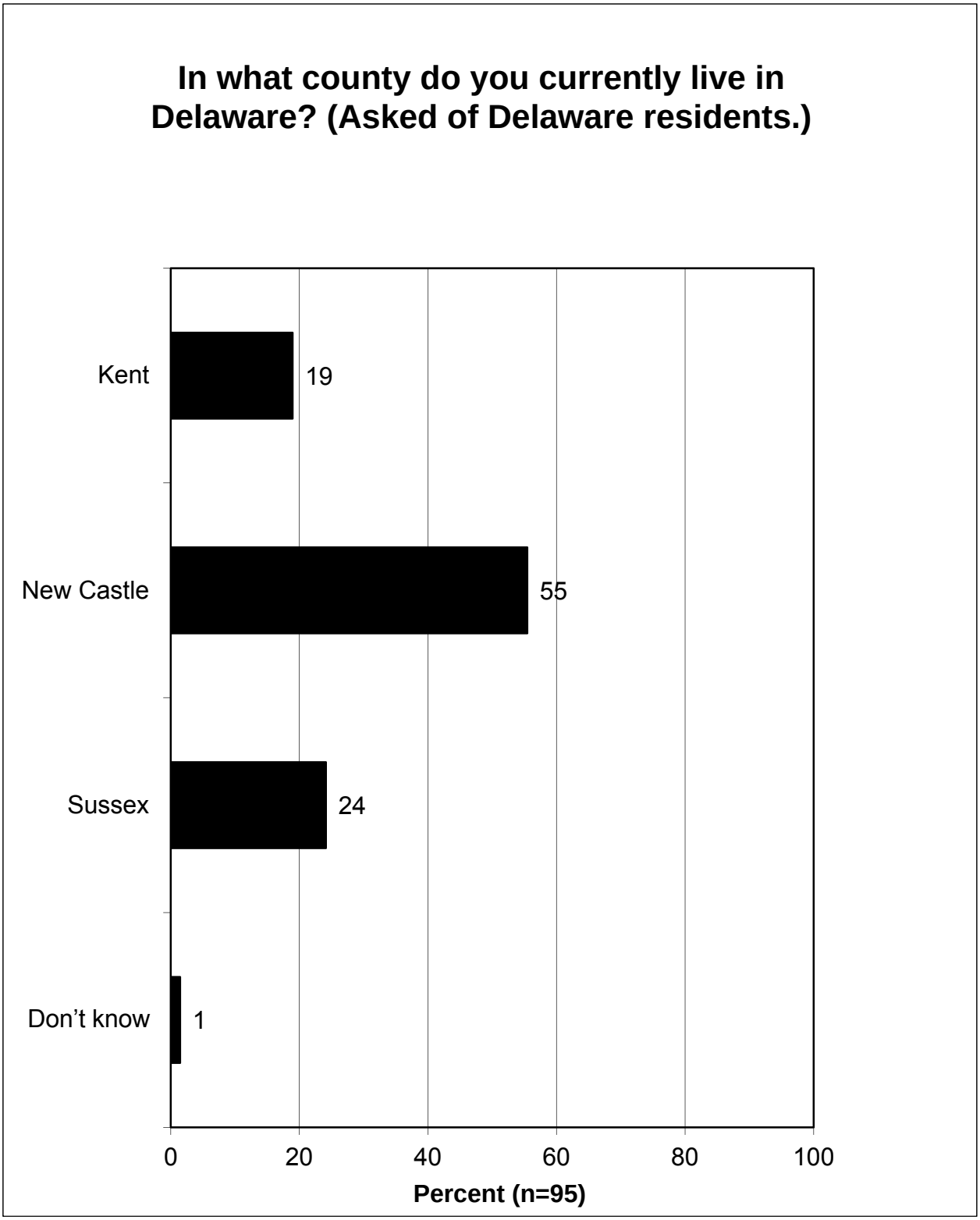



**Figure 73: County of Residence (Delaware)**

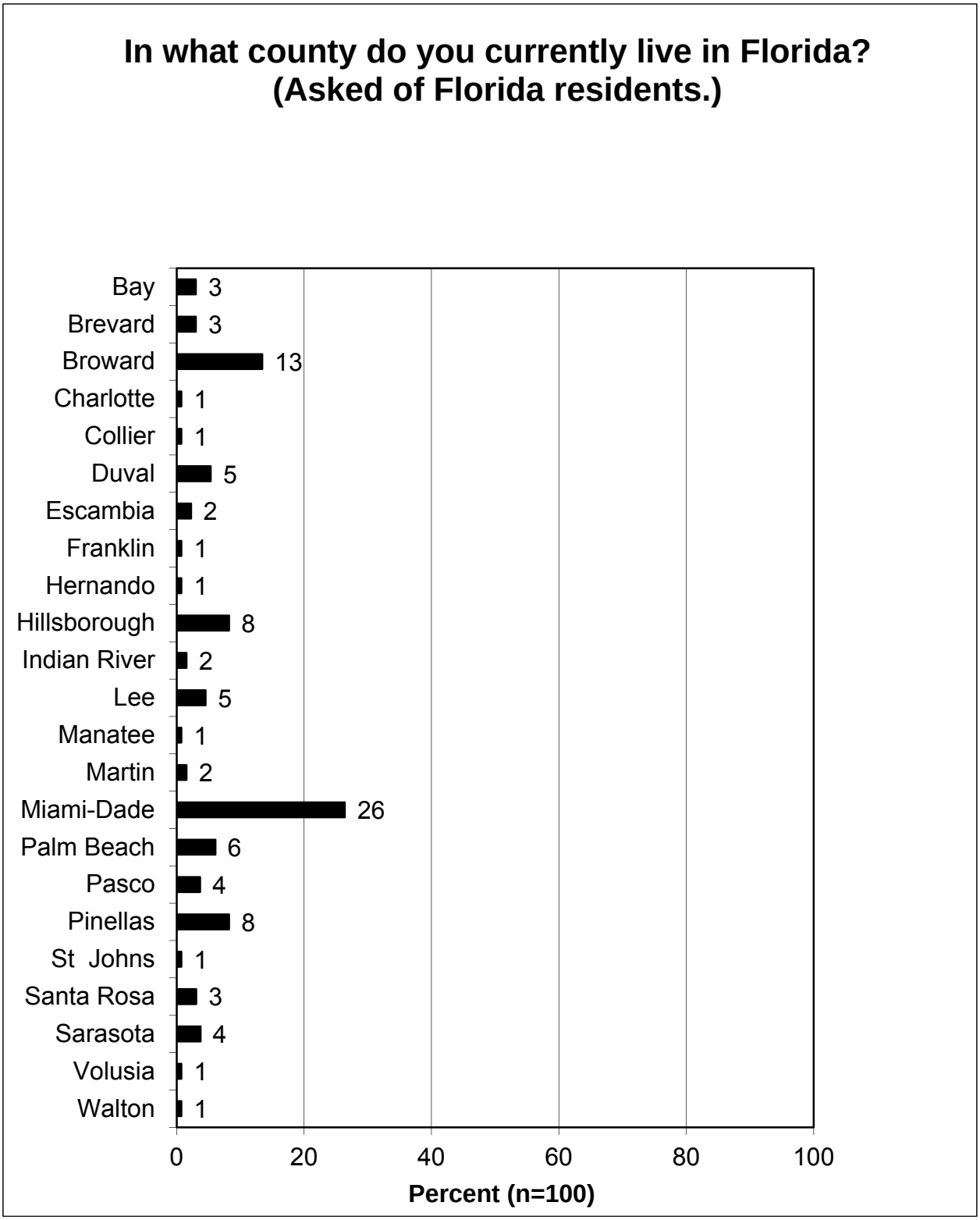



**Figure 74: County of Residence (Florida)**

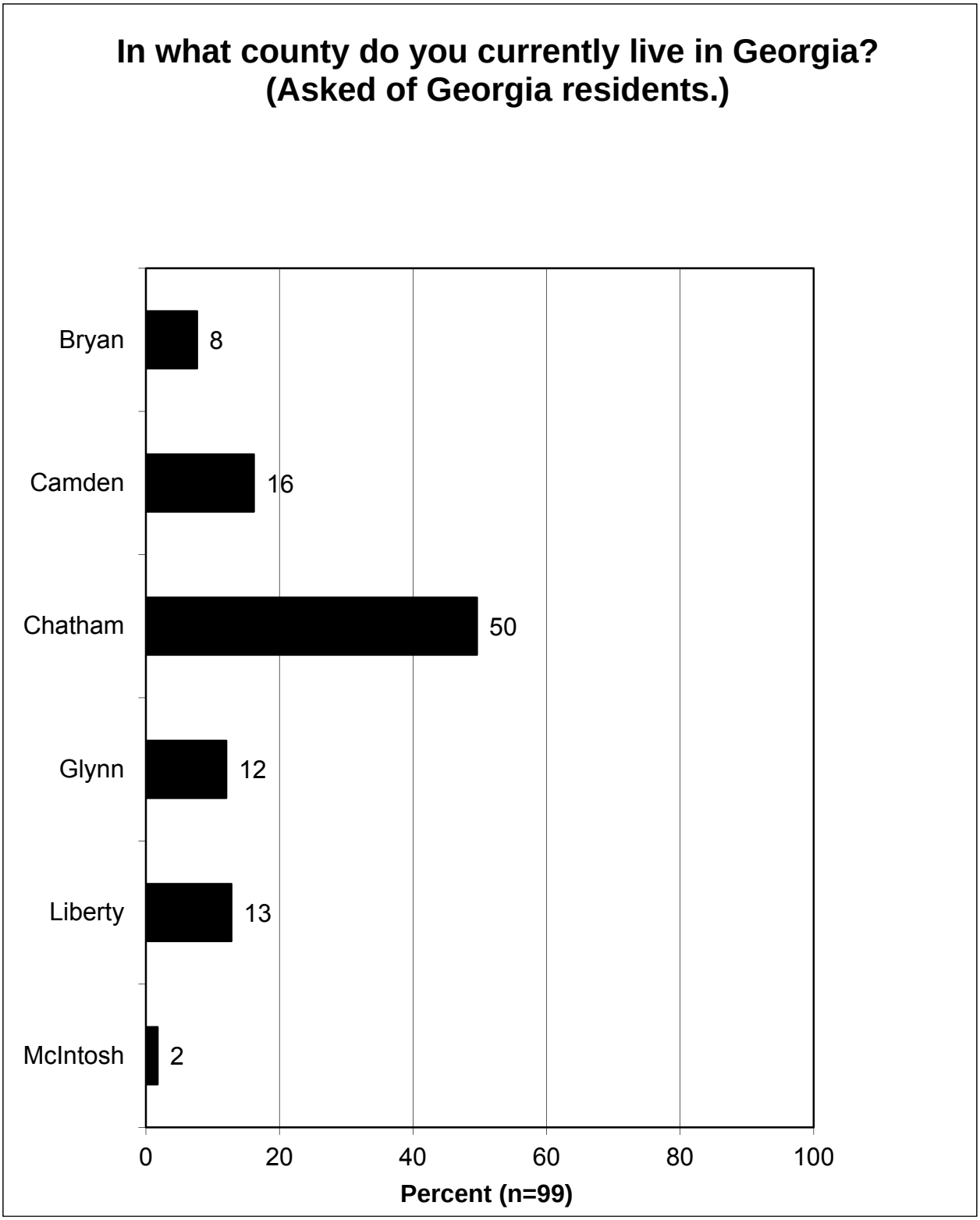



**Figure 75: County of Residence (Georgia)**

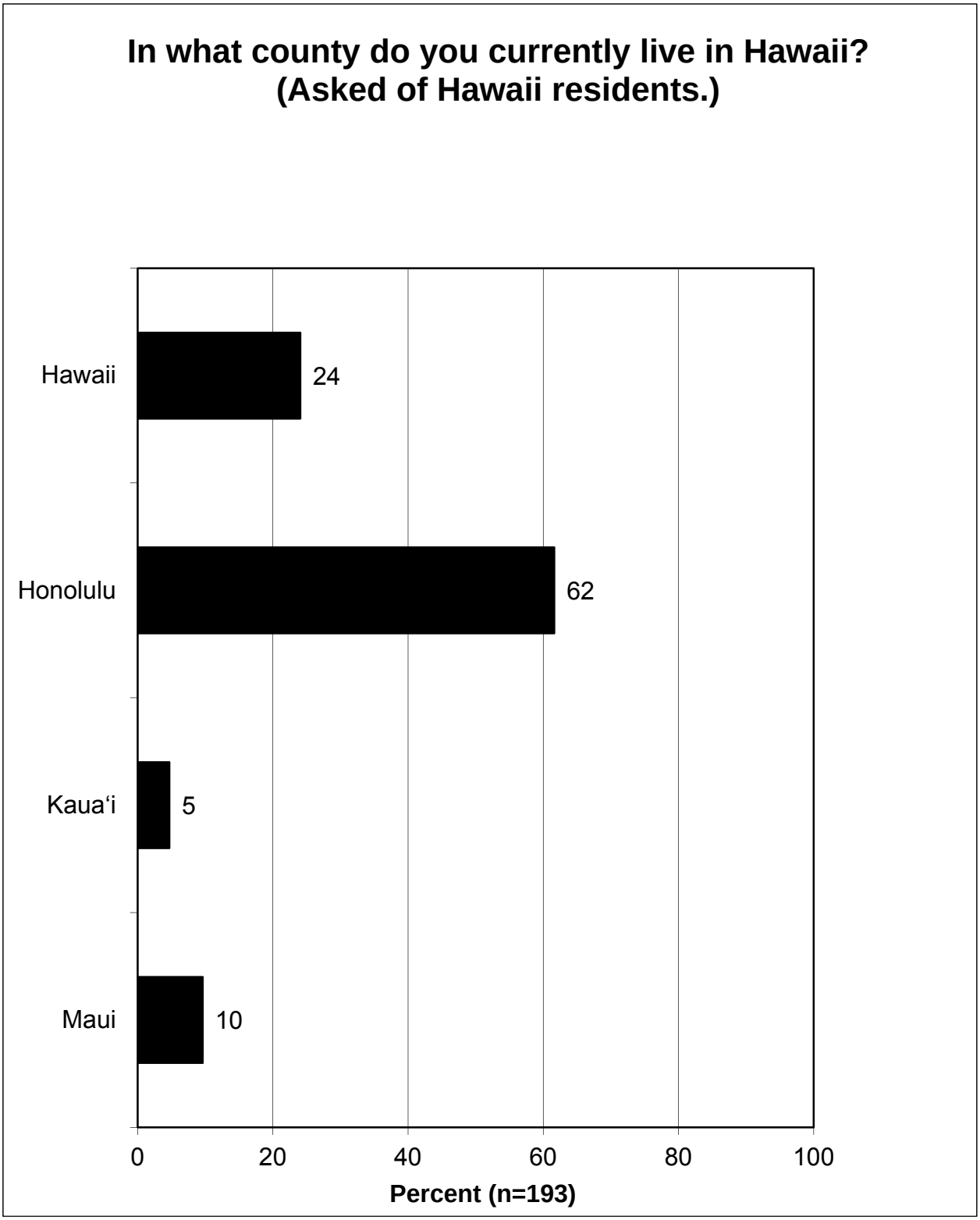



**Figure 76: County of Residence (Hawaii)**

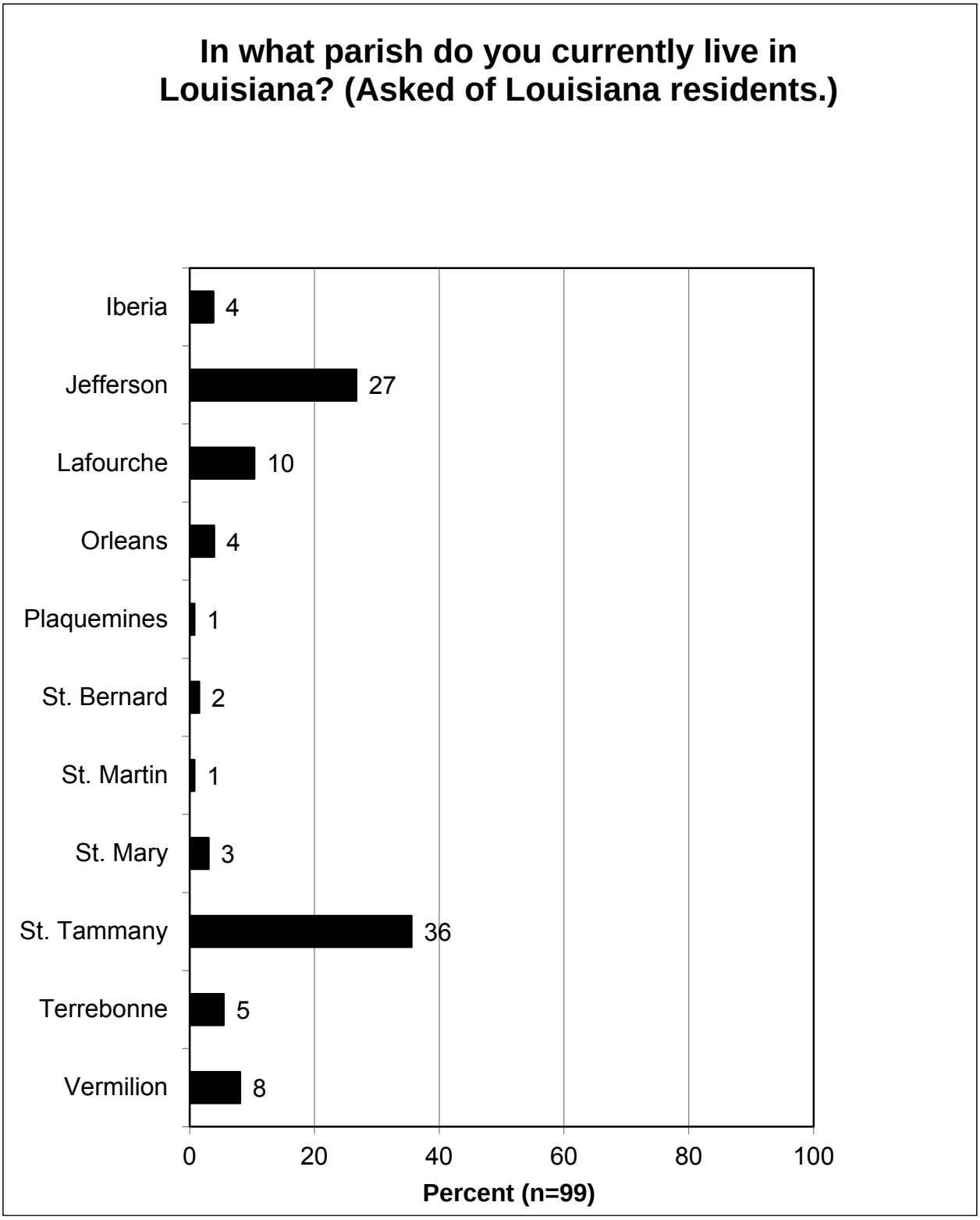



**Figure 77: Parish of Residence (Louisiana)**

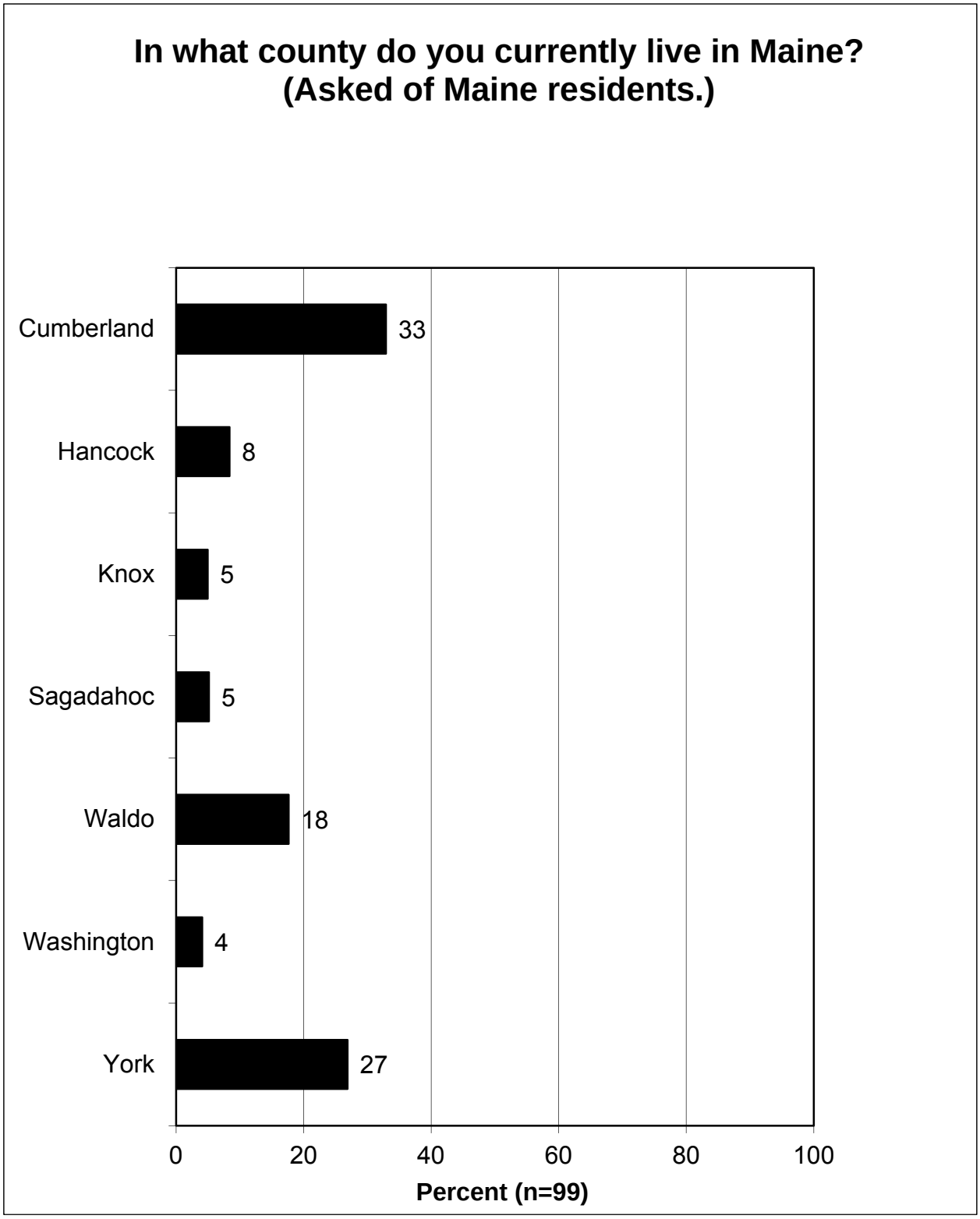



**Figure 78: County of Residence (Maine)**

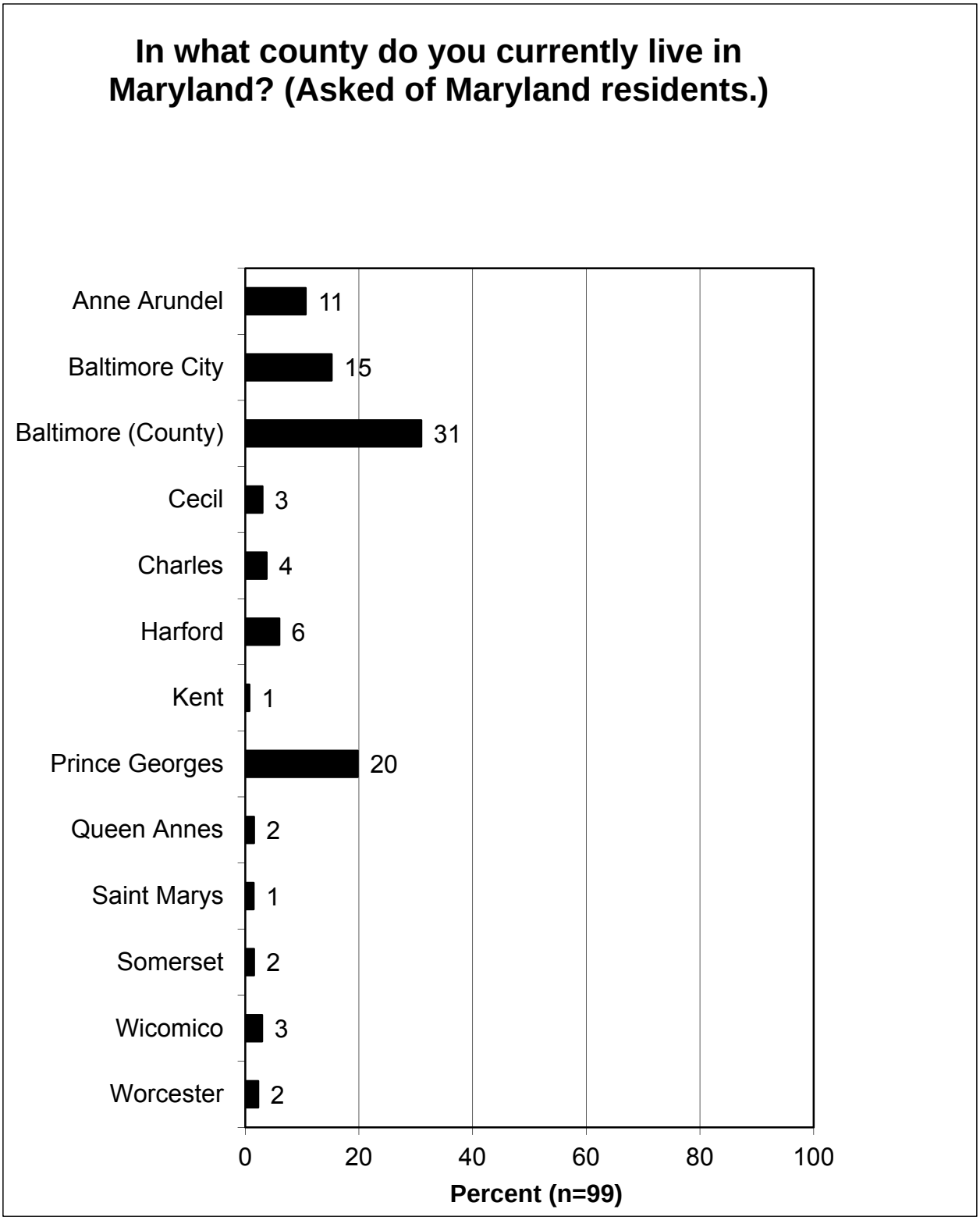



**Figure 79: County of Residence (Maryland)**

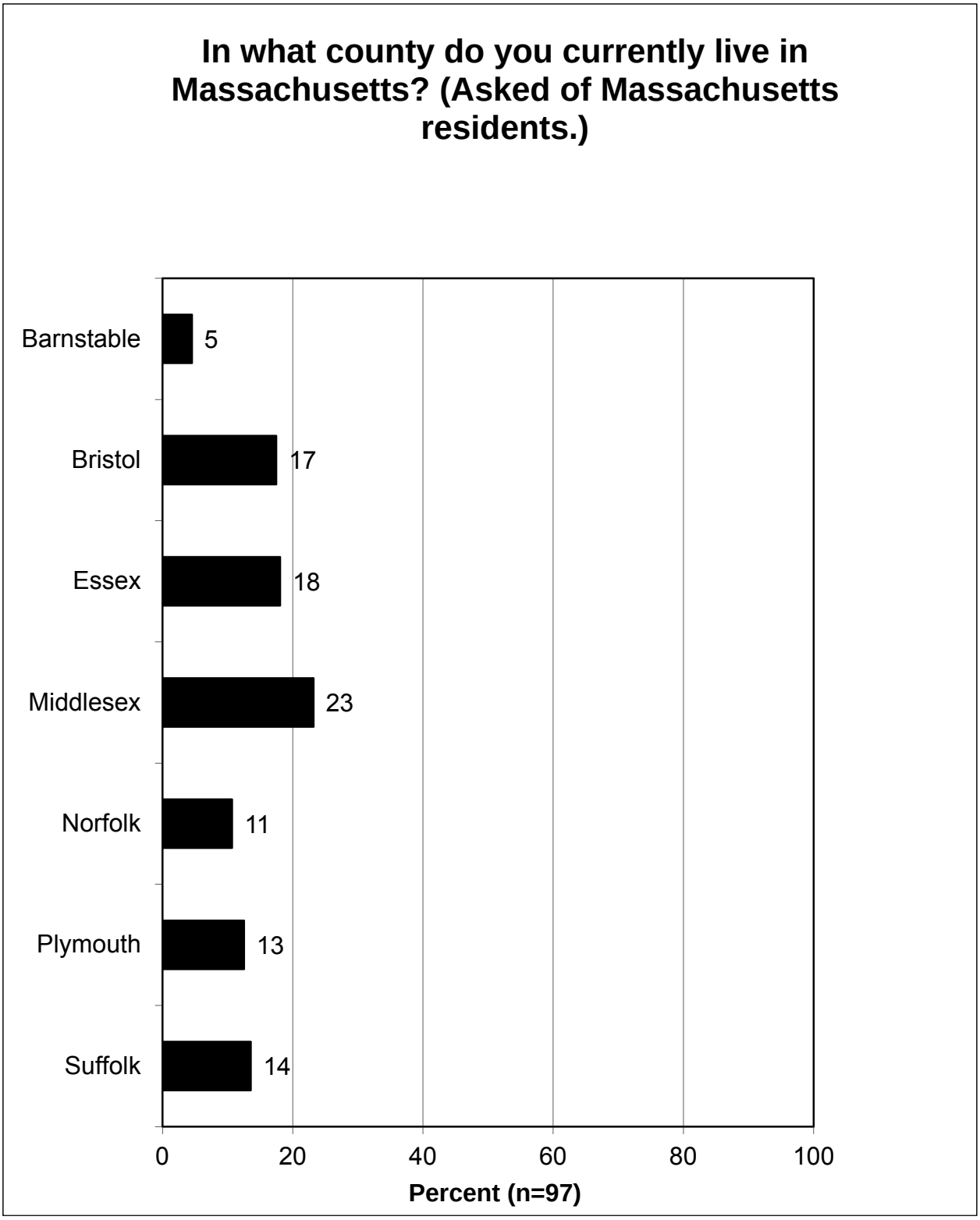



**Figure 80: County of Residence (Massachusetts)**

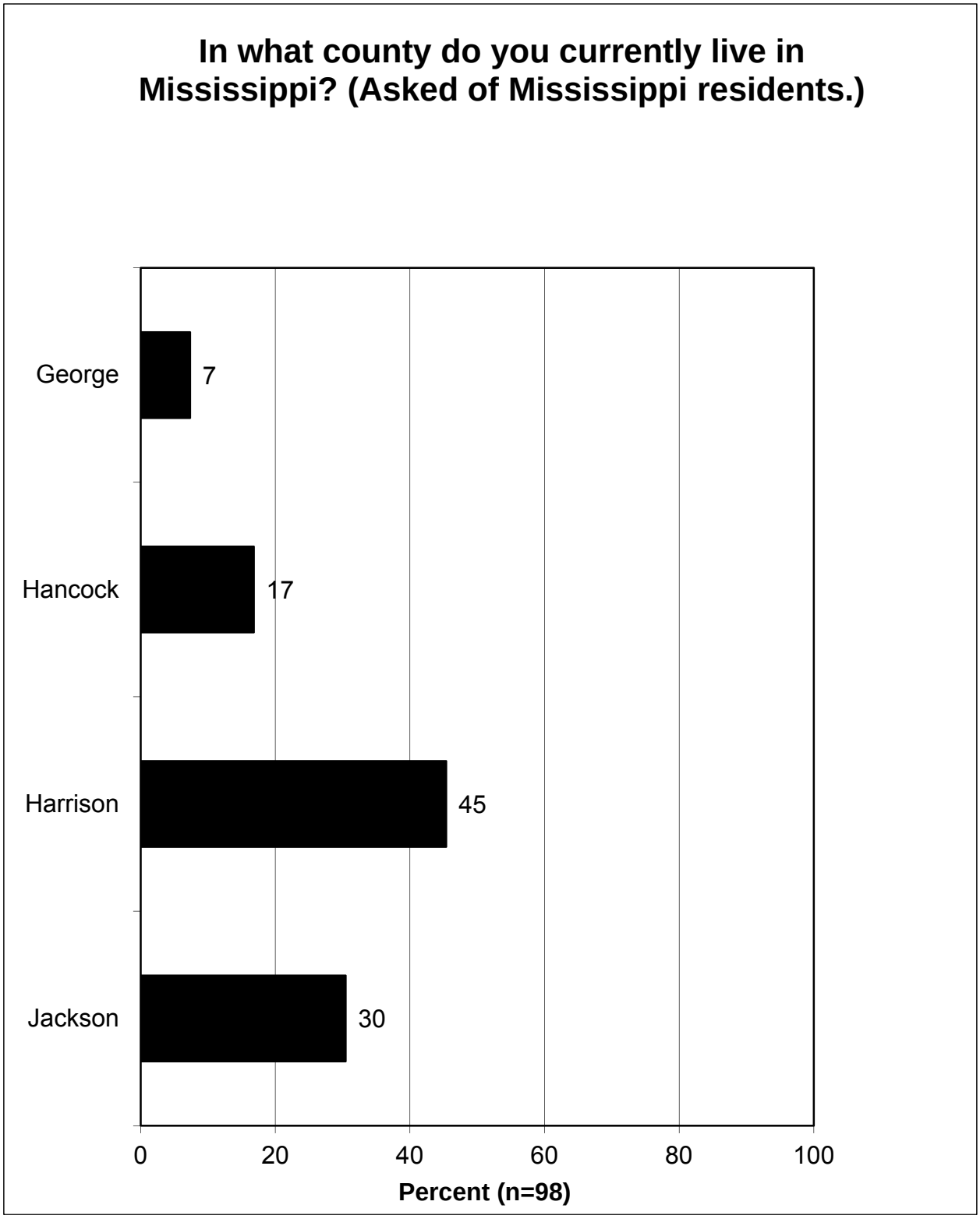



**Figure 81: County of Residence (Mississippi)**

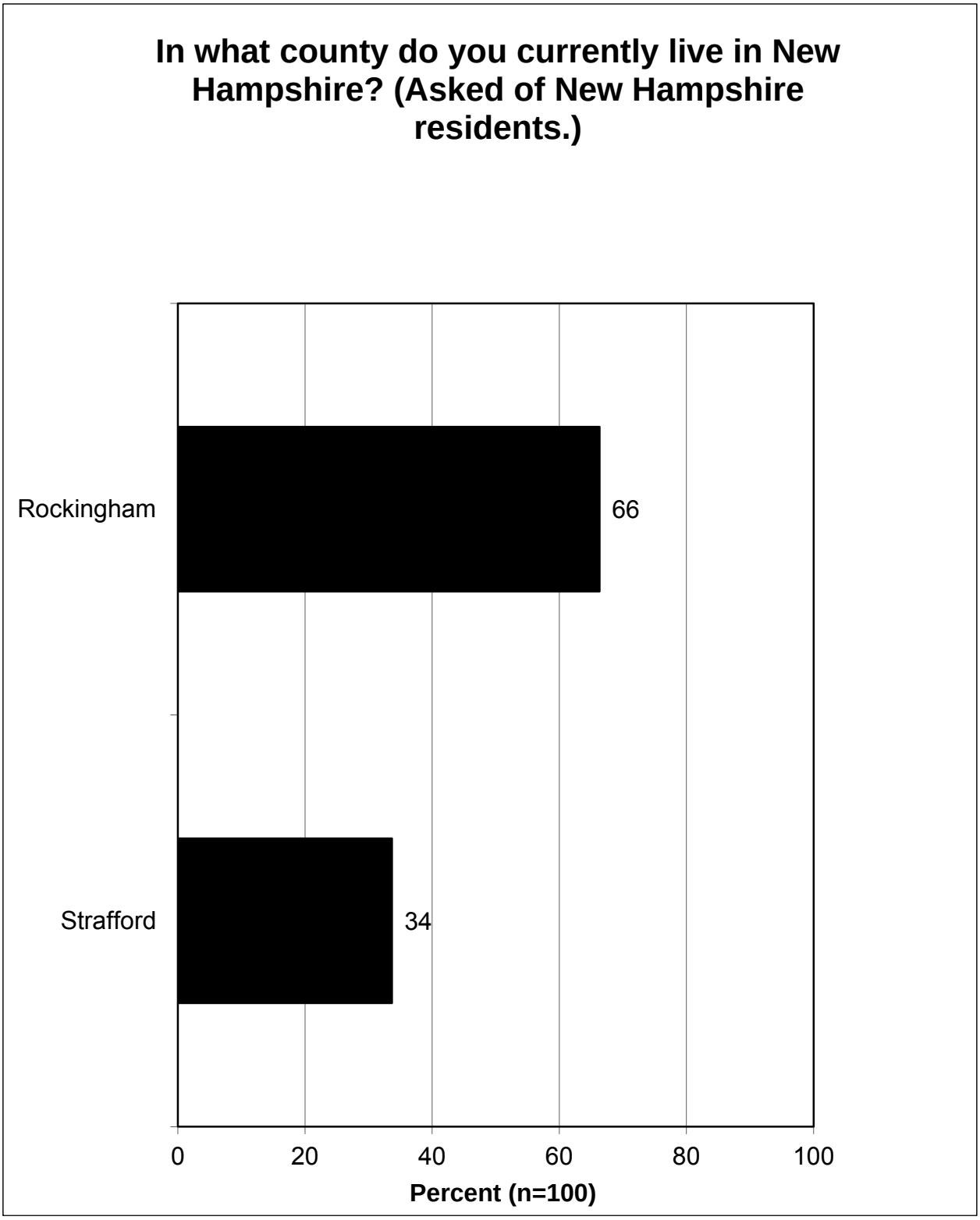



**Figure 82: County of Residence (New Hampshire)**

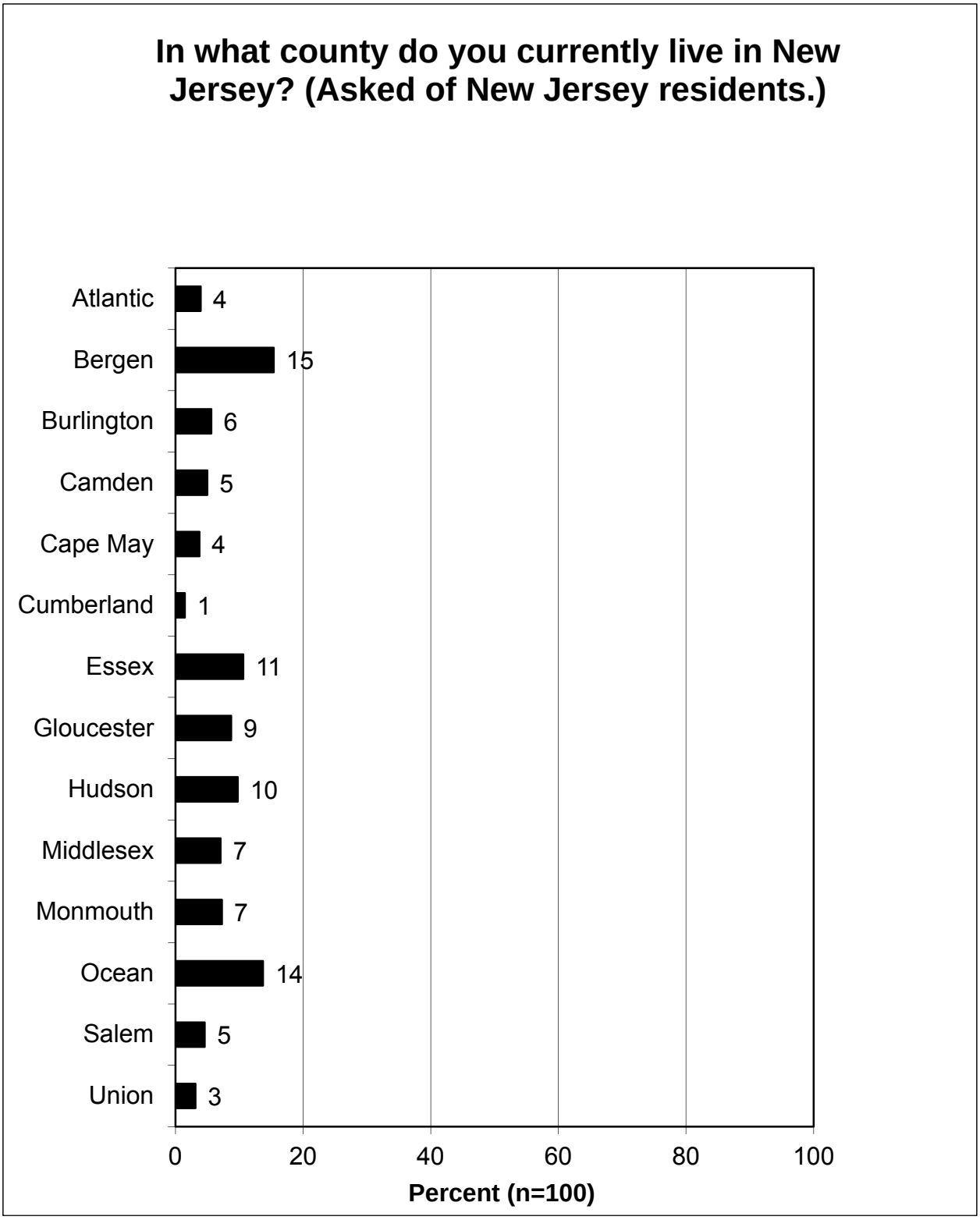



**Figure 83: County of Residence (New Jersey)**

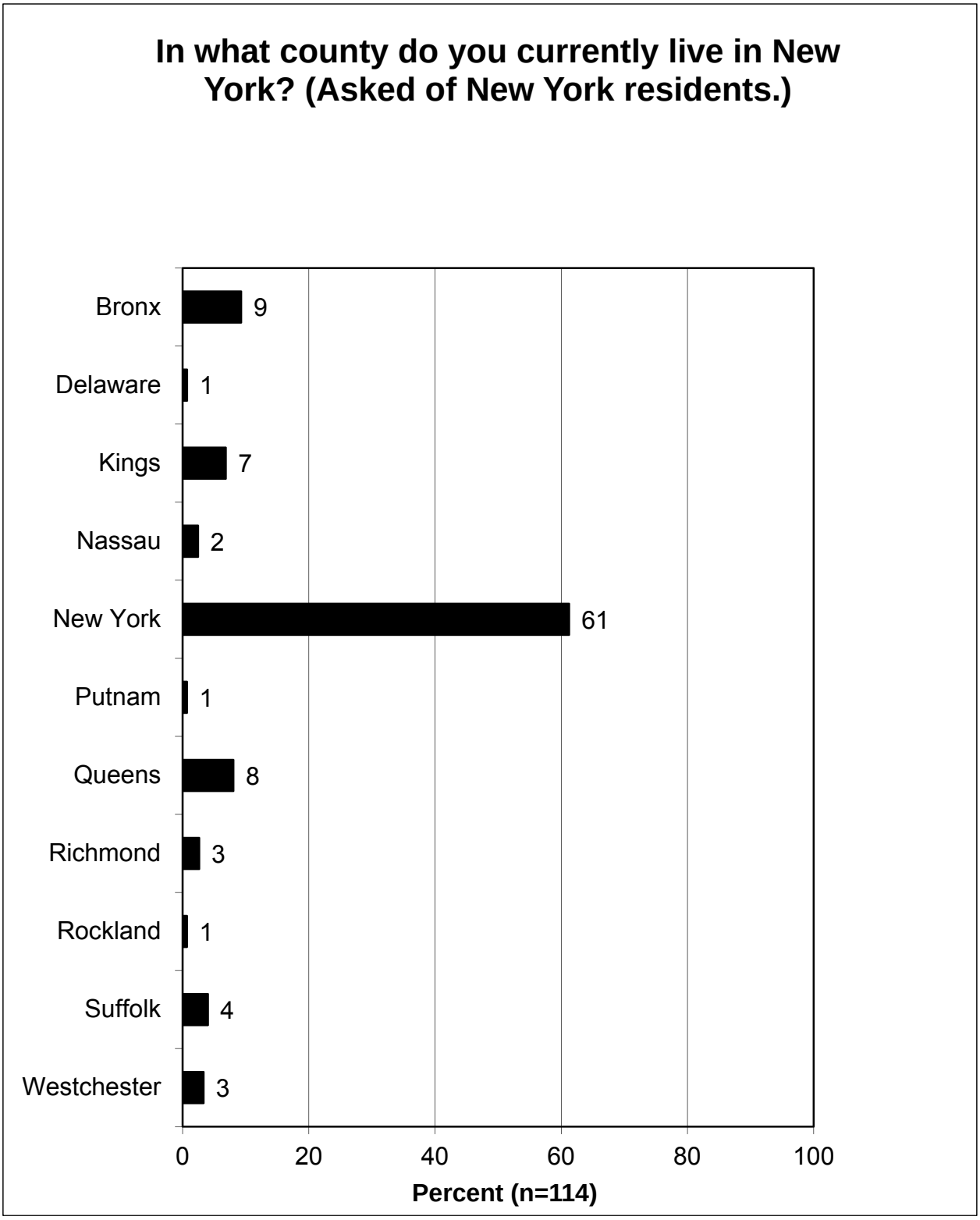



**Figure 84: County of Residence (New York)**

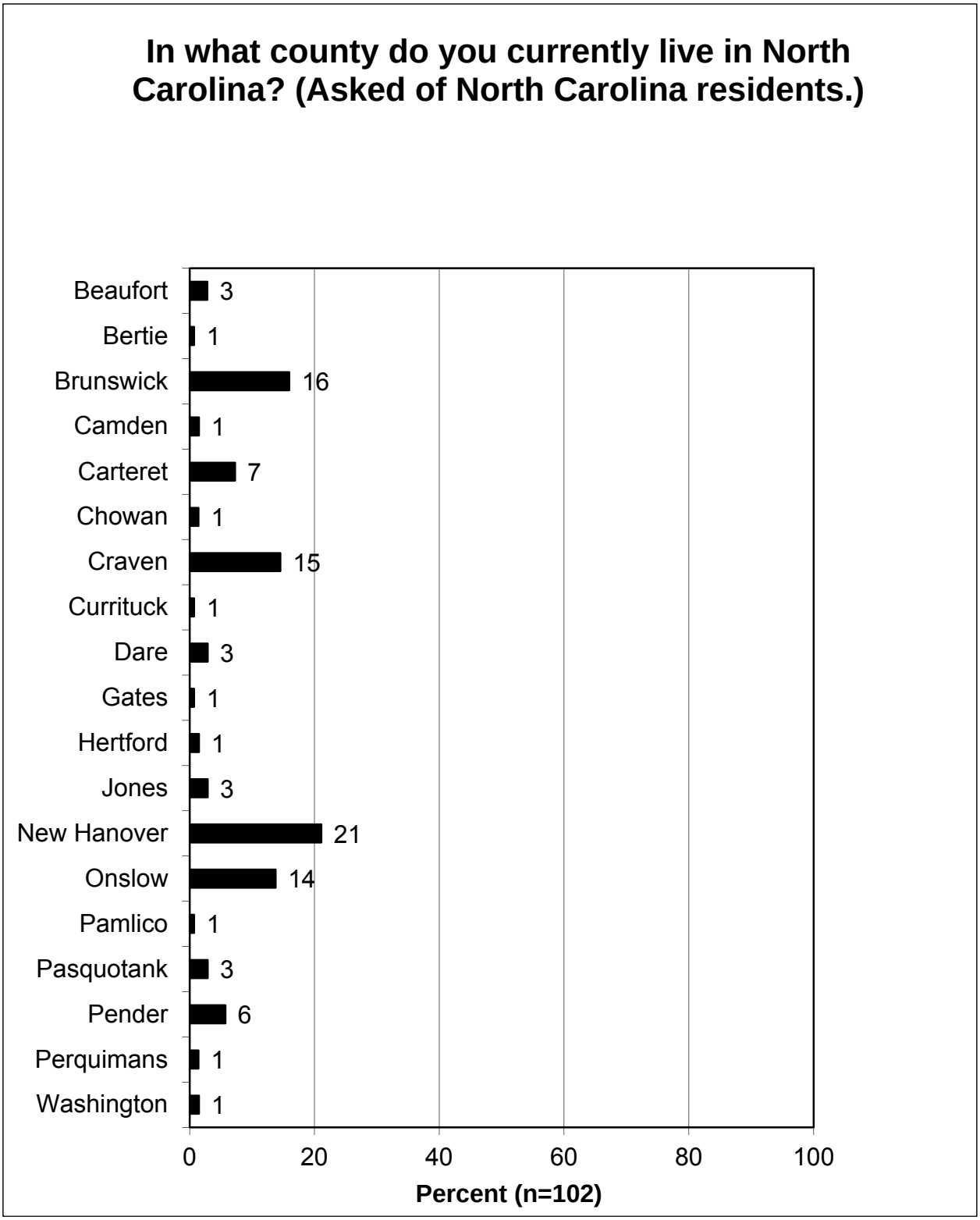



**Figure 85: County of Residence (North Carolina)**

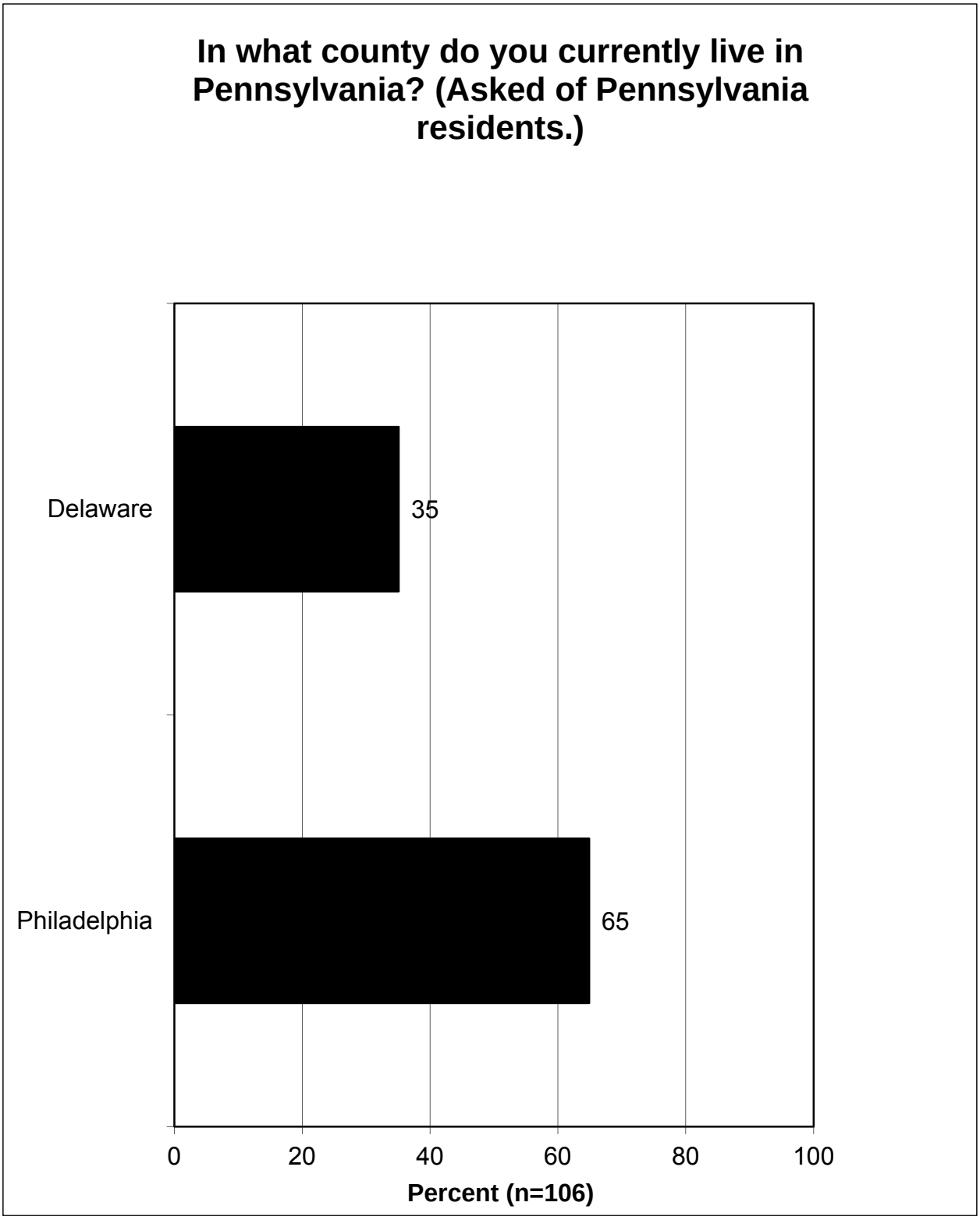



**Figure 86: County of Residence (Pennsylvania)**

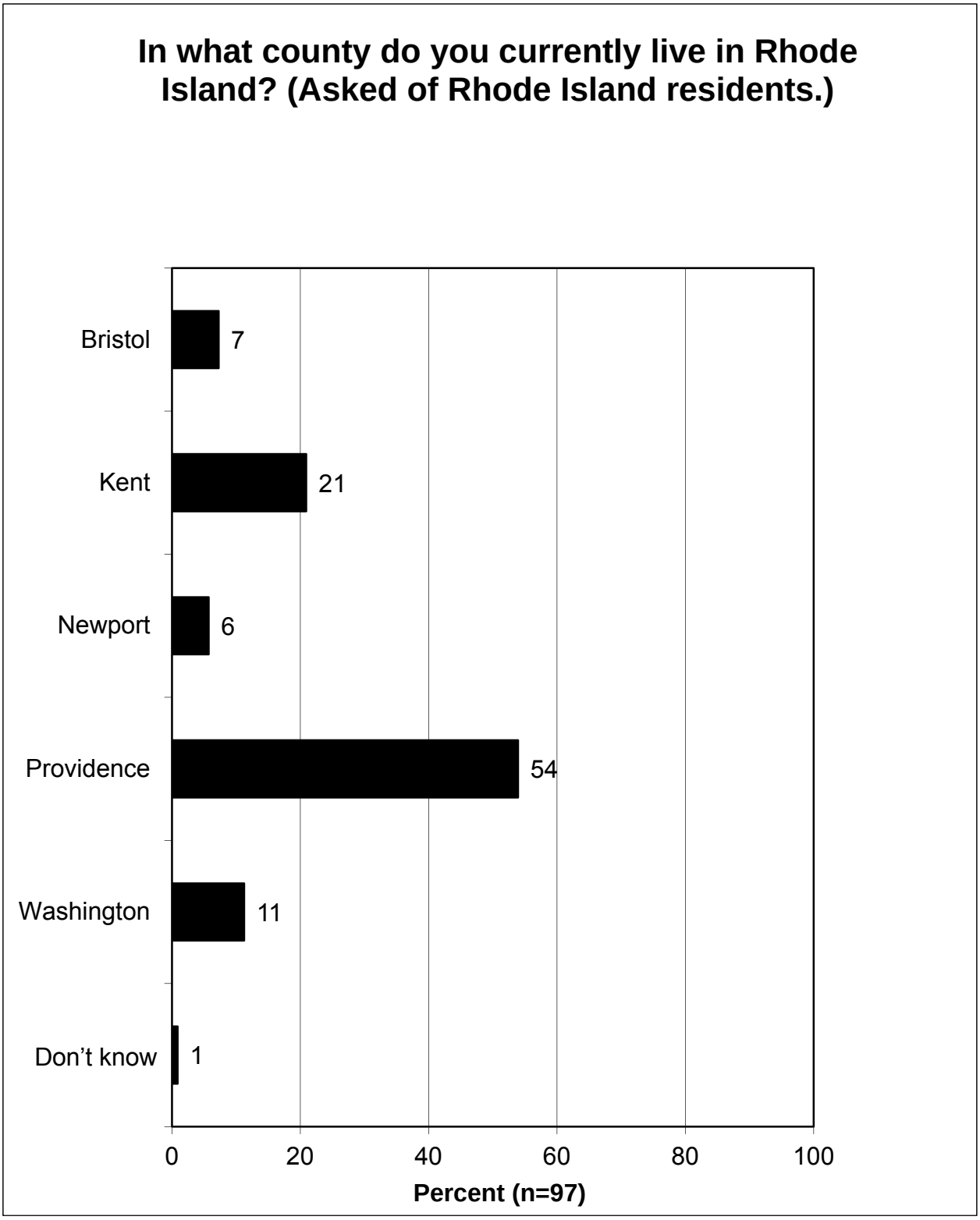



**Figure 87: County of Residence (Rhode Island)**

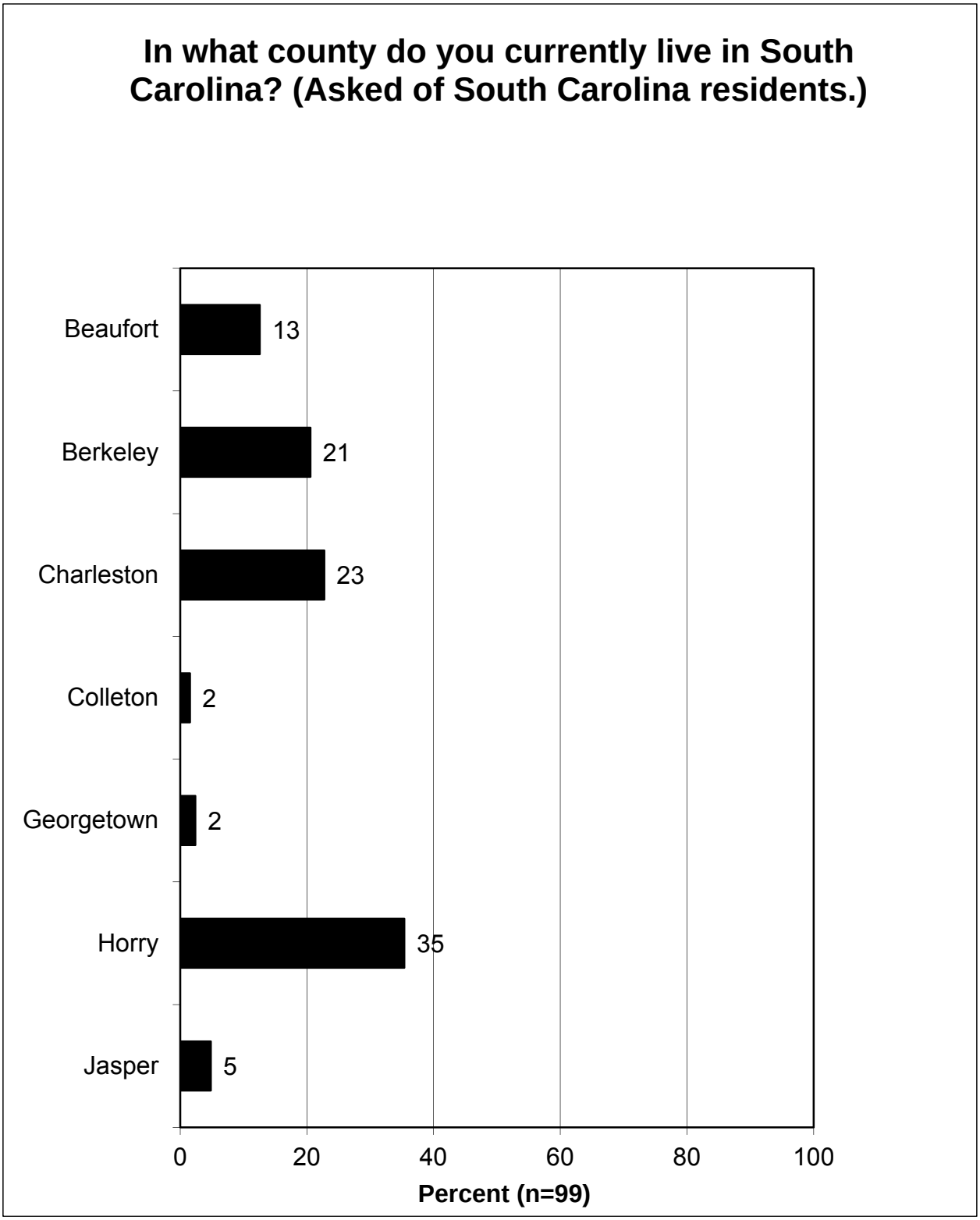



**Figure 88: County of Residence (South Carolina)**

## In what county do you currently live in Texas? (Asked of Texas residents.)

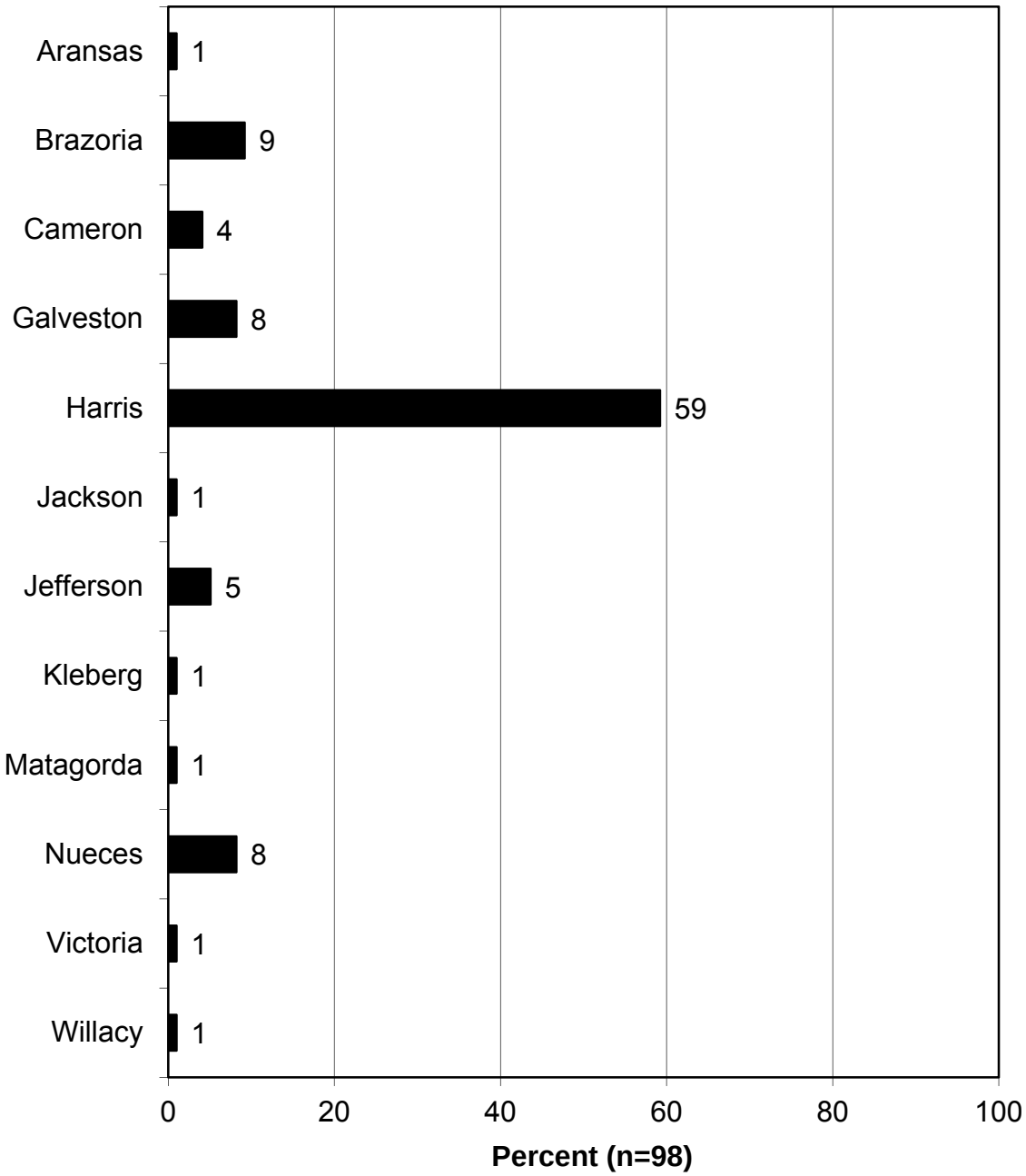



**Figure 89: County of Residence (Texas)**

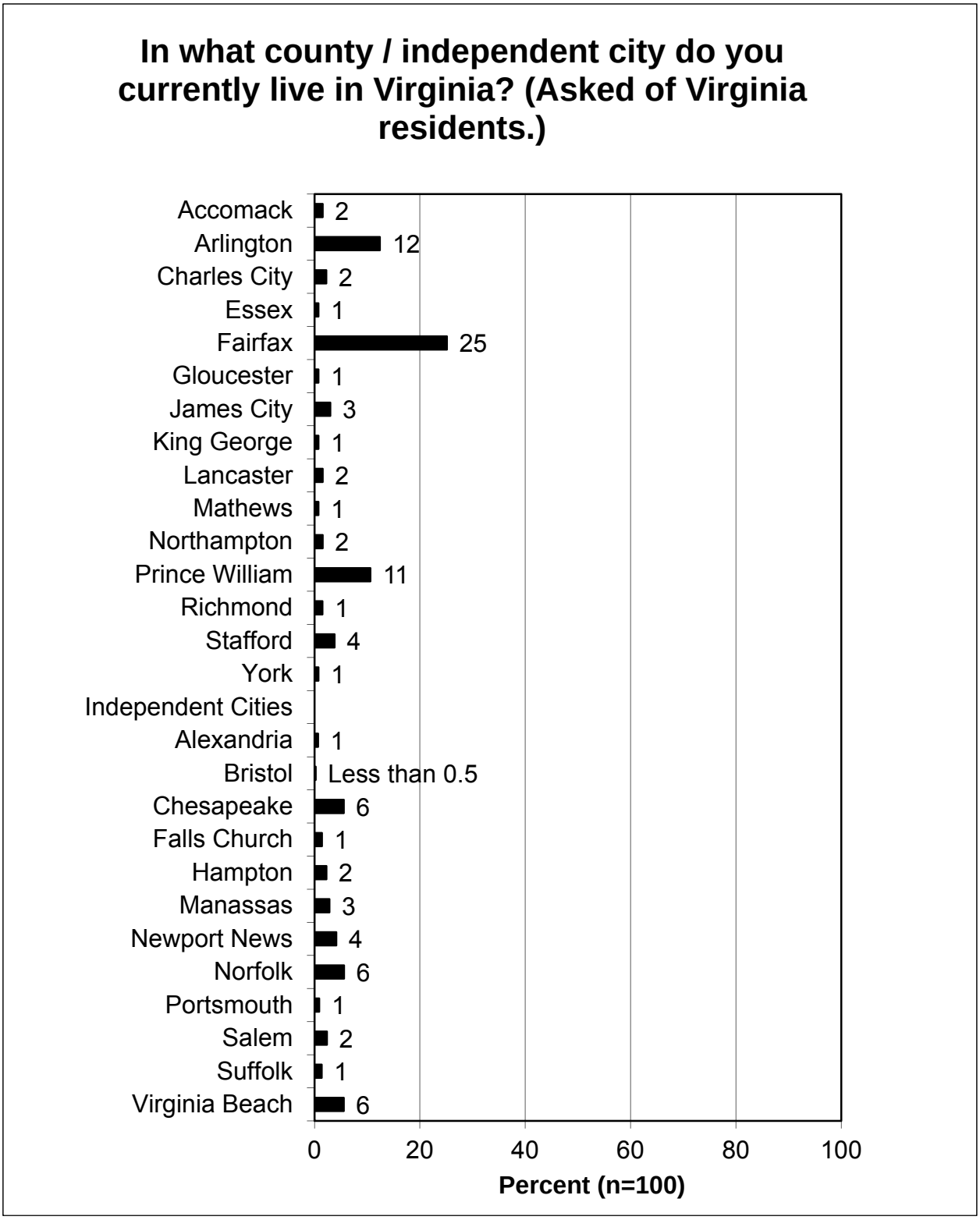



**Figure 90: County or Independent City of Residence (Virginia)**

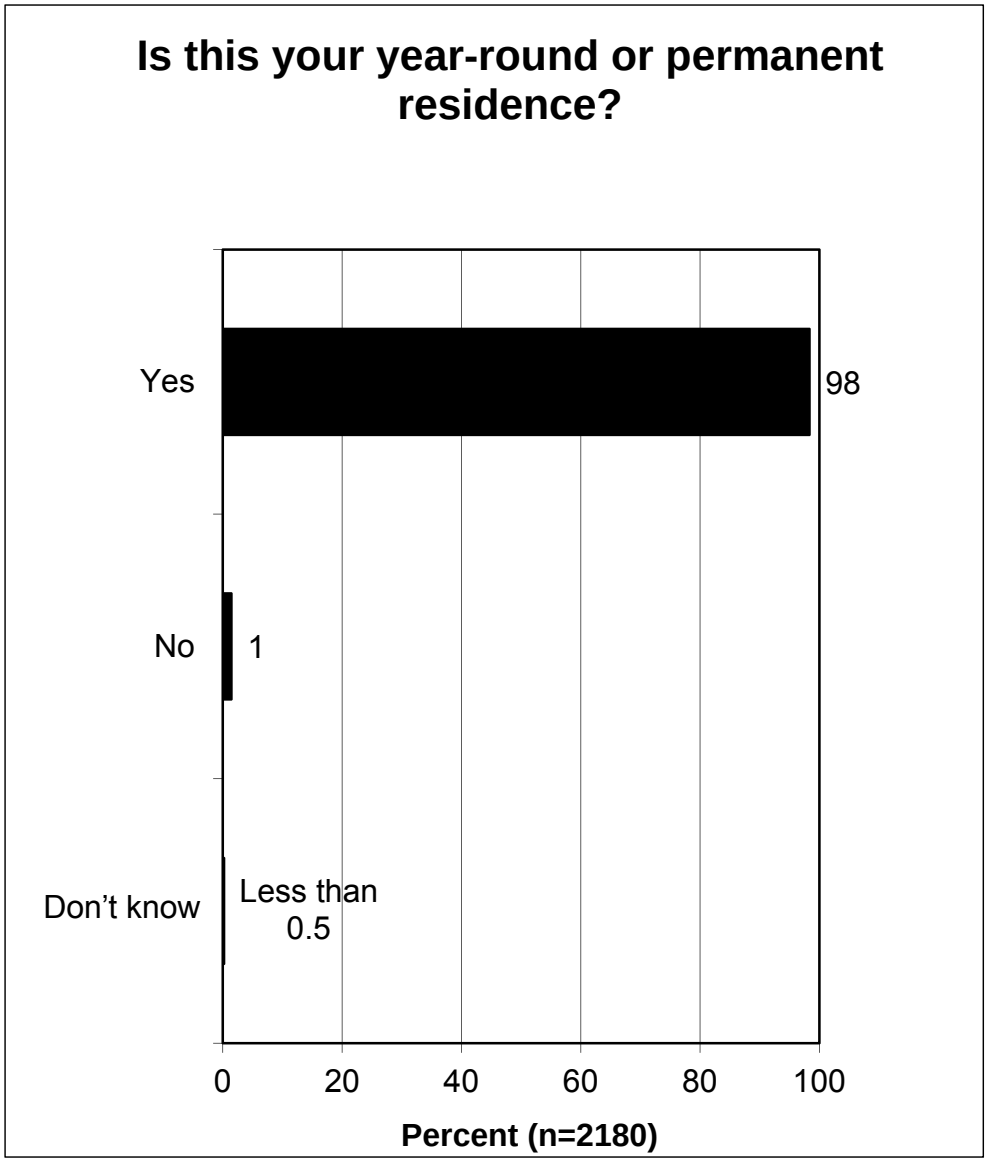



**Figure 91: Year-Round or Part-Time Residence Status**

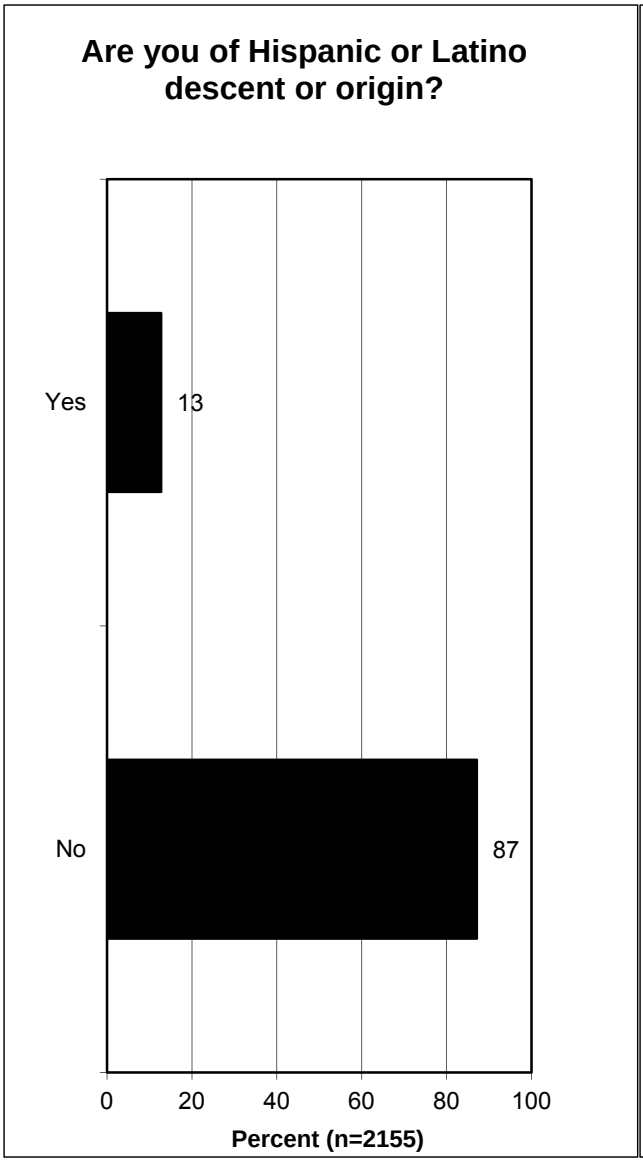



**Figure 92. Hispanic or Latino Descent of All Study Area Residents**

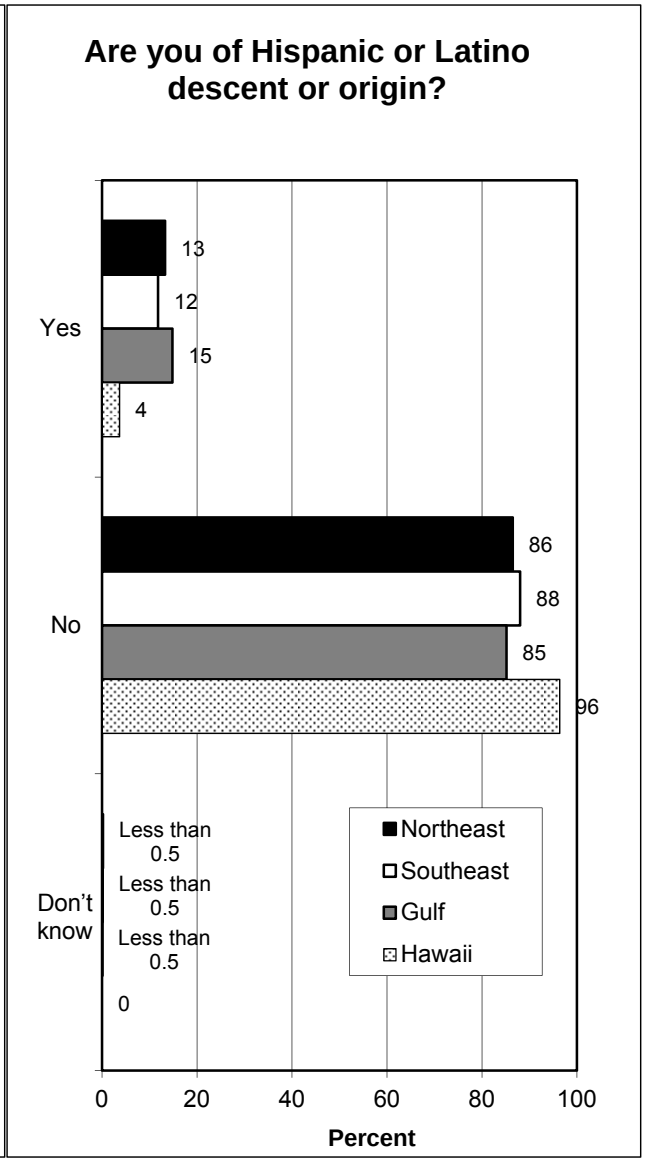



**Figure 93. Hispanic or Latino Descent by Region**

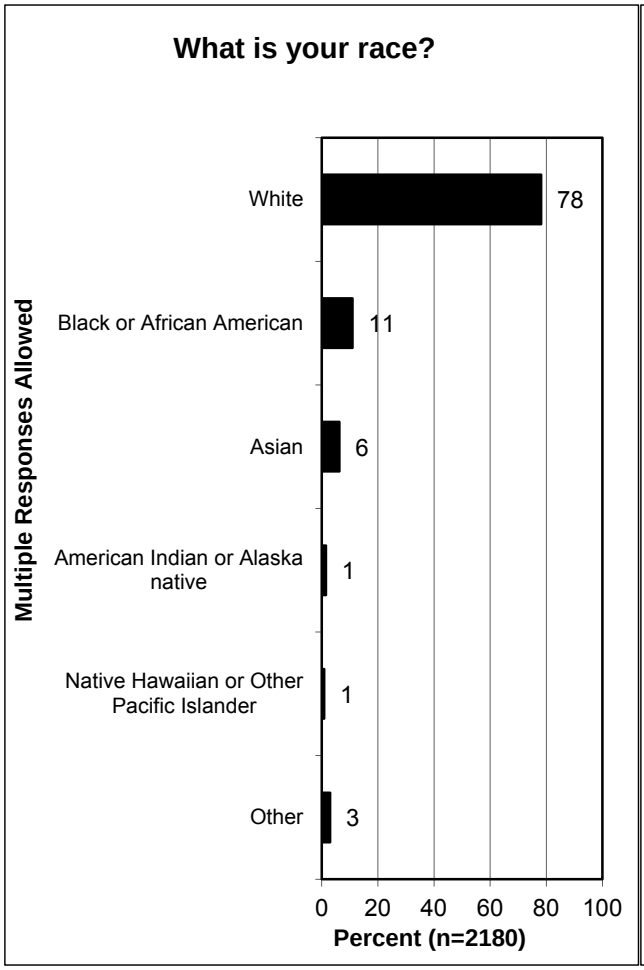



**Figure 94. Ethnicity of Study Area Residents**

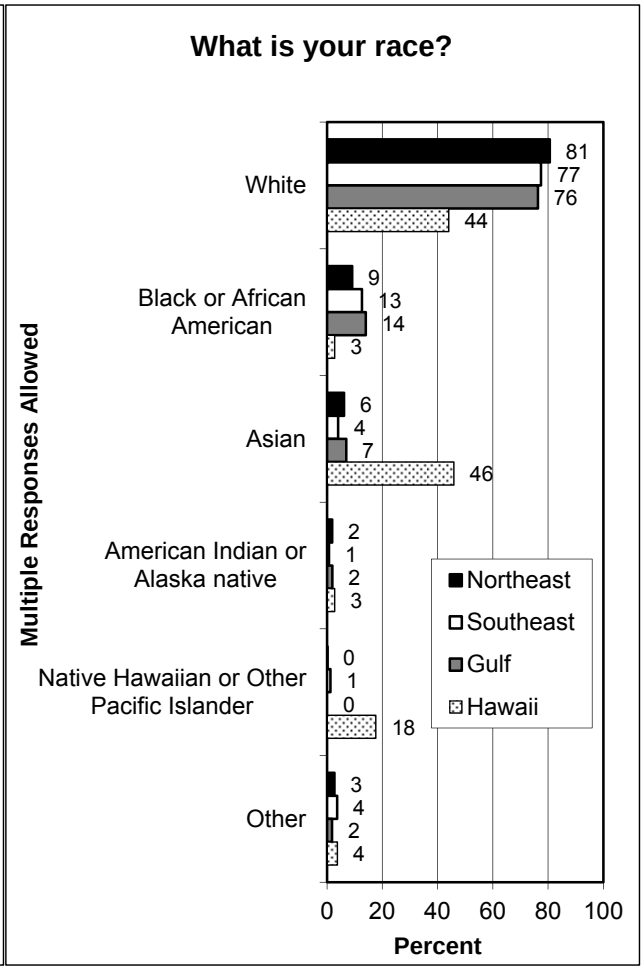



**Figure 95. Ethnicity of Region Residents**

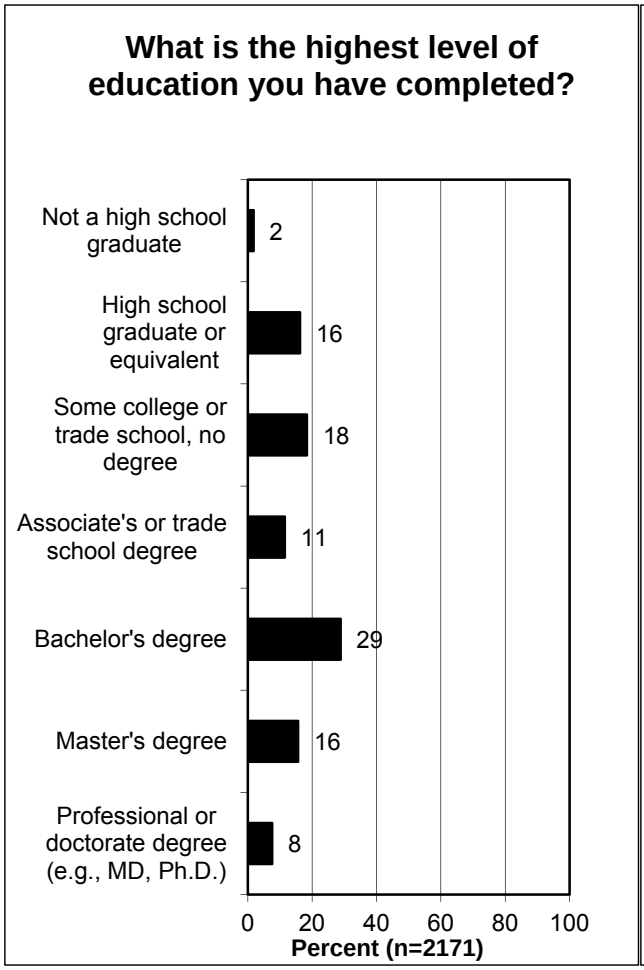



**Figure 96. Educational Level of All Study Area Residents**

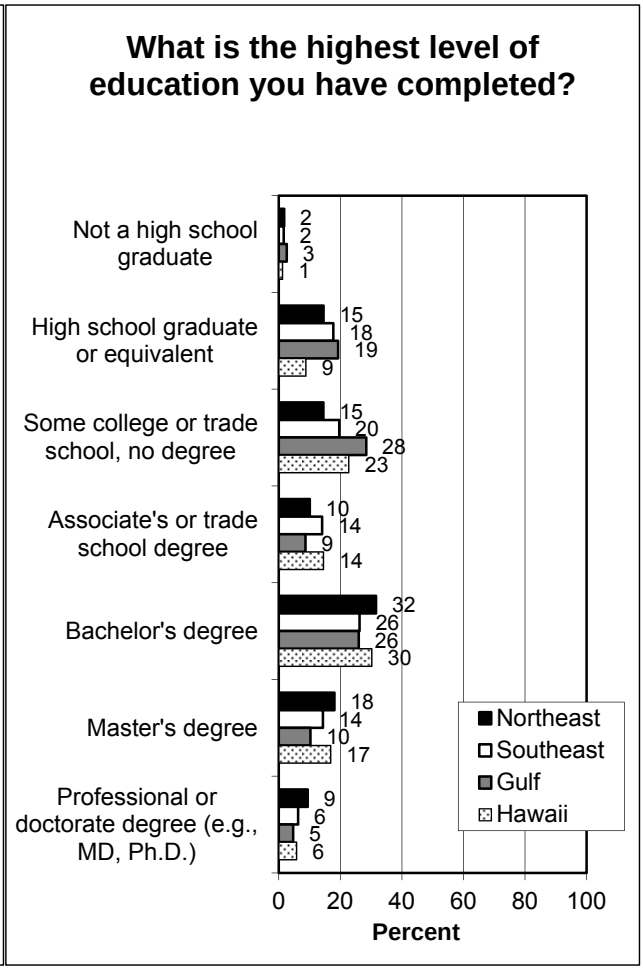



**Figure 97. Educational Level by Region**

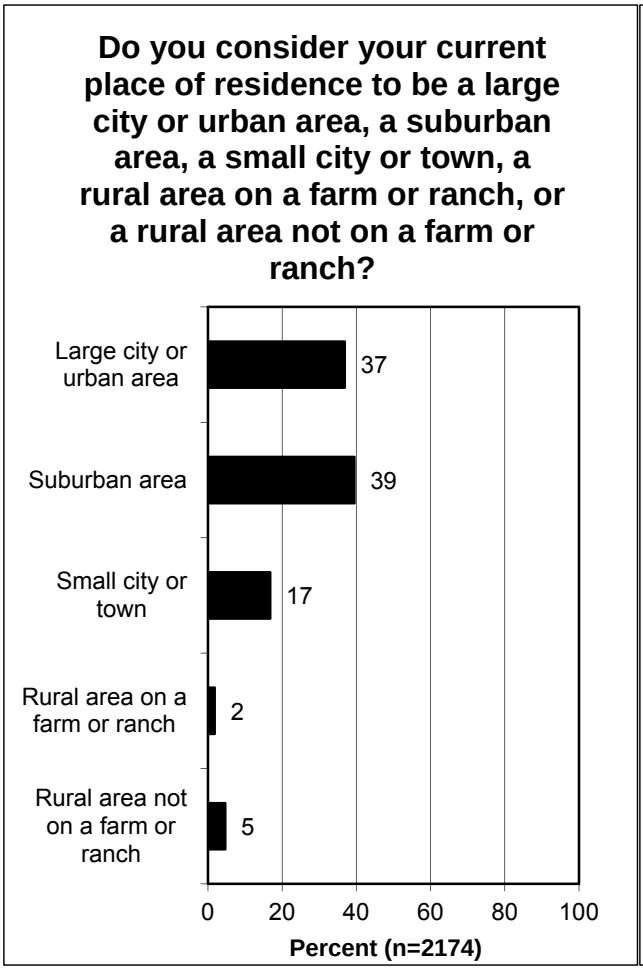



**Figure 98. Type of Residential Area of All Study Area Residents**

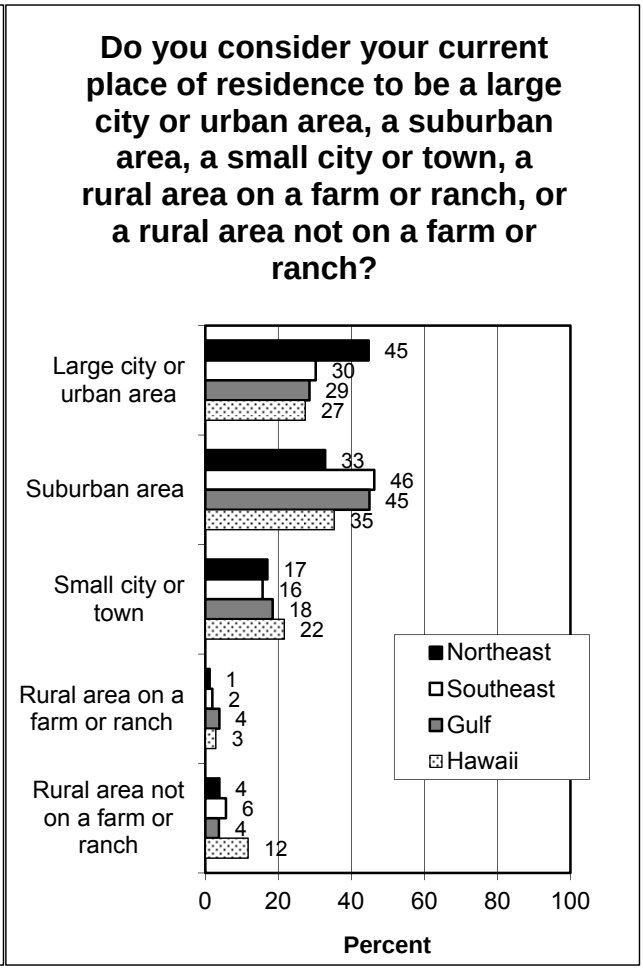



**Figure 99. Type of Residential Area by Region**

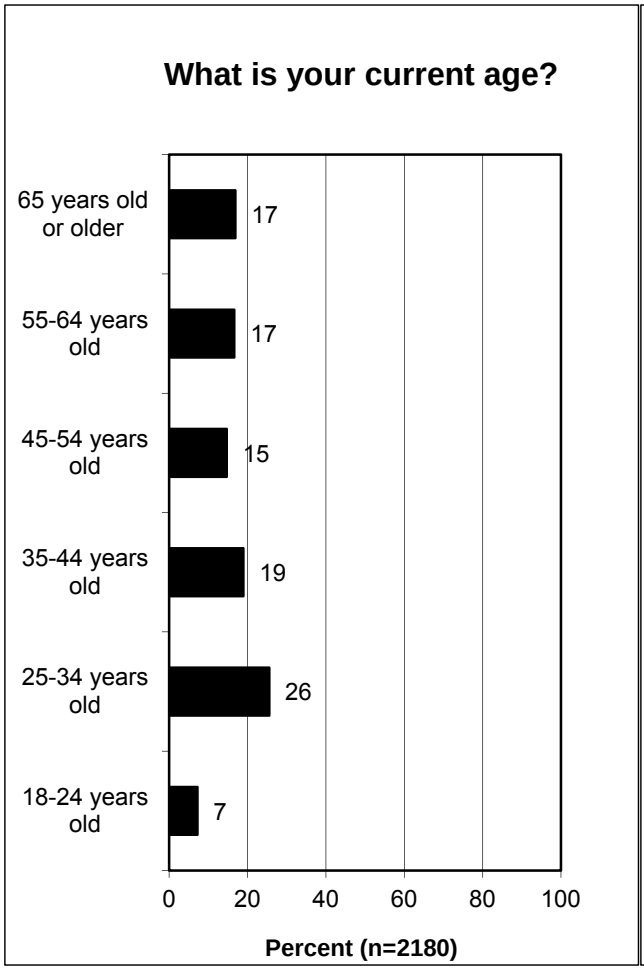



**Figure 100. Age of All Study Area Residents**

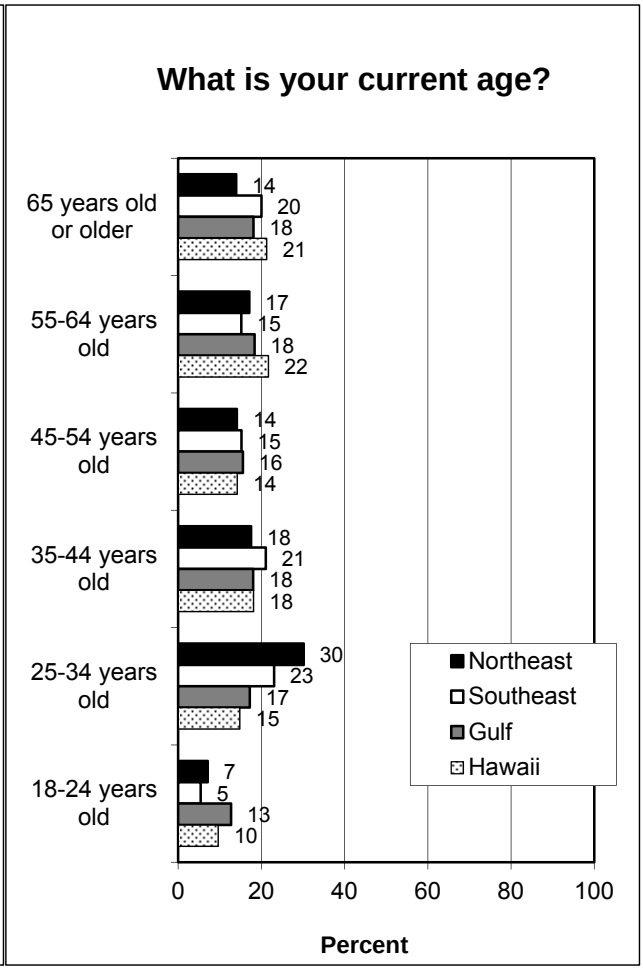



**Figure 101. Age of Study Area Residents by Region**

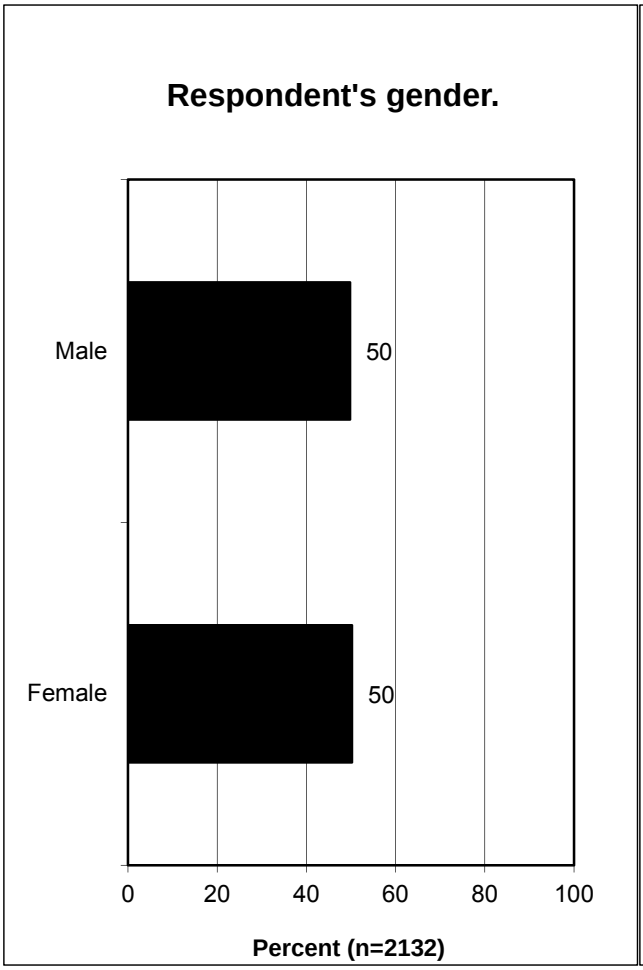



**Figure 102. Gender of All Study Area Residents**

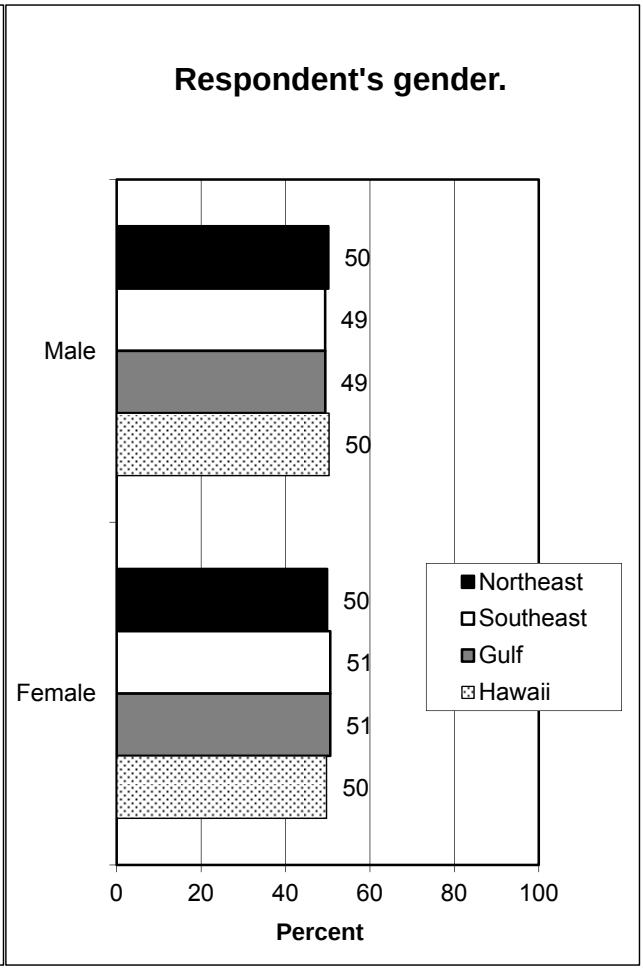



**Figure 103. Gender of Study Area Residents by Region**

# Appendix A: State-by-State Results

| Is this your year-round or permanent residence? | | | |
|---|---|---|---|
| | Yes | No | Don't know |
| Alabama | 97% | 1% | 2% |
| Connecticut | 98% | 2% | 0% |
| Delaware | 100% | 0% | 0% |
| District of Columbia | 97% | 2% | 1% |
| Florida | 97% | 3% | 0% |
| Georgia | 97% | 2% | 1% |
| Hawaii | 100% | 0% | 0% |
| Louisiana | 98% | 2% | 0% |
| Maine | 99% | 0% | 1% |
| Maryland | 99% | 1% | 0% |
| Massachusetts | 99% | 1% | 0% |
| Mississippi | 99% | 0% | 1% |
| New Hampshire | 100% | 0% | 0% |
| New Jersey | 99% | 1% | 0% |
| New York | 99% | 1% | 0% |
| North Carolina | 99% | 0% | 1% |
| Pennsylvania | 99% | 1% | 0% |
| Rhode Island | 100% | 0% | 0% |
| South Carolina | 98% | 2% | 0% |
| Texas | 98% | 1% | 2% |
| Virginia | 98% | 2% | 0% |
| Total | 98% | 1% | 0% |

| Thinking about the last major tropical storm or hurricane in the area in which you currently live, did you make any special preparations prior to or during the threat of this tropical storm or hurricane? | | | |
|---|---|---|---|
| | Yes | No | Don't know |
| Alabama | 81% | 17% | 2% |
| Connecticut | 61% | 38% | 1% |
| Delaware | 49% | 48% | 3% |
| District of Columbia | 41% | 58% | 1% |
| Georgia | 84% | 16% | 0% |
| Hawaii | 65% | 32% | 3% |
| Louisiana | 72% | 27% | 1% |
| Maine | 47% | 49% | 4% |
| Maryland | 47% | 49% | 5% |
| Massachusetts | 43% | 55% | 2% |
| Mississippi | 81% | 18% | 1% |
| New Hampshire | 48% | 51% | 2% |
| New Jersey | 70% | 26% | 4% |
| New York | 71% | 27% | 2% |
| North Carolina | 78% | 21% | 1% |
| Pennsylvania | 43% | 53% | 3% |
| Rhode Island | 57% | 43% | 0% |
| South Carolina | 80% | 17% | 3% |
| Virginia | 52% | 43% | 5% |
| Total | 62% | 36% | 3% |

| Did you leave the area prior to or during the threat of this tropical storm or hurricane? | | | |
|---|---|---|---|
| | Yes | No | Don't know |
| Alabama | 7% | 93% | 0% |
| Connecticut | 3% | 96% | 1% |
| Delaware | 16% | 83% | 1% |
| District of Columbia | 14% | 84% | 2% |
| Florida | 28% | 72% | 0% |
| Georgia | 64% | 36% | 0% |
| Hawaii | 6% | 93% | 1% |
| Louisiana | 23% | 77% | 0% |
| Maine | 1% | 99% | 0% |
| Maryland | 9% | 89% | 1% |
| Massachusetts | 8% | 92% | 0% |
| Mississippi | 27% | 73% | 0% |
| New Hampshire | 4% | 96% | 0% |
| New Jersey | 15% | 84% | 2% |
| New York | 35% | 64% | 1% |
| North Carolina | 8% | 92% | 0% |
| Pennsylvania | 10% | 89% | 2% |
| Rhode Island | 4% | 96% | 0% |
| South Carolina | 23% | 76% | 1% |
| Texas | 23% | 77% | 0% |
| Virginia | 16% | 82% | 1% |
| Total | 21% | 78% | 1% |

| How worried are you that a major tropical storm or hurricane will hit your area during the next 12 months? | | | | |
|---|---|---|---|---|
| | Very worried | Somewhat worried | Not at all worried | Don't know |
| Alabama | 18% | 54% | 26% | 2% |
| Connecticut | 7% | 51% | 41% | 2% |
| Delaware | 14% | 47% | 38% | 2% |
| District of Columbia | 12% | 45% | 42% | 1% |
| Florida | 27% | 46% | 23% | 4% |
| Georgia | 13% | 56% | 31% | 1% |
| Hawaii | 13% | 54% | 31% | 2% |
| Louisiana | 19% | 59% | 20% | 2% |
| Maine | 8% | 29% | 62% | 2% |
| Maryland | 17% | 32% | 50% | 1% |
| Massachusetts | 10% | 49% | 39% | 2% |
| Mississippi | 14% | 58% | 26% | 2% |
| New Hampshire | 4% | 45% | 50% | 1% |
| New Jersey | 17% | 53% | 29% | 1% |
| New York | 38% | 41% | 22% | 0% |
| North Carolina | 18% | 57% | 24% | 1% |
| Pennsylvania | 15% | 33% | 49% | 3% |
| Rhode Island | 8% | 53% | 36% | 3% |
| South Carolina | 19% | 56% | 23% | 2% |
| Texas | 26% | 52% | 21% | 2% |
| Virginia | 10% | 33% | 54% | 3% |
| Total | 22% | 45% | 30% | 2% |

| Do you typically make special preparations when your area is threatened by a tropical storm or hurricane? | | | |
|---|---|---|---|
| | Yes | No | Don't know |
| Alabama | 82% | 17% | 1% |
| Connecticut | 68% | 30% | 2% |
| Delaware | 63% | 34% | 3% |
| District of Columbia | 51% | 46% | 3% |
| Florida | 77% | 19% | 4% |
| Georgia | 80% | 20% | 0% |
| Hawaii | 69% | 29% | 3% |
| Louisiana | 90% | 7% | 3% |
| Maine | 55% | 42% | 3% |
| Maryland | 55% | 42% | 3% |
| Massachusetts | 60% | 38% | 2% |
| Mississippi | 84% | 14% | 2% |
| New Hampshire | 56% | 43% | 1% |
| New Jersey | 64% | 32% | 4% |
| New York | 78% | 20% | 2% |
| North Carolina | 79% | 21% | 0% |
| Pennsylvania | 57% | 41% | 2% |
| Rhode Island | 60% | 37% | 3% |
| South Carolina | 80% | 18% | 2% |
| Texas | 80% | 20% | 0% |
| Virginia | 59% | 40% | 1% |
| Total | 71% | 26% | 3% |

| If an evacuation was ordered for your area due to a major tropical storm or hurricane within the next 12 months, would you leave the area or would you stay? | | | | | | |
|---|---|---|---|---|---|---|
| | Definitely leave the area | Probably leave the area | Probably stay in the area | Definitely stay in the area | Depends on further details | Don't know |
| Alabama | 36% | 24% | 19% | 7% | 12% | 2% |
| Connecticut | 27% | 34% | 14% | 8% | 14% | 2% |
| Delaware | 27% | 41% | 16% | 1% | 14% | 1% |
| District of Columbia | 32% | 41% | 16% | 4% | 6% | 1% |
| Florida | 27% | 33% | 21% | 1% | 16% | 1% |
| Georgia | 37% | 34% | 10% | 3% | 15% | 0% |
| Hawaii | 25% | 31% | 21% | 7% | 15% | 1% |
| Louisiana | 51% | 28% | 9% | 2% | 8% | 2% |
| Maine | 35% | 27% | 15% | 5% | 14% | 3% |
| Maryland | 36% | 42% | 8% | 4% | 8% | 1% |
| Massachusetts | 31% | 36% | 15% | 6% | 10% | 2% |
| Mississippi | 46% | 24% | 16% | 2% | 9% | 2% |
| New Hampshire | 28% | 42% | 14% | 8% | 7% | 1% |
| New Jersey | 26% | 38% | 18% | 2% | 14% | 2% |
| New York | 41% | 30% | 17% | 5% | 7% | 1% |
| North Carolina | 26% | 30% | 17% | 12% | 15% | 1% |
| Pennsylvania | 28% | 33% | 9% | 5% | 21% | 3% |
| Rhode Island | 28% | 32% | 13% | 7% | 17% | 4% |
| South Carolina | 36% | 27% | 22% | 6% | 9% | 0% |
| Texas | 39% | 25% | 20% | 1% | 13% | 1% |
| Virginia | 34% | 28% | 23% | 2% | 10% | 2% |
| Total | 33% | 32% | 17% | 4% | 12% | 2% |

| When you become aware that a tropical storm or hurricane may potentially impact or affect your area or community, do you ever use the National Hurricane Center's website (www.nhc.noaa.gov) to get information? | | | |
|---|---|---|---|
| | Yes | No | Don't know |
| Alabama | 59% | 38% | 3% |
| Connecticut | 30% | 62% | 8% |
| Delaware | 44% | 50% | 5% |
| District of Columbia | 49% | 45% | 7% |
| Florida | 60% | 38% | 2% |
| Georgia | 64% | 34% | 2% |
| Hawaii | 60% | 36% | 4% |
| Louisiana | 53% | 42% | 6% |
| Maine | 35% | 62% | 3% |
| Maryland | 45% | 51% | 4% |
| Massachusetts | 39% | 60% | 1% |
| Mississippi | 67% | 29% | 4% |
| New Hampshire | 39% | 57% | 4% |
| New Jersey | 43% | 50% | 7% |
| New York | 66% | 29% | 5% |
| North Carolina | 65% | 31% | 4% |
| Pennsylvania | 29% | 65% | 6% |
| Rhode Island | 36% | 59% | 5% |
| South Carolina | 62% | 35% | 4% |
| Texas | 58% | 42% | 1% |
| Virginia | 57% | 38% | 5% |
| Total | 54% | 43% | 4% |

| How much would you say you know about tropical storms and hurricanes? | | | | | |
|---|---|---|---|---|---|
| | A great deal | A moderate amount | A little | Nothing | Don't know |
| Alabama | 38% | 47% | 11% | 2% | 2% |
| Connecticut | 10% | 41% | 46% | 2% | 1% |
| Delaware | 21% | 43% | 34% | 3% | 0% |
| District of Columbia | 12% | 49% | 32% | 6% | 1% |
| Florida | 28% | 50% | 20% | 1% | 0% |
| Georgia | 18% | 54% | 26% | 1% | 1% |
| Hawaii | 14% | 56% | 27% | 3% | 0% |
| Louisiana | 44% | 45% | 9% | 1% | 2% |
| Maine | 7% | 33% | 57% | 3% | 1% |
| Maryland | 15% | 40% | 40% | 5% | 0% |
| Massachusetts | 14% | 44% | 39% | 4% | 0% |
| Mississippi | 37% | 39% | 19% | 3% | 1% |
| New Hampshire | 13% | 45% | 40% | 2% | 0% |
| New Jersey | 10% | 51% | 36% | 3% | 1% |
| New York | 29% | 43% | 24% | 4% | 0% |
| North Carolina | 34% | 44% | 21% | 1% | 1% |
| Pennsylvania | 13% | 41% | 39% | 4% | 2% |
| Rhode Island | 6% | 51% | 41% | 2% | 0% |
| South Carolina | 29% | 56% | 13% | 2% | 0% |
| Texas | 20% | 62% | 18% | | 0% |
| Virginia | 17% | 47% | 31% | 5% | 0% |
| Total | 21% | 48% | 28% | 3% | 0% |

| How much would you say you know about official advisories and warnings for tropical storms and hurricanes? | | | | | |
|---|---|---|---|---|---|
| | A great deal | A moderate amount | A little | Nothing | Don't know |
| Alabama | 35% | 48% | 12% | 2% | 4% |
| Connecticut | 13% | 45% | 37% | 4% | 1% |
| Delaware | 20% | 45% | 32% | 2% | 0% |
| District of Columbia | 15% | 43% | 35% | 5% | 3% |
| Florida | 36% | 53% | 10% | 1% | 0% |
| Georgia | 27% | 48% | 24% | 2% | 0% |
| Hawaii | 19% | 55% | 22% | 5% | 0% |
| Louisiana | 47% | 41% | 9% | 1% | 2% |
| Maine | 7% | 43% | 43% | 3% | 4% |
| Maryland | 15% | 44% | 39% | 1% | 1% |
| Massachusetts | 20% | 37% | 39% | 3% | 0% |
| Mississippi | 38% | 44% | 15% | 3% | 1% |
| New Hampshire | 17% | 44% | 31% | 7% | 0% |
| New Jersey | 21% | 49% | 27% | 2% | 1% |
| New York | 34% | 45% | 17% | 5% | 0% |
| North Carolina | 38% | 41% | 20% | 1% | 0% |
| Pennsylvania | 17% | 39% | 35% | 6% | 2% |
| Rhode Island | 13% | 48% | 37% | 3% | 0% |
| South Carolina | 34% | 49% | 16% | 1% | 0% |
| Texas | 31% | 51% | 16% | 2% | 0% |
| Virginia | 22% | 50% | 23% | 5% | 0% |
| Total | 28% | 47% | 22% | 3% | 0% |

| How important would you say the advisory and warning information you have seen is to your decision on when to begin preparing for a tropical storm or hurricane? | | | | | | |
|---|---|---|---|---|---|---|
| | Extremely important | Very important | Somewhat important | A little important | Not at all important | Don't know |
| Alabama | 57% | 30% | 10% | 2% | 0% | 2% |
| Connecticut | 36% | 46% | 15% | 2% | 1% | 0% |
| Delaware | 36% | 42% | 19% | 2% | 1% | 0% |
| District of Columbia | 37% | 35% | 19% | 6% | 1% | 3% |
| Florida | 48% | 41% | 10% | 1% | 0% | 0% |
| Georgia | 51% | 33% | 14% | 1% | 1% | 0% |
| Hawaii | 46% | 36% | 11% | 2% | 4% | 0% |
| Louisiana | 57% | 34% | 8% | 0% | 0% | 2% |
| Maine | 34% | 39% | 17% | 6% | 0% | 3% |
| Maryland | 46% | 34% | 15% | 2% | 2% | 1% |
| Massachusetts | 39% | 48% | 9% | 3% | 0% | 0% |
| Mississippi | 50% | 36% | 7% | 4% | 2% | 1% |
| New Hampshire | 35% | 48% | 12% | 4% | 1% | 1% |
| New Jersey | 38% | 43% | 13% | 4% | 0% | 2% |
| New York | 53% | 34% | 11% | 1% | 0% | 1% |
| North Carolina | 51% | 33% | 13% | 3% | 1% | 0% |
| Pennsylvania | 34% | 35% | 17% | 8% | 3% | 3% |
| Rhode Island | 37% | 36% | 21% | 3% | 0% | 2% |
| South Carolina | 56% | 34% | 7% | 2% | 1% | 0% |
| Texas | 58% | 33% | 9% | 0% | 0% | 0% |
| Virginia | 40% | 35% | 14% | 5% | 5% | 1% |
| Total | 47% | 38% | 12% | 2% | 1% | 1% |

| How important would you say the advisory and warning information you have seen is to your decision on whether to leave the area or stay during a tropical storm or hurricane? | | | | | | |
|---|---|---|---|---|---|---|
| | Extremely important | Very important | Somewhat important | A little important | Not at all important | Don't know |
| Alabama | 50% | 35% | 11% | 1% | 2% | 2% |
| Connecticut | 36% | 40% | 16% | 6% | 1% | 1% |
| Delaware | 34% | 48% | 16% | 2% | 0% | 0% |
| District of Columbia | 37% | 42% | 12% | 5% | 1% | 3% |
| Florida | 35% | 43% | 22% | 0% | 0% | 0% |
| Georgia | 49% | 33% | 15% | 3% | 0% | 1% |
| Hawaii | 42% | 34% | 16% | 3% | 5% | 1% |
| Louisiana | 61% | 35% | 2% | 1% | 0% | 2% |
| Maine | 37% | 34% | 14% | 10% | 2% | 3% |
| Maryland | 40% | 36% | 15% | 5% | 2% | 2% |
| Massachusetts | 42% | 41% | 14% | 2% | 1% | 0% |
| Mississippi | 52% | 31% | 13% | 2% | 1% | 1% |
| New Hampshire | 38% | 44% | 13% | 2% | 2% | 1% |
| New Jersey | 38% | 40% | 14% | 6% | 1% | 2% |
| New York | 50% | 32% | 16% | 2% | 0% | 0% |
| North Carolina | 48% | 33% | 12% | 4% | 4% | 0% |
| Pennsylvania | 35% | 39% | 12% | 8% | 3% | 2% |
| Rhode Island | 38% | 31% | 25% | 4% | 1% | 2% |
| South Carolina | 54% | 34% | 9% | 1% | 2% | 0% |
| Texas | 46% | 37% | 13% | 2% | 2% | 0% |
| Virginia | 42% | 30% | 18% | 2% | 5% | 2% |
| Total | 42% | 37% | 16% | 3% | 1% | 1% |

| Based on the information you have seen for advisories and warnings about tropical storms and hurricanes that threaten your area, how would you rate that information in each of the following areas? Readability (i.e., how easy it is to read) | | | | | |
|---|---|---|---|---|---|
| | Excellent | Good | Fair | Poor | Don't know / Haven't seen any warnings |
| Alabama | 58% | 32% | 8% | 0% | 2% |
| Connecticut | 48% | 39% | 10% | 0% | 3% |
| Delaware | 38% | 53% | 5% | 1% | 4% |
| District of Columbia | 35% | 50% | 11% | 0% | 4% |
| Florida | 47% | 50% | 2% | 1% | 0% |
| Georgia | 49% | 45% | 3% | 0% | 3% |
| Hawaii | 38% | 45% | 9% | 2% | 6% |
| Louisiana | 44% | 50% | 4% | 0% | 2% |
| Maine | 33% | 47% | 7% | 0% | 13% |
| Maryland | 36% | 48% | 11% | 0% | 4% |
| Massachusetts | 35% | 50% | 9% | 0% | 6% |
| Mississippi | 56% | 36% | 7% | 0% | 2% |
| New Hampshire | 37% | 46% | 11% | 0% | 6% |
| New Jersey | 48% | 42% | 7% | 0% | 2% |
| New York | 52% | 37% | 10% | 0% | 1% |
| North Carolina | 54% | 36% | 7% | 0% | 2% |
| Pennsylvania | 34% | 45% | 13% | 2% | 7% |
| Rhode Island | 34% | 57% | 6% | 0% | 3% |
| South Carolina | 56% | 35% | 5% | 0% | 3% |
| Texas | 51% | 43% | 5% | 1% | 0% |
| Virginia | 43% | 45% | 4% | 2% | 6% |
| Total | 46% | 44% | 7% | 0% | 2% |

| Based on the information you have seen for advisories and warnings about tropical storms and hurricanes that threaten your area, how would you rate that information in each of the following areas? Understandability (i.e., how easy it is to understand) | | | | | |
|---|---|---|---|---|---|
| | Excellent | Good | Fair | Poor | Don't know / Haven't seen any warnings |
| Alabama | 55% | 36% | 7% | 0% | 2% |
| Connecticut | 46% | 45% | 3% | 1% | 3% |
| Delaware | 38% | 49% | 9% | 0% | 4% |
| District of Columbia | 37% | 44% | 14% | 1% | 4% |
| Florida | 52% | 42% | 6% | 0% | 0% |
| Georgia | 48% | 38% | 11% | 1% | 2% |
| Hawaii | 45% | 43% | 6% | 1% | 5% |
| Louisiana | 54% | 39% | 5% | 0% | 2% |
| Maine | 32% | 51% | 4% | 2% | 11% |
| Maryland | 41% | 42% | 13% | 0% | 4% |
| Massachusetts | 46% | 40% | 7% | 2% | 5% |
| Mississippi | 62% | 36% | 1% | 0% | 1% |
| New Hampshire | 50% | 40% | 5% | 0% | 5% |
| New Jersey | 46% | 44% | 8% | 0% | 2% |
| New York | 54% | 35% | 10% | 1% | 1% |
| North Carolina | 60% | 33% | 6% | 0% | 1% |
| Pennsylvania | 35% | 44% | 14% | 2% | 4% |
| Rhode Island | 40% | 54% | 4% | 0% | 2% |
| South Carolina | 60% | 35% | 5% | 0% | 0% |
| Texas | 56% | 41% | 3% | 1% | 0% |
| Virginia | 51% | 35% | 7% | 0% | 7% |
| Total | 50% | 40% | 7% | 1% | 2% |

| Based on the information you have seen for advisories and warnings about tropical storms and hurricanes that threaten your area, how would you rate that information in each of the following areas? Usefulness (i.e., how useful it is) | | | | | |
|---|---|---|---|---|---|
| | Excellent | Good | Fair | Poor | Don't know / Haven't seen any warnings |
| Alabama | 58% | 35% | 6% | 0% | 2% |
| Connecticut | 44% | 45% | 7% | 1% | 3% |
| Delaware | 34% | 59% | 3% | 1% | 4% |
| District of Columbia | 39% | 44% | 14% | 0% | 4% |
| Florida | 53% | 44% | 3% | 0% | 0% |
| Georgia | 50% | 44% | 4% | 0% | 3% |
| Hawaii | 44% | 37% | 10% | 3% | 5% |
| Louisiana | 59% | 34% | 5% | 0% | 2% |
| Maine | 37% | 42% | 9% | 2% | 11% |
| Maryland | 42% | 45% | 10% | 0% | 4% |
| Massachusetts | 49% | 38% | 6% | 2% | 5% |
| Mississippi | 59% | 37% | 3% | 0% | 2% |
| New Hampshire | 44% | 41% | 10% | 0% | 5% |
| New Jersey | 48% | 39% | 10% | 0% | 3% |
| New York | 50% | 41% | 6% | 1% | 2% |
| North Carolina | 59% | 32% | 7% | 1% | 1% |
| Pennsylvania | 46% | 36% | 13% | 2% | 4% |
| Rhode Island | 45% | 46% | 7% | 0% | 2% |
| South Carolina | 61% | 32% | 7% | 0% | 0% |
| Texas | 49% | 46% | 4% | 1% | 0% |
| Virginia | 47% | 38% | 8% | 2% | 5% |
| Total | 49% | 42% | 6% | 1% | 2% |

| Based on the information you have seen for advisories and warnings about tropical storms and hurricanes that threaten your area, how would you rate that information in each of the following areas? Reliability (i.e., how reliable it is) | | | | | |
|---|---|---|---|---|---|
| | Excellent | Good | Fair | Poor | Don't know / Haven't seen any warnings |
| Alabama | 46% | 42% | 10% | 0% | 2% |
| Connecticut | 39% | 50% | 7% | 1% | 3% |
| Delaware | 31% | 56% | 10% | 0% | 4% |
| District of Columbia | 30% | 49% | 16% | 1% | 4% |
| Florida | 36% | 54% | 7% | 4% | 0% |
| Georgia | 32% | 46% | 20% | 0% | 2% |
| Hawaii | 35% | 38% | 16% | 6% | 5% |
| Louisiana | 49% | 42% | 8% | 0% | 2% |
| Maine | 29% | 44% | 15% | 2% | 11% |
| Maryland | 35% | 49% | 12% | 0% | 4% |
| Massachusetts | 36% | 48% | 11% | 1% | 5% |
| Mississippi | 46% | 42% | 10% | 1% | 1% |
| New Hampshire | 35% | 47% | 13% | 0% | 6% |
| New Jersey | 36% | 46% | 16% | 1% | 2% |
| New York | 46% | 46% | 7% | 1% | 1% |
| North Carolina | 46% | 39% | 12% | 1% | 1% |
| Pennsylvania | 36% | 38% | 18% | 4% | 4% |
| Rhode Island | 28% | 56% | 14% | 0% | 2% |
| South Carolina | 54% | 29% | 14% | 2% | 0% |
| Texas | 46% | 47% | 5% | 1% | 0% |
| Virginia | 43% | 40% | 10% | 2% | 5% |
| Total | 40% | 47% | 10% | 2% | 2% |

| Based on the information you have seen for advisories and warnings about tropical storms and hurricanes that threaten your area, how would you rate that information in each of the following areas? Effectiveness (i.e., how effective it is at communicating the advisory or warning) | | | | | |
|---|---|---|---|---|---|
| | Excellent | Good | Fair | Poor | Don't know / Haven't seen any warnings |
| Alabama | 51% | 42% | 6% | 0% | 2% |
| Connecticut | 41% | 50% | 5% | 1% | 3% |
| Delaware | 38% | 50% | 7% | 0% | 4% |
| District of Columbia | 30% | 53% | 11% | 1% | 4% |
| Florida | 52% | 41% | 7% | 0% | 1% |
| Georgia | 49% | 45% | 5% | 0% | 2% |
| Hawaii | 41% | 42% | 10% | 2% | 5% |
| Louisiana | 55% | 36% | 7% | 0% | 2% |
| Maine | 33% | 41% | 11% | 3% | 12% |
| Maryland | 41% | 44% | 11% | 0% | 4% |
| Massachusetts | 44% | 41% | 10% | 0% | 5% |
| Mississippi | 62% | 34% | 3% | 0% | 1% |
| New Hampshire | 45% | 43% | 6% | 1% | 5% |
| New Jersey | 43% | 43% | 12% | 0% | 2% |
| New York | 47% | 44% | 7% | 2% | 1% |
| North Carolina | 53% | 38% | 8% | 0% | 1% |
| Pennsylvania | 39% | 42% | 12% | 3% | 4% |
| Rhode Island | 39% | 46% | 12% | 0% | 2% |
| South Carolina | 63% | 28% | 5% | 4% | 0% |
| Texas | 55% | 42% | 2% | 1% | 0% |
| Virginia | 44% | 42% | 4% | 2% | 8% |
| Total | 47% | 42% | 7% | 1% | 2% |

| How likely are you to use this same type of graphic to determine if and when you should begin preparations for a pending tropical storm or hurricane event? | | | | |
|---|---|---|---|---|
| | Very likely | Somewhat likely | Not at all likely | Don't know |
| Alabama | 60% | 32% | 4% | 3% |
| Connecticut | 51% | 37% | 8% | 3% |
| Delaware | 59% | 32% | 7% | 3% |
| District of Columbia | 53% | 35% | 8% | 4% |
| Florida | 66% | 33% | 1% | 0% |
| Georgia | 65% | 32% | 3% | 1% |
| Hawaii | 50% | 35% | 11% | 3% |
| Louisiana | 56% | 39% | 2% | 2% |
| Maine | 43% | 46% | 6% | 4% |
| Maryland | 50% | 40% | 5% | 5% |
| Massachusetts | 57% | 33% | 9% | 0% |
| Mississippi | 58% | 31% | 7% | 4% |
| New Hampshire | 57% | 35% | 8% | 0% |
| New Jersey | 39% | 46% | 11% | 4% |
| New York | 55% | 38% | 4% | 2% |
| North Carolina | 69% | 24% | 7% | 0% |
| Pennsylvania | 39% | 44% | 10% | 7% |
| Rhode Island | 51% | 33% | 9% | 6% |
| South Carolina | 65% | 27% | 7% | 1% |
| Texas | 54% | 39% | 4% | 3% |
| Virginia | 45% | 47% | 5% | 3% |
| Total | 55% | 38% | 5% | 2% |

| Based on this graphic and the area where you currently live, how likely are you to make preparations for a tropical storm or hurricane event? | | | | |
|---|---|---|---|---|
| | Very likely | Somewhat likely | Not at all likely | Don't know |
| Alabama | 63% | 29% | 6% | 3% |
| Connecticut | 65% | 26% | 4% | 5% |
| Delaware | 57% | 36% | 2% | 4% |
| District of Columbia | 35% | 42% | 17% | 6% |
| Florida | 59% | 27% | 10% | 5% |
| Georgia | 63% | 32% | 2% | 3% |
| Hawaii | 59% | 30% | 10% | 1% |
| Louisiana | 74% | 21% | 2% | 3% |
| Maine | 33% | 39% | 26% | 3% |
| Maryland | 43% | 39% | 14% | 4% |
| Massachusetts | 45% | 45% | 8% | 2% |
| Mississippi | 67% | 24% | 3% | 6% |
| New Hampshire | 58% | 32% | 10% | 0% |
| New Jersey | 48% | 39% | 7% | 6% |
| New York | 53% | 35% | 10% | 2% |
| North Carolina | 64% | 28% | 5% | 3% |
| Pennsylvania | 33% | 44% | 13% | 10% |
| Rhode Island | 50% | 48% | 0% | 3% |
| South Carolina | 68% | 24% | 6% | 2% |
| Texas | 57% | 35% | 4% | 3% |
| Virginia | 41% | 43% | 11% | 5% |
| Total | 53% | 35% | 9% | 4% |

| If you were to use this graphic for planning purposes during a tropical storm or hurricane event, how often would you check it for updates? | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | More than once an hour | Hourly | Every 2 to 3 hours | Every 4 to 5 hours | Every 6 to 7 hours | Every 8 to 9 hours | Every 10 to 11 hours | Every 12 hours / twice a day | Once a day |
| Alabama | 15% | 34% | 28% | 14% | 4% | 0% | 1% | 3% | 0% |
| Connecticut | 14% | 25% | 29% | 12% | 10% | 2% | 0% | 2% | 2% |
| Delaware | 14% | 34% | 28% | 12% | 8% | 1% | 0% | 2% | 1% |
| District of Columbia | 14% | 23% | 23% | 13% | 11% | 3% | 0% | 6% | 2% |
| Florida | 10% | 32% | 29% | 14% | 4% | 2% | 2% | | 3% |
| Georgia | 11% | 36% | 30% | 10% | 5% | 4% | 0% | 1% | 0% |
| Hawaii | 8% | 29% | 28% | 14% | 6% | 3% | 0% | 5% | 1% |
| Louisiana | 16% | 31% | 27% | 17% | 3% | | 0% | 2% | 1% |
| Maine | 5% | 26% | 32% | 11% | 1% | 5% | 0% | 12% | 1% |
| Maryland | 5% | 27% | 36% | 9% | 5% | 2% | 2% | 5% | 3% |
| Massachusetts | 11% | 28% | 37% | 12% | 4% | 1% | 2% | 1% | 1% |
| Mississippi | 18% | 39% | 13% | 17% | 3% | 1% | 1% | 2% | 2% |
| New Hampshire | 9% | 28% | 30% | 18% | 7% | 1% | 0% | 4% | 0% |
| New Jersey | 17% | 24% | 26% | 8% | 9% | 5% | 1% | 3% | 2% |
| New York | 11% | 28% | 16% | 17% | 17% | 3% | 3% | 2% | 3% |
| North Carolina | 9% | 22% | 39% | 12% | 7% | 4% | 2% | 2% | 2% |
| Pennsylvania | 12% | 35% | 21% | 9% | 6% | 7% | 0% | 1% | 1% |
| Rhode Island | 10% | 40% | 32% | 6% | 3% | 3% | 1% | 3% | 1% |
| South Carolina | 6% | 38% | 28% | 17% | 2% | 0% | 0% | 6% | 0% |
| Texas | 7% | 35% | 26% | 15% | 9% | 5% | 0% | 1% | 2% |
| Virginia | 9% | 28% | 20% | 18% | 9% | 2% | 1% | 5% | 5% |
| Total | 11% | 30% | 26% | 14% | 8% | 3% | 1% | 2% | 2% |

| Readability (i.e., how easy it is to read): How would you rate this graphic in each of the following areas? | | | | | |
|---|---|---|---|---|---|
| | Excellent | Good | Fair | Poor | Don't know |
| Alabama | 63% | 25% | 7% | 2% | 3% |
| Connecticut | 61% | 27% | 11% | 1% | 0% |
| Delaware | 58% | 29% | 9% | 2% | 2% |
| District of Columbia | 62% | 22% | 14% | 1% | 1% |
| Florida | 61% | 24% | 12% | 1% | 2% |
| Georgia | 63% | 26% | 9% | 2% | 1% |
| Hawaii | 52% | 25% | 15% | 6% | 1% |
| Louisiana | 65% | 25% | 8% | 2% | 0% |
| Maine | 51% | 35% | 9% | 2% | 3% |
| Maryland | 62% | 24% | 11% | 3% | 0% |
| Massachusetts | 62% | 22% | 13% | 2% | 0% |
| Mississippi | 56% | 25% | 17% | 1% | 1% |
| New Hampshire | 62% | 25% | 11% | 2% | 1% |
| New Jersey | 55% | 28% | 15% | 1% | 2% |
| New York | 60% | 30% | 7% | 2% | 1% |
| North Carolina | 69% | 26% | 3% | 2% | 0% |
| Pennsylvania | 52% | 28% | 10% | 8% | 3% |
| Rhode Island | 57% | 26% | 15% | 2% | 1% |
| South Carolina | 70% | 22% | 5% | 2% | 2% |
| Texas | 63% | 26% | 8% | 1% | 3% |
| Virginia | 63% | 32% | 4% | 0% | 1% |
| Total | 60% | 26% | 10% | 2% | 1% |

| Understandability (i.e., how easy it is to understand): How would you rate this graphic in each of the following areas? | | | | | |
|---|---|---|---|---|---|
| | Excellent | Good | Fair | Poor | Don't know |
| Alabama | 67% | 23% | 6% | 1% | 3% |
| Connecticut | 60% | 31% | 8% | 1% | 0% |
| Delaware | 58% | 32% | 6% | 2% | 2% |
| District of Columbia | 59% | 25% | 10% | 5% | 1% |
| Florida | 70% | 21% | 7% | 0% | 2% |
| Georgia | 70% | 19% | 8% | 3% | 1% |
| Hawaii | 54% | 29% | 11% | 6% | 0% |
| Louisiana | 62% | 26% | 12% | 0% | 0% |
| Maine | 55% | 32% | 8% | 2% | 3% |
| Maryland | 65% | 20% | 13% | 2% | 0% |
| Massachusetts | 57% | 32% | 8% | 3% | 0% |
| Mississippi | 59% | 23% | 14% | 3% | 1% |
| New Hampshire | 63% | 27% | 5% | 4% | 1% |
| New Jersey | 53% | 27% | 15% | 4% | 2% |
| New York | 58% | 26% | 7% | 6% | 2% |
| North Carolina | 72% | 22% | 4% | 1% | 0% |
| Pennsylvania | 54% | 27% | 9% | 7% | 3% |
| Rhode Island | 61% | 21% | 15% | 2% | 1% |
| South Carolina | 68% | 24% | 3% | 2% | 2% |
| Texas | 66% | 23% | 7% | 1% | 3% |
| Virginia | 67% | 28% | 4% | 1% | 0% |
| Total | 62% | 25% | 8% | 3% | 2% |

| Usefulness (i.e., how useful it is): How would you rate this graphic in each of the following areas? | | | | | |
|---|---|---|---|---|---|
| | Excellent | Good | Fair | Poor | Don't know |
| Alabama | 67% | 28% | 3% | 0% | 3% |
| Connecticut | 68% | 27% | 3% | 2% | 0% |
| Delaware | 62% | 26% | 10% | 0% | 2% |
| District of Columbia | 65% | 26% | 6% | 1% | 1% |
| Florida | 67% | 26% | 5% | 0% | 2% |
| Georgia | 65% | 28% | 5% | 0% | 2% |
| Hawaii | 53% | 28% | 11% | 5% | 2% |
| Louisiana | 64% | 29% | 6% | 0% | 0% |
| Maine | 51% | 38% | 6% | 1% | 4% |
| Maryland | 64% | 22% | 14% | 1% | 0% |
| Massachusetts | 54% | 35% | 11% | 1% | 0% |
| Mississippi | 65% | 23% | 8% | 2% | 1% |
| New Hampshire | 61% | 29% | 6% | 2% | 2% |
| New Jersey | 50% | 37% | 9% | 2% | 2% |
| New York | 65% | 20% | 11% | 3% | 1% |
| North Carolina | 68% | 25% | 5% | 1% | 0% |
| Pennsylvania | 55% | 28% | 10% | 5% | 3% |
| Rhode Island | 66% | 20% | 11% | 1% | 2% |
| South Carolina | 68% | 24% | 5% | 2% | 2% |
| Texas | 66% | 27% | 4% | 0% | 3% |
| Virginia | 69% | 25% | 5% | 1% | 0% |
| Total | 63% | 27% | 8% | 1% | 2% |

| Reliability (i.e., how reliable it is): How would you rate this graphic in each of the following areas? | | | | | |
|---|---|---|---|---|---|
| | Excellent | Good | Fair | Poor | Don't know |
| Alabama | 57% | 30% | 8% | 0% | 5% |
| Connecticut | 51% | 34% | 7% | 3% | 5% |
| Delaware | 51% | 33% | 11% | 1% | 4% |
| District of Columbia | 56% | 27% | 8% | 0% | 8% |
| Florida | 53% | 36% | 5% | 0% | 7% |
| Georgia | 48% | 33% | 12% | 0% | 7% |
| Hawaii | 47% | 23% | 16% | 6% | 8% |
| Louisiana | 53% | 37% | 7% | 0% | 2% |
| Maine | 35% | 40% | 14% | 2% | 9% |
| Maryland | 51% | 30% | 16% | 1% | 2% |
| Massachusetts | 44% | 43% | 10% | 1% | 3% |
| Mississippi | 55% | 21% | 15% | 3% | 6% |
| New Hampshire | 42% | 33% | 15% | 1% | 9% |
| New Jersey | 50% | 30% | 12% | 3% | 5% |
| New York | 60% | 23% | 15% | 1% | 1% |
| North Carolina | 54% | 33% | 11% | 1% | 1% |
| Pennsylvania | 47% | 29% | 14% | 2% | 8% |
| Rhode Island | 54% | 26% | 6% | 4% | 10% |
| South Carolina | 53% | 35% | 7% | 3% | 2% |
| Texas | 56% | 32% | 7% | 0% | 5% |
| Virginia | 55% | 31% | 10% | 2% | 3% |
| Total | 53% | 31% | 10% | 1% | 4% |

| Effectiveness (i.e., how effective it is at communicating the advisory or warning): How would you rate this graphic in each of the following areas? | | | | | |
|---|---|---|---|---|---|
| | Excellent | Good | Fair | Poor | Don't know |
| Alabama | 65% | 31% | 0% | 1% | 4% |
| Connecticut | 59% | 30% | 10% | 2% | 0% |
| Delaware | 60% | 28% | 8% | 1% | 3% |
| District of Columbia | 56% | 35% | 6% | 1% | 1% |
| Florida | 63% | 26% | 8% | 0% | 2% |
| Georgia | 66% | 24% | 9% | 1% | 1% |
| Hawaii | 53% | 30% | 12% | 3% | 2% |
| Louisiana | 63% | 24% | 13% | 0% | 1% |
| Maine | 48% | 33% | 13% | 3% | 3% |
| Maryland | 61% | 24% | 14% | 1% | 0% |
| Massachusetts | 57% | 29% | 12% | 2% | 0% |
| Mississippi | 59% | 23% | 16% | 2% | 1% |
| New Hampshire | 57% | 36% | 4% | 2% | 1% |
| New Jersey | 50% | 40% | 5% | 3% | 2% |
| New York | 65% | 25% | 5% | 3% | 1% |
| North Carolina | 67% | 26% | 5% | 1% | 1% |
| Pennsylvania | 53% | 26% | 12% | 5% | 4% |
| Rhode Island | 64% | 26% | 9% | 0% | 1% |
| South Carolina | 67% | 28% | 2% | 2% | 2% |
| Texas | 61% | 30% | 5% | 1% | 3% |
| Virginia | 69% | 22% | 8% | 2% | 0% |
| Total | 61% | 28% | 8% | 2% | 2% |

| In your opinion, is there any information that is unclear or confusing in this graphic? | | | |
|---|---|---|---|
| | Yes | No | Don't know |
| Alabama | 12% | 81% | 7% |
| Connecticut | 12% | 81% | 7% |
| Delaware | 15% | 79% | 6% |
| District of Columbia | 17% | 77% | 6% |
| Florida | 13% | 85% | 2% |
| Georgia | 13% | 81% | 6% |
| Hawaii | 25% | 69% | 6% |
| Louisiana | 16% | 74% | 9% |
| Maine | 24% | 71% | 5% |
| Maryland | 10% | 85% | 5% |
| Massachusetts | 10% | 86% | 4% |
| Mississippi | 21% | 73% | 6% |
| New Hampshire | 19% | 76% | 5% |
| New Jersey | 17% | 76% | 6% |
| New York | 20% | 76% | 4% |
| North Carolina | 16% | 81% | 3% |
| Pennsylvania | 15% | 76% | 9% |
| Rhode Island | 14% | 82% | 4% |
| South Carolina | 14% | 84% | 2% |
| Texas | 13% | 82% | 4% |
| Virginia | 8% | 89% | 2% |
| Total | 15% | 81% | 4% |

| In your opinion, is there any information (related to tropical-storm-force winds and arrival time) that is missing from this graphic? | | | |
|---|---|---|---|
| | Yes | No | Don't know |
| Alabama | 17% | 71% | 12% |
| Connecticut | 22% | 58% | 20% |
| Delaware | 8% | 72% | 20% |
| District of Columbia | 19% | 72% | 9% |
| Florida | 14% | 78% | 9% |
| Georgia | 14% | 77% | 9% |
| Hawaii | 23% | 61% | 16% |
| Louisiana | 14% | 67% | 19% |
| Maine | 19% | 55% | 25% |
| Maryland | 18% | 71% | 11% |
| Massachusetts | 15% | 72% | 13% |
| Mississippi | 17% | 65% | 17% |
| New Hampshire | 27% | 59% | 14% |
| New Jersey | 21% | 65% | 14% |
| New York | 20% | 73% | 8% |
| North Carolina | 26% | 64% | 10% |
| Pennsylvania | 11% | 74% | 15% |
| Rhode Island | 17% | 69% | 15% |
| South Carolina | 16% | 76% | 8% |
| Texas | 13% | 76% | 11% |
| Virginia | 12% | 78% | 10% |
| Total | 17% | 72% | 11% |

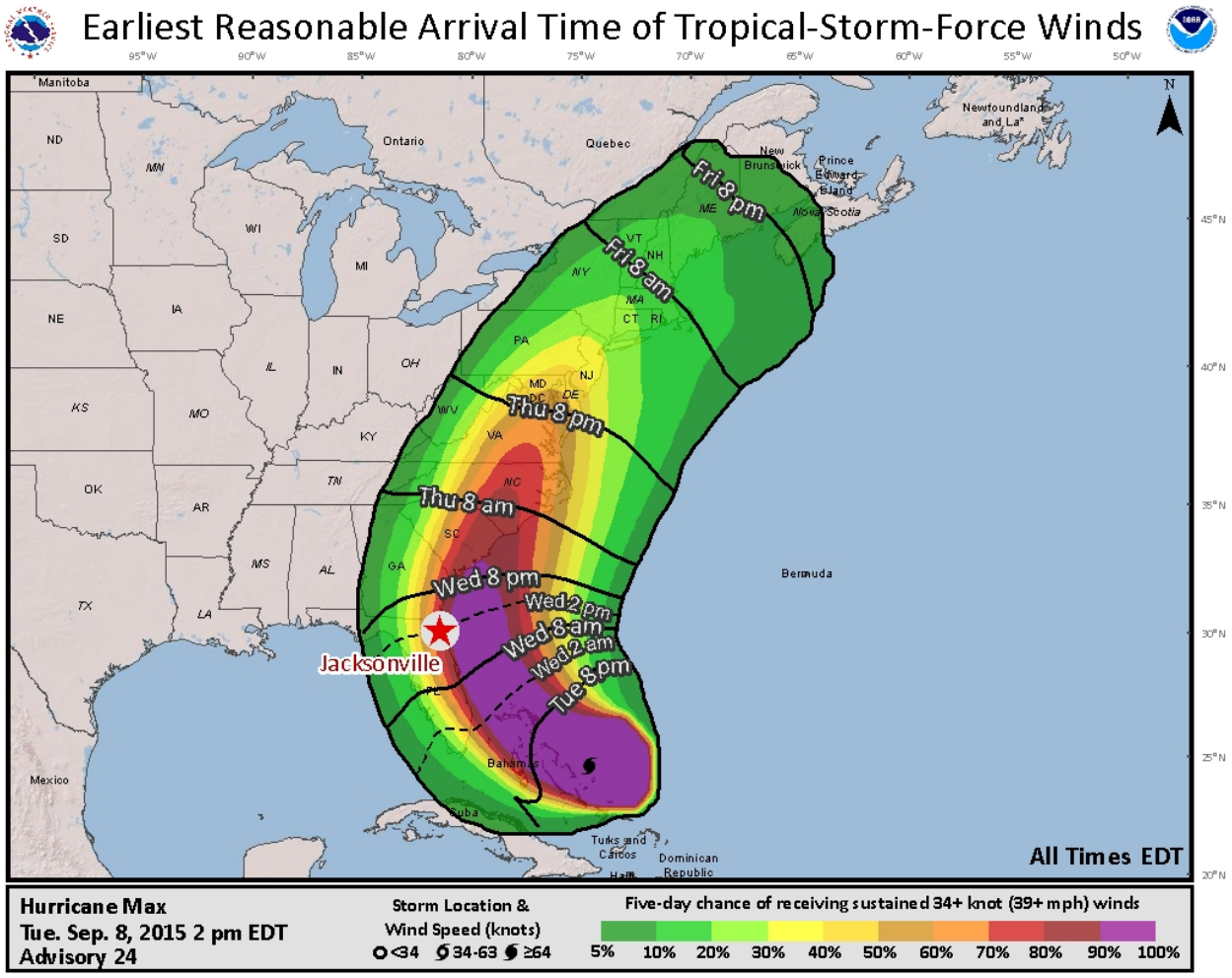
| The fonts used are large enough: Please indicate the extent to which you agree or disagree with each of the following statements about this graphic | | | | | | |
|---|---|---|---|---|---|---|
| | Strongly agree | Moderately agree | Neither agree nor disagree | Moderately disagree | Strongly disagree | Don't know |
| Alabama | 64% | 20% | 10% | 5% | 0% | 1% |
| Connecticut | 49% | 31% | 11% | 6% | 3% | 0% |
| Delaware | 59% | 24% | 11% | 1% | 4% | 1% |
| District of Columbia | 51% | 28% | 11% | 8% | 2% | 0% |
| Florida | 71% | 19% | 5% | 3% | 2% | 1% |
| Georgia | 61% | 25% | 7% | 4% | 3% | 1% |
| Hawaii | 57% | 26% | 9% | 5% | 1% | 2% |
| Louisiana | 68% | 22% | 2% | 3% | 2% | 3% |
| Maine | 55% | 23% | 2% | 12% | 5% | 2% |
| Maryland | 61% | 30% | 5% | 1% | 2% | 0% |
| Massachusetts | 57% | 30% | 6% | 2% | 4% | 1% |
| Mississippi | 63% | 18% | 10% | 6% | 2% | 2% |
| New Hampshire | 60% | 23% | 8% | 6% | 2% | 1% |
| New Jersey | 52% | 29% | 15% | 2% | 2% | 0% |
| New York | 53% | 31% | 10% | 3% | 1% | 1% |
| North Carolina | 66% | 26% | 4% | 3% | 1% | 1% |
| Pennsylvania | 50% | 25% | 12% | 11% | 2% | 0% |
| Rhode Island | 55% | 26% | 6% | 9% | 2% | 2% |
| South Carolina | 70% | 16% | 5% | 5% | 3% | 0% |
| Texas | 59% | 28% | 4% | 6% | 1% | 2% |
| Virginia | 59% | 26% | 11% | 5% | 0% | 0% |
| Total | 59% | 26% | 8% | 4% | 2% | 1% |

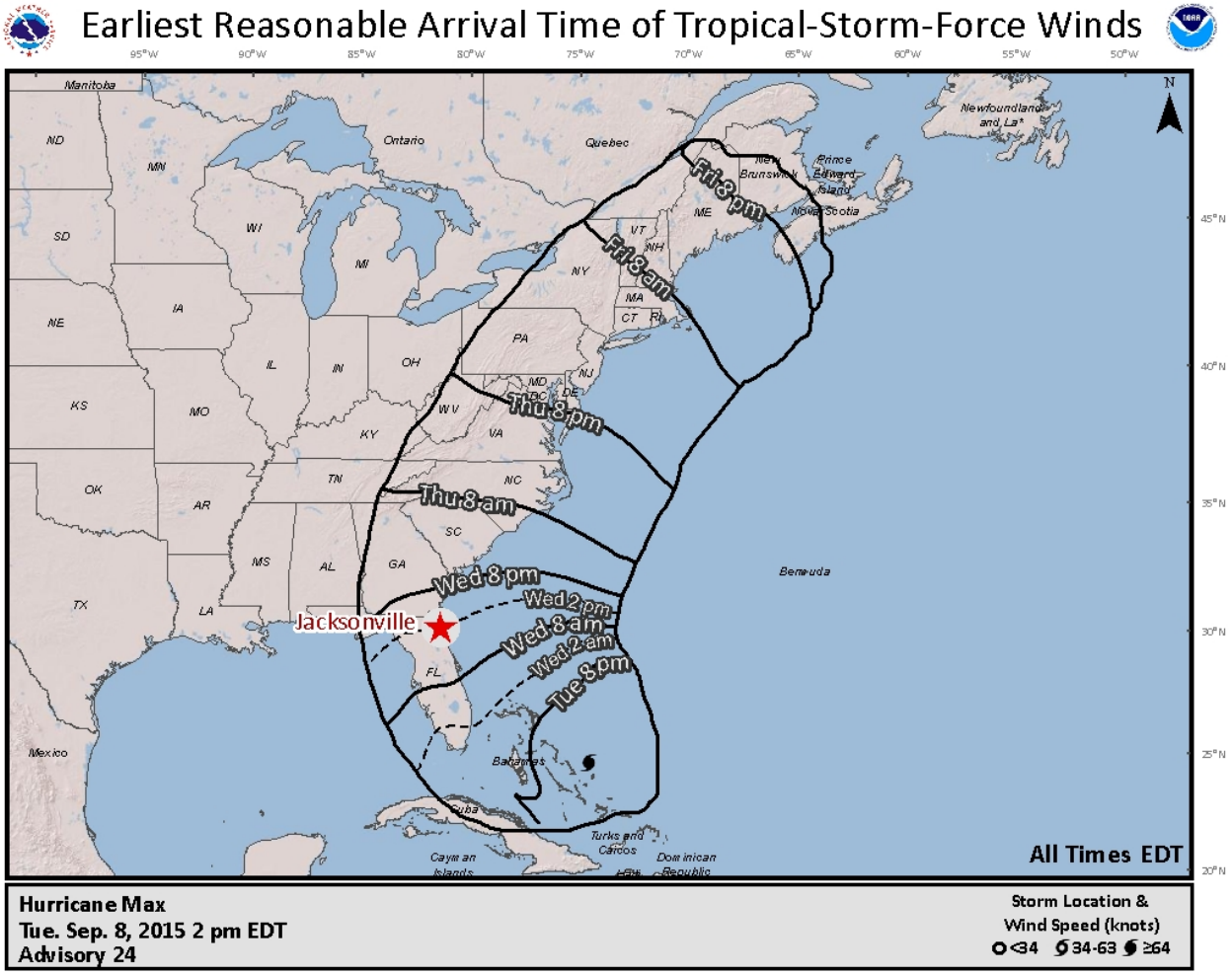
| The color coding is understandable: Please indicate the extent to which you agree or disagree with each of the following statements about this graphic | | | | | | |
|---|---|---|---|---|---|---|
| | Strongly agree | Moderately agree | Neither agree nor disagree | Moderately disagree | Strongly disagree | Don't know |
| Alabama | 71% | 25% | 2% | 2% | 0% | 0% |
| Connecticut | 52% | 34% | 12% | 2% | 0% | 0% |
| Delaware | 67% | 8% | 15% | 9% | 2% | 0% |
| District of Columbia | 57% | 28% | 8% | 6% | 1% | 0% |
| Florida | 69% | 23% | 3% | 4% | 0% | 1% |
| Georgia | 76% | 18% | 4% | 2% | 0% | 0% |
| Hawaii | 65% | 27% | 6% | 2% | 0% | 0% |
| Louisiana | 67% | 23% | 3% | 6% | 1% | 0% |
| Maine | 68% | 26% | 6% | 0% | 0% | 0% |
| Maryland | 71% | 12% | 8% | 6% | 3% | 0% |
| Massachusetts | 55% | 25% | 13% | 4% | 2% | 2% |
| Mississippi | 66% | 16% | 12% | 3% | 0% | 3% |
| New Hampshire | 65% | 24% | 4% | 3% | 2% | 2% |
| New Jersey | 61% | 25% | 10% | 4% | 0% | 0% |
| New York | 49% | 33% | 11% | 4% | 1% | 1% |
| North Carolina | 76% | 14% | | 5% | 3% | 2% |
| Pennsylvania | 52% | 28% | 12% | 3% | 5% | 0% |
| Rhode Island | 76% | 15% | 4% | 2% | 2% | 2% |
| South Carolina | 84% | 8% | 6% | 3% | 0% | 0% |
| Texas | 75% | 13% | 3% | 4% | 4% | 0% |
| Virginia | 67% | 24% | 7% | 2% | 0% | 0% |
| Total | 63% | 24% | 7% | 4% | 1% | 1% |

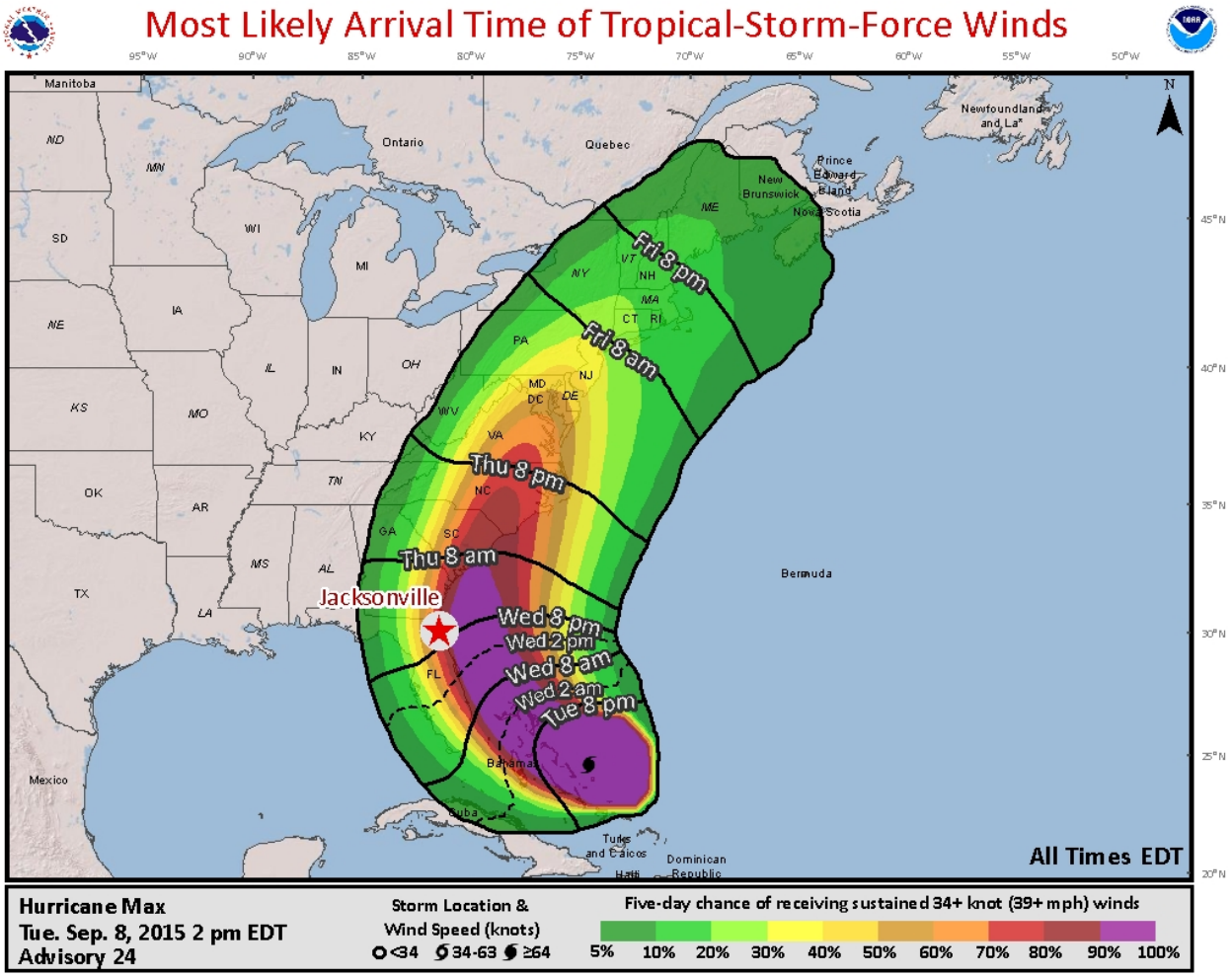
| You know for sure if the expected areas affected include your current area of residence: Please indicate the extent to which you agree or disagree with each of the following statements about this graphic | | | | | | |
|---|---|---|---|---|---|---|
| | Strongly agree | Moderately agree | Neither agree nor disagree | Moderately disagree | Strongly disagree | Don't know |
| Alabama | 59% | 31% | 7% | 1% | 0% | 2% |
| Connecticut | 62% | 16% | 14% | 7% | 1% | 0% |
| Delaware | 60% | 30% | 4% | 4% | 0% | 1% |
| District of Columbia | 57% | 29% | 9% | 4% | 1% | 1% |
| Florida | 58% | 33% | 5% | 1% | 1% | 1% |
| Georgia | 66% | 26% | 6% | 2% | 0% | 0% |
| Hawaii | 47% | 26% | 12% | 6% | 5% | 3% |
| Louisiana | 69% | 23% | 2% | 2% | 2% | 3% |
| Maine | 58% | 22% | 13% | 4% | 1% | 2% |
| Maryland | 64% | 23% | 11% | 0% | 2% | 1% |
| Massachusetts | 56% | 34% | 9% | 0% | 0% | 1% |
| Mississippi | 64% | 17% | 10% | 2% | 2% | 5% |
| New Hampshire | 63% | 24% | 8% | 4% | 1% | 1% |
| New Jersey | 52% | 29% | 14% | 5% | 1% | 0% |
| New York | 55% | 27% | 13% | 3% | 1% | 1% |
| North Carolina | 68% | 21% | 6% | 4% | 0% | 1% |
| Pennsylvania | 55% | 24% | 17% | 2% | 1% | 2% |
| Rhode Island | 55% | 27% | 7% | 6% | 3% | 2% |
| South Carolina | 72% | 22% | 1% | 3% | 2% | 0% |
| Texas | 56% | 29% | 4% | 7% | 2% | 2% |
| Virginia | 58% | 19% | 19% | 4% | 0% | 1% |
| Total | 57% | 28% | 10% | 3% | 1% | 1% |

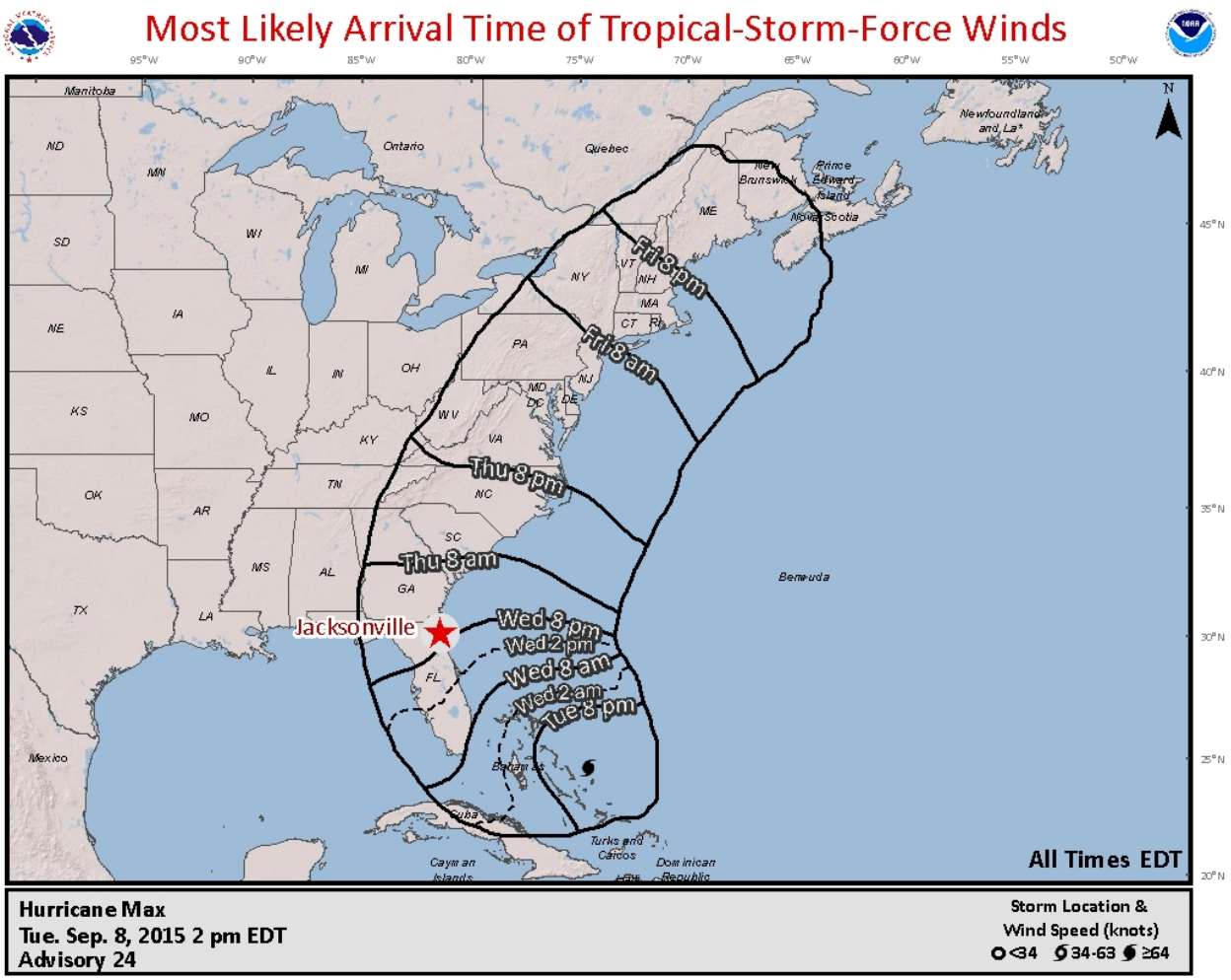
| You know for sure what time the winds could arrive in your current area of residence: Please indicate the extent to which you agree or disagree with each of the following statements about this graphic | | | | | | |
|---|---|---|---|---|---|---|
| | Strongly agree | Moderately agree | Neither agree nor disagree | Moderately disagree | Strongly disagree | Don't know |
| Alabama | 48% | 37% | 8% | 5% | 0% | 2% |
| Connecticut | 50% | 31% | 9% | 8% | 2% | 0% |
| Delaware | 51% | 35% | 7% | 6% | 0% | 1% |
| District of Columbia | 48% | 35% | 10% | 5% | 1% | 0% |
| Florida | 41% | 43% | 10% | 4% | 1% | 1% |
| Georgia | 49% | 38% | 8% | 5% | 0% | 1% |
| Hawaii | 44% | 29% | 14% | 6% | 5% | 2% |
| Louisiana | 50% | 35% | 6% | 4% | 2% | 3% |
| Maine | 40% | 37% | 11% | 10% | 1% | 2% |
| Maryland | 50% | 39% | 8% | 1% | 2% | 1% |
| Massachusetts | 46% | 37% | 13% | 2% | 2% | 1% |
| Mississippi | 54% | 29% | 10% | 2% | 2% | 3% |
| New Hampshire | 44% | 39% | 7% | 7% | 3% | 1% |
| New Jersey | 34% | 44% | 11% | 6% | 5% | 0% |
| New York | 53% | 29% | 12% | 4% | 1% | 1% |
| North Carolina | 62% | 28% | 8% | 2% | 0% | 1% |
| Pennsylvania | 46% | 25% | 20% | 7% | 2% | 0% |
| Rhode Island | 42% | 36% | 10% | 8% | 3% | 1% |
| South Carolina | 64% | 28% | 2% | 3% | 3% | 0% |
| Texas | 50% | 35% | 10% | 4% | 1% | 0% |
| Virginia | 50% | 25% | 17% | 5% | 2% | 0% |
| Total | 47% | 36% | 11% | 4% | 2% | 1% |

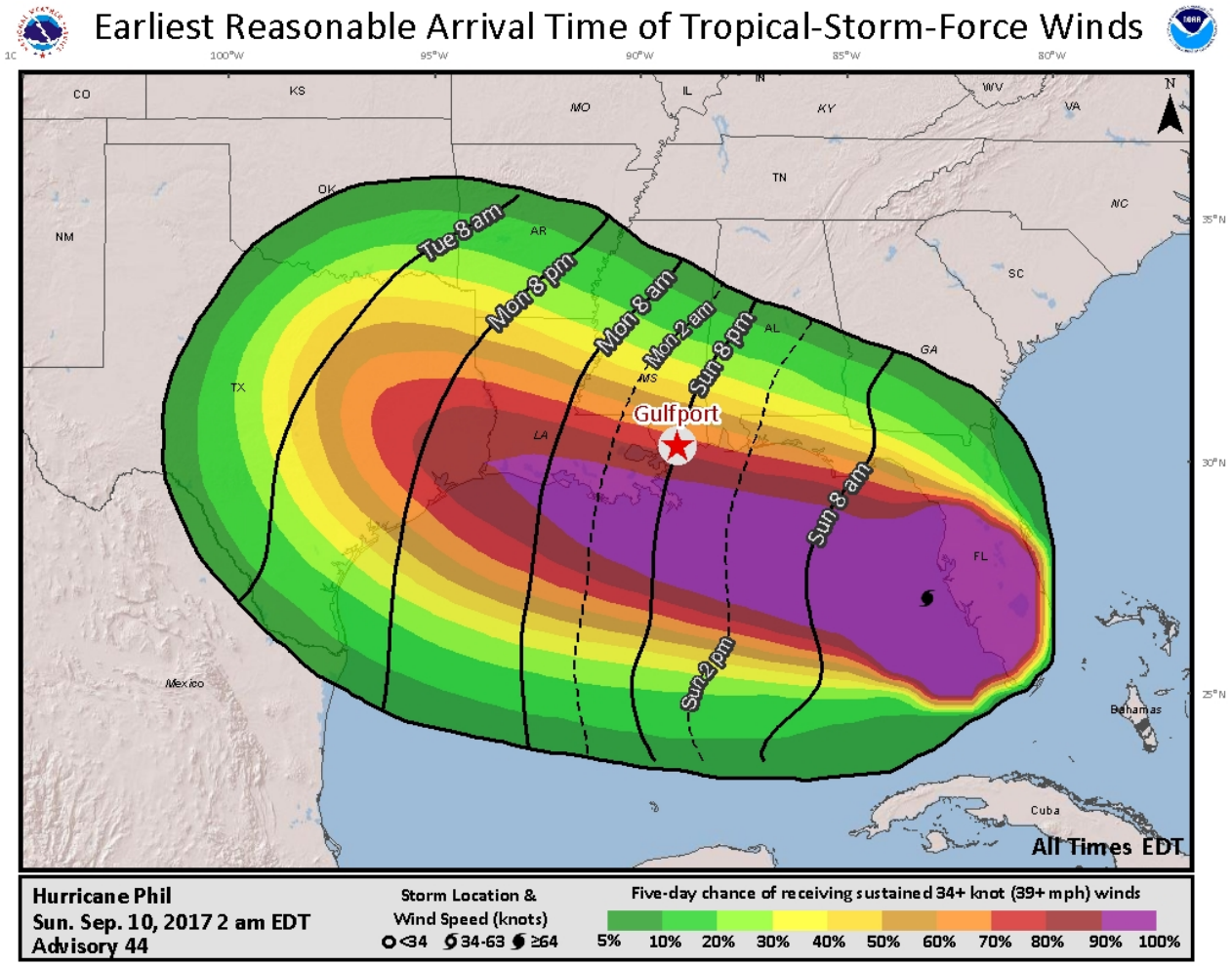
# Appendix B: Graphics Shown to Study Area Residents of the Southeast Region, Gulf Region, and Hawaii

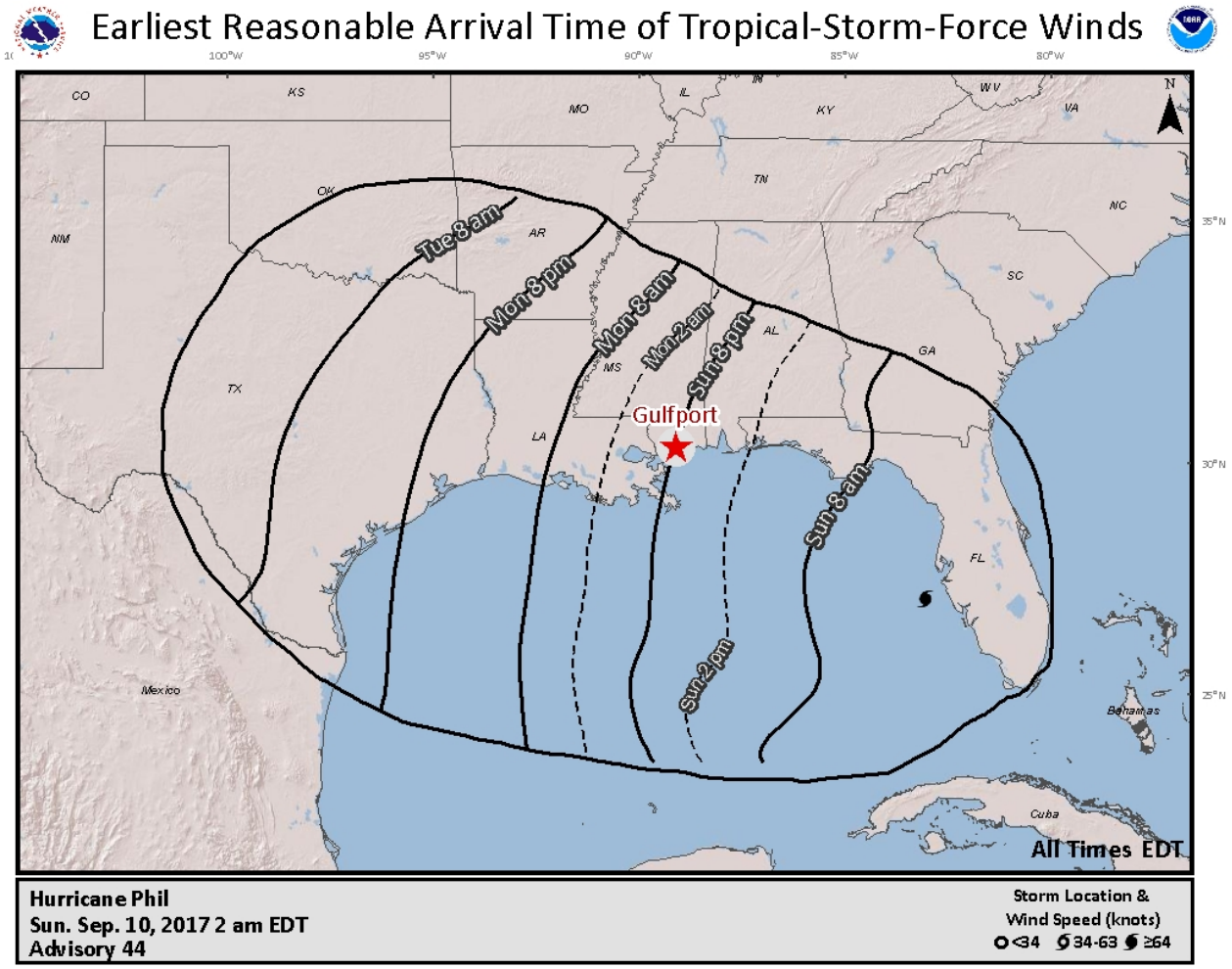


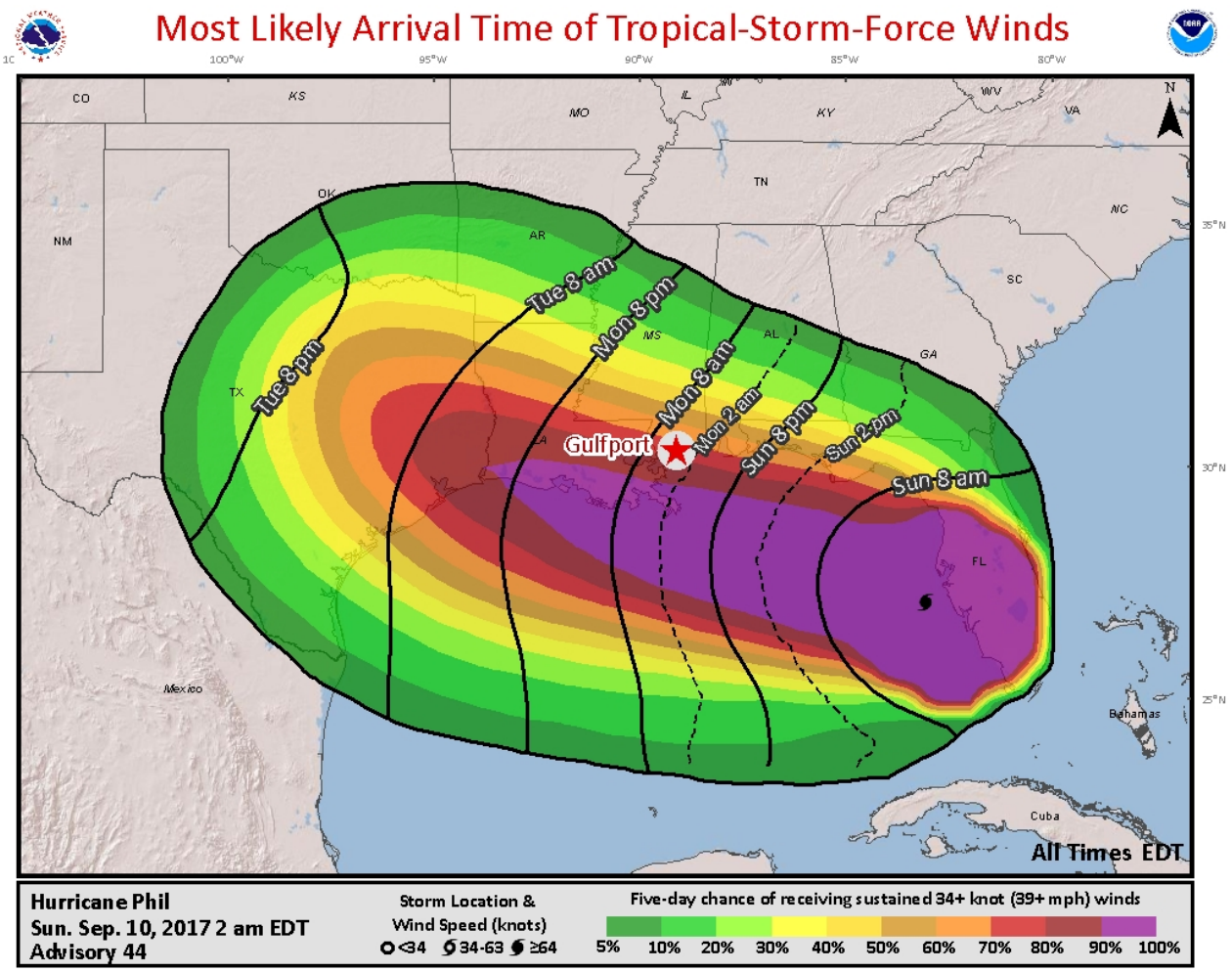

Earliest Reasonable Arrival Time of Tropical-Storm-Force Winds
95°W
90°W
85°W
80°W
75°W
70°W
65°W
60°W
55°W
50°W
45°N
40°N
35°N
30°N
25°N
20°N
N
Manitoba
Ontario
Quebec
Newfoundland and Lab.
New Brunswick
Prince Edward Island
Nova Scotia
ND
MN
SD
WI
MI
NY
VT
NH
ME
MA
CT
RI
NE
IA
IL
IN
OH
PA
NJ
MD
DC
DE
KS
MO
KY
WV
VA
NC
TN
OK
AR
SC
MS
AL
GA
TX
LA
FL
Bermuda
Bahamas
Cuba
Mexico
Cayman Islands
Turks and Caicos
Dominican Republic
Fri 8 pm
Fri 8 am
Thu 8 pm
Thu 8 am
Wed 8 pm
Wed 2 pm
Wed 8 am
Wed 2 am
Tue 8 pm
Jacksonville
All Times EDT
Hurricane Max
Tue. Sep. 8, 2015 2 pm EDT
Advisory 24
Storm Location &
Wind Speed (knots)
<34
34-63
≥64

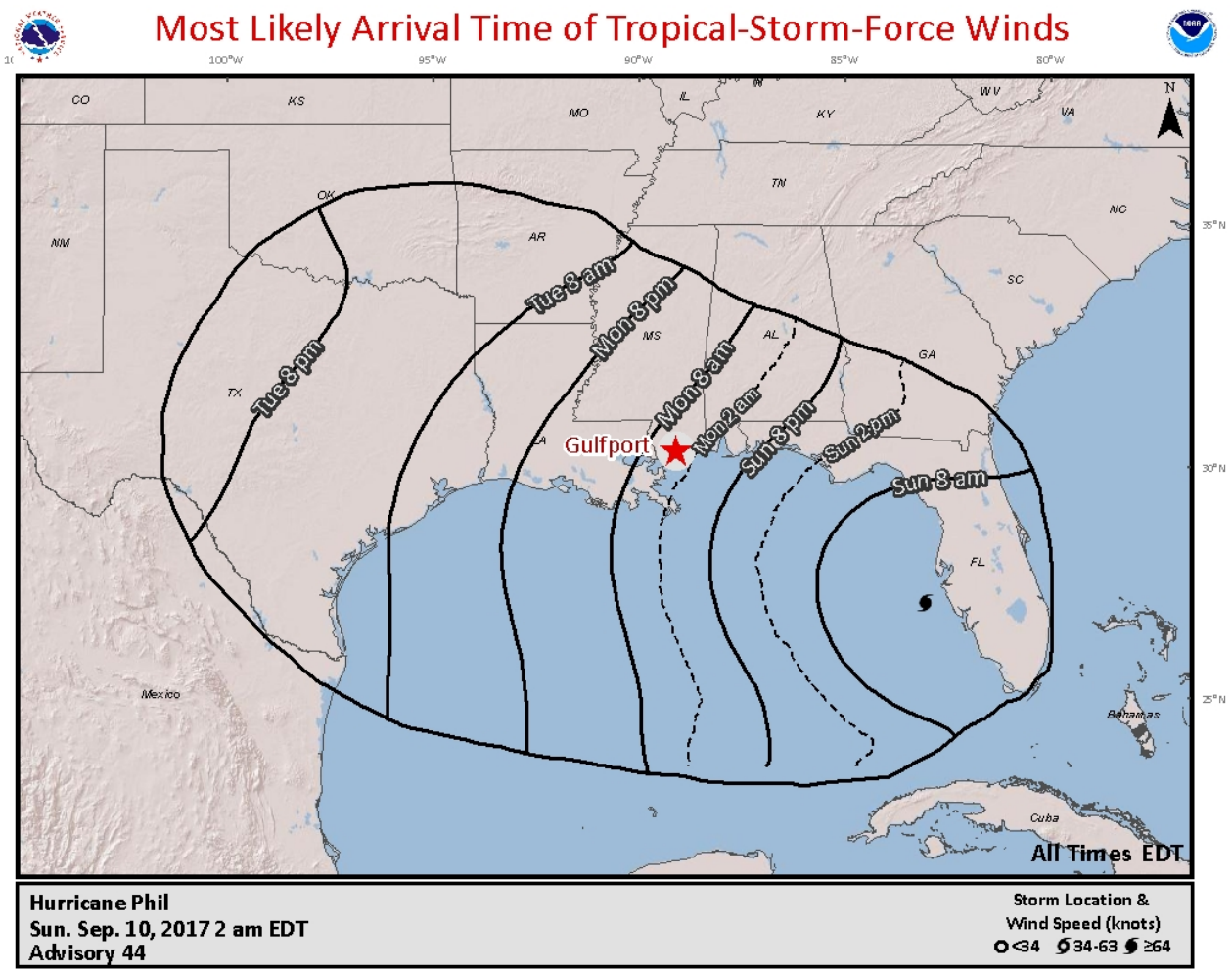

Most Likely Arrival Time of Tropical-Storm-Force Winds
Manitoba
Ontario
Quebec
Newfoundland and La.
Prince Edward Island
New Brunswick
Nova Scotia
ND
MN
SD
WI
MI
NE
IA
IL
IN
OH
KS
MO
KY
WV
PA
NY
VT
NH
ME
MA
CT
RI
NJ
MD
DC
DE
VA
NC
SC
GA
FL
AL
MS
TN
OK
AR
TX
LA
Mexico
Bermuda
Bahamas
Cuba
Haiti
Dominican Republic
Turks and Caicos
Jacksonville
Fri 8 pm
Fri 8 am
Thu 8 pm
Thu 8 am
Wed 8 pm
Wed 2 pm
Wed 8 am
Wed 2 am
Tue 8 pm
All Times EDT
Hurricane Max
Tue. Sep. 8, 2015 2 pm EDT
Advisory 24
Storm Location &
Wind Speed (knots)
<34 34-63 ≥64
Five-day chance of receiving sustained 34+ knot (39+ mph) winds
5% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

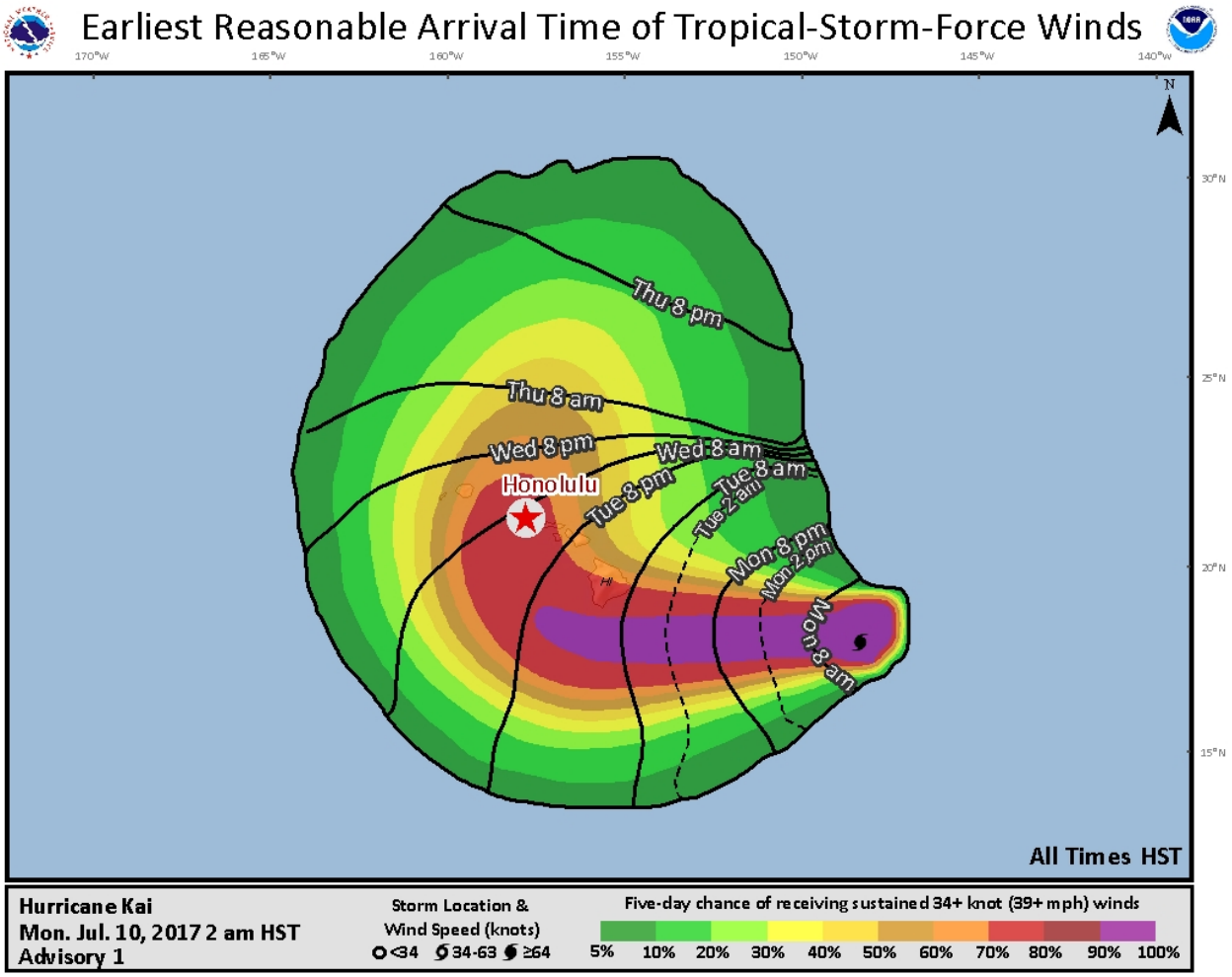

Most Likely Arrival Time of Tropical-Storm-Force Winds
Fri 8 pm
Fri 8 am
Thu 8 pm
Thu 8 am
Wed 8 pm
Wed 2 pm
Wed 8 am
Wed 2 am
Tue 8 pm
Jacksonville
Bermuda
Bahamas
Cuba
Mexico
All Times EDT
Hurricane Max
Tue. Sep. 8, 2015 2 pm EDT
Advisory 24
Storm Location &
Wind Speed (knots)
<34 34-63 ≥64

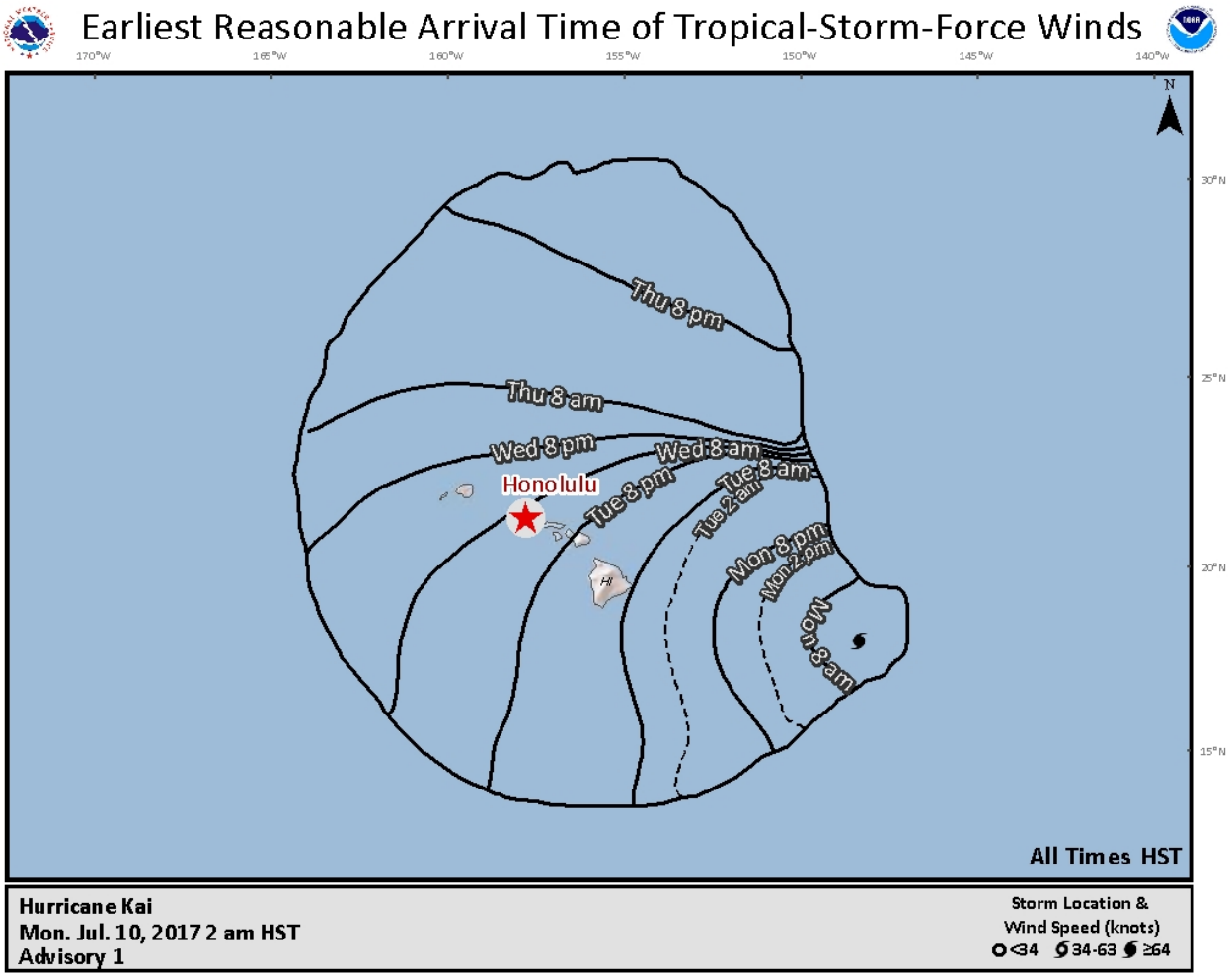

Earliest Reasonable Arrival Time of Tropical-Storm-Force Winds
Tue 8 am
Mon 8 pm
Mon 8 am
Mon 2 am
Sun 8 pm
Sun 8 am
Sun 2 pm
Gulfport
All Times EDT
Hurricane Phil
Sun. Sep. 10, 2017 2 am EDT
Advisory 44
Storm Location &
Wind Speed (knots)
<34 34-63 ≥64
Five-day chance of receiving sustained 34+ knot (39+ mph) winds
5% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

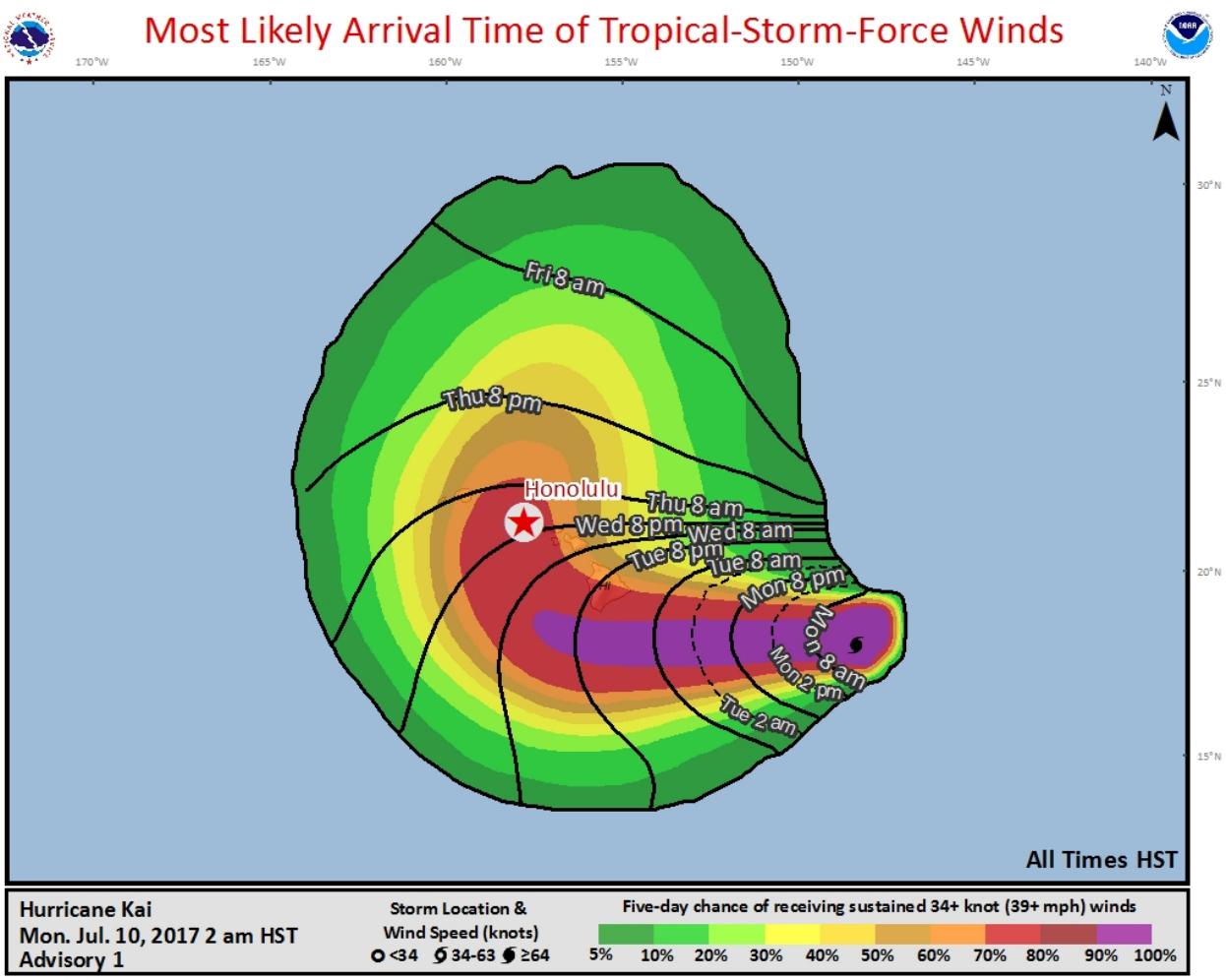

Earliest Reasonable Arrival Time of Tropical-Storm-Force Winds
100°W
95°W
90°W
85°W
80°W
CO
KS
MO
IL
IN
KY
WV
VA
TN
NC
SC
OK
NM
AR
MS
AL
GA
TX
LA
FL
Tue 8 am
Mon 8 pm
Mon 8 am
Mon 2 am
Sun 8 pm
Sun 8 am
Sun 2 pm
Gulfport
N
35°N
30°N
25°N
Mexico
Bahamas
Cuba
All Times EDT
Hurricane Phil
Sun. Sep. 10, 2017 2 am EDT
Advisory 44
Storm Location &
Wind Speed (knots)
<34
34-63
≥64

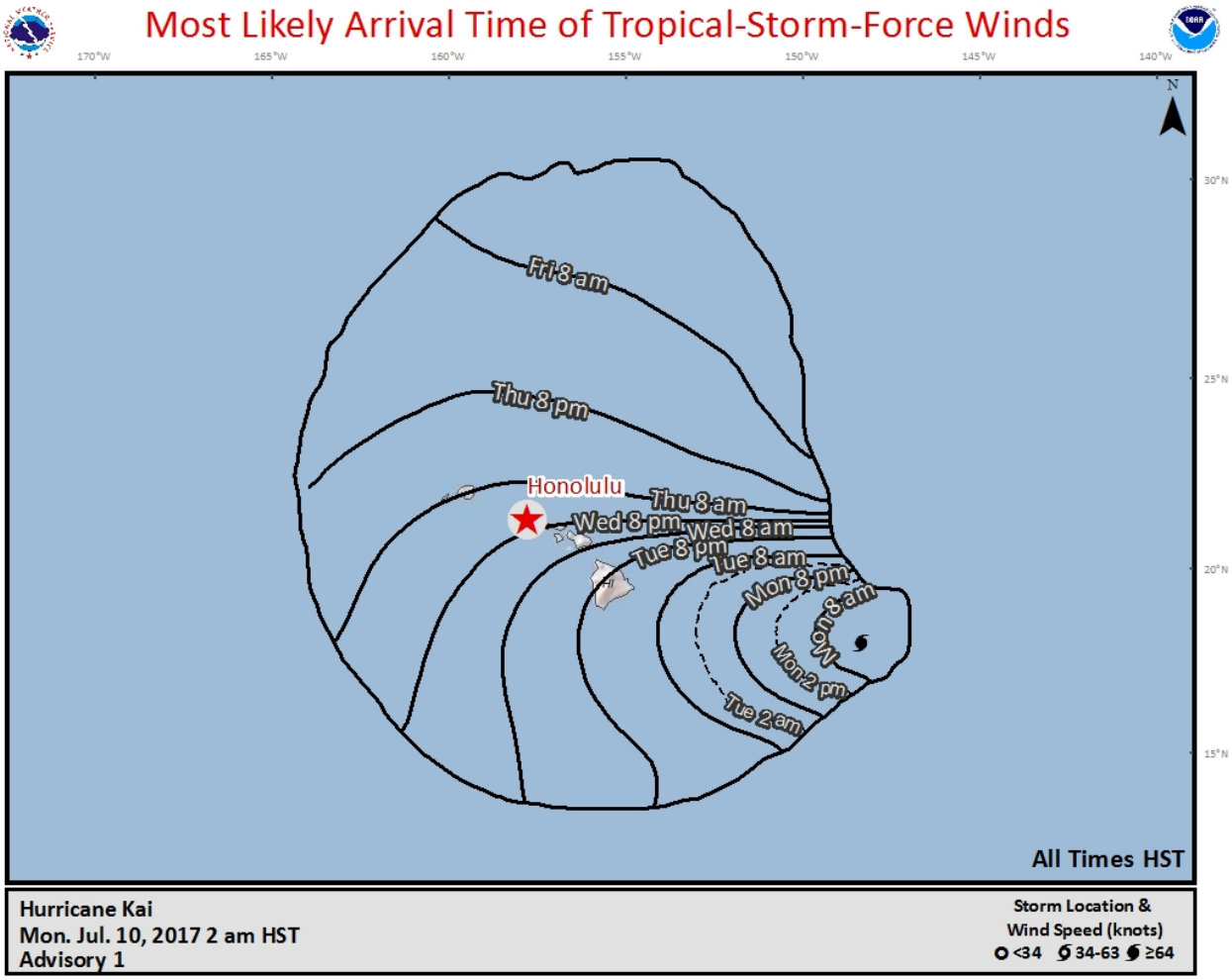

Most Likely Arrival Time of Tropical-Storm-Force Winds
100°W
95°W
90°W
85°W
80°W
35°N
30°N
25°N
N
CO
KS
MO
IL
KY
WV
VA
TN
NC
SC
OK
NM
AR
MS
AL
GA
TX
LA
FL
Mexico
Bahamas
Cuba
Tue 8 am
Mon 8 pm
Tue 8 pm
Mon 8 am
Mon 2 am
Sun 8 pm
Sun 2 pm
Sun 8 am
Gulfport
All Times EDT
Hurricane Phil
Sun. Sep. 10, 2017 2 am EDT
Advisory 44
Storm Location &
Wind Speed (knots)
<34
34-63
≥64
Five-day chance of receiving sustained 34+ knot (39+ mph) winds
5%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%


Most Likely Arrival Time of Tropical-Storm-Force Winds
100°W
95°W
90°W
85°W
80°W
CO
KS
MO
IL
IN
KY
WV
VA
TN
NC
SC
NM
OK
AR
MS
AL
GA
TX
LA
N
35°N
30°N
25°N
Tue 8 am
Mon 8 pm
Tue 8 pm
Mon 8 am
Mon 2 am
Sun 8 pm
Sun 2 pm
Sun 8 am
Gulfport
FL
Mexico
Bahamas
Cuba
All Times EDT
Hurricane Phil
Sun. Sep. 10, 2017 2 am EDT
Advisory 44
Storm Location &
Wind Speed (knots)
<34
34-63
≥64


Earliest Reasonable Arrival Time of Tropical-Storm-Force Winds
170°W
165°W
160°W
155°W
150°W
145°W
140°W
N
30°N
25°N
20°N
15°N
Thu 8 pm
Thu 8 am
Wed 8 pm
Wed 8 am
Tue 8 am
Tue 8 pm
Tue 2 am
Mon 8 pm
Mon 2 pm
Mon 8 am
Honolulu
All Times HST
Hurricane Kai
Mon. Jul. 10, 2017 2 am HST
Advisory 1
Storm Location &
Wind Speed (knots)
<34
34-63
≥64
Five-day chance of receiving sustained 34+ knot (39+ mph) winds
5%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%


Earliest Reasonable Arrival Time of Tropical-Storm-Force Winds
170°W
165°W
160°W
155°W
150°W
145°W
140°W
N
30°N
25°N
20°N
15°N
Thu 8 pm
Thu 8 am
Wed 8 pm
Wed 8 am
Tue 8 pm
Tue 8 am
Tue 2 am
Mon 8 pm
Mon 2 pm
Mon 8 am
Honolulu
HI
All Times HST
Hurricane Kai
Mon. Jul. 10, 2017 2 am HST
Advisory 1
Storm Location &
Wind Speed (knots)
<34
34-63
≥64


Most Likely Arrival Time of Tropical-Storm-Force Winds
170°W
165°W
160°W
155°W
150°W
145°W
140°W
N
30°N
25°N
20°N
15°N
Fri 8 am
Thu 8 pm
Honolulu
Thu 8 am
Wed 8 pm
Wed 8 am
Tue 8 pm
Tue 8 am
Mon 8 pm
Mon 8 am
Mon 2 pm
Tue 2 am
All Times HST
Hurricane Kai
Mon. Jul. 10, 2017 2 am HST
Advisory 1
Storm Location &
Wind Speed (knots)
<34
34-63
≥64
Five-day chance of receiving sustained 34+ knot (39+ mph) winds
5%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%


Most Likely Arrival Time of Tropical-Storm-Force Winds
170°W
165°W
160°W
155°W
150°W
145°W
140°W
N
30°N
25°N
20°N
15°N
Fri 8 am
Thu 8 pm
Honolulu
Thu 8 am
Wed 8 pm
Wed 8 am
Tue 8 pm
Tue 8 am
Mon 8 pm
Mon 8 am
Mon 2 pm
Tue 2 am
All Times HST
Hurricane Kai
Mon. Jul. 10, 2017 2 am HST
Advisory 1
Storm Location &
Wind Speed (knots)
<34
34-63
≥64