Survey to Assess National Weather Service Hurricane Products

The National Oceanic and Atmospheric Administration's (NOAA's) National Weather Service (NWS) needs your help to improve its communication of tropical cyclone hazards—and to help save people's lives and homes.

Please share your opinions by completing the following survey. The NWS is distributing this survey to emergency managers and members of the media. It asks for your opinions about possible improvements to tropical cyclone forecast products issued by local NWS offices and about some new map prototypes created by the National Hurricane Center (NHC).

This survey should take about 40 minutes of your time. Your participation is voluntary, and your responses to the questions are anonymous.

First, you will be answering a few questions about some local NWS hurricane products and services. When an area is under a hurricane watch or warning, NWS Weather Forecast Offices (WFOs) provide locally relevant threat and impact information in text and supporting graphical products.

Below are three ways in which a local WFO might reference the threat level (severity) of a particular hurricane hazard (wind, storm surge, flooding rain, and tornadoes) in its text products. Option A uses **labels**, Option B uses **ranges**, and Option C uses **both labels and ranges**. The example below is for wind.

WIND THREAT

OPTION A. LABELS	OPTION B. RANGES	OPTION C. LABELS & RANGES
Extreme	Greater than 110 mph	Extreme: Greater than 110 mph
High	74–110 mph	High: 74–110 mph
Moderate	58–73 mph	Moderate: 58–73 mph
Elevated	39–57 mph	Elevated: 39–57 mph
Little to None	Less than 39 mph	Little to None: Less than 39 mph

1. Which option do you prefer?
   - Option A (labels)
   - Option B (ranges)
   - Option C (labels and ranges)
   - No preference
   - Not sure
   - None of the above

[Next Screen]

Now, consider the labeling options presented below for the **second-to-lowest threat level** (outlined in red). Wind and surge are shown here for context.

THREAT LEVELS

THREAT LABEL	WIND	SURGE
Extreme	Greater than 110 mph	Greater than 9 feet above ground
High	74–110 mph	Greater than 6 feet above ground
Moderate	58–73 mph	Greater than 3 feet above ground
A. Elevated B. Slight C. Low D. Minor	39–57 mph	Greater than 1 foot above ground
Little to None	Less than 39 mph	Little to No storm surge flooding

2. Which label do you prefer for the second-to-lowest threat level?
   - Label A (Elevated)
   - Label B (Slight)
   - Label C (Low)
   - Label D (Minor)
   - No preference
   - Not sure
   - None of the above

[NEXT SCREEN]

Suppose that a major hurricane is approaching Florida's southwest coast. Map A below depicts the wind threat based on a **reasonable worst-case scenario,** which means there is a 10 percent (or 1 out of 10 chance) that the winds could be stronger than what is depicted on the map, while Map B uses **a most likely scenario,** which means there is a 50 percent (or 5 out of 10 chance) that the winds could be stronger than those depicted on the map.
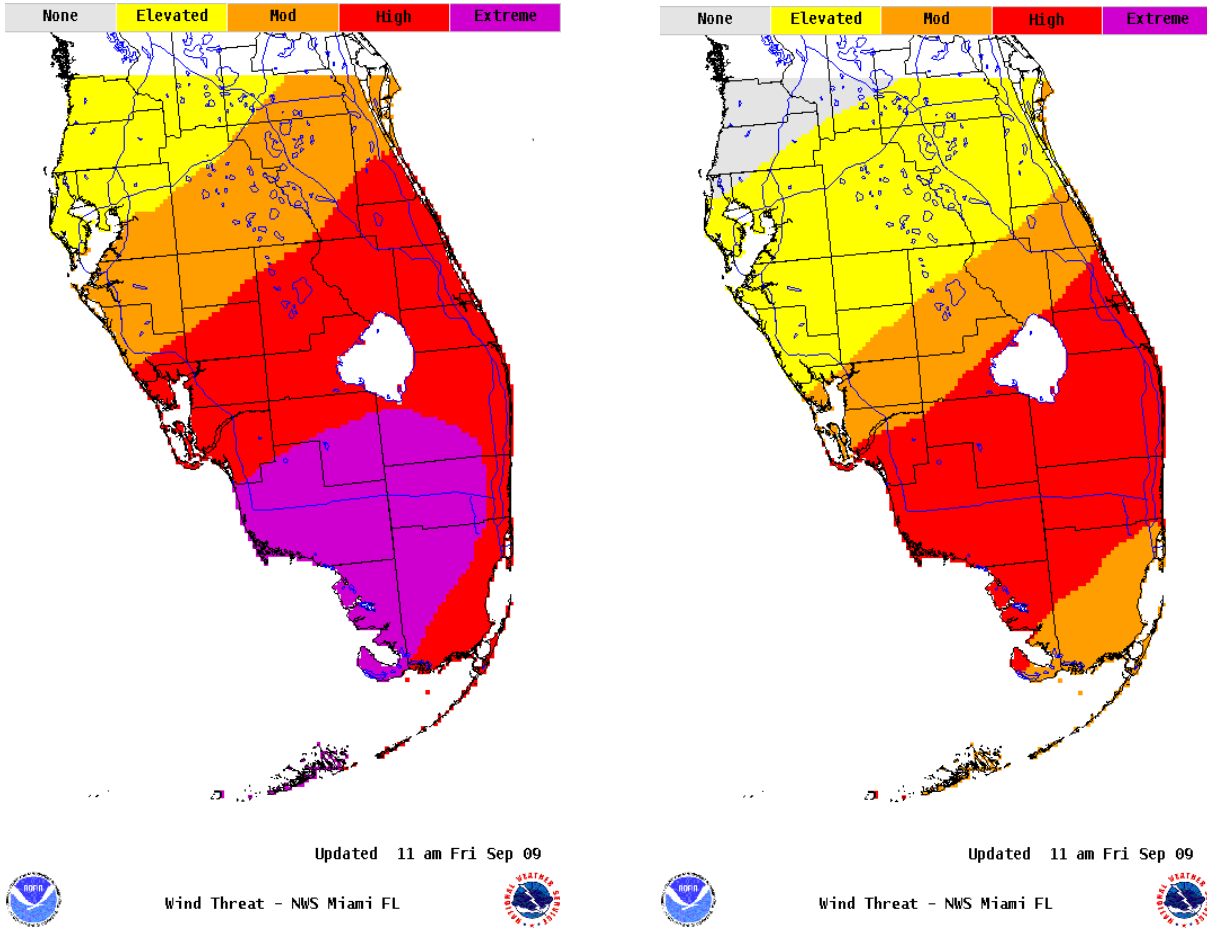
Map A. Reasonable worst-case scenario   Map B. Most likely scenario

3. Which map do you prefer for your **internal** decision-making/job responsibilities?
    - Map A (reasonable worst-case scenario)
    - Map B (most likely scenario)
    - Both maps (reasonable worst-case and most likely scenarios)
    - No preference
    - Neither map
    - Not sure
    - N/A

4. Which map do you prefer for your **external** communications?

- Map A (reasonable worst-case scenario)
- Map B (most likely scenario)
- Both maps (reasonable worst-case and most likely scenarios)
- No preference
- Neither map
- Not sure
- N/A

[NEXT SCREEN]

5. How useful do you consider each of the following statements for your **internal** decision-making/job responsibilities?

	Very Useful	Somewhat Useful	Not Particularly Useful	Not Useful At All	Not Sure
1. Emergency planning should include a reasonable threat for major hurricane force winds greater than 110 mph of equivalent Category 3 intensity or higher.					
2. Plan for winds from a major hurricane.					
3. Plan for winds greater than 110 mph.					
4. Plan for Category 3 hurricane force winds (110 mph).					

6. How useful do you consider each of these statements for your **external** communications?

	Very Useful	Somewhat Useful	Not Particularly Useful	Not Useful At All	Not Sure
1. Emergency planning should include a reasonable threat for major hurricane force winds greater than 110 mph of equivalent Category 3 intensity or higher.					
2. Plan for winds from a major hurricane.					
3. Plan for winds greater than 110 mph.					
4. Plan for Category 3 hurricane force winds (110 mph).					

[NEXT SCREEN]

WFOs are working with local authorities to develop **potential impact** (the possible amount of damage associated with a threat) statements to include in local text products. A set of potential impact statements are provided below for a high wind threat.

POTENTIAL IMPACTS FROM WIND: EXTENSIVE DAMAGE
BUILDINGS: Considerable roof damage to sturdy buildings, with some having window, door, and garage door failures leading to structural damage. Mobile homes severely damaged, with some destroyed. Damage accentuated by airborne projectiles. Locations may be uninhabitable for weeks.
TREES: Many large trees snapped or uprooted along with fences and roadway signs blown over.
ROADS: Some roads impassable from large debris, and more within urban or heavily wooded places. Several bridges, causeways, and access routes impassible.
UTILITIES: Large areas with power and communications outages.

7. How useful do you consider each of these bulleted sections for your **internal** decision-making/job responsibilities?

BUILDINGS Section:	TREES Section:	ROADS Section:	UTILITIES Section:
• Very useful	• Very useful	• Very useful	• Very useful
• Somewhat useful	• Somewhat useful	• Somewhat useful	• Somewhat useful
• Not particularly useful	• Not particularly useful	• Not particularly useful	• Not particularly useful
• Not useful at all	• Not useful at all	• Not useful at all	• Not useful at all
• Not sure	• Not sure	• Not sure	• Not sure

8. How useful do you consider each of these bulleted sections for your **external** communications?

BUILDINGS Section:	TREES Section:	ROADS Section:	UTILITIES Section:
• Very useful	• Very useful	• Very useful	• Very useful
• Somewhat useful	• Somewhat useful	• Somewhat useful	• Somewhat useful
• Not particularly useful	• Not particularly useful	• Not particularly useful	• Not particularly useful
• Not useful at all	• Not useful at all	• Not useful at all	• Not useful at all

- Not sure   - Not sure   - Not sure   - Not sure

[NEXT SCREEN]

The following tables present two different ways of labeling the **potential impacts** (the possible amount of damage associated with the threat) related to each **threat level** (severity). The example below is for wind. Table A uses the **same labels** for both the potential impacts and the threat level. Table B uses **different labels**.

HURRICANE THREATS AND IMPACTS

THREAT LABEL	POTENTIAL IMPACTS LABEL (for possible damage)	WIND
Extreme	Extreme	Greater than 110 mph
High	High	74–110 mph
Moderate	Moderate	58–73 mph
Elevated	Elevated	39–57 mph
Little to None	Little to None	Less than 39 mph

A. Same labels for threats and impacts

HURRICANE THREATS AND IMPACTS

THREAT LABEL	POTENTIAL IMPACTS LABEL (for possible damage)	WIND
Extreme	Devastating/Catastrophic	Greater than 110 mph
High	Considerable	74–110 mph
Moderate	Significant	58–73 mph
Elevated	Limited	39–57 mph
Little to None	Minimal	Less than 39 mph

B. Different labels for threats and impacts

9. Which labeling option do you prefer?
   - Table A (same labels for threats and impacts)
   - Table B (different labels for threats and impacts)
   - No preference
   - Neither

- Not sure

[NEXT SCREEN]

10. On a scale of 1 to 5, how well do you think each of the following terms characterizes the potential impacts from a **high wind threat (74 to 110 mph)**, where 1 represents the worst and 5 represents the best choice?

Considerable

1 – Worst 　　2 　　3 　　4 　　5 – Best

Significant

1 – Worst 　　2 　　3 　　4 　　5 – Best

Extensive

1 – Worst 　　2 　　3 　　4 　　5 – Best

11. On a scale of 1 to 5, how well do you think each of the following terms characterizes the potential impacts from a **moderate wind threat (58 to 73 mph)**, where 1 represents the worst and 5 represents the best choice?

Considerable

1 – Worst 　　2 　　3 　　4 　　5 – Best
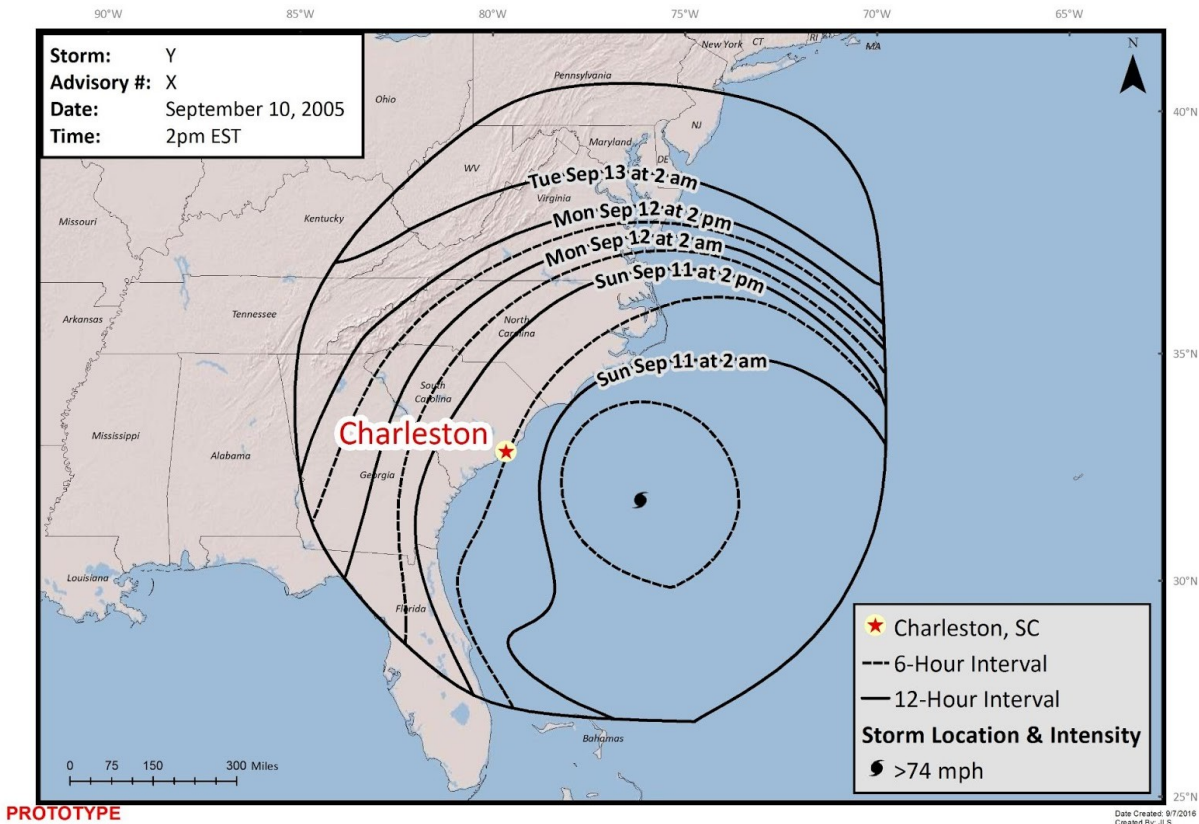
Significant

1 – Worst 　　2 　　3 　　4 　　5 – Best

[NEXT SCREEN]

Now, you will be looking at a number of prototype maps developed by the National Hurricane Center (NHC).

12. If you lived in Charleston, South Carolina, how would you interpret the following map? {open-ended}

[NEXT SCREEN]

13. How do you currently use projected timing information for the arrival of sustained tropical storm-force winds (greater than 39 miles per hour)? Check all that apply.
- For issuing evacuation orders
- For communicating with authorities
- For communicating with the general public
- During informal discussions with colleagues
- For media or social media sharing
- Other (please describe)
- N/A

14. How satisfied are you with your current sources for determining the arrival of sustained tropical storm-force winds?
    - Very satisfied
    - Somewhat satisfied
    - Not particularly satisfied
    - Not at all satisfied
    - Not sure
    - N/A

[NEXT SCREEN]

Imagine your area of responsibility is Charleston, South Carolina. Look at the two maps below. Map A depicts the **earliest reasonable** arrival time for sustained tropical storm-force winds, while Map B depicts the **most likely** arrival time.

Most Likely Arrival Time of Tropical Storm-Force Winds
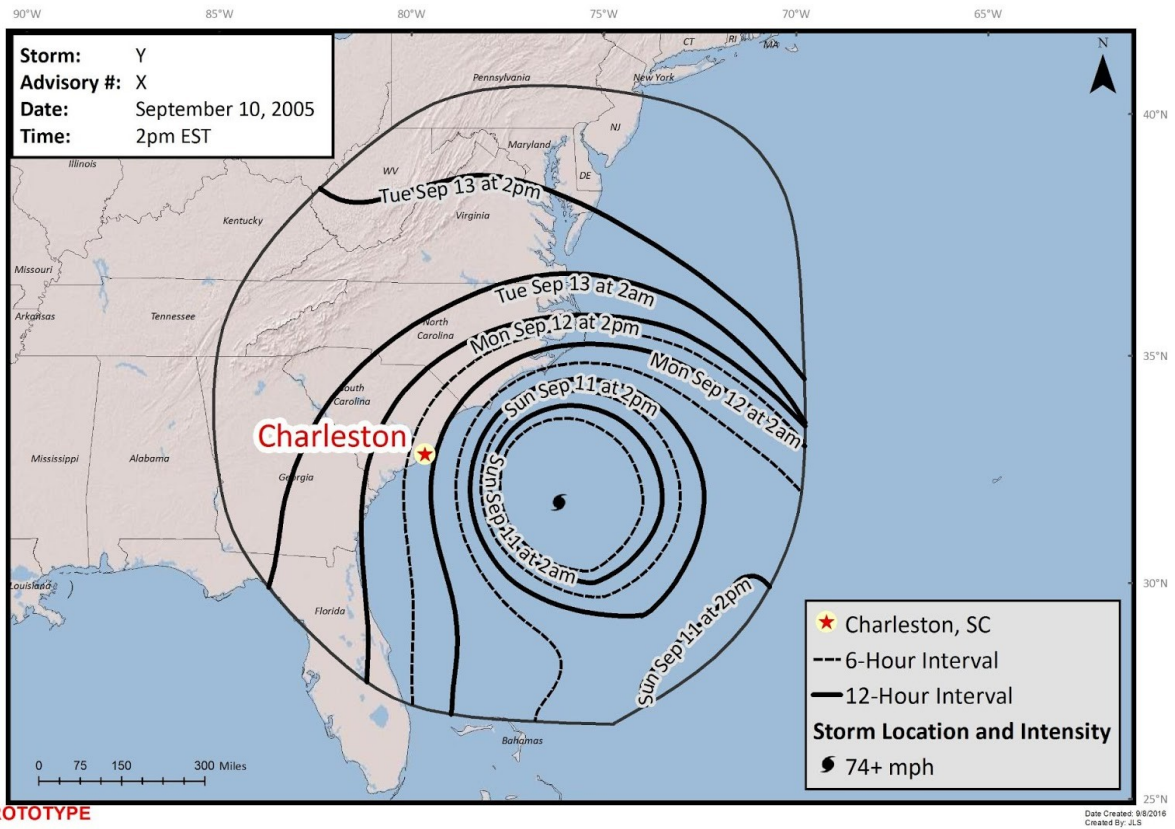
Storm: Y
Advisory #: X
Date: September 10, 2005
Time: 2pm EST

Tue Sep 13 at 2pm
Tue Sep 13 at 2am
Mon Sep 12 at 2pm
Mon Sep 12 at 2am
Sun Sep 11 at 2pm
Sun Sep 11 at 2am
Sun Sep 11 at 2pm

Charleston

★ Charleston, SC
--- 6-Hour Interval
— 12-Hour Interval
Storm Location and Intensity
🌀 74+ mph

PROTOTYPE
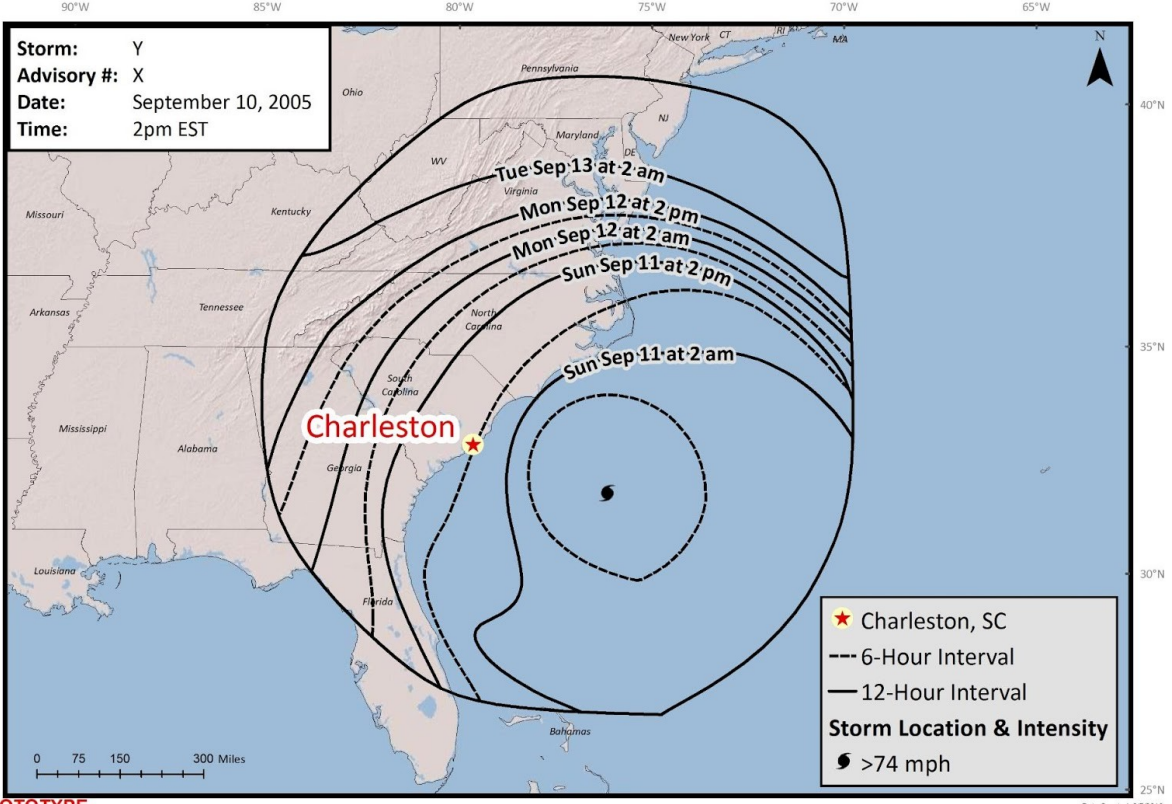
15. Which map do you prefer for your **internal** decision-making/job responsibilities?
   - Map A (earliest reasonable arrival time)
   - Map B (most likely arrival time)
   - Both maps (earliest reasonable and most likely arrival times)
   - No preference
   - Neither map
   - Not sure
   - N/A

16. Which map do you prefer for your **external** communications?
   - Map A (earliest reasonable arrival time)
   - Map B (most likely arrival time)
   - Both maps (earliest reasonable and most likely arrival times)
   - No preference
   - Neither map
   - Not sure
   - N/A

[NEXT SCREEN]

Here are two alternatives for expressing the arrival times on the map. Option A uses **specific timing labels**, while Option B gives **more general time periods**.

 Option A: Specific timing label, such as Saturday, October 3 at 2:00 a.m.
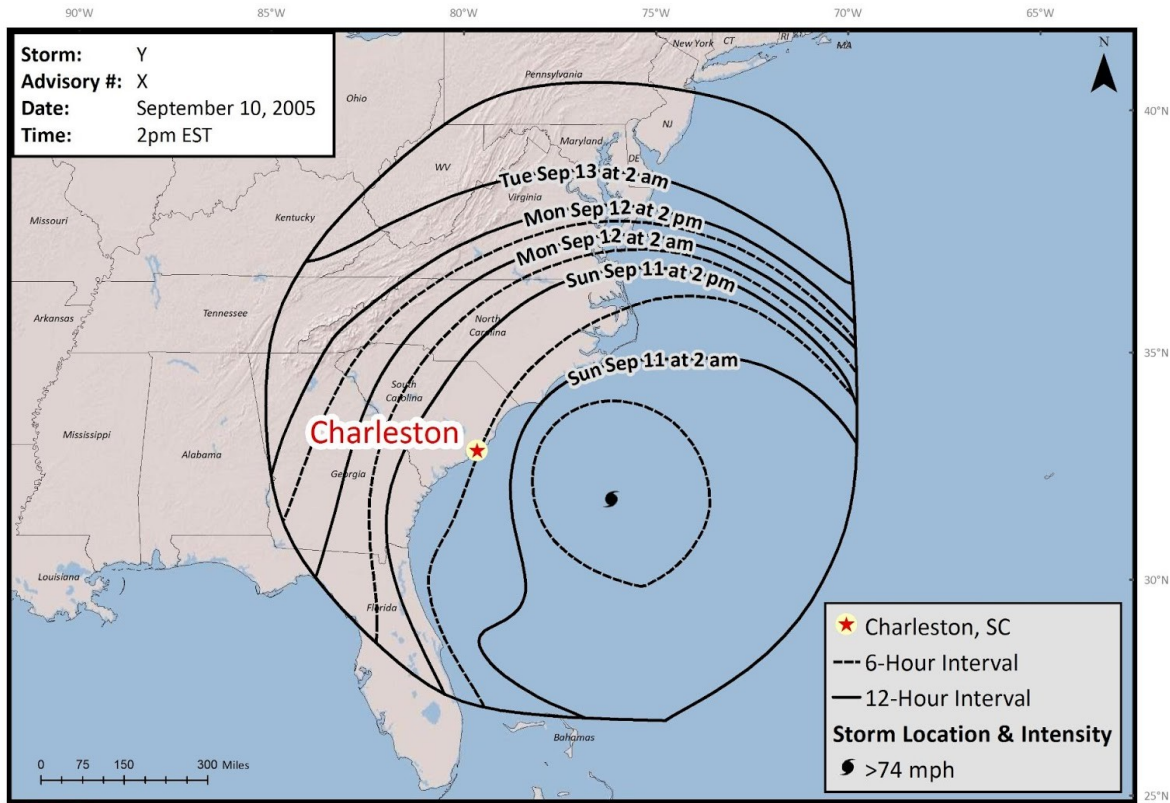 Option B: General timing label, such as Saturday, October 3, p.m.

17. Which timing labels do you prefer?
- Option A (specific timing labels)
- Option B (general timing labels)
- No preference
- Neither option
- Not sure

[NEXT SCREEN]

Here are two alternatives for time placement on the map. Map A places the label **on the segment border**, while Map B places the label in the **center of the segment**.

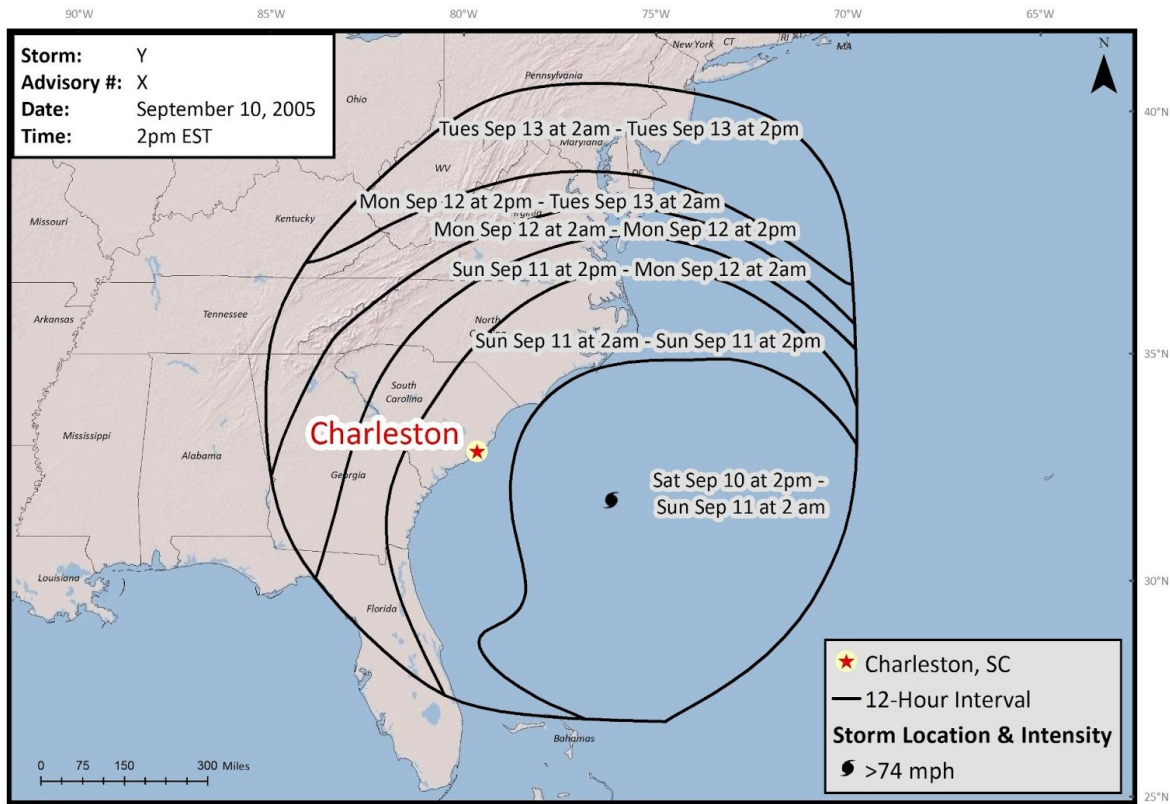Earliest Reasonable Arrival Time of Tropical Storm-Force Winds

Map A. Label on border

Earliest Reasonable Arrival Time of Tropical Storm-Force Winds

Storm: Y
Advisory #: X
Date: September 10, 2005
Time: 2pm EST

Tues Sep 13 at 2am - Tues Sep 13 at 2pm
Mon Sep 12 at 2pm - Tues Sep 13 at 2am
Mon Sep 12 at 2am - Mon Sep 12 at 2pm
Sun Sep 11 at 2pm - Mon Sep 12 at 2am
Sun Sep 11 at 2am - Sun Sep 11 at 2pm

Charleston

Sat Sep 10 at 2pm -
Sun Sep 11 at 2 am

★ Charleston, SC
— 12-Hour Interval
Storm Location & Intensity
🌀 >74 mph

PROTOTYPE

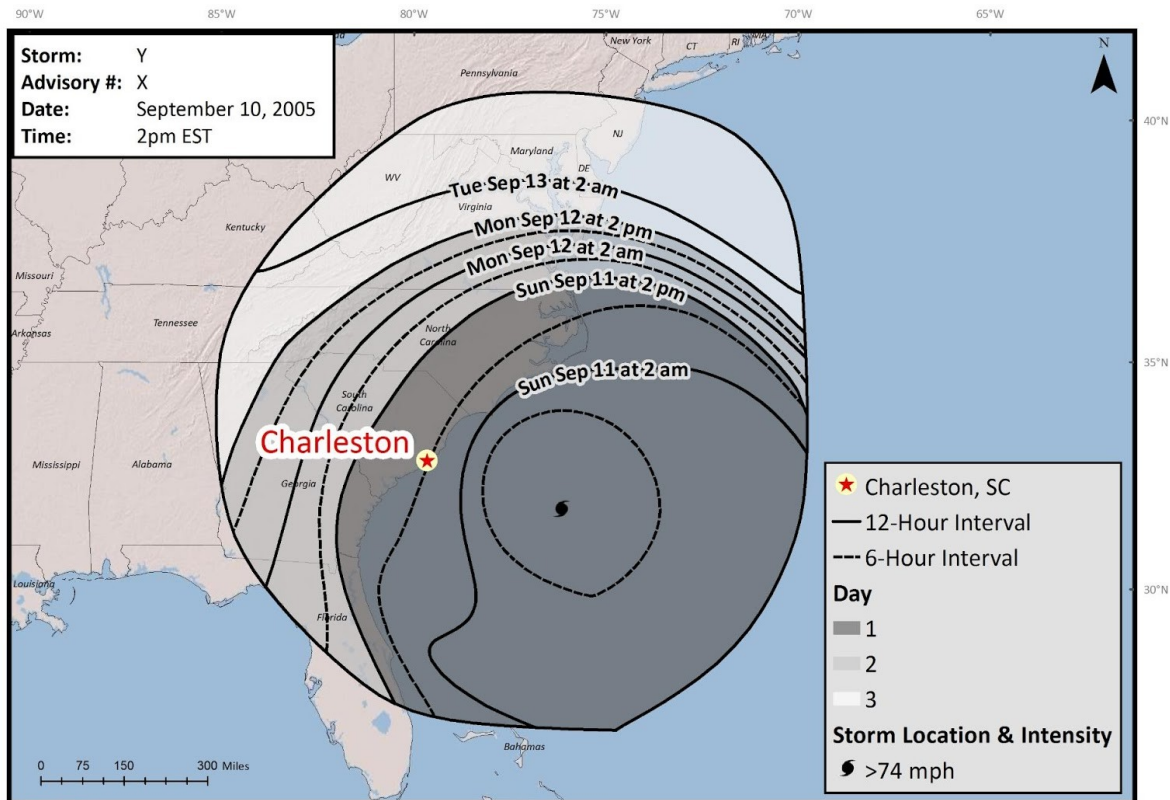**Map B. Label in center of segment**

18. Which time placement do you prefer?
   - Map A (on the border)
   - Map B (in center of segment)
   - No preference
   - Neither map
   - Not sure

[NEXT SCREEN]

Here are two different coloring options for the map. Map A uses shades of **gray**, while Map B uses **no color**.

Earliest Reasonable Arrival Time of Tropical Storm-Force Winds

Storm: Y
Advisory #: X
Date: September 10, 2005
Time: 2pm EST

Tue Sep 13 at 2 am
Mon Sep 12 at 2 pm
Mon Sep 12 at 2 am
Sun Sep 11 at 2 pm
Sun Sep 11 at 2 am

Charleston

★ Charleston, SC
— 12-Hour Interval
--- 6-Hour Interval
Day
1
2
3
Storm Location & Intensity
🌀 >74 mph

0   75   150   300 Miles
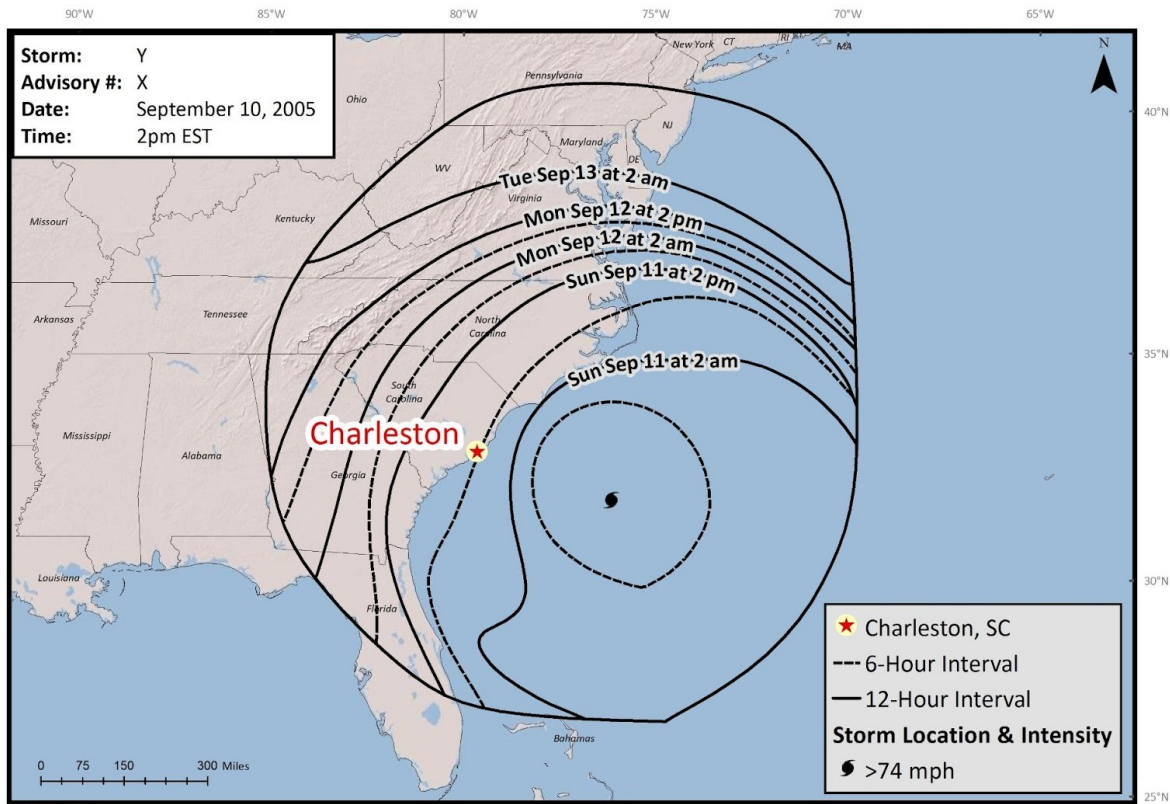
PROTOTYPE

Date Created: 9/8/2016
Created By: JLS

A. Shades of gray

Earliest Reasonable Arrival Time of Tropical Storm-Force Winds

Storm: Y
Advisory #: X
Date: September 10, 2005
Time: 2pm EST

Tue Sep 13 at 2 am
Mon Sep 12 at 2 pm
Mon Sep 12 at 2 am
Sun Sep 11 at 2 pm
Sun Sep 11 at 2 am

Charleston

★ Charleston, SC
--- 6-Hour Interval
—— 12-Hour Interval
Storm Location & Intensity
🌀 >74 mph

0 75 150   300 Miles

PROTOTYPE

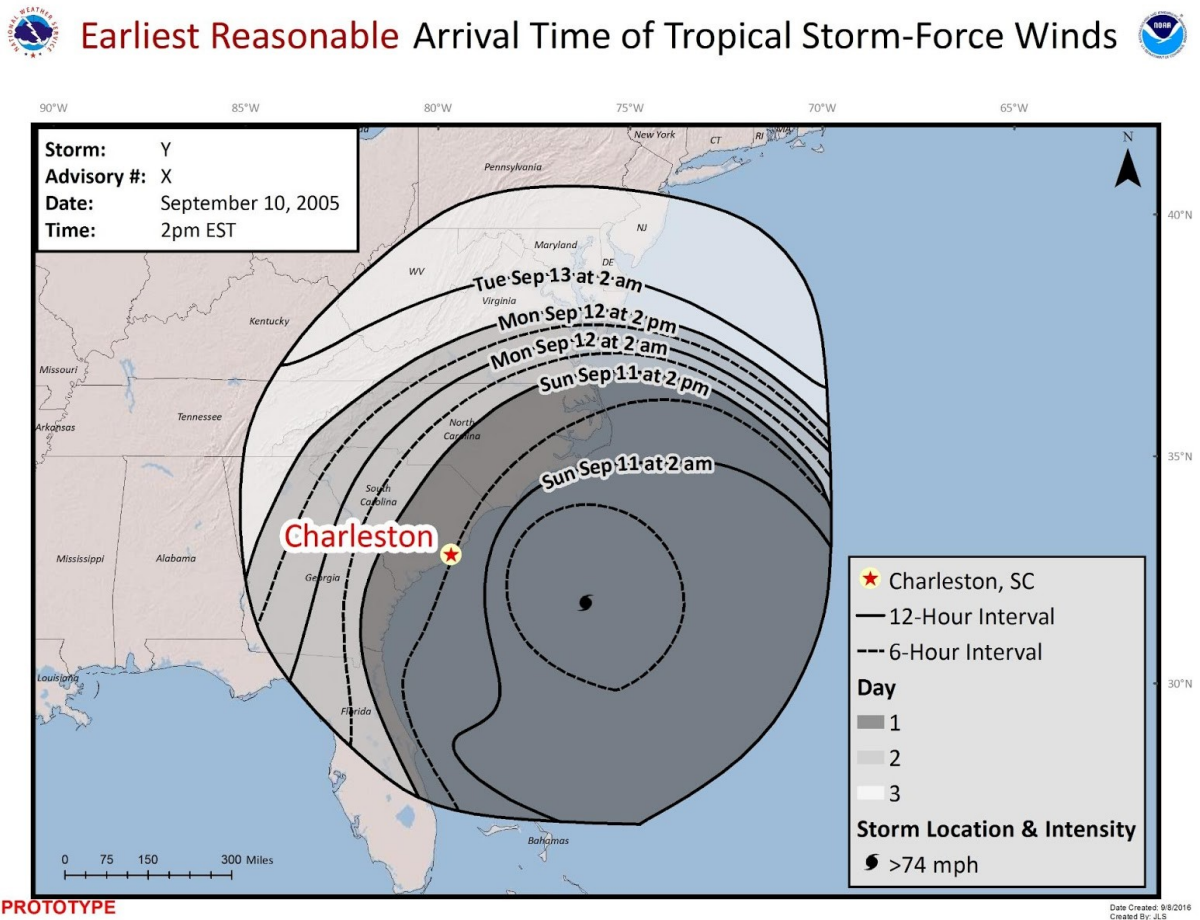Date Created: 9/7/2016
Created By: JLS

B. No color

19. Which map do you prefer?
    • Map A (shades of gray)
    • Map B (no color)
    • No preference
    • Neither map
   • Not sure

[NEXT SCREEN]

20. What does the darkest shade of gray in the map below convey to you?

Earliest Reasonable Arrival Time of Tropical Storm-Force Winds

Storm: Y
Advisory #: X
Date: September 10, 2005
Time: 2pm EST

- Area that could experience the most intense winds
- Area that could experience winds first
- Both
- Neither
- Not sure

[NEXT SCREEN]

The NHC currently produces a map depicting the probabilities (in percentages) that wind speeds of at least 39 mph will occur from the current time through the five-day forecast. Here is an example of this map.
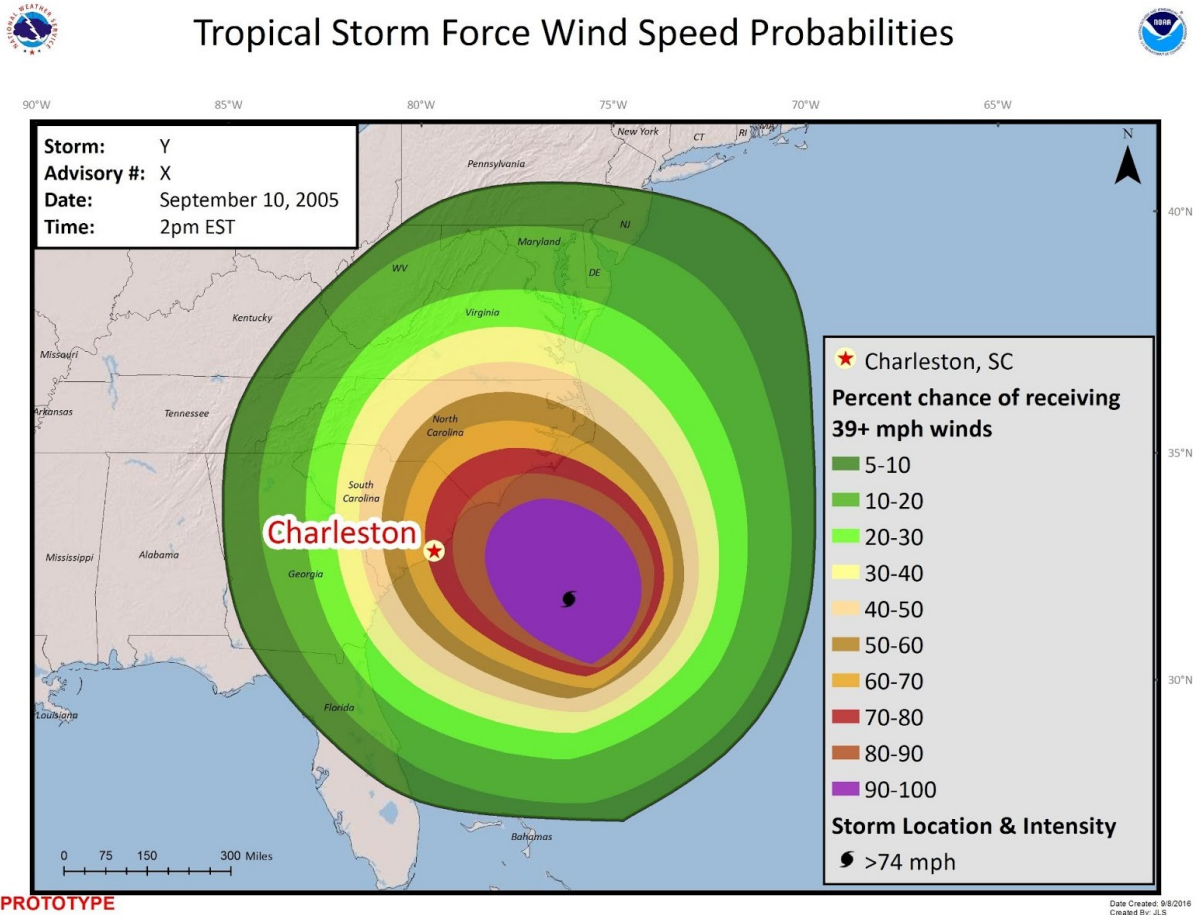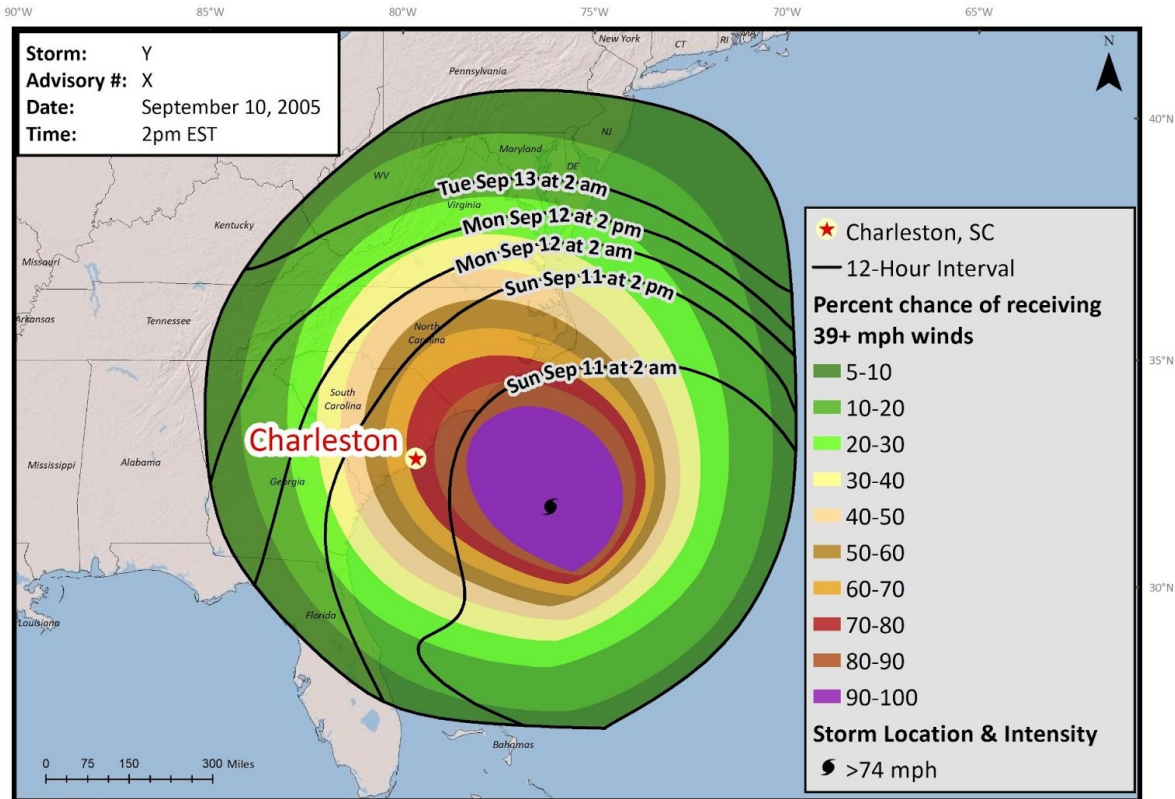

21. To what extent do you use this graphic in your decision-making/job responsibilities?
- Always use
- Frequently use
- Sometimes use
- Never use
- N/A

[NEXT SCREEN]

The map below combines the NHC wind speed probability data with the arrival of sustained tropical storm-force winds graphic.

Earliest Reasonable Arrival Time of Tropical Storm-Force Winds

Storm: Y
Advisory #: X
Date: September 10, 2005
Time: 2pm EST

★ Charleston, SC
— 12-Hour Interval

Percent chance of receiving 39+ mph winds
5-10
10-20
20-30
30-40
40-50
50-60
60-70
70-80
80-90
90-100

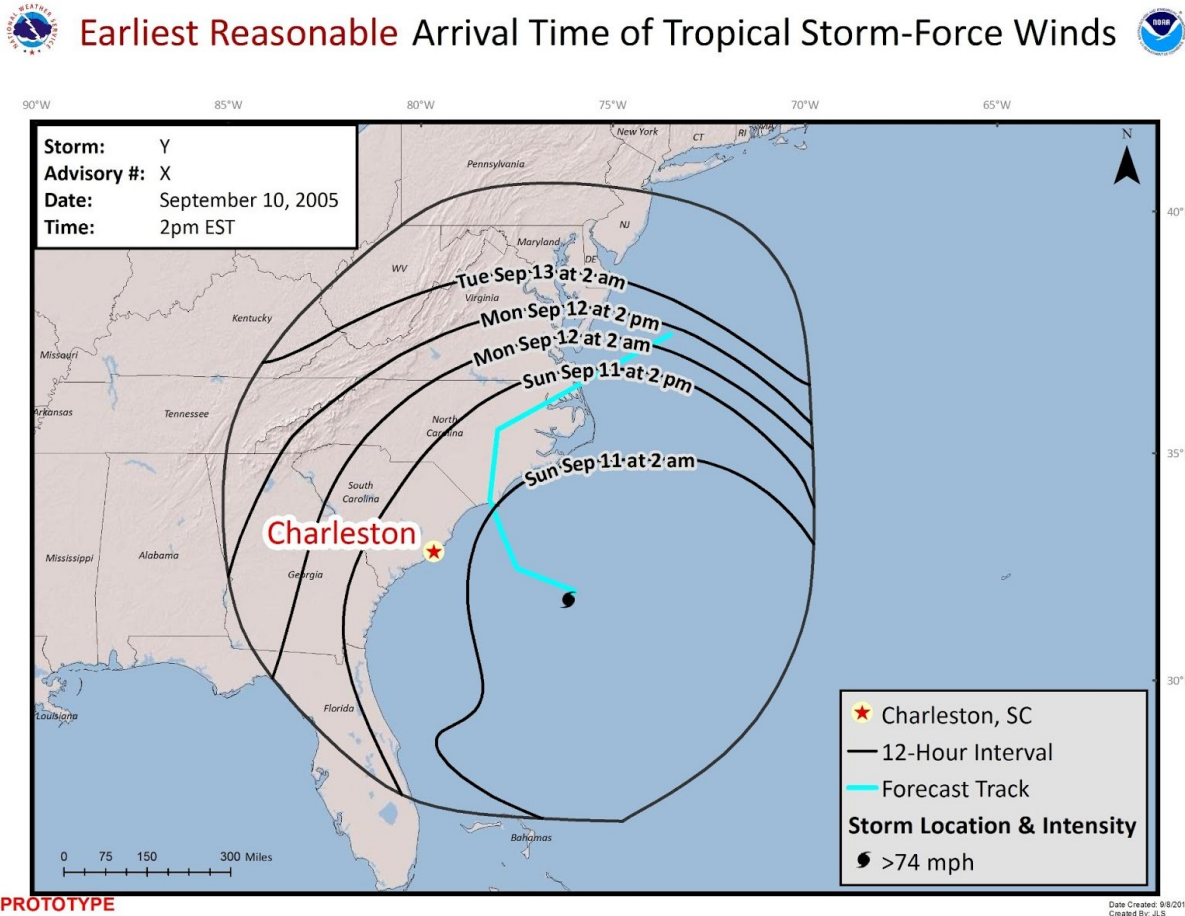**Storm Location & Intensity**
⚡ >74 mph

PROTOTYPE

22. If you lived in Charleston, South Carolina, how would you interpret this map? {open-ended}

23. How useful is this combination map?
   • Very useful
   • Somewhat useful
   • Not particularly useful
   • Not at all useful
   • Not sure

[NEXT SCREEN]

The following map combines the storm track with the arrival of sustained tropical storm-force winds.

24. If you lived in Charleston, South Carolina, how would you interpret this map? {open-ended}
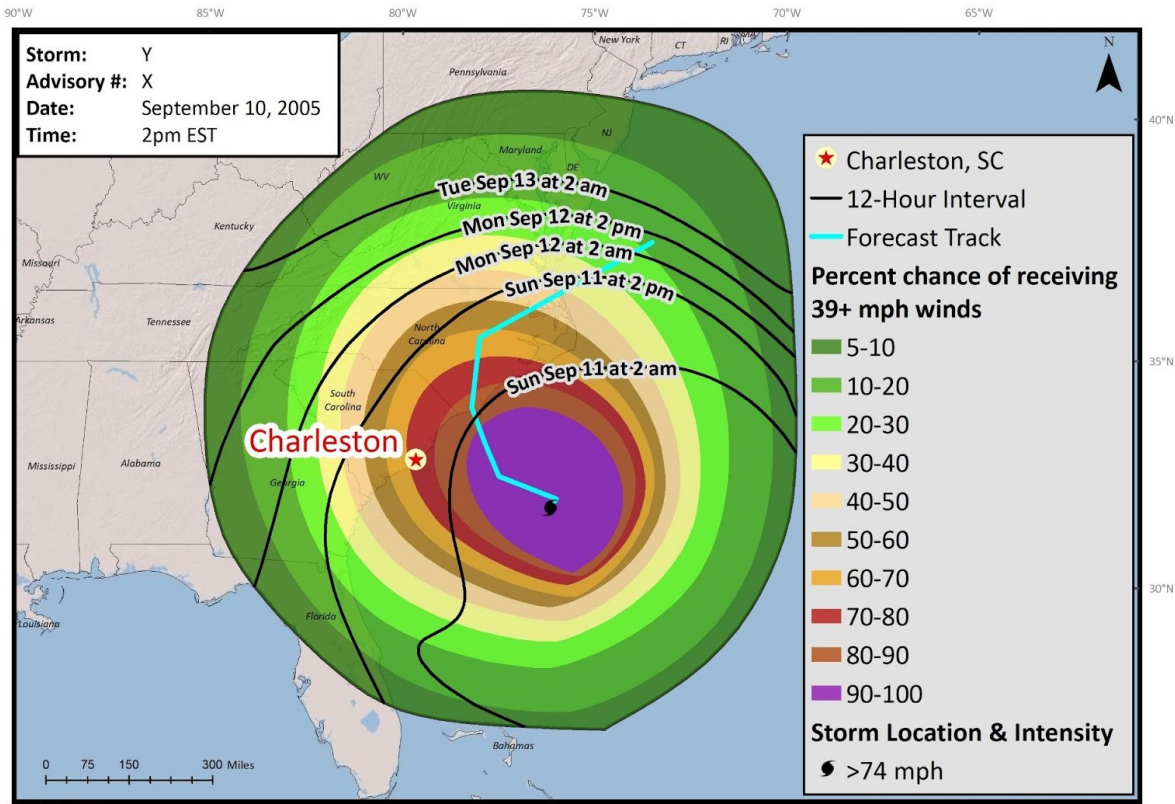

25. How useful is this combination map?
- Very useful
- Somewhat useful
- Not particularly useful
- Not at all useful
- Not sure

[NEXT SCREEN]

The map below combines three types of information: arrival of tropical storm-force winds, wind speed probabilities, and storm track.

Earliest Reasonable Arrival Time of Tropical Storm-Force Winds

Storm: Y
Advisory #: X
Date: September 10, 2005
Time: 2pm EST

★ Charleston, SC
— 12-Hour Interval
— Forecast Track
Percent chance of receiving 39+ mph winds
■ 5-10
■ 10-20
■ 20-30
■ 30-40
■ 40-50
■ 50-60
■ 60-70
■ 70-80
■ 80-90
■ 90-100
Storm Location & Intensity
⚡ >74 mph

PROTOTYPE

26. If you lived in Charleston, South Carolina, how would you interpret this map? {open-ended}
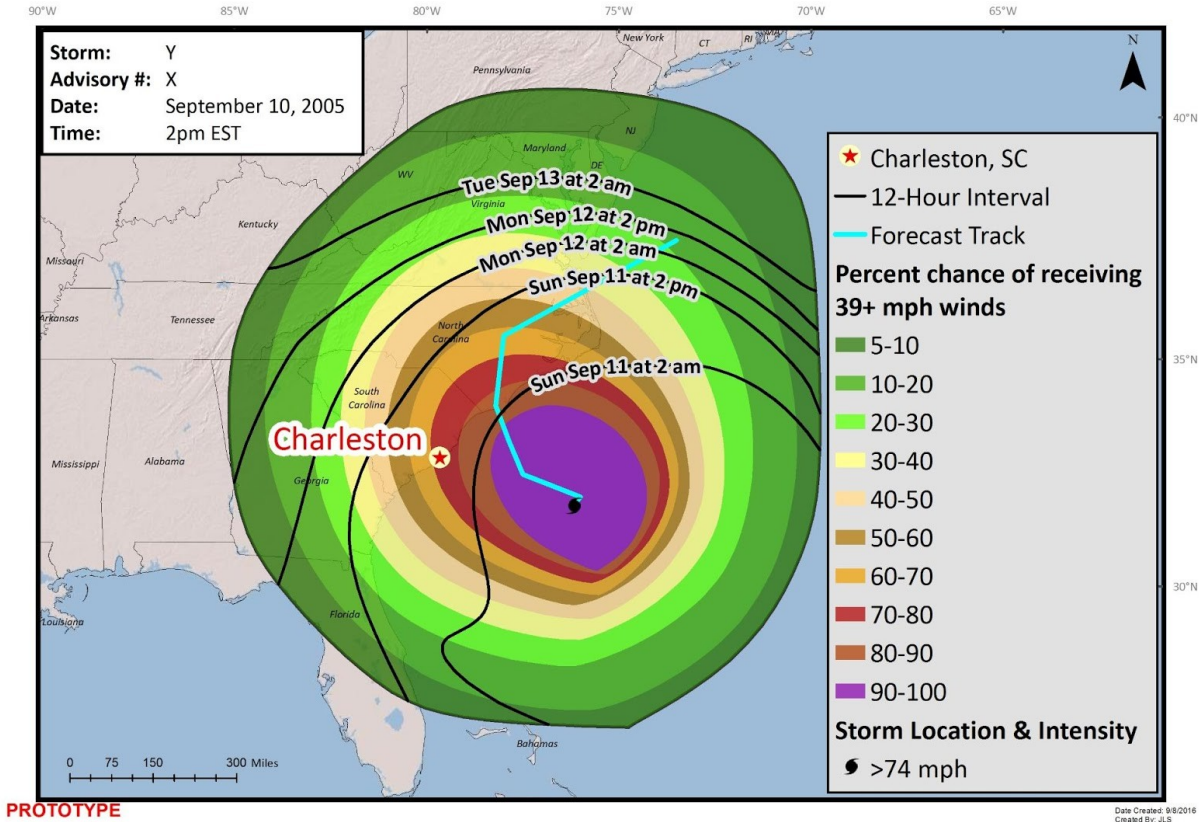
27. How useful is this combination map?
   • Very useful
   • Somewhat useful
   • Not particularly useful
   • Not at all useful
   • Not sure

[NEXT SCREEN]

The maps below show two different ways to depict the storm track. Map A uses a **center line**, while Map B uses **center points**.
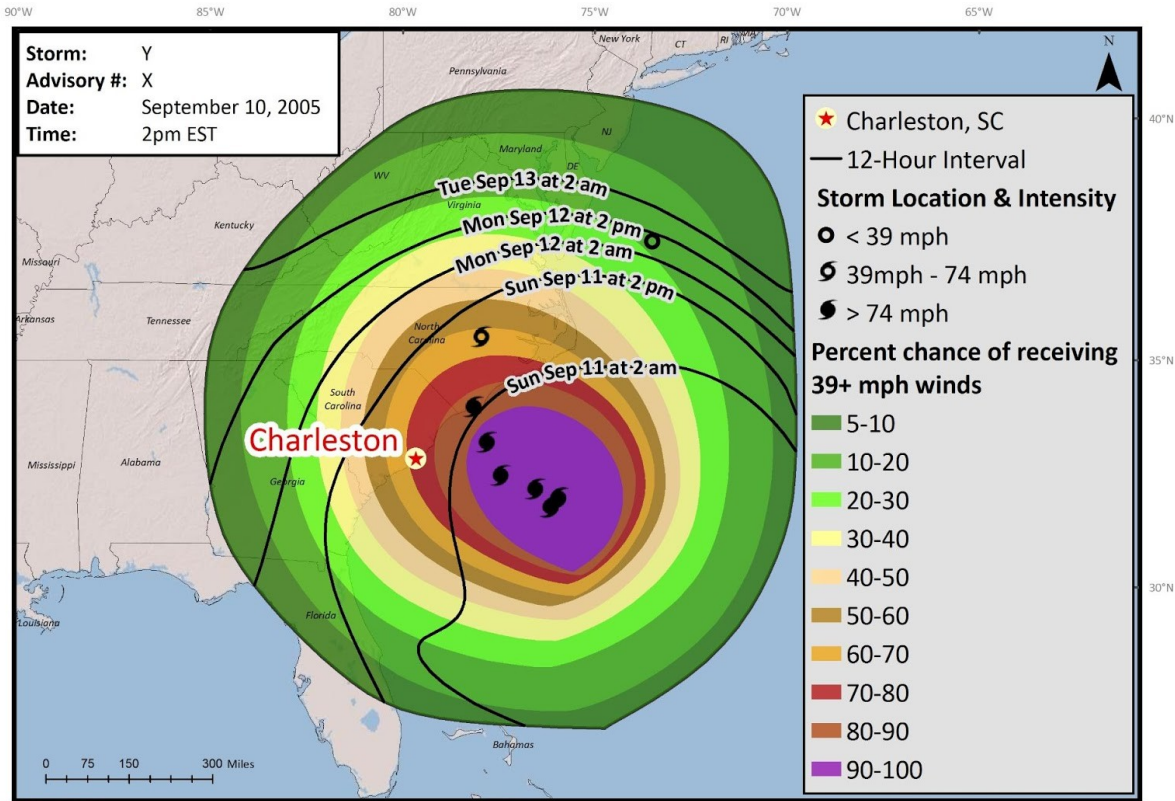

Earliest Reasonable Arrival Time of Tropical Storm-Force Winds

Map A. Storm track center line

Tropical Storm Force Wind Speed Probabilities

**Map B. Storm track
center points**

28. Which map do you prefer?
    • Map A (center line)
    • Map B (center points)
    • No preference
    • Neither map
    • Not sure

[NEXT SCREEN]

29. How useful is a toggle feature that would allow you to turn different types of information on and off?
   - Very useful
   - Somewhat useful
   - Not very useful
   - Not useful at all
   - Not sure

30. Now that you've had a chance to examine the prototypes, do you think that an Arrival of Sustained Tropical Storm-Force Winds graphic should be added to the NHC's suite of forecast products?
   - Definitely
   - Maybe
   - Probably not
   - Definitely not
   - Not sure

31. If the NHC issued the map, to what extent would you use it for your **internal** decision-making/job responsibilities?
   - Always use
   - Frequently use
   - Sometimes use
   - Never use
   - Not sure
   - N/A

32. If the NHC issued the map, to what extent would you use it for your **external** communications?
   - Always use
   - Frequently use
   - Sometimes use
   - Never use
   - Not sure
   - N/A

33. Are there any comments you'd like to make about your preferences, the design of the graphic, or about the graphic in general? Or any suggestions you'd like to make about further development of the graphic? {Open-ended}

Thank you for taking the time to complete this survey. Your input will be very helpful to the National Weather Service.