

FINAL REPORT

Findings from the Hurricane Local Products Survey

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Eastern Research Group, Inc. (ERG)

ERG provides environmental, social science, and engineering solutions to climate, weather, and coastal management issues. Learn more at www.erg.com.

NOAA's Office for Coastal Management

“Coastal management” is the term used by communities and organizations striving to keep the nation’s coasts safe from storms, rich in natural resources, and economically strong. The national lead for these efforts is NOAA’s Office for Coastal Management, an organization devoted to partnerships, science, and good policy. This agency, housed within the National Ocean Service, oversees major initiatives that include the National Coastal Zone Management Program, Coral Reef Conservation Program, Digital Coast, and National Estuarine Research Reserve System.

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Findings from the Hurricane Local Products Survey: Executive Summary

In recent years, the National Weather Service (NWS) has taken important steps to enhance the text and graphic products generated by local Weather Forecast Offices (WFOs) in areas affected (or forecast to be affected) by a tropical storm or hurricane. The Hurricane Local Statement (HLS) now provides a localized, general overview of tropical cyclone information for the entire region covered by each WFO, while a new automated product, the Tropical Cyclone Watch/Warning product (TCV), provides detailed meteorological information for specific zones (e.g., counties, parishes, marine areas). The automated TCV product is released as soon as it becomes available, followed by the HLS after WFO input.

Prior social science research (interviews and focus groups) helped to guide the changes in these products. However, some terminology, labels, and other issues remained that the NWS was interested in resolving with the help of partner input. The NWS contracted with Eastern Research Group, Inc. (ERG) to design a survey to gather partner insights and preferences on these remaining issues.

The target audience for the survey was broadcast meteorologists, NWS Warning Coordination Meteorologists (WCMs), and EMs who cover jurisdictions along the Atlantic and Gulf Coasts (Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, Puerto Rico, South Carolina, Texas, the U.S. Virgin Islands, and Virginia). Survey invitations were sent to a mail list of 659 individuals, and 79 respondents took the survey (8 WCMs, 36 EMs, and 35 broadcasters) for a response rate of 12%.

Key Findings

The survey asked questions about the labeling of different categories and levels for conveying threat (severity) and potential impacts associated with the different hurricane hazards (wind, storm surge, flooding rain, and tornadoes). Key findings included:

- A strong preference for *both* labels and ranges (e.g., for the wind threat, Extreme: Greater than 110 mph) for each threat level in the different hazard (wind, storm surge, flooding rain, and tornadoes) categories.
- A strong preference for labeling the threat and impact categories differently.
- Some preference for labeling the second-to-lowest threat category either “elevated” or “low.”
- Some preference for characterizing the potential impacts for the moderate threat level as “considerable” or “significant” and for characterizing the potential impacts for the high threat level as either “significant” or “extensive.”
- An interest in receiving threat maps showing *both* the reasonable worst-case scenario and the most likely scenario for internal decision-making/job responsibilities. For external uses, respondents were divided in their preference for both maps versus the most likely scenario.
- A very favorable response to all sections (buildings, trees, roads, and utilities) of the potential impact statements, which were deemed very or somewhat useful for both internal and external uses.

- A preference for some level of detail in precautionary/preparedness statements, with the statement “Plan for Category 3 hurricane force winds (110 mph)” ranking highest in usefulness for both internal and external uses, though only by a small margin in some cases.

In addition, respondents provided some additional comments in an open-ended format that touched upon keeping terminology and categorizations simple, as well as maintaining consistency in color and language with other NWS classifications, such as the Storm Prediction Center (SPC) risk categories for severe weather.

Conclusions, Recommendations, and Next Steps

Because of the small sample size, the results from this survey are not generalizable to the larger EM, media, and WFO populations. The results may, however, be useful for the NWS to consider (in concert with other research and internal discussions) as it contemplates any further changes to the local hurricane products.

This survey (and prior focus groups) revealed that NWS partners have differing opinions on the best choices for labels and terms used in the local hurricane products, but that if a classification system is used, it should be consistent with other NWS classifications to the extent possible. However, the research conducted to date has not yet discerned whether the threat and impact classification scheme actually results in more effective warning communication.

The survey also indicated respondents want *some* level of detail in the preparedness statements and that they liked the sections (buildings, roads, trees, utilities) presented in the potential impacts statements. These findings resonate with prior focus group results where NWS partners appreciated having detailed information in the hurricane local products about both the threats and potential impacts of different storm hazards, but they wanted to be able to find that information easily; have it conveyed in simple, conversational, nontechnical language; and have the information tailored to their localities.

Looking ahead, any additional testing of the information contained in the local hurricane products might best be accomplished with members of the public (in addition to NWS partners) in the context of a real or simulated storm and via web/mobile applications versus “text” products since this is how partners are likely to increasingly use the information, as well as how the public will view the information.

Findings from the Hurricane Local Products Survey: Full Report

Under contract with NOAA's National Weather Service (NWS), ERG conducted a Web-based survey in the fall of 2016¹ to gather feedback from its core partners on terminology, labeling, and other issues related to the Hurricane Local Statement (HLS) and Tropical Cyclone Watch/Warning product (TCV). The NWS has taken steps in recent years to shorten and reformat the HLS to better meet users' needs. The HLS now provides a localized, general overview of tropical cyclone information for the entire region covered by each Weather Forecast Office (WFO). The NWS has also introduced a new automated product, the TCV, which provides detailed meteorological information for specific zones (e.g., counties, parishes, marine areas). The automated TCV product is released as soon as it becomes available, followed by the HLS after WFO input.

Prior social science research (interviews and focus groups) provided insights to help guide the changes in these products. However, some terminology, labels, and other issues remained that the NWS was interested in resolving with the help of partner input. This survey was designed to gather partner insights and preferences on these remaining issues. A portion of the survey (see Appendix A) was also targeted at assessing options for a new map depicting the arrival time of sustained tropical storm-force winds (ATSFW) is under development by the National Hurricane Center (NHC); ERG has developed a separate summary of the findings from that portion of the survey.

Survey Design and Sample

The survey was designed to cover two sets of different, but related, tropical content under two separate Office for Coastal Management task orders. Q1-Q11 of the survey solicited input on some unresolved terminology and presentation issues related to the HLS/TCV and related graphics; Q12-Q33 of the survey focused on the ATSFW graphic. The content was combined in a single survey to reduce paperwork burden and potential survey fatigue on respondents.

The target audience for the survey was broadcast meteorologists, NWS Warning Coordination Meteorologists (WCMs), and EMs who cover jurisdictions along the Atlantic and Gulf Coasts (Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, Puerto Rico, South Carolina, Texas, the U.S. Virgin Islands, and Virginia). ERG compiled a mailing list for the survey by obtaining an email contact list of the 11 state/territorial EM agencies listed above from the Federal Emergency Management Agency (FEMA). We then sent a request to each state/territorial EM contact for email contact information for their coastal county contacts. For the media sample, we compiled a list of chief broadcast meteorologists at the four major local television stations (ABC, CBS, Fox, NBC) servicing the coastal markets from Virginia to Texas. All individuals on the mailing lists were asked to participate in the survey via an email invitation. Three follow-up reminders were also sent to potential participants.

¹The information collection request for the survey was approved by the Office of Management and Budget on September 14, 2016. The approval number was 201504-0648-015.

While 119 respondents completed the survey, 40 of these respondents were not on the mailing lists used to distribute the survey and submitted anonymous responses. Since we could not determine the professional identity of these respondents, they were deleted from the analysis. Table 1 provides a breakdown of respondents by type, while Table 2 provides a breakdown of respondents by state. The response rate for the survey was 12 percent.

Table 1. Sample Breakdown by Respondent Type

| Map | | EM | Media | WFO | TOTAL |
|--------------|--|-----------|-----------|----------|-----------|
| TOTAL | | 36 | 35 | 8 | 79 |

Table 2. Sample Breakdown by State

| State | Count | |
|--------------|-------------------------------------|-------------------------------|
| | Number Asked to Participate (Email) | Number of Responses (On-Line) |
| AL | 36 | 4 |
| FL | 197 | 25 |
| GA | 44 | 1 |
| LA | 58 | 7 |
| MS | 22 | 1 |
| MS & LA | 1 | 1 |
| NC | 80 | 9 |
| PR | 3 | 1 |
| SC | 52 | 4 |
| TX | 112 | 18 |
| USVI | 2 | 0 |
| VA | 53 | 8 |
| Total | 659 | 79 |

Threat and Impact Terminology and Labeling

The TCV and the HLS include impact statements for which to prepare for each tropical cyclone hazard (wind, storm surge, flooding rain, and tornadoes). The TCV also includes threat statements for which to plan (see Figure 1).

Labels for Threat and Impact Categories

Respondents were asked whether the threat and impact levels should be labeled with the same words or different ones (see Table 3 below, which was provided in the survey as an example of how the threat and impact categories could be labeled). In all, 75 percent thought the categories should be labeled differently.

* Flooding Rain

- Latest Local Forecast:
 - Peak Rainfall Amounts: Additional 4-8 inches, with locally higher amounts

- Current Threat to Life and Property: Elevated
 - Emergency considerations should include a threat of flooding.
 - Be safe and remain ready to protect against flooding rain impacts.
 - If flood related watches and warnings are in effect, heed recommended actions.

- Potential Impacts: Limited
 - Localized rainfall flooding may prompt a few evacuations.
 - Rivers and tributaries may quickly rise with swifter currents. Small streams, creeks, canals, arroyos, and ditches may become swollen and overflow in spots.
 - Flood waters can enter a few structures, especially in usually vulnerable spots. A few places where rapid ponding of water occurs at underpasses, low-lying spots, and poor drainage areas. Several storm drains and retention ponds become near-full and begin to overflow. Some brief road and bridge closures.

Figure 1. Sample TCV.

Table 3. Threat and Impact Label

| THREAT LABEL | POTENTIAL IMPACTS LABEL |
|----------------|--------------------------|
| Extreme | Devastating/Catastrophic |
| High | Considerable |
| Moderate | Significant |
| Elevated | Limited |
| Little to None | Minimal |

Descriptions for Threat Levels

The survey also tested three different ways (see Table 4) in which a local WFO might reference the threat levels in the TCV: 1) as labels, 2) as ranges, or 3) with both labels and ranges. A total of 82% of respondents (64 individuals) preferred both labels and ranges.

Table 4. Options for Labeling Threat Levels

| 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 |

Label for Second-to-Lowest Threat Category

The survey tested different options (see Table 5) for labeling the second-to-lowest threat level in the TCV. In all, 33% of respondents (26 individuals) preferred “elevated” while 28% (22 individuals) preferred “low.” Several respondents flagged storm surge in their open-ended comments to this question. One individual commented that the label for this category must be “strong enough to catch attention.” Another stated that “...1 to 3 feet of surge flooding is not minor in any way.”

Table 5. Options for Labeling the Second-to-Lowest 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 |

Labels for High and Moderate Potential Impacts Categories

The survey tested different labels for the high and moderate ranges in the potential impacts categories. For the high category, 41% (31 respondents) preferred “significant” while 34% (26 respondents) preferred extensive. For the moderate category, the respondents were nearly equally split between “considerable” (38% or 29 individuals) and “significant” (36% or 27 individuals). (See Table 6 below.) Several respondents also suggested “moderate” or “medium” for the moderate category. In open-ended comments, some respondents pointed out that terms can be very subjective. Additionally, the definitions of the different terms (see text box below) show some overlap, which may be contributing to a lack of strong preference for one term over another.

Table 6. Potential Impact Category Labels

| THREAT LABEL | POTENTIAL IMPACTS LABEL |
|----------------|---------------------------------------|
| Extreme | Devastating/Catastrophic |
| High | 41%: Significant; 34%: Extensive |
| Moderate | 38%: Considerable or 36%: Significant |
| Elevated | Limited |
| Little to None | Minimal |

Dictionary Definitions of Terms

Significant: Sufficiently great or important to be worthy of attention; noteworthy
<https://en.oxforddictionaries.com/definition/significant>

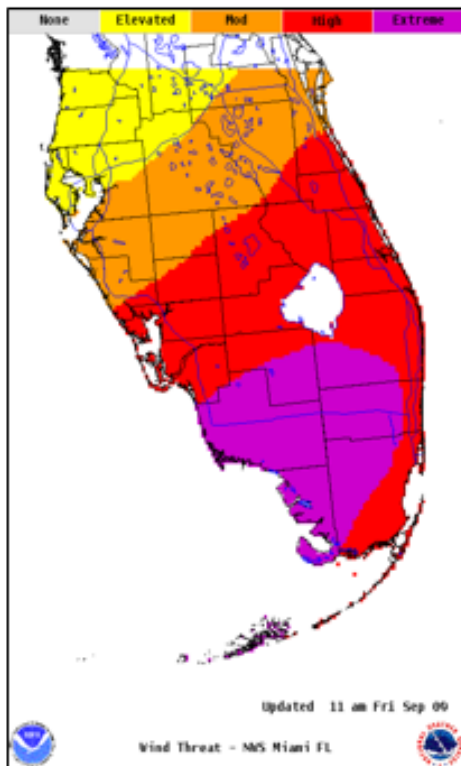
Extensive: 1) Covering or affecting a large area; 1.1) Large in amount or scale
<https://en.oxforddictionaries.com/definition/extensive>

Considerable:

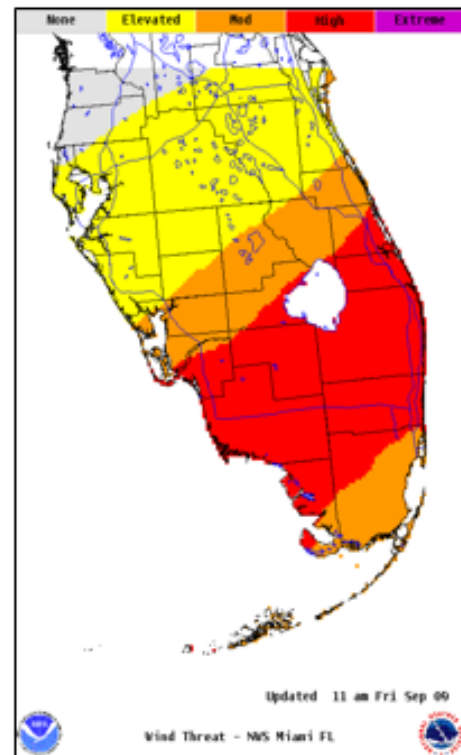
<https://en.oxforddictionaries.com/definition/major>

Probability Basis for Threat Maps

The survey presented two different threat maps (for wind) to gauge respondents' preference for the probability basis to create these maps for the different hurricane hazards. One map (see Map A in Figure 2 below) was based on the **reasonable worst-case scenario** (a 10 percent or 1 out of 10 chance that the winds could be stronger than what is depicted on the map). The other map (see Map B in Figure 2 below) represented the **most likely scenario** (based on 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

Figure 2. Map A is based on a 10 percent exceedance while Map B is based on a 50% exceedance.

Just over half of the respondents (53 percent or 41 individuals) wanted to see both maps for internal decision-making/job responsibilities. For external communication, 38% of respondents (29 individuals) preferred the map showing the most likely scenario, 34% (25 individuals) preferred both maps, and 23% (17 individuals) preferred the reasonable worst case scenario.

Preparedness Statements

The survey tested four different precautionary/preparedness statements with varying level of detail to discern which was most useful for internal and external decision-making/job responsibilities. The statement with the least detail, i.e., “Plan for winds from a major hurricane” ranked lower in usefulness than the other statements (see Table 7 and 8) for both internal and external uses. The statement “Plan for Category 3 hurricane force winds (110 mph)” ranked higher (in some cases, by only a slight margin) than the others for both internal and external decision-making/job responsibilities.

Table 7. Internal Decision-Making/Job Responsibilities

| QUESTION | VERY USEFUL | SOMEWHAT USEFUL | NOT PARTICULARLY USEFUL | NOT USEFUL AT ALL | NOT SURE |
|--|-------------|-----------------|-------------------------|-------------------|----------|
| Emergency planning should include a reasonable threat for major hurricane force winds greater than 110 mph of equivalent Category 3 intensity or higher. | 74% | 18% | 6% | 1% | 0% |
| | 92% | | | | |
| Plan for winds from a major hurricane. | 36% | 22% | 27% | 15% | 0% |
| | 58% | | | | |
| Plan for winds greater than 110 mph. | 43% | 46% | 11% | 0% | 0% |
| | 79% | | | | |
| Plan for Category 3 hurricane force winds (110 mph). | 51% | 43% | 5% | 0% | 0% |
| | 94% | | | | |

Table 8. External Decision-Making/Job Responsibilities

| QUESTION | VERY USEFUL | SOMEWHAT USEFUL | NOT PARTICULARLY USEFUL | NOT USEFUL AT ALL | NOT SURE |
|--|-------------|-----------------|-------------------------|-------------------|----------|
| Emergency planning should include a reasonable threat for major hurricane force winds greater than 110 mph of equivalent Category 3 intensity or higher. | 65% | 24% | 8% | 3% | 0% |
| | 89% | | | | |
| Plan for winds from a major hurricane. | 36% | 27% | 19% | 18% | 0% |
| | 63% | | | | |
| Plan for winds greater than 110 mph. | 47% | 45% | 8% | 0% | 0% |
| | 92% | | | | |
| Plan for Category 3 hurricane force winds (110 mph). | 53% | 43% | 4% | 0% | 0% |
| | 96% | | | | |

Potential Impact Statements

The survey tested the usefulness of different potential impact statements for buildings, trees, roads, and utilities, with an example provided for extensive damage from a high wind threat (see Table 9).

Respondents reacted very favorably to these sections, with 98% to 100% of all respondents finding each section (buildings, trees, roads, utilities) very or somewhat useful for both internal and external decision-making/job responsibilities.

Table 9. Examples of Potential Impact Statements

| 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. |

Other Suggestions

Several respondents provided comments recommending that the NWS keep terminology and categorizations simple. A couple of respondents urged consistency in color and language with other NWS classifications, such as the Storm Prediction Center (SPC) categories (see Figure 3). Sample comments include:

- Avoid words like "Enhanced" and "Elevated." No one outside of the National Weather Service uses these words in everyday conversation, therefore no one outside of the National Weather Service understands them.
- Try to keep the wording consistent among different NOAA's departments. This will limit confusion and streamline work flow.
- I feel the key is to KEEP IT SIMPLE. Use clear and understandable language to get the point across. I would argue that most people don't know the difference between a "low" risk or an "elevated" risk. Low, Medium, High, Extreme is enough. Using too many categories is confusing.






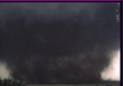
| Understanding Severe Thunderstorm Risk Categories | | | | | |
|--|---|--|---|---|---|
| THUNDERSTORMS (no label) | 1 - MARGINAL (MRGL) | 2 - SLIGHT (SLGT) | 3 - ENHANCED (ENH) | 4 - MODERATE (MDT) | 5 - HIGH (HIGH) |
| No severe* thunderstorms expected | Isolated severe thunderstorms possible | Scattered severe storms possible | Numerous severe storms possible | Widespread severe storms likely | Widespread severe storms expected |
| Lightning/flooding threats exist with all thunderstorms | Limited in duration and/or coverage and/or intensity | Short-lived and/or not widespread, isolated intense storms possible | More persistent and/or widespread, a few intense | Long-lived, widespread and intense | Long-lived, very widespread and particularly intense |
|  |  |  |  |  |  |
| • Winds to 40 mph • Small hail | • Winds 40-60 mph • Hail up to 1" • Low tornado risk | • One or two tornadoes • Reports of strong winds/wind damage • Hail - 1", isolated 2" | • A few tornadoes • Several reports of wind damage • Damaging hail, 1 - 2" | • Strong tornadoes • Widespread wind damage • Destructive hail, 2" + | • Tornado outbreak • Derecho |
| * NWS defines a severe thunderstorm as measured wind gusts to at least 58 mph, and/or hail to at least one inch in diameter, and/or a tornado. All thunderstorm categories imply lightning and the potential for flooding. Categories are also tied to the probability of a severe weather event within 25 miles of your location. | | | | | |

Figure 3. SPC Classification Scheme

Conclusions, Recommendations, and Next Steps

Because of the small sample size, the results from this survey are not generalizable to the larger EM, media, and WFO populations. The results may, however, be useful for the NWS to consider (in concert with other research and internal discussions) as it contemplates any further changes to the local hurricane products.

This survey (and prior focus groups) revealed that NWS partners have differing opinions on the best choices for labels and terms for levels in the threats/impacts categories. The prior focus groups also revealed conflicting, ambiguous, and sometimes ambivalent feelings about the word choices and classifications presented. The survey also showed (as did the prior focus groups) that if a classification system is used in the local hurricane products, it should be consistent with other NWS classifications to the extent possible. However, we have not yet discerned whether the threat and impact classification scheme results in more effective warning communication. A forecaster in one of the prior focus groups made the point that “we [NWS] are categorizing from our point of view, but that may not be what the user experiences.”

The survey also indicated respondents want *some* level of detail in the preparedness statements and that they liked the sections (buildings, roads, trees, utilities) presented in the potential impacts statements. These findings resonate with prior focus group results where NWS partners appreciated having detailed information about both the threats and impacts of different hurricane storm hazards, but they wanted to be able to:

- Find that information easily (e.g., via improved formatting, sections, and bullets).
- Have the information presented in simple, conversational, nontechnical language.
- Have the information tailored to their localities.

Looking ahead, any additional testing of the local hurricane products and their components might best be accomplished:

- With members of the public in addition to NWS partners.
- In the context of a real or simulated storm to better understand how people might use, share, and respond to the information, as well as to gauge potential implications on risk perception and behavior.
- In the context of a web/mobile applications versus “text” products since this is how partners are likely to increasingly use the information as well as how the public will view the information.

Appendix A: Survey

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 30 minutes of your time. Your participation is voluntary, and your responses to the questions are anonymous. You may complete a portion of the survey in one session and return later to finish the rest.

Paperwork Reduction Act Statement: Public reporting burden for this collection of information is estimated at 40 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other suggestions for reducing this burden to Jennifer Sprague-Hilderbrand, NOAA National Weather Service, 1325 East West Highway, Silver Spring, MD, 20910-3283. Notwithstanding any other provisions of the law, no person is required to respond to, nor shall any person be subjected to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act, unless that collection of information displays a currently valid OMB Control Number.

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
 - Other (please describe)

[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

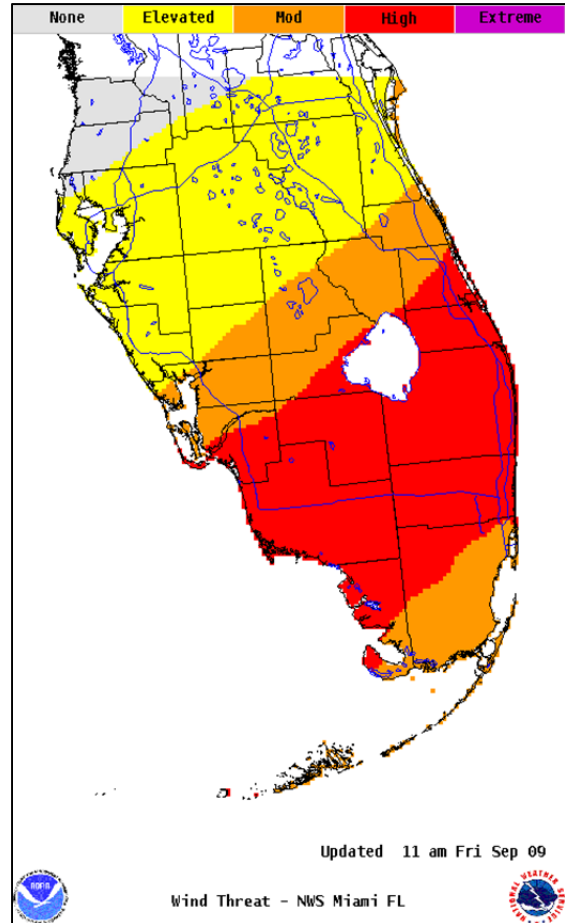
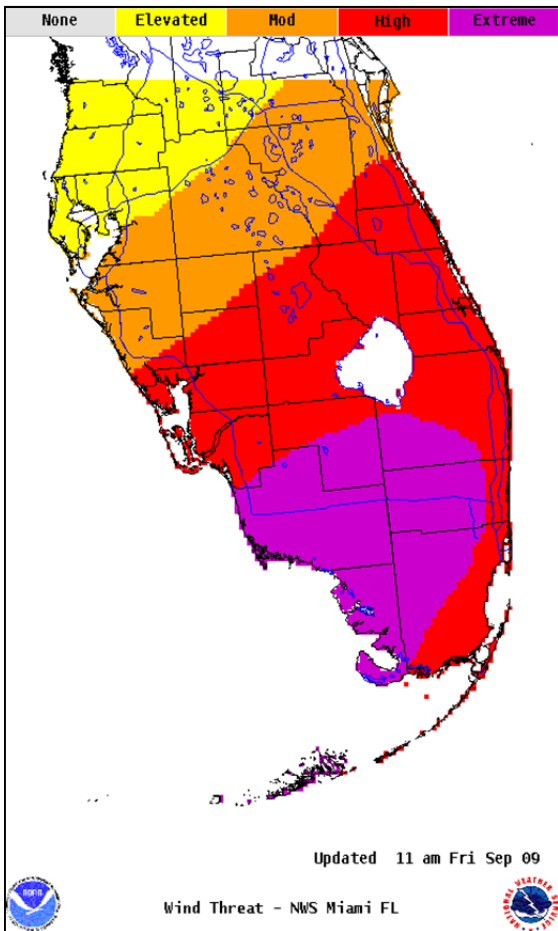
| THREAT LABEL | WIND | SURGE |
|--|----------------------|-----------------------------------|
| Extreme | Greater than 110 mph | Greater than 9 feet above ground |
| High | 74–110 mph | Greater than 6 feet above ground |
| Moderate | 58–73 mph | Greater than 3 feet above ground |
| A. Elevated B. Slight 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
- Other (please describe)

[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 (or, alternatively, a 90 percent chance that the winds would not be stronger than what is depicted). 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 (such as determining evacuations or preparing a broadcast)?
- 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 (such as communicating with the public or broadcasting a forecast)?
- 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. Local text products include statements that convey precautionary and preparedness information. How useful do you consider each of the following sample preparedness 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** statements (the possible amount of damage associated with a threat) 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: |
|--|--|--|--|
| <input type="checkbox"/> Very useful | <input type="checkbox"/> Very useful | <input type="checkbox"/> Very useful | <input type="checkbox"/> Very useful |
| <input type="checkbox"/> Somewhat useful | <input type="checkbox"/> Somewhat useful | <input type="checkbox"/> Somewhat useful | <input type="checkbox"/> Somewhat useful |
| <input type="checkbox"/> Not particularly useful | <input type="checkbox"/> Not particularly useful | <input type="checkbox"/> Not particularly useful | <input type="checkbox"/> Not particularly useful |
| <input type="checkbox"/> Not useful at all | <input type="checkbox"/> Not useful at all | <input type="checkbox"/> Not useful at all | <input type="checkbox"/> Not useful at all |
| <input type="checkbox"/> Not sure | <input type="checkbox"/> Not sure | <input type="checkbox"/> Not sure | <input type="checkbox"/> 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: |
|--|--|--|--|
| <input type="checkbox"/> Very useful | <input type="checkbox"/> Very useful | <input type="checkbox"/> Very useful | <input type="checkbox"/> Very useful |
| <input type="checkbox"/> Somewhat useful | <input type="checkbox"/> Somewhat useful | <input type="checkbox"/> Somewhat useful | <input type="checkbox"/> Somewhat useful |
| <input type="checkbox"/> Not particularly useful | <input type="checkbox"/> Not particularly useful | <input type="checkbox"/> Not particularly useful | <input type="checkbox"/> Not particularly useful |
| <input type="checkbox"/> Not useful at all | <input type="checkbox"/> Not useful at all | <input type="checkbox"/> Not useful at all | <input type="checkbox"/> Not useful at all |

all
 Not sure

all
 Not sure

all
 Not sure

all
 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. Which of the following terms best characterizes the potential impacts from a **high wind threat (74 to 110 mph)**?

- Considerable
- Significant
- Extensive
- No preference
- Not sure
- Other (please describe)

11. Which of the following terms best characterizes the potential impacts from a **moderate wind threat (58 to 73 mph)**?

- Considerable
- Significant
- Extensive
- No preference
- Not sure
- Other (please describe)

[NEXT SCREEN]

