HFIP Social Science Research

Update
October 4, 2017

STORM SURGE/ET INTERVIEWS

HERMINE/JULIA/MATTHEW

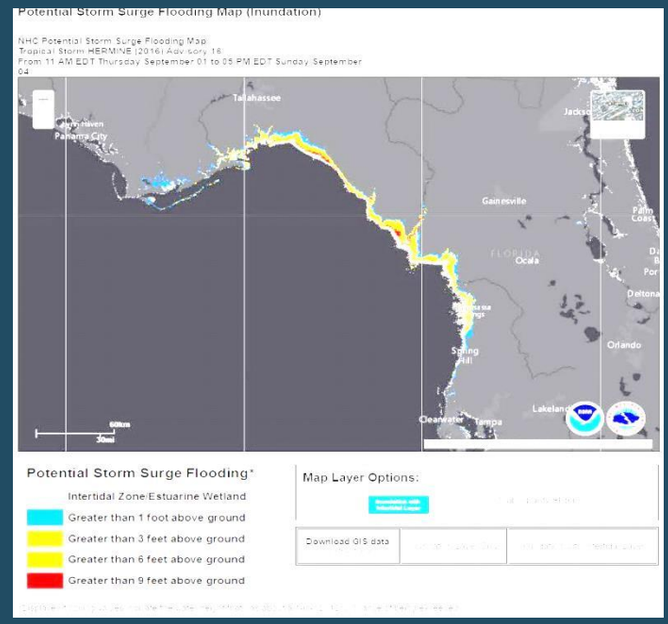
Hermine/Julia/Matthew Interviews Sample

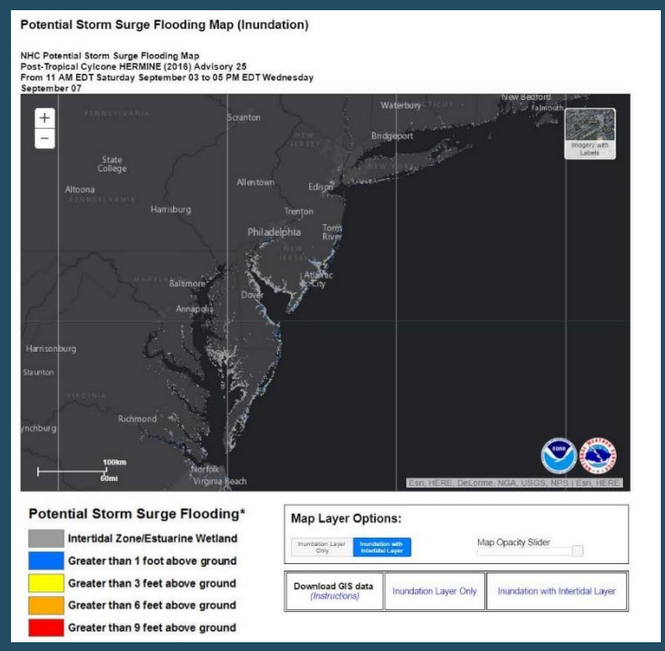
In-depth interviews with limited number of experts with experience using products

Region	WFO	Federal (FEMA)	State EM	County/ Local EM	Media	Total
Florida	2			4	2	**8**
New Jersey	1		1	3	1	**6**
Virginia	1			3	1	**5**
National		1			1	**2**
TOTAL	4	1	1	10	5	**21**

Findings Potential Storm Surge Flooding Map

1. Strong support
2. Widely viewed, shared
3. Potential water levels seemed realistic to most
4. Limited confusion with “above ground” datum





Potential Storm Surge Flooding Map

Wish List:

- Higher resolution
- Ability to zoom in closer
- More explanation of probability
- Larger, easier to read text
- More outreach and education

Potential Storm Surge Flooding Map

Other Issues/Concerns:

- Model resulted in unrealistic levels in some areas
- Some suggestions of another level between 1 and 3 feet
- Deterministic in appearance; not enough emphasis about what it's based upon

Matthew Service Assessment Findings:

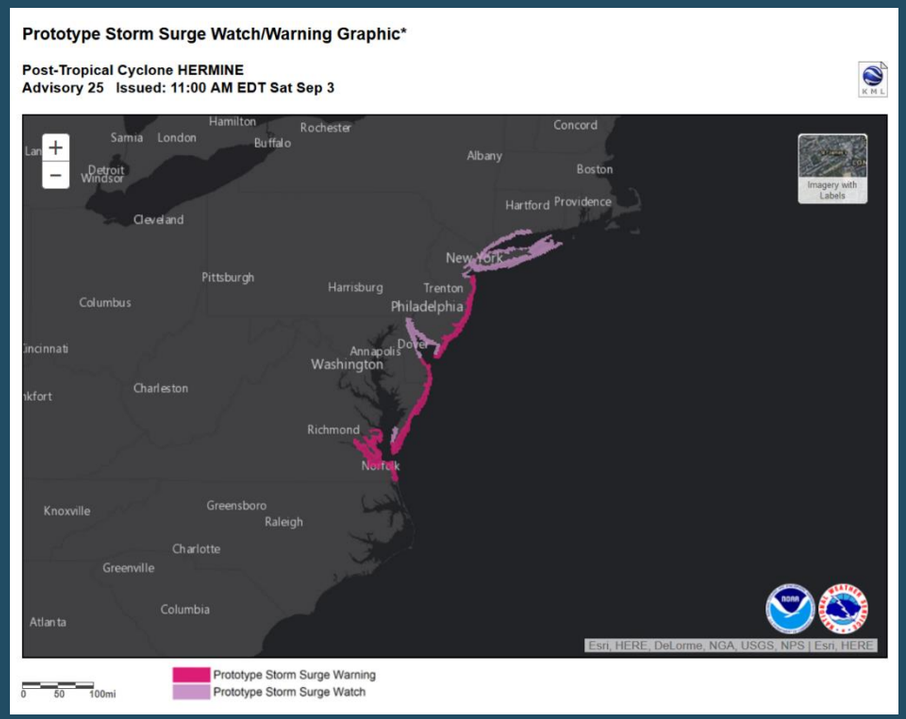
- Not universally understood…*"probable worst-case scenario"*

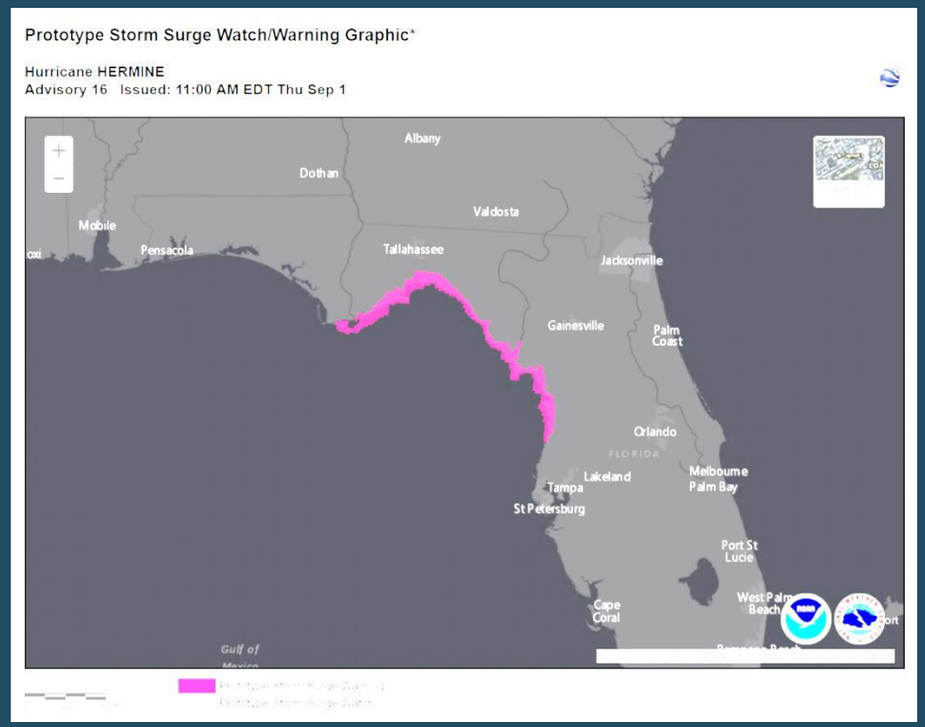
Prototype Storm Surge Watch/Warning

1. Most were aware of it and thought it could be useful
2. Reluctance to assess it until additional storms
3. Some concern about how

it would work with:

- TS/Hurricane W & W
- Potential Storm Surge Flooding Map





Prototype Storm Surge Watch/Warning Map

Other Issues/Concerns:

- Too many NWS products
- Too broad to be useful locally
- Not relevant for their area
- Not currently tied to EM actions

Transitioning Storms

1. Supportive of continuing to issue watches/warnings and producing potential SS flooding maps for these storms: fills an information gap

- Especially for storms with high impacts

2. Currently ET surge discussions too technical

3. ET/PT terminology unclear to public

SOCIAL MEDIA USED DURING HERMINE

TWEETS RELATED TO STORM SURGE MAPS

Methodology

Search of Twitter.com conversations between 8/28-9/06 that mentioned “Hermine” and “surge”

Findings

- 1,122 tweets directly related to Hermine and surge
- 189 tweets (17%) mentioned or linked to NHC’s surge maps
  - 106 unique users sent tweets
  - 35 tweets affiliated with NHC
  - Of the remaining 154 tweets, 63 (41%) shared the map(s)
  - 25 users were “prominent voices” with 10,000+ followers

ARRIVAL OF TROPICAL STORM FORCE WINDS MAP

PRELIMINARY SURVEY FINDINGS
COASTAL EMs, MEDIA & WFOS

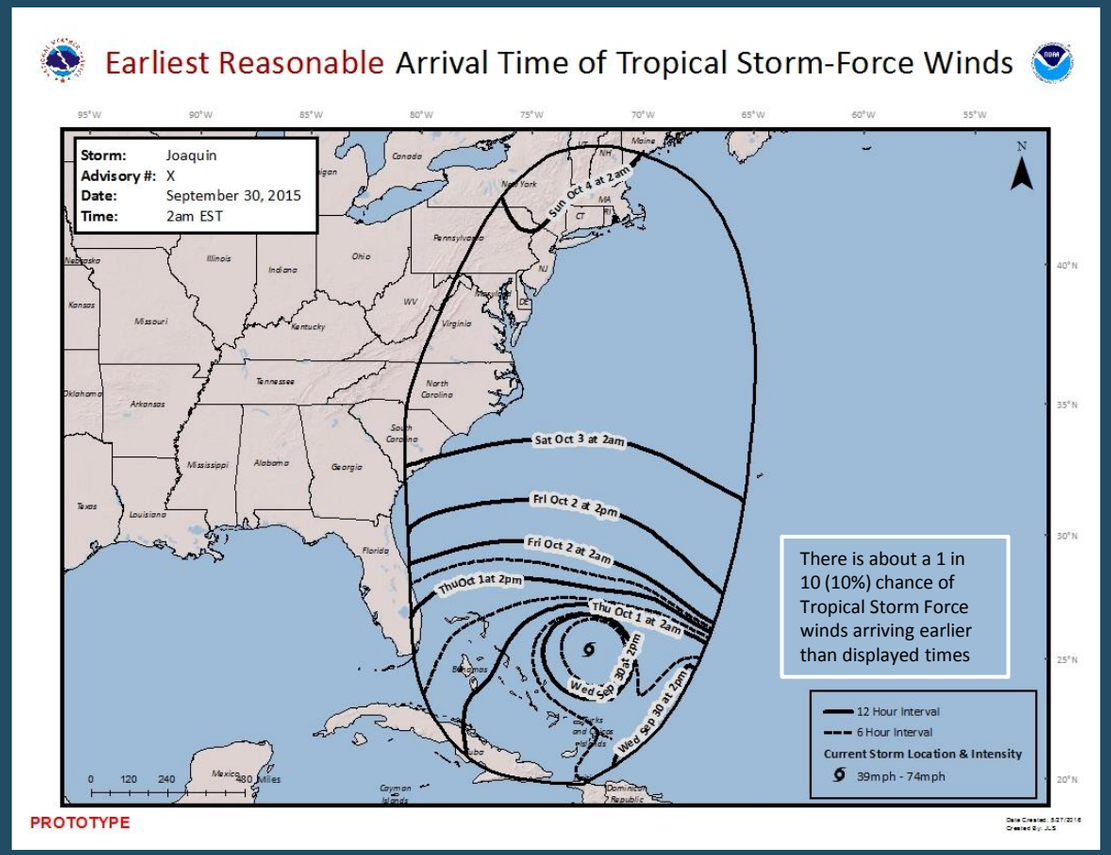
Sample

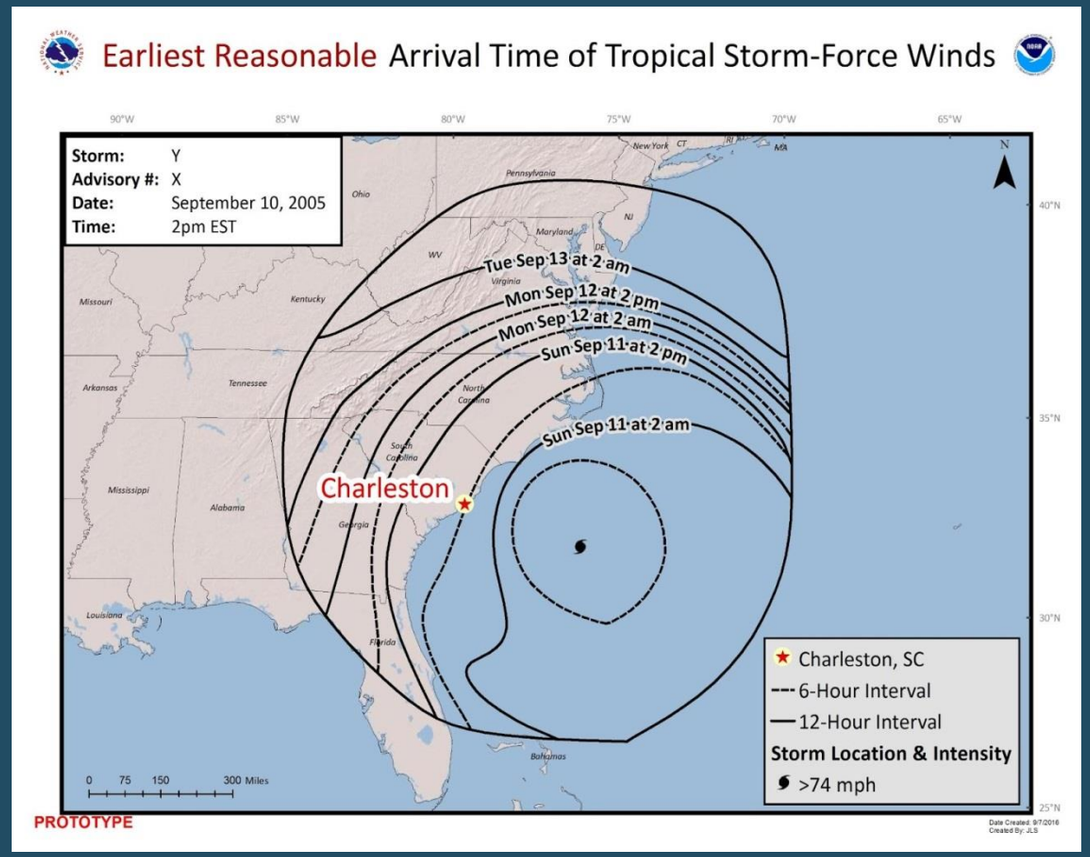
State	Count	
	Number Asked to Participate (Email)	Number of Responses (On-Line)
AL	36	4
FL	197	25
GA	44	1
LA	58	7
MS	22	1
MS & LA	1	1
NC	80	9
PR	3	1
SC	52	4
TX	112	18
USVI	2	0
VA	53	8
Not listed	0	40
Total	**659**	**119**

Response Rate= 18%

Completion Rate = 72%

Surveys Showed Maps Depicting Data From Either Joaquin or Ophelia





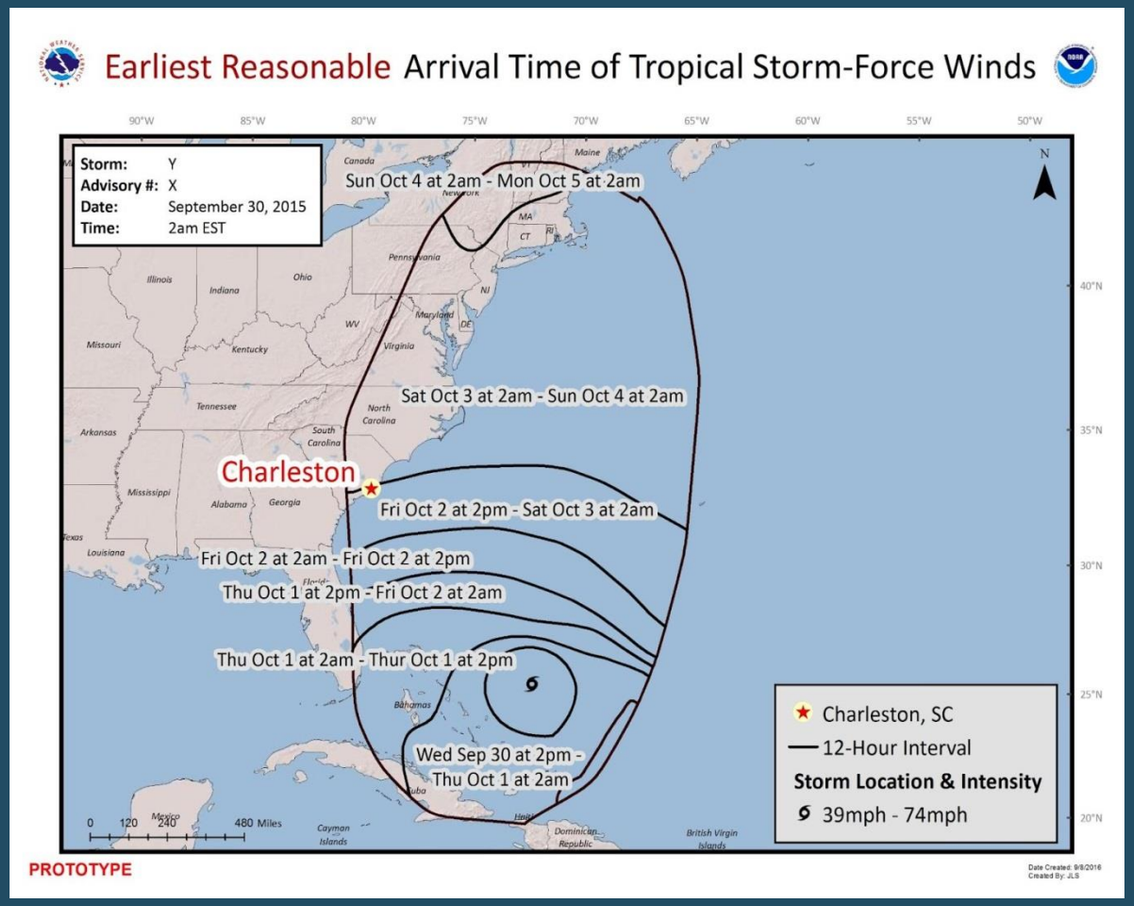
Questions About HLS/TCV/HTI Were Also Included

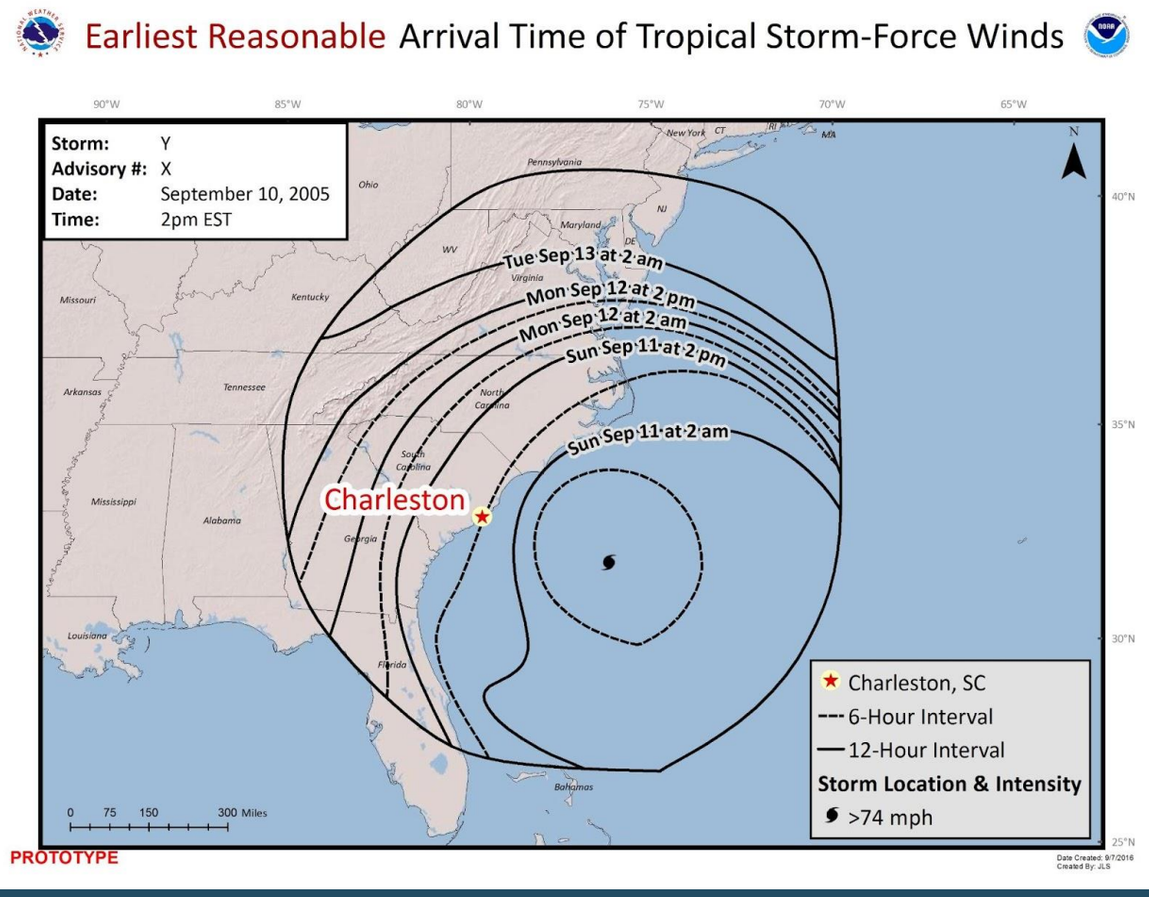
Preferred Probability Level for Maps Reported According to Map Example Used

Purpose	Saw Joaquin Map		Saw Ophelia Map	
	Internal Use	External Use	Internal Use	External Use
Earliest Reasonable Arrival Time	33%	**41%**	34%	**49%**
Most Likely Arrival Time	25%	30%	26%	37%
Both	**41%**	23%	**37%**	14%
Neither/Not Sure/No Preference	1%	5%	0%	0%

- General preference for Earliest Possible map, particularly for External Use
- Some interest in receiving both, particularly for Internal Use
- Those seeing Ophelia map were less likely to want both

Labeling of Times

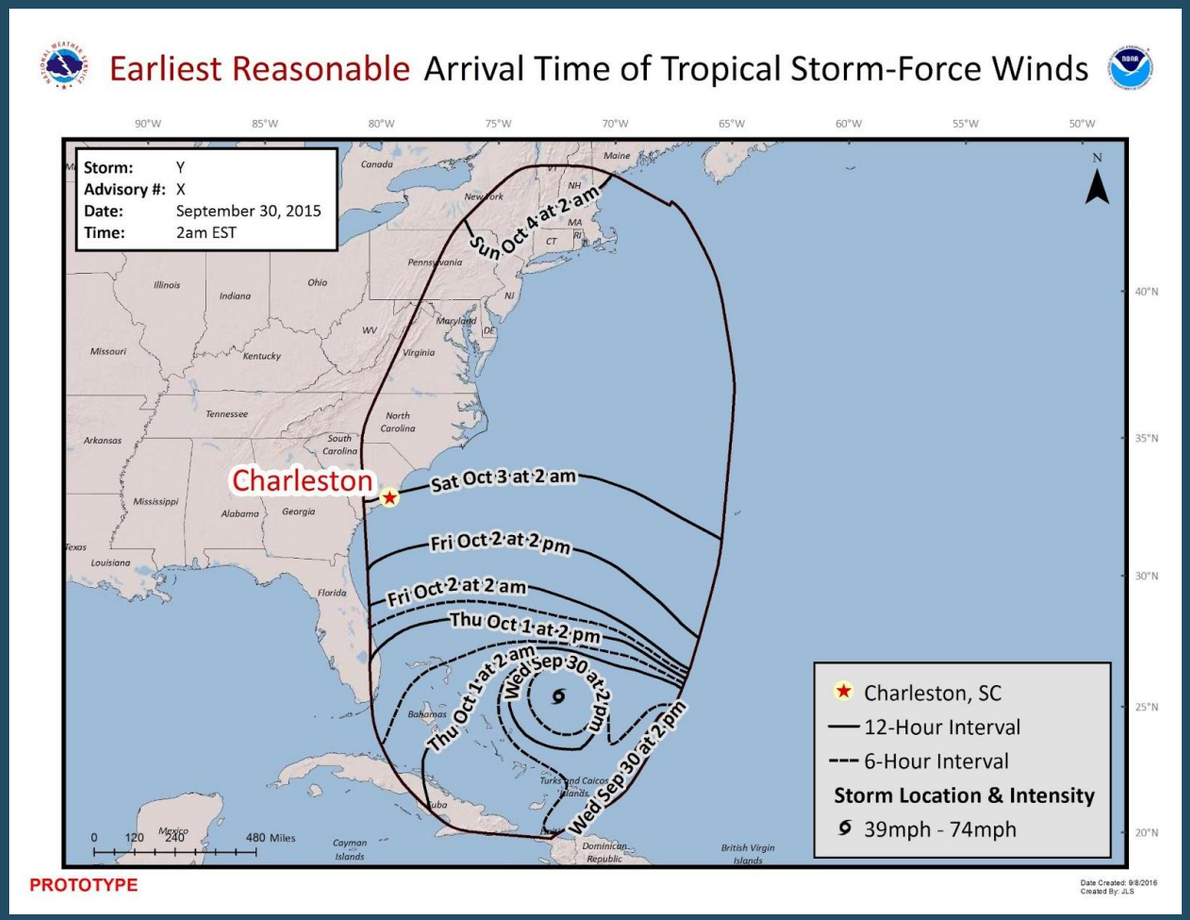


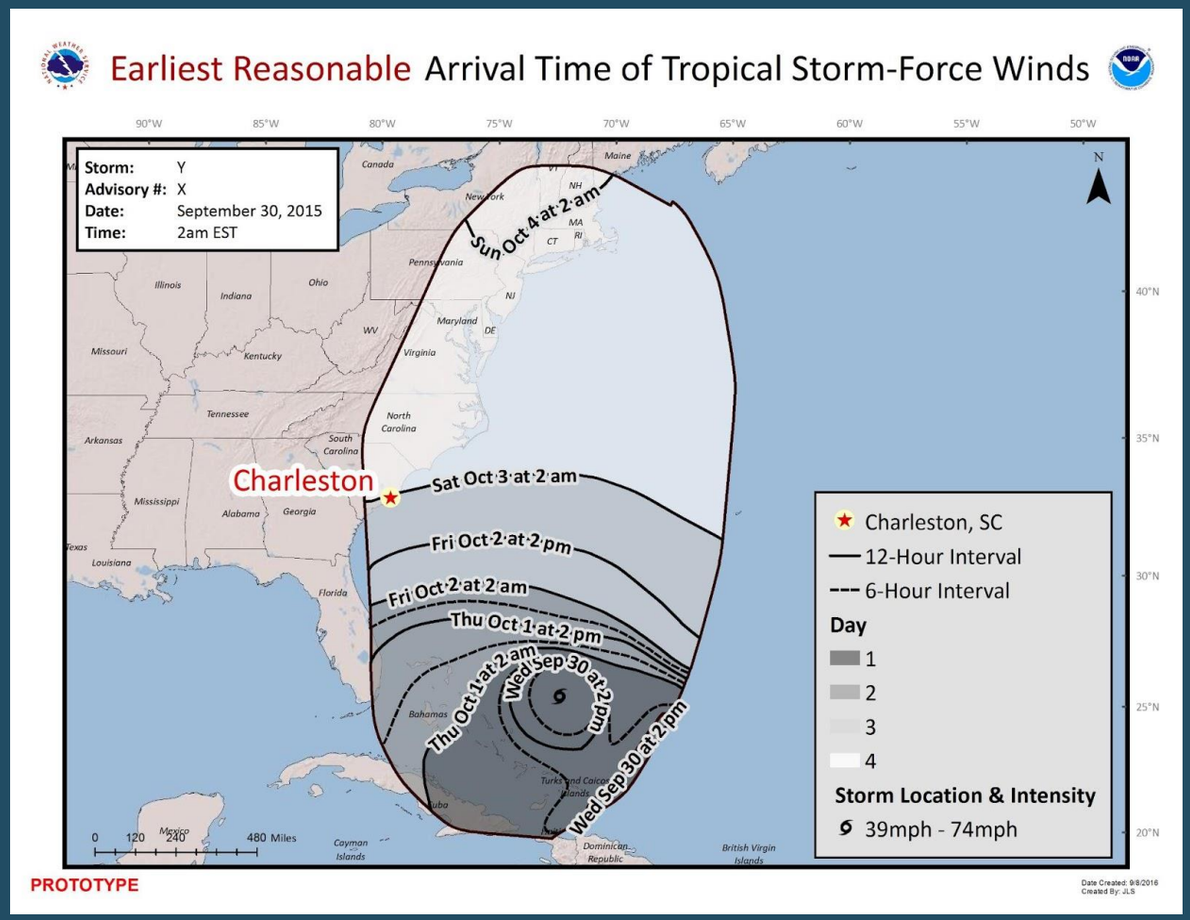


Preferred

- About 75% preferred use of specific times rather than general time frames
- Over 80% preferred placement of times on the borders rather than in the center of time segments
- No important differences related to which map they saw

Color Scheme





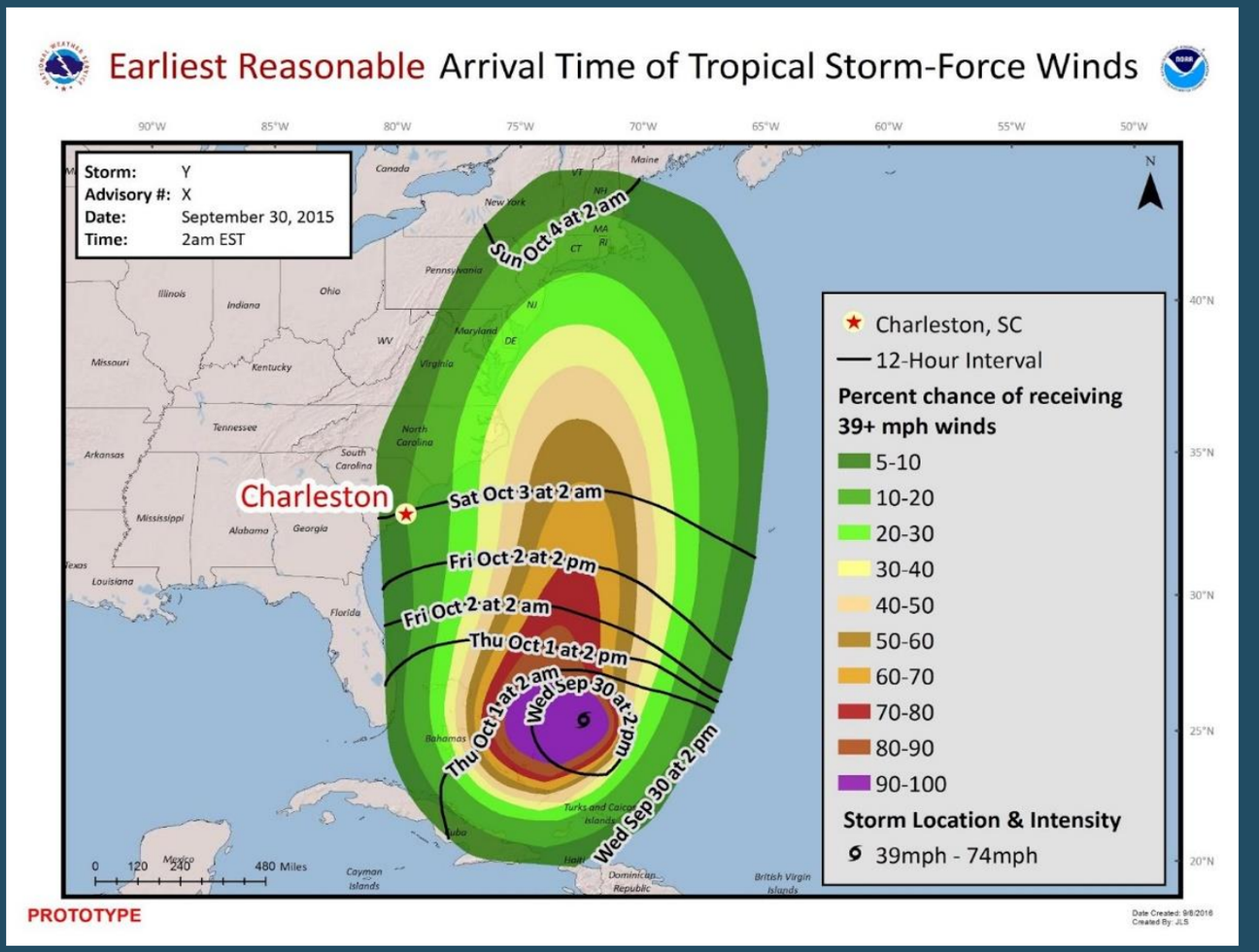
Preferred

- Slight majority preferred Gray over No Color
- Some interest in receiving both, particularly for Internal Use
- Most interpreted darker gray as depicting arrival time, but some thought it referred to potential intensity
- No important differences related to which map they saw

Combining Arrival Of Tropical Storm Force Winds Map With Other Forecast Data Maps:

- Wind Speed Probability
- Forecast Track

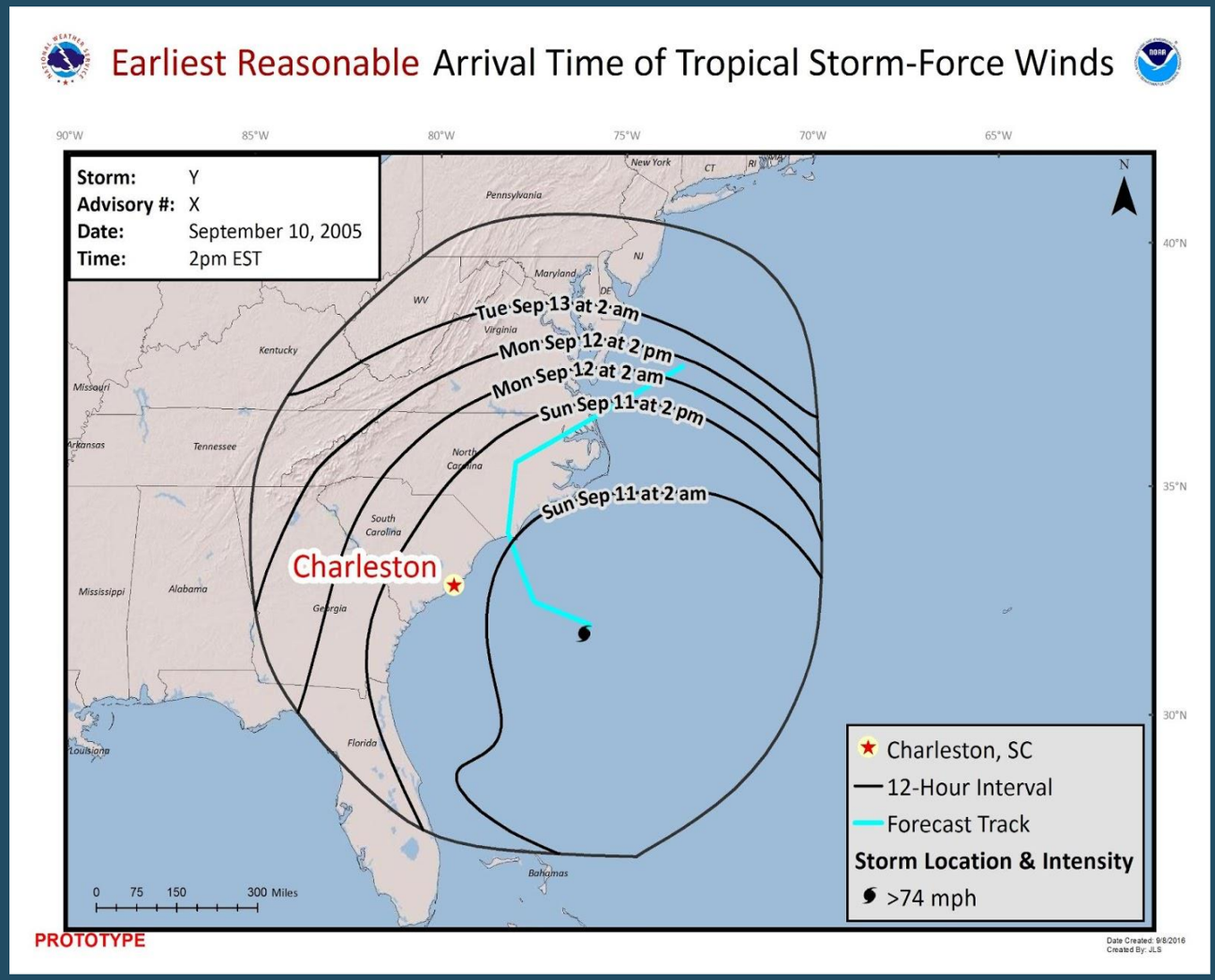
ATSFW and Wind Speed Probabilities



- Over 50% in both samples thought this map would be Very Useful
- Fewer in Ophelia sample answered Somewhat Useful (40% vs 21%)

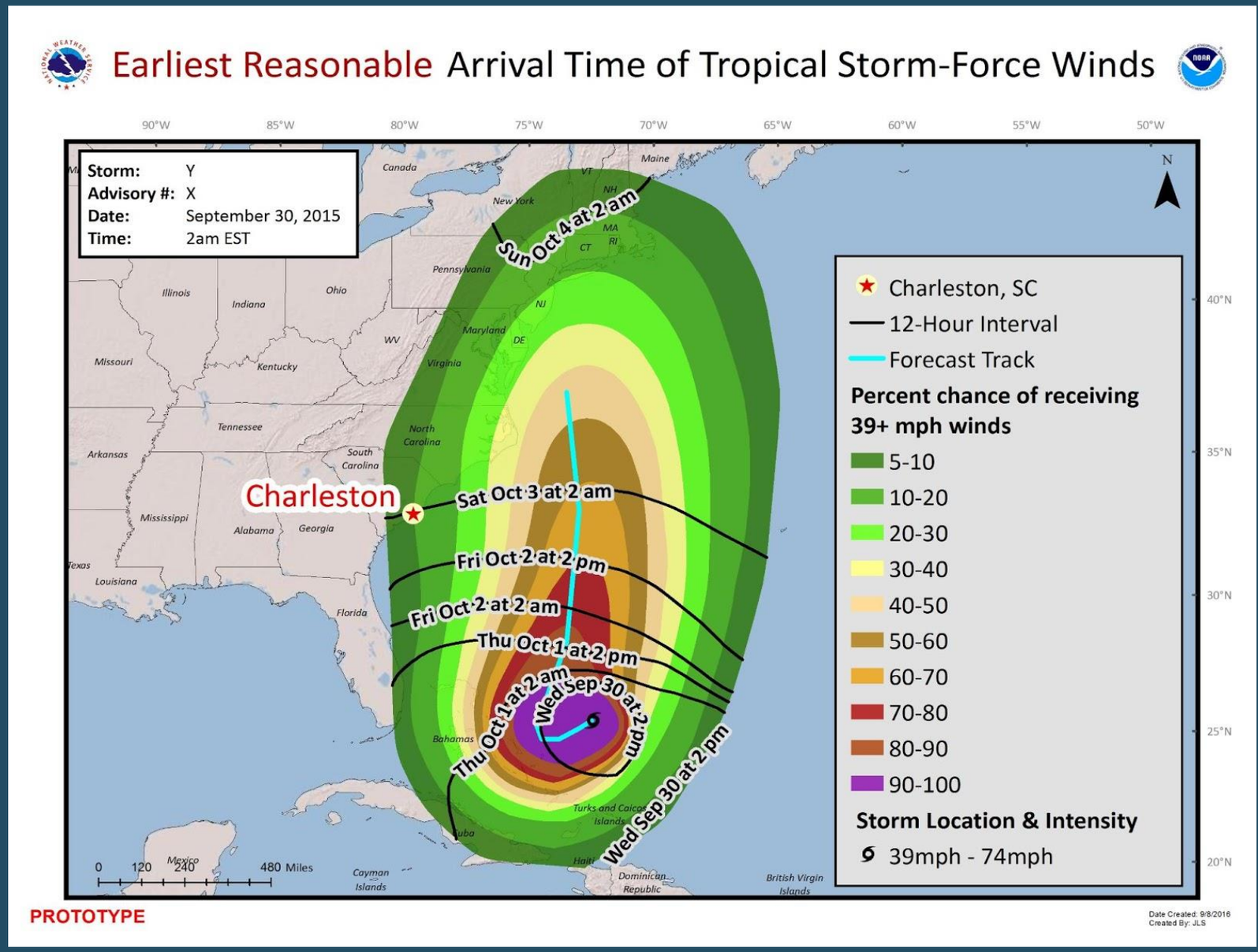
(Note: 89% say they Always or Frequently use the current Wind Speed Probabilities Map)

ATSFW and Storm Track



- Over 50% in both samples thought this map would be Very or Somewhat Useful
- Fewer in Joaquin sample choose Very Useful
- Opinion divided over showing track as a center line or as as center points

ATSFW, Wind Probabilities, and Track



- 85% of the Joaquin sample and 73% in the Ophelia sample rated this map as Very or Somewhat Useful
- Nearly unanimous support for having the ability to toggle

Summary of Findings

1. 91% think NHC should produce the map
2. 98% would always or frequently use for internal job responsibilities/decision-making and 88% would always or frequently use for external communication
3. Strong support for combining with Wind Speed Probabilities Map and Track Information
   - Findings were somewhat more mixed in Ophelia sample
   - Preference for ability to toggle information on and off
   - Concern that map could otherwise be too cluttered
4. Desire for more description on map

Phase 2:

1. Develop Online Survey to Test Prototypes with the Public.
2. Collect and Analyze Responses and Develop Recommendations
3. Final Presentation/Report on Findings and Recommendations

HURRICANE LOCAL PRODUCTS

PRELIMINARY SURVEY FINDINGS

Sample TCV

Use BOTH labels and ranges such as “Extreme: Greater than 110 mph”

Label threats and impacts 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.
```

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

Preferred Label for Second-to-Lowest Threat Category

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		Little to No storm surge flooding

Elevated	Slight	Low	Minor	No Preference, Not Sure, Other
35%	15%	25%	15%	10%

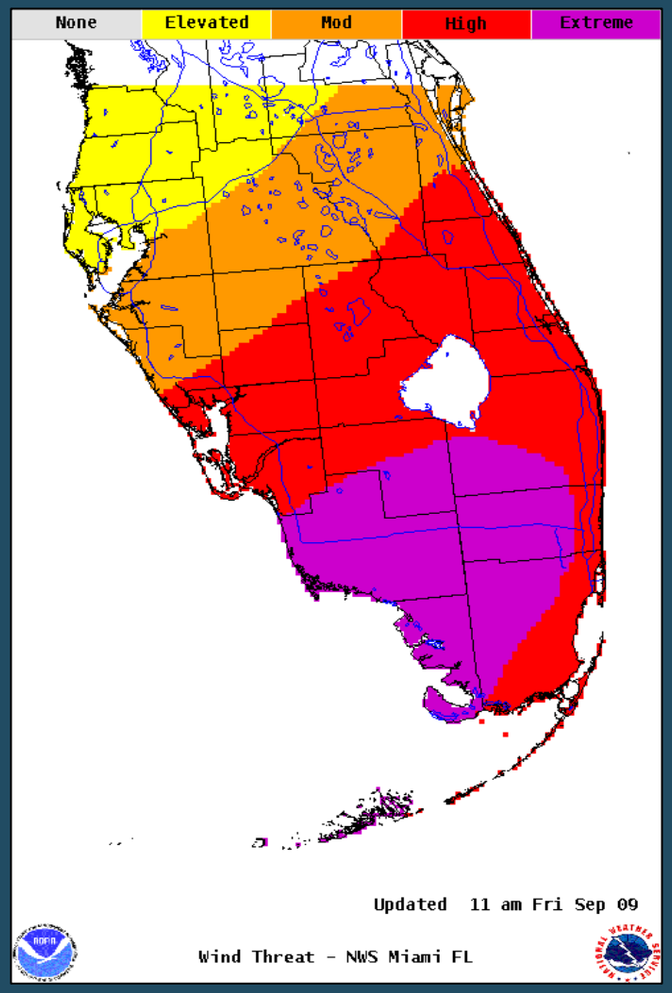
Preferred Label for Potential Impacts from High Wind Threat

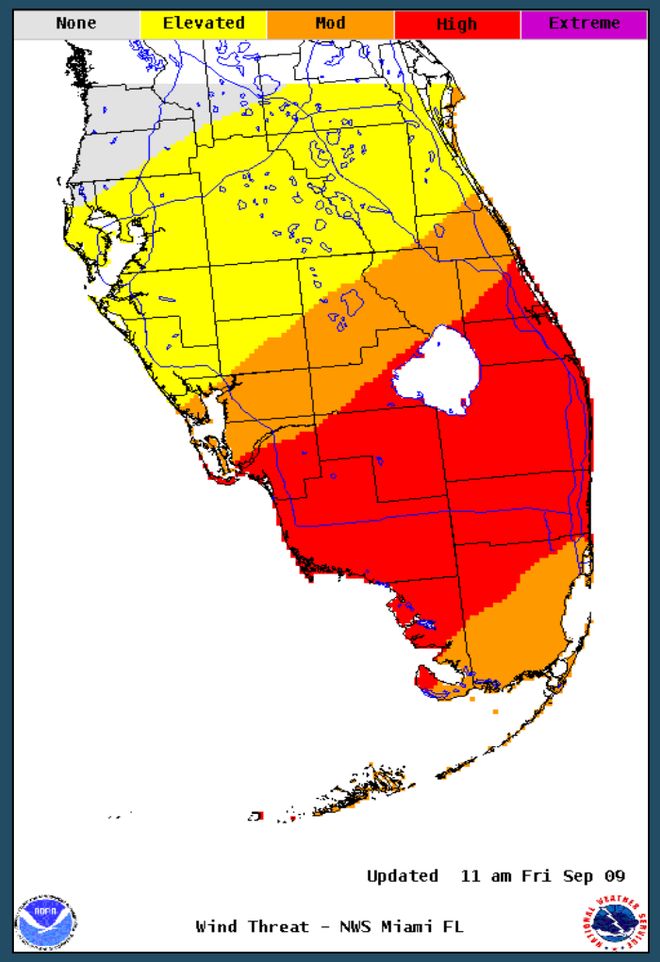
Significant	Extensive	Considerable	No Preference, Not Sure, Other
43%	29%	17%	11%

Preferred Label for Potential Impacts from Moderate Wind Threat

Significant	Extensive	Considerable	No Preference, Not Sure, Other
31%	9%	**36%**	24%

Preferred Probability for Depicting Wind Threat





Purpose	Reasonable Worst-Case Scenario	Most Likely Scenario	Both
For Internal Decision-Making /Job Responsibilities	17%	26%	**53%**
For External Communication	25%	**37%**	33%

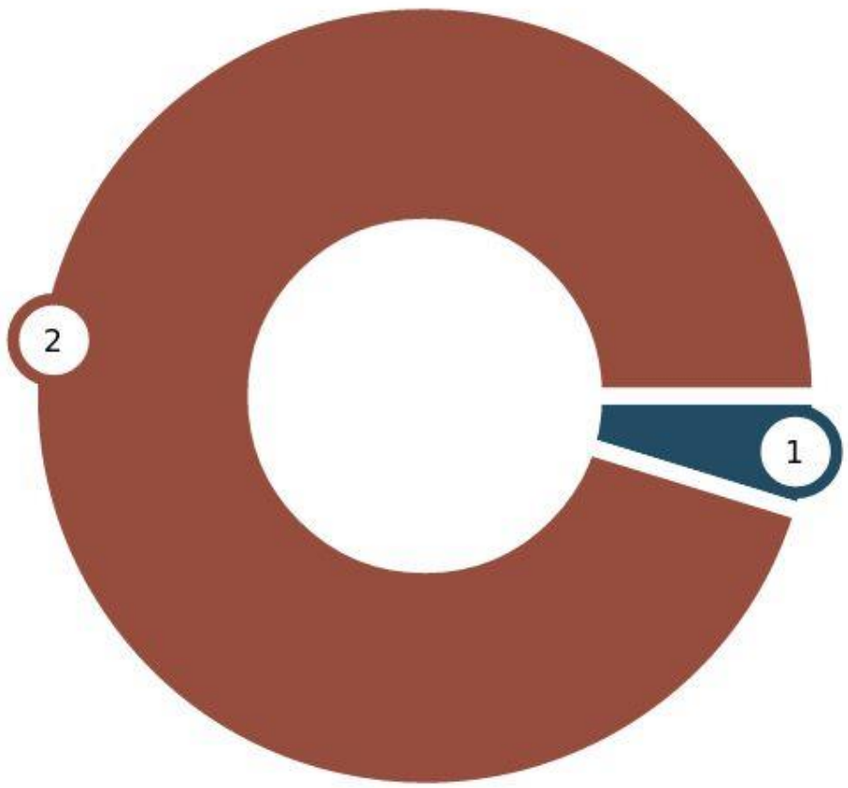
HURRICANE THREATS AND IMPACTS

2016 USABILITY STUDY

Liked that it looked like a commercial site and amalgamated information

But found the site hard to use in its current form

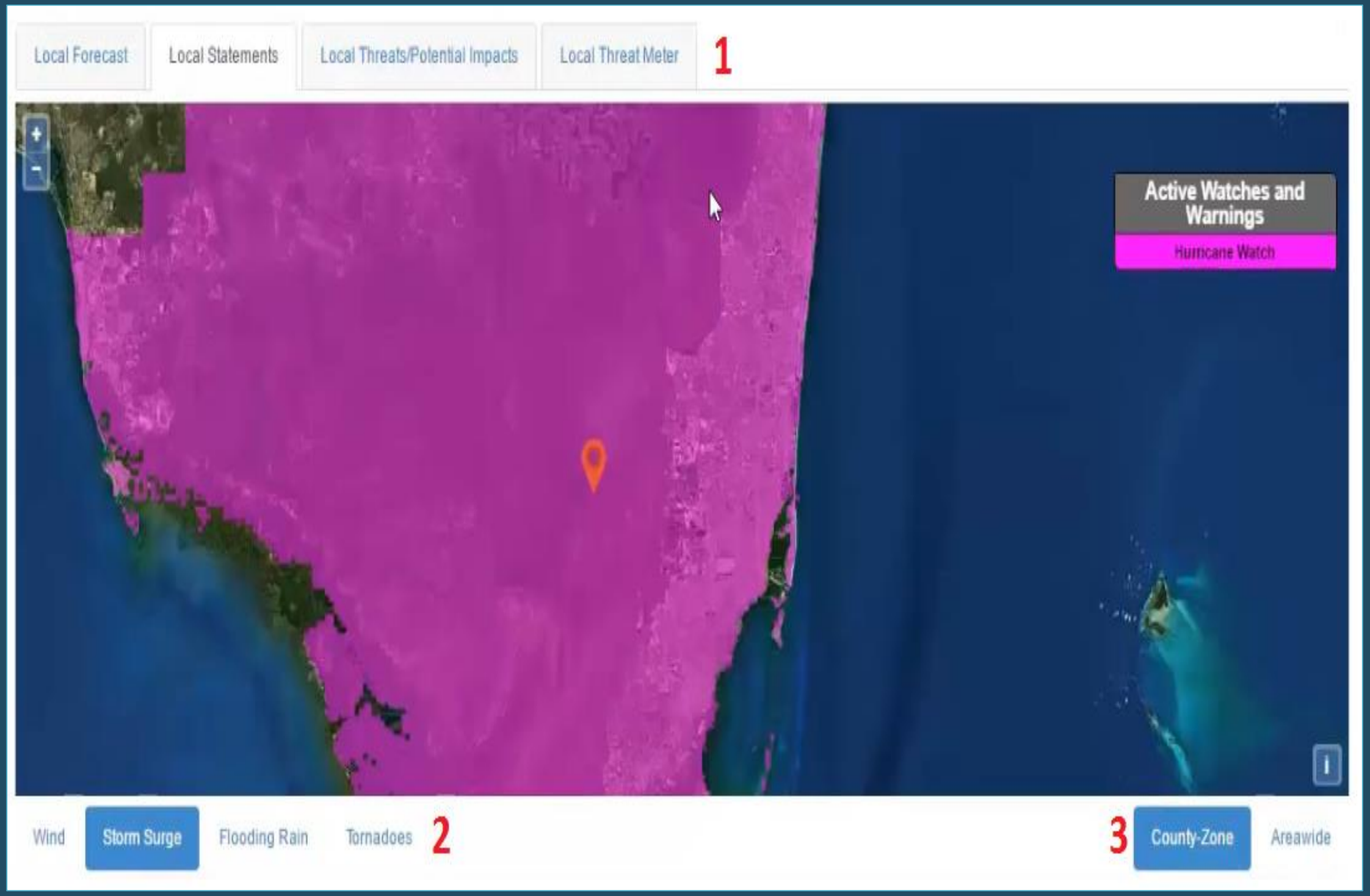
Task Completion



1	Completed all tasks	5%
2	Failed ≥ 1 task	95%

The physical map was particularly problematic

Too Many Levels of Navigation



Recommendations

1. Adopt an agile workflow approach
2. Implement ongoing user testing
3. Rethink the mashup between a visual interface and a text product

CONCLUDING THOUGHTS

APPRECIATE MORE TOOLS

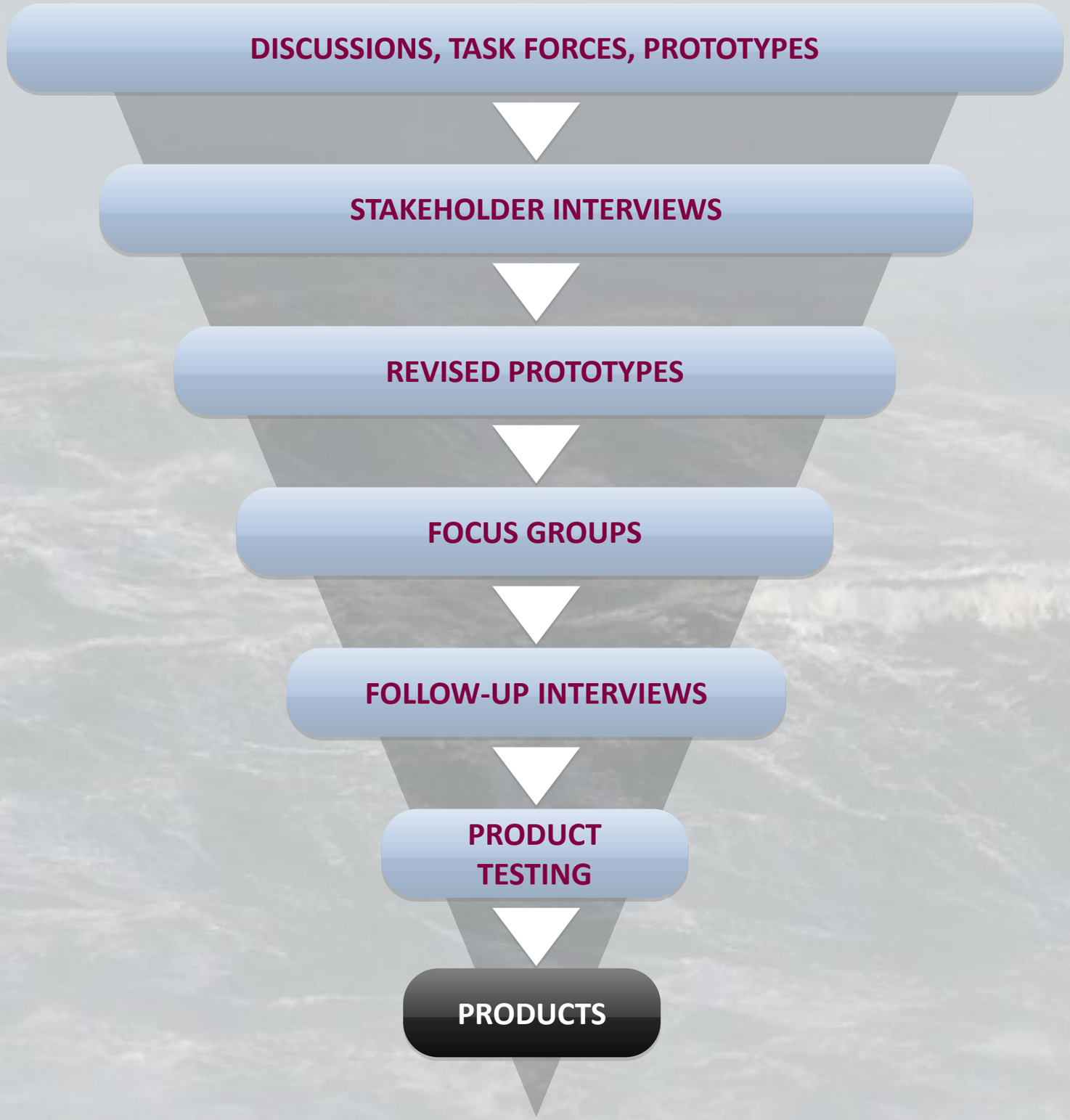
TAKES TIME TO BUILD TRUST

IN NEW PRODUCTS

WANT HIGH-QUALITY DESIGN

WANT MORE INTERPRETATION

THE PROCESS


DISCUSSIONS, TASK FORCES, PROTOTYPES
STAKEHOLDER INTERVIEWS
REVISED PROTOTYPES
FOCUS GROUPS
FOLLOW-UP INTERVIEWS
PRODUCT TESTING
PRODUCTS

Way Ahead

1. Further analysis of interpretation questions for ATSFW/HLS/TCV survey
2. Further refinement and testing of SS and ATSFW maps
3. Determine best approach for communicating ET storm surge threat for transitional storms
4. Rethink the HTI website and design it using an agile workflow approach and ongoing user testing
5. Continued and more in-depth analysis of social media during future events

HFIP Societal Impacts &
HFIP Socio-Economic Working Group

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- **Ed Rappaport (NHC)**
- Jamie Rhome (NHC)
- Robbie Berg (NHC)
- Lance Wood – (NWS/SR)
- Hendricus Lulofs – (NWS/ER)
- Matthew Green – (FEMA)
- Tiffany Hersey – (FEMA)
- William Hackett (CT EM)
- Christopher Moore (TX EM)
- Mike Sprayberry (NC EM)
- Chuck Lanza (FL EM)
- Craig Setzer (Media)
- Wes Hohenstein (Media)
- Karen Townsend (Private Sector - Sea Island Software)
- Hugh Gladwin (Anthropologist – FIU)

THANK YOU