Unit 4:
Making Better Decisions

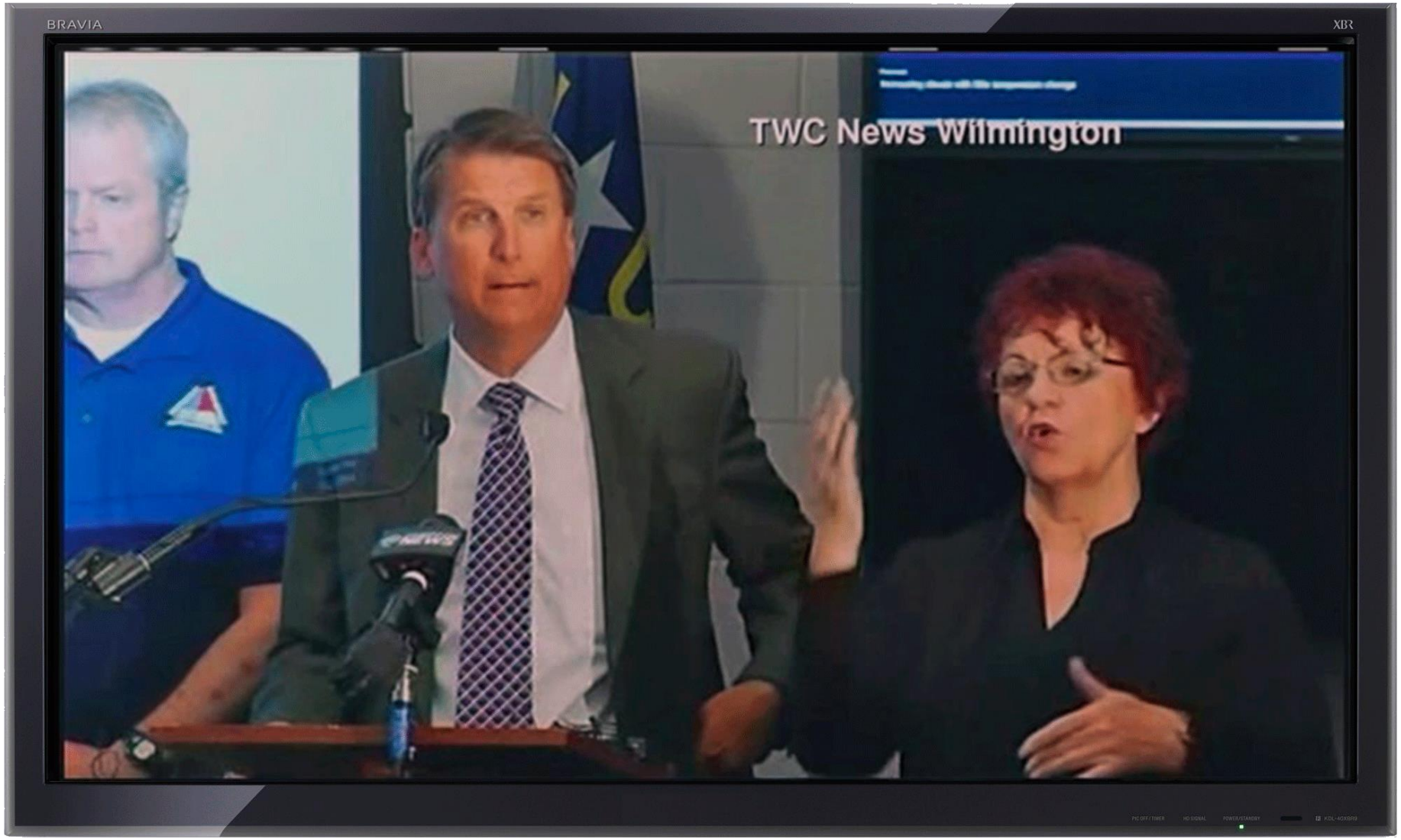
Unit Objectives

At the end of this unit, participants will be able to:

- Identify the components of the Hurricane Evacuation Study (HES)
- Explain clearance times and their use
- Identify the capabilities of HURREVAC

Review

What Are Best Practices?



It’s Not the Plan. It’s the Process.

Step 1

- Form a Collaborative Planning Team

Step 2

- Understand the Situation

Step 3

- Determine Goals and Objectives

Step 4

- Plan Development

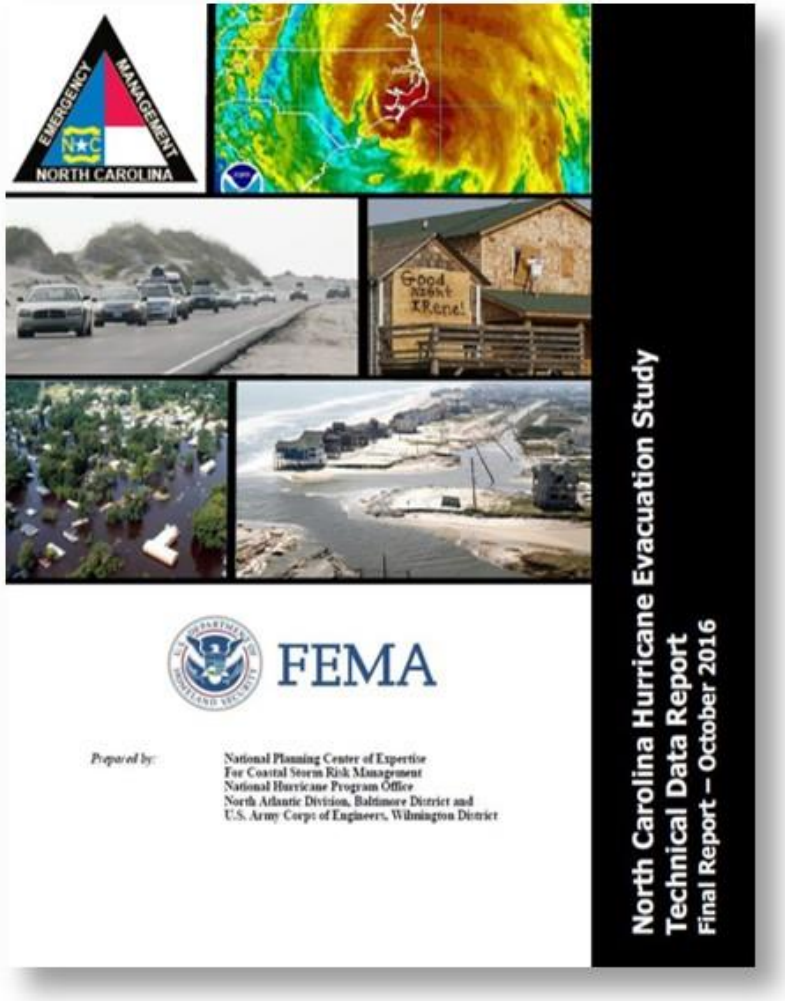
Step 5

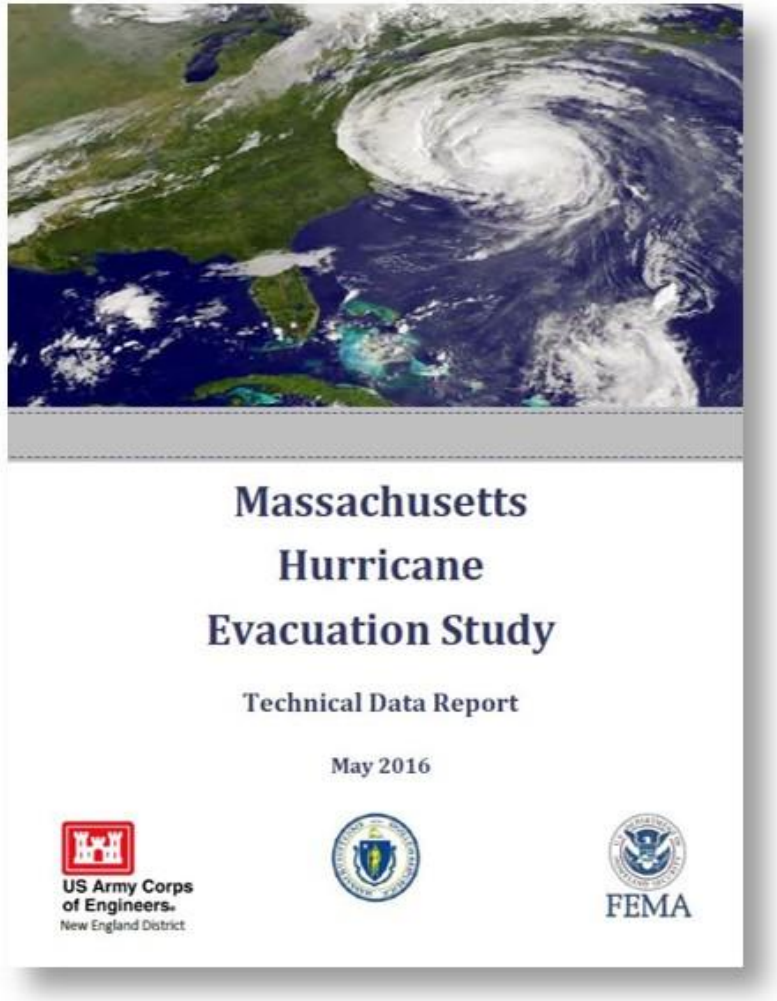
- Plan Preparation, Review & Approval

Step 6

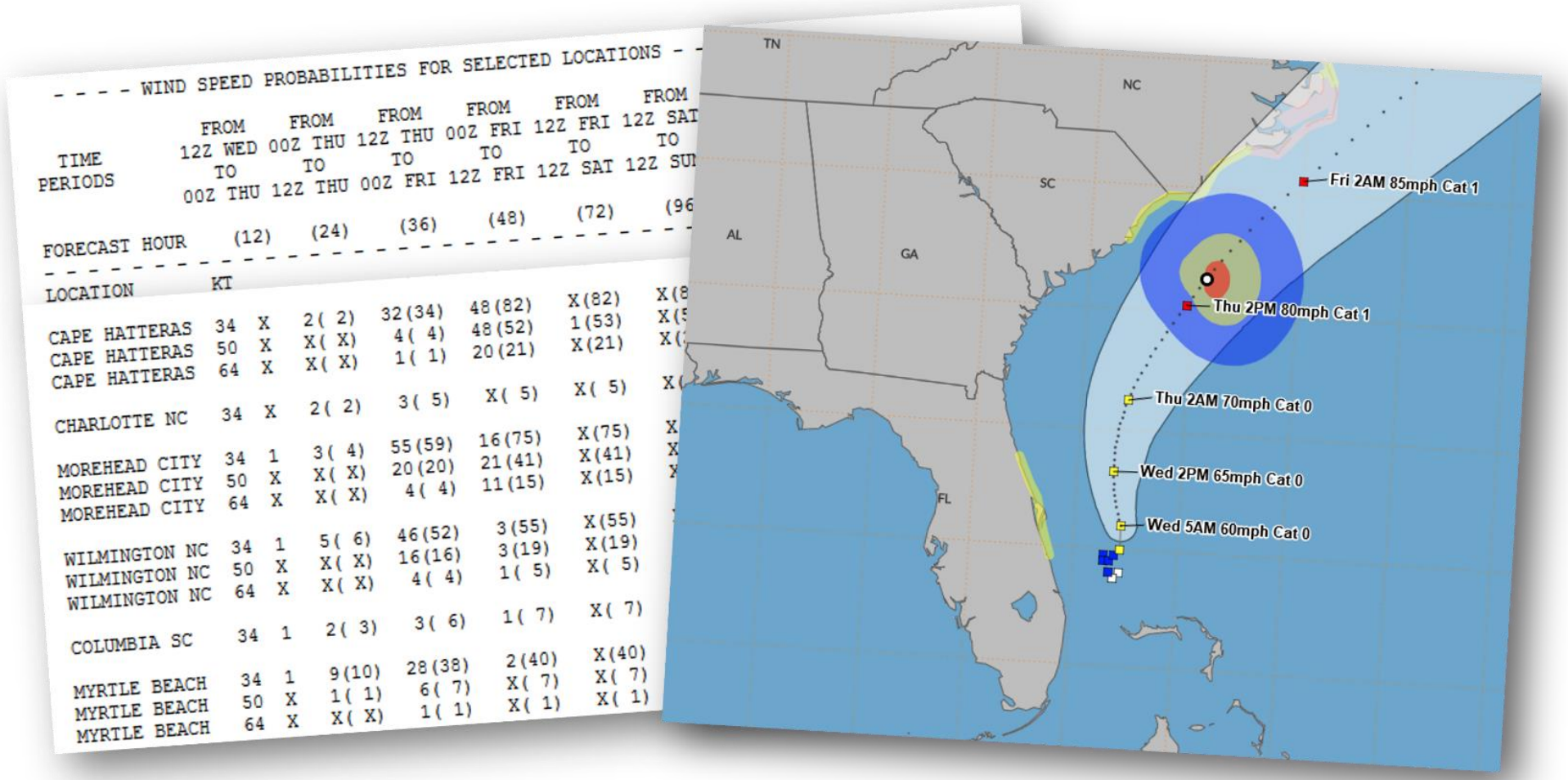
- Plan Implementation & Maintenance

Better Information – HES





Right Tools, Time and Reason



- - - - WIND SPEED PROBABILITIES FOR SELECTED LOCATIONS - -

TIME PERIODS		FROM 12Z WED TO 00Z THU	FROM 00Z THU TO 12Z THU	FROM 12Z THU TO 00Z FRI	FROM 00Z FRI TO 12Z FRI	FROM 12Z FRI TO 12Z SAT	FROM 12Z SAT TO 12Z SU
FORECAST HOUR		(12)	(24)	(36)	(48)	(72)	(96
LOCATION	KT						
CAPE HATTERAS	34	X	2(2)	32(34)	48(82)	X(82)	X(8
CAPE HATTERAS	50	X	X(X)	4(4)	48(52)	1(53)	X(5
CAPE HATTERAS	64	X	X(X)	1(1)	20(21)	X(21)	X(
CHARLOTTE NC	34	X	2(2)	3(5)	X(5)	X(5)	X
MOREHEAD CITY	34	1	3(4)	55(59)	16(75)	X(75)	X
MOREHEAD CITY	50	X	X(X)	20(20)	21(41)	X(41)	X
MOREHEAD CITY	64	X	X(X)	4(4)	11(15)	X(15)	X
WILMINGTON NC	34	1	5(6)	46(52)	3(55)	X(55)	
WILMINGTON NC	50	X	X(X)	16(16)	3(19)	X(19)	
WILMINGTON NC	64	X	X(X)	4(4)	1(5)	X(5)	
COLUMBIA SC	34	1	2(3)	3(6)	1(7)	X(7)	
MYRTLE BEACH	34	1	9(10)	28(38)	2(40)	X(40)	
MYRTLE BEACH	50	X	1(1)	6(7)	X(7)	X(7)	
MYRTLE BEACH	64	X	X(X)	1(1)	X(1)	X(1)	

The Process: Study. Plan. Execute.

FEMA

The Process: Study

What Is Useful Information?

FEMA

" We're not that much smarter than we used to be, even though we have *much more* information.

...that means the real skill now is learning how to pick out the *useful* information..."

The Signal and the Noise
- Nate Silver

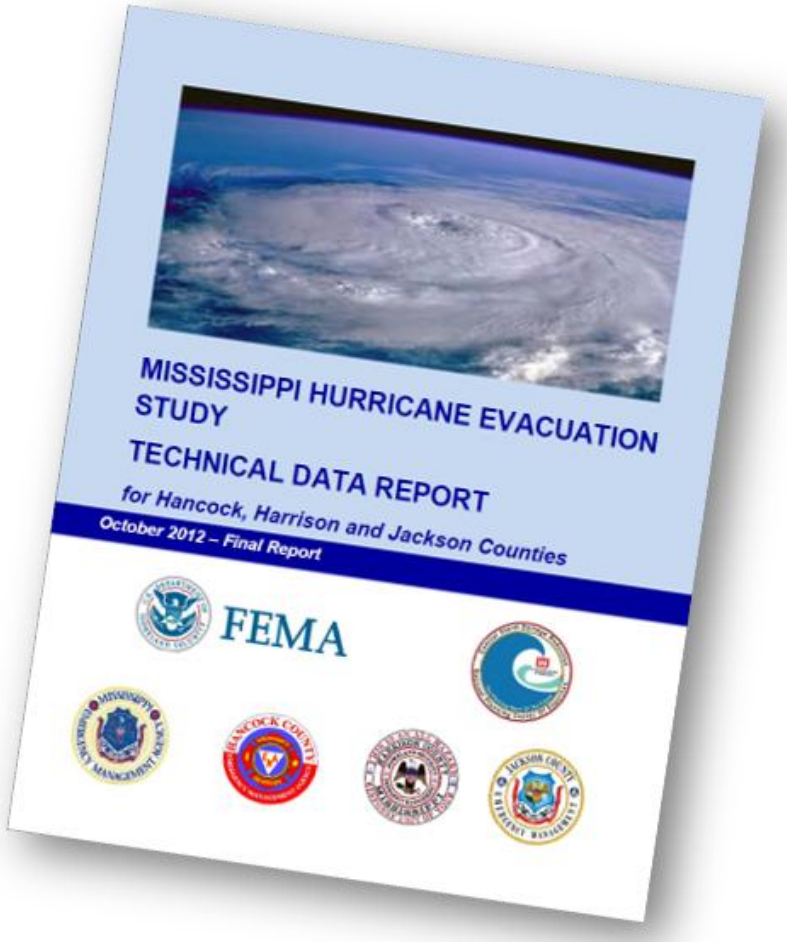
How Do the Hazards Affect You?

RESOURCES

- **Hurricane Evacuation Study (HES)**
- **THIRA** *Threat and Hazard Identification and Risk Assessment*
- Flood Risk Maps
- HAZUS Modeling
- Historical incidents
- **Local Knowledge**

Hurricane Evacuation Study Components

- **Hazard Analysis**
  What will be wet and what stays dry?
- **Vulnerability Analysis**
  Who/what will be affected in your community?
- **Behavioral Analysis**
  What is the Public thinking?
- **Shelter Analysis**
  What are your shelter needs?
- **Transportation Analysis**
  Where is traffic going to back up?



Better Information – Hazard

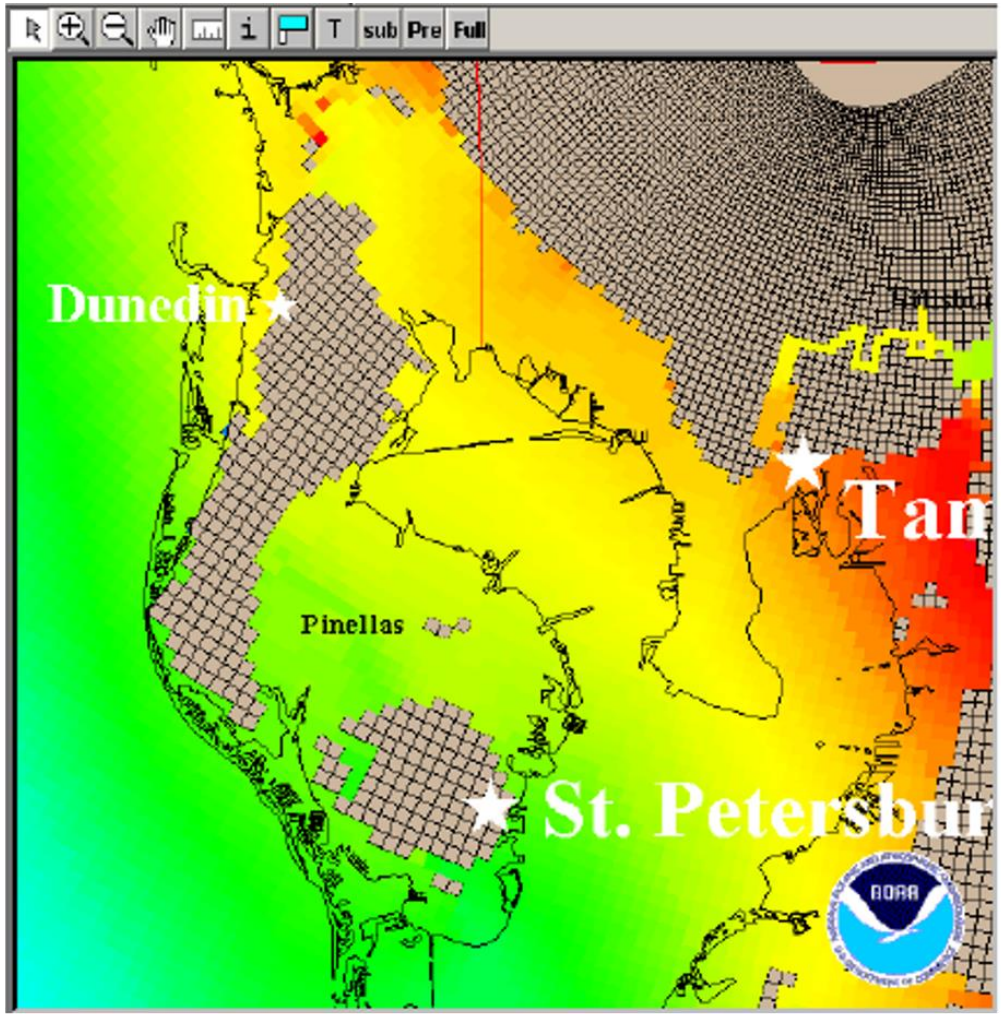
FAQs

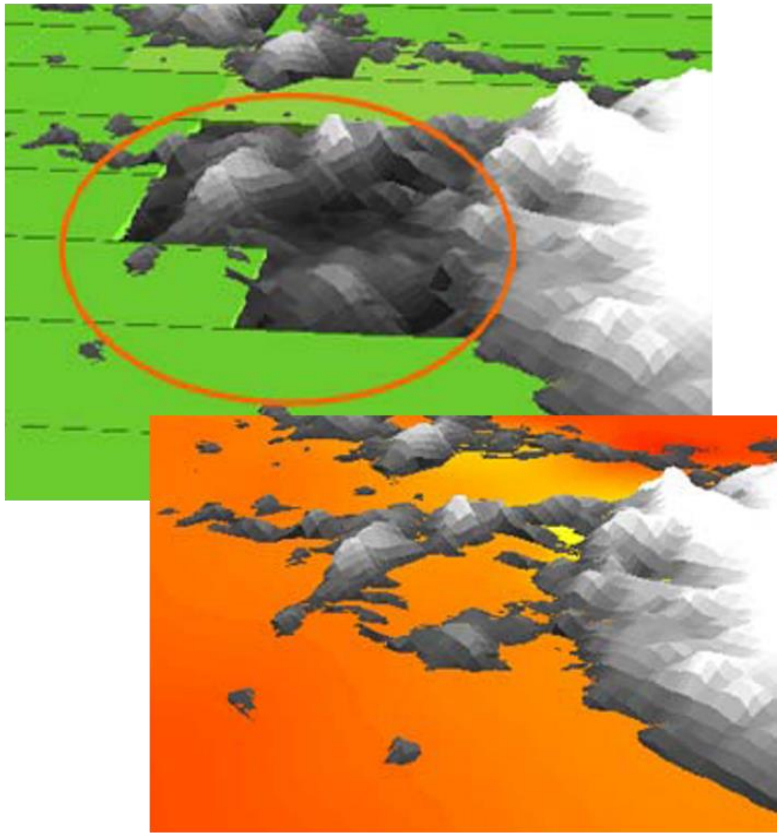
- What will be wet? Dry?
- How high will the water get?
- How far inland?

- Hazard Analysis

SLOSH. GIS Mapping. Surge Maps.

FEMA

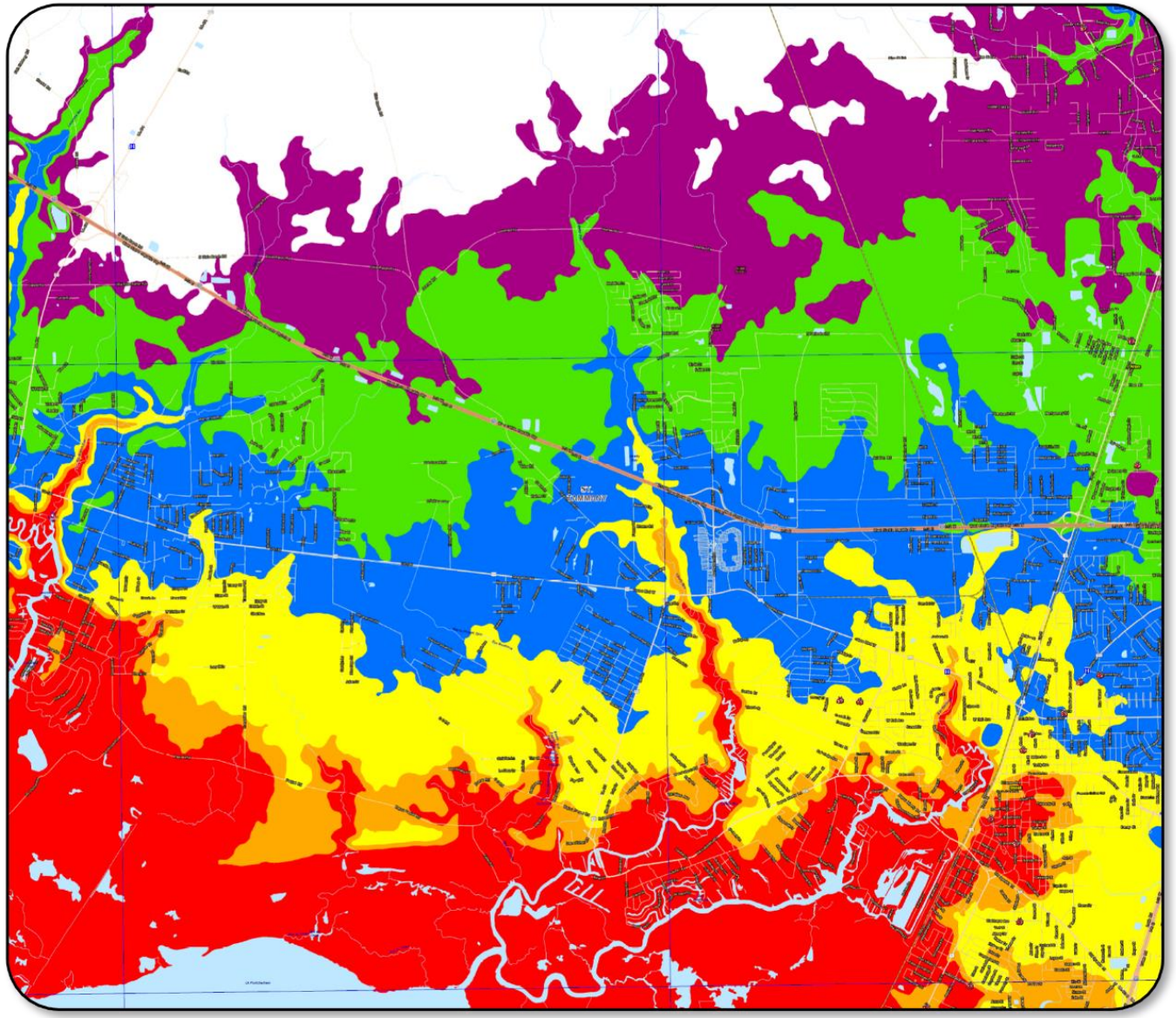




SLOSH Output by category, overlaid on a Digital Elevation Model

What's Wet and What's Dry?

FEMA



AREAS OF POSSIBLE FLOODING

- Tropical Storms and Category 1, 2, 3, 4, and 5 Hurricanes
- Category 1, 2, 3, 4, and 5 Hurricanes
- Category 2, 3, 4, and 5 Hurricanes
- Category 3, 4, and 5 Hurricanes
- Category 4 and 5 Hurricanes
- Category 5 Hurricanes

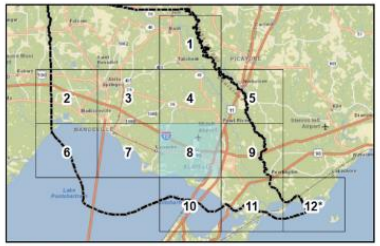
PANEL 8

NATIONAL HURRICANE PROGRAM
STORM TIDE FLOOD RISK AREAS

MAP ATLAS FOR:
St. Tammany Parish, Louisiana

JUNE 2015

PANEL LOCATOR DIAGRAM

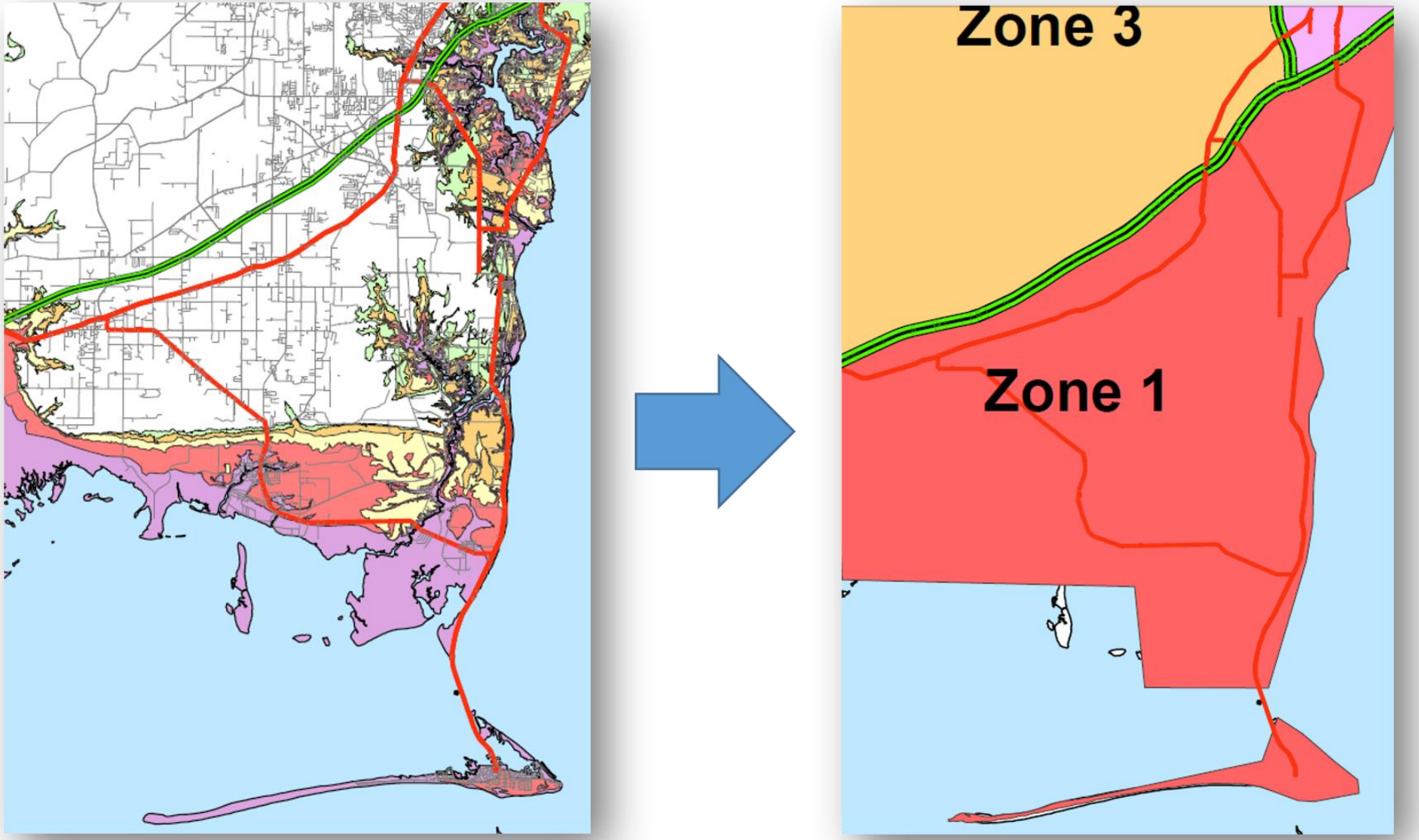


*PANEL NOT PRINTED

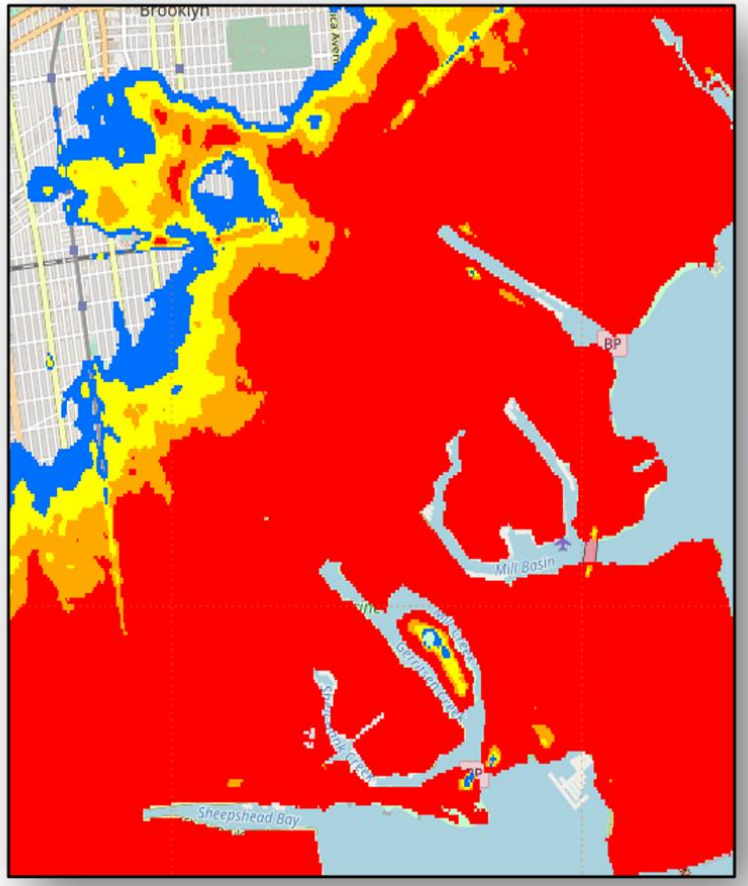
FEMA

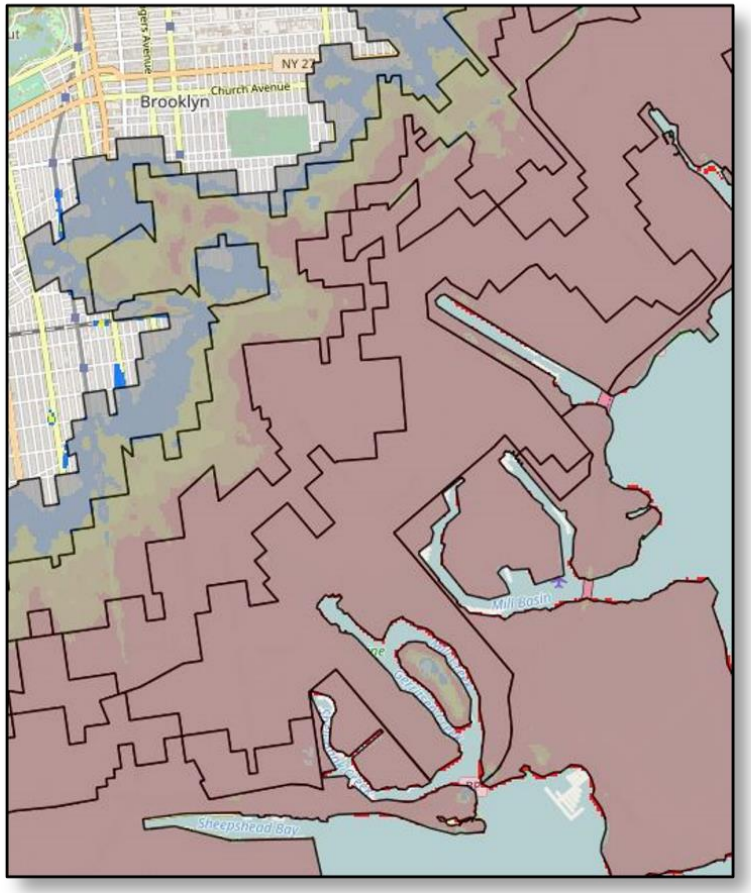
NOAA

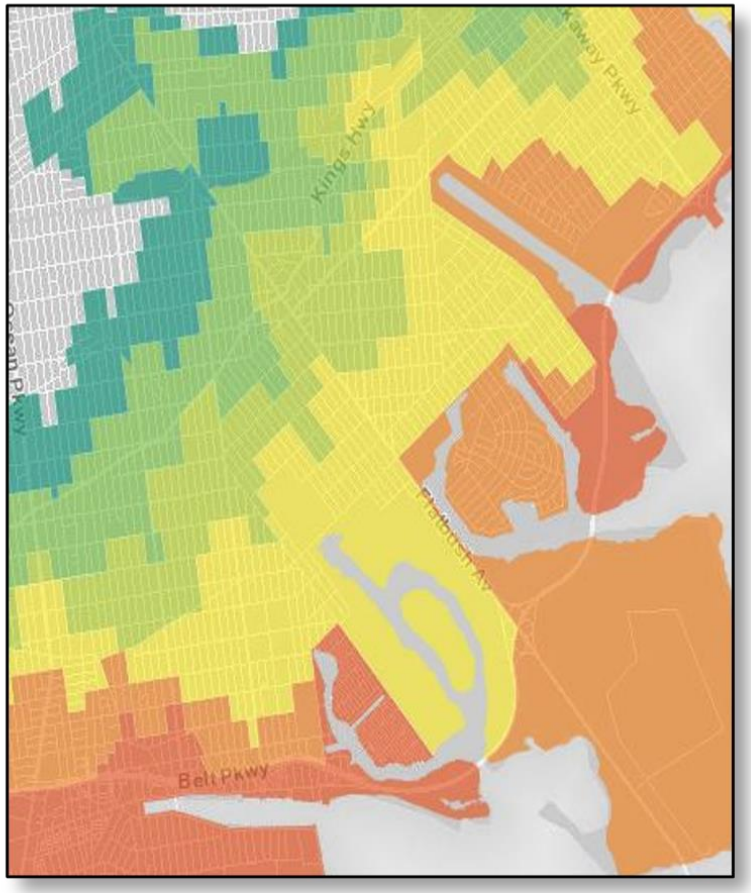
Building Evacuation Zones



Building Evacuation Zones with MOMs







Zone 1 Zone 2 Zone 3
Zone 4 Zone 5 Zone 6

NYC Surge Heights by Bearing (MEOWs)

FEMA

	WNW	NW	NNW	N	NNE	NE
Category 1	12.6	12.1	10.7	8.8	6.6	5
Category 2	20.9	20	20.1	16.5	11.4	8.1
Category 3	26.6	27.6	27.4	23.4	17	11.3
Category 4	32.4	33.9	33.9	30.6	21.7	14.6

NYC Evacuation Zones

FEMA

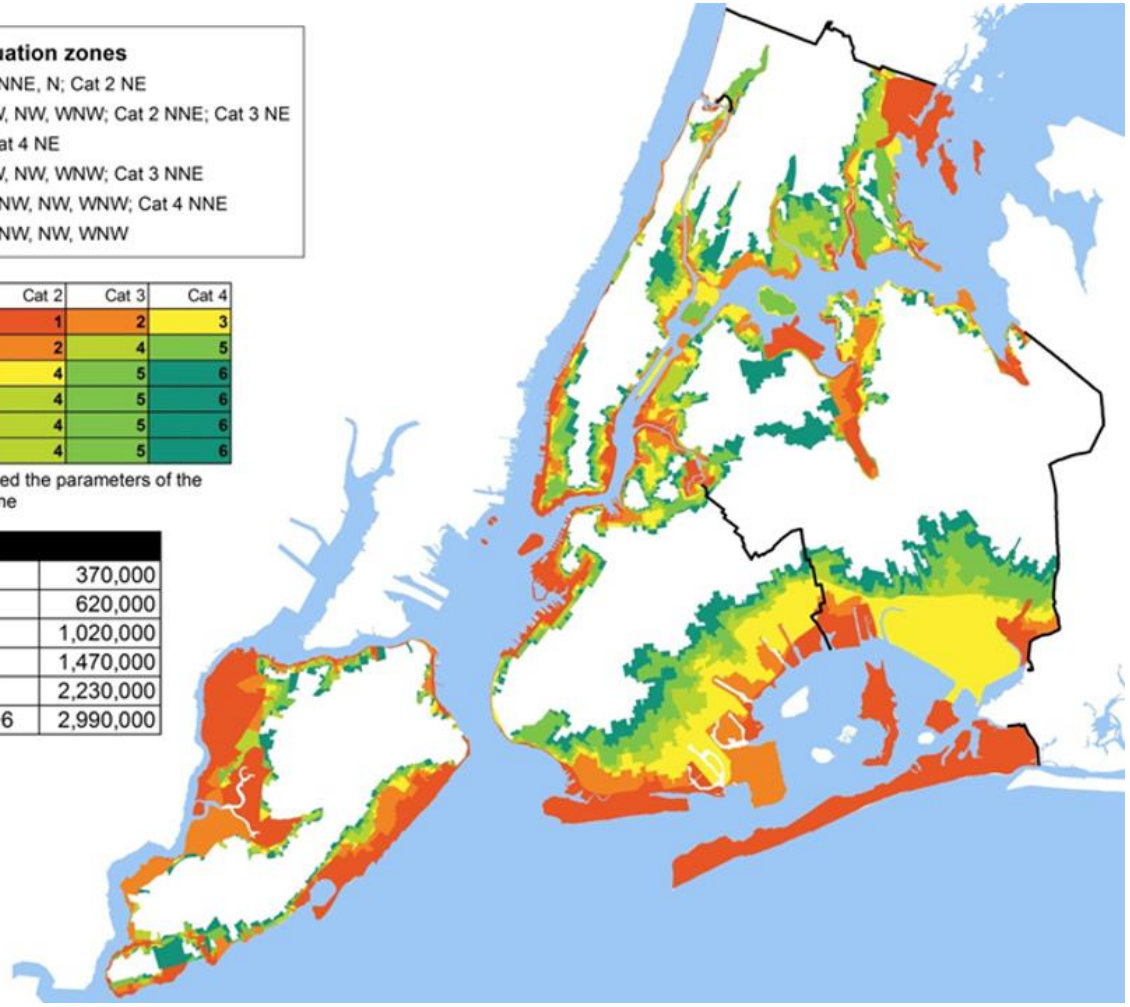
Hurricane evacuation zones

- 1 - Cat 1 NE, NNE, N; Cat 2 NE
- 2 - Cat 1 NNW, NW, WNW; Cat 2 NNE; Cat 3 NE
- 3 - Cat 2 N; Cat 4 NE
- 4 - Cat 2 NNW, NW, WNW; Cat 3 NNE
- 5 - Cat 3 N, NNW, NW, WNW; Cat 4 NNE
- 6 - Cat 4 N, NNW, NW, WNW

	Cat 1	Cat 2	Cat 3	Cat 4
NE	1	1	2	3
NNE	1	2	4	5
N	1	4	5	6
NNW	2	4	5	6
NW	2	4	5	6
WNW	2	4	5	6

* For storms that exceed the parameters of the model, go up one zone

2010 Population	
Zone 1	370,000
Zone 1+2	620,000
Zone 1+2+3	1,020,000
Zone 1+2+3+4	1,470,000
Zone 1+2+3+4+5	2,230,000
Zone 1+2+3+4+5+6	2,990,000



Better Information – Vulnerability

FAQs

- Who will be affected?
- What critical facilities are at risk?

- Vulnerability Analysis

Who's at Risk from Storm Surge?

FEMA

County Surge Area	Permanent Residential Structures	Non-Permanent Residential Structures	Total Residential Structures	Commercial Structures	Industrial Structures	Tourist Structures
Category 1	2,281	0	2,281	89	0	1
Category 2	5,007	253	5,330	209	4	2
Category 3	9,059	338	9,397	520	7	9
Category 4	9,480	380	9,860	525	7	9
Category 5	10,020	437	10,457	544	7	9
Non-Surge Area	5,518	682	6,200	99	0	1

Hancock County, MS

Table 3-7: Vulnerable Structures by Storm Surge Area
Mississippi Hurricane Evacuation Study – Technical Data Report – 2012

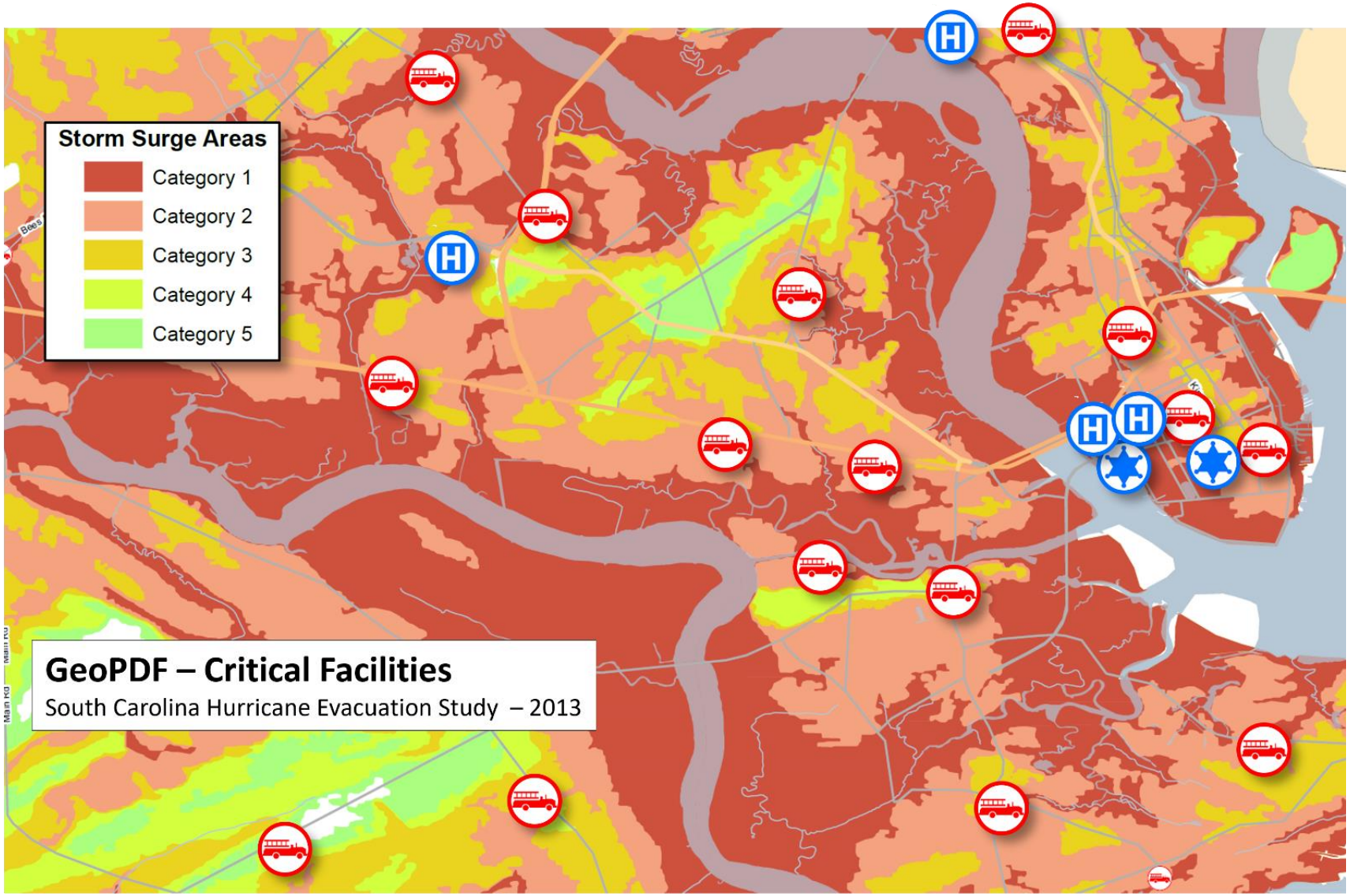
What Facilities Are at Risk?

Facility Type	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5	None
Casino	2	-	-	-	-	-
Dam	-	-	-	3	-	19
EOC	-	-	-	-	1	-
Fire	3	2	4	1	1	4
Hazmat	-	4	-	-	-	1
Hospital	-	-	1	-	-	-
Hotels	2	2	5	-	-	1
Police	-	-	4	-	-	-
School	1	3	5	1	-	1
Senior Center	-	-	1	-	-	-
Shelter	-	-	-	-	-	5
TOTAL	7	12	25	6	3	32

Hancock County, MS

Table 3-9: Critical Facilities Summary Table
Mississippi Hurricane Evacuation Study – Technical Data Report – 2012

What Facilities Are at Risk (GIS)?



Better Information – Behavior

FAQs

- Will the Public evacuate?
- Where will they go? How? When?
- Do they understand the threat?

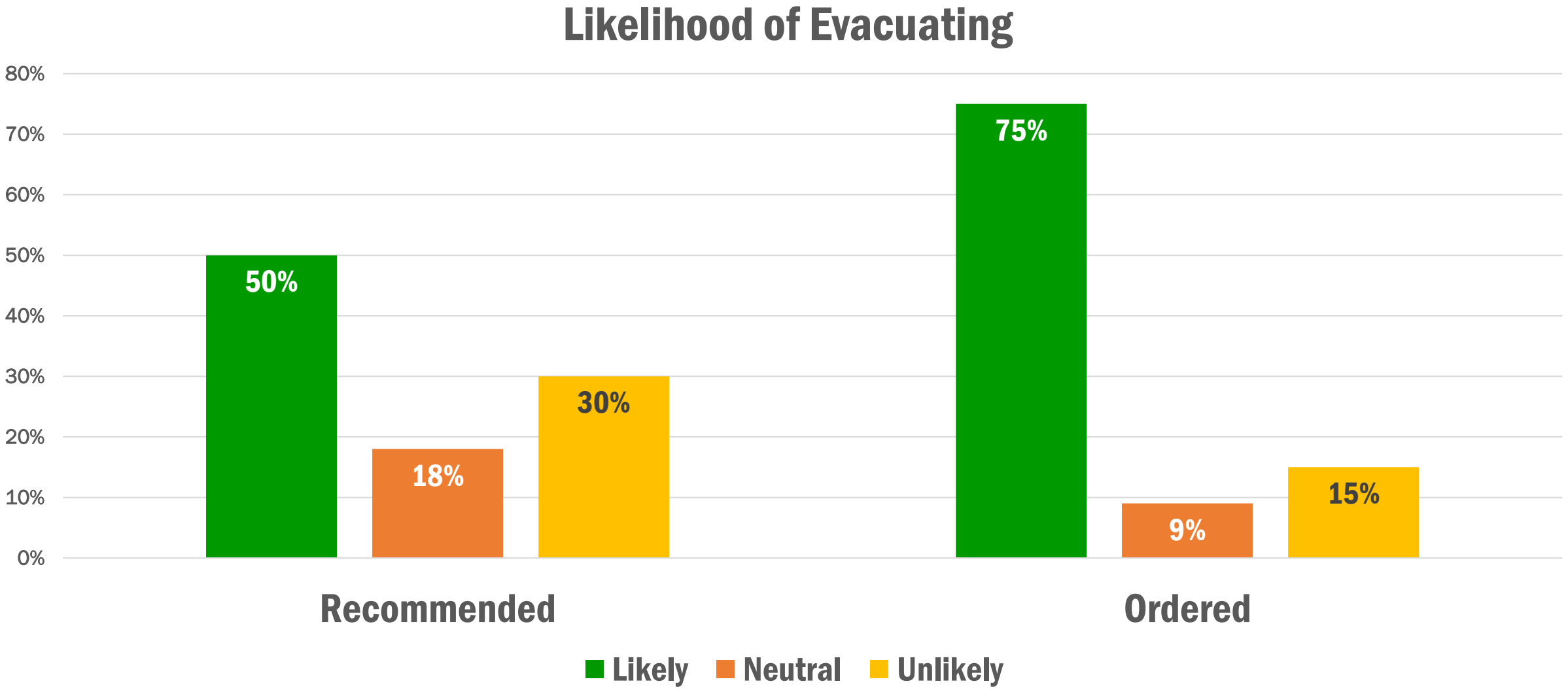
- Behavioral Analysis

What Are People Thinking?

SURVEY RESULTS

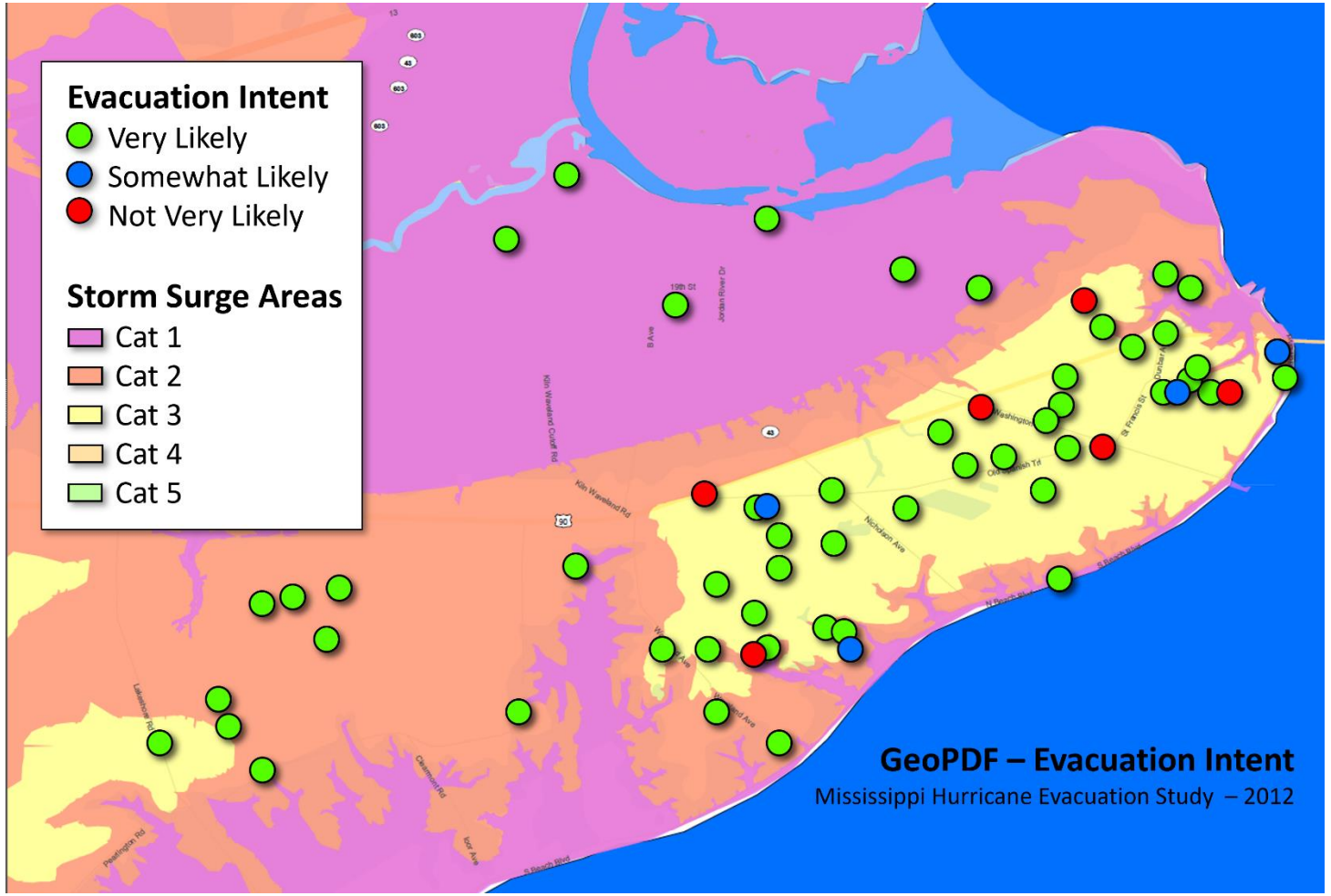
- Serious under-concern about surge
- Evacuation intent often overstated
- Evacuation intent highest for:
  - Major hurricanes
  - Mandatory/Ordered evacuations
  - Households with children
  - People with recent real hurricane experience
- Often get ‘False Experience’ effect

Will the Public Evacuate?



Where Should I Focus My Outreach?

FEMA



Bottom Line

WHY DO PEOPLE EVACUATE?

- They understand their vulnerability/risk
- They were told to evacuate

Better Information – Shelter

FAQs

- Who will seek public shelter?
- How many shelter spaces are needed?
- In county? Out-of-county?

- Shelter Analysis

Number of Shelter Spaces Needed?

FEMA

SHELTER ANALYSIS

- **Shelter Locations**, with respect to Evacuation Zones and Storm Surge flood risk areas
- **Potential Demand**
- **Identification of Deficits**

Shelter Usage Rates (planning purposes)

- 3-8% Coastal
- 10% Inland

What's Available?

Evacuation Scenario	Total Evacuating People Low Occupancy	Total Evacuating People High Occupancy	Public Shelter Demand Low Occupancy	Public Shelter Demand High Occupancy	Sheltering Capacity	Surplus/Deficit Low Occupancy	Surplus/Deficit High Occupancy
Category 1	60,660	101,821	1,576	1,990	8,239	6,663	6,249
Category 2	103,871	151,069	2,909	3,384	7,469	4,560	4,085
Category 3	113,773	162,005	3,567	4,052	7,746	3,902	3,417
Category 4	184,748	234,032	8,528	9,025	2,818	-5,710	-6,207
Category 5	211,125	260,502	10,898	11,295	0	-10,898	-11,395

Table 5-4: Evacuating Population and Public Sheltering Demand – Baldwin County Alabama Hurricane Evacuation Study – Technical Data Report – 2012

Resources for Evacuating Populations

SHELTER DEMAND	POTENTIAL EVACUEES	REGULAR CAPACITY 7,953 Additional Needed	EMERGENCY CAPACITY 15,906 Additional Needed	ASSESSMENT OF CAPACITY
1%	1,533	0	0	Regular Shelter Capacity Can Support Demand
2%	3,065	0	0	Regular Shelter Capacity Can Support Demand
3%	4,598	0	0	Regular Shelter Capacity Can Support Demand
4%	6,131	0	0	Regular Shelter Capacity Can Support Demand
5%	7,633	0	0	Regular Shelter Capacity Can Support Demand
6%	9,196	1,243	0	Emergency Shelter Capacity Can Support Demand
7%	10,728	2,775	0	Emergency Shelter Capacity Can Support Demand
8%	12,261	4,308	0	Emergency Shelter Capacity Can Support Demand
9%	13,794	5,841	0	Emergency Shelter Capacity Can Support Demand
10%	15,326	7,373	0	Emergency Shelter Capacity Can Support Demand
13%	19,924	11,971	4,018	Over Capacity
15%	22,990	15,037	7,084	Over Capacity
20%	30,653	22,700	14,747	Over Capacity

Better Information – Transportation

FAQs

- Where will traffic backup?
- What is the road capacity?
- How long will it take to evacuate?

- Transportation Analysis

How Long Will It Take to Evacuate?

FEMA

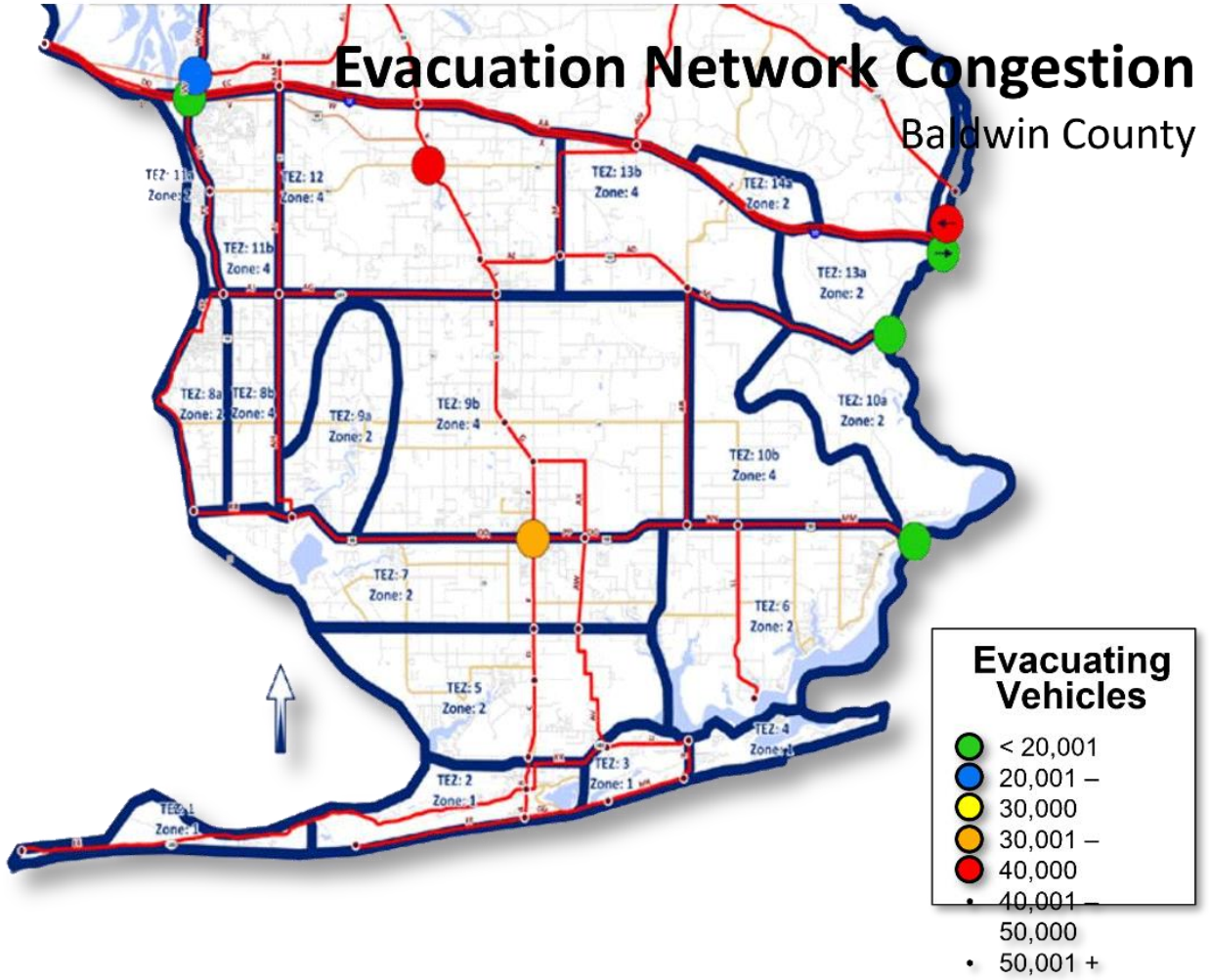
TRAFFIC MODEL INPUTS

- Demographics
- Behavioral Assumptions
- Evacuation Routes
- Roadway Capacities
- Travel Destinations
- Evacuation Scenarios

Where Will the Traffic Problems Be?

TRANSPORTATION ANALYSIS

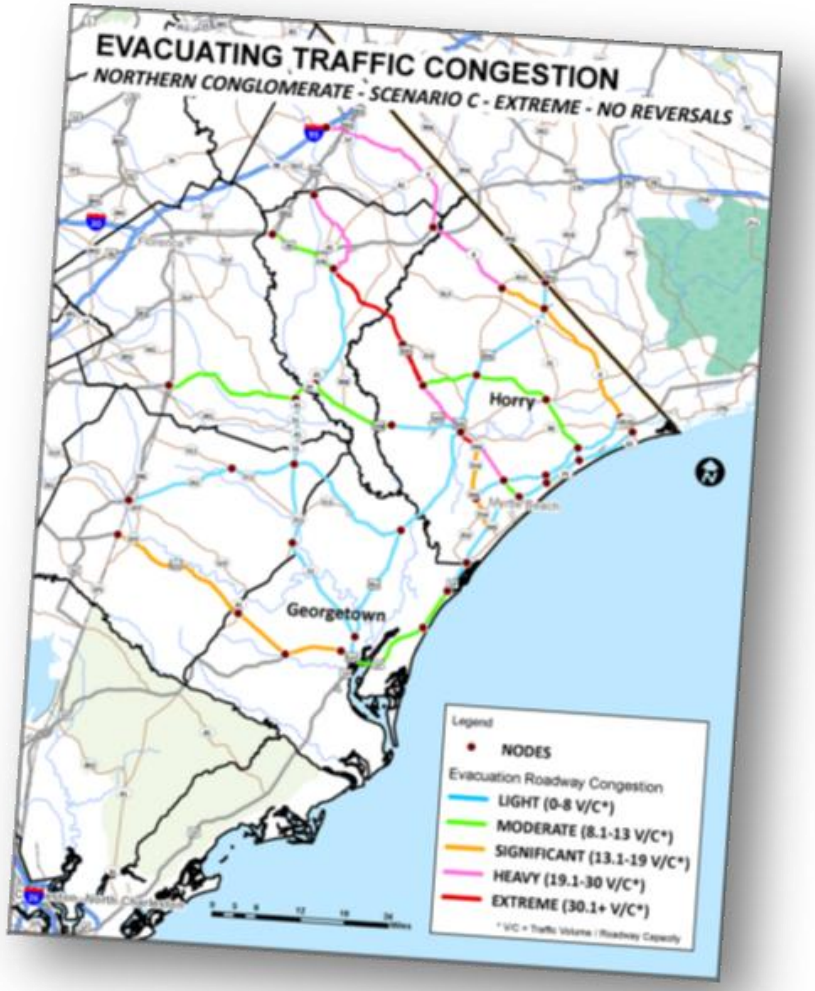
- **Traffic Patterns**
  - Bottle Necks
  - Evacuating Vehicles
- **Clearance Times**
  - Response Rate
  - Seasonal Population
  - Evacuation Scenarios
    one-way, multi-state, etc.



Modeled on the Road Network

CLEARANCE TIMES

- **Time for the evacuating population to reach a point of safety**
  - First evacuating vehicle enters the road network
  - Last vehicle reaches an assumed point of safety
  - Includes travel time and waiting in congestion
  - Doesn't relate to any one particular vehicle
  - Driven by bottlenecks



How Long Should Evacuation Take?

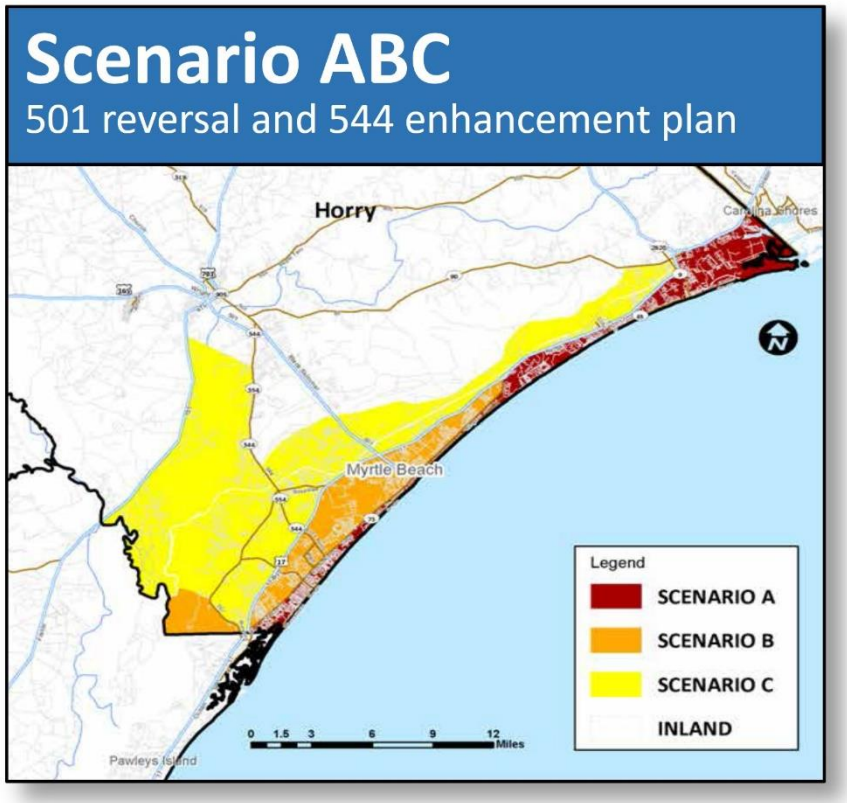


Figure 6-6: Evacuation Zones

South Carolina Hurricane Evacuation Study – Technical Data Report – 2013

Response	Low Occupancy	Med Occupancy	High Occupancy	Extreme Occupancy
SLOW	22	26	29	31
MEDIUM	20	24	27	29
FAST	19	23	26	28
IMMEDIATE	18	22	25	27

The Process: Plan

Trust the Process

Step 1

- Form a Collaborative Planning Team

Step 2

- Understand the Situation

Step 3

- Determine Goals and Objectives

Step 4

- Plan Development

Step 5

- Plan Preparation, Review & Approval

Step 6

- Plan Implementation & Maintenance

Making Better Decisions – Triggers

FAQs

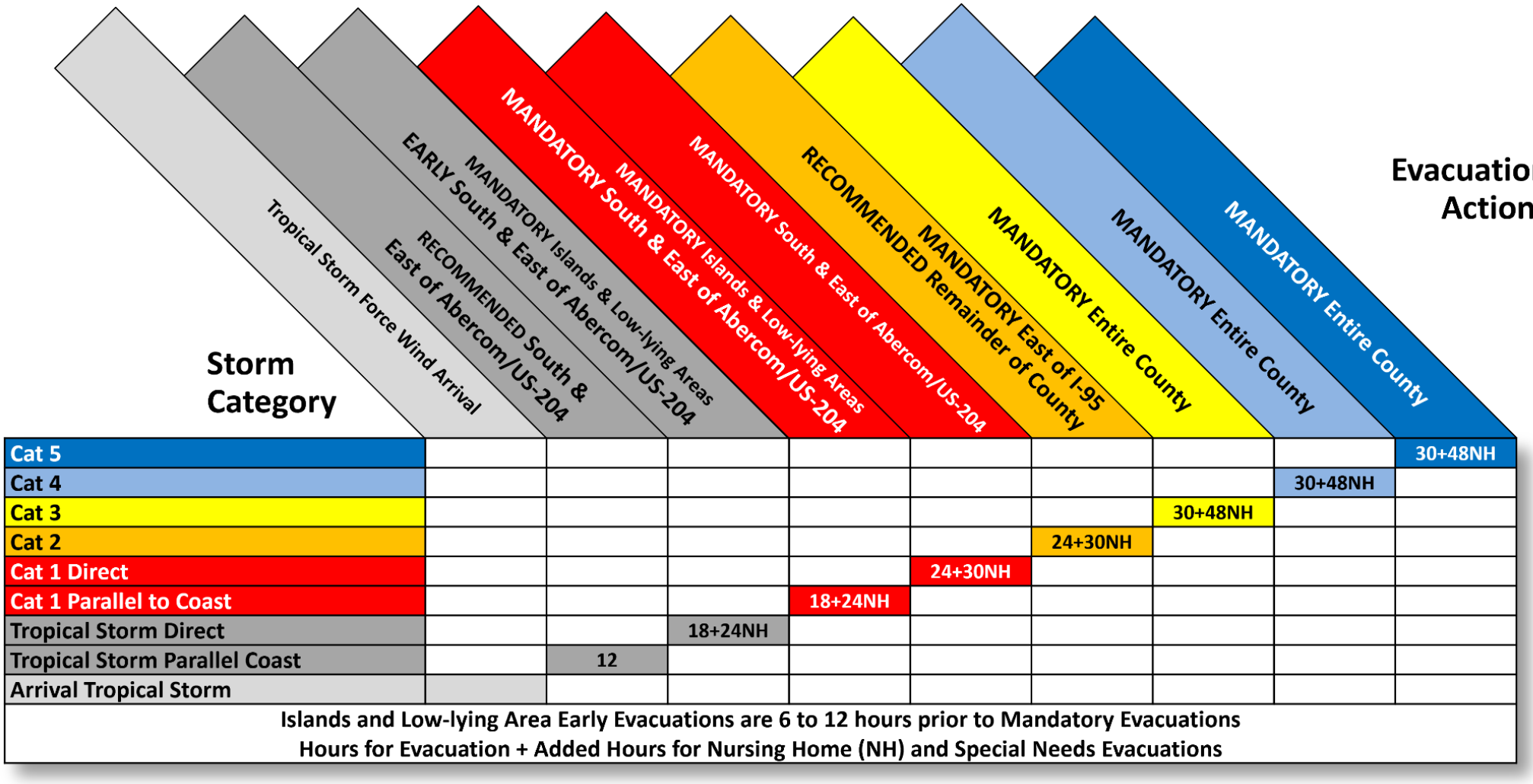
- What forces us to react?
- What is acceptable risk?
- What assumptions can I make?

- Identify Hazard Triggers

What Forces You to Act?

Lane Reversal Decision Factors	South Carolina Lane Reversal Factors South Carolina Hurricane Plan 2015
Decision Factor	Indicator
The storm's current/projected intensity and the public perception of the threat to their safety.	Category 3 or greater storm portrayed through the media as a significant threat will probably require the use of lane reversal.
Tourism occupancy: High tourist occupancy greatly increases evacuating population and thereby increases traffic congestion.	For a Category 1 or 2 storms, monitor traffic flow and have lane reversal ready. A Category 3 or greater storm will indicate the need for reversal. (Note: Beaufort County requires Highway 278 reversal during tourist season at 85% tourist occupancy)

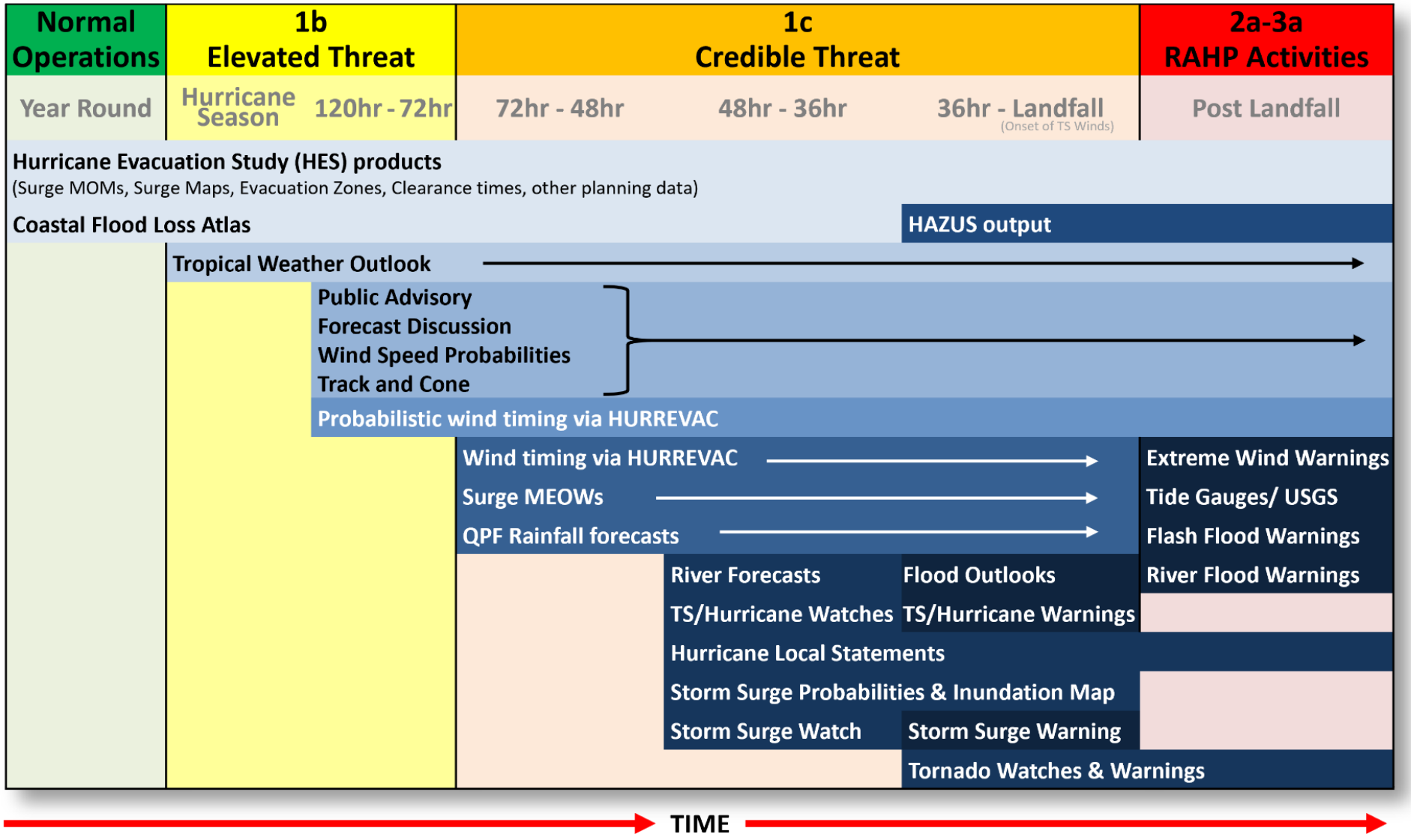
Storm Category vs. Evacuation Actions



Chatham County Evacuation Guidelines (Not Current)

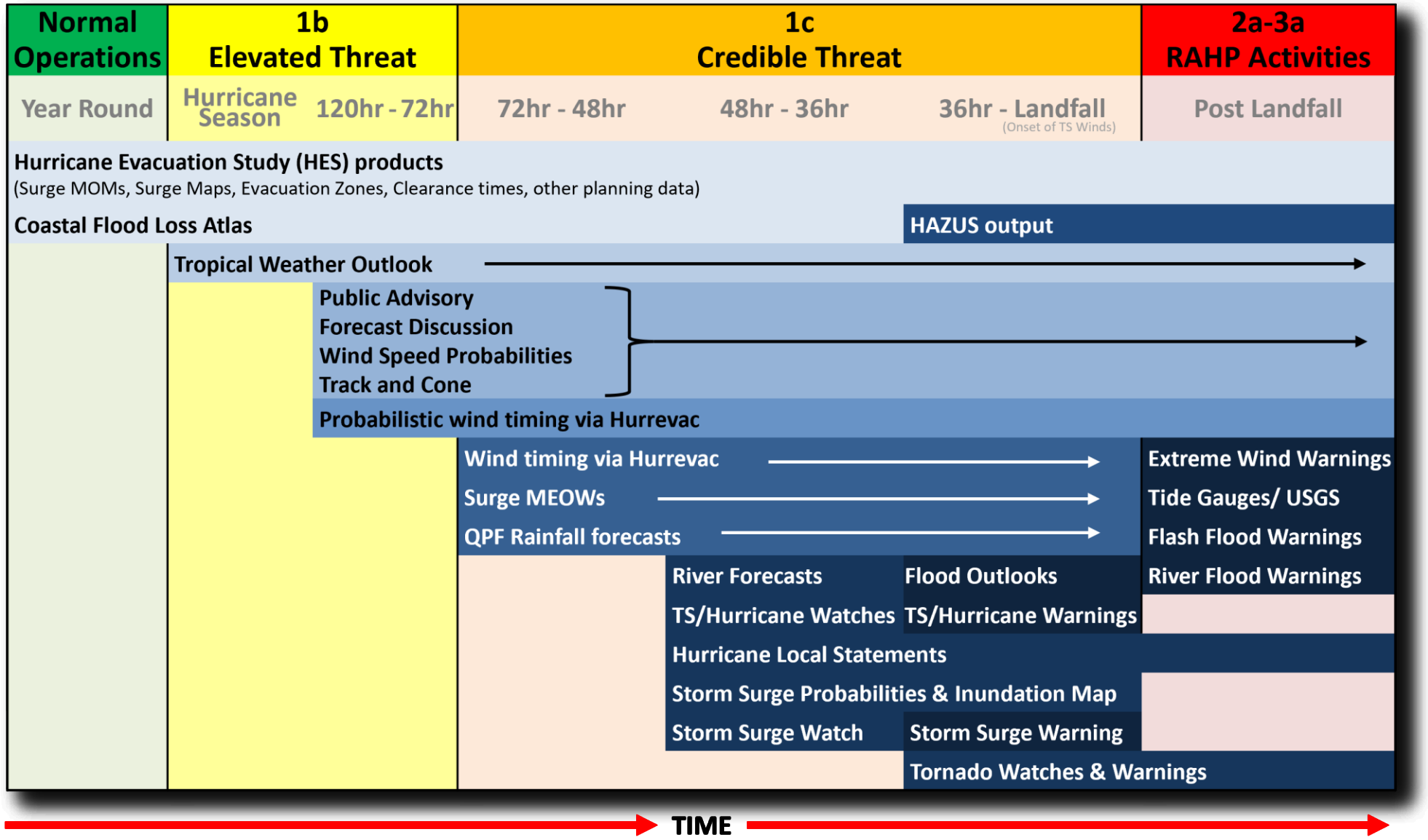
When Is Key Information Available?

FEMA



NWS Products – When is Key Info Available?

FEMA



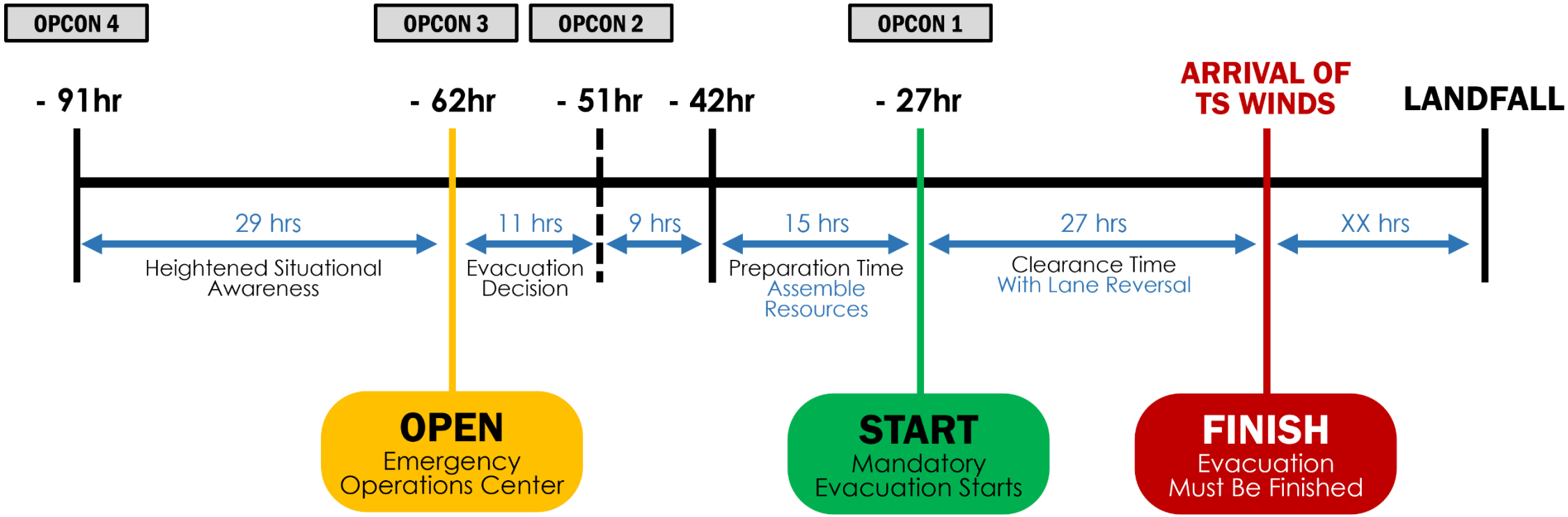
Making Better Decisions – Timelines

FAQs

- When do we open shelters?
- When do we need to deploy?
- How do we stay synchronized?

- Decision Timelines

Evacuation Scenario Decision Timeline



Horry County Evacuation Timeline for ABC Scenario

Hurricane Readiness Checklist

FEMA

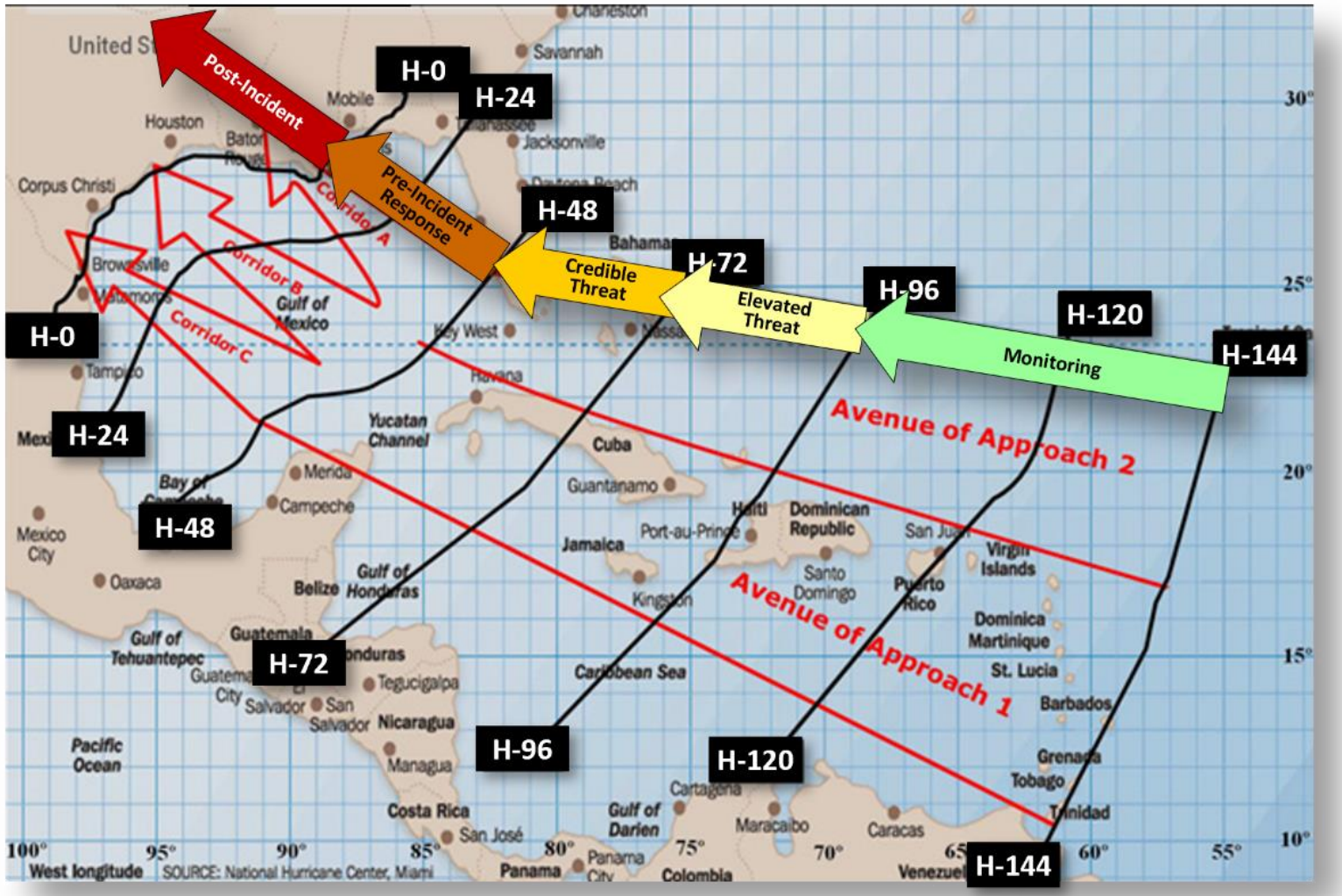
Hurricane Preparedness – prior to June 1	PRIORITY LEVEL	PERSONNEL RESPONSIBLE	STATUS OF TASK	DATE/TIME COMPLETED
Hurricane Planning				
• Update local hurricane operation, evacuation plans and resource files				
• Revise Standard Operating Procedures (SOPs)				
• Review local emergency management ordinances and update				
• Test HURREVAC and/or other hurricane tracking software				
• Review Stafford Act Policies with State Emergency Management				
• Determine evacuation decision making authority w/ line of succession				
Emergency Operations Center (EOC)				
• Replenish supplies and check equipment				
• Test communication lines				
• Update activation plans and train staff				
• Update HURREVAC to latest version				

Hurricane Readiness Checklist (cont.)

FEMA

Storm Impacts Imminent (~36 hours) Hurricane Watches and Warnings Issued	PRIORITY LEVEL	PERSONNEL RESPONSIBLE	STATUS OF TASK	DATE/TIME COMPLETED
Storm Watch				
• Conference calls with NOAA local WFO/RFC/SPC				
• Continue to monitor HURREVAC and other systems				
• Monitor storm track and provide local government officials updates				
• Anticipate the possible arrival of rainfall and tornados				
• Monitor river stages and rainfall forecast				
Emergency Operations Center (EOC)				
• Activate EOC (partial or full based on clearance times and threat)				
• Request primary ESF support agencies provide EOC briefings				
• Complete and distribute EOC situation reports, as applicable				
• Prepare EOC facility- Mitigate for Winds, Water, etc.				

Scenario-Based Operational Levels



FEMA RVI Hurricane Plan

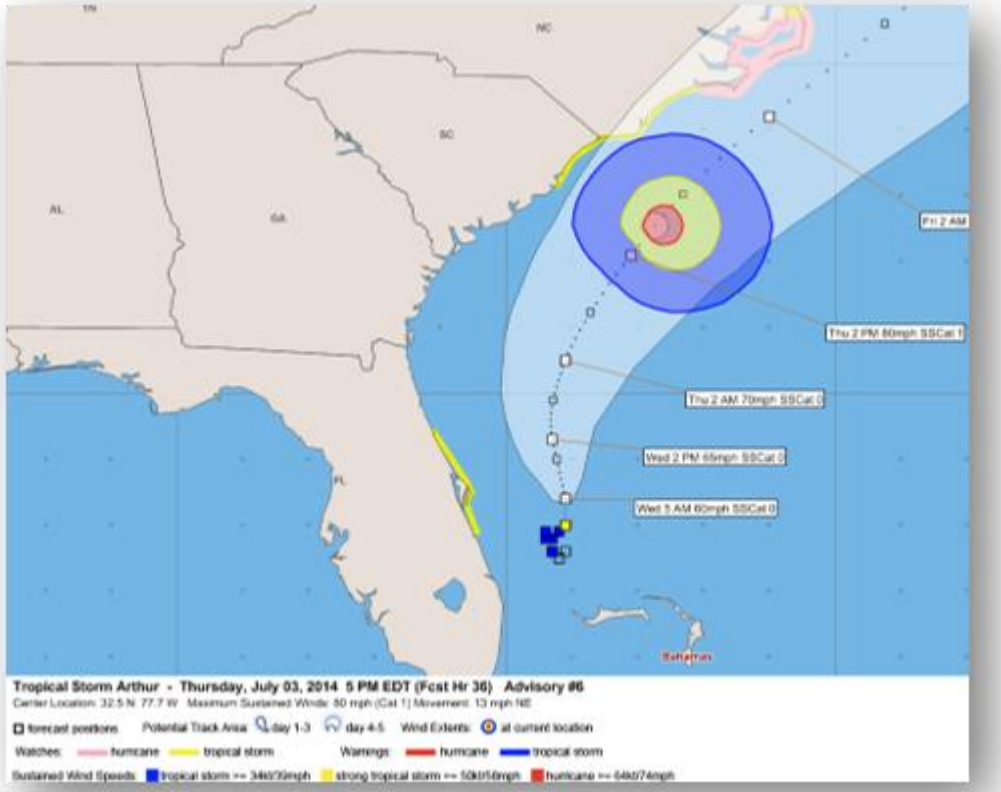
The Process: Execute

Analyze and Respond

FEMA

- - - - WIND SPEED PROBABILITIES FOR SELECTED LOCATIONS - - - -

TIME PERIODS		FROM 12Z WED TO 00Z THU	FROM 00Z THU TO 12Z THU	FROM 12Z THU TO 00Z FRI	FROM 00Z FRI TO 12Z FRI	FROM 12Z FRI TO 12Z SAT	FROM 12Z SAT TO 12Z SUN	FROM 12Z SUN TO 12Z MON
FORECAST HOUR		(12)	(24)	(36)	(48)	(72)	(96)	(120)
LOCATION	KT							
CAPE HATTERAS	34	X	2(2)	32(34)	48(82)	X(82)	X(82)	X(82)
CAPE HATTERAS	50	X	X(X)	4(4)	48(52)	1(53)	X(53)	X(53)
CAPE HATTERAS	64	X	X(X)	1(1)	20(21)	X(21)	X(21)	X(21)
CHARLOTTE NC	34	X	2(2)	3(5)	X(5)	X(5)	X(5)	X(5)
MOREHEAD CITY	34	1	3(4)	55(59)	16(75)	X(75)	X(75)	X(75)
MOREHEAD CITY	50	X	X(X)	20(20)	21(41)	X(41)	X(41)	X(41)
MOREHEAD CITY	64	X	X(X)	4(4)	11(15)	X(15)	X(15)	X(15)
WILMINGTON NC	34	1	5(6)	46(52)	3(55)	X(55)	X(55)	X(55)
WILMINGTON NC	50	X	X(X)	16(16)	3(19)	X(19)	X(19)	X(19)
WILMINGTON NC	64	X	X(X)	4(4)	1(5)	X(5)	X(5)	X(5)
COLUMBIA SC	34	1	2(3)	3(6)	1(7)	X(7)	X(7)	X(7)
MYRTLE BEACH	34	1	9(10)	28(38)	2(40)	X(40)	X(40)	X(40)
MYRTLE BEACH	50	X	1(1)	6(7)	X(7)	X(7)	X(7)	X(7)
MYRTLE BEACH	64	X	X(X)	1(1)	X(1)	X(1)	X(1)	X(1)



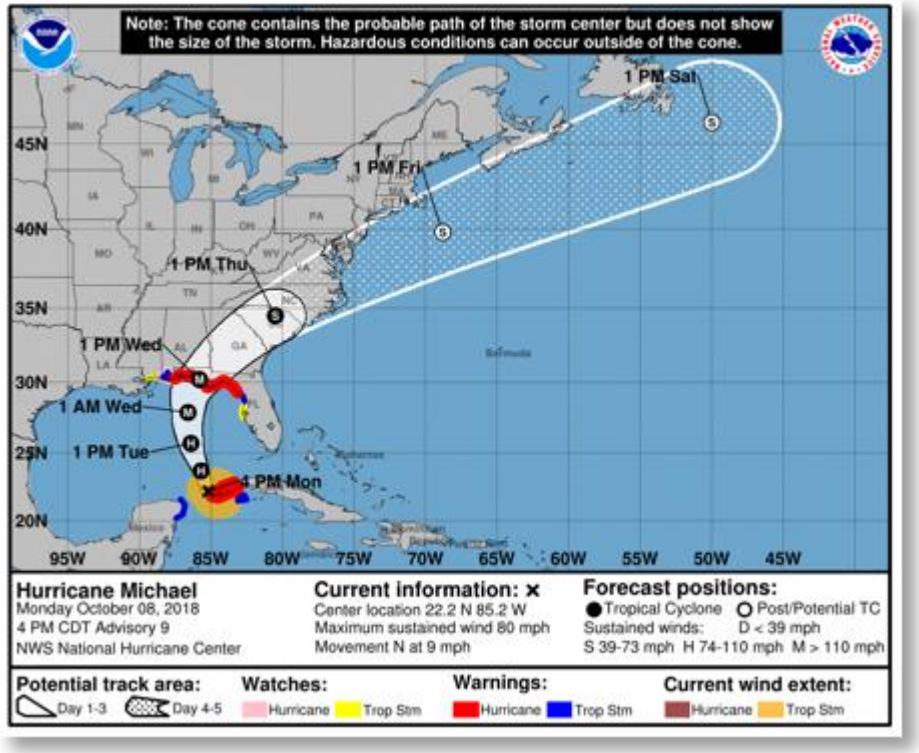
Making Better Decisions – Forecasts

FAQs

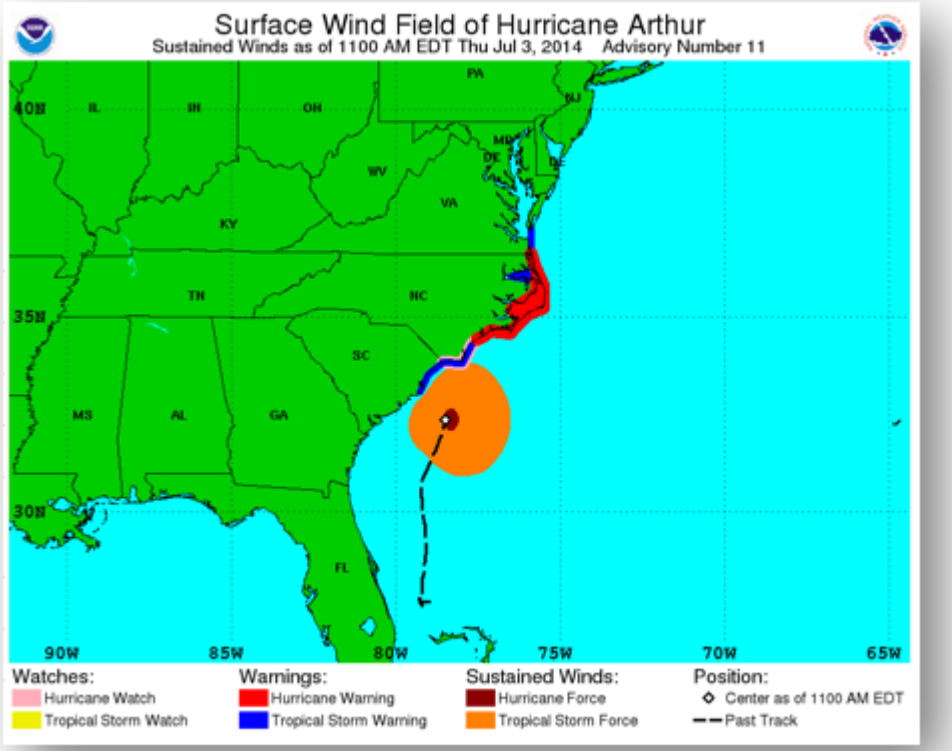
- What's the forecast?
- A threat to my community?
- When are hazards expected?

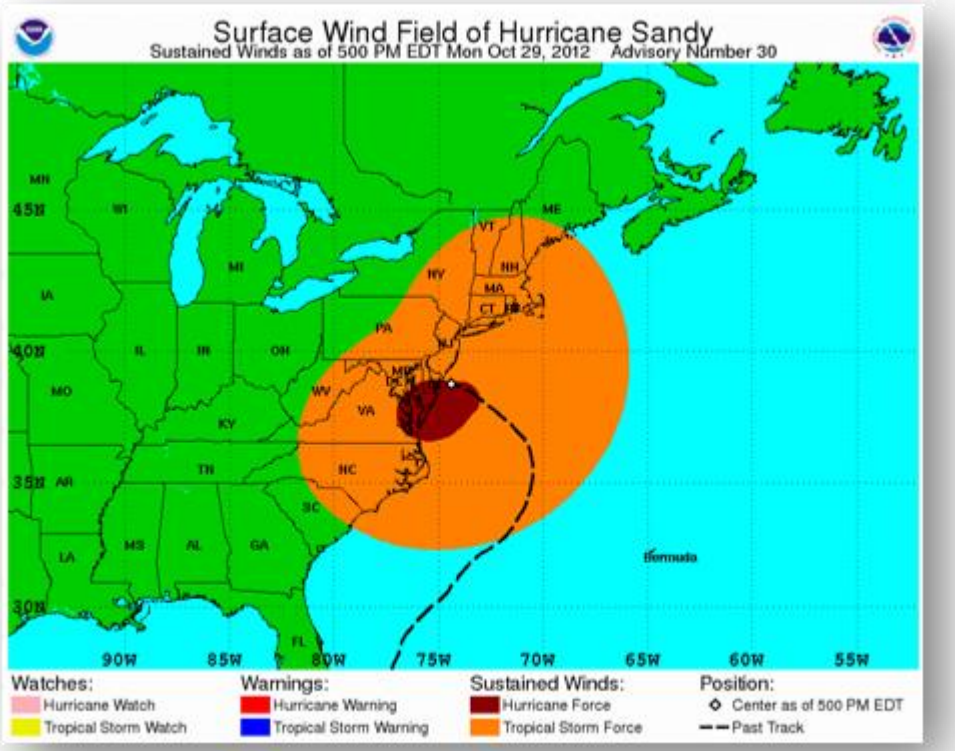
- NHC Forecasts

What NHC Forecasts?



Storm Characteristics





Where Is the Storm Going?

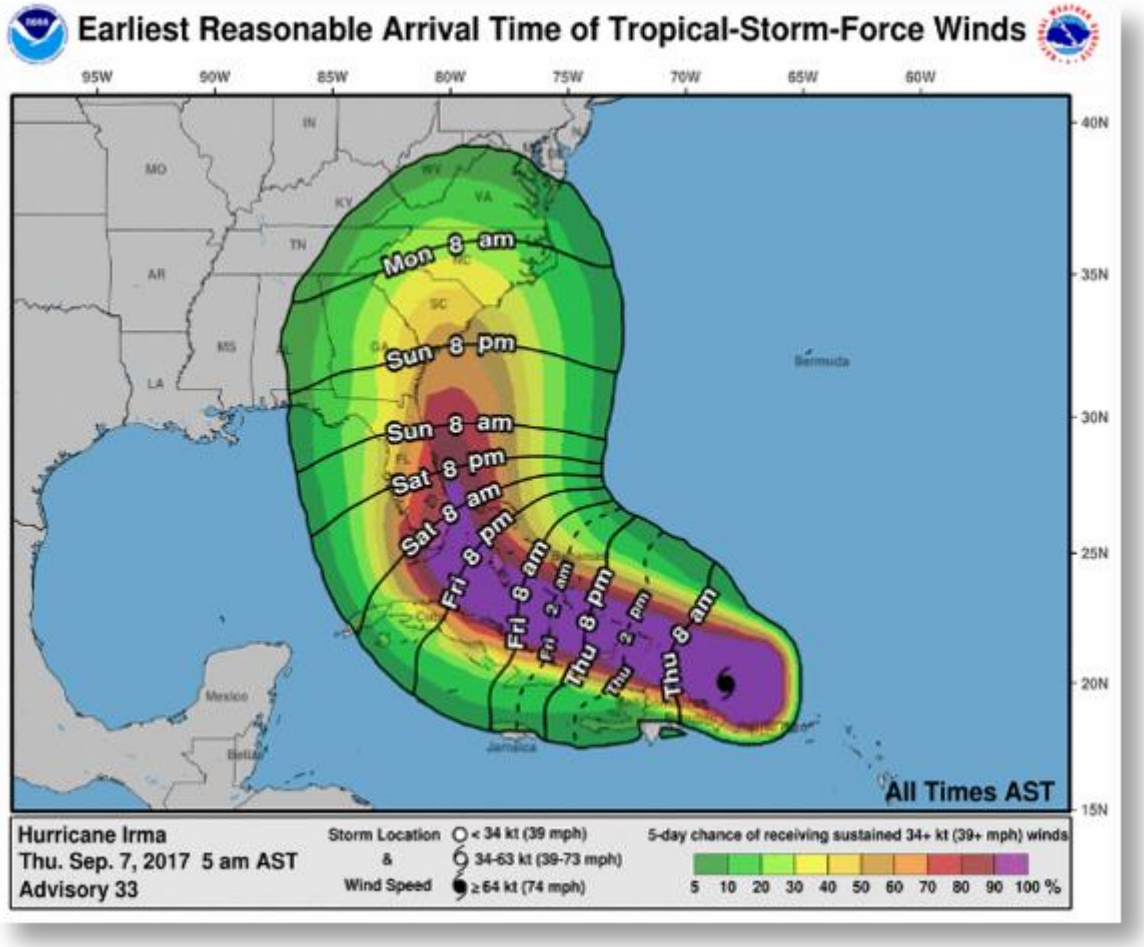
FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

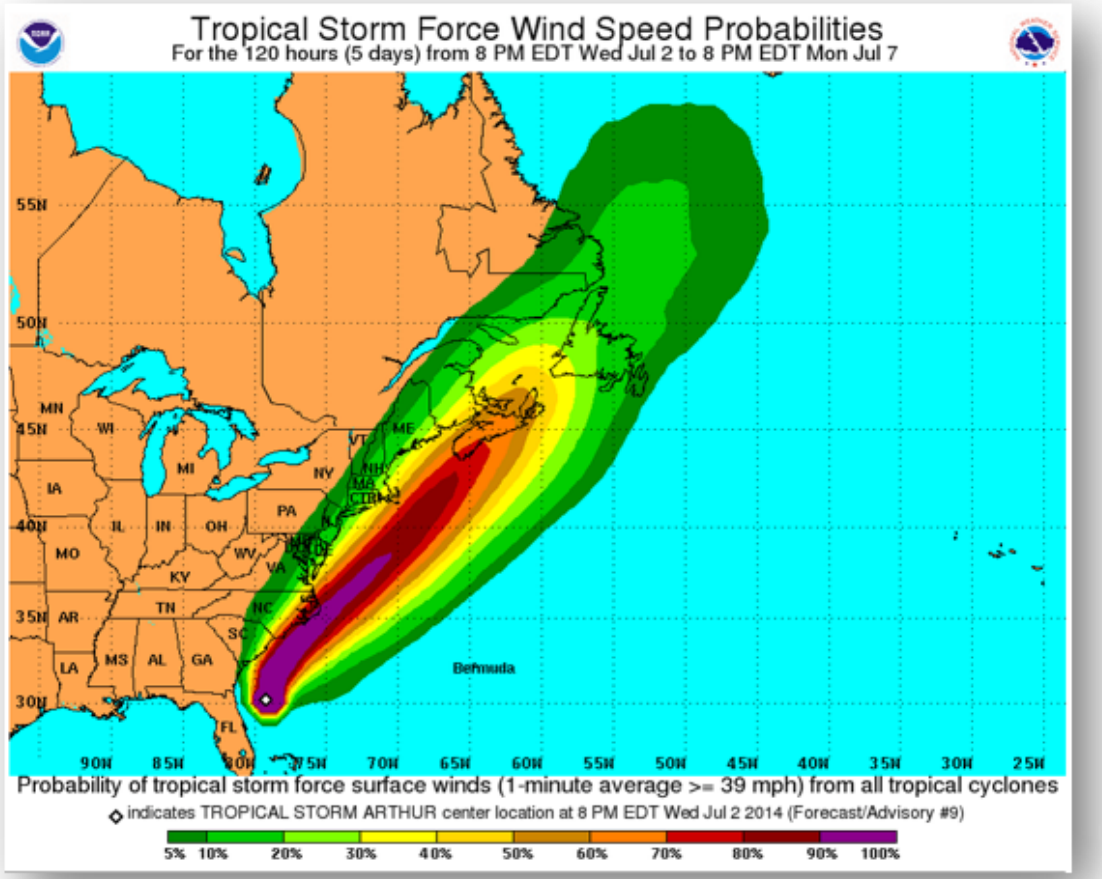
TROPICAL STORM ISAAC WIND SPEED PROBABILITIES NUMBER 21
NWS NATIONAL HURRICANE CENTER MIAMI FL AL092012
0900 UTC SUN AUG 26 2012

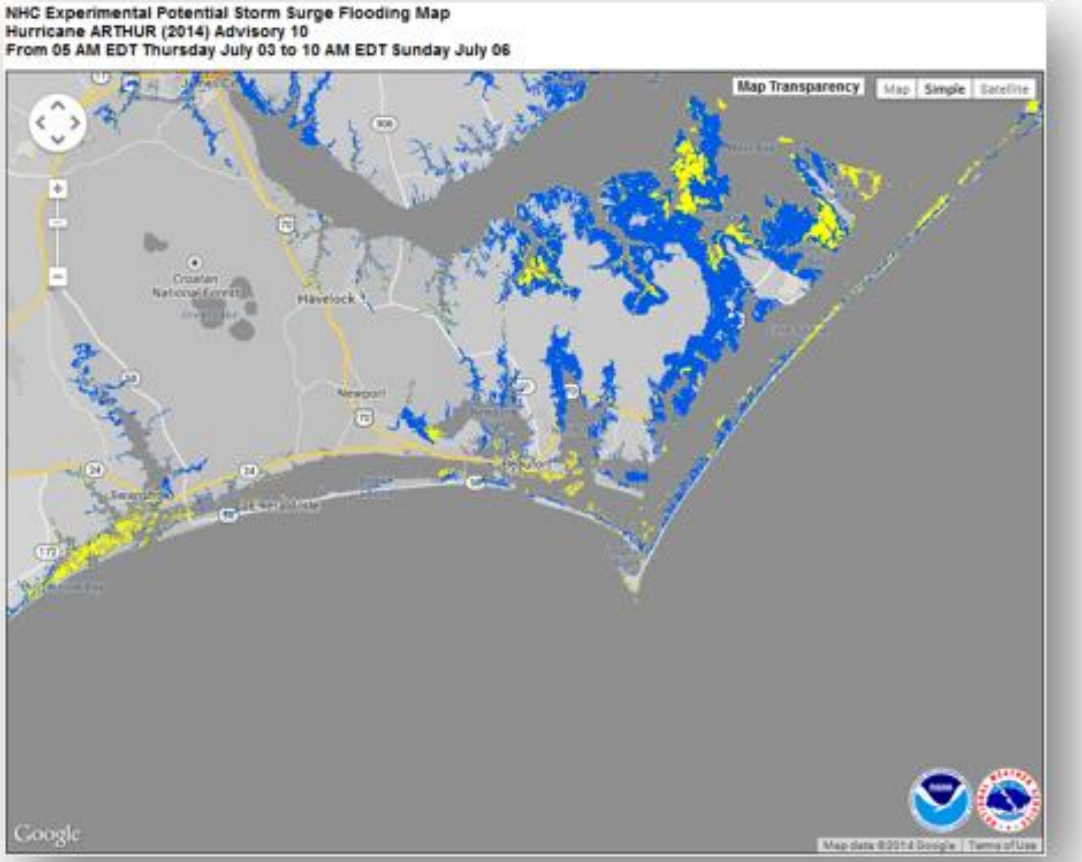
- - - - WIND SPEED PROBABILITIES FOR SELECTED LOCATIONS - - - -

TIME PERIODS		FROM 12Z WED TO 00Z THU	FROM 00Z THU TO 12Z THU	FROM 12Z THU TO 00Z FRI	FROM 00Z FRI TO 12Z FRI	FROM 12Z FRI TO 12Z SAT	FROM 12Z SAT TO 12Z SUN	FROM 12Z SUN TO 12Z MON
FORECAST HOUR		(12)	(24)	(36)	(48)	(72)	(96)	(120)
LOCATION	KT							
PANAMA CITY FL	34	X	3(3)	22(25)	30(55)	16(71)	2(73)	1(74)
PANAMA CITY FL	50	X	X(X)	1(1)	13(14)	15(29)	2(31)	1(32)
PANAMA CITY FL	64	X	X(X)	X(X)	3(3)	6(9)	2(11)	1(12)
PENSACOLA FL	34	X	X(X)	10(10)	32(42)	31(73)	5(78)	X(78)
PENSACOLA FL	50	X	X(X)	X(X)	6(6)	28(34)	5(39)	1(40)
PENSACOLA FL	64	X	X(X)	X(X)	1(1)	14(15)	3(18)	X(18)
MOBILE AL	34	X	X(X)	5(5)	24(29)	35(64)	8(72)	1(73)
MOBILE AL	50	X	X(X)	X(X)	3(3)	22(25)	8(33)	1(34)
MOBILE AL	64	X	X(X)	X(X)	1(1)	8(9)	4(13)	1(14)



Evaluate the Storm Threat





Making Better Decisions – HURREVAC

FEMA

FAQs

- What is the forecast?
- Evacuation start times?

- HURREVAC

HURREVAC 1

POLL QUESTION

Do you have a HURREVAC account?

A. Yes, and I use it regularly.
B. Yes, but I am unfamiliar with how to use it.
C. I just registered for an account.
D. I do not have an account.

HURREVAC 2

- **Hurricane tracking and decision support tool**
  - Uses NHC forecast data
  - Calculates evacuation start times
- **A resource for EMs during evacuations**
  - Common forecast picture
- **Reports**
  - Wind timing
  - Evacuation timing
  - Storm summary

HURREVAC 3

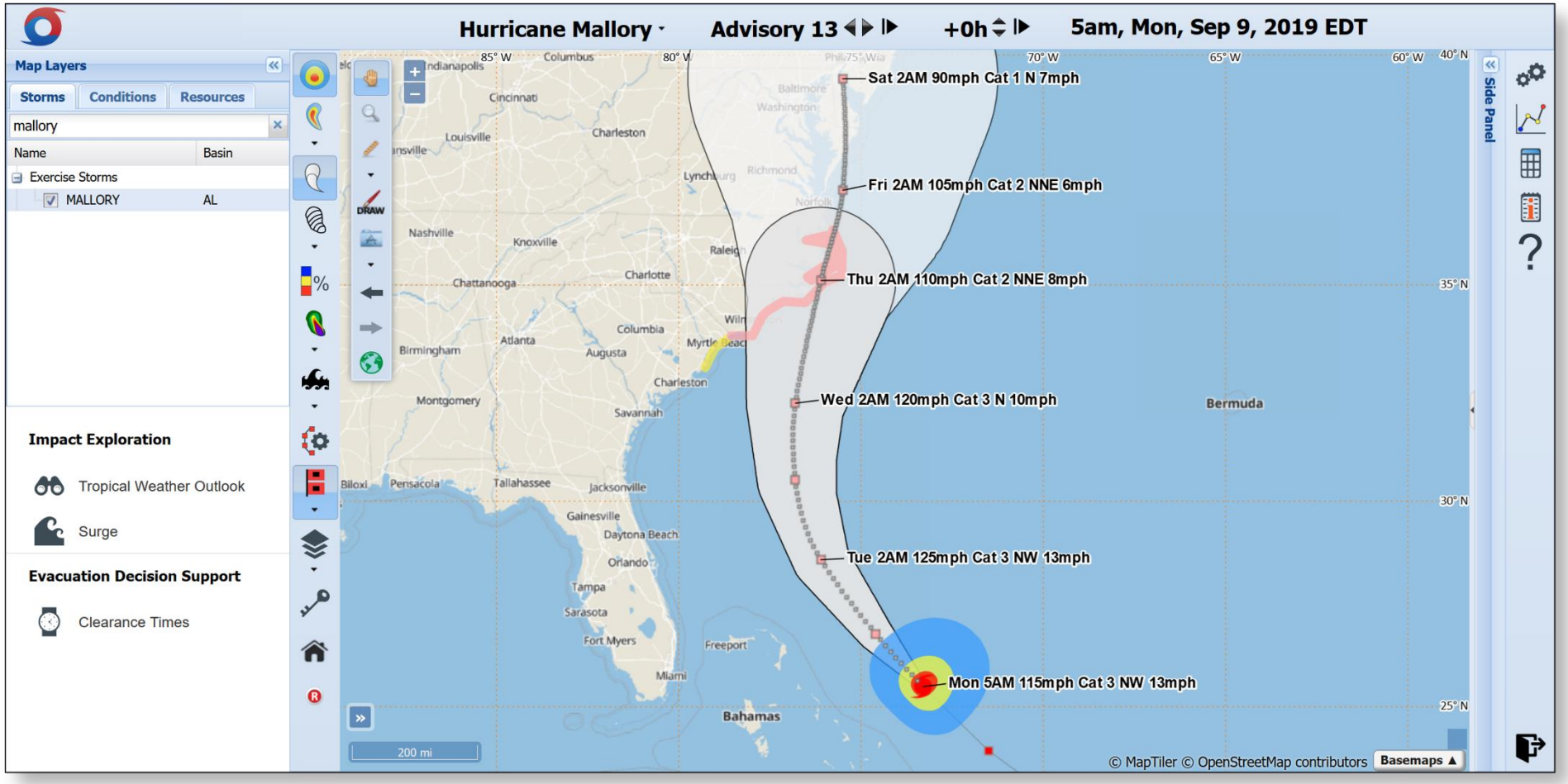
- **Web based**
  - No downloads or software to install
  - Use your computer, tablet or phone
  - Access your profile/preferences anywhere

- **SLOSH Display**
  - MOMs & MEOWs
  - MEOW mixer

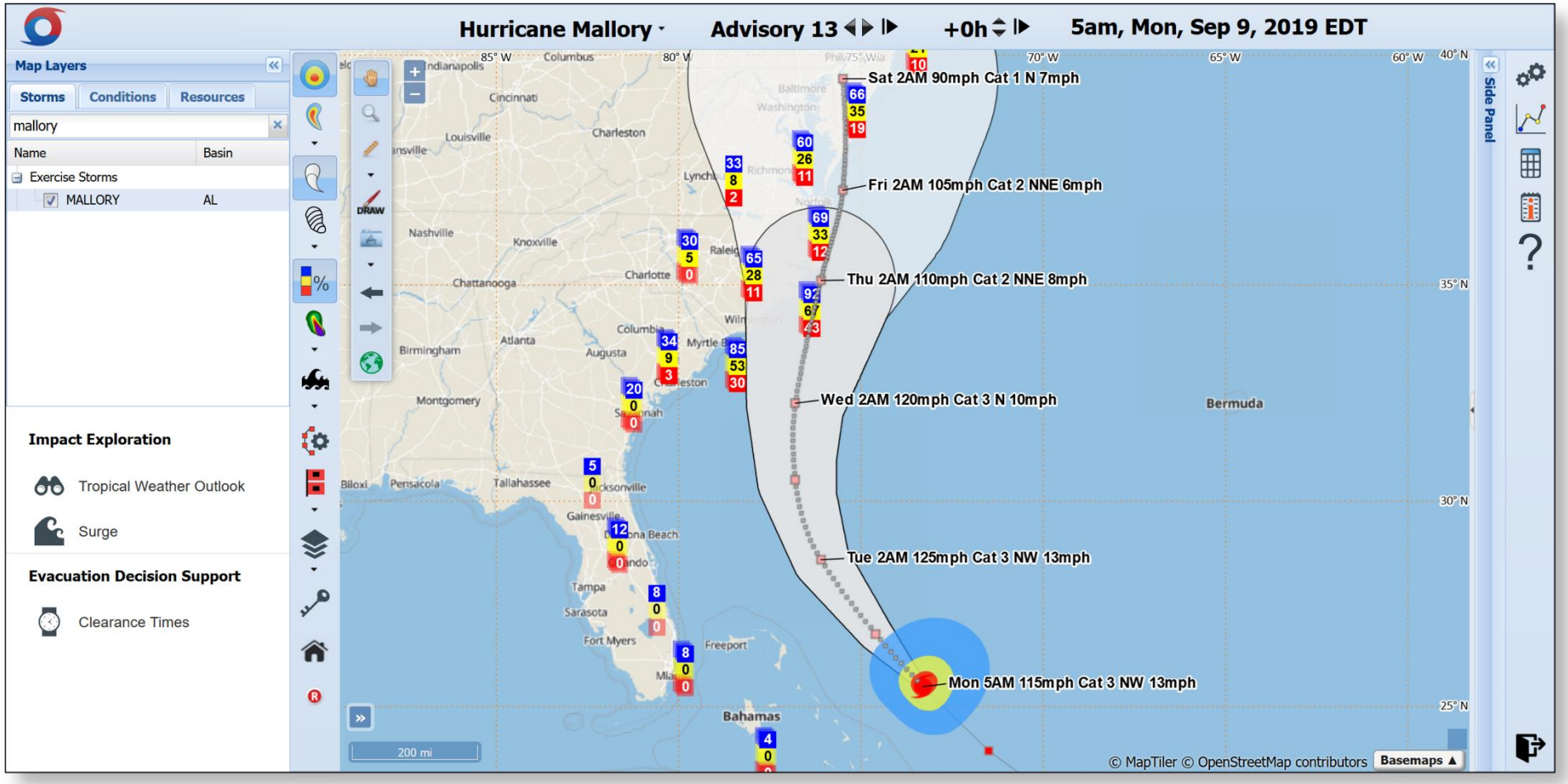
- **Register online**

  https://register.HURREVAC.com/

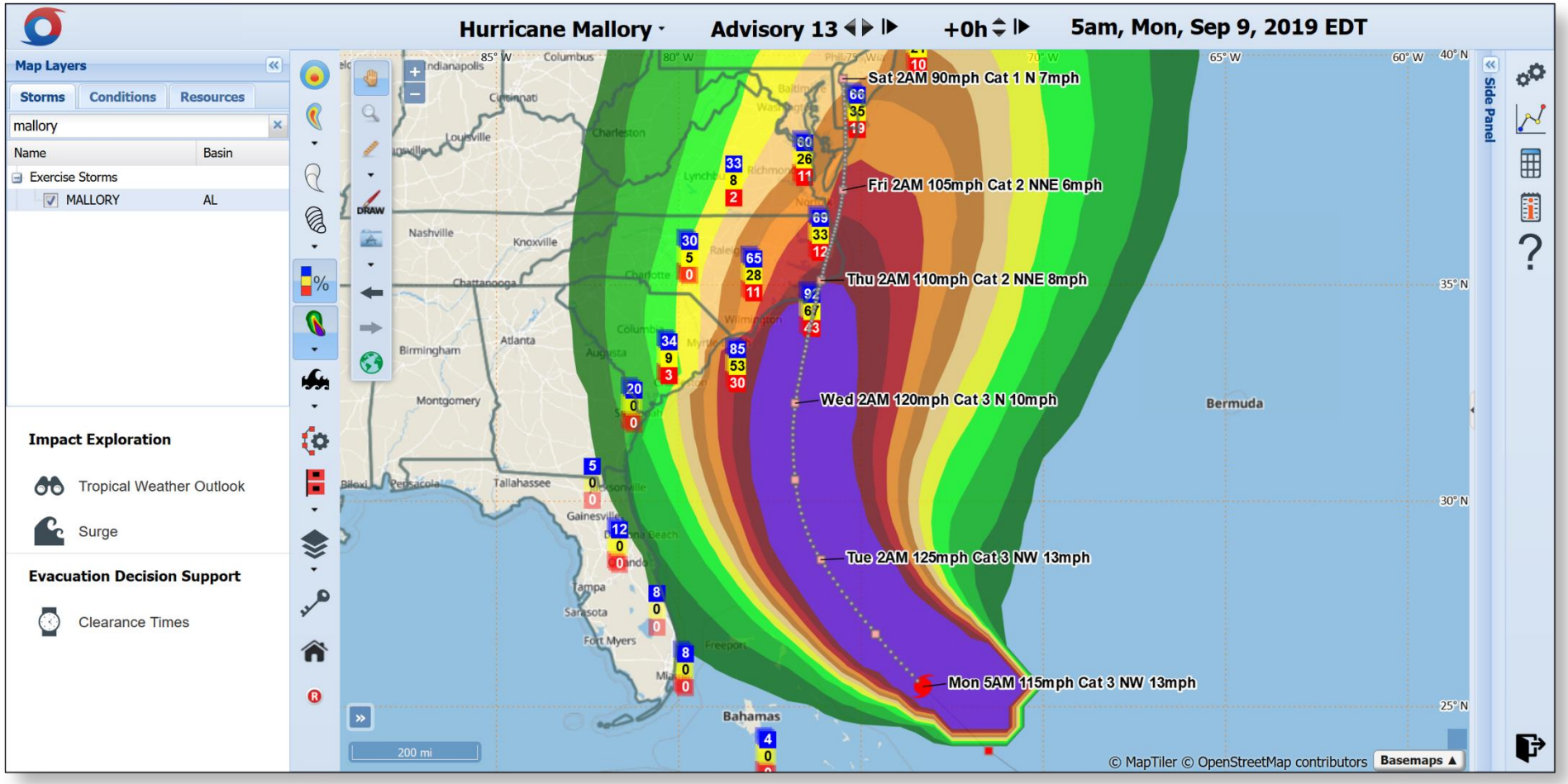
Forecast Track



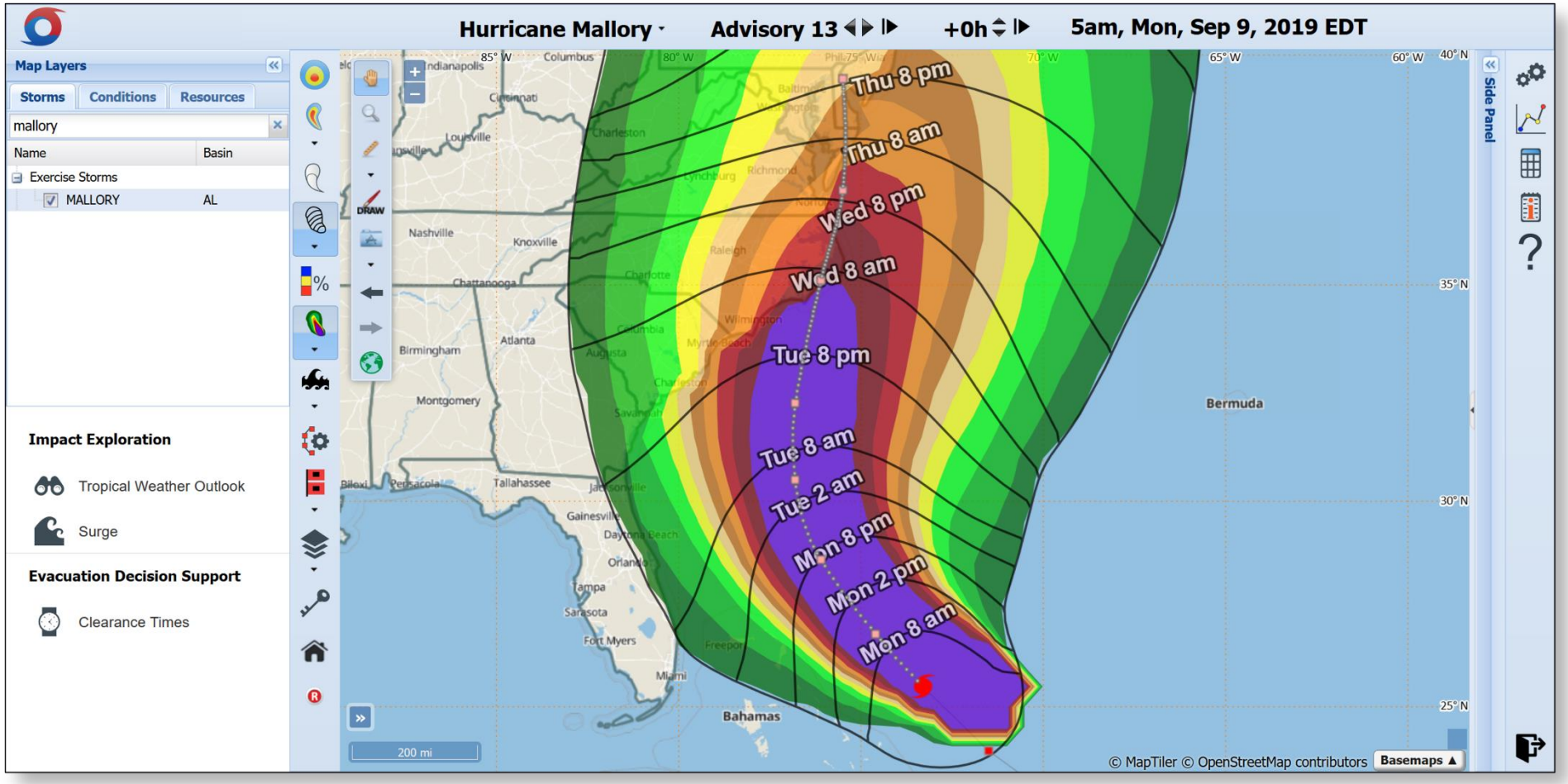
Wind Threat – Wind Speed Probabilities



Wind Threat - Speed Probabilities



Wind Threat - Time of Arrival



Wind Timing – Single Location

Wind Timing at Location MALLORY #13

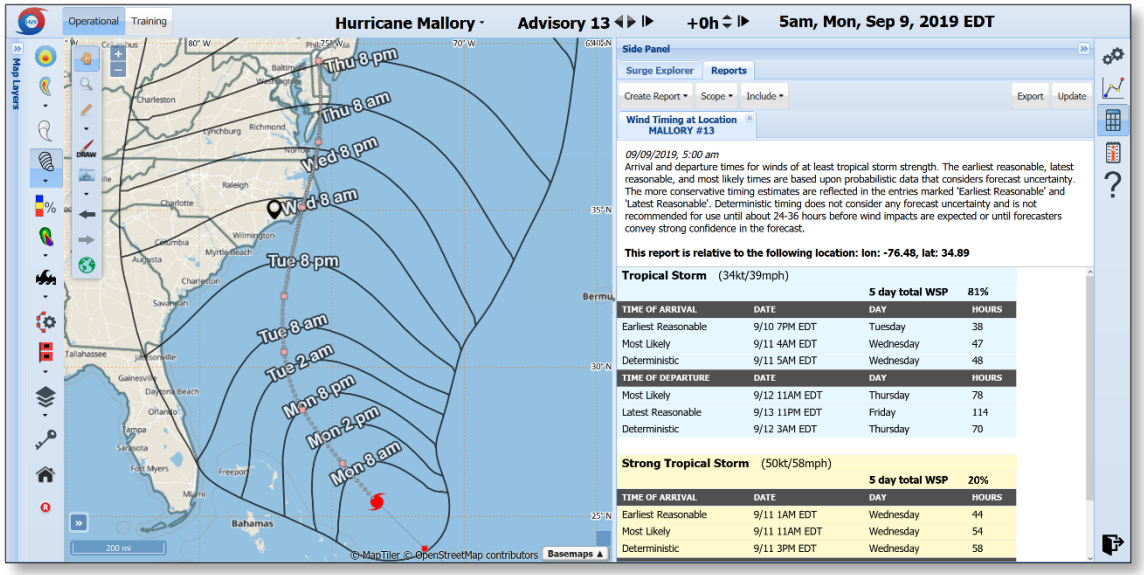
09/09/2019, 5:00 am

Arrival and departure times for winds of at least tropical storm strength. The earliest reasonable, latest reasonable, and most likely times are based upon probabilistic data that considers forecast uncertainty.

This report is relative to the following location: lon: -76.48, lat: 34.89

Tropical Storm (34kt/39mph)

			5 day total WSP	81%
TIME OF ARRIVAL	**DATE**		**DAY**	**HOURS**
Earliest Reasonable	9/10	7PM EDT	Tuesday	38
Most Likely	9/11	4AM EDT	Wednesday	47
Deterministic	9/11	5AM EDT	Wednesday	48
TIME OF DEPARTURE	**DATE**		**DAY**	**HOURS**
Most Likely	9/12	11AM EDT	Thursday	78
Latest Reasonable	9/13	11PM EDT	Friday	114
Deterministic	9/12	3AM EDT	Thursday	70



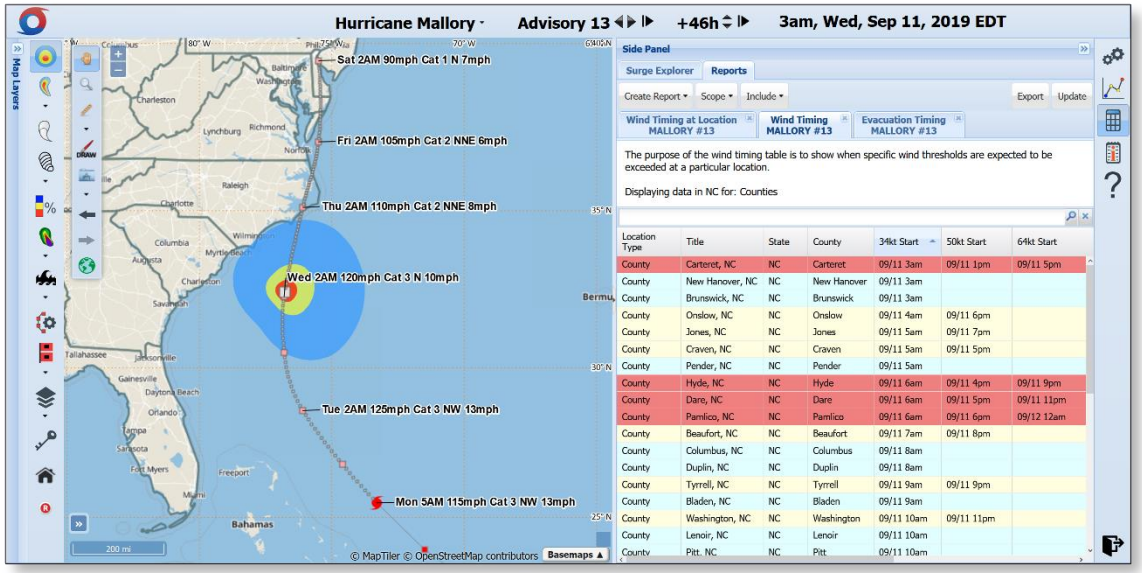
Wind Timing – All Affected Areas

Wind Timing
MALLORY #13

The purpose of the wind timing table is to show when specific wind thresholds are expected to be exceeded at a particular location.

Displaying data in NC for: Counties

State	County	34kt Start	50kt Start	64kt Start	64kt End	50kt End	34kt End
NC	Carteret	09/11 3am	09/11 1pm	09/11 5pm	09/12 3am	09/12 3am	09/12 3am
NC	New Hanover	09/11 3am					09/12 3am
NC	Brunswick	09/11 3am					09/12 3am
NC	Onslow	09/11 4am	09/11 6pm			09/11 10pm	09/12 3am
NC	Jones	09/11 5am	09/11 7pm			09/12 12am	09/12 3am
NC	Craven	09/11 5am	09/11 5pm			09/12 3am	09/12 3am
NC	Pender	09/11 5am					09/12 3am
NC	Hyde	09/11 6am	09/11 4pm	09/11 9pm	09/12 3am	09/12 3am	09/12 3am
NC	Dare	09/11 6am	09/11 5pm	09/11 11pm	09/12 3am	09/12 3am	09/12 3am
NC	Pamlico	09/11 6am	09/11 6pm	09/12 12am	09/12 3am	09/12 3am	09/12 3am
NC	Beaufort	09/11 7am	09/11 8pm			09/12 3am	09/12 3am
NC	Duplin	09/11 8am					09/12 3am



Evacuation Start Times

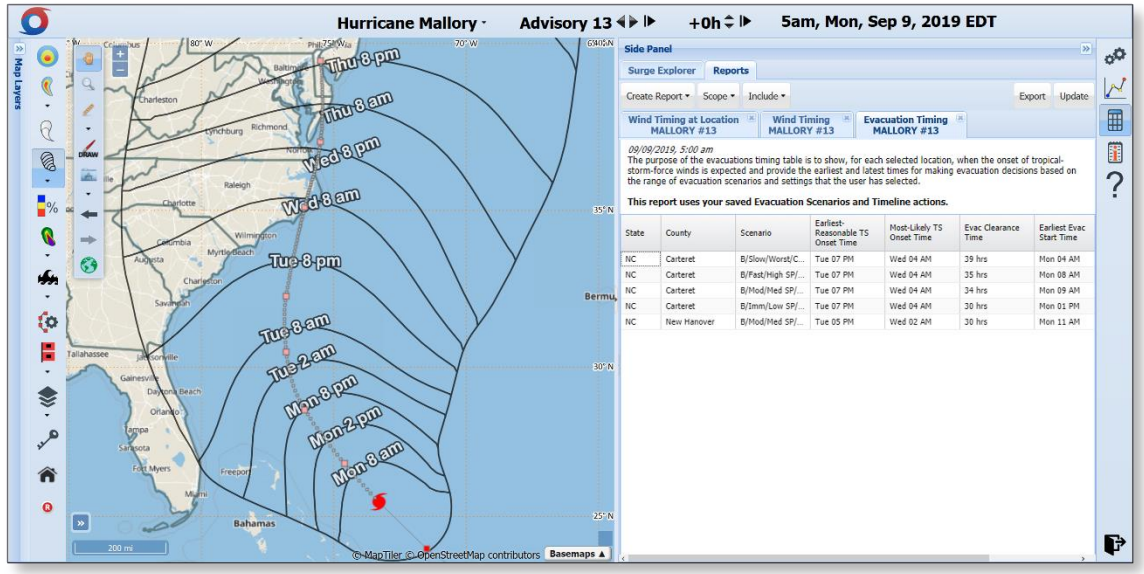
Evacuation Timing
MALLORY #13

09/09/2019, 5:00 am

The purpose of the evacuations timing table is to show, for each location, when the onset of tropical-storm-force winds is expected and provide the earliest and latest times for making evacuation decisions based on the range of evacuation scenarios and settings that the user has selected.

This report uses your saved Evacuation Scenarios and Timeline actions.

State	County	Scenario	Earliest-Reasonable TS Onset Time	Most-Likely TS Onset Time	Clearance Time	Earliest Evac Start Time	Latest Evac Start Time	TS WSP (%)
NC	Carteret	B/Slow/Worst/County	Tue 07 PM	Wed 04 AM	39 hrs	Mon 04 AM	Mon 01 PM	93
NC	Carteret	B/Mod/Med SP/County	Tue 07 PM	Wed 04 AM	35 hrs	Mon 08 AM	Mon 05 PM	93
NC	Carteret	B/Fast/High SP/County	Tue 07 PM	Wed 04 AM	34 hrs	Mon 09 AM	Mon 06 PM	93
NC	Carteret	B/Imm/Low SP/County	Tue 07 PM	Wed 04 AM	30 hrs	Mon 01 PM	Mon 10 PM	93



Calculating Evacuation Start Time

FEMA

HAZARDS

Storm Forecast

Arrival Time of Tropical-Storm Winds

–

PLANNING SCENARIOS

HES Data
(Hurricane Evacuation Study)
Pre-Determined Evacuation Zones and Scenarios

Clearance Time Scenario

=

EVACUATION

Evacuation Start Time

Calculating Evacuation Start Time 2

FEMA

HAZARDS

Storm Forecast

Arrival Time of Tropical-Storm Winds

47 Hours

–

PLANNING SCENARIOS

HES Data
(Hurricane Evacuation Study)
Pre-Determined Evacuation Zones and Scenarios

CATEGORY 3

Clearance Time Scenario

39 Hours

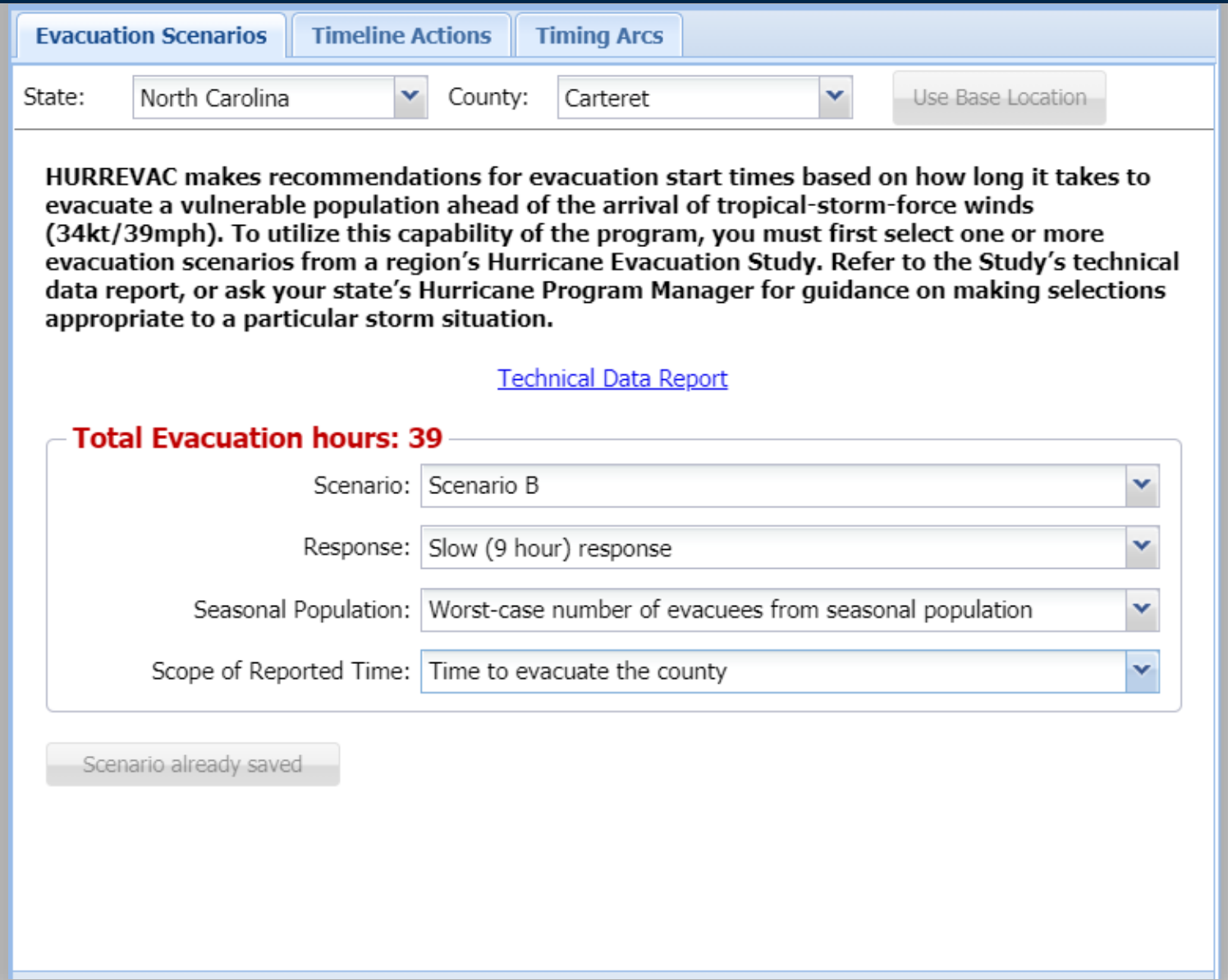
=

EVACUATION

Evacuation Start Time

8 Hours

Evacuation Scenarios



Evacuation Start Times (cont.)

Evacuation Timing
MALLORY #13

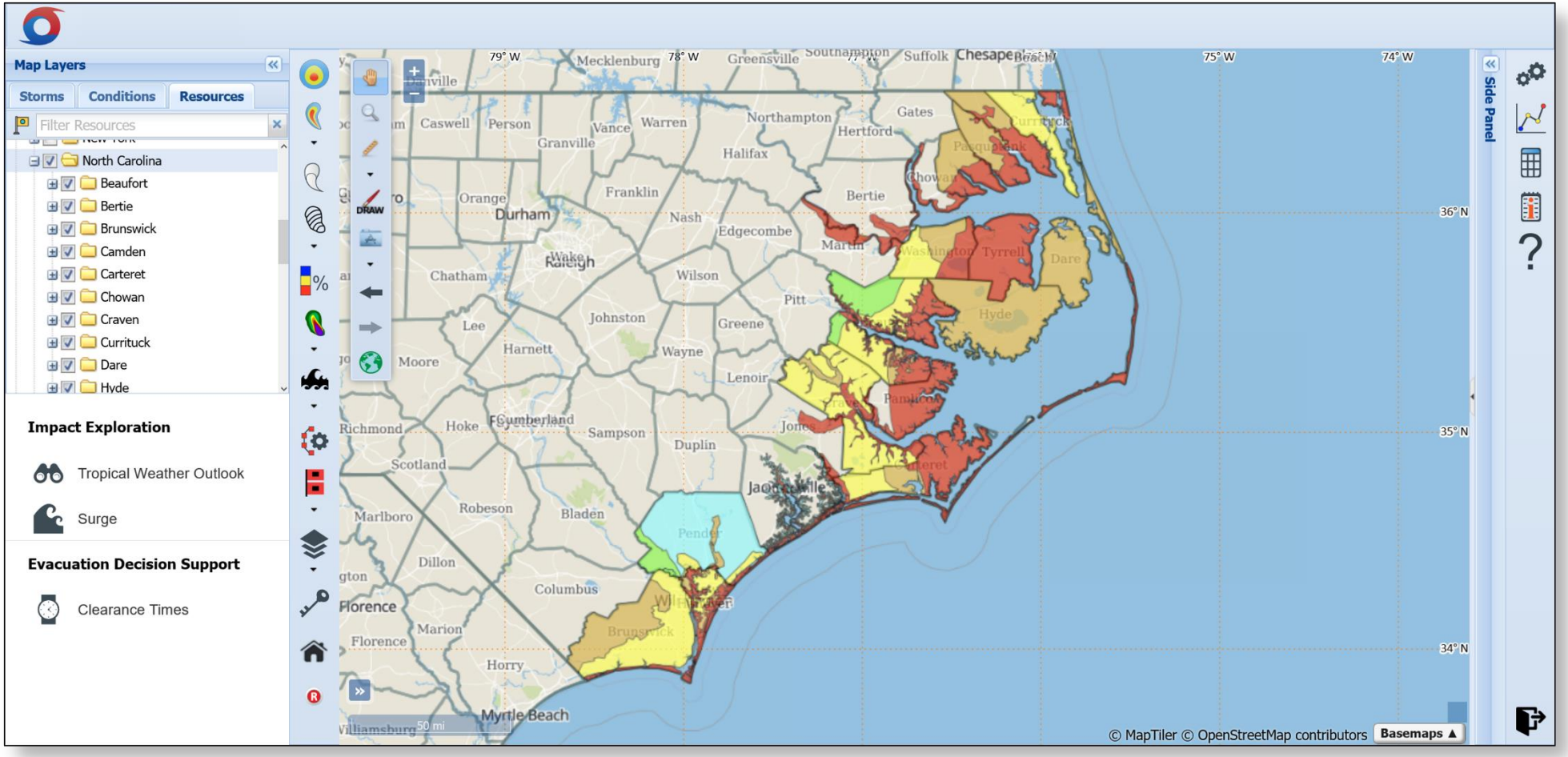
09/09/2019, 5:00 am

The purpose of the evacuations timing table is to show, for each location, when the onset of tropical-storm-force winds is expected and provide the earliest and latest times for making evacuation decisions based on the range of evacuation scenarios and settings that the user has selected.

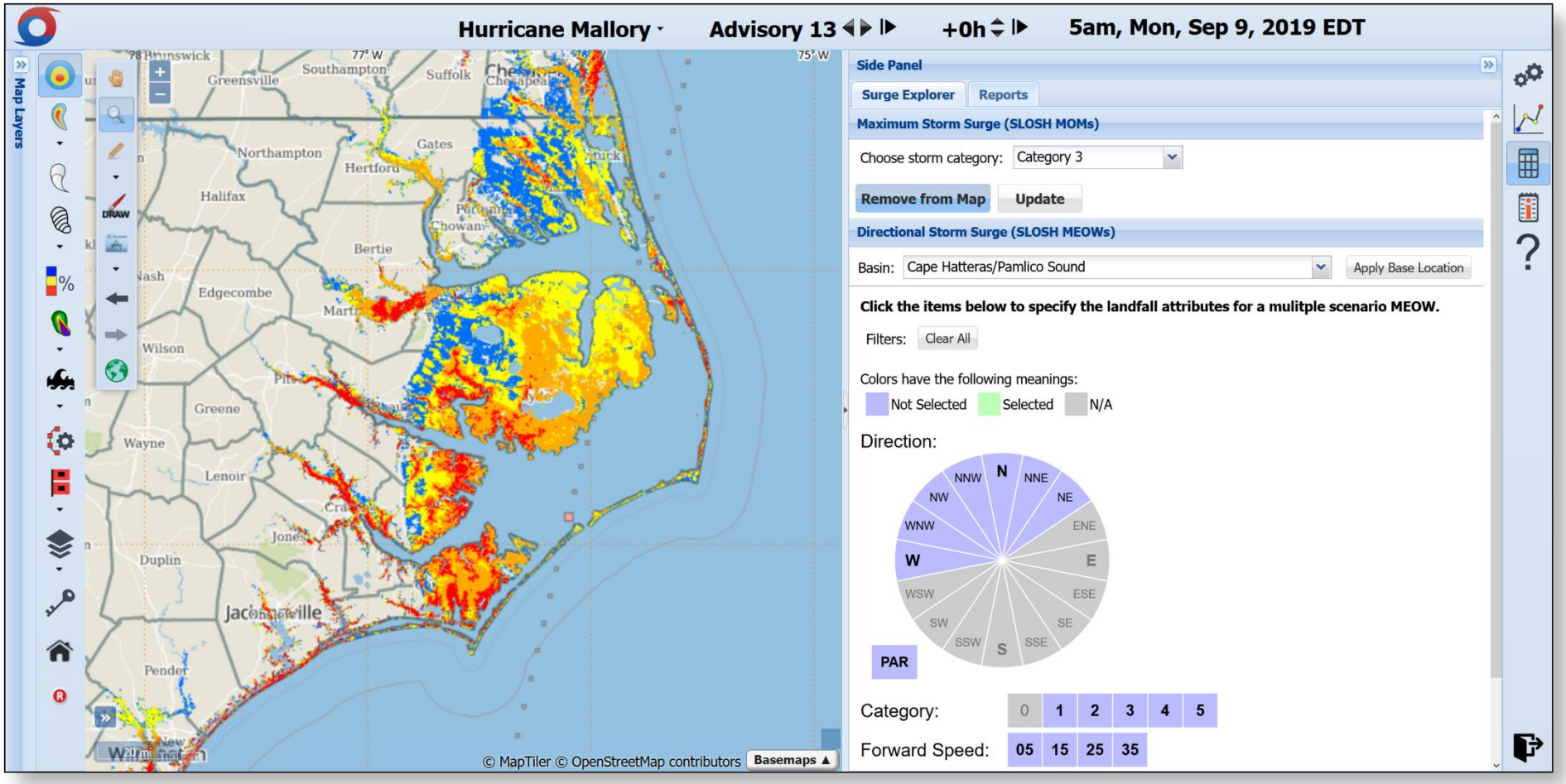
This report uses your saved Evacuation Scenarios and Timeline actions.

State	County	Scenario	Earliest-Reasonable TS Onset Time	Most-Likely TS Onset Time	Clearance Time	Earliest Evac Start Time	Latest Evac Start Time	TS WSP (%)
NC	Carteret	B/Slow/Worst/County	Tue 07 PM	Wed 04 AM	39 hrs	Mon 04 AM	Mon 01 PM	93
NC	Carteret	B/Mod/Med SP/County	Tue 07 PM	Wed 04 AM	35 hrs	Mon 08 AM	Mon 05 PM	93
NC	Carteret	B/Fast/High SP/County	Tue 07 PM	Wed 04 AM	34 hrs	Mon 09 AM	Mon 06 PM	93
NC	Carteret	B/Imm/Low SP/County	Tue 07 PM	Wed 04 AM	30 hrs	Mon 01 PM	Mon 10 PM	93

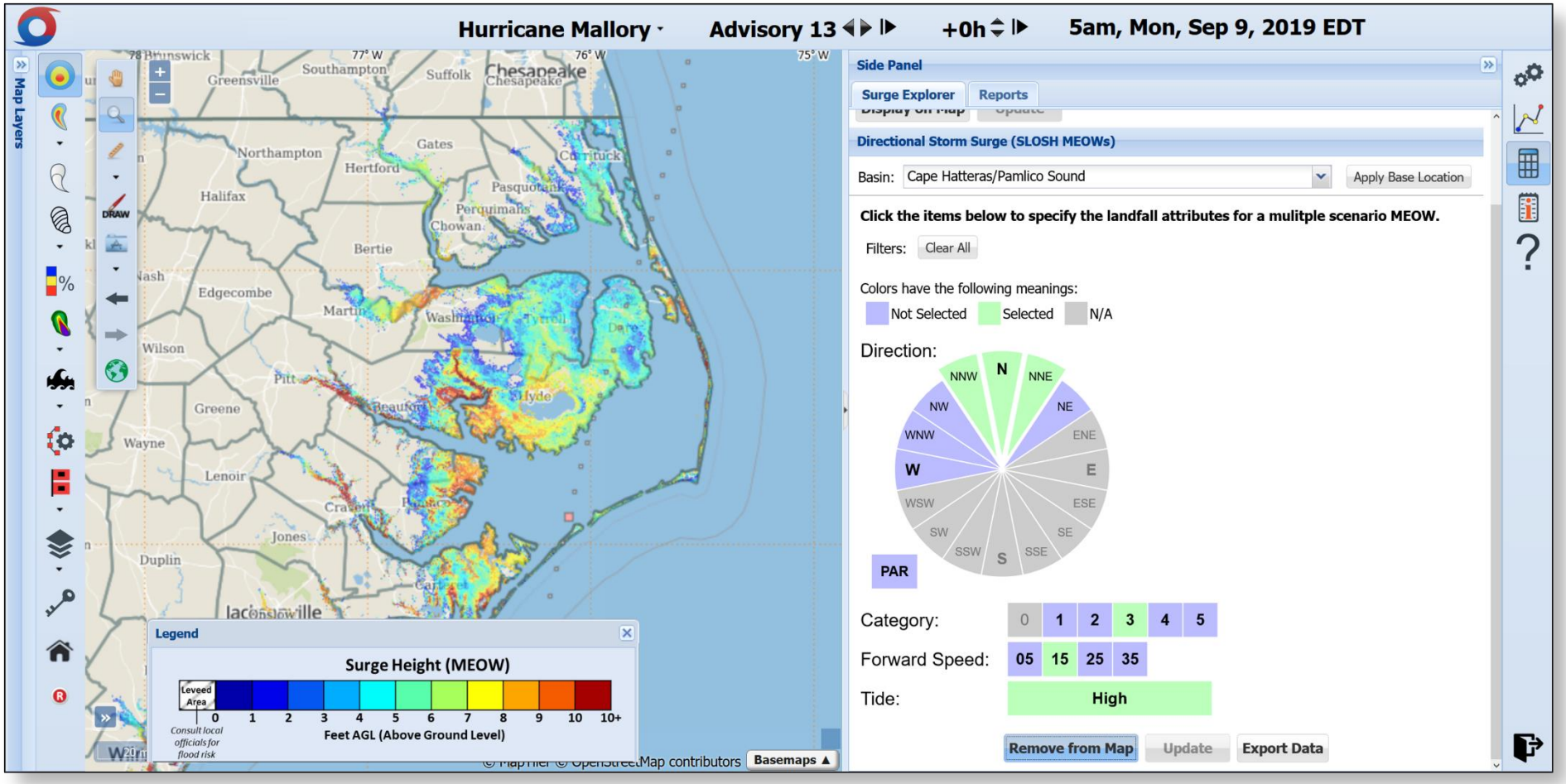
Evacuation Zones



Surge Threat – SLOSH MOMs

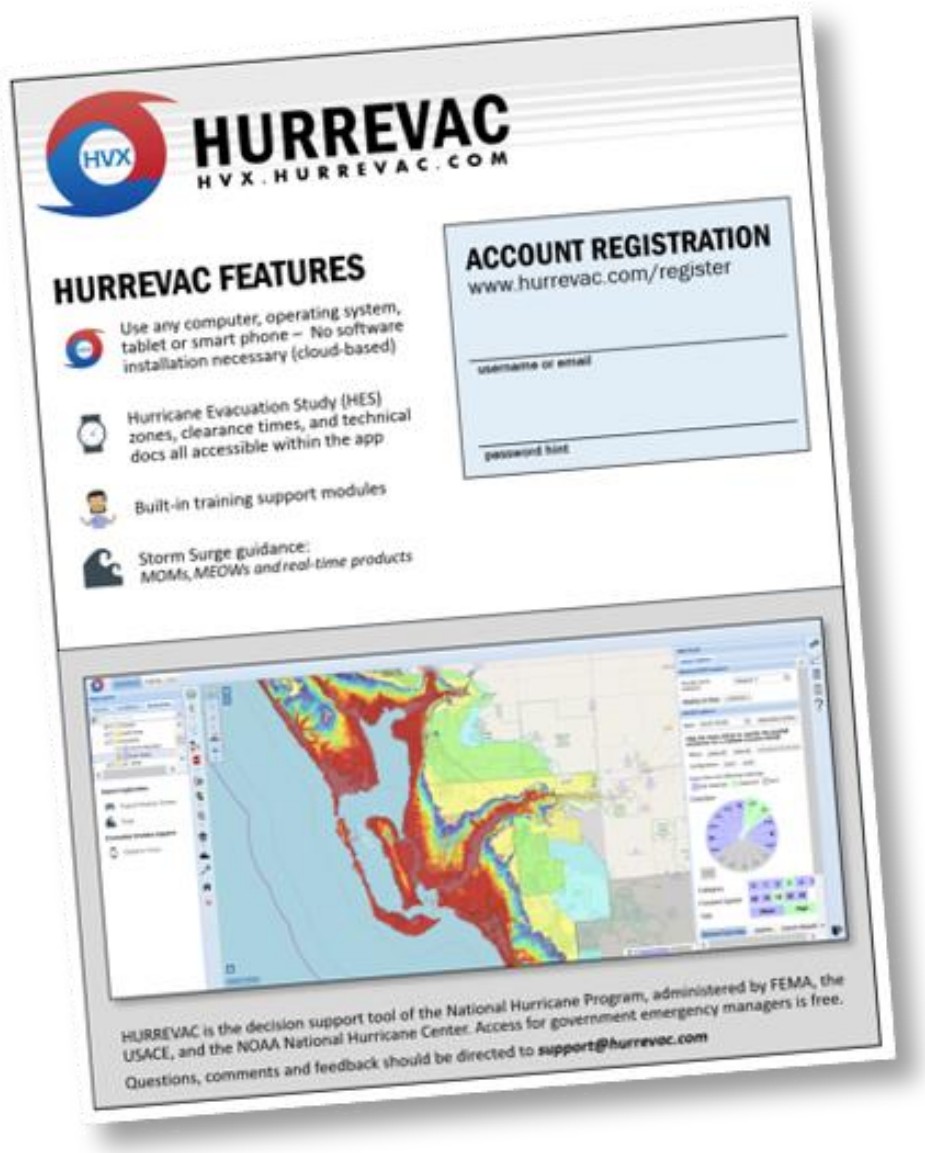


Surge Threat – SLOSH MEOWs



HURREVAC Account Registration

[HURREVAC's Registration Site](#).



Making Better Decisions – HLT

FAQs

- Confidence? Contingencies?
- What is the forecast/evacuation timing?
- Can we get a briefing?

- Hurricane Liaison Team

Background

- Initial idea arose in the early 1990s
- Proven during response to the 1995 Hurricane Season
  - Erin and Opal
- Formalized in 1996
  - Request from Governor of Florida to FEMA and NHC Director

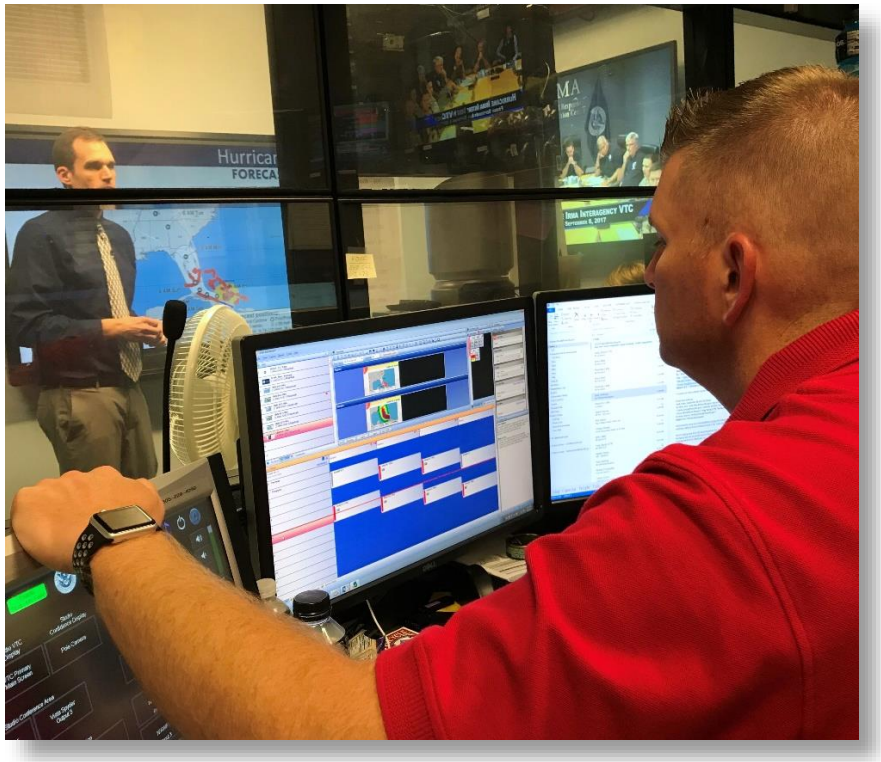
Mission

"The Hurricane Liaison Team's mission is to improve our Nation's capability to respond to hurricanes through the rapid exchange of critical information between the National Hurricane Center and Federal, State, Local, Tribal and Territorial emergency managers."

Rapid Communications

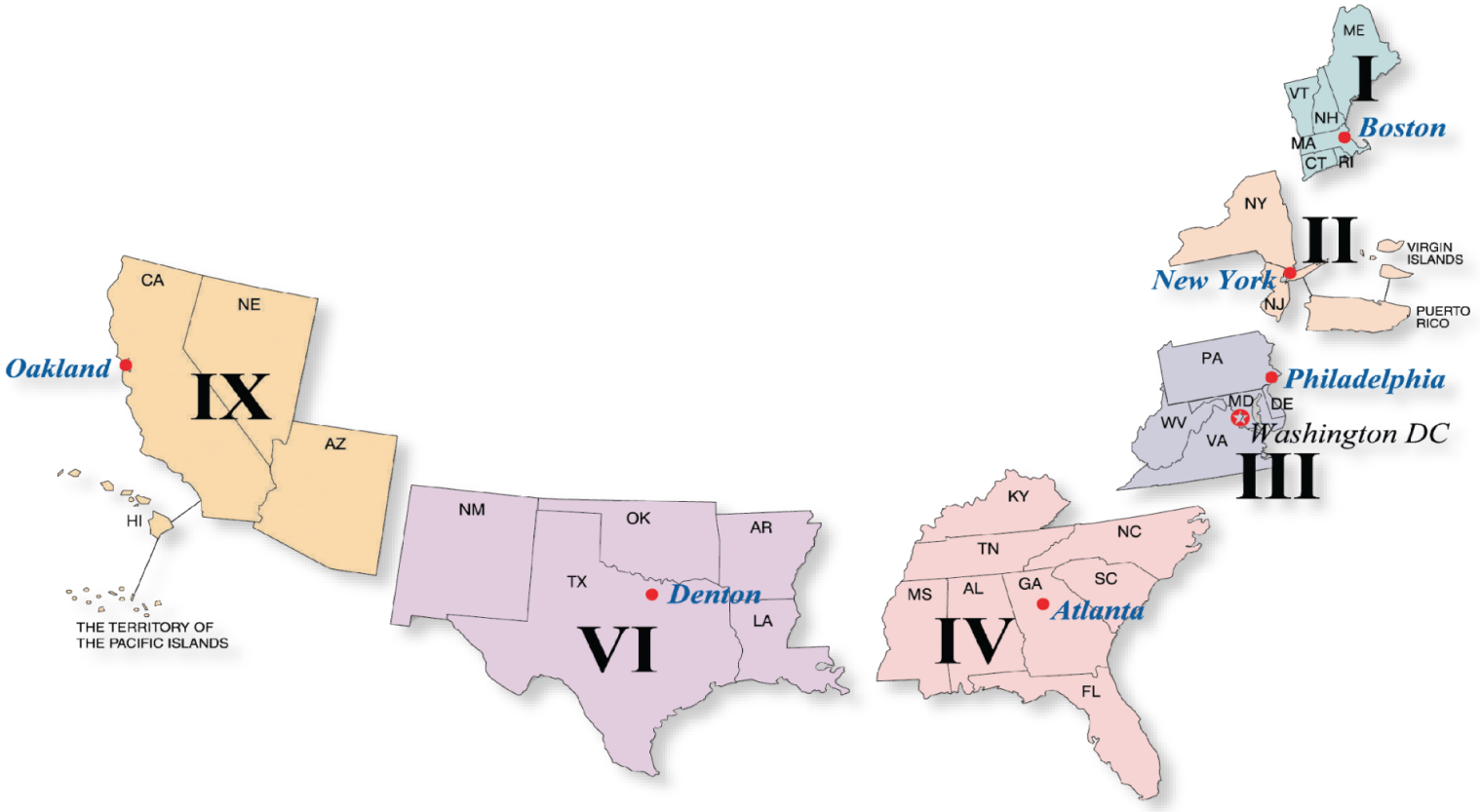
Partnership between the NWS and FEMA

- FEMA Hurricane Program Managers
- FEMA Reservists
- NWS meteorologists and hydrologist

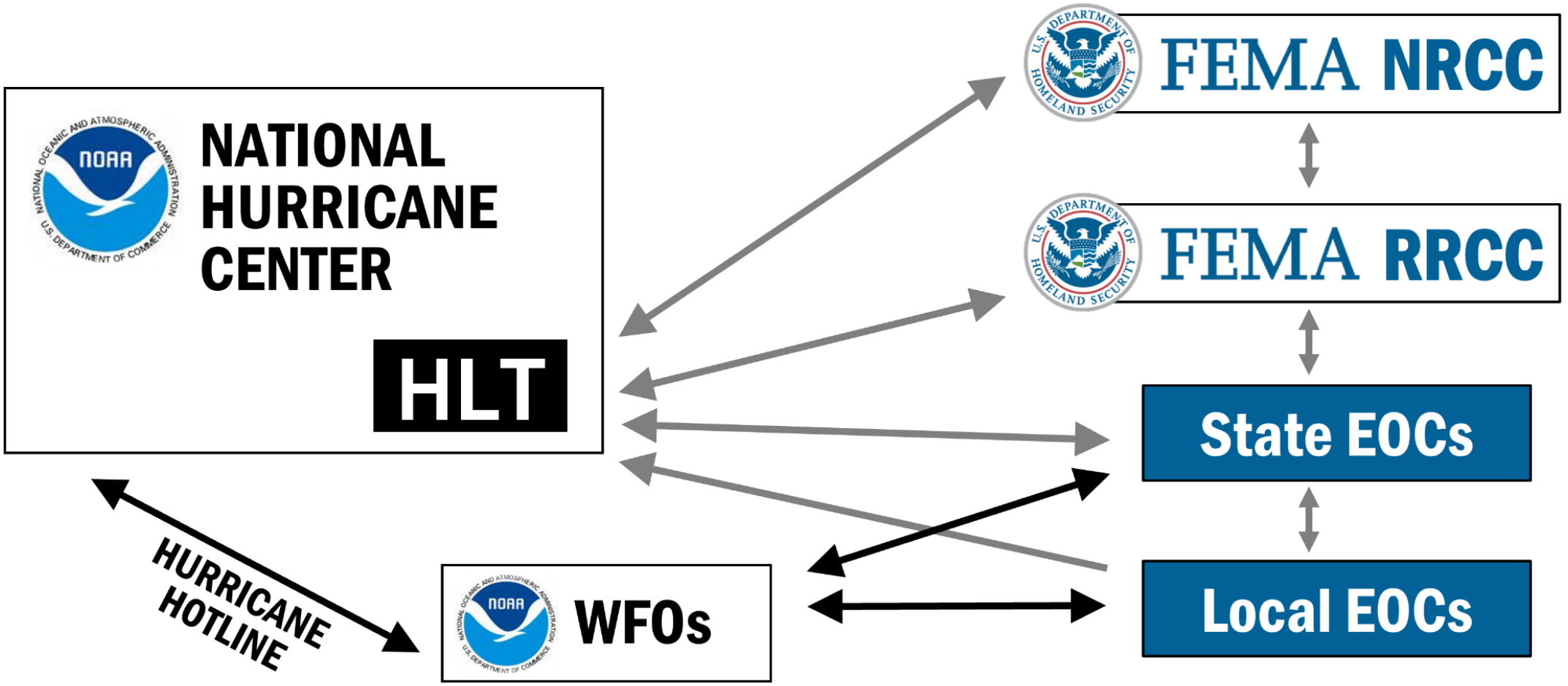


Regional Hurricane Program Manager (HPM)

- Technical Knowledge
- State/Local Relationships
- Deploy to NHC



Communication Flowchart



Responsibilities

- Real-time interpretation, assessment and guidance;
  - Apply NHC forecasts with Regional, State and local response evacuation plans
- Forum for EMs to ask questions,
  - Reinforce decisions;
  - Assist with use of NHC forecasts and predictive modeling
- Provide NHC visibility on State and local protective actions
  - Improve messaging

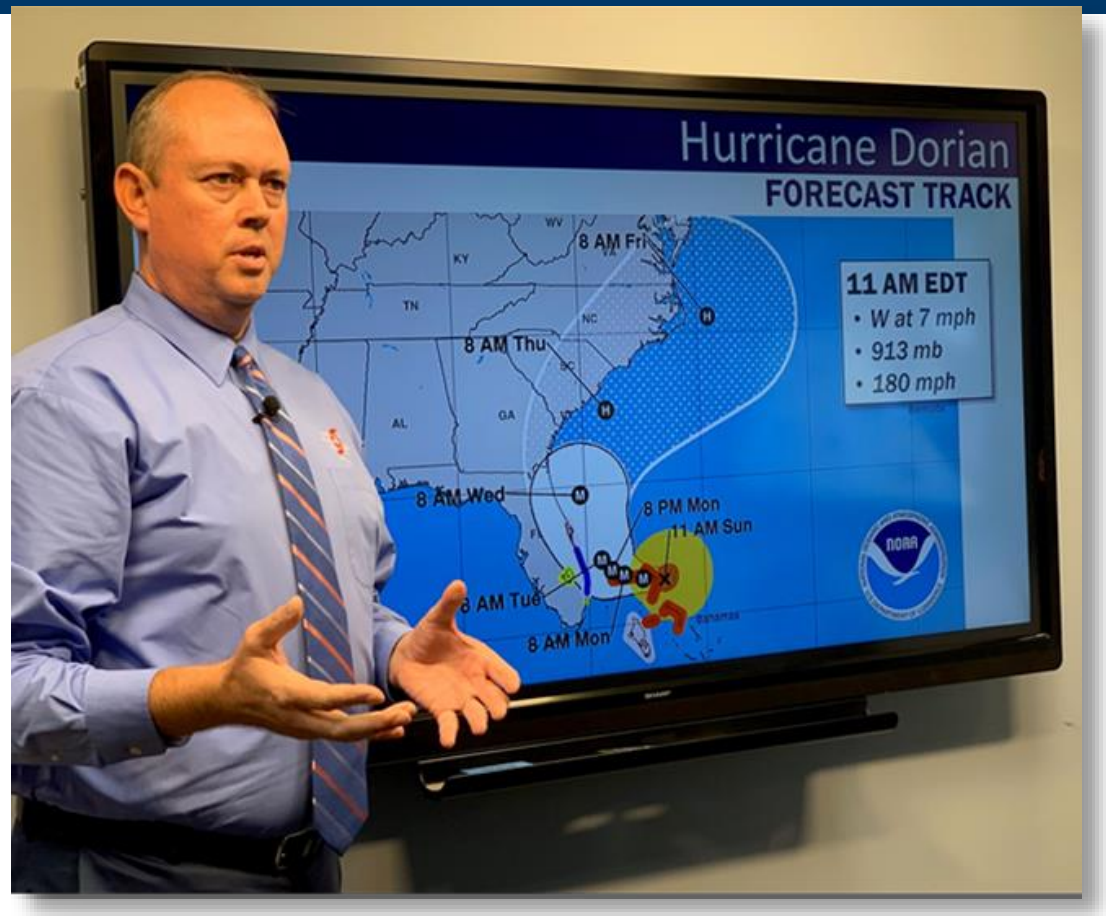
Responsibilities – Comms

Facilitate two-way communications

- Between the NHC and EMs
- Common forecast picture
- Relay EM issues to improve NWS/NHC messaging

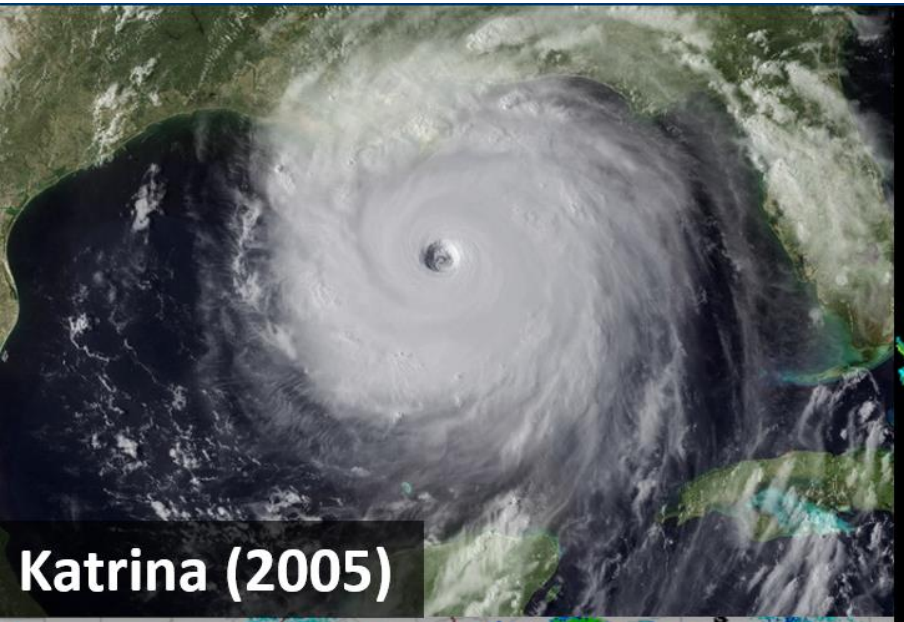
Video/Teleconferences

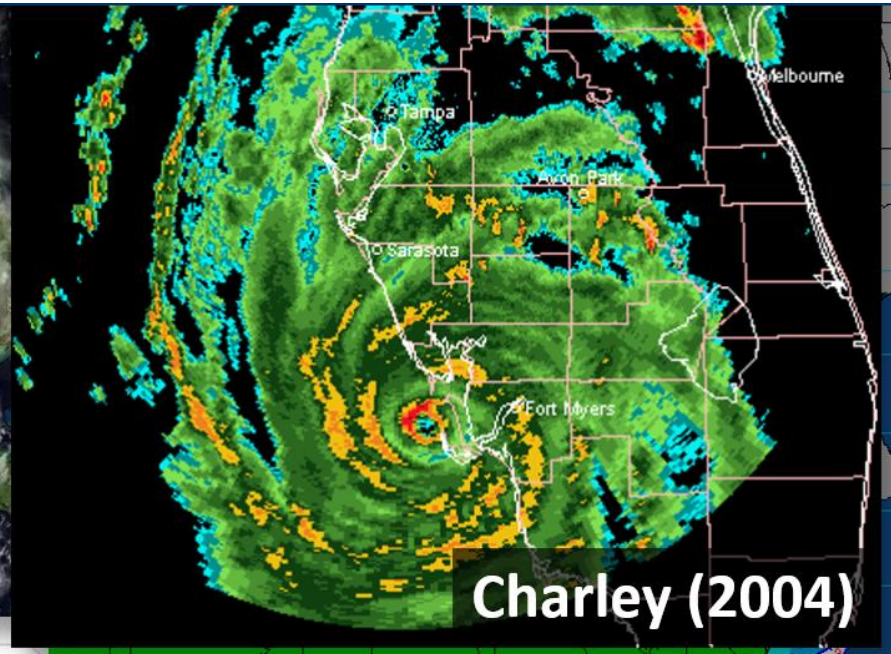
- NHC/NWS
  FEMA and other Federal Agencies
  Emergency Operations Centers (EOCs)

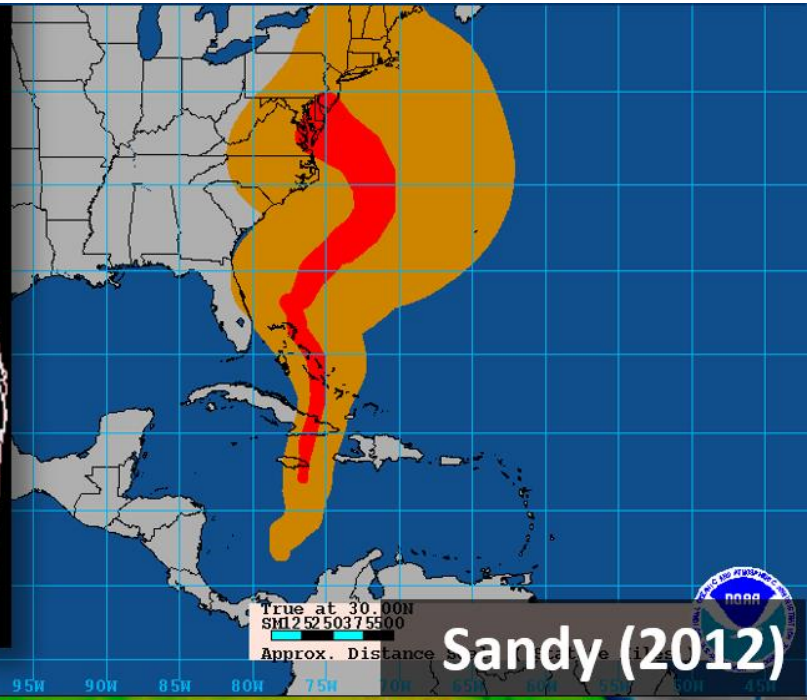


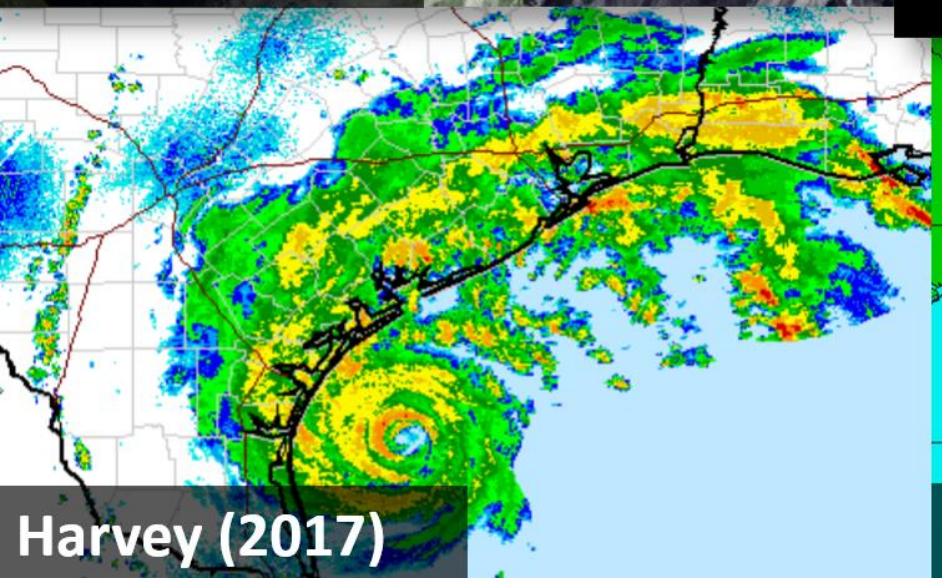
HLT: Recent Storm Examples

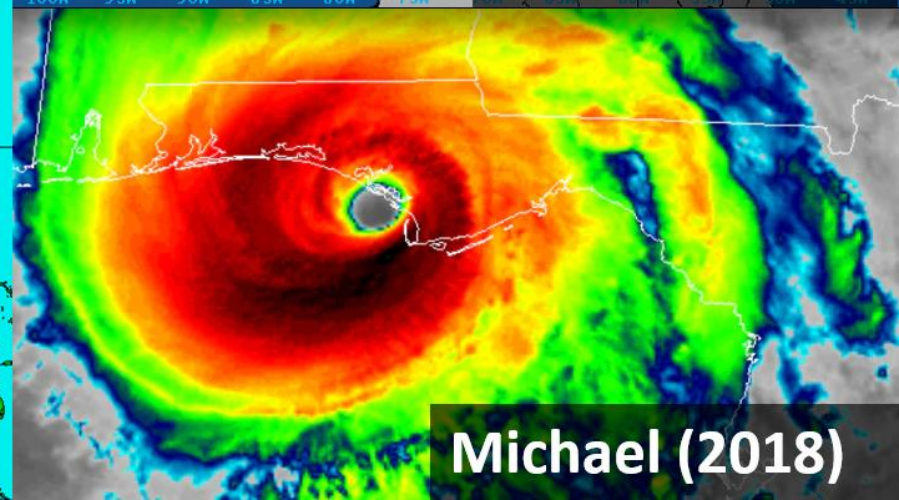
FEMA











Questions/Comments