

2024 HURREVAC Training Webinar Series

Day 3 – Evacuation Timing Features

June 12, 2024



FEMA



NATIONAL HURRICANE PROGRAM



HURREVAC

HURRICANE DECISION SUPPORT TOOL

Attendee information



Registration

- You are automatically signed in when you join
- Registration is still open for Days 4 & 5
- It is not necessary to attend all days

Audio

- All attendees are muted
- If having audio issues or video freezes, restart webinar or try watching link on a different device

Live Transcription

- Available in English and Spanish
- Opens in a separate browser window
- Links are in the chat window and reminder email

Downloadable handouts

- Today's slides
- HURREVAC Workspace Guide
- Also available from hurrevac.com in the **Learning Resources** section



Attendee information



Questions

- Submit in the question box

Feedback

- Daily survey launches after webinar
- Link also in follow-up email

Recording

- Will be posted later today on our YouTube channel and the **Learning Resources** tab of hurrevac.com
- Available if you miss a session, or as a year-round resource

Certificate

- One for each day attended
- Emailed from GoToWebinar about one hour after conclusion
- If missing, check junk/spam first
- Certificates cannot be generated for groups, or makeup viewing on YouTube





THIS WEEK'S AGENDA

JUNE 10: Intro to HURREVAC and the NHP (*available on YouTube*)

JUNE 11: Wind Forecast Features (*available on YouTube*)

JUNE 12: Evacuation Timing Features

JUNE 13: Storm Surge and Flooding Hazards

JUNE 14: Applying HURREVAC for Planning and Operations

Registration is still open for Days 4 & 5 at webinars.hurrevac.com

Today's Presenters



Thomas Laczo

National Hurricane Program Co-Manager
U.S. Army Corps of Engineers, Baltimore District

Karen Townsend

President, Sea Island Software



NATIONAL HURRICANE PROGRAM

OVERVIEW

**HES & HURREVAC
EVACUATION TIMING
FEATURES**



National Hurricane Program



products

services



FORECAST PRODUCTS



STORM SURGE MODELING



HURRICANE EVACUATION STUDIES



OPERATIONAL SUPPORT



PLANNING SUPPORT

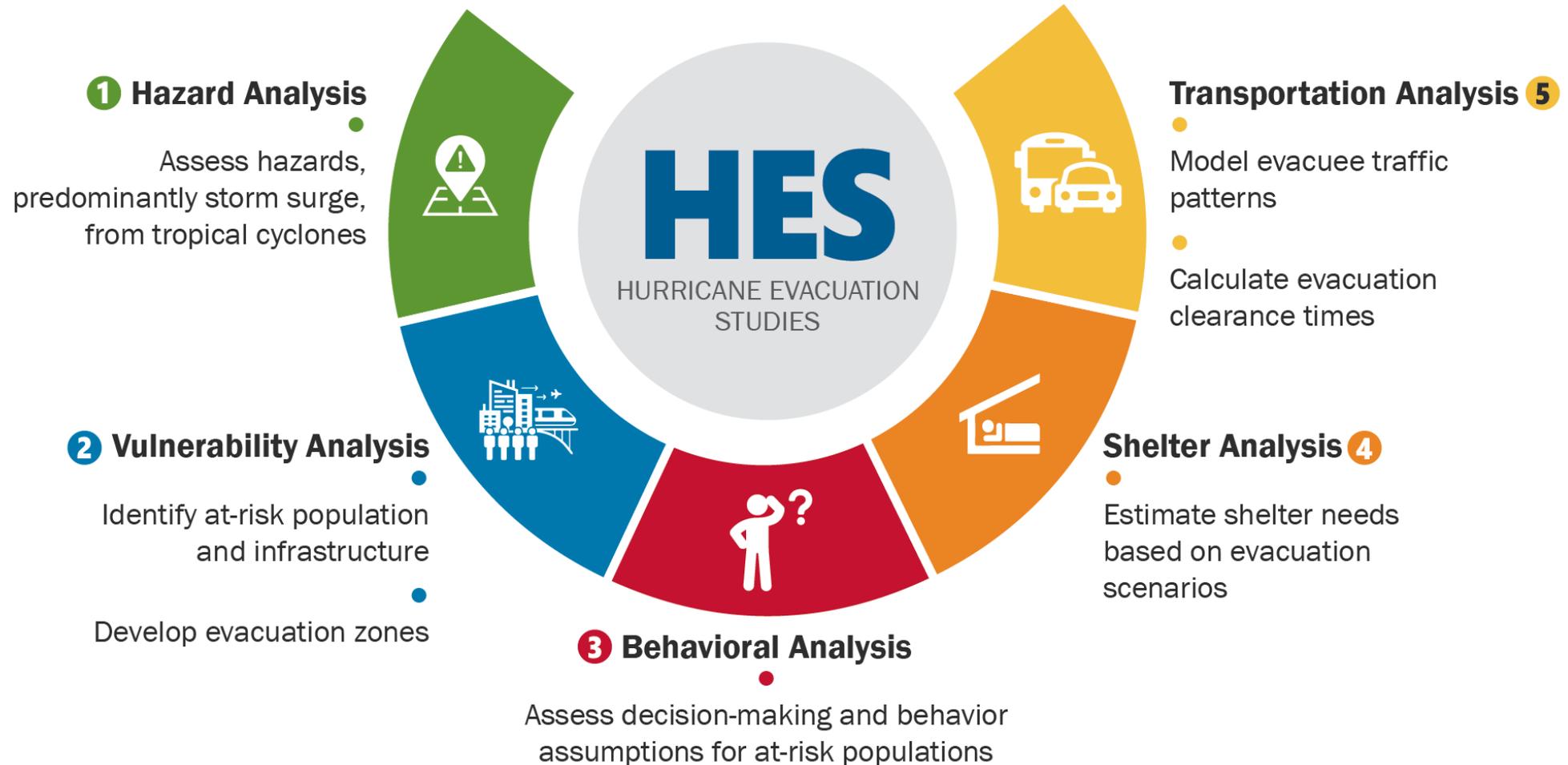


TRAINING



INFORMED DECISIONS

Hurricane Evacuation Studies





HAZARDS ANALYSIS

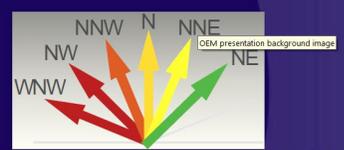
Outcomes



- Refined understanding of hurricane risks through:
 - Grouping and mapping MOMs and MEOWs
 - Overlaying storm surge and FEMA maps
 - Mapping Maximum Envelopes of Wind

Maximum Surge Heights by Storm Bearing

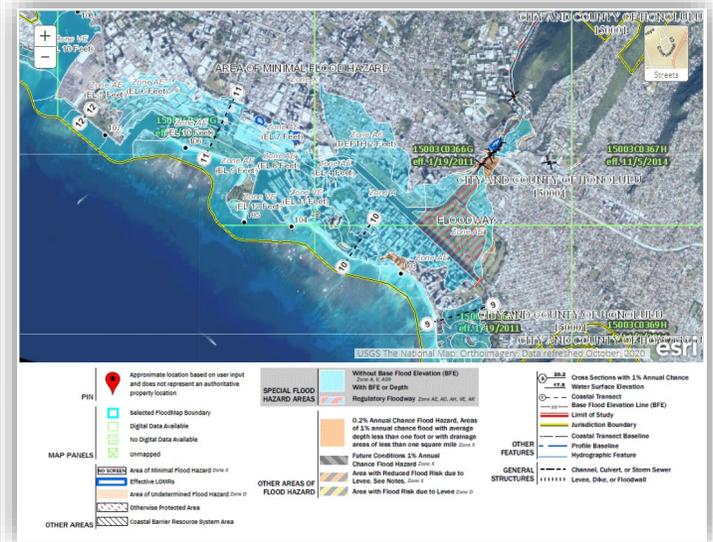
	WNW	NW	NNW	N	NNE	NE
Category 1	12.6	12.1	10.7	8.8	6.6	5
Category 2	20.9	20	20.1	16.5	11.4	8.1
Category 3	26.6	27.6	27.4	23.4	17	11.3
Category 4	32.4	33.9	33.9	30.6	21.7	14.6



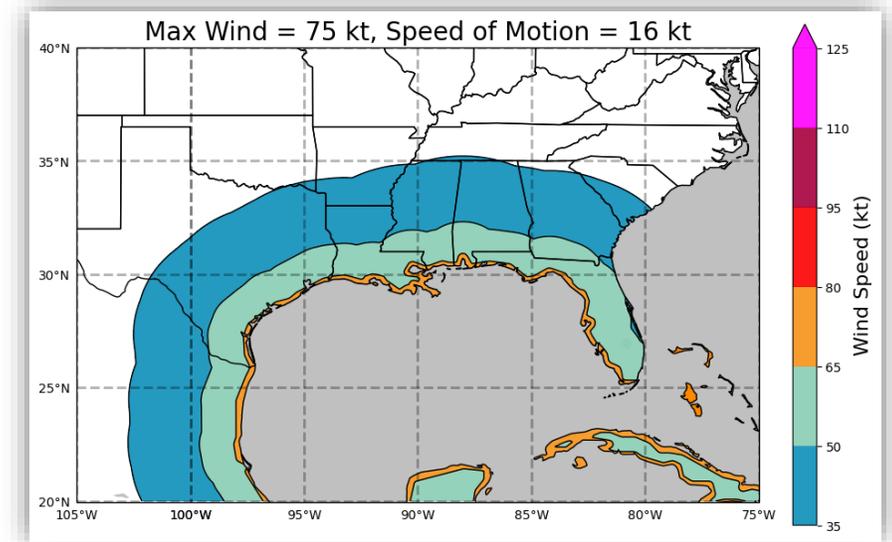
Confidential - FOUO



MOM and MEOWS Groupings



FEMA Flood Maps



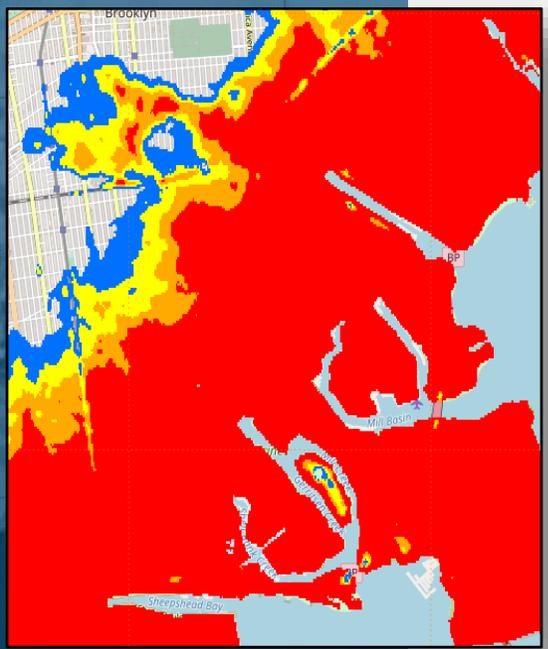
Maximum Envelopes of Wind



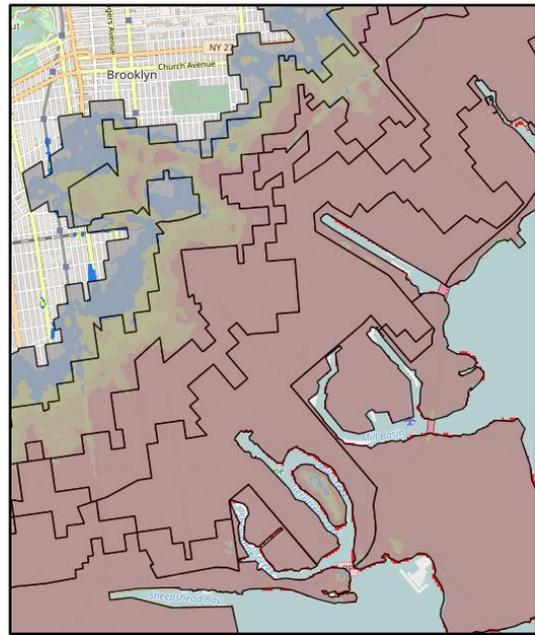
Outcomes

VULNERABILITY ANALYSIS

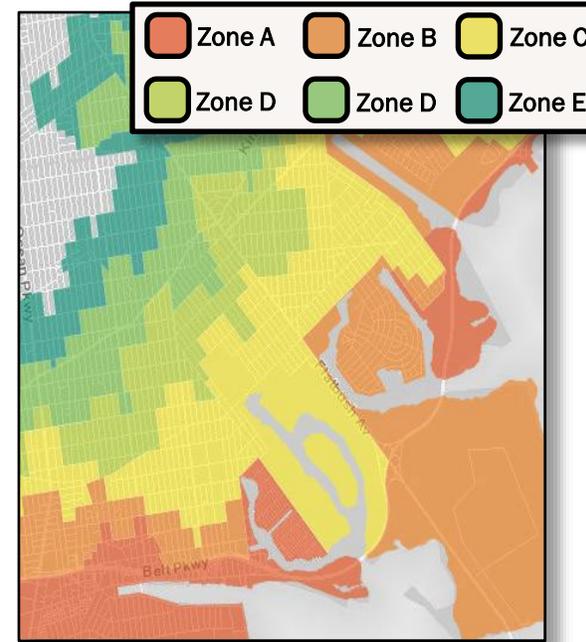
- Identify Vulnerable Population and Critical Infrastructure
- Develop (or refine) Evacuation Zones by combining hazard maps, vulnerability data, transportation network, and state & local input.



Hazard Maps



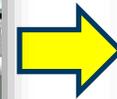
State + Local Input



Evacuation Zones

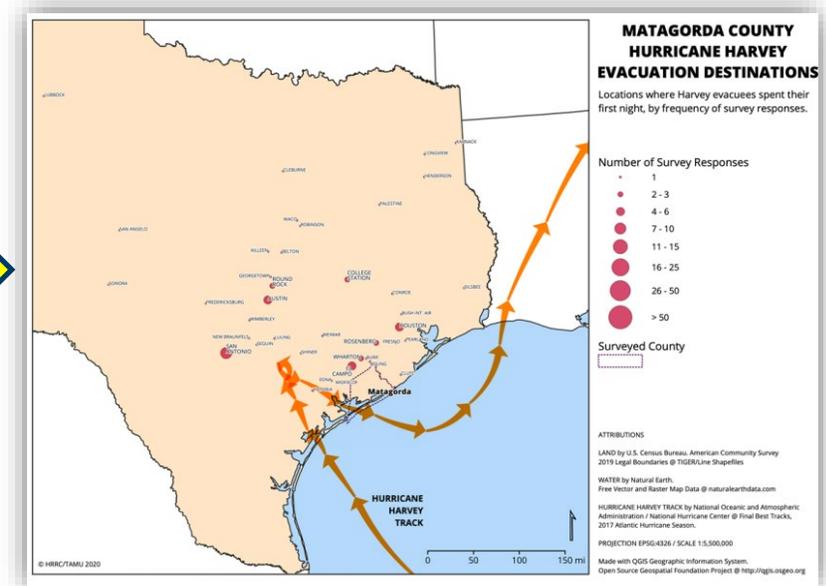


BEHAVIORAL ANALYSIS



Outcomes

- Conduct surveys to develop understanding of how populations respond to hurricane threats
 - Evacuation participation rates
 - Response time
 - Destination weights
 - Public shelter usage rates
 - Vehicle usage





SHELTER ANALYSIS



Outcomes

Conduct a detailed geospatial analysis and use shelter rates (from the behavioral analysis) to:

- Identify shelter locations
- Identify shelter vulnerability
- Perform and a demand vs capacity analysis

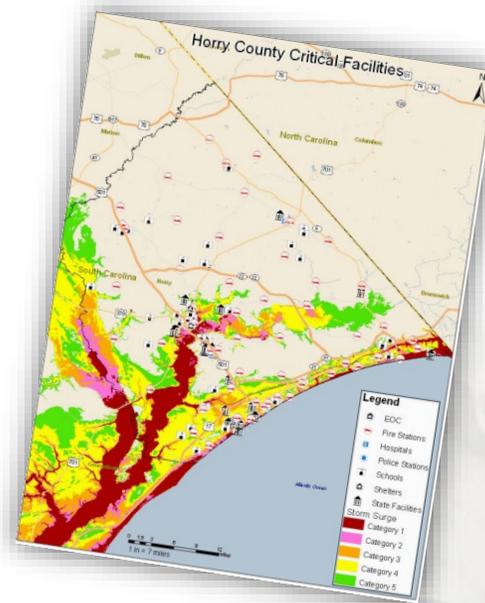


Table 5-1: Horry County Shelters

Name	Address	City	State	Zip	Surge Area	Evacuation Zone	FEMA 100 Year Floodplain	Capacity
Aynor Elementary School	516 Jordanville Rd.	Aynor	SC	29511	NA	NA	N	413
Aynor High School	201 Highway 24	Aynor	SC	29511	NA	NA	N	627
Conway Elementary School	1101 Snowhill Dr.	Conway	SC	29526	4	NA	N	683
Conway High School	2301 Church St.	Conway	SC	29527	NA	NA	N	1,280
Green Sea Floyds Elementary School	5000 Tulip Grove Rd.	Green Sea	SC	29545	NA	NA	N	533
Green Sea Floyds Middle & High School	4990 Tulip Grove Rd.	Green Sea	SC	29545	NA	NA	N	1,115
Loris Elementary School	901 Highway 9 Bus. East	Loris	SC	29569	NA	NA	N	464
Loris High School	301 Loris Lions Rd.	Loris	SC	29569	NA	NA	N	1,090
Pee Dee Elementary School	6555 Hwy 134	Conway	SC	29527	NA	NA	N	533
South Conway Elementary School	3001 Fourth Ave.	Conway	SC	29526	4	NA	Y	495
Whittemore Park Middle School	1808 Rhue St.	Conway	SC	29527	NA	NA	N	845
Total								8,078

Table 5-14: Public Sheltering Deficit/Surplus Analysis for the Northern Conglomerate

County	Shelter	Scenario A				Scenario B				Scenario C			
		Low Occ	Med Occ	High Occ	Extreme Occ	Low Occ	Med Occ	High Occ	Extreme Occ	Low Occ	Med Occ	High Occ	Extreme Occ
Horry	Shelter Demand	9,590	9,914	10,568	10,894	13,972	14,335	15,068	15,434	24,276	24,645	25,395	25,769
	Shelter Capacity	8,078	8,078	8,078	8,078	8,078	8,078	8,078	8,078	6,900	6,900	6,900	6,900
	Deficit / Surplus	-1,512	-1,836	-2,490	-2,816	-5,894	-6,257	-6,990	-7,356	-17,376	-17,745	-18,495	-18,869
Georgetown	Shelter Demand	2,722	2,762	2,845	2,885	3,996	4,039	4,131	4,177	4,387	4,432	4,523	4,570
	Shelter Capacity	2,560	2,560	2,560	2,560	2,560	2,560	2,560	2,560	2,560	2,560	2,560	2,560
	Deficit / Surplus	-162	-202	-285	-325	-1,438	-1,479	-1,571	-1,617	-1,827	-1,872	-1,963	-2,010

Note: Shelter capacity estimates are intended to provide a general overview of potential space surpluses or deficits when projected demand is reviewed in light of available identified spaces. Capacity figures are subject to change. Any specific shelter data or list is subject to change and may not reflect actual shelters employed.



TRANSPORTATION ANALYSIS

Outcomes



- Develop Evacuation Scenarios through close coordination with local & state emergency managers
- Transportation modeling to get Clearance Times using the Real Time Evacuation Planning Model (RtePM)
- HURREVAC Integration

Scenario	Subregion				Dir			Cat			Zones				Part Rate			LR		NC		Likely		REGIONAL CLEARANCE TIME		
	SS	P	MP	NN	ES	NW	NE	1/2	3	4	A	B	C	D	L	M	H	W	WO	W	WO	ML	CAT			
ES-1																									28	
ES-2																										28
ES-3																										45
ES-4																										38
ES-5																										58
ES-6																										50
ES-7																										34
ES-8																										45
ES-9																										38
ES-10																										58
ES-11																										58
ES-12																										50
ES-13																										67
ES-14																										67
ES-15																										58



Evacuation Scenarios | Timeline Actions | Timing Arcs

State: County:

HURREVAC makes recommendations for evacuation start times based on how long it takes to evacuate a vulnerable population ahead of the arrival of tropical-storm-force winds (34kt/39mph). To utilize this capability of the program, you must first select one or more evacuation scenarios from a region's Hurricane Evacuation Study. Refer to the Study's technical data report, or ask your state's Hurricane Program Manager for guidance on making selections appropriate to a particular storm situation.

[Virginia HES 2020](#)

Total Evacuation hours: Range of 15 hours - 96 hours

Internal Regions Evacuating:

External Regions Evacuating:

Evacuation Zone:

Storm Direction:

Evacuation Participation Rate:

Roadway Modification:

Saved Scenarios

<input type="checkbox"/>	Location	Scenario	Hours
<input type="checkbox"/>			

Evacuation Timing Features in HURREVAC



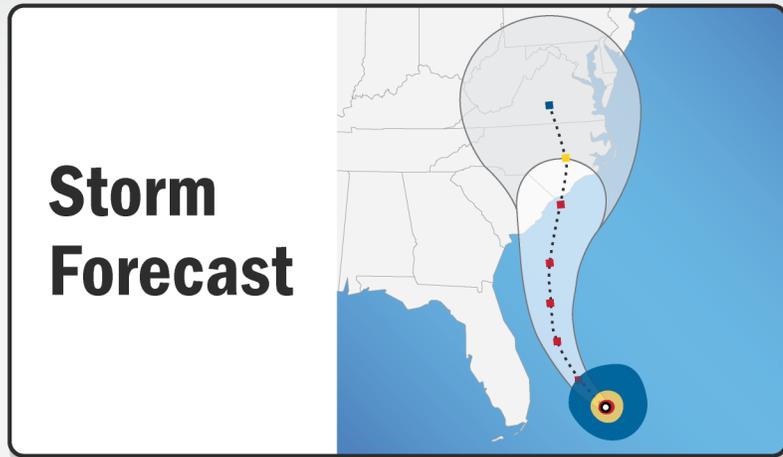
EVACUATION
ROUTE



Calculating Evacuation Start Time



HAZARDS



**Arrival Time of
Tropical-Storm-Force Winds**



PLANNING SCENARIOS

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



**Clearance Time
Scenario**



EVACUATION

**Evacuation
Start Time**



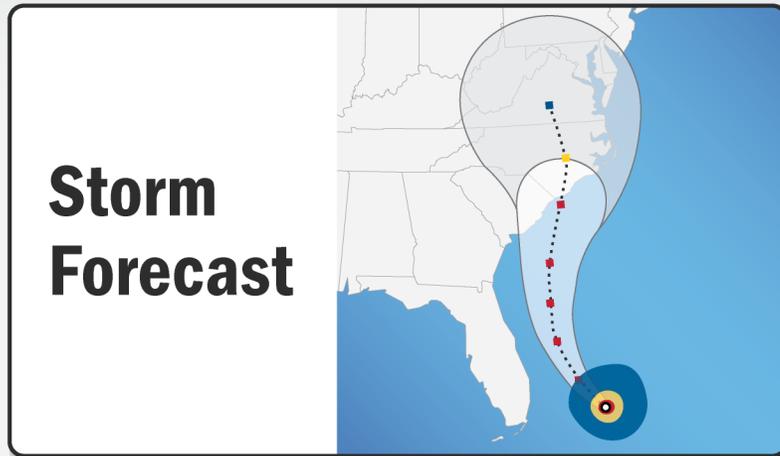
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Calculating Evacuation Start Time



HAZARDS

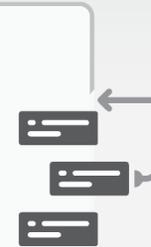


Arrival Time of
Tropical-Storm-Force Winds

8pm Saturday

PLANNING SCENARIOS

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



CATEGORY 3

Clearance Time
Scenario



36 Hours

EVACUATION

Evacuation
Start Time



8am Friday

HURREVAC Demo





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Thank you!

HURREVAC Support Team
support@hurrevac.com



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