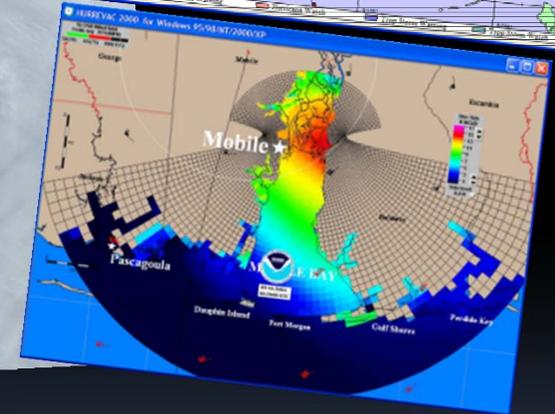
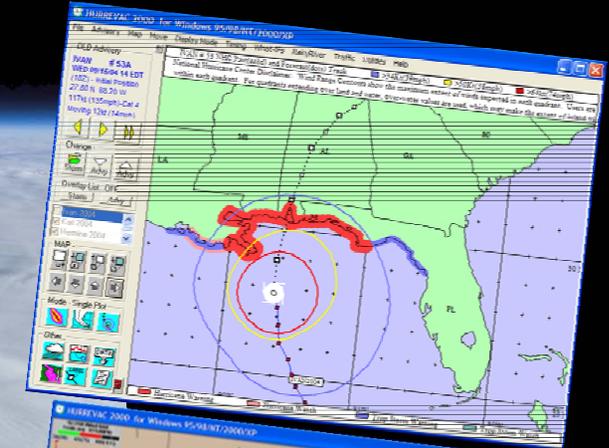
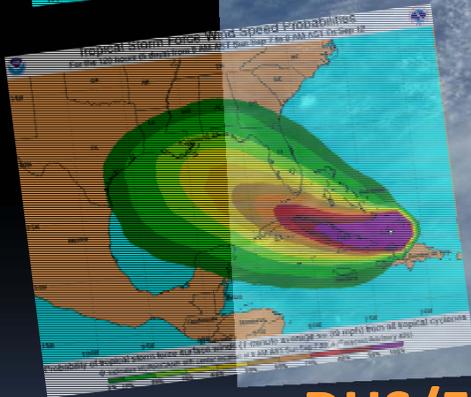
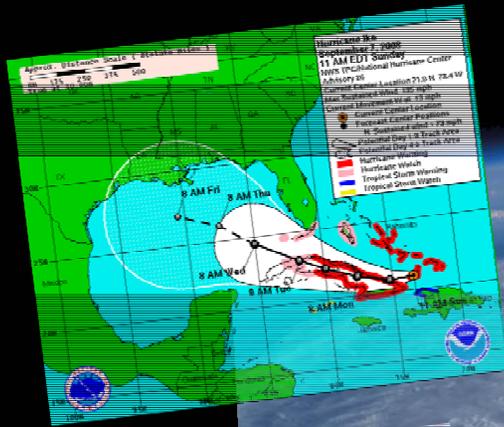


L-311 Hurricane Readiness for Coastal Communities



**DHS/Federal Emergency Management Agency
Emergency Management Institute
National Weather Service (NWS)
National Hurricane Center (NHC)**

Course Introduction



FEMA



FEMA

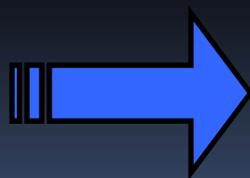


Course Background



Hurricane Readiness Challenges:

- Areas are vulnerable to hurricanes
- Population is growing and seasonal
- Population is not experienced with hurricanes
- Forecasting technology has limitations
- Hurricanes are not just a coastal problem



Elected and emergency management officials must make critical decisions to save lives and protect property.

Course Overview and Objectives

At the conclusion of this course, the participants should:

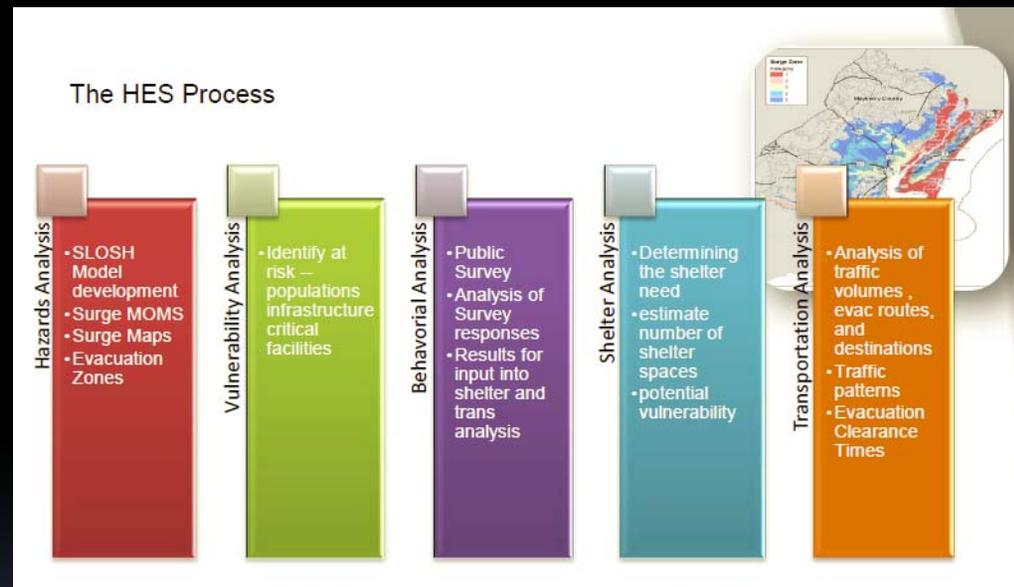
- Have a better understanding of the NHC forecast process and products
- Understand that NHC forecasts have significant uncertainties that must be considered in emergency management decision-making
- Have a greater understanding of how to use NHC storm surge information



Course Overview and Objectives

At the conclusion of this course, the participants should:

- Understand the components of Hurricane Evacuation Studies and how to plan of the threat



- Have greater insight into the resources available for evacuation decision-making

Participants will.....

- Have discussion with NHC & FEMA personnel
- Learn about the challenges of operational hurricane forecasting
- Learn about forecast uncertainties and how to deal with them
- Learn about hurricane hazards, with particular focus on storm surge
- Learn about the tools available for decision making when a storm threatens



Course Ground Rules...

- Cell Phones- *Silence*
- Stay off internet-
iPhone/iPad/Android/Blackberry
- Return from lunch and breaks on time!



Course Agenda

- 8:30-10:00 AM- Session 1
 - Hurricane Life Cycle and Hazards (8:40-9:20)
 - The NHC Forecast Process (9:20-10:00)
- 10:30-Noon- Session 2
 - NHC Forecast Verification- Quantifying Forecast Uncertainty (10:30-10:45)
 - NHC and WFO Products (10:45-11:15)
 - Wind Speed and Intensity Probabilities (11:15-Noon)

Course Agenda

Today

- 1:30-3:00 PM- Session 3
 - Introduction to Storm Surge (1:30-2:15)
 - Forecasting Storm Surge and Products (2:15-3:00)
- 3:30-5:00 PM - Session 4
 - Readiness- Planning for the Threat (3:30-4:15)
 - Hurricane Exercise- Putting the Pieces Together (4:15-5:00)

Let's see how much you already know... (or don't know and will learn)

1. The NHC assigns Saffir-Simpson Hurricane Scale categories based on what?
 - a. Size of the hurricane
 - b. Forecast storm surge
 - c. Maximum wind
 - d. Minimum pressure
 - e. b, c, and d

Scale Number (Category)	Sustained Winds (MPH)	Types of Damage Due to Hurricane Winds	Hurricanes
1	74-95	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.	Dolly (2008) on South Padre Island, Texas
2	96-110	Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.	Frances (2004) in coastal Port St. Lucie, Florida
3	111-130	Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.	Ivan (2004) in coastal Gulf Shores, Alabama
4	131-155	Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.	Charley (2004) in coastal Punta Gorda, Florida
5	>155	Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.	Andrew (1992) in coastal parts of Cutler Ridge, Florida

Let's see how much you already know... (or don't know and will learn)

2. The size of the circles that carve out the “cone of uncertainty” (the error cone) are drawn such that the actual position of the storm will fall within the circle _____ of the time.

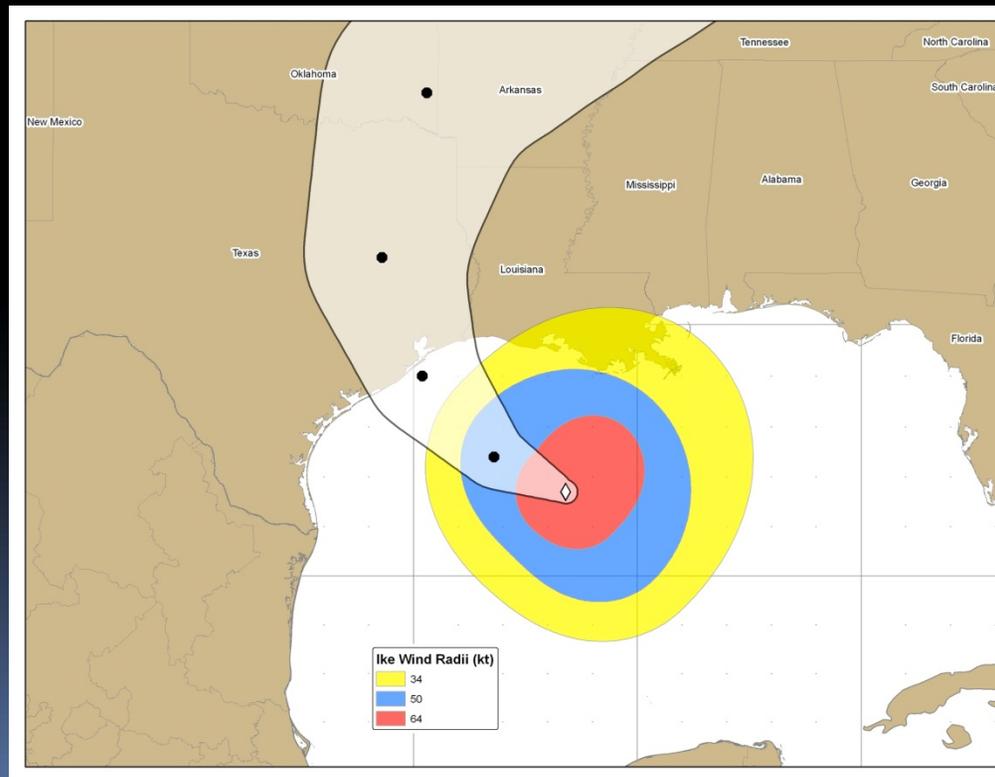
- a. one-half ($1/2$)
- b. two-thirds ($2/3$)
- c. three-quarters ($3/4$)
- d. four-fifths ($4/5$)



Let's see how much you already know... (or don't know and will learn)

3. Does the “cone of uncertainty” map out impact areas?
Yes or No

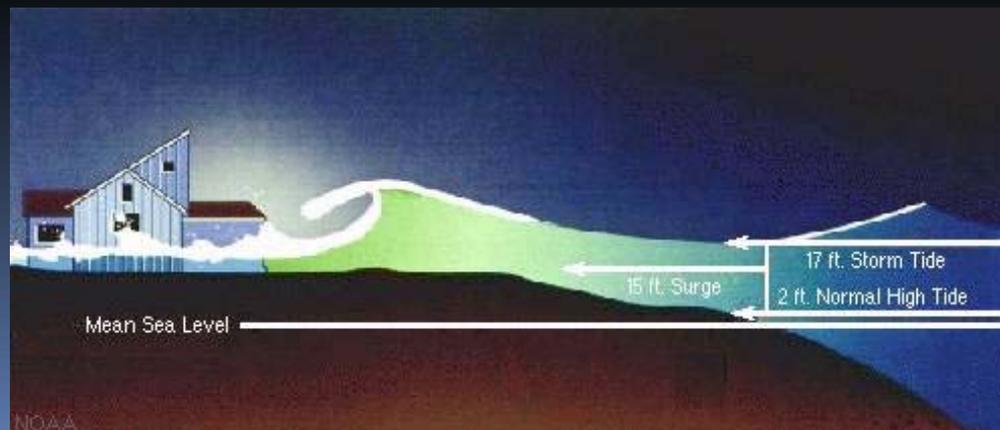
NO!!!! Impacts often occur outside the cone!



Let's see how much you already know... (or don't know and will learn)

4. What is Storm Surge?

- The total rise of water resulting from the flooding rivers, rainfall, tides and ocean water penetrating inland from a storm.
- The wall of water pushed ahead of a storm.
- The abnormal rise of water raised by the low pressure in the center of a storm.
- The abnormal rise of water generated by a storm over and above the predicted astronomical tide.



Let's see how much you already know... (or don't know and will learn)

5. When should a county evacuation be completed?
- a. Before tropical-storm-force-winds or other hazards arrive
 - b. Before watches and warning are issued
 - c. Before landfall of the eye of the hurricane
 - d. Before the arrival of hurricane-force-winds



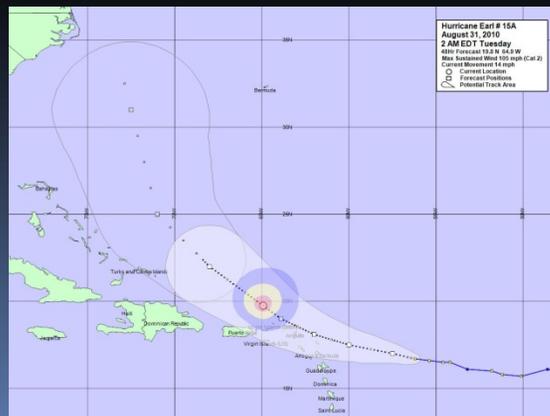
Let's see how much you already know... (or don't know and will learn)

6. What is a critical source of information of a communities hazards, vulnerability and behavior that go into the hurricane sections of a communities Emergency Operations Plan?
 - A. Hurrevac
 - B. National Hurricane Center
 - C. Hurricane Evacuation Study
 - D. Slosh Model

Let's see how much you already know... (or don't know and will learn)

7. Which one of the following doesn't the computer program HURREVAC do?

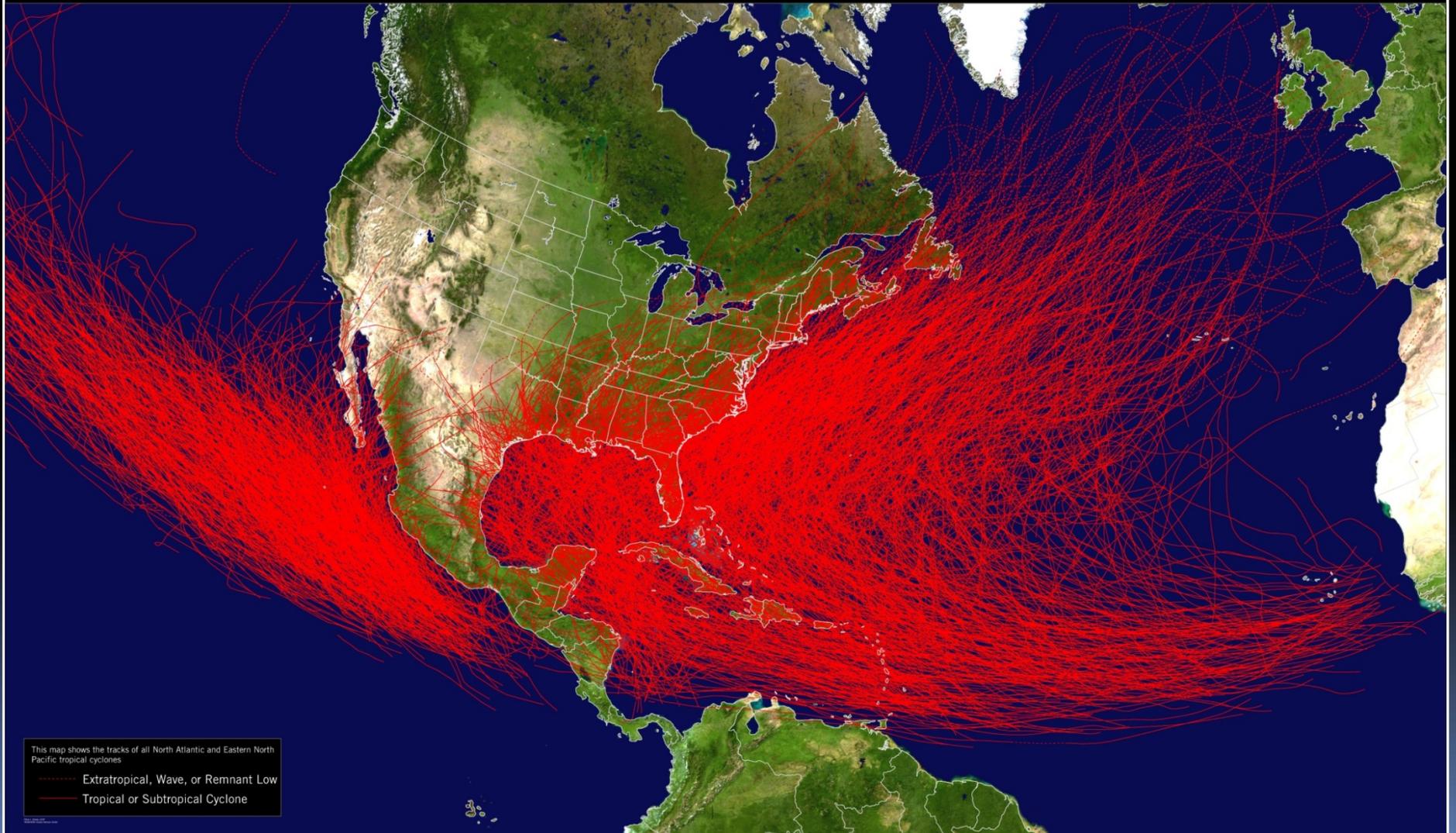
- a. Provides a common operation picture of the hurricane forecast
- b. Make evacuation decisions
- c. Graphically displays tropical cyclone and evacuation data
- d. Provides real time NWS and NHC forecasts



Ready to learn more...

Tropical Cyclone History

Data since 1949 in the Pacific, 1851 in the Atlantic



This map shows the tracks of all North Atlantic and Eastern North Pacific tropical cyclones

- Extratropical, Wave, or Remnant Low
- Tropical or Subtropical Cyclone