

Hurrevac2010 Comprehensive Training

Florida Governor's Hurricane Conference
May 24, 2010

Classroom Introductions

- Instructor
 - Karen Townsend, Sea Island Software
- Students
 - *Name, role in organization, level of experience with HURREVAC*

Course Agenda

- Morning
 - Introduction to HURREVAC and Hurricane Tracking
 - Getting Started with Hurrevac2010
 - Hurrevac2010 Basics
- Afternoon
 - Threat Assessment for Distant Storms
 - Evacuation Decision Timing
 - Evaluating Storm Surge and Flooding Potential
 - Working with Archive and Exercise Storms

Let's Get Started!



INTRODUCTION TO HURREVAC AND HURRICANE TRACKING

What is HURREVAC?

Hurrevac is a hurricane tracking and evacuation decision tool for government emergency managers

- Restricted distribution to over 8000 users worldwide



HURREVAC Sponsors

HURREVAC receives funding and technical support from cooperating agencies of the National Hurricane Program



FEMA



National Weather Service



U.S. Army Corps of Engineers

Program History

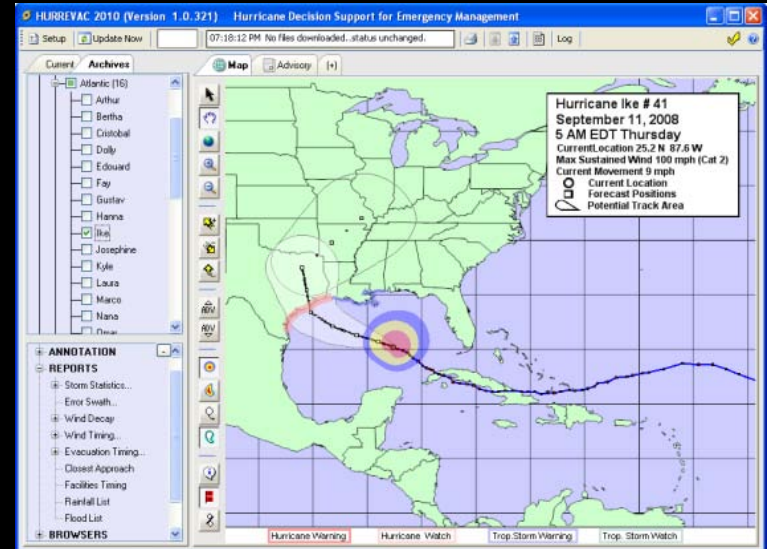
- Hurrevac was started in 1987 with a grant from FEMA to the South Carolina Emergency Management Agency
- The program was developed by John Townsend (a meteorologist in the Charleston, SC office of the National Weather Service)
- Coupled real-time data from the National Hurricane Center with results of FEMA/USACE Hurricane Evacuation Studies

Program History

- Early versions of Hurrevac were **state-specific**, with rudimentary DOS-based graphics
- In 1998, a single version applicable to all regions, was introduced (dubbed **HurWin95** for the Windows95 operating system)
- **Hurrevac2000** later expanded capabilities to include rainfall forecasts and Pacific storm tracking capabilities
- **Hurrevac2010** is a brand new platform for the program

What's New in Hurrevac2010

- Duplicates most functionality of Hurrevac2000, but with a more intuitive user interface
- Receives automatic forecast updates and presents a clearer picture of live situation
- Enhanced graphics and better base maps



Forecast Data Sources

- NOAA's National Hurricane Center (NHC) and various National Weather Service offices
- Central Pacific Hurricane Center (CPHC)
- US Navy's Joint Typhoon Warning Center (JTWC)



NHC Tropical Weather Outlook

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ABNT20 KNHC DDHMM
TROPICAL WEATHER OUTLOOK
NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL
200 PM EDT THU OCT 11 2007

FOR THE NORTH ATLANTIC...CARIBBEAN SEA...AND THE GULF OF MEXICO
FOR THE NEXT 48 HOURS...

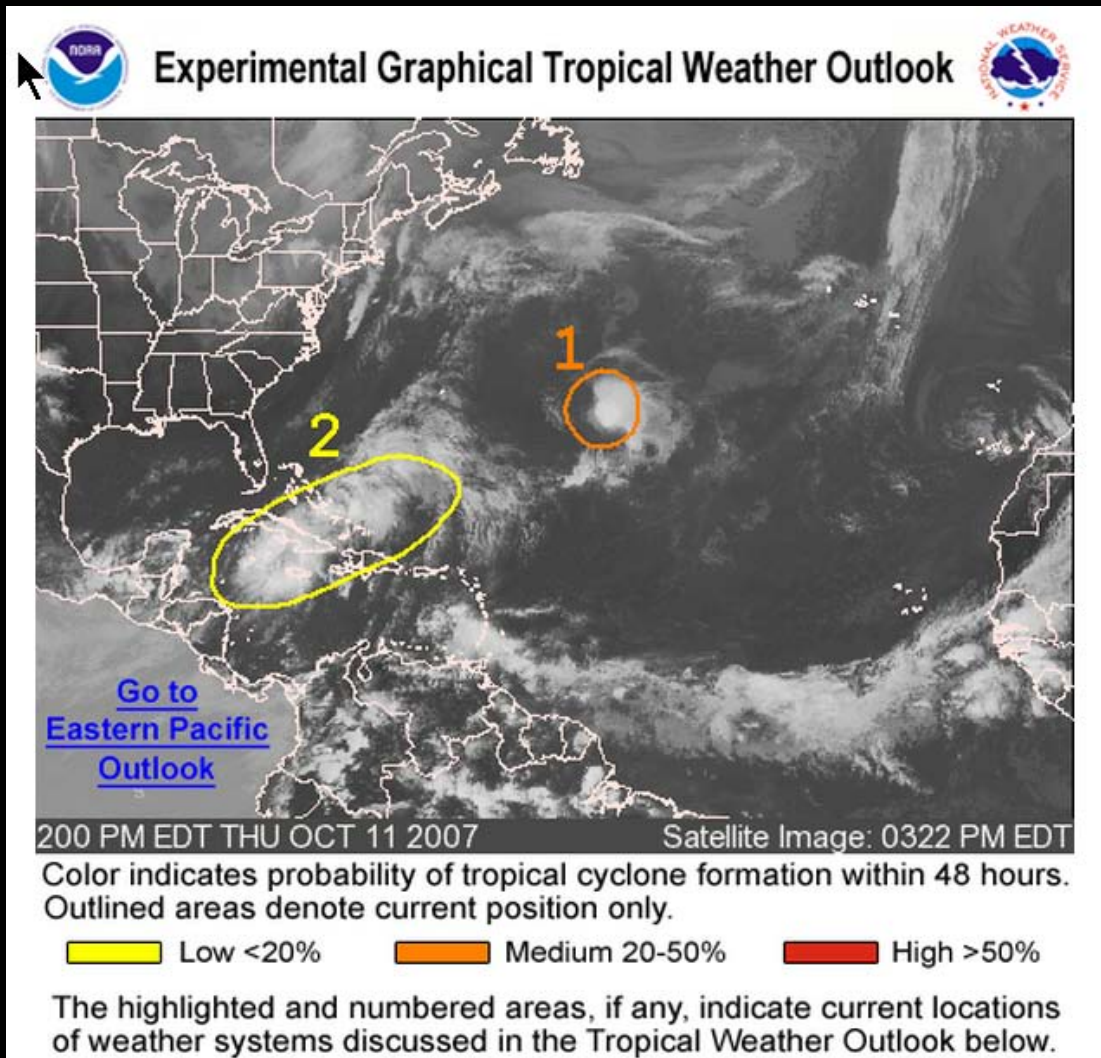
1. A SMALL AREA OF LOW PRESSURE IS LOCATED ABOUT 800 MILES EAST OF BERMUDA. ALTHOUGH UPPER-LEVEL WINDS ARE NOT FAVORABLE FOR SIGNIFICANT DEVELOPMENT OF THIS SYSTEM...ONLY A SMALL INCREASE IN ORGANIZED THUNDERSTORM ACTIVITY WOULD RESULT IN THE FORMATION OF A TROPICAL CYCLONE. THE LOW IS EXPECTED TO MOVE NORTHEASTWARD AND BECOME ABSORBED WITHIN A FRONTAL ZONE IN A COUPLE OF DAYS.

2. SHOWER ACTIVITY EXTENDS FROM THE NORTHWESTERN CARIBBEAN SEA ACROSS CUBA...THE BAHAMAS...AND INTO THE ATLANTIC FOR A FEW HUNDRED MILES. UPPER-LEVEL WINDS ARE UNFAVORABLE FOR DEVELOPMENT.

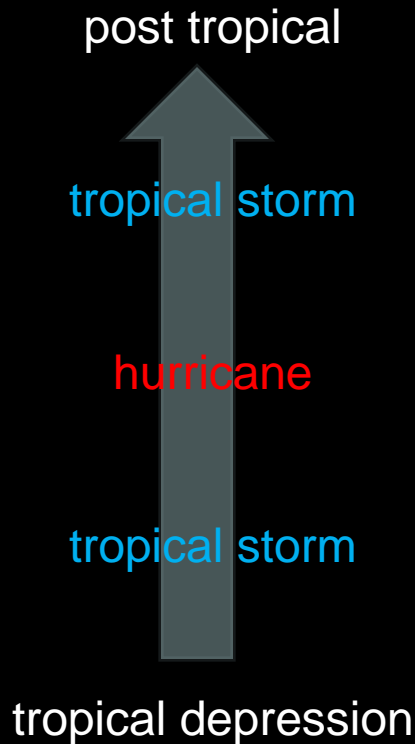
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FORECASTER FRANKLIN

NHC Graphical Tropical Weather Outlook



National Hurricane Center



- forecast advisory packages at 6-hour intervals for the duration of a tropical cyclone
- 2 or 3-hourly intermediate advisories when storm is near land

NHC Forecast/Advisory for Hurricane Ike

Hurricane IKE

ZCZC MIATCMAT4 ALL
TTAA00 KNHC DDHMM
HURRICANE IKE FORECAST/ADVISORY NUMBER 47
NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL AL092008
2100 UTC FRI SEP 12 2008

A HURRICANE WARNING REMAINS IN EFFECT FROM MORGAN CITY LOUISIANA TO NORTH OF PORT ARANSAS TEXAS. HURRICANE CONDITIONS ARE EXPECTED TO REACH THE COAST IN THE WARNING AREA LATER TODAY.

A TROPICAL STORM WARNING REMAINS IN EFFECT FROM PORT ARANSAS TO PORT MANSFIELD TEXAS. A TROPICAL STORM WARNING IS ALSO IN EFFECT FROM EAST OF MORGAN CITY TO THE MISSISSIPPI-ALABAMA BORDER... INCLUDING THE CITY OF NEW ORLEANS AND LAKE PONTCHARTRAIN.

HURRICANE CENTER LOCATED NEAR 27.7N 93.5W AT 12/2100Z
POSITION ACCURATE WITHIN 20 NM

PRESENT MOVEMENT TOWARD THE NORTHWEST OR 305 DEGREES AT 10 KT

ESTIMATED MINIMUM CENTRAL PRESSURE 955 MB
MAX SUSTAINED WINDS 90 KT WITH GUSTS TO 110 KT.
64 KT.....10SNE 90SE 50SW 60NW.
50 KT.....15ONE 150SE 75SW 90NW.
34 KT.....24ONE 200SE 150SW 170NW.
12 FT SEAS..39ONE 360SE 270SW 240NW.
WINDS AND SEAS VARY GREATLY IN EACH QUADRANT. RADII IN NAUTICAL MILES ARE THE LARGEST RADII EXPECTED ANYWHERE IN THAT QUADRANT.

REPEAT...CENTER LOCATED NEAR 27.7N 93.5W AT 12/2100Z
AT 12/1800Z CENTER WAS LOCATED NEAR 27.4N 93.1W

FORECAST VALID 13/0600Z 29.0N 94.8W
MAX WIND 95 KT...GUSTS 115 KT.
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NHC Forecast/Advisory for Hurricane Ike

Hurricane IKE

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 2100 UTC FRI SEP 12 2008

HURREVAC Manual Data Entry / Edit Use Official Hurricane Center Forecast Data

Hurricane Center Advisory Name + Number: **I_2008.STM** **IKE** **47**

ZULU (Z) Time of Issuance of Advisory: **2008** **SEP** **12** **2100 Z or.. (17EDT)**

Valid Time	Lat.	Lon.	Knots	34 Kt Wind Range (n.m.)				50 Kt Wind Range (n.m.)				64 Kt Wind Range (n.m.)			
				NE	SE	SW	NW	NE	SE	SW	NW	NE	SE	SW	NW
Initial	27.7	93.5	90	240	200	150	170	150	150	75	90	105	90	50	60
13/06Z	29.0	94.8	95	240	200	150	170	150	150	75	90	105	90	50	60
13/18Z	31.5	96.0	65	175	175	50	50	50	150	45	45	25	25		
14/06Z	35.0	94.5	30												
14/18Z	38.5	89.5	30												
15/18Z	38.5	89.5													
16/18Z	38.5	89.5													
17/18Z	38.5	89.5													

Central Pressure In Millibars (MB): **955**

*Sustained (not gusts)

Storm File Options:

Input Boxes - Edit Options:

Other Items:

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 BORDER...
 RAIN.

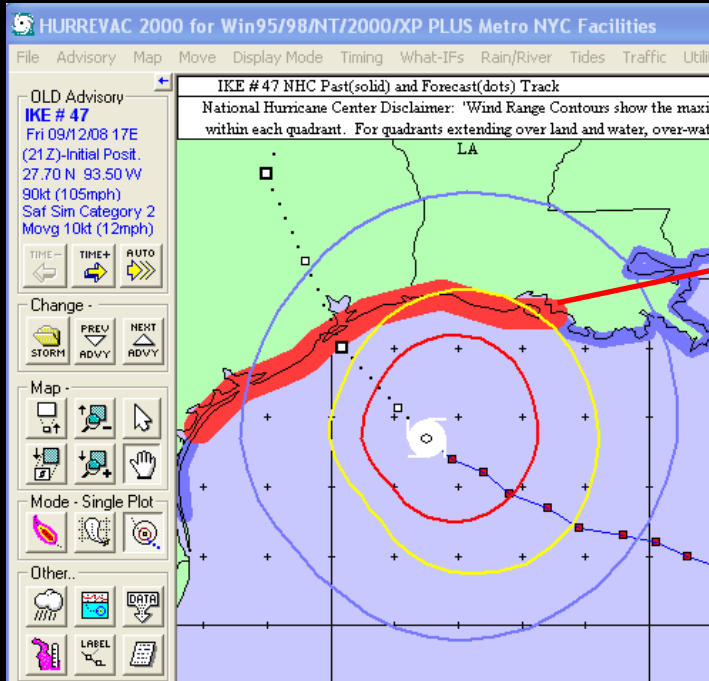
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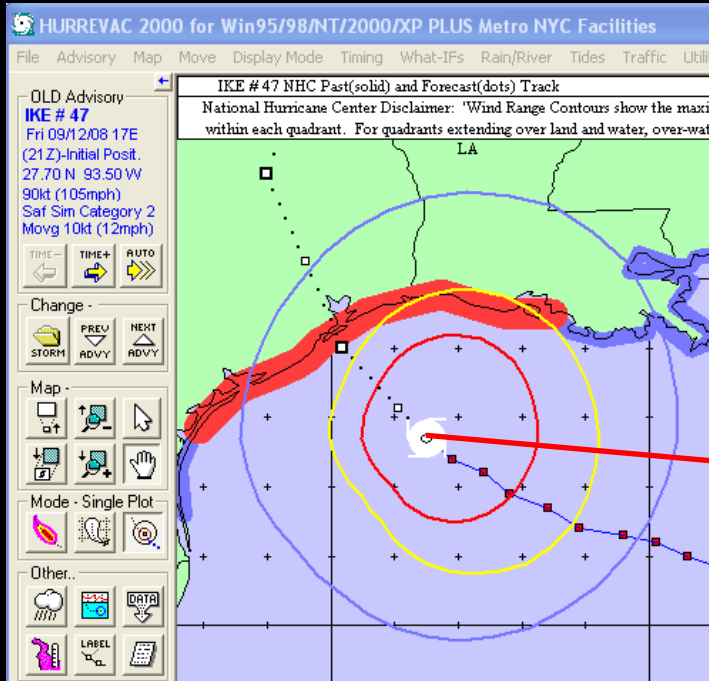
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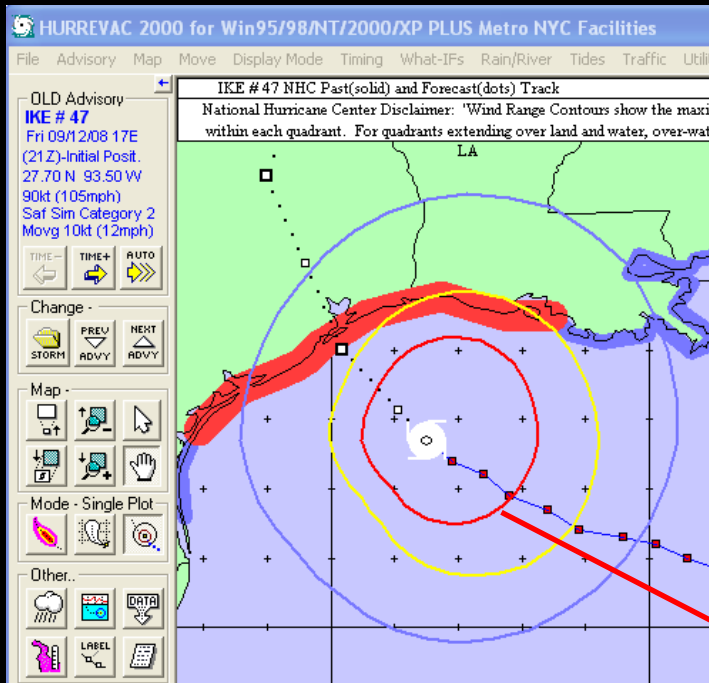
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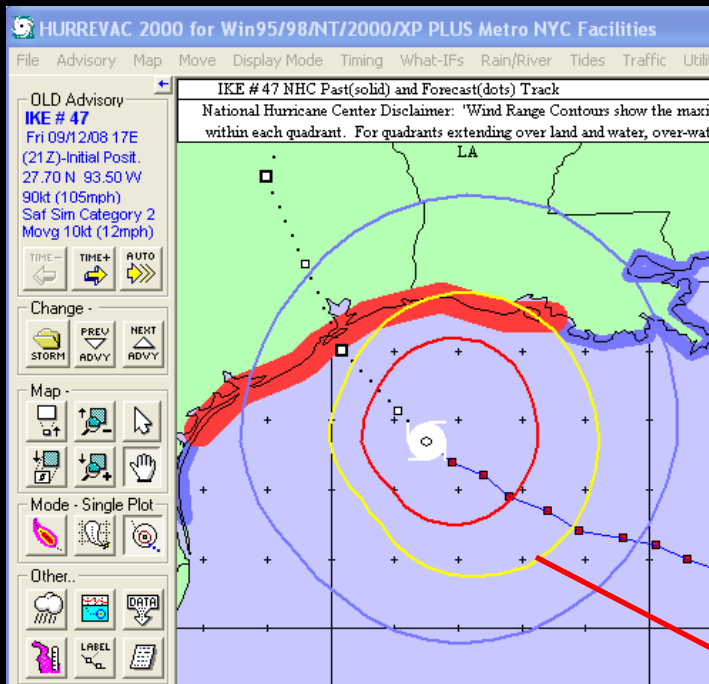
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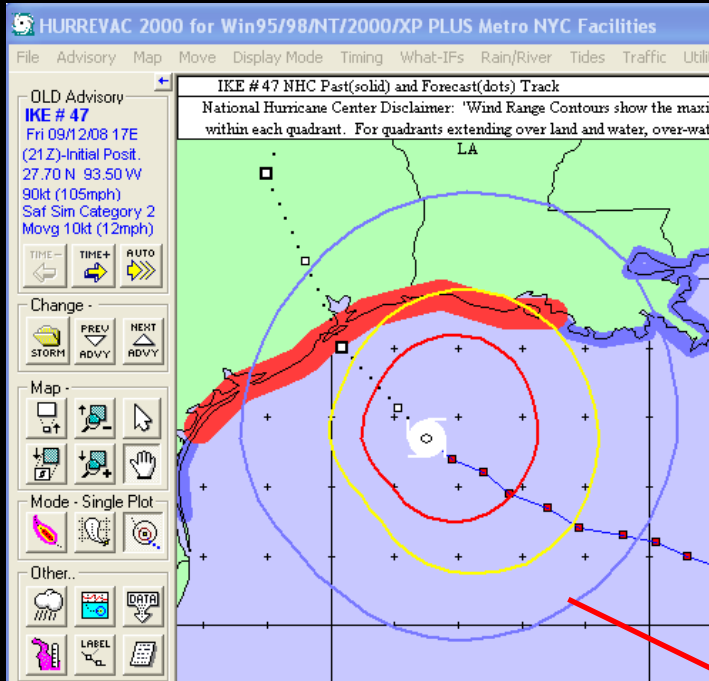
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Hurricane IKE



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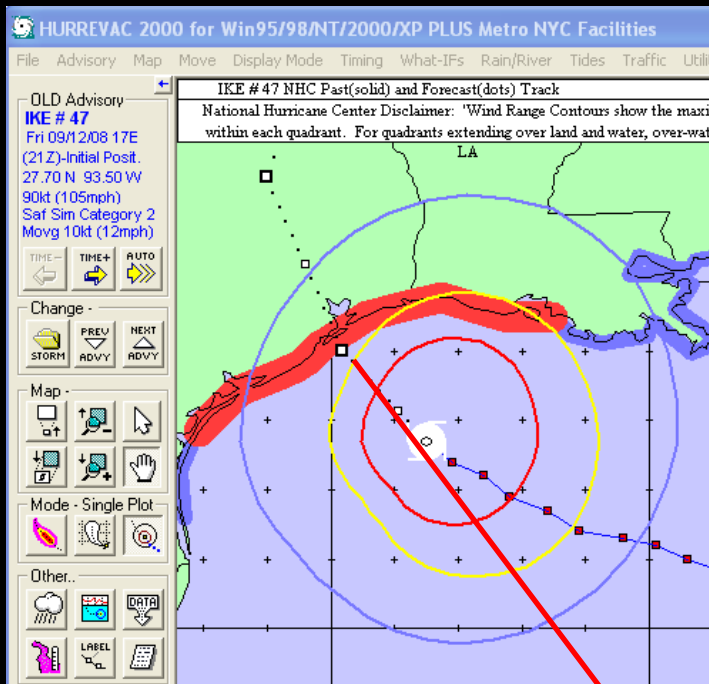
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- 12-hour forecast position is actually 9 hours from advisory 'initial' position
- 24, 36, 48, 72, 96, and 120-hour positions forecast as well

Hurricane IKE

ZCZC MIATCMAT4 ALL
 TTAA00 KNHC DDHHMM
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NHC Public Advisory for Hurricane Ike

Hurricane IKE

2008 MIATCPAT4 ALL
TTAA00 KNHC DDHMM
BULLETIN
HURRICANE IKE ADVISORY NUMBER 47
NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL AL092008
400 PM CDT FRI SEP 12 2008

...IKE'S FURY AIMED AT THE UPPER TEXAS AND SOUTHWEST LOUISIANA
COAST...

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FOR STORM INFORMATION SPECIFIC TO YOUR AREA...INCLUDING POSSIBLE
INLAND WATCHES AND WARNINGS...PLEASE MONITOR PRODUCTS ISSUED
BY YOUR LOCAL WEATHER OFFICE.

AT 400 PM CDT...2100Z...THE CENTER OF HURRICANE IKE WAS LOCATED NEAR
LATITUDE 27.7 NORTH...LONGITUDE 93.5 WEST OR ABOUT 135 MILES...220
KM...SOUTHEAST OF GALVESTON TEXAS AND ABOUT 240 MILES...385 KM...
EAST OF CORPUS CHRISTI TEXAS.

IKE HAS BEEN MOVING BETWEEN THE WEST-NORTHWEST AND NORTHWEST NEAR 12
MPH...19 KM/HR. A NORTHWEST MOTION IS EXPECTED TO CONTINUE TODAY
WITH A TURN TOWARD THE NORTH EXPECTED ON SATURDAY. ON THE FORECAST
TRACK...THE CENTER OF IKE WILL BE VERY NEAR THE UPPER TEXAS COAST
BY LATE TODAY OR EARLY SATURDAY.

MAXIMUM SUSTAINED WINDS REMAIN NEAR 105 MPH...165 KM/HR...WITH
HIGHER GUSTS. IKE IS A CATEGORY TWO HURRICANE ON THE
SAFFIR-SIMPSON SCALE BUT COULD REACH THE COAST AS A CATEGORY
THREE...MAJOR HURRICANE. STRONGER WINDS...ESPECIALLY IN STRONGER
GUSTS...ARE LIKELY ON HIGH RISE BUILDINGS.

IKE REMAINS A VERY LARGE HURRICANE. HURRICANE FORCE WINDS EXTEND
OUTWARD UP TO 120 MILES...195 KM...FROM THE CENTER...AND TROPICAL
STORM FORCE WINDS EXTEND OUTWARD UP TO 275 MILES...445 KM.

ESTIMATED MINIMUM CENTRAL PRESSURE IS 955 MB...28.20 INCHES.

COASTAL STORM SURGE FLOODING OF UP TO 20 FEET...WITH A FEW SPOTS TO
NEAR 25 FEET...ABOVE NORMAL TIDES ALONG WITH LARGE AND DANGEROUS
BATTERING WAVES...CAN BE EXPECTED NEAR AND TO THE EAST OF WHERE THE
CENTER OF IKE MAKES LANDFALL. THE SURGE EXTENDS A GREATER THAN
USUAL DISTANCE FROM THE CENTER DUE TO THE LARGE SIZE OF THE

NHC Forecast Discussion for Hurricane Ike

Hurricane IKE

210000 MIA TC DAT4 ALL
TTA 000 KMHC DDDHMM
HURRICANE IKE DISCUSSION NUMBER 47
NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL AL092008
500 PM EDT FRI SEP 12 2008

IKE HAS BEEN UNDER CONSTANT SURVEILLANCE BY BOTH NOAA AND AIR FORCE RECONNAISSANCE AIRCRAFT. THE DATA INDICATE THAT THE STRUCTURE OF IKE HAS CHANGED VERY LITTLE AND THE HURRICANE CONTINUES WITH A LARGE WIND FIELD AND LACKS A WELL-DEFINED TIGHT INNER CORE. INITIAL INTENSITY IS KEPT AT 90 KNOTS. AS MENTIONED EARLIER...THERE IS STILL A CHANCE THAT IKE COULD BECOME A MAJOR HURRICANE BEFORE LANDFALL...BUT BASICALLY THIS IS LARGELY IRRELEVANT SINCE WE ARE ONLY TALKING ABOUT A 10-KNOT WIND INCREASE. STATE OF THE ART TECHNIQUES TO FORECAST INTENSITY AND MY SKILLS ARE NOT GOOD ENOUGH TO PREDICT SUCH CHANGE WITH PRECISION. ALL WE NEED TO DO AT THIS TIME IS TO BE READY FOR A CATEGORY THREE HURRICANE. IKE WILL WEAKEN AFTER LANDFALL...AND IT IS FORECAST TO BECOME EXTRATROPICAL BY 48 HOURS...AND MERGE WITH A FRONTAL SYSTEM BY 72 HOURS.

IKE HAS CONTINUED ITS PUSH TOWARD THE WEST-NORTHWEST AND NORTHWEST AT ABOUT 10 KNOTS. THE STEERING CURRENTS ARE NOT EXPECTED TO CHANGE DURING THE NEXT 12 TO 24 HOURS AND THIS GENERAL MOTION SHOULD CONTINUE UNTIL LANDFALL ON THE UPPER TEXAS COAST AFTER MIDNIGHT TONIGHT. I AM CONFIDENT IN THE TRACK FORECAST SINCE THE GUIDANCE ENVELOPE IS VERY TIGHT AND MODELS TAKE IKE NOWHERE BUT TO THE UPPER TEXAS COAST. ONCE INLAND...IKE SHOULD REACH THE WESTERN EDGE OF THE SUBTROPICAL RIDGE AND TURN NORTHWARD AND NORTHEASTWARD UNTIL IT BECOMES ABSORBED BY A FRONTAL SYSTEM IN 2 TO 3 DAYS.

ONE SHOULD EMPHASIZE THAT IKE IS A VERY LARGE HURRICANE AND REGARDLESS OF WHERE THE CENTER OF THE HURRICANE MAKES LANDFALL...THE EFFECTS WILL BE FELT AT LARGE DISTANCES FROM THE CENTER. IN ADDITION...THE LARGEST STORM SURGE WILL OCCUR WITHIN THE ONSHORE FLOW NEAR OR JUST AFTER LANDFALL. A GAGE INDICATES THAT THE WATER LEVEL HAS ALREADY RISEN MORE THAN 9 FEET ON PART OF GALVESTON ISLAND.

FORECAST POSITIONS AND MAX WINDS

INITIAL	12/2100Z	27.7N	93.5W	90 KT
12HR UT	13/0600Z	29.0N	94.8W	95 KT
24HR UT	13/1800Z	31.5N	96.0W	65 KT...INLAND
36HR UT	14/0600Z	35.0N	94.5W	30 KT...INLAND
48HR UT	14/1800Z	38.5N	89.5W	30 KT...EXTRATROPICAL
72HR UT	15/1800Z	...ABSORBED BY A COLD FRONT		

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FORECASTER AVILA

Hurricane IKE

NHC Wind Probabilities for Hurricane Ike

2020 MIAFWSAT4 ALL
TT&00 KNHC DDHMM
HURRICANE IKE WIND SPEED PROBABILITIES NUMBER 47
NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL AL092008
2100 UTC FRI SEP 12 2008

AT 2100Z THE CENTER OF HURRICANE IKE WAS LOCATED NEAR LATITUDE 27.7
NORTH...LONGITUDE 93.5 WEST WITH MAXIMUM SUSTAINED WINDS NEAR 90 KTS
...105 MPH...165 KM/HR.

Z INDICATES COORDINATED UNIVERSAL TIME (GREENWICH)
ATLANTIC STANDARD TIME (AST)...SUBTRACT 4 HOURS FROM Z TIME
EASTERN DAYLIGHT TIME (EDT)...SUBTRACT 4 HOURS FROM Z TIME
CENTRAL DAYLIGHT TIME (CDT)...SUBTRACT 5 HOURS FROM Z TIME

I. MAXIMUM WIND SPEED (INTENSITY) PROBABILITY TABLE

CHANCES THAT THE MAXIMUM SUSTAINED (1-MINUTE AVERAGE) WIND SPEED OF
THE TROPICAL CYCLONE WILL BE WITHIN ANY OF THE FOLLOWING CATEGORIES
AT EACH OFFICIAL FORECAST TIME DURING THE NEXT 5 DAYS.
PROBABILITIES ARE GIVEN IN PERCENT. X INDICATES PROBABILITIES LESS
THAN 1 PERCENT.

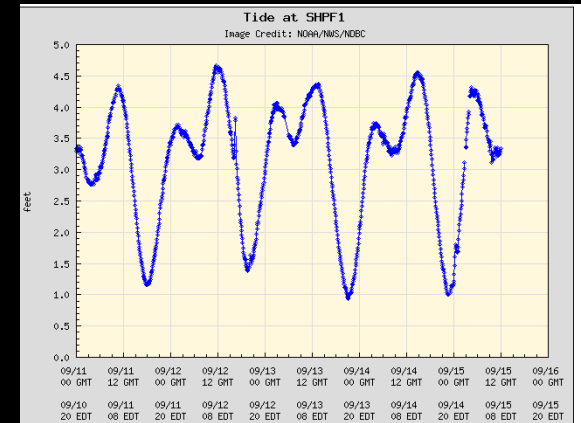
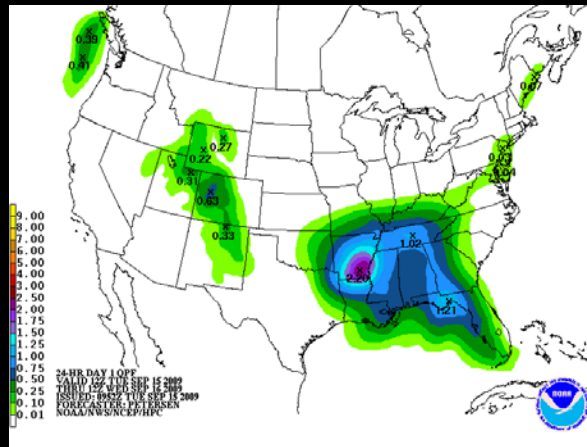
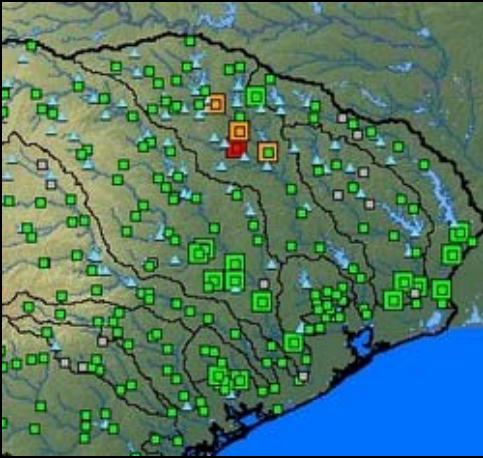
- - - MAXIMUM WIND SPEED (INTENSITY) PROBABILITIES - - -

VALID TIME	06Z SAT	18Z SAT	06Z SUN	18Z SUN	18Z MON	18Z TUE	18Z WED
FORECAST HOUR	12	24	36	48	72	96	120
DISSIPATED	X	X	30	40	NA	NA	NA
TROP DEPRESSION	X	2	56	58	NA	NA	NA
TROPICAL STORM	5	72	15	2	NA	NA	NA
HURRICANE	95	26	X	X	NA	NA	NA
HUR CAT 1	25	24	X	X	NA	NA	NA
HUR CAT 2	47	2	X	X	NA	NA	NA
HUR CAT 3	22	X	X	X	NA	NA	NA
HUR CAT 4	1	X	X	X	NA	NA	NA
HUR CAT 5	X	X	X	X	NA	NA	NA
FCST MAX WIND	95KT	65KT	30KT	30KT	NA	NA	NA

II. WIND SPEED PROBABILITY TABLE FOR SPECIFIC LOCATIONS

CHANCES OF SUSTAINED (1-MINUTE AVERAGE) WIND SPEEDS OF AT LEAST
...34 KT (39 MPH... 53 KPH)...
...50 KT (58 MPH... 93 KPH)...
...64 KT (74 MPH...119 KPH)...
FOR LOCATIONS AND TIME PERIODS DURING THE NEXT 5 DAYS

Other NWS Sources



- River Forecast Centers – river gages & flood outlooks
- Hydro-Meteorological Prediction Center – 3-day quantitative precipitation forecast
- NOAA – tide gages

Hurricane Evacuation Study

- Who should evacuate during a hurricane threat?
- When should the evacuation order be given to ensure all evacuees have enough time to get to safety?



Study Components

1. Hazards Analysis
2. Vulnerability Analysis
3. Behavioral Analysis
4. Shelter Analysis
5. Transportation Analysis

HES Clearance Times

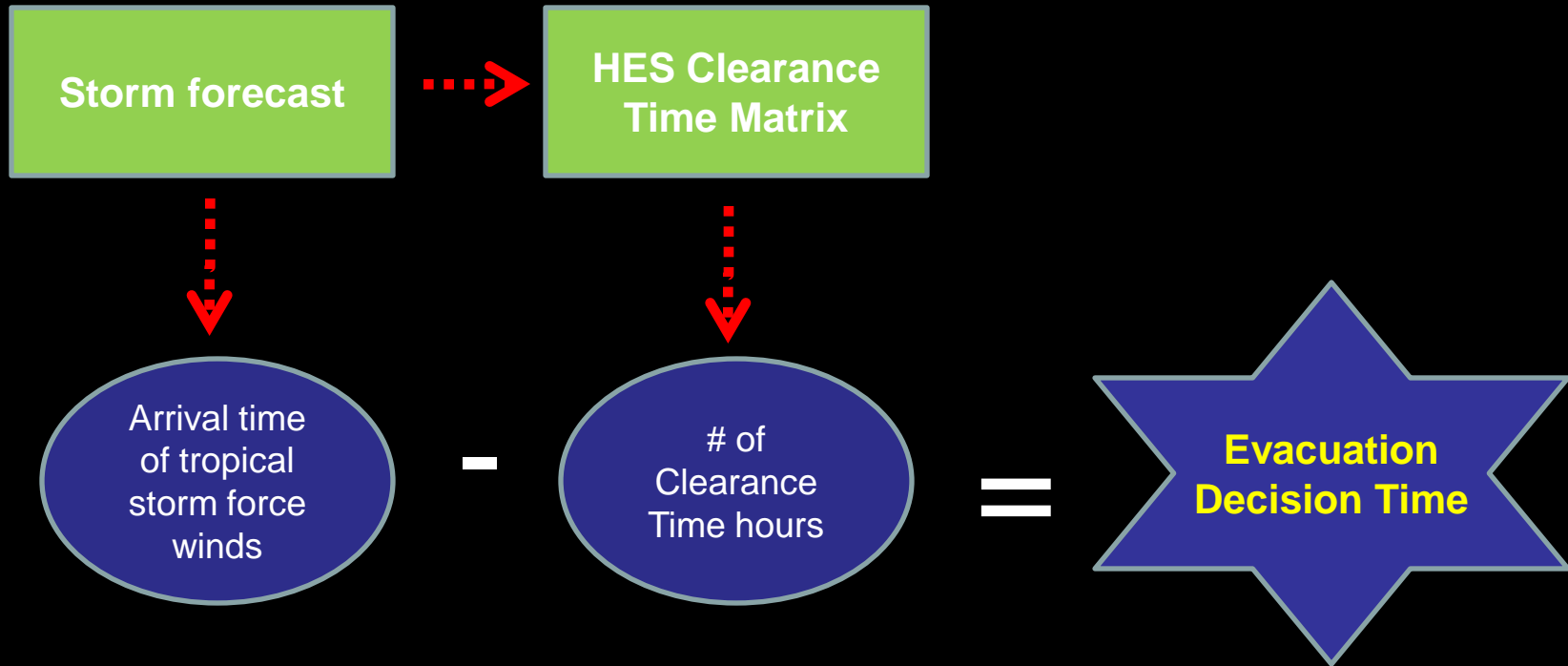
The amount of time needed to move all evacuees to safety before tropical storm force winds arrive.

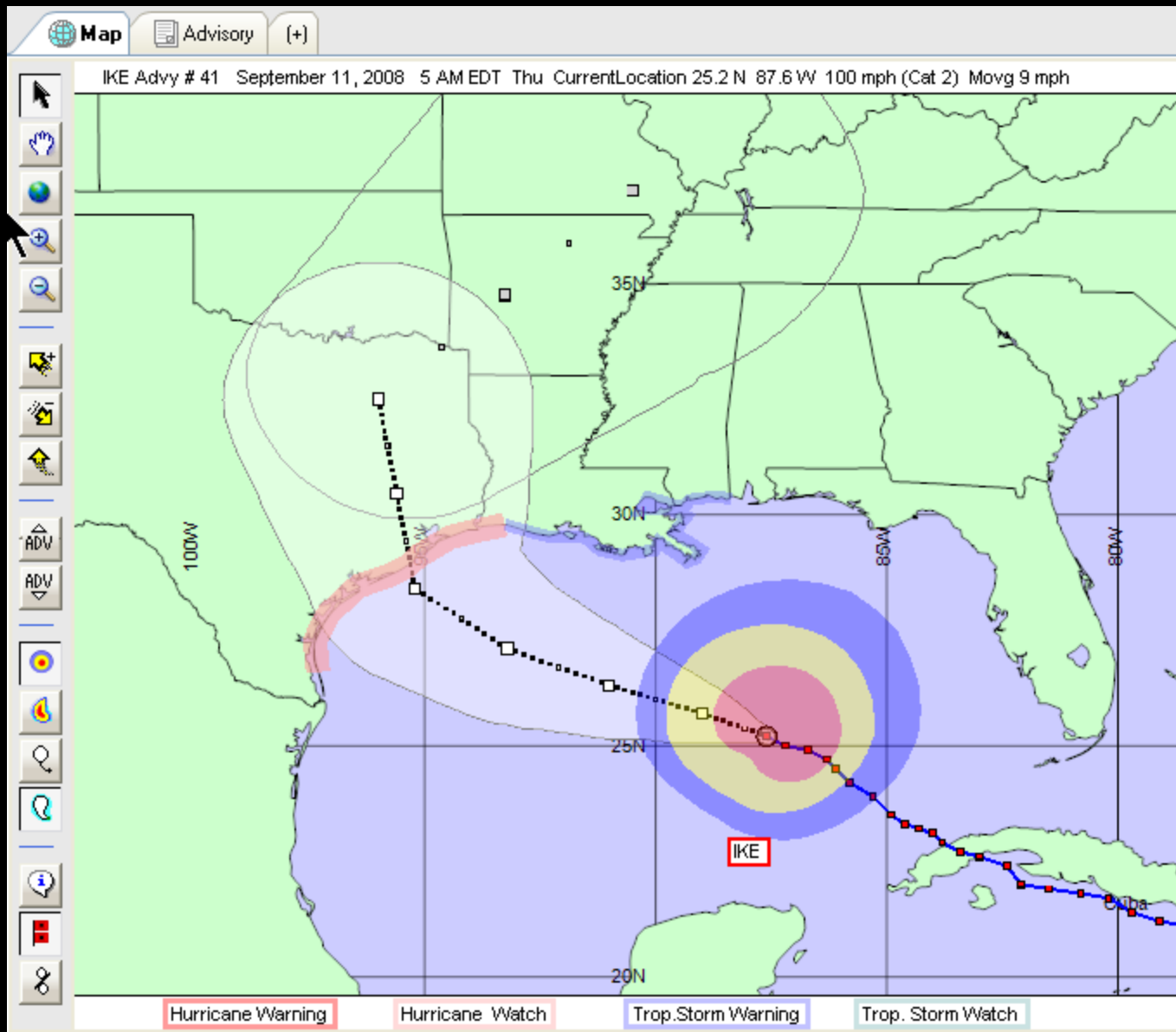
Clearance times vary depending on:

- Scenarios
- Storm intensity
- Tourist Occupancy
 - Response



Decision Time Calculation







Report (0)

(+)

Report for Hurricane Ike Based on Advisory 41 Issued 09/11/08 5AM EDT (OLD Advisory)

Evacuation Timing Local Areas (36 Items)



Location	Evac. Type	Decide	Dur.	Dark	Cat/Oc/Re	>34kt(39)	>64kt(74)	Eye	Nearest
TX Orange	Standard	09/11 03E[Past]	29	14	3 / M / M	09/12 08E	09/12 18E	09/13 00E	76 mi.
TX Jefferson	Standard	09/11 03E[Past]	29	14	3 / M / M	09/12 08E	09/12 17E	09/13 00E	56 mi.
TX San Patricio	Wor45 Part	09/11 13E	31	11	3 / M / M	09/12 20E	09/13 07E	09/13 11E	109 mi.
TX Nueces	Wor45 Part	09/11 14E	31	12	3 / M / M	09/12 21E	09/13 07E	09/13 11E	116 mi.
TX San Patricio	Worst Case	09/11 15E	29	11	3 / M / M	09/12 20E	09/13 07E	09/13 11E	109 mi.
TX Galveston	Heavy Traf	09/11 16E	18	11	3 / M / M	09/12 10E	09/12 21E	09/13 02E	10 mi.
TX San Patricio	Std45 Part	09/11 16E	28	11	3 / M / M	09/12 20E	09/13 07E	09/13 11E	109 mi.
TX Nueces	Worst Case	09/11 16E	29	12	3 / M / M	09/12 21E	09/13 07E	09/13 11E	116 mi.
TX Chambers	Standard	09/11 17E	17	11	3 / M / M	09/12 10E	09/12 20E	09/13 02E	26 mi.
TX Galveston	Light Traf	09/11 17E	17	11	3 / M / M	09/12 10E	09/12 21E	09/13 02E	10 mi.
TX Nueces	Std45 Part	09/11 17E	28	12	3 / M / M	09/12 21E	09/13 07E	09/13 11E	116 mi.
TX Brazoria	Heavy Traf	09/11 18E	18	11	3 / M / M	09/12 12E	09/12 22E	09/13 03E	7 mi.
TX Harris	Heavy Traf	09/11 18E	18	11	3 / M / M	09/12 12E	09/12 23E	09/13 04E	2 mi.
TX Cameron	Standard	09/11 19E	25	11	3 / M / M	09/12 20E	09/13 05E	09/13 09E	165 mi.
TX Harris	Light Traf	09/11 19E	17	11	3 / M / M	09/12 12E	09/12 23E	09/13 04E	2 mi.
TX Brazoria	Light Traf	09/11 19E	17	11	3 / M / M	09/12 12E	09/12 22E	09/13 03E	7 mi.
TX San Patricio	Wor45 Full	09/11 20E	24	11	3 / M / M	09/12 20E	09/13 07E	09/13 11E	109 mi.

Earliest

Closest

Alphabetical

All Locals

In Error Cone

Refresh

GETTING STARTED WITH HURREVAC



[Program Information](#)

[Support Services](#)

[Learning Resources](#)

[Outside Links](#)

A GIS-Based Storm Tracking Alternative

Sea Island Software also produces [HurricaneMapping.com](#), a site for ArcGIS and Google Earth users which is subscription-based and offers easy integration of hurricane data, in real-time, into your GIS system.



Welcome

HURREVAC is a computer program used by government emergency managers to track hurricanes and assist in decision-making for their communities.

This web site is maintained by Sea Island Software, Inc., the programmer, to enhance the support services for this program for valid EM users. We provide a number of resources to assist with both the use of HURREVAC and with emergency management issues as they relate to hurricanes.



Getting Started With HURREVAC

Need more information or training on HURREVAC? Start with a [program overview](#) or find out about the [differences between Hurrevac2000 and Hurrevac2010](#). If you don't yet have the software, please visit our [registration page](#) to apply for program access.

» Hurrevac2010

Sea Island Software began a phased state-by-state distribution of Hurrevac2010 following the National Hurricane Program's March 1st e-mail to all registered users announcing the launch of the new program. We expect to reach everyone with e-mailed invitations to download and install the new software by no later than March 12th. Thanks for your patience as we get this rolled out to many thousands of users!

Check the [Rollout Schedule](#) to see when you can expect your invitation.

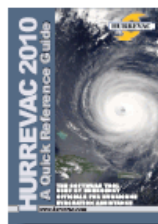
» Hurrevac2000

Hurrevac2000 will continue to be supported during our first season with Hurrevac2010 and you will be able to run the two programs concurrently on the same computer. The 2010 seasonal update for Hurrevac2000 will be distributed around May 15th.

More information available on the [Frequently Asked Questions](#) page



[PDF Factsheet](#)



[PDF Guide](#)



Program Information
Key Features
Hurrevac2010 Overview
HURREVAC History
Latest Versions
Registration/Distribution
Support Services
User Guides & Publications
Freq. Asked Questions
Hurrevac2010 Tech Notes
Hurrevac2000 Tech Notes
Contact Us
Learning Resources
Tutorials
Training Events
Hurricane Exercises
Outside Links
Agency Sponsors
Hurricane Forecasting
Evacuation Studies

New User Registration

In order to qualify for HURREVAC, you must be an active member of the government emergency management community--meaning that you are directly involved in hurricane evacuation decision-making for the residents in your state or community when a hurricane threatens.

Examples of eligible users are hurricane evacuation decision-makers in FEMA, Corps of Engineers, National Weather Service, State Emergency Management Agencies, and County or Parish Emergency Management Agency Offices.

State and county agencies other than the State Emergency Management Agency and County/Local Emergency Management Agency offices will need confirmation from those EM offices that you indeed do help those offices in hurricane evacuation decision-making and need the program for that purpose. Without such approval and confirmation, registration will be refused.

Complete all fields below

Title (optional)

First Name *

Last Name *

Agency *

Email Address *
(NOTE: We can only approve applicants with official government e-mail addresses)

Phone *

Street Address *

City *

State *

Zip Code *

Briefly describe your job title and emergency management duties as they relate to hurricane threats *

Installing Hurrevac

- The main installation file is 12Mbs in size
- Computer hardware requirements for Hurrevac2010 are WindowsXP or higher, and a screen resolution of at least 1024x768
- Hurrevac is a stand-alone program that doesn't require any third-party software to operate

Customizing Hurrevac

- Evacuation clearance times
 - Inundation maps
 - River gage maps
- Facilities (NY/NJ only)
- Risk profile (FL & VA only)



Program Information

[Key Features](#)

[Hurricane2010 Overview](#)

[HURREVAC History](#)

[Latest Versions](#)

[Registration/Distribution](#)

Support Services

[User Guides & Publications](#)

[Freq. Asked Questions](#)

[Hurricane2010 Tech Notes](#)

[Hurricane2000 Tech Notes](#)

[Contact Us](#)

Learning Resources

[Tutorials](#)

[OUTSIDE LINKS](#)

[Agency Sponsors](#)

[Hurricane Forecasting](#)

Hurrevac2010 Technical Notes

Help us improve and expand upon this new collection of technical documents for Hurrevac2010. Please send any comments, suggestions, or experiences you might have to share to support@hurrevac.com.

[TECH NOTE 1: Hurrevac2010 Hardware and Software Requirements](#)

Installation prerequisites and minimum hardware/software configurations recommended for Hurrevac2010

[TECH NOTE 2: Customizing Hurrevac2010 with Evacuation Data and Other State-Specific Plug-ins](#)

[TECH NOTE 3: Installing Hurrevac2010 on a Computer with Multiple Users](#)

Problems can occur on multi-user systems if the original MSI install package is missing or a limited-rights user does not full permissions to Hurrevac2010 data directory

[TECH NOTE 4: Network Deployments of Hurrevac2010](#)

How to advertise the MSI install package and deploy the evacuation data and other state-specific plug-ins

[TECH NOTE 5: Resolving Problems Downloading New Forecast Data within Hurrevac2010 River Gages](#)

How to get archived data into Hurrevac2010 for display with a historical storm

User Support Services

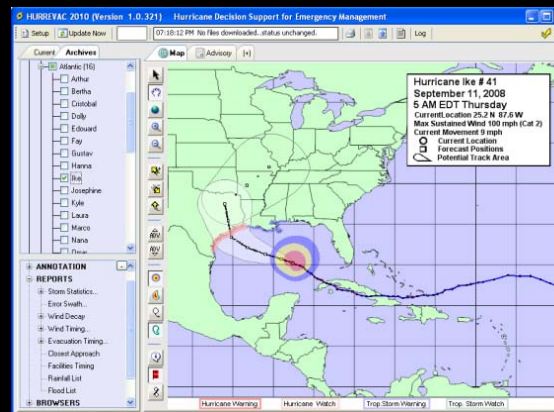
1. Technical documentation at <http://www.hurrevac.com/notes.htm>
2. Submit support questions at <http://www.hurrevac.com/contact.htm>
3. E-mail support@hurrevac.com
4. Call the Sea Island Software support line at (888) 840-4089

Hurrevac Training

- Comprehensive help system accessible from the program's help menu
 - Searchable index of topics
 - 'Using HURREVAC' introductory tour
- PDF Manual available on web site
- <http://www.hurrevac.com/training.htm> for other resources

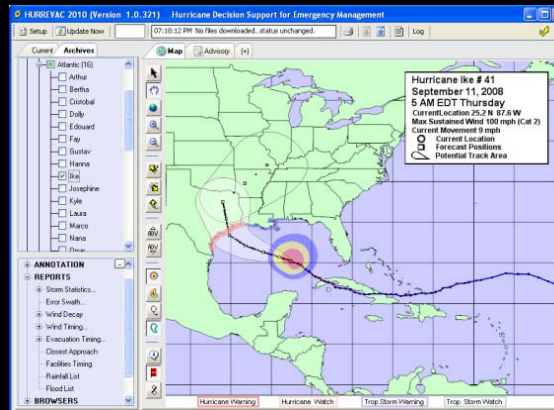
Let's jump into the program to go over program configuration and begin learning...

HURREVAC2010 BASIC SKILLS



Documenting and Briefing on an Approaching Storm

HURREVAC2010 EXERCISE



Frances (2004) Advisory 33

1. What is the date and time of this advisory?
2. What is the storm's current intensity, tracking speed, and direction?
3. Are there watches/warnings issued for Broward County?

Frances (2004) Advisory 33

4. What type of winds are forecasted at landfall?
5. When are the tropical storm force winds forecasted reach the Florida coast?

Frances (2004) Advisory 33

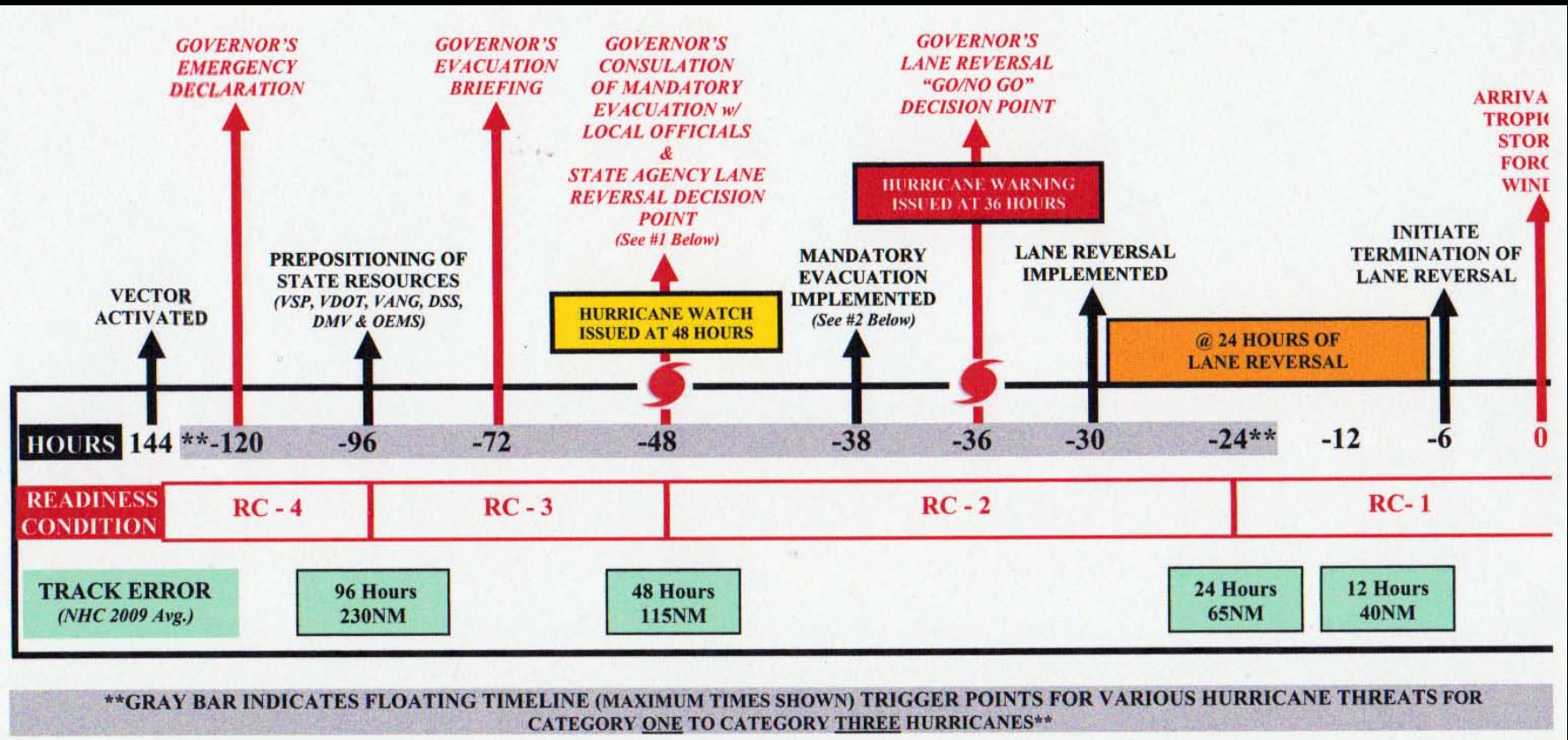
6. How does this advisory compare to previous ones in forecast track and storm intensity?
7. Does the public advisory and/or discussion give further insight into the forecast?

Frances (2004) Advisory 33

Export the following from HURREVAC:

- An annotated map showing storm's current location and labeled forecast track
- text of the public advisory/discussion
- a report of counties within the potential track area (error swath)

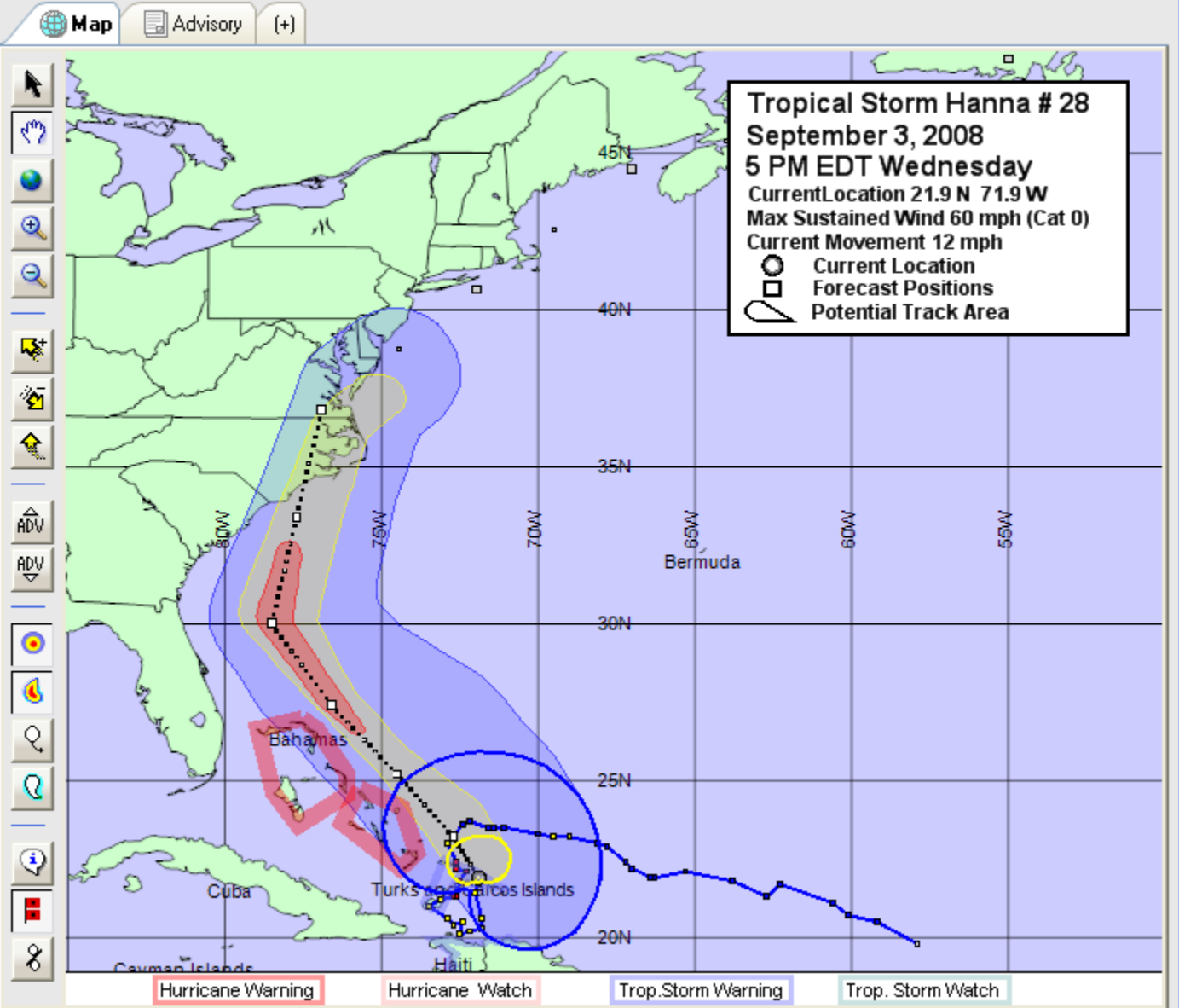
THREAT ASSESSMENT FOR DISTANT STORMS



This is an example of a timeline of preparations that starts at -96 hours, with a few key decisions being made at that point, at -72 hours, and at -48 hours. Just how much information can we get from HURREVAC when a storm is still so distant? And what level of accuracy can we expect from that information?

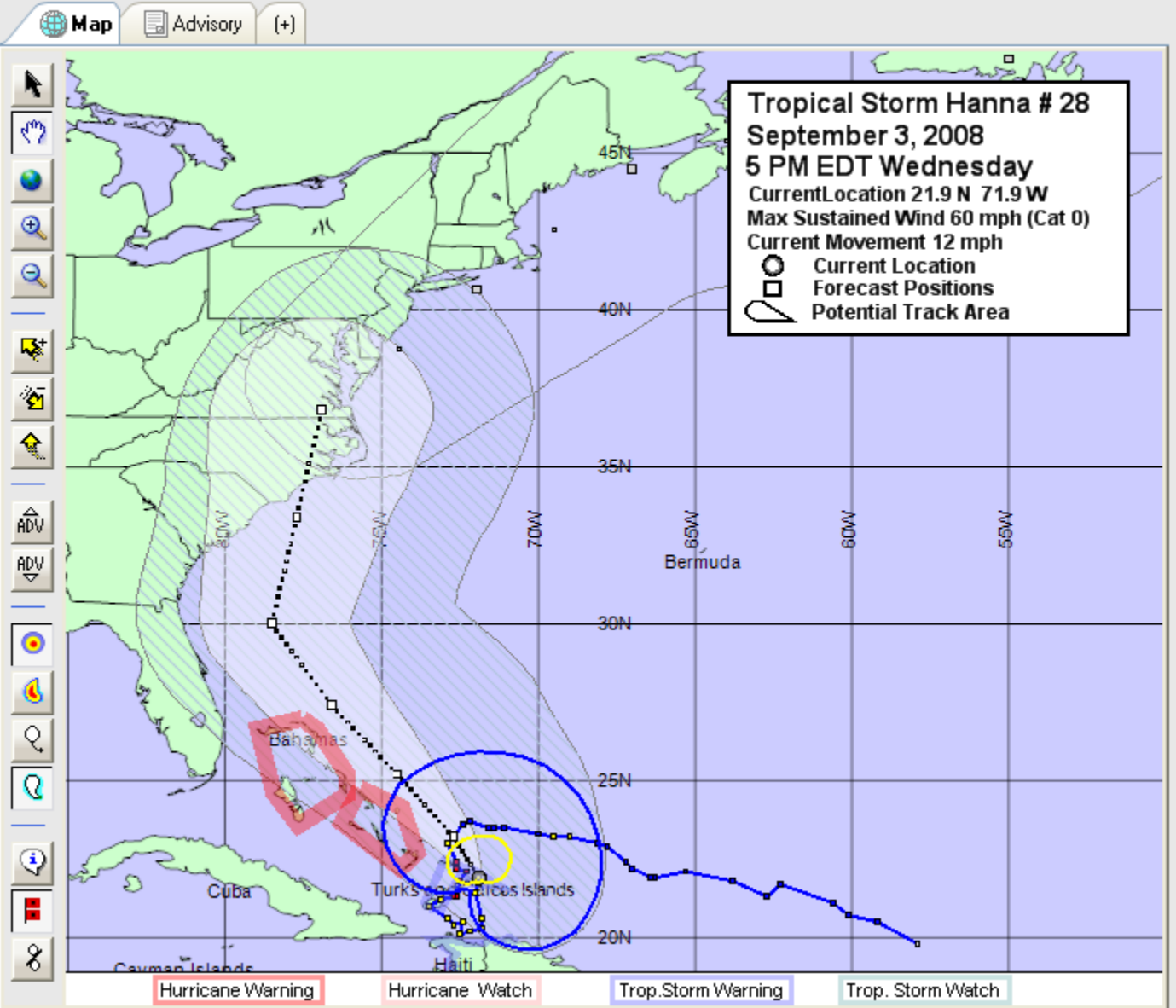


- Current Archives
- Atlantic (16)
 - Arthur
 - Bertha
 - Cristobal
 - Dolly
 - Edouard
 - Fay
 - Gustav
 - Hanna
 - Ike
 - Josephine
 - Kyle
 - Laura
 - Marco
 - Nana
 - Omar
- Upper Right
 - Lower Right
 - Lower Left
 - Near Storm
 - Banner At Top
 - Advisory Labels
 - Setup...
 - Custom Annotation
 - Wind Tags
 - Range Marks
 - Disclaimers
 - Show Place Names

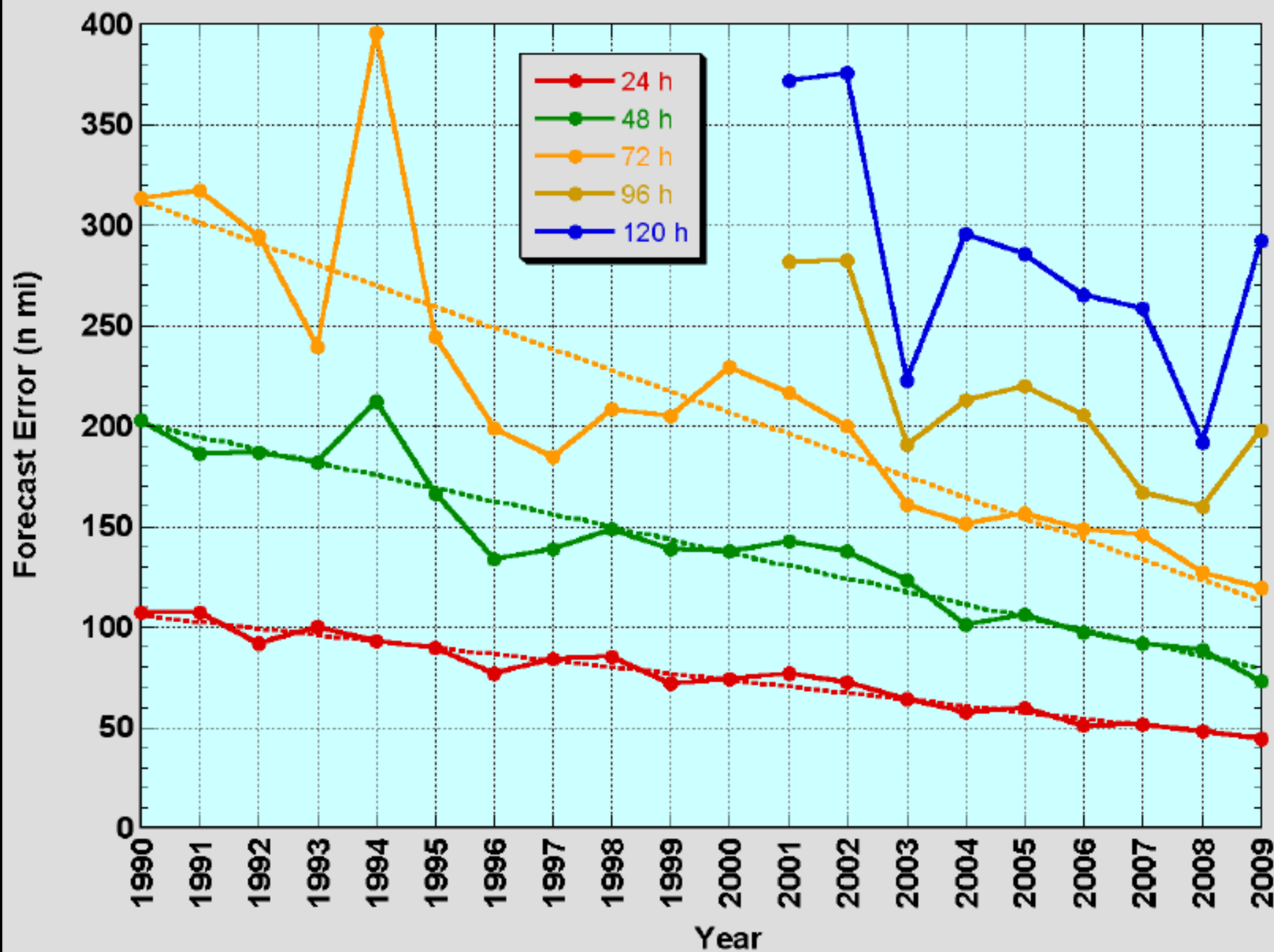


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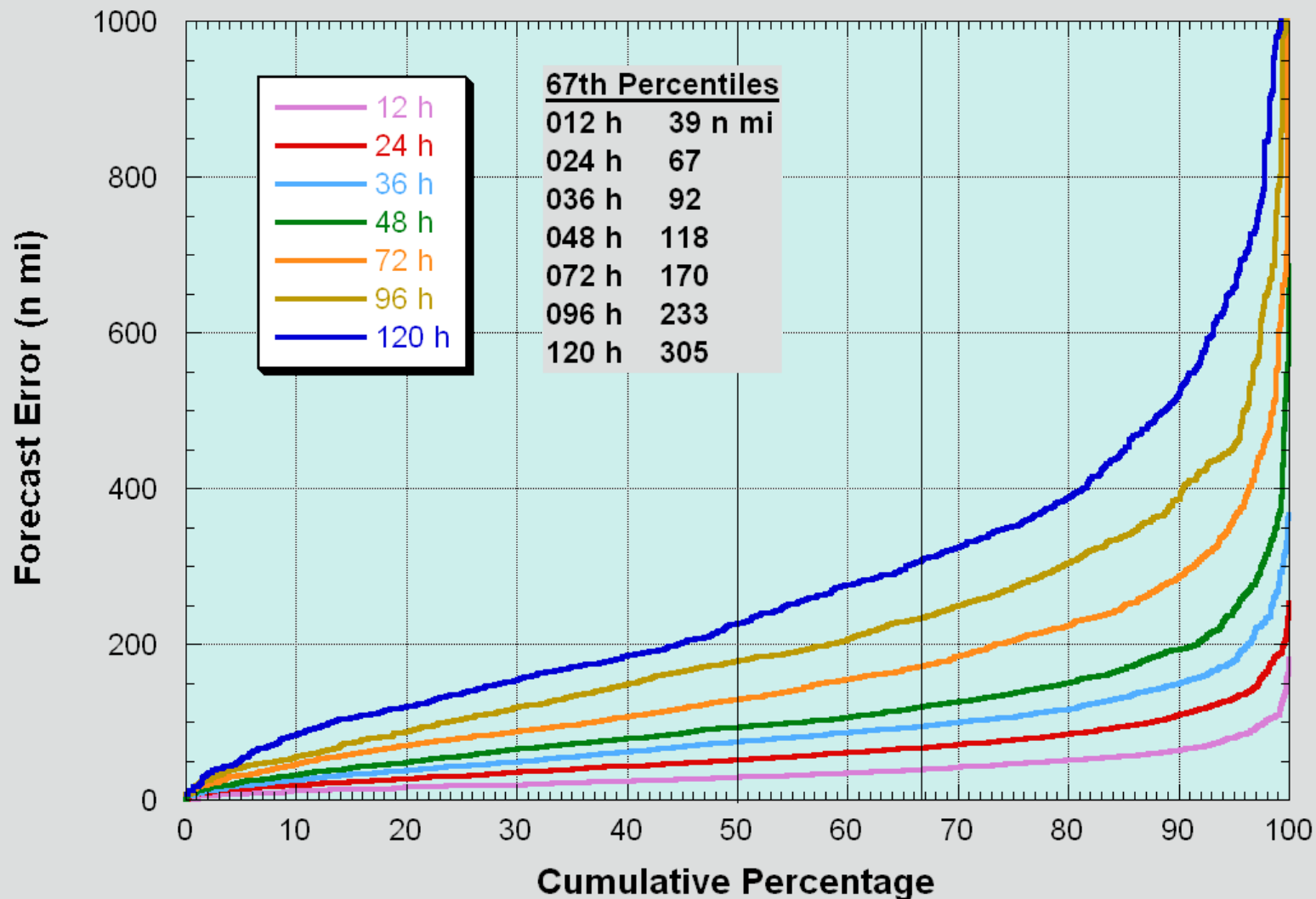
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- Lower Right
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NHC Official Track Error Trend Atlantic Basin



NHC Official Track Forecasts Atlantic Basin 2003-7



Atlantic Basin Official Error Rates for 2010

Forecast Period (hours)	Circle radius (nautical miles)
12	36
24	62
36	85 (4 less than 2009)
48	108 (3 less than 2009)
72	167 (6 less than 2009)
96	230 (10 less than 2009)
120	302 (17 less than 2009)

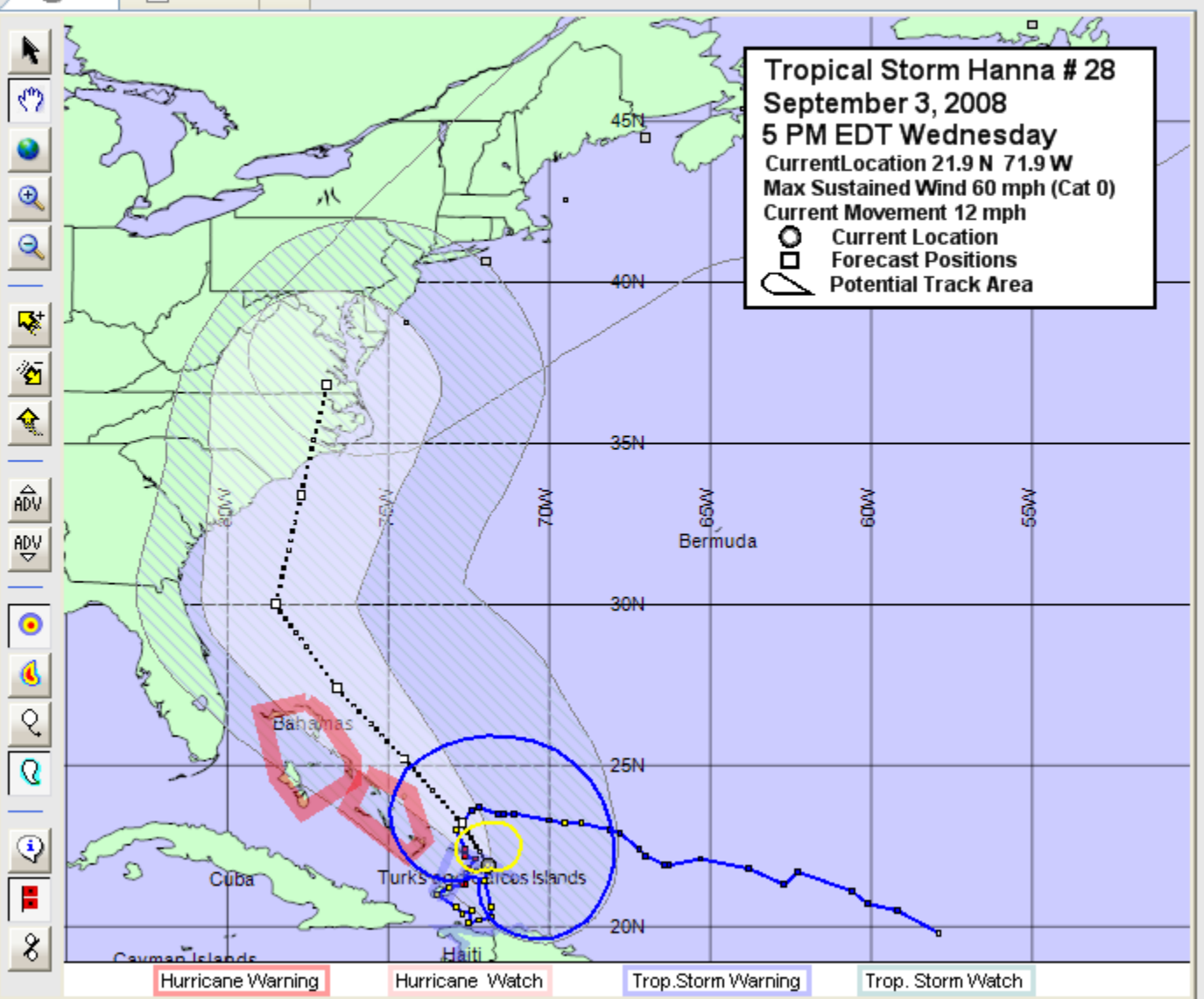
**two-thirds of historical official forecast errors over a 5-year sample fall within the circle.*

Current Archives

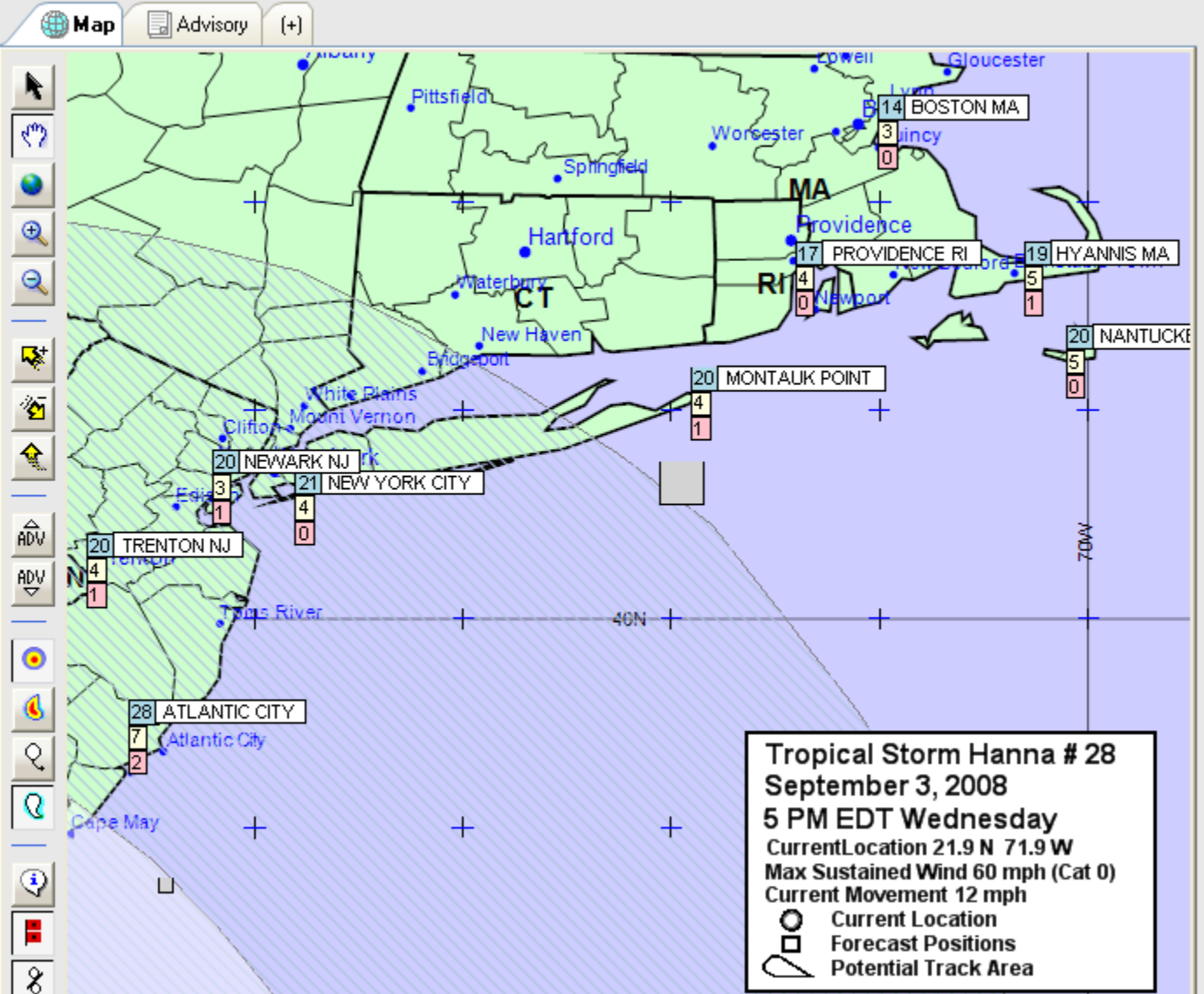
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Map Advisory (+)



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HANNA # 28 Wind Probability (Cumulative 120hour Total) % 34kt(39mph) % 50kt(58mph) % 64kt(74mph)

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

TIME PERIODS	FROM 18Z WED TO 06Z THU	FROM 06Z THU TO 18Z THU	FROM 18Z THU TO 06Z FRI	FROM 06Z FRI TO 18Z FRI	FROM 18Z FRI TO 18Z SAT	FROM 18Z SAT TO 18Z SUN	FROM 18Z SUN TO 18Z MON
--------------	-------------------------	-------------------------	-------------------------	-------------------------	-------------------------	-------------------------	-------------------------

FORECAST HOUR	(12)	(24)	(36)	(48)	(72)	(96)	(120)
---------------	------	------	------	------	------	------	-------

 LOCATION KT

HIBERNIA OILFD	34 X	X(X)	X(X)	X(X)	X(X)	X(X)	4(4)
----------------	------	-------	-------	-------	-------	-------	-------

CAPE RACE NFLD	34 X	X(X)	X(X)	X(X)	X(X)	1(1)	7(8)
----------------	------	-------	-------	-------	-------	-------	-------

NEW YORK CITY	34 X	X(X)	X(X)	X(X)	10(10)	11(21)	X(21)
---------------	------	-------	-------	-------	--------	--------	-------

NEW YORK CITY	50 X	X(X)	X(X)	X(X)	1(1)	3(4)	X(4)
---------------	------	-------	-------	-------	-------	-------	-------

NEWARK NJ	34 X	X(X)	X(X)	X(X)	9(9)	10(19)	1(20)
-----------	------	-------	-------	-------	-------	--------	-------

NEWARK NJ	50 X	X(X)	X(X)	X(X)	1(1)	2(3)	X(3)
-----------	------	-------	-------	-------	-------	-------	-------

NEWARK NJ	64 X	X(X)	X(X)	X(X)	X(X)	1(1)	X(1)
-----------	------	-------	-------	-------	-------	-------	-------

TRENTON NJ	34 X	X(X)	X(X)	X(X)	11(11)	9(20)	X(20)
------------	------	-------	-------	-------	--------	-------	-------

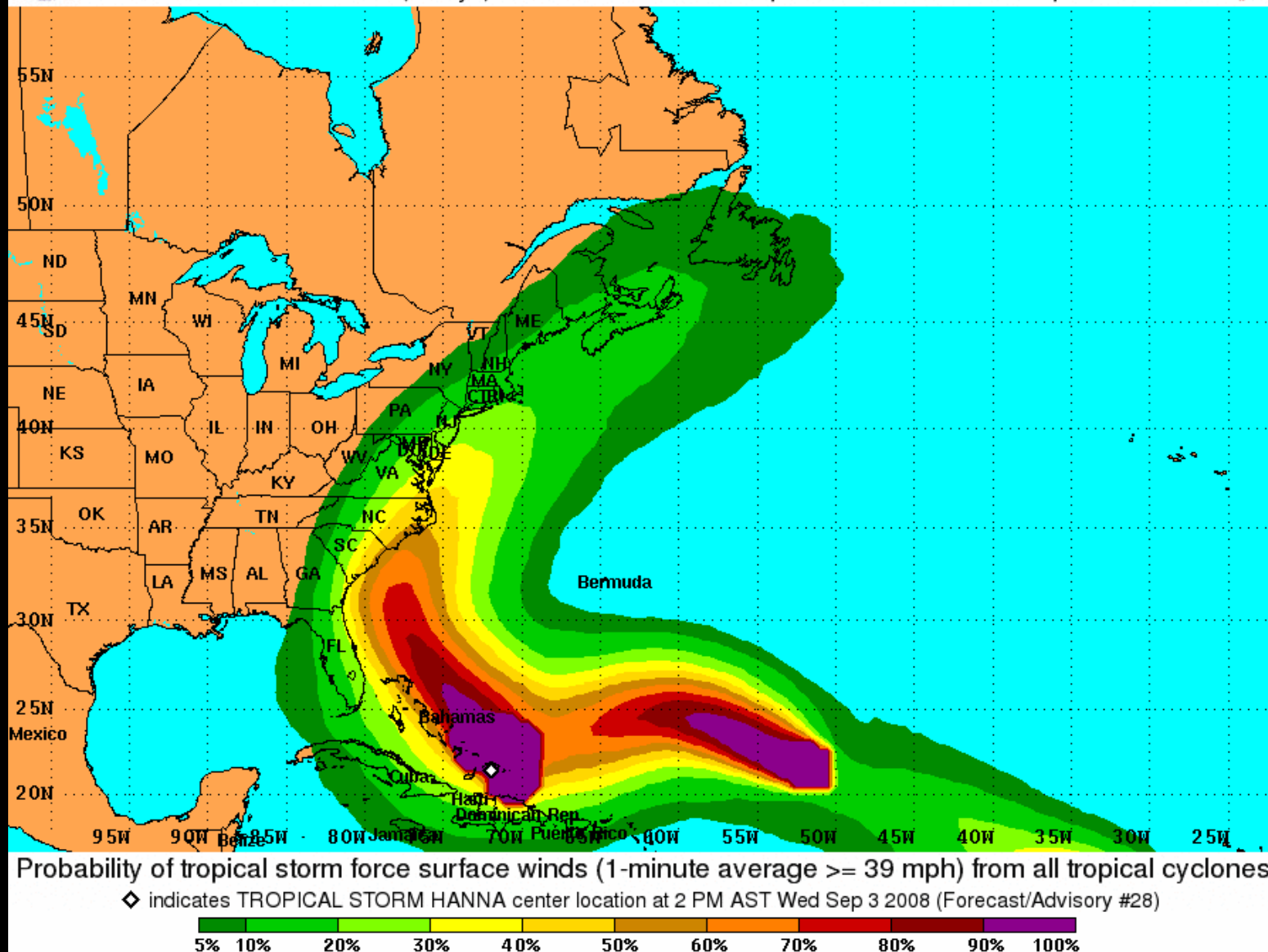
TRENTON NJ	50 X	X(X)	X(X)	X(X)	2(2)	2(4)	X(4)
------------	------	-------	-------	-------	-------	-------	-------

TRENTON NJ	64 X	X(X)	X(X)	X(X)	X(X)	1(1)	X(1)
------------	------	-------	-------	-------	-------	-------	-------



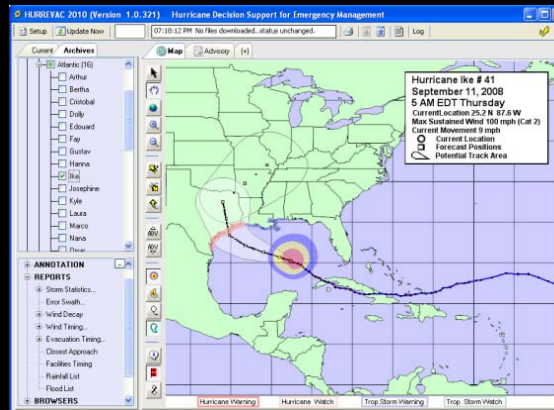
Tropical Storm Force Wind Speed Probabilities

For the 120 hours (5 days) from 2 PM AST Wed Sep 3 to 2 PM AST Mon Sep 8



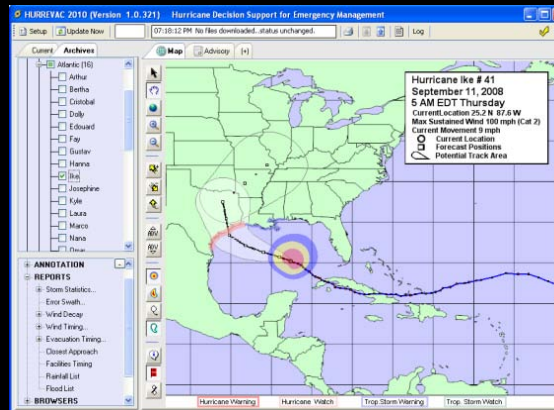
Let's jump into the program from here...

HURREVAC2010



Threat Assessment at 72 and 48 hours

HURREVAC2010 EXERCISE



Jeanne (2004)

72-hour Assessment

1. What is the first advisory in which fringe winds surrounding the 72-hour error swath touch the Florida coast?
2. Where is the storm at the time of this advisory (direction and distance)?
3. Does a direct hit to southern Florida seem plausible?

Jeanne (2004)

48-hour Assessment

At advisory 41, Broward County is now within the 48-hour window for arrival of tropical storm force winds.

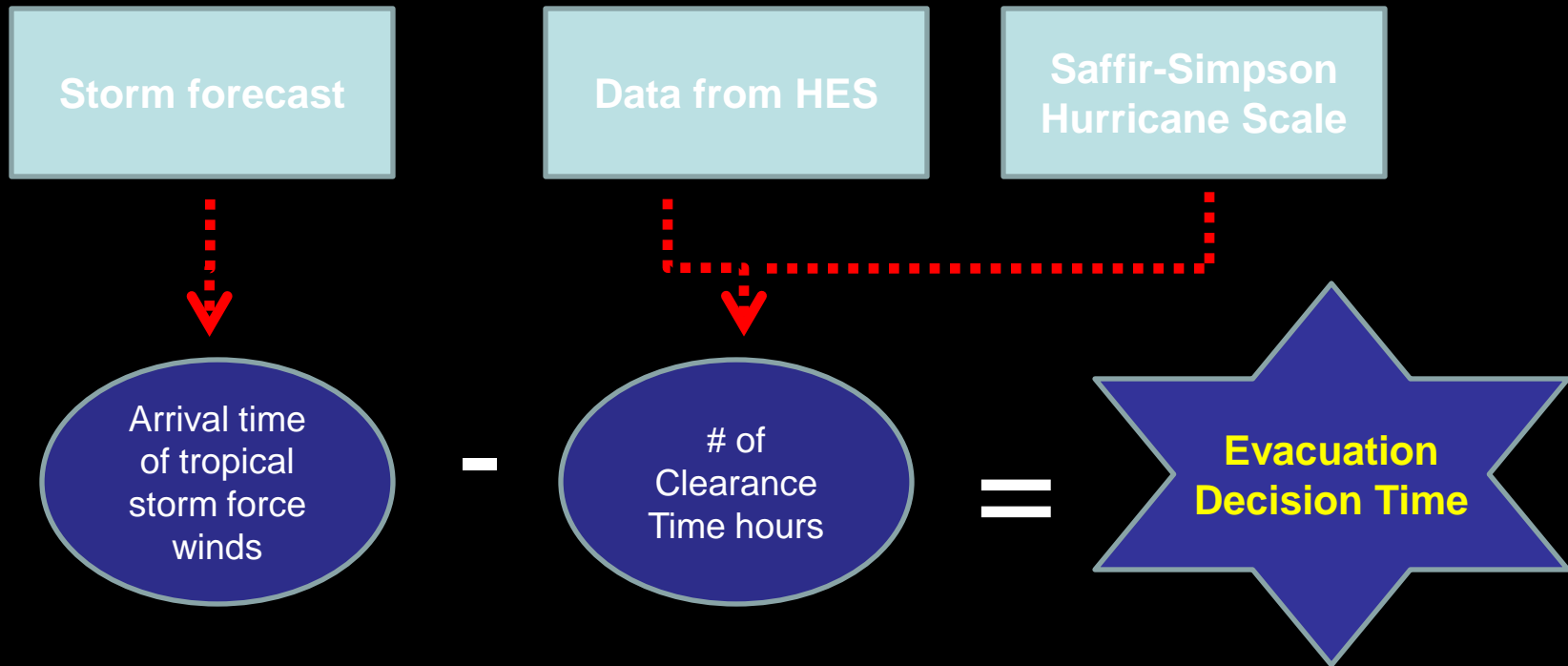
4. What hour are 34-kt winds forecast to begin?

Hint – advance the wind ranges

5. How much of a margin of error should be allowed to account for forecast uncertainty? *Hint – advance the error ellipse fringe winds*

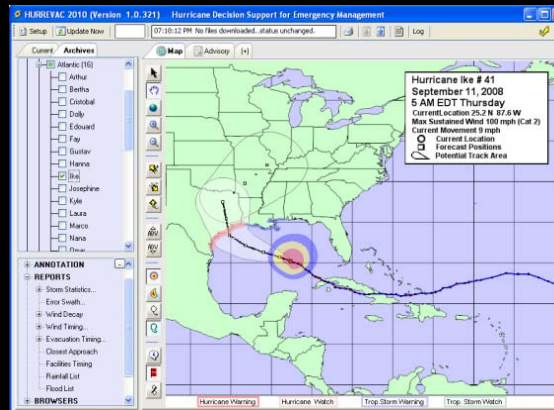
USING HURREVAC FOR EVACUATION DECISION TIMING

Decision Time Calculation



Evacuation Decision Time Calculation

HURREVAC2010 EXERCISE



Wilma 2005 Analysis

Run an evacuation timing report for Broward based upon Wilma Advisory 29.

1. How many hours are left before calculated decision time?
2. Does the suggested evacuation period fall during daytime or nighttime?

Wilma 2005 Analysis

3. What are the shortest and longest clearance times for Broward County?
4. Which clearance time is HURREVAC using by default in Wilma Advisory 29?

Wilma 2005 Analysis

Change HURREVAC's Evacuation Options Settings to force selection of a Cat 4 clearance time with an optional safety buffer of 2 hours.

5. Now how many hours are left before calculated decision time?

Wilma 2005 Analysis

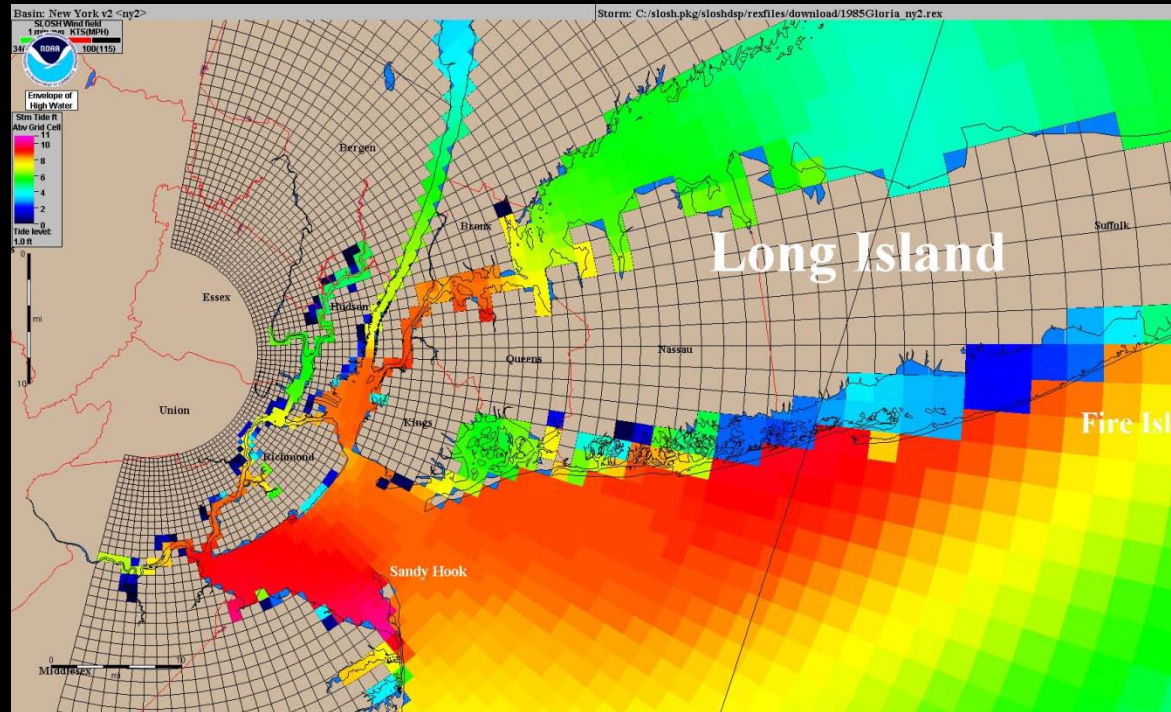
Set HURREVAC's Decision Time Alert for Broward County

6. On what advisory does the alert first appear?

7. Do we make an evacuation decision using this advisory or wait another 6 hours?

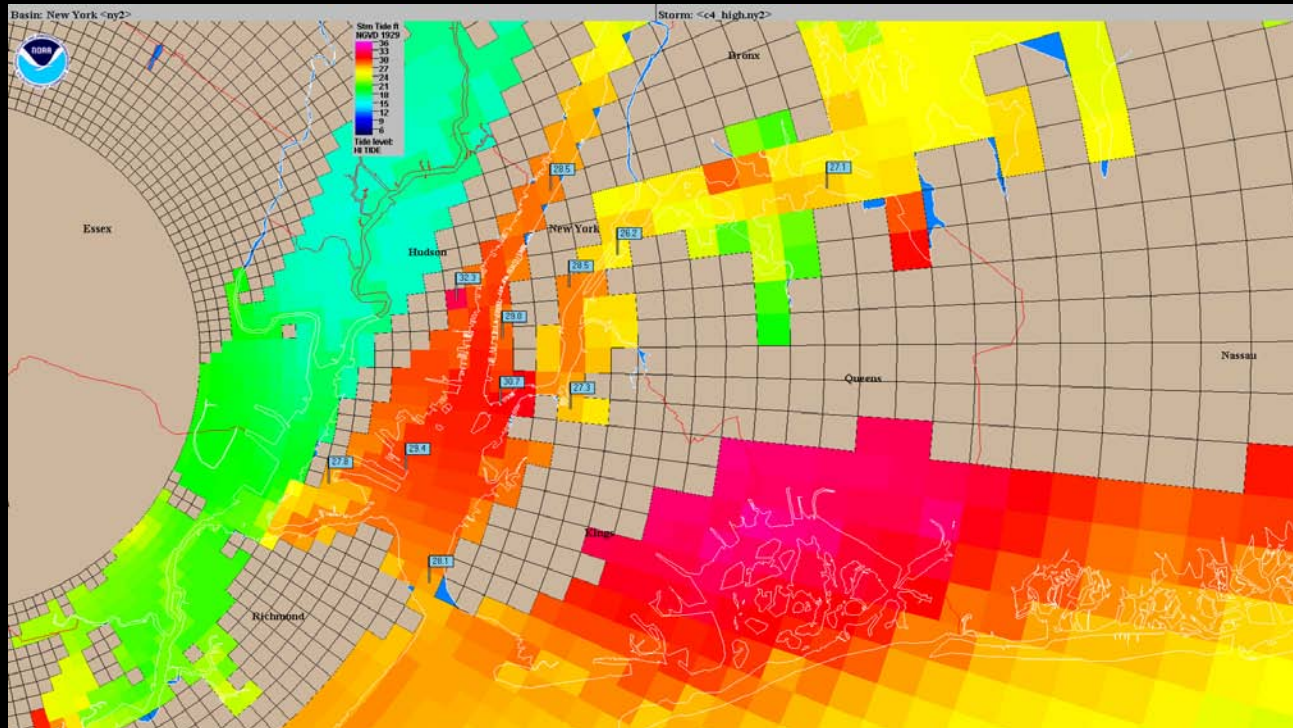
EVALUATING STORM SURGE AND FLOODING POTENTIAL

Gloria 1985



The SLOSH model accuracy is +/- 20%
...on a known storm track!

NYC Category 4 MOM



Worst case scenario at each grid location based upon many angles of approach and tracking speeds

Probabilistic Storm Surge

- New NHC product, became operational in 2008
- Available whenever a hurricane watch or warning is in effect for the Gulf or Atlantic coasts of the continental US
- Issuance follows one hour after regular advisory hours

IKE # 42 NHC Past(solid) and Forecast(dots) Track

>34kt(39mph)

>50kt(58mph)

>64kt(74mph)

National Hurricane Center Disclaimer: 'Wind Range Contours show the maximum extent of winds expected in each quadrant. Users are cautioned that winds vary greatly within each quadrant. For quadrants extending over land and water, over-water values are used, which may make the extent of inland wind radii appear unrealistically large'

OLD Advisory
IKE # 42
Thu 09/11/08 11E
(15Z)-Initial Posit.
25.50 N 88.40 W
85kt (100mph)
Saf Sim Category 2
Movg 9kt (10mph)

TIME- TIME+ AUTO

Change -
STORM PREV NEXT
ADVY ADVY ADVY

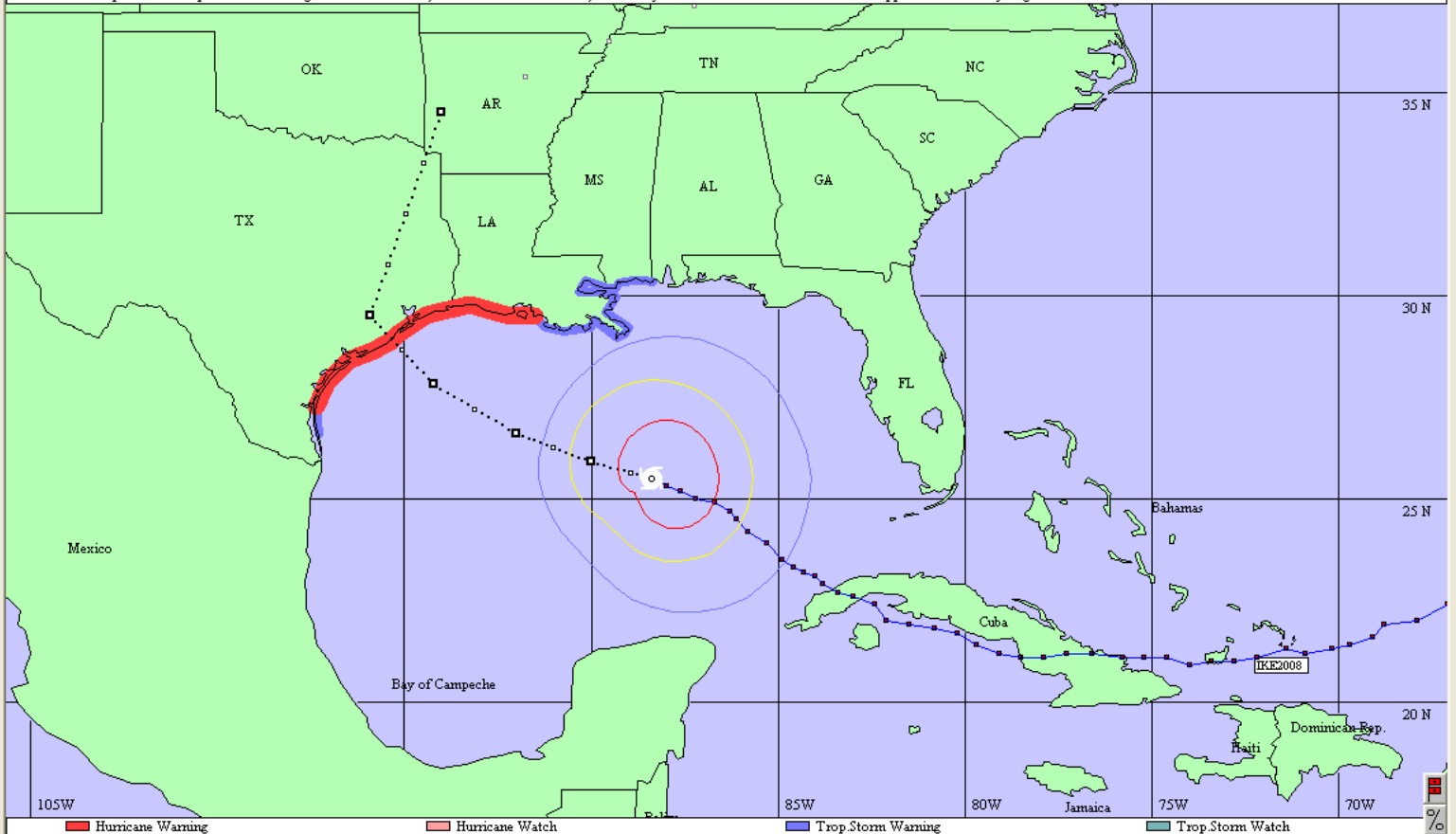
Map -
Map navigation icons

Mode - Single Plot
Mode icons

Other...
Other icons

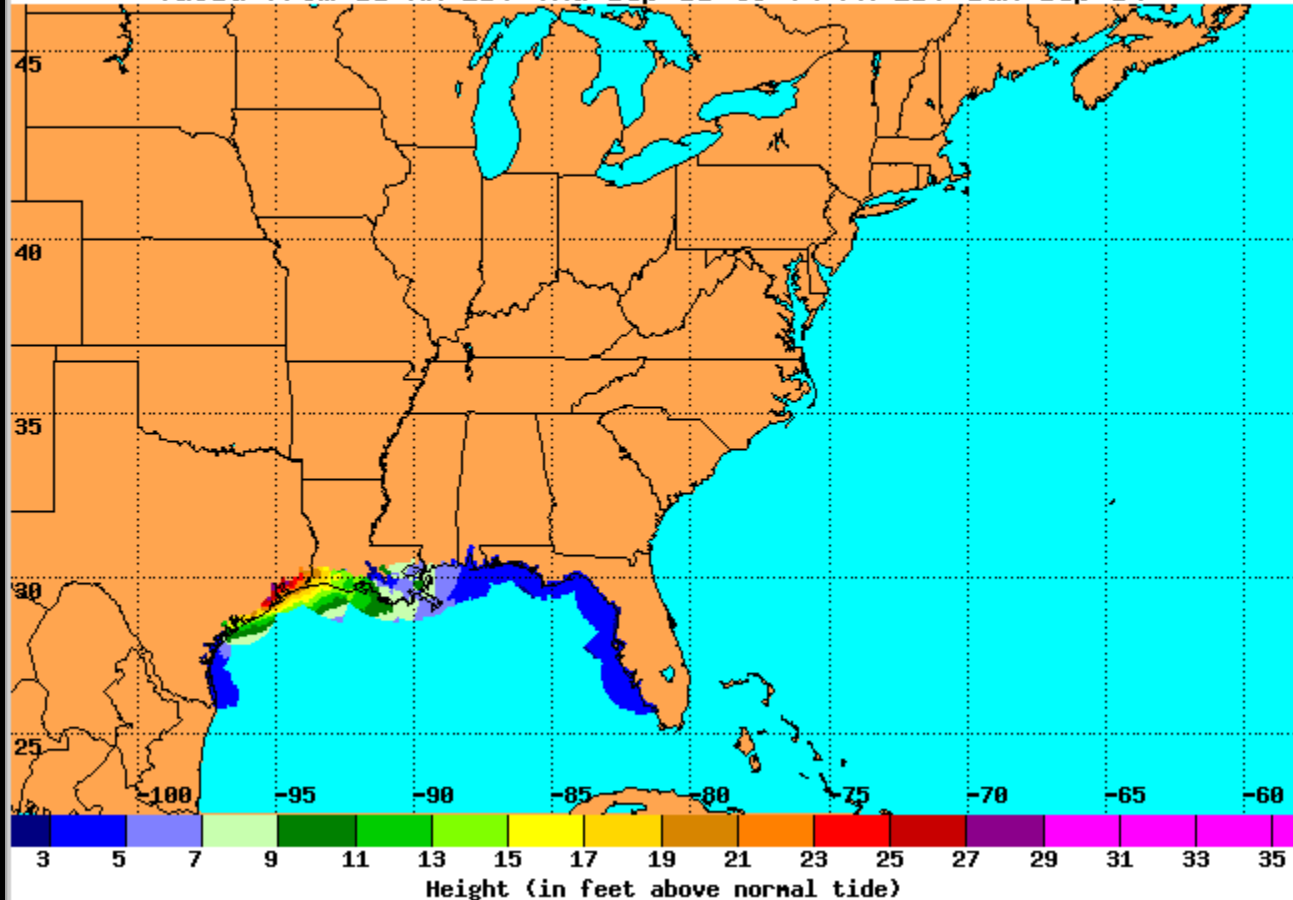
Overlay List...OFF
Storm Advy

- Ike 2008
- Hanna 2008
- Nicole 2010
- Nicole 2010
- Nicole 2010
- Bertha 1996
- Floyd 1999
- Charley 2004



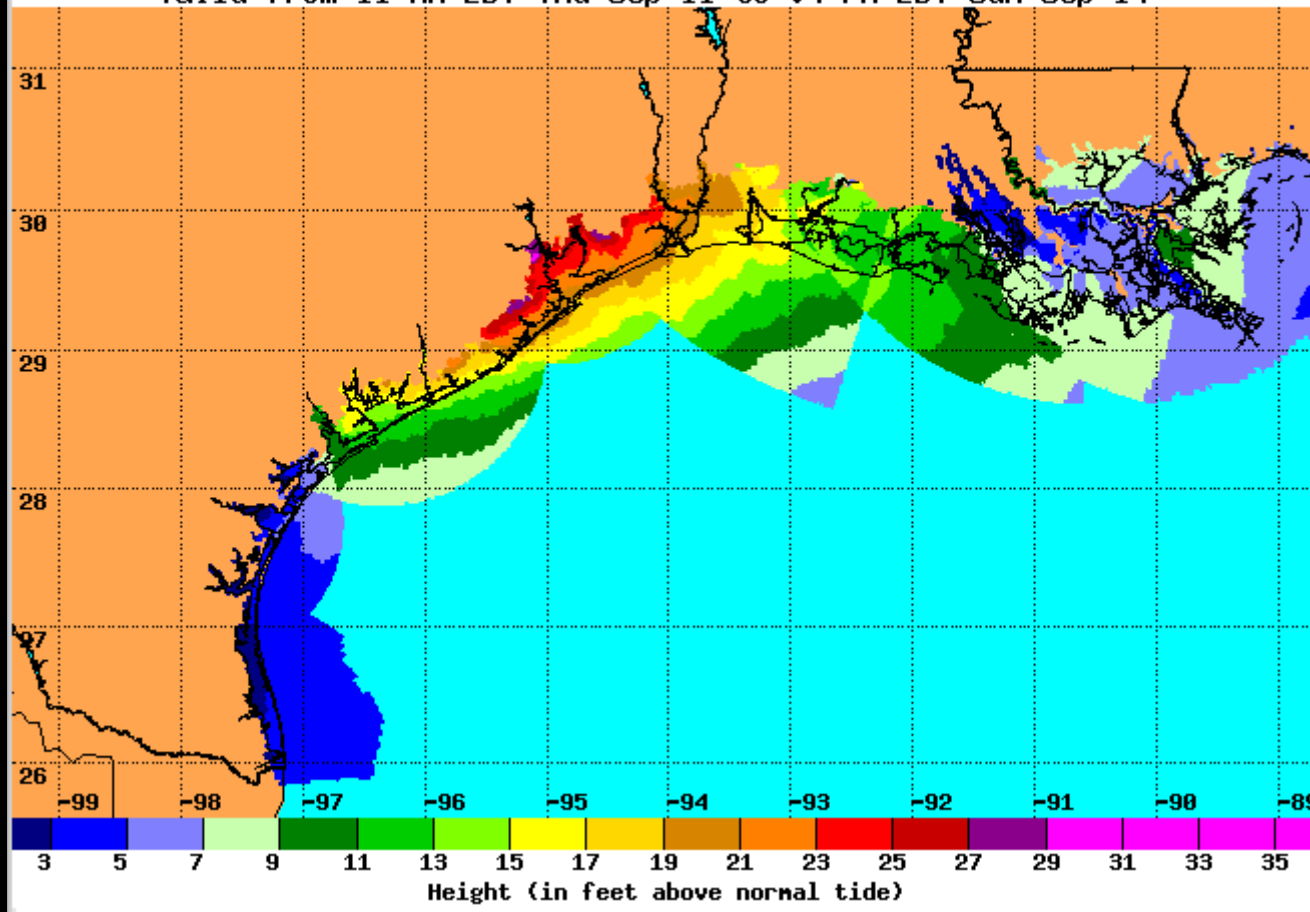


Experimental Tropical Cyclone Storm Surge Exceedance
Heights Which Have a 10% Chance of Being Exceeded
Hurricane Ike (2008) Advisory 42
Valid from 11 AM EDT Thu Sep 11 to 04 PM EDT Sun Sep 14



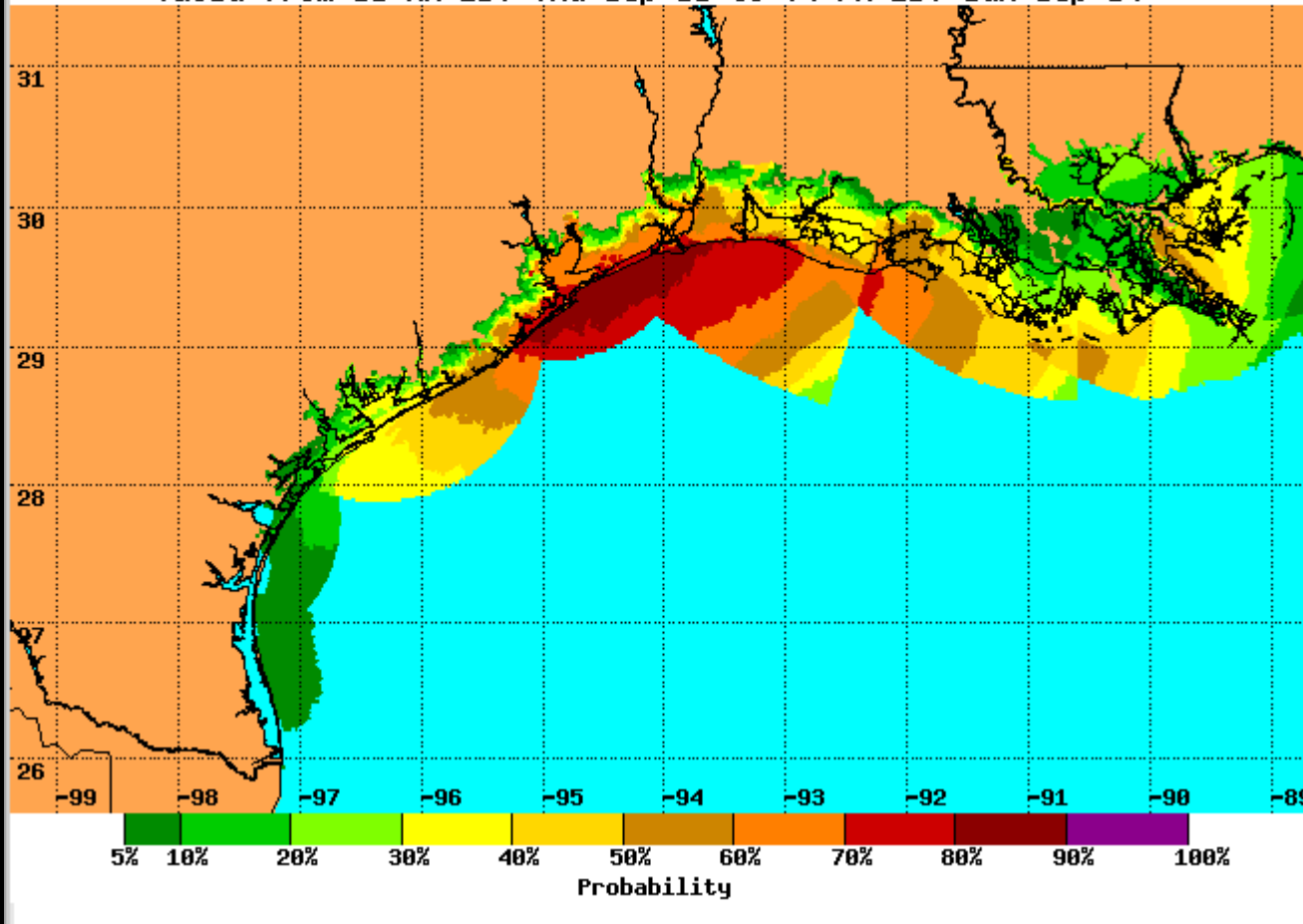


Experimental Tropical Cyclone Storm Surge Exceedance
Heights Which Have a 10% Chance of Being Exceeded
Hurricane Ike (2008) Advisory 42
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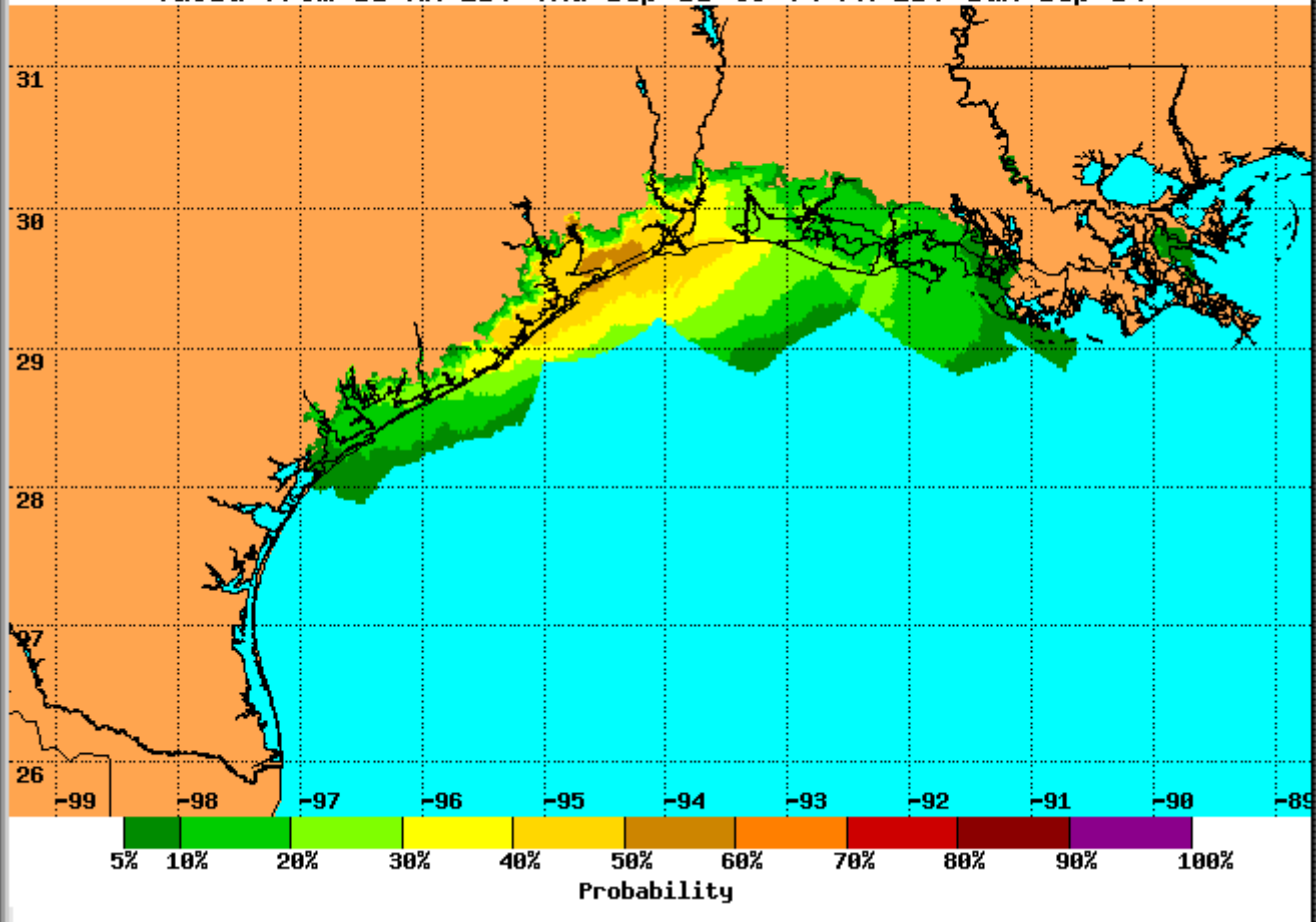


Experimental Tropical Cyclone Storm Surge Probabilities
Chance of Storm Surge \geq 5 feet at Individual Locations
Hurricane Ike (2008) Advisory 42
Valid from 11 AM EDT Thu Sep 11 to 04 PM EDT Sun Sep 14





Experimental Tropical Cyclone Storm Surge Probabilities
Chance of Storm Surge ≥ 10 feet at Individual Locations
Hurricane Ike (2008) Advisory 42
Valid from 11 AM EDT Thu Sep 11 to 04 PM EDT Sun Sep 14



WORKING WITH ARCHIVE STORMS