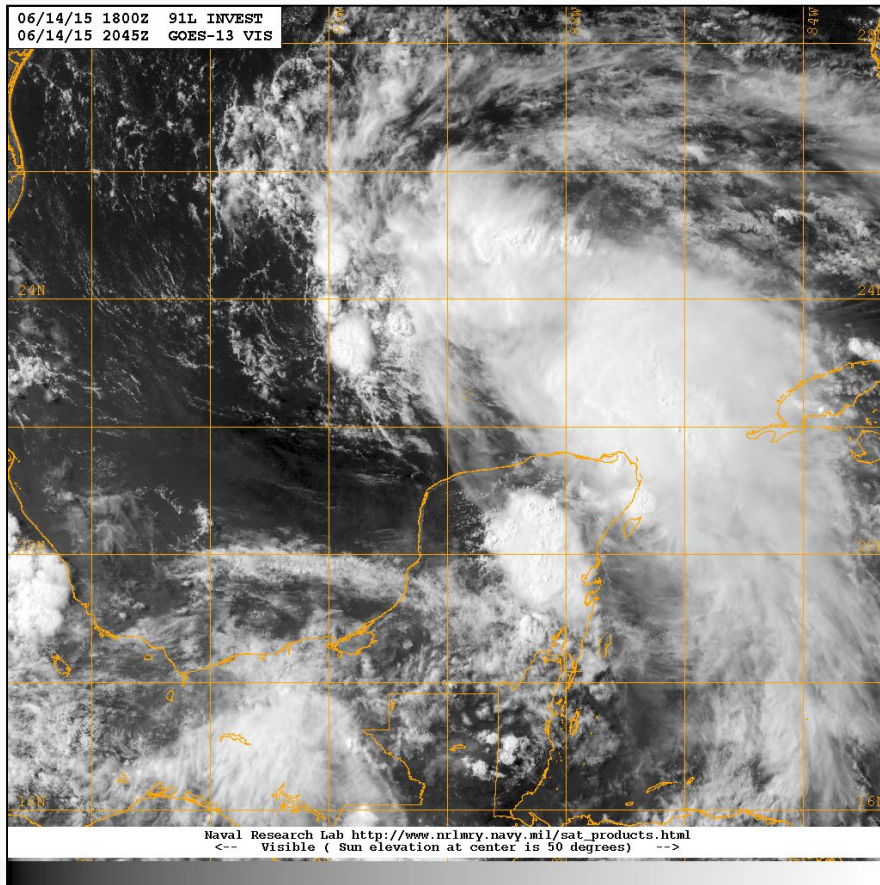
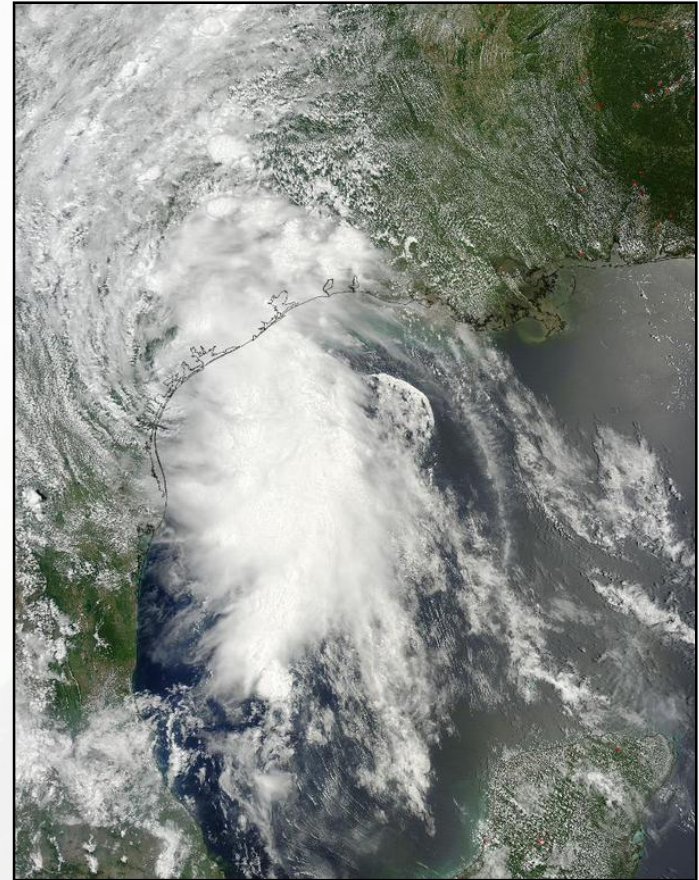


Potential Tropical Cyclone Advisories



Pre-Tropical Storm Bill disturbance
14 June 2015

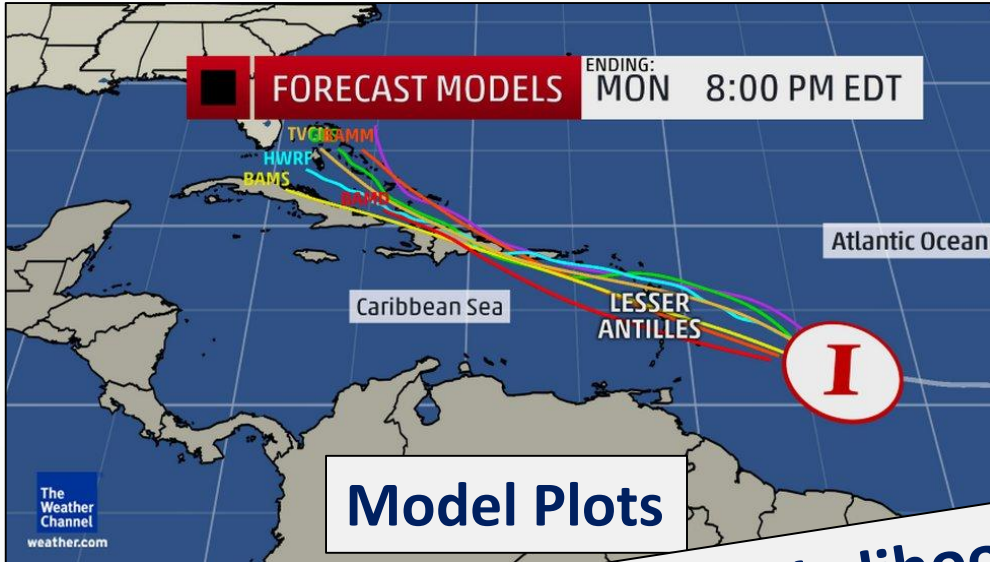


Bill's landfall in Texas less
than 24 h later

Daniel P. Brown
Warning Coordination Meteorologist
National Hurricane Center



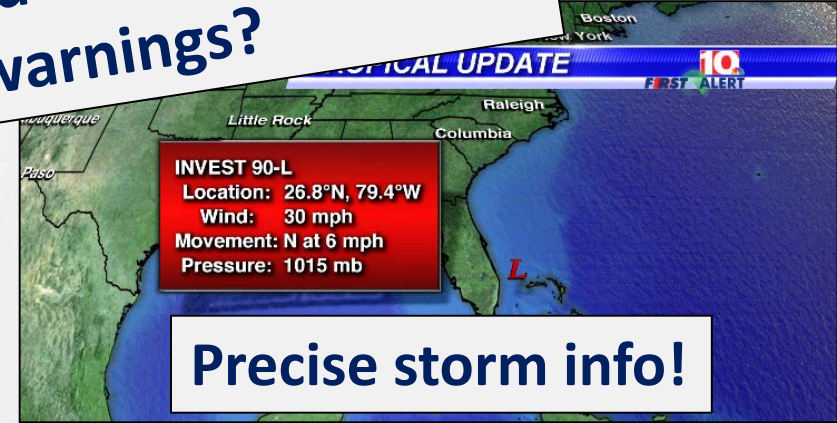
Pre-Tropical Cyclone Information



David Paul @MetDavidPaul · 28 Jul 2014
 #AL93 in the #AtlanticOcean may become a #tropicalstorm this week, moving to the WNW. May eventually turn north.

ENHANCED SATELLITE
MON 4:15 PM

But what is the likelihood of development, impacts, and warnings?



WXGeeksTWC and 4 others follow

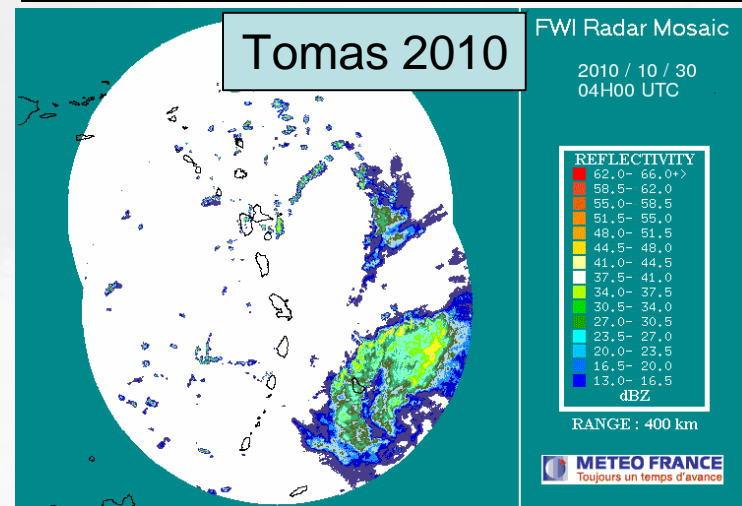
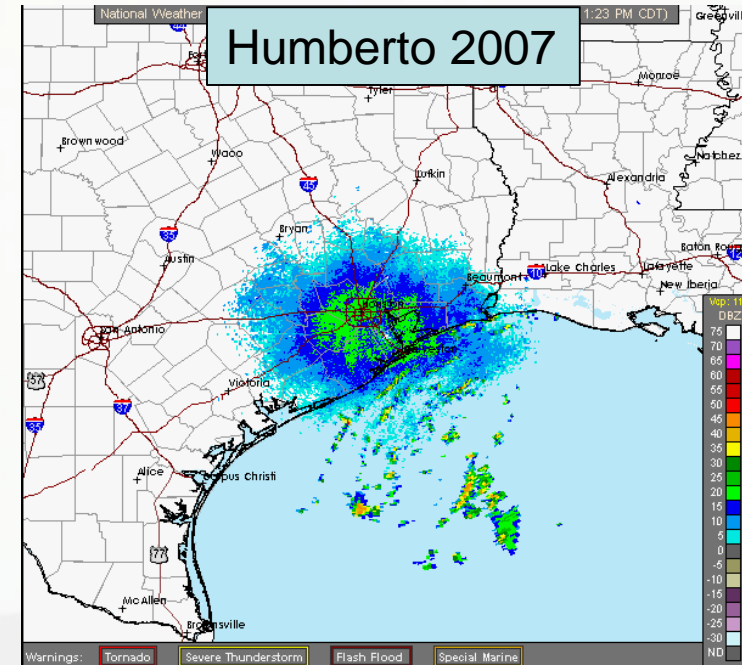
Ed Quinn @CataulaGaWX · 13 Aug 2013
 We now have #Invest92 in the #Caribbean 16.3N/81.3W and #Invest93 off the coast of #Africa 14.0N/17.0W #AL92 #AL93... fb.me/IvCQER6Z



Need For Watches and Warnings Before Formation



- Tropical cyclone development close to the coast highlighted a limitation in the NWS tropical cyclone watch/warning program.
- Not a new issue, but one that has been discussed within the NWS tropical cyclone program several times during the past couple of decades.
- What has changed is NHC's ability to anticipate and forecast tropical cyclone formation.





Recent Improvements to NHC's Tropical Cyclone Genesis Forecasts



- Tropical Weather Outlook originally a text-only product that discussed areas of disturbed weather and their potential for tropical cyclone formation.

TROPICAL WEATHER OUTLOOK
NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL
1130 AM EDT TUE AUG 23 2005

FOR THE NORTH ATLANTIC...CARIBBEAN SEA AND THE
GULF OF MEXICO...

A BROAD SURFACE LOW PRESSURE AREA IS PRODUCING
WIDESPREAD CLOUDINESS AND THUNDERSTORMS FROM
EASTERN CUBA AND HISPANIOLA NORTHWARD ACROSS THE
SOUTHEASTERN BAHAMAS...THE TURKS AND CAICOS
ISLANDS... AND INTO THE ATLANTIC FOR A FEW
HUNDRED MILES. THIS ACTIVITY HAS BECOME A LITTLE
BETTER ORGANIZED OVER THE SOUTHEASTERN
BAHAMAS... AND A TROPICAL DEPRESSION COULD FORM
LATER TODAY OR ON WEDNESDAY AS THE SYSTEM MOVES
TO THE WEST-NORTHWEST OR NORTHWEST AT 5 TO 10
MPH. AN AIR FORCE RESERVE UNIT RECONNAISSANCE
AIRCRAFT IS SCHEDULED TO INVESTIGATE THE SYSTEM
THIS AFTERNOON. INTERESTS IN THE BAHAMAS... THE
NORTH COAST OF CUBA...AND SOUTHERN FLORIDA
SHOULD MONITOR THE PROGRESS OF THIS SYSTEM.

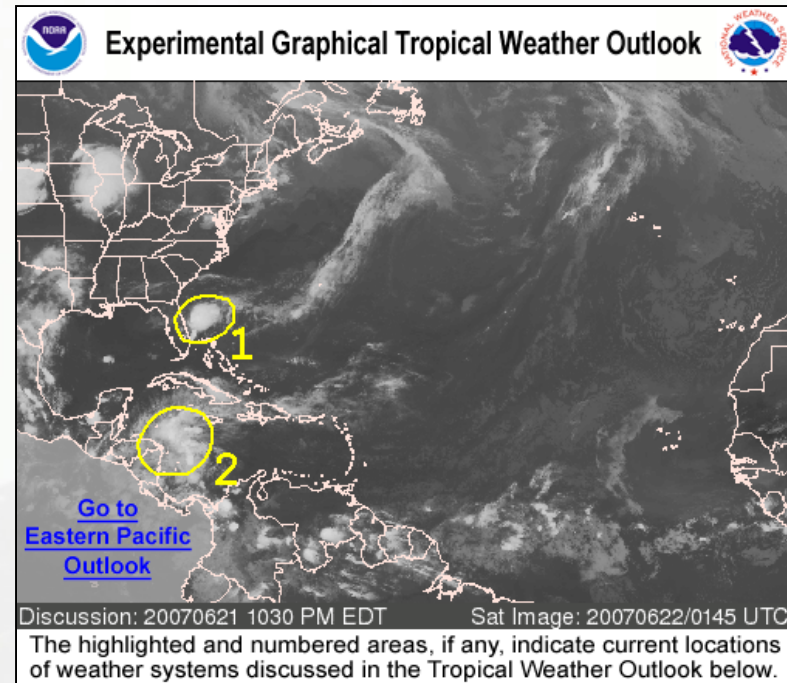
Pre-Hurricane Katrina Tropical Weather Outlook
23 August 2005



Recent Improvements to NHC's Tropical Cyclone Genesis Forecasts



- Tropical Weather Outlook originally a text-only product that discussed areas of disturbed weather and their potential for tropical cyclone formation.
- Graphical Tropical Weather Outlook introduced in 2007.



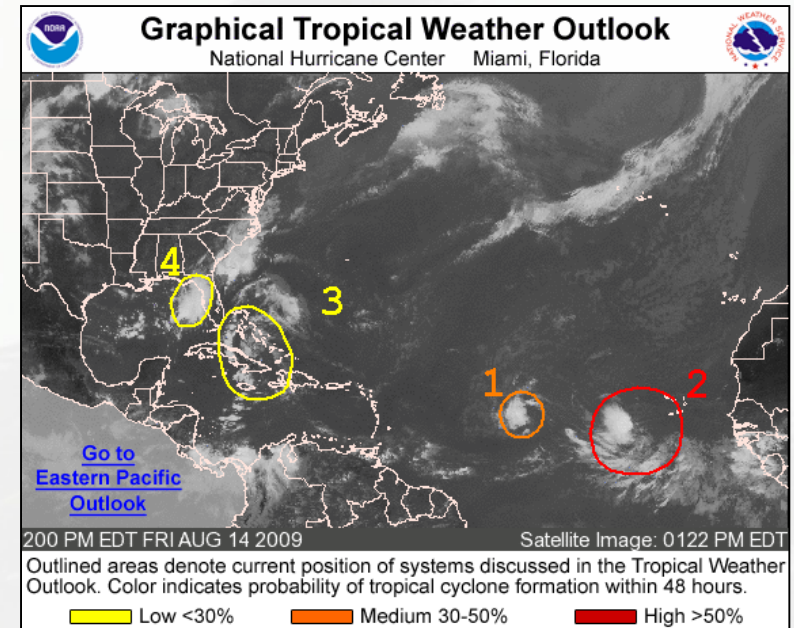
2007 Graphical Outlook highlighted the current location of disturbances discussed in the Outlook



Recent Improvements to NHC's Tropical Cyclone Genesis Forecasts



- Tropical Weather Outlook originally a text-only product that discussed areas of disturbed weather and their potential for tropical cyclone formation.
- Graphical Tropical Weather Outlook introduced in 2007.
- Color-coded probabilities of development added in 2008.



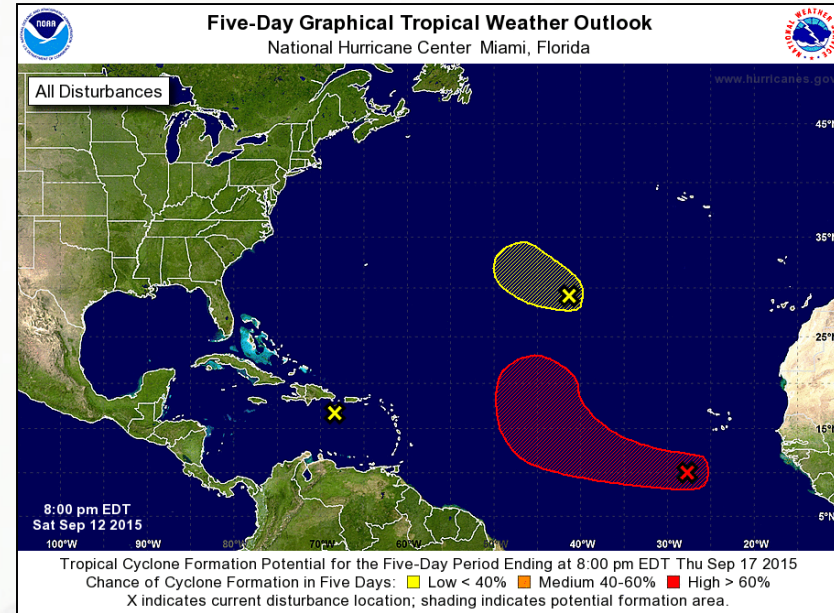
Color-coded probabilities of formation added



Recent Improvements to NHC's Tropical Cyclone Genesis Forecasts



- Tropical Weather Outlook originally a text-only product that discussed areas of disturbed weather and their potential for tropical cyclone formation.
- Graphical Tropical Weather Outlook introduced in 2007.
- Color-coded probabilities of development added in 2008.
- Time period covered by the Outlook extended from 48 h to 5 days in 2013.
- New 5-day graphic introduced in 2014.



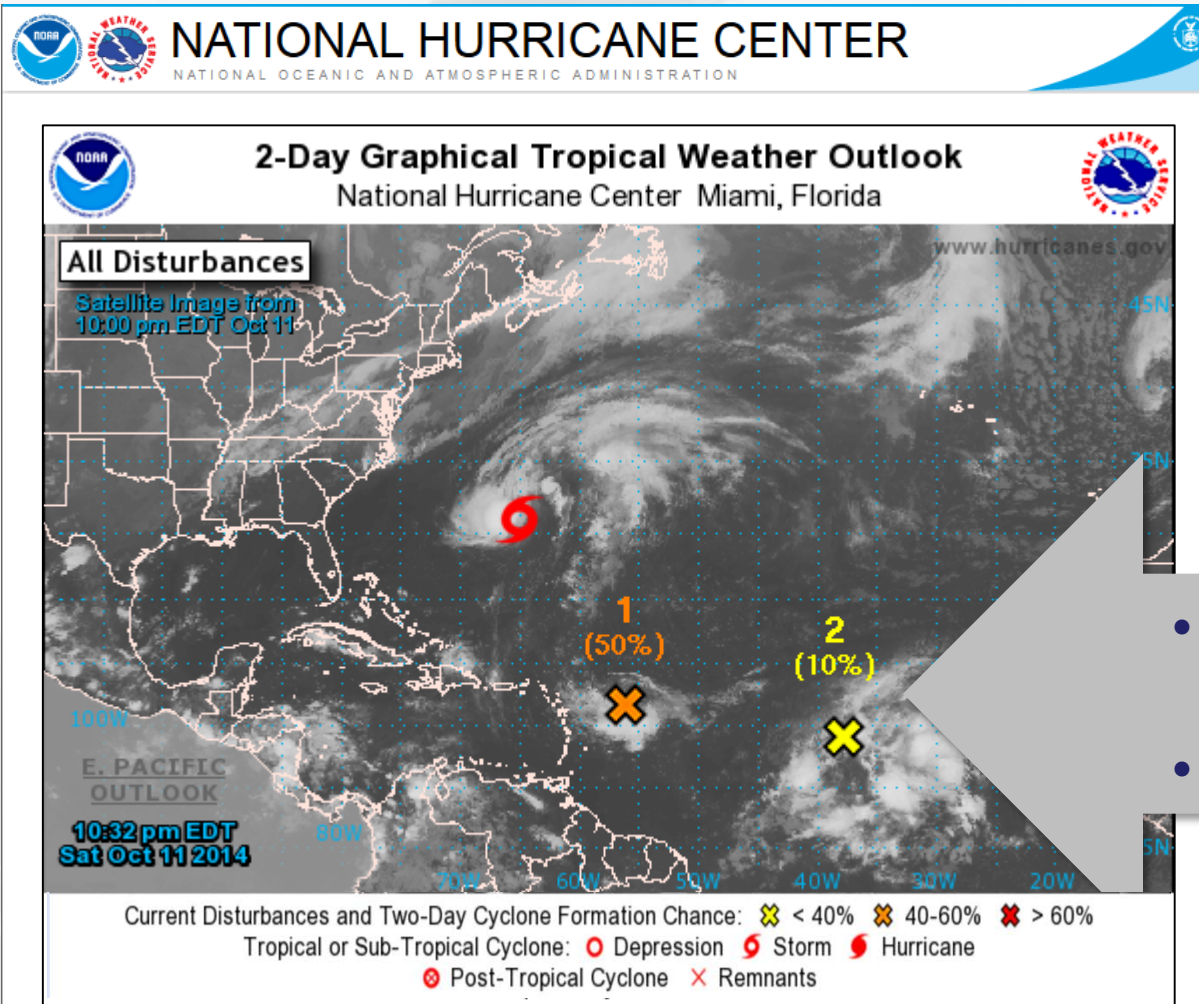
5-day graphic includes:

- Categorical formation potential
- Shading represents potential formation area
- Initial location of disturbance (X) indicated, if existing at issuance time
- Current storm information, not shown



Tropical Weather Outlook

Two-Day Graphic



Current location of disturbances

(discussed in the Tropical Weather Outlook)

Formation chance during the next 48 hrs

- **Categorical**
(Low, Medium, and High)
- **Probabilities**



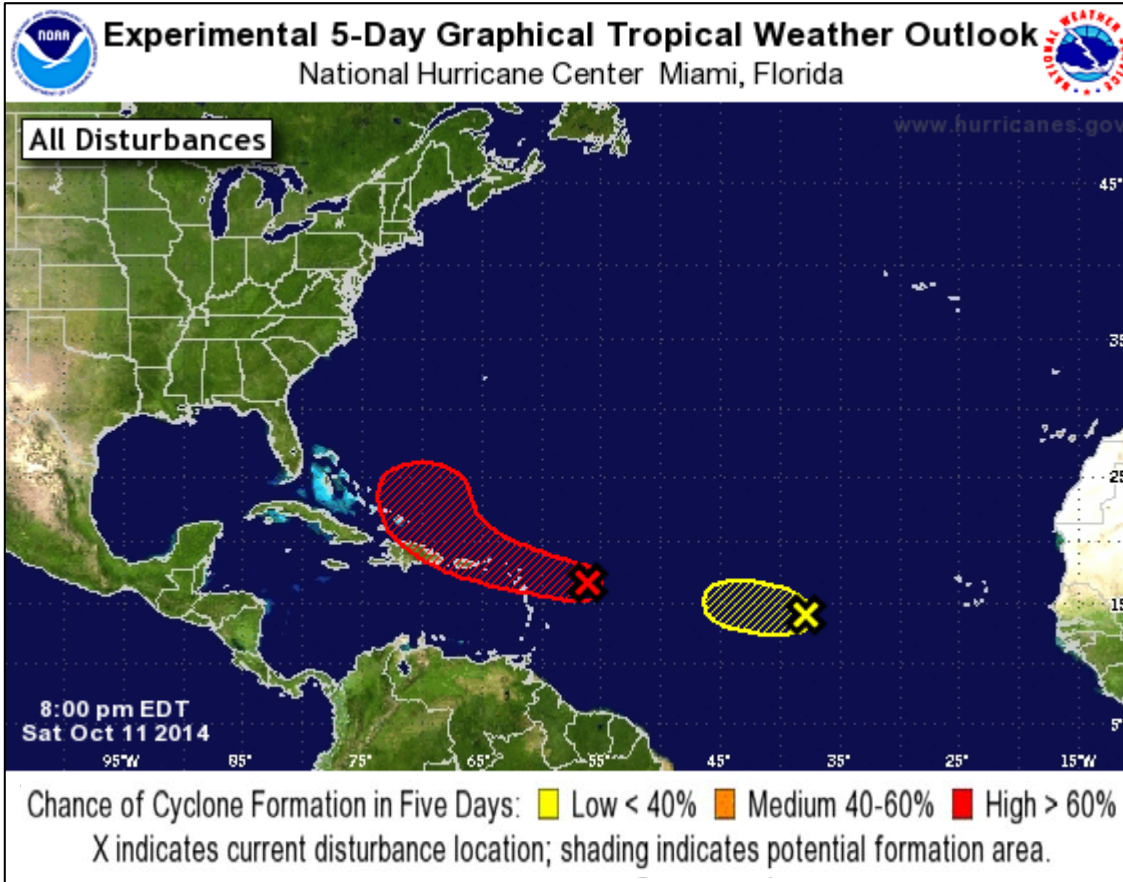
Tropical Weather Outlook

Five-Day Graphic



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- Formation potential during the next 5 days
- Initial location of disturbance (X) indicated
- Shading represents potential formation area
- Single disturbance-based graphics available to help when areas overlap



Potential Formation Area Not a 5-day Track Forecast



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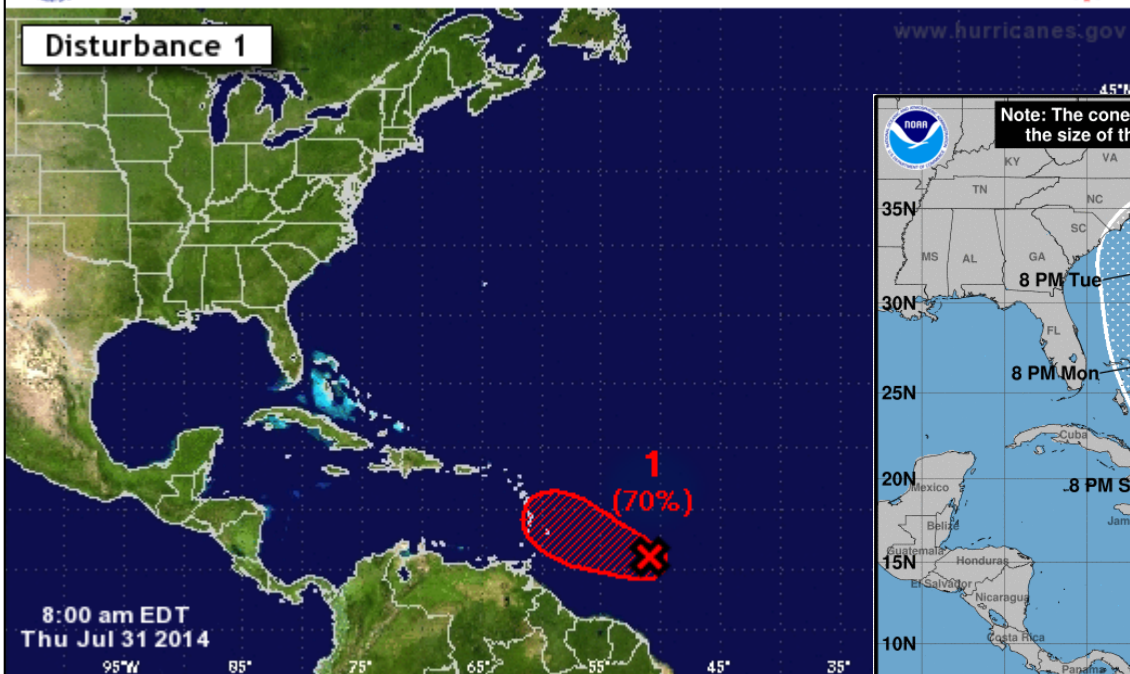


Experimental 5-Day Graphical Tropical Weather Outlook

National Hurricane Center Miami, Florida

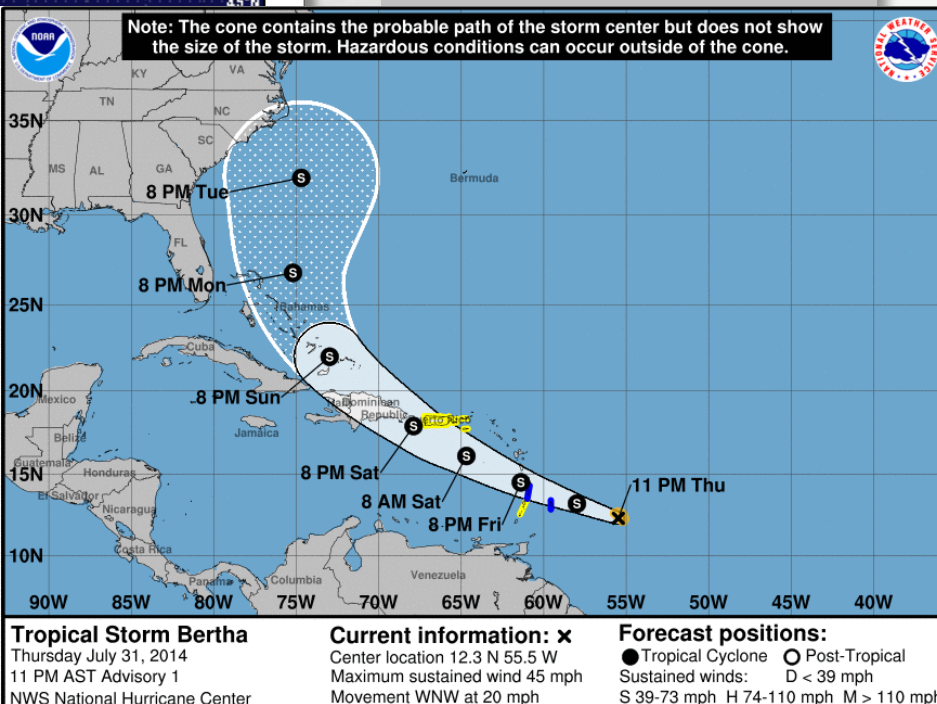


Disturbance 1



Tropical Cyclone Formation Potential for the 5-Day Period Ending 8:00 am
Chance of Cyclone Formation in 5 Days: Low < 30% Medium 30-50%
X indicates current disturbance location; shading indicates potential

Tropical Outlook
July 28 @ 8am



Tropical Storm Bertha
Thursday July 31, 2014
11 PM AST Advisory 1
NWS National Hurricane Center

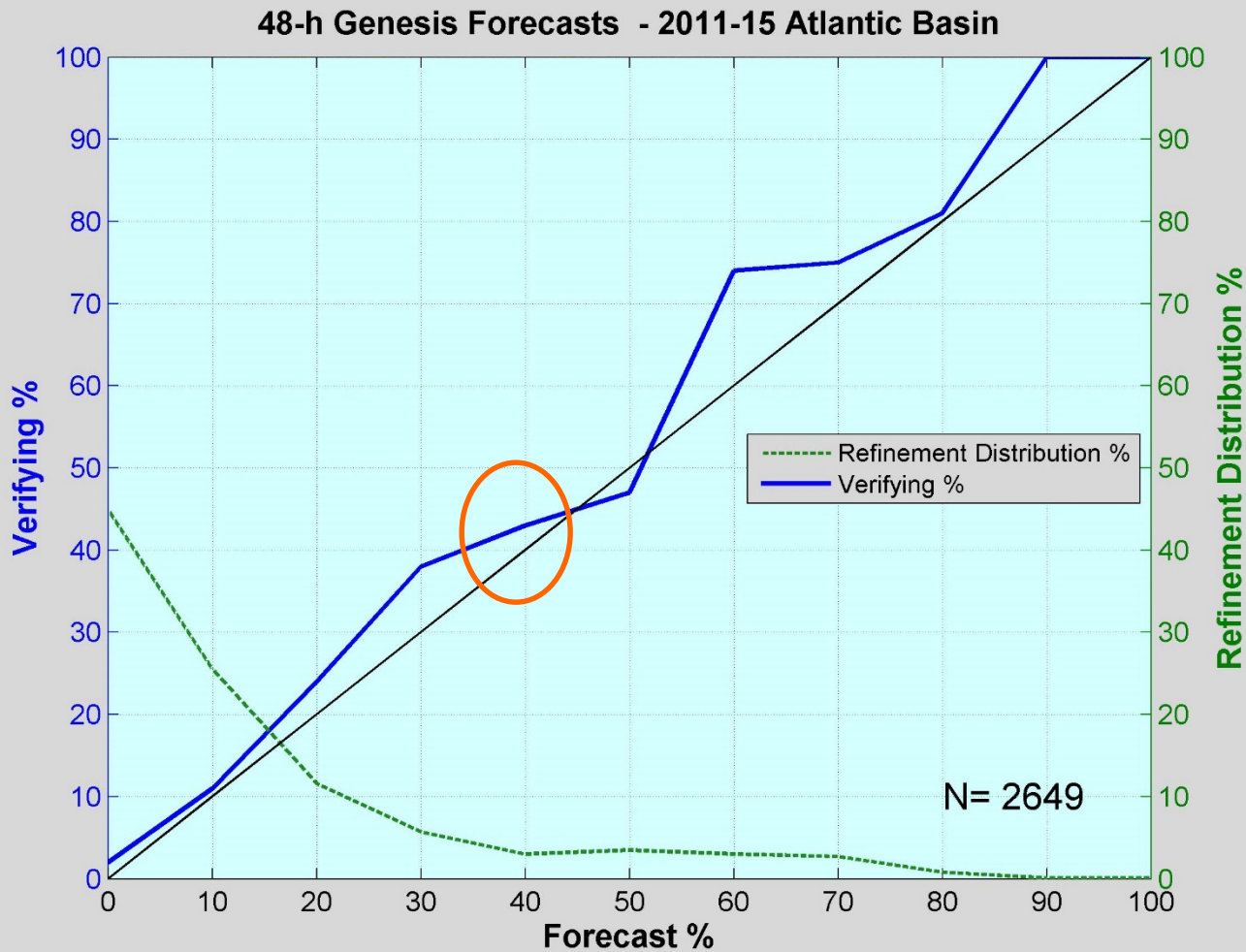
Current information: x
Center location 12.3 N 55.5 W
Maximum sustained wind 45 mph
Movement WNW at 20 mph

Forecast positions:
● Tropical Cyclone ○ Post-Tropical
Sustained winds: D < 39 mph
S 39-73 mph H 74-110 mph M > 110 mph

Potential track area: Day 1-3 (solid line) Day 4-5 (dotted line)
Watches: Hurricane (pink) Trop Stm (yellow)
Warnings: Hurricane (red) Trop Stm (blue)
Current wind extent: Hurricane (brown) Trop Stm (orange)



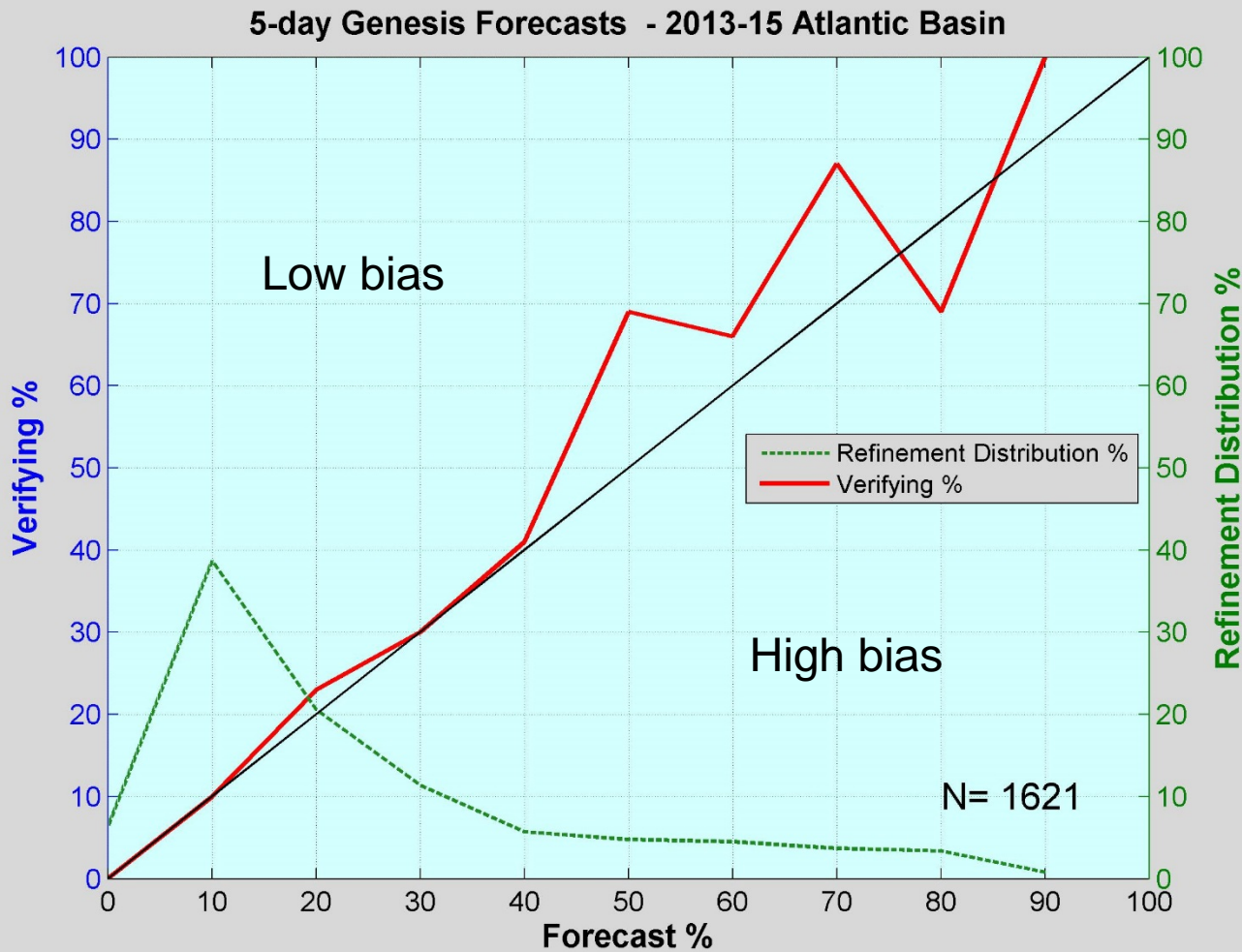
Verification of TWO Probabilities 48 hour



Forecasts very reliable. For example, when NHC has issued a 40% chance of formation of a disturbance within 48 hours, about 43% of the time they have become a TC within that time period.



Verification of TWO Probabilities 5-day probabilities



Well-calibrated from 0 to 40%.

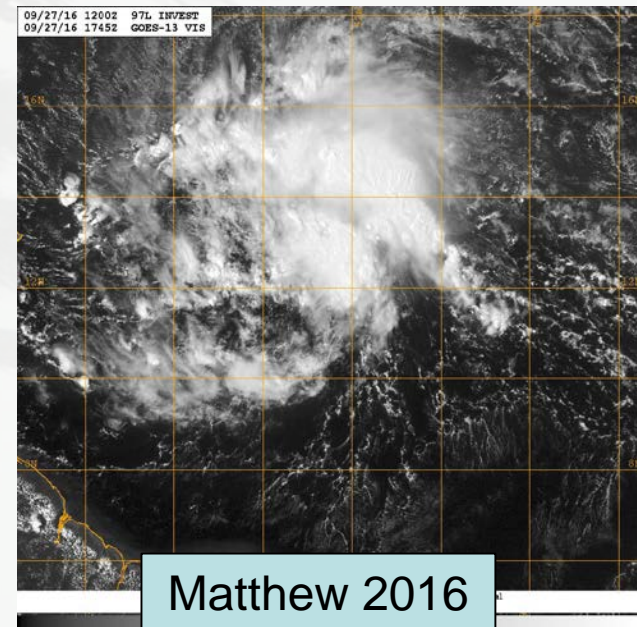
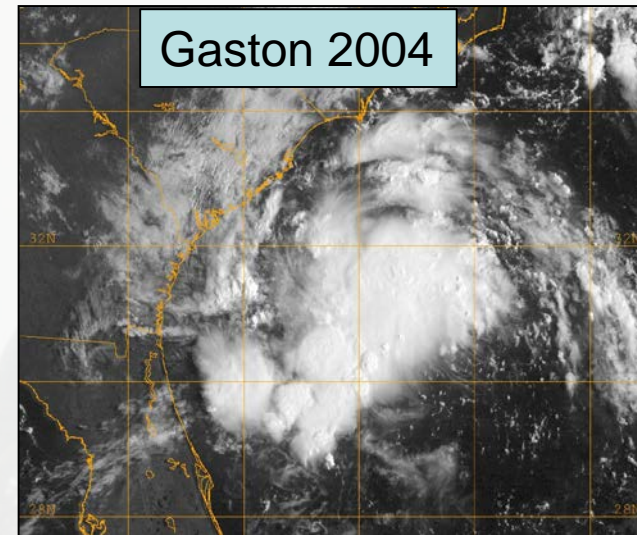
Low bias for probabilities from 50-70 %



Watches and Warnings Before Tropical Cyclone Formation



- NHC will have the option to issue advisories, watches, and warnings for disturbances that are not yet a tropical cyclone but which pose a threat of bringing tropical storm or hurricane conditions to land within 48 hours.
- Regular Tropical Storm and Hurricane Watch and Warning criteria apply
 - Watch – conditions possible within 48 h
 - Warning – conditions expected within 36 h

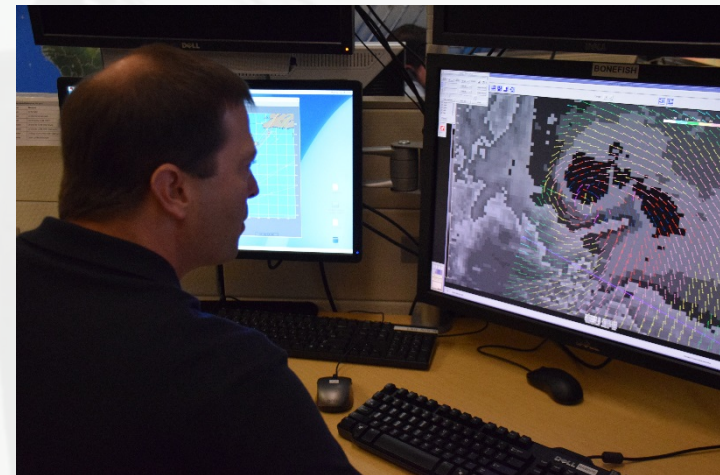




Naming and Numbering System for Potential Tropical Cyclones



- Similar naming/numbering rules that are currently in place to designate tropical depressions.
 - Both depressions and potential tropical cyclones draw designations sequentially from the list “One”, “Two”, “Three”, etc.
 - The designation (number) matches the number of systems within a basin that advisories have been written on in a given year.
 - When a potential tropical cyclone becomes a depression the number does not change.

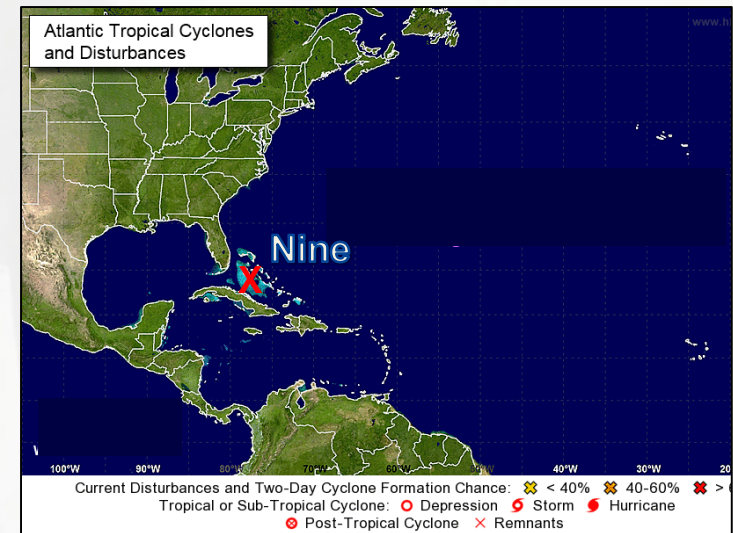
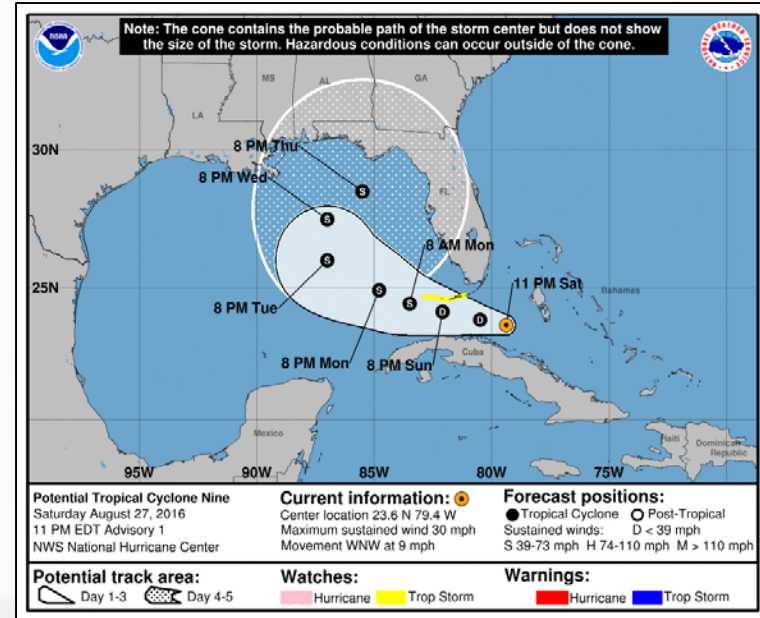




Watches and Warnings Before Tropical Cyclone Formation



- Accompanied by the standard suite of NHC advisory products
 - Public Advisory (including Intermediates)
 - Forecast Advisory
 - Discussion
 - Wind Speed Probabilities
 - Cone graphic
 - Storm surge products, as needed
- Genesis probabilities will appear in both the Tropical Weather Outlook and the Public Advisory.
- The Graphical TWO will no longer display a formation area for these systems, to avoid confusion with the (now available) 5-day track forecast and cone graphic.

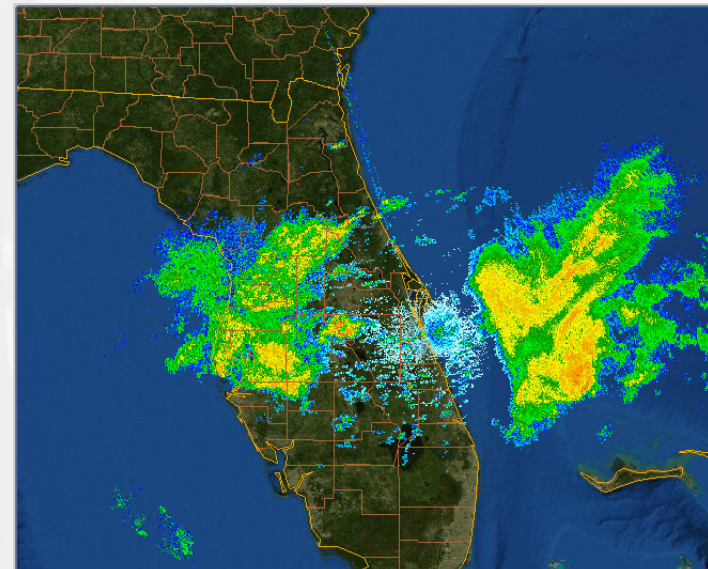
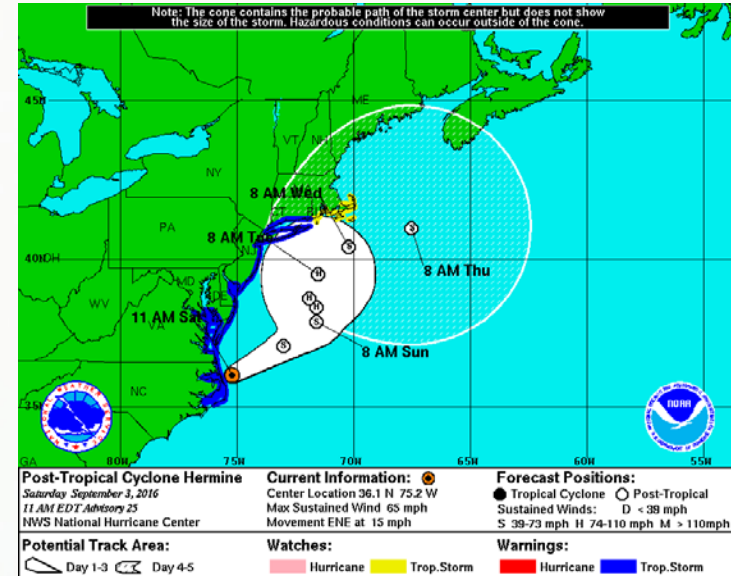




Watches and Warnings Before Tropical Cyclone Formation



- Initial advisory issuance is not directly tied to tropical cyclone formation chance.
- Initial issuance criteria include:
 - Likely impacts
 - Need for tropical cyclone watches or warnings
 - Desire to avoid switching warning types (tropical vs. non-tropical)





Potential Tropical Cyclone Messaging Considerations



- *Issued only for systems threatening land within the watch/warning time frame.*
- Advisory packages will be discontinued when watches and warnings are no longer necessary.
- When the threat is not imminent this could result in occasional gaps in product issuance.



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POTENTIAL TROPICAL CYCLONE ONE PUBLIC ADVISORY NUMBER 1
NWS NATIONAL HURRICANE CENTER MIAMI FL AL012016
400 PM CDT WED JUN 5 2016

...TROPICAL DISTURBANCE OVER THE EAST-CENTRAL GULF OF MEXICO EXPECTED TO BECOME A TROPICAL STORM...
...TROPICAL STORM WARNING ISSUED FOR PORTIONS OF THE WEST COAST OF FLORIDA...

SUMMARY OF 400 PM CDT...2100 UTC...INFORMATION

LOCATION...25.3N 86.5W
ABOUT 310 MI...500 KM SW OF TAMPA
ABOUT 320 MI...510 KM SSW OF APALACHICOLA FLORIDA
MAXIMUM SUSTAINED WINDS...35 MPH...55 KM/H
PRESENT MOVEMENT...N OR 360 DEGREES AT 3 MPH...6 KM/H
MINIMUM CENTRAL PRESSURE...1010 MB...29.92 INCHES

WATCHES AND WARNINGS

CHANGES WITH THIS ADVISORY...

A Tropical Storm Warning has been issued for the west coast of Florida from Boca Grande to Ochlockonee River.

SUMMARY OF WATCHES AND WARNINGS IN EFFECT...

A Tropical Storm Warning is in effect for...
* The west coast of Florida from Boca Grande to Ochlocknee River

A Tropical Storm Warning means that tropical storm conditions are expected somewhere within the warning



Potential Tropical Cyclone Messaging Considerations



- *Issued only for systems threatening land within the watch/warning time frame.*
- Advisory packages will be discontinued when watches and warnings are no longer necessary.
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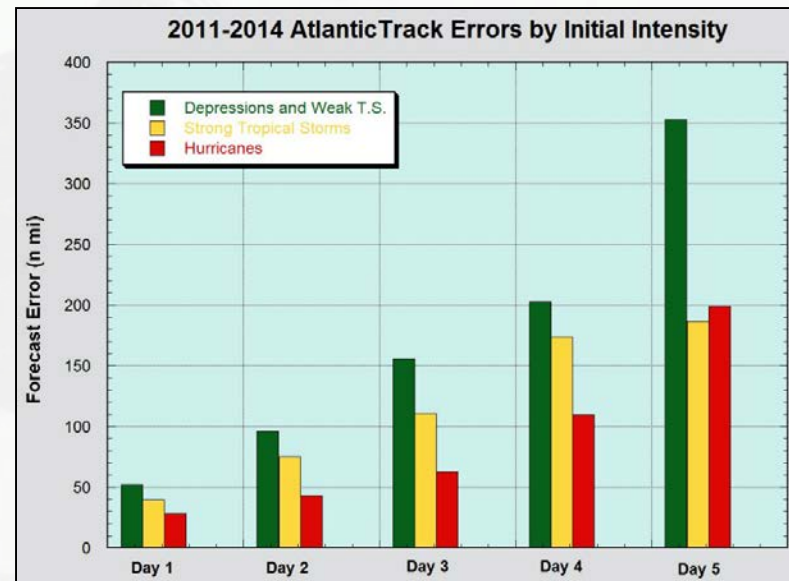
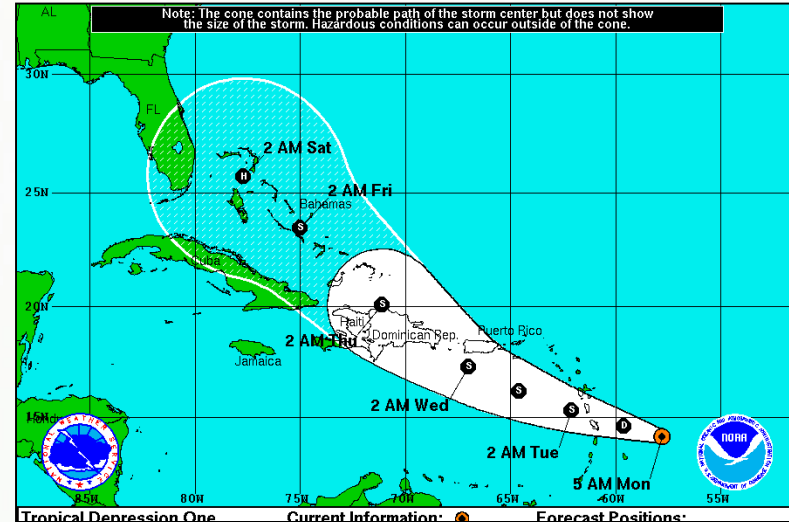
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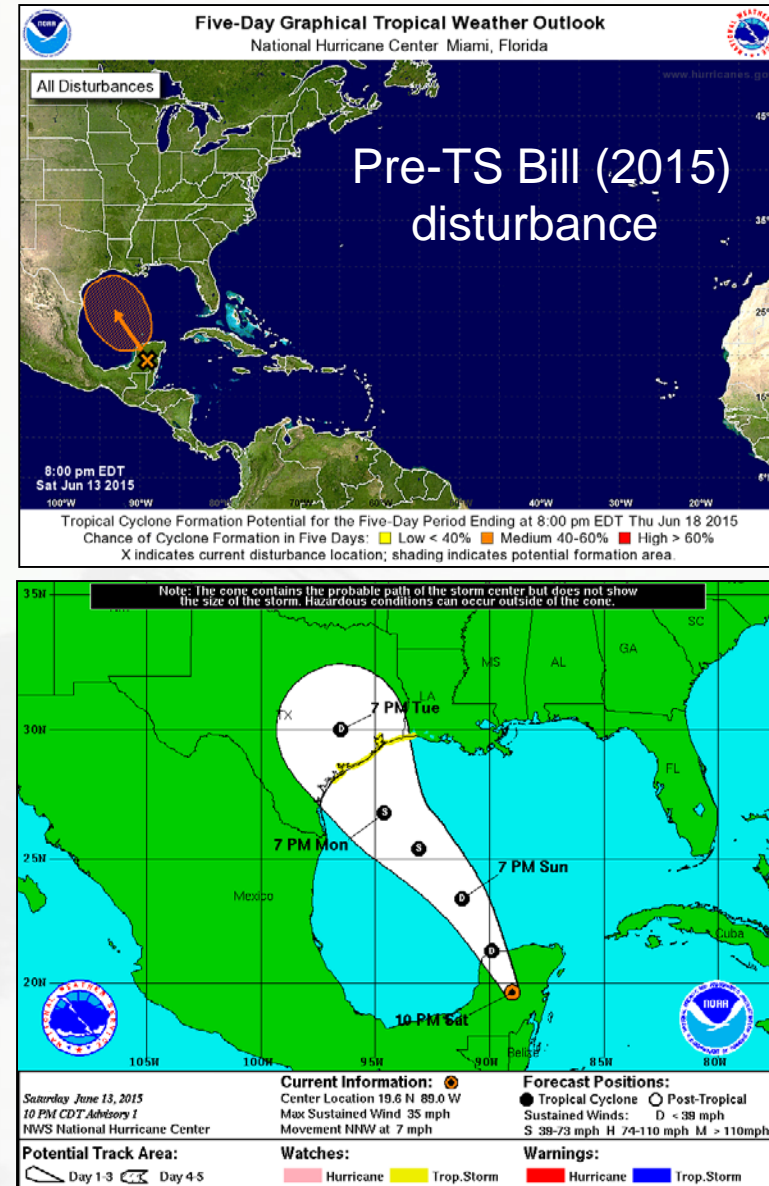
Potential Tropical Cyclone Messaging Considerations

- Earlier NHC advisories for systems that pose a long-range threat to the United States or other land areas.
- Forecasts likely to have greater uncertainty.
 - Intensity forecasts are likely to be conservative.
- False alarms could:
 - Reduce long-term effectiveness of watches and warnings
 - Affect reputation & trust of NHC tropical cyclone forecasts

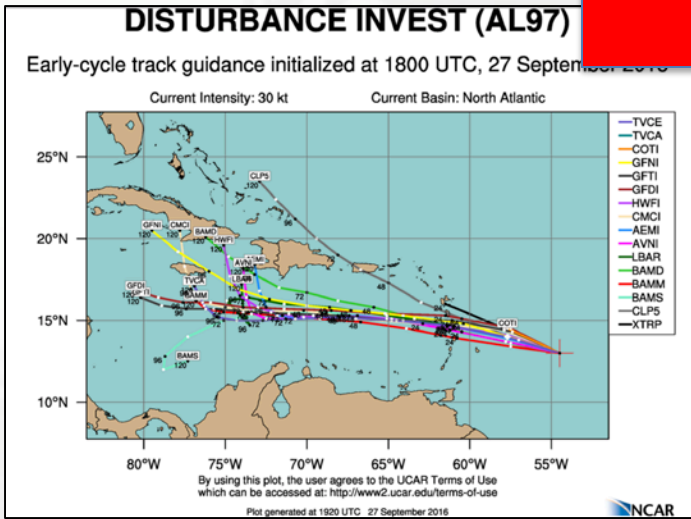
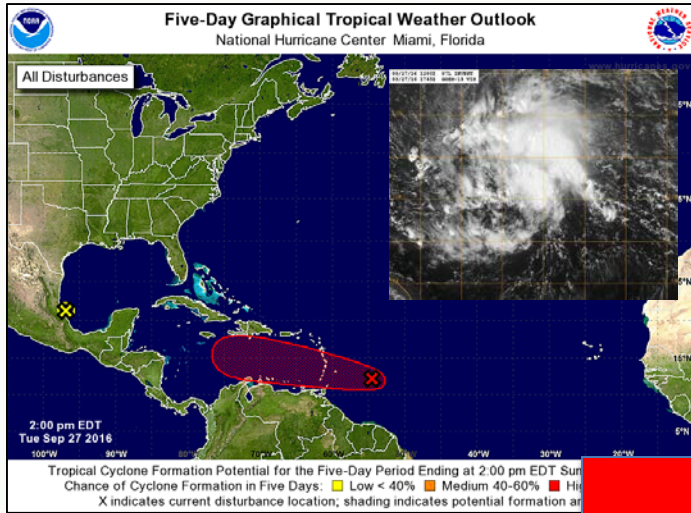


Key Takeaways

- Invests say nothing about a systems development potential. Users should refer to the Tropical Weather Outlook or Potential Tropical Cyclone advisories!
- Hatched areas on the 5-day Graphical Tropical Weather Outlook represent the potential formation area – not a true track forecast.
- NWS/NHC now able to provide appropriate lead time for watches and warnings for potential tropical cyclones!!

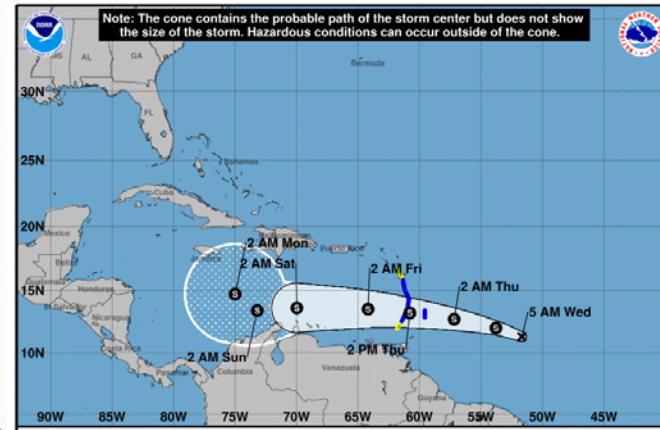


2016 Pre-Matthew



Outlook, invest numbers, model plots, no Watches/Warnings

2017 & Beyond



Watches/Warnings, track, public advisory, discussion, cone, wind speed probabilities, storm surge products (if needed)