

LOCAL OFFICE PRODUCTS/SERVICES



MEMA HURRICANE CONFERENCE

May 28, 2015

Bob Thompson

Weather Forecast Office Taunton, MA

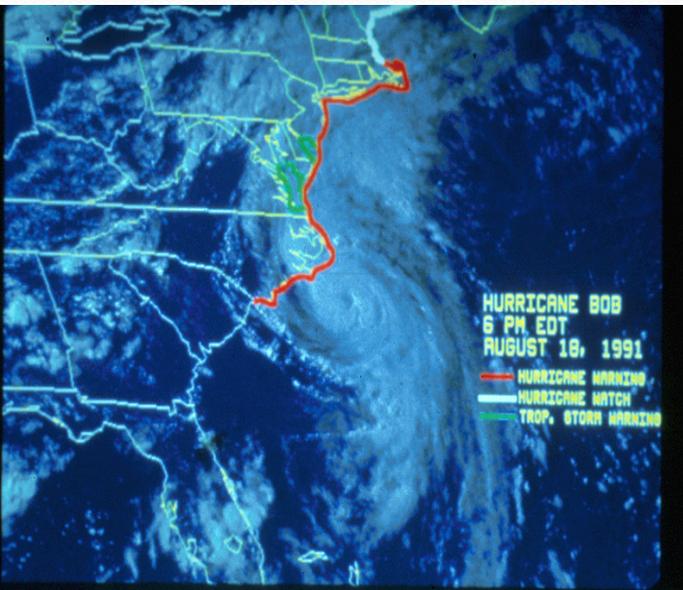
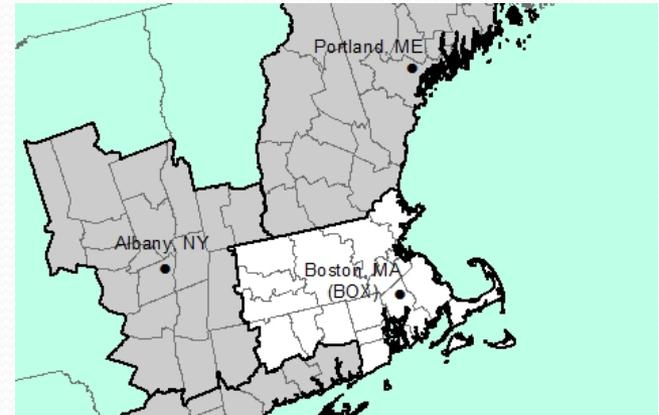


Your Local NWS Office handles all New England Weather!



LOCAL WEATHER INFORMATION

National Hurricane Center and local Weather Forecast Office work as a team



- Hurricane Local Statements (& TCV)
- Hurricane Threat and Impact Graphics
- Marine Weather Warnings
- Hazardous Weather Outlooks
- Area Forecast Discussion
- Decision Support Services Briefings

HURRICANE LOCAL STATEMENT

- **Purpose: provide concise overview of evolving hurricane threat for more effective response**
 - Executive weather summary of evolving weather situation
- **Primary focus:**
 - Hazard(s) of greatest concern
 - Areas where threat is greatest
 - Critical time frame
- **Revamped in 2015 to return to a more concise overview product (vs meteorologist rendition of *War and Peace*)**

HURRICANE LOCAL STATEMENT (HLS)

- No longer segmented
- Shorter and more manageable to produce and read
- **Overview section** will cover newest information and most critical impacts
- Covers all of Massachusetts except Berkshire County plus all of Rhode Island and most of northern Connecticut

HLS EXAMPLE

SUBTROPICAL STORM ANA LOCAL STATEMENT ADVISORY NUMBER 3
NATIONAL WEATHER SERVICE WILMINGTON NC AL012015
1148 AM EDT FRI MAY 8 2015

THIS PRODUCT COVERS SOUTHEAST NORTH CAROLINA AND NORTHEAST SOUTH CAROLINA

A TROPICAL STORM WARNING HAS BEEN ISSUED FOR THE COASTAL COUNTIES OF SOUTHEAST NORTH CAROLINA AND NORTHEAST SOUTH CAROLINA

NEW INFORMATION

* CHANGES TO WATCHES AND WARNINGS:

- A TROPICAL STORM WARNING HAS REPLACED THE TROPICAL STORM WATCH FOR INLAND PENDER...COASTAL PENDER...INLAND NEW HANOVER...COASTAL NEW HANOVER...INLAND BRUNSWICK...COASTAL BRUNSWICK...INLAND Horry...COASTAL Horry...INLAND GEORGETOWN AND COASTAL GEORGETOWN.

* CURRENT WATCHES AND WARNINGS:

- A TROPICAL STORM WARNING IS IN EFFECT FOR INLAND PENDER...COASTAL PENDER...INLAND NEW HANOVER...COASTAL NEW HANOVER...INLAND BRUNSWICK...COASTAL BRUNSWICK...INLAND Horry...COASTAL Horry...INLAND GEORGETOWN AND COASTAL GEORGETOWN.

* STORM INFORMATION:

- ABOUT 190 MILES SOUTH OF WILMINGTON NC OR ABOUT 180 MILES SOUTH-SOUTHEAST OF MYRTLE BEACH SC
- 31.5N 77.3W
- STORM INTENSITY 45 MPH
- MOVING SOUTHWESTWARD MINIMUM CENTRAL PRESSURE

SITUATION OVERVIEW

SUBTROPICAL STORM ANA CONTINUES TO DRIFT OFF THE SOUTHEAST COAST. THIS STORM WILL MOVE VERY SLOWLY OVER THE NEXT FEW DAYS AS IT APPROACHES THE COAST OF NORTHEAST SOUTH CAROLINA AND SOUTHEAST NORTH CAROLINA. THIS WILL CREATE AN EXTENDED PERIOD OF HEAVY RAINFALL...STRONG WINDS...AND STRONG RIP CURRENTS.

POTENTIAL IMPACTS

* WIND:

PROTECT AGAINST DANGEROUS WIND HAVING POSSIBLE SIGNIFICANT IMPACTS ACROSS THE COASTAL CAROLINAS. POTENTIAL IMPACTS IN THIS AREA

INCLUDE:

- DAMAGE TO PORCHES...AWNINGS...CARPORTS...SHEDS AND UNSECURED LIGHTWEIGHT OBJECTS BLOWN ABOUT.
- TREE LIMBS BROKEN OFF. SOME FENCES MAY BE BLOWN OVER.
- SCATTERED POWER AND COMMUNICATIONS OUTAGES.

* FLOODING RAIN:

PROTECT AGAINST LOCALLY HAZARDOUS RAINFALL FLOODING HAVING POSSIBLE LIMITED IMPACTS ACROSS THE FAR EASTERN PORTIONS OF SOUTHEAST NORTH CAROLINA AND NORTHEAST SOUTH CAROLINA.

POTENTIAL IMPACTS INCLUDE:

- LOCALIZED RAINFALL FLOODING MAY PROMPT A FEW EVACUATIONS.
- FLOOD WATERS CAN ENTER A FEW STRUCTURES... ESPECIALLY IN USUALLY VULNERABLE SPOTS. A FEW PLACES WHERE RAPID PONDING OF WATER OCCURS AT UNDERPASSES...LOW-LYING SPOTS...AND POOR DRAINAGE AREAS.

* OTHER COASTAL HAZARDS:

MINOR BEACH EROSION IS EXPECTED MAINLY ON EAST FACING BEACHES. STRONG RIP CURRENTS...LARGE BREAKING WAVES...AND STRONG LONGSHORE CURRENTS WILL CREATE DANGEROUS SURF CONDITIONS AT ALL LOCAL BEACHES.

PRECAUTIONARY/PREPAREDNESS ACTIONS

* OTHER PREPAREDNESS INFORMATION:

NOW IS THE TIME TO COMPLETE YOUR PREPARATIONS TO PROTECT LIFE AND PROPERTY IN ACCORDANCE WITH YOUR EMERGENCY PLAN.

OUTSIDE PREPARATIONS SHOULD BE WRAPPED UP BY THE END OF THE DAY BEFORE THE WEATHER CONDITIONS DETERIORATES.

KEEP CELL PHONES WELL CHARGED AND HANDY. ALSO...CELL PHONE CHARGERS FOR AUTOMOBILES CAN BE HELPFUL AFTER THE STORM. LOCATE YOUR CHARGERS AND KEEP THEM WITH YOUR CELL PHONE.

IF YOU ARE A VISITOR AND STILL IN THE AREA...LISTEN FOR THE NAME OF THE CITY OR TOWN IN WHICH YOU ARE STAYING WITHIN LOCAL NEWS UPDATES. BE SURE YOU KNOW THE NAME OF THE COUNTY IN WHICH IT RESIDES. PAY ATTENTION FOR INSTRUCTIONS FROM LOCAL AUTHORITIES.

CLOSELY MONITOR NOAA WEATHER RADIO OR OTHER LOCAL NEWS OUTLETS FOR OFFICIAL STORM INFORMATION. BE READY TO ADAPT TO POSSIBLE CHANGES TO THE FORECAST.

* ADDITIONAL SOURCES OF INFORMATION:

- FOR INFORMATION ON APPROPRIATE PREPARATIONS SEE READY.GOV
- FOR INFORMATION ON CREATING AN EMERGENCY PLAN SEE GETAGAMEPLAN.ORG
- FOR ADDITIONAL DISASTER PREPAREDNESS INFORMATION SEE REDCROSS.ORG

NEXT UPDATE

THE NEXT LOCAL STATEMENT WILL BE ISSUED BY THE NATIONAL WEATHER SERVICE IN WILMINGTON NC AROUND 6 PM EDT...OR SOONER IF CONDITIONS WARRANT.

Tropical Cyclone VTEC (TCV)

- **Segmented by forecast zone**
- **Lists watches, warnings, advisories for zone**
- **Lists highest impacts per forecast zone**
- **Primary objectives:**
 - Allow automated distribution of information via software (e.g. media maps highlighting warnings)
 - Provide focus on more specific areas (e.g. Cape Cod impacts)
- **Designed for automated display of headline and other info – not a rip and read product**
- **Web interface being developed centrally**

New TCV

- New product header (WFO identifier)
 - Includes advisory and NHC storm number
- Segment information; tropical VTEC
- Tropical headlines
- Locations in this segment (i.e. cities)
- Wind information including:
 - Latest wind forecast, **thresholds**
 - Windows for Tropical Storm & Hurricane force winds
 - Wind **threat for which plans/preparations** should be made.
 - Includes general threat trend
 - Statements are geared toward time to impact
 - **Potential impacts** to protect against

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WTUS82 KMFL 230915
TCVMFL

URGENT - IMMEDIATE BROADCAST REQUESTED
WILMA LOCAL WATCH/WARNING STATEMENT/ADVISORY NUMBER 32
NATIONAL WEATHER SERVICE MIAMI FL AL242005
515 AM EDT SUN OCT 23 2005

FLZ173-231545-
/O.NEW.KMFL.HU.W.1024.051023T0915Z-000000T0000Z/
/O.UPG.KMFL.HU.A.1024.000000T0000Z-000000T0000Z/
COASTAL MIAMI DADE COUNTY-
515 AM EDT SUN OCT 23 2005

...HURRICANE WARNING IN EFFECT...

* LOCATIONS AFFECTED
- MIAMI BEACH
- DOWNTOWN MIAMI

* WIND
- LATEST LOCAL FORECAST: EQUIVALENT TO STRONG TROPICAL STORM FORCE
WIND
- PEAK WIND FORECAST: 55-70 MPH WITH GUSTS TO 90 MPH
- WINDOW FOR TROPICAL STORM FORCE WINDS: EARLY MONDAY MORNING
THROUGH MONDAY AFTERNOON

- THREAT TO LIFE AND PROPERTY: HIGH
- THE WIND THREAT HAS REMAINED NEARLY STEADY FROM THE PREVIOUS
ASSESSMENT.
- EMERGENCY PLANNING SHOULD INCLUDE A REASONABLE THREAT FOR
HURRICANE FORCE WIND OF 74 TO 110 MPH OF EQUIVALENT CATEGORY 1
OR 2 INTENSITY.
- TO BE SAFE, AGGRESSIVELY PREPARE FOR THE POTENTIAL OF
EXTENSIVE WIND IMPACTS. LIFE THREATENING WIND POSSIBLE.
EFFORTS TO SECURE PROPERTIES SHOULD BE COMPLETED AS SOON AS
PRACTICAL.
- FAILURE TO ADEQUATELY SHELTER MAY RESULT IN SERIOUS INJURY OR
LOSS OF LIFE.

- POTENTIAL IMPACTS: EXTENSIVE
- CONSIDERABLE DAMAGE TO ROOFING AND SIDING MATERIALS OF STURDY
BUILDINGS, WITH SOME HAVING WINDOW, DOOR, AND GARAGE DOOR
FAILURES LEADING TO STRUCTURAL DAMAGE. MOBILE HOMES SEVERELY
DAMAGED, WITH SOME DESTROYED. HARDEST HIT LOCATIONS MAY BE
UNINHABITABLE FOR WEEKS.
- MANY LARGE TREES SNAPPED OR UPROOTED ALONG WITH FENCES AND
ROADWAY SIGNS BLOWN OVER. SOME ROADS IMPASSABLE FROM LARGE
DEBRIS, AND MORE WITHIN HEAVILY WOODED PLACES.
- SEVERAL BRIDGES, CAUSEWAYS, AND ACCESS ROUTES CONNECTING
BARRIER ISLANDS IMPASSIBLE.
- POWER OUTAGES ACROSS LARGE AREAS, WITH SEVERAL PLACES SUFFERING
EXTENDED OUTAGES.
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HURRICANE THREAT IMPACT GRAPHICS

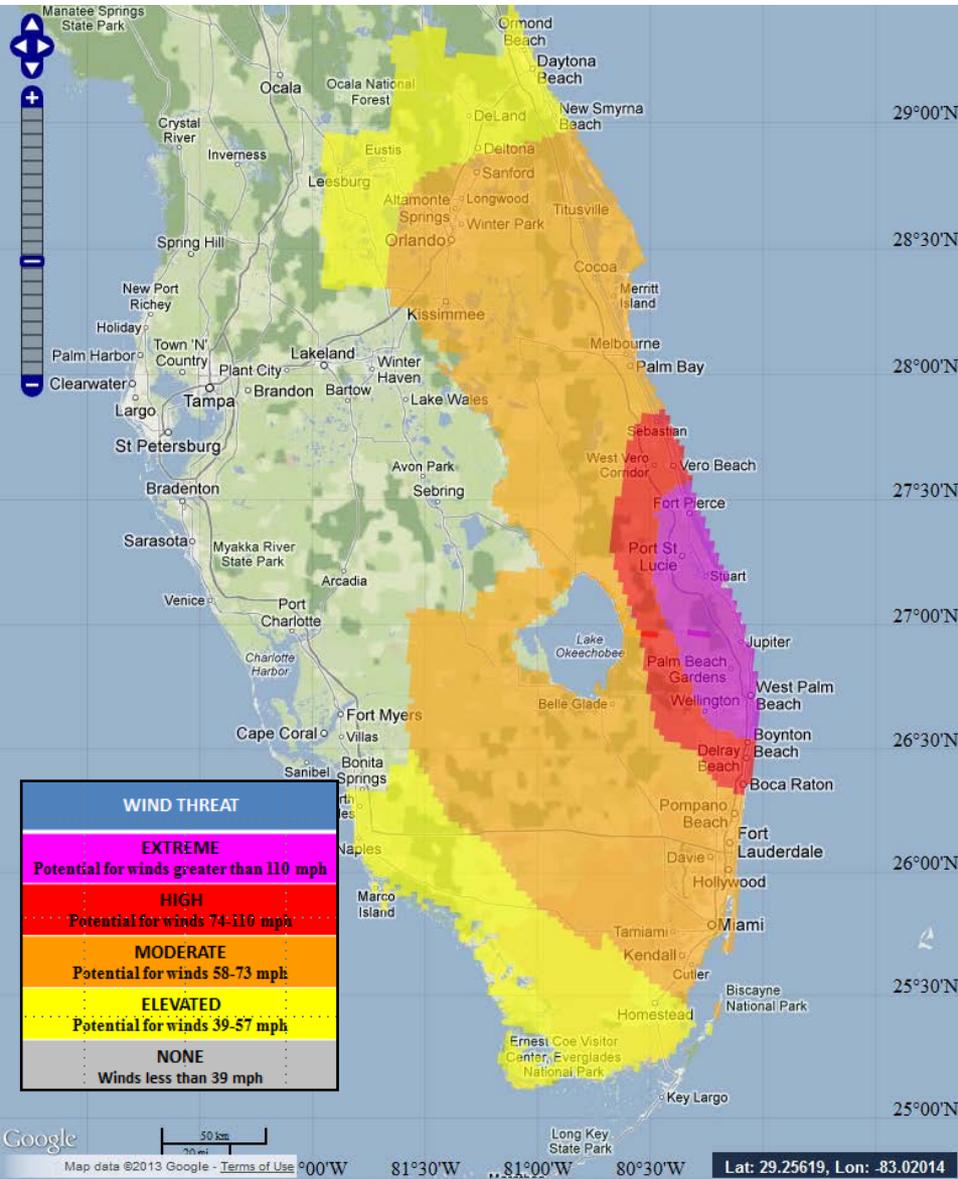
- Purpose: Communicate threat of each hurricane hazard
 - Factors in uncertainty
 - Easy to understand visual
- Helps to communicate reasonable or plausible worst case scenario for each threat (*not necessarily the most likely scenario*)
- What one needs to be ready for and respond to



Hurricane Threats & Impacts



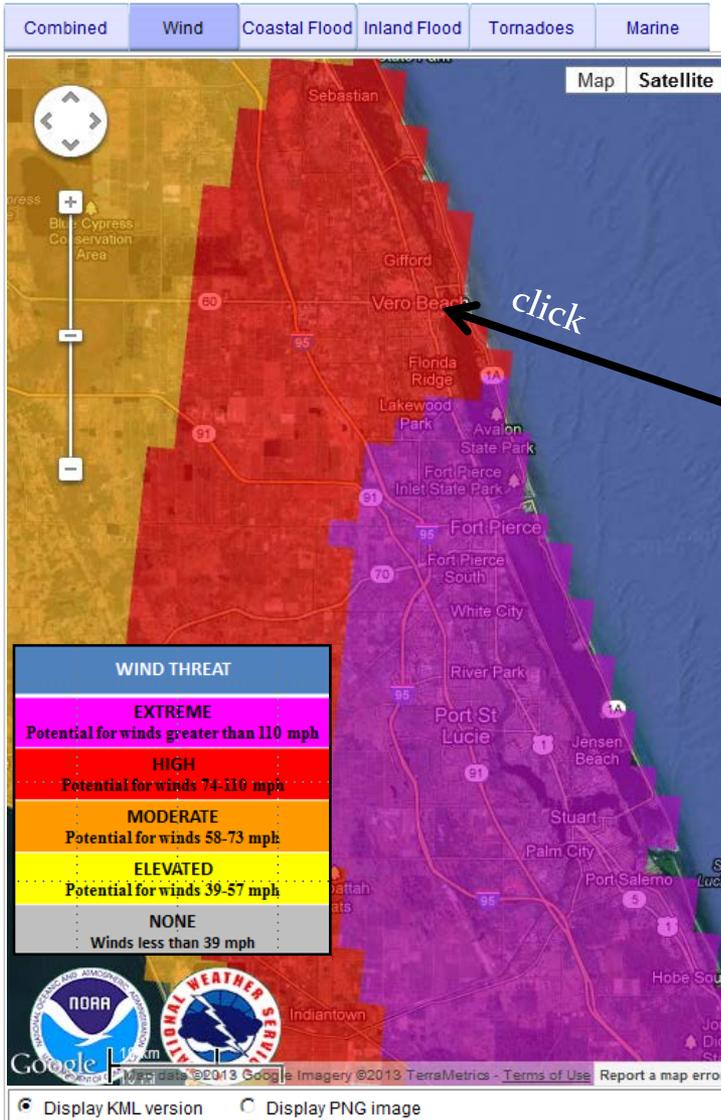
"A Picture is Worth a Thousand Words"



Wind Threat	Potential Wind Impacts
EXTREME Threat for wind greater than 110 mph	DEVASTATING TO CATASTROPHIC To be safe, aggressively prepare for the potential of devastating to catastrophic wind impacts from major hurricane force wind of equivalent Category 3 intensity or higher.
HIGH Threat for wind 74-110 mph	EXTENSIVE To be safe, aggressively prepare for the potential of extensive wind impacts from hurricane force wind of equivalent Category 1 or 2 intensity.
MODERATE Threat for wind 58-73 mph	SIGNIFICANT To be safe, earnestly prepare for the potential of significant wind impacts from strong tropical storm force wind.
ELEVATED Threat for wind 39-57 mph	LIMITED To be safe, prepare for the potential of limited wind impacts from tropical storm force wind.
LITTLE TO NONE Wind less than 39 mph	LITTLE TO NONE No immediate preparations needed; little to no wind impacts.



Hurricane Omega



Prepare for These Potential Impacts:

Wind Threat	Potential Wind Impacts (generalized)
HIGH THREAT for wind 74-110 mph	EXTENSIVE IMPACTS <ul style="list-style-type: none"> To be safe, aggressively prepare for the potential of extensive wind impacts from hurricane force wind of equivalent Category 1 or 2 intensity. Life threatening wind possible. Failure to adequately shelter may result in serious injury or loss of life. Considerable damage to roofing and siding materials of sturdy buildings, with some having window, door, and garage door failures leading to structural damage. Mobile homes severely damaged, with some destroyed. Damage accentuated by airborne projectiles. Hardest hit locations may be uninhabitable for weeks. Many large trees snapped or uprooted along with fences and roadway signs blown over. Some roads impassable from large debris, and more within urban or heavily wooded places. Several bridges, causeways, and access routes connecting barrier islands impassible. Power and communications outages across large areas, with several places suffering extended outages.

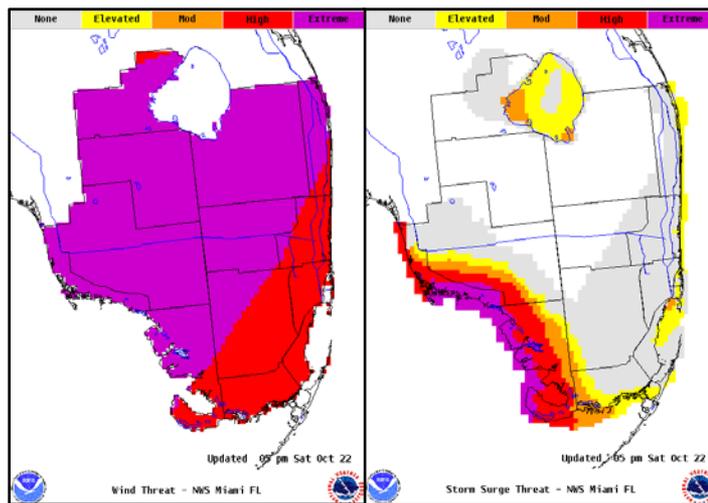
Also good for local hurricane briefings ... with added detail.



HTI - All Hazards

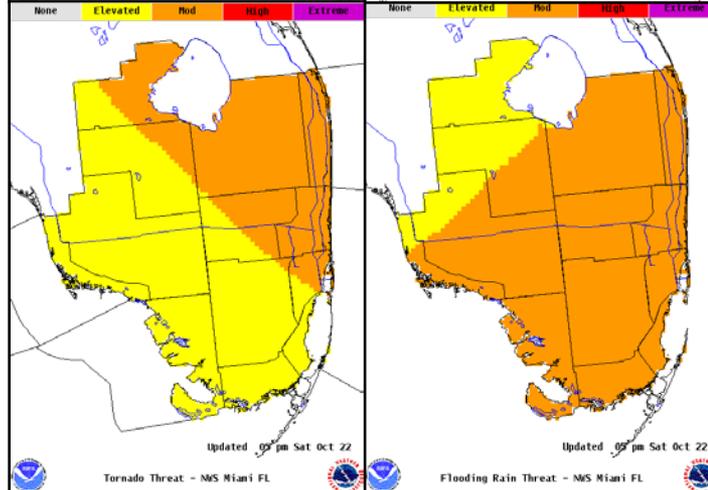
Wind

EXTREME THREAT for wind greater than 110 mph
HIGH THREAT for wind 74-110 mph
MODERATE THREAT for wind 58-73 mph
ELEVATED THREAT for wind 39-57 mph
LITTLE TO NO THREAT wind less than 39 mph



Storm Surge

EXTREME THREAT for surge flooding greater than 9 feet above ground
HIGH THREAT for surge flooding 6-9 feet above ground
MODERATE THREAT for surge flooding 3-6 feet above ground
ELEVATED THREAT for surge flooding 1-3 feet above ground
LITTLE TO NO THREAT little to no surge flooding



EXTREME THREAT for an outbreak of tornadoes
HIGH THREAT for numerous tornadoes
MODERATE THREAT for scattered tornadoes
ELEVATED THREAT for isolated tornadoes
LITTLE TO NO THREAT tornadoes not anticipated

EXTREME THREAT for extreme rainfall flooding
HIGH THREAT for major rainfall flooding
MODERATE THREAT for moderate rainfall flooding
ELEVATED THREAT for minor rainfall flooding
LITTLE TO NO THREAT little to no rainfall flooding

Tornadoes

Flooding Rain

THREE COASTAL FLOOD PRODUCTS

Aimed to complement each other

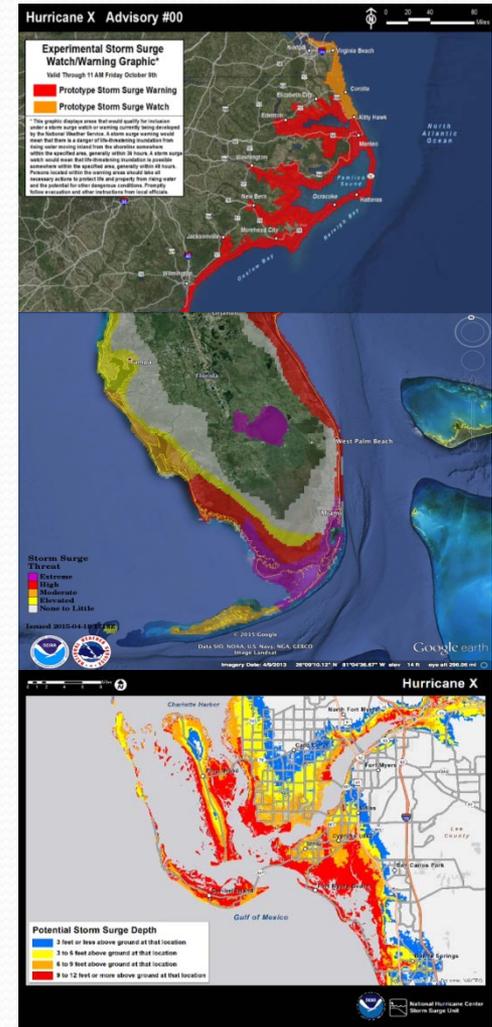
- NHC Experimental Storm Surge Watch/Warning Graphic - possibility/danger of life threatening inundation (> 3 feet) somewhere within the area within 48/36 hours.

- WFO Generated Storm Surge Threat

- Complements two NHC products above
- Threat and impact statements. Locally tailored. What to prepare for.
- Criteria/consideration for continuity as warning graphic
- Moderate or higher threat levels line up closely to watch/warning levels.

- NHC Inundation Graphic (Experimental)

- Based on 10% exceedance values. Location specific potential inundation (plausible worst case scenario).
- Can be used to assist with evacuation decision-making



MARINE HAZARDS

- Tropical Cyclone marine watches/warnings will appear in the Marine Weather Warning (MWW) Product
- The MWW is the one source for all marine watches/warnings/advisories whether tropical or extratropical
- HLS a land-based product
 - no marine warnings



HAZARDOUS WEATHER OUTLOOK (HWO)

- Issued every early morning
- Potential hazardous weather out to 7 days
- May be your first clue of a local concern!
- Threat evolution
 - May not appear too ominous at first (especially if time period is greater than 5 days)
 - But let that be your signal for higher situational awareness
 - Monitor evolution of threat with time (e.g. increasing or decreasing threat)
- Check HWO daily to maintain situational awareness



Local forecast by "City, St" or ZIP code

[Location Help](#)

News Headlines

- [Click here for the latest winter weather information throughout the 2014-2015 winter season](#)

NWS Weather Forecast Office - Boston / Taunton, MA

Boston, MA
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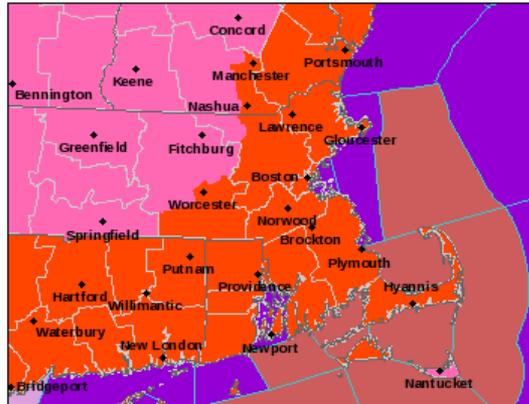
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Click on the map below to zoom in.



Last Map Update: Mon, Jan. 26, 2015 at 5:56:08 pm EST

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[Coastal Flood Warning](#)



[Gale Warning](#)



[Coastal Flood Advisory](#)



[Hazardous Weather Outlook](#)



AREA FORECAST DISCUSSION (AFD)

- **Explains the rationale behind the warning and forecast decisions (i.e., the “why” of the forecast)**
- **Favorite product for many broadcast meteorologists**
- **Confidence level and degree of uncertainty**
- **May indicate alternative scenarios possible**
- **A way to get inside our heads**

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NWS Weather Forecast Office - Boston / Taunton, MA

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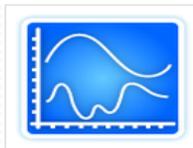
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BRIEFINGS

- **For emergency managers and other key decision makers**
- **PowerPoint slides and conference calls**
- **Will typically start 4 to 5 days ahead of hurricane**
- **Southern New England conference calls 1 to 3 times per day**
- **Available to participate on state calls (MA, RI, and/or CT as needed)**
- **One person dedicated to Decision Support Services**

GOING BACK TO NHC PRODUCTS...

- **Need to work together on local preparedness to ensure desired response by population**
 - **Meteorologists**
 - **Emergency Managers**
 - **Other local officials**
 - **Media**
- **In lay person terminology need to communicate risk**
 - **Storm Surge Warning and inundation maps delineate where risk is too high to leave to chance**

A Preparedness Challenge

- No Category 3 hurricanes have made landfall in southern New England since 1954
 - **And no hurricane at all since 1991**
- Buildup in coastal population and infrastructure presents a high risk for life and property
- Most New Englanders have not experienced a worst case scenario and many no hurricane at all!
 - **Inexperienced population!**

History can be a Guide to Our Future!

Wind



1938 Hurricane damage in Keene, NH



Gusts to 60 mph during Bob

**1938 Hurricane took down over a billion trees in New England
- 91 million in just Windham County in northeast Connecticut**

History can be a Guide to Our Future!

Flooding Rain



1938 Hurricane – Flooding in Winchendon



Tropical Storm Diane in 1955
Flash Flooding on route 44 in Putnam, CT



Tropical Storm Irene – Flash Flooding along the
Deerfield River (and Conway Street) in Buckland

Photo: J. Brown

History can be a Guide to Our Future!

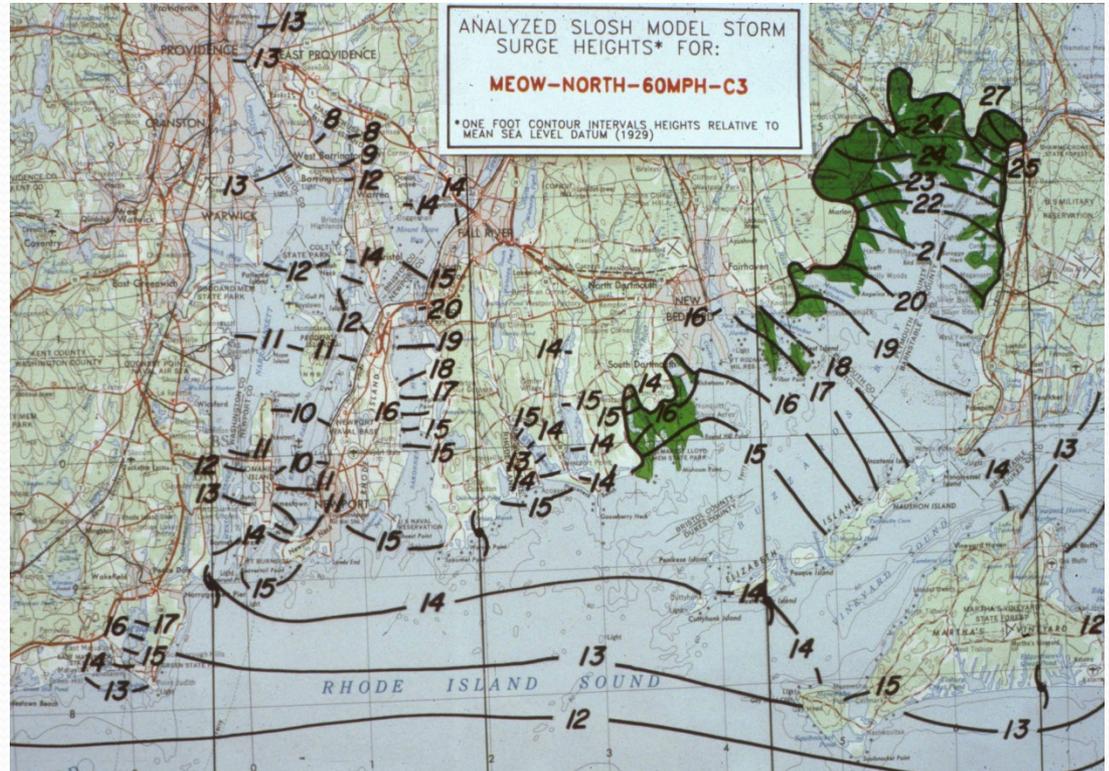
Flooding from Storm Surge



1938 Hurricane – 13 foot surge



Hurricane Bob (1991) – 6 foot surge



Near worst case for Narragansett
and Buzzards Bays

Sandy in 2012 – Close Call for MA



Misquamicut Beach – Westerly, RI (2 days after Sandy)



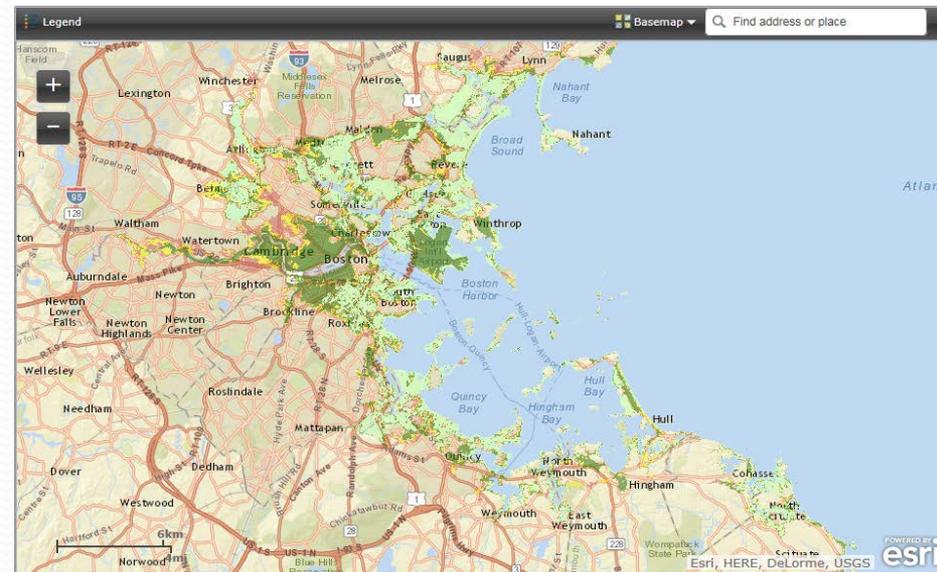
Had Sandy been another 150-200 miles further north?



Scituate - 1991

Hurricane Inundation Zones

Category 1 Category 2 Category 3 Category 4



Inundation from NW or WNW Moving Hurricane

RESPONDING TO THE NEXT ONE

- Inevitable that we will have another 1635, 1815 or 1938 scale hurricane
- Since 1938:
 - Science, computer and communications technology, and visualization aids
 - Aggressive NWS Decision Support Services
 - Proactive emergency management
- But also:
 - **Inexperienced population**
 - **Buildup along coast**
 - **Vulnerability of communications, energy, and transportation infrastructure**





Preparedness!

“Natural calamity strikes at just about the time that one forgets its terror.”

-- Japanese Proverb

Hurricane Edition **THE SUN** Local and Shore News
 Vol. 48, No. 39 WESTERLY, R. I., FRIDAY SEPTEMBER 23, 1938 Price Three Cents

Misquamicut Wiped Out; Napatree Point Gone; 50 Dead; Scores Missing

Westerly Paralyzed by Tropical Hurricane; Cottages at Charlestown Beach and Quonochontaug Washed Away; 4 Dead, 4 Missing In Stonington

Misquamicut with 500 cottages, was entirely wiped out, all cottages on Napatree point, which were destroyed and more than 50 people killed and millions of dollars of property damage resulted from a tidal wave and hurricane which struck Westerly late Wednesday afternoon.

Charlestown Beach and Quonochontaug beaches were destroyed. Westerly and the Rhode Island shore received the brunt of the force as New England, more deaths being reported in this locality than any other.

Records show that just 120 years ago to the day, depression -- a hurricane struck Westerly.

Forewarned Overflows
 The ocean backed up the Paw-

List of Dead and Missing

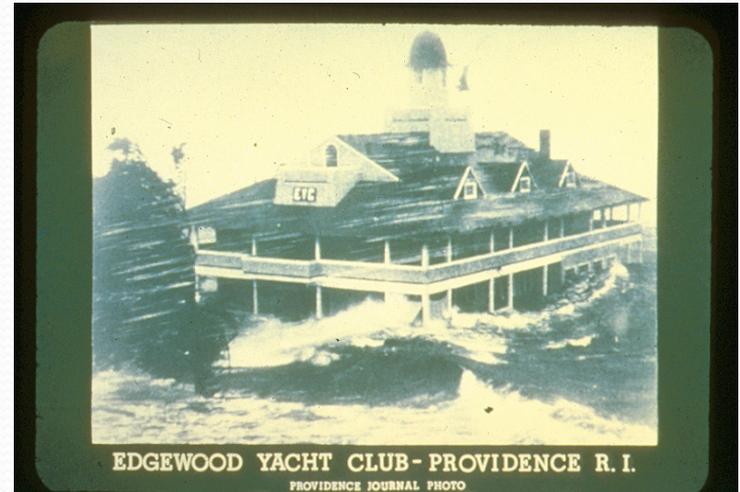
<p>Bodies Recovered</p> <p>Mrs. Henry Bennett, New York City Mrs. Ella Silver Mrs. Ralph Silver, Misquamicut Mrs. Charles Bradley Mrs. Susan Burton Mrs. J. N. Brown Mrs. George F. Clark, Quonochontaug Miss Harriet Clark, Charlestown Miss Ann Clark, Charlestown Miss Florence Clark, Charlestown Miss Philip Clemens Mrs. Lloyd M. Cook George Cross, Charlestown Mrs. George Davidson Mrs. Dorothy Mrs. Zoe Fletcher Father Fitzgerald Mr. James Gould</p>	<p> Mrs. Kingsbury Mrs. Harriette Evelyn Silver Mr. Bussey Edith Crocker Travis Powers Mrs. John Davidson Anne Busch Mrs. Anne Barrett H. L. Langford Mrs. Mabel and two children Mrs. William Silver Charles and two children Mrs. F. Hooper Anne S. Herron Catherine Cutler Theda O'Toole Francis O'Toole Edith Avery</p>
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Every one of the approximately 300 houses on Charlestown Beach was carried away.

Between 75 and 100 houses on the Charlestown Pond area including Charlestown-by-the-Sea were demolished. The few houses left in that area have been saved from a sea less to a quarter of a mile away. A few houses on hill pastures are not so badly damaged. Many people who were staying in that section just barely escaped.

Mrs. David Larkman and daughter who were on the beach started across the Pond on a door. Mrs. Larkman washed away, but Miss Larkman was saved, although she is in a poor condition.

Mrs. Joe and Nancy were in their car, leaving the beach, and stopped to assist the Troopmaster, Nancy who were in trouble. The wave



© 1938
 Copyrighted Photo by Linfield A. Baker, Ed., Marine Biological Laboratory, Woods Hole
 WOODS HOLE
 U. S. Fishery Building during the Hurricane



NOAA-15 HRPT RGB-CH1,CH2,CH4 09/18/2003 11:53 UTC (7:53 AM EDT)

Nature's Awesome Power!

Thank You

Atlantic Ocean

HURRICANE ISABEL

Hurricane Isabel - September 2003

New England/Massachusetts? - It's just a matter of time