



Weather-Ready Nation

National Oceanic and Atmospheric Administration



Town Hall Meeting





Town Hall Meeting



- Drones in NWS Damage Surveys
- Impact-Based Tornado/T'Storm Warnings
- Days 4-7 Winter Storm Threat Graphic
- Blizzard of 2016
- Range of Possibilities – Snow Forecast
- New Tools for Hurricane Season
- February 24th Tornado outbreak
- Conference Calls / Briefings



Town Hall Meeting



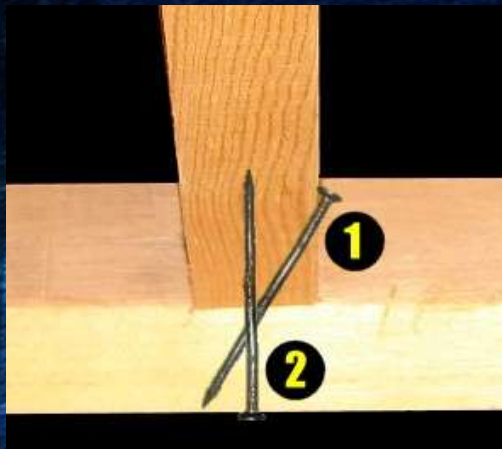
- What are your thoughts?
- What has worked well?
- What can we do better?



Using UAS Technology to Obtain Aerial Storm Damage Imagery

Mike Sporer
NWS Blacksburg

NWS Storm Damage Surveys



Observed damage indicators are analyzed to determine a likely cause and intensity



DOD	Damage description	EXP	LB	UB
1	Threshold of visible damage	65	53	80
2	Loss of roof covering material (<20%), gutters and/or awning; loss of vinyl or metal siding	79	63	97
3	Broken glass in doors and windows	96	79	114
4	Uplift of roof deck and loss of significant roof covering (>20%); collapse of chimney; garage doors collapse inward; failure of porch or carport	97	81	116
5	Entire house shifts off foundation	121	103	141
6	Large sections of roof structure removed; most walls remain standing	122	104	142
7	Exterior walls collapsed	132	113	153
8	Most walls collapsed, except small interior rooms	152	127	178
9	All walls	170	142	198
10	Destruction of engineered and/or well constructed residence; slab swept clean	200	165	220

Sometimes the best way to view damage is from the air

What appears to be minor tree damage from the ground...

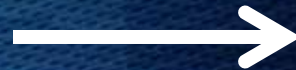


Can be part of a more significant damage path
when viewed from above



Track of EF1 tornado, Botetourt county Virginia
April 27, 2011

Traditionally aerial support has come from local emergency services or agencies such as the Civil Air Patrol



Today, UAS (Unmanned Aerial System, aka “Drones”) technology makes it possible to rapidly collect and share aerial imagery on a small scale!

Why Drones?

- Efficient
- Flexible
- Focus on small areas
- High-res imagery
- Digital datasets: 3D mapping / NDVI
- Access to damage inaccessible by ground
- Not restricted by roadways
- Quicker than walking

Drone pilots who operate professionally must have:

- Section 333 exemption from FAA
- Ensures training & protocol for ops near first responders

On Wednesday February 24th, 2016, an EF-3 tornado produced extensive damage in Virginia as it moved across Appomattox county, with the Evergreen area being particularly hard hit.

NWS Blacksburg conducted damage surveys along the path of the tornado and for the first time used aerial imagery from a drone.



The tornado track was not always well defined from the ground



However, the tornado track was clearly visible from the air



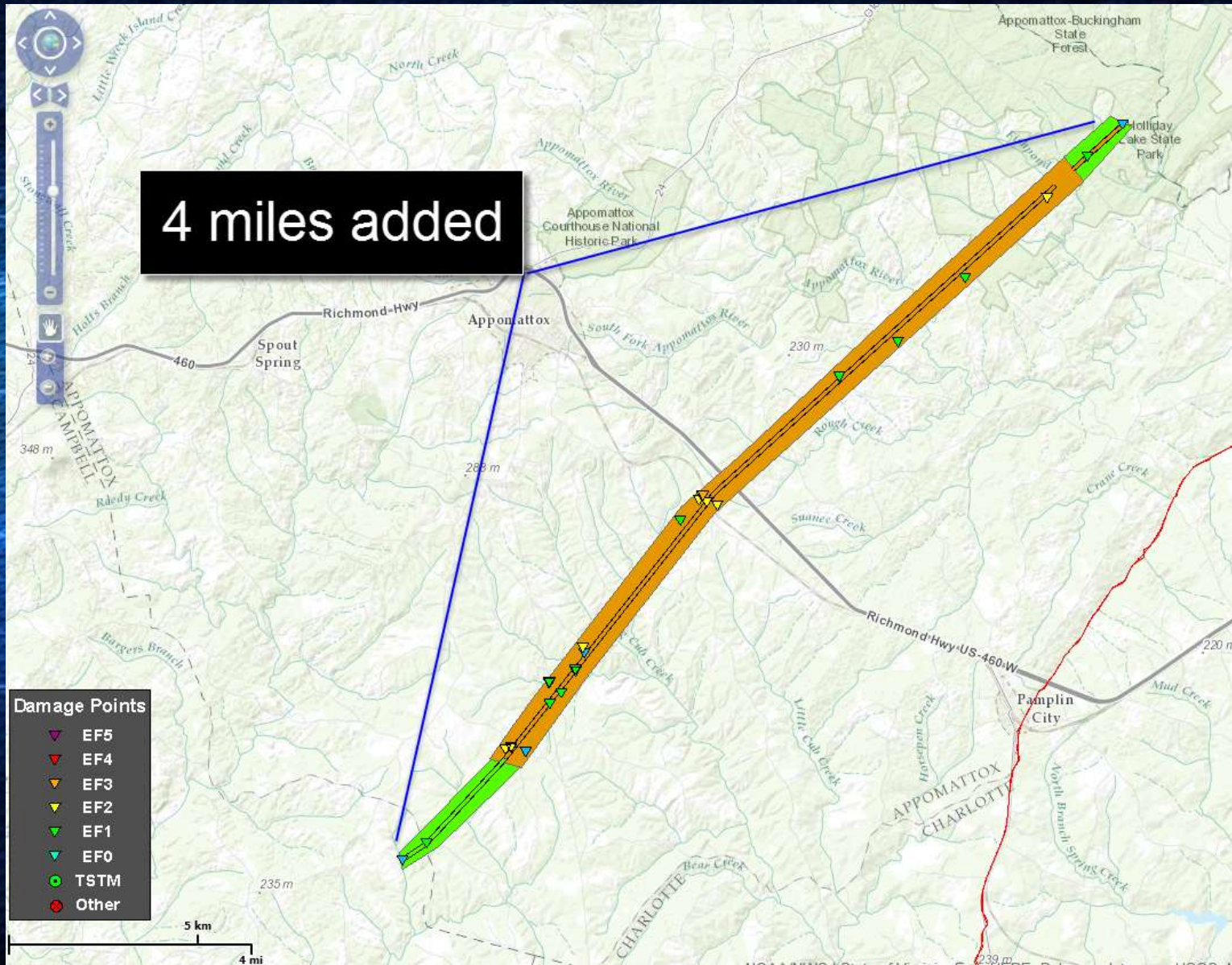
The drone was able to see deep into areas of tangled debris not safely accessible from the ground



Convergent patterns of damage indicative of a tornado were easier to see from the air



Drone imagery helped to better define the track length, adding 4 miles to the initial ground based estimate



The Road Ahead

- Local NWS use of drones will continue
- Regional/National NWS use of drones is currently under review
- Use of drones likely to become more widespread
- Full coordination is *critical* to avoid conflicts
- All use of drones dependent on future FAA regulations



Town Hall Meeting



- What are your thoughts?
- What has worked well?
- What can we do better?

Impact Based Warnings

Successfully Tested

- Central U.S. (including western VA)

National Implementation - April 13th

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719
WFUS53 KDMX 122125
TORDMX
IAC017-023-122200-
/O.NEW.KDMX.TO.W.0014.130612T2125Z-130612T2200Z/

BULLETIN - EAS ACTIVATION REQUESTED
TORNADO WARNING
NATIONAL WEATHER SERVICE DES MOINES IA
425 PM CDT WED JUN 12 2013

THE NATIONAL WEATHER SERVICE IN DES MOINES HAS ISSUED A

* TORNADO WARNING FOR...
SOUTHWESTERN BREMER COUNTY IN NORTHEAST IOWA...
CENTRAL BUTLER COUNTY IN NORTH CENTRAL IOWA...

* UNTIL 500 PM CDT

* AT 422 PM CDT...A SEVERE THUNDERSTORM CAPABLE OF PRODUCING A
TORNADO WAS LOCATED NEAR ALLISON...AND MOVING EAST AT 20 MPH.

HAZARD...TORNADO AND QUARTER SIZE HAIL.

SOURCE...RADAR INDICATED ROTATION.

IMPACT...FLYING DEBRIS WILL BE DANGEROUS TO THOSE CAUGHT
WITHOUT SHELTER. MOBILE HOMES WILL BE DAMAGED OR
DESTROYED. DAMAGE TO ROOFS...WINDOWS AND VEHICLES
WILL OCCUR. TREE DAMAGE IS LIKELY.

* LOCATIONS IMPACTED INCLUDE...
CLARKSVILLE...SHELL ROCK...WAVERLY AND PLAINFIELD.

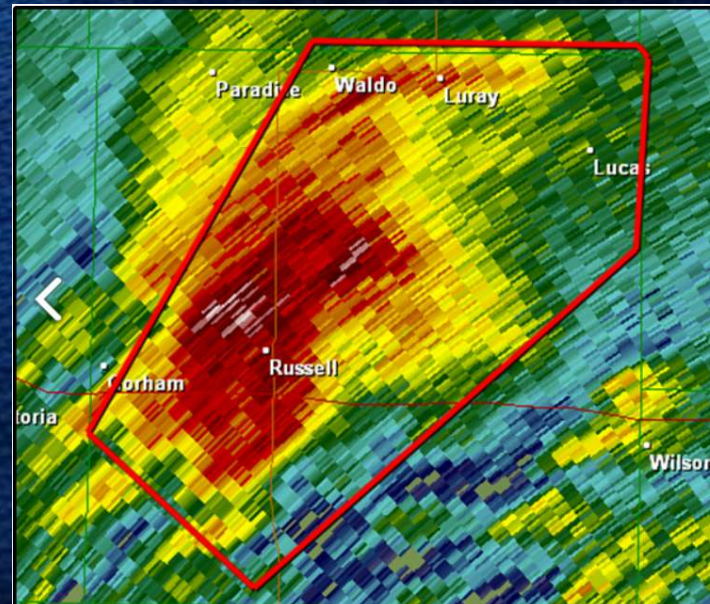
PRECAUTIONARY/PREPAREDNESS ACTIONS...

TAKE COVER NOW. MOVE TO AN INTERIOR ROOM ON THE LOWEST FLOOR OF
A STURDY BUILDING. AVOID WINDOWS. IF IN A MOBILE HOME...A VEHICLE
OR OUTDOORS...MOVE TO THE CLOSEST SUBSTANTIAL SHELTER AND PROTECT
YOURSELF FROM FLYING DEBRIS.

&&

LAT...LON 4284 9240 4264 9250 4265 9255 4275 9288
4289 9282
TIME...MOT...LOC 2125Z 280DEG 17KT 4279 9278

TORNADO...RADAR INDICATED
HAIL...1.00IN
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THE NATIONAL WEATHER SERVICE IN BLACKSBURG HAS ISSUED A

* SEVERE THUNDERSTORM WARNING FOR...
PATRICK COUNTY IN SOUTHWESTERN VIRGINIA...
SOUTHERN FLOYD COUNTY IN SOUTHWESTERN VIRGINIA...
EASTERN CARROLL COUNTY IN SOUTHWESTERN VIRGINIA...

* UNTIL 130 PM EST

* AT 1236 PM EST...A SEVERE THUNDERSTORM WAS LOCATED OVER PINE
RIDGE...MOVING NORTHEAST AT 35 MPH.

HAZARD...60 MPH WIND GUSTS AND QUARTER SIZE HAIL.

SOURCE...RADAR INDICATED.

IMPACT...HAIL DAMAGE TO VEHICLES IS EXPECTED. EXPECT WIND DAMAGE
TO ROOFS...SIDING...AND TREES.

* LOCATIONS IMPACTED INCLUDE...

HILLSVILLE...
FLOYD...
WOOLWINE...
CANA...
AND ARARAT.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

PREPARE IMMEDIATELY FOR LARGE HAIL AND DAMAGING WINDS. FOR YOUR
SAFETY...MOVE TO AN INTERIOR ROOM ON THE LOWEST FLOOR OF A STURDY
BUILDING. STAY AWAY FROM WINDOWS.

WHEN IT IS SAFE TO DO SO...PLEASE SEND YOUR REPORTS OF HAIL OF ANY
SIZE...AS WELL AS ANY REPORTS OF WIND DAMAGE...INCLUDING DOWNED TREES
OR LARGE LIMBS...TO THE NATIONAL WEATHER SERVICE BY CALLING TOLL FREE
AT 1...8 6 6...2 1 5...4 3 2 4. REPORTS AND PICTURES CAN ALSO BE
SHARED ON THE NATIONAL WEATHER SERVICE BLACKSBURG FACEBOOK PAGE AND
ON TWITTER.

66

A TORNADO WATCH REMAINS IN EFFECT UNTIL 700 PM EST FOR NORTH CENTRAL
NORTH CAROLINA.

LAT...LON 3656 8084 3693 8065 3694 8063 3695 8058
3689 8021 3687 8023 3685 8008 3655 8038
TIME...MOT...LOC 1736Z 221DEG 31KT 3652 8053

TORNADO...POSSIBLE
HAIL...1.00IN
WIND...60MPH

Companion Tornado Tag

TORNADO...RADAR INDICATED

Evidence on radar and near storm environment is supportive, but no confirmation.

TORNADO...OBSERVED

Tornado is confirmed by spotters, law enforcement, etc.

Tornado Damage Threat Tag

No Tag

Use most of the time, when tornado damage possible within the warning polygon. Tornado duration generally expected to be short-lived.

TORNADO DAMAGE
THREAT...CONSIDERABLE

Use rarely, when there is radar or other observational evidence that a tornado, capable of producing considerable damage of EF2 or greater is imminent or ongoing. Tornado duration generally expected to be long lived

TORNADO DAMAGE
THREAT...CATASTROPHIC

Use exceedingly rarely. Only when there is DIRECT observational evidence that a violent tornado (EF4-5) is striking or about to strike a population footprint. Tornado duration generally expected to be long lived. False alarm rate should be ZERO.

Tornado Tag In Severe Thunderstorm Warnings

TORNADO...POSSIBLE

A severe thunderstorm has some potential for producing a brief tornado although forecaster confidence is not high enough to issue a Tornado Warning.

Impact Based Warning Examples

Tornado – Radar Indicated or Observed

719
WFUS53 KDMX 122125
TORDMX
IAC017-023-122200-
/O.NEW.KDMX.TO.W.0014.130612T2125Z-130612T2200Z/

BULLETIN - EAS ACTIVATION REQUESTED
TORNADO WARNING
NATIONAL WEATHER SERVICE DES MOINES IA
425 PM CDT WED JUN 12 2013

THE NATIONAL WEATHER SERVICE IN DES MOINES HAS ISSUED A

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SOUTHWESTERN BREMER COUNTY IN NORTHEAST IOWA...
CENTRAL BUTLER COUNTY IN NORTH CENTRAL IOWA...
- * UNTIL 500 PM CDT
- * AT 422 PM CDT...A SEVERE THUNDERSTORM CAPABLE OF PRODUCING A
TORNADO WAS LOCATED NEAR ALLISON...AND MOVING EAST AT 20 MPH.

HAZARD...TORNADO AND QUARTER SIZE HAIL.

SOURCE...RADAR INDICATED ROTATION.

IMPACT...FLYING DEBRIS WILL BE DANGEROUS TO THOSE CAUGHT
WITHOUT SHELTER. MOBILE HOMES WILL BE DAMAGED OR
DESTROYED. DAMAGE TO ROOFS...WINDOWS AND VEHICLES
WILL OCCUR. TREE DAMAGE IS LIKELY.

- * LOCATIONS IMPACTED INCLUDE...
CLARKSVILLE...SHELL ROCK...WAVERLY AND PLAINFIELD.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

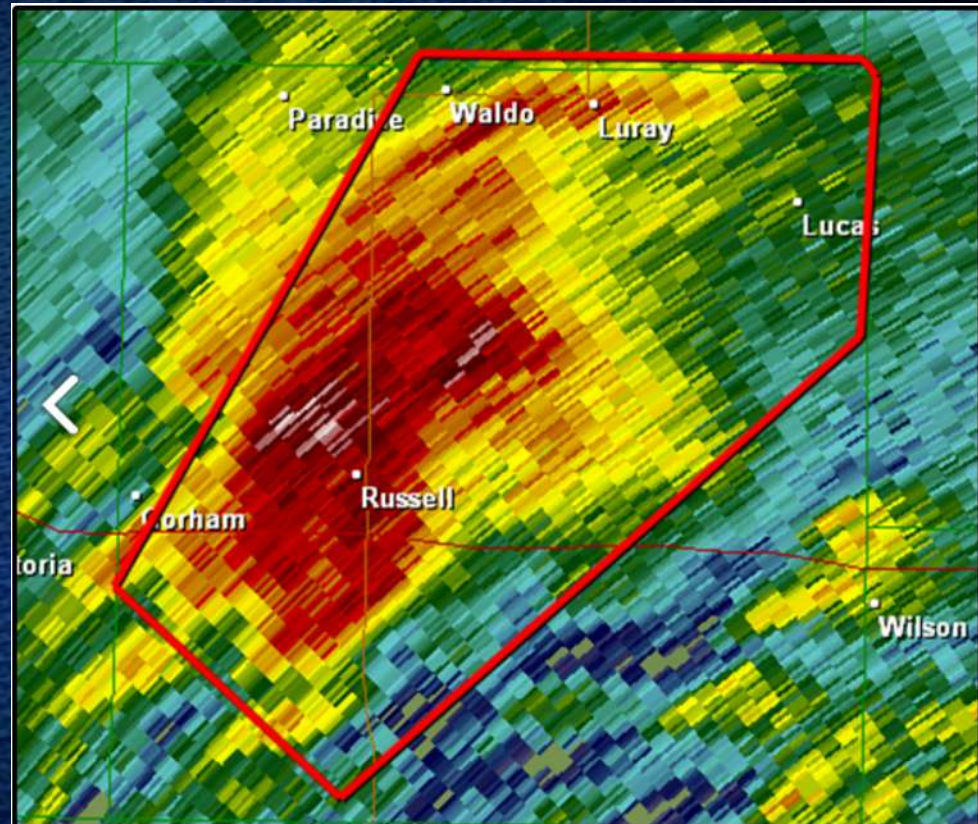
TAKE COVER NOW. MOVE TO AN INTERIOR ROOM ON THE LOWEST FLOOR OF
A STURDY BUILDING. AVOID WINDOWS. IF IN A MOBILE HOME...A VEHICLE
OR OUTDOORS...MOVE TO THE CLOSEST SUBSTANTIAL SHELTER AND PROTECT
YOURSELF FROM FLYING DEBRIS.

&&

LAT...LON 4284 9240 4264 9250 4265 9255 4275 9288
4289 9282
TIME...MOT...LOC 2125Z 280DEG 17KT 4279 9278

TORNADO...RADAR INDICATED
HAIL...1.00IN

SS



Impact Based Warning Examples

Tornado – Tag: Considerable

602
WFUS53 KDLH 292357
TORDLH
MNC001-021-300030-
/O.NEW.KDLH.TO.W.0011.130829T2357Z-130830T0030Z/

BULLETIN - EAS ACTIVATION REQUESTED
TORNADO WARNING
NATIONAL WEATHER SERVICE DULUTH MN
657 PM CDT THU AUG 29 2013

THE NATIONAL WEATHER SERVICE IN DULUTH MN HAS ISSUED A

- * TORNADO WARNING FOR...
NORTHWESTERN AITKIN COUNTY IN EAST CENTRAL MINNESOTA...
EXTREME EAST CENTRAL CASS COUNTY IN NORTH CENTRAL MINNESOTA...
- * UNTIL 730 PM CDT
- * AT 656 PM CDT...A CONFIRMED LARGE AND EXTREMELY DANGEROUS
TORNADO WAS LOCATED 4 MILES WEST OF HILL CITY...NEAR HIGHWAY
200...AND MOVING SOUTHEAST AT 25 MPH.

THIS IS A PARTICULARLY DANGEROUS SITUATION.

HAZARD...DAMAGING TORNADO.

SOURCE...CONFIRMED TORNADO FROM TRAINED SPOTTERS.

IMPACT...YOU ARE IN A LIFE THREATENING SITUATION. FLYING
DEBRIS MAY BE DEADLY TO THOSE CAUGHT WITHOUT SHELTER.
MOBILE HOMES WILL BE DESTROYED. CONSIDERABLE DAMAGE
TO HOMES...BUSINESSES AND VEHICLES IS LIKELY AND
COMPLETE DESTRUCTION IS POSSIBLE.

- * LOCATIONS IMPACTED INCLUDE...
HILL CITY...SWATARA...HAYPOINT AND BAIN.
HIGHWAY 200 WEST OF HILL CITY.
HIGHWAY 169 SOUTH OF HILL CITY.
QUADNA MOUNTAIN RESORT AREA.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

TO REPEAT...A LARGE...EXTREMELY DANGEROUS AND POTENTIALLY DEADLY
TORNADO IS ON THE GROUND. TO PROTECT YOUR LIFE...TAKE COVER NOW.
MOVE TO AN INTERIOR ROOM ON THE LOWEST FLOOR OF A STURDY BUILDING.
AVOID WINDOWS. IF IN A MOBILE HOME...A VEHICLE OR OUTDOORS...MOVE
TO THE CLOSEST SUBSTANTIAL SHELTER AND PROTECT YOURSELF FROM FLYING
DEBRIS.

THIS STORM HAS A HISTORY OF PRODUCING TORNADOES. TAKE COVER IN A
BASEMENT OR STORM SHELTER NOW!

&&

LAT...LON 4703 9377 4703 9359 4694 9335 4684 9342
4677 9361 4696 9386
TIME...MOT...LOC 2356Z 310DEG 22KT 4698 9370

TORNADO...OBSERVED
TORNADO DAMAGE THREAT...CONSIDERABLE
HAIL...1.75IN

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Impact Based Warning Examples

Tornado – Tag: Catastrophic

903
WFUS53 KFSD 050022
TORFSD
IAC035-050100-
/O.NEW.KFSD.TO.W.0020.131005T0022Z-131005T0100Z/

BULLETIN - EAS ACTIVATION REQUESTED
TORNADO WARNING
NATIONAL WEATHER SERVICE SIOUX FALLS SD
722 PM CDT FRI OCT 4 2013

...TORNADO EMERGENCY FOR WASHTA...

THE NATIONAL WEATHER SERVICE IN SIOUX FALLS HAS ISSUED A

* TORNADO WARNING FOR...
CHEROKEE COUNTY IN NORTHWEST IOWA...

* UNTIL 800 PM CDT

* AT 720 PM CDT...A SEVERE THUNDERSTORM CAPABLE OF PRODUCING A
LARGE AND EXTREMELY DANGEROUS TORNADO WAS LOCATED NEAR
WASHTA...AND MOVING NORTHEAST AT 30 MPH.

THIS IS A TORNADO EMERGENCY FOR WASHTA. TAKE COVER NOW. THIS
IS A PARTICULARLY DANGEROUS SITUATION.

THIS IS A PARTICULARLY DANGEROUS SITUATION.

HAZARD...DAMAGING TORNADO.

SOURCE...EMERGENCY MANAGEMENT CONFIRMED TORNADO.

IMPACT...YOU ARE IN A LIFE THREATENING SITUATION. FLYING
DEBRIS MAY BE DEADLY TO THOSE CAUGHT WITHOUT SHELTER.
MOBILE HOMES WILL BE DESTROYED. CONSIDERABLE DAMAGE
TO HOMES...BUSINESSES AND VEHICLES IS LIKELY AND
COMPLETE DESTRUCTION IS POSSIBLE.

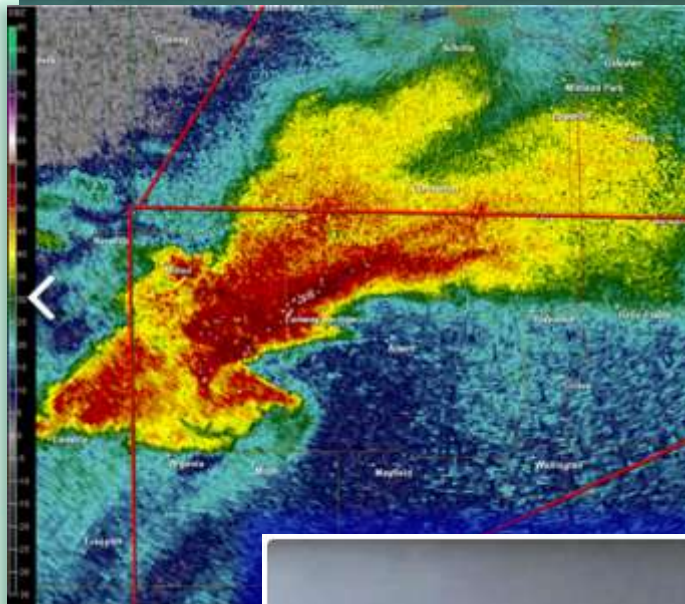
* THE TORNADO WILL BE NEAR...
QUIMBY AROUND 730 PM CDT.
CHEROKEE AROUND 745 PM CDT.
AURELIA AROUND 750 PM CDT.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

HEAVY RAINFALL MAY HIDE THIS TORNADO. DO NOT WAIT TO SEE OR HEAR
THE TORNADO. TAKE COVER NOW.

&&
LAT...LON 4259 9585 4291 9565 4291 9550 4283 9538
4269 9539 4256 9569 4256 9577
TIME...MOT...LOC 0023Z 225DEG 27KT 4260 9567

TORNADO...OBSERVED
TORNADO DAMAGE THREAT...CATASTROPHIC
HAIL...1.50IN



Impact Based Warning Examples

Severe Thunderstorm Warning: Tornado Possible

* SEVERE THUNDERSTORM WARNING FOR...
SOUTHERN LINCOLN COUNTY IN EAST CENTRAL MISSOURI...
WESTERN ST. CHARLES COUNTY IN EAST CENTRAL MISSOURI...
NORTHEASTERN WARREN COUNTY IN EAST CENTRAL MISSOURI...

* UNTIL 600 PM CDT

* AT 516 PM CDT...A SEVERE THUNDERSTORM WAS LOCATED NEAR WRIGHT
CITY...AND MOVING EAST AT 35 MPH.

HAZARD...GOLF BALL SIZE HAIL.

SOURCE...TRAINED WEATHER SPOTTERS.

IMPACT...DAMAGE TO VEHICLES...ROOFS AND WINDOWS.

GOLF BALL SIZE HAIL WAS REPORTED NEAR WRIGHT CITY WITH THIS STORM.

* LOCATIONS IMPACTED INCLUDE...
WENTZVILLE...LAKE ST. LOUIS...ST. PAUL...DARDENNE PRAIRIE...
O'FALLON...COTTLEVILLE...WELDON SPRING...ST. PETERS...MOSCOW
MILLS...NEW HELLE...FORISTELL...FLINT HILL...OLD MONROE AND
KAMPVILLE.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

FOR YOUR PROTECTION MOVE TO AN INTERIOR ROOM ON THE LOWEST FLOOR OF A
BUILDING.

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LAT...LON 3895 9067 3892 9066 3889 9063 3887 9058
3888 9054 3890 9052 3884 9053 3868 9061
3869 9066 3865 9071 3875 9117 3901 9112
TIME...MOT...LOC 2219Z 280DEG 32KT 3885 9100

TORNADO...POSSIBLE
HAIL...1.75IN
WIND...<50 MPH

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Town Hall Meeting

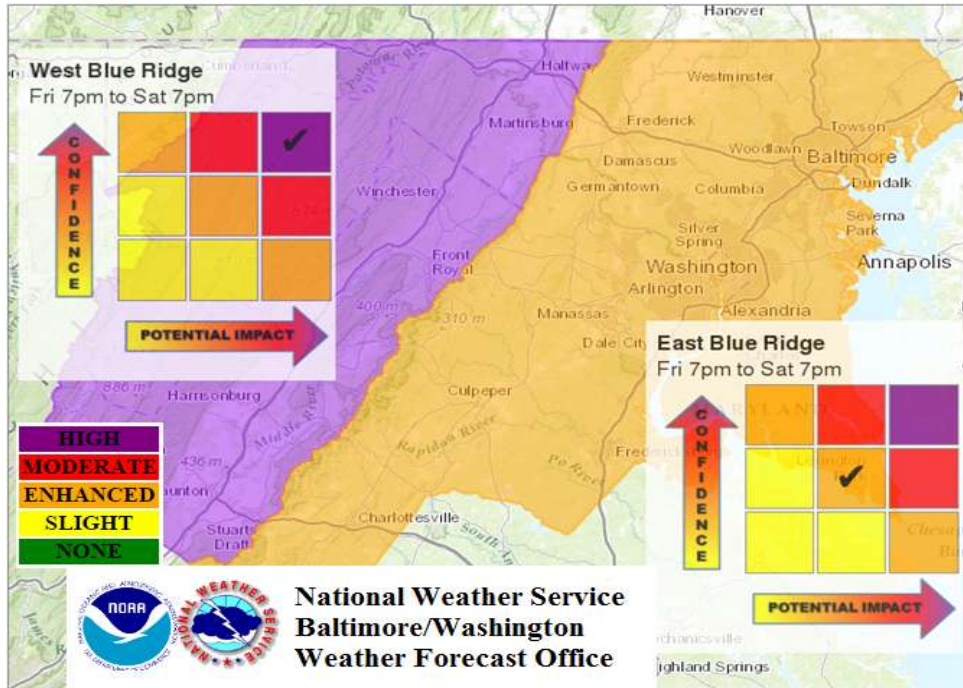


- What are your thoughts?
- What has worked well?
- What can we do better?

Winter Storm Threat

4 - 7 Days in the Future

Experimental Product by NWS Sterling

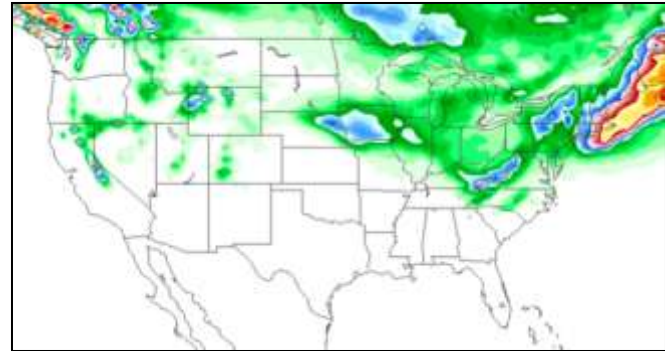


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High	High threat of high impact winter storm. Potential impacts include significant travel delays, closures, and threats to life and property. Plan ahead to minimize impact on you and your family.
Moderate	Moderate winter storm threat. Potential impacts include significant travel delays and closures. Plan ahead to minimize impact on you and your family.
Enhanced	Enhanced winter storm threat. Primary threat is disruption to travel.
Slight	Slight winter storm threat. May cause travel disruptions, particularly if threat increases.
None	No significant winter storm threat is currently expected. However, light wintry precipitation may still be possible.

Service Need – Extended Information

- Increasing requests for information on winter storms beyond watch/warning/advisory & accumulation forecast periods.
- Social Media hints/rumors amplify this need
 - Posting or Hying 1 run of 1 model



- Text-based Hazardous Weather Outlook (HWO)
 - Current tool to reflect threat
 - Largely tied to deterministic forecast
 - Not widely seen
 - Hard to share

Sample Hazardous Weather Outlook

HAZARDOUS WEATHER OUTLOOK

NATIONAL WEATHER SERVICE BALTIMORE MD/WASHINGTON DC

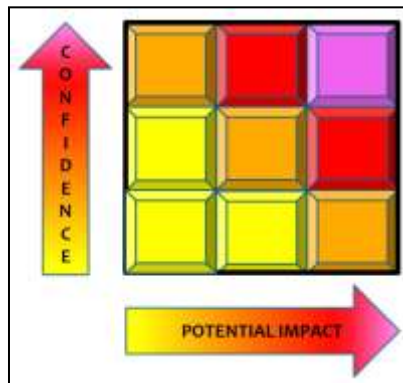
320 AM EST SAT MAR 2 2013

.DAYS TWO THROUGH SEVEN...SUNDAY THROUGH FRIDAY

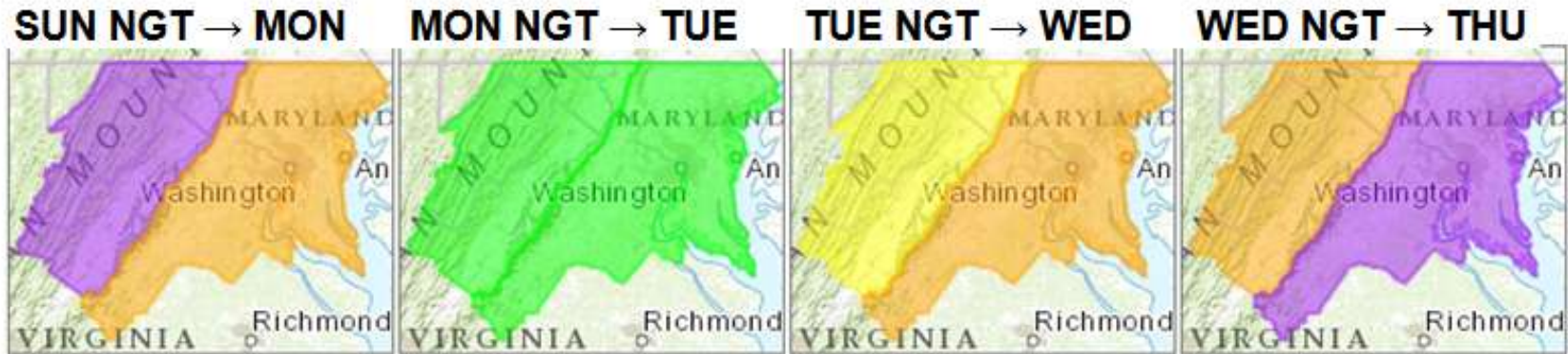
...A STRONG LOW PRESSURE SYSTEM **MAY** IMPACT THE AREA FOR A PERIOD BETWEEN TUESDAY AND THURSDAY... BRINGING **A CHANCE** FOR RAIN OR SNOW...GUSTY WINDS... AND COASTAL FLOODING. **UNCERTAINTY IN THE FORECAST REMAINS HIGH** DUE TO THE TRACK OF THE LOW...

Day 4-7 Winter Storm Threat

- Why use 1 model ?
 - Use 90-member ensemble of U.S. (20), European (50) & Canadian (20)
 - Chances of seeing few/several/double-digit accumulations
 - Throw in known signals for east coast “bombs”
- From all of this we can gauge level of:
 - Confidence -AND-
 - Potential Impact



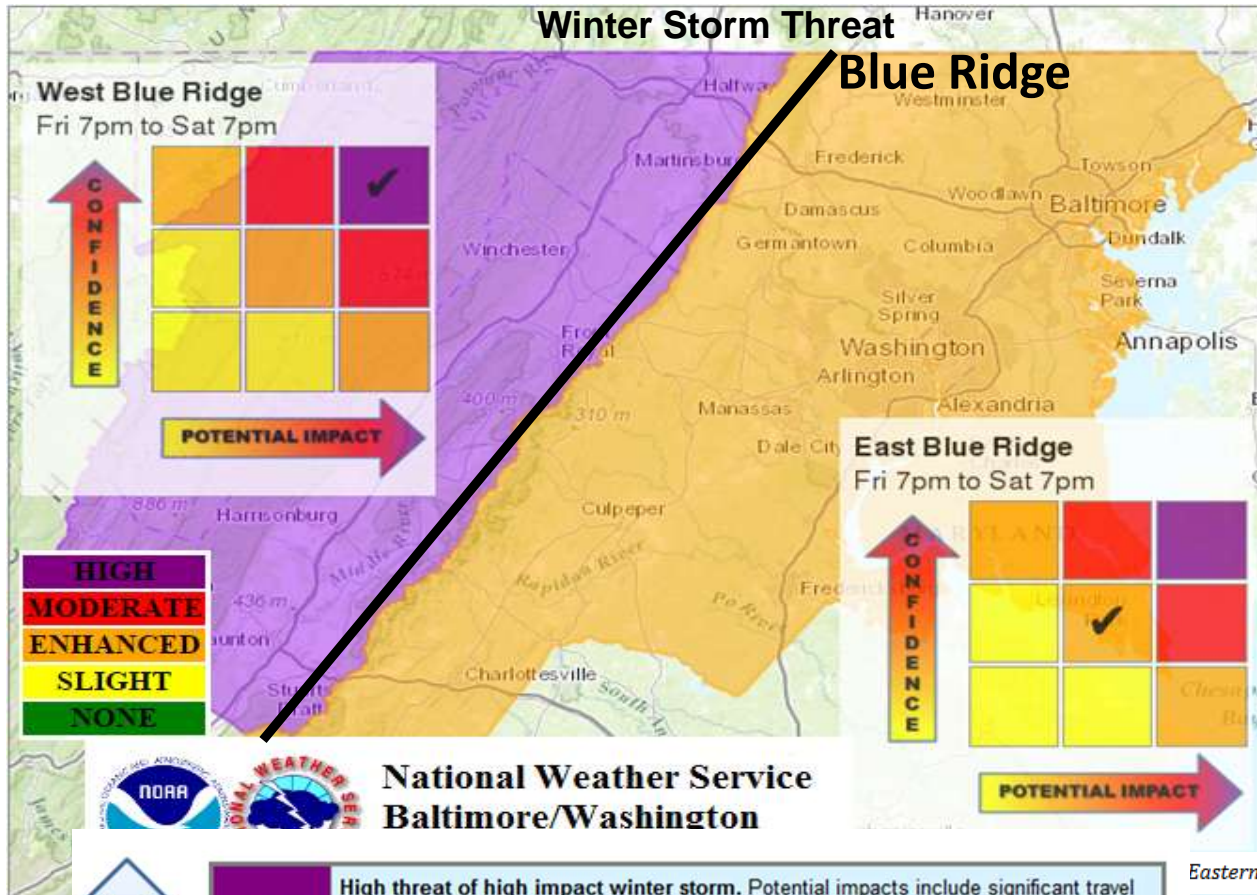
Experimental Product Overview



→ Click on maps to see daily Confidence vs. Potential impact. (Click [here](#) to hide.) ←

↑ T H R E A T	High	High threat of high impact winter storm. Potential impacts include significant travel delays, closures, and threats to life and property. Plan ahead to minimize impact on you and your family.
	Moderate	Moderate winter storm threat. Potential impacts include significant travel delays and closures. Plan ahead to minimize impact on you and your family.
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Experimental Product Overview



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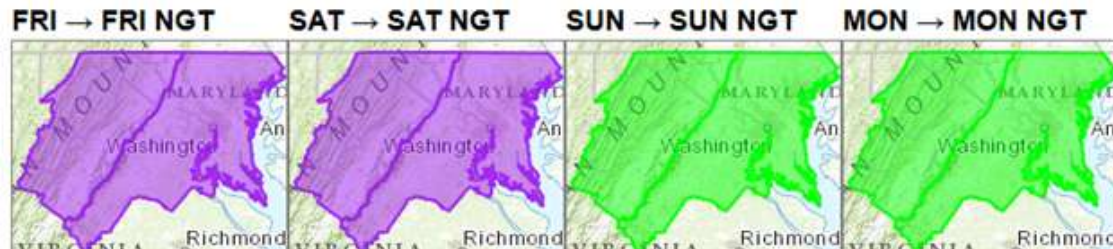
Eastern

Experimental Winter Threat Outlook

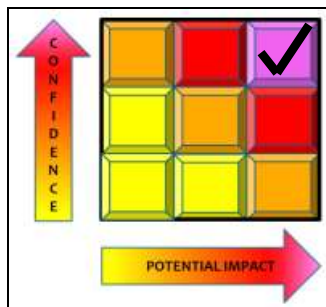
4:04 A.M. Tue Jan 19, 2016

Click on maps to see daily Confidence vs. Potential Impact graphic. (Click [here](#) to hide.)

Last Updated: 01/19/2016 4:04 AM Eastern

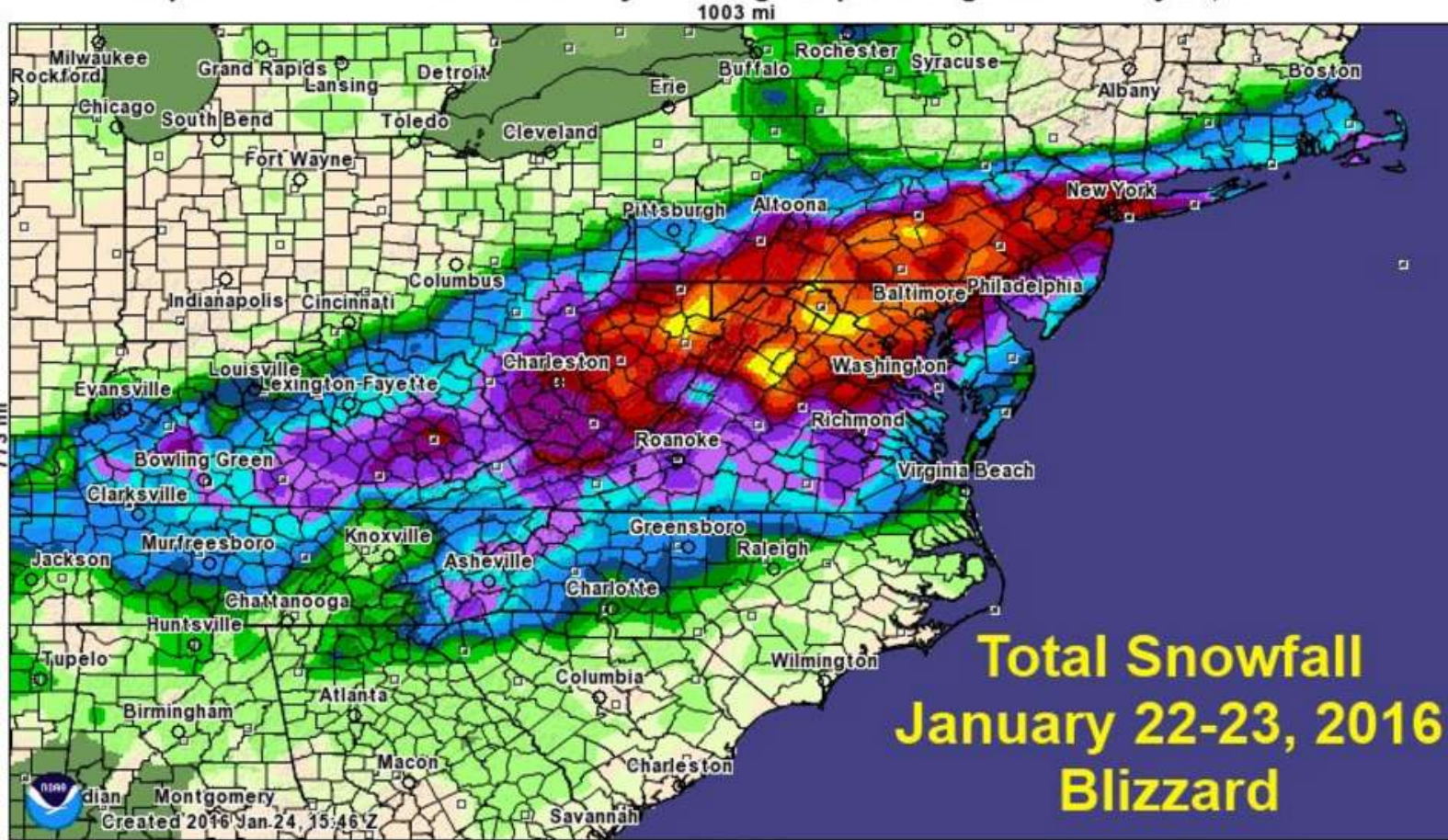


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Enhanced	Enhanced winter storm threat. Primary threat is disruption to travel.
Slight	Slight winter storm threat. If threat materializes, may cause travel disruptions.
None	No significant winter storm threat is currently expected. However, light wintry precipitation may still be possible.

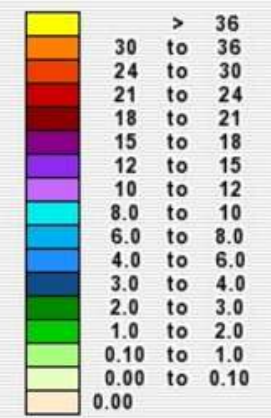


Blizzard of 2106

Interpolated Observed Snowfall Analysis during 72h preceding 2016 January 24, 12:00 UTC

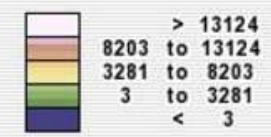


Inches of depth



Not Estimated

Elevation in feet

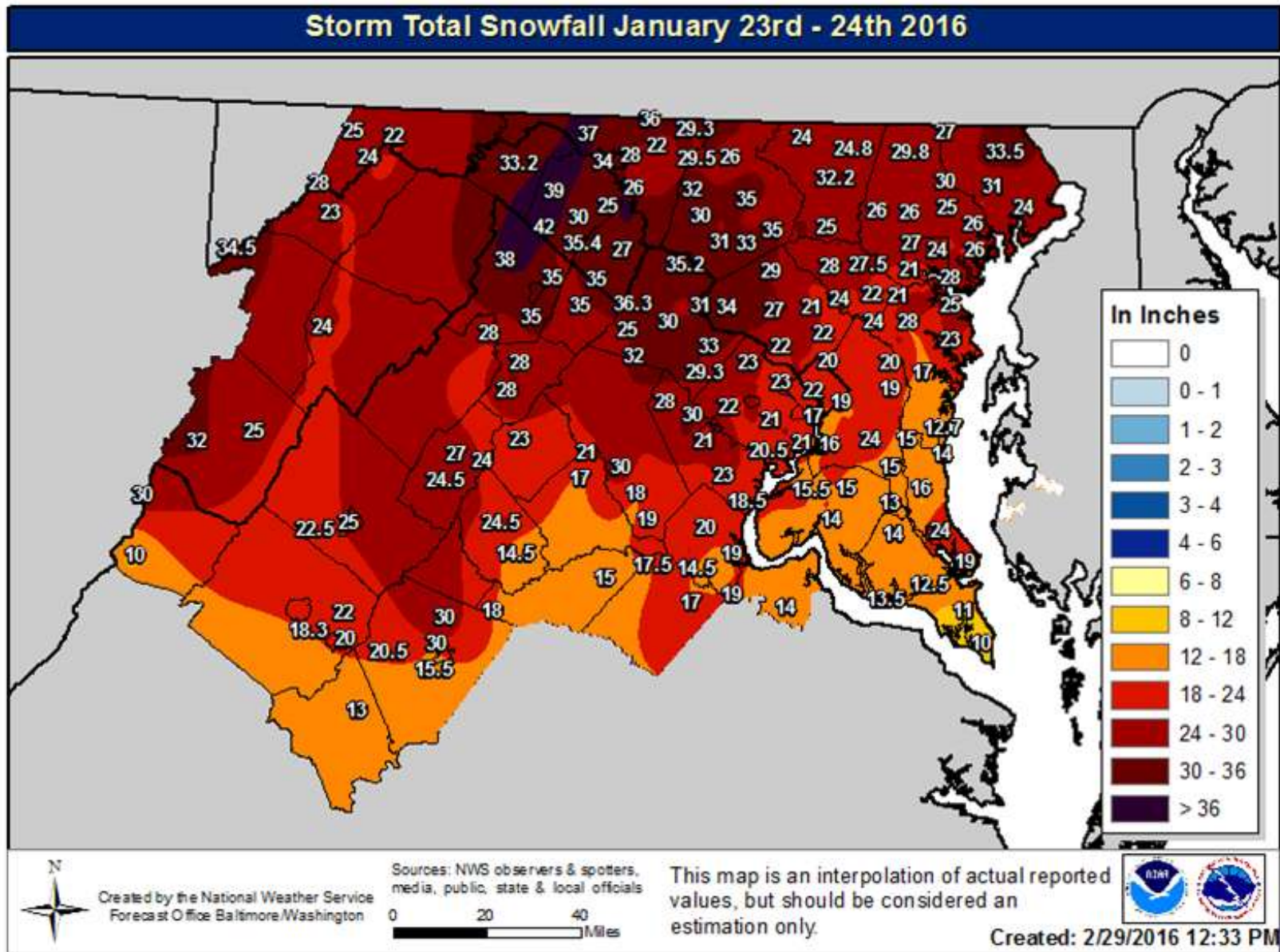


**Total Snowfall
January 22-23, 2016
Blizzard**

1168 mi

Created 2016 Jan 24, 15:46:12

Blizzard of 2106



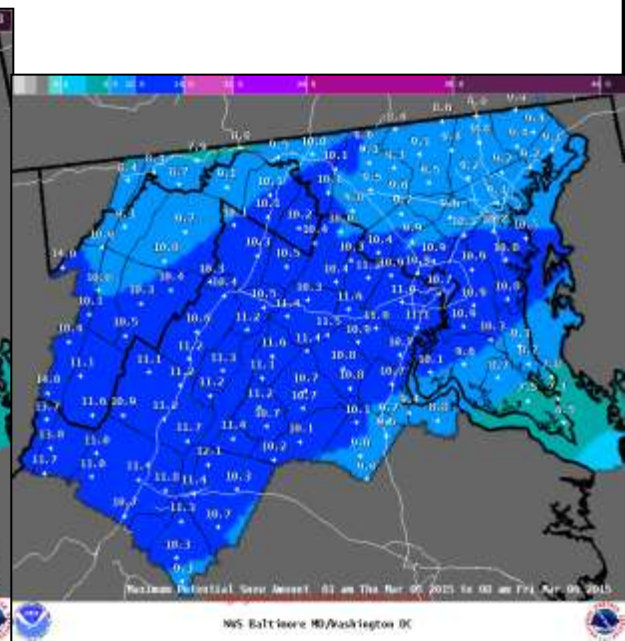
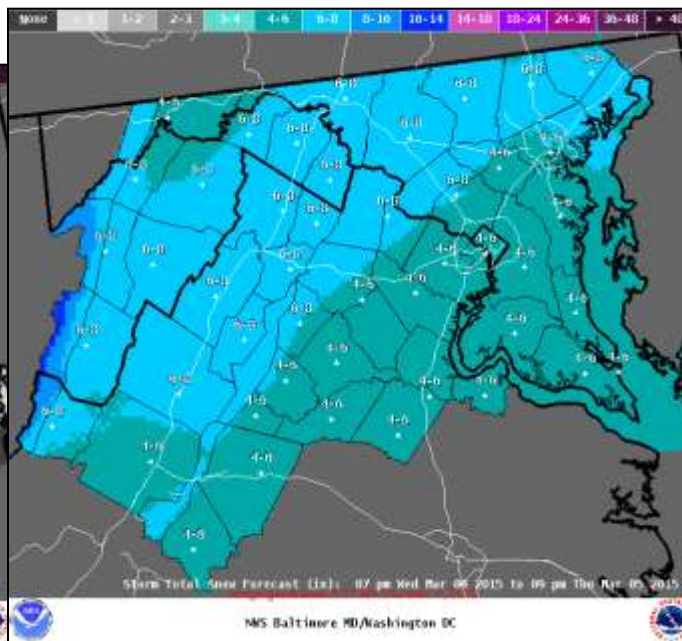
Range of Possibilities

Snow Forecasts

Minimum

Most Likely

Maximum



Expect at least this much

Official NWS Forecast

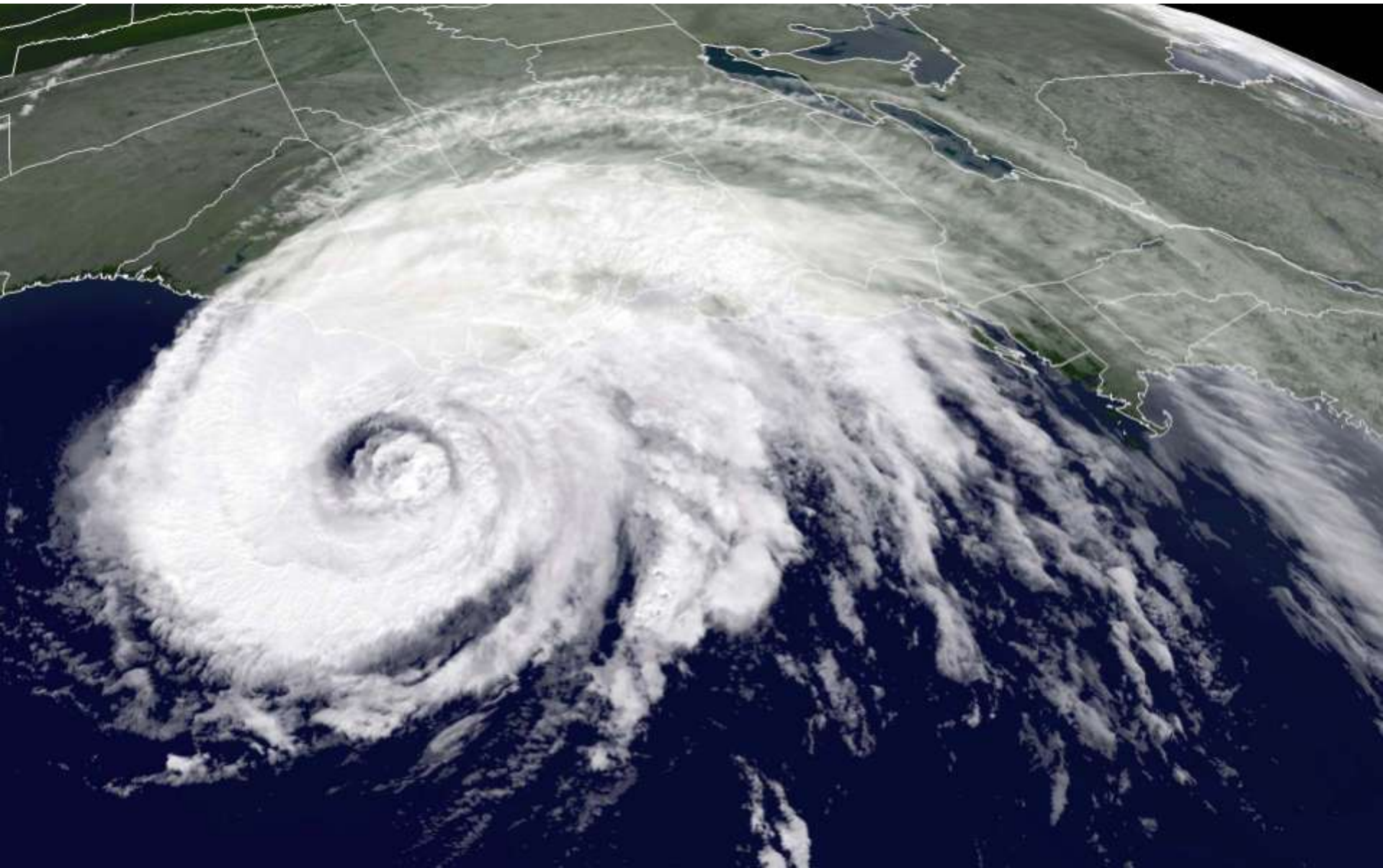
Potential for this much



Town Hall Meeting



- What are your thoughts?
- What has worked well?
- What can we do better?





New for 2015



Storm Surge:

- Tidal waters rising up and taking low lying areas
- Biggest killer for areas below 15' above sea level



Building a Weather-Ready Nation





New for 2015



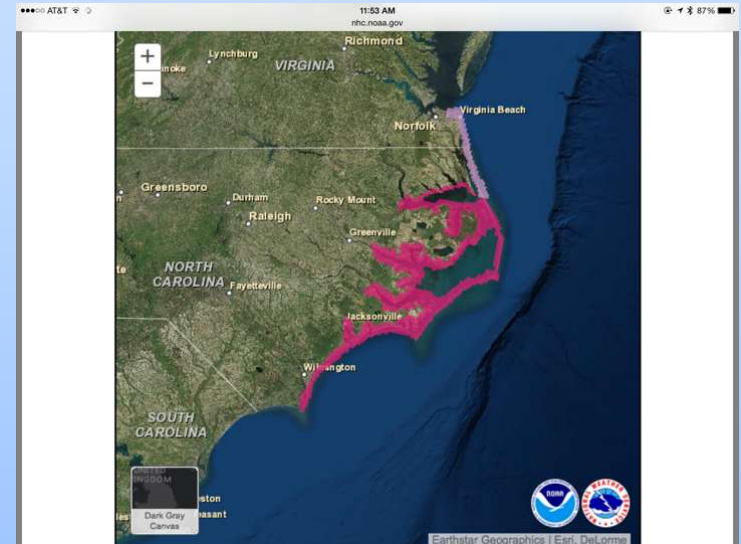
Storm Surge:

Previously:

- Threat was talked about within Hurricane Warning

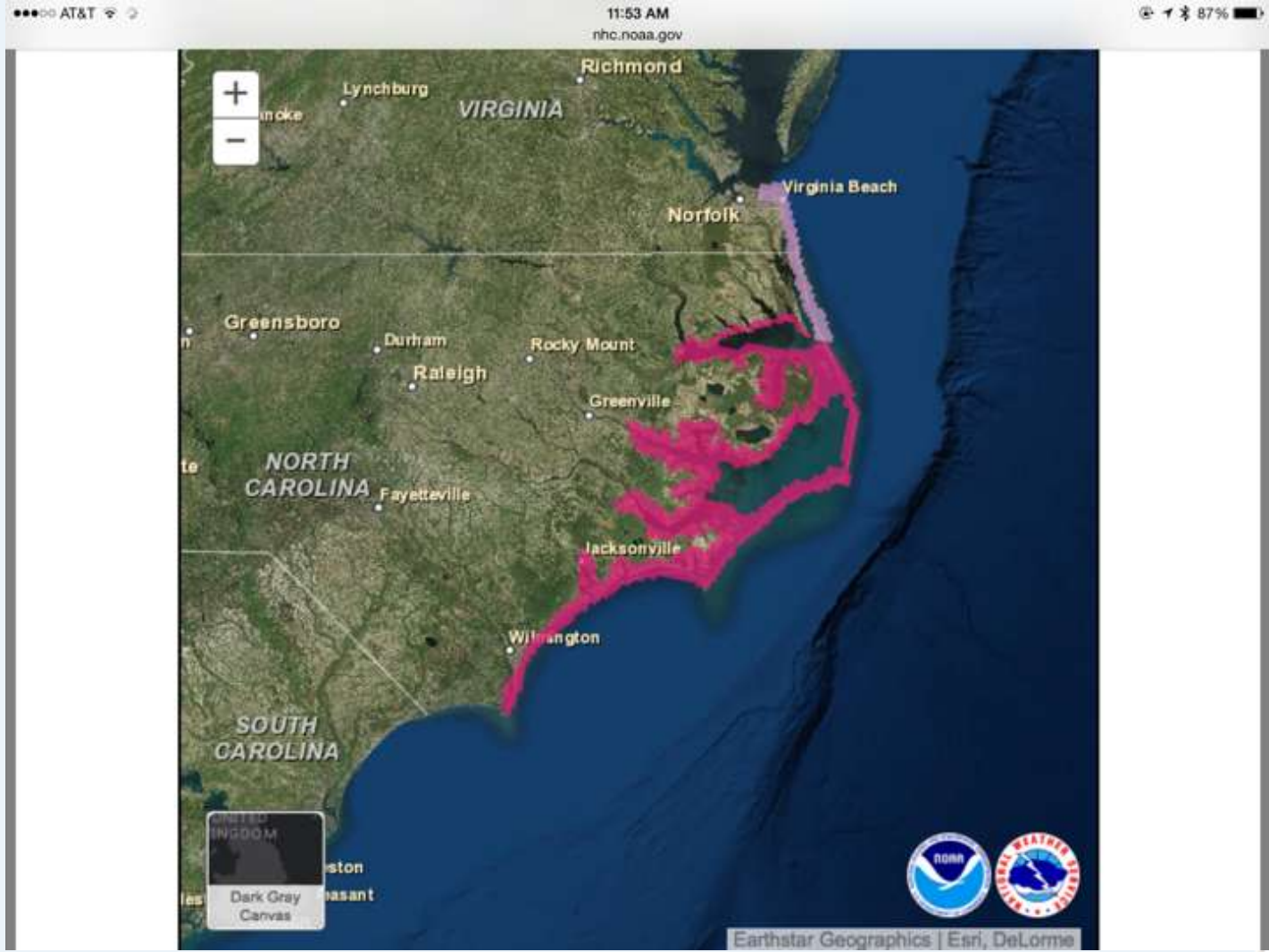
New for 2015:

- Alerting public for the most likely area of life threatening storm surge
- Storm Surge **Watch - Potential**
- Storm Surge **Warning - Expectation**





New for 2015



Building a Weather-Ready Nation





New for 2015



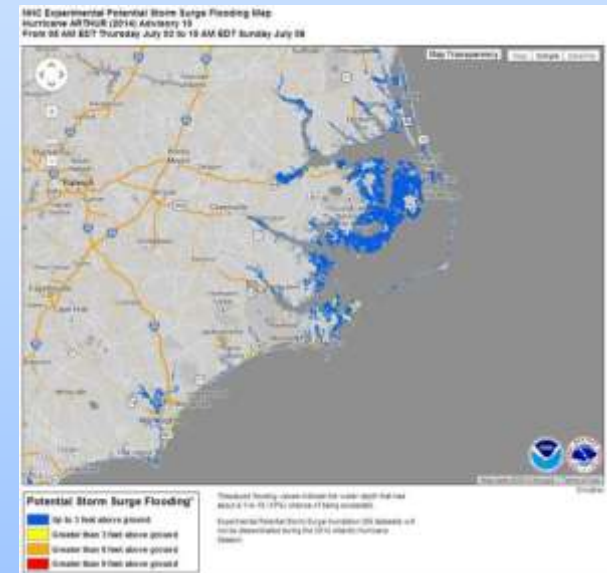
Storm Surge:

Previously:

- Threat described in text

New for 2015:

- **Showing** people where flooding will reach
- **Potential** Storm Surge Flooding
How bad COULD it be?





New for 2015



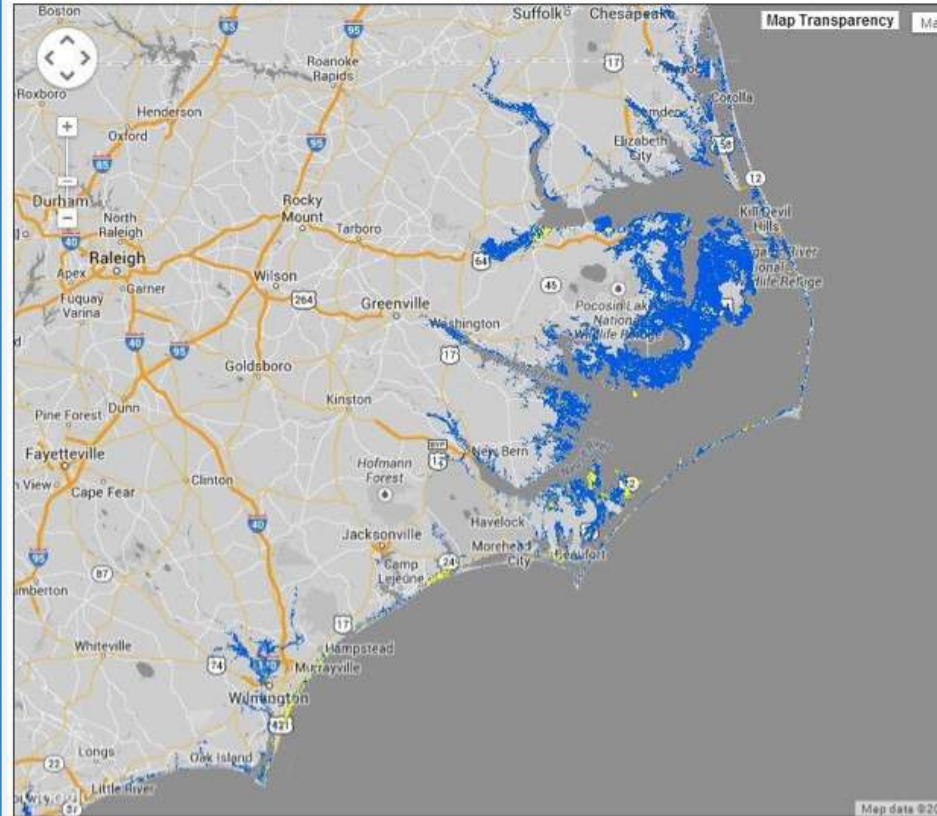
Storm Surge:

Potential Storm Surge Flooding

THIS IS NOT EXPECTED FLOODING

THIS IS REASONABLE WORST CASE

NHC Experimental Potential Storm Surge Flooding Map
Hurricane ARTHUR (2014) Advisory 10
From 05 AM EDT Thursday July 03 to 10 AM EDT Sunday July 06



Potential Storm Surge Flooding*

- Up to 3 feet above ground
- Greater than 3 feet above ground
- Greater than 6 feet above ground
- Greater than 9 feet above ground

*Displayed flooding values indicate the water depth that has about a 1-in-10 (10%) chance of being exceeded.
Experimental Potential Storm Surge Inundation GIS datasets will not be disseminated during the 2014 Atlantic Hurricane Season.





New for 2015



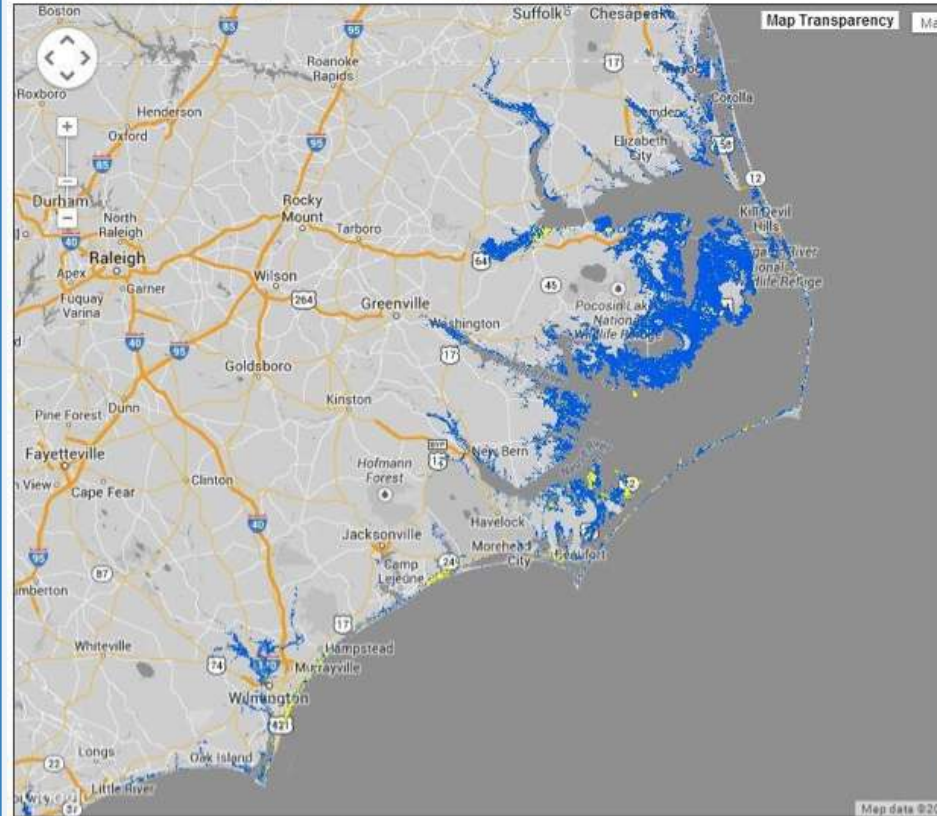
Storm Surge:

Potential Storm Surge Flooding

THIS IS REASONABLE WORST CASE

- Begin with issuance of watches/warnings
- Best used by EMs for:
 - evacuation decisions
 - who is at risk?

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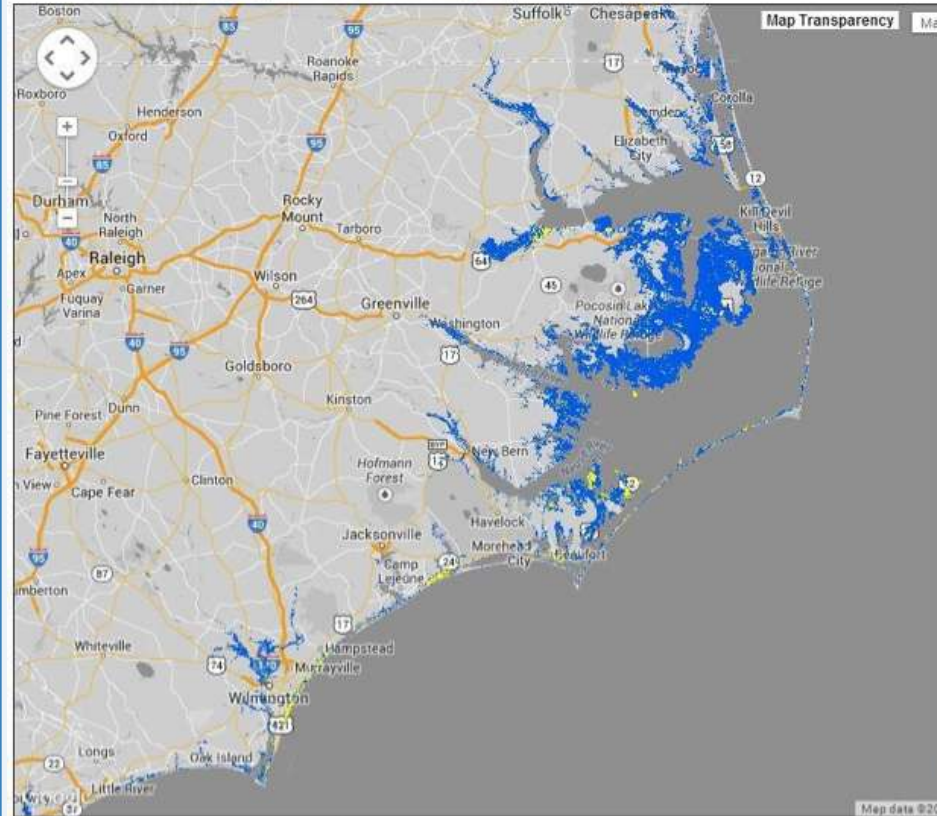
Storm Surge:

Potential Storm Surge Flooding

THIS IS REASONABLE WORST CASE

Different than:
surge watch/warnings -AND-
surge forecast still described in our text products.

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Town Hall Meeting



- What are your thoughts?
- What has worked well?
- What can we do better?

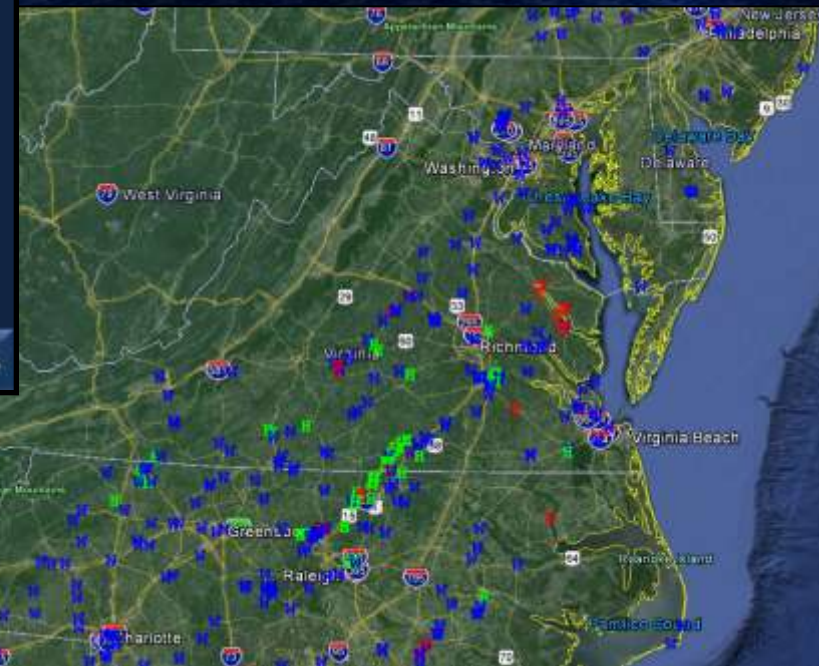
Tornado Outbreak

Feb 24th



Preliminary Tornado Tracks

From February 24, 2016



Building a Weather-Ready Nation

[@NWSWakefieldVA](#)

[NWSWakefieldVA](#)



Town Hall Meeting



- What are your thoughts?
- What has worked well?
- What can we do better?



Town Hall Meeting



Conference Calls / Briefings

- What are your thoughts?
- What has worked well?
- What can we do better?