

# Experimental Severe Weather Impact Graphics

Product Description Document (PDD)

June 9, 2015

## Part I - Mission Connection

a. Product Description – This experimental product is a graphical depiction of each short-fuse warning product issued by NWS Weather Forecast Offices (WFO), in the Contiguous United States (CONUS) only, with inclusion of impact information to supplement the graphics. “Short-fuse warnings” include Tornado, Severe Thunderstorm, and Flash Flood Warnings.

b. Purpose – The purpose of providing NWS short-fuse warnings in graphical format is to increase accessibility to these life-saving products via interfaces that are not conducive to long term product display. This encourages greater availability and more sharing of the warning message to platforms specializing in rapid sharing of perishable information, such as mobile devices and social media sites.

c. Audience – The graphical product is intended for general use by the public and NWS Core Partners in the broadcast/electronic media, emergency management, and other government agencies.

d. Presentation Format –

- 1) The experimental short-fuse warning graphic is available via a web-based “landing page” at <http://www.weather.gov/crh/impact>. The landing page consists of a table of active short-fuse warnings with columns containing issuing NWS office, warning type, cities affected, issuance time and date, expiration time and date, and total population affected. Users can sort the warning table by any of these columns to more quickly find warning(s) of interest. Upon clicking a row in the table, the associated warning graphic “pops up” on the user’s screen. In addition to the graphic, buttons appear allowing the user to optionally “share” the warning via the user’s own Twitter and Facebook accounts. This design is intended to encourage users to spread the word to their social media connections, increasing the “reach” of the critical warning message.
- 2) During the experimental period, official Twitter accounts from selected NWS WFOs will automatically disseminate these experimental graphics. This allows rapid dissemination of critical life-saving warning information to NWS Twitter account followers without the intervention of WFO staff. The WFOs participating in this experimental service are:

Atlanta, Georgia	@NWSAtlanta
Billings, Montana	@NWSBillings
Binghamton, New York	@NWSBinghamton
Burlington, Vermont	@NWSBurlington
Chicago, Illinois	@NWSChicago
Columbia, South Carolina	@NWSColumbia

Elko, Nevada	@NWSElko
Fort Worth, Texas	@NWSFortWorth
Hastings, Nebraska	@NWSHastings
New York City, New York	@NWSNewYorkNY
Omaha, Nebraska	@NWSOmaha
Raleigh, North Carolina	@NWSRaleigh
San Antonio, Texas	@NWSSanAntonio
Shreveport, Louisiana	@NWSShreveport
Tucson, Arizona	@NWSTucson

The use of dedicated Twitter accounts specific to warning type may also be announced for public comment during this experimental period.

e. Feedback Method – Comments are requested on national availability of the Severe Weather Impact Graphics. The intent is for these graphics to be produced to support short-fuse warnings produced by all local offices, and for Twitter-based dissemination from all local office accounts (but will be implemented in a phased manner). Web-based feedback will be solicited via an NWS Customer Survey link on the landing page, from June 9, 2015 through February 9, 2016. Comments during this period will also be accepted via email to [nws.ipwg@noaa.gov](mailto:nws.ipwg@noaa.gov). Comments may also be provided to:

Brian Walawender  
 Chief, Information Technology Branch  
 NWS Central Region Headquarters  
 7220 NW 101st Terrace  
 Kansas City, MO 64153-2371

## Part II – Technical Description

a. Format and Science Basis – The experimental graphical product is in Portable Network Graphic (PNG) format. The layout of the graphic depends on whether the graphic is displaying a Tornado Warning, Severe Thunderstorm Warning, or Flash Flood Warning:

1) Tornado Warning graphics and Severe Thunderstorm Warning graphics consist of two panels depicting: The warning area, County/Parish boundaries, selected communities, Interstate highways, U.S. highways, and storm motion vector with the radar image at warning issuance time in the background (left panel); The warning area with geographic information including a population density graphic, County/Parish boundaries, selected communities, Interstate highways, U.S. highways, railways, and a small regional locator map (right panel).

2) Flash Flood Warning graphics will consist of a single panel depicting the warning area, County/Parish boundaries, selected communities, urbanized areas, Interstate

highways, U.S. Highways, railways, lakes, ponds, rivers, streams, creeks, canals, and a small regional locator map.

During the experimental period, the graphical products will only be produced for warnings issued within the CONUS. Upon analysis of comments during this experimental period, the programmatic addition of short-fuse warning graphics issued by additional NWS Weather Forecast Offices inside and outside of the CONUS will be considered. The intent is for these graphics to be produced to support short-fuse warnings produced by all local offices, and for Twitter-based dissemination from all local office accounts (but will be implemented in a phased manner).

Example products are included at the end of this document.

The Tornado Warning and Severe Thunderstorm Warning graphics include the most recent radar image at the time of product generation with a storm motion vector. This vector uses the motion vector in the TIME...MOT...LOC section at the bottom of the associated text warning product. The length of the vector corresponds to a 20 minute period.

All graphics include printed information about the warning. This information includes the type of warning, the expiration time, the creation time of the graphic, and the Twitter handle for the issuing NWS WFO.

Impact statistics are also displayed on the graphics as printed information. This includes an approximate population count in the warning area, the area of the warning in square miles, the approximate total miles of Interstate and railroad within the warning area, and approximate counts of public schools, hospitals, airports, and national parks within the warning area.

Finally, storm information is displayed on graphics associated with Severe Thunderstorm Warnings and Tornado Warnings. At a minimum, the movement of the severe thunderstorm or tornado is included (e.g., "Northeast at 25 mph"). Maximum forecast hail size, maximum expected wind gusts, and the basis for the Tornado Warning (i.e., radar indicated vs. observed), are included when this information is also available in the text version of the warning.

"Ambient" population density data on Tornado Warning and Severe Thunderstorm Warning graphics are provided on a grid of approximately one square kilometer resolution derived from the [Landscan Ambient Population Dataset](#) 2010 Edition<sup>1</sup>. Ambient population refers to the population expected to be present in a grid box at any given time, regardless of residency. Therefore, the ambient population is not necessarily equal to the census population. Scientific discussion of the Landscan data set is available from:

Bhaduri, B., Bright, E., Coleman, P., Urban, M. "LandScan USA: A High Resolution Geospatial and Temporal Modeling Approach for Population Distribution and Dynamics" *GeoJournal*. 2007. 69: 103-117.

The key for the ambient population density graphic is as follows:

## Ambient Population Density (per $\sim 1 \text{ km}^2$ )

0 to 10	11+	201+	501+	1,001+	2,501+	5,001+	10,001+
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Interstate highway, U.S. highway, and railroad information are derived from the [National Transportation Atlas](#) 2012 Edition. Counts of public schools and hospitals in the warning area are derived from the Homeland Security Information Network Gold data set, 2011 Edition. The actual locations and names of schools and hospitals will not be included in the graphic.

On Flash Flood Warning graphics, hydrographic plots of lakes, ponds, rivers, creeks, streams, etc. are provided from the [US Geological Survey National Hydrography Dataset, as published in NHDPlus Version 2, 2015](#).

b. Availability – The experimental graphic will be generated upon first issuance of the text warning product and updated upon issuances of follow-up Severe Weather Statements and Flash Flood Statements. The graphics will generally be available on the web landing page and Twitter accounts within about a minute after the text product issuance.

During the experimental period the web landing page, Twitter dissemination, and associated graphics will not be supported during non-business hours, and may become unavailable in the event of software or hardware failure or during periods of Federal Government furlough/closure.

<sup>1</sup> Notice: The Landscan High Resolution Global Population Data Set is copyrighted by UT-Batelle, LLC, operator of Oak Ridge National Laboratory under Contract No. DE-AC05-00OR2275 with the United States Department of Energy. The United States Government has certain rights in this Data Set. NEITHER UT-BATTELLE, LLC NOR THE UNITED STATES DEPARTMENT OF ENERGY, NOR ANY OF THEIR EMPLOYEES, MAKES ANY WARRANTY, EXPRESS OR IMPLIED, OR ASSUMES ANY LEGAL LIABILITY FOR THE ACCURACY, COMPLETENESS, OR USEFULNESS OF THIS DATA SET.

## EXAMPLES

Example Warning Table on web “landing page”:

Experimental Severe Weather Impact Graphics					
Click on a Warning to display the Warning Graphic					
Office	Warning Type	Cities	Issuance	Expiration	Population
Albany NY	Flash Flood	Amsterdam...Broadalbin...Hagaman	3:59 pm EDT on June 3rd	9:00 pm EDT on June 3rd	64,721
Albany NY	Flash Flood	Albany...Schenectady...Saratoga Springs	3:56 pm EDT on June 3rd	10:00 pm EDT on June 3rd	620,877
Great Falls MT	Severe Thunderstorm	Hobson...Moore	3:58 pm EDT on June 3rd	4:15 pm EDT on June 3rd	449
North Platte NE	Severe Thunderstorm	Spencer...Lynch...Bristow	4:04 pm EDT on June 3rd	4:30 pm EDT on June 3rd	1,242
Omaha/Valley	Severe	...	4:04 pm EDT on	4:30 pm EDT on	...

Example Severe Thunderstorm Warning graphic “popup” from web landing page, with social media “share” buttons:

**Warning Information**

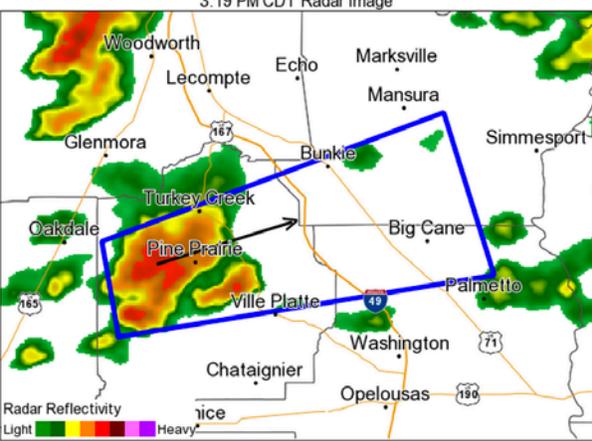
Spread the word: [Tweet](#) [Share](#) [View Full Image](#)



**Severe Thunderstorm Warning**  
Valid until April 27th, 2015 at 4:00 PM CDT

 @NWSLakeCharles  
Created Monday April 27th, 2015 at 3:20 PM CDT

3:19 PM CDT Radar Image



Warning Area



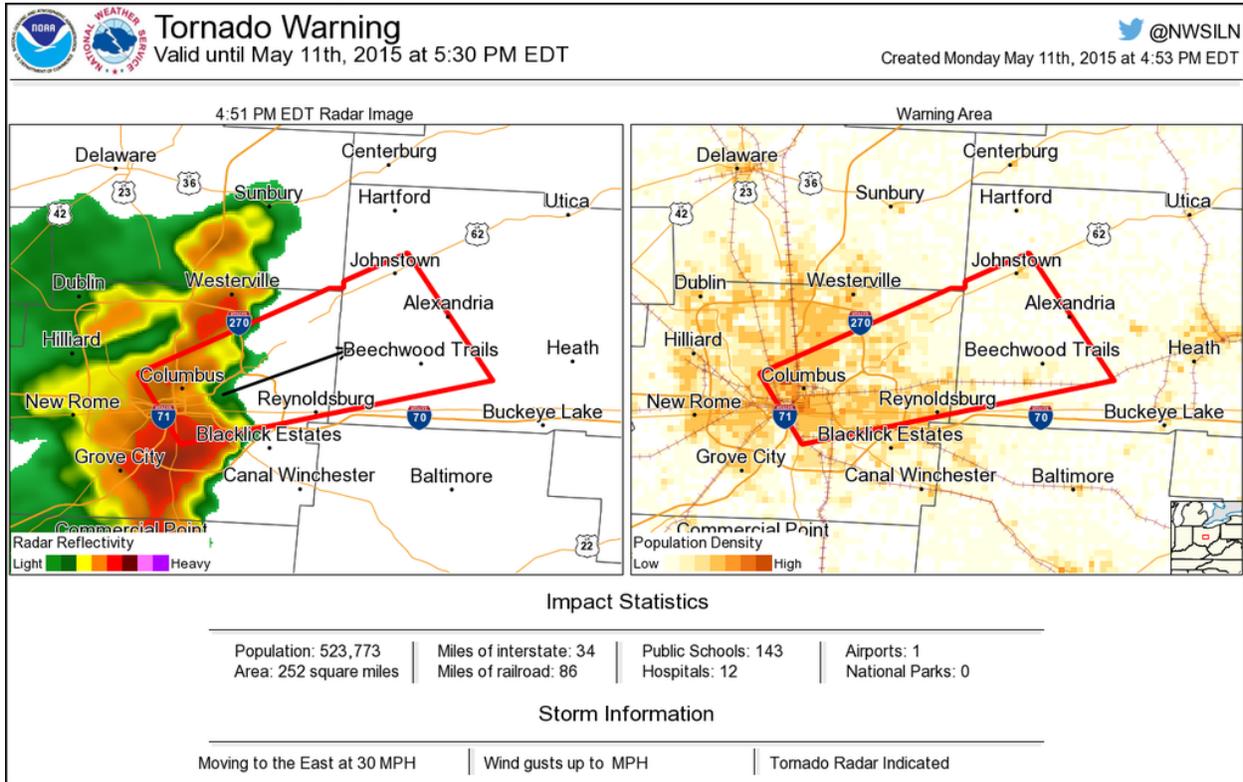
**Impact Statistics**

Population: 25,440	Miles of interstate: 18	Public Schools: 11	Airports: 2
Area: 645 square miles	Miles of railroad: 46	Hospitals: 1	National Parks: 0

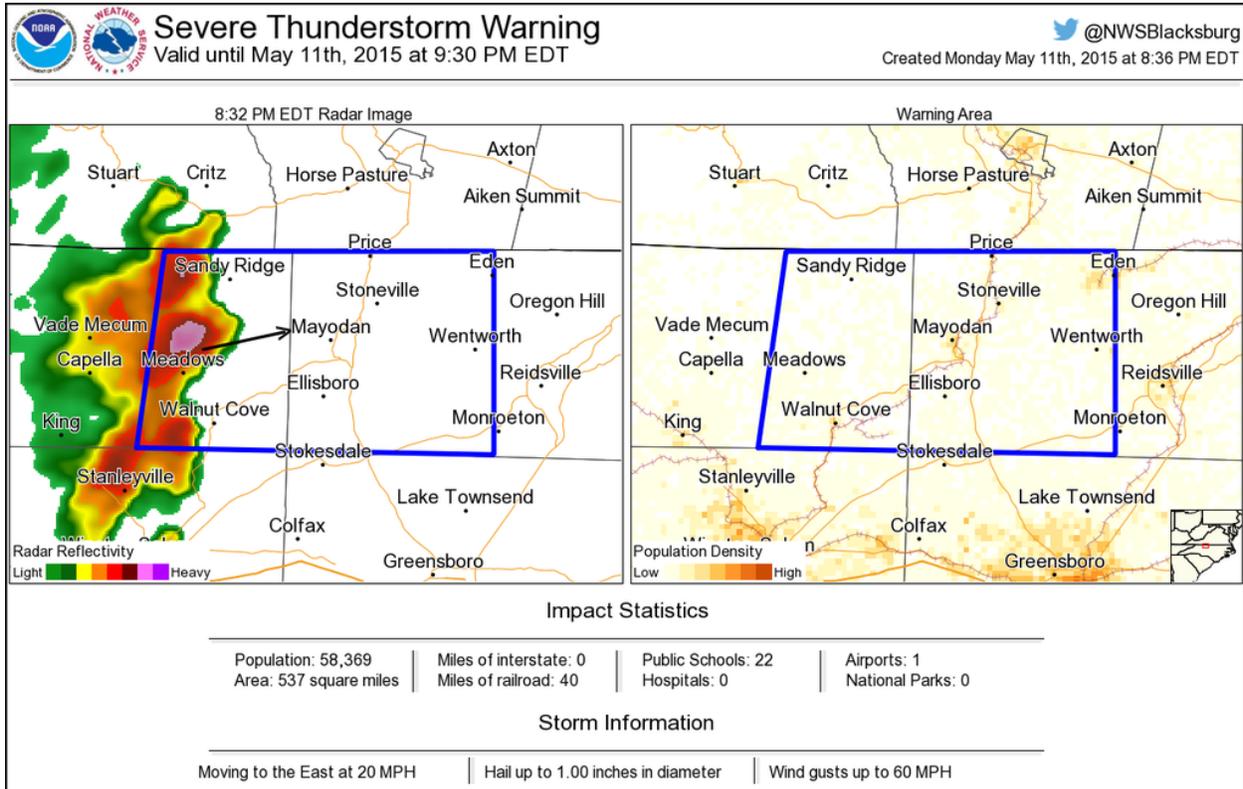
**Storm Information**

Moving to the East at 45 MPH

Example Tornado Warning graphic:



Example Severe Thunderstorm Warning graphic:



Example Flash Flood Warning graphic:

