

Experimental Days 3-7 Winter Storm Threat Product Description Document (PDD)

Revised: 13 December 2018

Part 1 – Mission Connection

A. Product / Service Description:

Alerting the public to weather threats is core to the National Weather Service (NWS) Weather Forecast Office (WFO) mission. Public, commercial and government users all desire and expect information on impactful winter storms (snow, sleet, and/or freezing rain) that could threaten their area(s) of interest. The NWS provides detailed watches and warnings for winter storms that have reached a certain threshold of certainty within mainly the day 1-2 forecast period. However, in the days 3-7 period, the NWS has fewer means for conveying degrees of forecaster confidence of a winter storm threat (i.e., uncertainty) and the storm's potential impact.

The NWS text-based Hazardous Weather Outlook (HWO), and its graphical version (enhanced HWO), do convey a level of winter storm threat in days 3-7, but there's more information that's not conveyed concerning storm uncertainty and/or impacts associated with these longer range winter threats. At times, our core customers can become confused when social media/private weather services highlight potential winter threats in days 3-7, while the NWS says little for that period.

Beginning in early January, 2016, the NWS WFO in Sterling, VA, began producing an experimental Days 4-7 Winter Storm Threat graphical product. The following winter season (2016-17), a threat forecast for day 3 was added (i.e, days 3-7). The format used for these products consists of a plan view map graphic for each day that depicts a winter threat as five threat levels, using easily-understood colors to express an increasing winter storm threat (i.e, green-minimal threat, yellow, orange, red and purple-extreme threat). Included on each day's plan view map was an inset graphic of a 3x3 matrix that highlights potential winter storm impact vs. forecast confidence.

Beginning December 20, 2018, for the 2018-2019 winter season, the experimental Days 3-7 Winter Storm Threat product will be expanded geographically to include more areas in the Mid-Atlantic region, as three NWS WFOs join the experiment. WFOs in Wakefield, VA (AKQ), State College, PA (CTP), and Mt. Holly, NJ (PHI) join WFO Sterling, VA (LWX) in producing these products for their respective areas of responsibility.

B. Purpose/Intended Use:

The experimental Days 3-7 Winter Storm Threat product is designed to provide decision makers with information about the level of risk posed by a winter storm in the day 3-7 forecast period – information that's easily understood and disseminated. This information will aid in preparedness and readiness in the community. This graphical approach to conveying winter threats in days 3-7 works in conjunction with the text-and graphical-based NWS HWO products. This process could be a potential input into the NWS graphical enhanced hazardous weather outlooks or other dashboard-style graphical display applications.

C. Audience:

The multi-office experimental NWS Days 3-7 Winter Storm Threat product is intended to provide information on potential weather storm threats to key decision makers, including local, state, and federal level officials, as well as the media and the general public.

D. Presentation Format:

The Days 4-7 Winter Storm Threat product consists of five plan view maps within the 4 participating (AKQ, CTP, LWX, and PHI) areas of responsibility. Each map highlights one of 5 levels of winter threat for each day 4-7. For each map, a complementary winter threat matrix graphic specifies the winter threat based on forecaster confidence and potential impact. Core partners can use this information, for example, to help convey the winter threat for the general public. The products are linked via the various WFO winter web pages.

E. Feedback Method:

An email link to leave feedback is available on the webpage for user feedback to use in future product refinement. The comment/feedback period will run while the product is in experimental mode throughout the winter 2018-19.

Technical or general comments may be addressed to:

National Weather Service

Attn: Chris Strong

43858 Weather Service Road

Sterling, VA 20166

or e-mail comments to: christopher.strong@noaa.gov

Part 2 – Technical

A. Format and Science Basis:

The Days 3-7 Winter Storm Threat product is depicted for specific (and non-changing) geographical areas as selected by each participating WFO. These threat areas are intentionally kept large to recognize the uncertainty inherent in forecasting winter storm threats beyond two days out. The color depicted for each area is determined by the threat matrix of confidence vs. potential impact for each day within the day 3-7 forecast.

The forecaster assess a host of multi-model ensemble data to assess confidence and impact from these inputs:

- 1. Probability of precipitation >0.25” expected to be frozen (i.e., snow and/or sleet).**
- 2. Probability of precipitation >0.50” expected to be frozen/freezing.**
- 3. Forecasts 925mb & 850mb u-wind anomalies and 850mb temperature anomaly.**
- 4. Forecasts of potential winter precipitation type (i.e., snow vs sleet vs freezing rain).**
- 5. Forecasts of freezing rain potential and amount).**

These inputs combine the best available guidance from multi-model ensembles to produce a base level of threat.

If there's a discernable and potentially impactful winter threat in the days 3-7 period, a 3x3 matrix will be displayed overlain on the maps. The matrix shows a checked box that highlights the best threat level within the 3x3 forecast confidence vs potential impact matrix. The matrix box is viewed by clicking on any of the Days 4-7 threat maps. The color codes depicted on both the map and in the matrix use colors commonly associated with threat depiction: green, yellow, orange, red, purple (see Fig 2). If there's no discernable winter threat, the threat matrix is not displayed; instead a green box (“no significant winter threat expected”) is shown. An algorithm is run at each office to assess the above 3 inputs to find one of 9 levels of threat combining forecast confidence and potential storm impact. The value is then shown in the matrix box for each day within each geographical area.

B. Availability:

This service is available as an experimental product 24 hours a day and 7 days a week between January 4, 2016, and April 15, 2016. It will be updated at least twice daily at 0900 and 2100 UTC (and as needed).

Real-time access to the Days 4-7 Winter Storm Threat product is obtained through each WFO's winter web page by selecting the tab marked “Days 3-7 Winter Storm Threat”:

WFO Wakefield, VA (AKQ): <http://www.weather.gov/akq/winter>

WFO State College, PA (CTP): <http://www.weather.gov/ctp/winter>

WFO Sterling, VA (LWX): <http://www.weather.gov/lwx/winter>

WFO Mt. Holly, NJ (PHI): <http://www.weather.gov/phi/winter>

C. Additional Information: See below for maps/matrix example and legend description.

Day 3 Winter Storm Threat

Valid Fri 7:00AM through Sat 7:00AM EST

Weather Forecast Office
Baltimore MD/Washington, DC
Issued Dec 12, 2018 3:10 PM EST

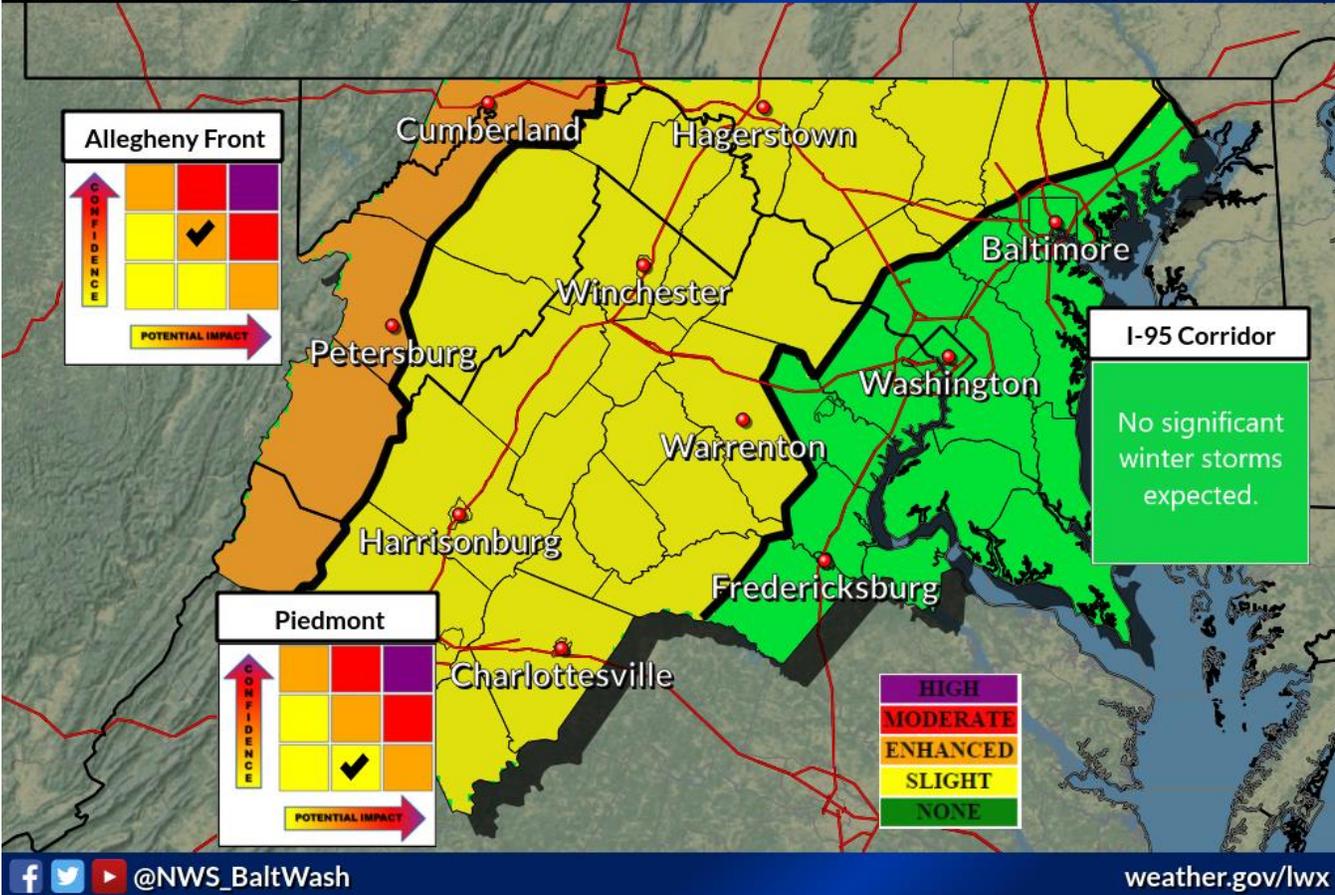


Figure 1 NWS (WFO Sterling-LWX) Days 3-7 Experimental Winter Threat Outlook Map/Matrix

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.
	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.

Figure 2 Definitions of potential winter storm impacts used in the NWS Days 4-7 Experimental Winter Threat Outlook