

Experimental Days 3-7 Winter Storm Threat at WFO Baltimore/Washington, DC Product Description Document (PDD)

Part 1 – Mission Connection

A. Product / Service Description:

Alerting the public to possible weather threats is core to the Weather Forecast Office (WFO) mission. Public, commercial and government users all desire and expect information on winter storms that may threaten their area(s) of interest. The National Weather Service (NWS) provides detailed winter watches and warnings for storms that have reached a certain threshold of certainty within the Day 1-2 period. However, we are largely silent with less certain but potentially impactful winter storm threats in Days 3-7 of the forecast.

While the NWS text-based Hazardous Weather Outlook (HWO) plays a supporting role in identifying potential 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.

The National Oceanic and Atmospheric Administration (NOAA)/NWS Weather Prediction Center (WPC) and Environmental Monitoring Center (EMC) have begun generating new experimental probabilistic winter guidance to help address this problem. This guidance can be analyzed, combined, and downscaled by the WFOs to provide planning information for the public and core partners. This process involves two core principles that are at the forefront of effective communication of risk to the public – communicating with easy-to-understand graphics, and utilizing multi-model ensembles to objectively capture the full range of possibilities in the Days 3-7 timeframe.

The logic used to express the new experimental Days 3-7 Winter Storm Threat product is a matrix of potential impact vs. confidence. For each day within days 3-7, the level of threat that the matrix derives can be shown on a map on our webpage using an easily-understood color code (Fig. 1). The matrix itself can also be displayed for those that want detail about level of confidence and potential impact (Fig. 2).

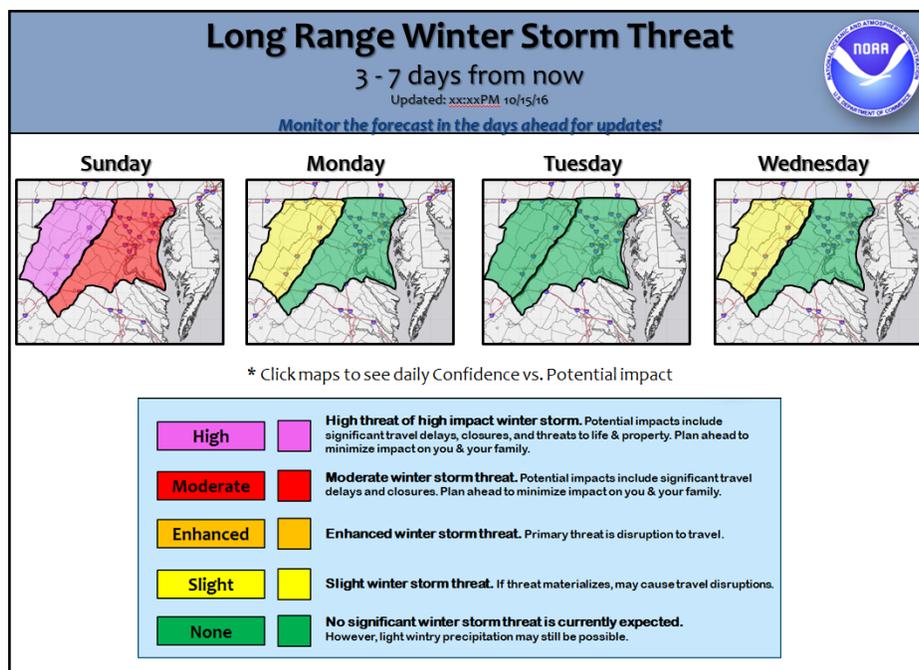
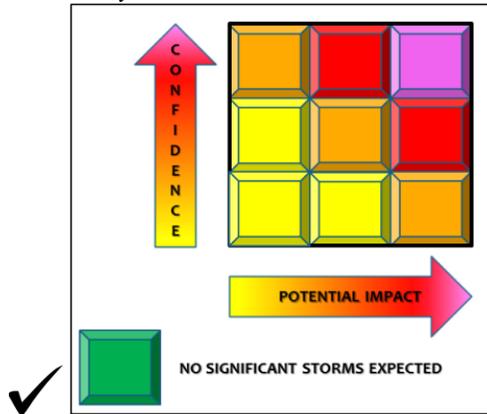


Figure 1. Days 3-7 Winter Storm Threat web presence

Figure 2. Days 3-7 Winter Storm Threat matrix



B. Purpose/Intended Use:

The 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 will work in conjunction with the text-based HWO product. This process eventually could be a potential input into graphical hazardous weather outlooks and other “dashboard” paradigm applications.

C. Audience:

This service is intended to provide information on potential weather threats to a wide range of decision makers, from the federal level to the individual family.

The Days 3-7 Winter Storm Threat product also serves internal NWS operations by enhancing situational awareness and ensuring service consistency. The integration of WPC’s probabilities, EMC’s guidance, as well as local warning criteria, results in a system that alerts forecasters when winter threats exist in the multi-model ensemble suite.

D. Presentation Format:

The Days 3-7 Winter Storm Threat product will be a combination of a plan view map highlighting the current winter threat level across the forecast area for each day 3-7. The threat matrix can be overlaid to further specify the threat based on confidence vs. impact. Core partners will help refine optimal language to convey the threat for the non-meteorological public. The product will be prominently linked on the Baltimore/Washington (LWX) WFO’s homepage and displayed on the WFO’s Winter Weather page.

E. Feedback Method:

Feedback will be accepted via electronic survey at the following link from December 1, 2016 to April 15, 2017:

www.nws.noaa.gov/survey/nws-survey.php?code=DAY3_7_WST.

In addition, an email link will be available in the feedback section of our webpage to provide feedback for further user refinement.

Technical or general comments may be addressed to:

National Weather Service
Attn: Steven Zubrick
43858 Weather Service Road
Sterling, VA 20166
or e-mail comments to: steven.zubrick@noaa.gov

Part 2 – Technical

A. Format and Science Basis:

The Days 3-7 Winter Storm Threat product will be provided for two areas of the LWX County Warning Area (CWA) - west & east of the Blue Ridge Mountains (see map, Figure 1). The product will be driven by a threat matrix of confidence vs. potential impact for each day within the day 3-7 forecast.

As it was last winter, for Days 4-7 the matrix will continue to assess confidence and impact from three different inputs: 1) Probability of precipitation >0.25” expected to be frozen, from the National Centers for Environmental Prediction’s (NCEP’s) multi-model ensemble; 2) Probability of winter storm snow accumulation, provided by WFO forecaster analysis of model ensembles; and 3) WFO forecaster analysis of forecast 850 mb u-wind anomalies to detect major East Coast snowstorms.

In order to add Day 3, the WFO determines a baseline threat for Day 3 from existent probabilities for 2” and 6” of snow from the 0-72 hour probabilistic snowfall grids. That baseline threat can be enhanced based on 850 mb u-wind anomalies from model ensembles, time of day in relation to rush-hours, and sub-freezing surface temperatures.

The inputs combine the best available guidance from WPC’s multi-model ensembles, with the WFO forecaster analysis of additional ensemble fields, mesoscale factors, and societal drivers to provide insights on levels of enhanced threat. For details about the logic on how threat is determined, consult the flowchart provided in Section C below.

The 3x3 matrix of confidence vs. impact will determine a color-coded threat level to show on the plan view. If there is no discernable winter threat, green is displayed as the color of the matrix. This color code follows commonly used colors for threat depiction - green, yellow, orange, red, purple. An algorithm will assess the three inputs provided by WPC and the WFO forecaster, and establish where on the matrix the threat falls for each day, within each of the two areas which the Winter Storm Threat is provided.

Alongside the matrix and maps will be a legend that further refines the threat associated with each color.

B. Availability:

This service will be available as an experimental product 24 hours a day / 7 days a week between December 1, 2016 and April 15, 2017. It will be updated at least twice daily at 0900 and 2100 Coordinated Universal Time (UTC), and as needed. Real-time access to the Days 3-7 Winter Storm Threat product will be obtained through the WFO LWX winter webpage: <http://www.weather.gov/lwx/winter>.

C. Additional Information: See next page for logic flowchart.

