

## Day 4-7 Winter Weather Outlook

### Part 1 – Mission Connection

Product Description – The Day 4-7 Winter Weather Outlook is a probabilistic forecast depicting the probability of winter precipitation (snow/sleet) exceeding 0.25 inches (~6 mm) water equivalent over a 24-hour period (12Z – 12Z). The product is comprised of 4 products (graphical and digital) displaying the forecast for Day 4, Day 5, Day 6, and Day 7. The outlook is prepared twice daily by Weather Prediction Center (WPC) medium range forecasters.

- a. Purpose – This product supports advanced planning of hazardous winter weather for internal NWS and external partners.
- b. Audience - The target audience includes NWS forecasters, the emergency management community, and anyone interested in winter weather forecasts.
- c. Presentation Format – The forecasts are presented on an interactive WPC webpage at the following URL: [http://www.wpc.ncep.noaa.gov/wwd/pwpf\\_d47/pwpf\\_medr.php](http://www.wpc.ncep.noaa.gov/wwd/pwpf_d47/pwpf_medr.php) as Probability of 0.25 inch liquid equivalent of snow/sleet.
- d. Feedback Method – Comments regarding the Day 4-7 Winter Weather Outlook can be provided via electronic survey: <http://www.nws.noaa.gov/survey/nws-survey.php?code=D47WWO> or can be sent to one of our feedback email addresses. Links for these addresses are located on the left-hand menu under “Contact Us”.

Comments may also be provided to:

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### Part II – Technical Description

- a. Format and Science Basis – The Winter Weather Outlook is created by calculating the joint probability of the WPC deterministic QPF exceeding 0.25 inches (~6mm) and the probability of frozen precipitation (snow/sleet).

The probability of the WPC 24-hour QPF being equal to or greater than 0.25 inches (~6 mm) is derived using a 24-hour deterministic QPF (disaggregated from the WPC medium range Day 4-5 and Day 6-7 deterministic QPF), and the 24-hour QPF from a multi ensemble system composed from the previous and most recent available Global Ensemble Forecast System (GEFS) and Canada Meteorological Center Ensemble (CMCE) forecasts (20 for each run of the GEFS and CMCE or 80 members in total).

The 24-hour deterministic WPC QPF is used as a mean and the 24-hour QPF from multi ensemble system members are used as variance to calculate a cumulative distribution function (CDF) to determine the probability of the WPC 24-hour QPF being equal to or greater than 0.25 inches (~6 mm).

The probability of frozen precipitation (snow/sleet) is calculated by using precipitation type fields from each of the members of the GEFS and CMCE forecasts (80 members aggregate). The precipitation type data is computed by applying a decision tree algorithm using 2-meter temperatures, and temperatures at the mandatory isobaric levels 925 hPa, 850 hPa, and 700 hPa. An ensemble probability of frozen precipitation is then created using a mosaic of the snow, sleet, and freezing rain precipitation types for all 80 ensemble system members.

Thus, the joint probability of the WPC deterministic QPF exceeding 0.25 inches (6mm) and the ensemble probability of frozen precipitation (snow/sleet) provides the probability of winter precipitation exceeding 0.25 inches (~6 mm).

This probability guidance output is manually modified by WPC medium range forecasters to create the final Winter Weather Outlook product.

b. Product Availability – These products are updated twice per day by 9 UTC and 2100 UTC.

c. Additional Information – None.