Experimental Weather Prediction Center (WPC) Day 4-7 Web-based Winter Weather Outlook

Part 1 – Mission Connection

a. Product Description – The experimental WPC Day 4-7 Web-based Winter Weather Outlook is a graphical 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 WPC medium range forecasters.

b. Purpose – This product supports advanced planning of hazardous winter weather for internal National Weather Service (NWS) and external partners.

c. Audience - The target audience includes NWS forecasters, the emergency management community, and anyone interested in winter weather forecasts.

d. 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.

e. Feedback Method – Comments regarding the experimental WPC Day 4-7 Web-based Winter Weather Outlook can be provided via electronic survey: http://www.nws.noaa.gov/survey/nws-survey.php?code=D47WWO or can be sent through WPC's online feedback form at: http://www.wpc.ncep.noaa.gov/mail_webmaster/.

Comments may also be provided to:

NOAA/NCEP
James Nelson (W/NP32)
5830 University Research Court
College Park, MD 20740
(301) 683-1484
James.A.Nelson@noaa.gov

Part II – Technical Description

a. Format and Science Basis – The experimental WPC Day 4-7 Web-based Winter Weather Outlook is created by calculating the joint probability of the WPC deterministic Quantitative Precipitation Forecast (QPF) exceeding 0.25 inches (~6 mm) and the probability of frozen precipitation (snow/sleet).

The probability of the WPC 24-hour QPF exceeding 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 QPFs), and the 24-hour QPF from a multi-ensemble system composed of the previous and most recently 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 the multi-ensemble system members are used as the variance to calculate a cumulative distribution function (CDF) to determine the probability of the WPC 24-hour QPF exceeding 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 and ice 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 (~6 mm) and the ensemble probability of frozen precipitation (snow/sleet) provide the probability of winter precipitation (snow/sleet) exceeding 0.25 inches (~6 mm) water equivalent.

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

b. Product Availability – The product is updated twice per day by 0900 UTC and by 1930 UTC.

c. Additional Information – None.