

NATIONAL WEATHER SERVICE INSTRUCTION 10-514

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Operations and Services

Public Weather Services, NWSPD 10-5

NATIONAL WINTER WEATHER PRODUCTS SPECIFICATION

NOTICE: This publication is available at: <http://www.nws.noaa.gov/directives/>.

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Signed _____ 10/11/2016

Andrew D. Stern Date

Director, Analyze, Forecast, and Support Office

National Winter Weather Products Specification

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1 Introduction. This procedural directive describes the winter weather products issued by the Weather Prediction Center (WPC) for the contiguous United States (CONUS), guidelines associated with these products, detailed content and format for each product type.

2 Probabilistic Heavy Snow and Icing Discussion (product category QPFHSD).

2.1 Mission Connection. WPC issues a heavy snow and icing discussion that provides the meteorological reasoning for the 24-hour probabilistic heavy snow and icing guidance graphics for Days One, Two, and Three. This text message is used by NWS field offices and the general meteorological community (private sector and the media), including the aviation community.

2.2 Issuance Guidelines.

2.2.1 Creation Software. WPC uses a text editor to issue the QPFHSD.

2.2.2 Issuance Criteria. The QPFHSD discussion follows the issuance of scheduled or event-driven updates to the probabilistic heavy snow and icing graphics. The discussion is routinely issued from September 15 to May 15.

2.2.3 Issuance Time. See Table 1, below.

2.2.4 Valid Time. See Table 1, below.

<i>WPC Probabilistic Heavy Snow and Icing Discussion</i>				
<i>Issuance Time (UTC)</i>	<i>Valid Time (UTC)</i>	<i>AWIPS ID</i>	<i>WMO Header</i>	<i>Product Description</i>
0930	1200 Day 1 to 1200 Day 3 (72 hour valid period)	QPFHSD	FOUS11 KWBC	Text providing meteorological reasoning for 24-hour heavy snow and icing probabilistic graphics for Days 1, 2, and 3
2130	0000 Day 1 to 0000 Day 3 (72 hour valid period)	QPFHSD	FOUS11 KWBC	Text providing meteorological reasoning for 24-hour heavy snow and icing graphics for Days 1, 2, and 3

Table 1. Product Schedule and Valid Times for Heavy Snow and Icing Discussion

2.2.5 Product Expiration Time. The product expires after either the valid time or a new product is issued.

2.3 Technical Description. The HSD follows the format and content described in this section.

2.3.1 Universal Geographic Code (UGC) Type. Not applicable.

2.3.2 Mass News Disseminator (MND) Broadcast Instruction Line. Not applicable.

2.3.3 MND Product Type Line. The QPFHSD header is Probabilistic Heavy Snow and Icing Discussion.

2.3.4 Content. WPC issues a heavy snow and icing discussion that provides the meteorological reasoning for the 24-hour Days One, Two, and Three probabilistic heavy snow and icing guidance graphics.

2.3.5 Format.

FOUS11 KWBC 210847
QPFHSD

PROBABILISTIC HEAVY SNOW AND ICING DISCUSSION
NWS WEATHER PREDICTION CENTER COLLEGE PARK MD
347 AM EST SAT DEC 21 2013

VALID 12Z SAT DEC 21 2013 - 12Z TUE DEC 24 2013

DAYS 1-3...

...PACIFIC NORTHWEST/NORTHERN ROCKIES...

OTHER THAN THE UNUSUALLY SLOW NAM AND FAST UKMET...WHICH LIE TOO CLOSE TO THE OUTER EDGES OF THE SOLUTION ENVELOPE TO WARRANT USEFUL CONFIDENCE IN THEIR RESPECTIVE DETAILS...MODELS INCLUDING THE ENSEMBLE MEANS...CLUSTER REASONABLY WELL WITH THE ARRIVAL AND PASSAGE OF A SHORTWAVE TROUGH MONDAY AND MONDAY NIGHT ... AND THUS WERE USED AS A BASIS TO DERIVE THE SNOW PROBABILITIES THAT MOSTLY AFFECT THE WINDWARD SLOPES OF THE WASHINGTON CASCADES INTO THE BITTERROOTS AND TETONS FOR DAY 2...WHERE LOW PROBABILITIES OF 8 INCHES OF SNOW EXIST. AS WITH PREVIOUS WINTRY WEATHER EVENTS TO AFFECT THE REGION...SNOW LEVELS WILL FALL SUBSTANTIALLY BEHIND THE TROUGH'S ASSOCIATED COLD FRONT...PERHAPS TO BELOW 1000 FEET IN SOME LOCATIONS.

THE PROBABILITY OF RECEIVING 0.25 INCHES OF FREEZING RAIN IS LESS THAN 10 PERCENT.

...SOUTHERN PLAINS INTO THE GREAT LAKES AND NEW ENGLAND...

MODEL SOLUTIONS FROM ALL GUIDANCE THE LAST COUPLE DAYS HAVE CLUSTERED TOWARD ONE ANOTHER...WITH THE FASTER NAM/ECMWF AND SLOWER GFS MOST INDICATIVE OF THE CONVERGENCE. THE INCREASED CONVERGENCE ALLOWS FOR MORE USEFUL BLENDING OF A SMALLER RANGE OF MORE LIKELY OUTCOMES TO PRODUCE THE SNOW/ICE PROBABILITIES. HOWEVER...THERE ARE STILL MANY UNRESOLVED ISSUES...MAINLY AS A RESULT OF DIFFERENT LIQUID EQUIVALENT TOTALS RESULTING FROM MESOSCALE ASCENT...PARTICULARLY BANDING. ON A LARGER-SCALE...AN INTERMEDIATE LOW TRACK FROM THE GFS/ECMWF FORM THE BASIS OF THE RAIN/SNOW LINE AND DETERMINING P-TYPES THROUGH THE PERIOD...WITH THEIR RESPECTIVE ENSEMBLE MEANS ALONG WITH THE UKMET/SREF MEAN ADDED TO ADDRESS THE SOLUTION SPREAD...WHILE THE NAM USED VERY LITTLE DUE TO ITS MORE NORTHERN AND FASTER LOW TRACK AND MORE QUESTIONABLE QPF.

THE RESULT IS A WIDE AND ELONGATED SWATH OF ICE...SOME POTENTIALLY QUITE

HEAVY...FORMING ALONG AND AHEAD OF THE LOW TRACK...WHILE A NARROWER SWATH OF HEAVY SNOW ACCOMPANIES THE DEFORMATION ZONE AHEAD OF THE MID/UPPER LEVEL TROUGH CENTER IMMEDIATELY NORTHWEST OF THE ICE. THE SNOW TOTAL FORECAST IS WELL AGREED UPON BY THE GUIDANCE...WITH RELATIVELY NARROW SPREAD...MAINLY A RESULT OF SLIGHT TIMING DIFFERENCES. THUS...MODERATE PROBABILITIES OF 8 INCHES OF SNOW SEEM WARRANTED FROM NORTHEAST KANSAS INTO SOUTHEAST IOWA...AND ALSO ACROSS NORTHERN MAINE...WITH THE MODERATE AREAS SURROUNDED BY A MUCH LARGER AREA OF HIGH PROBABILITIES OF 4 INCHES OF SNOW.

THE ICE FORECAST IS MORE PROBLEMATIC...AS THE LIQUID EQUIVALENT TOTALS GENERATED BY THE MODELS IS CONTAINED WITHIN THE MOIST AND OCCASIONALLY CONDITIONALLY UNSTABLE ENVIRONMENT THAT HAS THE POTENTIAL TO EXPERIENCE ERRORS DUE TO CONVECTIVE GRID-SCALE FEEDBACK. THE MAJORITY OF SOLUTIONS SHOW EVIDENCE OF THIS FROM THE EASTERN GREAT LAKES INTO NEW ENGLAND WHERE THE ICE FORECAST ARE HEAVIEST...AND WHILE SOME OF THE HIGHER TOTALS ARE POSSIBLE... EXACTLY HOW MUCH/WHERE/WHEN...IS TOO UNCLEAR AT THIS TIME...ALONG WITH P-TYPE UNCERTAINTIES...TO WARRANT HIGH CONFIDENCE IN SOME OF THE ROBUST ICE TOTALS GENERATED BY SOME OF THE SOLUTIONS OVER NEW YORK AND NEW ENGLAND...WHERE 2 AND 3-DAY ICE TOTALS OF 1 TO 2 INCHES ARE PROJECTED ACCORDING TO NAM/GFS/ECMWF/UKMET/CANADIAN. UNTIL SOME OF THE SMALLER-SCALE YET EXCEEDINGLY IMPORTANT DETAILS CAN BE RESOLVED...THE FORECAST FOCUSES MORE ON THE LARGER-SCALE ASPECTS THAT ARE EASIER TO FOLLOW AND ARE BETTER AGREED UPON WITHIN THE SOLUTIONS. EVEN WITH THIS MORE CONSERVATIVE APPROACH...PARTS OF NORTHERN NEW YORK/VERMONT INTO NEW ENGLAND HAVE THE POTENTIAL TO RECEIVE ICE TOTALS OF 0.5 TO 1.0 INCH THROUGH EARLY NEXT WEEK...WITH LOCALLY HIGHER AMOUNTS POSSIBLE.

JAMES

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2.4 Updates, Amendments, and Corrections. Products are updated, amended, or corrected, as necessary.

3 Probabilistic Heavy Snow & Icing Forecasts (prod cat. D[1-3]P [04S, 08S, 12S, 25Z]).

3.1 Mission Connection. WPC issues probabilistic heavy snow and icing guidance products to support the NWS winter weather watch / warning / outlook program, and to indicate heavy snow and icing threats to external users and partners. These products are issued in probabilistic form to better represent the forecast uncertainty associated with a particular event.

3.2 Issuance Guidelines.

3.2.1 Creation Software. WPC uses the National Centers Advanced Weather Interactive Processing System (N-AWIPS) software to generate these products.

3.2.2 Issuance Criteria. These are routine, schedule-driven products, issued as specified in Table 2. Charts are routinely issued from September 15 to May 15.

3.2.3 Issuance Time. Refer to Table 2.

3.2.4 Valid Time. Day 1 encompasses the forecast period from 12 to 36 hours on the 00 / 12 Coordinated Universal Time (UTC) model forecast cycle (00 UTC for the 0900 issuance and 12 UTC for the 2100 issuance), Day 2 encompasses the forecast period from 36 to 60 hours on the 00 / 12 UTC model forecast cycle, and Day 3 encompasses the forecast period 60-84 hours on the 00 / 12 UTC model forecast cycle. Refer to Table 2.

WPC Probabilistic Heavy Snow and Icing Graphical Guidance Product Schedule				
Issuance Time (UTC)	Valid Time (UTC)	AWIPS ID	WMO Header	Product Description
0900	1200 – 1200	D1P04S	PSBB04 KWNH	Day 1 Probability of Receiving at least 4” of Snow Accumulation Day 1 Probability of Receiving at least 8” of Snow Accumulation Day 1 Probability of Receiving at least 12” of Snow Accumulation Day 1 Probability of Receiving at least .25” of Ice Accumulation
	1200 – 1200	D1P08S	PSBB08 KWNH	
	1200 – 1200	D1P12S	PSBB12 KWNH	
	1200 – 1200	D1P25Z	PSBB25 KWNH	
2100	0000 – 0000	D1P04S	PSBB04 KWNH	Day 1 Probability of Receiving at least 4” of Snow Accumulation Day 1 Probability of Receiving at least 8” of Snow Accumulation Day 1 Probability of Receiving at least 12” of Snow Accumulation Day 1 Probability of Receiving at least .25” of Ice Accumulation
	0000 – 0000	D1P08S	PSBB08 KWNH	
	0000 – 0000	D1P12S	PSBB12 KWNH	
	0000 – 0000	D1P25Z	PSBB25 KWNH	
0900	1200 – 1200	D2P04S	PSBC04 KWNH	Day 2 Probability of Receiving at least 4” of Snow Accumulation Day 2 Probability of Receiving at least 8” of Snow Accumulation Day 2 Probability of Receiving at least 12” of Snow Accumulation Day 2 Probability of Receiving at least .25” of Ice Accumulation
	1200 – 1200	D2P08S	PSBC08 KWNH	
	1200 – 1200	D2P12S	PSBC12 KWNH	
	1200 – 1200	D2P25Z	PSBC25 KWNH	
2100	0000 – 0000	D2P04S	PSBC04 KWNH	Day 2 Probability of Receiving at least 4” of Snow Accumulation Day 2 Probability of Receiving at least 8” of Snow Accumulation Day 2 Probability of Receiving at least 12” of Snow Accumulation Day 2 Probability of Receiving at least .25” of Ice Accumulation
	0000 – 0000	D2P08S	PSBC08 KWNH	
	0000 – 0000	D2P12S	PSBC12 KWNH	
	0000 – 0000	D2P25Z	PSBC25 KWNH	
0900	1200 – 1200	D3P04S	PSBD04 KWNH	Day 3 Probability of Receiving at least 4” of Snow Accumulation Day 3 Probability of Receiving at least 8” of Snow Accumulation Day 3 Probability of Receiving at least 12” of Snow Accumulation Day 3 Probability of Receiving at least .25” of Ice Accumulation
	1200 – 1200	D3P08S	PSBD08 KWNH	
	1200 – 1200	D3P12S	PSBD12 KWNH	
	1200 – 1200	D3P25Z	PSBD25 KWNH	
2100	0000 – 0000	D3P04S	PSBD04 KWNH	Day 3 Probability of Receiving at least 4” of Snow Accumulation Day 3 Probability of Receiving at least 8” of Snow Accumulation Day 3 Probability of Receiving at least 12” of Snow Accumulation Day 3 Probability of Receiving at least .25” of Ice Accumulation
	0000 – 0000	D3P08S	PSBD08 KWNH	
	0000 – 0000	D3P12S	PSBD12 KWNH	
	0000 – 0000	D3P25Z	PSBD25 KWNH	

Table 2. Probabilistic Heavy Snow and Icing Chart Issuance and Valid Times

3.2.5 Product Expiration Time. The product expires after the valid time or a new probabilistic heavy snow and icing forecast is issued, whichever comes first.

3.3 Technical Description. Charts should follow the format and content described in this section.

3.3.1 UGC Type. Not applicable.

3.3.2 MND Broadcast Line. Not applicable.

3.3.3 MND Header. Not applicable.

3.3.4 Content. These charts depict the probability of receiving specific thresholds of accumulated snow or ice in a 24-hour time period.

- a. Snowfall - closed lines represent the probability (slight, moderate, and high) that enclosed areas will receive equal to or greater than a specific threshold accumulation (4", 8" or 12") of snowfall in a 24 hour period. Note: The 4" threshold on the Snowfall Probability Graphic is drawn only for elevations less than 7,500 feet. Elevation criteria are not imparted for the 8" and 12" thresholds.
- b. Freezing Rain - depicts the probability in the same manner and time period as snowfall, but with an accumulation threshold of 0.25" (one quarter of an inch) of freezing rain.
- c. The forecaster probability thresholds are:
 - (1) SLIGHT (SLGT): 10% to less than 40% chance of occurrence within the outlined area.
 - (2) MODERATE (MDT): 40% to less than 70% chance of occurrence within the outlined area.
 - (3) HIGH: 70% or greater chance of occurrence within the outlined area.

Notes:

- a. At times, the forecasters may use only one (slight) or two (slight and moderate) isolines for the forecast. This simply implies there is no moderate risk (only a slight risk is indicated) or high risk (only a slight and moderate risk are shown), respectively.
- b. Specific (deterministic) accumulations for a particular location in the United States can be obtained from the National Weather Service home page.
- c. The probabilistic graphics combined with the deterministic forecasts provide a user both the most likely amount expected from an event and the potential the event will produce accumulations in excess of specific thresholds.

3.3.5 Format Examples. Examples of Day 1 Snow and Ice Accumulation charts follow. The format for Day 2 and Day 3 charts is identical and examples are not provided.

3.3.5.1 D1P04S Example.

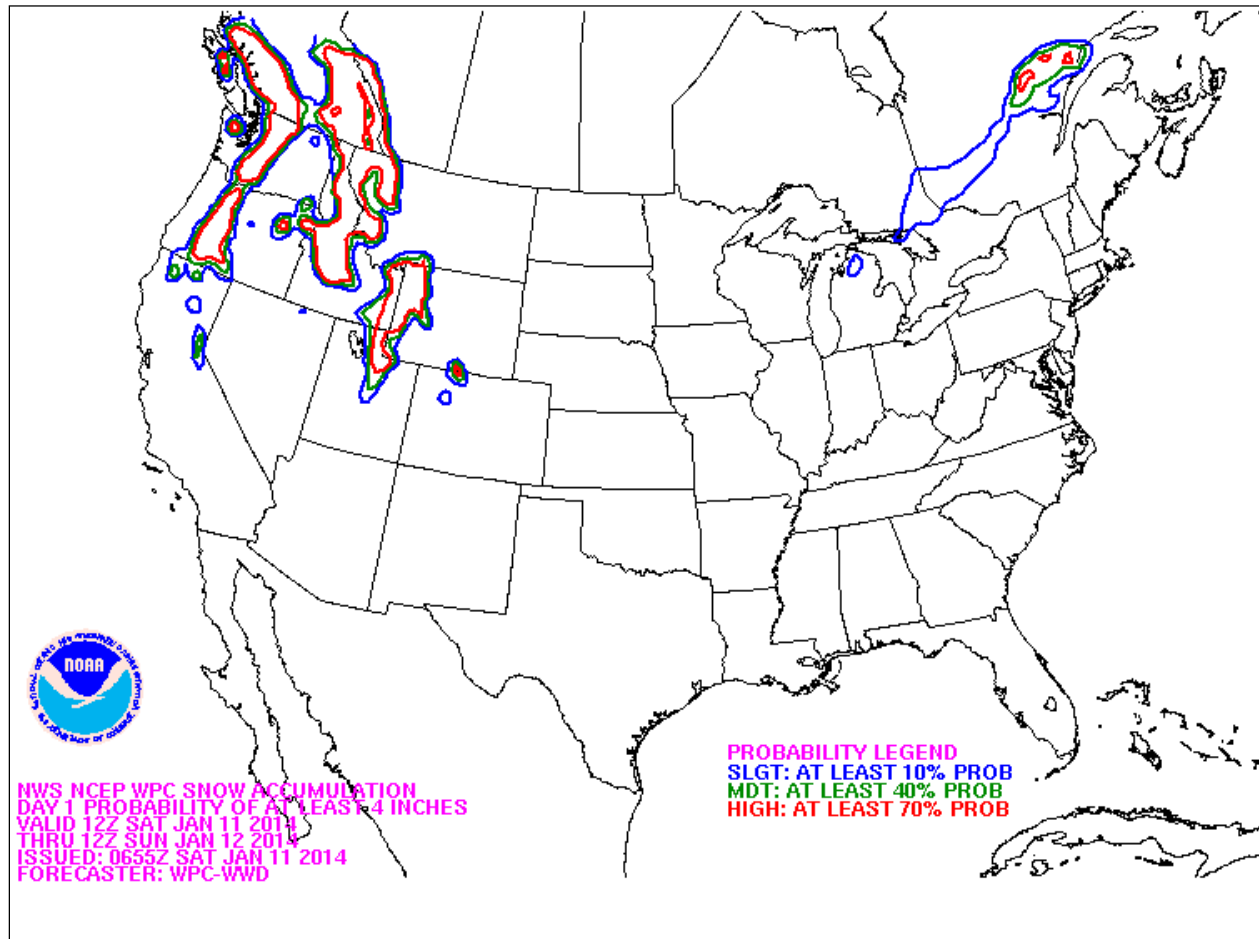


Figure 1. D1P04S - Day 1 Probability of Receiving at Least 4" Snow

3.3.5.2 D1P08S Example.

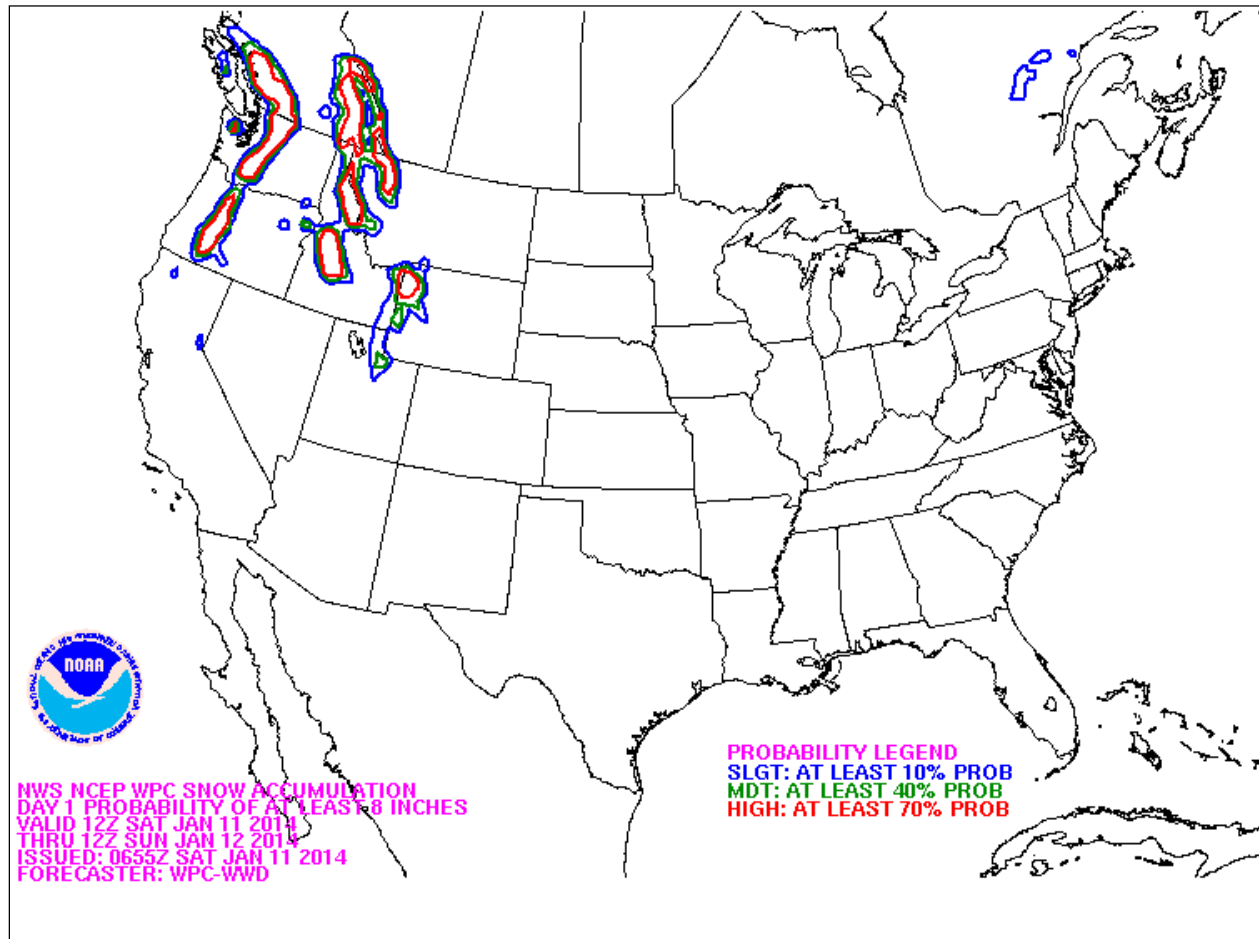


Figure 2. D1P08S - Day 1 Probability of Receiving at Least 8" Snow

3.3.5.3 D1P12S Example.

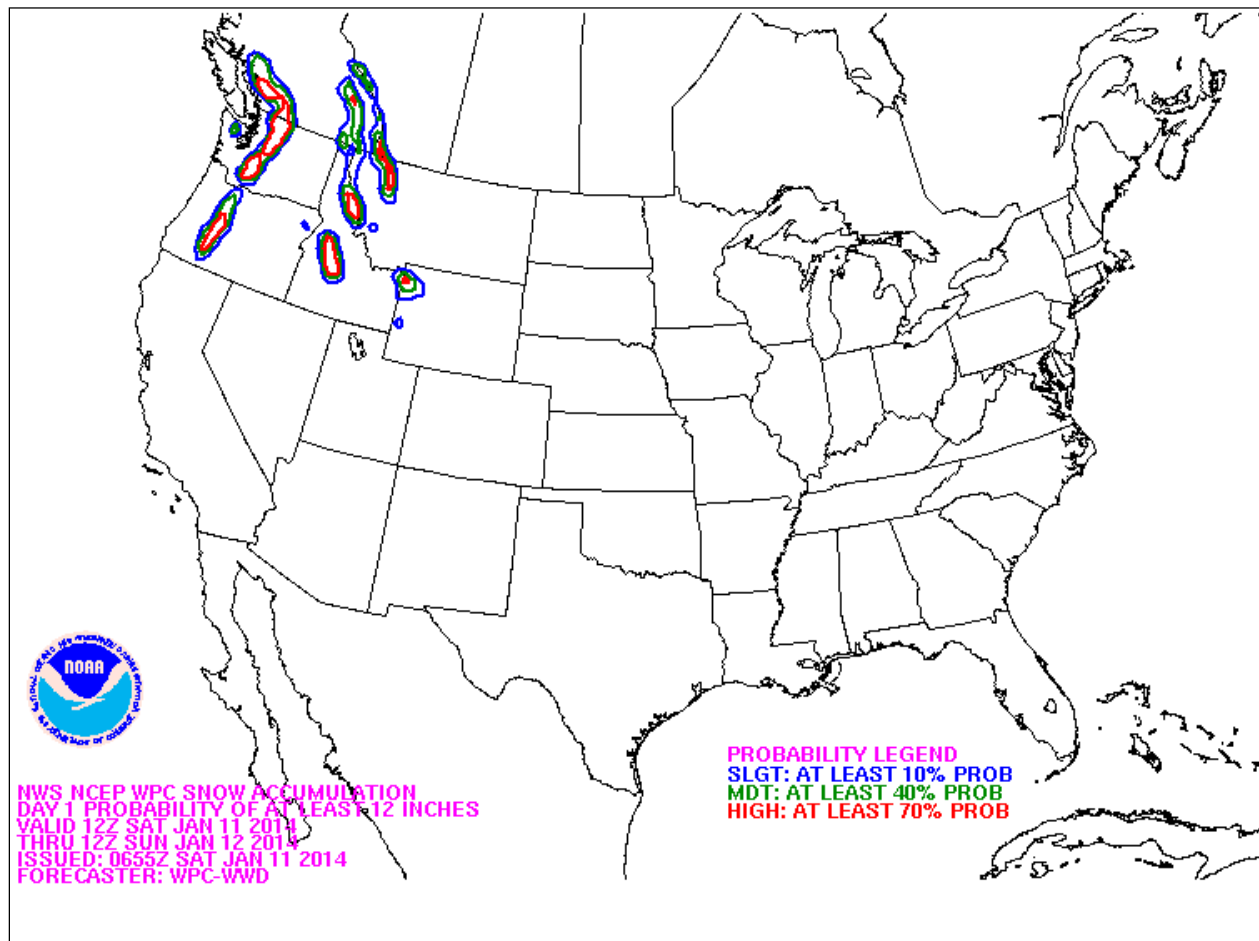


Figure 3. D1P12S - Day 1 Probability of Receiving at Least 12" Snow

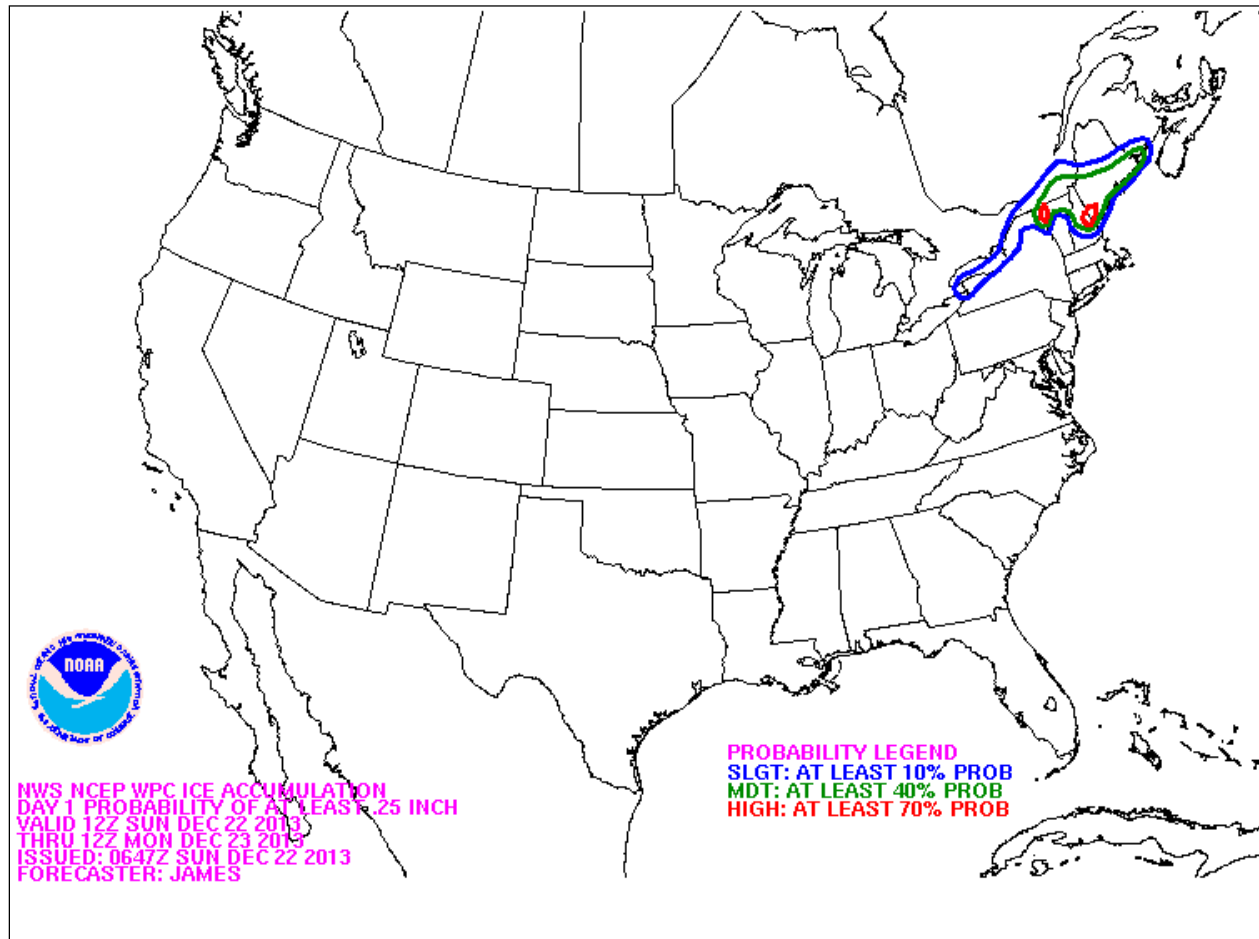
3.3.5.4 D1P25Z Example.

Figure 4. D1P25Z - Day 1 Probability of Receiving at Least 0.25" Ice

3.4 Updates, Amendments, and Corrections. WPC does not update / amend this product, but will correct it for format and grammatical errors as required.

4 **72-Hour Low Tracks Graphic (product category LWTK72).**

4.1 Mission Connection. WPC issues a graphical chart which depicts the initial and forecast location and central pressure of significant surface lows impacting the CONUS in 12-hour increments out to 72 hours into the future. This graphic is used by NWS field offices and the general meteorological community including the private sector and the media.

4.2 Issuance Guidelines.

4.2.1 Creation Software. WPC uses the N-AWIPS software to generate this product.

4.2.2 Issuance Criteria. This is a schedule-driven product, routinely issued from September 15 to May 15.

4.2.3 Issuance Time. The low tracks graphic is issued at 0900 UTC and 2100 UTC daily, or when any corrections or amendments are needed.

4.2.4 Valid Time. The low tracks graphic is valid until expiration time or until a new low tracks graphic is issued.

4.2.5 Product Expiration Time. The product expires at expiration time or when a new low tracks graphic is issued, whichever comes first.

4.3 Technical Description. The chart should follow the format and content described in this section.

4.3.1 UGC Type. Not applicable.

4.3.2 MND Broadcast Instruction Line. Not applicable.

4.3.3 MND Product Type Line. Not applicable.

4.3.4 Content. The chart depicts the initial and forecast location and central pressure of surface lows associated with significant winter weather in the CONUS in 12-hour increments out to 72 hours into the future (ending at 12 UTC on the 2100 UTC issuance and ending at 00 UTC on the 0900 UTC issuance). The initial position and central pressure of existing lows at 00 UTC or 12 UTC are depicted in black, with initial model positions of existing lows shown in cyan. WPC's forecast low positions and track forecast are depicted in black. The WPC forecast central pressure and all available computer model forecast positions for a given time period are depicted with symbols in colors matching the valid date and time of the forecast, as shown in the index. The spread of model forecast positions provides users with a sense of the uncertainty associated with the forecast.

4.3.5 Format.

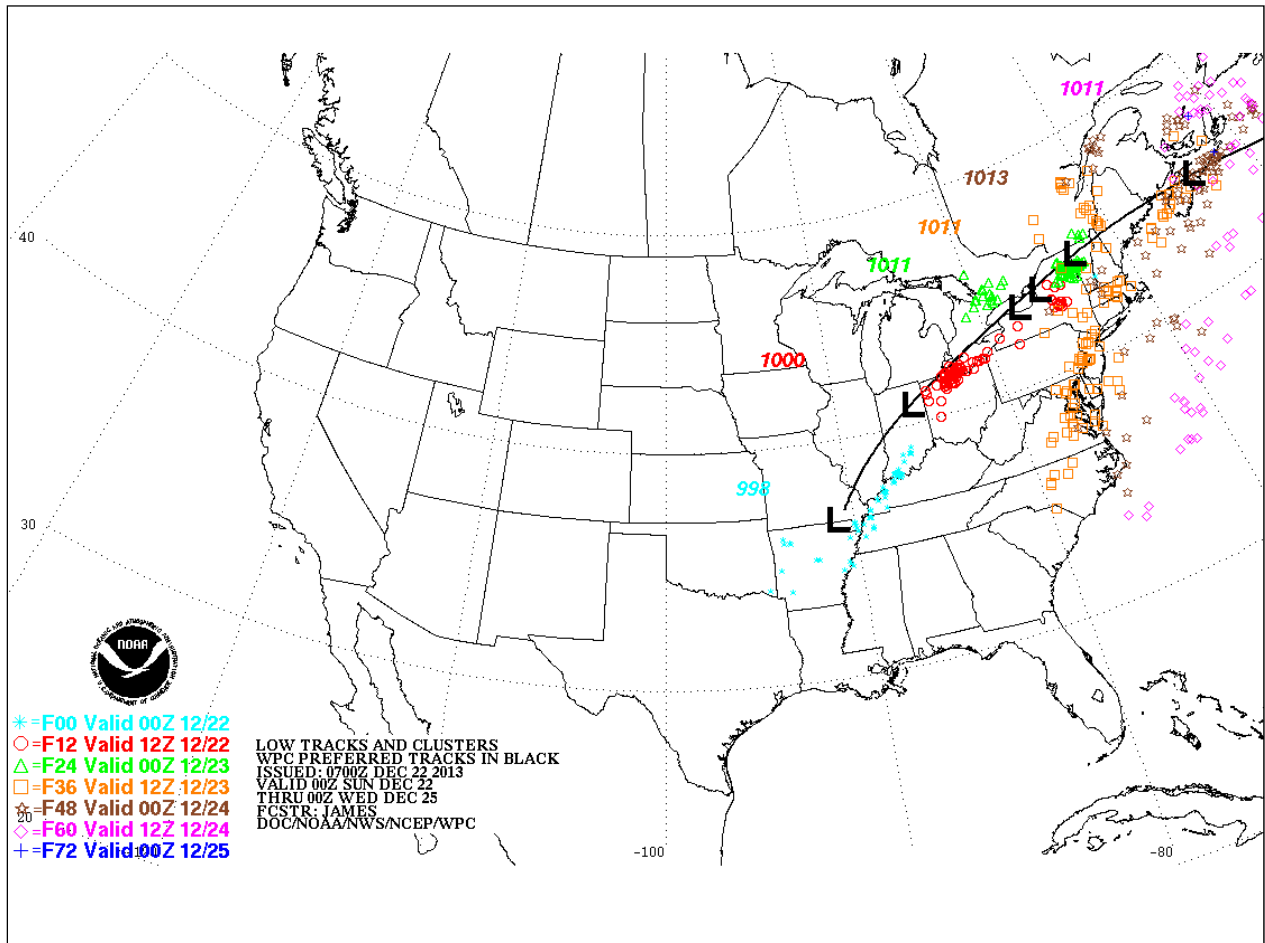


Figure 5. LWTK72 – 72-Hour Low Tracks

4.4 Updates, Amendments, and Corrections. WPC does not update / amend this product, but will correct it for format and grammatical errors as required.

5 72-Hour Low Tracks Graphic (Non-Technical) (no product ID or header).

5.1 Mission Connection. WPC issues a non-technical version of the 72-hour low tracks graphic chart which depicts the forecast location of significant surface lows impacting the CONUS in 12-hour increments out to 72 hours into the future. Due to its non-technical nature, this graphic can be used by the public as well as the general meteorological community, including the private sector and the media.

5.2 Issuance Guidelines.

5.2.1 Creation Software. WPC uses the N-AWIPS software to generate this product.

5.2.2 Issuance Criteria. This is a schedule-driven product, routinely issued from September 15 to May 15.

5.2.3 Issuance Time. The non-technical low tracks graphic is issued at 0900 UTC and 2100 UTC daily, or when any corrections or amendments are needed.

5.2.4 Valid Time. This product is valid until expiration time or until a new non-technical low tracks graphic is issued.

5.2.5 Product Expiration Time. The product expires at expiration time or when a new non-technical low tracks graphic is issued, whichever comes first.

5.3 Technical Description. The chart should follow the format and content described in this section.

5.3.1 UGC Type. Not applicable.

5.3.2 MND Broadcast Instruction Line. Not applicable.

5.3.3 MND Product Type Line. Not applicable.

5.3.4 Content. The chart depicts the forecast location of surface lows associated with significant winter weather in the CONUS in 12-hour increments out to 72 hours into the future (ending at 12 UTC on the 2100 UTC issuance and ending at 00 UTC on the 0900 UTC issuance). The forecast positions and track of the low are displayed in white. The initial position of existing lows at 00 UTC or 12 UTC will be depicted in red without circles. The yellow circles around each forecast low position represent a 75% probability that the observed low will be located within the circle. Note: This probability is derived from the previous season's verification data.

5.3.5 Format.

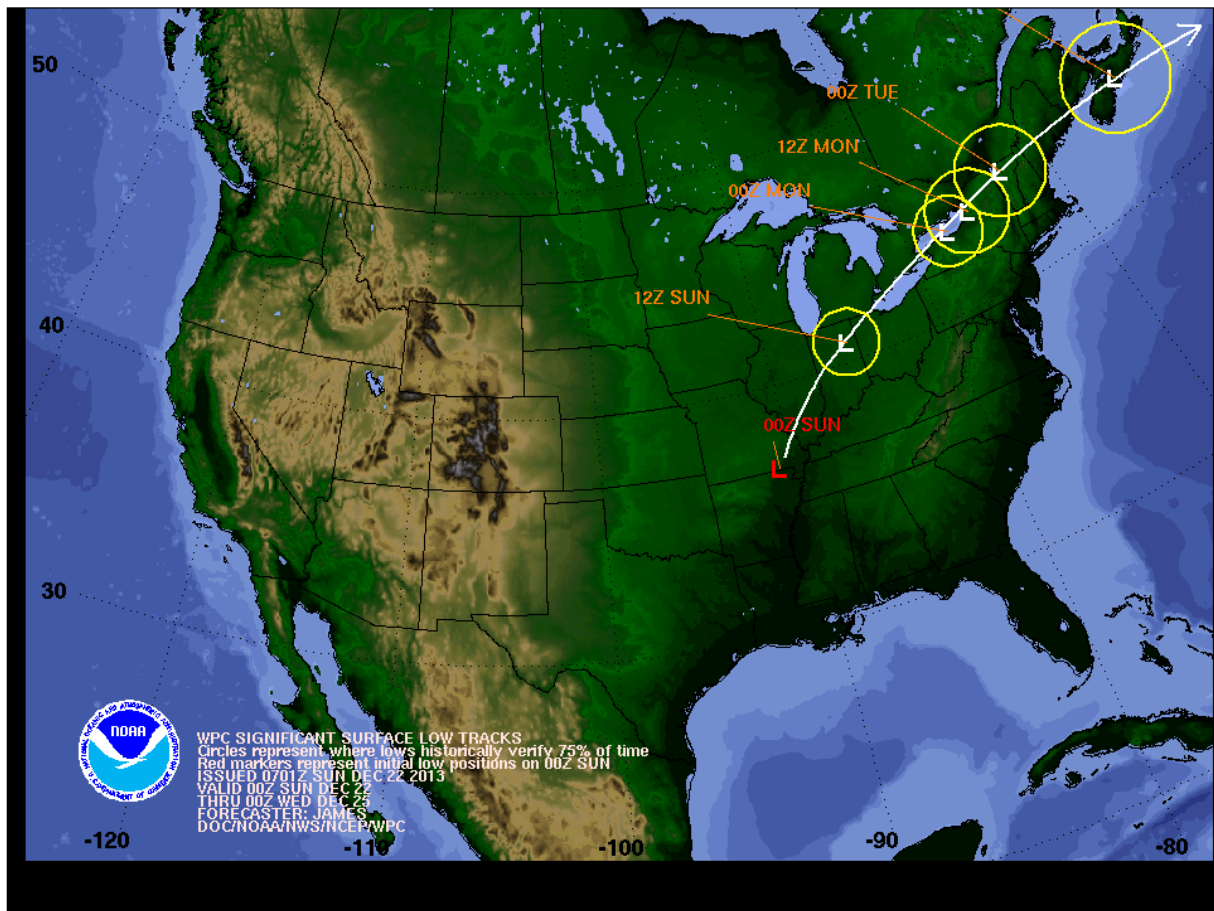


Figure 6. 72-Hour Low Tracks (Non-Technical)

5.4 Updates, Amendments, and Corrections. WPC does not update / amend this product, but will correct it for format and grammatical errors as required.