

**NATIONAL WEATHER SERVICE INSTRUCTION 10-513  
OCTOBER 12, 2022**

**Operations and Services  
Public Weather Services, NWSPD 10-5**

**WFO WINTER WEATHER PRODUCTS SPECIFICATION**

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

**OPR:** W/AFS21 (S. Perfater)

**Certified by:** W/AFS2 (G. Schoor)

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**SUMMARY OF REVISIONS:** This instruction supersedes NWSI 10-513, “*WFO Winter Weather Products Specification*,” effective May 7, 2020. The following revisions were made to this instruction:

1. Corrected an incorrect VTEC code label in Table 3.
2. Improved wording to impact-based warnings to allow for means of alternative messaging in lieu of warnings for locations at or above criteria when impacts are not expected to warrant alerting due to local climate and the risk of over-warning.
3. Reflected the addition of Impact Based Warning Tags for Snow Squall Warnings.
4. Updated Appendix D to include revised watch/warning thresholds for Central, Southern, and Western Regions.

**ALLEN.ALLISON.  
L.1365831072**

Digitally signed by  
ALLEN.ALLISON.L.1365831072  
Date: 2022.09.28 16:59:23 -04'00'

September 28, 2022

Allison Allen  
Director  
Analyze, Forecast and Support Office

Date

**WFO Winter Weather Products Specification**

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**1 Introduction**

This Instruction describes winter weather products issued by National Weather Service (NWS) Weather Forecast Offices (WFOs). It provides guidelines associated with these products, along with detailed content and format for each product type.

**2 Winter Weather Event and Definitions**

**2.1 Winter Weather Event**

A winter weather event is a meteorological phenomenon that affects public safety, transportation, and/or commerce, and typically occurs during the climatological winter season. Examples of winter weather events include snow, freezing rain, sleet, and wind chill.

## **2.2 Winter Weather Event Beginning Time**

A winter weather event begins when public safety, transportation and/or commerce are adversely affected as a direct result of the expected or occurring meteorological conditions.

## **2.3 Winter Weather Event Ending Time**

A winter weather event ends when meteorological conditions no longer pose a threat to public safety, transportation and/or commerce, or when such conditions are forecast to end.

## **3 Winter Weather Product Headlines**

The NWS winter weather-warning program will use specific product headline terms to denote forecast certainty and severity to increase public awareness and promote a proper response to impending hazardous winter weather events. These terms are Outlook, Watch, Warning, and Advisory.

It is critical that forecasters at WFOs affected by winter weather events reach a forecast consensus. This will enhance consistency with respect to geographical and/or time discontinuities, especially for outlooks and watches. Proper coordination will enable the NWS to speak with one voice when alerting users to the potential for such an event.

### **3.1 Outlook**

An outlook is used to indicate that a hazardous winter weather event may develop. It is intended to provide information to those who need considerable lead-time to prepare for the event.

### **3.2 Watch**

A watch is used when the risk of a hazardous winter weather event has increased, but its occurrence, location, and/or timing is still uncertain. It is intended to provide suitable lead-time for those who need longer planning lead times to set certain plans in motion before the event starts.

### **3.3 Warning and Advisory**

These products are issued when a hazardous winter weather event is occurring, is imminent, or has a very high probability of occurrence. A warning is used for conditions posing a threat to life or property. An advisory is issued for less serious conditions that cause significant inconvenience and, if caution is not exercised, could lead to situations that may threaten life and/or property.

## **4 Forecaster Judgment**

Protection of life and property takes precedence in decision-making processes. As such, criteria for winter storm watches, warnings and advisories are considered as guidance only, not strict thresholds. Forecasters may issue products based upon lower criteria if the event in question poses a significant threat to life due to timing or other circumstances. For example, an advisory or warning may be appropriate for a minor snowfall event that takes place near rush hour, even if forecast amounts do not meet strict criteria.

## **5 Winter Storm Outlook (Product Category HWO)**

## **5.1 Mission Connection**

Winter storm outlooks provide our users and partners from three to seven (3-7) day advance notice of a hazardous winter weather event, which has the potential to threaten life or property. The primary goal of this product is to provide information to those who need considerable lead time to prepare for the event.

## **5.2 Issuance Guidelines**

WFOs may use the Hazardous Weather Outlook (HWO) to issue winter weather outlooks. Winter weather outlooks should follow the issuance guidelines described in NWS Instruction (NWSI) 10-517.

## **5.3 Technical Description**

Winter weather outlooks should follow the format and content described in NWSI 10-517.

# **6 Winter Weather Watches, Warnings and Advisories (Product Category WSW)**

## **6.1 Mission Connection**

Winter weather watches, warnings and advisories provide our users and partners with advance notice of hazardous winter weather events which have the potential to threaten life or property. The primary goal of these products is to provide users and partners enough lead time to take appropriate action, and to describe the severity, location, timing and evolution of hazardous winter weather events occurring or forecast to occur.

## **6.2 Issuance Guidelines**

### **6.2.1 Creation Software**

WFOs will use the Advanced Weather Interactive Processing System (AWIPS) Graphical Hazards Generator (GHG) as the primary software to create and issue WSWs.

## **6.3 Winter Weather Products**

WFOs will issue the following winter weather products described in Table 1 below. Any values described in the table are for guidance only, as criteria are set locally in coordination with core partners. Factors such as public impact, storm timing, and snowfall rate in addition to standard accumulation criteria also inform issuance.

These products will follow the WHAT, WHERE, WHEN, IMPACTS, ADDITIONAL DETAILS and PRECAUTIONARY/PREPAREDNESS ACTIONS format as shown in Table 4. Further clarification of the content within these sections is described in Descriptive Text (Section 6.3.4.2.2).

The WHERE section will specifically point users toward the affected areas and WHEN will focus in on the most pertinent time period when the hazard is expected. The IMPACTS section will specify how users are likely to be affected by the hazard. ADDITIONAL DETAILS (optional) will provide supplemental information as necessary and PRECAUTIONARY/PREPAREDNESS will add Call to Action Statements to help users protect life and property.

**Table 1: Winter Weather Products (Product Category WSW)**

Watch Product Name	Description
Wind Chill Watch	Conditions are favorable for wind chill temperatures to meet or exceed <u>local</u> Wind Chill Warning criteria.
Winter Storm Watch	Conditions are favorable for a winter weather event having one or more hazards (i.e., snow, snow and blowing snow, snow and ice, snow and sleet, snow, ice and sleet, freezing rain, or lake effect snow) to meet or exceed <u>local</u> Winter Storm Warning criteria.
Warning Product Name	Description
Blizzard Warning	Sustained wind or frequent gusts greater than or equal to 35 mph accompanied by falling and/or blowing snow, frequently reducing visibility to less than 1/4 mile for three hours or more.
Ice Storm Warning	Ice accumulation meeting or exceeding locally defined warning criteria (typical value is 1/4 inch or more on an elevated horizontal flat surface).
Wind Chill Warning	Wind chill temperatures reaching or exceeding locally defined warning criteria (typical value is -18°F or colder).
Winter Storm Warning	<p>Winter weather event including:</p> <ol style="list-style-type: none"> <li>1. <b>Singular Event:</b> snow, lake effect snow (at regional discretion), ice, or sleet meeting or exceeding locally defined 12 and/or 24 hour warning criteria.</li> <li>2. <b>Multiple Event:</b> a combination of snow, ice, or sleet and blowing snow with at least one of the precipitation elements meeting or exceeding locally defined 12 and/or 24 hour warning criteria.</li> <li>3. <b>Impact Driven:</b> Winter storm is forecast but accumulations will not meet traditional criteria (see Section 6.2.2.3).</li> </ol>
Lake Effect Snow Warning (implemented at regional discretion)	Widespread or localized lake-induced snow squalls or heavy snow showers which produce snowfall accumulation meeting or exceeding locally defined warning criteria. Lake effect snow usually develops in narrow bands and impacts a limited area. Regions retain the option to issue Winter Storm Warnings for lake effect snow.
Advisory Product Name	Description
Wind Chill Advisory	Wind chill temperatures reaching or exceeding locally defined advisory criteria, but remaining below warning criteria.
Winter Weather Advisory	Winter weather event having one or more hazards (i.e., snow, snow and blowing snow, snow and ice, snow and sleet, snow, ice and sleet, freezing rain, or lake effect snow) meeting or exceeding locally defined 12 and/or 24 hour advisory criteria for at least one of the precipitation elements, but remaining below warning criteria or based on Impact Driven criteria (see Section 6.2.2.3).

### 6.3.1 Multiple Segments

If there is a high level of confidence that more than one discernible winter weather event (e.g., Winter Storm Warning and Ice Storm Warning) will occur within a WFO's warning area, or if the timing and/or accumulation is different, then the forecast team will issue separate WSW segments for each warning event.

Example: A winter storm is expected to produce a band of mixed precipitation across the northern sections of the local warning area (Zones 001-010) and an area of mostly ice accumulation of more than ½ inch in the southern portion of the warning area (Zones 011-016).

This scenario would require two separate warnings designated by two segments in one WSW. The two warnings would be as follows:

- Winter Storm Warning for Zones 001 to 010 (mixed precipitation)
- Ice Storm Warning for Zones 011 to 016 (ice)

Note: The wording in the “WHAT” section of the Warning will delineate the particular winter hazard for that area.

### 6.3.2 Issuance Criteria

#### 6.3.2.1 Winter Weather Watch Issuance Criteria

WFOs will issue a winter weather watch when conditions are favorable for a hazardous winter weather event to develop over part or all of the forecast area, but its occurrence is uncertain. WFOs should issue winter weather watches with as much lead time as possible when there is a 50 percent or greater chance of a hazardous winter weather event meeting or exceeding local warning and/or impact criteria. Watches are typically issued with lead times of 36 to 48 hours, and are encouraged to be issued with longer lead times (i.e., in the 3 to 4 day time period) when confidence is high. Care should be taken to balance the need to inform the public of impending hazardous weather with the need to avoid reducing the effectiveness of watches by issuing too many false alarms.

#### 6.3.2.2 Winter Weather Warning and Advisory Criteria

WFOs will issue winter weather warnings or winter weather advisories when hazardous winter weather is occurring, imminent, or has a high probability of occurrence over part or all of the forecast area. WFOs should issue winter weather warnings and winter weather advisories with as much lead time as possible for the first, second, or occasionally third forecast periods (fourth period on rare occasions), when there is an 80 percent or greater chance of a hazardous winter weather event meeting or exceeding local warning, advisory and/or impact criteria.

#### 6.3.2.3 Impact Criteria

The following is an example of impact criteria: A winter storm is forecast but accumulations will not meet published criteria. However, if it is early in the season or during a critical time of day such as rush hour when the impact will likely be high, then a Winter Storm Warning might be warranted. The forecaster may message winter weather hazards based on locally defined impacts through core partner feedback, and coordinate with surrounding WFOs for a consistent message. Alternatively, WFOs can also opt for means of alternative messaging in lieu of the existing suite

of winter warnings for locations at or above criteria when impacts are not expected to warrant alerting due to local climate or elevation and the risk of over-warning.

**6.3.2.4 Forecast Snowfall/Sleet Criteria**

Winter Storm Warnings and Winter Weather Advisories are based on an average value (rounded up to the nearest inch) of the forecast snowfall or sleet range and meets or exceeds the 12- and/or 24- hour local criteria depending on the duration of the event. The event duration is from the time winter weather precipitation begins to when it ends.

**Table 2: Example of Minimum Snowfall/Sleet Forecast Criteria for Winter Storm**

Local Warning Criteria (Inches)	Forecast Range (Inches)	Midpoint Value (Inches)	Issue Warning?
4	3 to 5	4	Yes
	2 to 4	3	No
6	4 to 8	6	Yes
	3 to 6	4.5	No
8	5 to 10	7.5	Yes (round up to 8)
	4 to 8	6	No
12	10 to 14	12	Yes
	6 to 12	9	No

**6.3.3 Issuance Time**

Winter weather watches, warnings and advisories are event-driven products.

**6.3.3.1 Winter Storm Watch Issuance Time**

WFOs should issue the initial watch as soon as confidence is high enough that an event may occur. However, a watch should not be issued within 12 hours of the event start time – by this time a decision should be made to either cancel or upgrade to a warning or advisory. Subsequent updates should be issued at least once every 12 hours until a warning or advisory is issued or the watch is cancelled.

**6.3.3.2 Winter Weather Warning/Advisory Issuance Time**

A WFO should initially issue a warning or advisory when a hazardous winter weather event is expected to meet or exceed local warning/advisory and/or impact criteria. WFOs should issue updated warnings or advisories at least once every six to eight hours until the event ends or is cancelled.

**6.3.4 Valid Time**

A watch, warning or advisory is valid for the time period as indicated in the primary Valid Time Event Code (P-VTEC) line and described in the headline. One can have multiple lines of the same event across a County Warning Area (CWA), especially if the precipitation is spreading slowly across the CWA.



#### **6.3.4.1 Event Beginning Time**

The event beginning time is when the hazardous event is expected to begin as defined in Section 2.2.

The event beginning time is placed in the P-VTEC line when issuance time is prior to the event beginning time. Otherwise, the event beginning time is zeroed out to indicate the event has begun (e.g., 000000T0000Z).

The event beginning time is also described in the watch, warning or advisory headline. If the issuance time is three or more hours prior to the event beginning time, the event beginning time is placed in the warning or advisory headline (e.g., WINTER STORM WARNING IN EFFECT FROM **10 PM THIS EVENING** TO 9 AM EST MONDAY). Otherwise, the event beginning time is omitted (e.g., WINTER STORM WARNING IN EFFECT UNTIL 9 AM EST MONDAY).

#### **6.3.4.2 Event Ending Time**

The event ending time is when the hazardous event is expected to end. The event ending time is placed in the P-VTEC line and described in the watch, warning, or advisory headline. The event ending time can match the product expiration time if the warning or advisory is in effect for eight hours or less.

#### **6.3.4.3 Product Expiration Time**

The product expiration time is the time when users can expect to receive an updated WSW.

#### **6.3.4.4 Watch Expiration Time**

The watch product expiration time is generally 12 hours after the issuance time and is placed at the end of the Universal Geographic Code (UGC) string.

#### **6.3.4.5 Warning or Advisory Expiration Time**

The warning/advisory product expiration time is generally 6 to 8 hours after the issuance time and should coincide with the next expected update or when the event is forecast to end. The product expiration time is placed in the UGC line.

### **6.4 Technical Description**

Winter Storm Watches, Warnings, and Advisories will follow the format and content described in this section.

#### **6.4.1 Universal Geographic Code (UGC) Type.**

WSWs will use the zone (Z) form of the UGC.

#### **6.4.2 Mass News Disseminator (MND) Broadcast Line**

The WSW MND line is “URGENT-WINTER WEATHER MESSAGE”.

## 6.5 WSW Content

The WSW may contain an overview section, but will include segmented forecast information.

### 6.5.1 Overview Section

The WSW overview section is **optional** and should be as **concise** as possible. If included, it should contain at least one of the following items:

#### 6.5.1.1 Overview Headline

A general headline statement that summarizes the hazardous weather threat, area affected and expected time of development. The overview headline will begin and end with three periods (...). For example:

...ANOTHER MAJOR WINTER STORM TO IMPACT THE PACIFIC NORTHWEST ON MONDAY AND TUESDAY...

...ICE STORM WARNINGS ISSUED FOR CENTRAL PENNSYLVANIA TODAY...

#### 6.5.1.2 Overview Text

The body of the overview section should contain a **brief**, non- technical description of the developing winter storm event. The description may include the location and movement of large-scale weather features (e.g., fronts, low pressure systems). Precede the first line of this descriptive information by a period (.). The overview text section should be as brief as possible, and not contain duplicate information already provided in other products.

#### 6.5.1.3 Segmented Forecast Information

Each segment of the WSW product will include a headline followed by text describing the reason(s) the WSW product was issued. Each segment describes a hazardous winter weather event(s) for the same geographical area.

#### 6.5.1.4 Watch, Warning, Advisory Headline

The headline will include the following elements in the order shown:

- Leading ellipsis (...)
- Valid WSW product name listed in Table 1.
- Event action phrase defined in Table 3.
- Event beginning day and time phrase defined in Appendix C (when applicable).
- Event ending day and time phrase defined in Appendix C (when applicable).
- Trailing ellipsis (...)

Exception: When necessary (e.g., mountainous terrain), areal descriptive terms and elevation indicators are permitted after the ending day and time phrase and before the trailing ellipsis.

#### Generic Headline Format:

Used when watch, warning or advisory product is in effect:

...<watch product name> <event action phrase> FROM <event beginning date and time phrase>

TO <event ending date and time phrase>...

Used when a warning or advisory product issuance time equals event beginning time:

...<warning product name> <event action phrase> UNTIL <event ending date and time phrase>...

Used to cancel a watch, warning or advisory prior to event beginning date and time:

...<watch product name> <event action phrase>...

Event Action Phrase. The event action phrase in the headline corresponds with the VTEC action code. Only the following event action phrases in Table 3 will be used in WSW headlines:

**Table 3: Event Action Phrases for WSW Headlines**

VTEC Action Code	Description	Required Event Action Phrase	Include Time/Date?
NEW	Initial watch, warning, advisory issuance	IN EFFECT	Yes
EXA	Expansion of watch/warning/advisory area.	IN EFFECT	Yes
EXB	Expansion of watch/warning/advisory area and change to advisory valid time.	IN EFFECT	Yes
CON	Continuation or update of watch/warning/advisory.	REMAINS IN EFFECT	Yes
EXT	Extend/shorten advisory/watch /warning start and/or ending date/time.	NOW IN EFFECT	Yes
CAN	Watch/warning/advisory cancelled prior to event end time.	IS CANCELLED	No
EXP	Warning/Advisory approaching the expiration time. Used up to 30 minutes prior to advisory end time. *Note: Not valid for Watches.	WILL EXPIRE AT	Yes
	Warning/Advisory has expired. Used up to 30 minutes after advisory expiration has passed. *Note: Not valid for Watches.	HAS EXPIRED	No
UPG	Upgrade watch to warning/advisory or advisory to warning or warning to warning. No headline.		No

WSW Headline Examples:

Initial issuance:

...WINTER STORM WATCH IN EFFECT FROM SUNDAY MORNING THROUGH MONDAY MORNING...

...BLIZZARD WARNING IN EFFECT FROM 7 AM THIS MORNING TO 11 AM EST WEDNESDAY...

Update:

...WINTER STORM WATCH REMAINS IN EFFECT FROM SUNDAY MORNING

THROUGH MONDAY MORNING...

...BLIZZARD WARNING REMAINS IN EFFECT UNTIL 11 AM EST WEDNESDAY...

Extended event end time:

...WINTER STORM WATCH NOW IN EFFECT FROM SUNDAY MORNING THROUGH MONDAY AFTERNOON...

Shortened event end time:

...BLIZZARD WARNING REMAINS IN EFFECT UNTIL 5 PM EST WEDNESDAY...

Expansion of area and shortened event start and end time:

...WINTER STORM WATCH IN EFFECT FROM SATURDAY EVENING THROUGH SUNDAY EVENING...

Cancellation prior to event end time/date:

...WINTER STORM WATCH CANCELLED...

...BLIZZARD WARNING CANCELLED...

Expiration statement up to 30 minutes prior to event end time:

...BLIZZARD WARNING WILL EXPIRE AT 5 PM EST WEDNESDAY...

Expiration statement up to 30 minutes after event end time:

...BLIZZARD WARNING HAS EXPIRED...

### 6.5.2 Descriptive Text (see Table 4 for message format)

For all winter storm watch products the “WHAT” bullet will begin with the expected phenomenon/(a) followed by the word “**possible**”. For all winter weather warning/advisory products the “WHAT” bullet will begin with the expected phenomenon/(a) followed by the word “**expected.**” The wording of the phenomenon will remain editable for forecasters. For watch products, the word “possible” is mandatory and will always be followed by a period (.). For warnings and advisories, the “expected” term may be amended during an event to other terms including “ongoing” or “continuing”, or the ongoing hazard may be described instead of using the word “expected” (i.e., “heavy snow.”).

For the products below, more specific wording will be required:

- In a Winter Storm Watch when only Blizzard Conditions are possible, the WHAT bullet will read “**Blizzard conditions possible.**”
- In a Winter Storm Watch when only Lake Effect Snow is possible, the WHAT bullet will read “**Heavy lake effect snow possible.**”
- In a Winter Weather Advisory when only Freezing Rain or Freezing Drizzle is expected, the WHAT bullet will read “**Freezing rain expected.**” (See above for ongoing event disclaimer).

- In a Winter Weather Advisory when only Lake Effect Snow is expected, the WHAT bullet will read “**Lake effect snow expected.**” (See above for ongoing event disclaimer).
- In a Winter Storm Warning when only Lake Effect Snow is expected, the WHAT bullet will read “**Heavy lake effect snow expected.**” (See above for ongoing event disclaimer).

The words “possible” and “expected” will be automatically produced by the formatter when the appropriate criteria are met or by choosing predetermined segment numbers. All other products will produce a suggested phrase in the WHAT section based on the grid content. These suggested phrases should only be edited when the forecaster believes value can be added.

Watch statements should include *generalized* values/impacts/amounts (e.g., wind chill values to 30 below zero possible, greater than 6 inches of snow possible, the potential exists for more than one quarter inch of ice accumulation).

Warning and advisory statements should include *specific* values/impacts/amounts (e.g., 3 to 6 inches, 8 to 12 inches, one quarter to one half inch of ice accumulation, reduction of visibility in blowing snow to a quarter of a mile or less).

Brief (potential) impact or Call to Action (CTA) statements, should include safety rules. CTAs can be effective in reminding people what actions to take in preparing themselves for the potential hazardous winter weather event. This information will be contained in the Precautionary/Preparedness Actions segment of the product.

### 6.5.3 Order of Segments

If multiple segments are needed, they will follow the order below. This order was designed to place the most important and/or time sensitive information near the beginning of the message. The order of segments is:

- Cancellation
- Warnings
- Advisories
- Watches

### 6.5.4 Order of Segment Headlines

More than one headline is required in a segment when two or more winter weather events (e.g., Ice Storm Warning today and Winter Storm Watch tomorrow) are forecast to occur for the same UGC or geographical area.

The order of headlines will follow the order of segments.

#### Examples:

Ice Storm Warning and Winter Storm Watch in effect for the same geographical area.

...ICE STORM WARNING IN EFFECT UNTIL 7 PM EST THIS EVENING...

...WINTER STORM WATCH IN EFFECT FROM THURSDAY MORNING TO FRIDAY MORNING...

Winter Storm Warning, Winter Weather Advisory, and Winter Storm Watch in effect for the

same mountain zone(s).

...WINTER STORM WARNING IN EFFECT UNTIL 11 AM PST WEDNESDAY ABOVE  
5000 FT...

...WINTER WEATHER ADVISORY IN EFFECT UNTIL 11 AM PST WEDNESDAY AT  
OR BELOW 5000 FT...

...WINTER STORM WATCH IN EFFECT FROM THURSDAY MORNING TO  
FRIDAY MORNING...

6.6 Format

Table 4: Generic Format for a WSW

<u>Product Format</u>	<u>Description of Entry</u>
WWaaii cccc ddhhmm	<i>(WMO Heading)</i>
WSWXXX	<i>(AWIPS ID)</i>
URGENT - WINTER WEATHER MESSAGE	<i>(Product Name or MND)</i>
NATIONAL WEATHER SERVICE city state	<i>(Issuing Office)</i>
time am/pm time_zone day mon dd yyyy	<i>(Issuance time/date)</i>
...<Overview headline statement>...	<i>(Optional)</i>
<General weather synopsis of developing winter storm>	<i>(Optional - one to three paragraphs)</i>
stZ001-005>015-ddhhmm-	<i>(UGC: Z &amp; expiration</i>
/k.aaa.cccc.pp.s.#####.yymmddThhnnZ <sub>B</sub> -yymmddThhnnZ <sub>E</sub> /	<i>time) (P-VTEC Line(s))</i>
zone st-zone st-zone st-	<i>(Zone Names)</i>
INCLUDING <THE CITIES OF> location...location	<i>(City/Location - optional)</i>
time am/pm time_zone day mon dd yyyy	<i>(Issuance time/date)</i>
...WATCH, WARNING, ADVISORY HEADLINE(S)...	
* WHAT...	
* WHERE...	
* WHEN...	
* IMPACTS...	
* ADDITIONAL DETAILS	
PRECAUTIONARY/PREPAREDNESS ACTIONS... (Call to Action (CTA) statements)	<i>CTA Begin Marker</i>
&&	<i>CTA End Marker</i>
\$\$	<i>(UGC Delimiter)</i>
Name/Initials/Forecaster ID	<i>(Optional after last segment)</i>

\*Note: Bullets should be one or two sentences and used to present critical information.

6.7 Updates, Cancellations and Corrections

WFOs will issue correction statements for format or grammatical errors as required. To reduce format or grammatical errors, forecasters should proofread the product before transmission.

WFOs will cancel the WSWs when the weather event has diminished before the valid time expires or the forecaster believes the threat for hazardous weather will not develop.

All WSWs will be updated when there is a change in timing, areal extent or expected conditions or within the minimum time frames designated below. All WSWs should be updated before the product expiration time is reached.

### 6.7.1 Minimum Watch Update Time Frame

At least once every 12 hours.

### 6.7.2 Minimum Warning/Advisory Update Times Frame

At least once every 6-8 hours until the event ends or is cancelled. The frequent updates will keep users and partners informed on the current and short-term aspects of the event.

The AWIPS Graphical Forecast Editor (GFE) GHG software provides the capability for forecasters to edit the headlines by “unlocking” them. Note: the default setting keeps headlines “locked”. A description of best practices for editing headlines is maintained at:

<http://www.weather.gov/os/vtec/pdfs/headlines.pdf>.

## 6.8 Upgrades

### 6.8.1 Upgrade Watch to Warning; Change to Advisory

When a winter weather watch is upgraded to a winter storm warning or changed to a winter weather advisory for the same geographical area, the WSW segment will contain one headline and two P-VTEC lines. The headline will list the new warning or advisory only. The first P-VTEC line will use the “UPG” action code to show the old winter storm watch is being upgraded. The second P-VTEC line will use the “NEW” action code to start the new winter weather warning or advisory.

### 6.8.2 Upgrade Watch to Warning Example

OKZ006>008-011>024-033>036-TXZ083-281100-

**/O.UPG.KOUN.WS.A.0004.080128T0500Z-080129T0000Z/** *(P-VTEC line 1)*

**/O.NEW.KOUN.IS.W.0003.080128T0500Z-080129T0000Z/** *(P-VTEC line 2)*

ALFALFA OK-BECKHAM OK-BLAINE OK-CADDO OK-CANADIAN OK-CUSTER OK-DEWEY OK- GARFIELD OK-GRANT OK-GREER OK-HARDEMAN TX-HARMON OK-JACKSON OK- KAY OK-KINGFISHER OK- KIOWA OK- LOGAN OK-MAJOR OK-NOBLE OK-PAYNE

OK-ROGER MILLS OK-WASHITA OK-

INCLUDING THE CITIES OF....ALTUS OK...CLINTON/WEATHERFORD OK...ELK CITY OK...EL RENO OK...ENID OK...GUTHRIE OK...HOBART OK...PONCA CITY OK...STILLWATER OK

1100 PM CST THU JAN 27 2008

**...ICE STORM WARNING IN EFFECT UNTIL 6 PM CST MONDAY...**



*(Only one headline used - lists active winter weather warning)*

<descriptive text>

\$\$

### 6.8.3 Upgrade Advisory to Warning

When a Winter Weather Advisory is upgraded to a Winter Weather Warning for the same geographical area, the WSW segment will contain one headline and two P-VTEC lines. The headline will list the new warning only. The first P-VTEC line will use the “UPG” action code to show the old advisory being upgraded. The second P-VTEC line will use the “NEW” action code to start the new winter weather warning.

### 6.8.4 Upgrade Advisory to Warning Segment Example

OKZ006>008-011>024-033>036-TXZ083-281600-  
 /O.UPG.KOUN.WW.Y.0004.000000T0000Z-070129T0000Z/ (P-VTEC line 1)  
 /O.NEW.KOUN.WS.W.0003.070128T1000Z-070129T0000Z/ (P-VTEC line 2)  
 ALFALFA OK-BECKHAM OK-BLAINE OK-CADDO OK-CANADIAN OK-CUSTER OK-  
 DEWEY OK- GARFIELD OK-GRANT OK-GREER OK-HARDEMAN TX-HARMON OK-  
 JACKSON OK- KAY OK-KINGFISHER OK- KIOWA OK- LOGAN OK-MAJOR OK-  
 NOBLE OK-PAYNE OK-ROGER MILLS OK-WASHITA OK-

INCLUDING THE CITIES OF....ALTUS OK...CLINTON/WEATHERFORD OK...ELK CITY  
 OK...EL RENO OK...ENID OK...GUTHRIE OK...HOBART OK...PONCA CITY  
 OK...STILLWATER OK  
 400 AM CST SUN JAN 28 2007

**...WINTER STORM WARNING IN EFFECT UNTIL 6 PM CST SUNDAY...**  
*(One headline used - lists new warning only for upgrades)*

<descriptive text>

\$\$

### 6.8.5 Upgrade Warning with a Warning

When a Winter Storm Warning is upgraded to an Ice Storm or Blizzard Warning for the same geographical area, the WSW segment will contain one headline and two P-VTEC lines. The headline will list the new warning only. The first P-VTEC line will use the UPG action code to show the old Winter Storm Warning being upgraded. The second P-VTEC line will use the NEW action code to start the blizzard or ice storm warning.

### 6.8.6 Upgrade Warning to a Warning Segment Example

TNZ005>011-023>034-056>066-075-077>080-093>095-202200-  
 /O.UPG.KOHX.WS.W.0004.000000T0000Z-150221T1500Z/  
 /O.NEW.KOHX.IS.W.0003.150220T1800Z-150221T1500Z/  
 STEWART-MONTGOMERY-ROBERTSON-SUMNER-MACON-CLAY-PICKETT-  
 HOUSTON- HUMPHREYS-DICKSON-CHEATHAM-DAVIDSON-WILSON-  
 TROUSDALE- SMITH-JACKSON-PUTNAM-OVERTON-FENTRESS-PERRY-

HICKMAN-LEWIS- WILLIAMSON- MAURY-MARSHALL-RUTHERFORD-CANNON-  
DE KALB-WHITE- CUMBERLAND-BEDFORD-COFFEE-WARREN-GRUNDY-VAN  
BUREN-WAYNE- LAWRENCE-GILES-

INCLUDING THE CITIES OF...DOVER...CLARKSVILLE...SPRINGFIELD...  
GALLATIN...LAFAYETTE...CELINA...BYRDSTOWN...ERIN...WAVERLY...  
DICKSON...ASHLAND CITY...NASHVILLE...LEBANON...MOUNT JULIET...  
HARTSVILLE...CARTHAGE...GAINESBORO...COOKEVILLE...LIVINGSTON...  
JAMESTOWN...LOBELVILLE...CENTERVILLE...HOHENWALD...FRANKLIN...  
BRENTWOOD...COLUMBIA...LEWISBURG...MURFREESBORO...WOODBURY...  
SMITHVILLE...SPARTA...CROSSVILLE...SHELBYVILLE...TULLAHOMA...  
MANCHESTER...MCMINNVILLE...ALTAMONT...SPENCER...WAYNESBORO...  
LAWRENCEBURG...PULASKI  
405 AM CST FRI FEB 20 2015

**...ICE STORM WARNING IN EFFECT FROM NOON TODAY TO 9 AM CST  
SATURDAY...**

*(Only one headline used - lists active winter weather warning)*

## **6.9 Replacing Warning or Advisories**

### **6.9.1 Replacing Warning with a Warning when not an Upgrade**

When a winter weather warning is replaced with another winter weather warning for the same geographical area, the WSW segment will contain two headlines and two P-VTEC lines. (Exception: see rules for Winter Storm Warning to Ice Storm or Blizzard Warning in 6.5.3.). The first headline and P-VTEC line are used to cancel the old warning, and the second headline and P-VTEC line are used to start the new warning. However, at regional discretion, WFOs that unlock headlines will consolidate the two headlines into a single headline (see Section 6.4.2).

### **6.9.2 Replace Ice Storm Warning Example**

OKZ006>008-011>024-033>036-TXZ083-281800-  
/O.CAN.KOUN.IS.W.0005.00000T0000Z-010129T0000Z/ (P-VTEC line 1)  
/O.NEW.KOUN.WS.W.0005.010128T1030Z-010129T0000Z/ (P-VTEC line 2)  
ALFALFA OK-BECKHAM OK-BLAINE OK-CADDO OK-CANADIAN OK-CUSTER OK-  
DEWEY OK- GARFIELD OK-GRANT OK-GREER OK-HARDEMAN TX-HARMON OK-  
JACKSON OK- KAY OK-KINGFISHER OK- KIOWA OK- LOGAN OK-MAJOR OK-  
NOBLE OK-PAYNE  
OK-ROGER MILLS OK-WASHITA OK-

INCLUDING THE CITIES OF....ALTUS OK...CLINTON/WEATHERFORD OK...ELK CITY  
OK...EL RENO OK...ENID OK...GUTHRIE OK...HOBART OK...PONCA CITY  
OK...STILLWATER OK  
430 AM CST SUN JAN 28 2001

**...ICE STORM WARNING IS CANCELLED...**

**...WINTER STORM WARNING IN EFFECT UNTIL 6 PM CST SUNDAY...**  
*(Two headlines used - lists cancelled warning, then new warning)*

*Or unified headline where headlines are unlocked*

**...ICE STORM WARNING REPLACED BY WINTER STORM  
WARNING...IN EFFECT UNTIL 6 PM CST SUNDAY...**

<descriptive text>

\$\$

## **7 Snow Squall Warning (Product category SQW)**

### **7.1 Mission Connection.**

Snow Squall Warnings (SQWs) are issued to protect lives and property. WFO forecasters issue SQWs to provide the public with advance notice of intense, but limited duration, periods of moderate to heavy snowfall, accompanied by gusty surface winds resulting in reduced visibilities and whiteout conditions.

### **7.2 Issuance Guidelines**

#### **7.2.1 Creation Software**

WFOs will use WarnGen to issue SQWs.

#### **7.2.2 Issuance Criteria**

WFOs should issue SQWs when there is radar or satellite indication and/or reliable reports (e.g., from DOTs, webcams, road network observations etc.) of snow squalls meeting or exceeding one or more of the following conditions:

- a. Condition 1: Visibility 1/4SM or less in snow with sub-freezing ambient road temperatures
- b. Condition 2: Plunging temperatures sufficient to produce flash freezes, along with a significant reduction in visibility from falling and/or blowing snow.

Forecaster judgment regarding impacts including time of day, day of week, and other societal factors should be considered. In those instances when lesser impacts are expected, a Special Weather Statement (SPS) can be issued.

#### **7.2.3 Issuance Time**

SQWs are non-scheduled, event-driven products.

#### **7.2.4 Valid Time**

Valid times should be within 30 to 60 minutes of issuance. For snow squalls that are expected to continue beyond the valid time of the original warning, WFOs should issue a new warning.

#### **7.2.5 Product Expiration Time**

The product expiration time is the end of warning valid time.

### 7.3 Technical Description

SQWs will follow the format and content described in this section.

#### 7.3.1 Universal Geographic Code (UGC) Type

County (Zone for Alaska and parts of Pacific Region).

#### 7.3.2 Mass News Disseminator (MND) Broadcast Line

SQWs should include the broadcast line: “BULLETIN - IMMEDIATE BROADCAST REQUESTED.”

#### 7.3.3 MND Header

The SQW MND header is “SNOW SQUALL WARNING.”

#### 7.3.4 SQW Content

The following guidelines apply to the issuance of SQWs by WFOs:

- a. Writing Style:
  1. SQWs will follow a standard bullet style format in a segmented product.
  2. Bullets should be brief.
  3. Locations used to identify the threatened areas should be larger towns and other familiar landmarks.
  4. Names of states and counties (or parts of counties) should be spelled out.
  5. Highway mile-markers should be included when a squall is occurring or forecast to move over a major interstate or highway but limited to five reference points or less.
  6. Call-to-Action (CTA) statements should be included.
  7. Recent credible reports of squalls and impacts should be included.
- b. Pathcasts:
  1. Warnings may contain 'pathcasts' (specific forecasts of location and arrival time) when the forecaster has very high confidence in the movement (direction and speed) of the snow squall.
  2. Any 'pathcast' issued will use terms of uncertainty appropriate to the state of the science (e.g., 'the snow squall will be near [location] around [time]').
- c. Number and Divisions of Counties/Parishes:
  1. WFOs should limit the number of counties/parishes in a SQW to 10 or less and utilize in similar fashion to short-fused warnings for severe weather.
  2. If separating a county/parish into divisions, WFOs should use no more than a nine-part division (i.e. northeast, east central, etc.) in coordination with state and local emergency managers and other partners.
- d. Combining Warnings:
  1. WFOs will keep Snow Squall Warnings separate from Winter Storm and Blizzard Warnings. Snow Squall Warnings will not be issued during these ongoing events. Snow Squall Warnings may be issued during Winter Weather Advisories if conditions are expected to worsen during a brief period of time.
- e. Format: The SQW format will contain this information in the following order (see Table 5)

1. First Bullet: Type of warning; and warning location(s);
2. Second Bullet: Expiration time of warning;
3. Third Bullet: Time, basis for warning (including recent credible reports); forecast impacts including “Hazard, Source, and Impact” lines.
4. Fourth Bullet: Locations to be impacted during the warning including mile markers, if applicable.

PRECAUTIONARY/PREPAREDNESS ACTIONS - One or two concise, action oriented CTA statements should be included. If CTAs are included under the PRECAUTIONARY/PREPAREDNESS ACTIONS, then two ampersands (&&) are required as a dissemination marker after the last CTA (see NWSI 10-1701, Section 5.5 for details on CTAs and markers).

LAT...LON - The warning area polygon as described by a series of latitude/longitude coordinates in decimal degrees with precision to hundredths (2 decimal places). The polygon will contain as few as three and as many as 20 vertices.

TIME...MOT...LOC - The tracking information gives the location and movement of the event being tracked. The format includes the time of the observed event in Coordinated Universal Time (UTC), followed by a three digit direction of movement in degrees (direction the event is moving from), followed by speed of movement in knots, and finally the location of the event as a single latitude/longitude coordinate, or in the case of a line, two or more latitude/longitude coordinates.

Impact-Based Warning (IBW) Coded Tag Lines – This section details the required and optional IBW coded tag lines. These outputs are linked to options made within the WarnGen product generation application and are not editable in the warning text. All tag lines and information wording will be in Uppercase. The specifications for IBW coded tag choices are as follows:

The snow squall source tag (SNOW SQUALL...) will be followed by the type of source, which includes:

- **RADAR INDICATED** – Evidence on radar and near storm environment is supportive, but snow squall conditions are not confirmed.
- **OBSERVED** – Snow squall conditions are confirmed by spotter, webcam, law enforcement, emergency management, or in situ visibility observations.

The snow squall impact tag (SNOW SQUALL IMPACT...) will be followed by:

- **General (no tag)** – Use frequently when snow squall conditions are expected or observed, but mitigating actions, combined with societal context, will reduce the threat to safe travel.
- **SIGNIFICANT** – Use only when suspected or observed conditions, both meteorological and non-meteorological, suggest a substantial threat to safe travel, such that WEA is warranted to alert all devices in the path of the squall.

Wireless Emergency Alerts (WEA) will be issued only for snow squall warnings with SIGNIFICANT impact tags.

### 7.3.5 Format

**Figure 5: Generic format for an SQW**

```

WUaa5i cccc ddhhmm
SQWccc
STC001-002-ddhhmm-
/k.aaa.cccc.pp.s.####.yymmddThhnnZB-yymmddThhnnZE/

BULLETIN - IMMEDIATE BROADCAST REQUESTED
Snow Squall Warning (...CORRECTED as required)
National Weather Service City State
time am/pm time_zone day mon dd yyyy

The National Weather Service in City has issued a

* Snow Squall Warning for...
  Portion County one in section State...(List warned counties)
  Portion County two in section State...(Number of counties will
  match number of counties in UGC Line)

* Until hhmm AM/PM time_zone (Expiration time of warning)

* At hhmm am/pm time_zone, warning basis, forward speed and
  direction.

  HAZARD... Warning basis elements (Heavy Snow, Wind Gusts,
  Visibility, Flash Freeze).

  SOURCE(Choose one or two) Radar indicated, Trained weather
  spotters, Webcams, Law enforcement, Emergency management, or
  Public.

  IMPACT... (General: Travel will become difficult and potentially
  dangerous within minutes.) (Significant: Dangerous and life-
  threatening travel conditions are expected to develop rapidly in the
  warning area.)

* Locations impacted include...
  Location #1, Location #2, Location #n. (n = variable number of
  locations).

PRECAUTIONARY/PREPAREDNESS ACTIONS...

(Call-to-Action statements).

&&

LAT...LON (Required list of latitude/longitude coordinate pairs
  outlining the forecaster-drawn warning area)

```

```
TIME...MOT...LOC hhnnZ xxxDEG xxKT xxxx xxxx (lat/lon couplet(s))
```

```
SNOW SQUALL...[OBSERVED or RADAR INDICATED]
```

```
SNOW SQUALL IMPACT...[only show if SIGNIFICANT]
```

```
$$
```

```
FORECASTER NAME/NUMBER (OPTIONAL)
```

**APPENDIX A. Winter Weather Product Examples**

**Winter Storm Watch: Blizzard Conditions**

MAZ024-120530-  
/O.NEW.KBOX.WS.A.0001.170213T0900Z-170214T0000Z/  
Nantucket MA-  
Including the city of Nantucket  
429 PM EST Sat Feb 11 2017

...WINTER STORM WATCH IN EFFECT FROM LATE SUNDAY NIGHT THROUGH  
MONDAY EVENING...

\* WHAT...Blizzard conditions possible. Snow and blowing snow  
accumulating 2 to 4 inches. Northwest winds 35 to 45 mph with  
gusts to 60 mph possible. Visibility one quarter mile or less  
at times.

\* WHERE...Nantucket.

\* WHEN...Late Sunday night through Monday.

\* IMPACTS...Heavy snow and strong winds may create snow covered  
roads, limited visibilities and produce scattered power  
outages. Whiteout conditions will be possible making travel  
very dangerous.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

For the latest updates, please visit our webpage at  
[www.weather.gov/boston](http://www.weather.gov/boston). You can follow us on Facebook at  
[www.facebook.com/NWSBoston](http://www.facebook.com/NWSBoston). You can follow us on Twitter at  
[@NWSBoston](https://twitter.com/NWSBoston).

&&

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**Winter Storm Watch: Lake Effect Snow**

NYZ004>006-150400-  
/O.EXT.KBUF.WS.A.0007.170215T1800Z-170217T1000Z/  
Wayne-Northern Cayuga-Oswego-  
Including the cities of Newark, Fair Haven, and Oswego  
300 PM EST Tue Feb 14 2017

...WINTER STORM WATCH NOW IN EFFECT FROM WEDNESDAY AFTERNOON  
THROUGH LATE THURSDAY NIGHT...

\* WHAT...Heavy lake effect snow possible. Accumulations 5 to 10



inches possible in the most persistent lake snows. West winds 15 to 25 mph with gusts up to 35 mph. Visibilities as low as a half mile at times.

- \* WHERE...Wayne, northern Cayuga, and Oswego counties.
- \* WHEN...Early Wednesday afternoon through late Thursday night.
- \* IMPACTS...Snow and blowing snow will produce difficult driving conditions with poor visibility and snow covered roads.
- \* ADDITIONAL DETAILS...Forecaster confidence is low at this time on exact time and location of impacts.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Heavy lake effect snow is possible across the region and rapid changes in road and visibility conditions may have a significant impact on travel. Stay tuned to NOAA Weather Radio or your favorite source of weather information for the latest updates. Additional details can also be found at [www.weather.gov/Buffalo](http://www.weather.gov/Buffalo).

&&

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**Winter Storm Watch (with optional synopsis)**

WWUS45 KBOU 232105  
WSWBOU  
URGENT - Winter Weather Message  
National Weather Service Denver CO  
205 PM MST WED FEB 23 2011

...Potential for Heavy Snow in the Northern Colorado Mountains for Thursday night through Friday night...

.A storm system developing across northern California will spread moisture and snowfall over portions of the Northern Colorado mountains from Thursday night and continuing through Friday night. The snow will gradually diminish on Saturday.

COZ031-033-240515-  
/O.NEW.KBOU.WS.A.0004.110225t0100z-110226t1300z/  
West Jackson and West Grand Counties above 9000 feet south and East Jackson/Larimer/North and Northeast Grand/Northwest Boulder Counties above  
9000 feet including the cities of East Slopes Park and Northern Gore Ranges, Gore Pass, Rabbit Ears Pass, Cameron Pass, Laramie and Medicine Bow Mountains, Rabbit Ears Range, Rocky Mountain

National Park and Willow Creek Pass  
205 PM MST WED FEB 23 2011

...WINTER STORM WATCH IN EFFECT FROM THURSDAY EVENING THROUGH  
LATE FRIDAY NIGHT...

- \* WHAT...Heavy snow possible. Snow will spread over the northern mountains with accumulations of 7 to 15 inches possible, with local higher amounts on west facing slopes. West to southwest winds of 15 to 30 mph with gusts to 45 mph.
- \* WHERE...Above 9000 feet including Gore Pass, Cameron Pass and Laramie and Medicine Bow Mountains.
- \* WHEN...Thursday evening through Friday night.
- \* IMPACTS...Travel will be very difficult to impossible due to snow-packed mountain passes and poor visibility.
- \* ADDITIONAL DETAILS...Mountain passes may become icy and snow-packed with winter driving conditions expected. Winds and snow will create blowing snow and poor visibilities at times.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Significant snow accumulations may occur that could impact travel. Stay tuned to the National Weather Service or your local news media for the latest updates and possible warning concerning this potential winter storm.

&&

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### **Winter Storm Warning**

WYZ112-114-221200-  
/O.UPG.KCYS.WS.A.0007.170222T1200Z-170224T1800Z/  
/O.NEW.KCYS.WS.W.0006.170222T1200Z-170224T1800Z/  
Sierra Madre Range-Snowy Range-  
Including the cities of Centennial and Albany  
753 PM MST Tue Feb 21 2017

...WINTER STORM WARNING IN EFFECT FROM 5 AM WEDNESDAY TO 11 AM  
MST FRIDAY...

- \* WHAT...Heavy snow expected. Periods of snow with 12 to 24 inches with locally higher amounts across west and north facing slopes and ridges. Southwest winds 20 to 30 mph with higher gusts. Visibilities below one half mile.

- \* WHERE...Sierra Madre and Snowy Ranges.
- \* WHEN...Wednesday through Thursday night.
- \* IMPACTS...Impacts mainly to travel and outdoor recreation. Mountain travel will be dangerous with slick and snow-packed roads.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

A Winter Storm Warning for heavy snow means severe winter weather conditions are expected or occurring. Significant amounts of snow are forecast that will make travel dangerous. Only travel in an emergency. If you must travel, keep an extra flashlight, food, and water in your vehicle in case of an emergency.

&&

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**Winter Weather Advisory: Freezing Rain**

ORZ507-WAZ029-152000-

/O.EXA.KPDT.WW.Y.0002.000000T0000Z-170215T2000Z/

Foothills of the Northern Blue Mountains of Oregon-

Foothills of the Blue Mountains of Washington-

Including the following locations Pendleton, Pilot Rock, Dayton, Waitsburg, and Walla Walla

828 AM PST Wed Feb 15 2017

...WINTER WEATHER ADVISORY IN EFFECT UNTIL NOON PST TODAY...

- \* WHAT...Freezing rain expected. Less than a tenth of an inch of ice expected.
- \* WHERE...Pendleton, Walla Walla.
- \* WHEN...Through midday.
- \* IMPACTS...Roads and sidewalks will become ice covered and hazardous as temperatures hover in the upper 20s to lower 30s.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Be prepared for slippery roads. Slow down and use caution while driving. For a detailed view of the hazard area visit <http://www.wrh.noaa.gov/map/?wfo=PDT>.

&&

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**Winter Weather Advisory: Lake Effect Snow**

OHZ010-011-013-020>022-031100-

/O.NEW.KCLE.WW.Y.0008.170303T0324Z-170303T1100Z/

Lorain-Cuyahoga-Geauga-Medina-Summit-Portage-

Including the cities of Lorain, Cleveland, Chardon, Medina,  
Akron, and Ravenna

1024 PM EST Thu Mar 2 2017

...WINTER WEATHER ADVISORY IN EFFECT UNTIL 6 AM EST FRIDAY...

- \* WHAT...Lake effect snow expected. Three to five inches of snow with squalls lowering visibility to a quarter mile. Gusty northwest winds and temperatures in the lower 20s.
- \* WHERE...Cleveland and surrounding areas.
- \* WHEN...Heaviest through 3 am but snow lingering until around sunrise.
- \* IMPACTS...Snow accumulation on roadways will cause hazardous travel conditions.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

During lake effect snow, the weather can vary from bands of locally heavy snow to dry weather just a few miles away. Visibilities can vary greatly. If you will be traveling in the advisory area be prepared for rapid changes in weather, visibility and road conditions.

&&

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**Blizzard Warning**

NJZ012-140100-

/O.CON.KPHI.BZ.W.0001.170314T0000Z-170314T2200Z/

Middlesex-

Including the city of New Brunswick

849 AM EDT Mon Mar 13 2017

...BLIZZARD WARNING REMAINS IN EFFECT FROM 8 PM THIS EVENING TO 6 PM EDT TUESDAY...

- \* WHAT...Blizzard conditions expected. Snow accumulation 18 to 24 inches. Northeast winds 10 to 20 mph with frequent gusts to 45

mph. Visibility one quarter mile or less at times. Temperatures in the mid 20s to lower 30s.

- \* WHERE...Middlesex County.
- \* WHEN...Monday evening through Tuesday. Heaviest snow late Monday night and early Tuesday morning.
- \* IMPACTS...Roads may be impassable. Widespread power outages are possible.
- \* ADDITIONAL DETAILS...The heavy snow will make many roads impassable and may produce widespread power outages due to the weight of the snow on tree limbs and power lines.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

A Blizzard Warning means severe winter weather conditions are expected or occurring. Falling and blowing snow with strong winds and poor visibilities are likely. This will lead to whiteout conditions, making travel extremely dangerous. Do not travel. If you must travel, have a winter survival kit with you. If you get stranded, stay with your vehicle.

&&

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**Ice Storm Warning**

Urgent - Winter Weather Message  
National Weather Service Sioux Falls SD  
855 PM CST Sat Jan 14 2017

IAZ014-021-022-031-032-Nez014-151100-  
/O.EXT.KFSD.IS.W.0001.170116t0300z-170117t0600z/  
Clay IA-Cherokee-Buena Vista-Woodbury-Ida-Dakota-  
Including The Cities Of...Spencer...Cherokee...Storm Lake...  
Sioux City...Ida Grove...Holstein...Battle Creek...  
South Sioux City  
855 PM CST Sat Jan 14 2017

...ICE STORM WARNING NOW IN EFFECT FROM 9 PM SUNDAY TO MIDNIGHT  
CST MONDAY NIGHT...

- \* WHAT...Significant icing expected. Wintry mix becoming all freezing rain before switching over to snow before ending. Ice accumulations of two tenths to a third of an inch followed by one to three inches of snow.

- \* WHERE...Spreading north into the area including Sioux City and Spencer.
- \* WHEN...Beginning Sunday evening and continuing into Monday. Freezing rain expected to be heaviest late Sunday night or early Monday morning.
- \* IMPACTS...Dangerously slick roads and widespread power outages.
- \* ADDITIONAL DETAILS...Ice accumulations and winds will likely lead to snapped power lines and falling tree branches.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Travel is strongly discouraged. Commerce will likely be severely impacted. If you must travel, keep an extra flashlight, food and water in your vehicle in case of an emergency.

&&

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**Snow Squall Warning: Example 1**

WWUS51 KBTV 011817  
SQWBTV

BULLETIN - IMMEDIATE BROADCAST REQUESTED  
Snow Squall Warning  
National Weather Service Burlington VT  
115 PM EST Mon Mar 1 2021

NYC019-033-VTC011-013-011900-  
/O.NEW.KBTV.SQ.W.0001.210301T1815Z-210301T1900Z/  
Clinton NY-Franklin NY-Grand Isle VT-Franklin VT-  
115 PM EST Mon Mar 1 2021

The National Weather Service in Burlington has issued a

- \* Snow Squall Warning for...
  - Northern Clinton County in northern New York...
  - Northeastern Franklin County in northern New York...
  - Northern Grand Isle County in northwestern Vermont...
  - Northwestern Franklin County in northwestern Vermont...
- \* Until 200 PM EST.
- \* At 115 PM EST, a dangerous snow squall was located along a line extending from 8 miles north of Perry Mills to near

Cannon Corners to near Churubusco to near Owls Head, moving east at 40 mph.

HAZARD...Intense bursts of heavy snow and gusty winds leading to blowing snow and visibility rapidly falling to less than one-quarter mile. Wind gusts greater than 35 mph.

SOURCE...Radar indicated.

IMPACT...Travel will become difficult and potentially dangerous within minutes.

Locations impacted include...

Chazy, Mooers, Altona, Alburgh Village, Ellenburg Depot, Champlain, Lyon Mountain, Merrill, Rouses Point, Alburgh, Isle La Motte, Highgate, Swanton, Ellenburg, Chazy Lake, Alburg Tongue, Mooers Forks, Ransoms Bay, Kelly Bay and Martindale Point.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Slow Down! Rapid changes in visibility and road conditions are expected with this dangerous snow squall. Be alert for sudden whiteout conditions.

&&

LAT...LON 4467 7395 4479 7419 4489 7403 4500 7380  
4501 7307

TIME...MOT...LOC 1815Z 259DEG 51KT 4512 7345 4501 7374 4491 7393  
4481 7413

SNOW SQUALL...RADAR INDICATED

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### **Snow Squall Warning: Example 2**

WWUS51 KBTV 182241  
SQWBTV

BULLETIN - IMMEDIATE BROADCAST REQUESTED  
Snow Squall Warning  
National Weather Service Burlington VT  
540 PM EST Wed Dec 18 2019

VTC005-007-015-017-023-027-182330-  
/O.NEW.KBTV.SQ.W.0021.191218T2240Z-191218T2330Z/

Lamoille VT-Caledonia VT-Orange VT-Chittenden VT-Windsor VT-  
Washington VT-  
540 PM EST Wed Dec 18 2019

The National Weather Service in Burlington has issued a

\* Snow Squall Warning for...  
Southwestern Lamoille County in northwestern Vermont...  
Southwestern Caledonia County in northeastern Vermont...  
Central Orange County in central Vermont...  
Southeastern Chittenden County in northwestern Vermont...  
Northern Windsor County in southern Vermont...  
Washington County in central Vermont...

\* Until 630 PM EST.

\* At 540 PM EST, a dangerous snow squall was located over  
Montpelier Junction, moving southeast at 25 mph.

HAZARD...Flash freeze on roads. Whiteout conditions with near  
zero visibility associated with intense bursts of heavy snow  
and gusty winds leading to blowing snow. Wind gusts greater  
than 35 mph.

SOURCE...Trained Spotter.

IMPACT...Dangerous and life-threatening travel conditions are  
expected to develop rapidly in the warning area.

\* This includes Interstate 89 between mile markers 30 and 72.

Locations impacted include...

Barre, Montpelier, Calais, Plainfield, Orange, Chelsea, Waterbury  
Village, Websterville, East Montpelier, Marshfield Village,  
Randolph, Waitsfield, Berlin, Fayston, Groton, Worcester,  
Middlesex, Marshfield, Bolton and Cabot Village.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Consider avoiding or delaying travel until the snow squall passes  
your location. If you must travel, use extra caution and allow  
extra time. Rapid changes in visibility and slick road conditions  
may lead to accidents.

Slow Down! Rapid changes in visibility and road conditions are  
expected with this dangerous snow squall. Be alert for sudden  
whiteout conditions.

&&



LAT...LON 4428 7297 4448 7287 4439 7214 4383 7252  
TIME...MOT...LOC 2240Z 292DEG 22KT 4428 7262

SNOW SQUALL...OBSERVED  
SNOW SQUALL IMPACT...SIGNIFICANT

\$\$

**Wind Chill Advisory**

ILZ003>006-008-010>014-019>023-032-033-039-Inz001-002-010-011-  
019-141730-  
/O.NEW.KLOT.WC.Y.0004.161215t0300z-161215t1600z/  
Winnebago-Boone-McHenry-Lake Il-Ogle-Lee-DeKalb-Kane-DuPage-Cook-  
La Salle-Kendall-Grundy-Will-Kankakee-Livingston-Iroquois-Ford-  
Lake In-Porter-Newton-Jasper-Benton-  
Including the cities of Rockford, Belvidere, Woodstock, Waukegan,  
Oregon, Dixon, DeKalb, Aurora, Elgin, Wheaton, Chicago, Ottawa,  
Oswego, Morris, Joliet, Kankakee, Pontiac, Watseka, Paxton, Gary,  
Valparaiso, Morocco, Rensselaer and Fowler  
324 AM CST Wed Dec 14 2016 /424 AM EST Wed Dec 14 2016/

...WIND CHILL ADVISORY IN EFFECT FROM 9 PM CST /10 PM EST/ THIS  
EVENING TO 10 AM CST /11 AM EST/ THURSDAY...

- \* WHAT...Very cold wind chills expected. Wind chills will fall to  
15 to 30 below zero.
- \* WHERE...Chicago and surrounding areas.
- \* WHEN...This evening through late morning Thursday.
- \* IMPACTS...Frostbite can occur on exposed skin in as little as  
30 minutes. Avoid prolonged time outdoors if possible.

PRECAUTIONARY/PREPAREDNESS ACTIONS...  
Frostbite can lead to hypothermia if precautions are not taken.  
If you must venture outdoors, make sure you wear a hat and  
gloves.

&&

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## APPENDIX B. Winter Weather Definitions

**Hazardous Winter Weather:** Hazardous winter weather is a winter weather event that endangers life or property, provides an impediment to commerce, or if proper precaution is not taken, can become life threatening.

### Hazardous Winter Weather Phenomena Definitions

- **Blizzard:** A blizzard means that the following conditions are expected to prevail for a period of 3 hours or longer:
  - Sustained wind or frequent gusts to 35 miles an hour or greater and
  - Considerable falling and/or blowing snow, i.e., frequently reducing visibility below 1/4 mile.

Although there is no set temperature requirement for blizzard conditions, the life-threatening nature of the low temperatures in combination with the other hazardous conditions of wind, snow, and poor visibility increases dramatically when the temperature falls below 20°F. Note: Blizzard conditions do not require snow to be falling.

- **Freezing Rain or Drizzle:** Rain or drizzle that falls in liquid form but freezes upon impact with the ground or exposed objects. Small accumulations of ice can cause driving and walking difficulties while heavy accumulations produce extremely dangerous and damaging situations primarily by pulling down trees and utility lines.
- **Ice Measurement:** Ice measurement is defined as the expected thickness of new ice accretion upon an elevated horizontal flat surface (in hundredths of inches).
- **Ice Storm:** An ice storm is used to describe occasions when damaging accumulations of ice are expected during freezing rain situations. Significant accumulations of ice pull down trees and utility lines resulting in loss of power and communication. These accumulations of ice make walking and driving extremely dangerous. Significant ice accumulations are usually accumulations of 0.25 inch (1/4 of an inch) or greater on an elevated horizontal flat surface. Some variations in the criteria may be locally established and will be documented in Regional Supplements. This includes both higher thresholds for regions that are accustomed to ice events and lower thresholds for areas where lesser amounts can cause major problems.
- **Sleet:** Sleet is a type of precipitation consisting of transparent or translucent pellets of ice, 0.25 inch or less in diameter. These pellets of ice usually bounce when hitting hard ground and make a sound upon impact.
- **Heavy Sleet:** Heavy sleet is a relatively rare event defined as an accumulation of ice pellets covering the ground to a depth of 1/2 inch or more.
- **Snow:** Frozen precipitation in the form of (white or translucent) ice crystals that steadily falls for several hours or more. Qualifiers, such as occasional or intermittent, are used when a steady, prolonged (for several hours or more) fall is not expected.

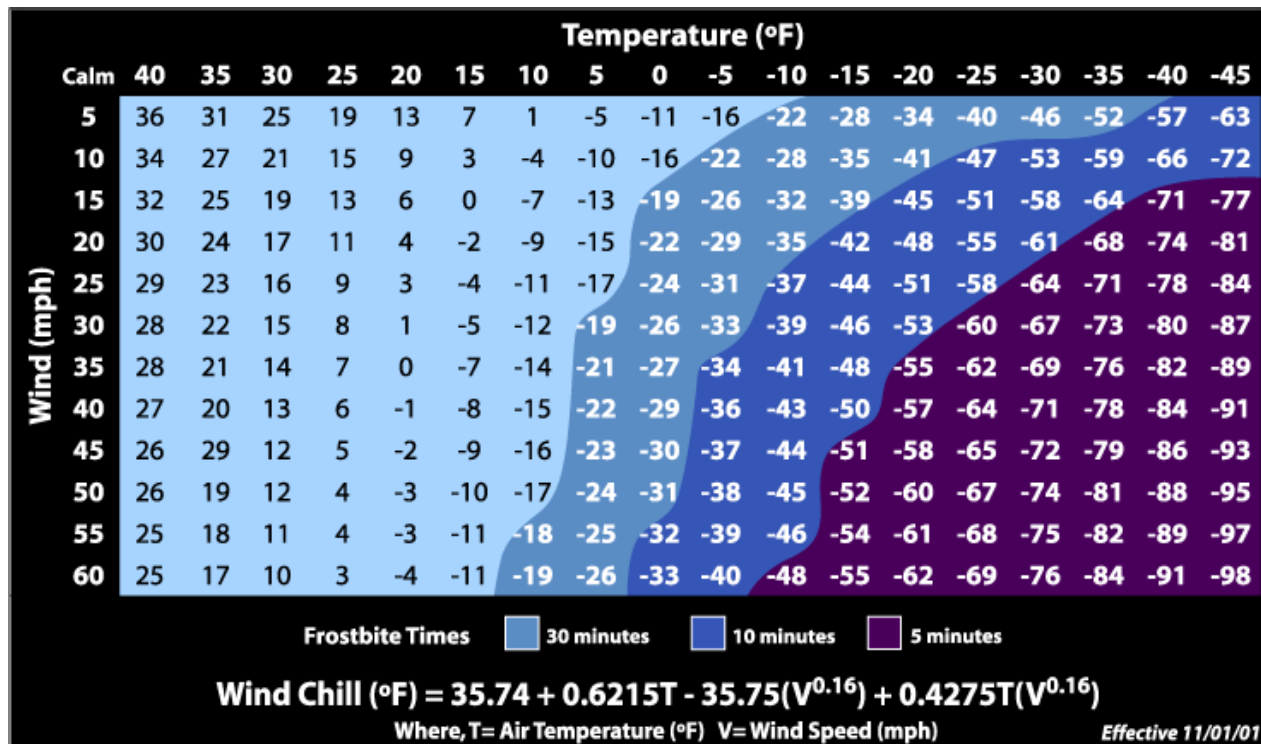
- **Blowing Snow:** Blowing snow is snow lifted from the surface of the earth by the wind to a height of 6 feet or more above the surface (higher than drifting snow), and blown about in such quantities that horizontal visibility is reduced to less than 7 statute miles. Blowing snow is usually accompanied by drifting snow.
- **Drifting Snow:** Drifting snow is snow lifted from the surface of the earth by the wind to a height of less than 6 feet above the surface. Drifting snow may occur during or after a snowfall. Drifting snow is usually associated with blowing snow.
- **Heavy Snow:** Heavy snow generally means:
  - Snowfall accumulating to 4 inches or more in depth in 12 hours or less; or
  - Snowfall accumulating to 6 inches or more in depth in 24 hours or less.

Variation in the criteria for heavy snowfall in certain sections of the country may be locally established and will be documented in Regional Supplements. This includes both higher thresholds for regions that are accustomed to snow and lower thresholds for areas where lesser accumulations can cause significant impacts.

Express snowfall amounts as a range of values, e.g., “8 to 12 inches.” However, in heavy snow situations where there is considerable uncertainty concerning the range of values, it may be more appropriate to use phrases, such as “...up to 12 inches...”, or alternatively, “...8 inches or more...”

- **Lake Effect Snow:** Snow showers that are created when cold, dry air passes over a large warmer lake, such as one of the Great Lakes, and picks up moisture and heat.
- **Snow Flurries:** Snow flurries are short duration (generally a few minutes) light snow showers with no measurable accumulation (trace category).
- **Snow Showers:** Snow showers are brief periods of snowfall in which intensity can be varied and may change rapidly. Some accumulation is possible. A snow shower in which light snow falls for a few minutes is typically called a snow flurry.
- **Snow Squalls:** Snow Squalls are intense, but limited duration, periods of moderate to heavy snowfall, accompanied by gusty surface winds resulting in reduced visibilities and, often, whiteout conditions. They move in and out quickly, and typically last less than an hour. Although snow accumulations are generally not significant, the combination of accumulating snow, gusty winds, falling temperatures and quick reductions in visibility can cause extremely dangerous conditions for motorists.
- **Wind Chill:** The Wind Chill Temperature is the air temperature at which the heat transfer rate and skin temperature would be the same in the absence of wind. The WCT represents the temperature the body feels when it is exposed to wind and cold. Prolonged exposure can lead to frostbite and hypothermia.

Wind Chill Chart



Based on human study research provided by the Office of the Federal Coordinator for Meteorology, the wind chill chart provides WCTs and objective frostbite time values. The threshold for dangerous WCT starts at -18°F, where frostbite can occur on exposed flesh within 30 minutes. As the WCT drops, the frostbite time decreases, especially with higher wind speeds. WFOs will include frostbite time references in the body of text for Wind Chill Warnings and should include frostbite time references, when applicable, for Wind Chill Advisories.

**APPENDIX C.    Headline Time Phrases**

**Winter Weather Watch Date/Time Phrases.** The watch headline will include a general event beginning and event ending day/time phrase. The general day/time phrases are defined in Table C-1.

**Table C-1:** General Headline Day/Time Phrases for Long Duration Watches

<b>Time Period Covered</b>	<b>Same Calendar Day Time Phrase</b>	<b>Day +1 Calendar Day Time Phrase</b>	<b>Day + 2 Calendar Day Time Phrase</b>
Midnight - 5:59 AM	Not Applicable	Late Tonight	Late (day + 1) Night
6 AM - 11:59 AM	Not Applicable	(day + 1) Morning	(day + 2) Morning
Noon - 5:59 PM	This Afternoon	(day + 1) Afternoon	(day + 2) Afternoon
6 PM - 11:59 PM	This Evening	(day + 1) Evening	(day + 2) Evening

**Issuance Time and Event Start Time on the same Calendar Day.** When the issuance time and event start time occur on the same calendar day, the watch headline will include the time phrases listed in Table C-1.

Example:

Issuance Time - 4 AM Tuesday

Event Start Time - 8 PM Tuesday

Event End Time - 4 PM Wednesday

Watch Headline:

...WINTER STORM WATCH IN EFFECT FROM THIS EVENING THROUGH WEDNESDAY AFTERNOON...

**Issuance Time and Event Start Time on Different Calendar Days.** When the issuance time and event start time occur on different calendar days, the watch headline will include the time phrase (Table C-2) and day(s) the product is in effect for.

Example:

Issuance Time - 4 AM Tuesday

Event Start Time - 6 AM Wednesday

Event End Time - 5 PM Thursday

Watch Headline:

...WIND CHILL WATCH IN EFFECT FROM WEDNESDAY MORNING THROUGH THURSDAY AFTERNOON...

**Winter Weather Warning and Advisory Date/Time Phrases.** Winter weather warning and advisory headlines will include the specific time, time zone indicator, and day the warning/advisory is in effect.

**Issuance Time and Event Start Time on the Same Calendar Day.** When the issuance time and event start time occur on the same calendar day, the warning and advisory headline will include the time phrases listed in Table C-2.

**Table C-2:** Headline Time Phrases for Long Duration Warnings and Advisories in Effect on Same Calendar Day of Issuance.

Time Period Covered	Same Calendar Day Time Phrase
Midnight - 5:59 AM	Early This Morning
6 AM - 11:59 AM	This Morning
Noon - 5:59 PM	This Afternoon
6 PM - 11:59 PM	This Evening

Example:

Issuance Time - 4 AM Tuesday Event  
 Start Time - 7 AM Tuesday Event  
 End Time - 11 AM Wednesday

Warning Headline:

...WINTER STORM WARNING IN EFFECT FROM 7 AM THIS MORNING TO 11 AM EST WEDNESDAY...

**Special Case #1:**

Similar Time Phrase for the Start and End Times. If the start and end time use the same time phrase, then only one time phrase will be used and it will placed after the end time.

Example:

Issuance Time - 10 AM Tuesday  
 Event Start Time - 1 PM Tuesday  
 Event End Time - 5 PM Tuesday

Warning Headline:

...WINTER STORM WARNING IN EFFECT FROM 1 PM TO 5 PM MDT THIS AFTERNOON...

**Special Case #2:**

If the start time and end time use “Early This Morning” and “This Morning”, then place the time phrase “This Morning” after the end time ONLY.

Example:

Issuance Time - 1 AM Tuesday  
 Event Start Time - 4 AM Tuesday

Event End Time - 9 AM Tuesday

Advisory Headline:

...WINTER WEATHER ADVISORY IN EFFECT FROM 4 AM TO 9 AM CST  
THIS MORNING...

**Issuance Time and Event Start Time are on Different Calendar Days.** When the issuance time and event start time occur on different calendar days, the warning and advisory headline will include the time and day(s) the product is in effect for.

Example:

Issuance Time - 3 PM Tuesday  
Event Start Time - 5 AM Wednesday  
Event End Time - 5 AM Thursday

Warning Headline:

...ICE STORM WARNING IN EFFECT FROM 5 AM WEDNESDAY TO 5 AM EST  
THURSDAY...

**Issuance Time Same as Event Start Time.** When the issuance time and event start time occur simultaneously, the warning and advisory headline will only include the event end time in the headline.

**Special Case #1**

If the event end time occurs on same calendar day as the issuance time, then use the same calendar rules for the end time phrase set in Table C-1.

Example:

Issuance Time - 4 AM Tuesday  
Event Start Time - 4 AM Tuesday  
Event End Time - 8 PM Tuesday

Advisory Headline:

...WINTER WEATHER ADVISORY IN EFFECT UNTIL 8 PM PST THIS EVENING...

**Special Case #2**

If the event end time occurs on a different day than the issuance time, then, the day phrase will be used after the event end time.

Example:

Issuance Time - 4 PM Tuesday  
Event Start Time - 4 PM Tuesday  
Event End Time - 2 AM Wednesday

Warning Headline:

...WINTER STORM WARNING IN EFFECT UNTIL 2 AM CST WEDNESDAY...

**Special Case #3**

If the issuance time is within three hours of the event start time, then only include the event end time in the headline.

Example:

Issuance Time - 10:15 PM

Tuesday Event Start Time - 1 AM

Wednesday Event End Time - 10 AM Wednesday

Advisory Headline:

...WINTER WEATHER ADVISORY IN EFFECT UNTIL 10 AM EST WEDNESDAY...

**Time Zone Indicators.** The long duration WSW warning and advisory headline will include a time zone indicator after the specific time. If two times are listed, then place the time zone indicator after the second time listed.

**Zone Grouping with Two or More Time Zones.** If the zone grouping includes more than one time zone, then the additional time zone(s) will be placed in forward slashes next to all time indicators.

Warning Headline:

...WINTER STORM WARNING IN EFFECT FROM 3 AM EDT /2 AM EST/ /2 AM CDT/ TO 10 AM EDT /9 AM EST/ /9AM CDT/ THIS MORNING...

Advisory Headline:

...WINTER WEATHER ADVISORY IN EFFECT UNTIL 8 PM PST /9 PM MST/ TONIGHT...



**APPENDIX D. Regional Winter Storm Warning Snow Criteria**

**Alaska Region:**

Zones and WFO	Winter Storm Warning (for Snow)
017-026 (Juneau)	6 inches in 12 hours or 12 inches in 24 hours
027-028 (Juneau)	6 inches in 12 hours or 12 inches in 24 hours
029 (Juneau)	12 inches in 24 hours
101-121 & 141-195 (Anchorage)	12 inches in 12 hours or 24 inches in 24 hours
125 & 135 (Anchorage)	24 inches in 12 hours
131 (Anchorage)	24 inches in 12 hours
201-214 (Fairbanks)	6 inches in 24 hours
215-224 (Fairbanks)	8 inches in 24 or less hours
225 - 227 (Fairbanks)	12 inches in 24 or less hours

**Pacific Region:**

Falling snow accumulating more than 6 inches during a 24 hour period. Roads are closed to workers and public on Mauna Kea and Mauna Loa with 6 inches or more snow accumulations on them to allow snow plow crews to clear them off.

**Southern Region:**

**WFO Winter Storm Warning:** *Also see graphic on next page.*

Heavy Snow Criteria	Heavy Snow Criteria	Zones
Albuquerque (ABQ)	4" per event 6" per event 10" per event	NM: 209, 219, 220, 225, 235, 236, 237, 238, 239, 240, 241 NM: 201, 203, 204, 205, 207, 212, 216, 217, 218, 221, 222, 223, 224, 227, 228, 229, 230, 231, 232, 233, 234 NM: 202, 206, 208, 210, 211, 213, 214, 215, 226
El Paso (EPZ)	6" in 12 Hrs / 9" in 24 Hrs 4" in 12 Hrs / 6" in 24 Hrs	402, 408, 414-416 above 7500' Remaining zones
Amarillo (AMA)	6" in 24 Hrs	All
Lubbock (LUB)	4" in 12 Hrs / 6" in 24 Hrs	All
Midland (MAF)	4" in 12 Hrs / 6" in 24 Hrs	All
Norman (OUN)	4" in 12 Hrs / 6" in 24 Hrs	All
Tulsa (TSA)	4" in 12 Hrs / 6" in 24 Hrs	All
San Angelo (SJT)	2" in 12 Hrs / 4" in 24 Hrs 4" in 12 Hrs / 6" in 24 Hrs	267, 319, 327, 413, 435, 307, 411 Remaining zones
Fort Worth (FWD)	2" per event	122-123-135-147-148-156-157-158-159-160-161-162-174-175

	4" per event	Remaining zones
<b>Austin-San Antonio (EWX)</b>	2" per event	All
<b>Houston (HGX)</b>	2" per event	All
<b>Corpus Christi (CRP)</b>	1" per event	All
<b>Brownsville (BRO)</b>	1" per event	All
<b>Little Rock (LZK)</b>	4" per event	All
<b>Memphis (MEG)</b>	4" in 12 Hrs / 6" in 24 Hrs 3" in 12 Hrs / 4" in 24 Hrs 2" in 12 Hrs / 3" in 24 Hrs	MO: 113, 115 AR: 009, 018 TN: 001, 002, 003, 004, 019, 020, 021, 022 Remaining zones MS: 010, 011, 012, 013, 015, 016, 017, 020, 021, 022, 023, 024
<b>Nashville (OHX)</b>	3" in 12 Hrs / 5" in 24 Hrs	All
<b>Huntsville (HUN)</b>	>2" in 12 Hrs/ >4" in 24 Hrs	All
<b>Morristown (MRX)</b>	4" in 12 Hrs / 6" in 24 Hrs 3" in 12 Hrs, 5" in 24 Hrs	TN: 012, 013, 014, 015, 016, 017, 018, 035, 042, 043, 044, 046, 047, 045, 041, 074, 072, 087 VA: 001, 002, 005, 006, Washington 008 Remaining zones
<b>Shreveport (SHV)</b>	2" per event	All
<b>Jackson (JAN)</b>	2" per event	All
<b>Birmingham (BMX)</b>	2" per event	All
<b>Atlanta (FFC)</b>	2" per event	All
<b>Lake Charles (LCH)</b>	2" per event	All
<b>New Orleans (LIX)</b>	2" per event	All
<b>Mobile (MOB)</b>	2" per event	All
<b>Tallahassee (TAE)</b>	2" per event	All
<b>Jacksonville (JAX)</b>	1" per event	All
<b>Tampa (TBW)</b>	≥ ½" per event	All
<b>Melbourne (MLB)</b>	≥ ½" per event	All
<b>Key West (KEY)</b>	≥ ½" per event	All
<b>Miami (MFL)</b>	≥ ½" per event	All

**Western Region**

<b>WFO</b>	<b>Warning Winter Storm</b>
Billings, MT	<6k ft = snow ≥6" in 12 hrs or ≥8" in 24 hrs >6k ft = snow ≥12" in 24 hrs Snow and wind, 1/4<vsby<1 mi for ≥3 hrs
Boise, ID	Zones 11, 13, 28 = snow >10" in 24 hrs Other zones = snow ≥4" in 12 hrs or ≥6" in 24 hrs

Elko, NV	Vlys = snow $\geq 6''$ in 12 hrs or $\geq 8''$ in 24 hrs Mtns = snow $\geq 8''$ in 12 hrs or $\geq 12''$ in 24 hrs
Eureka, CA	Elevations below 1000 feet = snow $\geq 2''$ in 12 hrs or $\geq 3''$ in 24 hrs At or Above 1000 feet = snow $\geq 5''$ in 12 hrs or $\geq 7''$ in 24 hrs Sleet = accumulation $\geq 1/2''$
Flagstaff, AZ	$< 5k$ ft = snow $\geq 4''$ $\geq 5k$ ft = snow $\geq 8''$
Glasgow, MT	Snow $\geq 6''$ in 12 hrs or $\geq 8''$ in 24 hrs Wind $\leq 34$ mph, vsby $\leq 1/4$ mi, $\geq 3$ hrs Ice accumulation $\geq 1/4''$ mod to major impacts to travel/commerce
Great Falls, MT	$\geq 6$ inches in 12 hrs or $\geq 8$ inches in 24 hrs
San Joaquin Valley/Hanford, CA	$< 2kft$ = snow $\geq 5''$ in 12 hrs or $\geq 7''$ in 24 hrs $2-6kft$ = snow $\geq 8''$ in 12 hrs or $\geq 12''$ in 24 hrs $> 6kft$ = snow $\geq 12''$ in 12 hrs or $\geq 18''$ in 24 hrs First storm or out of season = $\geq 4''$ in 12 hrs or $\geq 6''$ in 24 hrs
Las Vegas, NV	$< 3.5k$ ft = snow $\geq 2''$ in 12 hrs or $\geq 3''$ in 24 hrs $3.5k-7k$ ft = snow $\geq 6''$ in 12 hrs or $\geq 10''$ in 24 hrs $7-9.5k$ ft = snow $\geq 8''$ in 12 hrs or $\geq 12''$ in 24 hrs
Medford, OR	OR zones 21-26, CA80-81 $< 3k$ ft = snow $\geq 4''$ in 12 hrs or $\geq 7''$ in 24 hrs OR zones 27-28 = snow $\geq 12''$ in 12 hrs or $\geq 18''$ in 24 hrs OR zones 29-31, CA82-85, CA80-81 $> 3k$ ft = snow $\geq 6''$ in 12 hrs or $\geq 10''$ in 24 hrs
Missoula, MT	If travel safety will rapidly become much worse than 6-12 hours before and remain poor for a prolonged period
San Francisco Bay Area/Monterey, CA	$> 3k$ ft = snow $\geq 8''$ in 12 hrs or $\geq 12''$ in 24 hrs Mtns $< 3k$ ft = $\geq 5''$ in 12 hrs or $\geq 7''$ in 24 hrs
Los Angeles/ Oxnard, CA	Mtns $> 7k$ ft = snow 12" in 12 hrs or 18" in 24 hrs Mtns $< 7k$ ft = snow 8" in 12 hrs or 12" in 24 hrs Otherwise = snow 4" in 12 hrs or 6" in 24 hrs Sleet accumulation $\geq 1/2''$
Pendleton, OR	WAZ520 = $\geq 12$ inches in 24 hours WAZ030, ORZ502 = $\geq 10$ inches in 24 hours WAZ024, WAZ026, WAZ027, WAZ028, WAZ029, ORZ041, ORZ044, ORZ505, ORZ507, ORZ508, ORZ510, ORZ511 = $\geq 4$ inches in 24 hours ORZ503 = $\geq 7$ inches in 24 hours ORZ509 = $\geq 8$ inches in 24 hours ORZ049 = $\geq 5$ inches in 24 hours WAZ521, ORZ506, ORZ050 = $\geq 6$ inches in 24 hours
Phoenix, AZ	$> 7k$ ft = snow 8-12" in 12 hrs or $\geq 12''$ in 24 hrs $5-7k$ ft = snow 6-10" in 12 hrs or $\geq 10''$ in 24 hrs $< 5k$ ft = snow 2-4" in 12 hrs or $\geq 4''$ in 24 hrs
Pocatello, ID	Snow $\geq 6''$ vlys, $\geq 10''$ mtns in 24 hrs Sleet accum $\geq 3/4''$

Portland, OR	Cascades = snow $\geq 12''/12$ hrs or $\geq 18''/24$ hrs Cst Range/Foothills = snow $\geq 6''/12$ hrs or $\geq 10''/24$ hrs Hood Rvr Vly = snow $\geq 6''/12$ hrs or $\geq 10''/24$ hrs Vlys/Cst/Gorge = snow $\geq 4''/12$ hrs or $\geq 6''/24$ hrs
Reno, NV	<5k ft = snow 4" in 12 hrs or 6" in 24 hrs Sierra 5-7K ft, Nev >7k ft = snow 8" in 12 hrs or 12" in 24 hrs Sierra >7k ft = snow 12" in 12 hrs or 18" in 24 hrs Nev 5-7K ft = snow 6" in 12 hrs or 10" in 24 hrs
Sacramento, CA	>7k ft = snow 12" in 12 hrs or 18" in 24 hrs 3-7k ft = snow 8" in 12 hrs or 12" in 24 hrs <3k ft = snow 5" in 12 hrs or 7" in 24 hrs
Salt Lake City, UT	Dixie/Zion = snow $\geq 2''$ in 12 hrs or $\geq 4''$ in 24 hrs Vlys/WY = snow $\geq 6''$ in 12 hrs or $\geq 9''$ in 24 hrs Mtn Vlys = snow $\geq 8''$ in 12 hrs or $\geq 12''$ in 24 hrs Mtns = snow $\geq 12''$ in 12 hrs or $\geq 18''$ in 24 hrs
San Diego, CA	Vlys = snow 4" in 12 hrs or 6" in 24 hrs Mtns 3-5k ft = snow 8" in 12 hrs or 12" in 24 hrs Mtns >7k ft = snow 12" in 12 hrs or 18" in 24 hrs
Seattle, WA	Elevations 1500-5500 ft = Snow $\geq 12''$ in 12 hours or $\geq 18''$ in 24 hours Elevations below 1500 ft = Snow $\geq 4''$ in 12 hours or $\geq 6''$ in 24 hours Impact-based when winter weather conditions will not reach the above thresholds but could cause major impacts to travel (e.g. rapid accumulations, snowfall during commute hours, holiday travel, early/late season snow, after a dry spell).
Spokane, WA	Accumulation sleet $\geq 1/2''$ vlys = snow $\geq 4''$ in 12 hrs or $\geq 6''$ in 24 hrs Camas Prairie = snow $\geq 6''$ in 12 hrs or $\geq 8''$ in 24 hrs Mtns = snow $\geq 8''$ in 12 hrs or $\geq 12''$ in 24 hrs
Tucson, AZ	>7k ft, zones 510-514 = snow $\geq 12''$ 5-7k ft, zones 510-515 = snow $\geq 6''$ <5k ft, zones 501-509 = snow $\geq 3''$

**Central Region:**

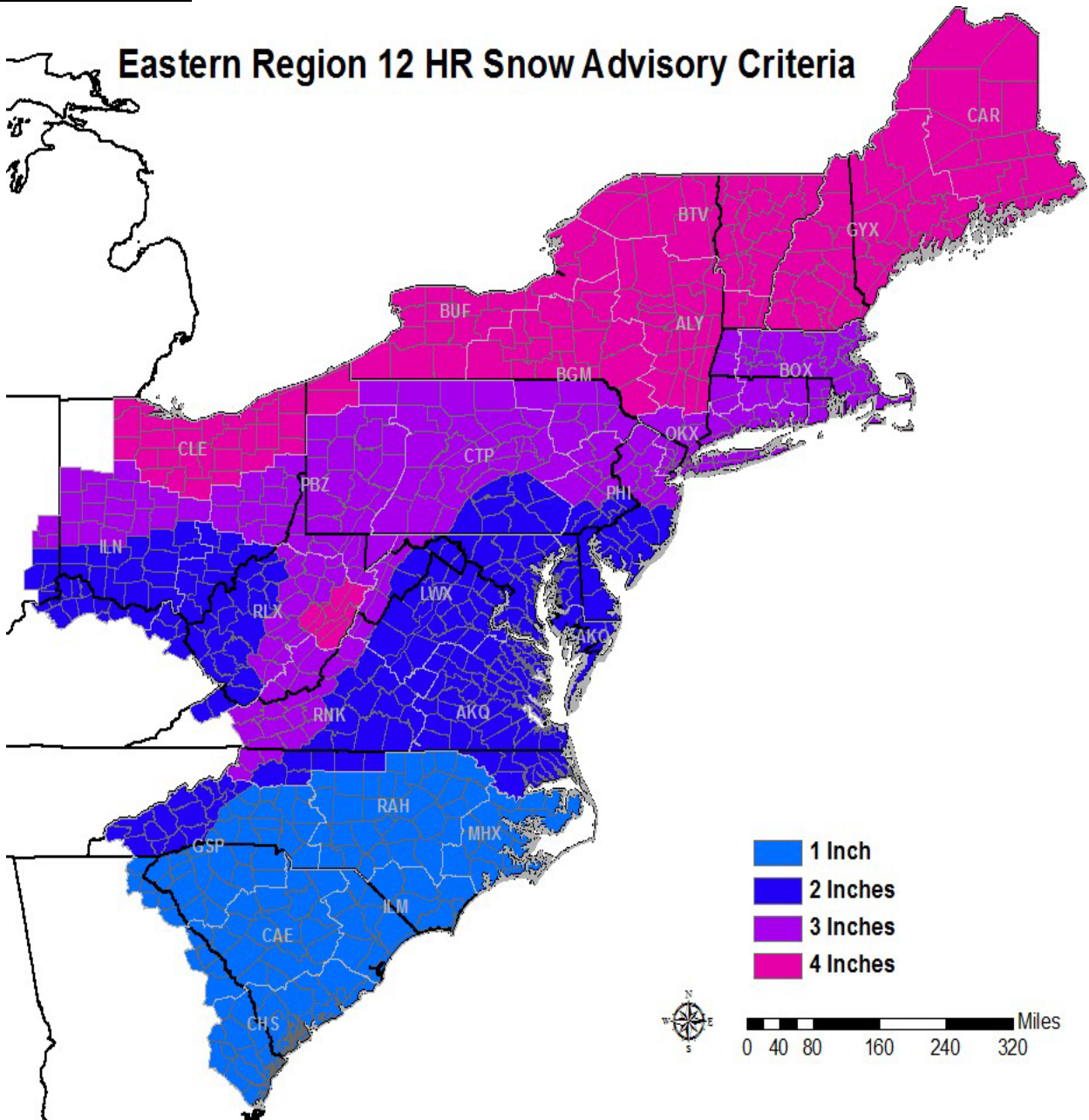
<b>WFO</b>	<b>Heavy Snow Criteria</b>	<b>WFO</b>	<b>Heavy Snow Criteria</b>
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**NWSI 10-513 OCTOBER 12, 2022**

Aberdeen (ABR)	6" in 12 hours 8" in 24 hours	Wichita (ICT)	6" per event
Gaylord (APX)	8" in 12 hours 10" in 24 hours	Central Illinois (ILX)	6" in 12 hours 8" in 24 hours
LaCrosse (ARX)	6" in 12 hours 8" in 24 hours	Indianapolis (IND)	6" in 12 hours 8" in 24 hours
Bismarck (BIS)	6" in 12 hours 8" in 24 hours	Northern Indiana (IWX)	6" in 12 hours 8" in 24 hours
Denver / Boulder (BOU)	6" in 12 hours/8" in 24 hours (Valleys) 8" in 12 hours/12" in 24 hours (Mountains)	Jackson, KY (JKL)	4" in 12 hours 6" in 24 hours
Cheyenne (CYS)	6" per event (Valleys) 12" per event	North Platte (LBF)	6" in 12 hours 8" in 24 hours
Dodge City (DDC)	6" in 12 hours 8" in 24 hours	Louisville (LMK)	4" in 12 hours 6" in 24 hours
Duluth (DLH)	6" in 12 hours 8" in 24 hours	Chicago (LOT)	6" in 12 hours 8" in 24 hours
Des Moines (DMX)	6" in 12 hours 8" in 24 hours	St. Louis (LSX)	6" per event
Detroit (DTX)	8" in 12 hours 10" in 24 hours	Milwaukee (MKX)	6" in 12 hours 8" in 24 hours
Quad Cities (DVN)	6" in 12 hours 8" in 24 hours	Minneapolis / Twin Cities (MPX)	6" in 12 hours 8" in 24 hours
Kansas City / Pleasant Hill (EAX)	6" in 12 hours 8" in 24 hours	Marquette (MQT)	8" in 12 hours 10" in 24 hours
Grand Forks (FGF)	6" in 12 hours 8" in 24 hours	Omaha (OAX)	6" in 12 hours 8" in 24 hours
Sioux Falls (FSD)	6" in 12 hours 8" in 24 hours	Paducah (PAH)	4" in 12 hours 6" in 24 hours
Hastings (GID)	6" in 12 hours 8" in 24 hours	Pueblo (PUB)	6" in 12 hours/8" in 24 hours (Valleys) 8" in 12 hours/12" in 24 hours (Mountains)
Goodland (GLD)	6" in 12 hours 8" in 24 hours	Springfield (SGF)	6" per event
Green Bay (GRB)	6" in 12 hours 8" in 24 hours	Topeka (TOP)	6" in 12 hours 8" in 24 hours
Grand Rapids (GRR)	8" in 12 hours 10" in 24 hours	Rapid City (UNR)	6" in 12 hours 8" in 24 hours



**Eastern Region:**





### Eastern Region 12 HR Snow Warning Criteria

