

# Update on Winter Weather Initiatives



## Partner Webinar October 31, 2019

*Stephen Baxter*  
*Acting Winter Weather Program Lead*

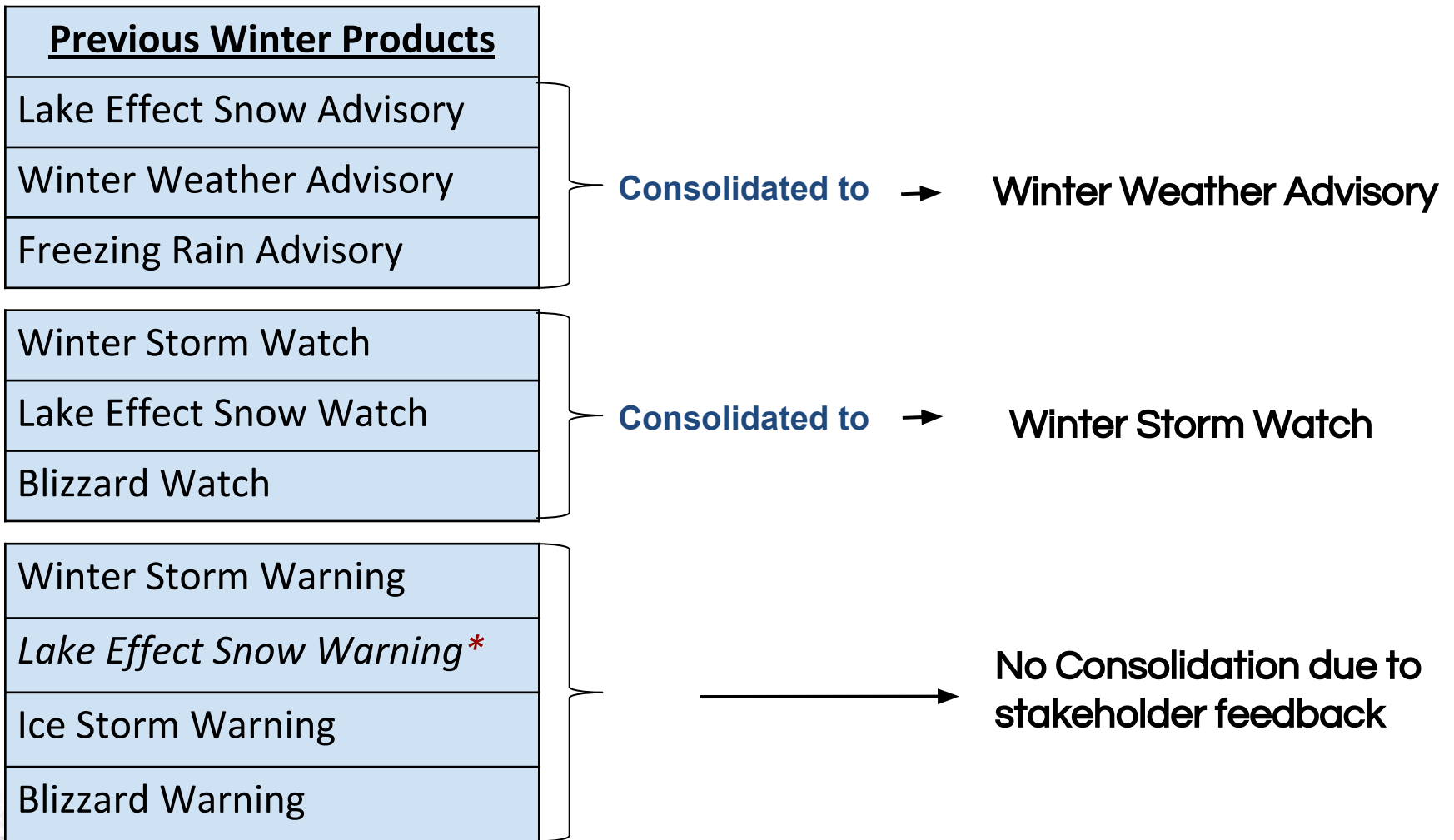


# Outline

- **New** Update on Hazard Simplification
- **New** Experimental Winter Storm Outlook
- **New** Testing Winter Key Messages
- Ongoing Experimental Winter Storm Severity Index
- Ongoing Experimental Probabilistic Winter Precipitation Forecast
- Updated Outreach Materials

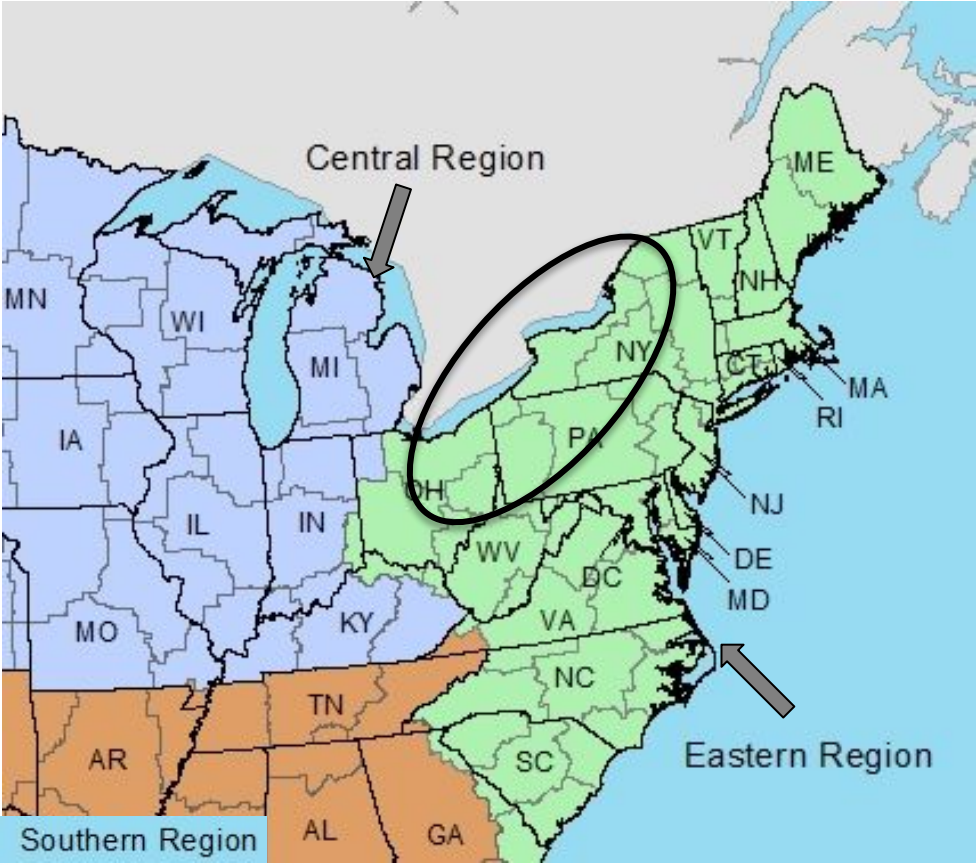


# Hazard Simplification Project: New Updates



*\*Consolidated in all Regions during 2018/19 but reinstated for 2019/20 season. This will be utilized only in Eastern Region.*

# Hazard Simplification Project: Lake Effect Snow Warning



- Lake Effect Snow Warnings are being reinstated *only* in Eastern Region this upcoming winter!
- In Central Region, high impact lake effect and lake enhanced events will trigger Winter Storm Warnings.

***Lake Effect Snow Warnings consolidated in all Regions during 2018/19 but reinstated for 2019/20 season. This will be utilized only in Eastern Region.***



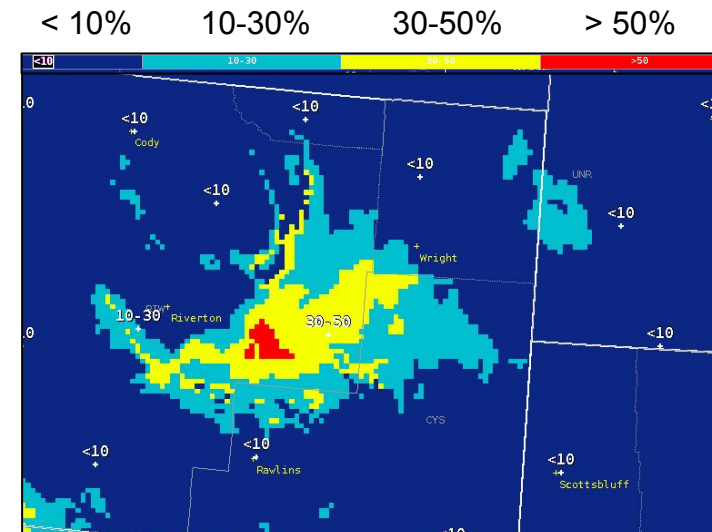
# Hazard Simplification Project

- An “Impacts” bullet has been added to the What, Where, When format for the winter weather products suite.
- Continuing to evaluate simplification options for advisories, special weather statements, and short term forecasts into a single winter weather message with the What, Where, When, Impacts bullet format.



# Experimental Winter Storm Outlook (WSO)

- The WSO provides the probability of achieving hazardous snow/ice accumulations using WFO-specific Watch/Warning criteria as a proxy threshold.
- The WSO establishes the missing national scale “Outlook” product in the winter program, serving as a unifying outlook for both external messaging and internal collaboration for consistent and collaborative Winter Storm Watch issuance.
- 50+ percent chance of meeting warning criteria triggers enhanced coordination between WPC & affected WFOs.
- Public-facing product launches December 16, 2019!

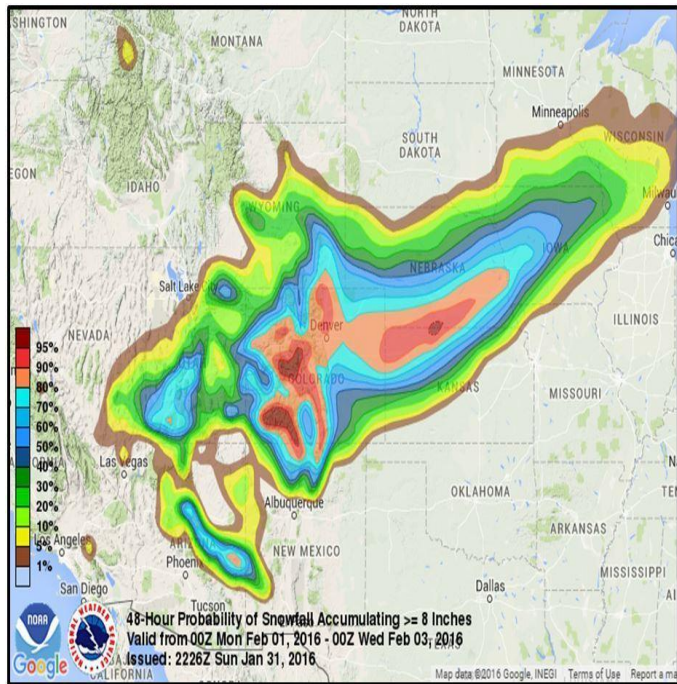


*Although related, there is not a direct tie between the Winter Storm Outlook and Winter Storm Watch Issuance by the WFOs.*



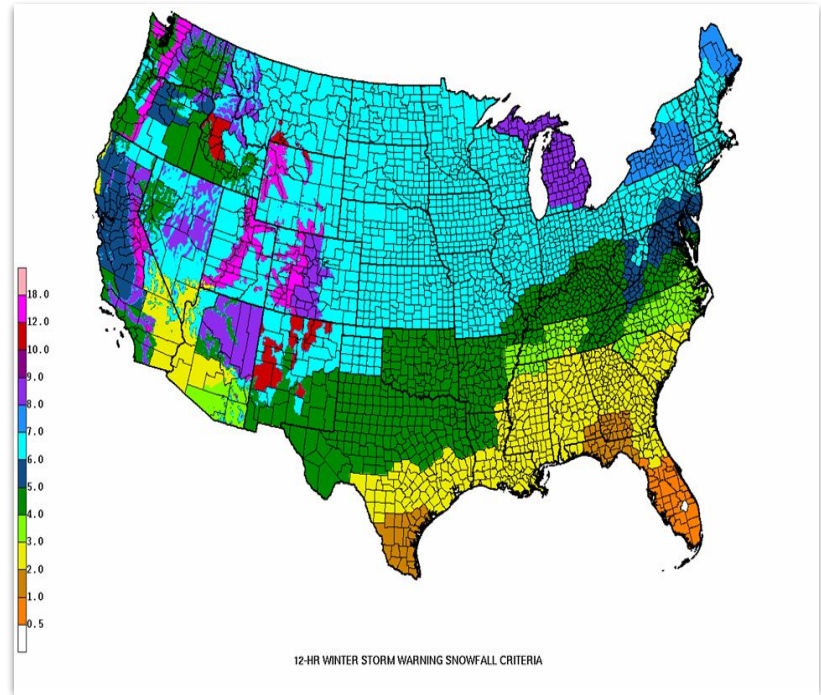
# Experimental WSO

Probability of snowfall or ice accumulations in excess of local WFO criteria for Days 1, 2, and 3.



WPC Probabilistic Winter Precipitation Forecast

Compared to...



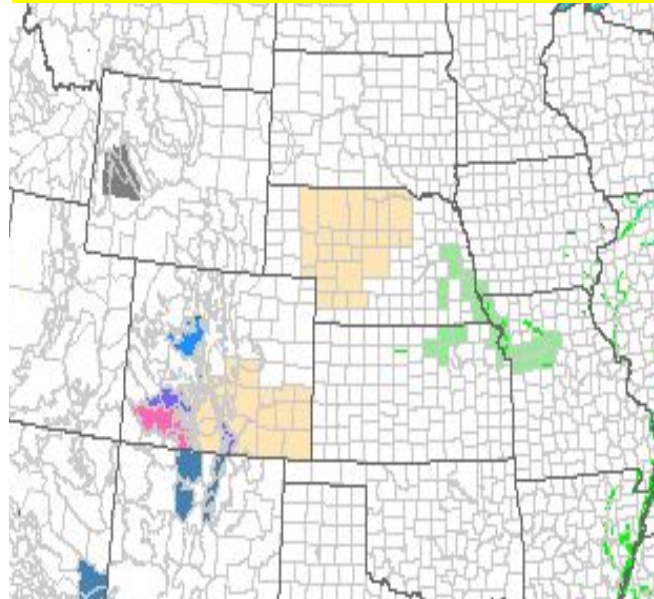
Winter Storm Warning Snowfall Criteria



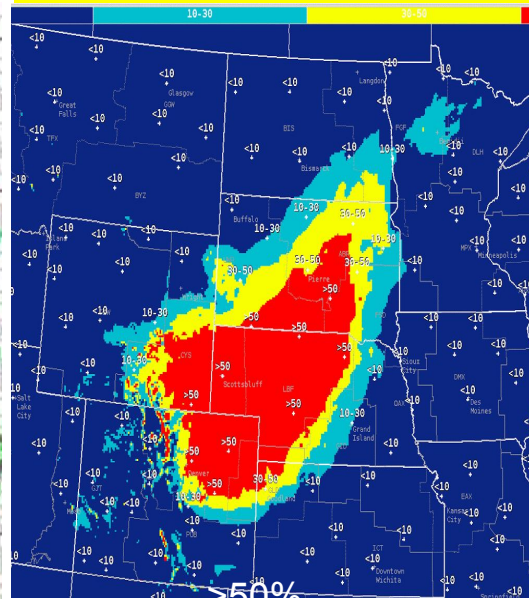
# Experimental WSO

Here is an example of the collaboration process, resulting in consistent and accurate Winter Storm Watches.

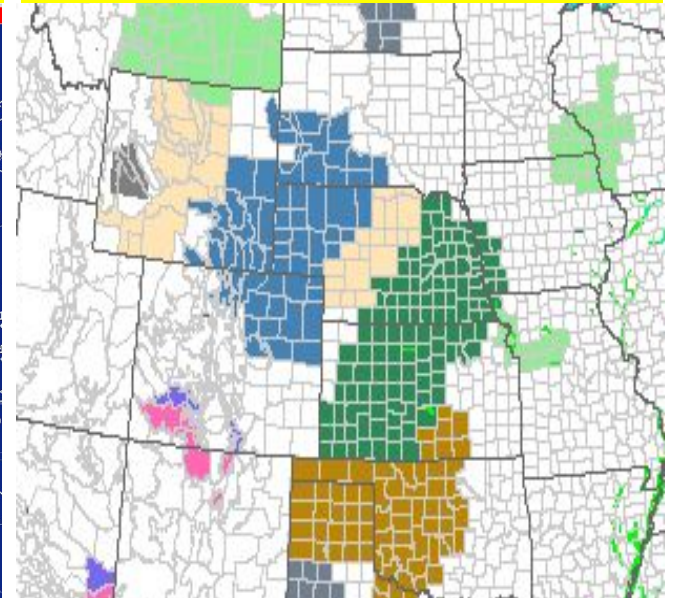
Pre-Conference Call Watches



Winter Storm Outlook



Post-Conference Call Watches



**WSO Webpage:**

<https://www.wpc.ncep.noaa.gov/wwd/wso>

**WSO Product Survey:**

<https://www.surveymonkey.com/r/ExpWinterStormOutlook>

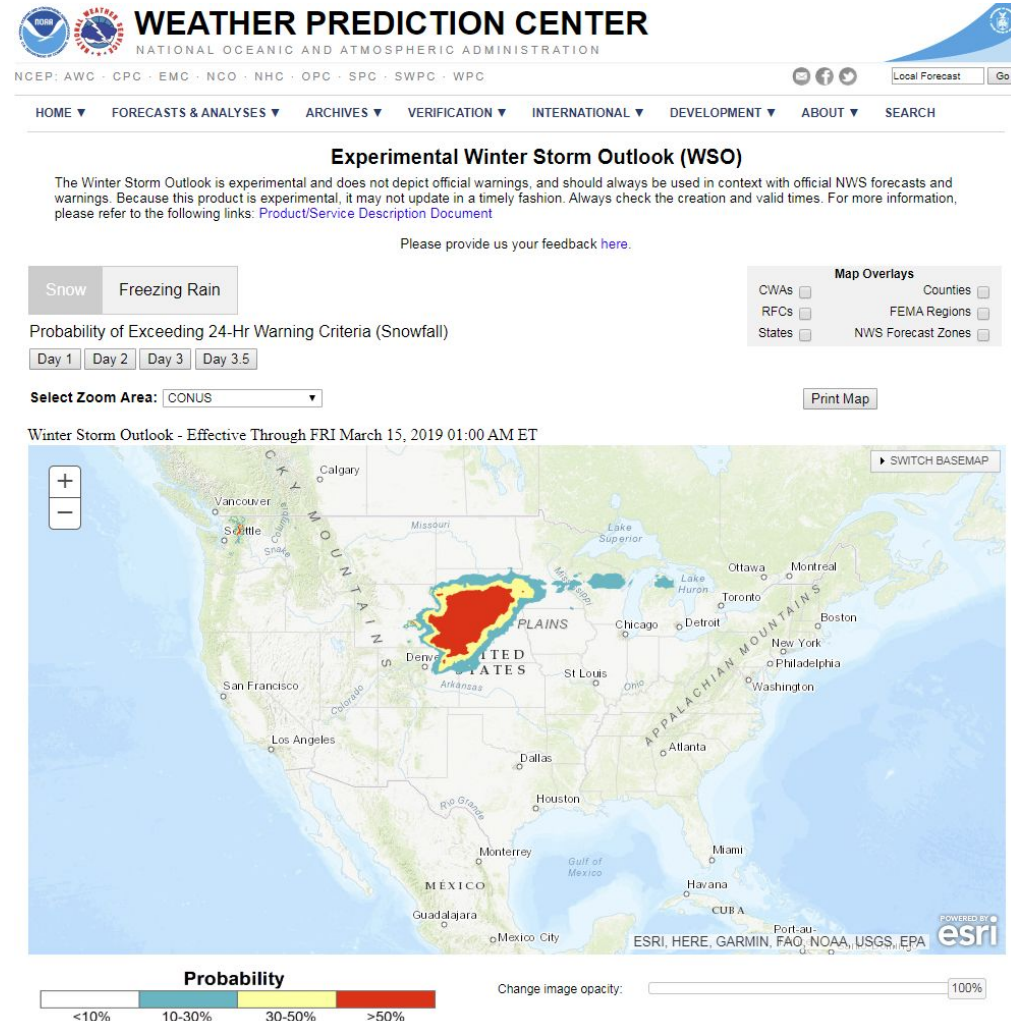




# Experimental WSO: Webpage

Coming December 16, 2019

- Clickable tabs
  - Loads WSO for Snow/ICE
  - Day Period tabs
- Dynamic Display
  - Can adjust transparency
  - Multiple basemap options
  - Adjustable zoom
- Map Overlays
  - Multiple overlays can be added to the map
- Print Image button
  - Creates a PDF of the map with your specifications



# Testing Winter Key Messages

- Building on Success with Tropical Cyclones
  - Galvanize partners and media around consistent, coordinated message
  - Coordinated among operational units
  - Available as slide on WPC homepage and integrated into WFO & WPC messaging

**Key Messages for Hurricane Michael**  
Advisory 12: 10:00 AM CDT Tue Oct 09, 2018


1. Life-threatening storm surge is likely along portions of the coasts of the Florida Panhandle, Big Bend, and Nature Coast, and a storm surge warning is in effect for these areas. Water levels will rise well in advance of the center of Michael, and residents within the storm surge warning area should finish preparations to protect life and property today.

2. Everyone in the hurricane warning area along the Florida Gulf Coast should prepare for life-threatening major hurricane winds associated with the core of Michael. Hurricane force winds will also extend well inland across portions of the Florida Panhandle, southern Georgia, and southeast Alabama as Michael moves inland.

3. Heavy rainfall from Michael could produce life-threatening flash flooding from the Florida Panhandle and Big Bend region into portions of Georgia and South Carolina.

4. Michael is expected to produce heavy rainfall and flash flooding over portions of western Cuba during the next day or so.

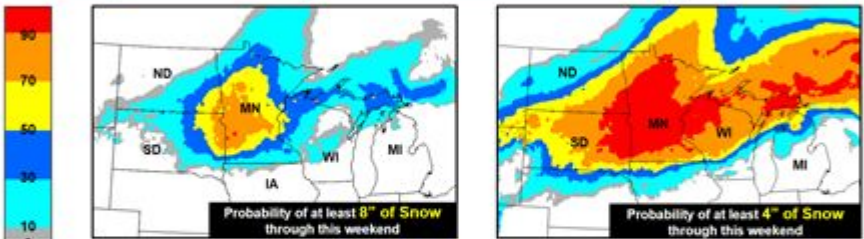
For more information go to [hurricanes.gov](http://hurricanes.gov)



The slide contains two maps. The top map is titled 'Tropical Storm Force Wind Speed Probabilities (Probability)' and shows a probability distribution of wind speeds along the Florida Gulf Coast. The bottom map is titled 'Most Likely Annual Time of Tropical Storm Force Winds' and shows a similar probability distribution along the Florida Gulf Coast.

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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

**Heavy Snow Likely This Weekend in the Upper Midwest**



The slide features two maps of the Upper Midwest region (North Dakota, South Dakota, Minnesota, Wisconsin, Iowa, and Michigan). The left map is titled 'Probability of at least 8" of Snow through this weekend' and shows a color-coded probability distribution. The right map is titled 'Probability of at least 4" of Snow through this weekend' and shows a similar color-coded probability distribution. A color scale on the left indicates probabilities from 0% to 90%.

- The greatest chances for heavy snow exist from eastern South Dakota, extreme southeast North Dakota eastward across much of southern/central Minnesota into northern/central Wisconsin and the Upper Peninsula of Michigan.
- There is potential for severely reduced visibility due to snowfall and considerable blowing snow. This could cause significant disruptions to travel.
- The snow is expected to be heavy and wet. This could add stress and weight to buildings, resulting in roof collapses. The wet and heavy snow will also lead to difficult snow removal, leading to the potential for health concerns.
- Check the latest forecasts and warning information regarding this weekend winter storm at [weather.gov](http://weather.gov)

Updated: 2 PM CST, Friday, March 8, 2019

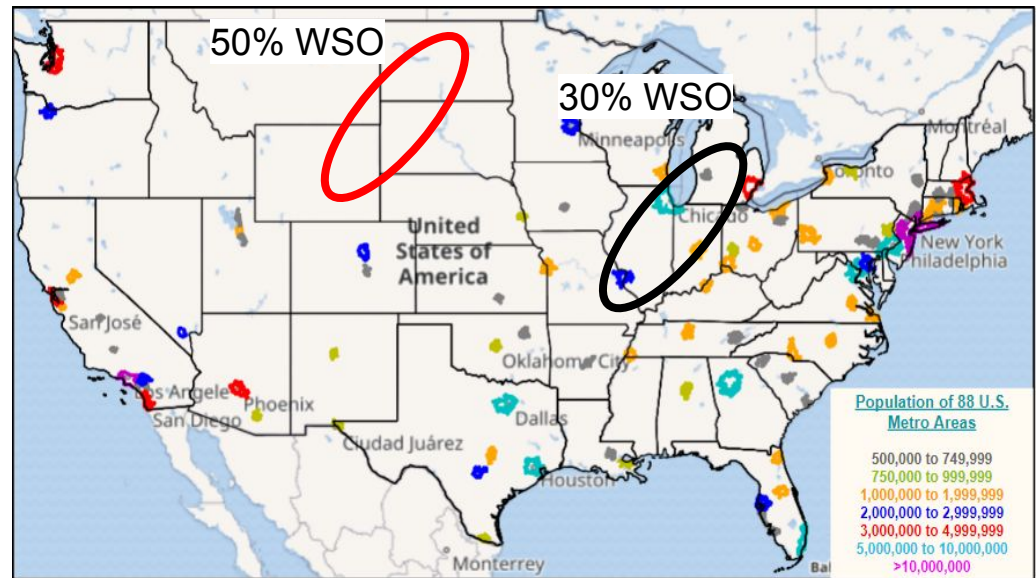


# Testing Winter Key Messages

Initiated for: **High-impact** scenarios that have a significant chance of travel disruptions or posing a hazard to life and property *and/or* **Significantly anomalous** events likely to generate substantial media attention.

## Common Trigger:

>500 mile long swath of >30% probability of local warning criteria being exceeded in the Winter Storm Outlook including at least one metropolitan area with at least 500,000 people  
Or, a similarly extensive swath of >50% probability, not necessarily encompassing a metro area

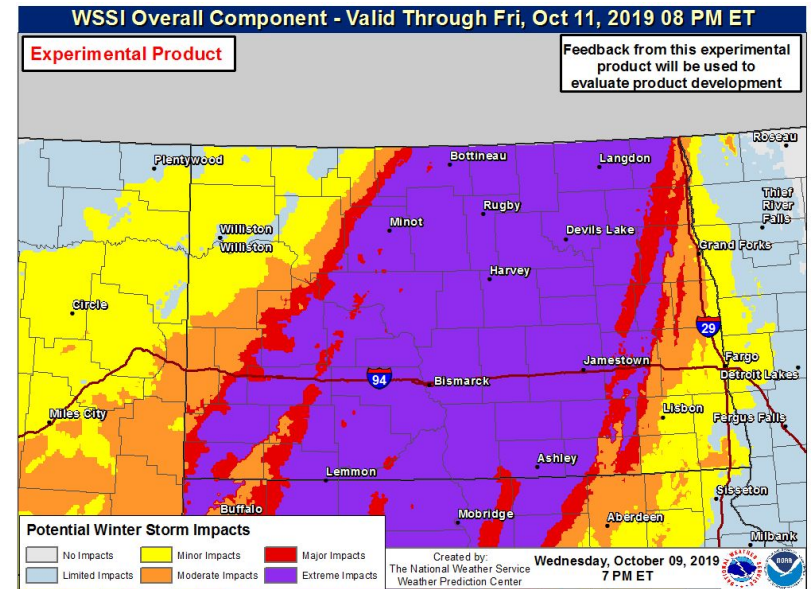


*Questions so far?*



# Experimental Winter Storm Severity Index (WSSI)

- Winter Storm Severity Index:
  - Assists NWS forecasters in maintaining situational awareness regarding potential significance of weather related impacts based upon the current forecast
  - Enhances communication to external partners, media and general public of an event's expected severity (e.g., societal impacts) and spatial extent
- Provides winter storm "impact" info out to 72 hours
  - Includes meteorological & non-meteorological factors
  - Six levels of impact provided in color-coded scale
  - 24 HR breakouts



Output available here:

<https://www.wpc.ncep.noaa.gov/wwd/wssi/wssi.ph>



Provide feedback here:

[https://www.surveymonkey.com/r/Exp\\_WSSI\\_2019](https://www.surveymonkey.com/r/Exp_WSSI_2019)



# Experimental WSSI

- Goal of the Product
  - Summarize multiple winter weather impacts from a storm into an easily consumable graphic
  - 72 Hour forecast
    - Data comes from the NWS National Digital Forecast Database (NDFD)
    - Updates every 2 hours
    - 24 HR breakouts
- Summary graphic is a composite of the maximum impact from any of the six components



## WSSI Impact Description

Potential Winter Storm Impacts	
	<b>No Impacts</b> Impacts not expected.
	<b>Limited Impacts</b> Rarely a direct threat to life and property. Typically results in little inconveniences.
	<b>Minor Impacts</b> Rarely a direct threat to life and property. Typically results in an inconvenience to daily life.
	<b>Moderate Impacts</b> Often threatening to life and property, some damage unavoidable. Typically results in disruptions to daily life.
	<b>Major Impacts</b> Extensive property damage likely, life saving actions needed. Will likely result in major disruptions to daily life.
	<b>Extreme Impacts</b> Extensive and widespread severe property damage, life saving actions will be needed. Results in extreme disruptions to daily life.

# Experimental WSSI

WSSI consists of 6 different storm components

- Snow Amount
  - Total amount or rate will heavily impact transportation system
- Ice Accumulation
  - Combined effects of ice accretion and wind
- Snow Load
  - Where weight of snow could result in damage to trees and power line
- Blowing Snow
  - Identify where blowing snow may impact transportation
- Ground Blizzard
  - Where pre-existing snow and strong winds combine to impact transportation
- Flash Freeze (regional)
  - Identifies areas with potential for roads to become ice covered



# Experimental WSSI: Webpage

- Clickable tabs
  - Loads WSSI components upon click
  - Day Period tabs
- Revised definitions
- Zoom to WFO
  - Dropdown Box
- Print Image button
  - Creates a PDF of the map with your specifications
- Variety of basemaps
  - Switch Basemap dropdown button
- Links to GIS Data

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Experimental Winter Storm Severity Index (WSSI) | Prototype Dynamic Display

Feedback from this experimental product will be used to evaluate product development. The WSSI does not depict official warnings, and should always be used in context with official NWS forecasts and warnings. Because this product is experimental, it may not update in a timely fashion. Always check the creation and valid times. For more information, please refer to the following links: [Product/Service Description Document](#), [WSSI Users Guide](#), [Internal Resources Page \(NWS Access Only\)](#)

Please provide us your feedback [here](#).

Overall Impact | Snow Amount | Snow Load | Ice Accumulation | Flash Freeze | Blowing Snow | Ground Blizzard

Overall Impact: Maximum impact from any of the components.

Days 1-3 | Days 1 | Days 2 | Days 3

Select Zoom Area: CONUS

Print Map

Winter Storm Outlook - Effective Through FRI March 15, 2019 01:00 AM ET

Potential Winter Storm Impacts	
No Impacts	Impacts not expected.
Limited Impacts	Rarely a direct threat to life and property. Typically results in little inconveniences.
Minor Impacts	Rarely a direct threat to life and property. Typically results in an inconvenience to daily life.
Moderate Impacts	Often threatening to life and property, some damage unavoidable. Typically results in disruptions to daily life.
Major Impacts	Extensive property damage likely, life saving actions needed. Will likely result in major disruptions to daily life.
Extreme Impacts	Extensive and widespread severe property damage, life saving actions will be needed. Results in extreme disruptions to daily life.

Change image opacity: 100%

Map Overlays

- NWS County Warning Area Boundaries
- FEMA Boundaries
- State Boundaries
- River Forecast Center Boundaries
- Counties Boundaries
- NWS Public Forecast Zones

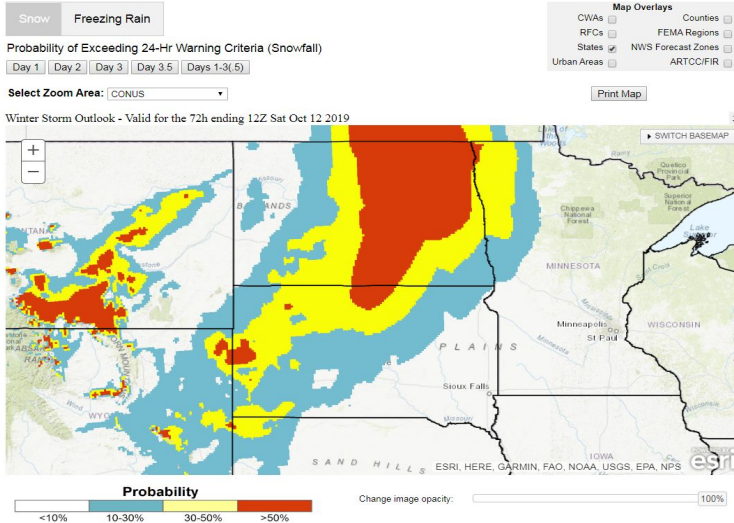
Download Latest WSSI in GIS Format:  
[Download Data in KML](#)  
[Download Data in SHP](#)

<https://www.wpc.ncep.noaa.gov/wwd/wssi/wssi.php>

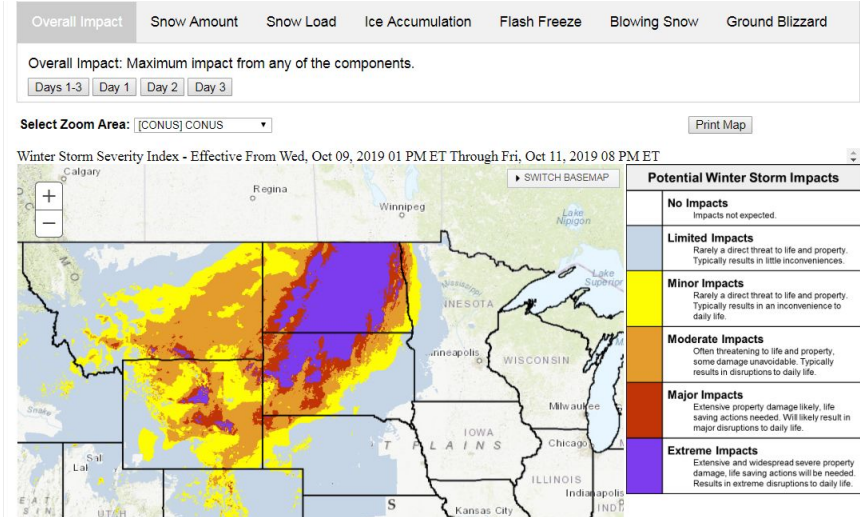


# Recent Example - Putting it all together!

## Winter Storm Outlook



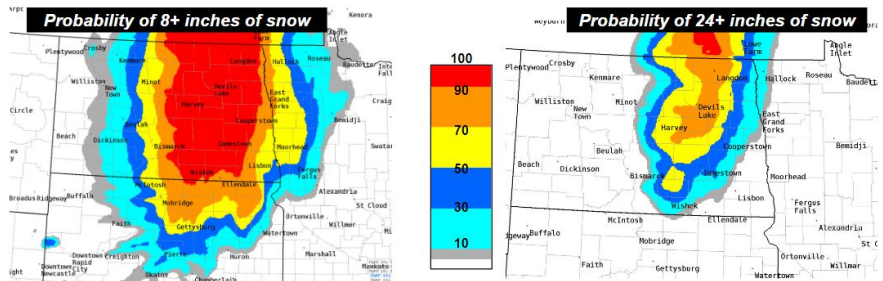
## Experimental Winter Storm Severity Index



## Key Messages

### Historic October Snow for the Northern Plains

6:30 PM EDT, Thursday, October 10, 2019



#### Forecast Information

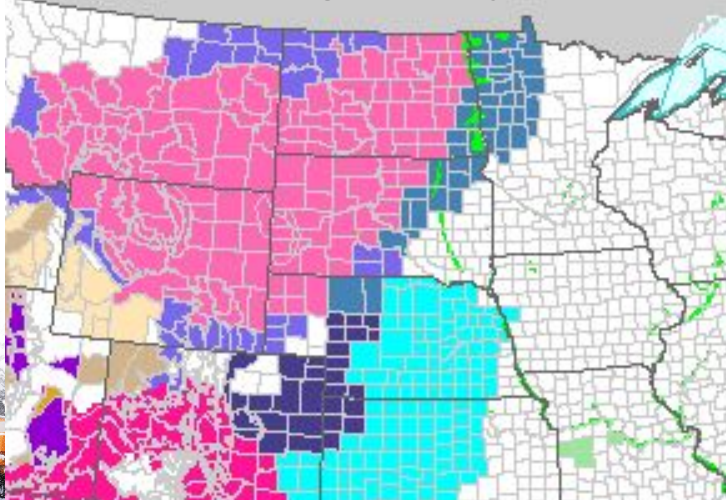
- Widespread heavy snow across the Dakotas into northwest Minnesota tonight into Saturday.
- Historic October snowfall totals are expected across portions of central and eastern North Dakota, where snowfall totals of 12 to 24 inches with higher amounts are expected.
- Blowing snow also expected, with blizzard conditions possible.

#### Impacts

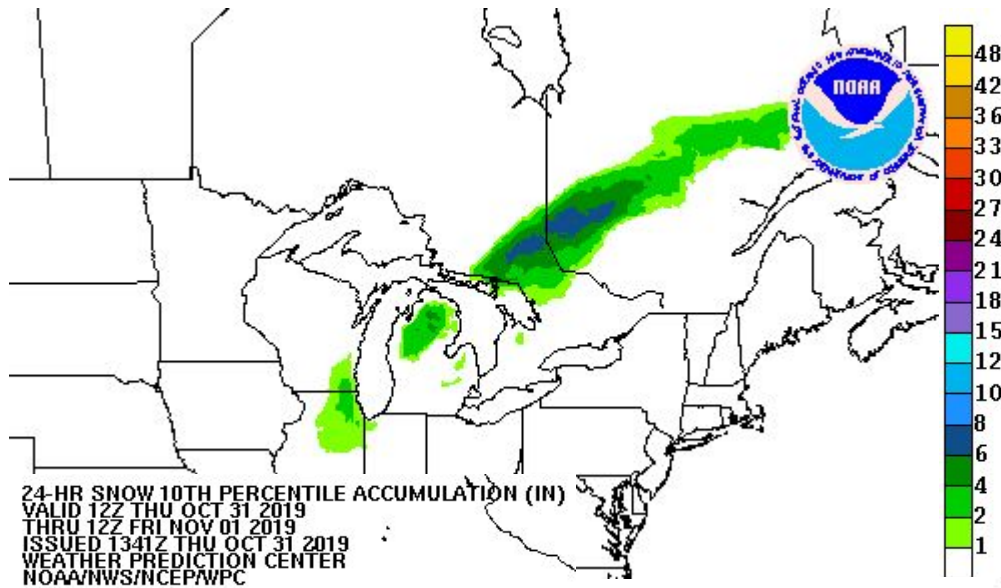
- Travel will become difficult to impossible through Saturday.
- Downed trees and some power outages expected.
- Agriculture and livestock likely to be impacted.

For more information, visit [www.wpc.ncep.noaa.gov](http://www.wpc.ncep.noaa.gov) and [www.weather.gov](http://www.weather.gov)

## Watch/Warning/Advisory



# Probabilistic Snowfall Forecasts - National View

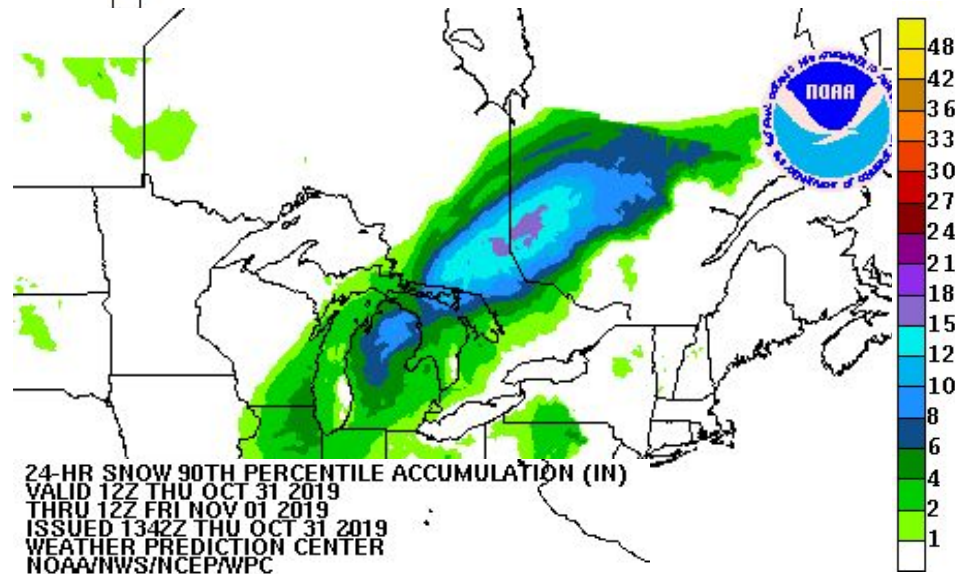


WPC issues probabilistic snowfall products that communicate the uncertainty associated with the forecast in addition to the expected (or most likely to occur) amount.

*Near real-time example of a 24-hour snowfall forecast:*

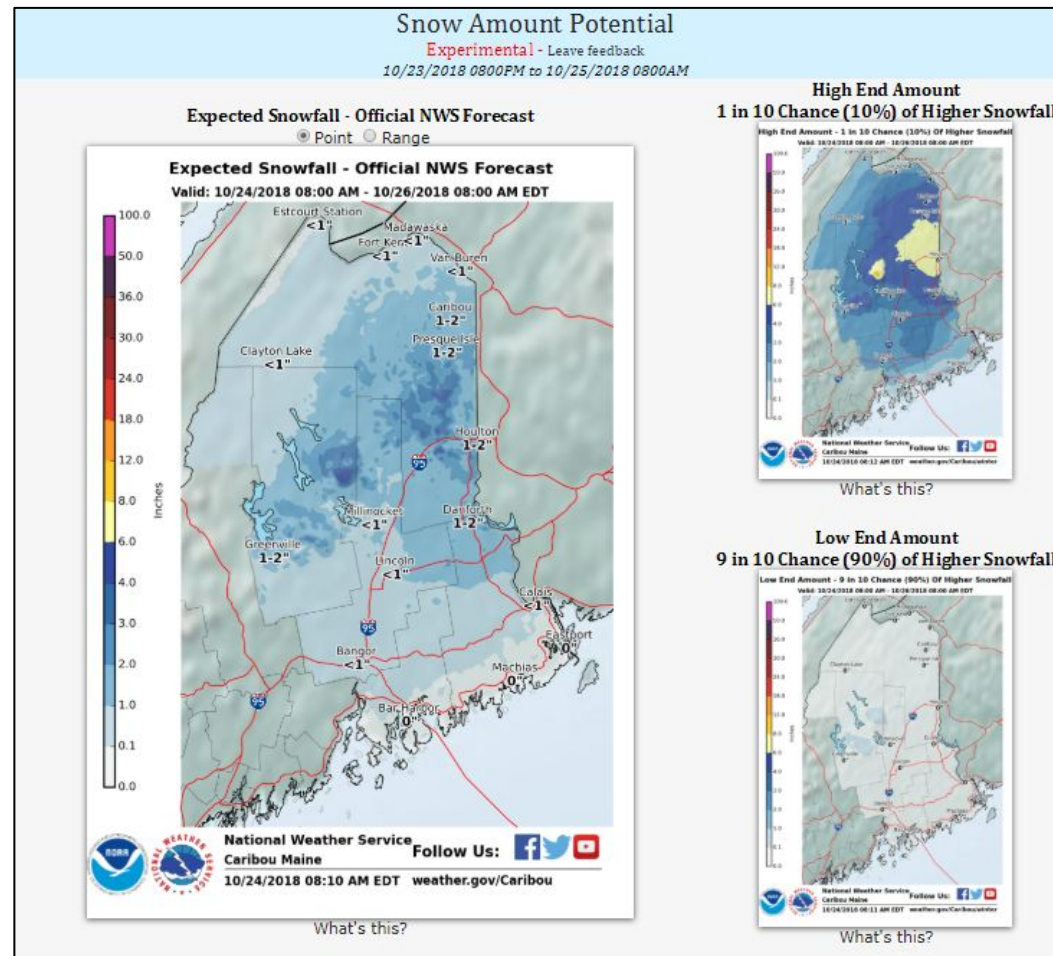
Low-end amount (90%chance)

High-end amount (10%chance)



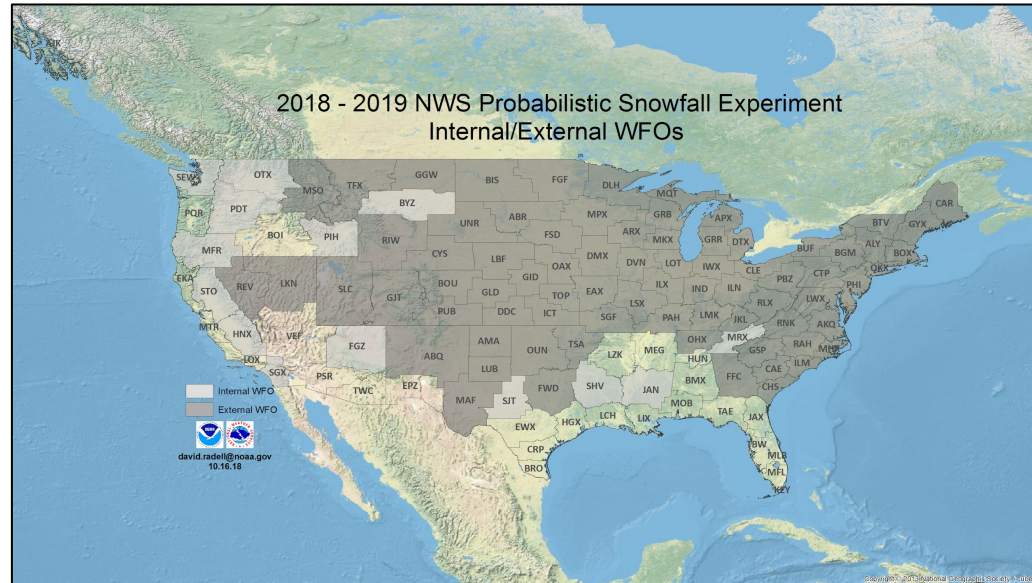
# Experimental Probabilistic Winter Precipitation Forecast (PWPF)

- Goal: Provide customers and partners a range of snowfall and icing amounts to better communicate forecast uncertainty during winter weather events
- 46-member ensemble (45 models + WPC)
  - Expert first guess forecast provided by WPC; WFOs add local knowledge
- Significant model diversity contributes to a range of possible outcomes



# Experimental PWPF

- No additional sites added in 2019-20.
- Plan for operational transition is in progress.
- One key issue is defining national and local roles in generating probabilistic snow and ice forecasts.



# NWS Winter Seasonal Safety Campaign



- NWS Winter Seasonal Safety Campaign launches on December 1 (first day of meteorological winter)
- Contains content on winter hazards including infographics, social media plans, presentations and videos
- Encourage partners to use and share this information
- See: [https://www.weather.gov/wrn/winter\\_safety](https://www.weather.gov/wrn/winter_safety)



**QUESTIONS AND ANSWERS ABOUT SNOW SQUALLS**  
WWW.WEATHER.GOV/SAFETY

**WHAT ARE THEY?**  
Quick intense bursts of snow  
Accompanied by strong gusty winds  
Short-lived, typically less than 3 hours  
Normally occur during the day

**WHAT ARE THE IMPACTS?**  
Rapidly reduced visibility  
Treacherous travel conditions  
Potential for chain-reaction accidents

**WHAT'S A SNOW SQUALL WARNING?**  
Warning is usually 30-60 minutes in length  
Issued for small areas where snow squalls are expected  
Similar to a Tornado or Severe Thunderstorm Warning

**HOW CAN YOU STAY SAFE?**  
Have a way to get forecasts and warnings  
Consider an alternate route or delaying travel  
Stay alert for rapidly changing road conditions  
Reduce speed and use low beam headlights

WEATHER.GOV

# Updated Outreach Materials

**flash freeze**  
Wet roads can freeze quickly at night or when there is a rapid drop in temperature behind a cold front.

**ROAD ICY PLEASE USE SLOWER SPEED**

**safety tips**

- Slow down
- Don't use cruise control
- Leave plenty of distance between you and other vehicles

**"Sneaky" Winter Hazards**  
The winter season brings many weather events that can "sneak" up on you. These are weather hazards that cause big impacts and make travel difficult without making big news.

**snow squalls**  
There is a long history of deadly traffic accidents associated with these intense snow events that are accompanied by strong winds and a quick reduction in visibility.

**safety tips**

- Avoid or delay motor travel until the squall passes
- Reduce your speed, turn on your headlights and hazard lights, and try to exit the road

**"Sneaky" Winter Hazards**  
The winter season brings many weather events that can "sneak" up on you. These are weather hazards that cause big impacts and make travel difficult without making big news.

WEATHER.GOV/WINTER

**WHAT'S A BLIZZARD?**

- BLOWING SNOW
- 35+ MPH WINDS
- ≤ 1/4 MI VISIBILITY
- FOR 3+ HOURS

**DID YOU KNOW THAT FALLING SNOW ISN'T NECESSARY FOR A BLIZZARD?**

A BLIZZARD THAT RESULTS FROM SNOW THAT HAS PREVIOUSLY FALLEN IS CALLED A GROUND BLIZZARD.





# Update on Winter Weather Initiatives

## Contributors:

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Greg Gust  
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## Links:

**WPC PWWF page:**  
[https://www.wpc.ncep.noaa.gov/pwvf/wwd\\_accum\\_probs.php](https://www.wpc.ncep.noaa.gov/pwvf/wwd_accum_probs.php)

**Local office Experimental PWWF page:**  
<https://www.weather.gov/btv/winter>

**Experimental WSSI:**  
<https://www.wpc.ncep.noaa.gov/wwd/wssi/wssi.php>

**Experimental WSO Webpage:**  
<https://www.wpc.ncep.noaa.gov/wwd/wso>

**Experimental WSO Product Survey:**  
<https://www.surveymonkey.com/r/ExpWinterStormOutlook>

Questions? [Michelle.Hawkins@noaa.gov](mailto:Michelle.Hawkins@noaa.gov) or [Stephen.Baxter@noaa.gov](mailto:Stephen.Baxter@noaa.gov)

