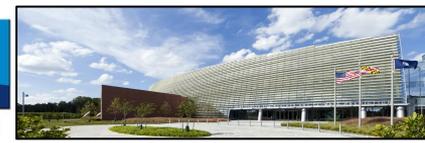




# WEATHER PREDICTION CENTER

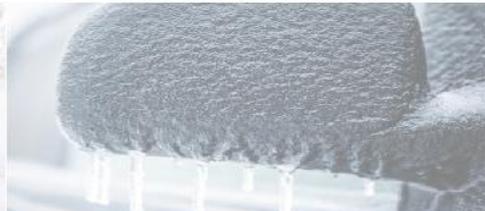
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



## *“Digging Out: Understanding WPC’s Winter Weather Desk”*



Josh in 2011:  
not always just a  
winter  
forecaster!





# What is NCEP/WPC?





# The Overview:

## Historical Roots:

- **March 16, 1942** - **Analysis Center** as the **Forecast Operations Branch (FOB)** of National Weather Bureau located downtown Washington, DC
  - Meteorological services for the War Department
  - Produced CONUS Analysis and Forecast Products (1 to 3 days)
- **January 1958** - Merged with Joint Numerical Weather Prediction Unit (Suitland, MD)
  - Named **National Meteorological Center (NMC)**
- **October 3, 1970** - Weather Bureau becomes National Weather Service (NOAA created)
- **January 1975** - Moved to World Weather Building in Camp Springs MD
  - 1 remaining employee (just retired this week!)
- **October 1, 1995** - NMC was reorganized into **National Centers for Environmental Prediction (NCEP)**
  - **HPC (Hydrometeorological Prediction Center)** is a subunit
  - Includes: **AWC, CPC, EMC, NHC/TAFB, OPC, SPC, SWPC, and Central Operations**

# NOAA Center for Weather and Climate Prediction - NCWCP

College Park, Maryland (M Square @ Univ. of Maryland)

August 2012

- March 5, 2013 - Renamed Weather Prediction Center

World Weather Building  
1975-2012



March  
2020



# National Centers for Environmental Prediction (NCEP): Provide specialized overview with daily national-level expertise

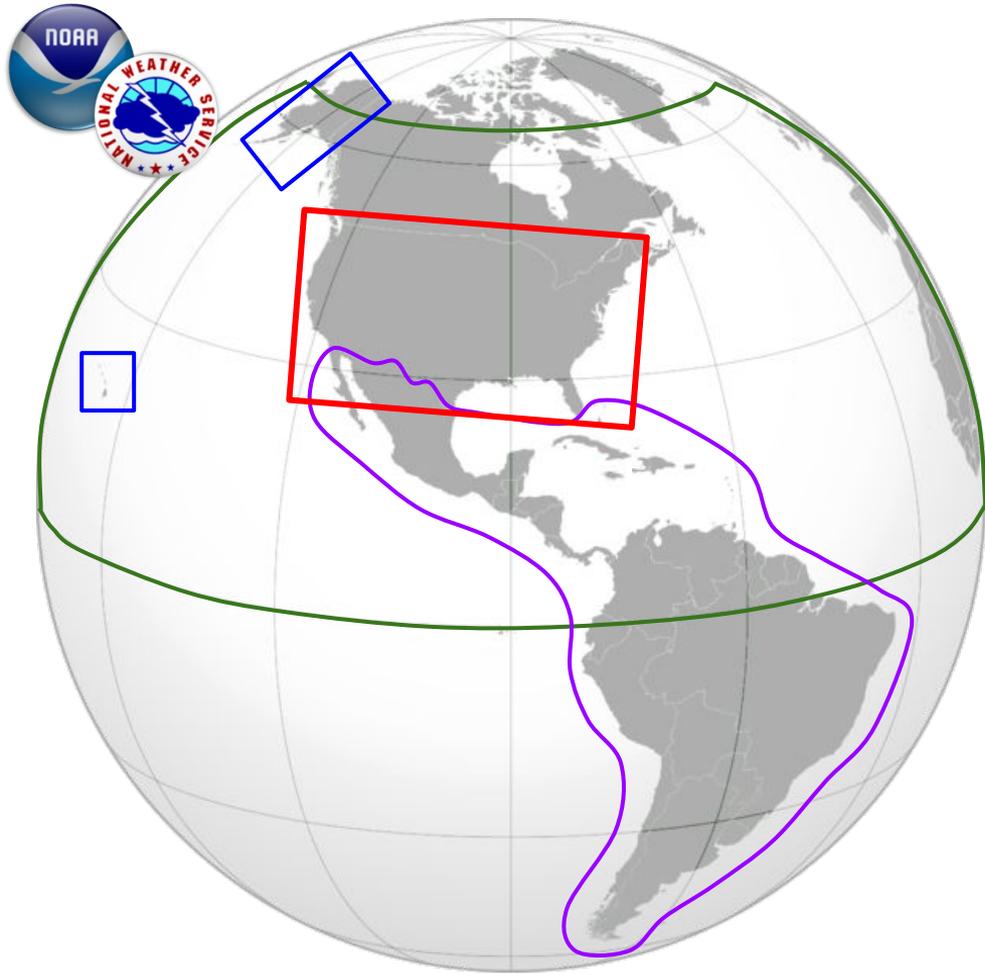
WPC's expertise being broader: Model Preference, Heavy Rain, Winter Weather, Pressures/Fronts  
Hence : WEATHER Prediction Center (even though every other Center is Predicting Weather)



WPC has a total of 9 specialized desks staffed at any given time, plus the International Desks, Developers, as well as, backup responsibilities to the National Hurricane Center. 32 Forecasters, 2 International Experts, 6 Managers, 3 Admin, 15 Developers (incl. contracts), 1 MetTech



WEATHER PREDICTION CENTER  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



# Large Domain

- CONUS: multitude of forecasts  
\*winter forecasts
- OCONUS: Alaska medium range grids and Hawaii forecast discussion
- Tropical cyclone rainfall statements with NHC and CPHC
- International Desk trains forecasters from Central and South America and the Caribbean

# WPC Mission

*National situational awareness and readiness for hazardous weather.  
Providing actionable information that is scientific, probabilistic, & impact-based.*

## Routine/Event driven products produced by WPC

### Analysis

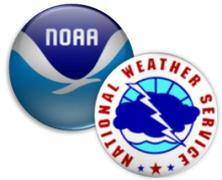
Unified Surface Analysis  
Social Media  
Storm Summaries  
CONUS High/Low  
Day 1-3 Hazards

### Short Range Days 1-3 6 to 84 hrs

Fronts/Press. & Discussion  
Precipitation(QPF) → **Winter Weather**  
Excessive Rainfall Outlook  
Metwatch - Mesoscale Precip Discussion  
National Media Phone Calls  
Rainfall Statements for TCs  
Service Backup for NHC in the Atlantic  
Advisories for Inland Depressions  
(CONUS)

### Medium Range Day 3-8 72 to 204 hrs

Days 3-7 Fronts/Pressures  
Max/Min Temps,  
QPF, Precip Prob,  
Cloud Cover, Wx Type  
Tropical Coordination - VTC  
Day 3-8 Hazards  
Chart



# WPC Winter Weather Desk (WWD)

- ❖ Seasonal desk with rotation of 4 forecasters
- ❖ Typically operates late September into May
  - Available for support for late/early season events (eg. Sep 2020, May 2020)
- ❖ **How did we get here?**

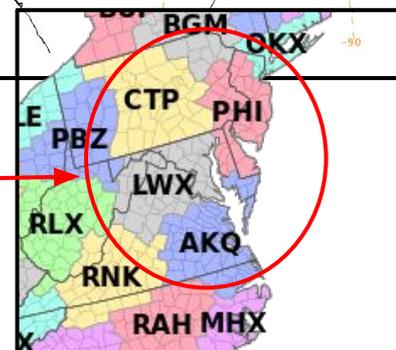
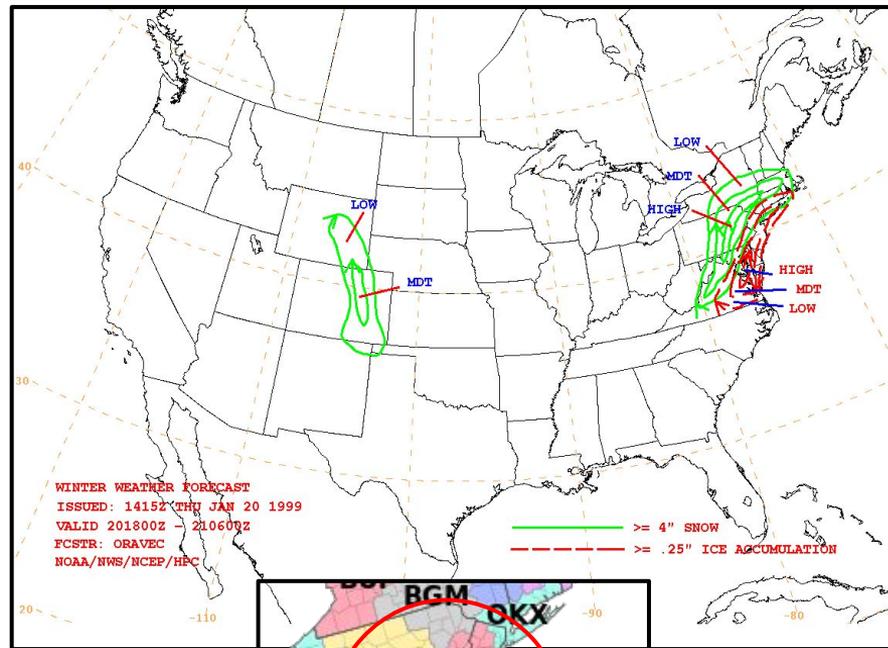


"There isn't enough winter weather to fill this desk."



# WPC WWD - History

- ❖ 1999-2001: WPC (then HPC) begins producing categorical probabilities for deterministic snow and ice accumulations
  - The snow accumulation probabilities are for greater than 4"
  - The ice accumulation (accretion) probabilities are for greater than 0.25"
- ❖ These initial forecasts were for only a small region of the Mid-Atlantic (CTP/PHI/LWX/AKQ)



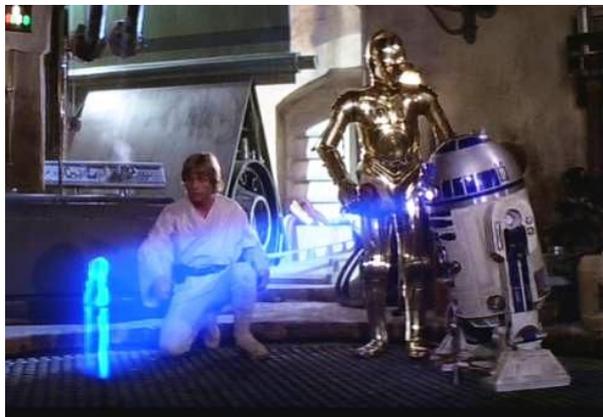


# WPC WWD - History

- ❖ IN 2001, WPC management collaborated with the local Weather Forecast Offices (WFOs) and NWS HQ to determine how WPC can best assist the winter forecasts

## NWS Winter Weather Desk

- ✍ Goals of 4 year experiment from 2001- 2004:
  - ✍ Improve Winter Weather Services to the public through coordination of the winter weather watches/warnings with National guidance products
  - ✍ Test short range ensemble for their applications to winter weather forecasting
- ✍ Motivation:
  - ✍ Jan 24-25, 2000; December 30, 2000; March 4-6, 2001



"Help me WPC, you're my only hope"



# WPC WWD - History

For the next 3 seasons (2001-2004) the first “Winter Weather Experiment” began between WPC and the NWS local WFOs.

- ❖ Forecasts:
  - Probability of 4, 8, and 12 inches of snow & deterministic snow forecast
  - Probability of 0.25” of ice & deterministic ice forecast
  
- ❖ Verification:
  - Probability of Detection (POD)
  - False Alarm Rate (FAR)
  - Critical Success Index (CSI)
  - Lead Time (LT)



# WPC WWD - History

ER	WWE1 (01-02')	WWE2 (02-03')	WWE3 (03-04')	WWD (04-05')
# WFOs	8	23	23	ALL
POD	.89	.90	.92	.92
FAR	.33	.30	.32	.30
CSI	.62	.65	M	.66
LT-Warn	13	15	18	21

CR	WWE2 (02-03')	WWE3 (03-04')	WWD* (04-05')
# WFOs	8	33	ALL
POD	.90	.88	.92
FAR	.40	.45	.32
CSI	.57	.51	.65
LT-Warn	13	13	17

WR	NonWWE 3 (03-04')	WWE3 (03-04')	WWD* (04-05')
# WFOs	12	10	ALL
POD	.86	.88	.88
FAR	.26	.27	.30
CSI	.66	.67	.64
LT-Warn	12	14	16

SR	NonWW E3 (03-04')	WWE3 (03-04')	WWD (04-05')
# WFOs	4	11	ALL
POD	.84	.92	.90
FAR	.37	.38	.39
CSI	.57	.59	.57
LT-Warn	5	9	9

2001: 8 WFOs, 2002: 31 WFOs, 2003: 77 WFOs, 2004: ALL WFOs



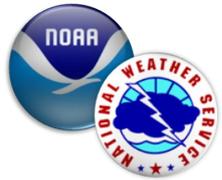
# WPC WWD - History

The Winter Weather Desk goes “operational” as WWD on Sep 15, 2004

WPC will provide probabilistic and deterministic expertise for all heavy snow and icing events across the CONUS

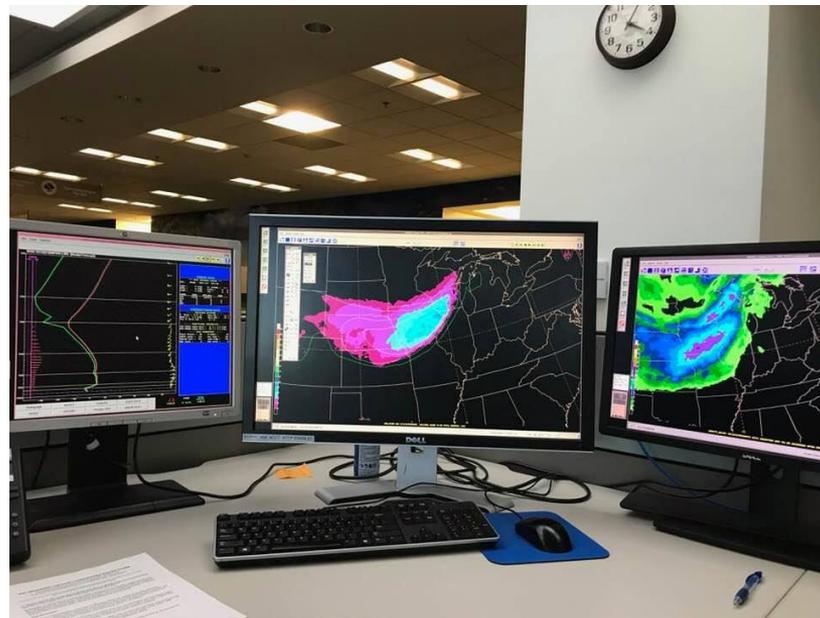


“Now, witness the power of this fully operational  
WPC Winter Weather Desk.”



# WPC: The operational WWD

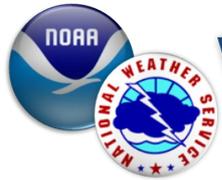
- ❖ WPC WWD products:
  - Deterministic snow and ice (D1-3)
    - Internal to NWS
  - Probabilistic snow and ice (D1-3)
  - Winter Storm Outlook (D1-4)
  - Winter Weather Outlook (D4-7)
  - Winter Storm Severity Index
  - Low Tracks Graphic
  - Heavy Snow/Ice Discussion
  - Winter Storm Key Messages





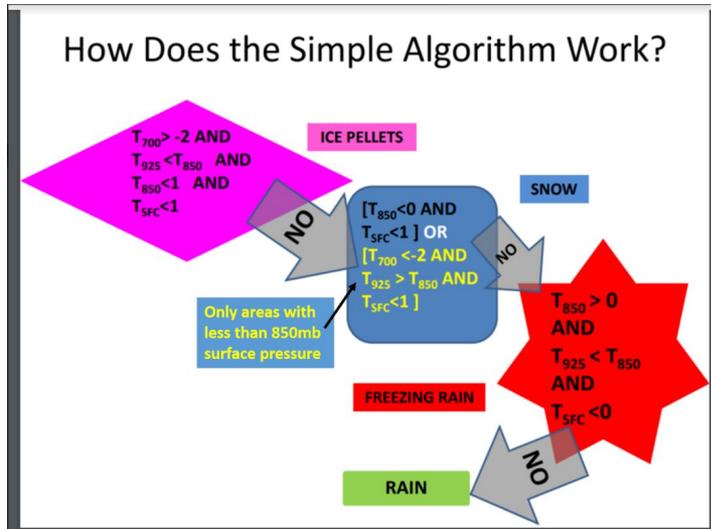
# WWD Products: Snow and Ice (D1-3)

- ❖ Through 2019: WWD created through NMAP (NAWIPS)
- ❖ 2019-2020 Season: Transition to AWIPS (GFE)
  - Better resolution (~40km → 5km)
  - Better verification (improved forecast skill scores)
  - Easier to assist WFOs
- ❖ Snow:
  - QPF \* PoWT \* SLR
    - (Quantitative Precipitation Forecast \*  
Probability of Weather Type \*  
Snow Liquid Ratio)
- ❖ Ice:
  - QPF \* PoWT \* ILR



# WWD Products: Snow and Ice (D1-3)

- ❖ Snow: QPF \* PoWT \* SLR
  - QPF: Quantitative Precipitation Forecast
  - PoWT: Probability of Weather Type
  - WPC "Decision Tree" algorithm:
    - Determines one precip type for each grid: Snow, Rain, Sleet, or Freezing Rain. There are 937,227 5km grid points!
    - Based on thermal structure (SFC, 925mb, 850mb, 700mb)
    - Decision tree algorithm determines precip type







# WWD Products: Snow and Ice (D1-3)

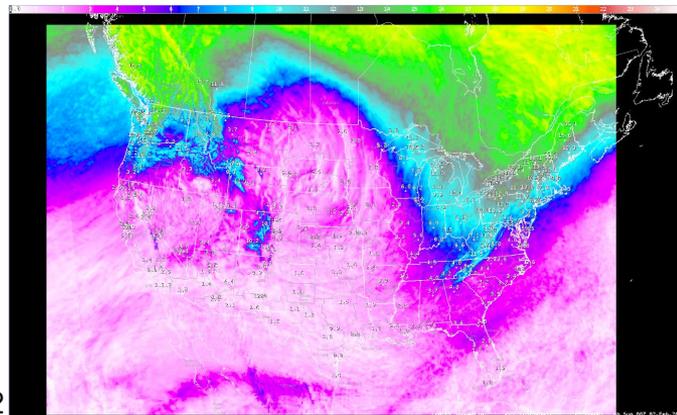
- ❖ Snow: QPF \* PoWT \* SLR
  - QPF: Quantitative Precipitation Forecast
  - PoWT: Probability of Weather Type

- SLR: Snow-Liquid Ratio:
  - Pre-2019: WPC Legacy SLR blend
  - 2019+: Modified NBM SLR

Pre-2019:



"These are not the SLR you are looking for"



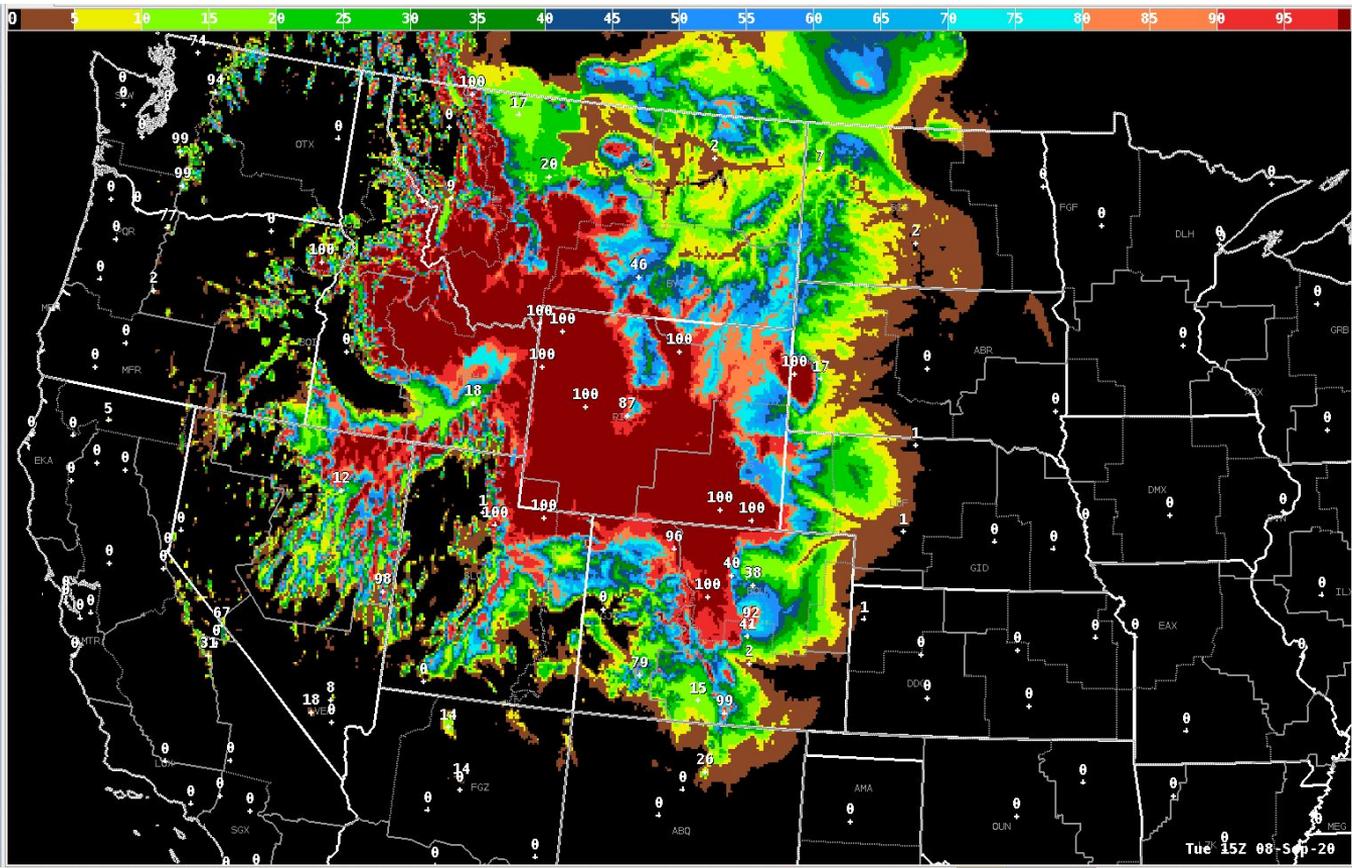
2019+: 1.13x NBM v3.2





# WWD Products: Snow and Ice (D1-3)

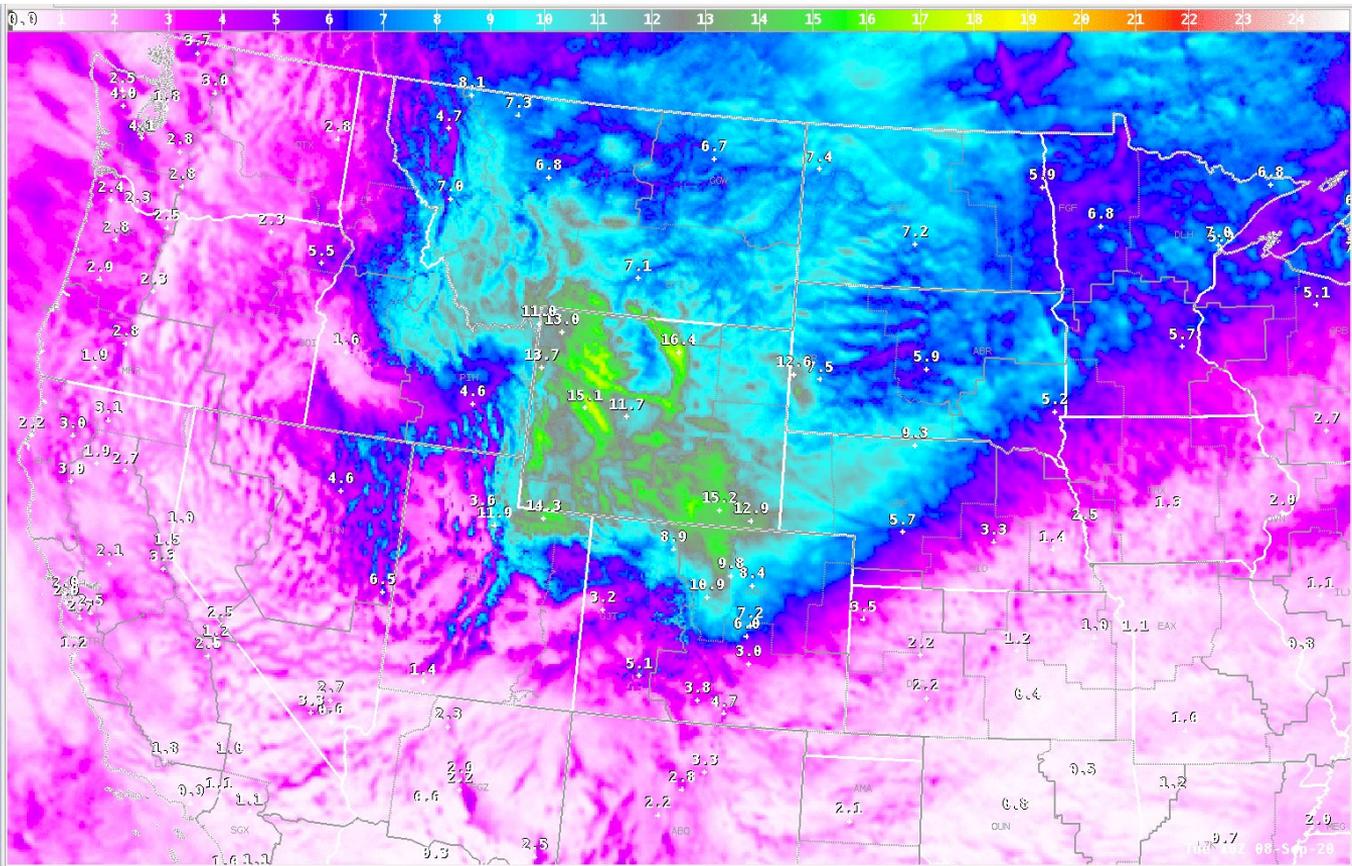
Day 3	Day 3
Sep 08	Sep 09
06	18
06	06
<input type="checkbox"/> OPF SFC Fcst (HUS)	2 2h16m 2h16m 2h16m 2h16m
<input type="checkbox"/> SnowAmt SFC Fcst (HUS)	2 2h 2h 2h 2h 2h
<input type="checkbox"/> IceAccum SFC Fcst (HUS)	2 2h 2h 2h 2h 2h
<input type="checkbox"/> PotFreezingRain SFC Fcst	3 34m 34m 34m 34m 34m
<input type="checkbox"/> PotRain SFC Fcst (HUS)	3 34m 34m 34m 34m 34m
<input type="checkbox"/> PotSleet SFC Fcst (HUS)	3 34m 34m 34m 34m 34m
<input checked="" type="checkbox"/> PotSnow SFC Fcst (HUS)	3 34m 34m 34m 34m 34m
<input type="checkbox"/> SnowRatio SFC Fcst (HUS)	4 4m 4m 4m 4m 4m
<input type="checkbox"/> PotSnow SFC Official (HUS)	
<input type="checkbox"/> PotSnow6 SFC CMCnh 0612	2 3h22m 3h22m 3h56m 4h15m 3h12m
<input type="checkbox"/> PotSnow6 SFC CMCreg 0618	
<input type="checkbox"/> PotSnow6 SFC ECENSMEAN 0612	3 3h 3h 3h 3h 3h
<input type="checkbox"/> PotSnow6 SFC ECENSMEAN 0618	2 20h 20h 20h 20h 20h
<input type="checkbox"/> PotSnow6 SFC ECMWF25 0612	2 2h59m 3h56m 2h54m 2h56m 2h47m
<input type="checkbox"/> PotSnow6 SFC GEFSMEAN 0612	3 3h 3h 3h 3h 3h
<input type="checkbox"/> PotSnow6 SFC GEFSMEAN 0618	3 3h 3h 3h 3h 3h
<input type="checkbox"/> PotSnow6 SFC GFS360 0612	3 5h19m 5h16m 5h13m 5h5m 5h5m
<input type="checkbox"/> PotSnow6 SFC HITRESwary 0612	





# WWD Products: Snow and Ice (D1-3)

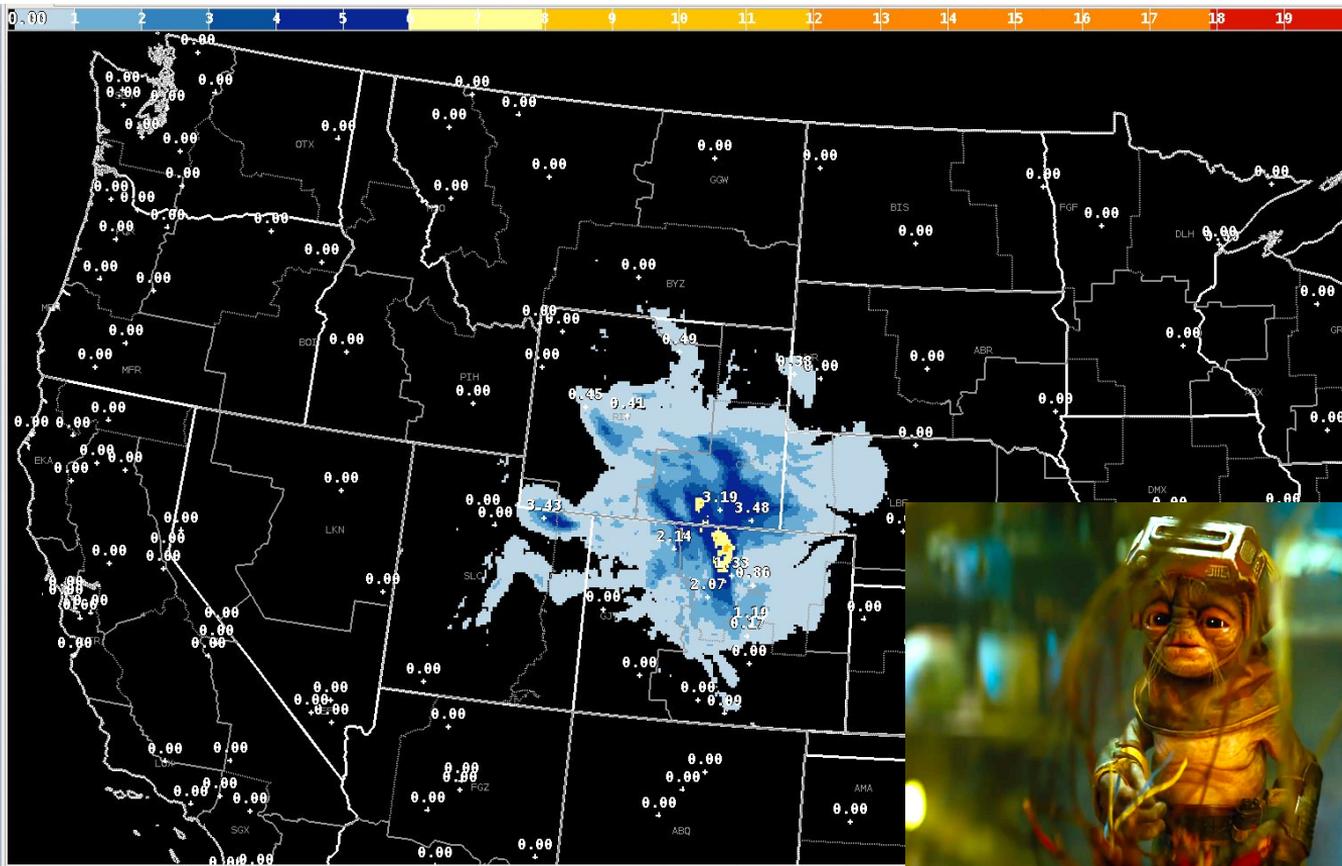
Day	Day 3
Sep 08 (Tue)	Sep 09
06	12 18
<input type="checkbox"/> QPF SFC Fcst (HUS)	2h16m 2h16m 2h16m 2h16m 2h16m
<input type="checkbox"/> SnowAmt SFC Fcst (HUS)	2m 2m 2m 2m 2m
<input type="checkbox"/> IceAccum SFC Fcst (HUS)	2m 2m 2m 2m 2m
<input type="checkbox"/> PotFreezingRain SFC Fcst	3 34m 34m 34m 34m 34m
<input type="checkbox"/> PotRain SFC Fcst (HUS)	3 34m 34m 34m 34m 34m
<input type="checkbox"/> PotSleet SFC Fcst (HUS)	3 34m 34m 34m 34m 34m
<input type="checkbox"/> PotSnow SFC Fcst (HUS)	3 34m 34m 34m 34m 34m
<input checked="" type="checkbox"/> SnowRatio SFC Fcst (HUS)	4 4m 4m 4m 4m 4m
<input type="checkbox"/> PotSnow SFC Official (HUS)	
<input type="checkbox"/> PotSnow6 SFC CMCnh 0612	2 3h27m 3h23m 3h7m 4h15m 3h12m
<input type="checkbox"/> PotSnow6 SFC CMCreg 0618	0m
<input type="checkbox"/> PotSnow6 SFC ECENSMEAN 06	3 8h 8h 8h 8h 8h
<input type="checkbox"/> PotSnow6 SFC ECENSMEAN 09	2 20h 20h 20h 20h 20h
<input type="checkbox"/> PotSnow6 SFC ECMWF25 0612	2 2h59m 3h6m 2h55m 2h56m 2h47m
<input type="checkbox"/> PotSnow6 SFC GEFSMEAN 06	
<input type="checkbox"/> PotSnow6 SFC GEFSMEAN 060	
<input type="checkbox"/> PotSnow6 SFC GFS360 0612	
<input type="checkbox"/> PotSnow6 SFC HTRESMary 06	





# WWD Products: Snow and Ice (D1-3)

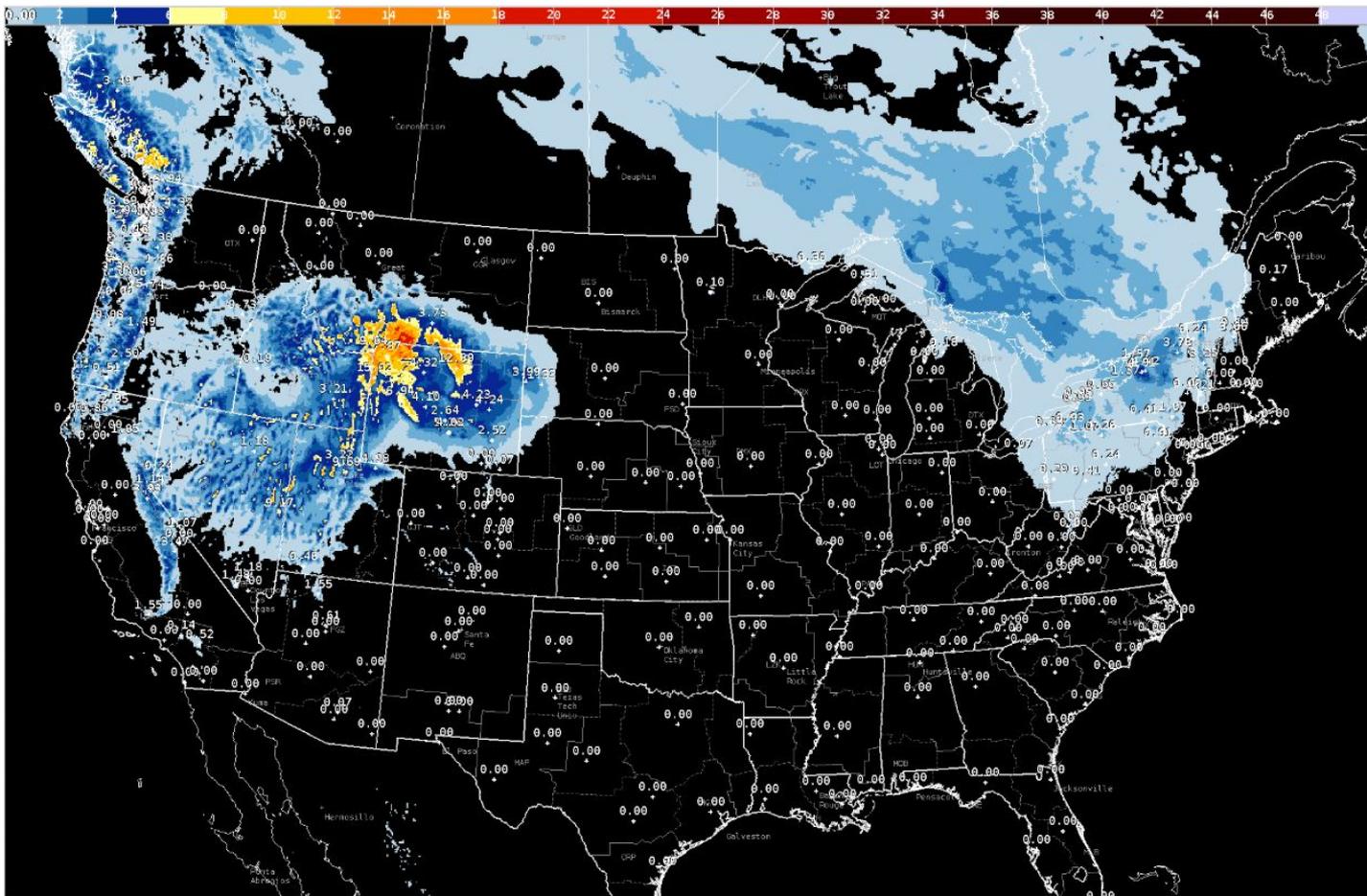
Day 3	Day 3				
Sep 08 (Tue)	Sep 09				
06	12	18	06		
<input type="checkbox"/> QPF SFC Fcst (HUS)	2	2h15m	2h15m	2h15m	2h15m
<input checked="" type="checkbox"/> SnowAmt SFC Fcst (HUS)	2	2m	2m	2m	2m
<input type="checkbox"/> IceAccum SFC Fcst (HUS)	2	2m	2m	2m	2m
<input type="checkbox"/> PotFreezingRain SFC Fcst	3	34m	34m	34m	34m
<input type="checkbox"/> PotRain SFC Fcst (HUS)	3	34m	34m	34m	34m
<input type="checkbox"/> PotSleet SFC Fcst (HUS)	3	34m	34m	34m	34m
<input type="checkbox"/> PotSnow SFC Fcst (HUS)	3	34m	34m	34m	34m
<input type="checkbox"/> SnowRatio SFC Fcst (HUS)	4	4m	4m	4m	4m
<input type="checkbox"/> PotSnow SFC Official (HUS)					
<input type="checkbox"/> PotSnow6 SFG CIMCh 0612	2	3h27m	3h23m	3h5m	3h12m
<input type="checkbox"/> PotSnow6 SFG CIMReg 0618					
<input type="checkbox"/> PotSnow6 SFG ECENSMEAN 06	3	3h	3h	3h	3h
<input type="checkbox"/> PotSnow6 SFG ECENSMEAN 05	2	20h	20h	20h	20h
<input type="checkbox"/> PotSnow6 SFG ECMWF25 0612	2	2h58m	3h6m	2h54m	2h55m
<input type="checkbox"/> PotSnow6 SFG GEFSMEAN 06	3	3h	3h	3h	3h
<input type="checkbox"/> PotSnow6 SFG GEFSMEAN 060					
<input type="checkbox"/> PotSnow6 SFG GFS360 0612	5	5h19m	5h16m	5h13m	5h5m
<input type="checkbox"/> PotSnow6 SFG HITRESWary 06					

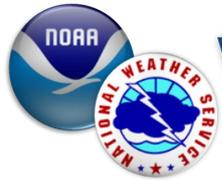


"WWD is Ready!"



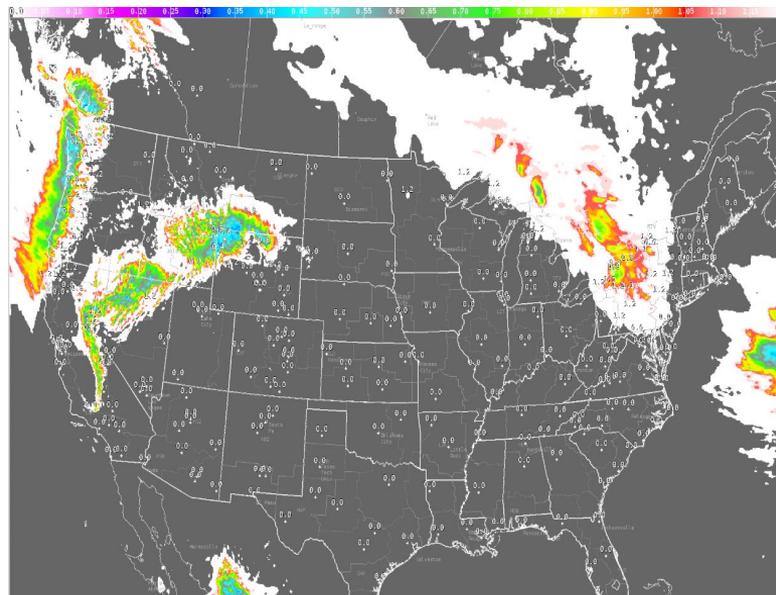
# WWD Products: Snow and Ice (D1-3)

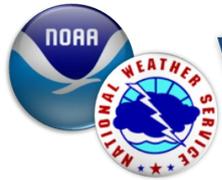




# WWD Products: Snow and Ice (D1-3)

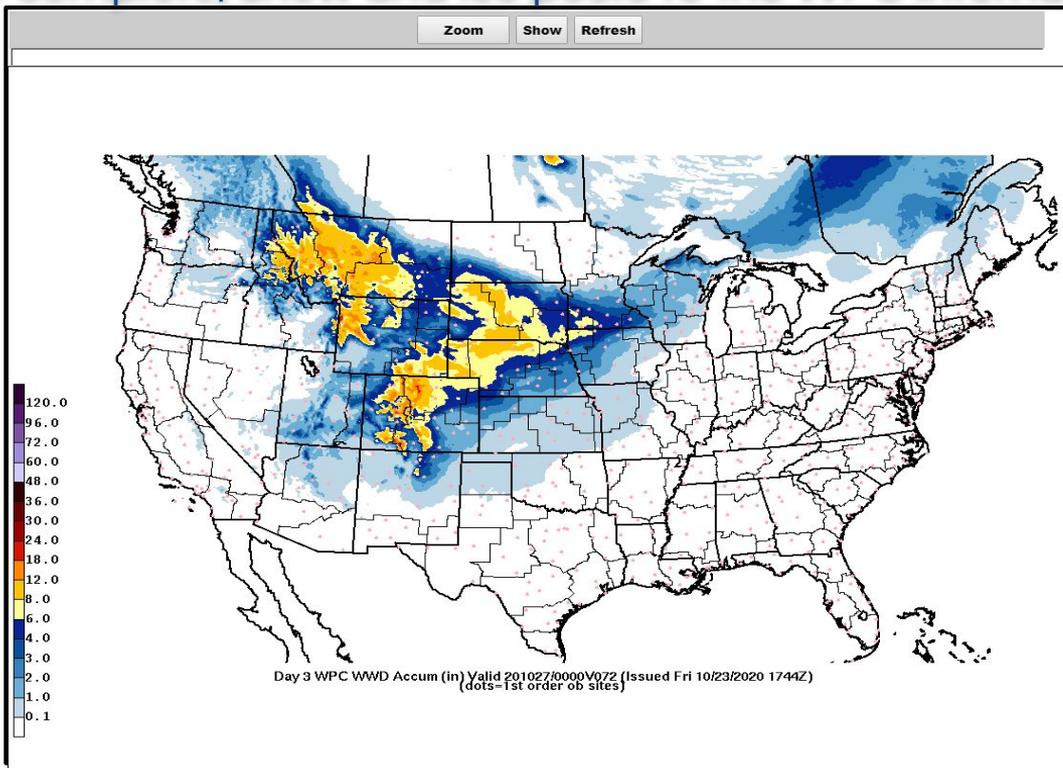
- ❖ Ice:  $QPF * PoWT * ILR$ 
  - QPF: Quantitative Precipitation Forecast
  - PoWT: Probability of Weather Type
  - ILR: Ice-Liquid Ratio:
    - Freezing Rain Accumulation Model (FRAM)





# WWD Products: Snow and Ice (D1-3)

Once complete, snow and ice posts to the WPC internal page for WFO perusal



WPC PRELIMINARY WINTER WEATHER ACCUMULATIONS  
INTERNAL USE ONLY

Select Domain:  CONUS  West  East

S&P/ZR Combo	S&IP	ZR
<input type="radio"/> Day 1 (24-h accumulation)	<input type="radio"/> Latest <input type="radio"/> previous	<input type="radio"/> Latest <input type="radio"/> previous
<input type="radio"/> Day 1½ (24-h accumulation)	<input type="radio"/> Latest <input type="radio"/> previous	<input type="radio"/> Latest <input type="radio"/> previous
<input type="radio"/> Day 2 (24-h accumulation)	<input type="radio"/> Latest <input type="radio"/> previous	<input type="radio"/> Latest <input type="radio"/> previous
<input type="radio"/> Day 2½ (24-h accumulation)	<input type="radio"/> Latest <input type="radio"/> previous	<input type="radio"/> Latest <input type="radio"/> previous
<input type="radio"/> Day 3 (24-h accumulation)	<input type="radio"/> Latest <input type="radio"/> previous	<input type="radio"/> Latest <input type="radio"/> previous
<input type="radio"/> Day 1+2 (48-h accumulation)	<input type="radio"/> Latest <input type="radio"/> previous	<input type="radio"/> Latest <input type="radio"/> previous
<input type="radio"/> Day 2+3 (48-h accumulation)	<input type="radio"/> Latest <input type="radio"/> previous	<input type="radio"/> Latest <input type="radio"/> previous
<input type="radio"/> 3 Day Total (72-h accumulation)	<input checked="" type="radio"/> Latest <input type="radio"/> previous	<input type="radio"/> Latest <input type="radio"/> previous

ZOOM - Zoom button, then repress LEFT click  
UNZOOM - repress ZOOM button  
PAN - Drag left button while zoomed  
SHOW - Opens printable graphic in a new window

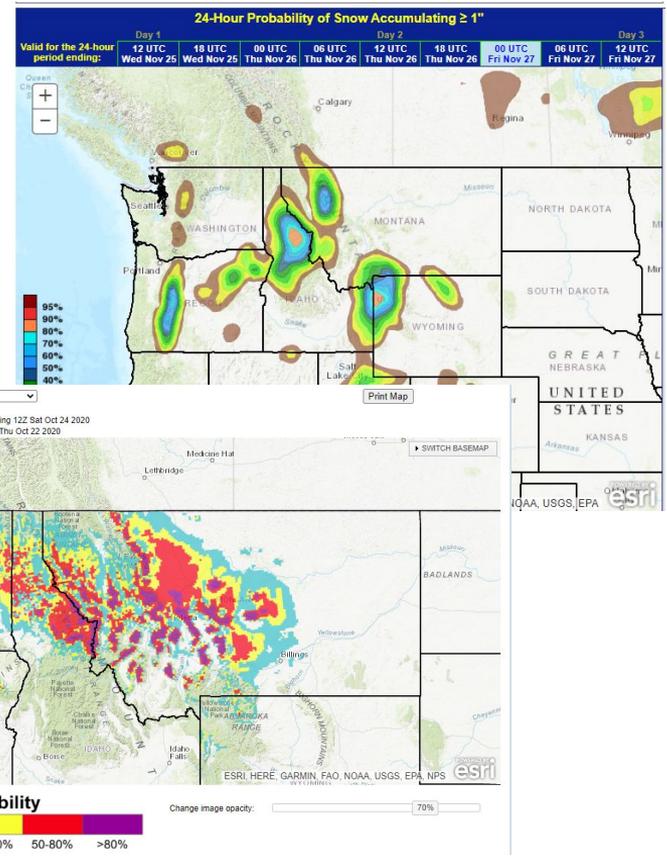
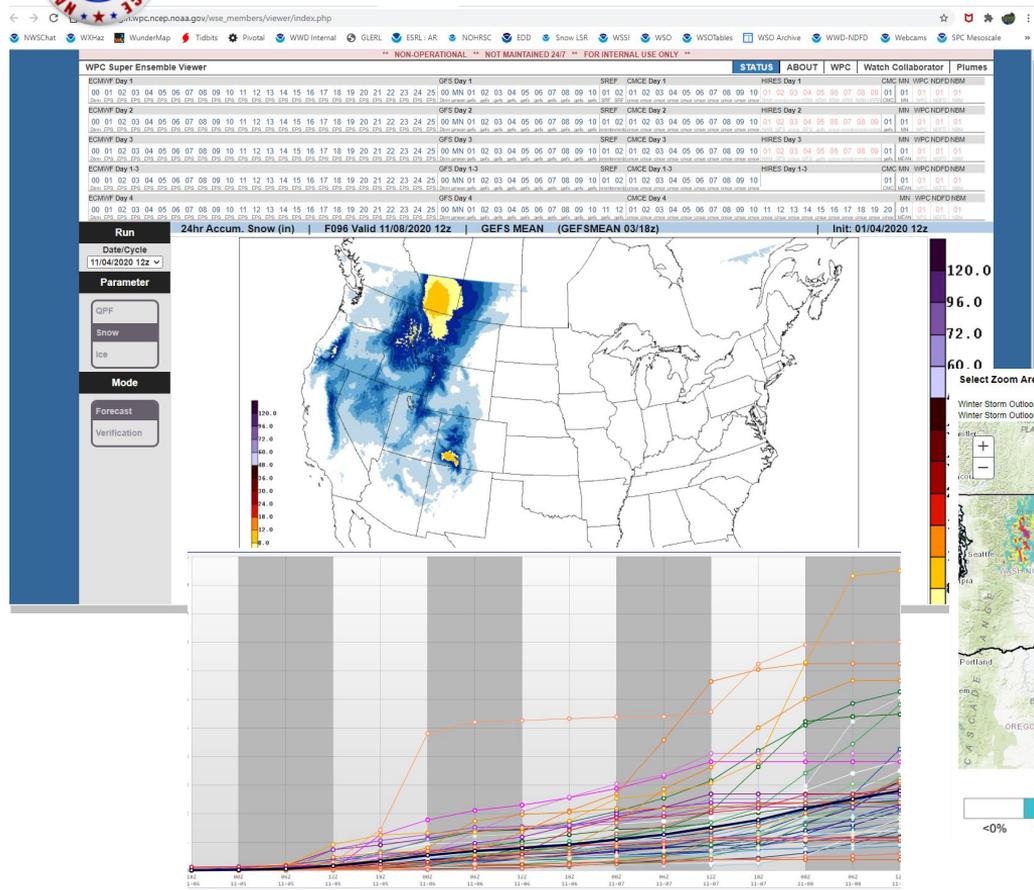
**\* Forecasts, Outlooks, & Impacts \***  
Links open in new windows (tabs)

- [WPC Superensemble Viewer](#)
- [WPC Superensemble Plumes](#)
- [Experimental Winter Storm Outlook](#)
- [WPC Winter Storm Watch Collaborator \(Legacy\)](#)
- [Experimental Winter Storm Severity Index](#)
- [Days 4-7 Probabilistic Winter Weather Outlook](#)
- [Days 4-7 WPC Medium Range Snowfall Probabilities](#)
- [Low Tracks Maps](#)

However, Probabilistic information is available to everyone!



# WWD Products: Probabilistic winter (D1-3)





# WWD Products: Probabilistic winter (D1-3)

- ❖ WPC Probabilistic Winter Forecasts:
  - Leverage all models using an ensemble approach to produce the most representative winter forecast
  - Accounts for outliers and high-end event potential
  - Provides a “reasonable worst case” forecast for decision makers
  - Encompasses more solutions to reduce the potential of a “missed event”
  
- ❖ Probabilistic Products:
  - Winter Storm Ensemble (WSE) & plumes, PWPF graphics, Winter Storm Outlook (WSO), Winter Weather Outlook (WWO)



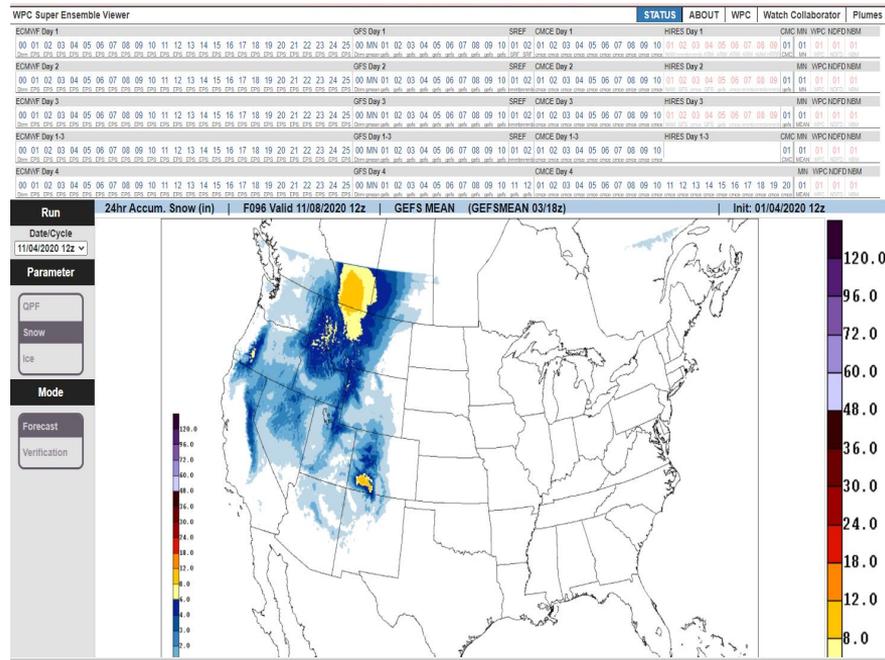
# WWD Products: Probabilistic winter (D1-3)

## ❖ WSE Viewer:

➤ Has output for QPF, Snow, and Ice from a selection of:

- 25 ECENS members
- 10 GEFS members
- 10 CMCE members
- 10 high-res
- All deterministic guidance

- Allows forecasters to see the range of possibilities for different events
- Internal to NWS only



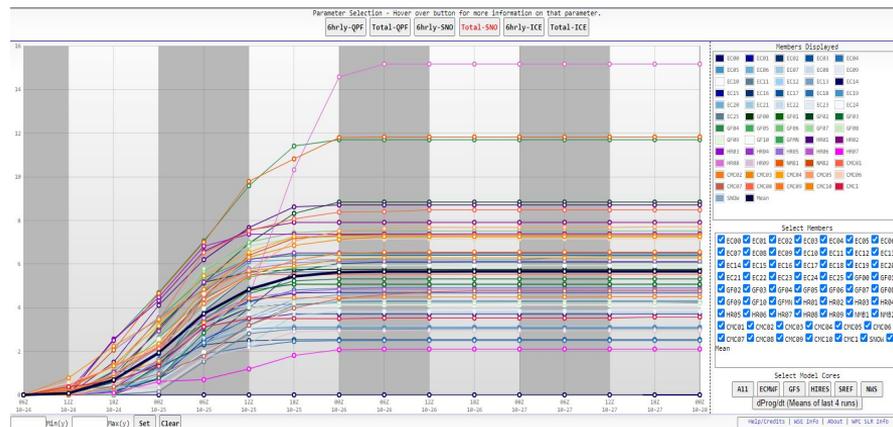
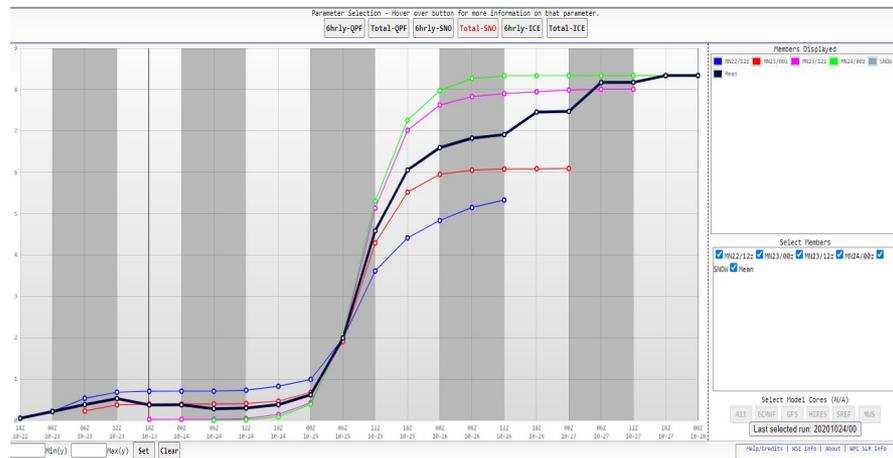


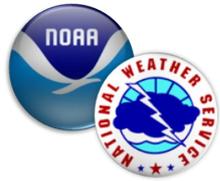
# WWD Products: Probabilistic winter (D1-3)

- ❖ WSE Plumes:
  - Shows all 63 ensemble members and the evolution of rain/snow/ice
  - Can show storm total or 6-hr accumulations
  - Allows forecasters to see the range of possibilities

- Focus on "clustering"
- Estimate percentiles
- Show outliers
- Dprog/Dt of means

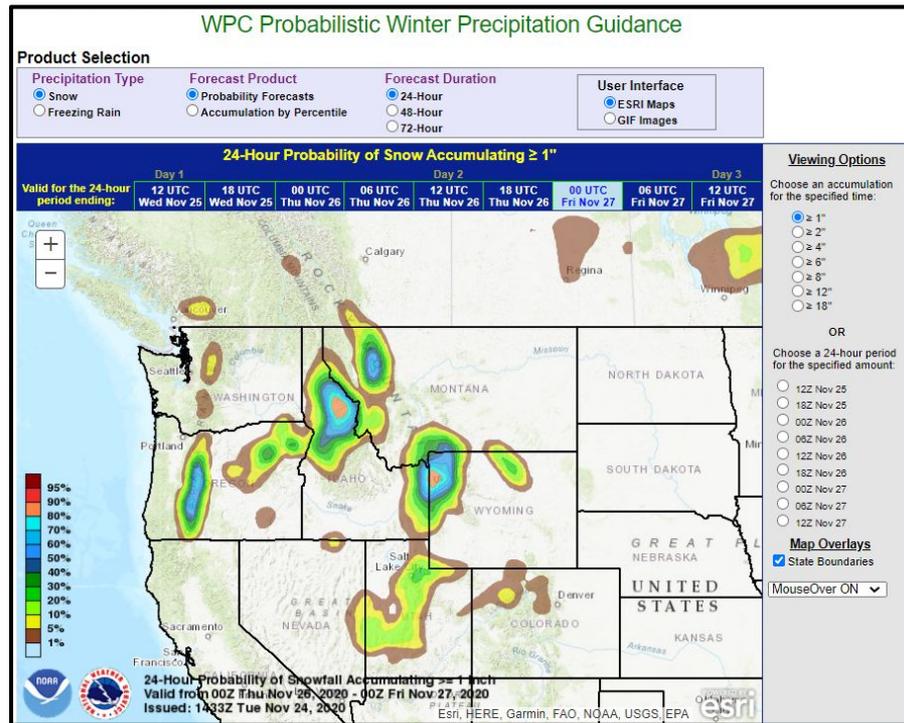
- Can help guide messaging (IDSS)
- Internal to NWS only





# WWD Products: Probabilistic winter (D1-3)

- ❖ Probabilistic Winter Precipitation Forecast (PWPF) viewer
  - Public facing product
  - Provides probabilities and percentiles of exceeding thresholds in 6, 24, 48, or 72 hr intervals
  - Can help with forecast confidence in amounts and spatial distribution
  - Used to message best and worst case scenarios



View Here:

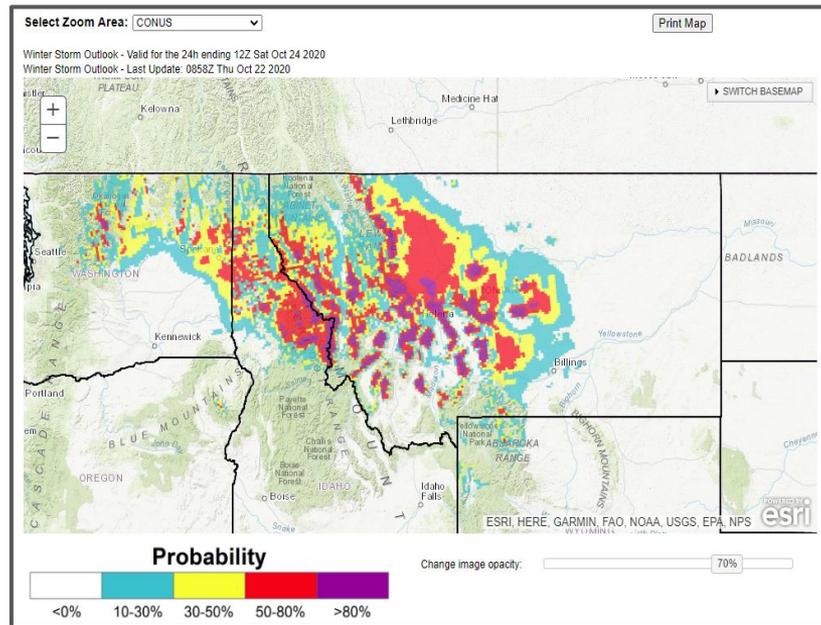
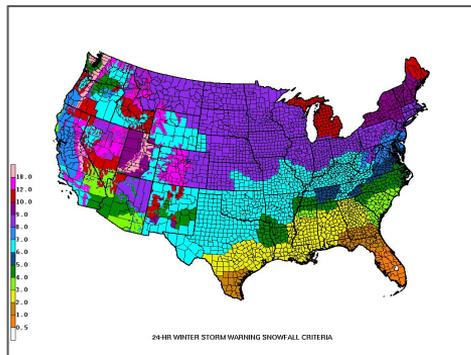
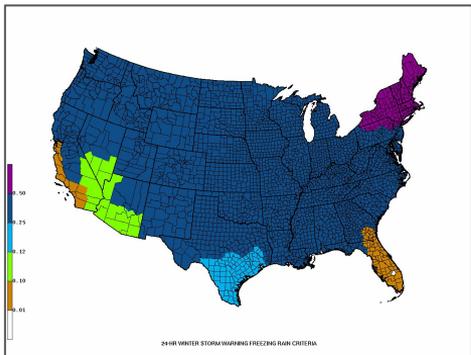
[https://www.wpc.ncep.noaa.gov/wwd/winter\\_wx.shtml](https://www.wpc.ncep.noaa.gov/wwd/winter_wx.shtml)



# WWD Products: Winter Storm Outlook

❖ Winter Storm Outlook: The probability of exceeding locally defined winter storm warning thresholds

- 12h/24h/event criteria
- Probabilities from <10, 10-30, 30-50, 50-80, >80 through Day 4



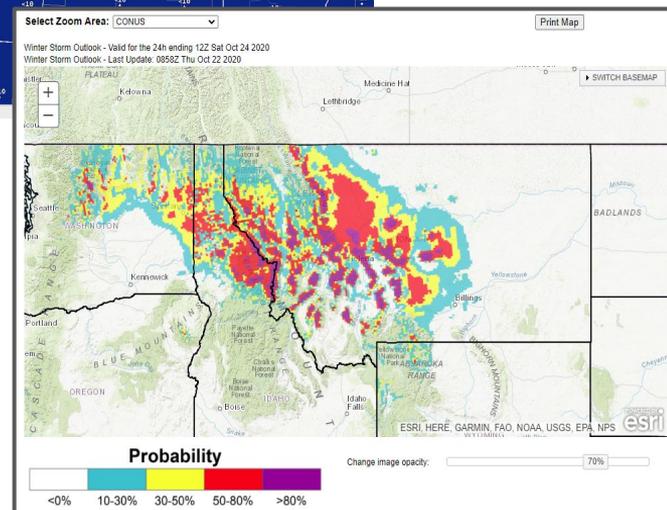
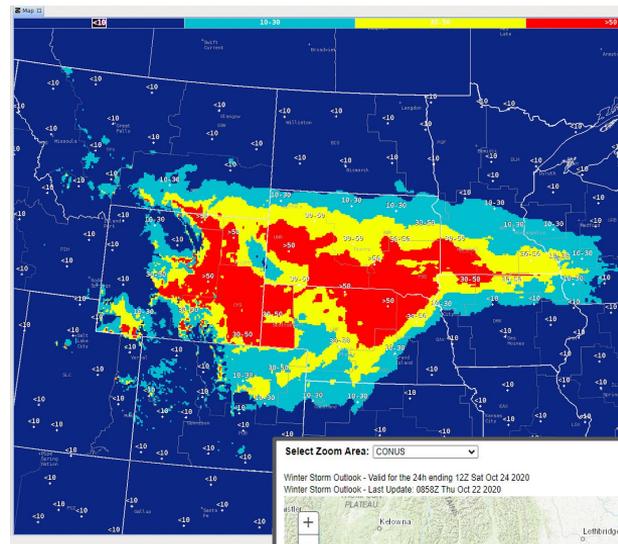


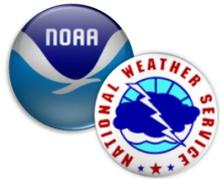
# WWD Products: Winter Storm Outlook

- ❖ Winter Storm Outlook:
  - Is available in GFE and the \*new\* operational website
  - Aids the WFO in watch/warning decisions for winter storms



"Sir, the possibility of warning criteria snow is as low as 2:1!"





# WSO Website

www.wpc.ncep.noaa.gov/wwd/wso/

- ❖ Clickable tabs
  - Loads WSO for Snow/Ice
  - Day 1-4 tabs
- ❖ Dynamic Display
  - Can adjust transparency
  - Multiple basemap options
  - Many zoom areas
- ❖ Map Overlays
- ❖ Print Image Options

The screenshot shows the NOAA National Oceanic and Atmospheric Administration (NOAA) website for the Experimental Winter Storm Outlook (WSO). The page features a navigation bar with links for HOME, FORECASTS & ANALYSES, ARCHIVES, VERIFICATION, INTERNATIONAL, DEVELOPMENT, ABOUT, and SEARCH. The main heading is "Experimental Winter Storm Outlook (WSO)". Below this, there is a feedback section with a red arrow pointing to the text "Please provide us your feedback here." The interface includes tabs for "Snow" and "Freezing Rain". A section titled "Probability of Exceeding Warning Criteria (Snowfall)" shows "Day 1" selected, with links for "Day 2", "Day 3", "Day 4", and "Days 1-4". Below this, there are links for "WPC PWPF Snow Forecast", "NWS Winter Storm Warning Snowfall Criteria: 12 HR / 24 HR", "WPC PWPF Ice Forecast", and "NWS Winter Storm Warning Freezing Rain Criteria: 12 HR / 24 HR". A "Select Zoom Area" dropdown is set to "CONUS". A map of the United States shows a color-coded probability of exceeding warning criteria for snowfall, with a legend below it ranging from <10% (blue) to >80% (red). The map also includes a "Map Overlays" section with checkboxes for CWSAs, RFCs, States, Urban Areas, Counties, FEMA Regions, NWS Forecast Zones, and ARTCC/FIR. A "Print Map" button is located to the right of the map. At the bottom, there are two panels for "Day 1" and "Day 2" showing static images of the WSO for Snow and Freezing Rain. The "Day 1" panel has "WSO for Snow" selected, and the "Day 2" panel has "WSO for Freezing Rain" selected. Both panels include a legend for the maximum probability of exceeding warning criteria and a note that the images are created by the National Weather Service.

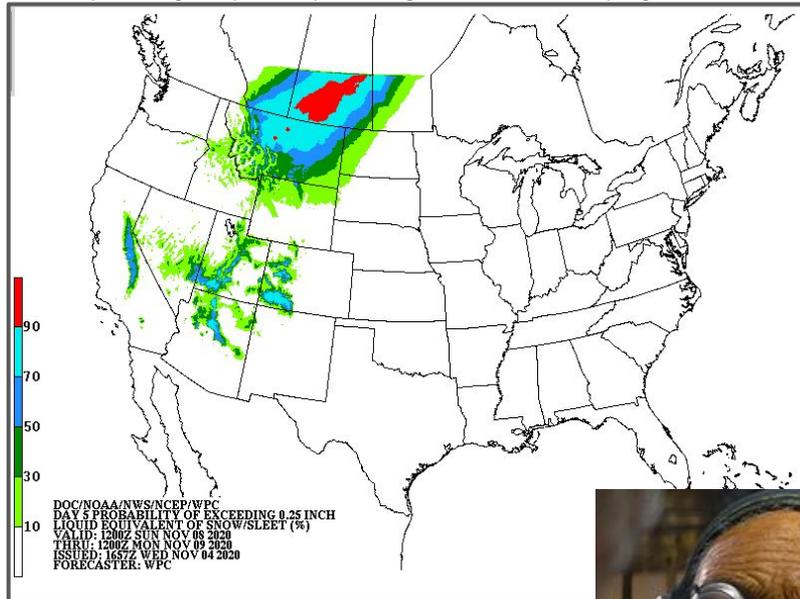
Feedback!



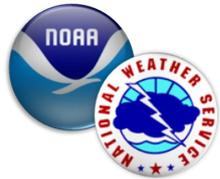
# WWD Products: Winter Weather Outlook

<https://origin.wpc.ncep.noaa.gov/index.shtml#page=wwx>

- ❖ Winter Weather Outlook:
  - Probability of 0.25" liquid precipitation falling as snow
  - 2-4" of snow
- ❖ Ensemble produced via all ECENS, GEFS, and CMCE members
- ❖ Helps improve early messaging for significant winter storm potential



"The forecast you seek is not behind you. It is in front of you"

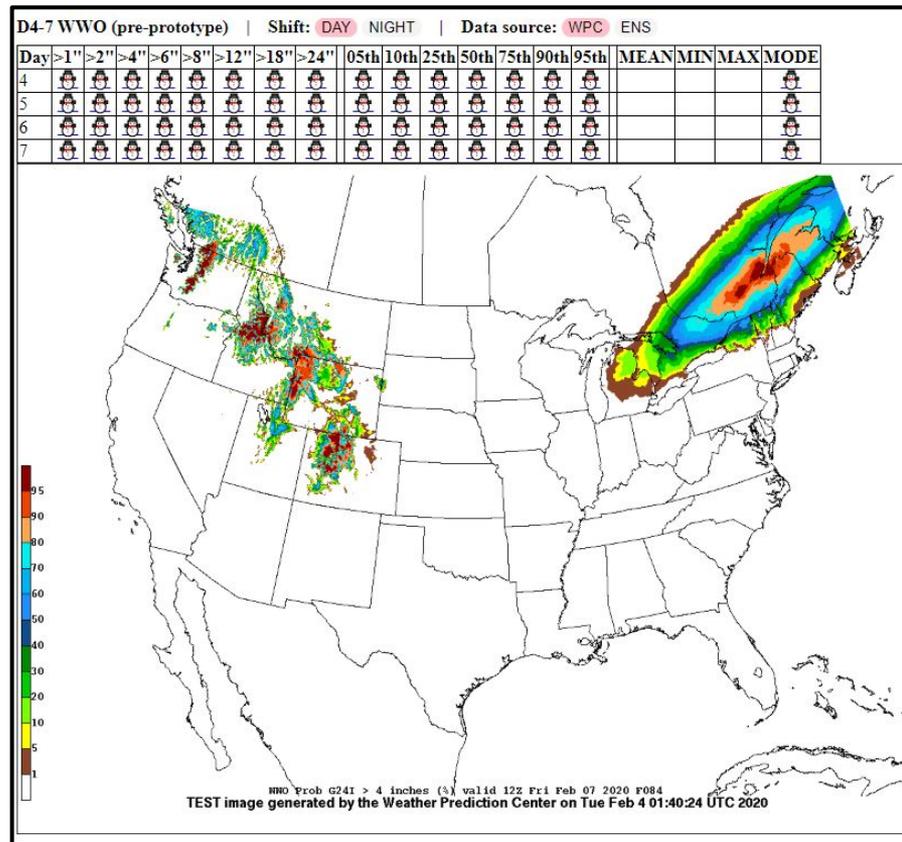


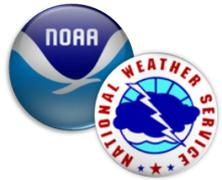
# WWD Products: Winter Weather Outlook

## ❖ Experimental Winter Weather Outlook:

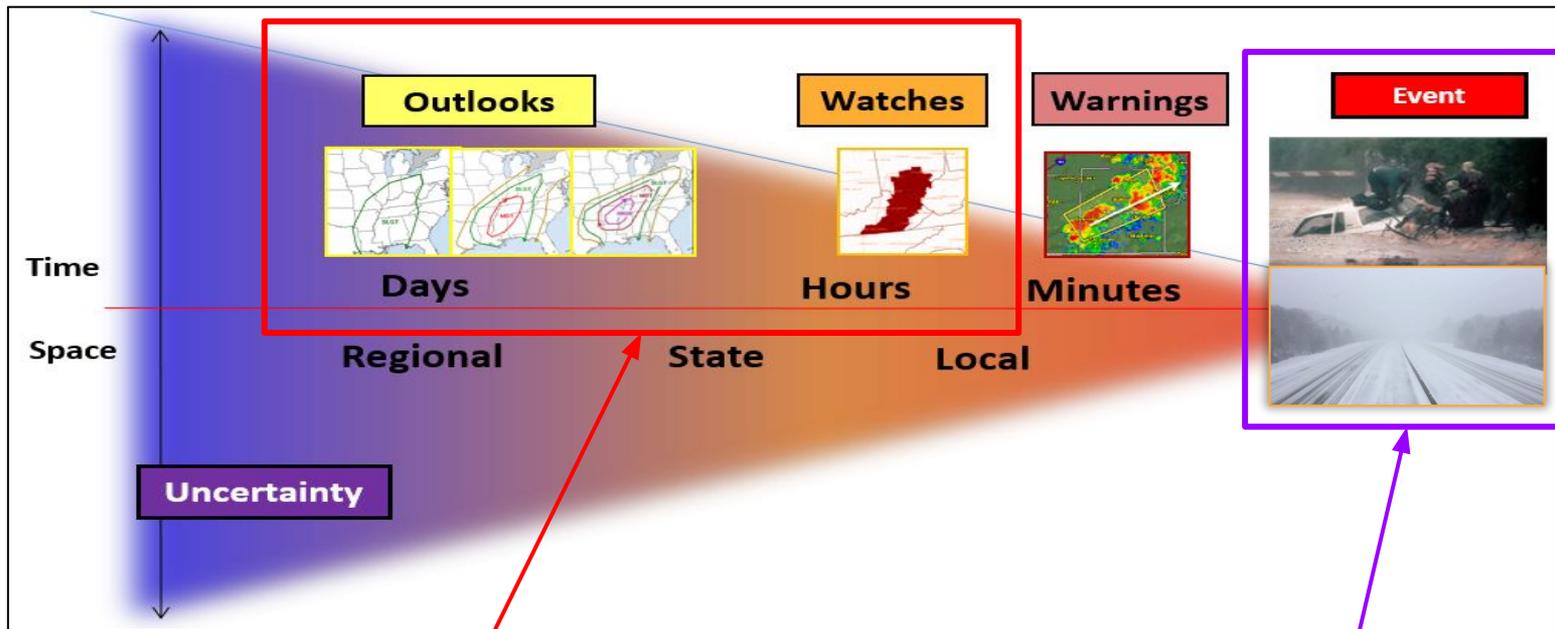
- PWPF for Days 4-7
- Probabilities for snowfall between 1 and 24", along with percentiles
- Uses all 103 ensemble members from the ECENS, GEFS, CMCE

## ❖ In testing! Could help improve lead times for winter storm watches beyond D3





# WWD Products: Shifting towards Impacts



**Currently: Winter Storm Outlook (WSO) informs the Winter Storm Watch creation through collaboration with Weather Forecast Offices (WFOs)**

**What about events that do not reach criteria?**



# WWD Products: Shifting towards impacts



Georgia, 2014



Pennsylvania, 2016



Ontario, 2014

Washington, D.C., 2016

LAURYN RICKETTS

## Inch of Snow Snarls Traffic Ahead of Expected

A crippling, historic snowstorm is still expected, with a blizzard watch issued; 18-24 inches of snow are possible

Published January 20, 2016 • Updated on January 21, 2016 at 12:40 pm

[f](#) [t](#) [e](#)



**LIVE**

**STORM TEAM 4**  
**NIGHTMARE COMMUTE ON SLIPPERY ROADS**  
 NW WASHINGTON **4**  
 28°

Hoth, 3665





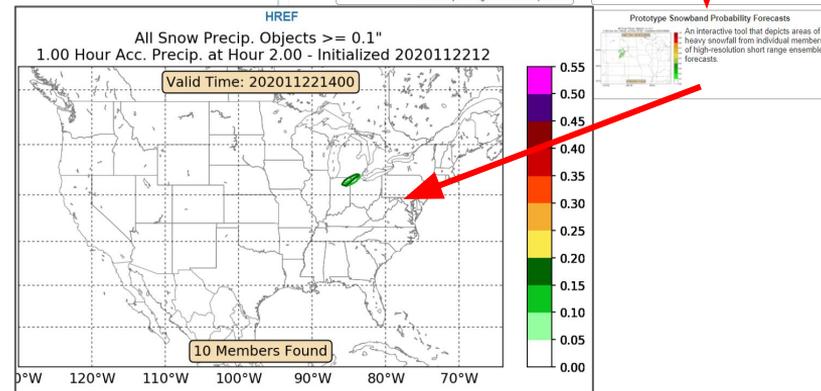
# WWD Products: Snowband Probability

- ❖ WPC Snowband Prototype tool
  - Indicates the potential for mesoscale snow banding from the HREF
  - Shows the intensity (snow rate) for each of the ensemble members
  - The higher the rate and greater number of members, the better the snowband potential

- ❖ Can help diagnose intense snow rates and “over-performing” snow accumulations

- ❖ Can be used in conjunction with SPC HREF probability tool:
  - <https://www.spc.noaa.gov/exper/href/>

The screenshot shows the Weather Prediction Center (WPC) website interface. At the top, there is a navigation bar with links for HOME, FORECASTS & ANALYSES, ARCHIVES, VERIFICATION, INTERNATIONAL, DEVELOPMENT, and ABOUT. Below this is a table of hazard categories for Dec 03, Dec 04, and Dec 05, with color-coded status indicators (e.g., EXCESSIVE RAINFALL, HEAVY SNOW, ICE). A red box highlights the 'Forecast Tools' link in the navigation bar. Below the navigation bar, there is a section titled 'Forecaster's Toolbox (Prototype)' which lists several tools: '1/30/24-hr Changes', 'Local Storm Reports', 'Ensemble Situational Awareness Table', 'GEFS Probabilities', 'Experimental Extreme Precipitation Monitor', and 'NDFD Forecast Temperature Records'. A red arrow points from the 'Forecast Tools' link to the 'Prototype Snowband Probability Forecasts' tool, which is highlighted with a red box. This tool is described as an interactive tool that depicts areas of heavy snowfall from individual members of high-resolution short range ensemble forecasts.





# WWD Products: Winter Storm Severity Index

- ❖ Winter Storm Severity Index (WSSI)
- ❖ Goal: Impacts Based Hazards
  - Summarize multiple winter weather impacts into an easily consumable graphics
  - 3-day forecast broken into 24-hr segments
  - Data comes from the National Digital Forecast Database (NWS NDFD)
- ❖ Highlights areas of significantly impactful winter weather, regardless of snow or ice amounts

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.

## Components:

Snow Amount  
Snow Load  
Ice Accumulation  
Blowing Snow  
Ground Blizzard  
Flash Freeze

Changes coming?



# WWD Products: Winter Storm Severity Index

- ❖ WSSI is now operational (2020) and is available to the public
- ❖ On the website:
  - Retrieve Static Images
  - Change Zoom level
  - Adjust WSSI Element
  - Download static images (updated at 01Z, 09Z, 13Z, 19Z, 21Z)

Overall Impact: Maximum impact from any of the components.  
Days 1-3 | Day 1 | Day 2 | Day 3

Select Zoom Area: [CONUS] CONUS

Winter Storm Severity Index - Effective From Mon, Nov 30, 2020 08 PM ET Through Thu, Dec 03, 2020 07 PM ET  
Last Updated: Monday November 30, 2020 06:17 PM ET

Print Map

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 a inconvenience to daily life.
<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. WSI 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.

Download Latest WSSI in GIS Format:  
Download Data in KML  
Download Data in SHP

\*NEW WSSI Static Image Archive:  
WSSI Static Image Archive Data

Change image opacity: 70%

Map Overlays:  
 River Forecast Center Boundaries  
 FEMA Boundaries  
 State Boundaries  
 Urban Areas  
 NWS Public Forecast Zones  
 ARTCC/FIR

Select Zoom Area: [CONUS] CONUS

Retrieve Static Images:  
 WSSI Overall  
 Blowing Snow  
 Ice Accumulation  
 Snow Amount  
 Snow Load  
 Select WSSI Element  
 Blowing Snow  
 Flash Freeze  
 Ground Blizzard

To retrieve static images please select a zoom area and WSSI element.  
\*Please Note\* Static images only update at 01, 09, 13, 19 and 21 UTC

Day 1: WSSI Overall - Valid From Wed, Nov 25, 2020 07 PM ET To Thu, Dec 03, 2020 07 PM ET

Day 2: WSSI Overall - Valid From Sat, Dec 05, 2020 07 PM ET To Wed, Dec 09, 2020 07 PM ET

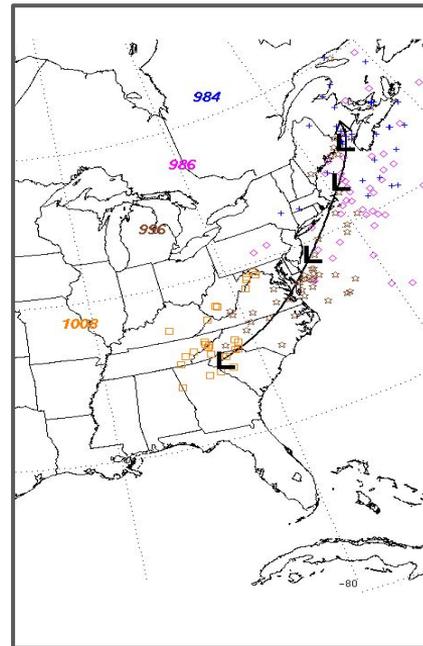
Day 3: WSSI Overall - Valid From Wed, Dec 02, 2020 07 PM ET To Thu, Dec 03, 2020 07 PM ET

Days 1 - 3: WSSI Overall Composite - Valid Through Thu, Dec 03, 2020 07 PM ET



# WWD Products: Low Tracks and Discussion

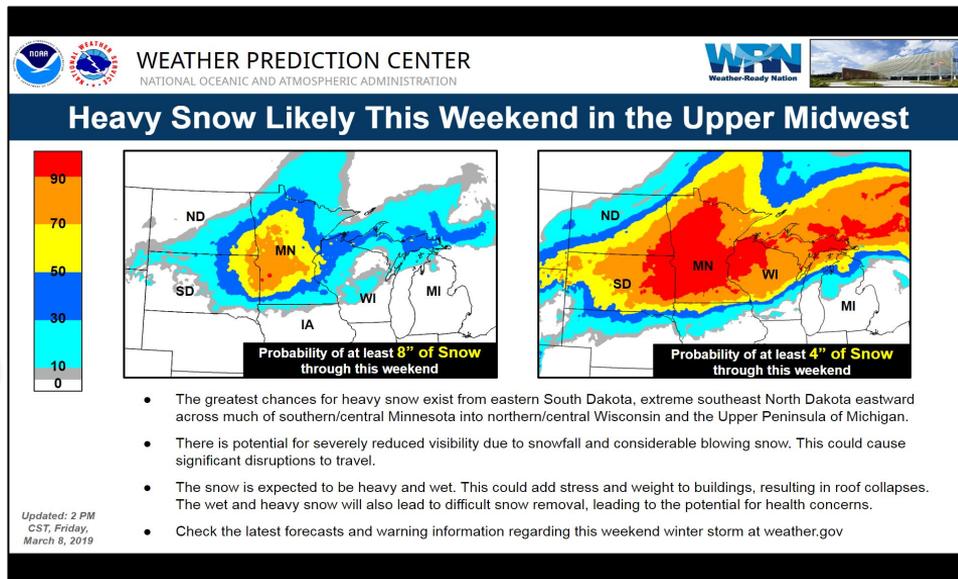
- ❖ WWD produces a graphic of low tracks and ensemble clusters associated with significant winter storms
  - The ensemble points can help gauge the confidence in the low positions
- ❖ A “heavy snow discussion” is also produced outlining the areas of most significant snow and ice during the next 3 days, while highlighting the meteorological reasoning for the forecast





# WPC WWD: Key Messages

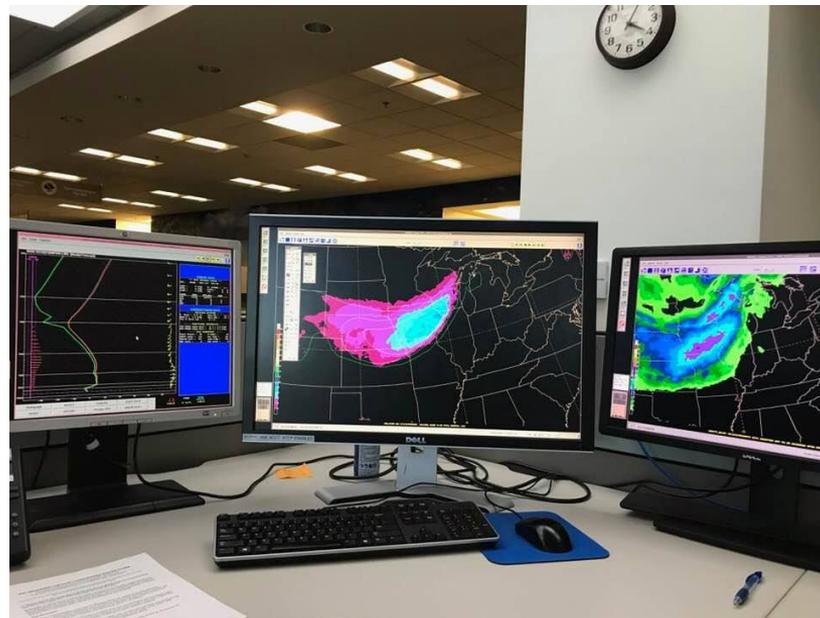
- ❖ WPC Coordinates “Key Messages” for significant winter events:
  - **When:** Large scale impactful snow or ice
  - **Who:** WPC, National Centers, Regional Centers, Forecast Offices
  - **Why:** Galvanize partners and media around consistent, coordinated, impacts messaging
  - **How:** Social Media Platforms and NWS distribution lists

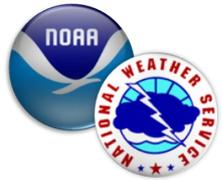




# WPC: The operational WWD

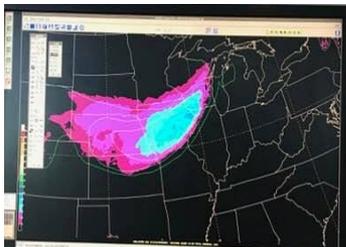
- ❖ WPC WWD methodology:
  - Forecasts created through the NWS Graphical Forecast Editor
  - NAWIPS/AWIPS
  - Collaboration chat
  - NWSChat
  - Phone calls
  - Conference calls (Now using Google Meet!)



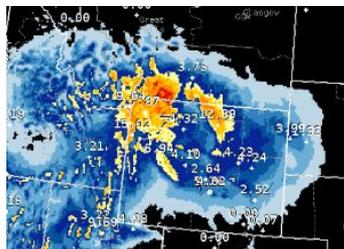


# WPC: The operational WWD

- ❖ WPC WWD methodology:
  - Forecasts created through the NWS Graphical Forecast Editor
  - NAWIPS/AWIPS



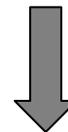
NMAP: 40km resolution, hand drawn contours



GFE: 5km resolution, computer generated, 937,227 grid points!



NMAP



GFE

Database Groups												Difference		Save	Recall	ViewGrids	CreateGrids	EditTools	SATools	WSOTools						
Databases												0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	Edit Areas		Manual Adjustments	
Fcst	Official	ECEnsMn -18/00Z	GFSMEAN -18/06Z	SREF -18/03Z	CMCreg -18/06Z	CMChh -18/00Z	ECMWF25 -18/00Z	GFS360 -18/06Z	WRFarw -18/00Z	WarMem2 -18/00Z	WRFnmh -18/00Z	Above1000ft	0	Add...	1.00											
0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	Above2000ft		Mult...												
0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	Above3000ft		Border Width												
0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	Above4000ft		0	Run											
0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	Above5000ft		Reset ScaVec												
0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	Above6000ft		Revert to Official												
0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	Above7000ft		Exit												
0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	Above8000ft														
0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	Above9000ft														
0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	Above10000ft														
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0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	Above13000ft														
NAMnest -18/06Z	NAM12 -18/06Z	NBN -18/07Z	None	None	None	None	None	None	None	None	None	set combine remove														
Clear GFE Edit Area																										



# WPC: The operational WWD

## WPC WWD methodology:

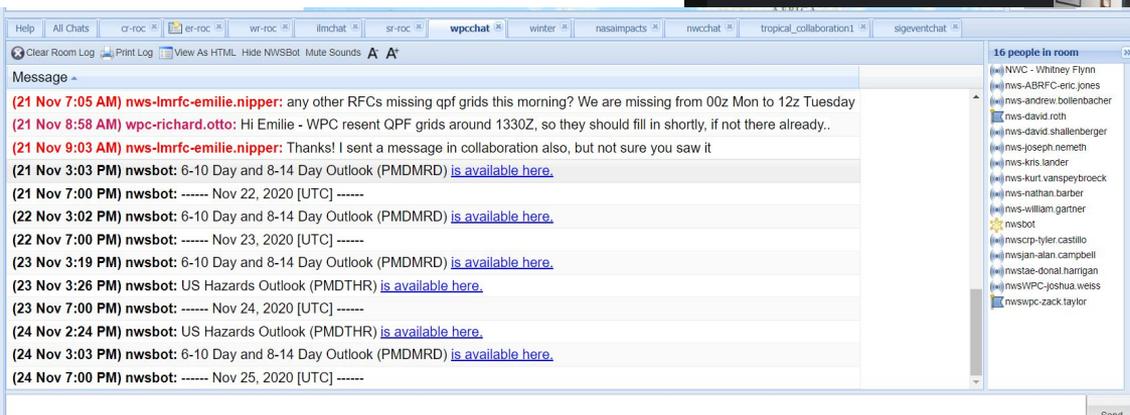


Direct phone calls

## Google Meet



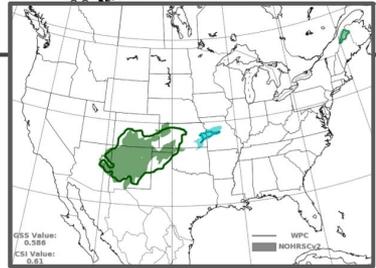
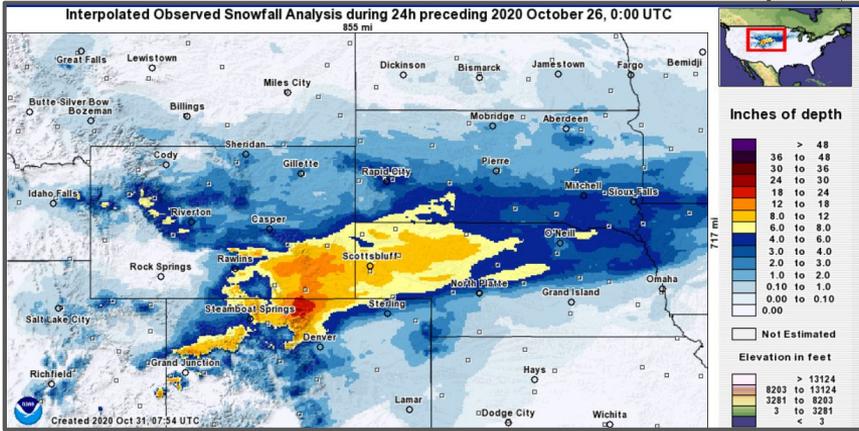
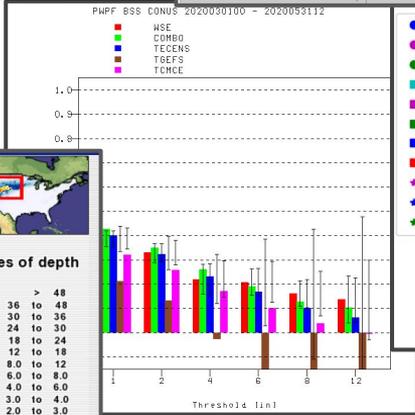
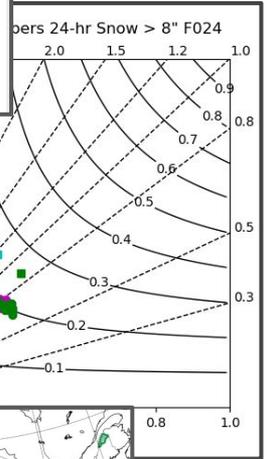
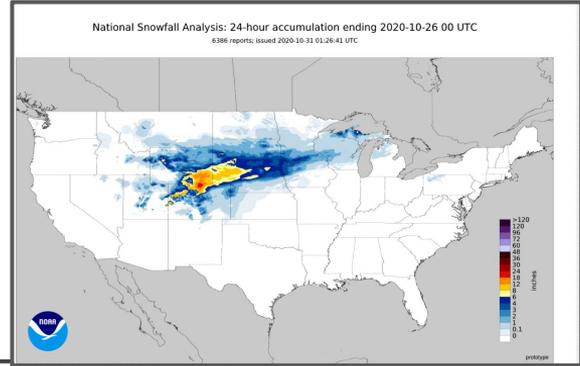
## Collaboration Chat

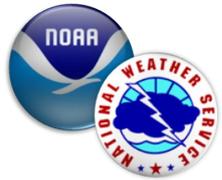




# WPC WWD: Verification

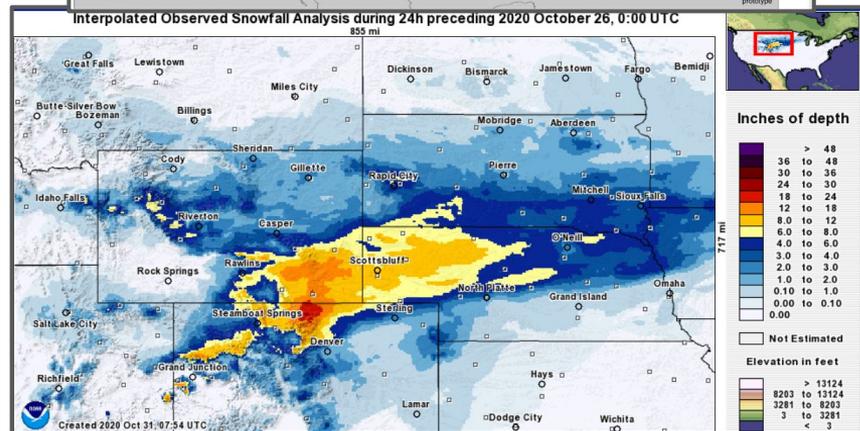
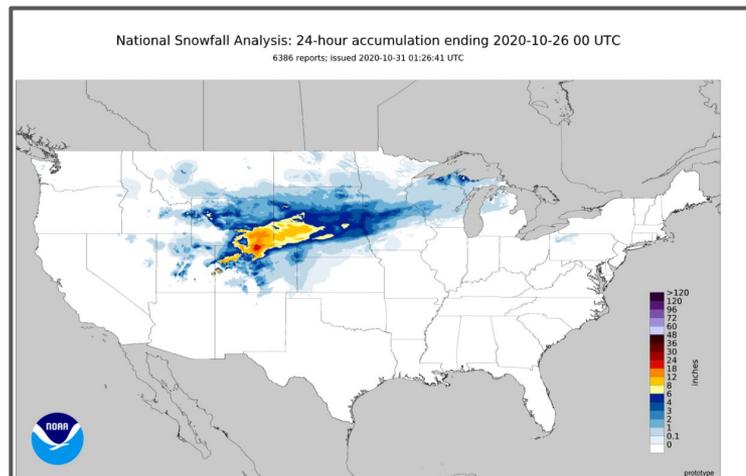
- ❖ Verification is conducted both subjectively and objectively
- ❖ Improves pattern recognition and forecast skill
- ❖ Allows for improvements in forecast tools
- ❖ Constantly being updated





# WPC WWD: Verification

- ❖ NOHRSC: National Operational Hydrologic Remote Sensing Center
  - Allows for both subjective and objective verification of snow events
  - Updated 4x/day at 1330, 1530, 1830, 2130 (Z) and uses all methods of reports and the HRRR thermals
  - Can be used to develop seasonal climatologies and departures





# WPC WWD: The Future

- ❖ WPC, especially the Winter Weather Desk, is always trying to improve and plan for the future
  - Winter Storm Watches
  - Improved and updated model guidance
  - More efficient coordination

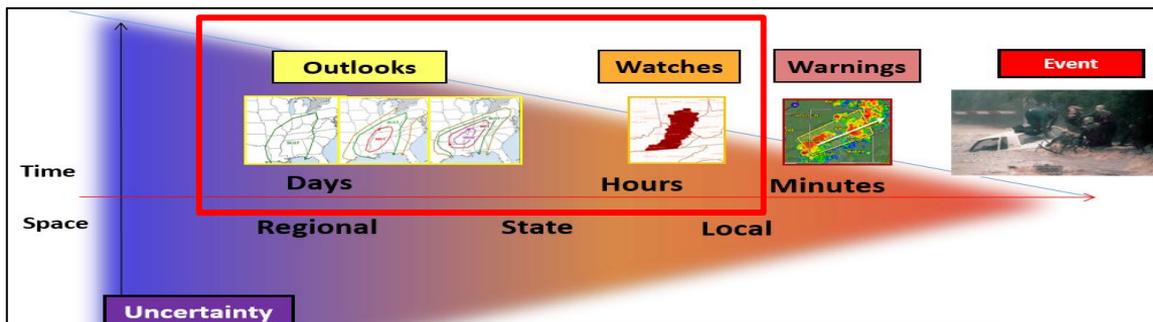


"Always in motion, the future is."



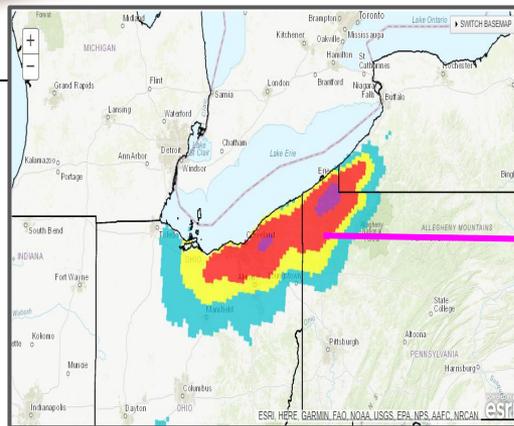
# WPC WWD: The Future

## ❖ Winter Storm Watches:



Current: WSO informs Winter Storm Watch Decisions

Future: WSO used to explicitly define Winter Storm Watches





# WPC WWD: The Future

- ❖ Improved Guidance and Coordination
  - Improved NBM calibration
  - Extended high-res guidance
    - FV3, CMC, HRRR
  - Faster and more efficient coordination
    - ISC



"The WWD made it to the WFOs in less than 12 parsecs."

Thank you for listening!  
Questions?

[joshua.weiss@noaa.gov](mailto:joshua.weiss@noaa.gov)



"The Globe of WPC's Winter Weather Desk"