



# **2023/2024 Winter Weather Spotter Training**

**Tony Edwards, NWS Charleston, WV**

## Your Observations of Snow and Ice are EXTREMELY Important to Us!

Here's what we do with your observations:

- Adjust our forecast as needed.
- Send the reports out to the media and the world (Local Storm Reports).
  - **Your report may help change someone's plans (and save lives!)**
- Use them for verification purposes so we know how good/bad our forecasts were.
- Include them in post event summaries which are used by state and local Emergency Management and even FEMA.





# Presentation Outline



- A Look Back at Last Winter?
  - Overall trends
  - Memorable storms



- How to Properly Observe and Report Winter Weather
  - What to report
  - Properly measuring snow and ice
  - How to send us your reports



- Forecasting Winter Weather
  - Why is it so hard to forecast winter storms?
  - Finding winter weather forecasts



- NOAA Winter Outlook
  - What it means for our region
  - How to be prepared

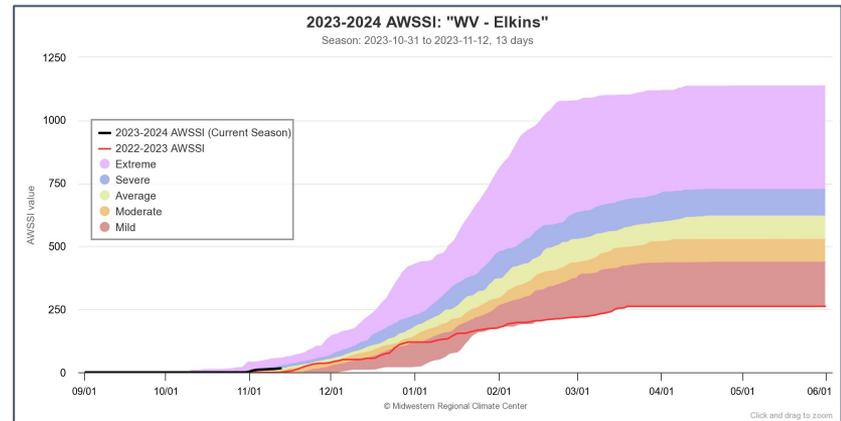
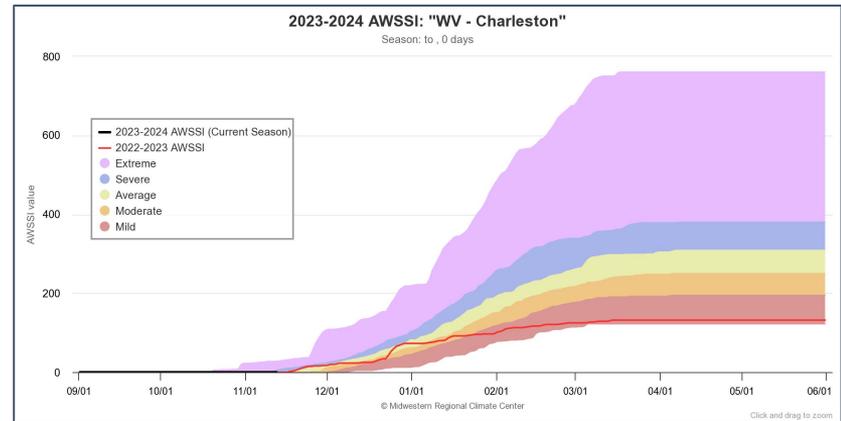
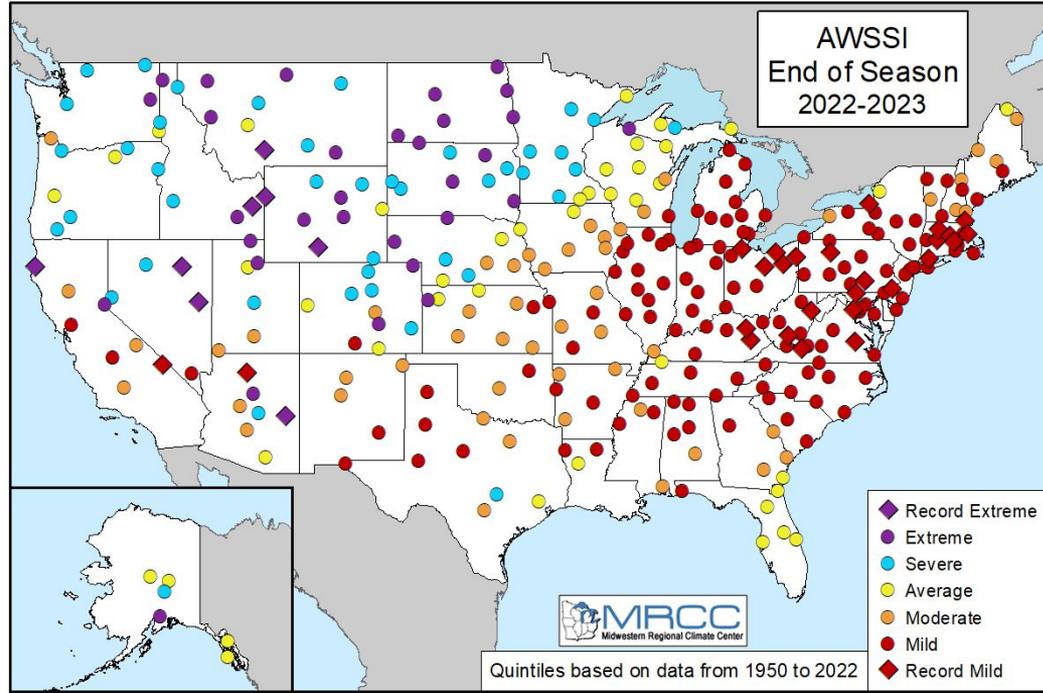


# A Look Back at Last Winter



# A Look Back at Last Winter

The Accumulated Winter Season Severity Index (AWSSI) attempts to quantify how severe the winter was.



# Winter 2022/2023 Recap



## 2022-2023 SEASONAL SNOWFALL AMOUNTS AND CORRESPONDING HISTORICAL RANK

LOCATION	OBSERVED VALUE	RANK	PERIOD OF RECORD
- BECKLEY, WV	11.5 INCHES	-> LEAST SNOWIEST	1893 TO 2023
- CHARLESTON, WV	3.0 INCHES	-> 2ND LEAST SNOWIEST	1901 TO 2023
- ELKINS, WV	15.2 INCHES	-> 2ND LEAST SNOWIEST	1899 TO 2023
- HUNTINGTON, WV	2.6 INCHES	-> 3RD LEAST SNOWIEST	1897 TO 2023

## FEBRUARY TOP TENS SET (AVERAGE TEMPERATURE)

LOCATION	TOP 10 RANK	OBSERVED VALUE
- CLARKSBURG, WV	: WARMEST	-> 45.7 F
- HUNTINGTON, WV	: 2ND WARMEST	-> 46.6 F
- ELKINS, WV	: TIED 2ND WARMEST	-> 40.6 F
- BECKLEY, WV	: 3RD WARMEST	-> 43.4 F
- PARKERSBURG, WV	: 3RD WARMEST	-> 43.5 F
- CHARLESTON, WV	: TIED 7TH WARMEST	-> 45.1 F

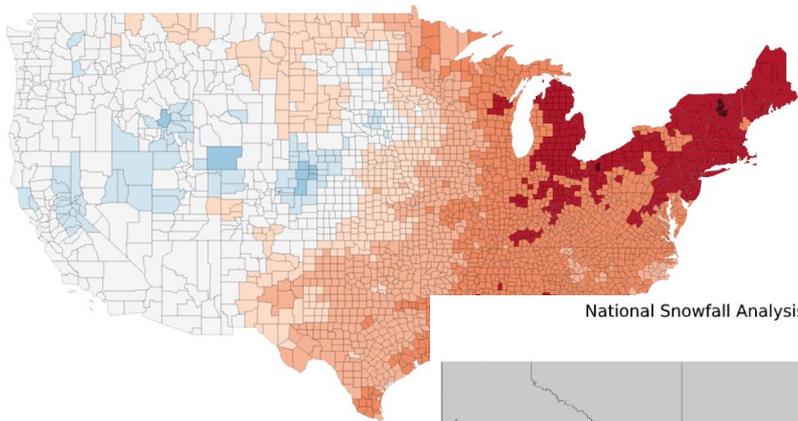


February 24  
Hurricane, WV

# A Look Back at Last Winter

County Average Temperature Anomaly

December 2022 - February 2023



-9°F -7°F -5°F -3°F -1°F 1°F 3°F 5°F 7°F 9°F

Contiguous U.S. (Hover over a County)

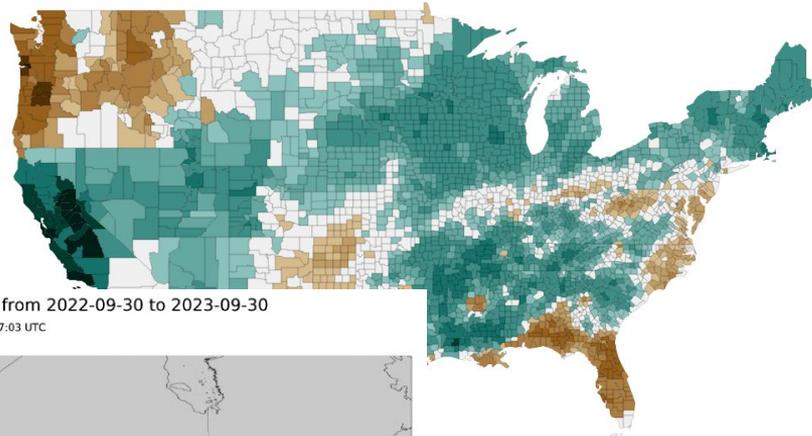
Temp: 34.89°F

Rank: 18th Warmest

Anoma

County Precipitation Anomaly

December 2022 - February 2023



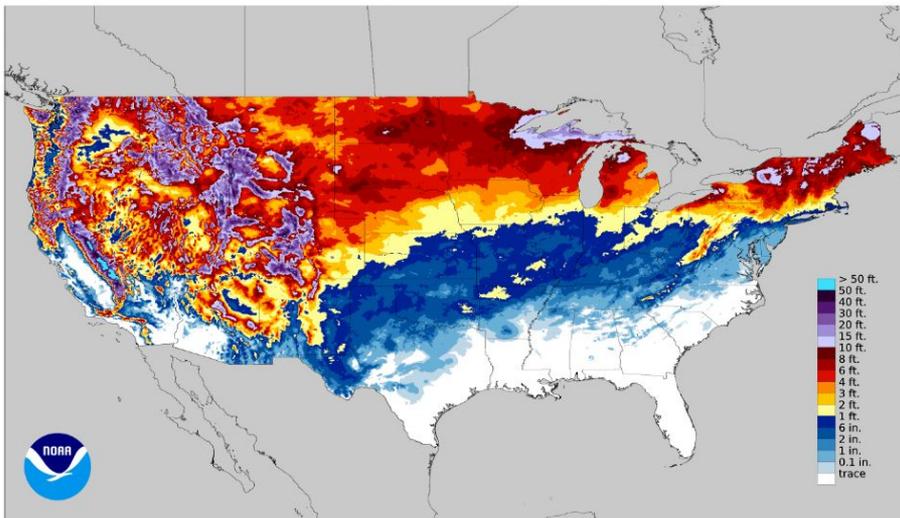
omaly: 0.95"

Mean: 6.79"



National Snowfall Analysis: accumulation from 2022-09-30 to 2023-09-30

Issued 2023-10-05 13:57:03 UTC

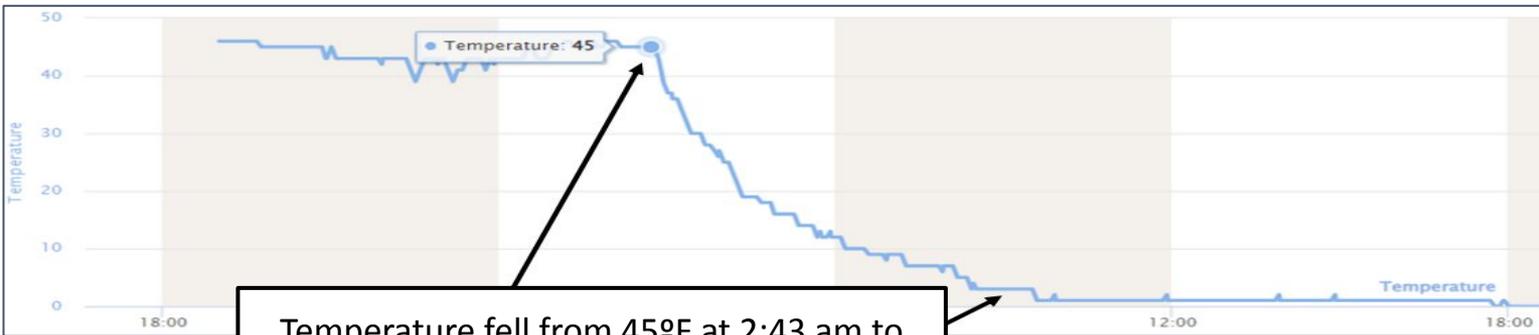


> 50 ft.  
50 ft.  
40 ft.  
30 ft.  
20 ft.  
15 ft.  
10 ft.  
8 ft.  
6 ft.  
4 ft.  
2 ft.  
1 ft.  
6 in.  
2 in.  
1 in.  
0.1 in.  
trace



# December 23-26 Arctic Blast

## Arctic Frontal Passage at Charleston Yeager Airport on Friday December 23rd



Temperature fell from 45°F at 2:43 am to 3°F at 8:43 am - a 42°F drop in 6 hours!

### Minimum Observed Wind Chills

#### .....HIGHEST WIND GUST REPORTS.....

Location	Speed	Time/Date	Provider
Clarksburg Airport	54 MPH	0654 AM 12/23	ASOS
Conaway Lake	48 MPH	0516 AM 12/23	RAWS
REEDSVILLE	47 MPH	0517 AM 12/23	CWOP
Charleston Airport	47 MPH	0250 AM 12/23	ASOS
Buckhannon Airport	47 MPH	0455 AM 12/23	AWOS
Snowshoe	46 MPH	1040 AM 12/23	CWOP
Parkersburg Airport	45 MPH	0345 AM 12/23	ASOS
Bee Mountain	44 MPH	0517 AM 12/23	RAWS
Huntington Airport	44 MPH	0852 AM 12/23	ASOS
Burr Oak	44 MPH	0535 AM 12/23	RAWS
Logan	43 MPH	0414 AM 12/23	RAWS
Louisa 1 S	42 MPH	0135 AM 12/23	KYMN2
Waterford	41 MPH	0408 AM 12/23	CWOP
Beckley Airport	41 MPH	0453 AM 12/23	ASOS
Elkins Airport	41 MPH	0529 AM 12/23	ASOS
Athens Airport	41 MPH	0135 AM 12/23	AWOS
Lakin	41 MPH	0416 AM 12/23	RAWS
Logan Cnty Airport	40 MPH	0415 AM 12/23	AWOS
Ashland Airport	40 MPH	0557 AM 12/23	AWOS

**Charleston**  
Recent Low Wind Chill: **-21**  
Record: **-38 on 1/20/1985**

**Huntington**  
Recent Low Wind Chill: **-25**  
Record: **-40 on 1/20/1985**

**Parkersburg**  
Recent Low Wind Chill: **-23**  
Record: **-44 on 1/21/1985**

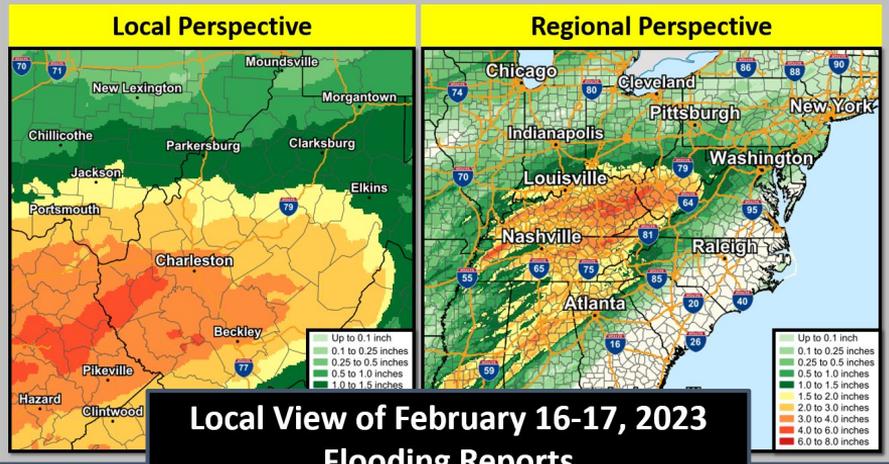
**Clarksburg**  
Recent Low Wind Chill: **-22**  
Record: **-34 on 1/17/1977**

**Elkins**  
Recent Low Wind Chill: **-28**  
Record: **-39 on 1/20/1985**

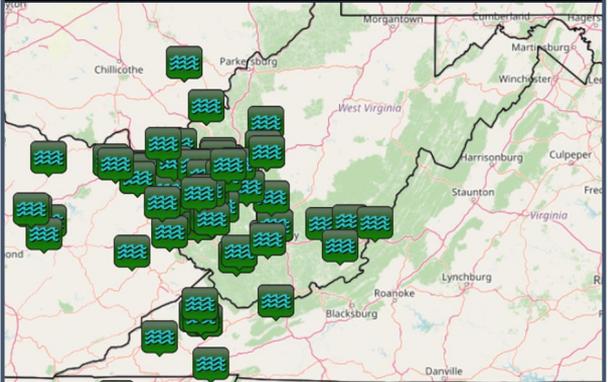
**Beckley**  
Recent Low Wind Chill: **-30**  
Record: **-49 on 1/21/1985**

# Heavy Rainfall and Flooding - February 16-17

## February 16-17 Rainfall Totals

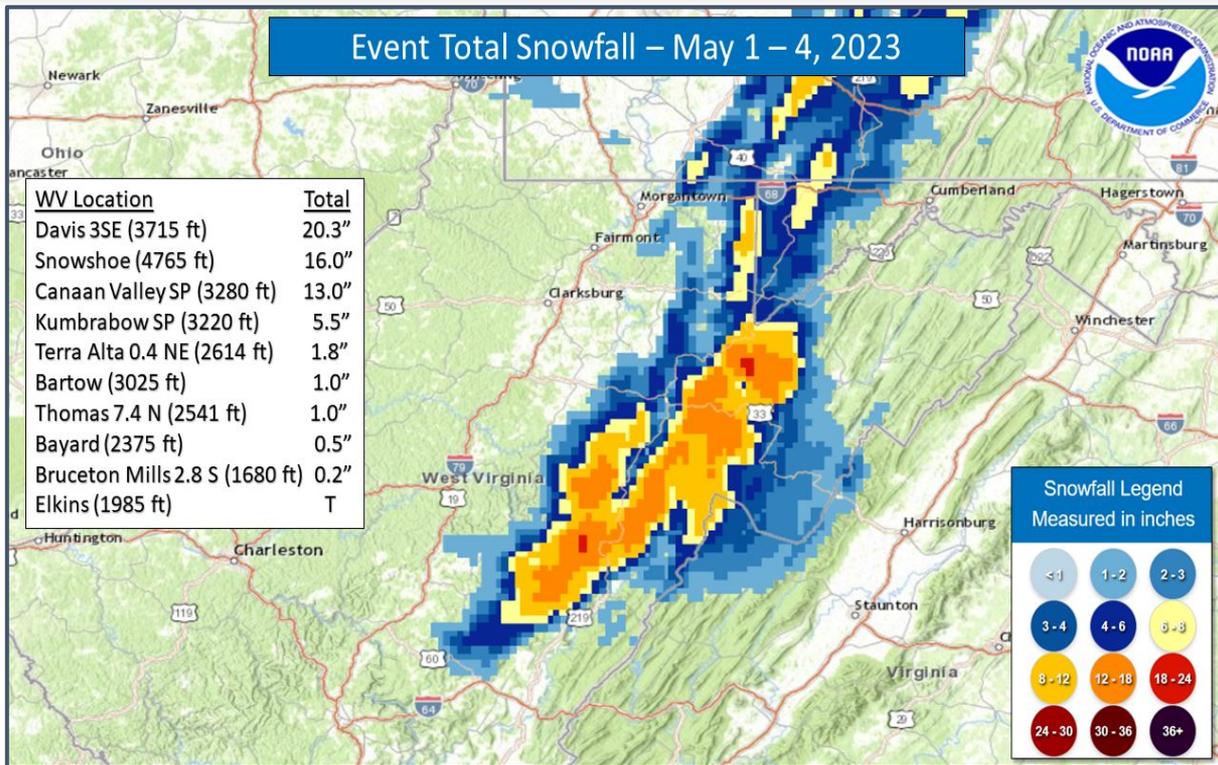


## Local View of February 16-17, 2023 Flooding Reports

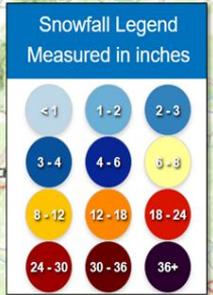




# Historic Late Season (High Elevation) Snowstorm - May 1-4



WV Location	Total
Davis 3SE (3715 ft)	20.3"
Snowshoe (4765 ft)	16.0"
Canaan Valley SP (3280 ft)	13.0"
Kumbrabow SP (3220 ft)	5.5"
Terra Alta 0.4 NE (2614 ft)	1.8"
Bartow (3025 ft)	1.0"
Thomas 7.4 N (2541 ft)	1.0"
Bayard (2375 ft)	0.5"
Bruceton Mills 2.8 S (1680 ft)	0.2"
Elkins (1985 ft)	T



All-Time May West Virginia State Snowfall Records Broken

Category	Old Record	New Record
Largest 24-Hr May Snow	10.0 In (Beckley, WV: May 8/9, 1923)	10.1 In (3 SE Davis, WV: May 2/3, 2023)
Largest May Snowstorm	12.0 In (Kumbrabow State Forest (WV): May 4-6, 1945)	20.3 In (3 SE Davis, WV: May 1-4, 2023)
Greatest May Snow Depth	6 In (Cheat Bridge, WV: May 12, 1924)	15 In (Snowshoe, WV: May 4, 2023)
Snowiest May	12.0 In (Kumbrabow State Forest (WV): May 1945)	20.3 In (3 SE Davis, WV: May 2023)

Photo courtesy of Jacob Redden

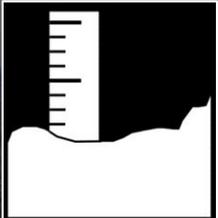




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# What to Report



## \*\*\* Snow, Sleet and Freezing Rain Amounts \*\*\*

✓ Intermediate reports during the storm and one final total at the end

- **Any Occurrence of Freezing Rain**
- **Changing Precipitation Types**
  - Rain – Freezing Rain – Snow – Etc

Report Precip  
Type Easily Using  
mPing App!



## Supplies

- **Snow measuring board, or a flat surface like a picnic table or porch railing**
  - Place the snow board on a flat surface away from trees or other obstructions.
  - Mark it with a flag so you know where it is under the snow.
  - Do not measure on grass as it will artificially inflate the total.
  - Two snow boards are great – one for new snow and one left undisturbed for snow depth measurements



- **Ruler or yard stick**
  - We typically prefer measurement in 1/10ths of an inch, but if you don't have a ruler that measures in those increments, just give us the fractional measurement and we'll convert it for you.

## What About Ice?

For spotter reports, we'll take either FLAT ICE or RADIAL ICE ACCUMULATION but just let us know how you took the measurement.

$$\text{Flat Ice} = \text{Radial Ice} / 0.4$$

### Taking a Radial Ice Accumulation Measurement



- Use a ruler to measure the thickness of ice on a branch.
- Often ice varies in thickness on the top and bottom of the branch. Measure both thicknesses and get the average thickness for your report.
- Top 3/10 inch | Bottom 1/10 inch  
**Average 2/10 inch**

### Taking a Flat Ice Accumulation Measurement



- Measure from top of flat surface such as a metal post or porch railing.
- Chip into the ice down to the surface and measure the accumulation of ice from the top of the surface.
- Example from pic: **1/2 inch**

# Sending Us Your Reports



**How to Report**

There are a variety of ways to report weather to the NWS office in Charleston, WV. By using the methods below, your severe weather reports will reach forecasters in real time. Please be sure to include the location of the weather event, e.g. 5 miles northwest of Charleston. You may also indicate if you are a trained spotter, a ham radio operator, a member of law enforcement, or other affiliation if applicable.

- Submit Report**  
Use this Web Based Form: [Submit Report](#)
- Spotter Hotline**  
[Trained weather spotters](#) can report significant weather conditions by calling the toll-free spotter hotline given to them as part of their training.
- Facebook**  
Post information on our Facebook page: <https://www.facebook.com/NWSCharlestonWV>
- Twitter**  
Send us a tweet: [@NWSCharlestonWV](#)
- Email**  
Send us an email: [rlx.ops@noaa.gov](mailto:rlx.ops@noaa.gov)
- Mobile App**  
Send reports from your location via a smartphone app: [MPing](#)

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**What to Report**

Reporting the following phenomena when they occur help us warn others!

Tornado   Damaging Winds   Hail   Flooding   Heavy Rain   **Snow**   Freezing Rain/Icing   Strong Winds   Fog

**Snow Info**

- How much snow fell (to nearest tenth of an inch if possible), e.g. 3.5".
- What period of time did the snow fall? (e.g. 1 hour 15 minutes.)
- Was the snowfall measurement estimated or measured?

For more information on how to properly measure snow, visit [https://media.cocorahs.org/docs/MeasuringSnow2\\_1.pdf](https://media.cocorahs.org/docs/MeasuringSnow2_1.pdf).

- Please send us reports by looking for the icon on you local NWS office website.
- You can report using the following platforms:
  - Web Based Form
  - Spotter Hotline given out to trained spotters
  - Facebook (NWSCharlestonWV)
  - Twitter (@NWSCharlestonWV)
  - Email us at [rlx.ops@noaa.gov](mailto:rlx.ops@noaa.gov)
  - Mping mobile app

**View Reports**

Most reports we receive are transmitted as Local Storm Reports and can be viewed at the following locations. Many reports are also stored in the official [NOAA Storm Events](#) database.

Local Storm Reports

Rainfall Reports (CoCoRaHS)

Snowfall Reports

<https://www.weather.gov/rlx/reports>

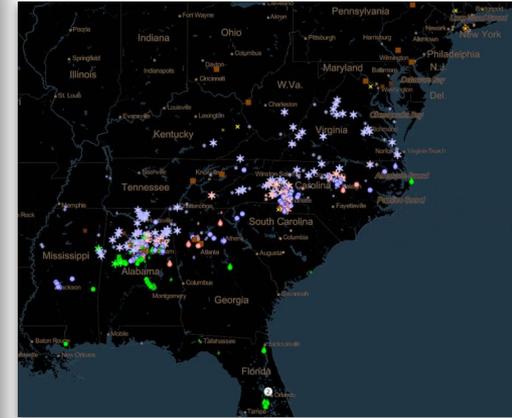
# How to Report

## Storm Report Form

- ➔ Available on PC and Mobile.
- ➔ Automatically routes your report to the appropriate NWS office
  - ◆ Great when traveling!
- ➔ Select “Trained Spotter” under Custom Groups

<https://inws.ncep.noaa.gov/report/>

## MPing App



- ➔ Search “mping” in your phones app store
- ➔ Your reports help are sent to us in real-time and help weather research!

<https://mping.nssl.noaa.gov/>

# How to Report

## Social Media



- Follow/Like us at **NWSCharlestonWV**
- We monitor Facebook and Twitter for reports
- Pictures of your snow/ice measurements are great!
- **Be sure to post location of report!**

## Amateur Radio

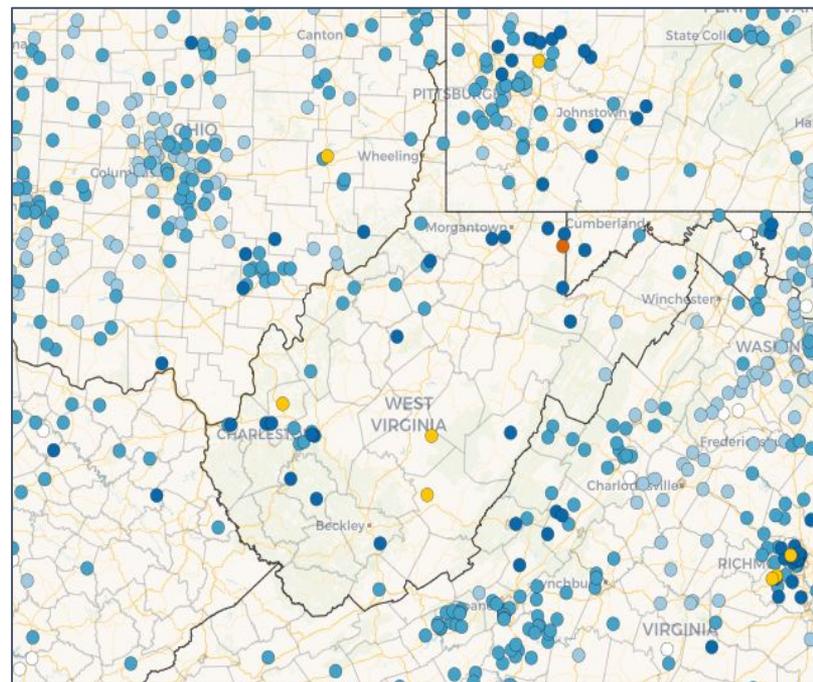


- New equipment (2m/440 and HF) was installed in 2022 at NWS Charleston!
- We are working on building out relationships with Amateur Radio groups in our service area for relay of reports from SKYWARN Nets.
- NWS Talk Groups on S1RN Radio

# CoCoRaHS – Rainfall and Snowfall Reporting

[https://www.weather.gov/rlx/cocorahs\\_observers](https://www.weather.gov/rlx/cocorahs_observers)

- The Community Collaborative Rain, Hail and Snow Network (CoCoRaHS) is a volunteer network of weather observers working together to measure and map precipitation in their local communities.
- Can be individuals but also fire departments, water plants, DOH garages, etc. There's also a program tailored to schools with lesson plans and teaching aids.
- It is very important to have “trained” observers in your county for FEMA Disaster Declarations for winter storms!
- Help us fill in the gaps on the map at the right by signing up today!





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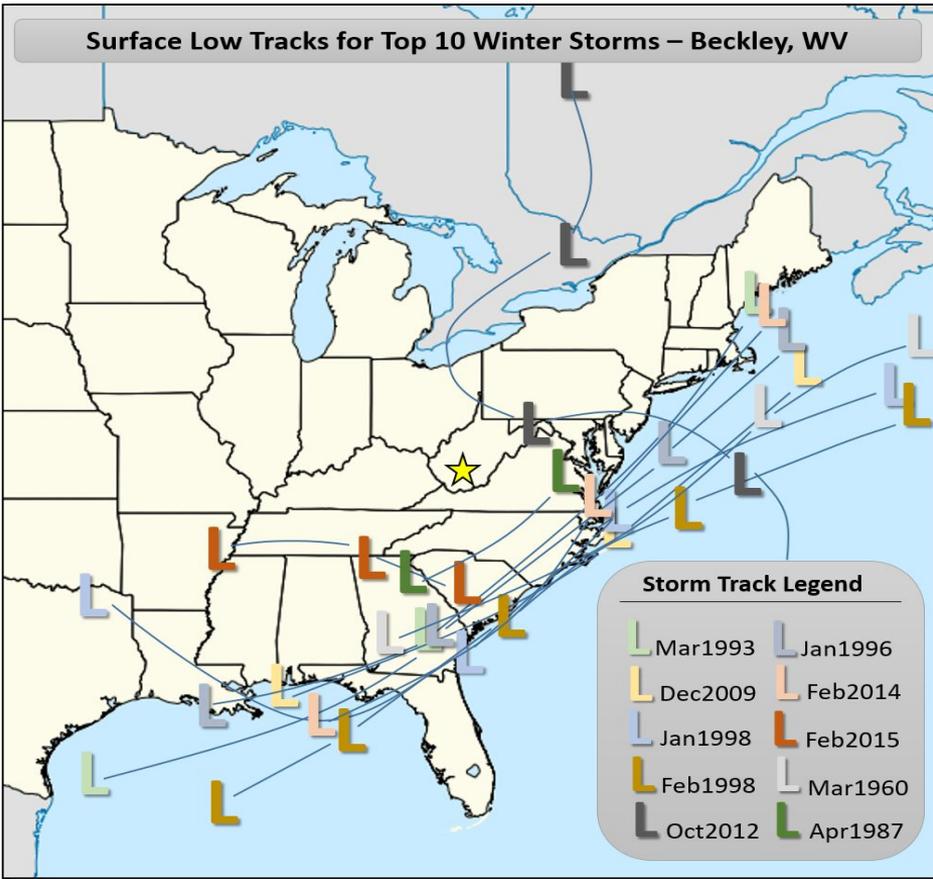
## The Key Ingredients for a Winter Storm

**Cold Air:** For snow and ice to form, the air must be below freezing in the clouds and near the ground.

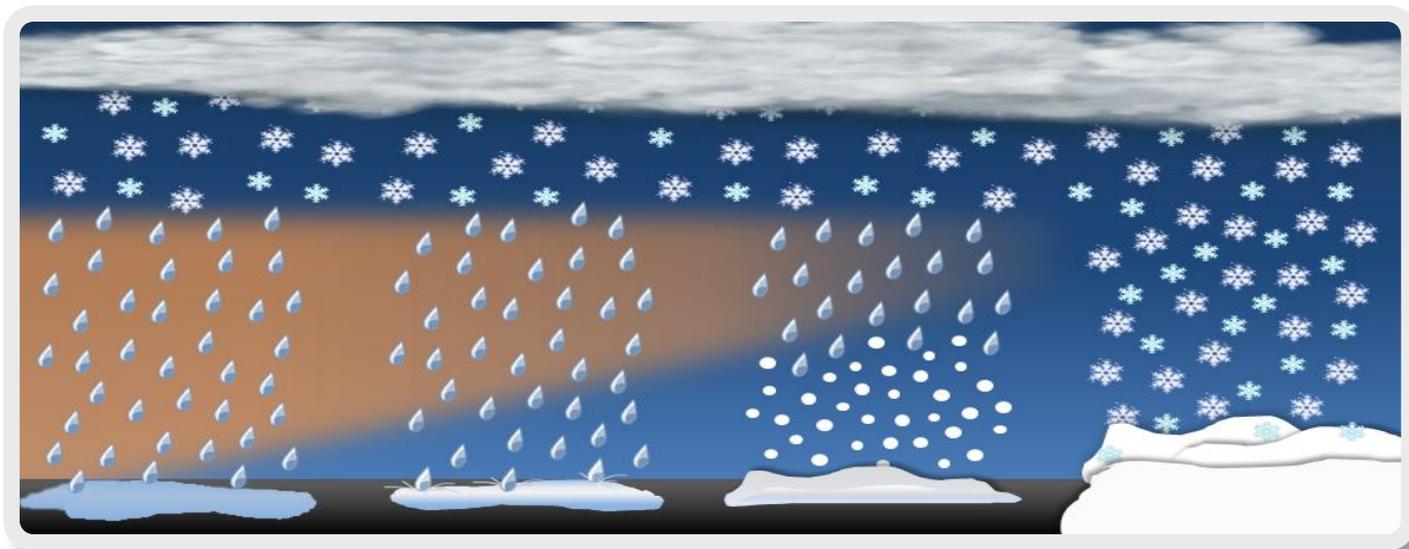
**Moisture:** Sources are large bodies of water, such as the Atlantic Ocean and Gulf of Mexico.

**Lift:** Causes moisture to rise and form clouds and precipitation.

**The surface low track is very important and often determines “who gets what” as far as precipitation type and amount!**



# Forecasting Winter Storms



## Snow falls out of clouds into cold air aloft and...

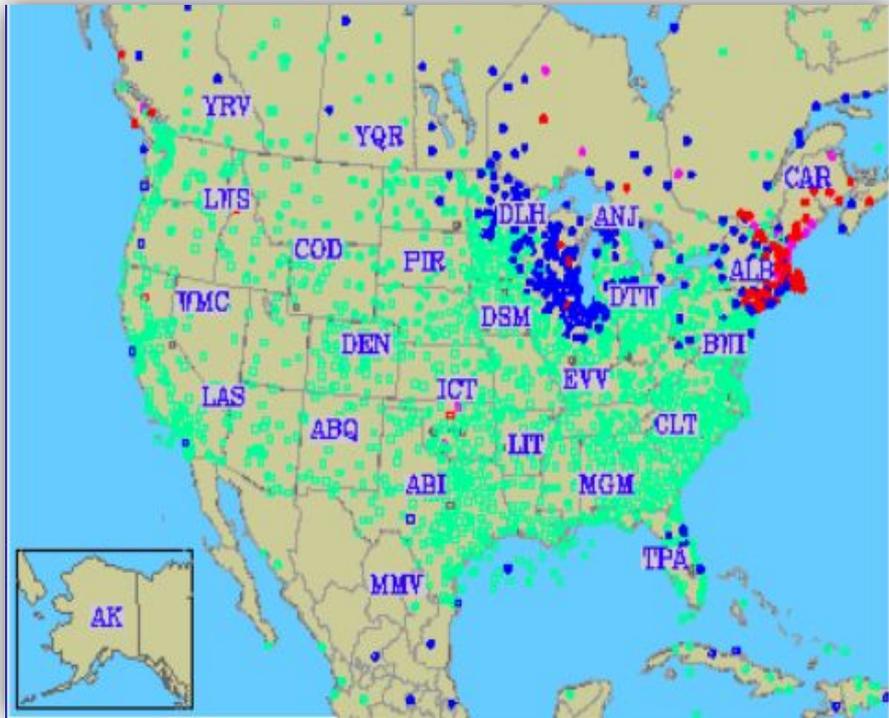
...melts to rain in a deep layer of warm air that extends down to the surface.

...melts to rain in a warm layer aloft, then freezes into glaze ice upon contact with cold surfaces.

...melts in a warm layer aloft, then refreezes into ice pellets in a layer of cold air above the surface.

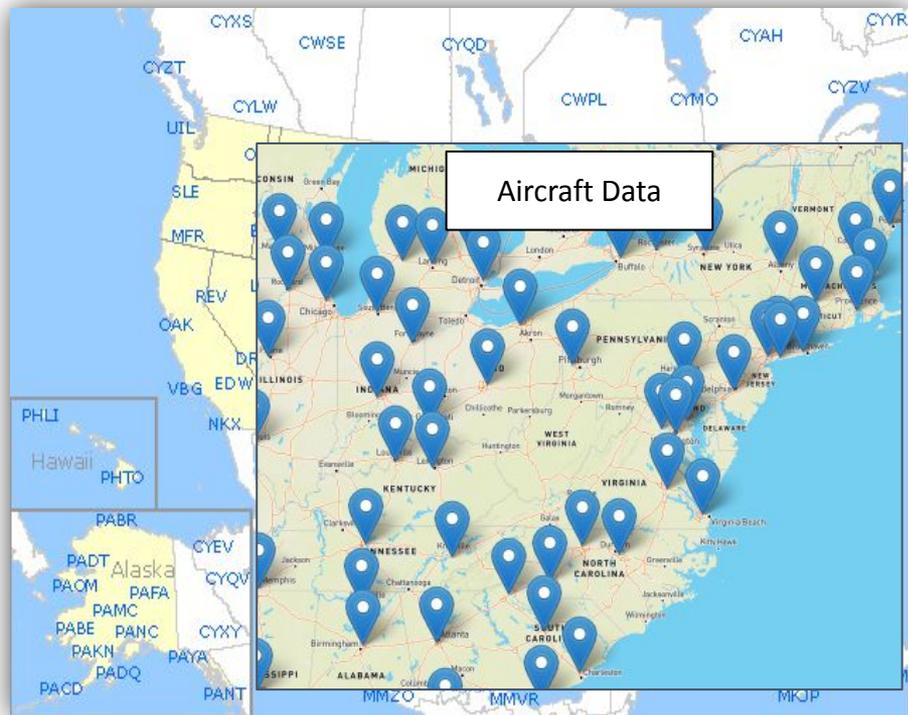
...remains snow in the absence of any warm layer of air aloft.

## Surface Observation Locations



We have a pretty good handle on what's going on at the surface.

## Upper Air Balloon Launch Locations



Above the surface, however, observations are rather sparse.

## Forecasting Snow Amount is THE Hardest Thing We Do!



**We have to get the temperature correct - at the surface and above the surface!**



**We have to get the amount of liquid that is going to fall right. Rainfall amount (liquid equivalent) is the second hardest thing we do!**

wet  
vs  
dry

**Finally, we have to get the snow to liquid ratio correct.**

If we get any of this wrong - and we will - then the snowfall forecast will be different than our forecast. That's why we like to use ranges!

# Forecasting Winter Storms

## Know the Terminology

### WINTER STORM WATCH

Significant winter weather is possible



Snow/ice amounts may meet warning criteria within the next few days.

**Monitor the latest forecast and be prepared!**

### WINTER STORM WARNING

Severe winter weather is occurring/imminent



Significant snow/ice amounts will pose a threat to life and property.

**Take necessary precautions and avoid travel!**

### WINTER WEATHER ADVISORY

Expect some travel difficulties



Snow/ice amounts will not meet warning criteria but will cause travel problems.

**Exercise caution, especially if you must travel!**

# Snow Squall Warnings

## Snow Squall Warning Criteria

- Snow squalls reducing the visibility to 1/4 statute miles or less,
- AND sub-freezing ambient road temperatures or plunging temperatures sufficient to produce flash freezes,
- AND gusty winds and blowing snow.

## SNOW SQUALL WARNINGS WILL ALERT ON CELL PHONES (WEA) THIS WINTER!

- WEA alerting will be reserved to when squalls target interstates and main highways.



### SNOW SQUALLS

- Intense bursts of snow and wind
- Short duration
- Whiteout visibility
- Rapidly deteriorating road conditions

National Weather Service **SNOW SQUALL WARNINGS**

- Issued when a snow squall is occurring or imminent
- Typically in effect for 30-60 minutes in a small, targeted area
- Can trigger a Wireless Emergency Alert to your phone
- When issued, slow down or delay travel

weather.gov 



 EMERGENCY ALERTS 1h ago

**Emergency Alert**  
Snow Squall Warning til 6:00 PM EST. Sudden whiteouts. Icy roads. Slow down! -NWS



# Tools for Winter Storm Situational Awareness

## Getting Day-to-Day Weather Info

- [weather.gov/charlestonwv](http://weather.gov/charlestonwv)
  - ◆ OR [weather.gov/\[zipcode\]](http://weather.gov/[zipcode])
  - ◆ Graphics
  - ◆ “Point-and-Click” Forecast

→ [Mobile.weather.gov](http://Mobile.weather.gov)

→ Facebook/Twitter  
◆ @NWSCharlestonWV

→ NOAA Weather Radio

→ Local TV/Radio

→ Reliable Apps and Websites

The image displays two screenshots of the National Weather Service interface for Charleston, WV. The top screenshot is a desktop view of the website, showing the current conditions at Yeager Airport (KCRW) with a temperature of 31°F (-1°C) and a forecast for the next several days. The bottom screenshot is a mobile app view, showing a similar interface with a focus on the current conditions and a detailed forecast for the next few days, including a chance of rain on Wednesday.

**Website Screenshot Details:**

- Current Conditions at Charleston, Yeager Airport (KCRW):** 31°F (-1°C), Light Snow Fog Mist, Humidity 96%, Wind Speed W 3 mph, Dewpoint 20°F (-7°C), Visibility 2.0 mi, Wind Chill 29°F (-1°C), Last update 24 Jan 12:54 pm EST.
- Extended Forecast for Hurricane WV:**

Time	Forecast	High	Low
This Afternoon	Partly sunny with light snow showers	35°F	22°F
Tonight	Mostly cloudy then isolated snow showers	30°F	22°F
Friday	Slight chance snow showers then sunny	35°F	25°F
Friday Night	Increasing clouds	30°F	18°F
Saturday	Mostly cloudy	35°F	26°F
Saturday Night	Mostly cloudy then slight chance snow showers	30°F	26°F
Sunday	Rain/snow then chance showers	30°F	28°F

**Mobile App Screenshot Details:**

- Current Conditions:** Charleston, Yeager Airport. Updated: 8 Mar 11:54 am EST. 39°F, Wind Vrb1 3 MPH, Dew Point 28°F (65% RH), Overcast.
- Forecast:** 8 Mar 11:54 am EST.
 

Time	Forecast	High	Low
This Afternoon	Mostly Cloudy	49°F	37°F
Tonight	30% → 80% Chance Rain then Rain	49°F	37°F
Wednesday	80% Rain	49°F	37°F



# Tools for Winter Storm Situational Awareness

weather.gov/{your zip code}

## Location Specific Hourly Weather

**NATIONAL WEATHER SERVICE**  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HOME FORECAST PAST WEATHER SAFETY INFORMATION EDUCATION NEWS SEARCH ABOUT

News Headlines

- NOAA Forecasters Predict Cooler, Wetter North and Warmer, Drier South
- Latest Hazardous Weather Outlook and Weather Synopsis

Your local forecast office is **Charleston, WV**

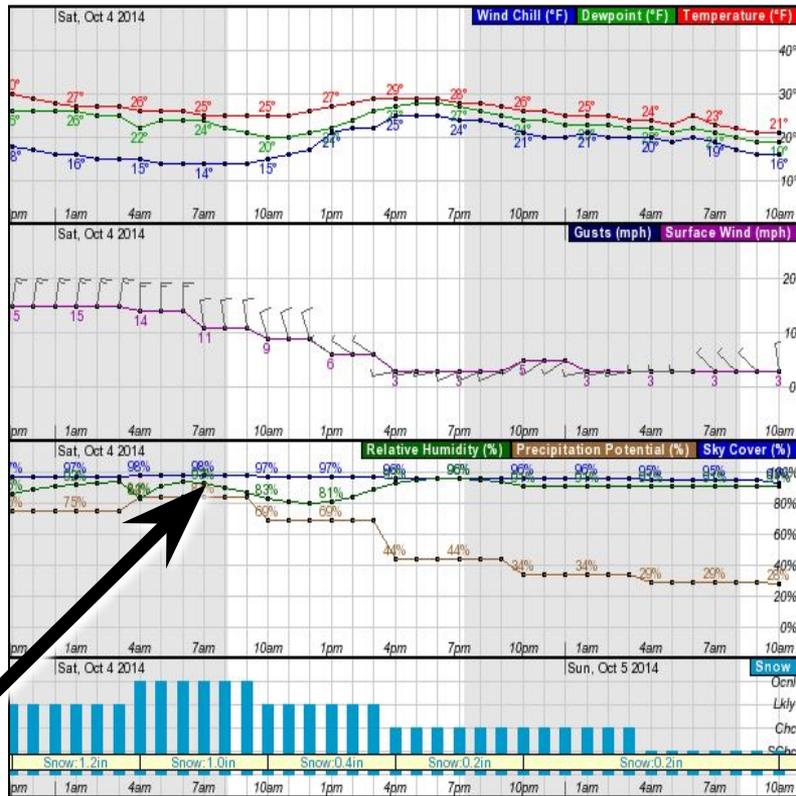
Current conditions at **Clarksburg, Clarksburg Benedum Airport (KCKB)**  
Lat: 39.3°N Lon: 80.22°W Elev: 1201ft

Mostly Cloudy  
**46°F**  
8°C

Humidity 51%  
Wind Speed SW 15 G 23 mph  
Barometer 29.81 in (1009.5 mb)  
Dewpoint 29°F (-2°C)  
Visibility 10.00 mi  
Wind Chill 40°F (4°C)  
Last update 30 Oct 12:53 pm EDT

Extended Forecast for **Clarksburg WV**

This Afternoon	Tonight	Tuesday	Tuesday Night	Wednesday	Wednesday Night	Thursday	Thursday Night	Friday
Partly Sunny	Mostly Cloudy	Mostly Sunny	Increasing Clouds	Chance Rain/Snow then Chance Showers	Chance Showers	Chance Showers	Chance Showers	Chance Showers
High: 52°F	Low: 36°F	High: 49°F	Low: 32°F	High: 52°F	Low: 44°F	High: 66°F	Low: 50°F	High: 62°F



**Additional Forecasts and Information**

FORECAST AREA FORECAST FOR BROAD-HITT COUNTY, KY

Forecast Discussion  
Printable Forecast  
Text Only Forecast

Hourly Weather Graph  
Tabular Forecast  
Quick Forecast

Air Quality Forecasts  
International System of Units  
About Point Forecasts

Hazardous Weather Outlooks  
Rivers & Lakes  
Observations

Climate Data  
Forecast Graphs  
Digital Forecast

NWS Jackson Products & Services  
Back to NWS Jackson, KY

**RADAR & SATELLITE IMAGES**

**HOURLY WEATHER GRAPH**



# Winter Weather Page



**NATIONAL WEATHER SERVICE**  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HOME FORECAST PAST WEATHER SAFETY INFORMATION EDUCATION NEWS SEARCH ABOUT

Local forecast by "City, ST" or ZIP code  
 Enter location...    
[Location Help](#)

**News Headlines**

- Simplification of NWS Flood Products starting on Nov 4th
- Latest Hazardous Weather Outlook and Weather Briefing
- Past News Headlines and Web Articles

**Winter Weather/Probabilistic Snow Forecasts** Charleston, WV  
 Weather.gov > Charleston, WV > Winter Weather/Probabilistic Snow Forecasts  
 Weather Forecast Office

Current Hazards Current Conditions Radar Forecasts Rivers and Lakes Climate and Past Weather Local Programs

Probabilistic Snowfall Forecasts WV Probabilistic Snowfall Forecasts Ice Accumulation Forecasts WV Ice Accumulation Forecasts

6-hr Snowfall Forecasts 6-hr Ice Accumulation Forecasts WV 6-hr Snowfall Forecasts WV 6-hr Ice Accumulation Forecasts

Onset/End-Timing Graphics Winter Storm Outlook and Winter Storm Severity Index Snow and Ice Observations

Medium/Long Range Forecast

Quick Page Navigation

**Precipitation Onset/End Timing**

**Onset of Winty Precipitation**  
 Winter Precipitation Onset Time  
 What's this?

**End Timing of Winty Precipitation**  
 Winter Precipitation End Time  
 What's this?

**Winter Storm Severity Index (WSSI)**  
 Winter Storm Severity Index (WSSI)  
 What's this?

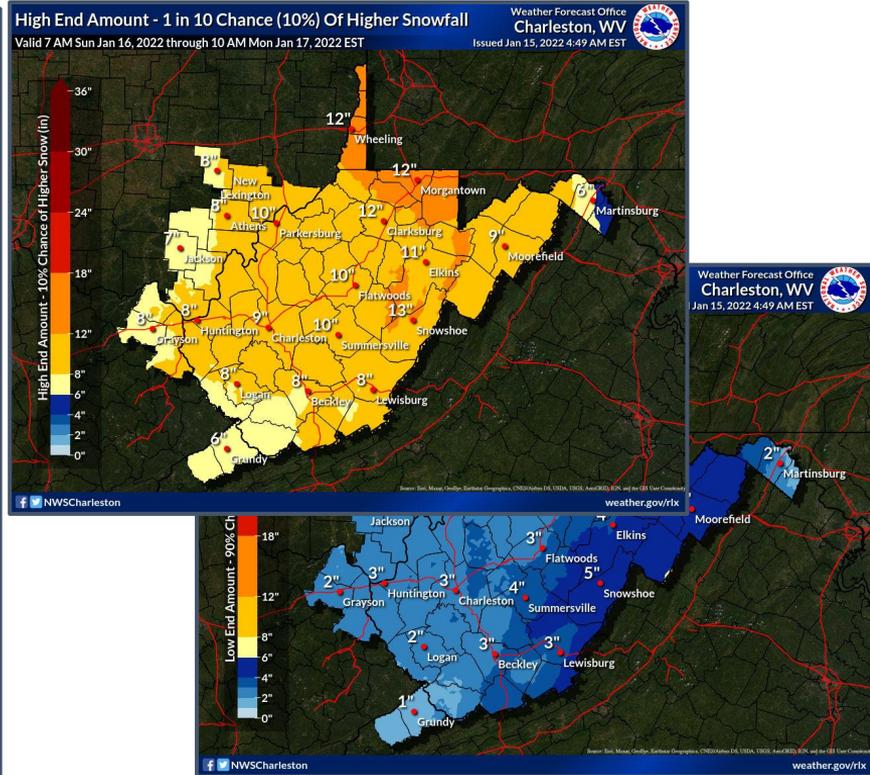
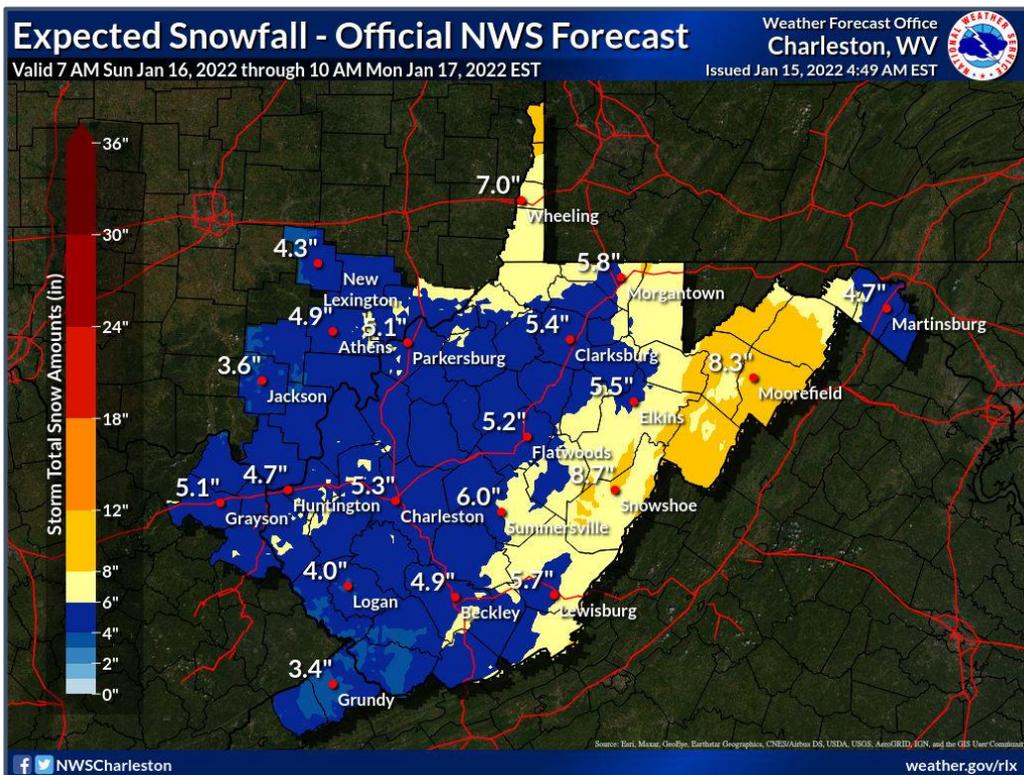
**Winter Storm Outlook (WSO)**  
 Winter Storm Outlook (WSO)  
 What's this?

- Comprehensive winter weather forecast information can be found by looking for the icon on you local NWS office's webpage.
- Winter weather information for the NWS Charleston, WV forecast area and statewide graphics for West Virginia can be found at [www.weather.gov/rlx/winter](http://www.weather.gov/rlx/winter)

# Probabilistic Snowfall Forecasts

[www.weather.gov/rlx/winter](http://www.weather.gov/rlx/winter)

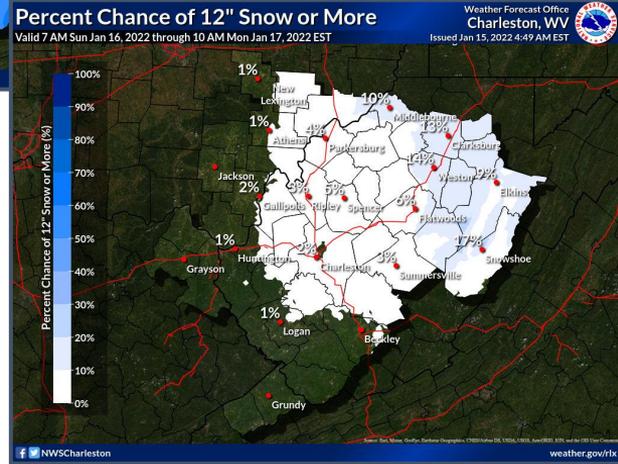
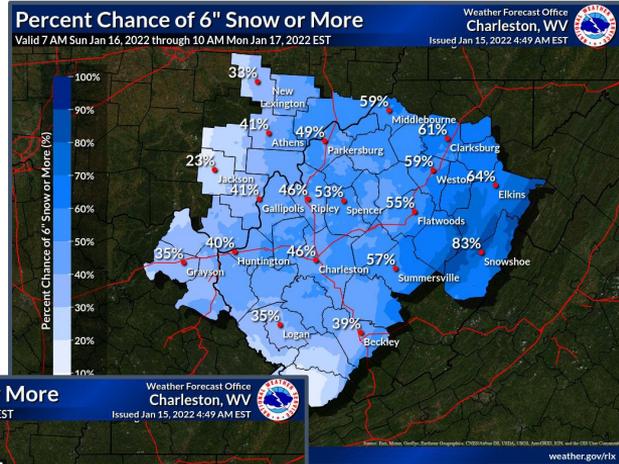
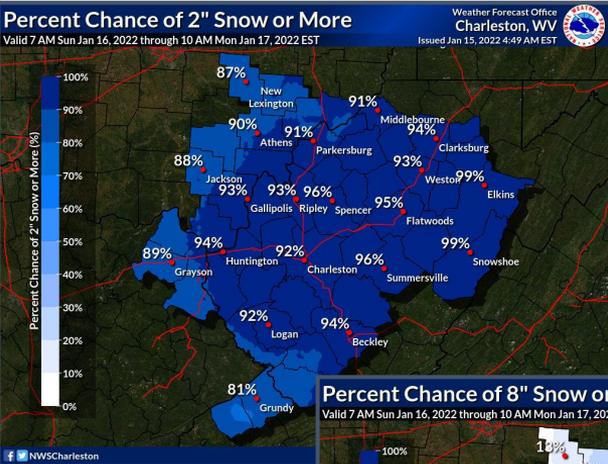
Given the difficulty in forecasting snowfall amounts, potential “worst case” and “best case” scenarios are given to assist with planning and response activities. When the gap between “best case” and “worst case” is large, confidence is low.



# Probabilistic Snowfall Forecasts

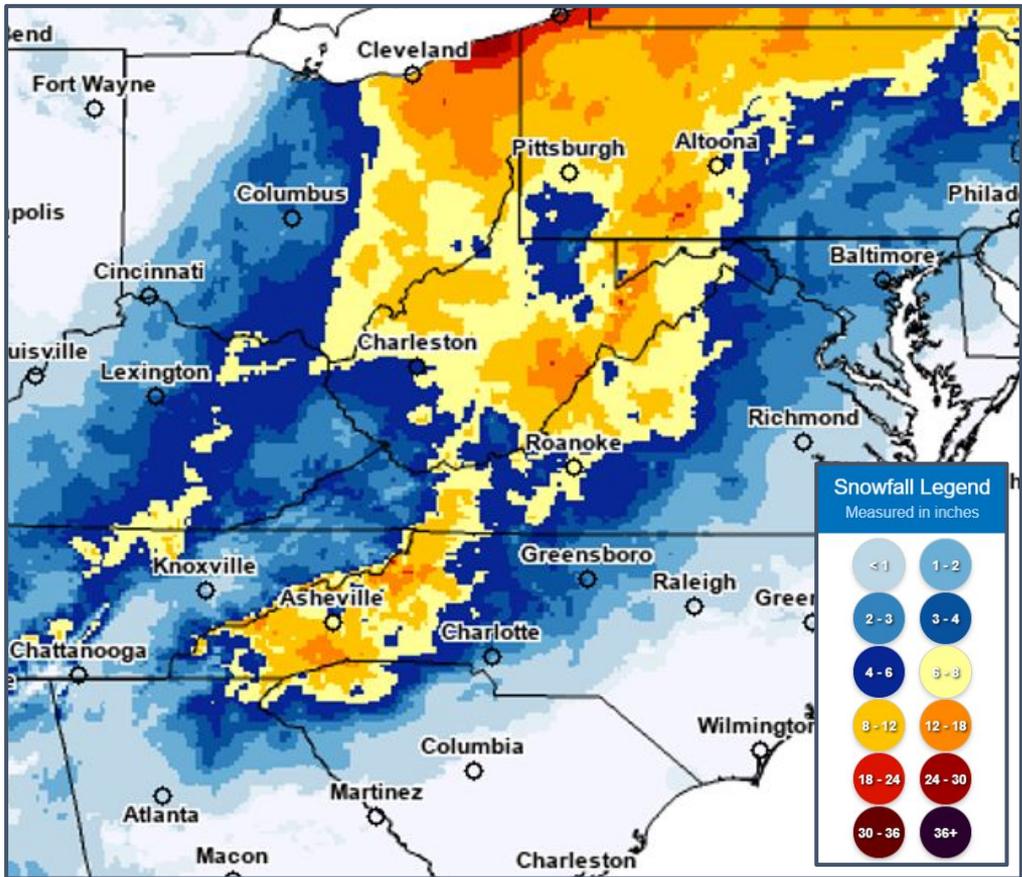
[www.weather.gov/rlx/winter](http://www.weather.gov/rlx/winter)

The probability of reaching/exceeding certain thresholds can also be found on our winter weather page.



# Probabilistic Snowfall Forecasts

Here's the final snowfall totals - January 16-17, 2022



## Parkersburg

- Forecast- 5.1"
- Worst Case- 10"
- Final Total- 10.3"

## Charleston

- Forecast- 5.3"
- Worst Case- 9"
- Final Total- 6.0"

## Morgantown

- Forecast- 5.8"
- Worst Case- 12"
- Best Case- 3"
- Final Total- 3.0"

# West Virginia Highway Forecast Profiles

Probabilistic Snowfall Forecasts	WV Probabilistic Snowfall Forecasts	Ice Accumulation Forecasts	WV Ice Accumulation Forecasts
6-hr Snowfall Forecasts	6-hr Ice Accumulation Forecasts	WV 6-hr Snowfall Forecasts	WV 6-hr Ice Accumulation Forecasts
Onset/End-Timing Graphics	Winter Storm Outlook and Winter Storm Severity Index	Snow and Ice Observations	WV Highway Snow
WV Highway Ice	Medium/Long Range Forecast		



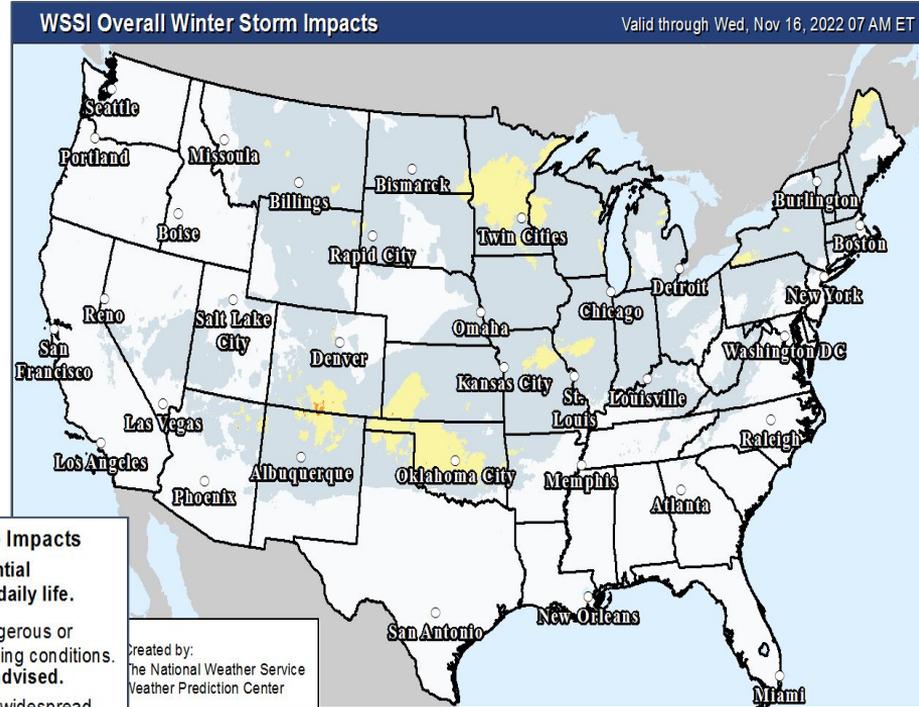
Newly added is highway snow/ice forecast profiles for several Interstates and US Highways

- Interstate 64**  
Huntington to White Sulphur Springs
- Interstate 68**  
Morgantown to Hazelton
- Interstate 77**  
Bluefield to Parkersburg
- Interstate 79**  
Charleston to Morgantown
- Interstate 81**  
Ridgeway to Marlowne
- US Route 33**  
Ravenswood to High Knob
- US Route 50**  
Parkersburg to Capon Bridge
- US Route 219**  
Rich Creek to Silver Lake

# Winter Storm Severity Index

[www.wpc.ncep.noaa.gov/wwd/wssi/wssi.php?id=RLX](http://www.wpc.ncep.noaa.gov/wwd/wssi/wssi.php?id=RLX)

- Provides winter storm impact information out to 72 hours.
- Includes meteorological and non-meteorological factors and factors in differences in regional susceptibility.
  - Snow Load (weight of snow)
  - Snow Amount
  - Ice Accumulation
  - Ground Blizzard
  - Flash Freeze (during and after precipitation)
  - Blowing Snow
- Experimental Probabilistic and rolling 24 hour period options are also available.



<p><b>Winter Weather Area</b> Expect winter weather.</p> <ul style="list-style-type: none"> <li>• Winter driving conditions. <b>Drive carefully.</b></li> </ul>	<p><b>Minor Impacts</b> Expect a few inconveniences to daily life.</p> <ul style="list-style-type: none"> <li>• Winter driving conditions. <b>Use Caution while driving.</b></li> </ul>	<p><b>Moderate Impacts</b> Expect disruptions to daily life.</p> <ul style="list-style-type: none"> <li>• Hazardous driving conditions. <b>Use extra caution while driving.</b></li> <li>• Closures and disruptions to infrastructure may occur.</li> </ul>	<p><b>Major Impacts</b> Expect considerable disruptions to daily life.</p> <ul style="list-style-type: none"> <li>• Dangerous or impossible driving conditions. <b>Avoid travel if possible.</b></li> <li>• Widespread closures and disruptions to infrastructure may occur.</li> </ul>	<p><b>Extreme Impacts</b> Expect substantial disruptions to daily life.</p> <ul style="list-style-type: none"> <li>• Extremely dangerous or impossible driving conditions. <b>Travel is not advised.</b></li> <li>• Extensive and widespread closures and disruptions to infrastructure may occur.</li> <li>• Life-saving actions may be needed.</li> </ul>
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# Graphical Hazardous Weather Outlook

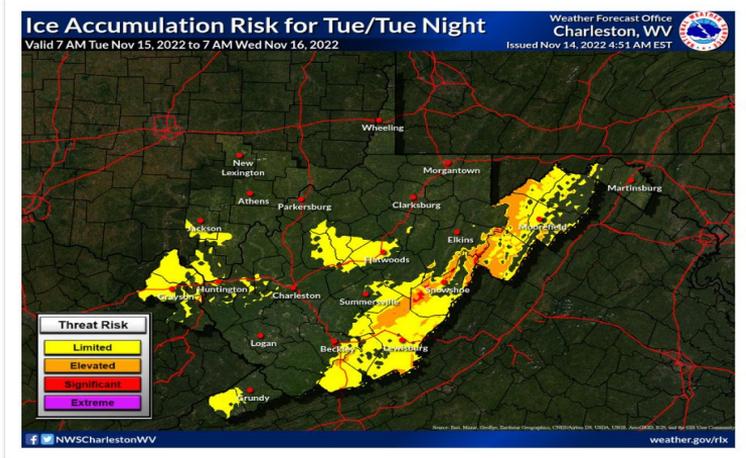
The screenshot shows the National Weather Service website for Charleston, WV. At the top, there are navigation links: HOME, FORECAST, PAST WEATHER, SAFETY, INFORMATION, EDUCATION, NEWS, SEARCH, and ABOUT. Below the navigation is a search bar and a "Local Forecast by City, ST, or ZIP code" section. The main content area is titled "NWS Forecast Office Charleston, WV" and includes a "Current Hazards" link. A map of the region is displayed, with a "Hazardous Weather Outlook" icon highlighted in yellow. Below the map, there are sections for "Weather Story", "Local Radar", and "Satellite". At the bottom, there is a "Text Product Selector" and a grid of icons for various weather services, including "Hazardous Weather Outlook". A hand cursor is pointing to the "Hazardous Weather Outlook" icon.

- Graphical Hazardous Weather Outlook can be found by looking for the  icon on your local NWS office's webpage.
- Or go to [www.weather.gov/erh/ghwo?wfo=rlx](http://www.weather.gov/erh/ghwo?wfo=rlx)

# Graphical Hazardous Weather Outlook

## Experimental Graphical Hazardous Weather Outlook

Select Zoom Area:



24 Hr Hazard Risks	Today	Tue	Wed	Thu	Fri	Sat	Sun
Severe Thunderstorm	Green						
Tornado	Green	Green					
Thunderstorm Wind	Green	Green					
Hail	Green	Green					
Lightning	Green						
Excessive Rainfall	Green						
Wind	Yellow	Green	Yellow	Yellow	Yellow	Green	Green
Fog	Green						
Fire Weather	Green						
Excessive Cold	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow
Ice Accumulation	Yellow	Red	Green	Green	Green	Green	Green
Snow/Sleet	Green	Yellow	Orange	Yellow	Green	Green	Green

- Quick way to get briefed on what weather hazards are in the forecast over the next week
- Change the hazard graphic map by clicking on the “chicklet” icon in the hazard matrix.
- Includes statewide graphics by changing the “Select Zoom Area” dropdown
  - WV- [www.weather.gov/erh/ghwo?wfo=rlx](http://www.weather.gov/erh/ghwo?wfo=rlx)
  - OH- [www.weather.gov/erh/ghwo?wfo=iln](http://www.weather.gov/erh/ghwo?wfo=iln)
  - KY- [www.weather.gov/erh/ghwo?wfo=lmk](http://www.weather.gov/erh/ghwo?wfo=lmk)



# Presentation Outline



- A Look Back at Last Winter?
  - Overall trends
  - Memorable storms



- How to Properly Observe and Report Winter Weather
  - What to report
  - Properly measuring snow and ice
  - How to send us your reports



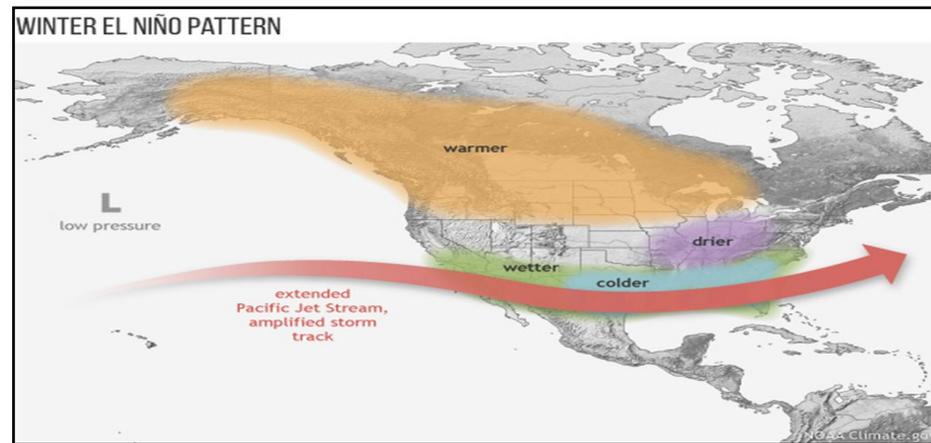
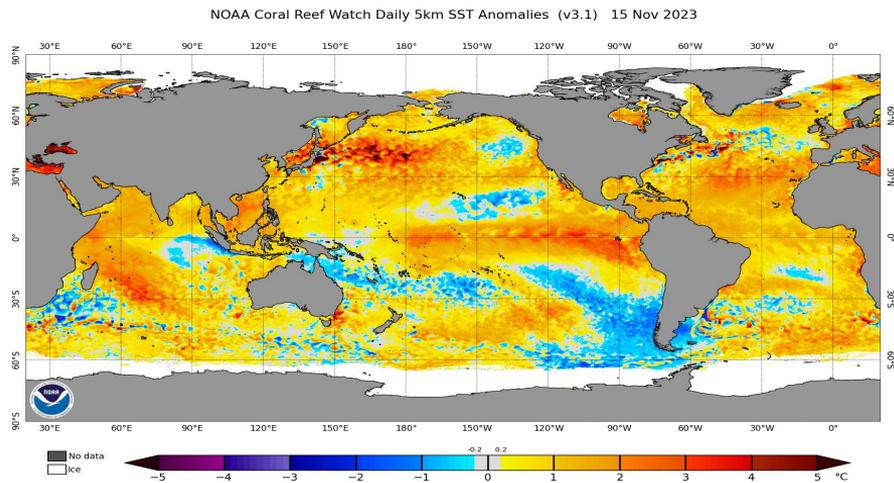
- Forecasting Winter Weather
  - Why is it so hard to forecast winter storms?
  - Finding winter weather forecasts



- NOAA Winter Outlook
  - What it means for our region
  - How to be prepared

## What is it REALLY?

- **El Nino** is a pattern of abnormally warm water in the central Pacific Ocean which has long reaching impacts on the weather across the Northern Hemisphere.
- A **moderate to strong El Nino** is anticipated throughout the winter of 2023/24.
- A typical El Nino winter features a storm track that favors a drier than normal winter across the Ohio Valley with a wetter and colder than normal winter across the Deep South, Carolinas into Virginia.



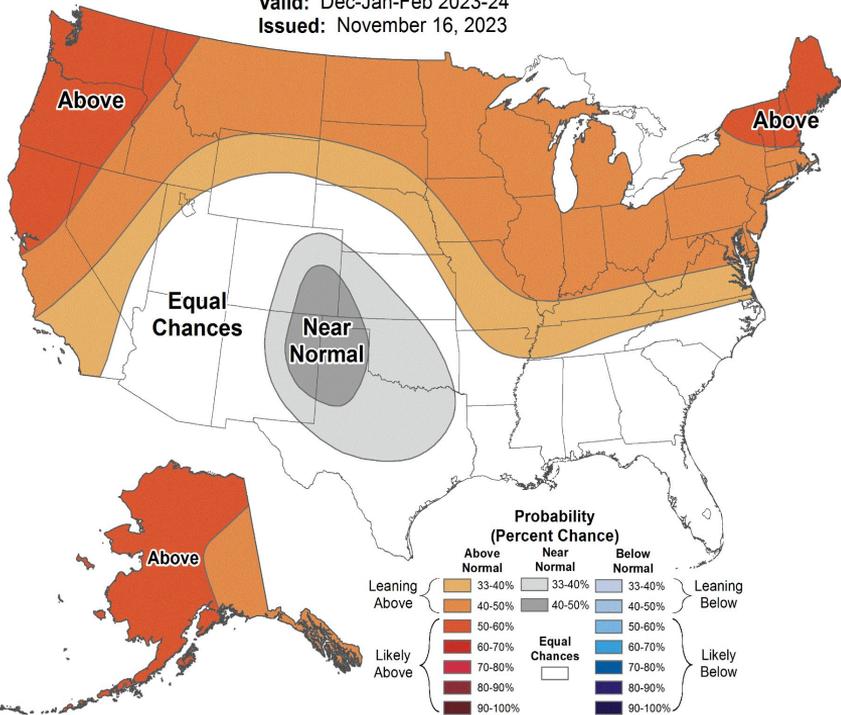
# Winter 2023/24 Outlook



## Seasonal Temperature Outlook



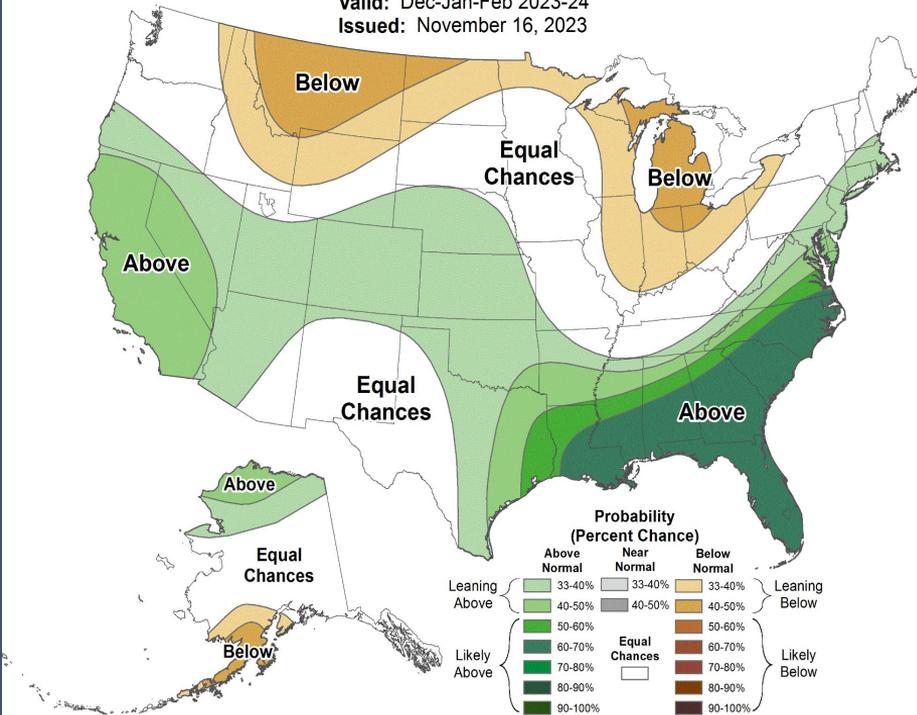
Valid: Dec-Jan-Feb 2023-24  
 Issued: November 16, 2023



## Seasonal Precipitation Outlook



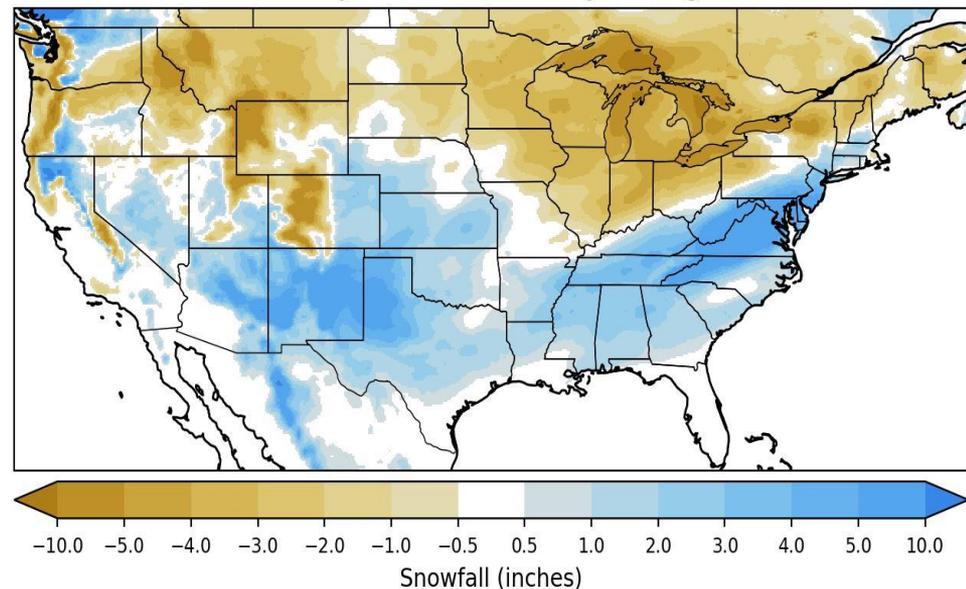
Valid: Dec-Jan-Feb 2023-24  
 Issued: November 16, 2023



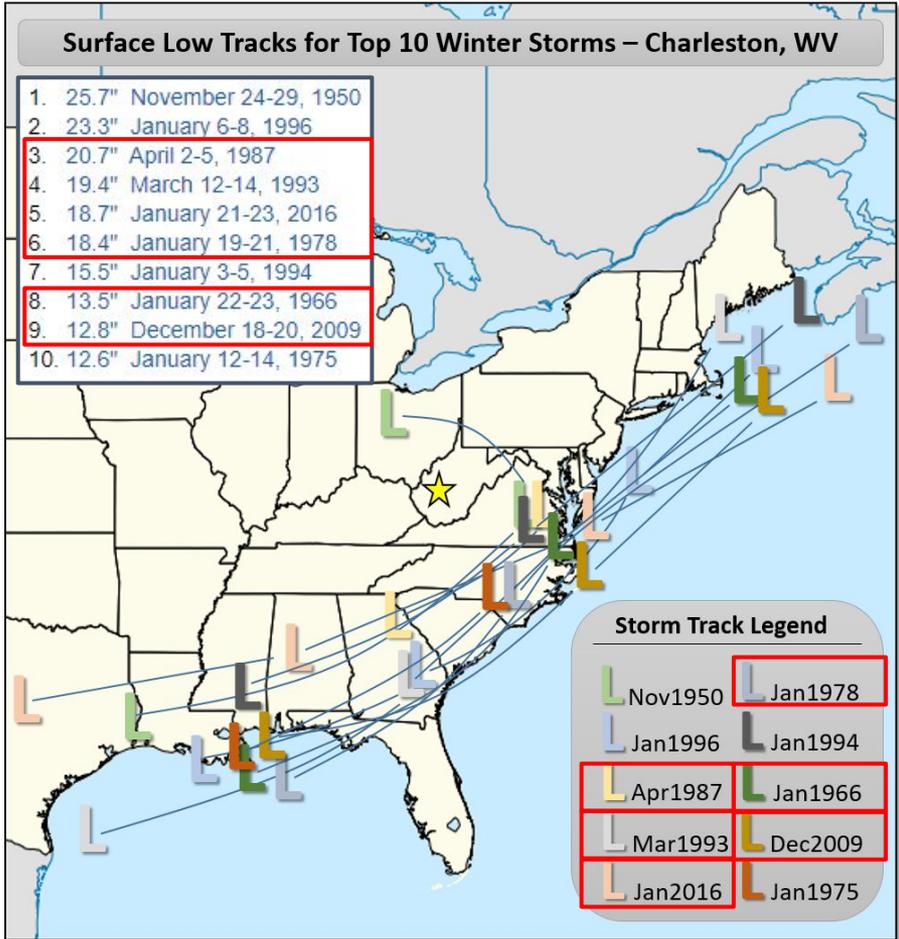
## What About Snowfall?

- Arctic outbreaks, ice storms and snowstorms are difficult to predict more than 1 to 2 weeks in advance. The frequency, number and intensity of these events cannot be predicted on a seasonal timescale.
- Taking all El Nino events and averaging them out, snowfall tends to be around average.
- For **strong El Ninos**, snowfall tends to run above average for most of the state.

ERA5Land DJF Snowfall Anomaly: Strong El Nino



# Winter 2023/24 Outlook

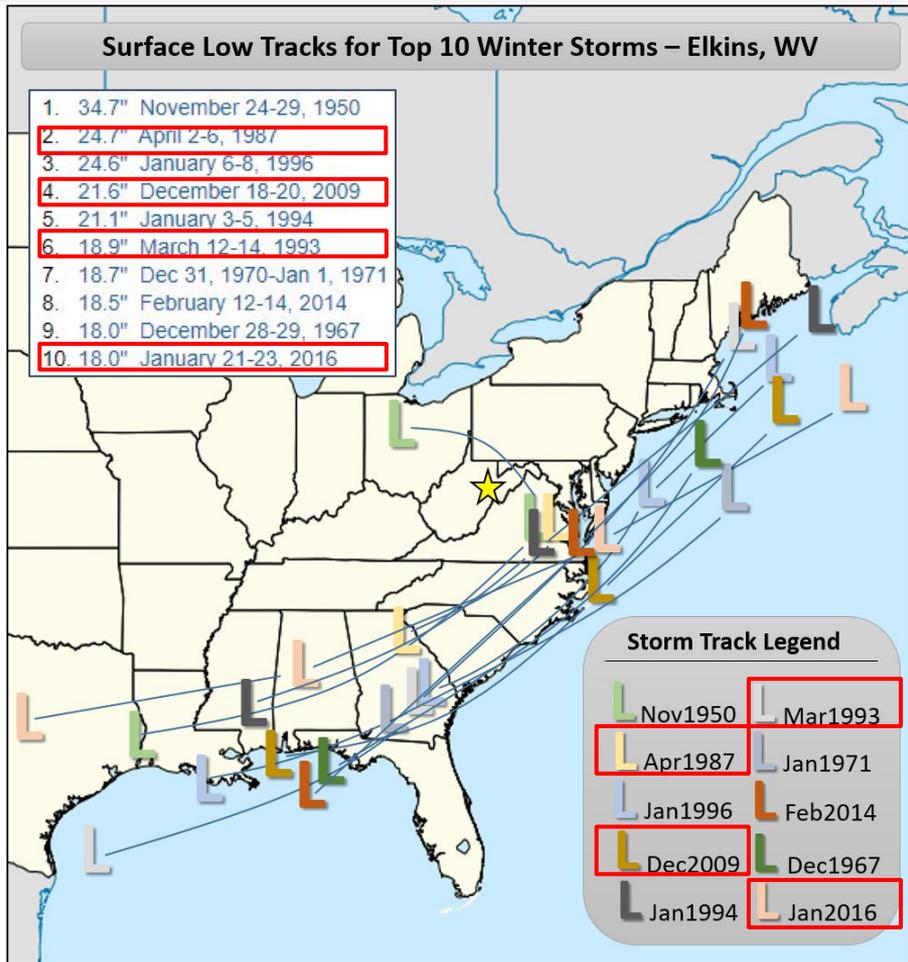


## What About Snowfall?

- For the top 10 Snowstorms for Charleston,
  - **6 occurred during El Nino winters**
  - 1 occurred during ENSO Neutral winters
  - 3 occurred during a La Nina winter



# Winter 2023/24 Outlook



## What About Snowfall?

- For the top 10 Snowstorms for Elkins,
  - **4 occurred during El Nino winters**
  - 3 occurred during ENSO Neutral winters
  - 3 occurred during a La Nina winter



## The #1 Best Thing You Can Do To Be Prepared – Build a Kit!

- **Water**, one gallon of water per person per day for at least three days
- **Food & medicine/prescriptions**, at least a three-day supply
- **Radio**, battery-powered or hand crank radio and a NOAA Weather Radio with tone alert and extra batteries for both
- **Flashlight and extra batteries**
- **First aid kit**
- **Whistle** to signal for help
- **Face mask** to help filter contaminated air and plastic sheeting and duct tape to shelter-in-place
- **Moist towelettes**, garbage bags and plastic ties for personal sanitation
- **Wrench or pliers** to turn off utilities
- **Manual can opener** for food
- **Local maps**
- **Cell phone** with chargers, inverter or solar charger





## Don't Forget Your Car!



**BUILDING AN EMERGENCY SUPPLY KIT  
FOR YOUR CAR**

**WHY?**  
Because you never know when you will encounter winter weather or an emergency road closure

**AMERICA'S  
PrepareAthon!**  
BE READY. TAKE PART. PREPARE.

- Cell Phone Charger
- First Aid Kit
- Jumper Cables
- Spare Tire
- Flares
- Water, Snacks
- Mittens, Hat, Boots, Warm Clothes
- Flashlight
- Snow Shovel and Brush
- Blankets
- Full Tank of Gas
- Sand or Kitty Litter
- Tow Rope

## Winter Road Trip Safety



- Each year, more than 5,000 people are killed and more than 418,000 injured due to weather-related vehicle crashes.
- TAKE IT SLOW IN THE SNOW!
- If temperatures are near freezing, drive like you're on ice – you may be!
- Check the forecast and road conditions on the route between your home and your destination.

## Other Considerations!



- Hypothermia occurs when your body temperature drops below 96°F.
- If you or someone you know shows the above signs of hypothermia, get medical attention immediately.



- Inspect/clean your chimney
- Test out your backup generators, make sure they will start.
- Keep generators away from homes and garages

<https://www.weather.gov/safety/cold>