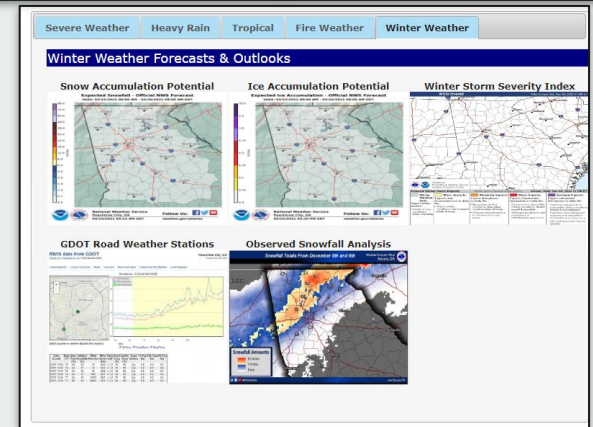
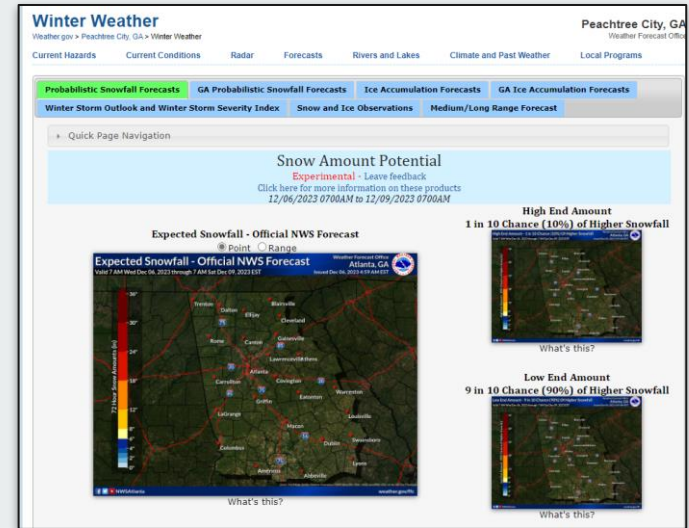


NWS Atlanta Winter Weather Page(s)

www.weather.gov/ffc/winter



2023 North & Central Georgia IWT/Partners Workshop



Winter Snow/Ice Probabilistic Forecasts

www.weather.gov/ffc/winter

- Program started: Winter 2015-16
- **Objective:** figure out best ways to incorporate “ensemble” modeling and communicate uncertainty while providing a reliable forecast
- Communicating the Range of Possibilities
- Proper communication of uncertainties =
 - Providing the “goal posts” of possibilities
 - Better decision-making, planning, and preparations
 - Minimizes the economic loss and impacts on public safety





Winter Snow/Ice Probabilistic Forecasts

www.weather.gov/ffc/winter

- Three (3) Snow / Ice products:
 - Minimum “amount(s)” – *Expect at least this much*
 - Most Likely – *Official NWS “deterministic” forecast*
 - Maximum – *Potential for this much*



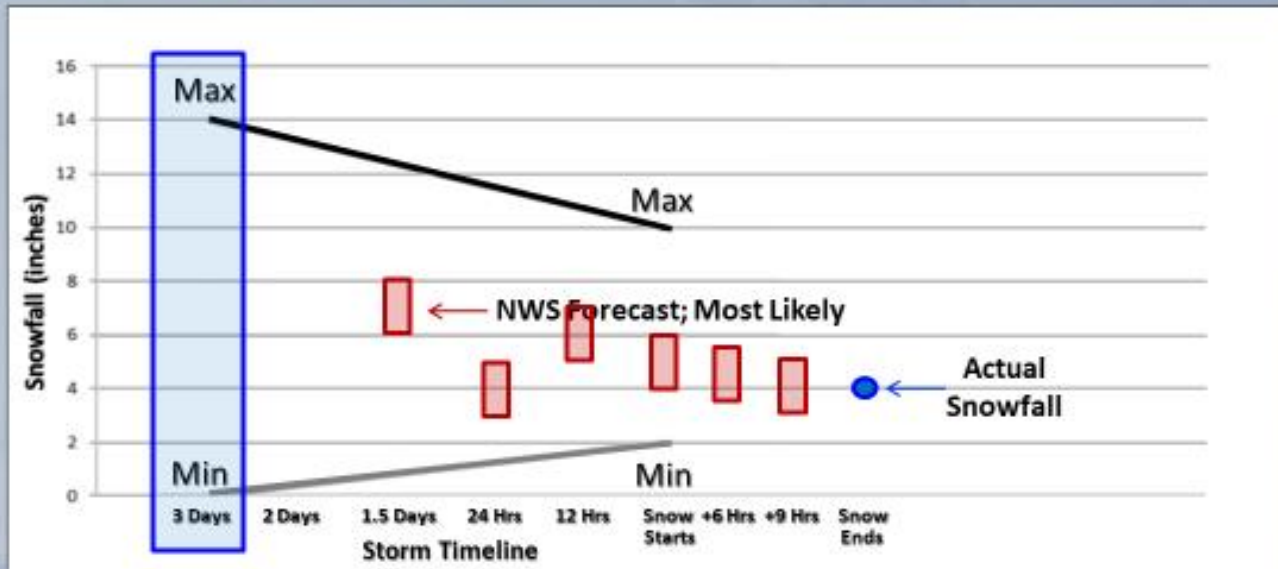
Range or “Goal Posts” of Possibilities

- Chance (probability) that Snow (Ice) Will Be Greater Than Or Equal To (\geq)...
 - 0.1”, 1”, 2”, 4”, 6”, 8”, 12” and 18”
 - 0.01”, 0.1”, 0.25”, 0.5”, 1”
- Locality Tables:
 - Specific numbers for various locations in each county

County: <div>County: Coweta, GA</div>										
For cities in Coweta, GA County										
Location	Snow Amount Potential			Chance of Seeing More Snow Than						
	Low End Snowfall	Expected Snowfall	High End Snowfall	>=0.1"	>=1"	>=2"	>=4"	>=6"	>=8"	>=12"
Grantville, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%
Moreland, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%
Newnan, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%
Senoia, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%
Sharpsburg, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%

Idealized Situation

- As Storm Nears...
 - Range of Possibilities Shrinks
 - Confidence Increases
- NWS Forecast Between Max/Min





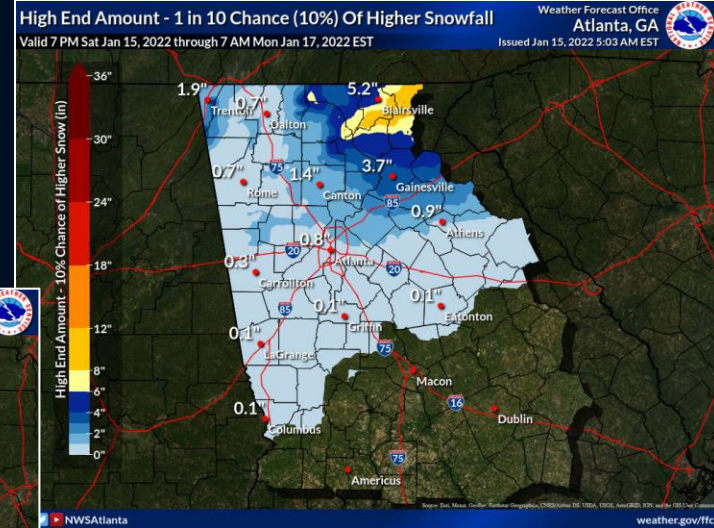
Case 1: Probabilistic Snow Forecast

www.weather.gov/ffc/winter

Expect At Least This Much

Potential For This Much

Most Likely Forecast (NWS)

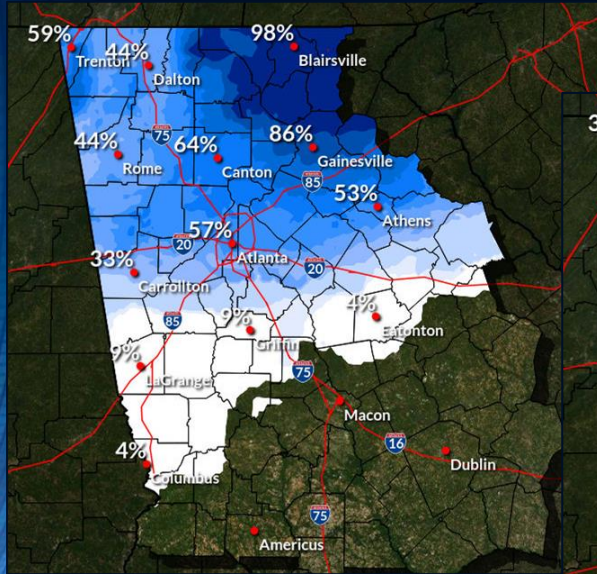




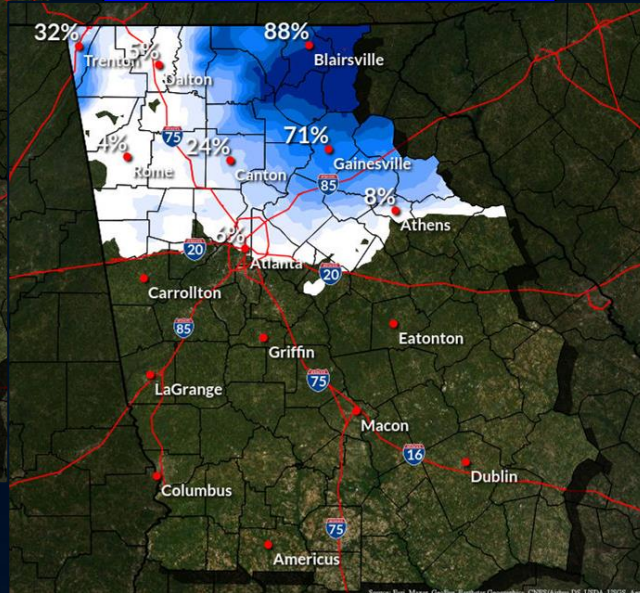
Case 1: Probabilistic Snow Forecast

www.weather.gov/ffc/winter

Chance of seeing $\geq 0.1''$



Chance of seeing $\geq 1''$



Location Example (Canton GA):

- Chance of $\geq 0.1''$ = 64%
- Chance of $\geq 1''$ = 24%
- Chance of $\geq 2''$ = 2%

Chance of seeing $\geq 2''$





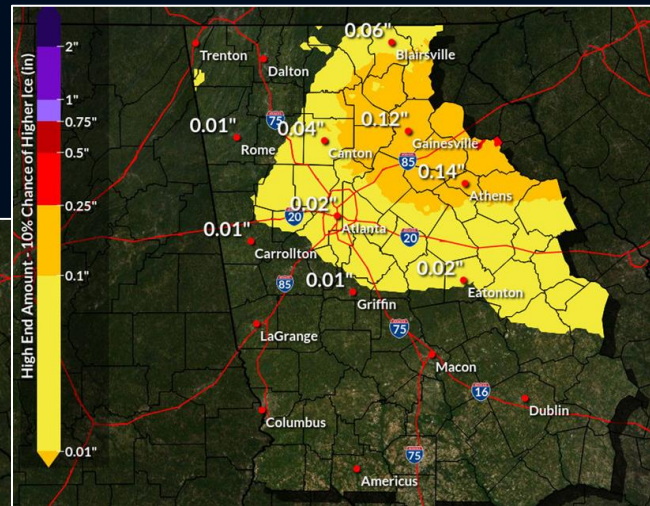
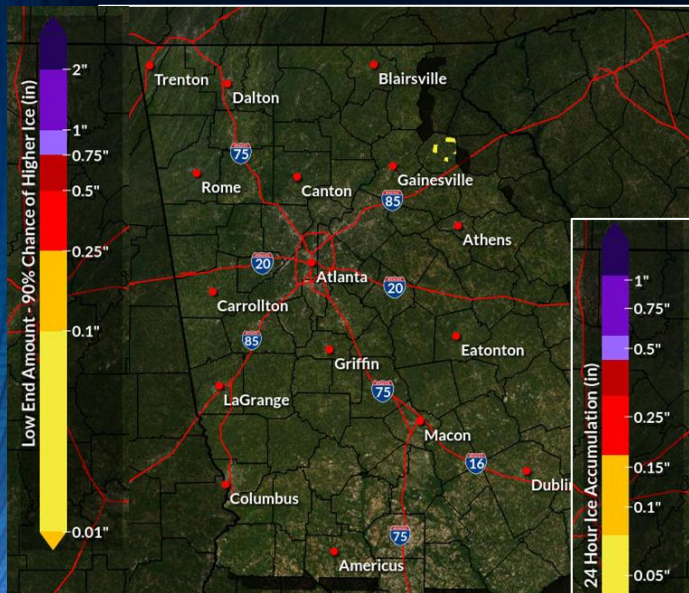
Case 2: Probabilistic Ice Forecast

www.weather.gov/ffc/winter

Expect At Least This Much

Potential For This Much

Most Likely Forecast (NWS)





Case 2: Probabilistic Ice Forecast

www.weather.gov/ffc/winter

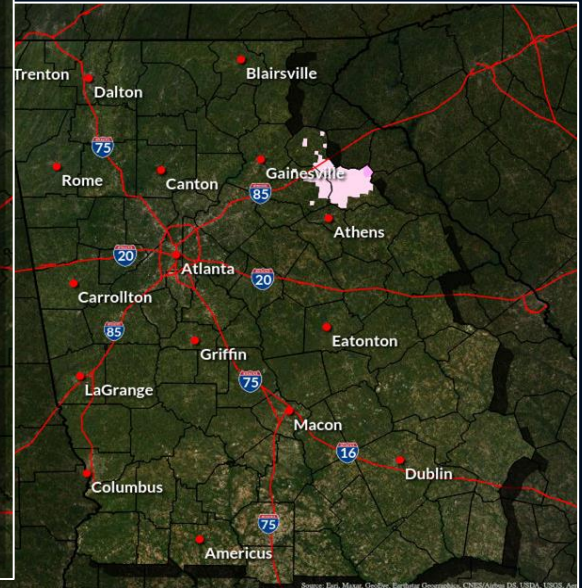
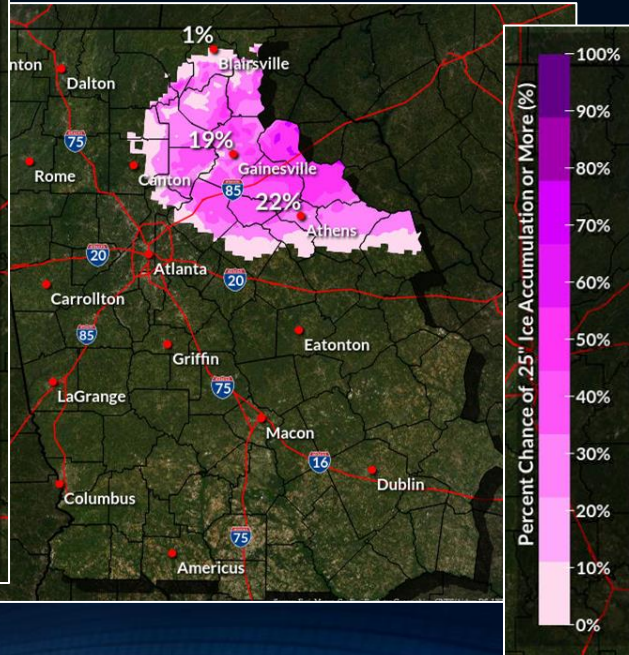
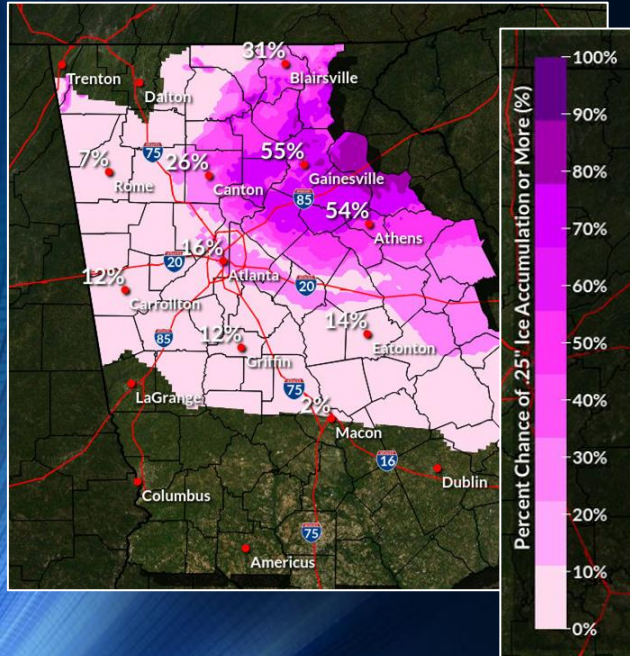
Chance of seeing $\geq 0.01''$

Location Example (Gainesville GA):

- Chance of $\geq 0.01''$ = 55%
- Chance of $\geq 1''$ = 19%
- Chance of $\geq 2''$ = 0%

Chance of seeing $\geq 0.1''$

Chance of seeing $\geq 0.25''$



Locality Tables (for SNOW only)!

Choose your location
(county list of towns/cities)

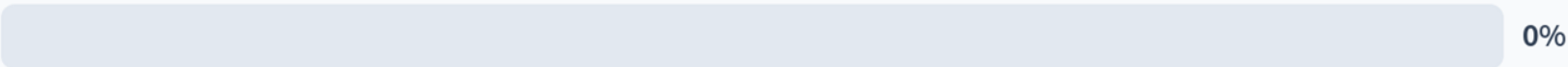
Choose your location		County: Selected										
County list of towns/cities)		Snow Amount Potential			Chance of Seeing More Snow Than							
Location	Low End Snowfall	Expected Snowfall	High End Snowfall	>=0.1"	>=1"	>=2"	>=4"	>=6"	>=8"	>=12"	>=18"	
Macon, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	
Carrollton, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	
Canton, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	
Holly Springs, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	
Woodstock, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	
Athens, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	
Marietta, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	
Smyrna, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	
Newnan, GA	Range of Possibilities "Goal Posts"			Probability (%) of Exceedance								
Decatur, GA												
Douglasville, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	
Blue Ridge, GA	0	0	<1	18%	0%	0%	0%	0%	0%	0%	0%	
Fayetteville, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	
Peachtree City, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	
Rome, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	
Atlanta, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	
Roswell, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	
Sandy Springs, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	
Ellijay, GA	0	0	<1	3%	0%	0%	0%	0%	0%	0%	0%	
Lawrenceville, GA	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	

Range of Possibilities "Goal Posts"

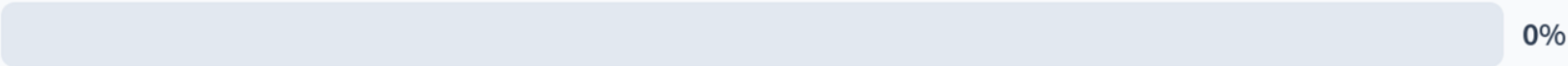
Probability (%) of Exceedance

Does your agency use "probable worst/best case" information for weather decision-making?

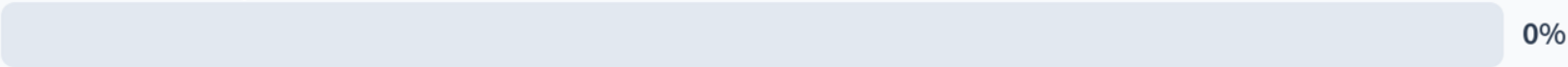
Yes



No



What the heck is probable worst/best-case information??





Other Winter Weather Tools & Resources + NWS Winter Products

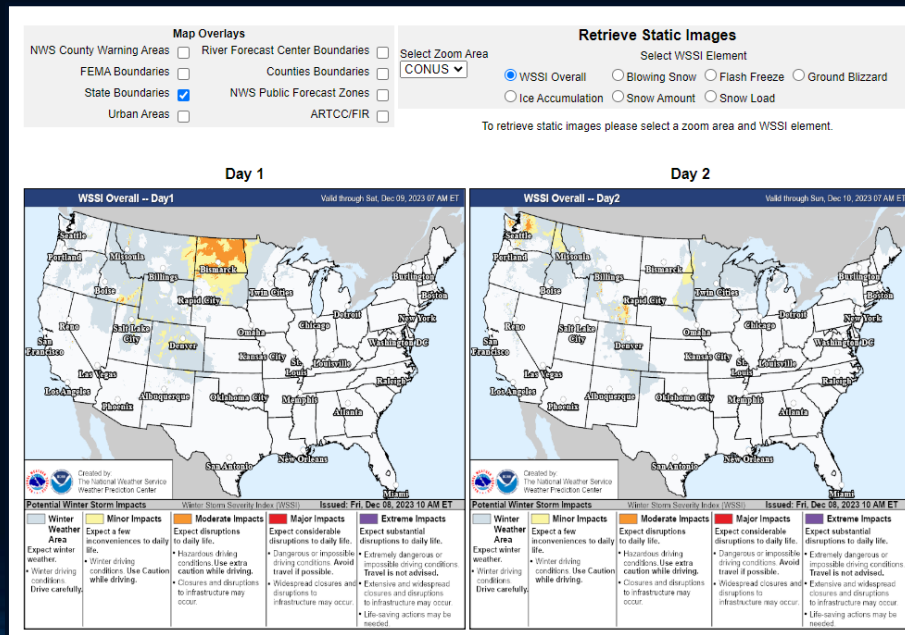
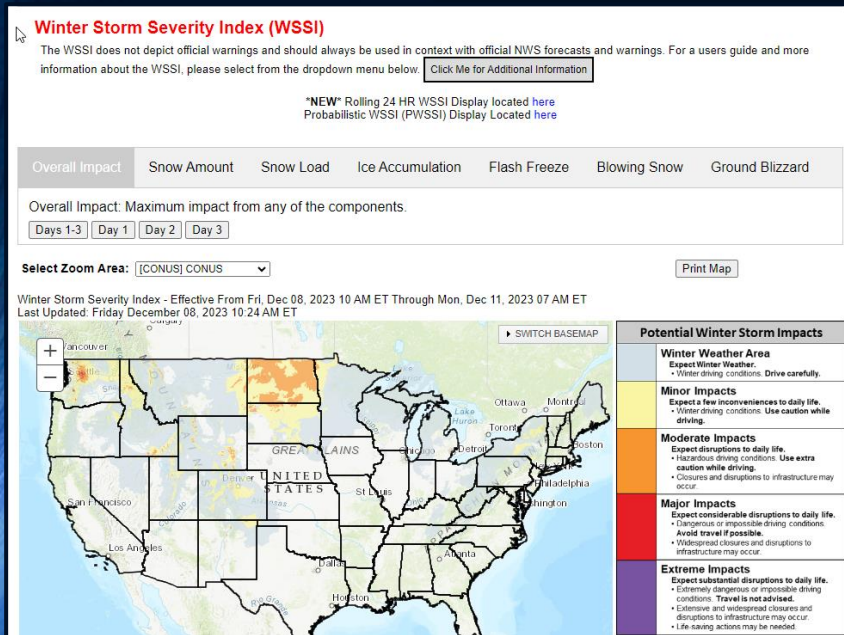
NWS Atlanta Integrated Warning Team / Partners Workshop
December 11, 2023



WSSI – Winter Storm Severity Index

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

What's the difference between 2" snow in Atlanta vs. 2" snow in the mountains of Wyoming?
WSSI designed to provide a more simplified reasoning behind this question.





WSSI – Winter Storm Severity Index

<https://www.wpc.ncep.noaa.gov/wwd/wssi/wssi.php?id=FFC>

Overall Impact

Snow Amount

Snow Load

Ice Accumulation

Flash Freeze

Blowing Snow

Ground Blizzard

Overall Impact: Maximum impact from any of the components.

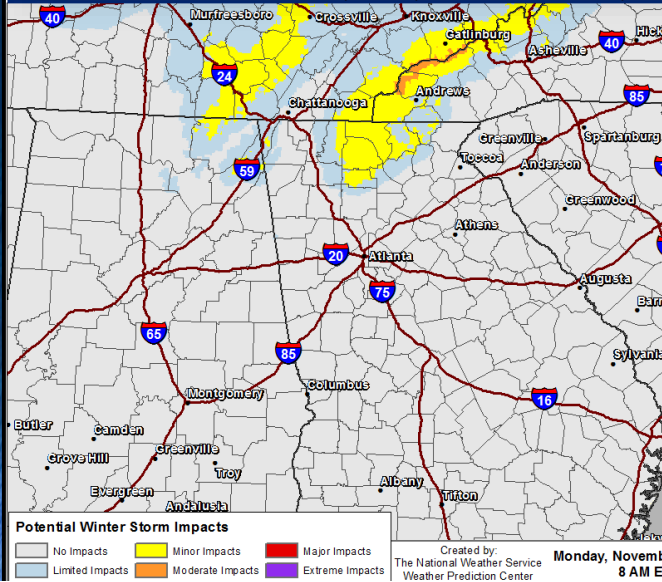
Days 1-3

Day 1

Day 2

Day 3

WSSI Snow Amount - Valid From Mon, Nov 30, 2020 08 AM ET To Tue, Dec



Potential Winter Storm Impacts

Winter Weather Area

Expect Winter Weather.

- Winter driving conditions. **Drive carefully.**

Minor Impacts

Expect a few inconveniences to daily life.

- Winter driving conditions. **Use caution while driving.**

Moderate Impacts

Expect disruptions to daily life.

- Hazardous driving conditions. **Use extra caution while driving.**
- Closures and disruptions to infrastructure may occur.

Major Impacts

Expect considerable disruptions to daily life.

- Dangerous or impossible driving conditions. **Avoid travel if possible.**
- Widespread closures and disruptions to infrastructure may occur.

Extreme Impacts

Expect substantial disruptions to daily life.

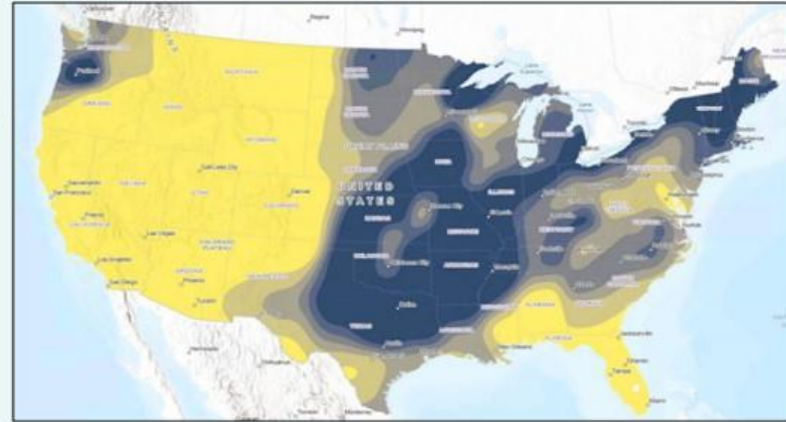
- Extremely dangerous or impossible driving conditions. **Travel is not advised.**
- Extensive and widespread closures and disruptions to infrastructure may occur.
- Life-saving actions may be needed.

- Identifies / rates 6 components
 - snow amount
 - snow load
 - ice accumulations
 - flash freeze
 - blowing snow
 - ground blizzard
- Graphics for each of the 6 components
- Helps create an all-inclusive **Winter Storm Severity Index**

What's the difference between 2" snow in Atlanta vs. 2" snow in the mountains of Wyoming?
WSSI designed to provide a more simplified reasoning behind this question.

WSSI - UPDATES THIS YEAR

- Non Meteorological Factors
 - Enhanced datasets for
 - Snow & ice load and regional hardness data
 - Vegetation Index (dense vegetation for snow load component)
 - Coniferous Forest Density (eliminates non-realistic discontinuities)
 - Land Use resolution increase/smoothing (eliminates non-realistic discontinuities)
 - Updated algorithm for duration of impacts (blowing snow and ground blizzard)
- Flash Freeze and Ground Blizzard extended out to 72 hours
- Ice Accumulation Improvements
 - Updated ice & wind methodology
 - Integrated an ice climatology to introduce regionalization
 - Impact level threshold changes (Minor/Moderate → Transportation, Major/Extreme → Power Outages/Disruptions)
- Flash Freeze
 - Account for refreezing from snow melt



Ice Amount Factoring





NWS Atlanta -- North & Central GA Integrated Warning Team Meeting

SPS – Winter Product (review)

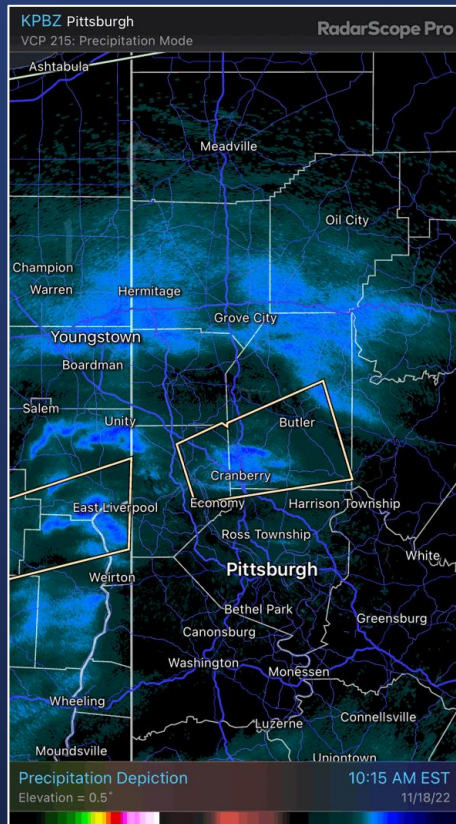


Why use the SPS for winter weather?

- **Fill the information gap between Watch or Warning issuance and when the winter conditions begin**
- **Give details on when precipitation is expected to begin and end**
- **Message potentially impactful events that do not meet Warning or Advisory criteria**
- **Give details on precipitation types and expected changeovers, accumulations, and calls-to-action**
- **Provide rumor control**



Case from NWS Pittsburgh



11:07

Near KPBB

Special Weather Statement 22m
Pennsylvania
Allegheny, Beaver & Butler

...A SNOW SHOWER WILL AFFECT NORTHEASTERN BEAVER...SOUTHERN BUTLER AND NORTH CENTRAL ALLEGHENY COUNTIES... At 1102 AM EST, a snow shower was located near Rochester, or near Monaca, moving east at 40 mph. Locations impacted include... Cranberry, Butler, Aliquippa, Beaver Falls, Monaca, Economy, Homeacre-Lyndora, New Brighton, Shanor-Northvue, Beaver, Baden, and Meridian. This includes the following highways... Pennsylvania Turnpike between mile markers 14 and 31. Interstate 79 in Pennsylvania between mile markers 77 and 93. Visibilities will drop quickly to less than a half mile in this snow shower, and a quick accumulation of one-half to one inch of snow is possible, including on roads. Conditions can deteriorate rapidly in winter weather situations. Be prepared for snow or ice covered roads. Slow down and allow extra time when traveling.

Done

SPS basis: Heavy snow shower

- **Speed & direction** of “hazard”
- **Locations impacted** (current + future)

Hazards / Impacts:

- **Visibilities**
- **Expected accumulations**
- **Weather hazard** (reiterate)
- **Safety statement(s)**



Example 2: Wintry precip above a certain elevation*

...A WINTRY MIX WILL AFFECT CENTRAL TOWNS...NORTHERN LUMPKIN...
SOUTHEASTERN GILMER...NORTHWESTERN WHITE...NORTHWESTERN
DAWSON... NORTHEASTERN PICKENS...CENTRAL UNION AND SOUTHEASTERN
FANNIN COUNTIES...

SPS basis: wintry mix

At 206 PM EST, an area of mixed precipitation including snow, sleet and
freezing rain was located across the **higher elevations of Northern Georgia**.
Light wintry accumulations are possible.

Timing / Precip type /
General Location

Impacts from this wintry mix will be confined to elevations above
approximately 2000 feet.

Elevations to be impacted

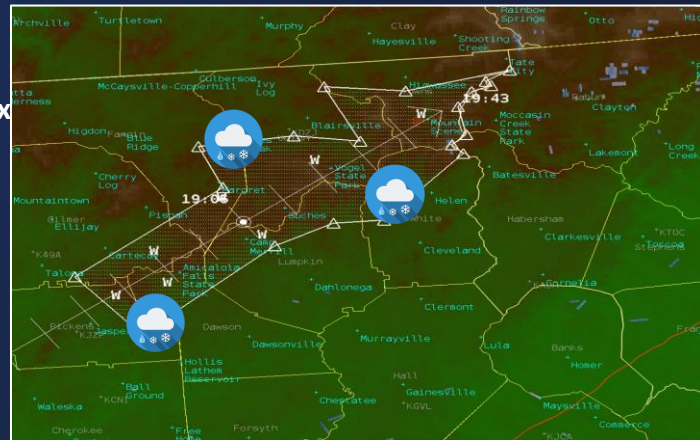
Locations impacted include...

Young Harris, Suches, Amicalola Falls State Park, Sequoyah Lake, Blue
Mountain Shelter, Woods Hole Shelter, Low Gap Shelter, Fausett Lake,
Len Foote Hike Inn, Vogel State Park, Anna Ruby Falls...

Locations to be impacted

Although this event is expected to be short lived, if conditions
worsen, a **Winter Weather Advisory may become necessary**. Please
monitor local media outlets and the National Weather Service for
further statements.

Safety/Prep information



***In this situation, the polygon
was drawn to include only the
portions of the counties at or
above 2000 feet**



Example 3: Supplementing a Warning*

...WINTER PRECIPITATION WILL AFFECT NORTH CENTRAL ROCKDALE...
BARROW...DEKALB...FORSYTH...GWINNETT...BANKS...NORTHWESTERN WALTON...
SOUTHEASTERN DAWSON...HALL...JACKSON...NORTHEASTERN FULTON AND WEST
CENTRAL MADISON COUNTIES...

A mix of winter precipitation is expected to begin by 4 PM across these counties.
Precipitation may begin as a mix of rain, sleet, and snow before transitioning
to all snow by evening as colder air filters in from the northeast.

Locations impacted include...

Gainesville, Lawrenceville, Decatur, Winder, Jefferson, Commerce,
Cumming, Homer, Peachtree Corners, Sandy Springs, Roswell, Johns
Creek, Alpharetta, Dunwoody, Milton, Duluth, Sugar Hill, Snellville,
Suwanee and Buford.

**A Winter Storm Warning is in effect for the area. Please monitor
local media outlets and the National Weather Service for further
statements.**

Icy roads are possible as the snow melts on the roads then quickly
refreezes.

Conditions can deteriorate rapidly in winter weather situations. Be
prepared for snow or ice covered roads. Slow down and allow extra
time when traveling.

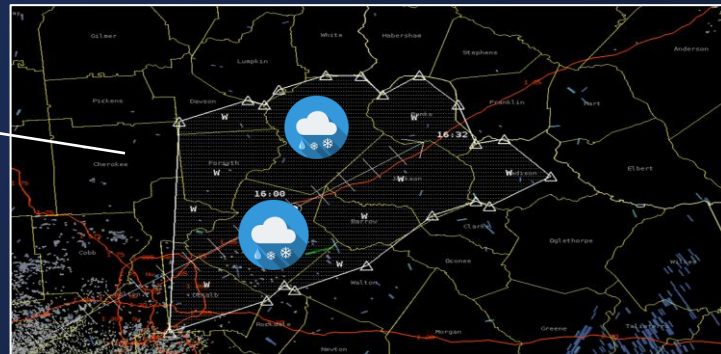
- Timing
- Precip type

Locations to be impacted

**Mention of Winter Storm
Warning in effect!**

- Potential Impacts
- Safety/Prep actions

SPS covering classic “wedge area”



*** In this situation, a Warning is already in effect, so this product is intended to provide updated information to the public**



The Winter SPS is not just for precipitation!

- Freezing fog
 - Flash freeze
 - Black ice
- } Little to no accumulation involved, but can have major impacts on travel and thus require special messaging

Planned, future additions include:

- Bulleted, standardized format
- Updated call-to-action options
- Additional information options for the forecaster to choose from



NWS Atlanta -- North & Central GA Integrated Warning Team Meeting

NWS Product Definitions / Criteria



NWS Atlanta (Winter Weather) Forecast “Guide”

Winter Weather Forecast Funnel

Start DSS/Outlook

- **Low Predictability (Confidence <30%)**
- Details very uncertain but start raising awareness for potential high impact event
- Starting partner emails is recommended, especially if the potential is gaining attention.
- Graphics show large area of possible impacts/broad wording.
- Main forcing mechanism = synoptic, ~4-7 days in advance.
- Main forcing mechanism = mesoscale, ~2-5 days in advance.

Increase DSS/Continue Outlook

- **Medium Predictability (Confidence 30-50%)**
- Use probability graphics. WPC WWD graphics may not apply locally at our 2" threshold; consider creating graphics using ensembles/meteograms or draw graphics highlighting potential areas vs. actual amounts.
- Synoptic = ~3-4 days in advance. Mesoscale = 1-3 days in advance.
- Continue email updates to partners / consider “special” webinar (as needed)
- **SPS issuance** (i.e Winter Outlook) suggested for potential high-impact event

- **4-7 Days out** from a “potential” winter event

- Attempt to control the message(s)
- Raise awareness but emphasize the enormous uncertainty in the forecast

- **2-4 days out...**

- Begin showing graphics (i.e. areas of concern, range of possibilities, etc.)
- Winter Outlook (SPS) may be issued
- Email Updates / Special Webinar?



NWS Atlanta (Winter Weather) Forecast “Guide”

Watch

- **High Predictability (Confidence 50-80%)**
- Based on situation: use range-based accumulation or combo of probability of exceedance, potential, range-based accumulation.
- Synoptic = ~1-3 days in advance. Mesoscale = ~1-2 days in advance
- Continue email updates and/or “special webinars to partners
- **Watch issuance** recommended if “warning” criteria expected to be met and/or widespread significant impacts expected

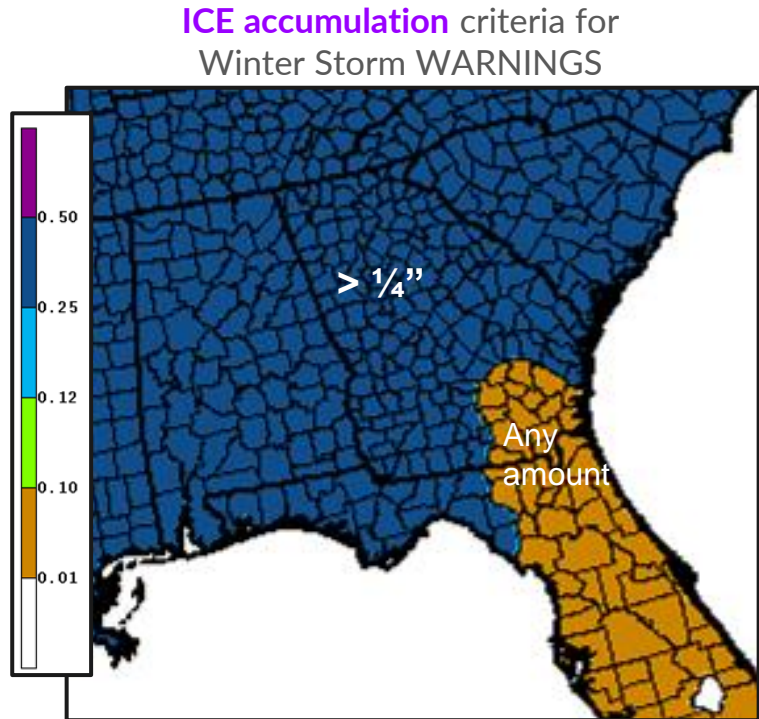
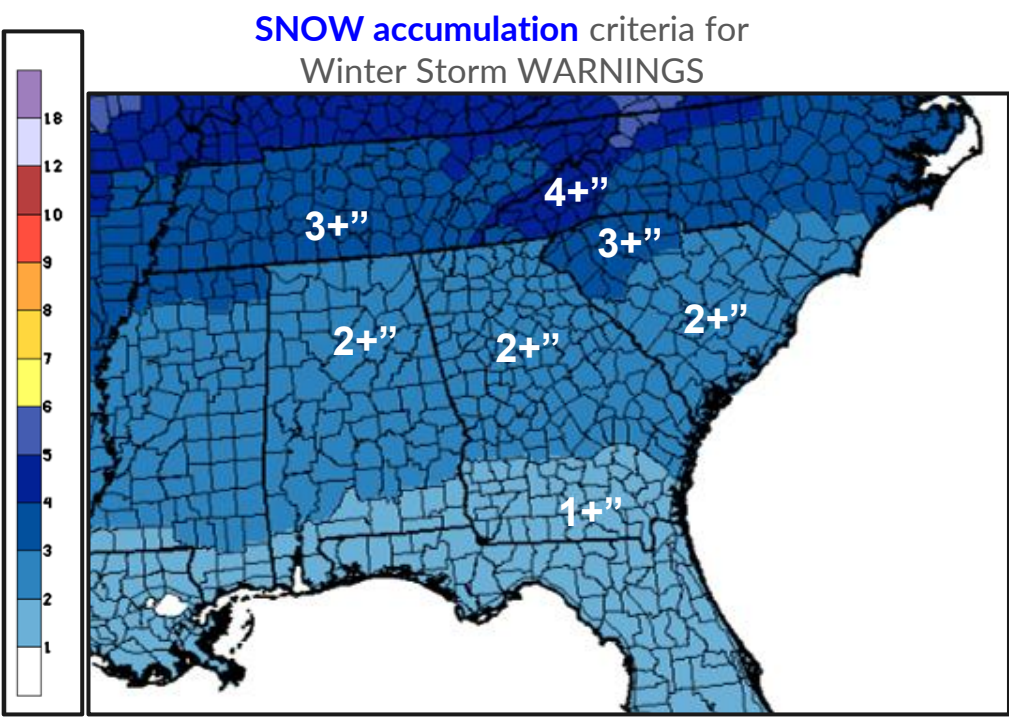
Warning

- **Very High Predictability (>80%)**
- Use precip range accumulation graphic.
- Synoptic = ~1-2 days in advance.
- Mesoscale ≤1 day before event
- **Warning issuance** if criteria met and/or widespread significant impacts expected OR
- **Advisory issuance** if warranted.

- During Watch and/or Warning phase, consider use of **SPS (Significant Weather Advisory)** for onset/end time, p-type changes, brief snow “bursts” (i.e. up to 1” < 30 minutes), and/or any other notable hazard information

- **Within 48 hours** from a “potential” winter event
 - Fine-tune graphics (introduce timing, snow/ice accumulations)
 - A Winter Storm WATCH may be needed
 - Special Webinars + Email Updates
- **Within 24 hours...**
 - Continue to fine-tune & update graphics (messaging)
 - Special Webinars / Slack Updates
 - Winter Storm WARNING?

Snow / Ice - Winter Storm Warning Criteria (Regional WFOs)





Impacts Play a Role!

34°

3" of Snow



28°

1/2" of Snow

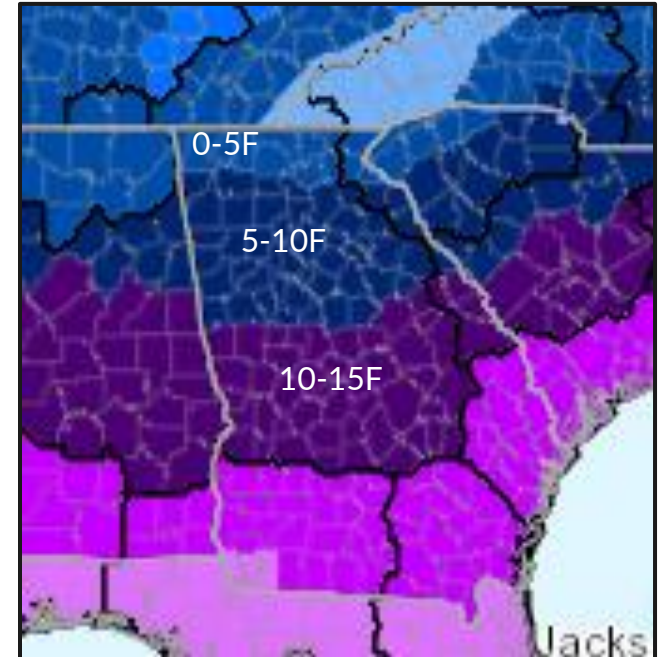


Looking ahead... 2024-25 Cold Weather Product Changes

Next Winter (2024-25) will likely start the NWS Consolidation for Extreme Cold, Freeze, and Wind Chill Products. Go [here](#) for more details:



New thresholds for
“Cold Weather Advisory”
includes Wind Chill values



An **“Extreme Cold Warning”** would be issued if either wind chill values OR actual air temperatures get
< 0F (north)
< 5F (central including metro)
< 10F (southern counties)



Thank you!

NWS Atlanta Integrated Warning Team / Partners Workshop
December 11, 2023