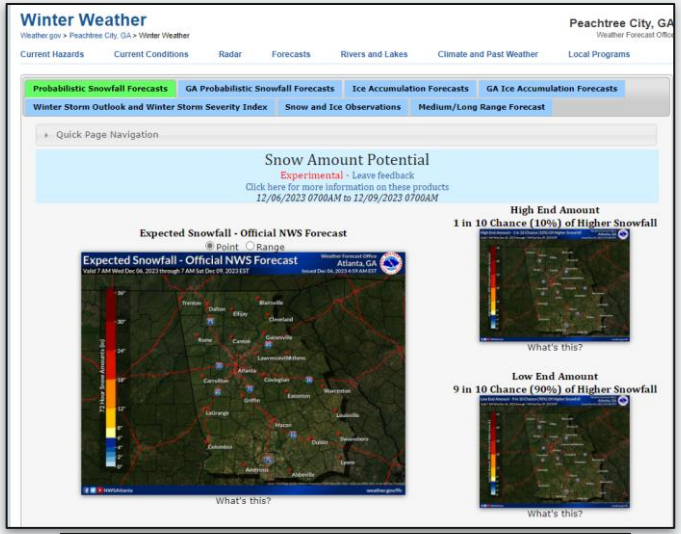
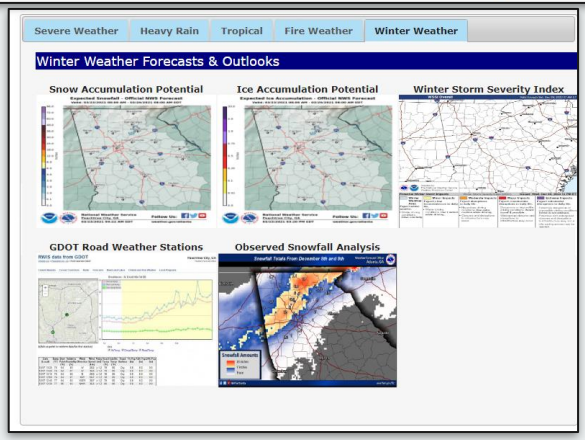
NWS Atlanta Winter Weather Page(s)

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 (≥)…
  - 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

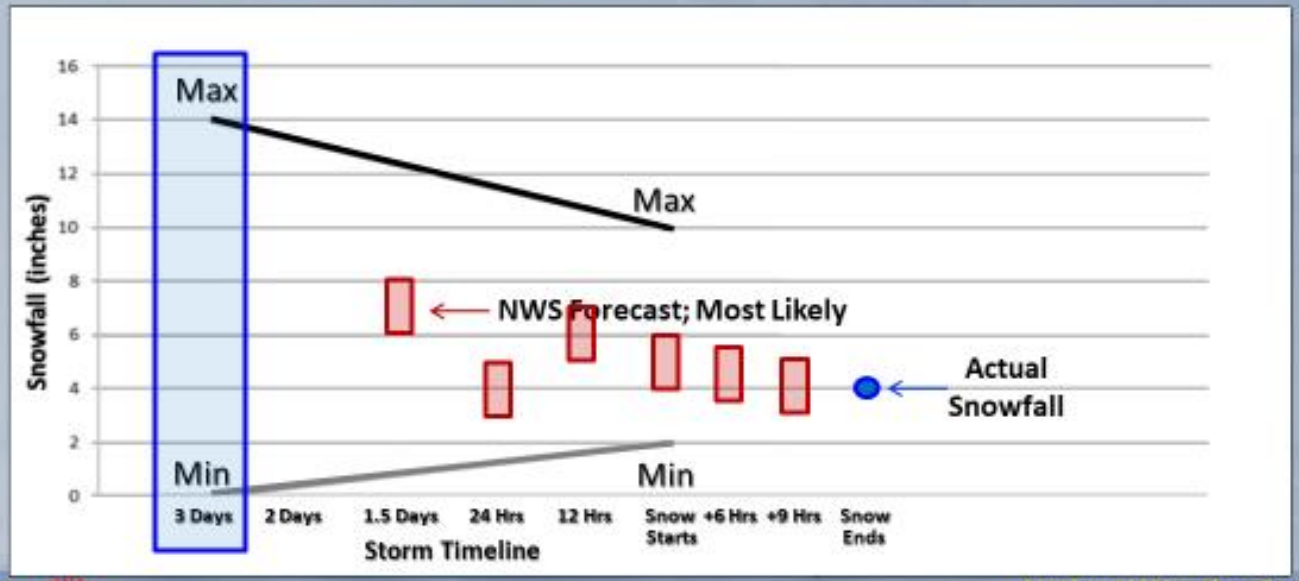
County: Coweta, GA

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

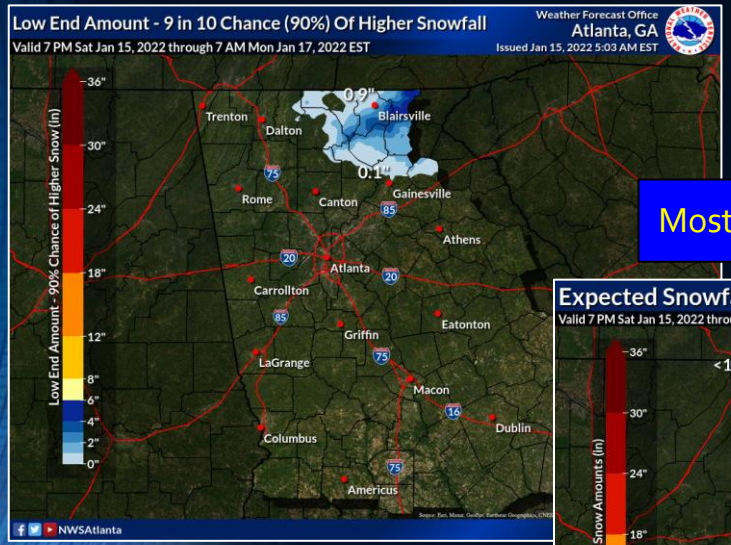
- As Storm Nears…
  - Range of Possibilities Shrinks
  - Confidence Increases
- NWS Forecast Between Max/Min



Case 1: Probabilistic Snow Forecast

www.weather.gov/ffc/winter

Expect At Least This Much



Most Likely Forecast (NWS)

Potential For This Much

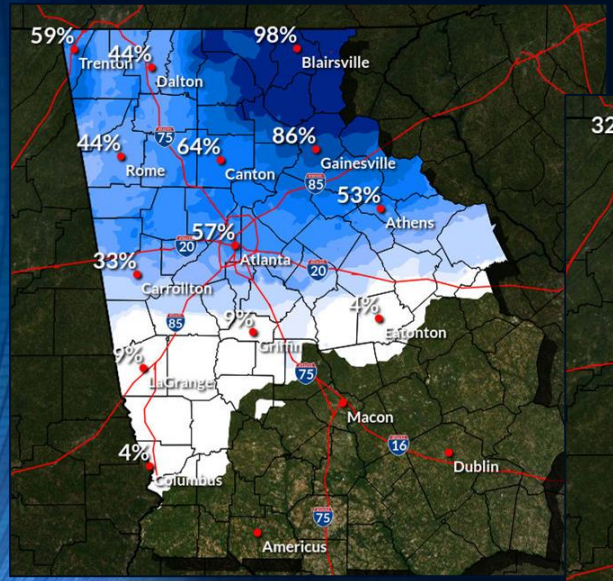
Case 1: Probabilistic Snow Forecast

www.weather.gov/ffc/winter

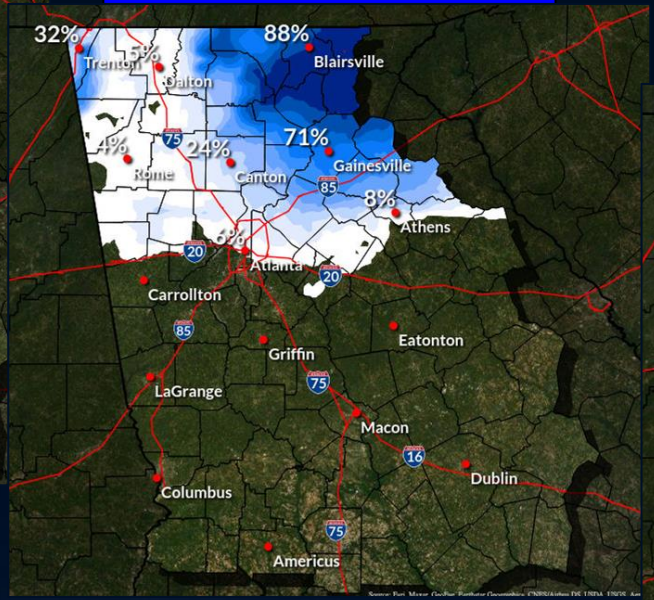
Location Example (Canton GA):

- Chance of ≥ 0.1” = 64%
- Chance of ≥ 1” = 24%
- Chance of ≥ 2” = 2%

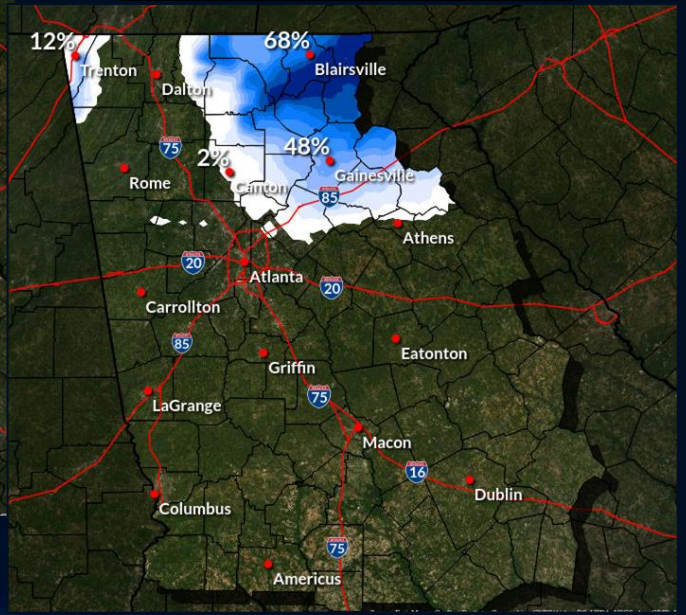
Chance of seeing ≥ 0.1”



Chance of seeing ≥ 1”



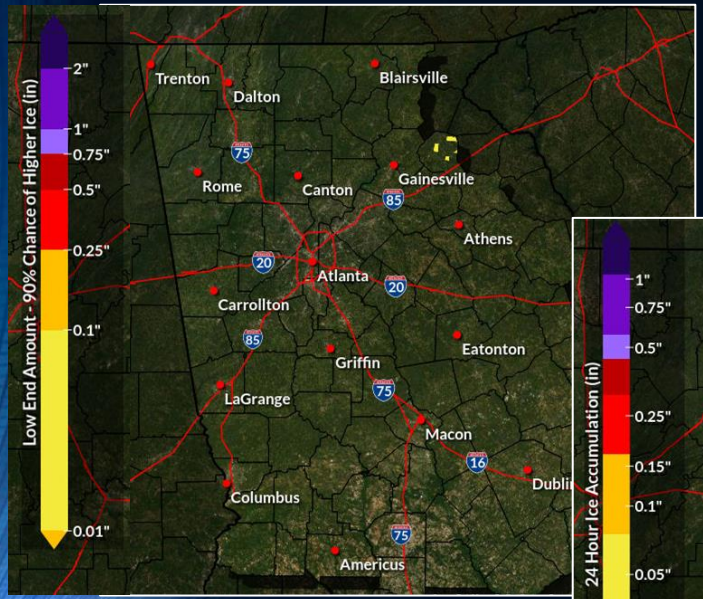
Chance of seeing ≥ 2”



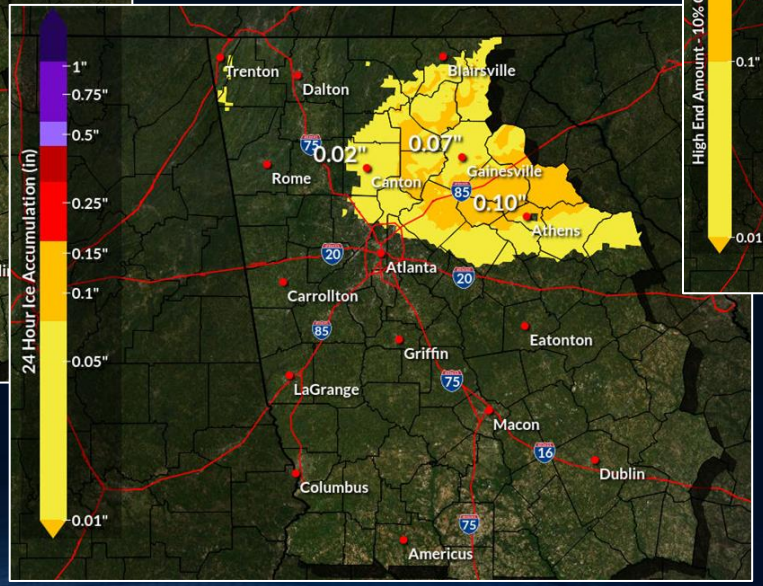
Case 2: Probabilistic Ice Forecast

www.weather.gov/ffc/winter

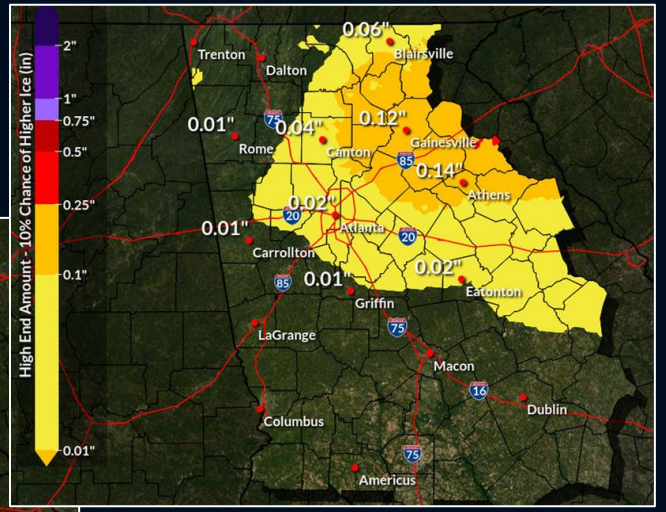
Expect At Least This Much



Most Likely Forecast (NWS)



Potential For This Much



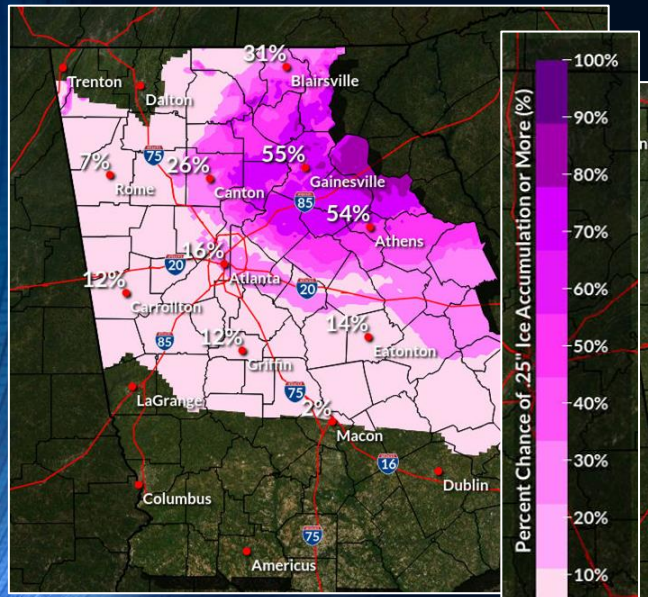
Case 2: Probabilistic Ice Forecast

www.weather.gov/ffc/winter

Location Example (Gainesville GA):

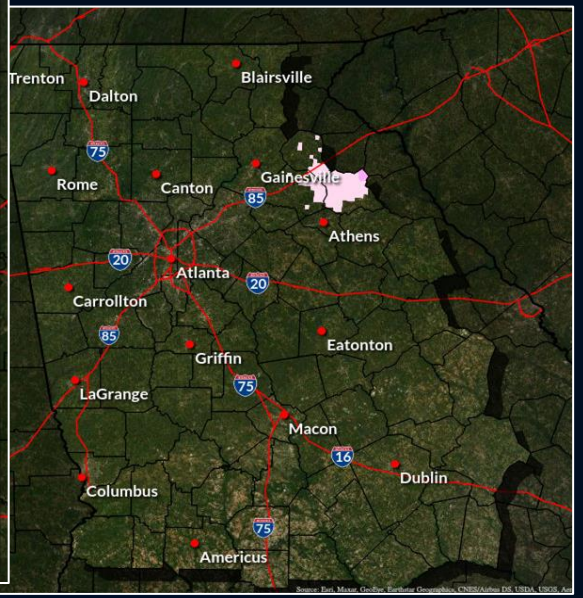
- Chance of ≥ 0.01” = 55%
- Chance of ≥ 1” = 19%
- Chance of ≥ 2” = 0%

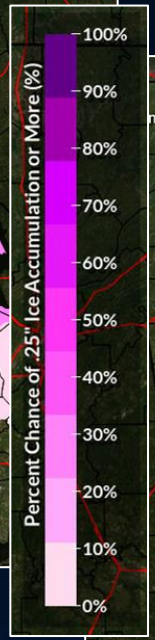
Chance of seeing ≥ 0.01”

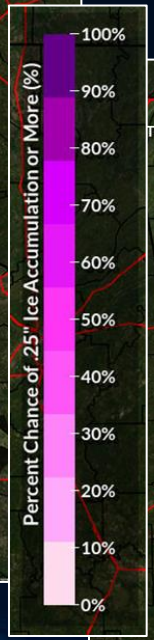


Chance of seeing ≥ 0.1”

Chance of seeing ≥ 0.25”







Locality Tables (for SNOW only)!

Choose your location
(county list of towns/cities)

County: Selected

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"	>=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											0%
Decatur, GA											0%
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

0%

No

0%

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

0%

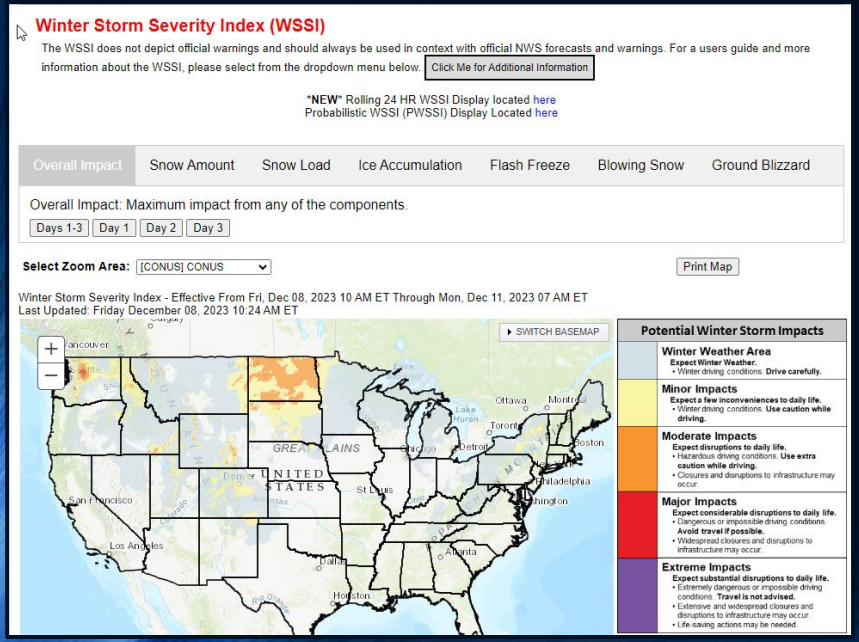
Other Winter Weather Tools & Resources + NWS Winter Products

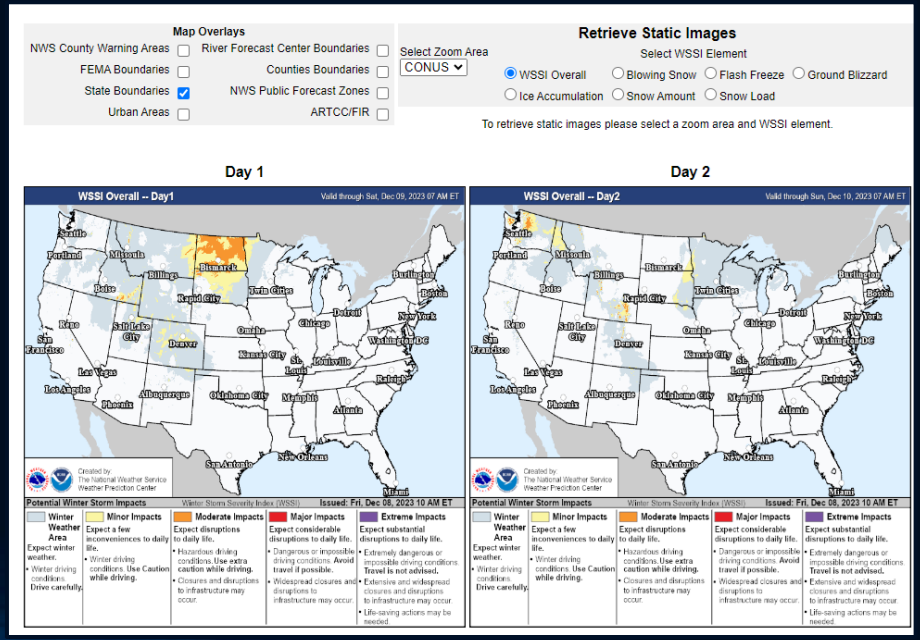
NWS Atlanta Integrated Warning Team / Partners Workshop
December 11, 2023

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.





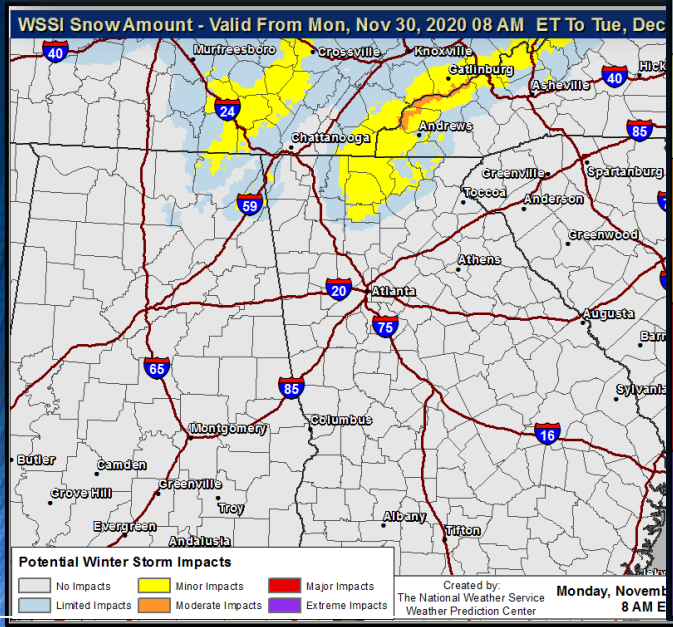
WSSI – Winter Storm Severity Index

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



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.

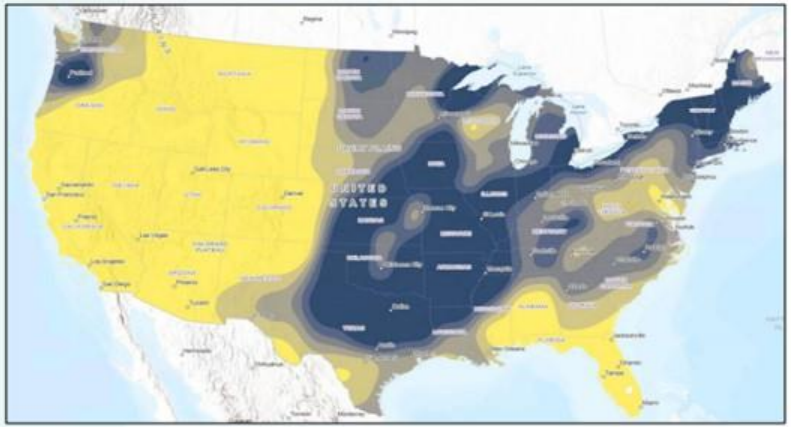
Extreme Impacts
Expect substantial disruptions to daily life.
- Extremely dangerous or impossible driving conditions. **Travel is not advised.**
- Extensive and widespread closures and disruptions to infrastructure may occur.
- Life-saving actions may be needed.

- 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 hardiness 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

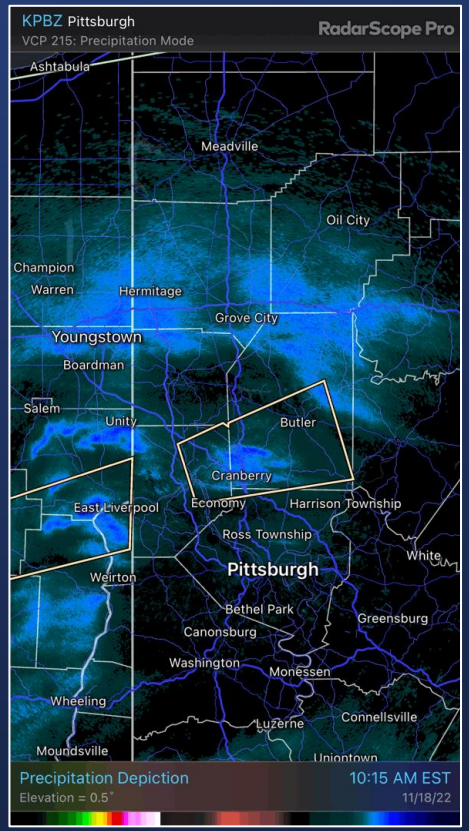
NWS Atlanta -- North & Central GA Integrated Warning Team Meeting

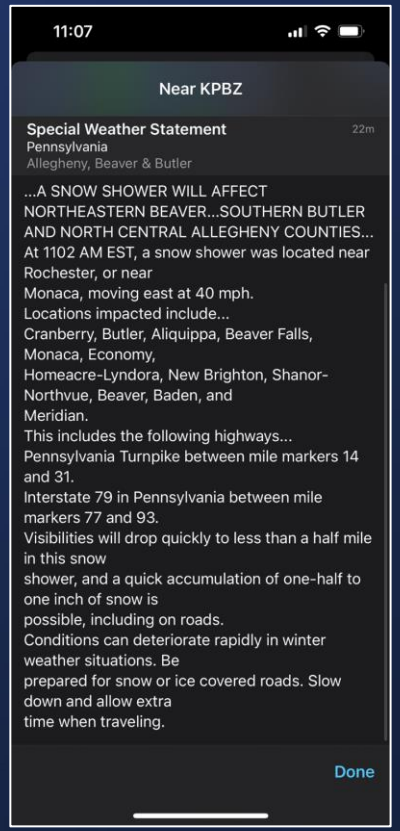
SPS – Winter Product (review)

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





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.

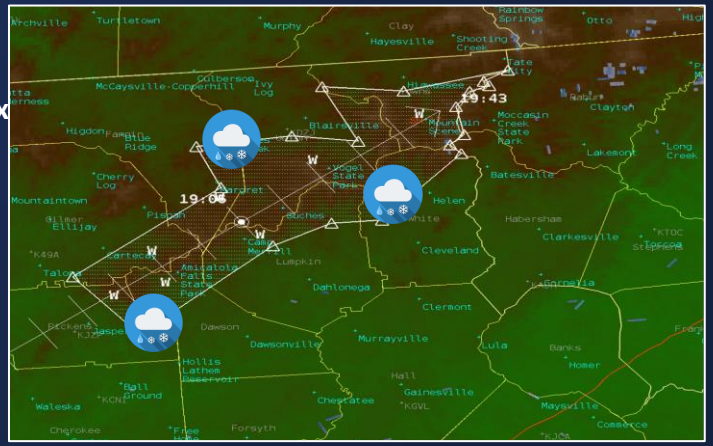
Elevations to be impacted

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.

- **Timing**
- **Precip type**

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.

Locations to be impacted

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

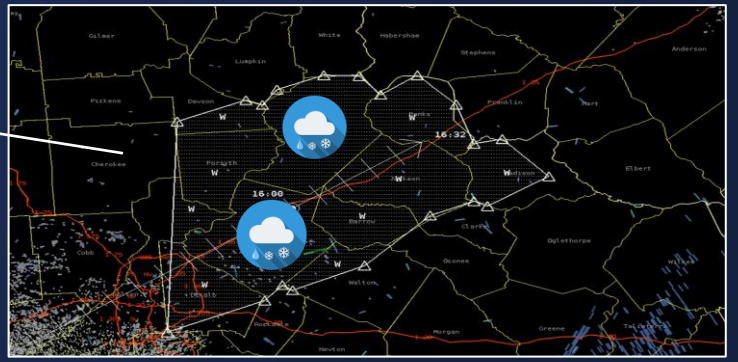
Mention of Winter Storm Warning in effect!

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.

- **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

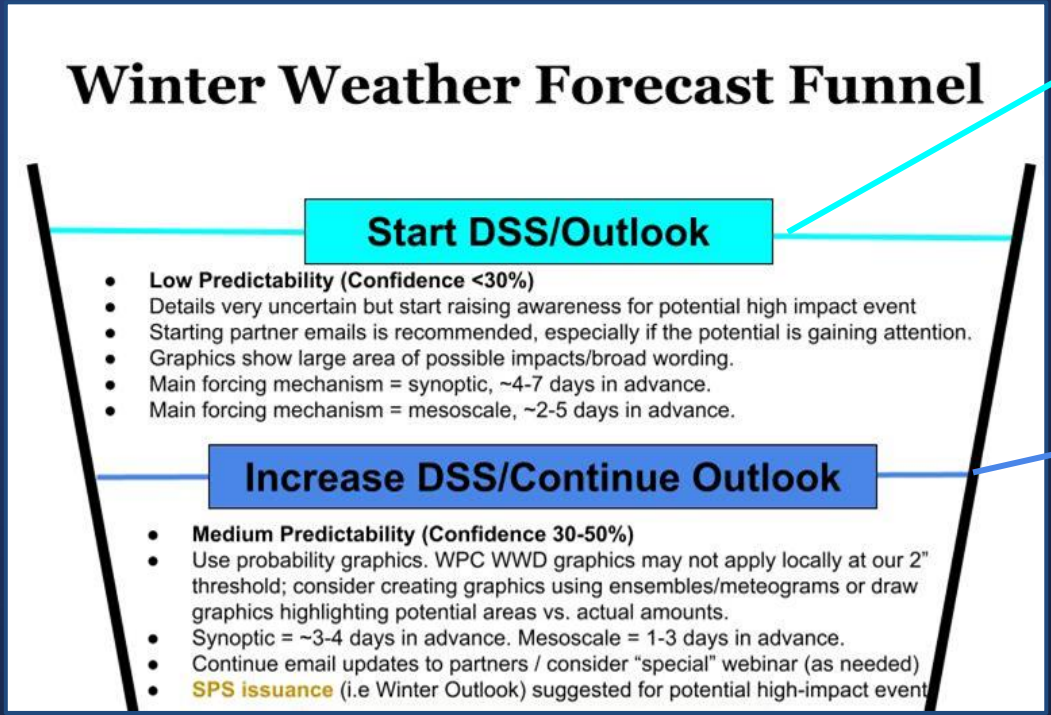
Planned, future additions include:

- 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

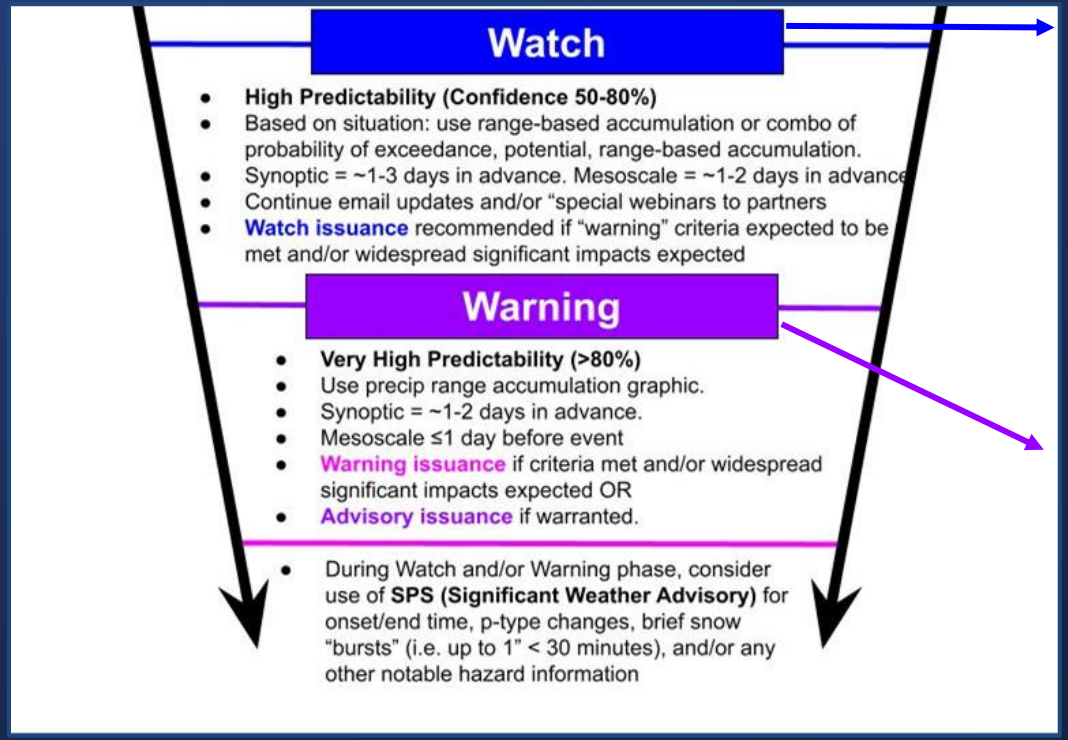
NWS Product Definitions / Criteria

NWS Atlanta (Winter Weather) Forecast "Guide"



- 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?

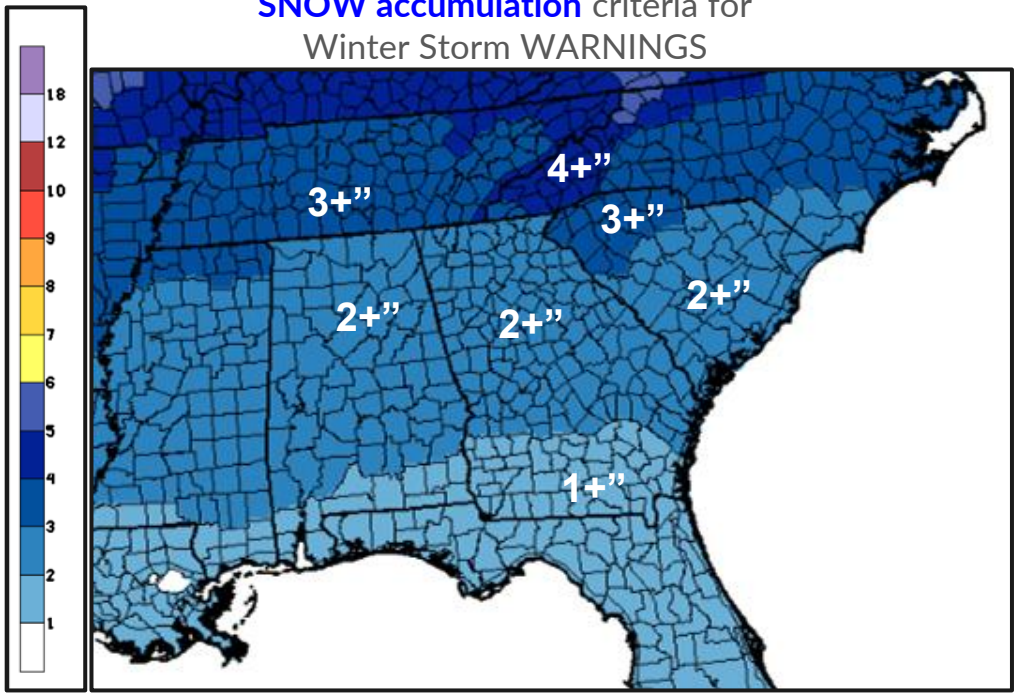
NWS Atlanta (Winter Weather) Forecast "Guide"



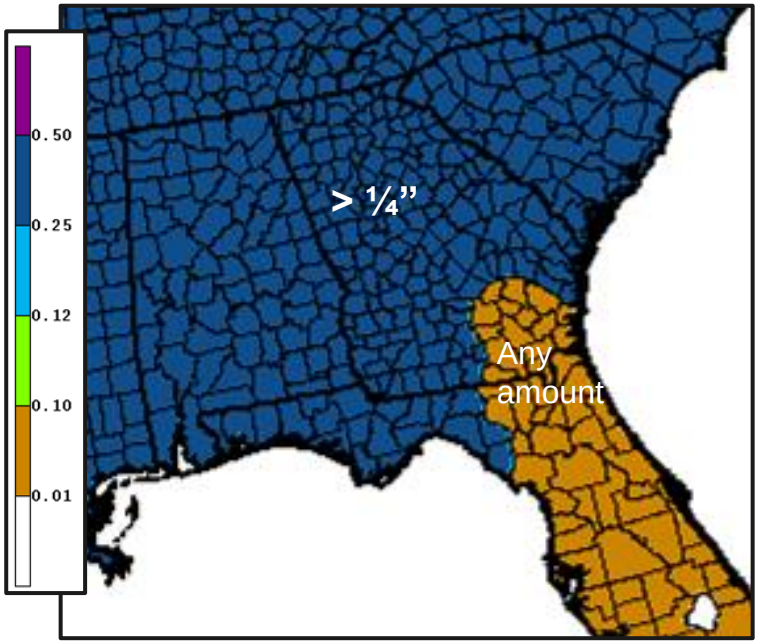
- Within 48 hours from a "potential" winter event
  - Fine-tune graphics (introduce timing, snow/ice accumulations)
  - A Winter Storm WATCH may be needed
  - Special Webinars + Email Updates
- Within 24 hours…
  - Continue to fine-tune & update graphics (messaging)
  - Special Webinars / Slack Updates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

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

SNOW accumulation criteria for Winter Storm WARNINGS



ICE accumulation criteria for Winter Storm WARNINGS



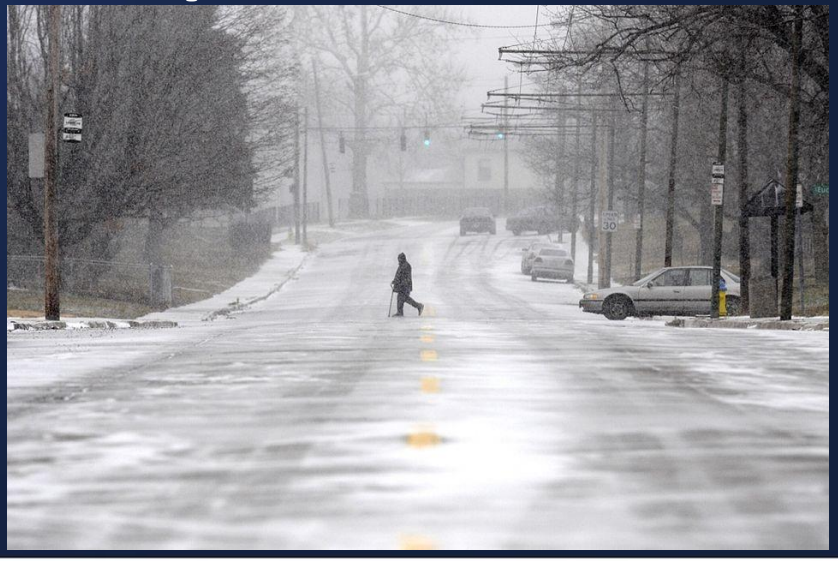
Impacts Play a Role!

34º

3” of Snow

28º

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:

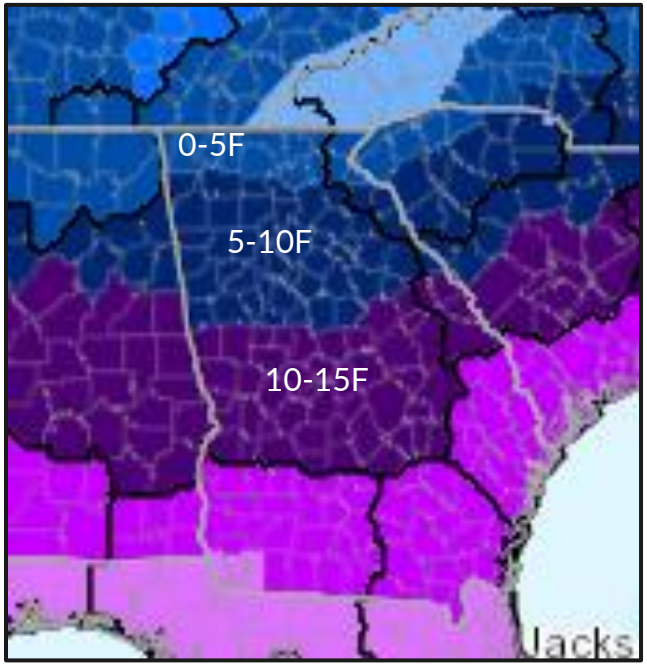
An **"Extreme Cold Warning"** would be issued if either wind chill values OR actual air temperatures get

< 0F (north)

< 5F (central including metro)

< 10F (southern counties)

New thresholds for
"Cold Weather Advisory"
includes Wind Chill values



Thank you!

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