

The SPIA Index™

*A collaborative project between a local
NWS-WFO & a private individual -
for the public good!*

Developed by **Sid Sperry,**

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Oklahoma Association of Electric Cooperatives, Oklahoma City, OK

President & CEO, SPIDI Weather Solutions

&

Steven Piltz,

Meteorologist In Charge (MIC)

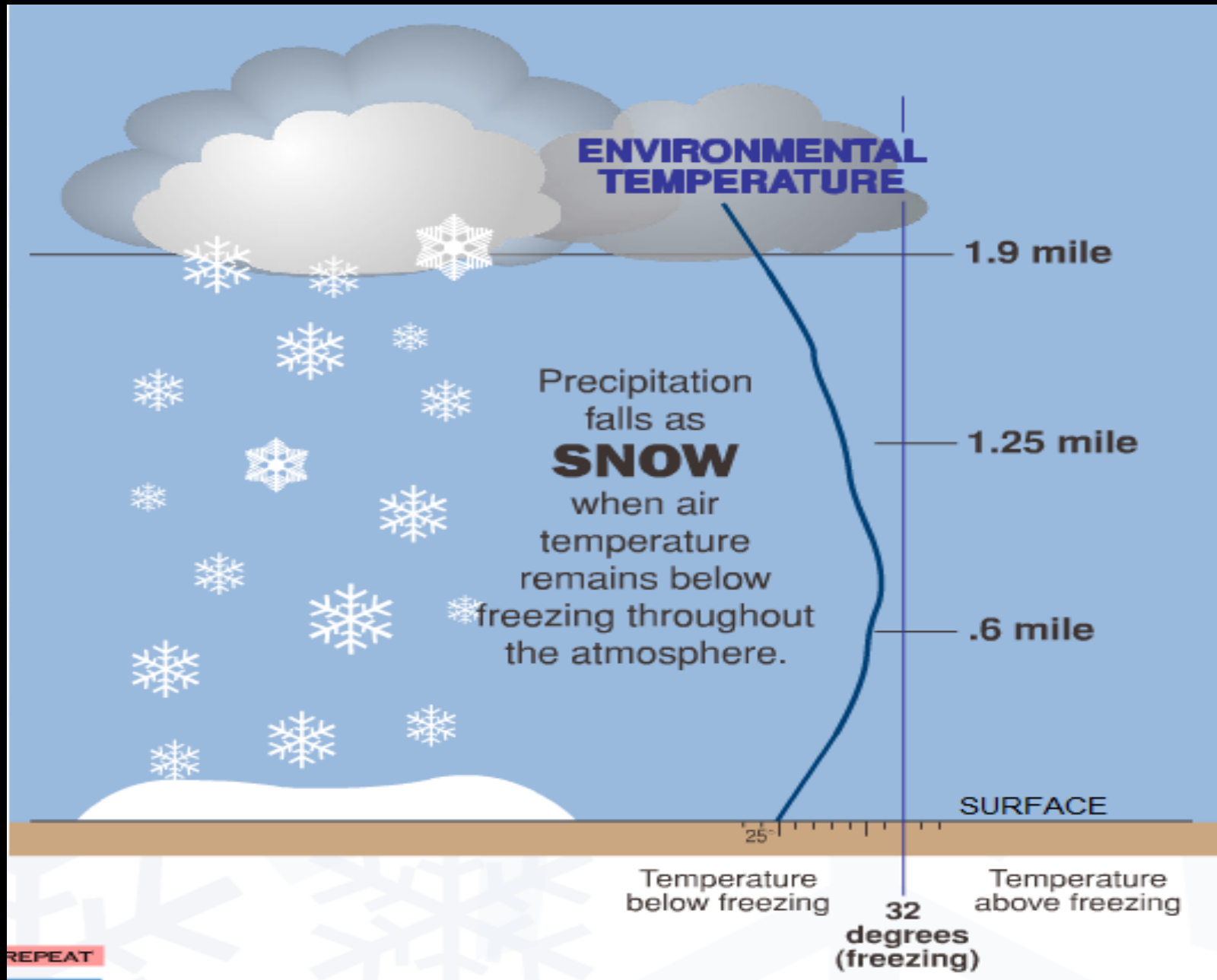
National Weather Service Forecast Office (WFO), Tulsa, OK

“Sperry-Piltz Ice Accumulation Index®” or “SPIA Index™”

Forecasting Winter Weather
Precipitation Types Can be
DIFFICULT!

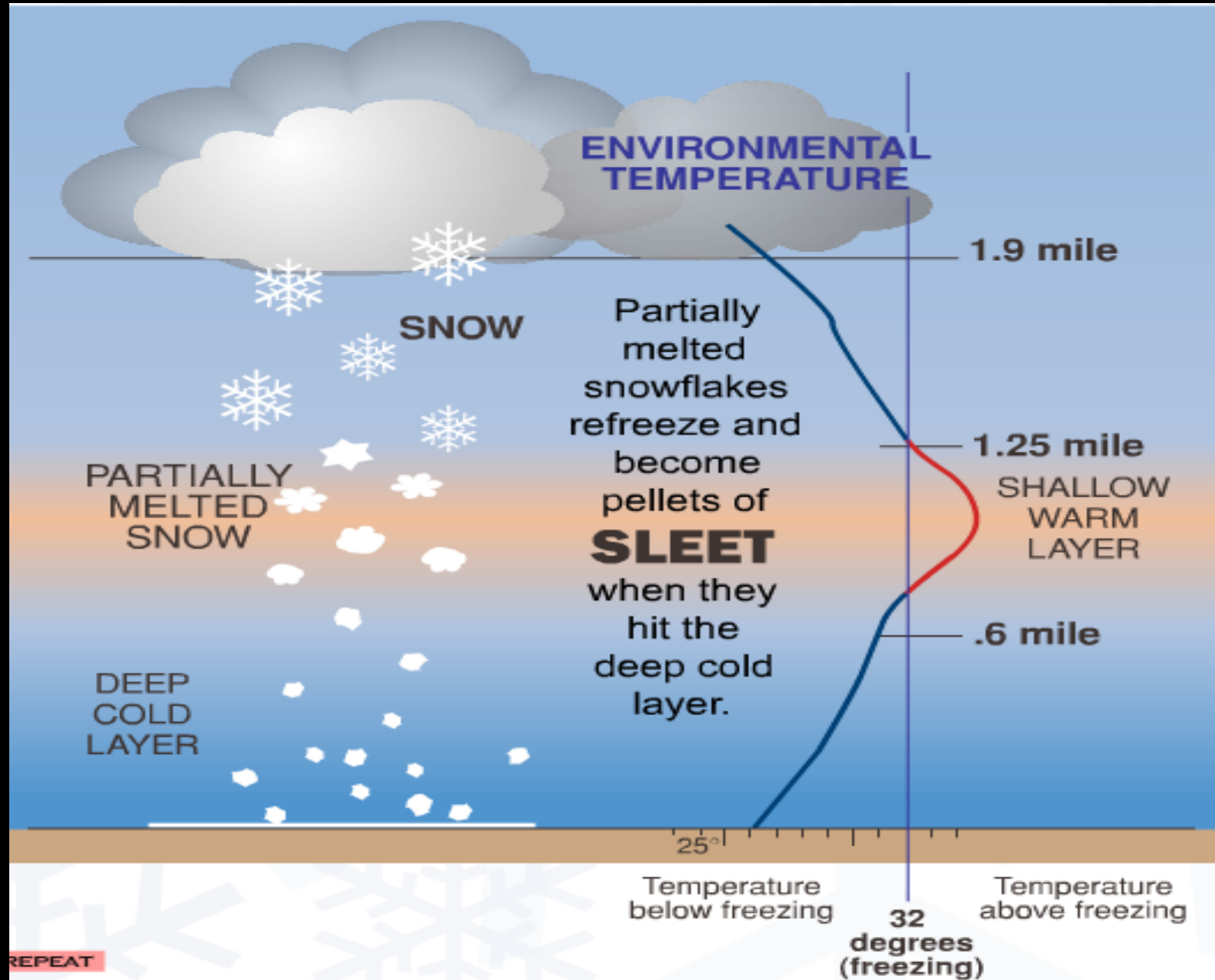


Snow



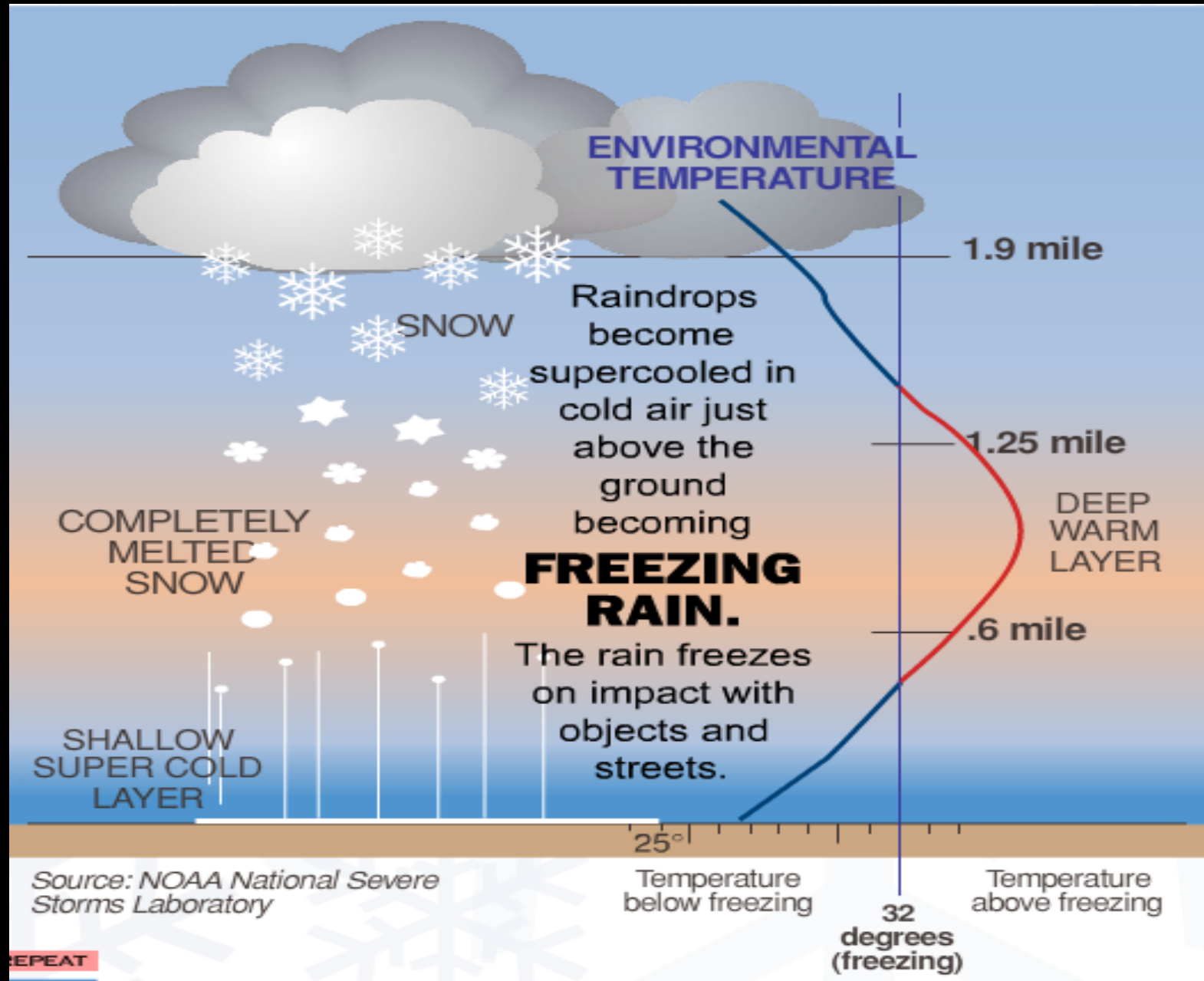
Graphics Source:
NOAA National
Severe Storms
Laboratory

Sleet



Graphics Source:
NOAA National
Severe Storms
Laboratory

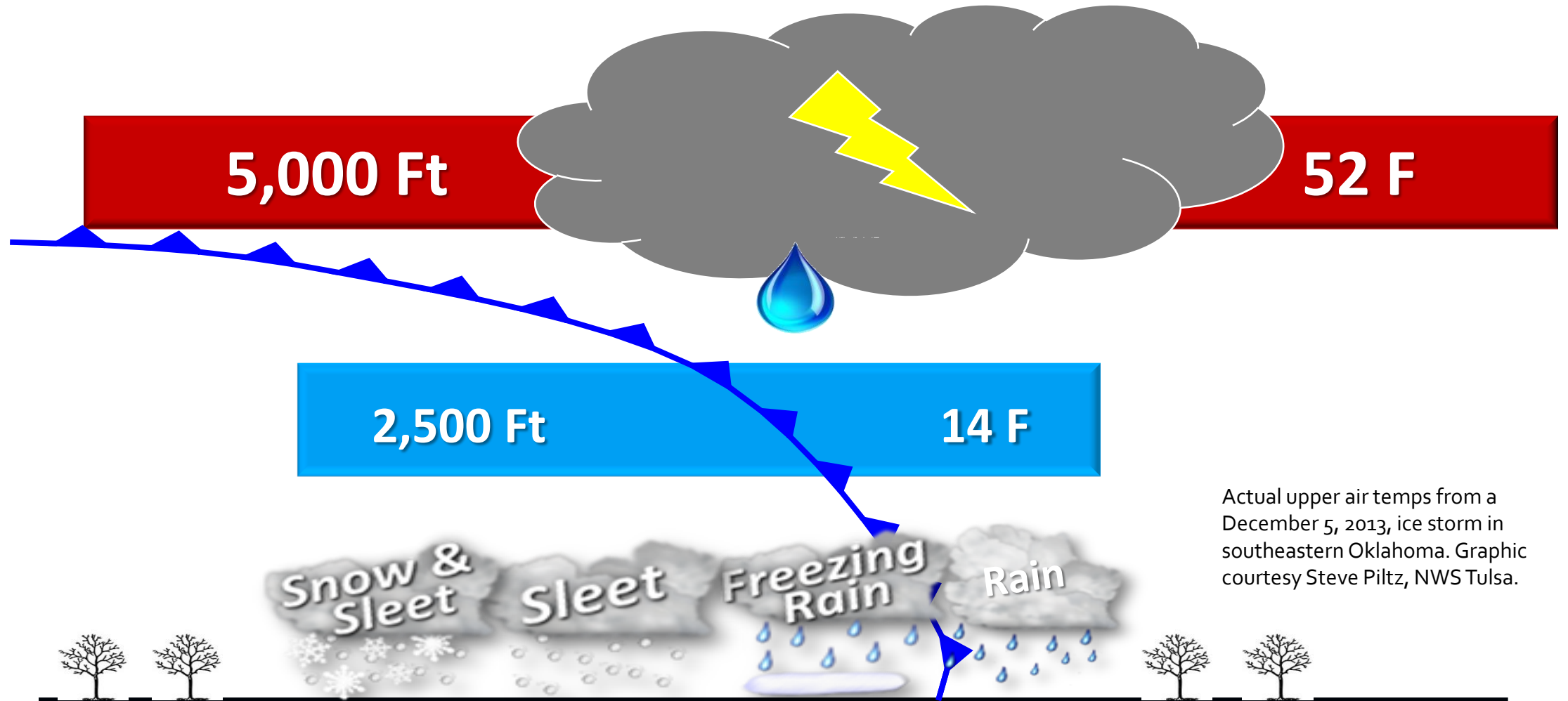
Freezing Rain



Graphics Source:
NOAA National
Severe Storms
Laboratory

10,000 Ft

32 F



Actual upper air temps from a December 5, 2013, ice storm in southeastern Oklahoma. Graphic courtesy Steve Piltz, NWS Tulsa.

Upper air temperatures are critical to winter weather forecasting. How are they obtained?

Different kinds of 'extreme' weather events are now becoming much more common. *Preparedness is key.*

January, 2002 Ice Storm:
Cimarron Electric Co-op, Kingfisher, OK



February, 2013 Snow/Ice Storm:
Cimarron Electric Co-op, Kingfisher, OK



What is the 'Sperry-Piltz Ice Accumulation Index[©]' or SPIA IndexTM?

- The **SPIA IndexTM** was conceived in late December, 2006, following back-to-back ice storms in the OK panhandle.
- The **SPIA IndexTM** is a forward-looking ice accumulation & ice damage prediction index that uses an algorithm of researched parameters that, when combined with NWS forecast data (NDFD), predicts the projected footprint, total ice accumulation, and the resulting potential damage from approaching ice storms.
- It is a *decision-support tool* to be used for *risk management* and/or winter-weather *preparedness* by numerous entities.



What is the 'Sperry-Piltz Ice Accumulation Index[©]' or SPIA IndexTM?

- The **SPIA IndexTM** is to ice storms what the *Enhanced Fujita Scale* is to tornadoes and what the *Saffir-Simpson Scale* is to hurricanes; unlike the Fujita Scale, the **SPIA IndexTM** measures an ice storm and its impact *before* the event.
- Prior to its creation, no such ice-impact scale existed for gauging potential damage *before* a freezing rain event occurred.
- The **SPIA IndexTM** is now listed as a NWS 'experimental product' and is being tested by 11 NWS WFOs with CWAs in parts of **9** states: **AR, GA, IL, KY, LA, MO, OK, TN** and **TX**. (CRH & SRH regions)



Where can I find it on the Web?



www.spia-index.com

The Sperry-Piltz Ice Accumulation Index, or “SPIA Index” – Copyright, February, 2009

ICE DAMAGE INDEX	* AVERAGE NWS ICE AMOUNT (in inches) <small>*Revised-October, 2011</small>	WIND (mph)	DAMAGE AND IMPACT DESCRIPTIONS
0	< 0.25	< 15	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	0.10 – 0.25	15 - 25	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
	0.25 – 0.50	< 15	
2	0.10 – 0.25	25 - 35	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
	0.25 – 0.50	15 - 25	
	0.50 – 0.75	< 15	
3	0.10 – 0.25	> = 35	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
	0.25 – 0.50	25 - 35	
	0.50 – 0.75	15 - 25	
	0.75 – 1.00	< 15	
4	0.25 – 0.50	> = 35	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
	0.50 – 0.75	25 - 35	
	0.75 – 1.00	15 - 25	
	1.00 – 1.50	< 15	
5	0.50 – 0.75	> = 35	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.
	0.75 – 1.00	> = 25	
	1.00 – 1.50	> = 15	
	> 1.50	Any	

(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

Weather Conditions and SPIA Index Levels at a Glance:

Ice and Wind: <small>* Average NWS Ice in Inches; Wind in MPH.</small>	< 15 mph	15-25 mph	25-35 mph	> = 35 mph
0.10 – 0.25 inches	0	1	2	3
0.25 – 0.50 inches	1	2	3	4
0.50 – 0.75 inches	2	3	4	5
0.75 – 1.00 inches	3	4	5	5
1.00 – 1.50 inches	4	5	5	5
> 1.50 inches	5	5	5	5

SPIA Index, Copyright February 10, 2009. Registration #TX 7-027-591. *Graphics revised – October, 2011.

SPIA-Index.com website overview

- Regional NWS Forecasts Featuring Multi-State 'Regional' Views, Plus an 'Oklahoma Only' View.

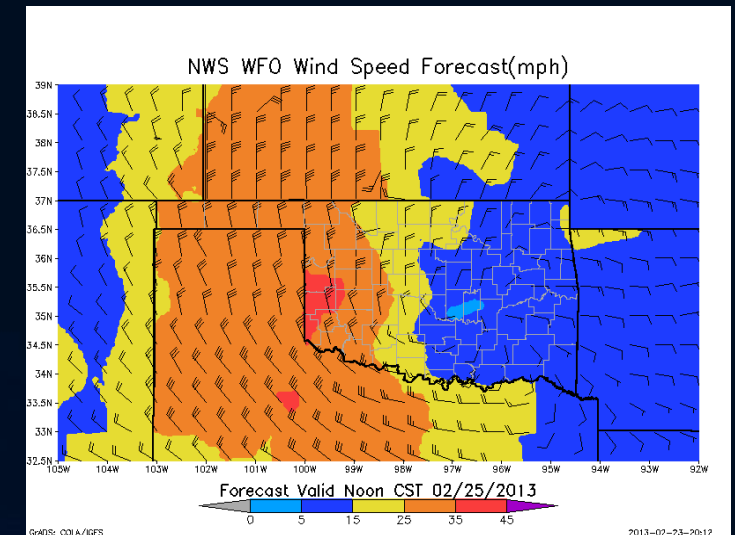
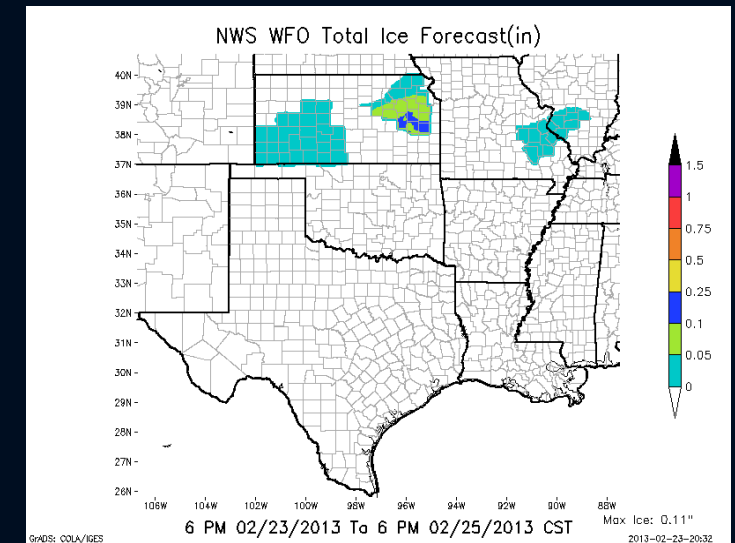
- Five Displays Available in Each Region:

- **SPIA Index™** (Ice Accumulation & Wind Forecast)
- **QPF** (Quantitative Precipitation Forecast)
- **Snow & Ice Forecast**
- **Temperature Forecast**
- **Apparent Temperature Forecast.**

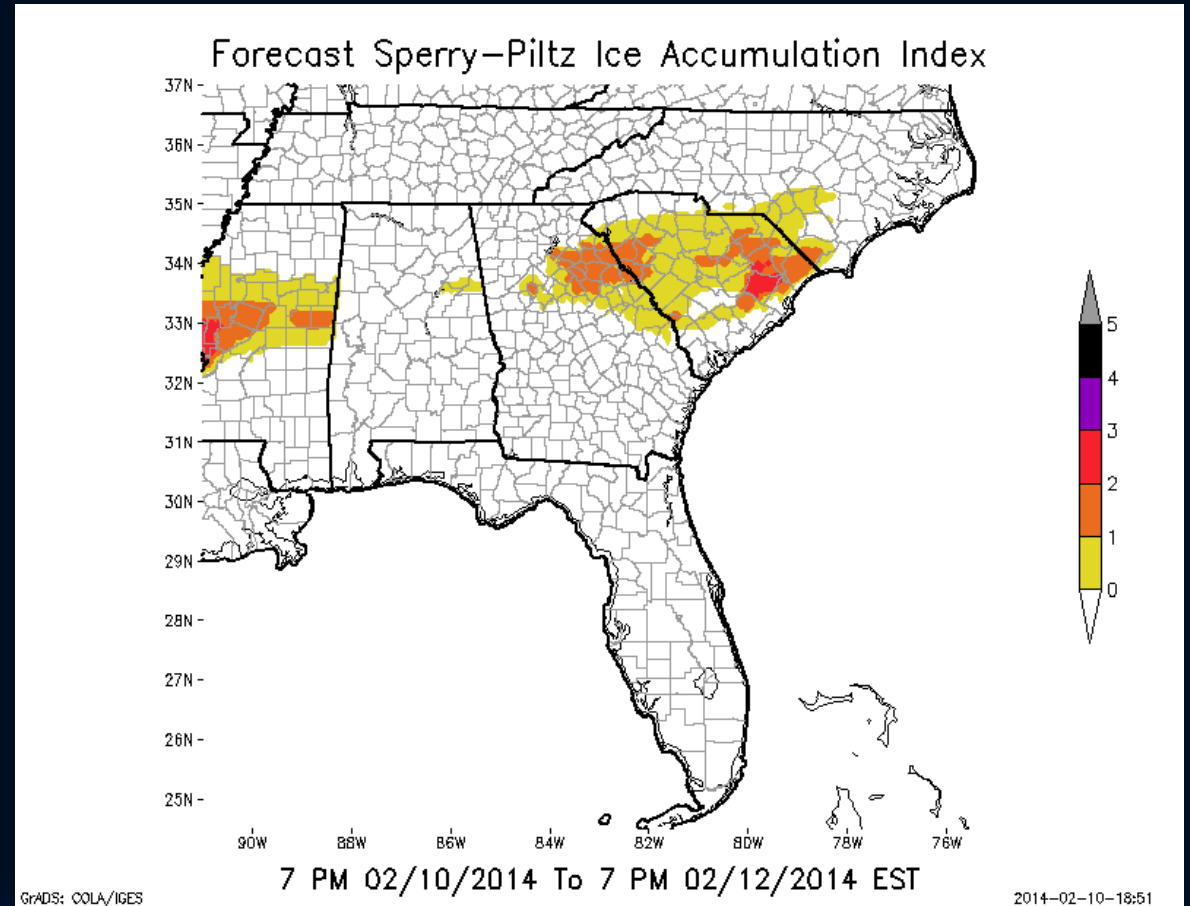
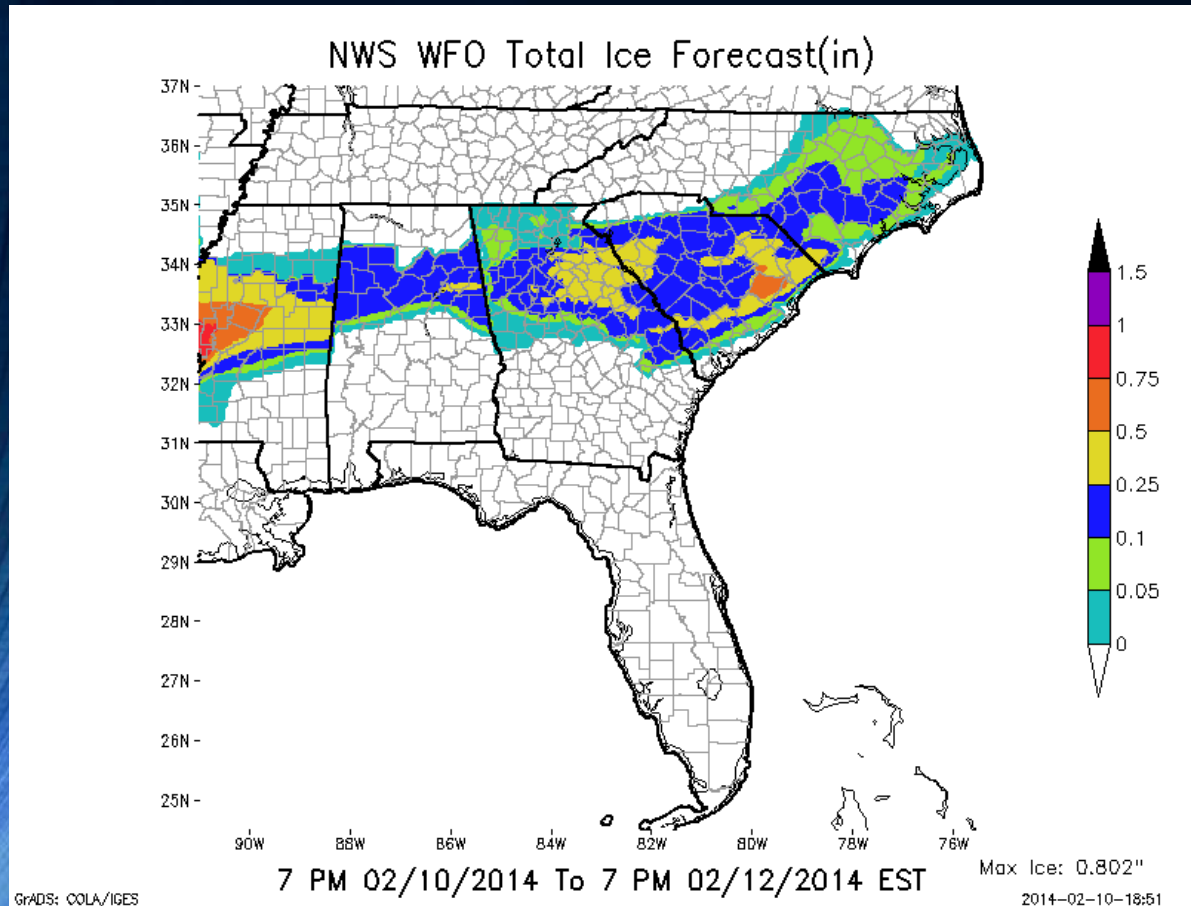
- 'Oklahoma Only' View Displays Additional Content:

NWS Fire Weather Products

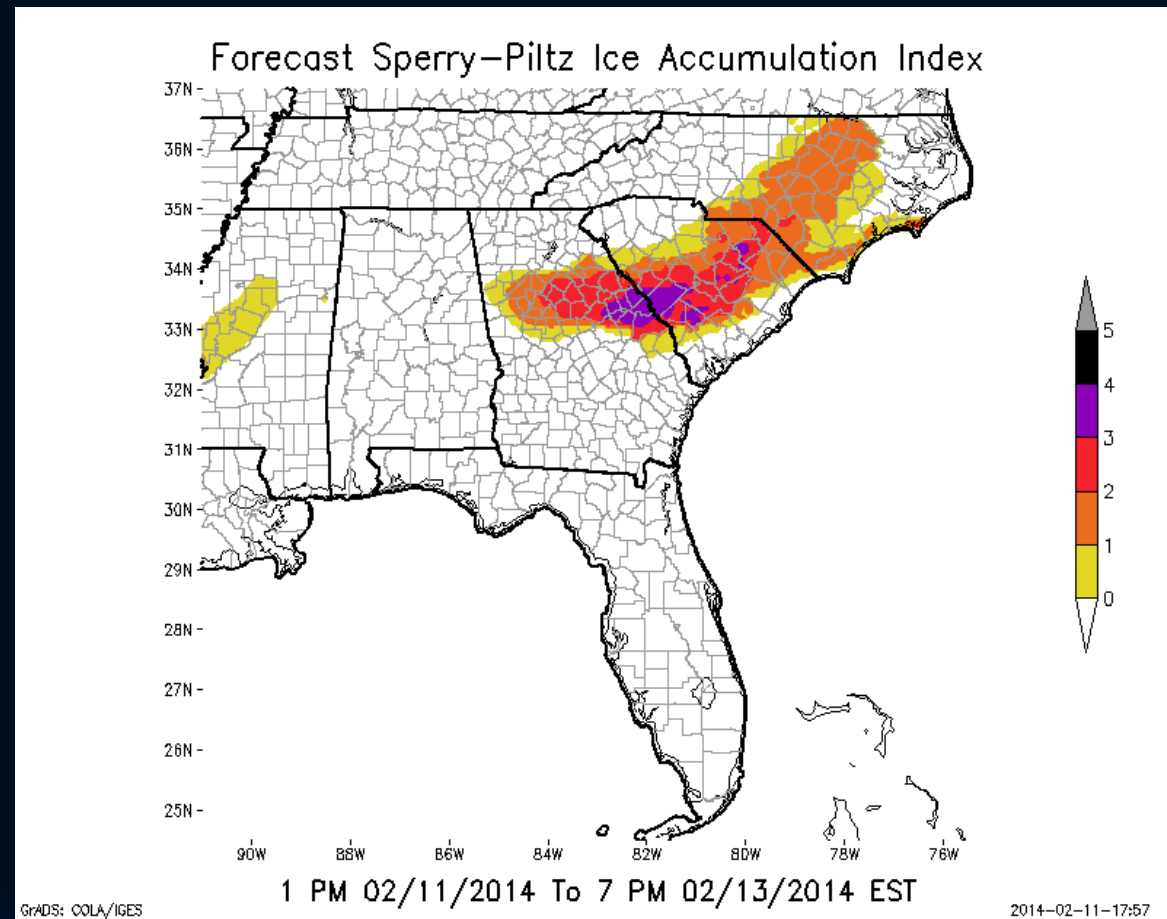
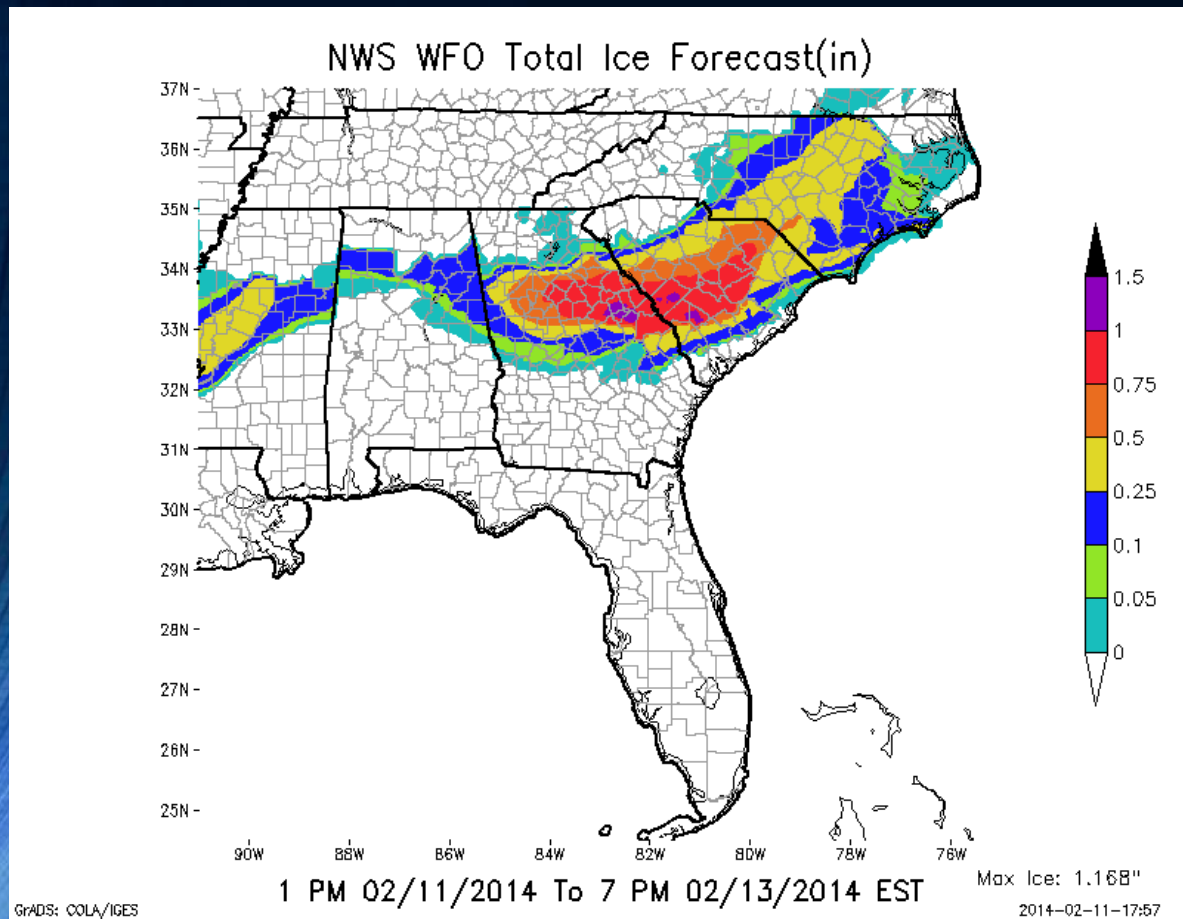
- **Fire Weather Relative Humidity**
- **Fire Spread Index**



Georgia – South Carolina Ice Storm February 12-13, 2014: Forecast 7 pm 2/10/14

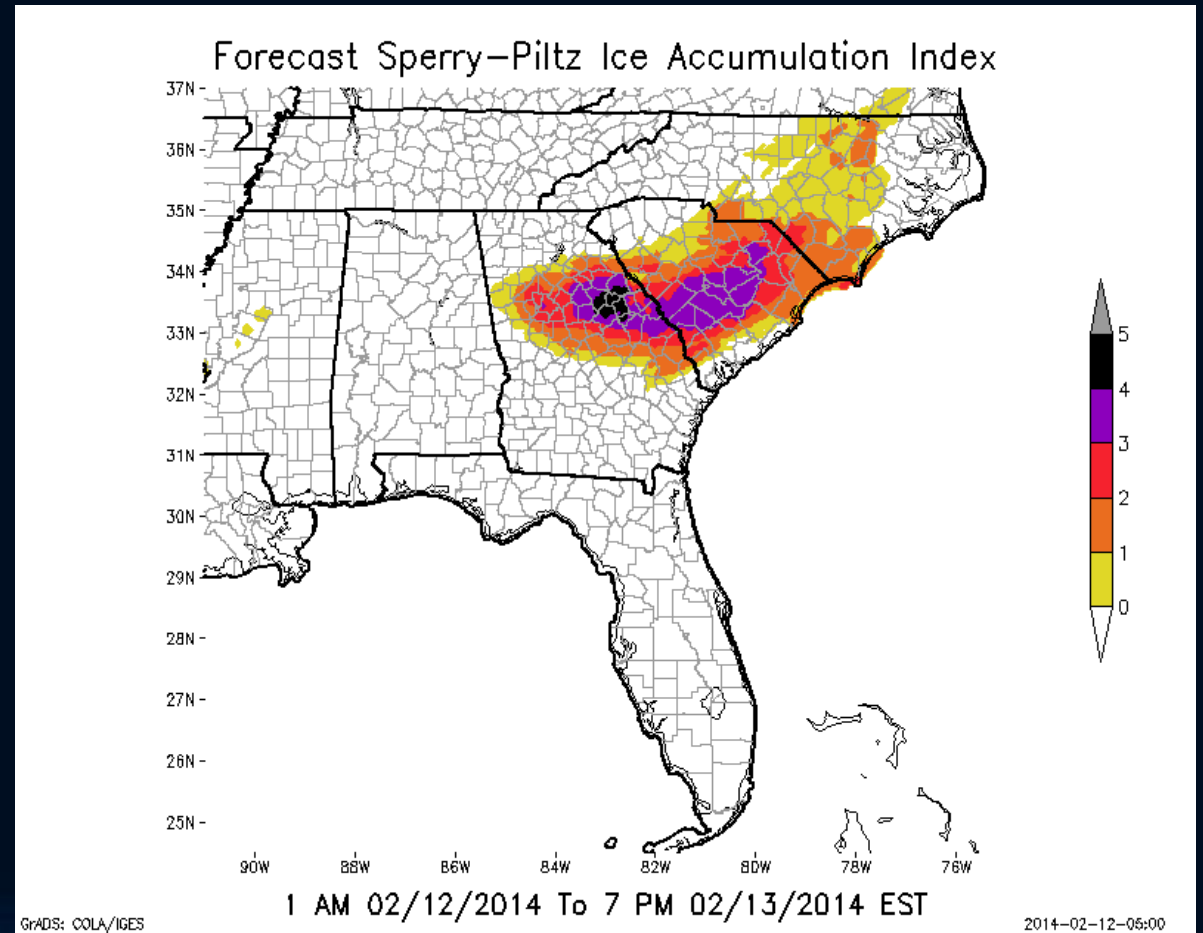
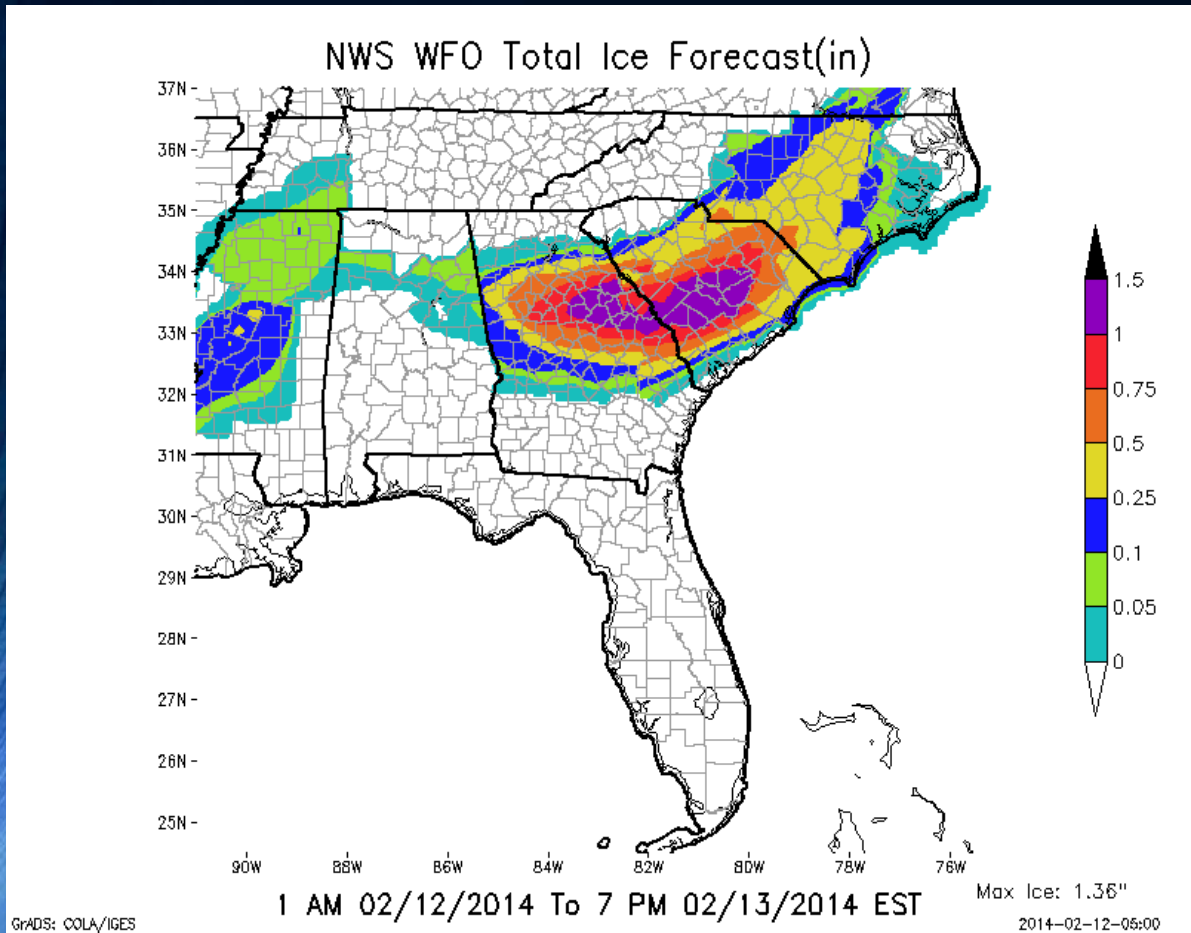


Georgia – South Carolina Ice Storm February 12-13, 2014: Forecast 1 pm 2/11/14



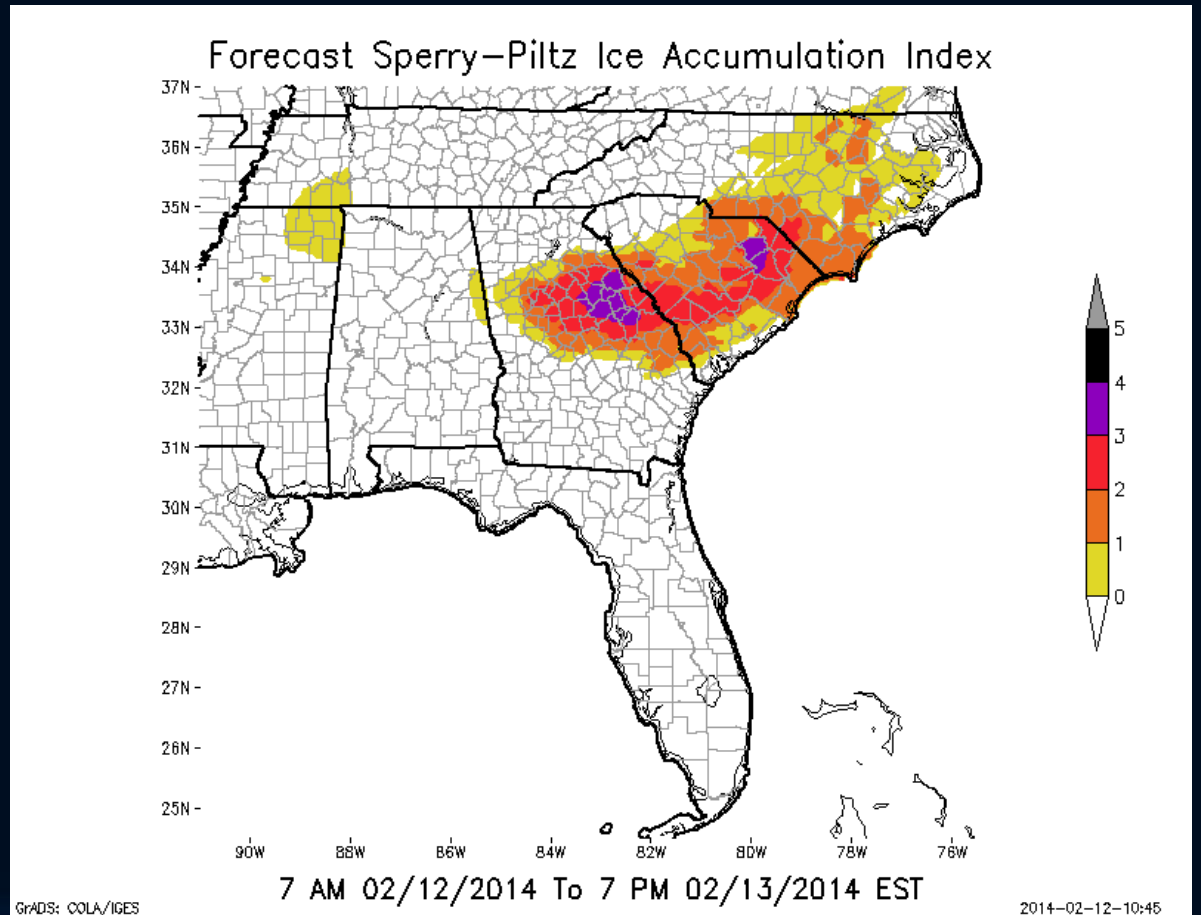
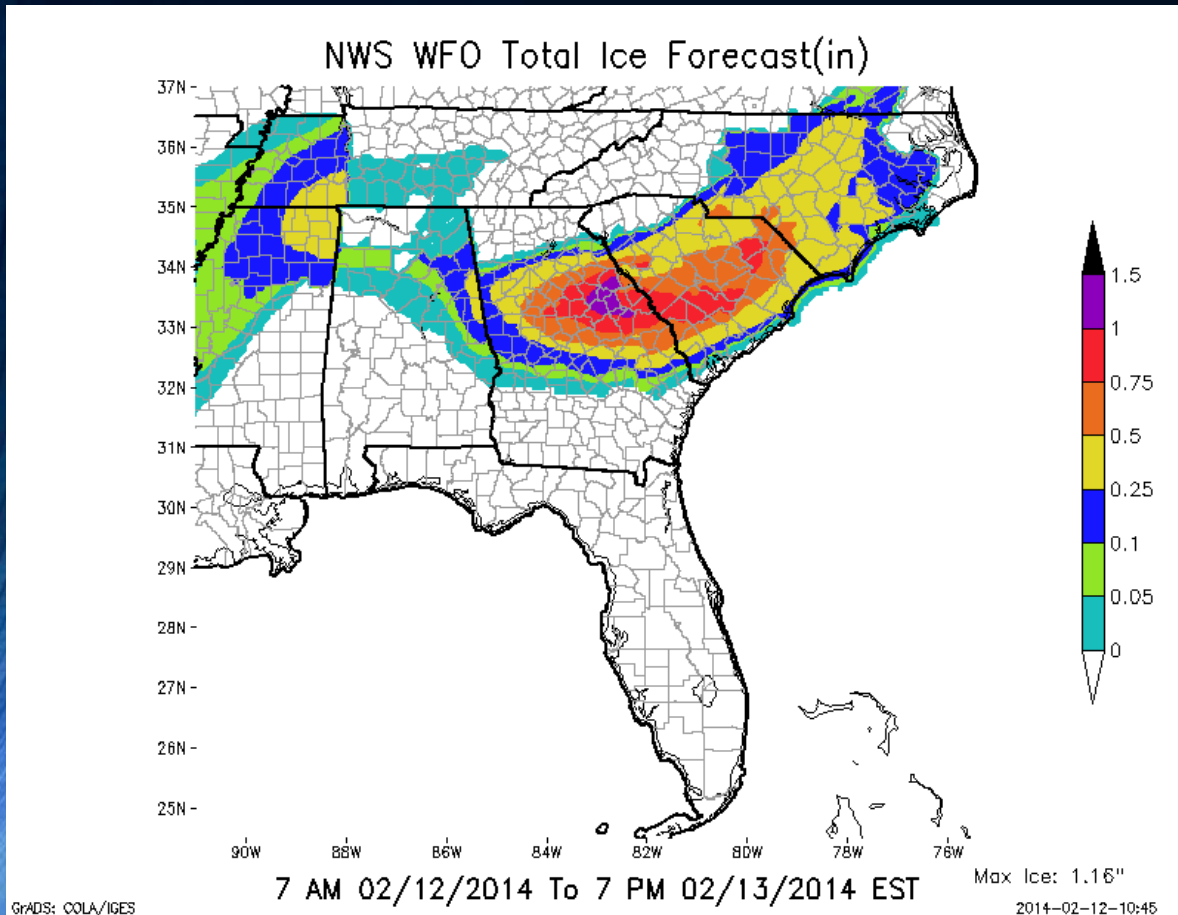
Georgia – South Carolina Ice Storm

February 12-13, 2014: Forecast 1 am 2/12/14



Georgia – South Carolina Ice Storm

February 12-13, 2014: Forecast 7 am 2/12/14

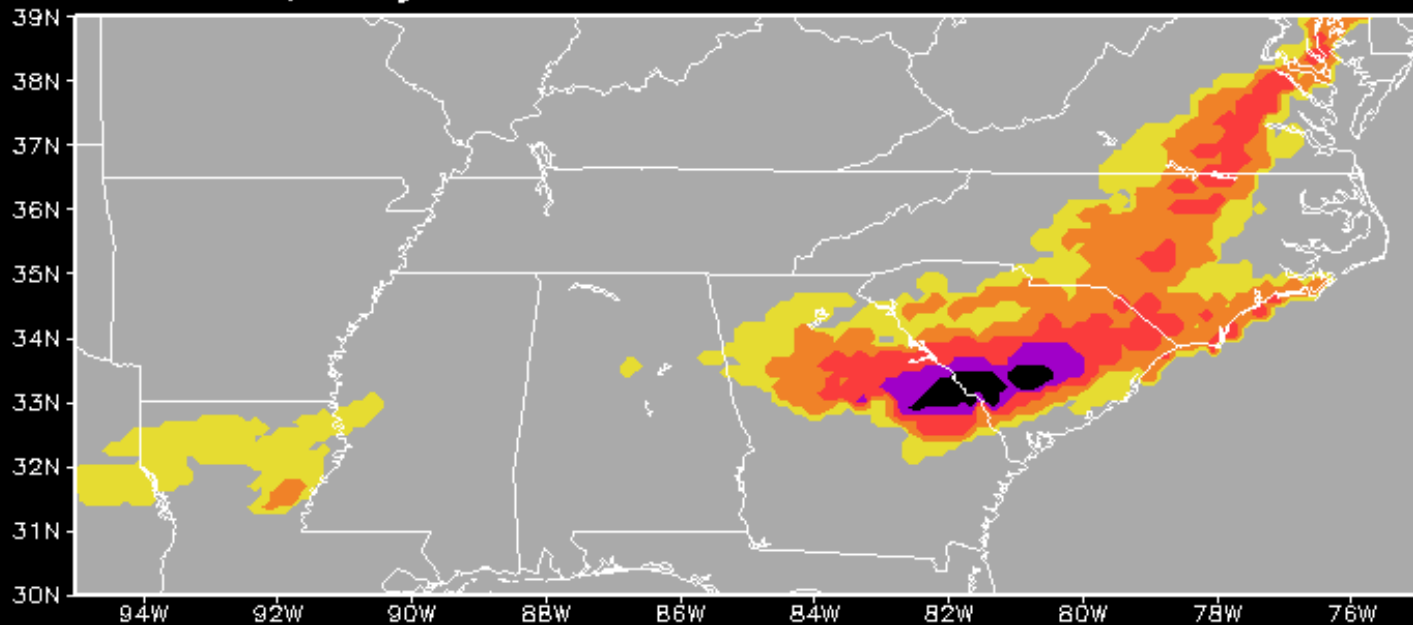


Over 850,000 customer outages were reported with this storm by 15 electric utilities; outages lasting 7-10 days.

How accurate is the SPIA Index™?

You decide.

Sperry-Piltz Ice Accumulation Index

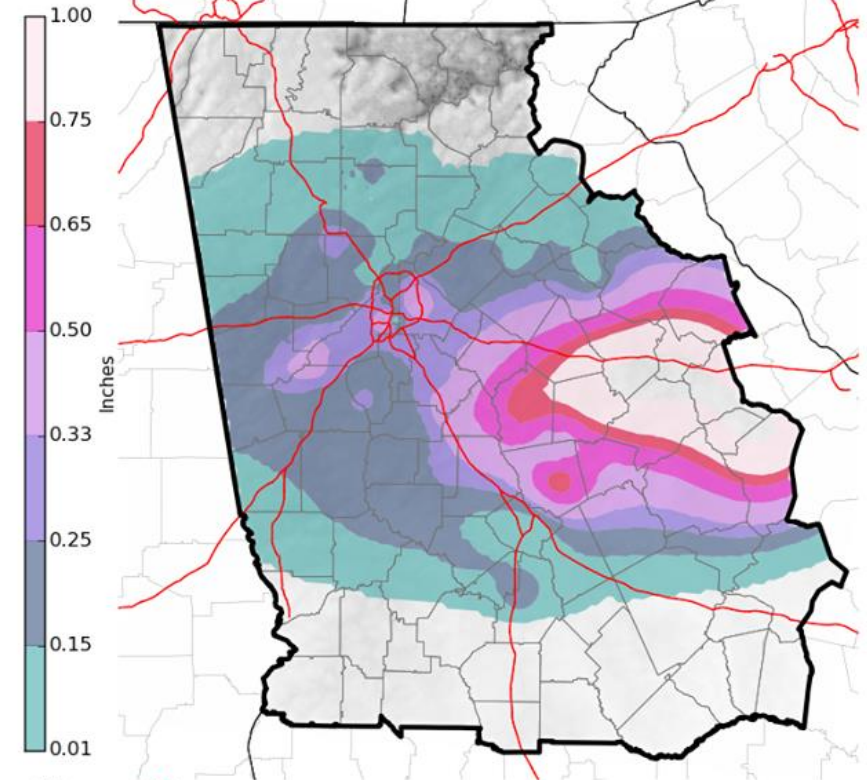


WRF-NAM Run From: 00Z11FEB2014 Valid Thru: 09Z14FEB2014

(6:00 p.m. 10 Feb 2014 valid through 3:00 a.m. 14 Feb 2014)



Preliminary Ice Totals through 11 AM Feb. 13



National Weather Service
Peachtree City, GA
02/13/2014 03:50 PM EST

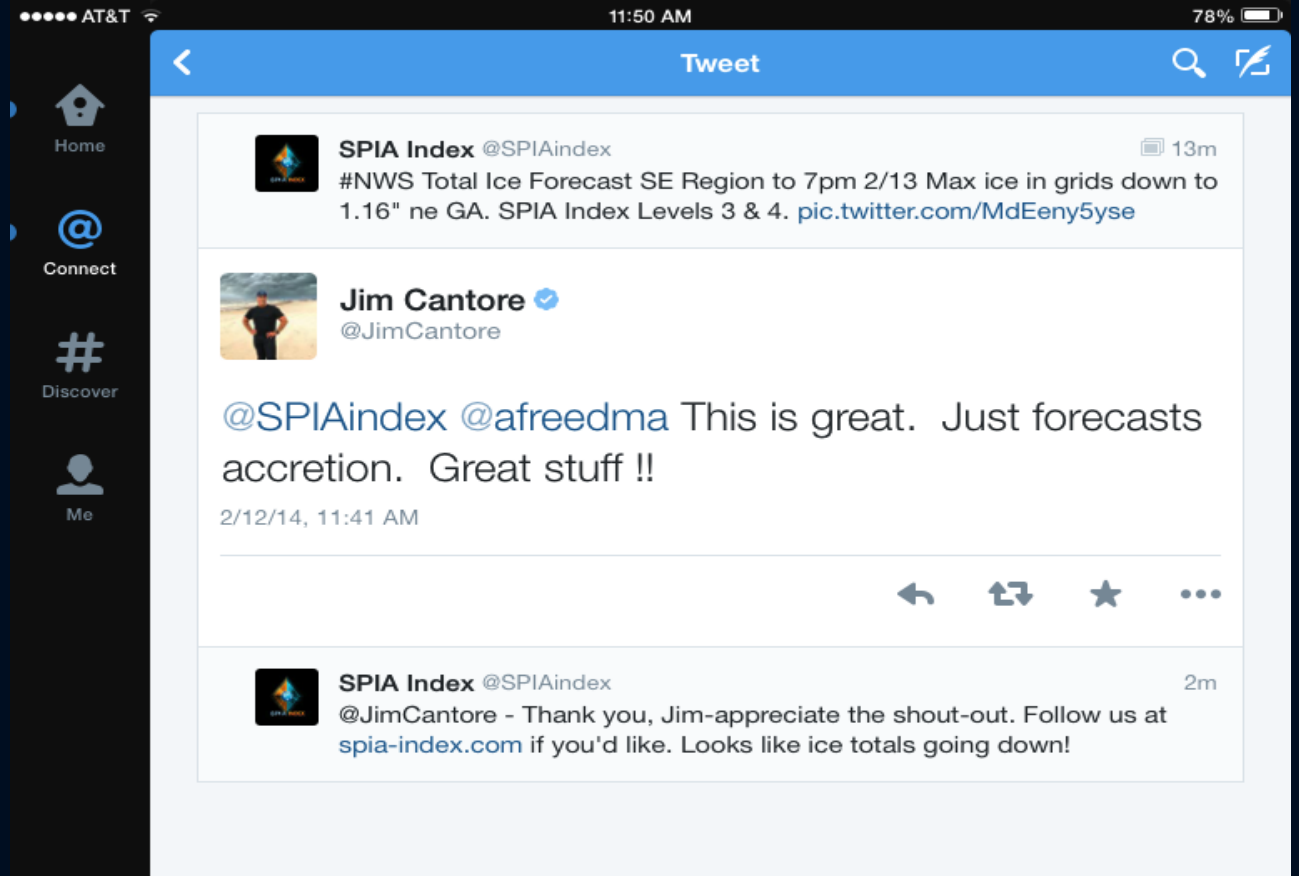
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weather.gov/atlanta



A "Shout-Out" from The Weather Channel's Jim Cantore via Twitter:



Find SPIA Index™ info and alerts by following us on Twitter: @SPIAindex

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- Planning
- Locating Power Lines
- GTC-EPRI Siting Model
- Community Involvement
- Easements/Property Rights
- Projects
- Regulations

What the Lines Look Like

Georgia's most common power lines
 Power lines are defined by their voltage. If a power line were a garden hose, the volume flowing through it would be current and the pressure in the line would be voltage. A kilovolt, 1000 volts, is abbreviated kV.

The power trip from plant to customer is actually a continuous relay between power lines of decreasing voltages. It begins with the heavy weights (500 kV in Georgia) and ends with 120- and 240-volt lines that run to homes.

Transmission lines carry power from plants to local utilities. In Georgia, power travels down a series of different size transmission lines: 500 kV, 230 kV, 115 kV and some 69 kV and 46 kV. Transmission lines are often thought of as the large cross-country variety, but lines of 230 kV and lower voltages are common along roadsides too.

Distribution lines, typically 25,000 and 12,000 volts, are networks of local power lines that EMCs and other utilities use to deliver electricity to homes, businesses, schools and so on. In some cases, industrial customers take service directly from a transmission line. While distribution lines are often thought of as the ones on wooden poles along neighborhood streets, they are also built on metal and concrete poles. Unlike their transmission counterparts, these lines are commonly built underground. The most common distribution lines in Georgia are 25 kV and 12 kV.



TRANSMISSION



DISTRIBUTION



Tree Damage and the SPIA Index™: 'Excessive Tree Damage' begins with Level 3



Building and maintaining high-voltage power lines and substations for Georgia's electric cooperatives.

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Planning & Construction

- Planning
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Line Heights & Easements Widths

Typical Transmission Line Structure Heights (approximates)

	Roadside	Cross Country
115 kV Line Single pole	80-120 feet	60-80 feet
115 kV Line H-frame	n/a	60-90 feet
230 kV Line Single pole	80-120 feet	75-90 feet
230 kV Line H-frame	n/a	65-95 feet
500 kV Structure	n/a	100-150 feet

Typical Transmission Line Easement Widths (approximates)

	Roadside	Cross Country
115 kV Line Single pole	25-42.5 feet	± 100 feet
115 kV Line H-frame	n/a	± 100 feet
230 kV Line Single pole	25-42.5 feet	± 100 feet
230 kV Line H-frame	n/a	± 125 feet
500 kV Structure	n/a	150-180 feet



Georgia Transmission Corporation, a wholly-owned subsidiary of Georgia's Electric Cooperatives, requires certain R-O-W easements based on line type & height.



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SPIA INDEX™

Oklahoma Regions: Northeast Southeast North Central South Central North Rockies South Rockies Northwest Southwest

QUESTIONS?



*Thank
You!*





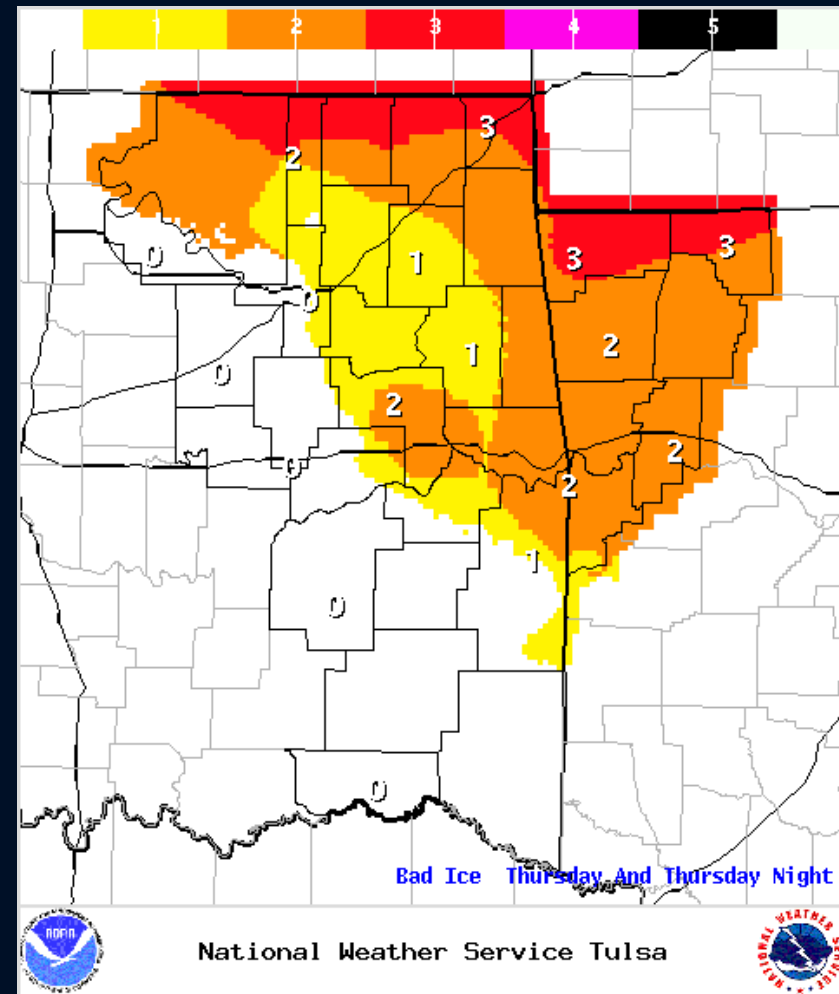
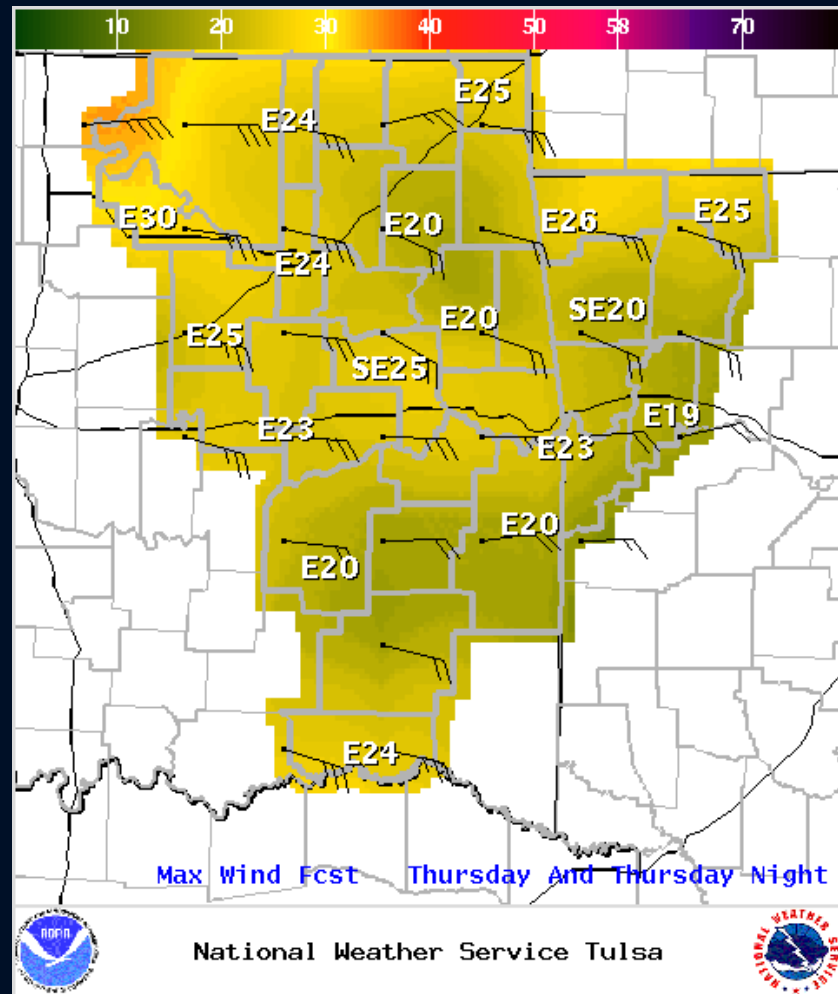
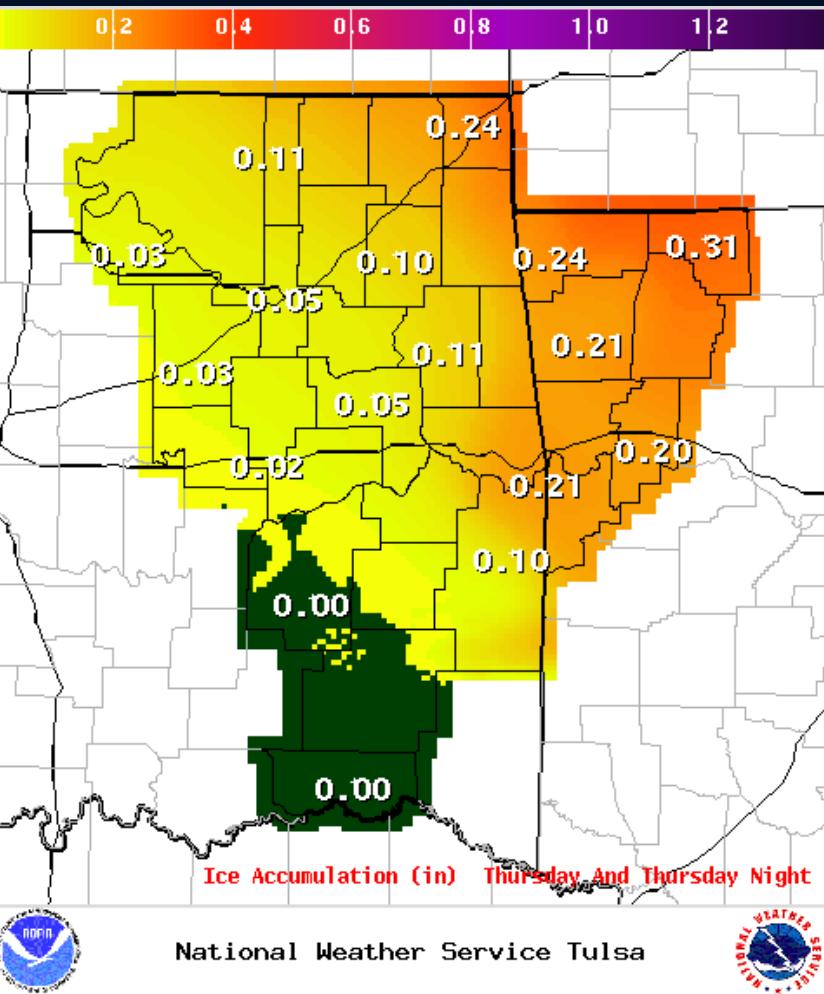


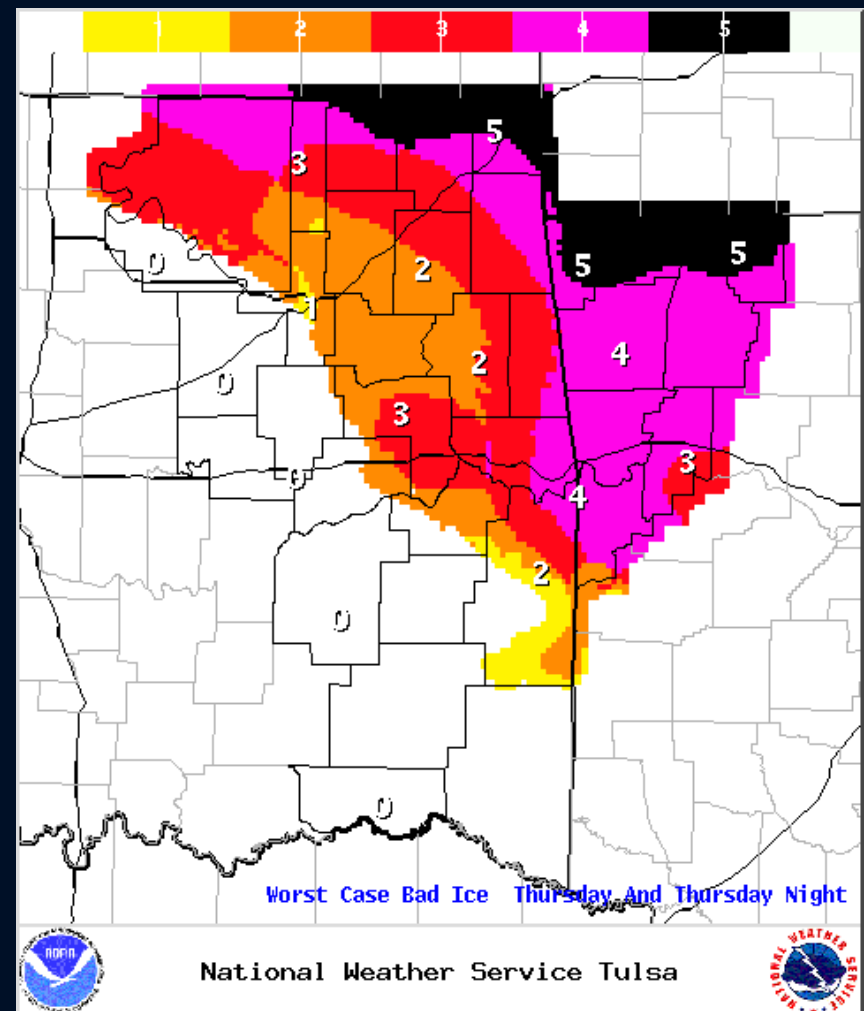
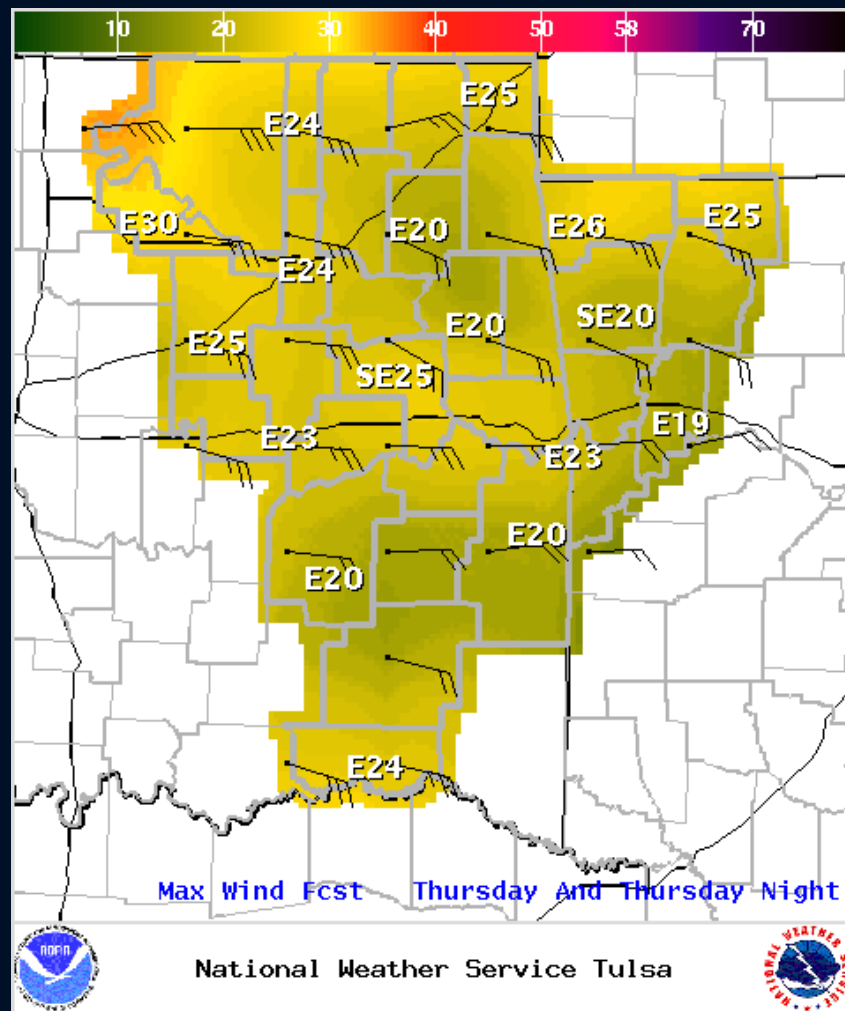
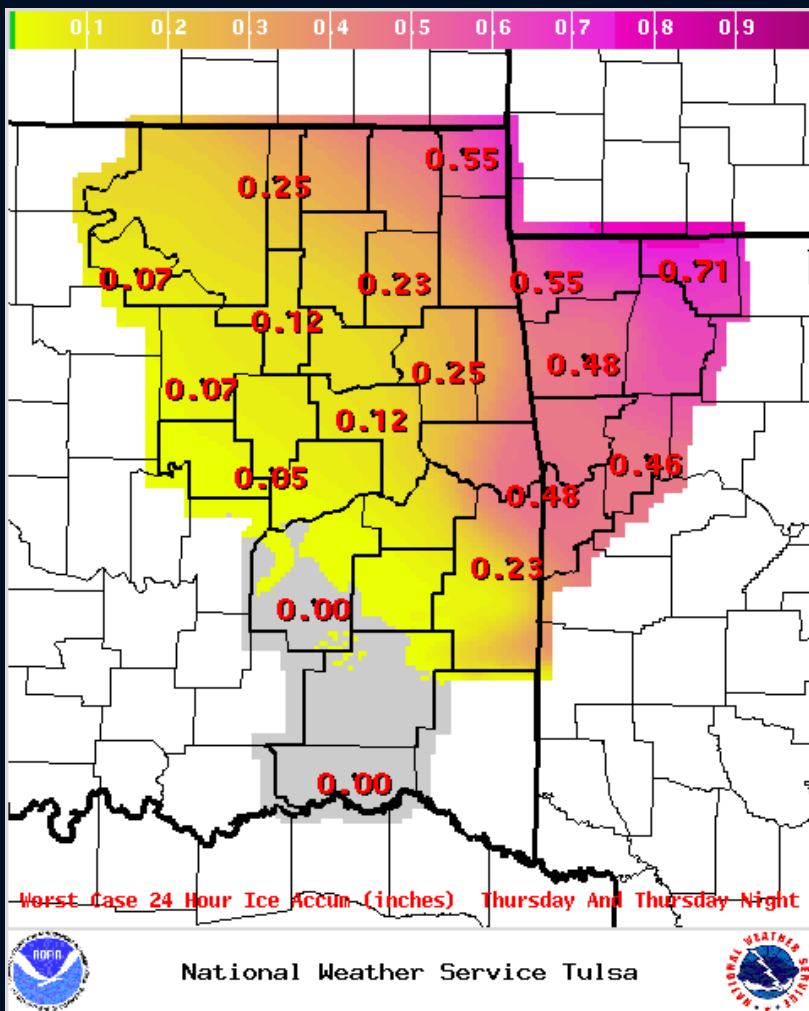




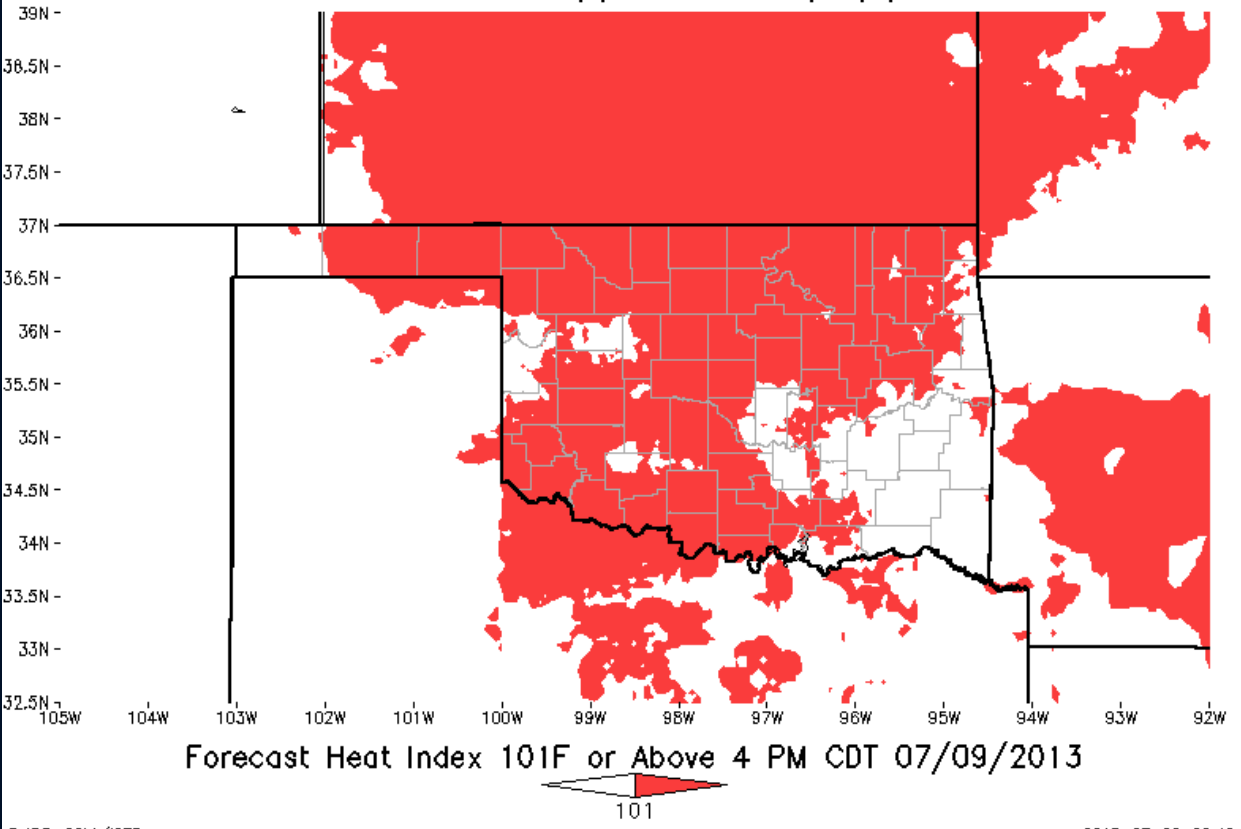




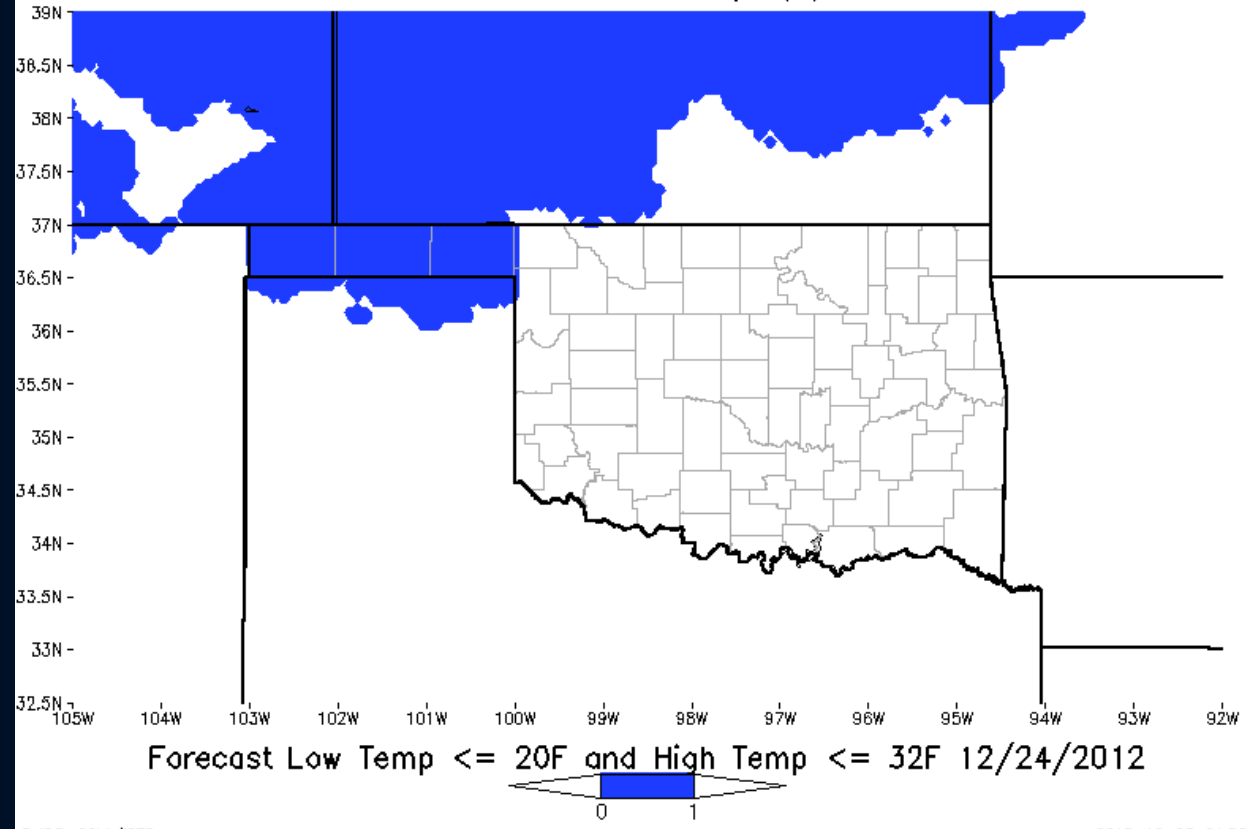




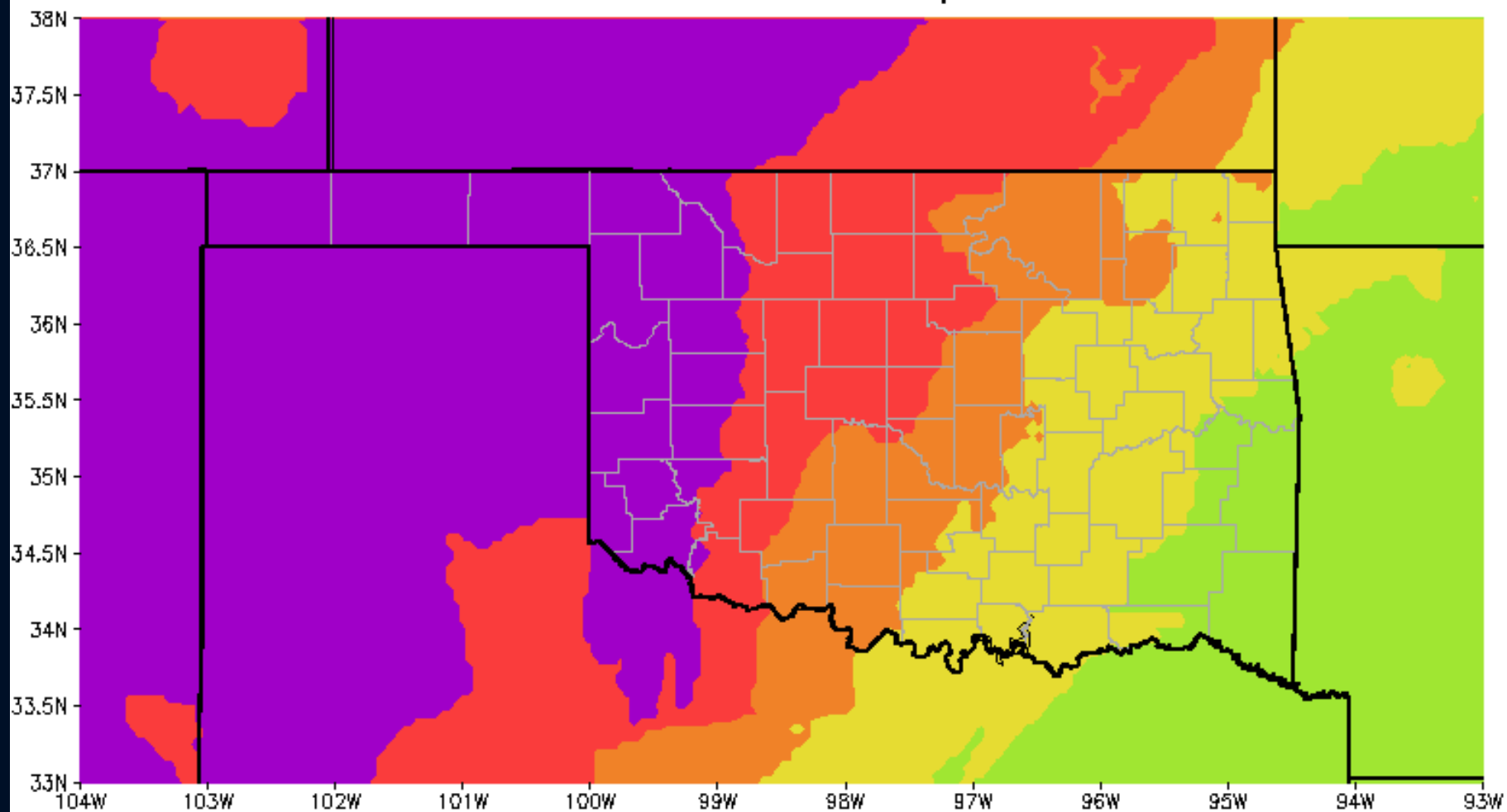
NWS WFO Apparent Temp (F)



NWS WFO Temp (F)



NWS WFO Forecast Fire Spread Index



Spread Index Forecast 4 PM CDT 03/17/2014

