



The Appalachian Spotter

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National Weather Service
Morristown TN

New Wind Chill Index

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The NWS is implementing a replacement Wind Chill Temperature (WCT) index for the 2001/2002 winter season. The reason for the change is to improve upon the current WCT Index used by the NWS, which is currently based on the 1945 Siple and Passel Index. The new formula will make use of advances in science, technology, and computer modeling to provide a more accurate, understandable, and useful formula for calculating the dangers from winter winds and freezing temperatures.

Specifically, the new WCT index will:

- use wind speed calculated at the average height (5 feet) of the human body's face instead of 33 feet (the standard anemometer height);
- incorporate modern heat transfer theory (heat loss from the body to its surroundings, during cold and breezy/windy days);
- lower the calm wind threshold to 3 mph;
- assume the worst case scenario for

solar radiation (clear night sky).

		Temperature (°F)																	
		40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
Wind (mph)	Calm	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
	5	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
	10	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
	15	30	24	17	11	4	-2	-9	-15	-22	-29	-36	-42	-48	-55	-61	-68	-74	-81
	20	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
	25	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
	30	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
	35	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
	40	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
	45	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
	50	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
55	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98	
60																			

Frostbite occurs in 15 minutes or less

In 2002, adjustments for solar radiation (i.e., the impact of sun) for a variety of sky conditions (sunny, partly sunny and cloudy) will be added to the calculation model.

Special points of interest:

- * Winter Weather Awareness Week is November 11th-17th
- * Toll-free Spotter Number for Spotter Reports Only **1-800-697-0075**
- * General Weather Information Number **423-586-3771**
- * Spotter e-mail **sr-mrx.spotter@noaa.gov**
- * **www.srh.noaa.gov/mrx**

Flooding Hits Southwest Virginia and Northeast Tennessee

Stephen Parker, SOO
Brian Boyd, Service Hydrologist
Rich Pollman, Senior Forecaster

July 25th through 29th

During three successive weekends in late July and early August, parts of southwest Virginia and northeast Tennessee were hit with heavy rainfall which caused significant flooding.

On July 26th and 27th numerous showers and thunderstorms moved from southeast Kentucky into southwest Virginia and northeast Tennessee. Rainfall amounts from these two days ranged from just a few tenths to up to 5 inches. While this rain-

(Continued on page 3)

Graphical Forecast Coming Soon

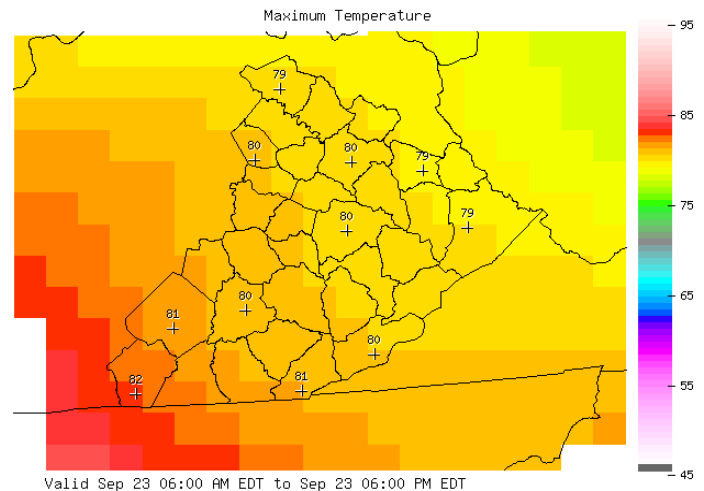
Stephen Parker, Science and Operations Officer
Lyle Wilson, Senior Forecaster

As you may have noticed over the past year or so, the National Weather Service (NWS) is branching out into new ways of issuing forecasts. The days of issuing only a worded forecast (such as "Partly cloudy with a high near 80") are gone. Some of you may have already seen our experimental digital forecasts (columns of numbers of mostly 3-hourly forecasts extending out about 48 hours into the future, with some parameters going out a full week into the future) or our first attempt at "graphical" forecasts (taking the digital forecasts, reorganizing them, and adding colorful symbols), on our web page. We hope you have found these forecast products useful. In the near future, we will be adding yet another form of forecast to our suite of products. This new forecast will be truly "graphical", in that it will be a color picture of expected conditions, and not simply the digital forecast "dressed up" with pretty symbols. In addition, your office here in Morristown will take part in a national test to mesh numerous office's graphical forecasts into one database that anyone can access on the internet (this program is called the NDFD, National Digital Forecast Database).

We will issue colorful meteorological forecast maps of our forecast area (most of East Tennessee, five counties in Southwest Virginia, and Clay and Cherokee counties in North Carolina) for the following parameters: maximum and minimum temperature, daily out to 48 hours from forecast time; and temperature, percentage of precipitation (chance of rain, for ex.), relative humidity, wind chill, heat index, and wind forecasts, each one every 3 hours out to 48 hours from forecast time.

"...an image with amazing resolution, showing temperature patterns up and down the slopes of the Appalachians..."

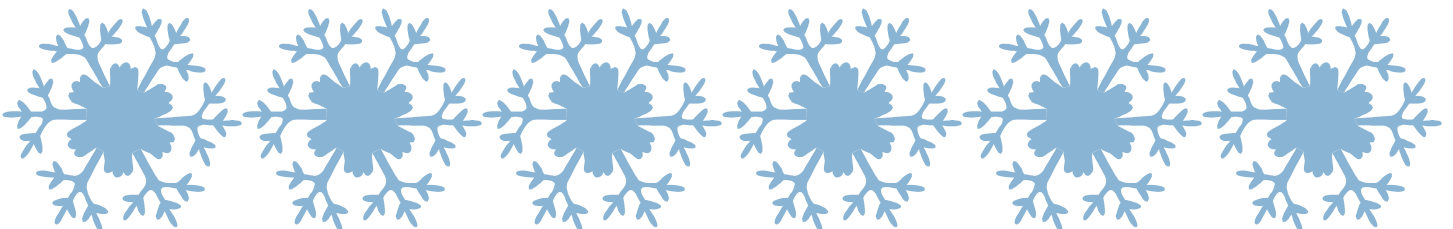
These maps will consist of images of color, with a corresponding "enhancement curve" (which functions like a "key") to tell you what each color represents. County and state boundaries and selected forecast points will also be overlaid on the color images, to help folks find whatever location they may be interested in.



Example of Graphical Forecast from NWS Jackson, KY

"How will we produce these new maps", you may wonder? We will be using new software called GFE (Graphical Forecast Editor), which is part of our overall IFPS (Interactive Forecast Preparation System). This new GFE software package allows us to assign a different value for each 5 kilometer by 5 kilometer (about 3 miles by 3 miles) "box" within and near our forecast area. This produces an image with amazing resolution, showing temperature patterns up and down the slopes of the Appalachians, in the valley of East Tennessee, and even displaying temperature differences in the Sequatchie Valley! Powerful graphical editing tools allow us to do this efficiently, because there is no way to achieve this level of forecast resolution by hand.

Admittedly, we are still working on improving our skill in such precise forecasting, and without much in the way of actual temperature data to use in many areas, some of our forecasting (in the more remote areas) amounts to "educated guesswork". We are currently conducting local research to help us issue more accurate forecasts in these areas, and we will do everything we can to provide you with the best forecasts possible. We hope you enjoy the new products, scheduled to be on our internet site possibly as early as November. Please let us know what you think!



Significant Flooding the Weather Story from this past Summer

(Continued from page 1)

fall did cause some minor urban and small stream flooding, for the most part the rainfall just saturated the ground and set the conditions that would lead to widespread flooding during the next two days.

Rainfall picked up again in the evening hours on July 28th across southwest Virginia and northeast Tennessee. The Flash Flood watch was issued on July 28th at 11:15 a.m., and the first Flash Flood warning was issued at 2:15 a.m. on July 29th. Thirty-two subsequent Flash Flood warnings were issued across southwest Virginia and northeast Tennessee through the rest of the day on the 29th. Rainfall amounts for July 28th and 29th were similar to those on the two previous days. The difference this time was the ground was already saturated and nearly all of the rain that fell on July 28th and 29th became runoff. Unfortunately, one man died in Scott County, Virginia, along Big Stoney Creek near Fort Blackmore, when his home was swept away by the flood water.

August 4th and 5th

Weather situation: A nearly tropical environment was in place over the Southern Appalachian region. An upper level system was moving south toward the region in weak northerly flow. Precipitation began in the eventual flooding area around 10:30 p.m. Friday Aug 3rd, according to eyewitness accounts, and continued through early afternoon Saturday Aug 4th. Flooding first began around 2:30 am EDT. The precipitation continually redeveloped over Greene County, and eventually drifted south into eastern Cocke County.



Standing on the Highway 70 bridge over the Nolichucky River at the Nolichucky Dam. The water is gushing around the left shoulder (right side of the picture) of the dam. One official reported the water to be hitting the bridge, prompting the closing of the road, and later inspection of the bridge. The bridge survived without damage.

It appears obvious that the terrain played a strong role in forcing this event. The rainfall maximum occurred where the elevation changes from around 1500 feet to over 4300 feet in a distance of about 9 miles. The low level winds flowed up this slope. This created the necessary lift of the warm and unstable air mass to generate thunder-

storms. However, why the event occurred in this particular location (dramatic elevation changes also occur north-northeast and south-southwest of the rainfall maximum) is

not known. There were no fronts or boundaries discernable in the vicinity.

Good rainfall data were hard to come by. An unofficial gage at Viking Mountain (4952 feet MSL), located approximately 7 miles southwest of the radar-indicated maximum, measured 15.35 inches from "Friday evening" until "Sunday evening" (The road was out and he had to hike up to the gage). We had a discussion with a man who lived very close to the radar-indicated maximum, and he emptied his 5-inch gage twice during the event. All he could tell us was that he, "...had more than 10 inches of rain...." Many people felt that they had over 10 inches of rain, and some indicated that 12 to 15 inches of rain was not an unreasonable estimate.



Looking south, just south of Highway 107, on Horse Creek in southeast Greene County. The creek here is normally about 20 feet wide. This is August 6 after the August 4-5 flooding. The water damaged the road bed, but left the asphalt intact. If you drive your car on the thin asphalt crust, you will end up in the creek.

Summary of Local Storm Report information to date:

- No significant injuries or deaths
- First reports of flash flooding received at 2:20 am. First actual flash flooding likely occurred between 2:00 and 2:20 am EDT (first warning issued 2:36 am EDT). We have been told consistently that the "real" or "significant" flooding began around 3:00 am EDT.

Greene County Damage

- Approximately 75 roads damaged
- Several hundred houses with water damage
- Several houses with structural damage and/or washed off of their foundation
- Numerous evacuations of low-lying areas along creeks and rivers in the flood warning area
- Several vehicles washed into creeks

Washington County Damage

- Approximately 80 miles of road damaged
- Sixteen bridges out initially
- Approximately 35 mobile homes and 5 homes destroyed
- Approximately 100 homes damaged
- 35 rescue evacuations completed

(Continued on page 5)

Winter Safety

BE PREPARED...Before the Storm

- Have flashlight, extra batteries, NOAA Weather Radio, extra food and water, and emergency heating source and heating fuel available in your home.
- Have a *winter survival kit* in your vehicle including blankets, flashlight, first-aid kit, non-perishable food, extra clothes, sand or cat litter, and a shovel.

When Caught in a Winter Storm in a Vehicle

- Stay in your vehicle; run the motor ten minutes each hour for heat (open the window and clear exhaust pipes to avoid carbon monoxide poisoning); make yourself visible; exercise.

When Caught in a Winter Storm in a Building

- Stay inside; eat and drink to provide the body with energy; wear layers of loose-fitting warm clothing.

Frostbite is damage to body tissue caused by that tissue being frozen. Frostbite causes a loss of feeling and a white or pale appearance in extremities, such as finger, toes, ear lobes, or the tip of the nose. **Hypothermia** is the dangerous lowering of body temperature. Warning signs include uncontrollable shivering, memory loss, disorientation, drowsiness, and apparent exhaustion. For both cold related conditions, get medical help immediately!

Winter Reporting

Snow can be one of the simplest, and yet is generally one of the most misunderstood weather elements to observe. To correctly measure and report snow depth, you need to measure several locations in open exposed areas and average these measurements to get the accurate snow depth. If you want to get the greatest depth be sure that this is reported as a drift, not the snow depth. If you took a number of measurements and found the average to be 10 inches with the greatest 19 inches, report snow depth of 10 inches with drifts to 19 inches. Like we said, simple but easy to misunderstand

SNOW	1 INCH OR MORE PER 12 HOURS
SLEET OR FREEZING RAIN	WHEN TRAVEL BECOMES HAZARDOUS, REPORT ICE ACCUMULATION IF POSSIBLE
NON-CONVECTIVE HIGH WINDS	MEASURED OR ESTIMATED WINDS OVER 50 MPH, ANY DAMAGE CAUSED BY WIND
RAIN	1 INCH OF RAIN DURING AN EVENT
FLOODING	WHEN FLOODING THREATENS ROADS OR PROPERTY

Spotter Notes; New Spotter E-mail Account Name

New Spotter E-mail Account Name

The name of the spotter e-mail account has been changed to: sr-mrx.spotter@noaa.gov Please continue to send your electronic reports to this e-mail account. As always, be sure to get real time reports to the NWS via phone (1-800-697-0075) or amateur radio. The e-mail account should only be used for electronic data or for reports the day after the storm.

Send Us Comments, Suggestions, Photos, and Video

This Spotter Newsletter is your newsletter! If you have any comments or suggestions, please pass them onto us through either the e-mail account or by the mail. Also, we can always use more photos and videos to keep the spotter presentation fresh and local.

Updated Skywarn Program Planned

Next spring you will notice a updated spotter program. The planned updates include a few new slides (hopefully, a few of them from the central and southern Appalachian region), and more video segments. We realize that the elements that we ask you to view and report to the NWS are always moving and evolving. It is difficult to show this in a still picture. Over the next several years there will be an effort to incorporate much more video into our Skywarn presentations.



Videos will increasingly become more of a part of Skywarn presentations

2001 Severe Weather Statistics through October 1st

County	Number of Warnings	Warnings Verified	Lead Time (minutes)	Missed Events
Anderson	4	4	14.1	2
Bledsoe	2	1	16.0	0
Blount	5	4	15.0	3
Bradley	8	6	15.1	1
Campbell	4	4	25.0	0
Carter	3	3	11.3	0
Claiborne	6	6	17.8	2
Cocke	4	3	10.0	0
Cherokee, NC	3	3	17.7	0
Clay, NC	1	0	-	0
Grainger	6	6	11.7	0
Greene	9	7	15.1	0
Hamblen	4	4	10.4	1
Hamilton	12	10	22.5	1
Hancock	4	4	17.5	0
Hawkins	7	5	27.2	0
Jefferson	2	2	11.0	1
Johnson	5	5	24.8	0
Knox	8	8	12.7	0
Loudon	9	5	15.7	0
Lee, VA	6	6	25.7	0

County	Number of Warnings	Warnings Verified	Lead Time (minutes)	Missed Events
McMinn	11	9	15.7	0
Marion	10	6	23.3	0
Meigs	5	4	12.4	1
Monroe	9	8	12.0	1
Morgan	3	3	13.0	0
Polk	9	8	16.0	0
Rhea	5	2	6.7	1
Roane	2	2	12.0	1
Scott, TN	5	3	7.3	0
Sequatchie	3	3	20.0	0
Sevier	5	4	15.0	0
Sullivan	11	10	11.2	2
Russell, VA	5	2	14.7	1
Scott, VA	6	6	14.6	1
Unicoi	2	2	17.5	0
Union	5	3	19.3	0
Washington, TN	4	4	15.5	0
Washington, VA	9	8	17.5	1
Wise, VA	5	4	20.3	0
CWA TOTAL	226	184	16.1	20

Flooding in Unicoi County

(Continued from page 3)

August 11th through 13th

Thunderstorms developed during the afternoon and evening hours on both August 11th and 12th across the mountains of northeast Tennessee. These storms developed ahead of a cold front in a tropical air mass. The cold front eventually went through the region during the afternoon on August 13th. Ra-

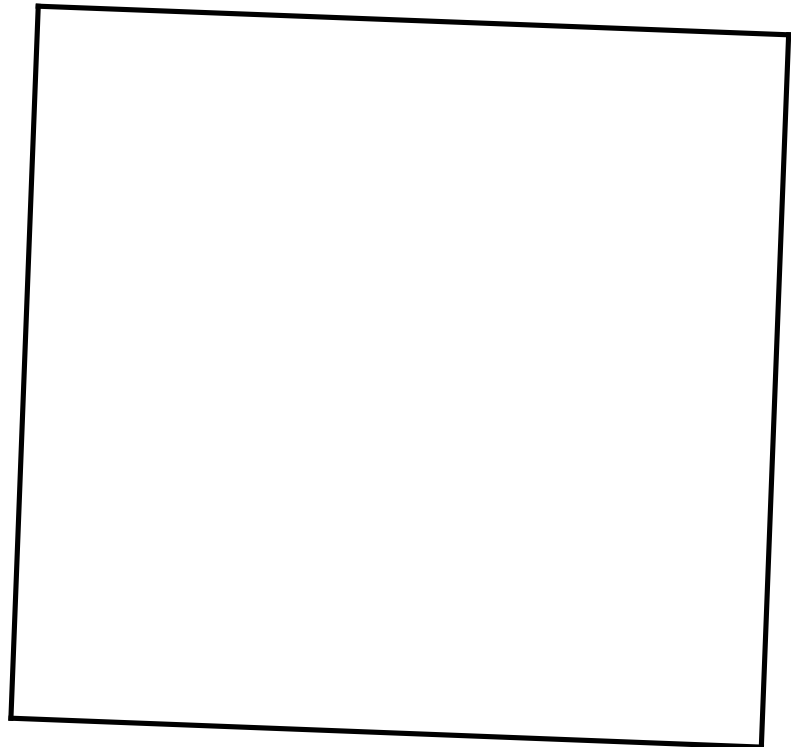
dar estimates from this event ranged from two inches to over six inches in a two or three day span, with the heaviest of the rain in Unicoi county. Unicoi county had the most extensive flooding during this event, but other mountainous areas also experienced flooding in Cocke, Greene, Washington, Carter and Johnson counties. Fortunately again, there were no reports of significant injuries or deaths.

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mrx](http://www.srh.noaa.gov/mrx)



Winter Outlook and Preparedness

Jerry McDuffie, Meteorologist In Charge

As I sit here in late September developing this short message, the temperature is dropping through the 50s into the 40s and should approach 40 degrees for a low tonight. That will test or break a record low for some locations in east Tennessee. Does this mean a colder winter this year? No one knows. What do the winter months ahead have in store for us?

As we go into fall and then into winter, we can expect our weather patterns to be more normal than in the last 2-4 years. We have enjoyed pretty mild winters lately, but this winter should be more normal. This year, all signs of the La Nina, which has kept us relatively warm the last few years is gone. There is some evidence of a developing weak El Nino by the early part of 2002. At this time, it is not believed that this relatively weak El Nino will be of much consequence to our area. Although, a more detailed winter forecast will be issued in mid October, the current projections appear to call for near normal temperatures and precipitation for the East Tennessee area into next March or April. Should the El Nino become stronger than an-

anticipated, the resulting weather here could vary from normal to wetter than normal precipitation and normal to warmer than normal temperatures.

In any case, it appears that we will experience more rain, snow, along with some occasional colder temperatures than in the last few years. We may very well have some periods of severe weather in the form of severe thunderstorms, flash flooding and possibly even a tornado through the next 5 months. We will need to get good, accurate reports of these events. We will need to help our citizens to be prepared for this winter weather. The information you folks provide plays a big role in the success we have in completing our job. Our staff at WFO Morristown has continually tried to provide the best in weather support. This is a team effort and all of you are part of that team. We work closely with the Tennessee Emergency Management Agency and the various Media in an effort to provide the very best service we can. If you have any suggestions for us, we will gladly listen to them. We thank you all, in advance, for your contributions. Have a safe and comfortable winter.

