



WINTER WEATHER AWARENESS

A Campaign by the
National Weather Service
Tennessee Emergency Management
Agency
North Carolina Emergency
Management
Virginia Department of Emergency
Services

Tennessee November 13-15, 2007

Virginia December 2-8, 2007

North Carolina December 2-8, 2007

Winter is approaching. Hazardous weather can strike with little notice. Tornadoes strike with unwanted regularity. As winter approached five years ago, Tennesseans experienced the secondary severe weather maximum at its worst with the Veterans Day Tornado outbreak. Severe thunderstorms with downburst winds and large hail occur even more frequently. Even with the current drought in East and Middle Tennessee, floods and flash floods can wash people and property away with little notice.

The National Weather Service and the State Emergency Management Agencies would like to bring another weather threat to the forefront and heighten everyone's awareness of this significant weather threat – Winter Weather.

Last winter was somewhat mild with a few small snow events and several significant snow events across the southern Appalachians. January 16th 2003 saw a snowstorm move across the southern Appalachian region with 4 to 8 inches of snow in many areas. Ample forecast and warning time allowed road crews to react and prevent major problems.

The winters the past few years have been relatively mild across the region and lulled everyone into a feeling that those were what a "Normal" winter is like. The Christmas Eve 1998 ice storm caused over 17 million dollars of damage and wide-

spread transportation problems. The winter of 95-96 saw many areas of the Southeastern U.S. experiencing a number of very heavy snow and ice storms. Heavy snow or ice can trap people in their homes or automobiles. People are inconvenienced, injured or even killed.

Even without snow or ice, intense cold can injure or kill before a person is aware they are at risk. Fatalities from hypothermia have occurred in air temperatures of 40-50 degrees. Persons with certain chronic health conditions and those over 65 are more at risk for hypothermia, **even within the home.**

One hazard we do not often associate with winter is flooding. Floods occur when too much rain or melted snow fill river or creek basins too quickly. Along Tennessee's rivers and streams, flooding is a natural part of life and most common during winter and early spring. Frozen ground, sparse vegetation, and less evaporation are all factors that allow water to run off the land and reach the rivers quickly during the cold months.

The States of Virginia and North Carolina will highlight Winter Awareness during the week of December 2nd-8th. The National Weather Service in Morristown and the Tennessee State Emergency management Agency will highlight November 13th-15th to bring these hazards to the attention of the public. We will be sending information through our communications network including the National Weather Service's NOAA Weather Radio during this period. We hope you will all join in this effort to make this the safest winter possible.

From the Meteorologist in Charge—George Mathews

Winters are Always Interesting

With the approach of Winter, we all feel a little excitement in the air--will we get hammered with a big snow storm, ice storm, or other crazy weather? I think we all hope we're ready at home for a big winter storm and of course we're preparing for winter here at the NWS. A few years ago, our training would consist of refreshing ourselves with some of the old forecasting techniques and rules of thumb and going over our operational guidelines, etc. Usually, we would depend on a few minor events in November in the higher terrain to get us ready for the bigger storms in the heart of the Winter. Now we're fortunate to actually train on real winter weather with our Weather Event Simulator (WES) from Winter storms in previous years in our area or from somewhere else. This simulator is essentially a mock-up of one of our workstations that plays incoming weather information of an event from a previous Winter. Getting to actually go through the processes of analyzing and forecasting a real (recorded) event with real data is priceless. We're going through our paces with our training right now--practicing forecasting winter storms before the first snowflake has landed on top of ol' Smoky. One twist this year is that we are also training on forecasting extreme wind events in the mountains and foothills. David Gaffin, one of our Senior Forecasters, has

been researching mountain wind events, and we're applying what he has learned in his research to our training.

More Snow in the Forecast this Winter

Okay, did that get your attention??? This winter we're adding another 24 hours to our actual snow forecast (that's what I mean in the title above--we'll be offering more forecasting of snow). Last year, the snow accumulation forecasting extended out to 48 hours, so our forecast issued at 4pm on Monday would potentially address snow accumulations through Wednesday. Of course, our forecast might mention snow in the forecast for Friday (four days away), but accumulations were not included. For this Winter we will add another "day" and "night" period to pass along accumulations. In the example above (forecast issued Monday afternoon), the snow accumulation would also be included (as needed) for Wednesday Night and Thursday. Since this is pretty far-reaching and winter forecasting can be very challenging, this part of the forecast will not be numerical, rather it will be qualitative, with phrases such as, "heavy snow accumulations possible", etc. The actual numerical snow accumulation forecast is set for the first three periods, so once again, in the example of the forecast issued on Monday afternoon, the forecast for Tuesday Night would be the last one mentioning numerical accumulations. And by the way, the prescribed way of measuring snow is to sample ten locations in your yard and

Know the Threat!!

Snow and Freezing Rain

Heavy snow and/or freezing rain can immobilize a region and paralyze a city. Accumulations of snow can collapse buildings and knock down trees and power lines. Rural areas may be isolated for days. It is recommended that each household have provisions and the ability to remain self-sufficient for at least 3 days without power, or help, as it may take this long to reopen main roads and reestablish vital services.

Hypothermia

Warning Signs

Uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness and apparent exhaustion.

Detection

Take the person's temperature. If below 95 degrees F, immediately seek medical care. This is a life threatening situation. If care is not immediately available, begin warming the person slowly. Warm the core first. Get the person into warm clothing and wrap them in a warm blanket covering the head and neck. Do not give the person alcohol, drugs, coffee, or any very hot beverage or food, warm broth is better. Do not warm the extremities first, this drives cold blood toward the heart and may cause heart failure.

Flooding

Winter is approaching and in addition to being cold and possibly snowy, it's also the flood season. Leaves are beginning to fall off the trees, and the ground will either freeze or potentially become substantially wet. Leaves trap rain and regulate the rate at which it hits the ground and sinks in. Less leaves = more rain hitting the ground faster. Wet or frozen soils can hold much less water than dry ones, and so more water hitting the ground means more runoff, instead of percolating down into the water table. More runoff = more flooding.

The summer of 2005 was relatively wet, however late summer into fall has been pretty dry. The overall rainfall for the year 2005 to date has been much below normal over most of the area. Hence, soils are dry and there is more room for water storage in the reservoirs and water table than in normally available. The outlook for autumn and early winter flooding is lower than normal. BUT...remember that one or two big rainfall events around these parts can change that pic-

Wind Chill

Wind Chill is based on the rate of heat loss from exposed skin caused by the combined effects of wind and cold. As the wind increases, heat is carried away from the body at an accelerated rate, driving down the body temperature. Animals are also affected by wind chill. The biggest question that always comes up with wind chill is, does it affect water pipes and car radiators. The answer is no, the accelerated loss of heat occurs on exposed skin only.

Frostbite

Frostbite is damage to body tissue caused by the tissue being frozen. Frostbite causes the loss of feeling and a white or pale appearance in extremities, such as fingers, toes, earlobes, or the tip of the nose. If symptoms are detected, get medical help IMMEDIATELY. If you must wait for help, slowly re-warm affected areas. If the person is also showing signs of hypothermia, warm the body core before the extremities.

ture completely. Remember the autumn of 2004 when four tropical storms moved across the region and soaked us down good. You always need to be on the lookout for potential flood problems. Even very dry top soil will enable flooding if enough rain falls at once.

Rules of safety in rain events are:

- Keep an eye on bodies of water at all times
- Pay attention to the weather where you are AND upstream from you
- NEVER drive through water running over the road
- Even after the rain, flooding may have secretly undermined roads beds

If you come to a closed or flooded road, TURN AROUND! DON'T DROWN! Don't make law enforcement officials have to go looking for you next of kin.

If you follow these simple rules, you will never have to say, "The flood came up so fast, we had no warning!"

Before the Storm—Know the Terms

A **Winter Weather Advisory** is issued when ice or snow is expected to hinder travel, but conditions are not serious enough to require warnings.

Freezing rain is forecast when expected rain is likely to freeze as soon as it strikes the ground, potentially creating a coat of ice on roads and walkways. Sleet consists of small particles of ice mixed with rain. Sleet causes roads to freeze and become slippery.

A **Winter Storm Watch** means that severe winter weather is possible within the next

day or two.

A **Winter Storm Warning** means that severe winter weather conditions are expected within the next 24 hours. A blizzard warning means that heavy snow and winds of 35 mph or more are expected.

Be Prepared – Keep a battery powered radio and flashlights in working order, stock extra batteries.



Before the Storm—Preparations

Be Prepared – Keep a battery powered radio and flashlights in working order, stock extra batteries.

Store drinking water and have food that can be prepared without an electric or gas stove. Stock emergency water and cooking supplies. Have candles and matches available in case of a power outage. Be careful how you use them.

Be certain that needed medications are available.

Be Prepared for isolation at home – Make sure you have sufficient heating fuel; regular fuel sources may be cut off. Have some kind of emergency heating equipment and

fuel so that you can keep at least one room warm, but do NOT use a gas fired grill inside the home. Take measures to protect plumbing from freezing. Contact local utilities for winter tips.

Keep your car or truck “winterized” - Winterizing includes being certain about antifreeze protection levels and use a gasoline additive to reduce gasoline freezing. Carry a “Winter Car Kit” that includes high energy foods, a windshield scraper, flashlight, tow rope or chain, shovel, tire chains, blanket, bag of sand or salt, fluorescent distress flag and an emergency flare – all in case you’re trapped in your vehicle by a winter storm. Keep extra gloves, mittens, hats, earmuffs and outerwear in the vehicle throughout the winter.



During the Storm

Stay Informed – Listen to radio or television for updates on weather conditions. With early warning, you may avoid being caught in the storm, or at least be better prepared to cope with it.

Dress for the season : Avoid getting wet – Many layers of thin clothing are warmer than a single layer of thick clothing. Mittens are warmer than gloves. Wear a hat; most body heat is lost through the top of the head. Cover your mouth to protect lungs; don't directly inhale extremely cold air.

Overexertion can bring on a heart attack – a major cause of death during and after winter storms – If shoveling snow isn't critical, don't do it. If you must shovel, don't overexert yourself.

If you are isolated at home – Conserve fuel by keeping your house cooler than usual and by "closing off" heat to some rooms. When kerosene heaters are used, maintain ventilation to avoid toxic fumes. Use only the fuel recommended by the

manufacturer and follow operating instructions. Use a carbon-monoxide detector/ alarm and a smoke alarm.

Do Not Drive into Worsening Conditions – If you must travel, take winter driving seriously. Travel by daylight, and keep others informed of your schedule. Drive with extreme caution. Never try to save time by driving fast or by using back-road shortcuts.

If a Blizzard traps you in your vehicle – Pull off the highway, stay calm and remain in your vehicle where rescuers are most likely to find you. Set your directional lights to "flashing" and hang a cloth or distress flag from the radio antenna or window.

Do not set out on foot unless you can see a building close by where you know you can take shelter. Be careful: distances are distorted by blowing snow. A building may seem close, but actually may be too far away to walk to in deep snow.

Trapped in a Vehicle

If you run the engine to keep warm, open a window slightly for ventilation. This will help protect you from possible carbon monoxide poisoning. Periodically clear away snow from the exhaust pipe.

Exercise to maintain body heat, but avoid overexertion. In extreme cold, use road maps, seat covers, and floor mats for insulation. Huddle with passengers and use your coats as blankets.

Never let everyone in the car sleep at one time. One person should always be awake to look out for rescue crews.

Be careful not to use up all battery power. Balance electrical energy needs – the use of lights, heat and radio with supply. At

night, turn on the inside dome light, so work crews can spot you.



If in a remote area:

Spread a large cloth or the vehicle floor mats on the snow to attract rescue personnel who may be surveying the area from above. Once the blizzard passes, you may need to leave the car and proceed on foot to better shelter.

Keeping in Touch After any disaster, friends, relatives, insurance adjusters, etc. may need to locate you and your family. The following tips may reduce the confusion associated with making contact:

Evacuations

(1) Before evacuating your home, establish a contact person (and phone number) out of the potential disaster area where friends and relatives should “check-in” with each other.

(2) When you evacuate, consider leaving a note, securely attached to the front door, telling where you can be reached – but only if you have reason to believe someone might come looking for you.

(3) If widespread damage occurs, insurance adjusters or others might have trouble identifying your home or finding you. After the danger is over, therefore, consider spray painting the following information somewhere that is highly visible: Name, address, insurance company, policy number and contact number

| | December | January | February | Season |
|---------------------------|----------|---------|----------|--------|
| <u>Bristol</u> | | | | |
| Normal High Temp | 47.8 | 44.1 | 48.9 | 46.9 |
| Normal Low Temps | 26.8 | 24.3 | 27.0 | 26.0 |
| Normal Temperatures | 37.3 | 34.2 | 38.0 | 36.5 |
| Normal Precipitation | 3.39 | 3.52 | 3.40 | 10.31 |
| Normal Snowfall | 2.2 | 5.5 | 4.1 | 11.8 |
| <u>Knoxville</u> | | | | |
| Normal High Temperature | 49.8 | 46.3 | 51.7 | 49.3 |
| Normal Low Temperature | 31.9 | 28.9 | 31.8 | 30.9 |
| Normal Temperature | 40.9 | 37.6 | 41.8 | 40.1 |
| Normal Precipitation | 4.49 | 4.57 | 4.01 | 13.07 |
| Normal Snowfall | 0.7 | 3.7 | 3.0 | 7.4 |
| <u>Chattanooga</u> | | | | |
| Normal High Temperature | 52.0 | 48.8 | 54.1 | 51.6 |
| Normal Low Temperature | 32.7 | 29.9 | 32.6 | 31.7 |
| Normal Temperature | 42.4 | 39.4 | 43.4 | 41.7 |
| Normal Precipitation | 4.81 | 5.40 | 4.85 | 15.06 |
| Normal Snowfall | 0.1 | 2.0 | 1.3 | 3.4 |

Records

All Time Cold Temperatures

| | | | |
|-------------|-----|-------------------------|-----------|
| Chattanooga | -10 | Feb 13, 1899, 1/31/1966 | 1/21/1985 |
| Knoxville | -24 | Jan 21, 1985 | |
| Tri-Cities | -21 | Jan 21, 1985 | |

Coldest Average Winter

| | | |
|-------------|------|------------------|
| Chattanooga | 34.8 | 1962-63 |
| Knoxville | 34.2 | 1963-64 |
| Tri-Cities | 30.0 | 1976-77, 1977-78 |

Coldest Monthly Average

| | Dec | Jan | Feb | Mar |
|-------------|------|------|------|------|
| Chattanooga | 34.3 | 1917 | 28.5 | 1977 |
| Knoxville | 29.2 | 1876 | 26.7 | 1940 |
| Tri-Cities | 27.8 | 1963 | 22.1 | 1977 |

Snowfall

| | Dec | Jan | Feb | Mar | Seasonal |
|-------------|------|------|------|------|----------|
| Chattanooga | 14.8 | 1886 | 15.8 | 1893 | 17.3 |
| Knoxville | 25.4 | 1886 | 15.1 | 1962 | 25.7 |
| Tri-Cities | 12.9 | 1963 | 22.1 | 1966 | 20.4 |

24 Hour Snowfall

| | | | | | | | | |
|-------------|------|------|------|------|------|------|------|------|
| Chattanooga | 12.0 | 1886 | 10.2 | 1988 | 9.9 | 1912 | 20.0 | 1993 |
| Knoxville | 8.9 | 1969 | 12.0 | 1962 | 17.5 | 1960 | 14.1 | 1993 |
| Tri-Cities | 9.6 | 1969 | 13.0 | 1996 | 11.5 | 1996 | 14.2 | 1993 |

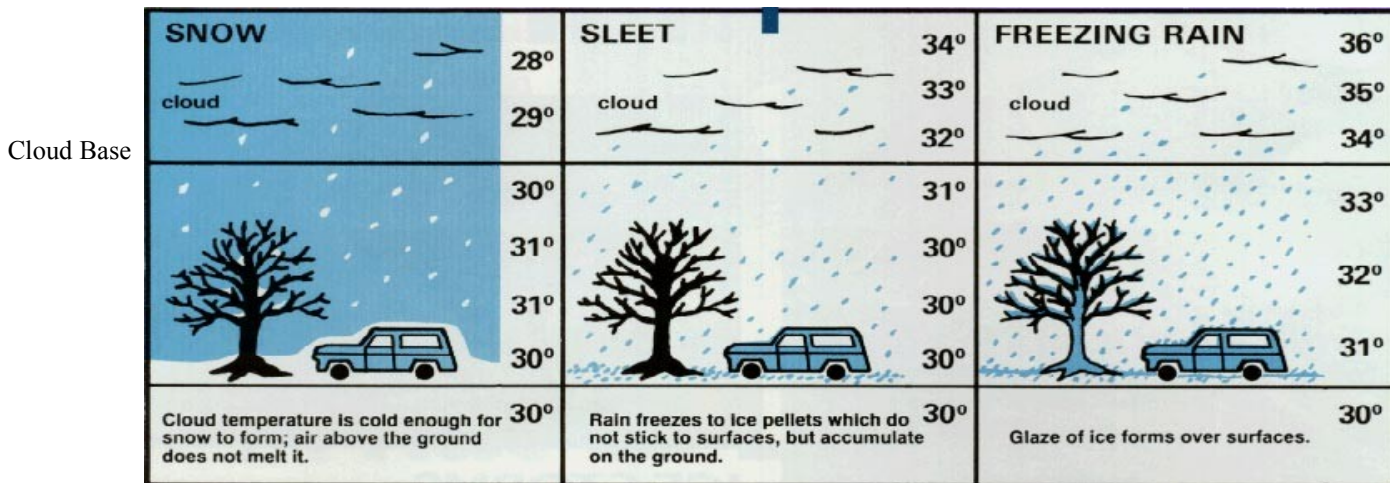
average the measurements--and then, of course, report it in to us. :-)

Forecast for Winter--Smoky!?!

Every Winter is a little different. We at the National Weather Service in Morristown are hoping conditions this Winter aren't extremely different but fear they could be--in a bad way. Of course, in the Winter half of the year, roughly October through March, conditions are much windier than in the Summer half of the year. Cold fronts can bring gusty winds and drier air that can whip up leaves, and dust, and even a kid's homework (if they don't have a good grip on it!). I usually think of Winter as a cleansing time of year that nature's plants get to rest and the air is pure and crisp. Well, with one of the worst droughts to hit this area in many people's lifetimes, there is more dust in the air but even important and much more imposing, is the fact that there is much less water in the wood and leaves on the forest floor. For all the dry "fuels" in the area, it has been hauntingly quiet on the wildfire front this Fall, and I fear that could all change if the wrong combination of wind, dry air, and cigarette butts hit all at once.

As you probably know, there are live plants and dead plants, generally live, green plants don't burn (until they get baked by an on-going fire), it's the dead wood, and grass, and leaves we have to worry about. These are all called fuels by forestry agencies and fire fighters, because they are fuels for a fire. As the humidity rises and falls so does the amount of water stored in these dead fuels. Small fuels like dead grass breathe this humidity in and out of its fibers very quickly, but large fuels like large tree limbs or fallen whole trees can take weeks or months to react to changes in moisture. This year's drought and several years of overall dryness have contributed to some of the driest large fuels ever recorded. So, even if the rains pick back up over the next couple of months, these large fuels

Continued on Page 12



Snow

Flurries: Light snow falling for short durations. No accumulation or light dusting is all that is expected.

Showers: Snow falling at varying intensities for brief periods of time. Some accumulation is possible.

Squalls: Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant. Snow squalls are best known in the Great Lakes region.

Blowing Snow: Wind driven snow that reduces visibility and causes significant drifting. Blowing snow may be snow that is falling and/or loose snow on the ground that is picked up by the wind.

Blizzard: Winds over 35 mph with snow and blowing snow reducing visibility to near zero.

Sleet

Rain drops that freeze into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects. However, it can accumulate like snow and cause a hazard to motorist.

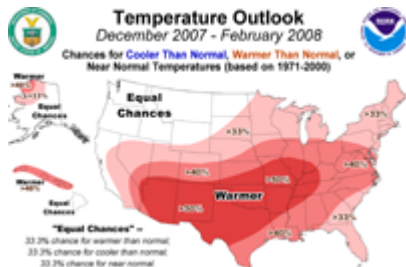
Freezing Rain

Rain that falls onto a surface with a temperature below freezing. This causes it to freeze to surfaces, such as trees, cars, and roads, forming a coating or glaze of ice. Even small accumulations of ice can cause a significant hazard.

NOAA Reports U.S. Likely to Have Above-Average Winter Temperatures

La Niña Arrives, Southern Drought Concerns Intensify

October 9, 2007



U.S. Temperature Outlook, December 2007 - February 2008.

NOAA forecasters are calling for above-average temperatures over most of the country and a continuation of drier-than-average conditions across already drought-stricken parts of the Southwest and Southeast in its winter outlook for the United States, announced at the 2007-2008 Winter Fuels Outlook Conference in Washington, D.C., today.

“La Niña is here, with a weak-to-moderate event likely to persist through the winter,” said Michael Halpert, head of forecast operations and acting deputy director of NOAA’s Climate Prediction Center. “The big concern this winter may be the persistence of drought across large parts of the already parched South. And while December through February is likely to be another milder-than-average winter for much of the country, people should still expect some bouts of winter weather.”

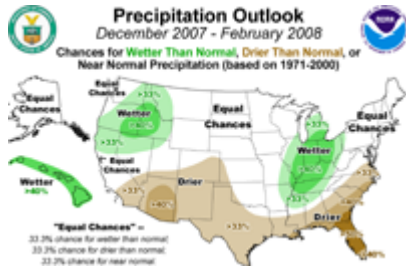
For the 2007-2008 U.S. winter, from December through February, NOAA seasonal forecasters predict:



Sea surface temperatures, January 1, 2007 - October 3, 2007. Purple and blue colors represent lower-than-average sea surface temperatures.

- In the Northeast and the Mid-Atlantic, temperatures are expected to be above average in response to the long-term warming trend. Snowfall for the region will depend on other climate factors, which are difficult to anticipate more than one-to-two weeks in advance.
 - The drought-plagued Southeast is likely to remain drier-than-average due to La Niña, while temperatures are expected to be above average.
 - In the Great Lakes and Tennessee Valley, temperatures and precipitation should be above average.
 - The south-central Plains should see drier-than-average conditions and warmer-than-average temperatures. Above-average temperatures are also expected in the central Plains. The northern Plains has equal chances of above-, near-, or below-average temperature and precipitation.
 - In the Northwest, there are equal chances for above-, near-, or below-average temperatures. Precipitation should be above average in much of the region due to La Niña.
- Drought conditions are expected to persist in the Southwest due to La Niña, and temperatures are likely to be above average.
 - Northern Alaska is expected to be milder-than-average, while the rest of Alaska has equal chances of above-, near-, or below-average temperatures and precipitation. In Hawaii, temperatures and precipitation are expected to be above average.

For more information contact the National Weather Service at (423) 586-3771 or e-mail Howard.waldron@noaa.gov, regular mail 5974 Commerce Blvd; Morristown, TN 37814, or your **LOCAL** Emergency Management Director. 9



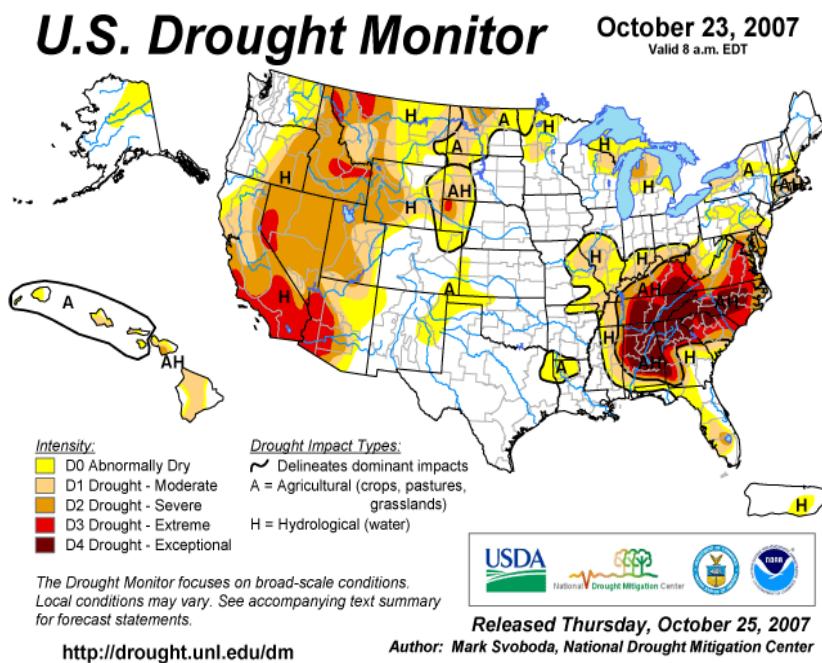
U.S. Precipitation Outlook, December 2007 - February 2008.

15 at 8:30 a.m. Eastern Time.

NOAA is dedicated to enhancing economic security and national safety through the prediction and research of weather and climate-related events and information service delivery for transportation, and by providing environmental stewardship of our nation's coastal and marine resources. Through the emerging Global Earth Observation System of Systems (GEOSS). NOAA is working with its federal partners, more than 70 countries and the European Commission to develop a global monitoring network that is as integrated as the planet it observes, predicts and protects.

This winter is predicted to be warmer than the 30-year norm. For the country as a whole, NOAA's heating degree day forecast for December through February projects a 2.8 percent warmer winter than the 30-year normal, but a 1.3 percent cooler winter than last year.

The U.S. winter outlook is produced by a team of scientists at the Climate Prediction Center in association with NOAA-funded partners. Scientists base this forecast on long-term climate trends and a variety of forecast tools from statistical techniques to extremely complex dynamical ocean-atmosphere coupled models and composites. The outlook will be updated on Oct. 18 and again on Nov.



Drought

East and most of Middle Tennessee has been experiencing exceptional drought for most of the fall. This condition has brought significant hardship to many areas including impacts on agriculture and some drinking wells including municipal water sources have been impacted. As we move into the winter we may see some slight improvement, but with the overall forecast for the winter being drier than normal, that relief may be relatively minor.

FIRE SITUATION...

RECENT RAINS HAVE IMPROVED THE FIRE POTENTIAL SITUATION GREATLY. HOWEVER, ANY LAPSE IN RAINFALL WILL ALLOW DRYING TO RE-COMMENCE. PLEASE USE CAUTION WHEN LIGHTING ANY FIRES, AND OBTAIN ALL NECESSARY PERMITS IF REQUIRED BY LAW. LAST, REMEMBER THAT MANY FIRES ARE STARTED BY CARELESSNESS SUCH AS TOSSING CIGARETTES OUT THE WINDOWS OF CARS.

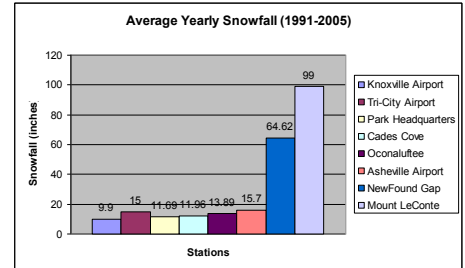
Great Smoky Mountain National Park Snowfall Analysis

by David Hotz

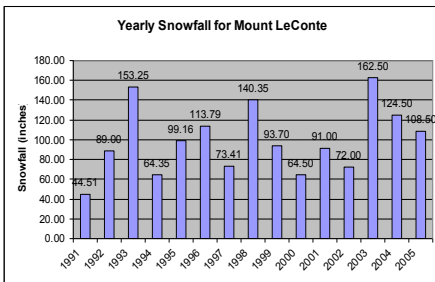
The Great Smoky Mountain National Park contains some of the most diverse terrain in the eastern United States. Elevations in the park range from 875 to 6,643 feet. The National Weather Service Office at Morristown has the responsibility for issuing forecasts for the Tennessee side of the park. The GSMNP is one of the most visited national parks in the United States with a variety of outside activities, such as hiking, camping, fishing, and sightseeing.

The main road across the park is U.S. highway 441, which crosses NewFound Gap at an elevation of 5048 feet MSL.

The average yearly snowfall shows a large variation between the lower terrain stations, such as Park Headquarters, and the higher terrain stations, such as NewFound Gap and Mount Le-Conte. The difference between Park Headquarters and Mount LeConte is around 90 inches. The lower terrain locations receive an average yearly snowfall around 12 inches with Mount LeConte's average is nearly 100 inches.



The average snowfall for the park's lowest elevations stations, which are Park Headquarters and Cades Cove, is only about 2 inches more than the Knoxville Airport.



Mount LeConte average snowfall over the last 15 years is nearly 100 inches, but a graph of yearly snow accumulation shows a wide range. The minimum snowfall was less than 45 inches in 1991 with the greatest accumulations reported in 2003 with over 160 inches.

Snowfall data shows several years when the lower elevations stations received an inch or less of snow accumulation for the entire year. The least yearly snowfall was only a trace at Cades Cove in 1992 and Oconaluftee in 2005.

The snowiest year for the entire park was 1993, which was the year of the Super-Storm, with an overall average snowfall for the 5 stations being almost 75 inches. The year with the least snowfall was 1991 with a 5 station average of less than 20 inches.

The average number of days per year with snowfall of 1 inch or more varied from 4 and 5 across the lower elevation stations to 26 at Mount LeConte (Fig. 5). The yearly number of days of snowfall at NewFound Gap is around 19, which is similar to the normal 18 snowfall days at Minneapolis Saint Paul, Minnesota.

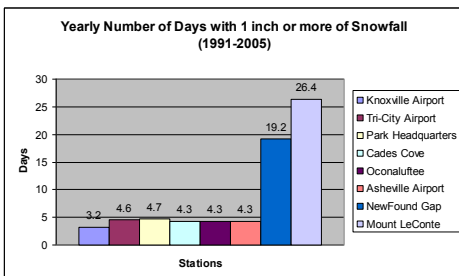
Monthly and Daily Snowfall

The monthly average snowfall shows a wide range from the lower elevation stations and the park higher terrain stations. Overall, the snowiest month across the park is January with the highest average monthly snowfall around 25 inches at Mount LeConte.

Only NewFound Gap and Mount LeConte reported snowfall in the months of May and October. The earliest snowfall for NewFound Gap is October 25th, which occurred in 2005, with 1.5 inches. The earliest for Mount Le-

Conte is October 19th, which occurred in 1996, with 0.1 inch. The latest snowfall for both NewFound Gap and Mount LeConte occurred on May 8-9th, 1992 with 4 and 12.5 inches, respectively.

| | Park Headquarters | Cades Cove | Oconaluftee | New-Found Gap | Mount Le-Conte |
|------|-------------------|------------|-------------|---------------|----------------|
| 1991 | 2.50 | 7.50 | 9.75 | 33.87 | 44.51 |
| 1992 | 1.00 | 0.00 | 1.00 | 50.25 | 89.00 |
| 1993 | 24.00 | 34.00 | 57.00 | 106.55 | 153.25 |
| 1994 | 7.75 | 10.75 | 2.25 | 45.25 | 64.35 |
| 1995 | 12.13 | 9.15 | 9.79 | 58.27 | 99.16 |
| 1996 | 29.84 | 36.29 | 29.96 | 90.03 | 113.79 |
| 1997 | 15.00 | 12.45 | 12.52 | 47.76 | 73.41 |
| 1998 | 15.70 | 5.75 | 4.25 | 77.75 | 140.35 |
| 1999 | 7.55 | 3.00 | 11.75 | 62.10 | 93.70 |
| 2000 | 9.00 | 8.05 | 17.70 | 45.60 | 64.50 |
| 2001 | 10.00 | 10.00 | 6.00 | 54.50 | 91.00 |
| 2002 | 6.20 | 5.50 | 6.00 | 43.50 | 72.00 |
| 2003 | 18.00 | 15.00 | 23.00 | 98.00 | 162.50 |
| 2004 | 5.00 | 10.00 | 3.50 | 88.50 | 124.50 |
| 2005 | 4.50 | 1.00 | 0.00 | 58.50 | 108.50 |



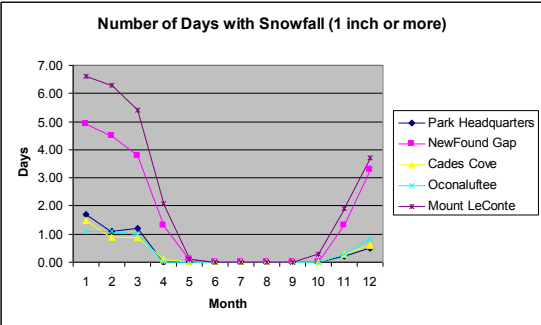
The latest first snowfall in the park occurred in Winter of 2001-2002. Mount LeConte did not receive its first measurable snow until December 24th, 2001 with only 0.5 inch. NewFound

Gap did not receive any measurable snow until January 7th, 2002.

The greatest number of days with snowfall of 1 inch or more is at the Mount LeConte station with an average of 7 days for the month of January (Fig. 6). NewFound Gap's greatest number of days with snowfall of 1 inch or more is 4.9 for the month of January. This number is comparable to the normal number of days of snowfall for January at Minneapolis Saint Paul, Minnesota, which is 4.5. The lower elevations stations, such as the Park Headquarters and Cades Cove, average between 1 and 1 1/2 days of 1 inch or more of snowfall for January through March. This is comparable to both the Tri-City and Asheville Airports.

| | Knoxville Airport | Tri-City Airport | Park Headquarters | Cades Cove | Oconaluftee | Asheville Airport | New-Found Gap | Mount Le-Conte |
|------------|-------------------|------------------|-------------------|------------|-------------|-------------------|---------------|----------------|
| Jan | 3.70 | 5.50 | 4.36 | 3.99 | 3.03 | 4.30 | 17.99 | 25.28 |
| Feb | 3.00 | 4.10 | 2.13 | 1.90 | 1.90 | 4.10 | 13.16 | 20.42 |
| Mar | 1.60 | 1.90 | 3.15 | 3.51 | 4.82 | 3.10 | 15.57 | 24.80 |
| Apr | 0.80 | 0.90 | 0.40 | 0.13 | 0.00 | 1.00 | 2.92 | 7.46 |
| May | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.27 | 0.83 |
| Oct | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.43 |
| Nov | 0.10 | 0.30 | 0.20 | 0.30 | 1.37 | 1.00 | 3.28 | 6.15 |
| Dec | 0.70 | 2.20 | 1.47 | 1.50 | 1.98 | 2.20 | 11.49 | 15.28 |

The greatest daily snowfall for each of the park stations was reported during the March 13-14th, 1993 Super-storm. Mount LeConte received over 30 inches on March 14th, 1993



Conclusions

The GSMNP has its own unique climatology with average snowfall varying greatly across the park. It is crucial for the visitors of the GSMNP to have an understanding of these wide variations in snowfall climatology across the park, especially the difference in average snowfall between Park Headquarters and the higher elevation locations, such as NewFound Gap and Mount LeConte.

Visitors of the GSMNP can get a false sense of security by the usually limited snowfall across the southern United States, but then get caught off guard by the potential heavy snowfalls over the higher terrain. Travelers and hikers through

the NewFound Gap should realize that the average snowfall is 62 inches, which is more than Boston, Massachusetts with an average of 43.8 inches or Chicago, Illinois with an average of 38 inches. The number of days per year with 1 inch of more of snowfall is also much greater at NewFound Gap with 19 days, then both Boston, Massachusetts and Chicago, Illinois which each average around 12 days.

The snowfall climatology at Mount LeConte is similar to Caribou, Maine. Both locations have an average annual snowfall around 100 inches with the average number of days per year with 1 inch or more of snow around 26 at Mount LeConte and 29 at Caribou, Maine.

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will probably be dry through the entire Winter. So, we certainly need to keep our guard up now with fuels of all shapes and sizes being dry and we probably need to keep that guard up right through the Spring. So, instead of a Winter that offers clean air and a time for nature to cool off from the long, hot Summer, will this Winter be filled with smoke and heat? Hopefully not, but the potential is certainly there. The most dangerous times are right now, while the fuels are still relatively warm, humidities low, and winds can get pretty gusty. (And the way this drought is going we might not have any water to fight the fire!) Let's all prepare for the worst and communicate safe and responsible activities related to working with any type of fire. Of course if there are any fires, we supply general Fire Weather Forecasts to show when weather conditions are more threatening for rapid spread of wildfires, and we can issue as-needed "spot" forecasts for wildfire support to help proactively deal with an on-going fire.

Thanks to all of you for supporting mission to save lives and property--we're here 24 hours a day for any weather concerns that threaten your mission. Let's continue to help each other through this Winter and through 2008! Have a safe and happy holiday season!

George Mathews