Mid-South Chronicle

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Weather Year in Review

By: Krissy Scotten

The year 2008 was very active as far as weather across the Midsouth. In 2007, there were only two tornadoes reported during the entire year! On January 8th, 2008, the Midsouth had already topped 2007's tornado total with five tornadoes reported across Northeast Arkansas and West Tennessee just on that day alone! If the early tornadoes were any indication of what was to come, no one could have anticipated the magnitude of the Super Tuesday Tornado Outbreak on February 5th. Several significant tornadoes not only swept through the Midsouth but across much of the Southeast. Winter reappeared in March with a significant snow storm followed by major river flooding that continued into April. The month of May experienced a few strong tornadoes while June had several minor wind events. July was the hottest month this year while August was well below normal temperature wise which was a pleasant surprise compared to the summer of 2007! Hurricane Ike brought strong winds to the Midsouth in September while a tornado touched down in the driest month, October. The secondary severe weather season was a quiet one with NO SEVERE WEATHER during the entire month of November! What happens in December is yet to come. We will just have to wait and see!

2008 Weather Year in Review for Memphis/Mid-South

January	February	March
29th - High Wind Event where a 59mph wind gust was recorded at Memphis International Airport.	**5th** - Super Tuesday Tornado Outbreak brought significant tornadoes to Memphis, Jackson TN, and Oxford MS.	**7th** - Heavy Snow Storm brought 3 to 9 inches of snow to the area.
April	**May**	**June**
Major River Flooding continued into the first half of April especially across Northeast Arkansas.	**2nd & 8th** - EF3 tornadoes occurred in Earle, AR (2nd) and Tupelo, MS (8th).	**1st** - Severe storms brought damaging winds and large hail to East Arkansas and North Mississippi.
July	**August**	**September**
29th - 101F was recorded at Memphis International Airport which was the highest temperature of the year.	No 100F or higher temperatures were recorded at Memphis, Tupelo, and Jackson during the month. Memphis observed 7.45 inches of rain in August.	**14th** - Hurricane Ike brought high winds to the Midsouth. Jonesboro Municipal Airport recorded a 62 mph wind gust.
October	**November**	**December**
7th - EF1 Tornado touched down near Pontotoc, Mississippi.	No severe weather reported during the entire month! November was unseasonably cold and dry for the area.	??? TO BE DETERMINED

Inside this issue:

How the National Weather Service Keeps Our Skies Safe

By: Doug Boyette

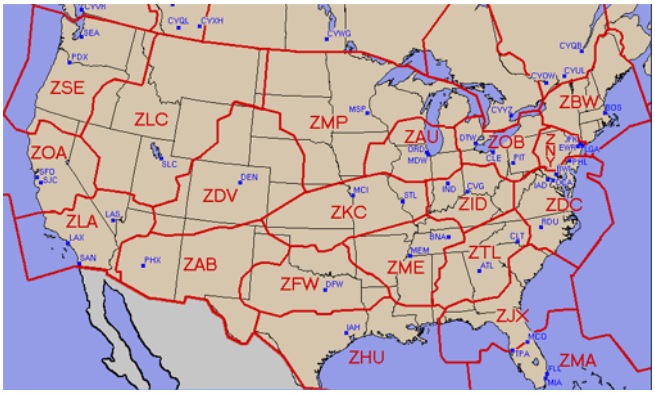
On a fateful Spring day in 1977 Southern Airways flight 242 departed Huntsville on a short-hop flight to Atlanta. Thunderstorms lay ahead, not unusual for April weather in the south. But the day would be far from usual.

Before reaching Atlanta the airplane encountered strong cells, most of them visible on the onboard weather radar concealed in the nose cone. The pilots were about to perform a bob-n-weave routine they'd done many times before, avoiding the heaviest cells and trying to get down and through safely. But the cells were a bit heavier than their radar was showing due to a phenomenon called attenuation, where the light rain they were flying in fooled the radar. What they thought was a "hole" between cells turned out to be a shaft of heavy rain and hail. Upon penetration both jet engines flamed out, leaving the pilots in a desperate attempt to get them restarted before time ran out. Sadly, they were too close to the ground and the aircraft glided down powerless and landed on a two-lane road in a neighborhood. Seventy souls perished.

Upon post-accident investigation the National Transportation Safety Board determined that up-to-date weather information was lacking in the decision-making process. Their finding was that weather dissemination to pilots could be greatly improved by inserting meteorologists directly into the FAA traffic control centers to provide face-to-face service. With the stroke of a pen the Center Weather Service Unit (CWSU) program was born.

CENTER WEATHER SERVICE UNITS

There are 21 CWSUs nationally, 20 in the "conus" and one in Alaska. CWSUs provide direct consultation to the en-route FAA decision-makers at these facilities and use direct access phone systems to keep remote facilities, such as Towers, informed of the latest weather changes.



Network of Air Route Traffic Control Centers—each has a CWSU. "ZME" is Memphis.

Memphis Center lies in the heart of America, meaning most of the air traffic worked by controllers is passing through on its way to major airline hubs at Dallas, Houston and Atlanta. Bad weather results in the preponderance of all delays nationally—in 2007 the figure was 76.9 percent—and this particularly applies to the southern United States. The Mid South region sees a significant amount of thunderstorms and severe weather every year, as much as any other part of the country.

CWSU Operations Desk in Memphis Center

The challenge of any CWSU forecaster, particularly those in the Memphis CWSU, is to accurately predict where and when these storms will form, how long they will last, how fast they will move, and how tall the storm tops will be--all several hours before they occur. It's a rather daunting task.

"Federal Express's worldwide package hub makes Memphis the busiest cargo airport in the world."

SPECIALIZED SERVICE

All things considered FAA planners require more precise weather information than required by the average citizen, although traffic planners are interested in shorter periods of time, often as narrow as the 0-2 hour range. Memphis forecasters monitor latest radar and satellite trends and use sophisticated computer predictions to estimate ground conditions in advising planners on short term weather changes. For longer term planning (2-6 hours) they participate in a process known as Collaborative Decision Making, or CDM. The weather component of CDM is called CCFP, or Collaborative Convective Forecast Product, which is a graphic depiction of thunderstorm coverage out to six hours. The product is derived through an on-line chat session held every two hours during the traditional "thunderstorm season". The final output gives FAA personnel at both the en-route and national facilities a good idea of where they might need to move aircraft to avoid the weather.

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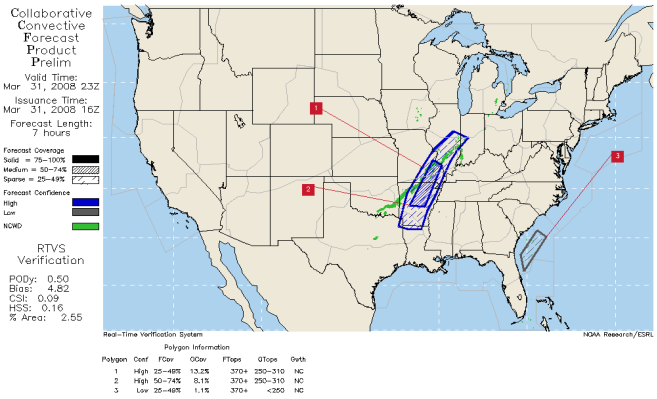
CONTINUED: How the National Weather Service Keeps Our Skies Safe



An example of a preliminary CCFP chart. Shadings represent coverage and confidence. Meteorologists through the National Airspace System use a chat session to comment on the product, which is produced by the NWS Aviation Weather Center and used by FAA air traffic planners

Problem is, the thunderstorm season never really ends in the MidSouth. This means forecasters must fill gaps in the loss of CCFP service during the "off-season" and as many know, some of the worst severe storms on record have slammed the Mid South during the winter months. Vigilance must remain high all year round.

Thunderstorms aren't the only weather that contributes to hazards and delays. Low clouds and fog, icing, turbulence, and strong or shifting winds can produce as many headaches for traffic managers if heavy fog slows down landing rates or severe turbulence constricts en-route airspace. Additionally, if surface winds shift unexpectedly during a busy airport landing period the result will be delays and wasted fuel from having to reconfigure approach patterns.

Working with other NWS facilities, such as the Memphis Weather Forecast Office, CWSU forecasters assess information pass along their best estimates of the onset or ending of hazardous conditions, which are factored into FAA estimates of how many aircraft can land at a given airport per hour or use the same slice of en-route airspace. Erroneous forecasts can not only lead to holding and delays but if bad enough to "near misses" or worse. The job of FAA Traffic Managers is to spread out the traffic so as to avoid these events but to do so they need quality input from the forecasters. The pressure is always on when bad weather is present.

CARGO HUB

Federal Express's worldwide package hub makes Memphis the busiest cargo airport in the world. Upwards of 130 aircraft arrive in a short period Monday through Friday evenings, which puts a strain on air traffic controllers during the best of conditions. Deteriorating weather, especially if unexpected, can cost millions of dollars and result in important packages and letters not getting to their destination on time.

To make things work smoothly, it requires accurate and early planning, which begins around 6:00pm. CWSU forecasters work with the various Memphis facilities to provide the best input into these traffic plans, updating and advising accordingly as the night goes on.

OUTREACH

Not all weather delivery remains inside, though. The Memphis CWSU is involved with NWS forecasters at the main Memphis office, FAA Safety personnel, commercial airline pilots, and volunteers from the private sector in providing weather seminars to regional pilots and other interested personnel through the Aviation Team of the Mid South, referred to as ATOMS. These events promote weather awareness and flight safety.

Memphis CWSU forecaster staffs booth at Aviation Career Day 2006.

IN CONCLUSION

America's last major weather-related aviation disaster was nine years ago. No doubt better training for pilots, improved technology in FAA facilities, and better awareness of hazards has played a major role in reducing accidents, technology such as terminal wind shear and microburst depictions and 3D renderings of radar information, such as the commercial Gibson Ridge (GR)-2 Analyst program.

But one would be remiss to ignore the consistent face-to-face support provided by CWSU meteorologists when discussing this safety record. The availability of an on-site forecaster immersed in the business of air traffic control becomes critical when aircraft are moving at 300-600 mph and conditions are rapidly changing. In sum, the bottom line is a safer flight for taxpayers and visitors flying through the skies of America.

Hey! Are you a Meteorologist with the National Weather Service? What does it take to get a job like that?

By: Jim Belles

We've heard it all – "You guys are really lucky because you only need to be accurate half the time and you still have a job!" Well, it's not all that bad, but perhaps you were wondering what the qualifications are for becoming a meteorologist with the National Weather Service.

Although it may not seem like it, meteorology is a physical science. Because the atmosphere behaves like a fluid of water it's important to have an understanding of mathematics and physics to describe how it flows across the Earth. For meteorologists, we use mathematical equations to help predict where the "fluid of air" will go. After all, it's kind of like trying to predict where a leaf is going to be three days from now as it flows down the Mississippi River. Ever heard of the Jet Stream?

Ok, it can be complicated, if not impossible to predict precisely, but amazingly our science is able to track storms reasonably well. So, what kind of experience and education does it take to issue a tornado warning or predict a winter storm? For service as a government meteorologist you need a college degree in meteorology or a combination of education and experience. The course work requires a fair amount of mathematics and physics. And that's before you take the heart of your course work in meteorology. Why so much math? Math is the language of science and is used to describe physical processes.

For those interested, we've included some of the courses one must take:

- Weather Analysis & Prediction of Weather Systems
- Atmospherics Dynamics
- Atmospherics Thermodynamics
- Physical Meteorology
- Remote Sensing
- Calculus and Ordinary Differential Equations
- Physics

We also need three electives that may cover the following areas: Physical climatology, radiative transfer, aeronomy, advanced thermodynamics, advanced electricity and magnetism, light and optics, computer science.

What fun! After all that course work you'll be ready to issue you first flash flood warning! Well, not exactly. You'll need some time, maybe a year or so, gaining experience at a weather office before you can make that decision, but you're on your way to becoming a National Weather Service meteorologist!

Spotter of the Half Year: Robert McLaughlin

By: Krissy Scotten

1. Why are you a Skywarn Storm Spotter?

I love the weather!! As well as helping people, if I could save one life with my abilities of storm spotting, I feel it would ALL be worth it. I have always sat there at the computer looking at the weather, and giving my own forecast, to see if I could predict the weather, and believe it or not, I get pretty close ALOT.

2. What is the most interesting weather event you have experienced?

I have been through several tornadoes and have volunteered in several hurricanes. The most interesting I believe would have to be the 3 tornadoes that I have volunteered that went through Madison County over the past several years. I believe that's just because they was right here in my backyard.

3.Where are you from and where do you currently reside?

I am originally from Ft. Myers, Florida in Lee County. I reside in Alamo, Tennessee in Crockett County.

Left to right: Randy Smith (KI4OAS), Robert McLaughlin - Spotter of the Half Year (KI4WKW), and Andy Russell (KJ4CLS) from the Skywarn group in Crockett County, TN.

4. How does your community react when severe weather threatens the area?

We as a group here in Crockett County, try to be in our positions well before the storm reaches our area. This way I feel we can be the most ready for the event. We can watch as it comes in, and we will have tracks of the event before it gets to our county.

5. If you had one piece of advice for amateur storm spotters, what would it be?

Don't be afraid to get involved, there are great teachers everywhere. I love to help people, and I love the weather, so when you put them both together you get the best of both worlds with Amateur Spotters. You also get to know GREAT people like I have here. One has to be ready, but never try it alone, look for guys like my friends.

Presidential Debate Decision Support By Richard Okulski

The National Weather Service's office in Memphis, Tennessee provided "on site" decision support for the Mississippi Emergency Management Agency's Presidential Debate emergency response role in Oxford, Mississippi on September 25-26, 2008.

WCM Richard Okulski deployed to the Mississippi State Mobile Emergency Operations Center (EOC) to provide weather watch and site specific forecasts. He was prepared to provide "stand up" briefings as requested by the EOC staff and other decision makers.

Richard and other WFO Memphis emergency response meteorologists deploy with a laptop personal computer with "AWIPS emulator" or FX-Net software and a portable printer. The office can also deploy a portable weather station as the situation dictates. Each WFO Memphis emergency response meteorologist has received FEMA sponsored Incident Command System training.

The weather was dry with near normal temperatures during Richard's deployment. Richard integrated into the Mobile EOC team, provided site specific forecasts for the team's Incident Action Plan and hourly observations for the Oxford Fire Department for potential HAZMAT concerns.

Pictured Above: WCM Rich Okulski on site at the Presidential Debate in Oxford, MS.
Pictured Below: Mississippi Emergency Management Agency's Mobile Operations Center.

Recent HAZMAT Exercises By Andy Sniezak

The National Weather Service in Memphis participated in a two day HAZMAT training exercise on July 29 & 30 at Horn Lake High School in Horn Lake, Mississippi. The exercise on July 29 was run by the Mississippi Army National Guard's 47th Civil Support Team while the exercise on July 30 was run by the DeSoto County Emergency Management Agency. The exercise for both days was similar in that a scenario where terrorists overtake a school where church campers were staying. The terrorists take hostages and eventually they release some hazardous materials before being captured.

On the first day of the exercise, the Mississippi Army National Guard had a Davis Weather Station set up at the site so wind, temperature, and humidity data were available on a real time basis. We were able to test our office satellite phone and made a successful phone call from the office to the site. The Mississippi Army National Guard also had a person on site whose specific job was to deal with plume modeling.

If you are planning a HAZMAT exercise, the National Weather Service would like to participate! Please contact Rich Okulski at: (901) 544-0401 or Richard.Okulski@noaa.gov

The DeSoto County Emergency Management Agency (EMA) did not have as much equipment for their exercise on July 30. There was no weather equipment at the site so any wind, temperature and humidity data had to be accessed through the internet. In addition, the exercise on July 30 was on a smaller time scale. Both exercises allowed the National Weather Service to practice for HAZMAT situations as well.

Teaching Weather to Teachers By: Thomas Salem Jr.

The National Weather Service office in Memphis helps area pre-college level teachers learn about the weather through a graduate level course offered through the American Meteorological Society and the State University of New York at Brockport. The course is entitled DataStreme Atmosphere. The teachers learn about the circulation of the atmosphere, how temperature and pressure are related, and how to read weather charts. The teachers are encouraged to promote the teaching of science, mathematics and technology using weather as a vehicle, across the K-12 curriculum. The classes are offered twice a year (the fall semester, starts in August, and the spring semester, starts in January). The course is 12 weeks long, with assignments each week. The teachers are in contact with a mentor who ensures the teacher understands the material. The mentors form a local team and consist of teachers and meteorologist from the National Weather Service. Everyone gets together about 3 times during the semester.

If you would like to learn more about the DataStreme Atmosphere course you can check out the web site at http://www.ametsoc.org/amsedu/DataStremeFrames.html. The list of the local team leaders can be found at http://www.ametsoc.org/amsedu/dstreme/extras/leaders.html. If you want you can call the National Weather Service office in Memphis and find out more by asking for Tom Salem, (901) 544-0399 ext 224.

StormReady By: Anthony Cavallucci

StormReady is a National Weather Service program created to help communities prepare for severe weather. The goal of the StormReady program is to improve communication and weather preparedness, and it gives clear guidance to emergency managers on improving their hazardous weather operations.

StormReady communities are better prepared to save lives from the onslaught of severe weather through better planning, education, and awareness. No community is storm proof, but StormReady can help communities save lives.

To become officially StormReady, a community must:

- *Establish a 24 hour warning point and emergency operations center.
- *Have more than one way to receive severe weather warnings and forecasts to alert the public
- *Several ways to monitor local weather
- *Promote the importance of public readiness through community seminars.
- *Develop a formal hazardous weather plan, which includes training severe weather spotters and holding emergency exercises.

For additional information please contact Anthony Cavallucci at the National Weather Service Office in Memphis or visit the StormReady http://www.stormready.noaa.gov where you can submit an online application.

NOAA Weather Radio Drive By: Rich Okulski

Warning Coordination Meteorologist Rich Okulski took part in a NOAA Weather Radio Programming Drive at a Kroger's Grocery Store in Jackson, TN on November 13, 2008. The other participants included Bruce Thomas from Midland Weather Radio, WBBJ-TV out of Jackson TN, and Madison County Emergency Management. Madison County Mayor Jimmy Harris also made a 30 minute appearance. Coincidentally, Mayor Harris was elected the night of Super Tuesday Tornado Outbreak on February 5, 2008.

Kroger sold around 400 NOAA Weather Radios in 2 and 1/2 hours. They had 300 radios in stock and made a run to another store for an additional 140 radios. Bruce Thomas, Madison County Emergency Management Office, and Rich Okulski from the National Weather Service programmed the radios outside the store after citizens purchased a NOAA Weather Radio. WBBJ-TV shot live footage of the programming. The National Weather Service was supposed to give an interview, however the line was non-stop from 430 pm to 7 pm!

There will be three more programming events prior to the holiday season. The goal is to sell and program between 1500 and 2000 NOAA Weather Radios.

From Left to Right: WCM Rich Okulski, Madison County Emergency Manager Marty Clements, Bruce Thomas from Midland Weather Radio, and Madison County Mayor Jimmy Harris

Farewell to New Texan Todd Beal

Meteorologist Intern Todd Beal recently departed the National Weather Service Office in Memphis for Amarillo, Texas. Todd was selected for a promotion to a Journeyman Forecaster position in August.

Todd, who is originally from the Memphis area, graduated from Mississippi State University with a Bachelor's and Masters Degree in Meteorology. Even though Todd was born and raised in the Midsouth, he loves to storm chase! Amarillo, Texas appealed to him with the flat terrain that allows thunderstorms to be seen for miles. It's very difficult and dangerous to chase tornadoes in the Midsouth, so now Todd will be much closer to storm chasing land!

Todd is pictured on the right in his new Texan hat during his farewell party. He is definitely missed especially his eagerness to cover midnight shifts!

GOOD LUCK TODD!

Meet Jim Branda

James (Jim) A. Branda, a native Wisconsinite and a retired Air Force Master Sergeant, joined the National Weather Service in December 2005. He was assigned to the Weather Forecast Office in Glasgow, Montana as a Hydro-Meteorological Technician where he completed his required courses to cross-over as a Meteorologist for the agency. James has been married for almost 21 years and has two sons and a daughter. His move to the Memphis, TN office was prompted by his desire to get closer to family residing in eastern Kentucky, using his military retirement benefits at the Naval Activity Base in Millington, and the challenge to provide accurate and timely severe weather warnings to the Mid-South public.

Jim is pictured left singing the Star Spangled Banner. ***Welcome Jim!*** Photo courtesy of Clay Berger.

Meet Alan Gibbs: CWSU Forecaster

Alan Gibbs was born in Carbondale, IL on April 22, 1950 and graduated from Texas A&M University in 1972. And yes, he was in the Corps of Cadets at A&M for four years (Whoop!). After graduation, he spent the next 20 years on active duty serving his country as a weather officer in the Air Force (retired in 1992). In 1995, he was selected for a civil service job as a Met Tech in DoD at Tinker AFB, OK, and then in 1997, he advanced to a Meteorologist position at Peterson AFB, CO in the Headquarters, Air Force Space Command (HQ AFSPC). By the time he left HQ AFSPC in 2006, he was the Chief of Terrestrial & Space Weather Operations and supervised four people.

After all of this, Alan decided to get back into day-to-day weather operations through the NWS. In January 2006, he was selected for a General Forecaster position at the Elko, NV WFO and worked there for two+ years. However, mediocre air service, medical facilities, and shopping in that part of Nevada led him to look elsewhere in 2008. Fortunately, he was selected for his current position at the Memphis CWSU and worked his first shift just in time for 5 1/2 inches of snow on March 7, 2008. This position is fantastic as it gets him back to his Air Force roots in supporting aviation!

Alan is an AMS member and received his certified consulting meteorologist (CCM #581) designation thru the AMS in 1998. He is married to his wife, Kathy, and they have a son (Larry--32 yrs old) and two daughters (Cassie--25 years old and Nikki--24 years old). Alan is pictured to the right just after his first hole-in-one! ***Welcome Alan!***

Measuring Winter Precipitation Across the Mid-South
By: Corey Chaskelson

The Mid-South averages between 1 to 5 inches of ice or snow accumulations each winter season. Winter precipitation in the Lower Mississippi is not as frequent as locations in the Rockies or Great Lakes Region. Consequently, residents of the Mid South have less opportunities to measure and report frozen precipitation during the winter months. Here are a few tips to help you take winter precipitation measurements for the upcoming winter season.

Measuring new snowfall (this includes snow, sleet, and snow pellets):

- Place a snowboard (piece of wood, plywood, or board 1-2 square feet in area) on top of the snow, preferably in an area that is not prone to blowing or drifting snow.
- As snow deposits on the board, use a ruler or yardstick to measure the snow that has accumulated on the board, noting the time period during which the snow fell.
- Wipe the board clean of snow and place it back on top of the snowpack to start a new measurement cycle.
- If you do not have a snow board, Use a ruler or yardstick to measure the depth of the snow on the ground (in an area not prone to blowing or drifting.) This should be done in 3 or 4 different locations and then an average computed.
- After a period of snowfall, measure the depth of the snow on the ground again.
- Obtain the amount of new snowfall by taking the new reading and subtracting the old reading. This should give you the amount of new snowfall since your last measurement.

Important points to remember when measuring snow:

- If snow continually melts as it lands, and the accumulation never reaches 0.1 inches on your measuring surface, snowfall should be reported as a trace.
- It is essential to measure snowfall (and snow depth) in a location where the effects of blowing and drifting are minimized. (In open areas where windblown snow cannot be avoided, several measurements may often be necessary to obtain an average depth, and they should not include the largest drifts. In heavily forested locations, try to find an exposed clearing in the trees. Measurements beneath trees are inaccurate since large amounts of snow can accumulate on the trees and never hit the ground.)
- Snowfall should be reported to the nearest tenth of an inch.
- Freezing rain (ice glaze) should never be reported as snowfall. This precipitation type is liquid precipitation and should be reported as such.

Measuring the amount of snow (winter precipitation) on the ground:

- Use a yardstick to obtain the depth of the snow on the ground.
- Take your measurement in 3 or 4 different locations (preferably in an open area).
- Compute an average of your measurements to obtain the most representative snow depth.

Important points to remember when measuring the depth of snow (winter precipitation):

- When using a yard stick, make sure the stick is pushed vertically into the snow until the bottom of the stick rests on the ground. Try not to mistake an ice layer or crusted snow as "ground". The measurement should reflect the average depth of snow, sleet, and glaze ice on the ground at your usual measurement site (not disturbed by human activities). Measurements from rooftops or paved areas should not be made.
- Report snow depth to the nearest whole inch, rounding up when one-half inch increments are reached (for example;0.4 inches is reported as a Trace, 3.5 inches is reported as 4 inches).
- There will be times when half of the ground will be bare and the other half will be covered with snow. This is most common in hilly areas or when gusty winds have blown snow. Under these circumstances, an average snow depth should still be computed. For example, if half of the ground is bare and the other half is covered with six inches of snow, the snow depth should be entered as the average of the two readings, or three inches. When, in your judgment, less than 50 percent of the exposed ground is covered by snow, even though the covered areas have a significant depth, the snow depth should be reported as a trace. When no snow or ice is on the ground in exposed areas (snow may be present in surrounding forested or otherwise protected areas), report snow depth as zero.
- When strong winds have blown the snow, take several measurements where the snow was least affected by drifting and average them. If most exposed areas are blown free of snow while others have drifts, follow the guidelines in step number 3 to obtain a representative snow depth.

For additional information on measuring winter precipitation visit the Community Collaborative Rain, Hail and Snow Network website at:

http://www.cocorahs.org/Content.aspx?page=measuresnow