EYE ON THE SKY

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National Weather Service
Louisville, Kentucky

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A Newsletter for Emergency Managers, Core Storm Spotters, Media, and Public Officials in Central Kentucky and South-Central Indiana

Comments and suggestions are always welcome. Your feedback is very important to us!

Please contact us by telephone, e-mail, or mail at

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This publication also is available on-line at **www.crh.noaa.gov/lmk/newsletter**

Chief Editors For This Issue:

Van DeWald / Ted Funk

Message From the Top

by Kimberly Pye, Meteorologist in Charge

Welcome to this edition of Eye on the Sky!

What a welcome to Louisville! When I left Montana last fall I thought I was escaping the snow and cold. It certainly has been a wild winter in the Ohio Valley, from severe thunderstorms over Veteran's Day weekend to heavy snow the first week of December to a major ice storm over Valentine's Day weekend. I can say one thing about the weather in the Ohio Valley: it can do it all! I hope all of you made it through the winter safely.

I again would like to take the opportunity to thank all of the tireless spotters and emergency service personnel who help us tremendously in calling in reports and getting the weather word out. If you have not had a chance to attend one of our Skywarn spotter training classes yet, I encourage you to participate. I plan to attend a few of these classes to meet the people that help the National Weather Service issue timely and accurate advisories and warnings.

I am eager to see what spring brings to our region. Whatever weather comes, I know the NWS Louisville staff and its team of storm spotters and emergency mangers will continue their reputation of providing top notch warning services to the people of central Kentucky and south-central Indiana.

In this time of heightened security, it is difficult for us to provide short notice tours to anyone who would like to visit the National Weather Service. Therefore, please call ahead if you plan on being in the area and would like to stop by. Feel free to call me at 1-502-968-8842 X 642. Have an enjoyable spring.

Inside This Issue . . .

Send us your severe weather reports!

We need your help. If you observe severe weather, please let us know as soon as possible

Thank You!!

Responding to Severe Weather

by Van DeWald, Forecaster

The National Weather Service provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters, and ocean areas for the protection of life and property and enhancement of the national economy. This effectively means that we monitor and respond to severe weather, and issue appropriate information to alert citizens of south-central Indiana and central Kentucky of impending severe hazards.

Peak severe weather season in our region typically is April, May, and June. However, severe storms can strike at any time of year and any time of day. In fact, we've had large tornadoes in the middle of winter (e.g., Owensboro, Kentucky on January 3, 2000), and we've had tornadoes in the middle of the night (e.g., Irvington, Kentucky on April 28, 2002). Thus, it's very important to be prepared at all times and have a plan of action should severe weather develop in your area.

The warning process is 3-tiered. First, we must detect severe storms. By using technology to the best of our ability, in concert with real-time spotter reports, we are experiencing fewer missed events and fewer false alarms. In other words, we're doing a very good job of detecting storms and evaluating their potential severity. Second, we must issue a warning for a severe storm to let folks know what type of weather to expect, and when to expect it. And third, and perhaps the most important step, the public must choose to make an appropriate response to the warning. Through continued education and outreach efforts, we hope that people will realize that a credible hazard exists and will seek appropriate shelter at once.

Even before a warning is issued though, you should remain aware of the local environment by listening to or reading the "Hazardous Weather Outlook" and other products which provide information on the what, when, where, how, and why of severe weather. The outlook is issued each morning around 600 am local time and updated during the day as new data becomes available, or as hazards or impacts change. The greatest level of detail is placed in the "Day One" portion of the outlook, but important clues are provided in the "Days Two through Seven" portion as well.

Ideally, a "Tornado" or "Severe Thunderstorm" watch will be issued 1 to 4 hours before any warnings are needed. Severe weather watches are issued for large geographic areas, such as entire states or portions of adjacent states. A watch simply means that conditions are favorable for severe weather development in and near the watch area. A watch does not mean that severe weather WILL develop, only that it's possible. However, in certain situations, a warning may be issued without or before a tornado or severe thunderstorm watch is in effect.

Danger

If a severe threat is imminent, a warning will be issued for a single county or group of adjacent counties typically for 15 to 60 minutes in duration. In warnings, we are as specific as possible to delineate the expected hazards, location, and timing of severe cells versus towns in their path. We also issue follow-up "Severe Weather Statements", as necessary, about halfway through and after a warning has expired to provide updated storm information and damage reports.

So, the bottom line is this: It's our job to protect the life and property of citizens of south-central Indiana and central Kentucky by issuing warnings and statements as necessary, 24 hours a day, 7 days a week, 365 days a year. Severe weather warnings are issued to elicit a response from the public, in hopes of alerting people to seek shelter from impending danger. While the National Weather Service can continue to make improvements on detecting severe weather and can continue to make informed decisions to issue appropriate warnings, it's ultimately up to YOU to make the correct response. In fact, your life may depend on it. Stay safe.

New Snowfall Observer for Lexington

by Larry Dattilo, Data Acquisition Program Manager

We are proud to announce that Lexington again has accurate and reliable snowfall measurements. In the mid 1990s, snowfall measurements were taken by NWS personnel at Bluegrass Field. The installation of an Automatic Surface Observing System left a gap in snowfall observations until just recently.

Mr. Charlie Wilson has agreed to take daily snowfall, snow depth, and water equivalent measurements for the Lexington area. In fact, he forwarded this information to our NWS office several times this past winter. The information was incorporated into climate summaries, winter weather forecasts, and more importantly, winter weather advisories and warnings for the Lexington area. For example, Mr. Wilson was instrumental in keeping us abreast of the ice storm that devastated Lexington over Valentine's Day weekend. His constant input and measurements allowed more accurate forecasts and warnings for the region.

Mr. Wilson has been part of the National Weather Service family for several decades. He retired in the mid 1980s from the NWS office in Lexington. He had been there for many years and has a vast knowledge of weather patterns, climatology, and winter weather observation.

We thank Mr. Wilson for all his efforts and welcome him back to our working family.

A Snowy Cold Winter for Much of the Region

by Pat Waidley, Hydrometeorological Technician, and Ted Funk, Science and Operations Officer

This winter proved to be one of the snowiest in quite a while for portions of central Kentucky and south-central Indiana, despite long range climate predictions (due to expected effects from El Nino) last fall of above normal temperatures and near or below normal precipitation. Although we did not experience many deep snowfalls, we did have numerous episodes of light snow which was somewhat unusual for the area.

Based on official records taken at our NWS office, Louisville received 24.2 inches of snow this season (through mid March), nearly 10 inches above the normal snowfall for the area of 14.6 inches (based on 1971-2000 normals). Louisville also experienced a rare ice and sleet storm over Valentine's Day weekend. Since November 1, snow was reported on 50 days, including 27 days with measurable snow and 23 days with a trace. In addition, overnight low temperatures fell to 32 degrees or colder on 90 occasions since early November, including stretches of 16 nights in a row from November 26-December 11, 22 in a row from January 10-31, and 17 straight nights from February 4-20. The coldest temperature recorded this winter in Louisville was 1 degree above zero on January 27.

In Lexington, 19.9 inches (estimated) of snow fell since November 1, above the normal snowfall for east-central Kentucky of 15.7 inches (based on 1971-2000 normals). This total did not include the Valentine's Day weekend ice storm which devastated Lexington and nearby communities with up to one inch of ice accumulation and around 75,000 people without power at the height of the storm. Some people remained without power for several days. In Lexington, snow was recorded on 43 days since November 1, including 19 days with measurable and 24 with a trace of snow. Meanwhile, on 91 days, low temperatures reached 32 degrees or colder since November 1, including the same extended stretches and dates of cold weather as occurred in Louisville. The coldest temperature in Lexington was -7 on January 27.

In Bowling Green, 11.5 inches of snow fell this season, slightly above the normal snowfall for southern Kentucky of about 10.2 inches (based on 1971-2000 normals). Bowling Green experienced 24 days with snow since the beginning of November (13 measurable, 11 trace). In addition, 77 nights had a low temperature of 32 degrees or colder, including 12 consecutive from November 28-December 9, and 10 each from January 10-19 and February 4-13. The coldest temperature recorded in Bowling Green was -2 on January 24.

Changes to Public Severe Weather and Hydrologic Products

by Van DeWald, Forecaster

On March 25 at 200 am est, the National Weather Service will complete the transition to end-state World Meteorological Organization (WMO) communication headers for eight of our public warning products. Products affected by this change include Tornado Warnings (TOR), Severe Thunderstorm Warnings (SVR), Flash Flood Warnings (FFW), Flood Warnings (FLW), Special Weather Statements (SPS), Flash Flood Statements (FFS), Flood Statements (FLS), and Local Storm Reports (LSR).

Below, you will find a list of the specific products affected, their current AWIPS ID and WMO headers, and their new AWIPS ID and WMO headers, effective March 25:

CURRENT AWIPS ID	CURRENT WMO HEADER	NEW AWIPS ID	NEW WMO HEADER
TORSDF	WFUS53 KLMK	TORLMK	WFUS53 KLMK
SVRSDF	WUUS53 KLMK	SVRLMK	WUUS53 KLMK
SPSSDF	WWUS35 KSDF	SPSLMK	WWUS83 KLMK
LSRSDF	WWUS30 KSDF	LSRLMK	NWUS53 KLMK
FFWSDF	WGUS53 KLMK	FFWLMK	WGUS53 KLMK
FLWSDF	WGUS43 KLMK	FLWLMK	WGUS43 KLMK
FFSSDF	RWUS32 KSDF	FFSLMK	WGUS73 KLMK
FLSSDF	RWUS42 KSDF	FLSLMK	WGUS83 KLMK

It is extremely important that all users of NWS warning products make sure that your communication system directories exactly match the headers listed above, beginning on March 25. Failure to do so will prevent high priority warning and statement products from reaching their intended audience.

Additionally on March 25, we will be changing from the Zone (Z) form to the County (C) form of the Universal Geographic Code (UGC) in many of our hydrologic products. County UGC codes follow the federal information processing standards (FIPS) for its numbering system. County/FIPS UGCs also are used in tornado, severe thunderstorm, and flash flood or flood warnings, in tornado and severe thunderstorm watches, and in severe weather statements.

Below, you will find a list of the specific products affected and their corresponding UGC type. Please note that Flood Watches (FFA) will continue to use Zone (Z) UGC coding.

PRODUCT NAME	PRODUCT ID	UGC TYPE
HYDROLOGIC OUTLOOK	ESFSDF	COUNTY CODES
FLOOD WATCH	FFASDF	ZONE CODES
FLASH FLOOD WARNING	FFWLMK	COUNTY CODES
FLASH FLOOD STATEMENT	FFSLMK	COUNTY CODES
FLOOD WARNING	FLWLMK	COUNTY CODES
FLOOD STATEMENT	FLSLMK	COUNTY CODES
HYDROLOGIC STATEMENT	RVSSDF	COUNTY CODES
HYDROLOGIC SUMMARY	RVASDF	COUNTY CODES
DAILY RIVER AND LAKE SUMMARY	RVDLMK	COUNTY CODES

The Science Corner

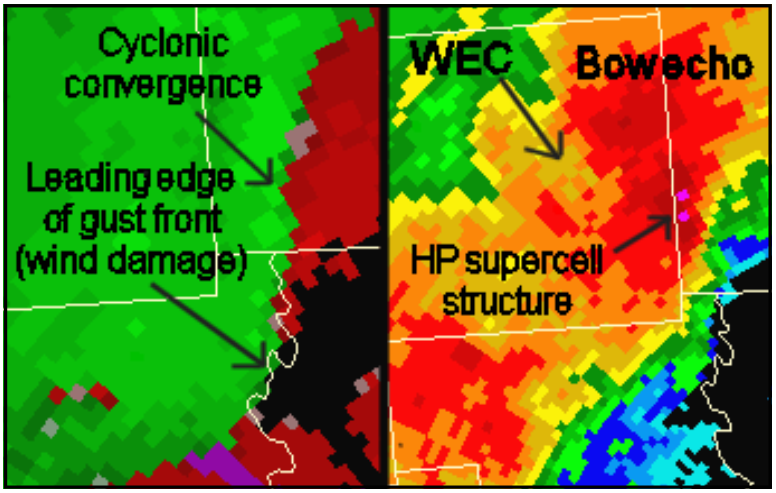
By Ted Funk
Science and Operations Officer

The November 10, 2002 Severe Weather Outbreak: A Radar Signature Analysis

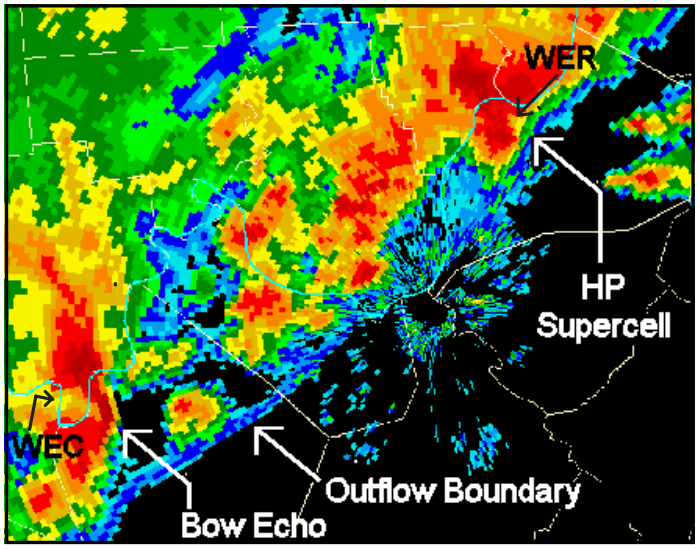
On November 10, 2002, a major severe weather outbreak occurred across the Ohio Valley, including an organized squall line, embedded bow echoes, and classic and high precipitation (HP) supercells. The Storm Prediction Center (SPC) in Norman, Oklahoma placed our area under a high risk of severe thunderstorms that day. Such risks are relatively rare, and reserved for those situations when strong vertical wind shear, instability, significant dynamical forcing (lift), and a strong jet stream combine to produce rapid development of severe storms capable of inflicting widespread wind damage and a few strong (F2 or F3 on the Fujita scale) or violent (F4 or F5) tornadoes.

Thunderstorms broke out over Illinois and western Kentucky, then spread eastward across Indiana, central Kentucky, and Tennessee in the afternoon and early evening. The storms produced many reports of wind damage and hail over Kentucky and southern Indiana. In addition, a brief tornado touched down in Casey County in south-central Kentucky. While central Kentucky was spared significant tornadoes, parts of Ohio and Tennessee were not so lucky. Damaging tornadoes from classic supercell storms were reported in Ohio, including near the town of Van Wert in northwest Ohio, and in Tennessee, southeast of Nashville.

During a warning situation such as November 10, meteorologists at NWS Louisville interrogate WSR-88D Doppler radar imagery for specific storm types, signatures, and trends associated with wind damage, large hail, and tornadoes. This rapid, but thorough assessment, along with spotter input and a constant knowledge of the near storm environment, enables forecasters to make informed, timely warning decisions to facilitate the protection of life and property. Below are several radar images from the November 10 event and accompanying discussions explaining important signatures related to severe weather. Numerous other radar products are available to NWS Louisville forecasters than those shown below. More information on severe storm structure is available on our website at www.crh.noaa.gov/lmk/soo/docu/document.htm.

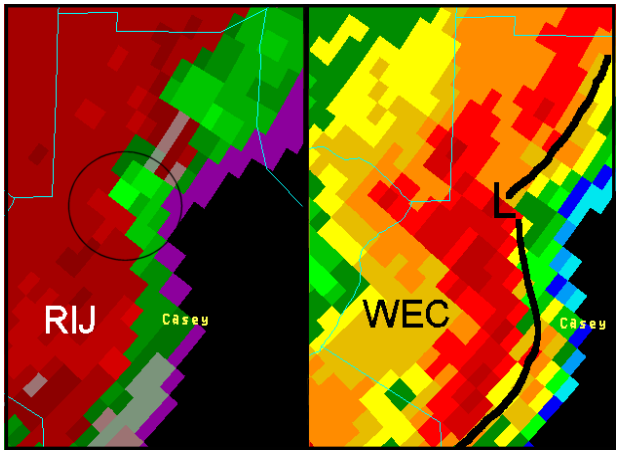


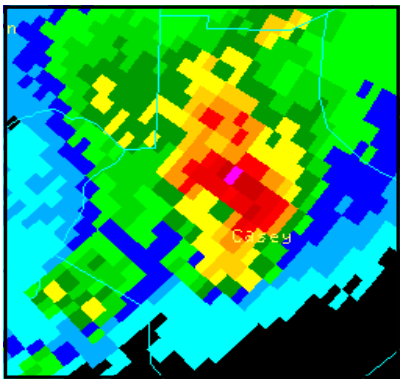
This close-up shows a bow echo in low-level reflectivity data (near left) embedded within a squall line over southern Indiana. HP supercell structure was noted along the leading edge of the bow, associated with large hail and a cyclonic convergence zone in storm-relative velocity map (SRM) data along the gust front (far left; radar is located to southeast of display; red (green) color denotes winds directed away from (toward) the radar). This location is where transient tornadoes can develop within bow echoes. Note also a weak echo channel (WEC; lighter rain) behind the bow, indicative of strong winds (green inbounds) producing surface wind damage along the leading edge of the bow. In this case, the leading edge of the gust front was along the Crawford/Harrison County line, ahead of the highest reflectivity (heaviest rain) over central and western Crawford County.



Numerous storm types were observed within the squall line as it crossed the Ohio River. Entering Louisville was an HP supercell (upper right) that exhibited a weak echo region (WER) on the front forward flank. A meso-cyclone (rotating updraft) is common within the WER of an HP storm and must, therefore, be monitored closely for tornado development. Farther southwest, an outflow boundary and gusty winds had pushed ahead of the main storms. Note a small cell just behind the boundary, which developed due to enhanced convergence along this gust front. The inter-action of such boundaries with existing storms can be crucial to storm intensification and even tornado development. Behind the gust front, a small bow echo (with a WEC; lower left) was resulting in wind damage along the bow's leading edge (i.e., its apex).

As the squall line raced across south-central Kentucky, a distinctive bow echo was noted over Casey County in low-level reflectivity data (far right). This structure can be thought of as a miniature (storm-scale) low pressure and frontal system. The low center ("L") often is the location of a rotating updraft/ mesocyclone, where tornadoes can form. Note in the SRM data (near right) the tight circulation (circled; bright green inbounds toward the radar located to the northwest of the image next to red outbound winds), which produced a brief F0-F1 tornado. Along the bulging cold (gust) front to the south of the low, wind damage is maximized along the leading edge of a pronounced rear inflow jet (RIJ; brighter red colors; near right) which is coincident with a weak echo channel (WEC; far right). Weaker winds, but still potentially severe, extend along the boundary to the northeast of the low.

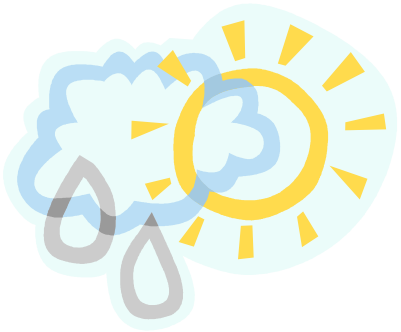




Forecasters also routinely evaluate the vertical structure of thunderstorms for clues to their severity and future evolution. This image (left) over Casey County shows the same bow echo as in the above image, although at a higher altitude (20-25 kft). The image reveals large hail (dark red and pink colors) held aloft in the storm, indicative of an intense updraft that could produce large hail at the surface as it descends to the ground. Reflectivity aloft also is tilted eastward compared to low-levels (above image), suggesting a strongly sheared environment supportive of severe storms. Vertical cross-sections (not shown) provide better visualization and continuity of vertical storm structure.

Flooding in February

by Mike Callahan, Service Hydrologist



Some of the most significant flooding in recent years across our forecast area occurred during February 2003. The flooding was initiated by an episode of heavy rain between February 14-16. Most sections of central Kentucky received 2-3 inches during this period with lighter amounts over southern Indiana. This rain caused minor flooding on sections of the Licking, Kentucky, Salt, and Green River basins in Kentucky. Moderate levels were reached along the Kentucky River and on the Rolling Fork of the Salt River. This was the worst flooding since 1984 on the Kentucky River at Ford Lock.

The flooding resulted in evacuations of some homes along the Kentucky River due to flooded roads, but water did not enter any homes. There also were no injuries reported.

On February 21-23, another winter storm dumped a little more than an inch of rain over the same area, with highest amounts in southern Kentucky. This rain caused new minor flooding on the Muscatatuck River in south-central Indiana, and on the Rolling Fork, Licking River, and Rough River in Kentucky. It also prolonged the flooding on the Green River. The water eventually resulted in minor flooding on the Ohio River at Tell City, Indiana.

However, the flooding was short-lived and all rivers had dropped below flood stage by the first week in March. The rainfall outlook for this Spring is for below to near normal precipitation.

In Search of Excellence

by Pam Lozier, Administrative Assistant

In the last issue of this newsletter, I discussed the Combined Federal Campaign and the caring and compassionate staff at NWS Louisville. In this issue, I would like to tell you about my position here at the National Weather Service. As Administrative Assistant, my duties include budget and financial management, timekeeper, personnel clerk, bookkeeping, procurement and property management, and general office management.

Recently, a team from our Central Region headquarters visited our office for an administrative review. The purpose of this review was to ensure that the office was compliant with established laws, regulations, and regional policies. Their goal was to review our administrative programs and procedures, and make recommendations if improvements were needed. The administrative team was courteous and complete in their review. The office fared quite well, although some recommendations were made that would improve administrative functions within our office.

After the review, I realized that I am not perfect; perfection is a destination. That is why I decided to call this article, "In Search of Excellence." All my life I have strived for perfection. I believed that perfection or being perfect was the only acceptable way of life. I wanted everything in all aspects of my life to be perfect, including my job. However, with perfection, there is no room for improvement.

So, in a nutshell, I have learned that I am not perfect, nor will I ever be. No human is. But I am in constant search of excellence, which gives me the freedom to learn from my mistakes, and to do better every time with every try. As I strive for excellence, I become passionate about what I want to be excellent at, in both my personal and professional life.

I strongly believe that being passionate about what you do creates positive results. I have decided there is always room for learning and an opportunity to grow with each new experience. So whatever your goals are, either personal or professional, be passionate about them, understand that none of us will ever be perfect, and search for excellence!

Flash Flood Hot Spots…We Need Your Help

by Don Kirkpatrick, Lead Forecaster

NWS Louisville is coordinating with each county Emergency Manager (EM) in our county warning area across central Kentucky and south-central Indiana to research flash flood history and current flood vulnerability. In an effort to provide better future service, we are asking each county EM the following questions:

1. Are you a flash flood prone county?
2. Where have you had road closures or building evacuations in the past?
3. Is flash flooding due to terrain/soil type, the rapid rise of nearby streams or creeks, and/or poor urban drainage?
4. Where are the most dangerous parts of the county for flooding (hot spots)?

Our goal is to make better warning decisions based on county flash flood potential and provide detailed information for the area involved. We will zoom in on the highest radar rainfall estimates and with the help of our spotters, determine the need for a warning or statement predicated on our knowledge of individual county terrain, stream, and drainage features.

We have been in contact with several south-central Kentucky counties and discovered that most are not flash flood prone, but all counties have certain hot spots. The exceptions are Warren and Barren counties, which have numerous vulnerable areas. For example, the city of Bowling Green is quite flash flood prone with at least 20 locations within city limits highly susceptible to heavy rains. Several state and county roads throughout Warren and Barren counties are flash flood prone as well.

We appreciate the information received to this point from the EM's. This data will greatly enhance our ability to provide property and life saving warning information to the people of central Kentucky and south-central Indiana.

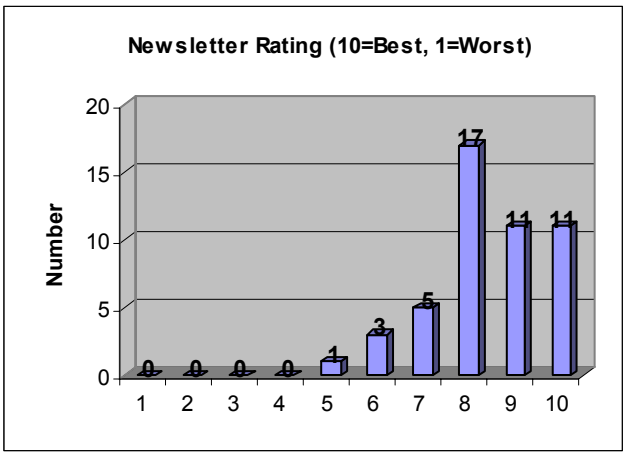
Newsletter Feedback Form Results

by Ted Funk, Science and Operations Officer

In our Fall 2002 newsletter, we enclosed a feedback form to solicit your ideas and comments to help us evaluate the newsletters we send you. We received 48 forms in all, including some from spotters, emergency managers (half the total), county judge executives, and the media.

Nearly all respondents indicated they enjoy receiving and reading the newsletter. Ninety-four (94) percent thought newsletter articles were “informative” or “very informative” while the other 6 percent stated that it depended on the articles themselves. Ninety (90) percent (43 out of 48) indicated the newsletter was the right length (6-10 pages), while 5 others thought it was too long. On a scale of 1 to 10 (10 being the best), 81 percent rated it from 8-10, 17 percent from 6-7, while 2 percent (1 respondent) gave it a 5 (see chart). Meanwhile, 13 (28) people rated the newsletter as “excellent” (“very good”), 7 thought it was “good,” and no one voted for “average” or “poor.”

Finally, most respondents (40 out of 48) preferred the newsletter in hardcopy form in the mail, 5 preferred both a hardcopy and electronic copy on our website, while 3 indicated an electronic copy was sufficient. As a reminder, we post all newsletters on our website, in both HTML and Portable Document Format (PDF) at www.crh.noaa.gov/lmk/newsletter/index.html. Thank you very much to all of you who took the time to fill out and return our feedback form. Also, thanks to those of you who provided written comments. This information will help us as we consider articles for future issues.



Lightning and Tornado Myths and Facts

by Ted Funk, Science and Operations Officer

Myth: *Rubber tires on motor vehicles insulate you from lightning strikes.*

Fact: Rubber tires offer no protection from lightning strikes. It is the steel in the automobile which can provide protection from lightning. Lightning takes the easiest path between two points, so when it strikes the roof of a car, the easiest path to the ground is through the metal surrounding the passenger compartment, not through it. If you are not touching any metal surface of the vehicle, you are protected from the dangers of lightning. However, convertibles offer no protection from lightning.

Myth: *Lightning never strikes twice in the same place.*

Fact: Lightning can strike repeatedly the same objects year after year. Tall structures, such as the Empire State Building, Sears Tower, mountain tops, tall trees, and radio and television antennas are hit many times a year by lightning. The Empire State Building is struck by lightning an average of around 20 times a year.

Myth: *A person struck by lightning retains an electric charge and should not be touched.*

Fact: You can (and should) administer first aid to a victim as soon as possible. He or she does NOT retain any electrical charge. However, make sure the victim was struck by lightning and not by a downed power line due to a storm. If the line is touching the person, then he or she may still carry an electrical charge and should not be touched! In this case, contact authorities for help immediately.

Myth: *Opening windows to equalize air pressure will save a roof or even a home from destruction by a tornado. The extreme low pressure in a tornado will cause a house or building to explode.*

Fact: Homes are damaged by strong winds, not air pressure changes. Even with windows closed, most houses and commercial buildings have enough openings to vent the pressure difference in the time that it takes for a tornado to pass. It is the violent wind in a tornado that destroys or damages a house, not the buildup of air pressure inside the structure. Leave the windows alone and seek immediately shelter in a safe place should a tornado threaten.

Myth: *The best place to be during a tornado is in the southwest corner of a building or basement.*

Fact: The best place to be is in a basement, but not the southwest corner as this usually is the direction from which a tornado approaches. Go into a small interior room or under a sturdy workbench in the middle or northeast part of the lowest level of your home (a basement if possible). Cover yourself with blankets to protect yourself from any flying debris.

Myth: *You can outrun a tornado in your vehicle.*

Fact: An automobile is the worst place to be during a tornado. The intense wind in a strong tornado can blow vehicles around like toys. If you are in a motor vehicle and a tornado threatens, get out of the vehicle and take cover in a ditch or ravine.

Myth: *Tornadoes do not occur in mountainous areas, only on flat terrain.*

Fact: Tornadoes are spawned from severe thunderstorms occurring in an environment characterized by strong wind shear, instability, and enhanced low-level convergence and lift. Strong tornadoes do not care what the landscape looks like and can follow the ups and downs of the terrain. Weak, brief tornadoes, however, may tend to “hop” over low spots in the landscape, but do not count on this.

Climatological Calendar

Climatological Data: Winter 2002/2003

Location	Month	Average	Departure	Rain / Snow	Departure	Highest	Lowest
Louisville	Dec	36.4°	-1.2°	7.62″ / 7.7″	+3.93″	61° (18th)	10° (6th)
	Jan	27.2°	-5.8°	1.57″ / 5.3″	-1.71″	56° (8th)	1° (27th)
	Feb	31.4°	-6.2°	5.28″ / 10.7″	+2.03″	62° (2nd)	5° (8th)
Lexington	Dec	35.6°	-0.7°	4.08″ / 4.3″	+0.05″	59° (18th)	12° (6th)
	Jan	26.1°	-5.9°	0.95″ / 6.3″	-2.39″	55° (9th)	-7° (27th)
	Feb	31.9°	-4.5°	4.85″ / 8.3″	+1.58″	62° (22nd)	2° (8th)
Bowling Green	Dec	39.5°	+1.2°	4.87″ / 3.5″	-0.19″	65° (18th)	13° (6th)
	Jan	31.0°	-3.2°	1.36″ / 3.4″	-2.79″	60° (9th)	-2° (24th)
	Feb	35.8°	-2.8°	5.92″ / 4.6″	+1.77″	67° (2nd)	10° (8th)

Normal High/Low Temperatures

Location	Mar 1	Apr 1	May 1	Jun 1
Louisville	51/32	62/42	71/51	80/61
Lexington	50/32	61/40	70/49	79/59
Bowling Green	53/32	64/41	73/50	82/60

Outlook for Spring 2003

The 90-day outlook for March, April, and May 2003 calls for near normal temperatures, and below to near normal precipitation across the lower Ohio Valley.

Astronomical Calendar

Sunrise/Sunset

	Louisville		Lexington		Bowling Green		
Date	Sunrise	Sunset	Sunrise	Sunset	Sunrise	Sunset	Times are given in est (Eastern Standard Time), edt (Eastern Daylight Time), cst (Central Standard Time), and cdt (Central Daylight Time), as appropriate.
Mar 1	7:15 am est	6:36 pm est	7:10 am est	6:31 pm est	6:17 am cst	5:40 pm cst	
Apr 1	6:29 am est	7:06 pm est	6:24 am est	7:01 pm est	5:32 am cst	6:08 pm cst	
May 1	6:47 am edt	8:34 pm edt	6:42 am edt	8:29 pm edt	5:52 am cdt	7:35 pm cdt	
Jun 1	6:22 am edt	9:00 pm edt	6:17 am edt	8:55 pm edt	5:28 am cdt	8:00 pm cdt	

Moon Phases

New Moon	First Quarter	Full Moon	Last Quarter
Mar 2	Mar 11	Mar 18	Mar 24
Apr 1	Apr 9	Apr 16	Apr 23
May 1	May 9	May 15	May 22
May 31	Jun 7	Jun 14	Jun 21

Spring Equinox (Start of Spring):
March 20 at 8:00 pm est (7:00 pm cst)

Start of Daylight Savings Time:
Sunday, April 6 at 2:00 am local time - turn clocks ahead one hour