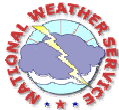


2007 Shareholders' Report

NATIONAL WEATHER SERVICE
LOUISVILLE, KENTUCKY



The National Weather Service (NWS) provides weather, hydrologic, and climate forecasts and warnings for the United States and its territories for the protection of life and property and enhancement of the national economy.

A Message From the Meteorologist-in-Charge



Welcome to the third edition of the National Weather Service (NWS) Louisville Shareholders' Report. I will

repeat what I state each year: "You are a shareholder in the NWS!" As a taxpaying citizen of this country, you have invested in the Federal government, of which the NWS is a part. We have been in Louisville since 1871, and serve southern Indiana and central Kentucky.

The NWS was appropriated \$684,342,000 for Fiscal Year 2007. That equates to an investment of \$2.26 per person. As the Meteorologist-in-Charge of your investment, I feel it is my duty to report to you how

your "holdings" have fared during the year.

This report details activities of the NWS Louisville Weather Forecast Office (LMK WFO) and events in its county warning area (CWA) during 2007. I hope you find our activities have demonstrated the sort of stewardship you expect from your public servants. I welcome your comments and suggestions as to how the NWS can be an even better investment for you.

John D. Gordon
Meteorologist-in-Charge



Photo: John Bradshaw

National Weather Service, Louisville

6201 Theiler Lane
Louisville, Kentucky 40229

tel: 502.969.8842

fax: 502.968.5663

e-mail: w-lmk.webmaster@noaa.gov

web: weather.gov/louisville



Who Is the National Weather Service?

Meteorologists, hydrologists, and other professionals keeping a constant eye on weather, water, and climate concerns throughout the United States and its territories.

The NWS is a dedicated team of professional meteorologists, hydrologists, and technicians providing critical weather information to the public. Our primary goal is the protection of life and property from the effects of all types of weather. The NWS provides timely and accurate warnings of tornadoes, severe thunderstorms, and floods. We are the sole official voice for issuing weather warnings during life-threatening situations.

We also issue routine forecasts for the general public, aviators, and fire weather

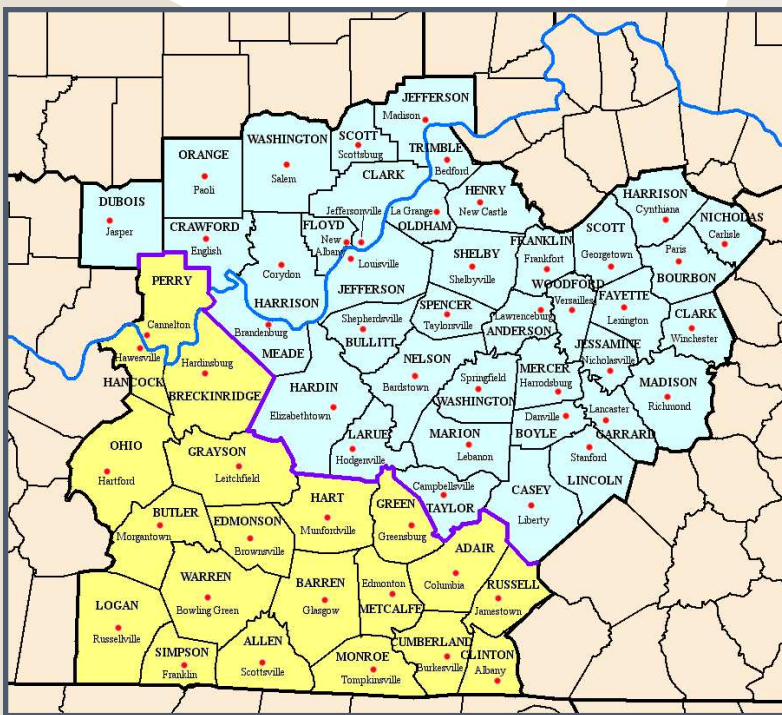
specialists via NOAA Weather Radio (NWR), the Internet, and AP Weather Wire. All NWS data, including computer model forecast charts and historical climate information, are made available at little or no additional charge to the public.

We also welcome college students who are studying meteorology to volunteer at NWS Louisville. There are a variety of programs and varying levels of participation available.

Morgan Barry, of Ball State University, developed an

extensive GIS database for the office. Brian Wolfe, who is attending Purdue University, was a great help with our StormReady program. Valparaiso University student Stephanie Dunten assisted with our NOAA Weather Radio program, worked extensively on the science education pages on our website, and also shadowed forecasters.

College students studying meteorology can contact NWS Louisville at (502) 969-8842 for more information.



The NWS office located in Louisville, Kentucky (LMK) is charged with providing life-saving meteorological and hydrological information to 49 counties in central Kentucky and 10 counties across south-central Indiana. This area includes Lexington and Bowling Green in Kentucky as well as Jasper and Madison in Indiana. On the map above, the counties colored blue are in Eastern Time and those shaded yellow are in Central Time.

Contents

Message from the MIC	1
Who Is the National Weather Service?	2
Storm-Based Warnings	3
CoCoRaHS	4
Graphicast	4
Web Presence	5
NOAA Weather Radio	6
Rivers	7
Severe Weather Spotting	8
HAZMAT	9
Outreach	9
Office Activities	10-11
Bow Echo Workshop	12
2007 Temperature and Precipitation Amounts	12
Office Research	13
Fire Weather	13
Aviation Weather	13
Severe Weather Performance	14
2007's Greatest Weather Events	15
Staff Changes	16
Plans for 2008	16

Storm-Based Warnings

The NWS now delivers more precise warnings that are designed to affect only those people who are truly in the path of the storm.

The NWS now issues “storm based warnings” for tornadoes, severe thunderstorms, and flash floods. Formerly, warnings were issued based on counties. Now with storm based warnings, the NWS specifies areas within a county and refers to commonly known landmarks such as highways or rivers.

Storm-based warnings show the specific meteorological threat area and are not confined by political boundaries. By focusing only on the areas that are truly threatened by the storm, warning polygons improve NWS warning quality. Storm-based warnings promote improved graphical warning displays and support a wider distribution through cell phone alerts, pagers, and PDAs. The media can display the polygons showing the public where the true threat is, and who is at greatest risk.

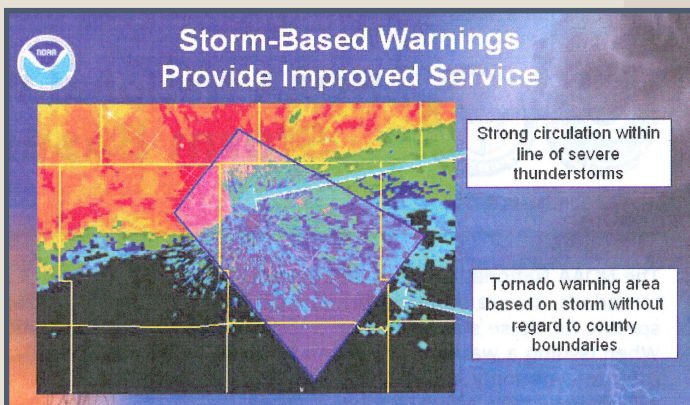
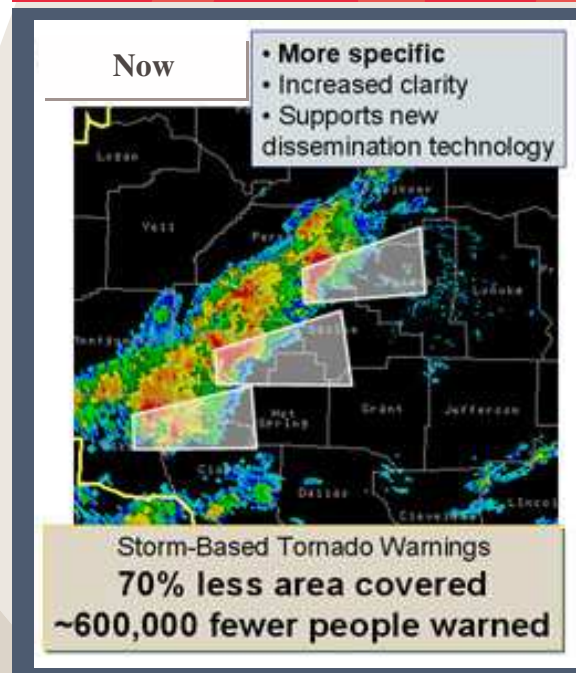
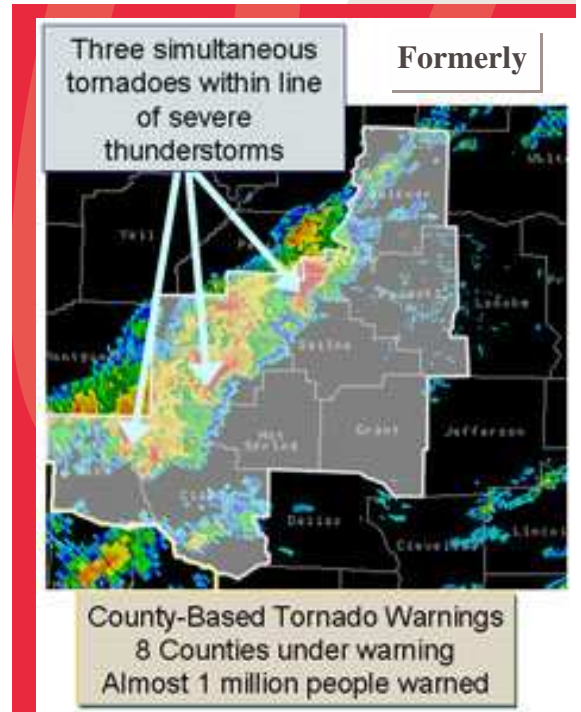
The typical storm-based warning is smaller in size than that of a county-based warning. The resulting economic value to the public due to the reduced cost of sheltering will be at least \$100 million per year. Emergency Managers can make better decisions concerning

resource allocation. Law enforcement and fire departments know exactly which areas need to be put on alert. Schools and businesses can more accurately determine whether they will or will not need to activate their tornado procedures and close down operations. Airport operators are able to better ascertain whether or not they need to suspend air traffic at an airport.

The warned area is defined by latitude/longitude pairs and depicted graphically by polygons.

For audio broadcasts, such as on NOAA Weather Radio (NWR), portions of counties are described (northeast, southwest, etc.) and familiar landmarks such as highways or rivers are used.

If a storm moves out of the warning polygon or a new storm develops outside of the polygon, a new warning must be issued. If you have any questions or comments about the new storm-based warning philosophy, please contact Warning Coordination Meteorologist (WCM) Joe Sullivan at joe.sullivan@noaa.gov.





CoCoRaHS

Imagine dozens of weather observers across a single metropolitan region, and hundreds of observers across the state. That is the reality of CoCoRaHS.



CoCoRaHS is the Community Collaborative Rain, Hail, and Snow network, and is one of the most exciting and fastest growing weather endeavors in the nation! It involves volunteers of all ages and backgrounds who accurately measure rain, snow, and hail whenever they occur. The data collected benefit countless agen-

cies and organizations within the fields of agriculture, public safety, and scientific research. The NWS is a primary user of this invaluable information.

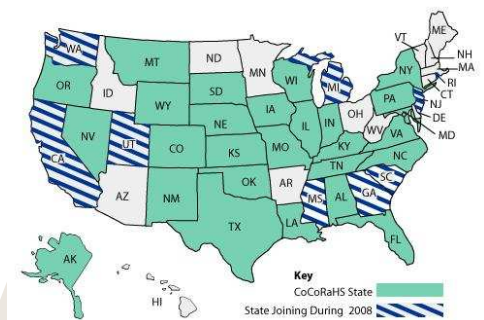
ing sessions for new weather volunteers.

If you are interested in this program and you have a desire to help us with rain, snow, and hail measurements, please send an e-mail to the Louisville office of the National Weather Service (wlmk.webmaster@noaa.gov) today!



People who participate in the CoCoRaHS project simply sign up at the CoCoRaHS website (cocorahs.org), purchase a \$29 rain gauge, receive training, and start reporting. The data are freely available to everybody via www.cocorahs.org, whether you're an observer or not.

The NWS has been instrumental in bringing the program to Kentucky and Indiana, and provides live train-



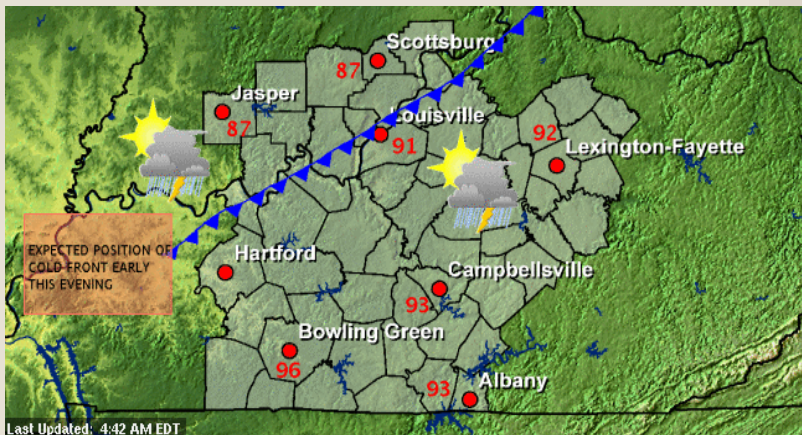
Graphicast

With one mouse click you get a graphical representation of the day's primary weather story.

The Graphical Weather Story of the Day, or "Graphicast," is a pictorial representation that depicts the most important weather feature in the forecast area of responsibility of individual NWS offices. Forecasters may include frontal positions, temperatures, chances of precipita-

tion, or any other meteorological variable that is of particular significance on a given day. The idea is to show a "snapshot" of the most important aspects of the forecast, giving customers weather information at a glance.

The Graphicast is intended to showcase the most important weather event in the forecast, whether that be the current day's weather, or an upcoming storm system several days away. Simply click on the "Weather Story" link on our homepage to access the Graphicast.

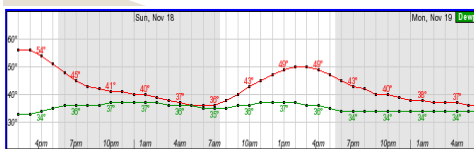
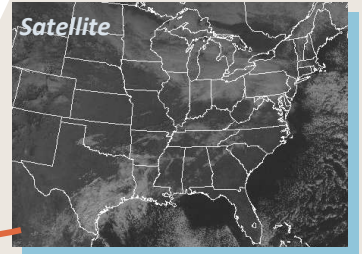
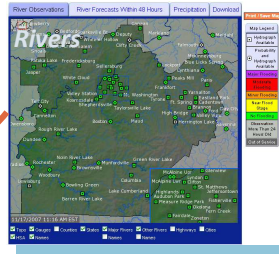
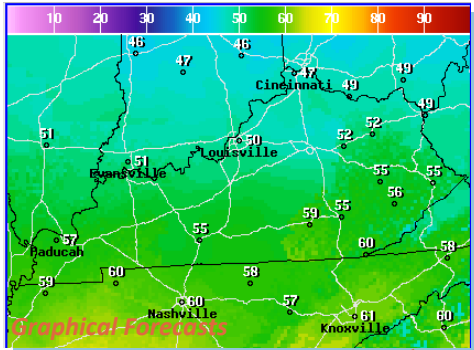


Web Presence

Whatever weather information you need, it's freely and quickly available via our website.

Up-to-the-minute weather information is always at your fingertips with the NWS's suite of detailed web pages. On our homepage, weather.gov/louisville, the day's most important headlines are listed at the top of the page. Immediately below the headlines is a map of the region with critical forecast weather events color-coded for instant identification. Better yet, click on the map and you will get a personalized forecast specifically generated for the exact spot you chose.

The website is automatically updated whenever we disseminate any of our products, so you can be certain that the most current weather, river, and climate information are ready and waiting for you.



Monday, November 19 at 9am
Temperature: 43°F Dewpoint: 34°F

Historical Data

STATION: LEXINGTON
MONTH: NOVEMBER
YEAR: 2007
LATITUDE: 38 1 N
LONGITUDE: 84 3 6 W

DAY	MAX	MIN	AVG	DEP	HDD	CHD	WTR	SNW	DPTH	SFD	SPD	DIR	MIN	PSBL	S-S	WX	SPD	DR
1	59	42	51	0	14	0	T	0.0	0	6.6	13	350	M	3		17	340	
2	60	35	48	-3	17	0	0.00	0.0	0	6.5	13	70	M	0		15	80	
3	60	29	45	-5	20	0	0.00	0.0	0	2.7	13	300	M	1		15	320	
4	60	34	47	-3	18	0	0.00	0.0	0	8.1	23	290	M	0		31	290	
5	67	39	53	3	12	0	0.29	0.0	0	12.8	28	220	M	6	138	40	320	
6	48	34	40	-9	25	0	0.00	0.0	0	9.2	20	310	M	9		28	290	
7	47	30	39	-10	26	0	0.00	0.0	0	3.0	10	390	M	2		15	300	
8	51	28	40	-8	25	0	0.00	0.0	0	7.8	16	200	M	2		22	200	
9	57	38	48	0	17	0	T	0.0	0	7.5	15	340	M	6		21	350	
10	50	31	41	-7	24	0	0.00	0.0	0	2.8	9	140	M	0	18	10	140	
11	61	35	48	1	17	0	0.06	0.0	0	10.6	20	210	M	4		25	210	
12	67	48	58	11	7	0	T	0.0	0	12.2	21	220	M	7		28	220	
13	59	53	56	9	9	0	0.58	0.0	0	8.0	16	150	M	9	1	20	230	
14	65	49	57	11	8	0	0.38	0.0	0	10.0	18	320	M	10	13	25	310	
15	49	33	41	-5	24	0	T	T	0	11.1	22	310	M	9		29	300	
16	44	24	34	-12	21	0	0.00	0.0	0	4.6	13	230	M	2	1	18	230	

NOAA's National Weather Service Weather Forecast Office
Louisville, KY

Home Site Map News Organization

Local forecast by "City, St" or Zip Code
City, St Go

Current Hazards / Warnings / Outlooks
U.S. Hazards
Hurricane Info
Safety Rules
Submit Report

Current Conditions
Observations
Satellite Images
Rivers & Lakes AHPs
Precip Estimate
Snow Cover
Severe Weather Summary

Radar Imagery
Local Radar
Nationwide

Forecasts
Activity Planner
Local Area
Aviation
Fire Weather
Graphical
Interactive
Weather Radio
Forecast Discussion
Winter Weather
Non Precipitation

Rivers / Hydrology
AHPs / River Info
Flash Floods
Official Precip Reports
Supplemental Precip Reports
Climate
Local
National
More...

Top News of the Day

- An arctic front is approaching...
- ...Very Cold Temperatures This Weekend...
- 2007 was 5th warmest year on record globally, 10th warmest in U.S.

Click on the map below for the latest forecast.

Click here for your forecast!

Read watches, warnings & advisories
Zoom In
Zoom Out

Flood Warning
Wind Chill Advisory
Special Weather Statement
Hazardous Weather Outlook

Latest Conditions in Louisville International, KY
Jan 18 5:56 pm 33°F Partly Cloudy (1°C)

Choose Your Front Page City
Select A City:

Quick Links...

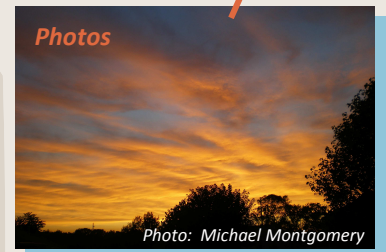
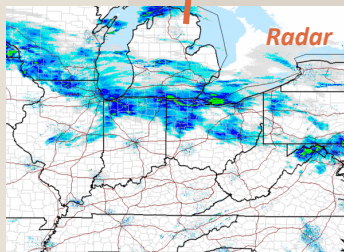
- Radar Data (Loop)
- Local Precipitation Reports
- Forecast Discussion
- Hazard Wx Outlook
- Report Severe Wx
- AHPs Rivers & Lakes
- Climate Data
- Science Section
- Photo Album

This Day in Local Weather History ...

18 January 1929 → A tornado (unofficially F2) moved from Summersville to Campbellville in Green and Taylor counties. Two people were killed at the county line. Another tornado (unofficially F3) killed one person at Sonora as it moved through Hardin and Larue counties.

Current Conditions!

Plus forecasts tailored for fire weather, aviation, and much more!



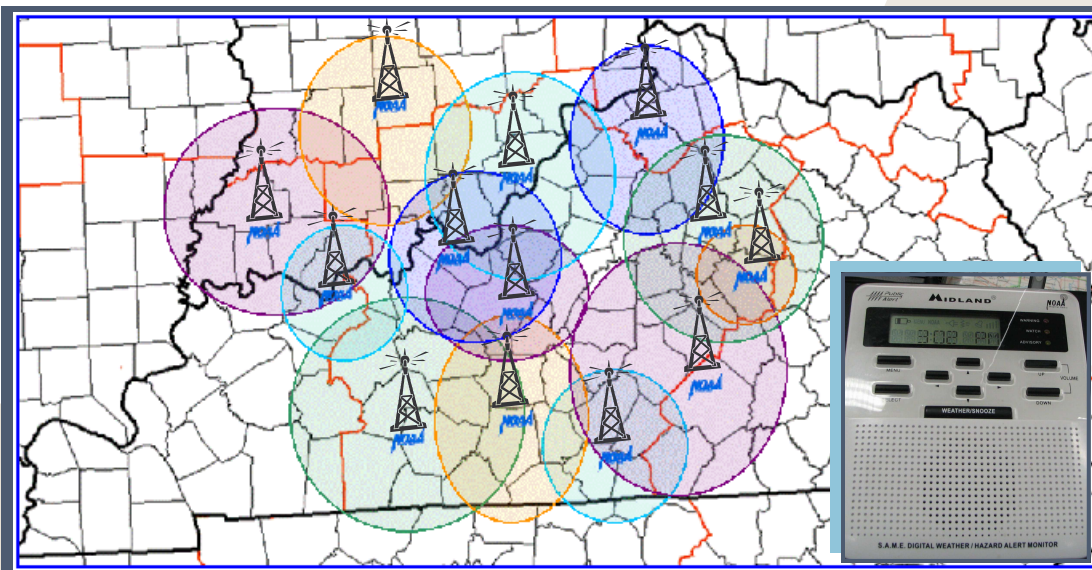
Weather Radio

Your home sits directly in the path of a devastating tornado. The National Weather Service has issued a Tornado Warning. But it's 3 o'clock in the morning. How would you know?

NOAA Weather Radio (NWR) is a service of the National Oceanic and Atmospheric Administration (NOAA), broadcasting on seven VHF frequencies ranging from 162.40 MHz to 162.55 MHz. These frequencies are outside the normal AM and FM broadcast bands, and are therefore not found on the average home radio. There

affects the coverage area, we broadcast a special signal that can automatically turn on certain types of NWR receivers, providing the latest information available about the hazard. When set to an audible or visual alarm, these radios serve as an excellent indoor warning system, and can wake you up in the middle of the night to give you

Many local retailers and electronics stores sell NWR at affordable prices. When purchasing NWR, be sure to get one with "SAME" technology so that you will receive the alarm tone when the NWS issues a warning. Also, many portable (FRS) radios and crank-style emergency radios contain the weather bands. With NWR,



NOAA Weather Radio coverage across southern Indiana and central Kentucky

are numerous specially built receivers that are commercially available for receiving these broadcasts.

During routine weather, NWR programming provides current weather and hydrologic conditions, climatological information, and the latest NWS forecast, in a cycle that repeats every three to five minutes.

The NWR transmitters serving central Kentucky and southern Indiana are programmed from the NWS office in Louisville. When significant hazardous weather

time to move to a safer location within your home.

Through partnership with the local, state, and Federal Emergency Management community, NWR can also warn you of non-weather emergencies, such as hazardous material spills, child abductions (Amber Alerts), and national attacks. In this way, NWR is an "all-hazards" radio. In 2006 and 2007, the NWS partnered with the U.S. Office of Homeland Security in an initiative to send NWR's to all public schools in the nation.

you'll have the most dependable source of weather information at your fingertips. From day-to-day weather forecasts to warnings of dangerous storms, NWR will be ready to alert you 24 hours a day, 365 days a year!

For much more information on NWR, including how to correctly program your receiver, see our NWR Help Page at www.crh.noaa.gov/lmk/?n=wrheadpg.

Be Ready! Be Prepared! Become a NWR listener today.

Rivers

We keep track not only of what falls from the sky, but also what happens to it after it enters our rivers.

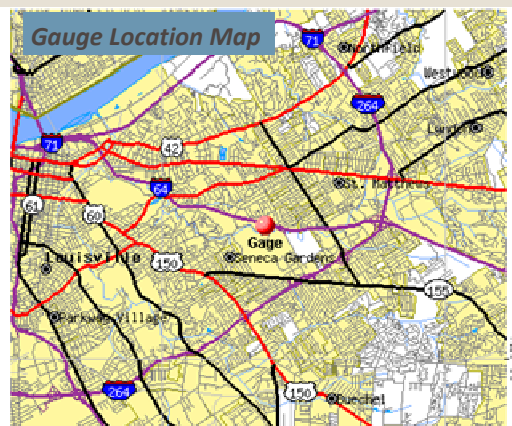
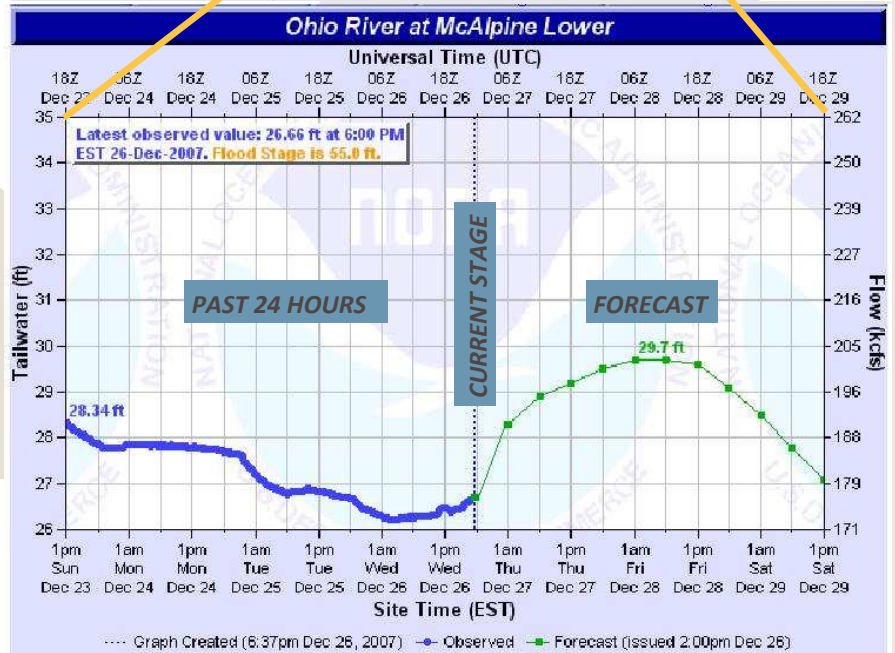
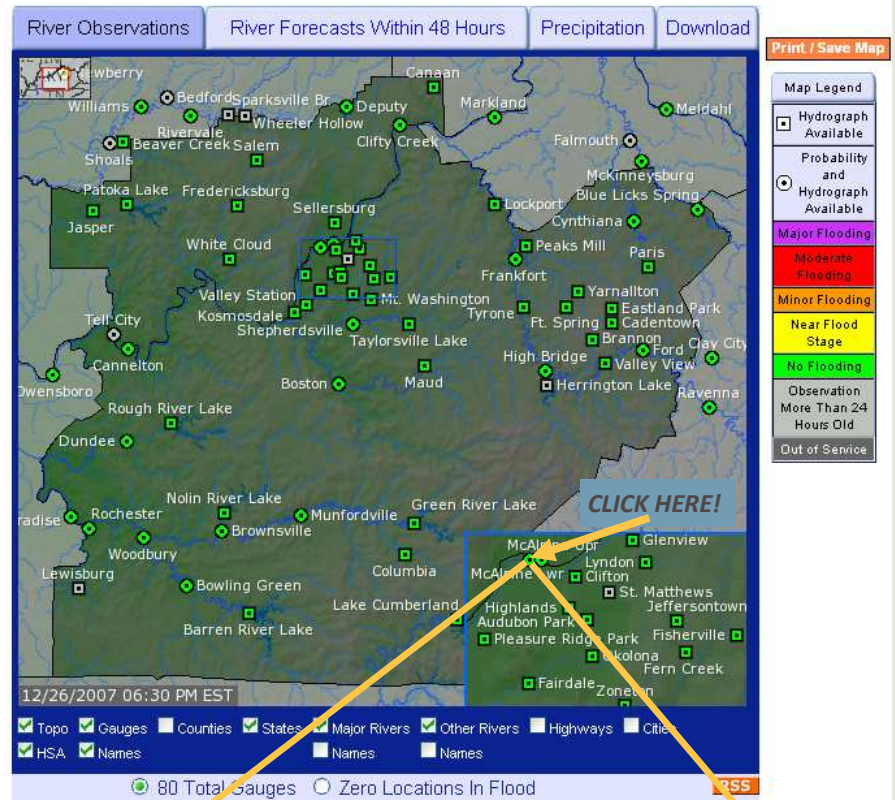
The NWS has been working with various federal, state, and local agencies to improve the Advanced Hydrologic Prediction System (AHPS) web pages (www.crh.noaa.gov/ahps2/index.php?wfo=lmk). AHPS is a quick and easy method of seeing the latest river stages and forecasts throughout central Kentucky and southern Indiana.

Louisville's Metropolitan Sewer District (MSD) allowed us to put their network of Jefferson County stream gauges on the AHPS web pages. The density of this network is apparent by looking at the insert map in the bottom right corner of the main AHPS map (see image at right). Most of these gauges report every hour so residents and drivers in the Louisville area can keep track of stream levels in flood prone locations.

A similar network of gauges exists in Lexington as well. These gauges are supported by Lexington-Fayette County Government.

With AHPS, customers can see at a glance how the rivers have been behaving, what the current stage is, and for many locations a detailed river level forecast is provided. This gives the public plenty of time to prepare for upcoming floods or periods of low water.

Weather Forecast Office Louisville, KY



- Historical Crests**
- (1) 9.60 ft on 04/02/1970
 - (2) 8.75 ft on 09/23/2006
 - (3) 6.70 ft on 03/02/1997
 - (4) 8.10 ft on 02/01/1943
 - (5) 7.21 ft on 02/18/2000
 - (6) 7.21 ft on 05/01/1993
 - (7) 7.02 ft on 07/18/1971
 - (8) 7.01 ft on 04/04/1999
 - (9) 7.00 ft on 07/14/1993
 - (10) 6.67 ft on 08/03/1987
- [Show More Historical Crests](#)

Historic high and low river levels, courtesy of the U.S. Geological Survey, and gauge location maps are included.

We plan to add even more information to the AHPS web pages in the future. The NWS wants the AHPS web pages to be the single source for all the hydrologic information taxpayers need.

Severe Weather Spotting

Help the NWS put out better warnings! Become an official Severe Weather Spotter!

Tornadoes and severe thunderstorms rake across southern Indiana and central Kentucky each year, destroying property and in some cases taking lives. It is the responsibility of the NWS to issue warnings *before* these storms strike your neighborhood, giving plenty of time to seek safe shelter.

Meteorologists at the NWS have at their disposal an amazing array of technological equipment to assist in disseminating warnings to the public. Radar, aircraft soundings, weather balloons, satellite pictures, and diagnostic computer models provide many tools with which to dissect the atmosphere and the storms that erupt in our skies. However, there is one more piece of equipment that is crucial to an effective warning program.

Eyes.

Specifically, severe weather spotters' well-trained eyes that can identify storm features that have the potential to turn deadly. Every year the NWS trains volunteers

throughout the region to spot severe weather and to send their reports immediately to the NWS office in Louisville. These reports may make the difference in "go/no-go" decisions for the NWS warning meteorologist.

Spotter talks are normally given in the late winter and early spring, just before severe weather season begins. In 2007 we gave 60 spotter training classes to over 1300 people. However, we can never have enough spotters. If you are interested in learning more about severe weather and would like to become an official volunteer severe weather spotter for the NWS, please consider attending a spotter training class. The class usually lasts about 2 hours, and is often held at local community centers or public safety offices. Watch our website, especially during February and March, for class schedules. Or, contact our Warning Coordination Meteorologist Joe Sullivan at joe.sullivan@noaa.gov. We need you to help us save lives!



Photo: Chris Wathen

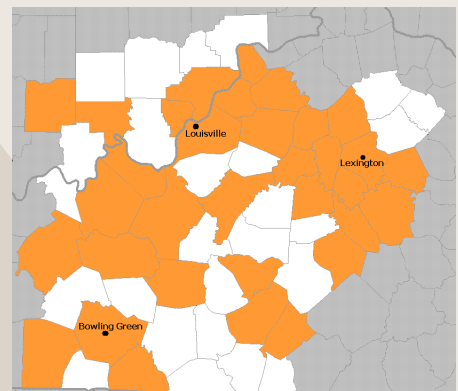
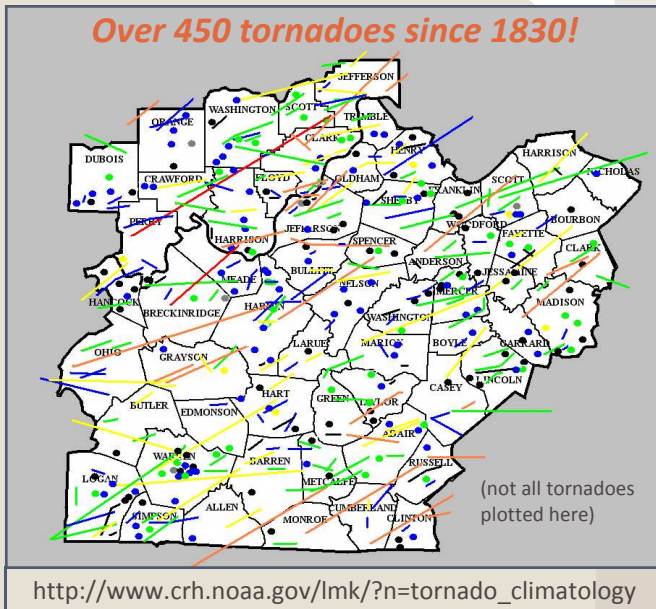
Is the photo above of a harmless cloud, or a potentially deadly tornado?



Photo: Steven Townsend, Code 3 Images Photography

What is this? Is it dangerous?

To learn more, attend a spotter class or see our website at www.crh.noaa.gov/lmk/?n=trainingdoc



Counties shaded in orange hosted a NWS spotter class in 2007.

(not all tornadoes plotted here)

HAZMAT

The NWS provides critical weather support during hazardous material emergencies.



Photo: David Stephenson

When an industrial accident occurs and poisonous smoke or fumes shoot into the air, weather conditions are paramount to the decision makers involved with the spill. Which

way will the smoke go? How many people will be affected? Will evacuations be necessary?

We provide the weather data that are vital to keeping officials informed and the public as safe as possible. The NWS can convey information such as current and forecast wind speeds, frontal passages, inversion heights, and chances of precipitation.

On January 16, 2007 a train derailment occurred in northern Bullitt County (see image at left). NWS Louisville was in frequent contact with officials providing up-to-the-minute weather support for the first several hours

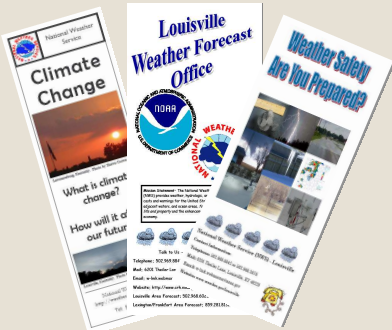
after the accident occurred. Officials were kept abreast of wind conditions and forecasts, allowing them to discern where the greatest threat to public safety would occur.

Contact NWS Louisville at (502) 969-8842 whenever HAZMAT weather support is needed across south central Indiana or central Kentucky.



Outreach

Have the NWS speak or appear at your next event!



We have excellent brochures!

The staff of the Louisville NWS office participated in nearly 60 public events in 2007 (and that's not even counting the five dozen spotter classes we gave)! We gave weather talks at meetings of Rotary Clubs, Chambers of Commerce, schools, and many other venues.

placed fans, we can produce a fascinating mini-tornado in the simulator.

We also have excellent posters and brochures available, as well as educational pages on our website at www.crh.noaa.gov/lmk/?n=outreach.

John Gordon wows the audience...



We had a weather booth at the Kentucky State Fair, the University of Louisville's "ECO-FAIR," and Bernehim Forest's ColorFest. For large events such as the state fair, we brought along our Tornado Simulator that was built right here at the Louisville office (see image at right). Through the use of water vapor and strategically

If you would like us to speak on any weather-related topics for your organization's next get-together, please let us know. You may talk to our Warning Coordination Meteorologist Joe Sullivan at joe.sullivan@noaa.gov or (502) 969-8842. Joe can also help you schedule your county's next spotter training class.



Above: Not a real tornado, but an incredible simulation! Let us know if you'd like to see it at your next event!

Office Activities

There's much more to the NWS than warnings and forecasts...



Since Spring of 2000 we have published office **newsletters**, full of intriguing weather stories as well as projects in which NWS Louisville has been involved. Those newsletters are available on-line at www.crh.noaa.gov/lmk/?n=newsletter.



NWS Louisville has negotiated an agreement with Traffic Response and Incident Management Assisting the River Cities (**TRIMARC**) in Louisville to put select warnings on their Dynamic Message Signs (DMS) and their Highway Advisory Radio (HAR, 530 AM) during the most extreme weather circumstances.

If the NWS issues a Tornado Warning or Severe Thunderstorm Warning for 70 mph winds and/or hail at least 1 inch in diameter in or near Louisville, you will see a message appear on the DMS's saying "Severe Weather Alert - Tune to 530 AM." Tune your radio to the HAR and you will hear all valid warnings and statements. Armed with this information motorists are able to take an alternate route, seek shelter, or pull safely off the highway until the threat has passed.



Counties included in the NWS/TRIMARC partnership

Planning and development of the **Kentucky Mesonet** continued in 2007 through Western Kentucky University (WKU) and a partnership with the NWS. The mesonet is a dense network of automated weather sensors that will be installed throughout the Commonwealth. Four stations are currently operating on an experimental basis in central Kentucky, located in Logan, Warren, Ohio, and Casey counties. Site license agreements have been signed for additional stations to be located in Bullitt and Fayette counties. Negotiations are underway to finalize site license agreements at many other sites as well. NWS representatives play a vital role in helping to identify many of the candidate Mesonet sites across Kentucky.



Experimental data are available in near real-time and can be viewed at kymesonet.org. Historical information is also available.

Data are acquired from remote Mesonet weather stations via cellular communications to the Mesonet computing systems housed at Bowling Green Municipal Utilities. A direct feed of near real-time meteorological data from mesonet databases to the NWS is planned for the summer of 2008.

Ninety percent of all presidentially declared disasters are weather related, leading to around 500 deaths per year and nearly \$14 billion in damage. **StormReady**, a program started in 1999, helps arm America's communities with the communication and safety skills needed to save lives and property – before and during the event. StormReady helps community leaders and emergency managers strengthen local safety programs. StormReady communities are better prepared to save lives from the onslaught of severe weather through better planning, education, and awareness.

Seven University of Kentucky County Extension Agencies earned StormReady Supporter recognition during the summer of 2007, and by late in the year the new NWS Louisville StormReady team was actively pursuing new initiatives with a number of entities. Six Flags' Kentucky Kingdom became the newest StormReady supporter in the Louisville warning area on December 6, becoming one of just a handful of theme parks in the country earning this designation.

Central Kentucky's Newest StormReady Supporters:

- Muhammad Ali Center
- Grayson County Extension Service
- Henry County Extension Service
- Bullitt County Extension Service
- Trimble County Extension Service
- Oldham County Extension Service
- Spencer County Extension Service
- Anderson County Extension Service
- Six Flags Kentucky Kingdom

There's much more to the NWS than warnings and forecasts...

In November the Louisville Convention and Visitor's Bureau (LCVB) named MIC John Gordon an **LCVB Ambassador** for bringing the 33rd Annual Meeting of the National Weather Association (NWA) to Louisville. The NWA will meet here in October 2008, bringing five hundred professional scientists to Louisville for the six day long meeting.



Ambassador John Gordon accepts his award.



For over a century, volunteer weather observers have participated in the **Co-Operative Weather Observer Program**. The intrepid weather watchers send in their temperature and precipitation reports to the NWS every day.

In 2007, the Louisville office was pleased to present the following service awards to some of our best and brightest volunteer observers:
Madison, IN: 50 years
 Elizabethtown KSP: 25 years
 Lebanon, KY: 20 years
 Albany, KY: 10 years

We also were very fortunate to add new locations in Lewisburg, KY, McDaniels, KY, and Etoile, KY.

Electronic Systems Analyst Bill Whitlock was presented with the **REX (Regional Excellence) Award** for his development of a calling program that allows NWS employees from any office in the central part of the United States to reach upper management whenever significant weather strikes, any time of day or night.

Forecaster Angie Lese was given the **Regional Cline Award for Meteorology** for her successful development and execution of a Midwest Bow Echo Workshop held at the Rauch Planetarium in Louisville in early 2007. Meteorologists came together to share the latest knowledge of severe thunderstorm squall lines (see next page for more).



In a continuing effort to keep the lines of communication open with our forecasting partners, NWS Louisville initiated a program in which **chat software** is used at the NWS office and all media outlets in our area of responsibility. This chat software can be used at any time, but comes in most useful during episodes of severe weather. With this live chat software, we can instantly share information with many media meteorologists throughout the region simultaneously. Similarly, the media can pass important weather information on to the NWS that they observe or receive from their viewers. The ongoing conversation between the NWS and the media further strengthens our joint ability to warn, serve, and protect the public from threatening weather.

Drought swept across much of the southeastern United States in 2007, including the Tennessee and Ohio valleys. Mild drought conditions had begun to develop over southern Kentucky by the first of June, and had become severe and widespread throughout central Kentucky by the end of the month.

As summer heated up, rain continued to be evasive. The drought became extreme by early August and continued through the entire month of September into early October. From August 1 to October 15 Bowling Green, for instance, received less than four inches of rain and hit 100 degrees nine times.

During the drought, from early June to late November, NWS Louisville issued a Drought Information Statement every week. The statement was a lengthy treatment of the latest drought developments, and the effects the dry weather was having on local agriculture and standards of living. Also present were discussions of the current large-scale meteorological atmospheric conditions and the forecast for the upcoming several days to three months.

Through the Drought Information Statements our customers were kept abreast of the latest drought conditions and forecasts, as well as their impacts.



Left: Cracked, dry ground in Mercer County, June 2007. Photo courtesy Jordan Wirth

Bow Echo Workshop

NWS Louisville hosted a valuable scientific conference in early 2007.

On February 28 and March 1, 2007, the first-ever Midwest Bow Echo Workshop was held at the Rauch Planetarium on the campus of the University of Louisville (U of L). This workshop was organized by meteorologist Angela Lese from NWS Louisville, and was aided by NWS Central Region Headquarters, the Arts and Sciences department at U of L, and the Rauch Planetarium staff.



Regional Director Lynn Maximuk congratulates Angie for winning the prestigious Regional Cline Award

The purpose of the workshop was to gather the most experienced scientists in one place to discuss how to implement new research into NWS warning operations.

Roughly 100 people attended the two-day workshop, where NWS meteorologists, atmospheric science researchers, university personnel, and broadcast meteorologists were able to share recent research. The workshop turned out to be a highly successful event.

Why focus on bow echoes? Recent studies suggest that a number of tornadoes across the United States each year are spawned by bow echoes (about 20%) as opposed to individual supercell thunderstorms (about 75%). Interestingly, the percentage of bow echo spawned tornadoes is as high as 50% in the Midwest and lower Ohio Valley (i.e., Indiana, Illinois, Kentucky, and Ohio). Thus, there is a need to focus new

research efforts on these important and powerful storm systems.

Bow echo formation can create a complex warning scenario for NWS meteorologists. Bow echo tornadoes tend to develop very quickly, whereas supercell tornadoes will typically take longer to form. In addition, bow echoes can produce straight-line wind damage, occasionally equivalent to

that of a weak tornado. Bow echoes can also produce flash flooding, which is responsible for the most weather-related deaths.

There are many aspects of bow echoes from which to learn, and this workshop was a step in the right direction of improving upon current warning techniques and the overall knowledge of bow echoes.



Presentations were shown inside the Rauch Planetarium dome.

City	Normal Annual Temperature	2007 Annual Temperature	2007 Departure from Normal	Normal Annual Precipitation	2007 Precipitation	2007 Departure from Normal
Bowling Green	57.2°	59.9°	+2.7°	51.63"	42.00"	-9.63"
Lexington	55.2°	57.3°	+2.1°	45.91"	43.71"	-2.20"
Louisville	56.9°	60.3°	+3.4°	44.54"	44.53"	-0.01"

Office Research

Great local research projects are furthering the science of meteorology.

When the weather is quiet, NWS Louisville meteorologists have time to work on important research projects. Sometimes these projects are short papers that are shared with others in the office, and other times the research is done on a much larger scale and is included in national professional publications. Some of our current projects include the following:

- Post-mortems of significant weather events, such as the October 18 tornado outbreak, to study the meteorology of the event and also to examine our performance
- Study of squall lines, examining their development and behavior
- Combing through tens of thousands of pieces of local historical weather data, verifying all temperature, precipitation, and snowfall records that are made available to the public
- Examining the use of data from weather instruments mounted on aircraft to assist in the warning decision process
- Collecting information and photographs from the deadly April 3, 1974 and March 27, 1890 tornado outbreaks
- Cataloging and ranking all places in southern Indiana and central Kentucky that flood easily
- Quarterly literature review in which all forecasters read and discuss a selected paper from a scientific meteorological journal

Fire Weather

We lend meteorological support to agencies responsible for wildfires and prescribed burns.

In addition to the routine forecasts most members of the public are used to seeing, NWS Louisville produces special forecasts with parameters of particular interest to people involved with fighting and controlling wildfires. These specialized forecasts include information such as moisture levels in the atmosphere, winds just off the surface, how high smoke plumes will reach, and

how easily smoke will be dispersed. The Hoosier National Forest is one of the most important users of this information.

Due to the drought conditions in 2007, the traditional fire weather season was started a full month early this year. During the hot dry summer months, the Louisville NWS office issued 44 fire weather

forecasts for specific locations when requested by fire officials.

Of course, the United States is not the only country affected by wildfires. Our Fire Weather Program Leader, Joe Ammerman, spent three weeks in Sydney, Australia, in March helping that nation's meteorologists during an extended severe fire weather season there.

Aviation Weather

The nation's aviation program relies on forecasts from the National Weather Service.

Pilots across the United States are required to check NWS forecasts before they are allowed to take off and before they are cleared to land. At the Louisville office we issue forecasts for Louisville International Airport, Blue Grass Airport, and Bowling Green/Warren County

Regional Airport. These forecasts include wind, cloud, visibility, and precipitation information.

In 2007, our forecasts for these airports improved by decreasing our false alarm rate and increasing our ability to predict

dangerous flying conditions such as low cloud heights, low visibilities, and wind shear.

The NWS Louisville staff spoke with hot air balloon pilots on several occasions during 2007, and collaborated with forecasters from UPS.

Severe Weather Performance

The NWS keeps careful track of how well it performs during severe weather.

The number one goal of the National Weather Service is to provide life-saving warnings of deadly severe weather. Because of the paramount importance of this aspect of our duty to American taxpayers, we keep a close eye on how well we perform during severe weather outbreaks.

In 2007 your Louisville NWS office issued*:

- 18 Flash Flood Warnings
- 348 Severe Thunderstorm Warnings
- 59 Tornado Warnings

*county-based

With 299 known severe weather events in 2007:

- Our probability of detection of severe weather: 81%
- Our false alarm rate: 49%
- Average lead time (how long the warning was issued before the weather struck): 13.1 minutes

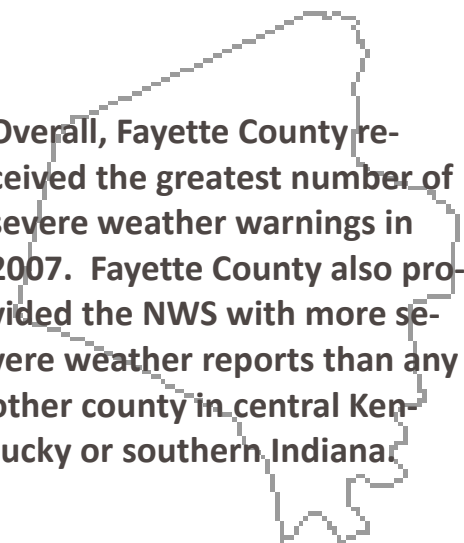
“False Alarm Rate” indicates the number of times we issued a warning but no severe weather was reported. Unfortunately, sometimes severe weather may have actually occurred but was never reported to the NWS. That is one reason why weather spotter reports are so crucial to a successful warning program.

The largest severe weather event of 2007, by far, was the tornado and severe thunderstorm outbreak of October 18-19. For the year of 2007, the outbreak had:

- 20% of the year’s severe thunderstorm warnings
- 88% of the year’s tornado warnings
- 29% of the year’s total warnings

For the October 18-19 event, we had an average lead time of 16 minutes. The greatest lead time of the event was 36 minutes.

Overall, Fayette County received the greatest number of severe weather warnings in 2007. Fayette County also provided the NWS with more severe weather reports than any other county in central Kentucky or southern Indiana



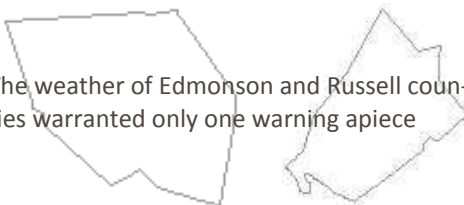
Greatest number of severe thunderstorm warnings: Clark County, Kentucky, with 15



Greatest number of tornado warnings: Breckinridge County, with 7

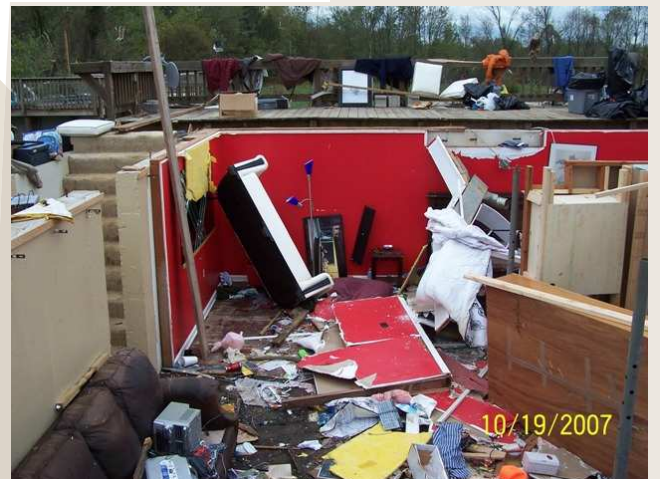


The weather of Edmonson and Russell counties warranted only one warning apiece



Above: A funnel cloud spins over rooftops of homes in Lexington on May 5. It did not touch down. Photo courtesy Alan Creech/Chris Bailey/WKYT

Right: Giant hail in Hart County on April 3. Photo courtesy Annette Puckett



Above: All that was left of a vanished home after an EF3 tornado in Clark County, Indiana on October 18. Only the basement remained. NWS photo

Southern Indiana and Central Kentucky were no strangers to wild weather in 2007.

April 3

A powerful cold front brought an impressive round of severe storms to the entire region. Huge hail pounded many locations, with hailstones as big as baseballs in Hart County (see picture). Also, the year's first two tornadoes were recorded. Shortly after 8 pm an EF-1 twister spun along a 13 mile path in Casey County east of Dunnville with 105 mph winds. An EF-0 tornado produced minor damage in Taylor County north of Mannsville. The cold front that produced the storms also brought an end to an extended period of very warm weather, and ushered in unseasonably cold air that would lead to another one of the year's most interesting weather events (see next event).



Photo: Tom and Phyllis Atteberry

April 6-7

A frigid air mass settled into the Ohio and Tennessee valleys for Easter weekend. On April 6, which was Opening Day at Keeneland, scattered snow showers developed and brought nearly an inch of snow to Lexington (see picture). It was a record snowfall for the date. The next day was the peak of the cold outbreak, with highs only in the middle 30s to around 40 degrees that set daily records for cold maximum temperatures. That night Bowling Green fell to an amazing low of 23°, which was just five degrees away from the all-time low for the month of April. The late freeze would prove to be the first of a one-two punch farmers would take when the summer drought set in late in the year.



Photo: Steve Blake

August 16

Drought and heat characterized the entire summer and the first half of the fall season in 2007. Numerous high temperature records were set, including eight records in Louisville in August alone. The sweltering heat reached its apex on the 16th day of August as nearly everyone in central Kentucky and southern Indiana saw the mercury soar into the triple digits. Lexington, Louisville, and Bowling Green all set record highs that day (102°, 105°, and 106°, respectively). The 105° reading in Louisville was the hottest temperature ever seen there in August, and only two degrees away from the hottest temperature ever seen in any month in Louisville. The nights were hot too, with the morning low temperature on the 16th in the lower to middle 80s in many spots, especially in urban areas. Later that day welcome relief came in the form of scattered thunderstorms, the rain from which quickly dropped temperatures to cooler levels than the morning lows. However, the heat and general drought would continue into October, with highs still in the 90s as late as October 8.



Photo: Greg LaFamore

October 18-19



On the afternoon of October 18, a strong low pressure center was over Iowa with a sharp cold front dropping south across Missouri. A strong jet stream was blowing overhead and plenty of moisture was streaming

northward from the Gulf of Mexico. As the cold front proceeded to the east, large areas of severe thunderstorms broke out from the mid-Mississippi Valley into Kentucky and Indiana. In southern Indiana and central Kentucky, several of the storms produced tornadoes. As a matter of fact, it was the largest October tornado outbreak this region has ever seen, with twice as many twisters as the next largest October outbreak. The worst of the evening's tornadoes had surface winds of 138 mph, and inflicted EF-3 damage when it swept a rural home completely off of its basement and foundation in Clark County, Indiana. Other tornadoes struck the counties of Perry, Hancock, Breckinridge, Meade, Marion, and Bullitt. A small EF-0 tornado even touched down right in the city of Louisville, slightly damaging a grocery store.

Staff Changes in 2007

The Louisville NWS office greeted several new faces in 2007.

Joe Sullivan, Warning Coordination Meteorologist

Joe arrived at NWS Louisville in January as our newest WCM. Though he was born and raised in Iowa, he worked at many NWS offices throughout the country before coming to Louisville with his wife and four children. Joe received a Department of Commerce Silver Medal for making NWS radar data available via the Internet, and won a Cline Award for designing a telecommunications networking process that saves taxpayers \$100,000 per year. At Louisville, Joe is in charge of the severe weather spotter program and many of our outreach activities.



Toby TenHarmself, Information Technology Officer

Toby worked at seven NWS offices, in a variety of jobs, before transferring from Duluth, MN to Louisville in July. Toby keeps our main computer systems working smoothly and answers our many questions about all things technological.

Jim Maczko, Senior Meteorologist

Though Billings, MT was where Jim last worked before coming to Louisville, he was born and raised in Ohio and is happy to be back in this part of the country. Jim brings experience in fire weather and snow forecasting.

Andrea Lammers, Meteorologist

Andrea was a student employee at NWS Louisville during 2005 and 2006, which led to permanent employment at Louisville in 2007. Andrea has worked on research projects and has become a valued member of our forecast team.

Plans for 2008

NWS Louisville has ambitious plans for continued excellent customer service and office development this year.

- Update all of our web pages, and think more in terms of the eyes of the customer
- Create winter weather "one stop shop" web page
- Have first-ever media seminar in Bowling Green
- Decrease tornado false alarm rate by 10%
- Partner with the structural engineers, media, and Civil Air Patrol and other aviation groups for more detailed storm damage surveys
- Overhaul storm spotter program and increase number of hazardous weather reports
- Develop more efficient office budget program
- Host 33rd Annual National Weather Association meeting at the Galt House in Louisville in October
- Host regional information technology and gridded forecast summit
- Start Local Leadership Enrichment group
- Continue to call majority of Kentucky and Indiana public schools in our area of responsibility, and educate schools how to program their new NWR
- Improve fog forecasting
- Change format of morning observation products
- Add on to the office's storage facility
- Hire customer service-oriented and proactive replacements for retired Data and Acquisition Program Manager Larry Dattilo and Senior Meteorologist Alex Beauvois