



National Weather Service
Louisville

Shareholders **REPORT** **2023**



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For over 150 years, the National Weather Service (NWS) has remained committed to serving the people of southern Indiana and central Kentucky. That's 24 hours a day, 365 days a year, with forecasters on 3 shifts a day, and a cadre of great professionals supporting operations. This document, our 19th annual Shareholders Report, details the activities of NWS Louisville across 49 counties in central Kentucky and 10 counties in southern Indiana.



Despite a relatively calm spring season in terms of severe weather, with the exception of tornadoes associated with a squall line on April 5, there were two significant long track tornado events later in the year. An EF-1 tornado in August with estimated 105 mph peak winds along a 26-mile long path in southern Indiana was the longest known tornado track ever recorded for that month in our area (see page 9). Another tornado, on December 9, touched down near Clarksville, TN and traveled for nearly 48 miles to Simpson County, KY. The twister reached a peak strength of EF-3 in Tennessee, with estimated 150 mph winds, along its path. The storm occurred almost two years to the day after the deadly Quad State outbreak.

One of the most significant changes in how we communicate the forecast is the greater use of probabilistic information. We're excited to be developing new ways to communicate to our partners forecast information in both deterministic, e.g., "A high of 32°", and probabilistic, e.g., "A 60% chance of the high being above 32°" ways. This is a paradigm shift in our traditional messaging.

Our outreach team visited 11 bourbon distilleries, meeting with safety and emergency management personnel to showcase what NWS Louisville can offer for better preparedness. We're thrilled to have recruited our first Weather-Ready Nation Ambassador bourbon distillery, Angel's Envy.

In 2023 my personal favorite accomplishment was obtaining a river gauge and forecast point for the Green River at Mammoth Cave National Park. Our partnership with the National Park Service has grown exponentially in recent years, and this river forecast will help them make more informed decisions regarding their ferry operations. I extend my gratitude to the Ohio River Forecast Center in Wilmington, OH, and our Service Hydrologist Andrea Schoettmer, for their hard work in making this dream a reality.

Accomplished 2023 Goals

- Increasing the number of deployment-ready forecasters (page 3)
- New river forecast point on the Green River in Mammoth Cave National Park (page 6)
- Bourbon Trail outreach visits (page 7)
- Probabilistic forecast messaging (page 8)
- Improve the office's Situational Awareness Display (page 13)

Our top 5 goals for 2024, are 1) improving tornado warnings (especially squall line tornadoes), 2) providing support for major events including the April solar eclipse, 150th Kentucky Derby, PGA Championship, and the 50th anniversary of the April 3, 1974 Super Outbreak; 3) Flood Inundation Mapping (FIM) training; 4) outreach to Spanish speakers, the deaf and hard of hearing; and 5) increasing partnerships with our state parks.

Our office's core foundation is exceptional customer service and public stewardship, and we're committed to demonstrating that through our activities. In 2023 the NWS cost each American only \$4. I welcome your suggestions on how the National Weather Service office in Louisville can become and even more valuable investment for you.

I am grateful to Lead Forecaster and Shareholders Report Editor Tom Reaugh for assembling this report, and Science and Operations Officer Ryan Sharp for his thorough review of the document.

John Gordon
Meteorologist-in-Charge

BECOMING DEPLOYMENT READY

Mike Kochasic, Warning Coordination Meteorologist

One of the most exciting and rewarding parts of the NWS Warning Coordination program is the ability to serve alongside key safety partners when and where it matters most. As forecast models and decision-making datasets increase in capacity and complexity, Impact-based Decision Support Services (IDSS) are becoming increasingly in demand across central Kentucky and south-central Indiana. The IDSS program is a top priority for Ken Graham, Director of the NWS.



NWS employees undergo extensive training to ensure they have the necessary professional competencies to provide quality IDSS through all phases of events and disaster life cycles. Upon successful completion of Federal Emergency Management Agency (FEMA) courses, NWS training, and real-world onsite event experience, the NWS employee has earned certification to perform proficiently in a deployment and is officially recognized as “deployment ready”.

At the beginning of 2023, three employees at NWS Louisville were recognized as deployment ready and fulfilled most of the requests to be onsite at large events when public safety was potentially at risk of impactful weather. One of our office’s targets for the year was to increase the number of employees that were able to provide onsite IDSS. This year, we added several more employees to the deployment-ready ranks (for a total of 8), while an additional 7 staff members have made intentional strides toward becoming certified.

In the photo on the left, meteorologist Kyle Wilkins installs portable weather equipment atop Churchill Downs ahead of the Kentucky Oaks and Derby. Information from this instrumentation is monitored by onsite meteorologists in Churchill Downs’s Command Center. In this way, meteorologists can deliver crucial weather information directly to Churchill Downs officials, greatly enhancing the spectators’ safety.

Over the course of the year, NWS Louisville supported 84 events. Of those, 20 days were onsite events that included days at Thunder over Louisville (2), races at Churchill Downs (7), the Madison Regatta (3), Bourbon and Beyond (4), and Louder than Life (4), with many of our new deployment-ready folks supporting the IDSS efforts (a total of 34 employee days). This is just one example of how our operations are becoming more flexible to serve event partners and keep the public safe from hazardous weather.



Lead Meteorologist Brian Schoettmer briefing pilots and officials the day before Thunder Over Louisville.



Brian Schoettmer with weather monitoring sources providing weather support at Thunder Over Louisville.

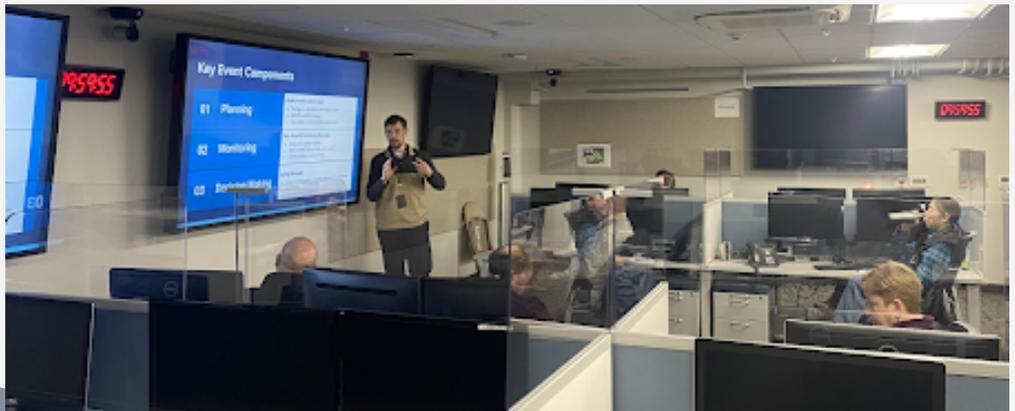
TABLETOP EXERCISES

Mike Kochasic, Warning Coordination Meteorologist

Do you ever wonder what NWS employees do whenever there's NOT severe weather? One major item is: training! The NWS is heavily invested in preparedness for hazardous weather conditions in our communities. But we don't just say it – we practice it too.

One way we help ourselves and our partnering agencies practice preparedness and train for hazardous weather scenarios is through conducting tabletop exercises. Tabletop exercises are a form of simulated training that involve group discussion and walking through hypothetical scenarios. These exercises help organizations prepare and respond to emergency situations. The purpose of tabletop exercises includes exploring different scenarios, practicing decision-making under pressure, and ensuring preparedness. They also assist communicating and coordinating with partnering agencies, skill development, training, and improvement from past scenarios.

This year the NWS met with area Emergency Management, Churchill Downs, U.S. Army Corps of Engineers, U.S. Geological Survey, National Park Service, Kentucky Division of Water, Kentucky National Guard, and other local municipal entities to conduct weather-based scenarios. This ensures that, together, we serve our constituents the best we can. Through tabletop exercises the NWS and our partners can better stay ahead of big weather events, successfully face unexpected complications, improve our resilience, and have an effective response during emergencies.



Top: Lead Meteorologist Brian Schoettmer leads a table top exercise with Emergency Management in Bowling Green.

Above: Meteorologist Chase Graham addresses Lexington's Emergency Management Agency.

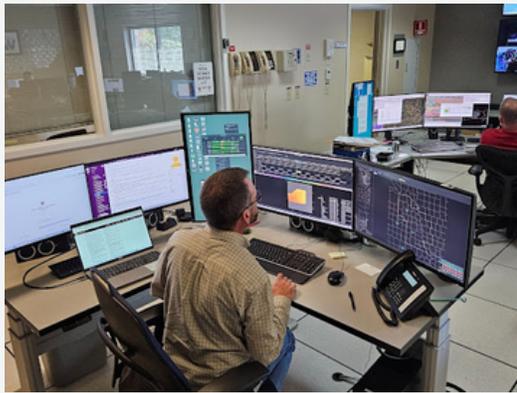
Left: Brian Schoettmer takes participants through a severe weather scenario at Churchill Downs in Louisville.

WHEN “THE BIG ONE” STRIKES

Brian Schoettmer, Lead Meteorologist

Ron Steve, Lead Meteorologist

The New Madrid Seismic Zone, along with other lesser-known fault lines, quietly poses a significant earthquake threat to our region. Even though the last major earthquakes to occur on the New Madrid happened back in 1811-1812, it wasn't all that long ago in a geologic time frame. Some geologists suggest that the New Madrid may be overdue for another major shake. No one knows when another serious earthquake may strike, but planning and preparation do occur in the emergency management community and other public service agencies. Functional and tabletop exercises simulating real-life events and testing the response of local, state, and federal agencies are critical to the planning and preparation process. In 2023 NWS Louisville participated in one such exercise simulating a major earthquake in the region.



Meteorologist and Information Technology Officer Kevin Farina backing up NWS Paducah.

On October 18 a total of fifteen NWS forecast offices, a regional river forecast center, and NWS's Central Region Headquarters in Kansas City participated in a functional exercise simulating the NWS response to a major earthquake. A regional tabletop exercise was then conducted the following day to discuss what went well, what needed improvement, and what a longer-term response and recovery might look like after a disaster. Many aspects of an NWS office's ability to still function and provide critical weather information were tested during this realistic exercise.

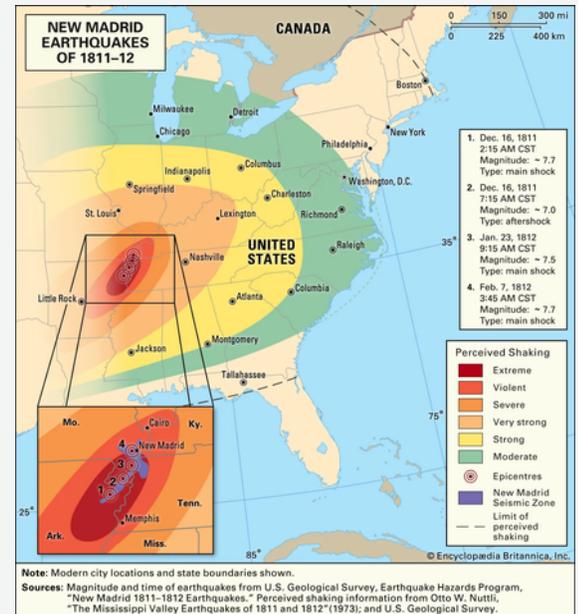


Image Source: britannica.com

One key scenario tested our response capabilities as if the NWS office in Paducah, Kentucky had lost all ability to communicate. Normally, NWS Louisville is the primary backup office for Paducah, however, our workload became quite overwhelming given the need for an ongoing forecast, meeting requests of multiple partners in our service area as well as NWS Paducah's area, and the earthquake's impacts to our own staffing. The combination of these factors forced a third backup office, far removed from the earthquake zone, to take over for NWS Paducah's forecast operations. Then, later in the simulation, another office had to briefly take over NWS Louisville forecast operations so our office could allocate its limited resources to support partners throughout Kentucky who would be responding to such a disaster. This is the first time that tertiary backup in the NWS had been tested on such a large scale, and the overall outcome was successful!

The functional exercise was eye opening to just how quickly an office can become overwhelmed, especially when dealing with direct impacts to employees and their ability to get into work. In addition, a large-scale disaster could render useless some of the technology that we take for granted. For instance, the internet, landline and cellular phones, and important digital documents that we store on computers may not be usable in the aftermath of a disaster. Figuring out ways to communicate with other offices, ensure employee safety, and continue our operations can become challenging when losing many of the key tools we are accustomed to using. Identifying ways to back up these key tools was one of the main takeaways from the exercise. The best practices and lessons learned will be applied here and at other NWS offices to help the agency be better prepared, more nimble, and more adaptable during any large-scale crisis. As a result, vital weather information will continue to flow to NWS partners and the American public when they need it most.



Meteorologist Chase Graham runs a chemical dispersion plume based on forecast winds at the site of a simulated damaged chemical plant.

MAMMOTH CAVE RIVER GAUGE

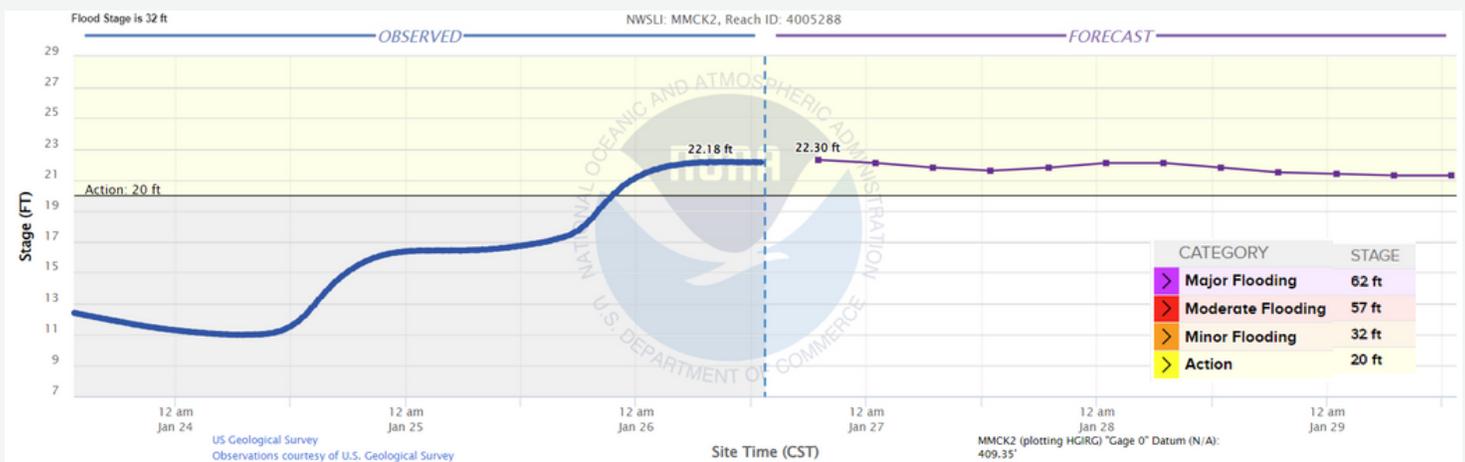
Andrea Schoettmer, Service Hydrologist

On October 31 NWS Louisville, in coordination with the Ohio River Forecast Center (OHRFC), began daily river forecast services for the Green River at Mammoth Cave at the request of Mammoth Cave National Park. This river forecast request came from the National Park Service since water levels affect Green River Ferry operations and impact trails and cave tours. Another reason this new river point location was chosen to receive new forecast services comes from the public's familiarity with the park's location, using Mammoth Cave as a reference point. River forecasts for Mammoth Cave could be challenging due to karst factors that make runoff tracking difficult. The OHRFC is willing to take on that challenge with NWS Louisville.



Green River Ferry crossing in Mammoth Cave National Park.

Forecasts for the Green River at Mammoth Cave will be issued daily and will be available via the NWS Louisville webpage. Flood Warnings will be issued when water levels are expected to reach or exceed the minor flood stage level of 32 feet.



RISHEL AWARD

From NWS Insider

Congratulations to NWS Louisville's Senior Service Hydrologist, Andrea Schoettmer, recipient of the prestigious 2022 Gregg B Rishel Award given in May of 2023.

This award recognizes outstanding science and/or service contributions toward the fulfillment of the water resources services mission. The award considers contributions that advance forecast and warning tools; data observation, collection, and analyses; flood safety and water resources outreach; timely and accurate operational forecasts; service plans, policies, or procedures; and cooperative efforts with local, state, and federal agencies.

Andrea provided outstanding leadership and hydrologic warning support in assisting NWS Jackson during the historic, deadly flash flooding in late July 2022 in eastern Kentucky. Andrea provided mutual aid for Impact-based Decision Support Services and traveled to NWS Jackson to conduct flood damage surveys and gather aerial imagery.



Service Hydrologist Andrea Schoettmer receives the Rishel Award from Meteorologist-in-Charge John Gordon.

Through social media and web page content and via community engagements, Andrea actively promotes flood readiness and awareness. She obtained and placed Turn Around Don't Drown (TADD) signage for multiple vulnerable locations, worked with partners to improve river forecasting, and responded to additional river forecast service requests. Andrea has also provided crucial input to the ground-breaking team that authored the National Flood Inundation Mapping (FIM) Concept of Operation for the implementation of real-time flood inundation mapping.

WEATHER AMBASSADORS

Mike Kochasic, Warning Coordination Meteorologist

The NWS is a proud partner of FEMA, and the two agencies work closely together since approximately 90% of disasters are weather related according to the United Nations. Since 2021 FEMA has highlighted a renewed commitment to delivering better services to marginalized and other vulnerable populations. To continue the NWS mission of building a Weather-Ready Nation, in accordance with directives from NWS Director Ken Graham, we as an organization have highlighted vulnerable communities to increase resilience building.

One such vulnerable population is tourism, particularly those who visit the Kentucky Bourbon Trail distilleries and the national parks within the region. Many distilleries are located in low-lying areas next to rivers or streams and are prone to dangerous flash flooding. National parks can be remote and have limited cell coverage. Additionally, the excessive heat Kentucky summers bring, and rapidly developing severe weather, can affect outdoor events in these locations.

To connect safety personnel with educational tools and weather planning resources for the tourism industry, one of NWS Louisville's 2023 goals was to increase Weather-Ready Nation Ambassadors (WRNA) by partnering with the national park system and Kentucky Bourbon Trail. WRNA participants serve as change agents and leaders to bring weather education and safety to their communities. In total, 10 distilleries joined the WRNA team, and there's room for more!

NWS Louisville also joined forces with Mammoth Cave National Park, Abraham Lincoln Birthplace National Historical Park, and Camp Nelson National Monument. All agreed to become part of the WRNA team to help convey educational and safety information to park visitors and staff.

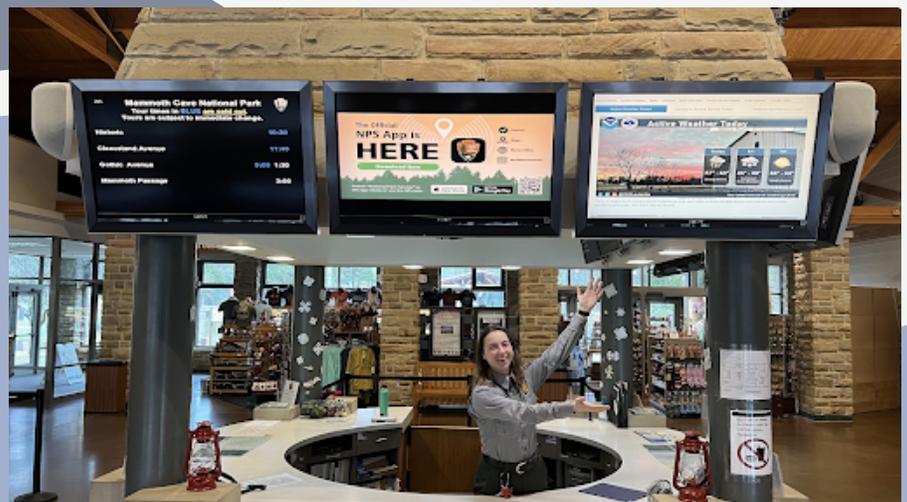
By utilizing the NWS's resources, planners can make informed decisions to keep visitors and staff safe from hazardous weather. This is particularly important in high-traffic tourist destinations such as national parks and Bourbon Trail distilleries.



Above and right: NWS Louisville staff and students welcoming new Weather-Ready Nation Ambassadors along the Bourbon Trail at Maker's Mark in Loretto and Wild Turkey in Lawrenceburg.



Below: Weather information from NWS Louisville on display in the Mammoth Cave National Park Visitor Center



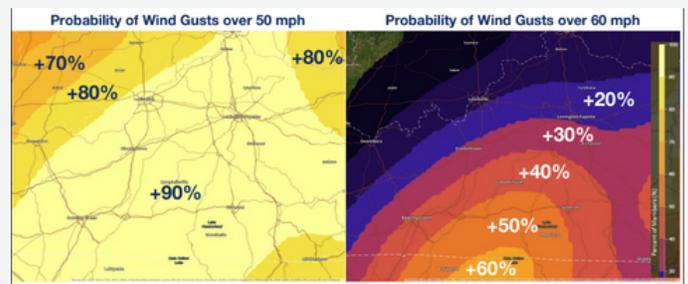
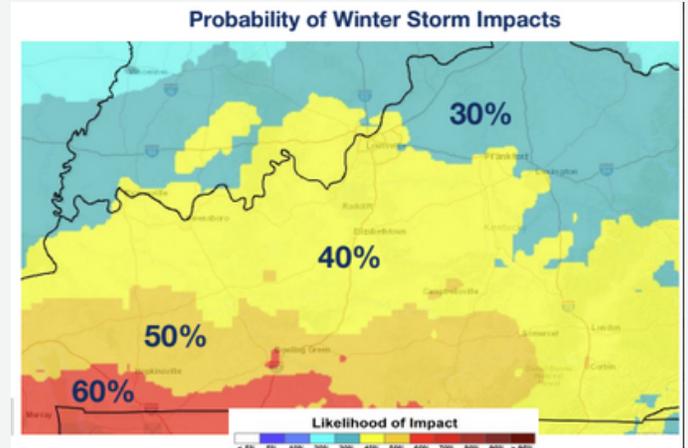
PROBABILISTIC MESSAGING

Chase Graham, Meteorologist

Over the past 10 to 15 years, advances in computing capabilities have made it possible to run various weather prediction models more quickly and at higher resolutions than ever before. Additionally, multiple runs of the same weather model can be performed at the same time, with small changes made to the starting point of each run of the model to account for errors in observational data. This modeling technique, referred to as “ensemble forecasting”, allows for a wider range of possibilities than deterministic forecasting based on just a handful of model solutions. Ensemble forecasts have signaled extreme or impactful weather, like the high winds and severe weather on March 3, more quickly than deterministic forecasts.

Another benefit of the development of ensembles is the ability to express forecast likelihood in an objective manner. Probabilities of experiencing a weather event can now be expressed numerically based on the percentage of ensemble members which satisfy a specified criteria (e.g., wind gusts greater than 40 mph). While this has been a welcome development for NWS meteorologists, it also brings new communication challenges as we transition the ways we present the forecast to our core partners and the public. Fortunately, there has been progress in recent years on data visualization platforms within the National Oceanic and Atmospheric Administration (NOAA, the NWS’s parent organization) as well as from private enterprise that help meteorologists interpret as well as display probabilistic data. NOAA-developed platforms such as the Whole Story Uncertainty and Probabilities (WSUP) Viewer, the Dynamic Ensemble-based Scenarios for IDSS (DESI), the Ensemble Situational Awareness Table (ESAT) and others are frequently used by NWS Louisville forecasters in preparation of the forecast as well as communicating forecast information in briefings and public-facing graphics.

Probabilistic messaging and forecasting will only increase in coming years as it falls under one of NWS Director Ken Graham’s “Ken’s 10” priorities for the future of the NWS (www.noaa.gov/NWStransformation). At NWS Louisville probabilistic messaging has already been incorporated into the Area Forecast Discussion as forecasters frequently express forecast confidence using emerging techniques from social science research. Ultimately, the further implementation of probabilistic forecasting and messaging will allow NWS Louisville to provide weather information, which is more scientifically robust while still being practical and useful for our core partners and the public.



The system coming in this weekend could bring some much needed rain to the region. Probabilities show an 80-90% chance of receiving 0.50 inches or greater, and a 40-60% chance of receiving 1.00 inches or greater.

Examples of graphics that show probabilistic forecast messaging, and an example of using probabilities in the Area Forecast Discussion.

NEW RECORD LOW PRESSURE

CJ Padgett, Meteorologist

An anomalously deep area of low pressure tracked northeast across the Lower Ohio Valley on March 3. This intense storm produced extremely strong gradient winds from the southwest. The strongest winds lasted for several hours, with widespread peak gusts between 60 and 80 mph occurring during the afternoon and early evening. Powerful winds gusted to 79 mph at Louisville International Airport and 78 mph at Lexington's Blue Grass Field. The system also produced very heavy rain and flash flooding. A new record rainfall for the date was set at Louisville with 2.79", beating the old record of 1.87". In addition, three brief EF-1 tornadoes touched down in southern Indiana.

New All-Time Low Pressure Records

Louisville 28.85" (old record 28.93" 2/28/1902)

Bowling Green 28.96" (old record 29.04" 3/28/1984)



Drone imagery from the NWS Louisville damage survey of tornado damage in Hanover, Indiana.

NWS Louisville issued a High Wind Warning for this event on the previous day, March 2. Issuing a High Wind Warning that far in advance of a storm is extremely unusual, and has not been done at NWS Louisville in at least the past two decades according to Meteorologist-in-Charge John Gordon. Kentucky Governor Andy Beshear declared a State of Emergency ahead of the severe weather event, calling for Kentuckians to prepare for the expected weather. NWS Louisville provided numerous briefings to the Governor's Office throughout the day. The High Wind Warning, and resulting State of Emergency, led to the cancellation of school across the state. Many businesses closed in anticipation of the extreme weather. Kentucky high school basketball postseason games were postponed to the following weekend.

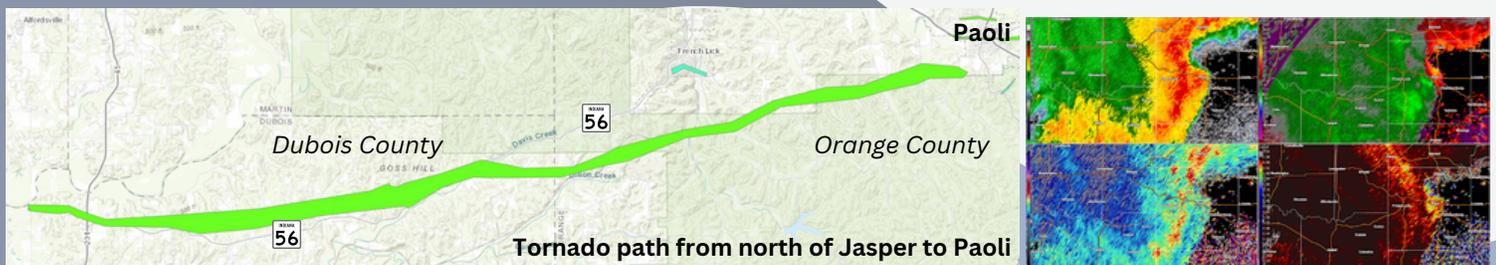
NEW RECORD TORNADO TRACK LENGTH

Evan Webb, Meteorologist

Shortly after midnight on August 7 a severe squall line pushed across southern Indiana and the Louisville Metro. The storms produced hail, damaging winds, and six tornadoes. Most of the tornado damage was concentrated along State Route 56 from north of Jasper to Salem where tornadic winds up to 107 mph were estimated.

A long track EF-1 tornado traveled nearly 26 miles through Dubois and Orange counties, breaking the record for the longest known tornado track for the month of August entirely within the NWS Louisville area of responsibility. The previous known record was a 4 mile tornado path from an F1 twister near Deputy, Indiana on August 14, 2002.

Squall lines, known in meteorology as Quasi-Linear Convective Systems (QLCS), are an especially challenging warning scenario for forecasters because relatively weak (EF-0 and EF-1) tornadoes can spin up very quickly. The half dozen tornadoes in southern Indiana on August 7 all occurred between 12:24 and 1:15 a.m. EDT.



A portion of the QLCS became oriented in a north-south alignment, increasing the tornado threat due to the alignment's relation to available wind shear (variations in wind at different heights above the ground). In this 4-panel image of radar data (above, right), the top-left panel shows radar reflectivity (Z), the top-right panel shows storm relative velocity (SRV), the bottom-left panel shows differential reflectivity (ZDR), and the bottom-right panel shows the correlation coefficient (CC). These radar images reveal a low-level area of rotation over Paoli. NWS Louisville issued Tornado Warnings for Dubois, Orange, and Washington counties in southern Indiana. Several Severe Thunderstorm Warnings were disseminated as well.

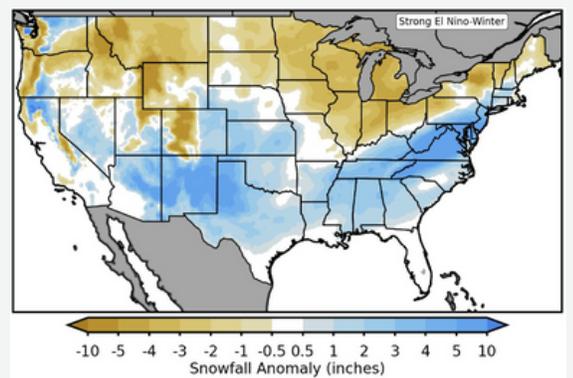
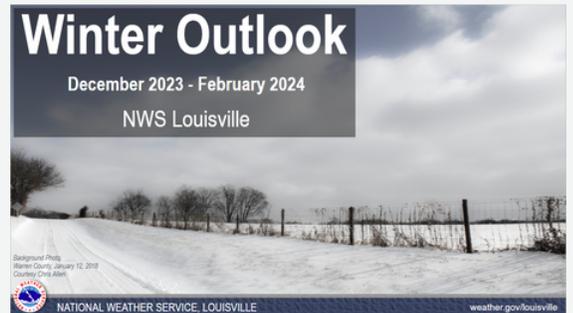
LOCAL SEASONAL OUTLOOKS

Tom Reaugh, Lead Meteorologist

NOAA's Climate Prediction Center (CPC), located outside Washington, DC, provides national monthly and seasonal outlooks of temperature and precipitation. NWS Louisville combines CPC's national outlook with local expertise to craft a Winter Outlook for southern Indiana and central Kentucky. This year the outlook was locally authored by members of NWS Louisville's Climate Team and was made available to the public on October 26. The local outlook addresses topics including temperature, precipitation, snowfall, drought, the state of El Niño/La Niña, and a look at how past winters have behaved based on historical El Niños/La Niñas. In addition to presenting the outlook directly to the Kentucky Emergency Management Agency in Frankfort, it was sent to partners, posted on Facebook and X, and made available on NWS Louisville's website.

NWS Louisville will continue to author local winter outlooks, and we hope to begin issuing outlooks for the other seasons as well.

Additionally in 2023 NWS Louisville began writing 1 to 2 month outlooks covering temperature, precipitation, and other information pertinent to each particular outlook. Similar to seasonal outlooks, these products also start with CPC's national scale information and then use local expertise to focus on the middle Ohio Valley.

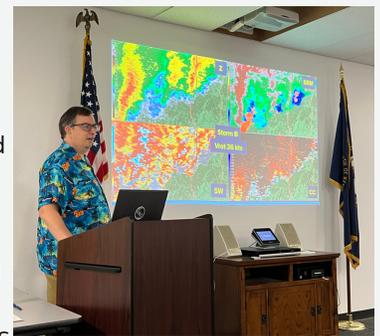


MEDIA WORKSHOP

Brian Neudorff, Meteorologist

On October 13 NWS Louisville hosted 17 weather broadcasters and television meteorologists who represent four of the five media markets in this office's area of responsibility (Louisville, Lexington, Bowling Green, and Nashville) for the return of our Media Workshop. This all-day event featured various presentations from NWS Louisville meteorologists on topics that were suggested by members of the media. Topics presented included: the latest radar techniques used in severe weather warnings along with case studies highlighting these examples, how our office and forecasters collaborate with the Storm Prediction Center and Weather Prediction Center during high impact weather events, and how we issue our various watches, warnings, and advisories taking criteria and societal impact into account. Another presentation featured winter weather cases including snow squall warnings and how a relatively thin coating of snow caused accidents and road closures around Lexington, KY in March. We highlighted new tools currently being used by the NWS and how we are using these tools to change our messaging of impactful weather via the use of probabilities. During the lunch break a guest speaker from the Kentucky Commission on the Deaf and Hard of Hearing talked to the group about how this community gets weather information, and what those in the media could do to assist in better understanding of weather warnings, watches, and advisories.

The event was a great success with positive feedback. We plan on hosting another workshop in 2024 with the goal of even more of our media partners participating.



Science and Operations Officer Ryan Sharp discusses radar tornado detection.



John Gordon speaks to meteorologists from local media and NWS Louisville.

MCALPINE: OVER A CENTURY OF SERVICE

Andrea Schoettmer, Service Hydrologist

McAlpine Locks and Dam in Louisville was awarded the NOAA Honored Institution Award for 75 years of Weather Observations in cooperation with the NWS and the World Meteorological Organization Award for more than 100 years of Hydrological Observations. Meteorologist-in-Charge John Gordon, along with other NWS staff, presented the awards to Louisville District Deputy Commander Lt. Col. Guillermo Guandique and the US Army Corps of Engineers Operations Division Chief Waylon Humphrey at a ceremony at the McAlpine Locks and Dam project office on October 30.



From left to right: Senior Service Hydrologist Andrea Schoettmer, Observations Program Leader Cliff Goff, USACE Operations Division Chief Waylon Humphrey, Meteorologist-In-Charge John Gordon, and Louisville District Deputy Commander Lt. Col. Guillermo Guandique.

“The folks here are easy to work with, great attention to details, answer all our questions, and are very accommodating. We are thankful for the good work that has been done by the Corps.” Gordon said. “We are very thankful to honor 191 years here.”

Humphrey commented “I want to thank the Louisville National Weather Service for not only presenting this recognition, but for their continued partnership as we work together to achieve our common goals.”

CULTURE ACTIVITIES

Samantha Michlowitz, Meteorologist

The NWS Louisville Culture Team has been instrumental in promoting growth, camaraderie, and positivity in the workplace. This year, the team continued their long-standing Slugger-of-the-Month program in which employees recognize their co-workers' achievements. The team also oversaw NWS Louisville's annual food drive and chili cook-off.

In May the team took part in a new NOAA-wide initiative, the Organizational Health Blueprint. Each office member completed a survey which allowed the team to analyze how people feel about their work environment, what is working well, and what can be improved upon. From this survey, the team concluded that we have a positive culture at NWS Louisville. The team decided to focus on soft skills development, including leadership skills and civility in the workplace, for the remainder of the year and through 2024 via podcast and inspirational video sharing and lunchtime discussions.

Over the summer months the team organized fun outings with summer students to Louisville Slugger Bats Minor League games, movies, game nights, trivia nights, and more. The team also hosted a farewell dinner for Jessica Lee, a forecaster who moved on to NWS Headquarters. Jessica was the Culture Team program leader at the time; her great efforts to initiate, develop, and grow the NWS Louisville Culture Team are deeply appreciated. She left a great legacy.

In the fall the team hosted the annual chili cook-off. The cook-off is a great opportunity to build relationships with local partners and put our chili skills to the test. In attendance were TV meteorologists, retired NWS employees, and private sector meteorologists. Winners were given the coveted title of Best Chili and Most Unique Chili. In addition, the office participated in a food drive to benefit a Louisville food bank. The office provided a large monetary sum and a sizable canned food donation.

To end the year the Culture Team planned an off site holiday party for staff and their families. It was a great way to get to know one another outside the office setting and enjoy some holiday treats.

2023 was a successful year of growth for culture at NWS Louisville, and the team has even more planned for 2024.



Left: Students, staff, and family gather at a local Mexican restaurant to bid farewell to forecaster Jessica Lee.



Right: Group picture after seeing *Barbie* and *Oppenheimer*.

STUDENT ACTIVITIES

CJ Padgett, Meteorologist

2023 was a busy year for student internships at NWS Louisville. We were fortunate to host five students from both near and far from Louisville. Students shadow meteorologists on the forecast desks, help operations during severe weather, experience storm surveys, participate in trips and meetings outside the office, and conduct a research project to help improve our office operations.

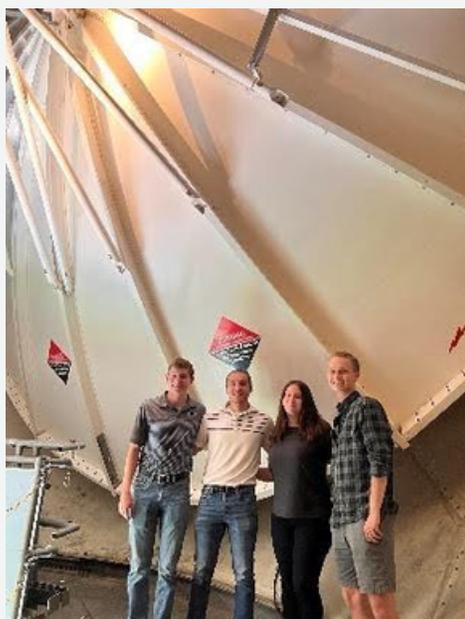
NICO PORCELLI

FLORIDA STATE UNIVERSITY PATHWAYS STUDENT

Nico worked several shifts at NWS Louisville during the summer where he gained forecast experience and learned about NWS operations. He has been working hard on our historical tornado database during the fall semester.



Nico Porcelli crafting an aviation weather forecast.



Owen Rahman, Joe Hildebranski, Hanna McDaniel, and Dylan Girone inside our radar tower.

HANNA MCDANIEL

FLORIDA STATE UNIVERSITY HOLLINGS SCHOLAR

Hanna spent the summer identifying common traits for squall line tornadoes in our area, which is being used by forecasters to improve our warning operations on lead time and accuracy.

DYLAN GIRONE

UNIVERSITY OF ARIZONA HOLLINGS SCHOLAR

Dylan researched how thunderstorm initiation can vary depending on the type of land use across our forecast area. This research was able to identify that there is an increase in thunderstorm activity over forest and cropland boundaries.

OWEN RAHMAN

PURDUE UNIVERSITY VOLUNTEER STUDENT

Owen worked on georeferencing our Advanced Hydrologic Prediction Service flood statements. His work gives us an idea of what type of impacts an area could see depending how high flood waters get.

JOE HILDEBRANSKI

INDIANA UNIVERSITY VOLUNTEER STUDENT

Joe applied his computer programming skills to decipher verification statistics of the European weather model's Extreme Forecast Index. His findings showed that the index gave signals up to 7 days in advance for our biggest weather events of the year. This research will help increase forecaster confidence in the days leading up to a major weather event.



Science and Operations Officer Ryan Sharp guiding Owen and Joe through a severe weather simulation

SITUATIONAL AWARENESS DISPLAY

Todd Adkins, Electronic Systems Analyst

NWS Louisville has a bank of television screens that display information including weather cameras, regional radar, the Kentucky Mesonet, flight tracking, and local news stations. We call this our Situational Awareness Display (SAD). In 2023 the SAD underwent its first major update in over six years. Hardware upgrades included the addition of two new 55" Ultra High Definition displays, four screen splitters, and a more robust dedicated PC. These hardware improvements increased the number of data sources available and provided a more modern look.

The new displays and screen splitters increased the available simultaneously viewable source inputs from 8 to 16. This allows meteorologists more data points while providing decision support services to our customers. The new more robust PC provides improved graphics and increased storage and processing capability for web based and local weather data applications.

GOALS FOR 2024



Sharpening radar meteorologists' skills in detecting pre-tornadic radar data signatures

Deploy meteorologists to the area's most vulnerable public events



Flood Inundation Mapping training for forecasters

Increase service and outreach



Encourage state parks to become Weather-Ready Nation Ambassadors

NWS WEATHER RESOURCES

NWS Louisville



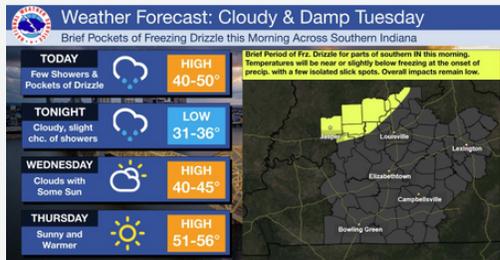
weather.gov/lmk

Radar



radar.weather.gov

Local Outlooks



weather.gov/lmk/weatherstory

Nationwide Outlooks



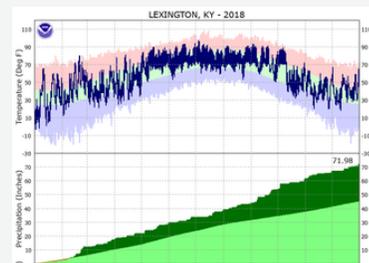
weather.gov/crh/outlooks

Severe Storms



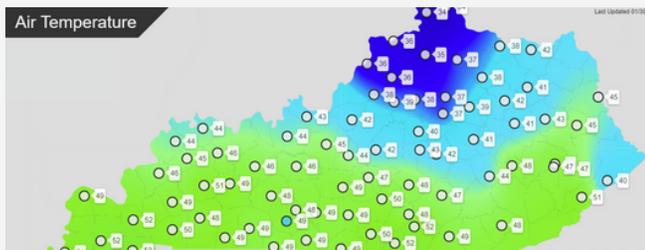
spc.noaa.gov

Climate



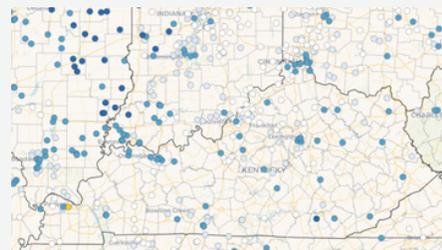
weather.gov/lmk/one-stop-climate

Kentucky Mesonet



kymesonet.org

Citizen Science



cocorahs.org

Aerial view of a vast sea of white clouds from an elevated perspective. The sun is low on the horizon, creating a bright glow and casting long, soft shadows across the cloud tops. The sky transitions from a pale yellow near the horizon to a clear blue at the top.

National Weather Service

6201 Theiler Lane
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Background photo: Clouds above the Ohio River in September 2023. Dan McKerny

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