

The Mountain Weather Journal

Volume 2

Issue 2



WHAT'S NEW AT JACKSON???

By: *Shawn Harley*
Meteorologist-in-Charge

Greetings from your National Weather Service Forecast Office in Jackson, Kentucky. As winter draws to a close, we have been busy making preparations for the upcoming spring and summer seasons. This spring we will be implementing a lake wind advisory program, and will also be lowering the criteria for heat advisories and excessive heat warnings.

The lake wind advisory program will commence on April 1. Lake wind advisories will be issued in the months of April through October for sustained winds of 20 to 29 mph or gusts of 35 to 44 mph. We will continue to issue wind advisories for sustained winds of 30 to 39 mph or gusts of 45 to 57 mph, and high wind warnings will continue to be issued for sustained winds greater than 39 mph or gusts greater than 57 mph. Wind advisories, high wind warnings, and lake wind advisories will be issued for winds not associated with thunderstorms.

Lake wind advisories were first discussed at our annual customer-partner workshop in 2003. Since then, feedback from other groups, including marinas, indicates that a lake wind advisory program would be a beneficial service. Boating is a very popular recreational activity on the numerous lakes in eastern and south central Kentucky. Wind speeds which are a concern to boaters are not necessarily a concern to those on land. As such, there is a lower threshold for issuing a lake wind advisory, as opposed to a regular wind advisory or high wind warning.

Another topic discussed at the 2003 Customer-Partner workshop was the criteria used for issuing various weather advisories and warnings. The workshop participants felt that the current advisory and warning criteria used by the Jackson National Weather Service Forecast Office met local needs, with the possible exception of the criteria used for

heat advisories and warnings. The general feeling at the workshop was that the heat related criteria were too high.

The proposal to use lower heat advisory and warning criteria was carefully studied by meteorologists at our office over the past several months. After researching past weather records, various heat related studies, and the criteria used in nearby areas, it was decided that indeed our area would be better served with lower heat advisory and warning criteria. Beginning May 1 the new criteria will go into effect. We will issue a heat advisory when the heat index is forecast to reach 105 degrees while during the same 24 hour period the overnight heat index is forecast to remain near or above 75 degrees. An excessive heat warning will be issued when the daytime heat index is expected to reach 110 degrees and corresponding nighttime heat indices are expected to remain near or above 75 degrees.

Please remember that all advisories and warnings are available on weather radio, marine band radio, and on our web page. As always, we would appreciate hearing from you. If you have any comments regarding the newsletter, NOAA Weather Radio, our webpage or any other service we provide, please give us a call, send us an e-mail, or drop us a note. We are constantly striving to improve our products and services and your feedback is important.

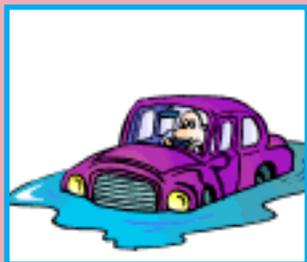
TABLE OF CONTENTS

What's New at Jackson???	Page 1
Safety Rules.....	Page 2
Climate Corner.....	Page 3
Fire Weather.....	Page 3
News from the COOP.....	Page 4
Ham News.....	Page 4
Hydrology.....	Page 5
Tech Tips.....	Page 5
Storm of the Season.....	Page 6
Weather History.....	Page 7
Kid's Corner.....	Page 8

SAFETY RULES

By: *Phil Hysell*
Warning Coordination Meteorologist

Flash Flooding Safety Rules



Flash floods and floods are the #1 weather related killer in Kentucky and across the United States. In 2003, four people in Kentucky lost their lives due to flash flooding.

If driving, ***DO NOT DRIVE THROUGH FLOODED AREAS!*** even if

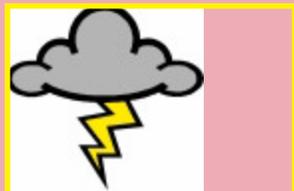
it appears shallow enough to cross. Nearly half of deaths due to flash flooding are from people driving through flooded areas. Water that is only one foot deep can displace 1500 lbs! Two feet of water can EASILY float most automobiles! Roadways concealed by floodwaters may not be intact.

If caught outside, go to higher ground immediately! Avoid small rivers or streams, low spots, culverts, or ravines. Do not try to walk through flowing water more than ankle deep, as it only takes six inches of water to knock you off your feet. Do not allow children to play around streams, drainage ditches or viaducts, storm drains, or other prone to flood areas

If ordered to evacuate or if rising water is threatening, leave immediately and move to higher ground!

Lightning Safety Rules

Lightning is the #2 weather related killer. In Kentucky, more people are killed by lightning in an average year than tornadoes. Although Severe Thunderstorm Warnings are NOT issued for lightning, you should move to shelter when thunder is heard as lightning can strike 10 to 15 miles away from where the rain falls.



If outside, go to a safe shelter immediately, such as inside a sturdy building. A hard top automobile with the windows up can also offer fair protection.

If you are boating or swimming, get out of the water immediately and move to a safe shelter away from the water!

If you are in a wooded area, seek shelter under a thick growth of relatively small trees.

If you feel your hair standing on end, squat with your head between your knees. Make yourself as small as possible with as little contact with the ground as possible. **Do not lie flat!**

Avoid: Isolated trees or other tall objects, bodies of water, sheds, fences, convertible automobiles, tractors, and motorcycles.

If inside, avoid using the telephone (except for emergencies) or other electrical appliances.

Do not take a bath or shower.

Tornado and High Wind Safety Rules



The greatest danger from tornadoes and high winds associated with severe thunderstorms is flying debris. It is important that you take shelter during Tornado AND

Severe Thunderstorm Warnings.

In a home or building, move to a pre-designated shelter, preferably a basement or underground shelter and get under something sturdy.

If a basement or underground shelter is not available, move to a small interior room or hallway on the lowest floor and get under a sturdy piece of furniture. Put as many walls as possible between you and the outside.

- * **Stay away from windows**
- * **Get out of Automobiles.**

Do not attempt to outrun a tornado in your car; instead, leave it immediately for safe shelter.



If caught outside or in a vehicle, lie flat in a nearby ditch or depression and cover your head with your hands. **DO NOT** seek shelter under a highway overpass.

Mobile homes, even if tied down, offer little protection from tornadoes. You should leave the mobile home and go to the lowest floor of a sturdy nearby building or storm shelter.

CLIMATE CORNER

By: Jonathan Pelton
Lead Forecaster



Temperatures at the start of the winter were averaged below normal. The average temperature at Jackson for December was 37.1 or about 1.2 degrees below normal. Temperatures in

January were a tad more below normal than December. The average temperature in January was 33.2 or about 0.7 degrees below normal. Readings in February were near normal.

However, no extremely cold temperatures and very few record low temperatures were recorded. So far this winter, the coldest temperatures occurred during a brief Arctic cold snap in late January. Low temperatures on the morning of the 31st ranged from a few degrees below zero in northern Kentucky, to the single digits above zero near the Tennessee and Virginia borders. The lowest reading was minus five recorded at Flemingsburg. At the Jackson Julian Carroll Airport a temperature of 1 degree was recorded on January 31st, which was the lowest temperature recorded there since February 4th of 1996. Also, the London Corbin Airport had a reading of 3 degrees that morning. Temperatures quickly moderated, as high temperatures that day were not as brutal. The mercury recovered to the mid 20s to lower 30s.

Even though temperature averaged near, to slightly below normal, snowfall for this winter has been rather sparse. At the Jackson Weather Office and over most of eastern Kentucky, snowfall this season has been 15 inches. The only widespread snow was a four-day event from the 17th through the 20th of December. A total of 6.6 inches of snow fell at the Jackson Weather Office during this time-frame. This event brought ridgetops and higher elevation locations near the Virginia border higher totals from this event of about 10 to 15 inches, with deeper valleys only getting about 3 or 4 inches. However, some of the heaviest snows have historically fallen in March and April. So it is still possible that a late season snow could add to these totals.

Visit us at our web page:

<http://www.crh.noaa.gov/jkl>

If you have any questions or concerns,
contact us at (606) 666-8000 or email
our webmaster at:
w-jkl.webmaster@noaa.gov

FIRE WEATHER

By: Jonathan Pelton
Lead Forecaster

Safety Tips and Things to Remember During Fire Season

Fire Season in Kentucky is broken into two parts. The spring season runs from February 15th through May 30th, while the fall season runs from October 1st through December 15th. During these seasons, keep in mind that it is illegal to burn anything within 150 feet of any woodland or brushland, except between the hours of 6 p.m. and 6 a.m.

Safety precautions should be taken and weather conditions considered before conducting any outdoor burning and remember to check with the Kentucky Division for Air Quality and Division of Waste Management to make sure you are in compliance with their outdoor burning regulations.

NEVER burn anything during windy weather or extreme drought conditions. It is important to be aware of the increased threat of wildfires during these fire seasons, especially during dry periods or drought conditions. This is especially true for those who live in a forested area and for those who plan on visiting area forests. Here are some safety tips to help protect life and property from wildfires:

1. Check with local fire authorities or public land management officials to obtain current fire restriction information.
2. For campfires, clear the campfire site down to bare soil. Circle the fire pit with rocks and build the campfire away from overhanging branches, dry grass, pine needles, logs and steep slopes.
3. Never leave a campfire unattended. When putting out a campfire, drown the fire. Keep a bucket of water and shovel nearby.
4. Homes near forested areas should have trees thinned within 100 feet of buildings. Remove lower tree branches, especially those that may overhang the roof.
5. Rake and clear surface fuels, such as leaves, limbs and pine needles, away from homes in wooded areas.

For detailed information on protecting your home from wildfires, visit the Firewise website at www.firewise.org.

NEWS FROM THE CO-OP

By: David Stamper
Data Acquisition Program Manager

HAM NEWS

By: Merl Heinlein, Jr.
Lead Forecaster



Pictured left to right: Dave Stamper, Bernice, Betty Jo, Barbara, Lorene Lewis, Brenda, Bonnie, and Billie June.

I am very sad to pass on to you that a long time Cooperative Weather observer has passed away. Mrs. Lorene "Cumile" Lewis passed away on January 14, 2004 at the age of 71. Mrs. Lewis reported precipitation data to the National Weather Service (NWS) from March 1, 1967 right up until her death, a period of merely 37 years..

In August of 1994, Mrs. Lewis was honored with the prestigious John Companius Holm Award after reporting data for 27 years. In 1998, Jeff Carico, Barbara Cravens, and I presented Lorene with a 30 year length of service award for her timely reports.

In addition to reporting precipitation data to the NWS, Lorene was a member of the kitchen and housekeeping staff at the Pine Mountain Settlement School from 1988 to 1996. For 19 years she served as a foster mother in the Big Laurel area. During that time she fostered around 50 children. Lorene was married to Fred Lewis and celebrated their 50th wedding anniversary on July 3, 1996. At the time of her death, Lorene was survived by her husband Fred, two sons and six daughters. Lorene was a member of the Pine Mountain Church of God.

I feel very sorry for the Lewis family and regret that I was unable to attend their mother's service. Unfortunately, my mother passed away ten days later on the 24th of January after suffering a series of strokes that began on December 15th. It has been a very sad time over the past few months, thus little has been done with the co-op program. The only good news that I have is that on January 15th, I became a grandpa for the very first time. Here is a photo of my granddaughter, Cadence Alece Turner. I Hope to see you all soon. Dave



HAM RADIO AT JACKSON

We at the National Weather Service (NWS) in Jackson depend on HAM radio operators, especially those trained in the SKYWARN spotter program, to relay reports of various severe weather events such as winter storms, flash flooding, severe thunderstorms, and tornadoes. SKYWARN is the spotter program sponsored by the NWS which provides critical severe weather information to the NWS for timely and appropriate warning issuances. Radio amateurs have assisted as communicators and spotters since SKYWARN's inception in the early 1970s. HAM radio is sometimes the only way to get severe weather reports in real time if power lines are down.

One goal of the NWS is to activate a network of trained HAM radio operators to report severe weather as needed. Coordinating and relaying severe weather reports in a timely manner are of the utmost importance to help protect lives and property.

The NWS recruits HAM radio volunteers through SKYWARN, trains them in proper weather spotting procedures at local spotter talks, and accepts the volunteers' reports during watches and episodes of severe weather. By utilizing the SKYWARN HAM radio volunteers, the NWS has "eyes and ears" throughout the affected area in conjunction with NWS radar, satellite, and other forecasting and monitoring tools.

If your county is under a warning, such as a severe thunderstorm, flash flood, tornado, or winter storm warning, there is no doubt that NWS Jackson needs your reports. Thanks to the centralized location of NWS Jackson in relation to eastern Kentucky, most HAM reports are able to be received quite well.

Local HAM radio clubs are encouraged to contact the National Weather Service for the purpose of establishing organized SKYWARN networks with radio amateurs serving as communicators and spotters.

To find repeaters in the area which are often utilized by NWS Jackson to obtain reports, check out our web site at www.crh.noaa.gov/jkl/skywarn/repeaters.html. One of the best ways to obtain information on local HAM clubs and HAM license test sites is to visit the National Association for Amateur Radio web site at www.arrl.org. The information at the top left corner of the site is readily available and updated frequently. If you do not have internet access, give us a call and we will be happy to assist you. To find out about SKYWARN spotter training classes available in your area, check out our website or give us a call. SKYWARN classes are also announced on NOAA Weather radio.

HYDROLOGY

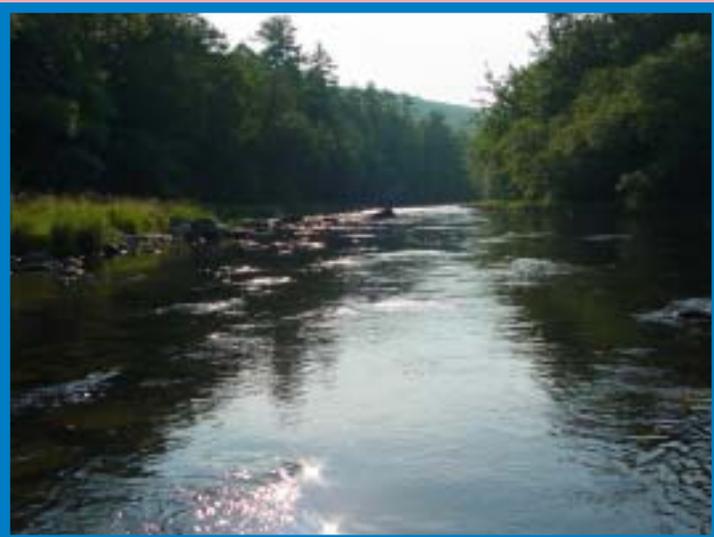
By: *Britt Westergard*
Service Hydrologist

Greetings and salutations, eastern Kentucky. My name is Britt Westergard and I'm the new Service Hydrologist at the National Weather Service. I am both new to the Weather Service and new to eastern Kentucky. I moved here in September of 2003 (just a few short months ago) from Binghamton, New York. Don't stop reading just because I'm from New York – I should tell you now that I'm not from New York City, I'm from upstate, where there are rolling hills and farms and such.

Before I moved here, I was in my fourth year of working for the United States Geological Survey (USGS) as a student trainee in hydrology while working on my Master's degree. My job at the USGS was fun – I got to go out and wade around in beautiful mountain rivers for most of the summer, surveying the shape of the rivers, how fast they were flowing, and what materials made up the riverbed. Then in the winter, I helped analyze all of the data we had collected during the summer and wrote reports on what we had found. This was less fun than the summer work, but of course it had to be done.

Part of my work at the USGS was also the research for my Master's degree. I studied the effects that one of the dams in the Catskill Mountains has had on the river downstream from the dam. My boss at the USGS was studying how the dam had affected river biology, like fish and mussels, so I decided to work on how the actual river – the banks and the riverbed – changed after the dam was put in. You would expect a river channel to change if you suddenly run less water through it, but as it turns out, this river barely changed at all, which really surprised us.

I'm very excited to be at the NWS in Jackson. The staff here has been fantastic in helping me become familiar with my job responsibilities, taking me on field trips to see the area, and just generally making me feel at home. I look forward to working with them. I also look forward to meeting some of you, as I get out and about more in eastern Kentucky. Until then!



TECH TIPS

By: *Karen Oudeman*
General Forecaster

HOW TO MEASURE HAIL

Large hail is one of the three indicators of a severe thunderstorm (the others being damaging wind and tornadoes). Receiving severe weather reports from you assists our forecasters with their job of warning communities ahead of time of severe thunderstorms. Here are a few things to keep in mind when measuring and reporting hail.

1. **Always be safe!** Wait for a lull in the storm or until the hail has ended to take a measurement. Hail as large as pennies is considered damaging hail.
2. **Note the times the hail began and ended.** This is vital information for the forecaster because it lets them connect what was seen on radar to what actually happened on the ground.
3. **Measure the diameter of the smallest, largest, and most common hailstone with a ruler.** If a ruler is not available, a coin can be used to estimate the diameter. The diameter of a dime is slightly less than 3/4 of an inch, while a penny is 3/4 of an inch. Don't compare the hail to marbles, as marbles come in many sizes.
4. **If the hail covered the ground, measure the average depth of hailstones on the ground.**

All reports of severe hail are published in the National Weather Service publication, *StormData*.



Photos are courtesy of the Colorado Climate Center

STORM OF THE SEASON

By: Phil Hysell

Warning Coordination Meteorologist

While the winter of 2003-2004 was fairly tame compared to some of the prior winters eastern Kentucky have experienced, there were a few weather events that we will remember. Some of these events include the flash flooding of January 2nd, 2004 when the National Weather Service (NWS) in Jackson issued 22 flash flood warnings in less than 12 hours; and perhaps the winter storm on January 25th that accumulated a coating of ice one-quarter to three-quarters of an inch thick. During this event, the NWS issued a Winter Storm Watch over 39 hours prior to the event. We also will likely remember the bitter cold that dropped temperatures below zero in many locations on the morning of January 31st. Here in Jackson, our temperature bottomed out at one degree above zero, which was the coldest temperature we have experienced since 1996!

However, the storm which affected more people this winter was likely the flash flooding that occurred on February 5th and continued into the 6th. The recipe for this flooding event was classic. First, winter is an especially vulnerable period for flooding as trees and plants that normally help absorb rain are bare or dormant, enhancing the rainfall runoff. Second, our ground was already saturated from a lengthy period of above normal precipitation, as January 2004 was our sixth wettest January on record. In addition, the NWS in Jackson totaled three-quarters of an inch of rain on the 2nd and 3rd of February, leaving creeks and streams running well above normal. Finally, the amount and duration of the rain that began on the 5th was too much for the ground to absorb. Rainfall totals from this storm totaled two to four inches in many locations. Below is a table showing some of the greatest amounts:

Location:	48 Hour Rainfall Totals:
2 N Somerset - Pulaski County	4.33 inches
Stearns - McCreary County	4.21 inches
London State Police - Laurel County	4.15 inches
Monticello - Wayne County	4.08 inches
London - Corbin Airport - Laurel County	4.00 inches
5 NW Victory - Laurel County	3.79 inches
Mt. Vernon - Rockcastle County	3.52 inches

Not only were numerous roads flooded due to standing water, but many creeks, streams and even some rivers flooded. The Kentucky River at Heidelberg and Booneville; as well as the Cumberland River at Williamsburg and Barbourville all exceeded flood stage. Thankfully there were no fatalities directly attributed to the flooding! Thank you to everyone who provided us with rainfall totals and reports of flooding.

***** NOTICE *****

Unless otherwise notified by you, this will be the last copy of the Mountain Weather Journal that will be mailed. Beginning with the next issue, you may access the Mountain Weather Journal on our web page at: <http://www.crh.noaa.gov/jkl>. If you would still like to have the Mountain Weather Journal mailed to your home, please contact us at w-jkl.webmaster@noaa.gov or at (606) 666-8000.

WEATHER HISTORY

By: Karen Oudeman
General Forecaster

30 Year Anniversary of Super Outbreak 1974

This April will mark the 30th anniversary of the Super Outbreak of 1974. This one event that spanned a little more than 16 hours from April 3-4, affected thousands of lives across 13 states, including Kentucky. Much has changed at the forecast desk and in homes, businesses, and schools since that devastating spring day.

All of the needed atmospheric elements came together and interacted at just the right time to produce 148 tornadoes that killed 330 people and injured 5,484 others. An active severe weather day just two days prior, on the 1st, served as a “heads up” for forecasters and provided a fresh image of the destructiveness of severe storms in the minds of others from the Gulf Coast states through the Ohio Valley.

The first severe thunderstorm watch was issued for the Ohio Valley at 9:27 a.m. EDT. The rapid development and widespread extent of the tornado outbreak is evident in the report times of the first tornado occurrences. Around 3:00 p.m. EDT, tornadoes touched down in Bradley County, TN, and Gilmer County, GA. Within 10 minutes, tornadoes were reported in McLean and Logan Counties, IL. At 3:20 p.m. EDT, separate killer storms set down in the Indiana counties of Perry and Lawrence. In Ohio the first tornado was reported about 4:30 p.m. EDT, and the Brandenburg, KY storm touched down at 4:40 p.m. EDT.

Between 4:40 p.m. EDT April 3 and midnight, at least 26 vicious tornadoes struck Kentucky, causing more deaths, injuries, and property damage across Kentucky than any previous tornado outbreak in recorded history. In Eastern Kentucky, tornadoes touched down in Montgomery, Clay, and McCreary counties, with multiple tornadoes reported in Wayne, Pulaski, Laurel, and Rockcastle counties.

This outbreak, one of the largest outbreaks in recorded United States history, opened eyes about tornado myths and stirred discussion about preparedness and response activities. One myth disproved, that is applicable to eastern Kentucky was the following:

Myth: Tornadoes don't go up and down steep or high hills.

Fact: A tornado that hit Guin, AL stayed on the ground as it climbed the 1640-foot Monte Sano Mountain and grew in intensity as it descended the northeast slope. The Blue Ridge tornado of that day formed in the mountains at 1800 feet just east of Mulberry Gap and crossed a 3000-foot ridge before moving down to the bottom of the canyon. The tornado finally climbed to the 3300-foot top before dissipating.

Engineering studies from the damage led to safer school construction designs and supported the claim that an interior hallway is the safest place to be in a school. Communication weaknesses were improved, primarily through the increase in NOAA Weather Radio coverage. Today, many television and radio stations get

involved and stay “live” on the air throughout a severe weather event, relaying vital National Weather Service weather warnings.

Thirty years ago, forecasters looked at a radar scope and could only see gray splotches and had to wait for visual confirmation before issuing a tornado warning. Today, Doppler radar enables the forecaster to view full color, high-resolution radar imagery including storm motions and internal velocities. High-resolution satellite imagery enables forecasters to see details in cloud structure even before the first raindrop touches the ground. All of today's state of the art technology has enabled the forecaster to provide a tornado warning to the public with an average of 11 minutes of lead-time.



Tornado paths from April 3-4, 1974



1974 satellite technology.



Current satellite technology

KID'S CORNER

HOMEMADE BAROMETER

By: Anthony Richey
Meteorologist Intern

MATERIALS:

1. A wide mouth glass jar like a mayonnaise jar.
2. A large, round balloon
3. A strong rubber band or string to secure the balloon to the jar.
4. A drinking straw
5. Sheet of light colored construction paper
6. Petroleum jelly
7. A thermometer
8. Tape
9. Glue
10. Match

DIRECTIONS

1. Cut a large piece out of the balloon, wider than the mouth of the jar.
2. Coat the edge of the rim of the jar with petroleum jelly to form a tight seal.
3. Stretch the balloon over the mouth of the jar, though not too tightly. Secure the balloon to the top of the jar with one or more rubber bands.
4. Make a diagonal cut across one end of the straw to make a pointer. Tape the uncut end of the straw to the center of the piece of balloon across the top of the jar.
5. Make a scale for your barometer by folding the construction paper into a triangle. After folding the paper, stand it up on its end near the cut end of the straw.
6. Be sure to place your barometer in an area away from windows and heating or air conditioning vents. As the temperature of the air inside of the jar changes, so will the readings of your barometer. As long as the temperature of the air in your barometer stays about the same, you will get good readings. **Be sure to read your barometer near the same temperature, each time you record the position of the pointer on your scale.**

Let the barometer sit for about 15 minutes so it can adjust to the air pressure. After that, look at the pointer to see how much it has moved. Make a mark on the construction paper to indicate the position of the pointer. Also write down what type of weather is occurring outside and draw a symbol on your barometer's scale, next to the mark you just made, indicating what the weather is doing. If that it is raining outside, draw a cloud with rain falling from it next to the mark. If the weather is sunny, draw a sun next to the mark you just made and so on.

The top end of your scale should have a large "H" marked on it and a large "L" at the bottom. Bright, sunny weather usually occurs with high pressure systems (H) and cloudy, rainy weather with low pressure systems (L). When your barometer points toward the "H" on your scale, you can usually expect the weather to improve. When your barometer points toward the "L" on your scale, you can usually expect the weather to become cloudy and rainy. When high pressure is affecting the weather at your house, the air will be heavier and will press down on the balloon on the top of your barometer. This will cause the pointer to point upward toward the "H" on the scale. When low pressure is affecting the weather at your house, the air above the jar will be lighter and the air in the jar will try to rise up and out, causing the balloon to bulge upward. This will cause the pointer to point downward toward the "L" on the scale, indicating bad weather is more likely.

