

The Great Basin: Spotter Newsletter

On the Cover: Debris flow in Eureka!

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Spotter Reminder:

Please call the NWS with your snowfall reports during and after any snow events. The spotter hot-line numbers are:

(775) 778-6720

Or

(866) 326-5364

Flash flooding caused a debris flow near Eureka, Nevada in August 2007. Rock and soil from the adjacent hillside spread across the roadway. (Photo courtesy of Jeff Savadel, Warning Coordination Meteorologist, National Weather Service, Elko, Nevada).



Flash Flooding and Debris Flow

By Larry Whitworth (Lead Forecaster)

Excessive rainfall is always a cause for concern in hilly or mountainous terrain. Flash flooding, or rapid flooding, is a great concern for southern California, as is debris flow, and creates problems in rural Nevada as well. There is an ongoing partnership by the National Oceanic and Atmospheric Association (NOAA) and the United States Geological Survey (USGS) to monitor and predict flash floods and debris flow.

Flash flooding can be associated with late spring or summer convection and is compounded by regional topography. Another factor is land that has been devastated by wildfire activity, which will have a lower threshold for rainfall runoff than an unaffected area. A debris flow, commonly known as a mudslide, is closely associated with flash flooding but can have differing flow characteristics and perhaps cause more damage due to rock and soil content. A burn area in hilly terrain would be one example of a situation when a debris flow would be possible if rain occurs or even likely given that a significant precipitation event is in the forecast. Jack Hayes, Ph.D., director of the National Weather Service, stated in November that “Moderate amounts of rainfall on a burned area can lead to flash floods and debris flows. The powerful force of rushing water, soil, and rock can destroy everything in its path, leading to injury or death.” A flash flood incident occurred in Eureka County, Nevada in August 2007 that included a debris flow of soil and rock that did major damage to at least one home.

Southern California is especially susceptible to potentially devastating flash floods and debris flow caused by excessive rainfall. Rapidly-moving debris flow, triggered by severe rainstorms, are among the most numerous and dangerous type of landslides, particularly in California. Debris flow can begin suddenly, accelerate quickly, reach velocities up to 40 mph, and flow downstream for several miles. They can smash homes and other structures, wash out roads and bridges, sweep away cars, knock down trees, and lay down thick deposits of mud, rock and other debris where they come to rest, obstructing drainages and roadways.

As a first step, NOAA’s National Weather Service (NWS) and USGS have jointly developed a debris flow and flash flood warning system to protect Southern Californians from potentially devastating debris flow and flash floods in and around burn areas created by recent wildfires. Post-wildfire debris flows are closely linked to precipitation and are therefore more predictable than other landslides. The USGS has developed precipitation thresholds that help identify potential debris flows in recent burn areas and provides this information to NWS forecast offices in Southern California. Using a flash flood monitoring and prediction tool (FFMP), weather forecast offices monitor rainfall, and if it approaches the thresholds developed for burn areas, incorporate wording about debris flow hazards into flash flood warnings and public information statements (PNS). Flash flood Warnings (FFW) are communicated to the public through the Emergency Alert System (EAS) and NOAA All Hazards Radio (NAHR), and directly to local emergency managers.

Excessive rainfall over hilly terrain can lead to devastation caused by flash flooding and debris flow. As demonstrated by the partnership in southern California, NOAA and the USGS are committed to improving forecast and warning capabilities.

Flash Flooding in Eureka

By Jeff Savadel (Warning Coordination Meteorologist)

On August 1, 2007 copious moisture combined with an unstable atmosphere across central Nevada lead to widespread thunderstorms. Heavy rains on the hilly terrain in and around Eureka produced large amounts of runoff that damaged about a dozen homes, several businesses and other city infrastructure. Total damages amounted to \$297,000. One home had 4 feet of mud in the basement (see below), while many rural roads were washed out (see picture on cover). Flooding was also reported across state highway 278 about 7 miles north of Eureka. The Eureka county airport reported 1.63 inches of rain but the radar indicated the heaviest rain occurred just west of downtown Eureka with radar estimates of 2 to 3 inches.



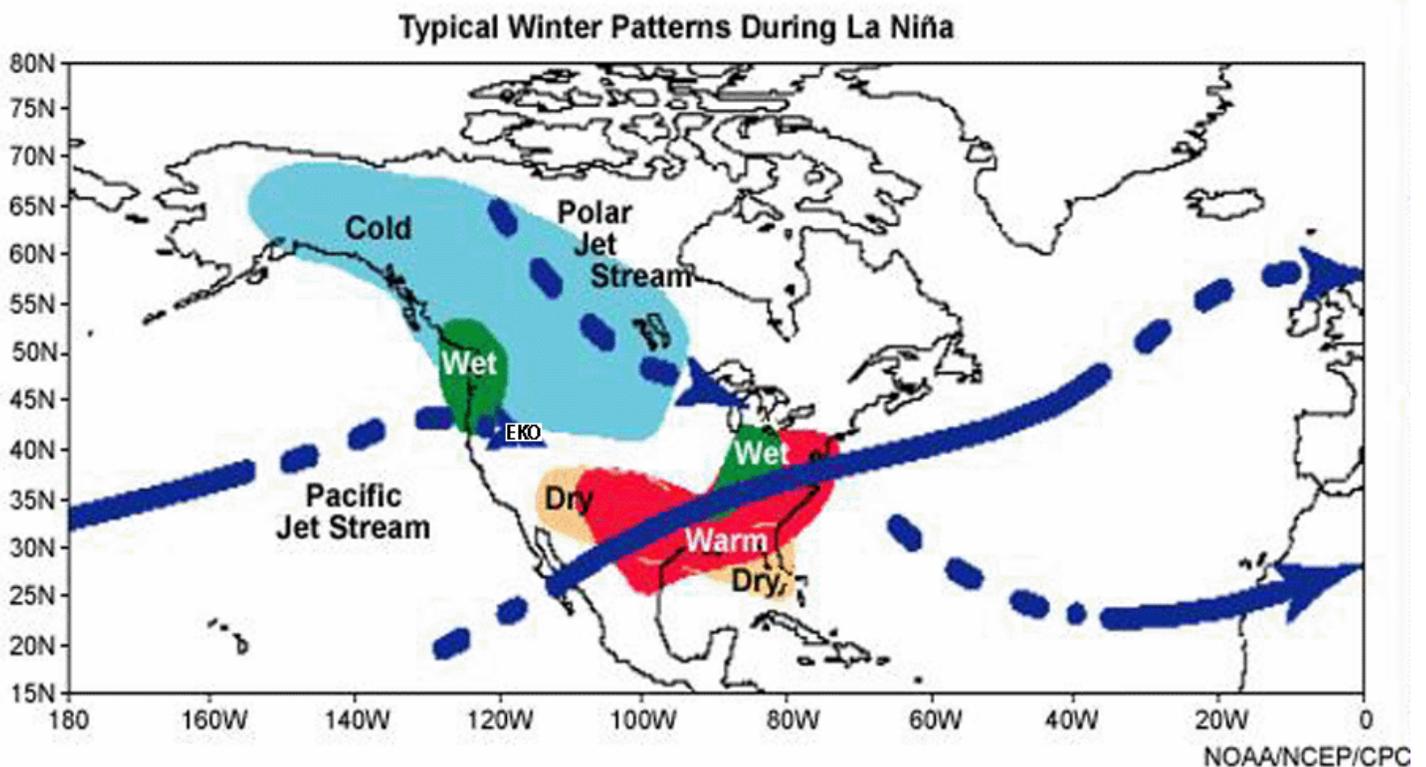
The NWS office in Elko issued a flash flood warning for this area based on radar estimated precipitation amounts. Situations like this are excellent examples of the value of spotter reports. Radar estimated precipitation amounts are often too high, which can make it difficult for meteorologists to determine if a flash flood warning is necessary. Obtaining ground truth reports from spotters about observed rainfall intensity and amount can greatly help the warning meteorologist in the decision-making process for issuing warnings. As always, we strongly encourage our spotters to report any observed extreme weather or weather related damage.

La Nina Returns

By Ray Martin (Meteorologist Intern)

The weather phenomenon known as La Nina has appeared in the eastern equatorial Pacific Ocean once again. Cooler than normal ocean water temperatures have been observed in this region since September. La Nina impacts on the United States usually involve wetter and cooler than normal weather across the Pacific Northwest due to the jet stream directed toward that part of the country, with drier and warmer than normal weather across the southern tier of states.

The impact from a La Nina across the Elko Weather Forecast Office's County Warning Area varies from south to north, with a greater chance of cooler and wetter weather across the north, while drier and warmer conditions tend to prevail across the south, compared to the climatological norm.



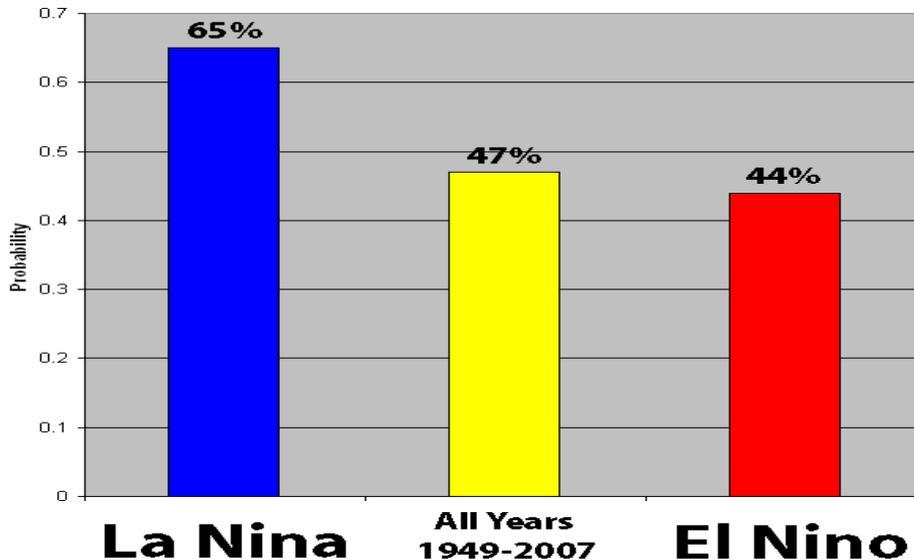
La Nina is dominated by a somewhat weaker jet... but its directed almost directly at us here in northern NV!

How is Elko Affected by La Nina?

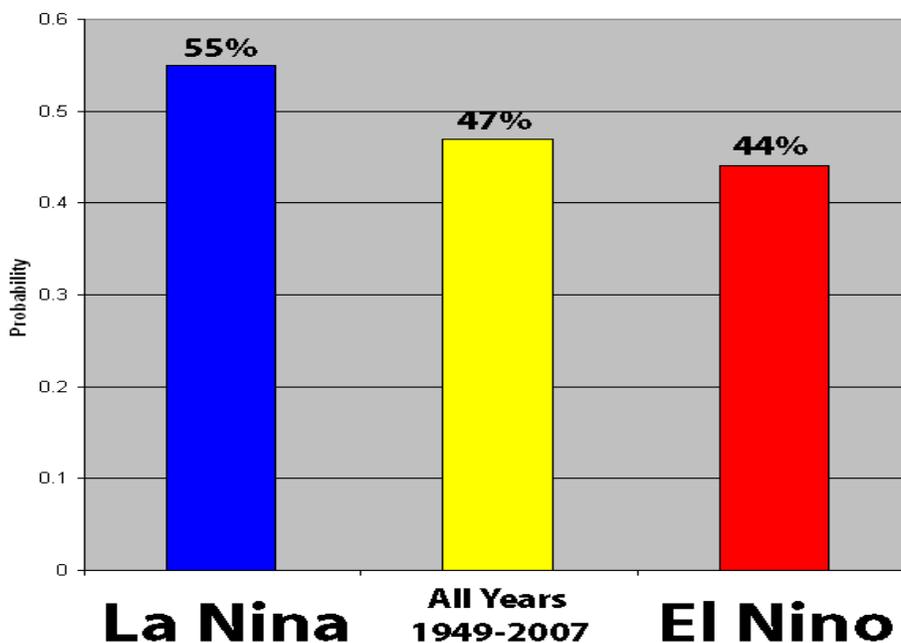
By Ray Martin (Meteorologist Intern)

A local climatological study recently done for the city of Elko itself indicated a 65 percent chance of above average seasonal snowfall, a 55 percent chance of above normal seasonal precipitation, and a 55 percent chance of below normal seasonal temperatures. While these percentages represent a greater likelihood of cooler, wetter, and snowier weather in Elko during the upcoming winter, the relatively low probabilities indicate that the outcome of this winter is by no means certain!

Probability that July-June (annual) snowfall will be above average



Probability that December-February (winter) average temperature will be below average



New Air Quality and UV Index Forecasts

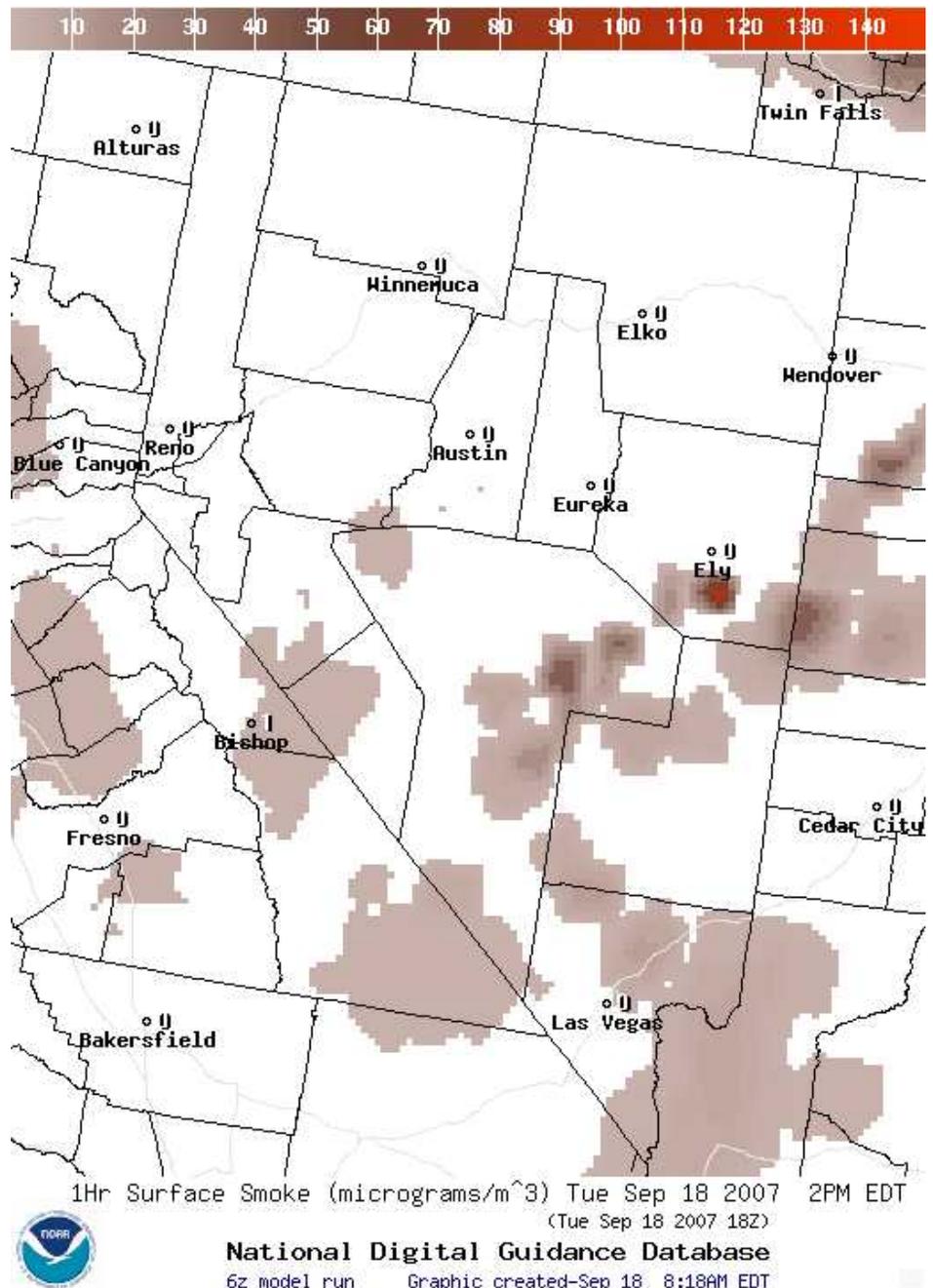
By Jeff Savadel (Warning Coordination Meteorologist)

The NOAA National Weather Service has been developing new air quality forecast products over the past several years. These forecast products include ozone concentrations (1-hour and 8-hour), surface smoke concentrations and column-average smoke concentrations. When large fires surround the area, smoke is often a big problem for air quality. The NWS in Elko is working with local officials to help provide the public with notification on days where air quality could present health risks. To view these forecast products, go to the air quality section of our website at: <http://www.wrh.noaa.gov/lkn/airquality.php>

In addition, we have also added a link to UV Index forecasts on our web page at:

<http://www.wrh.noaa.gov/lkn/UVIndex.php>

UV radiation in our region can be intense due to frequent clear skies and high elevation areas, where there is less distance for UV radiation to travel through the atmosphere and be scattered. Short term overexposure to UV radiation can result in sunburn, while long term overexposure increases the risk of skin cancer. Increased awareness of UV intensity forecasts and the proper actions to take (e.g., using sun screen) will help protect individuals from the harmful effects



Weather Safety Crossword Puzzle

Courtesy of the Las Vegas NWS Office

Across:

- 1) 30/30_____Safety rule: Go indoors if, after seeing lightning, you can not count to 30 before hearing thunder. Stay inside for 30 minutes after hearing the last clap of thunder.
- 2) The NWS issues a_____when conditions are favorable for dangerous weather to develop.
- 3) Long exposure to_____temperatures can cause hypothermia and frostbite.
- 4) It only takes_____inches of fast moving flood water to knock an adult off of their feet.
- 5) A_____occurs when strong winds pick up particles of dust and sand.
- 6) _____temperatures can cause deaths from heat stroke, and are especially deadly when children and pets are left in cars.
- 7) A_____is a normally dry streambed or flood channel. During a flash flood they can fill with water in under a minute! Never play or swim in fast moving water!
- 8) The NWS issues a_____when dangerous weather is imminent or occurring..
- 9) In the desert southwest, thunderstorms occur more frequently during the summer_____from later June into September.

Down:

- 1) _____can produce flash floods, lightning, high winds, large hail, and tornadoes.
- 2) _____kill more people per year than lightning, hurricanes, and tornadoes combined.
- 3) _____of swift moving water can sweep away a car! Half of all flash flood deaths are in automobiles.
- 4) Severe Thunderstorm_____can exceed 100mph and can knock down trees and powerlines.
- 5) Monitor NOAA Weather_____for the latest forecasts and warnings from your local NWS office.
- 6) Seek shelter in a basement or small interior room in the center of a building (such as a closet, bathroom, or hallway) when a_____warning is issued.

CHOOSE FROM THE FOLLOWING WORDS (to complete the puzzle on the next page):

RADIO

FLOODS

TORNADO

WASH

TWO FEET

WINDS

WARNING

LIGHTNING

COLD

HOT

WATCH

MONSOON

THUNDERSTORMS

SIX

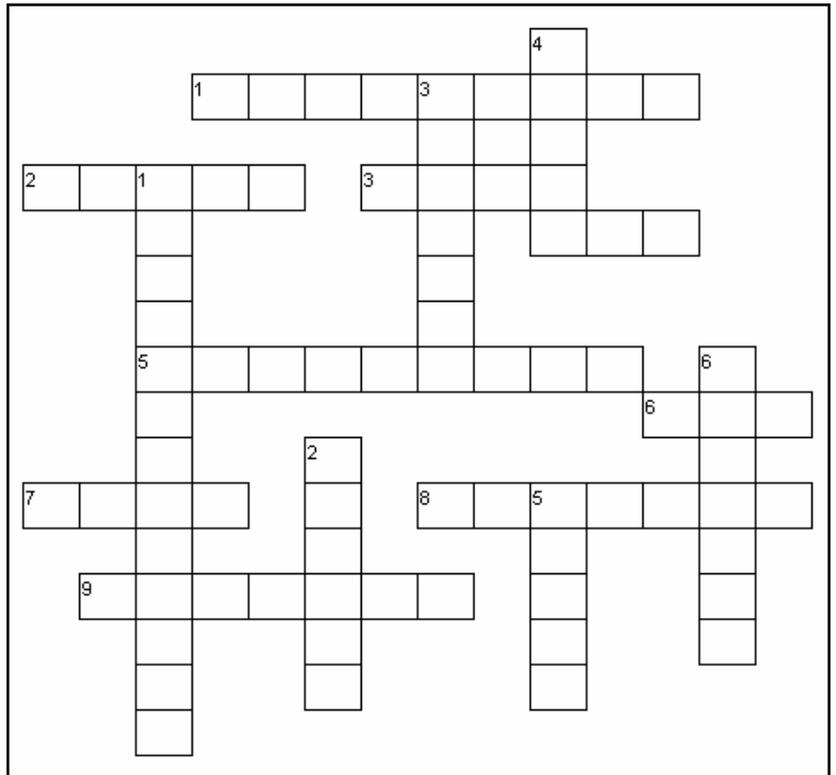
DUST STORM

Weather

Safety

Crossword

Puzzle



NOTE: Newsletters will continue to be published in June and December. However, since they look much better in color on our webpage, this will be the last version mailed out. The online newsletter can be found at: <http://www.wrh.noaa.gov/lkn/newsletter.php>

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