

The Great Basin Spotter Newsletter

Summer 2008 Edition

Volume 12, Issue 1

The online newsletter can be found at:
<http://www.wrh.noaa.gov/lkn/newsletter.php>

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Rainbow

Image ID: wea00138, NOAA's National Weather Service (NWS) Collection
Photo Date: September 1976

Highlights of Winter 2007-2008

By Ray Martin (Forecaster)

In northeastern Nevada, the winter of 2007-2008 was notable for about 7 weeks of exceptionally stormy conditions from around the last week of December into the first week of February.

In Elko, this stormy period caused January 2008 to be the 6th snowiest on record, with 28.0". Almost half of that fell in two storms, one on January 8th after Elko received 6.5 inches, and the second on January 31st when 6.2 inches of snowfall were reported. The exceptionally snowy January, combined with an additional 7.3" on February 2nd-3rd, helped result in the 4th highest average February snow depth (average amount of snow on the ground) during the month of February 2008, with a monthly average snow depth of 11 inches. The depth briefly reached 20 inches at 10AM PST on February 3rd, with the maximum climatological snow depth of 19 inches recorded at 4AM PST on February 4th.

It is believed this was the most snow on the ground in Elko at one time since January 1996, when 25" of snow fell over a 3 day period during Elko's biggest snowstorm on record.

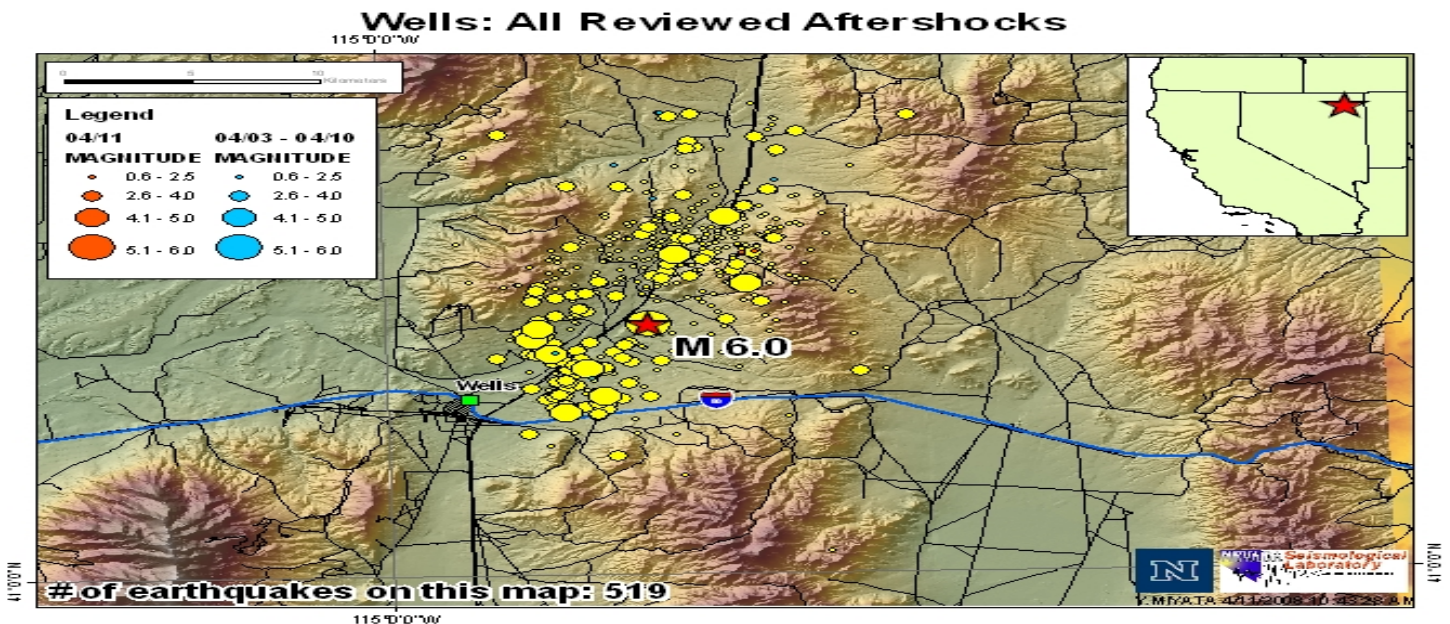
The photo is of the NWS complex from February 6th, when the official snow depth was 18 inches.



Earthquake Hydrology

By Larry Whitworth (Lead Forecaster)

On February 21st, 2008, Wells, Nevada experienced a devastating 6.0 earthquake. Thankfully, no lives were lost; however, when the ground shakes at this magnitude, everything natural and man-made is subjected to intense pressure from varying directions, including water flow above and below-ground. Aftershocks continued in the region surrounding Wells. This impacted the daily quality of life for the citizens of Wells beyond that which the primary earthquake perpetrated. The study of the effects of earth movement on bodies of water can involve more than one discipline such as seismology, hydrology and geology.



The town of Wells, situated approximately 50 miles east of Elko along Interstate 80, is still cleaning up after the major earthquake that occurred in late February. The quake, centered about 11 miles southeast of town, shook so violently as to leave the 44-year-old Wells High School in possible disrepair. Nevada is the second-most seismically-active state in the contiguous U.S. and although large earthquakes are rare in the Silver State, at least 16 quakes of 6.0 magnitude or greater on the Richter scale have been recorded since the 1840s. The strongest earthquakes have historically occurred in the western and southern parts of the state. As residents in and around Wells know, when a strong earthquake occurs, immediate and surrounding areas can receive catastrophic damage to underground infrastructure such as water and gas pipelines, electricity cables, sewer systems and mining-related activities. Underground and above-ground flows of water can also be severely impacted.

The relationship between seismic activity and hydrology is not well understood; however, evidence of changes in stream flow and well-water levels have been traced to earthquakes dating as far back as 1906. On June 21st, 2003 the University of Washington Office of News and Information, based out of Seattle, WA published an article on its website entitled “*Charting seismic effects on water levels can refine earthquake understanding.*” This article describes some astounding effects that seismic activity can have on water sources. There have been reports of earthquakes causing a rise or fall in water levels in wells, lakes, and streams in the past and a quake centered in Alaska is even credited with sloshing water in Seattle's Lake Union and Lake Pontchartrain in New Orleans. This same event was blamed for muddy tap water in Pennsylvania the following day. *Continued on next page*

Earthquake Hydrology *cont.*

By Larry Whitworth (Lead Forecaster)

When an earthquake occurs of moderate or intense magnitude, above and below-ground water-flow can be affected. Researchers have discovered that a mild earthquake, around magnitude 3, could generate effects on well-water as far as about 10 miles from the epicenter and effects on well-water from a magnitude 9 quake could be observed more than 6,000 miles away. Since seismology, hydrology, and geology techniques can all be applied to research, a cross-discipline approach is essential to a full understanding of the effects due to earthquakes. For the complete article posted by the University of Washington at Seattle, go to <http://uwnews.org/article.asp?articleid=2143>.



Wells Earthquake Photos Courtesy of Elko Daily Free Press.

The strong earthquake that rocked Wells, Nevada last February subjected above and below-ground infrastructure to intense pressure from varying directions. Aftershocks continue in the region, as does the effect on streams and underground water flows. Scientists and other personnel in the fields of seismology, hydrology, and geology study these effects in an effort to better understand the physics and mechanics resulting from ground movement, and thus mitigate the quality of life impact for citizens in towns like Wells.

FSI

Four-Dimensional Storm Cell Investigator

By Ryan Knutsvig (Science & Operations Officer)

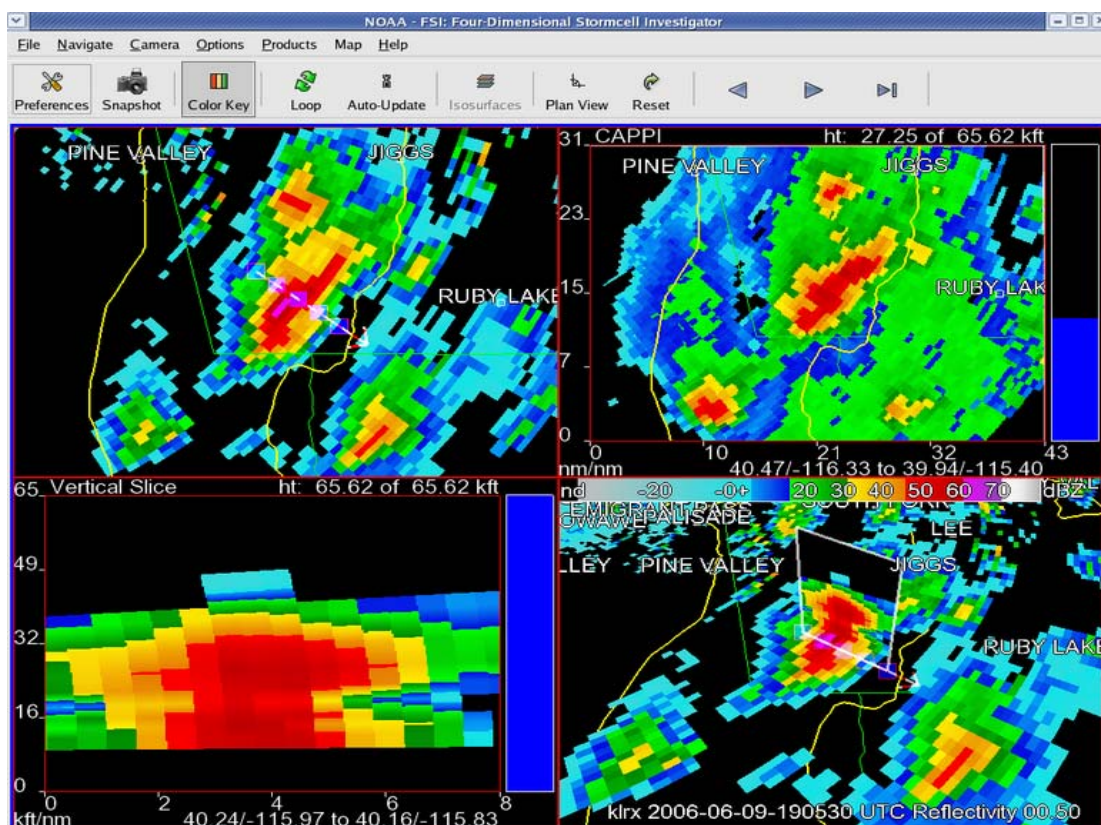
The NWS has a new tool to help with this year's convective season. Using the Four Dimensional Storm Cell Investigator (FSI), warning meteorologists will have the ability to cut a vertical cross-section across a threatening thunderstorm cell in seconds. In the past, meteorologists would have to draw a line through a thunderstorm on a traditional radar image, send the request to the radar, wait for the radar to produce the image, and hope they put the line in the right place. Now users can simply move the line with their mouse and watch the cross-section change based on where the line is in the storm. This has been labeled a "dynamic cross-section" or a "cross-section on the fly."

Constant altitude cross sections (CAPPIS) are also available. Historically in warning environments, meteorologists would only look at data on a horizontal slice (0.5°, 1.5°, etc.) that is predetermined by the radar's volume coverage pattern (VCP). These slices were never horizontal, but increased with height as the distance away from the radar increased. Now users can simply grab a toolbar and move it up and down to quickly get the radar data on a truly horizontal plane.

The FSI project is a collaborative project between the NWS's Meteorological Development Laboratory in Silver Spring, MD, the National Severe Storms Laboratory in Norman, OK, the Warning Decision Training Branch, also in Norman, OK, and the Global Systems Division in Boulder, CO.

The goal of the developers was "to increase warning skill and lead time, and therefore improve public service. The 3D/4D visualization should allow forecasters to discover new clues and signatures useful in diagnosis of severe and tornadic storms." With this new tool available this year, forecasters at the NWS in Elko, NV will get a new look at thunderstorms across the Great Basin. (See image below)

For more information, visit http://www.nws.noaa.gov/mdl/dab/FSI_index.htm.



Spotter Training and Reminders

By Jeff Savadel (Warning Coordination Meteorologist)

Storm spotters play a critical role in the warning process at National Weather Service forecast offices. Their reports often determine if a warning will be issued and are also valuable in adding credibility to ongoing warnings. As a reminder, we ask you to call us 24/7 at:

775-778-6720 or toll-free at **866-326-5364** if you observe:

- Tornadoes (Make sure you see rotation)
- Wind of 58+ mph or any wind-related damage
- Hail ½”+
- Flash flooding and/or rainfall rates of 1/2”+ per hour

If ever in doubt, err on the side of caution and call with your report.

Also, in support of the wildland fire fighting community, WFO Elko will issue short-term weather forecasts to identify immediate hazards to fire fighters. The primary hazard in our region is strong outflow winds from thunderstorms. We ask that you report any strong wind gusts associated with outflow boundaries, ideally with measured wind speed and direction.

Forecasters can often see outflow boundaries on radar that are close to the radar location in Battle Mountain, but in areas such as White Pine county and northern Nye county, these outflow boundaries are too shallow to be detected by radar. Your help reporting these types of features could have a tremendous impact on our operations and help protect the fire fighters.

Lastly, current spotters are urged to get training every 2 years. If it has been a while since you've had your training please contact me (Jeffrey.Savadel@noaa.gov - **775-778-6716**) and we can try to get some refresher training completed. Thanks to all spotters for their help in supporting the NWS mission to save and protect lives and property!

Elko County, NV Flooding 2006



Eureka, NV Tornado 2006



Skywarn Recognition Day Observed in Elko

By Jonathan McGee (Forecaster)



The 9th annual SKYWARN Recognition Day held this past December was a huge success nationwide, and also locally, thanks to the efforts of the Elko Amateur Radio Club. SKYWARN Recognition Day, developed in 1999 by the National Weather Service (NWS) and the American Radio Relay League (ARRL), celebrates the contributions that volunteer SKYWARN radio operators make to the National Weather Service. During this 24-hour event held back on December 1st, amateur radio operators visited their local NWS office and worked as a team to contact other amateur radio operators across the country. Nearly 15,000 contacts were made among the 90 NWS offices that participated in the 2007 event. Locally, the Elko Amateur Radio Club made 493 contacts with participants in 47 different states which was the 8th highest total among the 90 participating NWS offices.

Locally, this was the 6th straight year that the Elko Amateur Radio Club has participated in SKYWARN Recognition Day along with the National Weather Service Forecast office in Elko. The Elko Amateur Radio Club members donated their own equipment and time to set up a transmitting site at the Elko NWS Forecast Office.

So, why does the National Weather Service and the American Radio Relay League cosponsor this event? Well, the NWS and the ARRL both recognize the importance that amateur radio operators provide during severe weather. Many NWS offices acquire real time weather information from amateur radio operators in the field which provides vital ground truth information during significant severe weather events. These operators, for example, may report the position of a tornado, the height of flood waters, or damaging wind speeds during hurricanes. All of this information is critical to the mission of the NWS which is to preserve life and property. SKYWARN Recognition Day celebrates this special contribution made by amateur radio operators.

Three Month Outlooks: Jul-Aug-Sep 2008

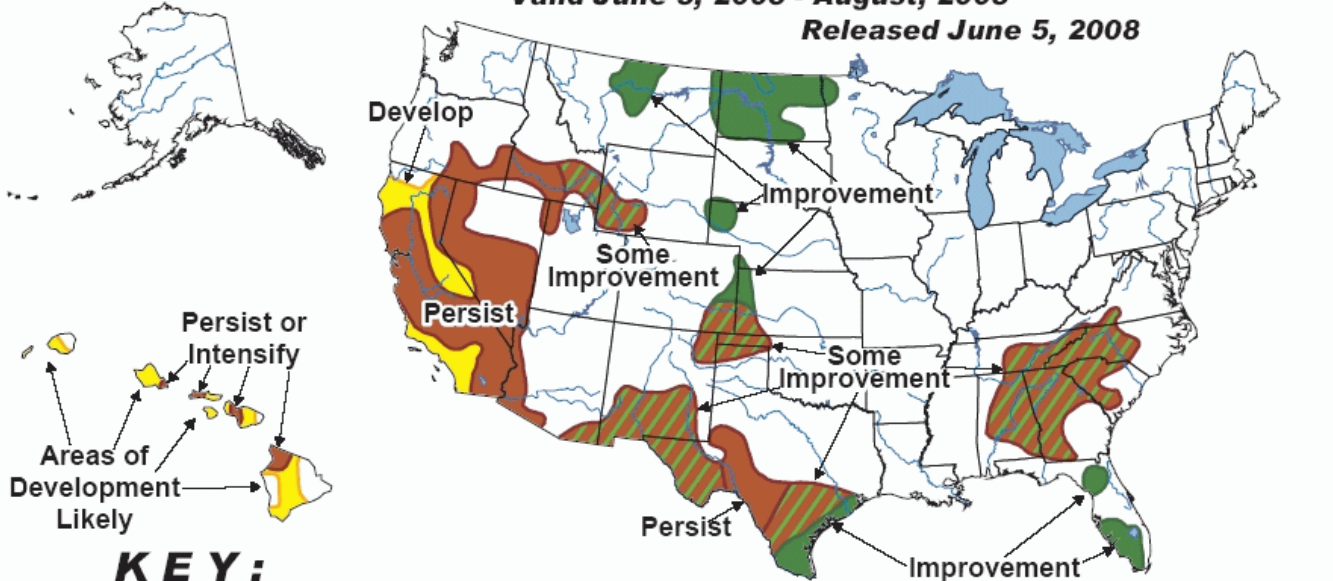


U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid June 5, 2008 - August, 2008

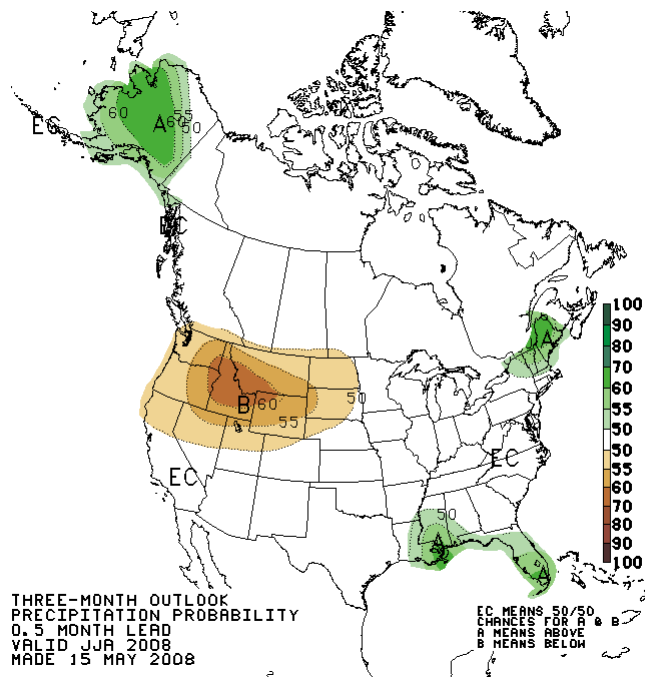
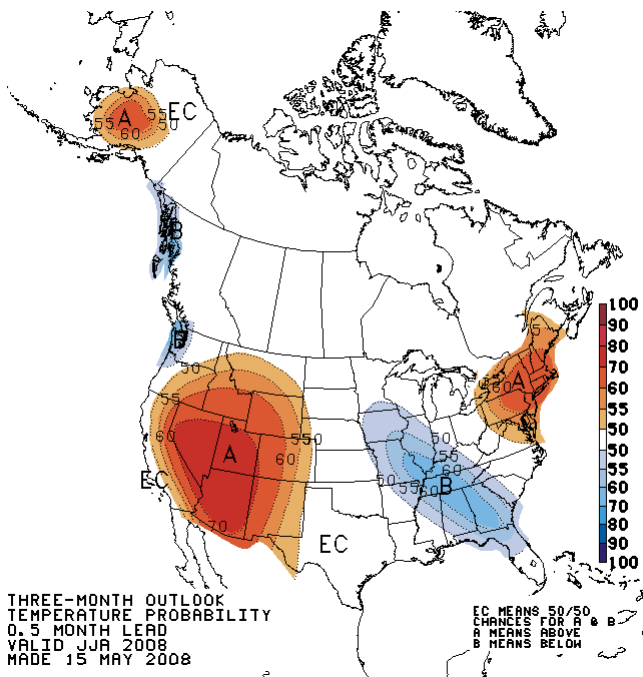
Released June 5, 2008



Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

Three month outlook: TEMPERATURE

Three month outlook: PRECIPITATION





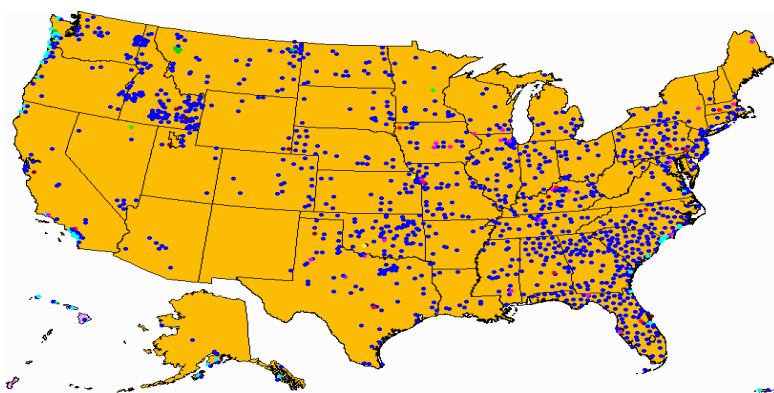
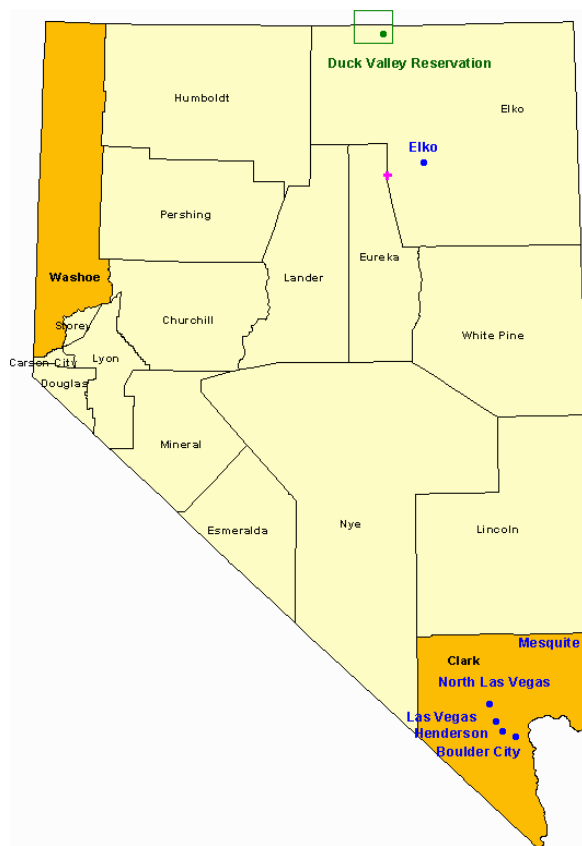
StormReady

University of Nevada, Reno Fire Science Academy Declared a StormReady Supporter

The NWS StormReady program recognizes communities and leaders that have gone the extra mile to help protect citizens from weather related hazards. StormReady heightens safety and awareness of citizens to the numerous hazards of a given area and improves communication between the NWS and general public. The biggest hazards in our area include weather-related risks from wildfires, winter storms, flash floods, etc. Hazmat incidents are another serious risk in our region due to significant rail and road transportation of hazardous materials. Currently there are three StormReady Communities in the WFO Elko area of responsibility. The Duck Valley Indian Reservation was recognized in July 2006 as a StormReady Community. The city of Elko, and Elko's outlying community Spring Creek, were both recently recognized in Spring 2008 as StormReady. WFO Elko staff are also working with other communities to help them gain StormReady status.

StormReady Supporters are local entities, such as businesses or schools, that promote the principles and guidelines of the StormReady program into their severe weather safety and awareness plans. The University of Nevada, Reno Fire Science Academy (FSA) was recognized last Fall as a StormReady Supporter. This status was attained after the FSA worked with the NWS Elko office to arrange a weather safety and spotter training session; incorporate a severe weather action plan; maintain a weather observing system on-site and actively use NOAA All-Hazards Weather Radio to receive notification of any warnings or watches issues by the NWS. Congratulations to the city of Elko and the Fire Science Academy on their achievements!

Kevin Baker
(Meteorologist-in-Charge) presents StormReady plaque to UNR Fire Science Academy representative and weather spotter, Randy Squires.



Lightning Safety

By Spring 2008, 11 people had died in the United States due to lightning strikes. In 2007, 45 people in the U.S. were killed by lightning with countless other injuries also occurring. The average number that lightning kills is 62 people per year in the U.S. The majority of those killed by lightning were male (89%), many of them in their 20s. Lightning remains one of the biggest weather hazards over central and northern Nevada. Many of those who are struck by lightning are not killed, but suffer lifelong related ailments. WFO Elko highlighted this risk during the national Lightning Safety Awareness Week which ran from June 22 - 28, 2008. Some basic safety tips include:

- Seek shelter indoors in a house, school or large building.
- Stay off phones, computers and video games.
- Get in a hardtop vehicle if indoor shelter is unavailable.
- Stay out of outdoor and indoor pools.
- Do not stand under trees (25% of those killed by lightning in 2008 were standing under trees).

Be aware of the weather forecast and potential for thunderstorms. Check for the latest weather forecasts via weather.gov, NOAA Weather Radio, or local media outlet.



Lightning

Image ID: nssl0116, NOAA's National Severe Storms Laboratory (NSSL) Collection
Photo Date: June 6, 1974
Credit: NOAA Photo Library, NOAA Central Library; OAR/ERL/National Severe Storms Laboratory (NSSL).



Multiple cloud-to-ground and cloud-to-cloud lightning strokes during night-time. Observed during night-time thunderstorm .

Image ID: nssl0010, NOAA's National Severe Storms Laboratory (NSSL) Collection
Photographer: C. Clark
Credit: NOAA Photo Library, NOAA Central Library; OAR/ERL/National Severe Storms Laboratory

UV Index and Air Quality Forecasts

During the summer months, remember to check out the UV Index and air quality forecast products. The “Air Quality” and “UV Index” links can be found on the left hand side of our web page at weather.gov/elko. The surface smoke forecast product might be of particular interest during times of active wildfires. For more details, check out the web link or reference the related article in last winter’s newsletter.

NOAA NWS



Mission

We deliver climate monitoring, assessment, and prediction products for timescales from weeks to years to the Nation and the global community for the protection of life and property and the enhancement of the economy

Vision

To be the world's best and most trusted climate service center, using partnerships to develop cutting-edge climate products.

The online newsletter can be found at:

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

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