

# **Record Flash Flood of July 8, 1999: Ten Year Anniversary**

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Mention "Las Vegas" and "weather" to most people in the same sentence and you'll typically get these responses – "sunny", "hot" or "dry." While these words do describe the weather in Las Vegas on a number of days during the year, residents and visitors of Las Vegas should be aware that high impact weather events such as flooding, strong winds or snow can occur in the Las Vegas Valley. One of these instances of high impact weather took place ten years ago this July, when extensive flash flooding occurred in the Las Vegas Valley.

On the morning of July 8, 1999, a number of ingredients were in place to trigger thunderstorms. A southeast flow in the atmosphere resulted in an influx of monsoonal moisture into the region and an inverted upper-level trough axis was in place over the Colorado River Valley. This trough served as a forcing mechanism in combination with the abundant moisture already in place across the Mojave Desert, resulting in thunderstorms developing during the early morning hours of 8 July. The thunderstorms were primed with plenty of rainfall to unleash.

Showers and thunderstorms began to develop in the northwest part of the Las Vegas Valley just before 9:30 AM and shortly thereafter became more widespread and intense. Subsequently, thunderstorms moved northward into the southern part of the valley. By 11:00 AM, showers and thunderstorms had covered just about all of the Las Vegas Valley, with the heaviest rain producing storms over the west side and across the central and southern portions of the valley. Between 11:00 AM and noon, McCarran International Airport received 1.05 inches of rain - nearly a quarter of the normal annual rainfall for Las Vegas! By the afternoon, showers and thunderstorms began to wane as forcing that was in place in the atmosphere begun to weaken.

The highest rainfall total reported in the Las Vegas Valley was 3.23 inches near the intersection of Paradise Road and Windmill Road, in the southern part of the valley. At McCarran International Airport, 1.29 total inches of rain fell, tying the record for the sixth greatest calendar day total. In general rainfall amounts exceeded an inch in all but the northeast and far northern parts of the valley; and exceeded 2 inches in several south-central neighborhoods as well as parts of Summerlin. According to the USGS record peak flows occurred at several stations on Duck Creek, Flamingo Wash and the Las Vegas Wash. Based on the flows observed at these points some portions of the Las Vegas Valley may have exceeded a 100 year flood value.

Why was the flooding from this storm so extensive? First, the Las Vegas Valley slopes downward in elevation from west to east by roughly 1,000 feet. Thus the natural drainage of the valley would cause rain that falls on the west side of the valley to run eastward. Therefore, much of the heavy rain that fell on the west side of the valley drained east sending a torrent of rushing water towards the east side helping to exacerbate the flooding problems. Secondly, the extensive work done by the Regional Flood Control District to improve the wash system and drainage basins across the valley was just in the beginning phases in 1999. Thus the water was not actively being channeled and diverted to prevent flash flooding. Instead, many of the roads in Las Vegas were built over natural drainage areas and acted as a "channel" for water to funnel and drain down across the valley. Lastly, the copious amounts of rain that fell were unleashed on a widespread area and onto a naturally poor drainage ground composition.

Damages from this storm totaled around \$25 million dollars (in 1999 figures) making this by far the most costly flood event ever to occur in the Las Vegas Valley. Two people died in the storm, one a motorist who was involved in a weather-related accident, and the other a transient who was caught in a wash that filled up with floodwaters. Road flooding was extensive throughout the valley, including portions of Las Vegas Boulevard. Floodwaters inundated a number of buildings including the Forum Shops at Caesars which saw up to 2 feet of water inside. Even City Hall and the Mayor's office suffered water damage. On the east side of the valley, a mobile home park near the Flamingo Wash suffered erosion resulting in one home falling into the wash and four others destroyed by rushing water. The weight of water on roofs also resulted in two roof collapses – the roof on a grocery store and the other a motorcycle dealership. Two hundred seventy five storm related emergency phone calls were logged by rescue officials in six hours, with calls to 149 locations in a 15 minute period just before 12:00 PM. Swiftwater rescues totaled over 200 across the valley.

While dozens of flash floods have affected Las Vegas since this event, including a noteworthy one in August of 2003, this event ranks as the biggest flood-related impact on modern Las Vegas. The size and scope of the flooding resulted in it having far reaching impacts. Even with the advancement in weather forecasting and flood control measures over time, floodwaters should never be underestimated.

### ***Acknowledgements***

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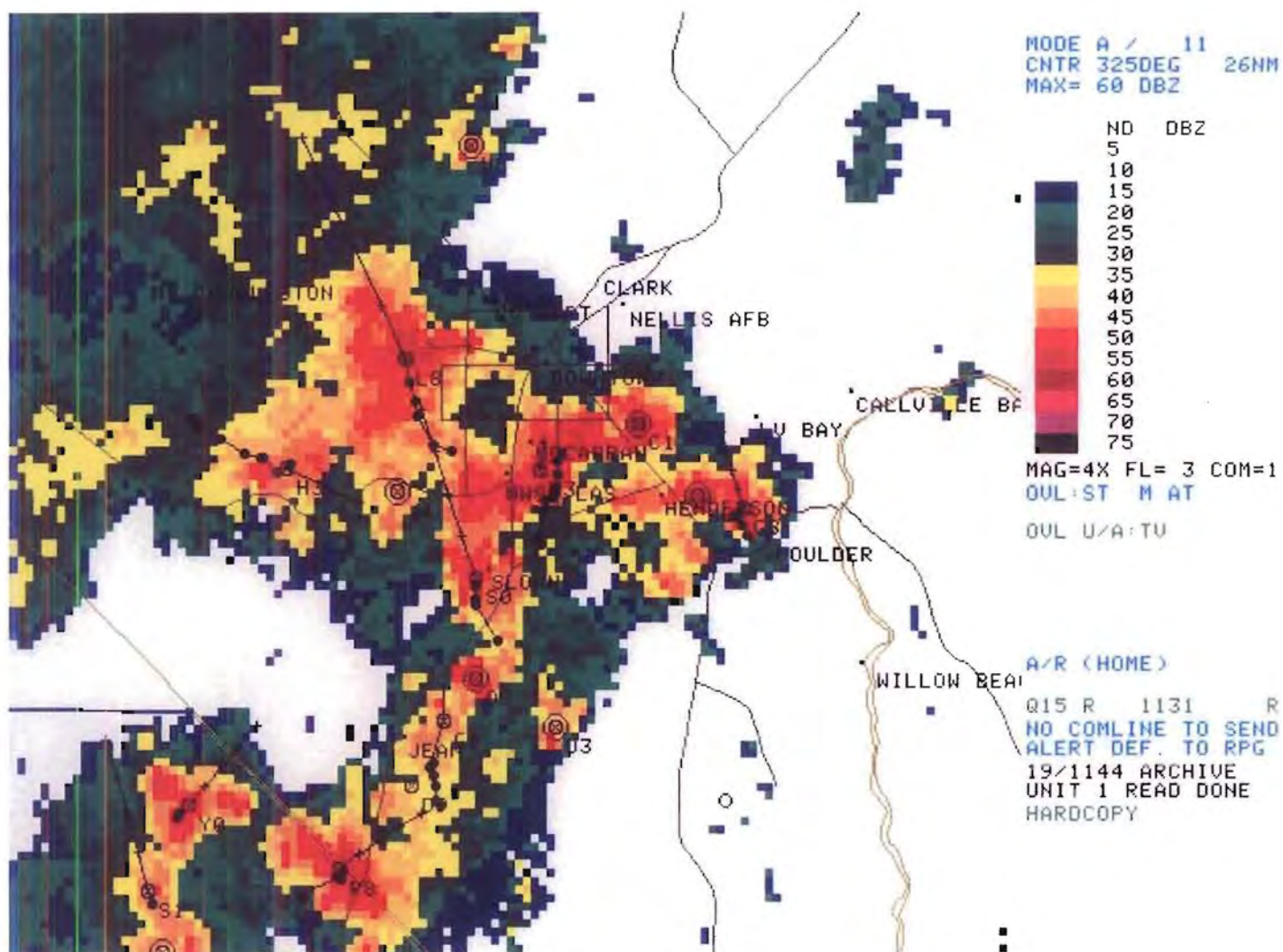


Figure 1 – Radar image over the Las Vegas Valley around 11 AM on July 8, 1999.



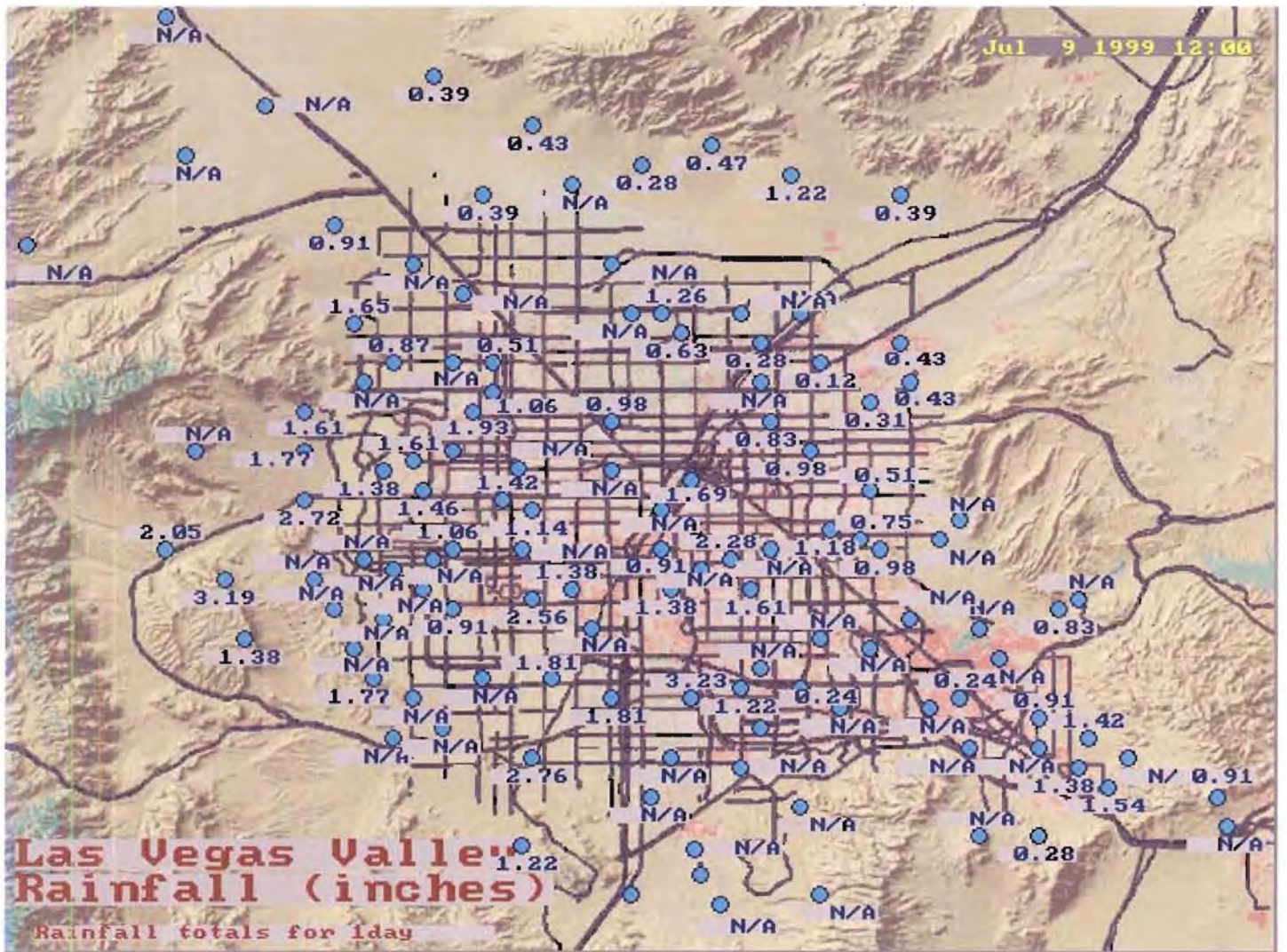


Figure 2 – Selected rainfall totals from around the Las Vegas Valley for July 8, 1999, from the Clark County Regional Flood Control District.



Figure 3 – Damage from the flood still remained several days later along Boulder Highway. Photo Courtesy Clark County Regional Flood Control District.



Figure 4 – Cars flipped by floodwaters near Boulder Highway and the Flamingo Wash. Photo Courtesy Las Vegas Review-Journal.





Figure 5 – Debris lining Boulder Highway after the storm. Photo Courtesy Clark County Regional Flood Control District.



Figure 6 – The Gowan Detention Basin came within one foot of capacity, reaching a depth of 22 feet. Photo Courtesy Clark County Regional Flood Control District.