

# WEB-BASED FLOOD CHRONOLOGY OF THE CARSON RIVER BASIN, CALIFORNIA AND NEVADA, FROM 1852 TO THE PRESENT

Anne E. Jeton<sup>1</sup>

## ABSTRACT

As new areas are developed to accommodate growth, communities are increasingly faced with the need to develop in flood-prone areas. Current efforts by the State of Nevada Floodplain Management Program, Nevada Division of Water Resources (NDWR), to support the Federal Emergency Management Agency's (FEMA) Map Modernization program, have been to act as a point of contact at the State level in communicating mapping needs for Nevada communities. In conjunction with floodplain mapping, NDWR has identified the task of compiling flood-hazard information in a format accessible and understandable to the general public and Federal, State, regional, and local agencies. The Nevada Floodplain Management Program considers it essential to make historical flood information publicly available, particularly for river basins with significant current and future population growth.

The U.S. Geological Survey with the support of FEMA through NDWR's Floodplain Management Program has developed a web site to make historic flood information for the Carson River Basin publicly available. The focus of the web site is on existing data, both measured and estimated, and for flood events prior to streamflow monitoring. The web site contains information to help the general public in understanding the extent and frequency of flood hazards and risks in the Carson River Basin. Available information on specific flood events may include photographs, video clips, and links to related web sites, flood-frequency analyses, meteorological data, narratives, and streamflow data. USGS Fact Sheet 2006-3102 provides additional information, and the URL for this web site is <http://nevada.usgs.gov/crflid/>.

## NEWS RELEASE

A news release was issued on July 7, 2006 and is shown below (Table 1).

Table 1. Flood chronology news release for the Carson River Basin.

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<u>News Release</u>	<u>Address</u>
U.S. Department of the Interior U.S. Geological Survey	USGS Nevada Water Science Center 2730 N. Deer Run Rd. Carson City, Nevada 89701

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<u>Release</u>	<u>Contact</u>	<u>Phone</u>	<u>Fax</u>
July 7, 2006	Anne E. Jeton	775-887-7628	775-887-7629

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## **Flood Chronology of the Carson River Basin, California and Nevada Web Site**

The U.S. Geological Survey (USGS), Department of the Interior, with the support of the Federal Emergency Management Agency (FEMA) and Nevada's Floodplain Management Program, Nevada Division of Water Resources (NDWR), has developed a web site that makes historic flood information for the Carson River Basin publicly available. Current efforts by the State of Nevada Floodplain Management Program, NDWR, have been to act as a point of contact at the State level in communicating mapping needs for Nevada communities to support the Map Modernization Program (FEMA). In conjunction with floodplain mapping, NDWR has identified the task of compiling flood-hazard information in a format accessible and understandable to the general public and Federal, State, regional, and local agencies.

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As new areas are developed to accommodate growth, communities are increasingly faced with the need to develop in flood-prone areas. The web site contains information to help increase the understanding of the extent and frequency of flood hazards and risks in the Carson River Basin. The focus of the web site is on existing data, both measured and estimated, and for flood events prior to streamflow monitoring. The web site is available at <http://nevada.usgs.gov/crfid/>.

Additional information about this and other USGS studies of water resources in Nevada may be obtained by e-mail sent to [GS-W-NVpublic-info@usgs.gov](mailto:GS-W-NVpublic-info@usgs.gov) or by visiting the USGS home page at <http://nevada.usgs.gov>.

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### **FACT SHEET**

The fact sheet for the Carson River Basin flood chronology was released as USGS Fact Sheet 2006-3102 on June 30, 2006, and is attached as Appendix 1.



# Flood Chronology of the Carson River Basin, California and Nevada Web Site

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<http://nvdw.usgs.gov/crflf/>

Information on this web site may be viewed in several ways:

**By specific flood event.** Events can be viewed by date, river reach (section of the river), or county. Available information may include photographs, video clips, flood-frequency analyses, meteorological data, narratives, streamflow data, and links to related web sites.

### Floods included in the web site

November 2006	May 1956	February 1954
January 1977	December 1955	March 1890
July 1964	November 1950	January 1886
February 1968	January 1943	July 1875
June 1953	March 1938	January 1875
February 1982	December 1937	January 1874
January 1980	March 1928	January 1868
May 1977	January 1914	January 1862
December 1964	July 1913	December 1861
February 1963	January 1909	December 1852
July 1960	March 1907	
August 1955	January 1903	

**By specific area:** Areas can be viewed on maps which show the extent of river reaches and county boundaries. The county pages include zoning or land-use maps that show locations of specific events.



Search by River Reach



### Carson City

Map of Carson City, Nevada



**By gaging station:** Gaging stations can be selected from the gaging-station map or by selecting a flood event, county, or river reach. Available hydrologic information includes annual peak flows, flood frequencies, and links to flood maps.



### Gaging Station 1C311400

Annual Peak Flows

Peak Flow Frequency Analysis

Annual Peak Flows

Peak Flow Frequency Analysis

Annual Peak Flows

Peak Flow Frequency Analysis

Annual Peak Flows

Peak Flow Frequency Analysis

## Appendix 1, cont.

### Carson River Basin

The Carson River Basin covers about 4,000 square miles in west-central Nevada and eastern California, from the eastern slopes of the Sierra Nevada in Alpine County, Calif., to the Carson Sink in Churchill County, Nev. The highest altitude in the basin is about 11,000 feet in the Sierra Nevada dropping to just under 4,000 feet above sea level near the Carson Sink.

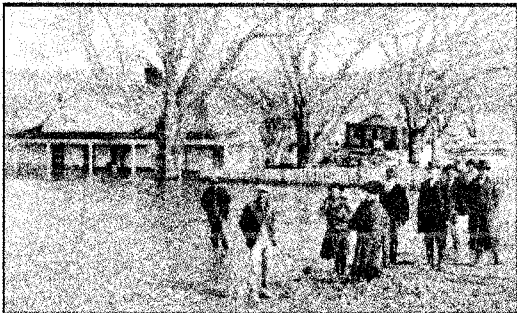
Annual precipitation amounts vary from more than 55 inches at the upper altitudes to less than 5 inches at the lowest altitudes. At the upper altitudes, the snowpack accumulates during December through March when most precipitation falls as snow. Snowmelt provides most of the tributary and main-channel Carson River streamflow.

### Flooding

Flooding, whether localized or basinwide, is a common phenomenon in the Carson River Basin. Three main types of flooding occur in the Basin:

#### Main Channel Flooding

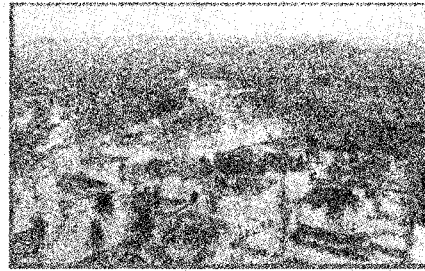
Main-channel floods in the basin result from rain on the mountain snowpack which contributes to rapid snowmelt. As flow in the Carson River increases due to rapid snowmelt in the mountains, the channel overflows and floods adjacent areas known as floodplains (relatively smooth land bordering rivers that flood at time of high water). Because the Carson Valley is a broad floodplain, flooding can be widespread.



Main-channel flooding at the Hoover Hotel, Dayton, Nev., 1906. Photograph courtesy of the University of Nevada, Reno, Special Collection.



Localized flooding near Dayton Valley Road, Dayton, Nev., 2006.



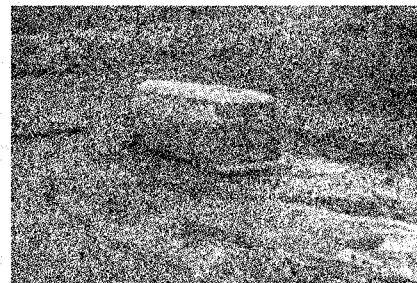
Main-channel flooding in the Carson Valley. Photograph by Rick Johnston, Nevada Department of Transportation.

#### Localized Flooding

Localized flooding (also known as flash flooding) results from intense rainfall during summer thunderstorms and typically occurs on alluvial-fan surfaces (gently sloping, fan-shaped landforms common at the base of mountain ranges). Localized flooding is characterized by high-velocity flows, erosion, sediment transport and deposition, and unpredictable flow paths. The risks from this type of flooding increase as development continues on flash-flood prone surfaces such as the east side of the Carson Valley and at the base of the Pine Nut Mountains in Dayton.

#### Debris Flows

Debris flows are the result of water from intense rainfall or rapid snowmelt mixing with sediment to become a slurry similar to wet concrete. In steep canyons (for example, the east slope of the Carson Range), debris flows can reach high velocities, transport large boulders, and cause catastrophic damage from impact or burial.



Volkswagen bus trapped in mudflow south of Genoa, 1971. Photograph by Pat Glency, USGS retired.

Additional information about the Carson River Basin, this web site, as well as an explanation of terms is available at <http://nevada.usgs.gov/rlfd/>

— Anne E. Jeton

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