

U.S. Army Corps of Engineers (USACE)
Sacramento District
American River peak discharge estimates for Jan. 1862 at Fair Oaks gage

This is one of three documents which contain American River peak discharge estimates for January 1862 flood event at the Fair Oaks gage (USGS 11446500). These documents were produced to help size and design Folsom Dam by estimating the largest flood the dam and reservoir would experience.

1941	Bossen Leslie E. Bossen, Assistant Engineer, U.S. Army Corps of Engineers, Sacramento District "THE 1862 FLOOD ON THE AMERICAN RIVER, CALIFORNIA" (Aug. 1941) Source: Ronald Stork, Friends of the River, 1418 20th Street, Suite 100, Sacramento, CA 95811
1941	Bossen Leslie E. Bossen, Assistant Engineer, U.S. Army Corps of Engineers, Sacramento District "DISCHARGE RATING CURVES OF AMERICAN RIVER AT FAIR OAKS AND AT FOLSOM" (Aug. 1941) Source: Ronald Stork, Friends of the River, 1418 20th Street, Suite 100, Sacramento, CA 95811
1943	Bossen Leslie E. Bossen, Assistant Engineer, U.S. Army Corps of Engineers, Sacramento District "THE FLOOD CREST OF JANUARY, 1943 ON THE AMERICAN RIVER" (Feb. 1943) Source: Ronald Stork, Friends of the River, 1418 20th Street, Suite 100, Sacramento, CA 95811

Collected by Gary Estes
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THE 1862 FLOOD ON THE AMERICAN RIVER, CALIFORNIA

1. Historical Background. The period of the 1862 flood is January 9-12, inclusive (U.S.W.B. Bulletin #43 entitled "The Rivers and Floods of the Sacramento and San Joaquin Watersheds, page 61). The rainfall of December 1861 and January 1862 was notably heavy as was the flooding throughout the whole northern California. The floods of this period are the worst of record. In 1912 the elevation of the 1862 attested high water level at the Old Stone Stable near where the Stockton and Coover Mill stood on the right bank of the American River approximately a mile upstream of the present Folsom bridge crossing was determined. The elevation of same was made 183.0 and the elevation of the March 1907 flood crest at the same location was made 171.6 both are to U.S.G.S datum. A note found in the files of Mr. Joseph Gross, a Sacramento Civil Engineer states that the flood crest of 1874 reached the level of the floor of the Old Stone Stable. The floor at that time was approximately 181.4 U.S.G.S. elevation. Levels of other historical and more recent floods have been referred to the sill of the most westerly of the windows on the south side of the old stable. The elevation of this window sill is 185.7 U.S.G.S. datum. The crest of the December 1867 flood was supposed to have reached near the levels of that of January 1862 flood but no definite data on this flood can be found except for points considerably upstream on the American River drainage area. A note in the files of Mr. Gross establishes the 1862 flood level immediately upstream of the old railroad bridge which stood at the site of the present concrete arch highway bridge at Folsom at elevation 158.5 Sacramento City datum and 153.2 County datum. By levels from the Folsom powerhouse U.S.G.S.B.M. run in April 1941 this flood level was determined 153.8 U.S.G.S. datum. Also from files of Mr. Gross the level of 1862 flood was noted 7.75 feet above the level of the 1907 flood at the Fair Oaks bridge. At 1941 gage datum at Fair Oaks U.S.G.S. river discharge station the March 1907 flood crested at 31.4 thus the 1862 flood would have been 39.1 U.S.G.S. staff gage datum.

2. 1862 Flood Discharge at Fair Oaks U.S.G.S. Station. Channel cross-sections at the bridge and at two locations on the U.S.G.S. gage high water level control just downstream of the bridge surveyed shortly after the 1928 flood are available (Welle's State Report on March 1928 flood). After concluding that the 1928 flood discharge was about 150,000 c.f.s. at this station an extreme highwater extension of the Fair Oaks discharge rating curve was made on the basis of hydraulic properties of the three above mentioned cross-sections. The 1862 flood discharge taken off this extended curve is 269,000 c.f.s. With the 1928 flow placed at 155,000 the 1862 flow would have a value of 286,000 c.f.s.

3. 1862 Flood Discharge at Folsom Powerhouse. There were no 1862 highwater levels observed at this location.

4. 1862 Flood at Folsom Bridge. During the period 1858-68 the California Central Railroad crossed by bridge over the American River at Folsom. This bridge was located on the site of the present concrete arch highway bridge. In addition, there was a highway bridge about 100 feet upstream of the railroad bridge. As obtained from files of Mr. Gross

the 1862 flood crest obtained indirectly from Mr. Leete's observation in 1862 and subsequent observation and study since then was determined as 153.2 County datum, 158.5 Sacramento City datum, and 153.8 U.S.G.S. datum (1929 adjustment). The discharge rating curve for the river at the bridge was based on a relation curve of river stages at the powerhouse and bridge for observed flood discharge at Fair Oaks. This rating curve was extended to extreme flood flows on the basis of hydraulic properties of the channel cross-section surveyed in 1917. With the value of 155,000 c.f.s. assumed for the March 1928 flood crest 322,000 c.f.s. was obtained for the 1862 flood, and with 160,000 c.f.s. for the former 352,000 c.f.s. was obtained for the latter.

5. 1862 Flood at Stockton-Coover Mill near Folsom. Near the site of the razed mill, at the old stone stable the ruins of which still remain the 1862 flood level was observed. In the U.S. Weather Bureau Bulletin #43 published June 1913 on page 61 the level of the 1862 flood on the U.S.W.B. powerhouse gage is given 38.3. ^{It is} the result of adding the difference between the 1862 and 1907 flood levels at the stone stable which is about a mile upstream to the 1907 flood height on the U.S.W.B. gage at the powerhouse. At the stone stable several flood levels have been recorded. Of these the 1862 and 1874 flood levels, before mentioned, were 183.0 and 181.4, respectively, the March 1928 level at 175.0, the March 1907 at 171.5, the December 1937 at 170.8, the February 1925 at 168.8 and the March 1940 at 168.0, all U.S.G.S. datum. The February 1925 and March 1928 flood elevations were determined and recorded by engineers of the State Water Resources. The level of the March 1928 flood crest was closely verified from still existing drift and wash lines in 1941 by L. E. Bossen of U.S.E.D. Also at this same time were obtained from drift and wash lines and verified by a witness of the floods, the levels of the December 1937 and March 1940 peak flows. From these various observations and a cross-section of channel at the stone stable surveyed by State Engineer and crest discharge of same floods at Fair Oaks a rating curve for this location was determined and extended to extreme flood stages. With the 1928 flood 155,000 c.f.s. the flood of 1862 would have been 265,000 c.f.s. and with the 1928 flood 160,000 c.f.s. the 1862 flood would have been 278,000 c.f.s.

6. Conclusions. From studies mentioned in the foregoing paragraphs the following conclusions regarding the 1928 and 1862 flood crest flows are made: The 1928 flood flow should have the value of 150,000 c.f.s. at Fair Oaks and 160,000 c.f.s. at Folsom. The 1862 flood flow should have approximately the value of 265,000 c.f.s. at Fair Oaks and 280,000 c.f.s. at Folsom.

Leslie E. Bossen
Assistant Engineer

*There has been no other study of the 1862 flood
the flow at the stone stable is given that the
at a point it will be more fully investigated*