

Flood Control Accomplishments 1986 - 2007



**Sacramento
Area Flood
Control
Agency**

February 2007

OVERVIEW

In 1986, the most severe flood in a century hit the Sacramento Valley and exposed many deficiencies in the Sacramento area's flood control system. These included:

- structural weaknesses in the east levee of the Sacramento River that made this levee susceptible to extensive seepage during the flood, nearly triggering a failure of the levee at several locations in the Natomas area;
- inadequate conveyance capacity in the levee-confined streams and drainage channels connecting the Natomas and North Sacramento areas to the American River, nearly causing the levees along the Natomas East Drainage Canal to overtop; and
- inadequate reservoir storage capacity for flood control at Folsom Dam, requiring dam operators to make releases to the lower American River above the safe carrying capacity of the levee system.

SAFCA was formed in 1989 to address these deficiencies and move the Sacramento area as quickly as possible to a 100-year level of flood protection, with the added goal of achieving a "200-year level" of protection over time.

The 1997 flood, which nearly equaled the severity of the 1986 flood, provided a measure of SAFCA's progress. Improvements to the flood control system funded by SAFCA and its state and federal partners allowed the 1997 flood to pass through the Sacramento area with little of the stress that nearly produced catastrophic, uncontrolled flooding in 1986.

The 1997 flood did cause levee failures elsewhere in the Sacramento Valley, leading federal engineers to upgrade urban levee engineering standards throughout the Valley. These new standards complicated SAFCA's effort to achieve 100-year flood protection and substantially increased the extent and cost of the levee improvements needed to achieve this level of protection. Nevertheless, by the end of February 2007 SAFCA and its partners succeeded in providing at least a 100-year level of flood protection to the major floodplains in Sacramento, reducing the risk of flooding to more than 100,000 parcels and making flood insurance optional and substantially less costly for these parcels.

Approximately 5,000 parcels in the Mayhew and South Sacramento areas remain in the federally regulated 100-year floodplain and changed engineering standards for urban levees may cause another 25,000 parcels in the Natomas area to revert to this status. The next steps in SAFCA's ongoing flood control program are to provide these areas with at least a 100-year level of protection within three to five years and to achieve a 200-year level of protection for Sacramento's major floodplains within a decade. These efforts would be funded by SAFCA's new Consolidated Capital Assessment District and would build on the Agency's accomplishments during the decades following the record floods of 1986 and 1997.

Chronology of Accomplishments

Date	Problem	Improvement Project	Accomplishments
February 1986	Record flood causes several levee failures in Sacramento Valley. Sacramento nearly suffers catastrophic uncontrolled flooding.		
November 1989		SAFCA formed to address flood control system deficiencies exposed by 1986 flood, achieve 100-year protection in the Sacramento area as quickly as possible and reach 200-year protection over time.	
May 1991			SAFCA Board forms Operations and Maintenance Assessment District #1 to fund agency planning, administration, levee strengthening along the Sacramento river and system operation and maintenance.
October 1993	Sacramento River East Bank Levee: This levee was constructed during the early part of the 20th Century using sandy materials dredged from the river. High water during 1986 flood caused seepage through the levee nearly triggering failure in several locations	Sacramento Urban Levee Reconstruction Project	SAFCA and its federal partners complete improvements to address through-levee seepage. Cutoff walls inserted in 18 miles of the levee in developed areas. Twelve miles of drainage berms constructed in agricultural areas of Natomas. These improvements allow the strengthened levee to withstand the 1997 flood along the Sacramento River and its tributaries with little evidence of stress.
March 1995	Folsom Dam: Runoff during 1986 flood nearly exhausted the 400,000 acre-feet of reservoir storage space available for flood control at Folsom Dam, causing dam operators to release 134,000 cubic feet per second (cfs) into the lower American River channel, 20 percent more than the system design flow of 115,000 cfs.	Interim Folsom Dam Reoperation Agreement	SAFCA executes agreement with the federal government to make up to 270,000 acre feet of additional reservoir storage space available for flood control based on storage conditions in three non-federal reservoirs upstream of Folsom Dam. This additional storage helps contain the 1997 flood without exceeding the system design flow in the American River channel.
June 1995	Natomas/North Sacramento Levee System: High flows in the American River channel combined with high runoff in Dry/Robla and Arcade Creeks during the 1986 flood caused flooding in portions of North Sacramento and nearly overtopped the levees along the Natomas East Main Drainage Canal (NEMDC)	North Area Local Project (NALP) Capital Assessment District #2 formed to fund improvements to levees along the streams and drainage channels connecting Natomas and North Sacramento to the American River	SAFCA initiates project to raise levees along Dry/Robla Creek, Arcade Creek, and NEMDC and construct a new pumping station in the NEMDC to permit safe containment of a "200-year" flood. These improvements allow the flood control system in Natomas and North Sacramento to contain the 1997 flood along the American River and its tributaries without encroaching into the design freeboard of the improved levees.
June 1996	American River Levee System: The 1986 flood triggered significant bank erosion at several sites along the lower American River, threatening to undermine the stability of adjacent levees. Additional erosion occurred along the south levee of the American River in the River Park area in February 1996 with relatively low flows in the river.	Federal/State Bank Protection Program	Bank protection system developed by SAFCA's Lower American River Task Force initiated. Significant stabilization work at the River Park site was completed three weeks before the 1997 flood, likely preventing a failure of the adjacent levee during the 1997 flood.
January 1997	Near record flood passes through Sacramento without significant stress, but several levees fail elsewhere in the Sacramento Valley		

Chronology of Accomplishments

Date	Problem	Improvement Project	Accomplishments
July 1998	Natomas/North Sacramento Levee System	North Area Local Project (NALP)	Improvements to the levees around Natomas and North Sacramento allow the federal government to remove about 25,000 parcels from the regulated 100-year floodplain, making flood insurance optional and less costly.
October 1999			Congress authorizes improvements to the levee system along the lower American and Sacramento rivers, modifications to Folsom Dam and improvements to the levees along Morrison Creek and its tributaries in South Sacramento.
June 2000		Property owners approve formation of American River/South Streams Group Capital Assessment District #3 to fund local share improvements to American River Levees, Folsom Dam and improvements to levees along Morrison Creek and its tributaries.	
February 2005	American River Levee System: Federal risk analysis indicates that through-levee seepage could impair the performance of the American River levees during large floods. This analysis was expanded to include underseepage following the 1997 flood. The federal government also concluded that the portions of the American River levee system needed to be raised to ensure safe containment of emergency flood releases from Folsom Dam up to 160,000 cfs.	American River Common Features Project	Levees along both banks of the American River strengthened through the insertion of cutoff walls and the completion of erosion control improvements. These improvements, combined with the continuing reoperation of Folsom Dam, allow the federal government to remove about 50,000 parcels from the regulated 100-year floodplain, making flood insurance optional and reducing insurance rates.
October 2006	Folsom Dam: The main spillway at Folsom Dam provides inadequate capacity to meet federal dam safety standards or to permit safe containment of a "200-year" flood	Folsom Dam Modifications Project	The federal agencies responsible for Folsom Dam reach agreement on a plan to construct a new auxiliary spillway that will enable the dam to meet dam safety standards and to safely contain a "200-year" flood
February 2007	<p>Sacramento River East Bank Levee: Federal risk analysis indicates that erosion and underseepage could impair the performance of the Sacramento River East Bank Levee during large floods.</p> <p>South Sacramento Streams/Levees: The channels along Morrison Creek and its tributaries have inadequate capacity to safely contain a 100-year flood in the Morrison Creek watershed and face additional stress from high water stages in the North Delta due to flooding along the Cosumnes and Mokelumne Rivers.</p>	<p>Sacramento River Bank Protection Project and American River Common Features Project</p> <p>South Sacramento Streams Group Project</p>	Erosion repairs and insertion of a deep cutoff wall through portions of the Sacramento River east bank levee and improvements to the North Beach Lake levee and the lower portion of Morrison Creek levee system allow the federal government to remove about 25,000 parcels in the Pocket and Meadowview areas from the regulated 100-year floodplain, making flood insurance optional and less costly.