

Arroyo Seco Flood Timeline

Year	Event
1861-62	Severe flood in Arroyo Seco; described in "The Cattle on a Thousand Hills."
1880s	First low dam at Devil's Gate for water diversion to Pasadena
1884	Destructive floods, the most serious recorded in LA County to date
1889	Severe flood in Arroyo Seco.
1911	Los Angeles Board of Park Commissioners proposes an extensive network of parkways and scenic boulevards. Centerpiece was a parkway through the Arroyo Seco to connect Los Angeles with the Angeles National Forest. (J. B. Lippincott was a member of the board). Landscape architect Laurie Davidson Cox drew up specific plans for the parkway. (Gum263-64)
1912	In April the Los Angeles City Council approves acquiring Arroyo Seco lands by means of an assessment district.
1913	A bond measure election to acquire Los Angeles Arroyo Seco lands for park purpose fails
1914	Flood in Arroyo Seco destroys 10 bridges and 30 homes; \$5-10 million in damage, 43 lives lost; 5,820 cfs
1914	Los Angeles constructs walls for 3200 feet on one side of the Arroyo and 1600 on the other in city right of way to protect the Arroyo slopes in the Avenue 35 area. County jail laborers did much of the work. Project cost: \$19,900
1915	Los Angeles County Flood Control District is created by an act of the state legislature
1915	County surveyor makes a survey of the Arroyo from the mountains to the LA city limits
1915	J. B. Lippincott, LA park commissioner and engineering consultant to the new flood control district, proposes a comprehensive flood and transportation package for the Arroyo Seco. His plan includes a revetted channel through the Arroyo with a boulevard on each side and the acquisition of adjoining land for parklands
1916	Major flood in Arroyo Seco; 3,150 cfs
1916	Pasadena gives the County a flood and water conservation easement to build a dam in the Arroyo Seco
1917	Devil's Gate Dam is the single issue in a County Flood Control Bond Issue that passes despite opposition from Municipal League.
1920	Devil's Gate Dam dedicated, the first dam built by the Los Angeles County Flood Control District; Project cost: \$483,000
1923	Effort to purchase LA Arroyo Seco lands for park purposes succeeds.
1924	The Major Traffic Plan of Olmstead, Bartholomew and Cheney is authorized, submitted and adopted; report enthusiastically advocates a five-lane highway on each bank of the Arroyo Seco Channel.
1924	LA city engineer made studies of alternative plans for single roadway on the north channel bank and for roadways on each bank. Adequate channel capacity and stability will be expensive.
1924	Proposal for dam at Sheep's Corral (southern end of Brookside Park) rejected by Pasadena City Board of Directors despite earnest appeal from James Reagan, head of LACFCD.
1930	Frederick Law Olmsted Jr. and Harland Bartholomew, develop a comprehensive plan for park development that includes an extensive series of parkways including an Arroyo Seco Parkway.
1930	A study of discharge into Devil's Gate Reservoir and the Arroyo Seco is completed under the direction of E. C. Eaton, chief engineer of the Los Angeles county Flood Control District.

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1931	LACFCD Comprehensive Plan for Flood Control & Conservation – General Features map, 3-25-1931, lists Arroyo Seco channel south of Devil's Gate Dam as one of "Channels Ultimately to Be Developed."
1931-34	Arroyo Seco in Northeast Los Angeles is used as a borrow pit for highway grading and job development program by a series of public agencies from August 1931 to July 1934.
1932	Montrose fire sends large amount of silt and sediment into Devil's Gate basin.
1934	Flood hits La Canada and La Crescenta with devastating impact killing 49 people, destroying 198 homes and causing \$6.1 million damage; 400 more homes uninhabitable. The flooding primarily goes down Verdugo Creek into the LA River, not into the Arroyo Seco.
1934	Los Angeles County Flood Control District is reorganized with a semi-independent commission; flood bond issue passes.
1934-35	Trapezoidal channel is constructed in the Central Arroyo from Devil's Gate Dam through the Rose Bowl area to Holly Street with a soft bottom as part of a CWA, SERA, WPA project.
1935	The Los Angeles County Flood Control District develops a comprehensive \$100 million flood control program consisting of channelization of the major streams and the construction of debris basins in the foothills. This plan includes channelizing the Arroyo stream from Devil's Gate Dam to the Los Angeles River.
1935	The Federal government begins funding flood control measures in Los Angeles County.
1935	The Works Progress Administration takes over the gravel operation in LA, designating it as a flood control project sponsored by the city of Los Angeles. Trapezoidal cross-section construction chosen since it minimized steel and lumber and maximized hand labor, satisfying requirements of relief funding. Wide parts (80") of the channel had an unpaved floor. South Pasadena also had an unpaved bottom for 2000 feet to accommodate water conservation.
1935	Some federal money made available through the Emergency Relief Appropriation Action of 1935 for flood projects on some tributaries of the LA River
1935	In March 1935 bill authorizing the War Department to make preliminary examination of LA and SG rivers signed by President Roosevelt.
1935-40	The Works Progress Administration undertakes channelization of the Arroyo Seco in Los Angeles as part of construction of Arroyo Seco Parkway. Final stretch between Avenue 22 and Avenue 40 is completed in late 1940. Total cost of the Federal Relief Labor project was about \$7,000,000, procured by Los Angeles City Engineer Lloyd Aldrich.[i]
1936	Flood Control Act of June 2, 1936, provides for extensive flood control improvements were authorized in the basins of the LA and San Gabriel Rivers.
1938	Massive flood in March in Los Angeles County including the Arroyo Seco; Arroyo flow highest ever at 8,620 cfs
1938	Angeles Highway Damage Heavy; stretch from Redo Box to Short Canyon, a stretch of four or five miles has at least 35 or 30 major gaps in the new highway; "Water Department's Storm Damage Heavy – Equipment in Arroyo, Millard Canyon Hit;" 600 feet of 30-inch concrete pipe in the AS canyon had been washed out; The water department's intake in Millard Canyon also one of its diversion dams, were washed out in the storm, Mr. Jones said. "Photograph Shows Narrowness of Rose Bowl's Escape" also photo of spillway at DG Dam; "City's Loss is Set at \$750,000" exclusive of loss to Municipal Gold Course was placed at \$75,000 by Harvey W. Hincks, city engineer-street superintendent.
1938	County Asked to Rebuild Channel . . . City Manager C. W. Koiner sends Letter to Chairman Jessup on the flood control need in the Arroyo: " I feel that special emphasis should be made regarding the carrying capacity of the new channel, and also that it should be gunited bottom and sides, the point being to construct the channel so that the water can be carried away promptly." "Experience has shown that not enough attention has been given to the

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	construction of flood control channels in that they have not been of sufficient capacity to carry the water away quickly. /This is no criticism because out of our experience we learn to make improvements of this kind. /Your personal attention to this matter will be greatly appreciated by our city for the reason that our golf course has been one-third destroyed. We are going to rebuild same and will abide the time that the channel can be rebuilt which we trust can be hurried along as one of the projects that you may be able to secure WPA assistance on."
1938	Rubio and Las Flores channel requested to Eaton Canyon
1938	"Mr. Koiner revealed today that he advocated to the Flood Control District, the construction of a dam across the mouth of the Arroyo Seco, as a possible WPA project."
1938	Description of damage in Altadena and Eaton Canyon system; Morris Jones says damage in county area alone was \$2,5000,000. For the entire county, including cities and state highways, the damage would run an aggregate of \$6,000,000.
1938	William V. Mendenhall, supervisor of the Angeles National Forest, said this morning he believes the Angeles forest had been put back in the "pack train days," due to the general flood damage to the entire area." Crews in San Antonio and Big Tujunga areas are dispatched to rescue residents.
1938	"Parkway Project Launching Near": "Cursory examination of the Arroyo Seco channel at the Arroyo Boulevard and Grevalia Street intersection today revealed that no damage was done to the channelization work recently completed by the WPA. The concrete piers erected in anticipation of the bridge that will span the Arroyo as part of the Parkway project have withstood the rush of waters of the past week and, so far as Parkway Association officials and the probable contractor can determine, there is nothing to detain actual start of the work."
1938	"It's fortunate for the Parkway that the WPA project of channelization was completed prior to the flood," declared Mr. Hinshaw today. "The rip-rap and concrete work withstood the unusual strain. If the work of channelization could be continued up the Arroyo to prevent the rolling down of great boulders during floods, the flood problem of the Arroyo would be virtually solved." (Carl Hinshaw, executive chairman of the Pasadena Parkway Association.)
1938	3/05/38 - "Repair cost Placed at \$715,000 – Storm Drain Loss in City if \$500,00 Highway Work is Set at \$1500,000; The storm loss for all roads in the entire county was \$9.972.083; Supervisor confirmed reports that the county is releasing as much water as possible form the flood control dams to provide reservoir space for water in the event of a future rain. Reports that 11 dams were in danger of breaking were denied. Detailed cost figures for each city; All roads into Arroyo are closed; "Damage is Slight on Watershed" Experts Make Survey of Mountain Area" "I still believe in vegetation as the answer to the watershed problem," Charles J. Kraebel, senior silviculturalist for the CA Forest and Range Experiment Station, declared.
1938	3/05/38 - Survey Indicates Flood Death Toll of 159 with Damage of 60 Millions"
1938	Santa Ana River was the worst performer during the So Cal deluge of March 3.
1938	3/07/38 - Death Toll Now Put at 177; typhoid inoculations from upper segment of the Santa Ana River to Fullerton. \$65 million damage estimate. \$11 million Hansen Dam facility seen as solution to alleviating flood threat to the area below San Fernando Road that was so hard hit in the recent storm." The wife of the governor of Alaska is trapped on a ledge in San Gabriel Canyon during the flood
1938	3/9/38 - Damage in Canyon Found Serious – Detailed description of damage in San Gabriel Mountains.
1938	3/10/38 - "Forest Loss in Floods \$813,000" control projects hit. San Antonio spreading grounds, "Scattered Canyon Cabin Damage Disclosed" details loss of many leased structures which were washed away in the storm.
1938	\$623,372 allocated for construction of the flood channel in the Rose Bowl areas.
1938	Rush to complete the channel from Howard Street lining the channel to Seco Street

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1938	In Pasadena 2.5 miles channel is built from 1938 to 1940 as a WPA project, sponsored by the city of Pasadena, the state of California and the Flood Control District at a cost of \$1,142,500.
1938	Sediment level reaches 2.69 million cubic yards.
1940	Arroyo Seco Parkway officially opens
1941	USFS \$1,170,000 fire, flood protection program for Arroyo Seco receives approval on January 22. Brown Canyon Barrier is to be the first major construction project in this program.
1942	Brown Mountain Barrier Dam built by US Forest Service in upper watershed, 3.5 miles north of the mouth of the Arroyo.
1943	Brown Canyon Barrier viewed as a test for other debris facilities and barriers; two more high barriers planned farther down the canyon. Evacuations of canyon residents postponed.
1943	Major flood in Arroyo Seco; 5,660 cfs
1943	Pasadena Engineering Department is conducting survey of the topography of the lower Arroyo Seco looking to the future installation of a channel. Unimproved section 1.8 miles.
1943	Flood causes damage to Arroyo Seco flood channel; cities ask Flood Control District for help and appeal to state for emergency fund support.
1943	City Engineer John H. Allin believes that Parkway stands in danger of being destroyed by flood. "The fact that we have a storm channel from Devil's Gate Dam down to a point south of Brookside Park intensifies the rush of the water. It is just like turning a fire hose into a loose bank of dirt," Mr. Allin say.
1943	Pasadena Engineering Department has obtained data and plans from CFCD and will make a survey of the Arroyo from the lower end of the present channel at West Holly Street to the south city boundary.
1943	County turns down Pasadena pleas for improvement of the AS channel, south of Devil's Gate Dam. Pasadena estimates that \$310,000 would be necessary to repair the existing AS channel in Pasadena, South Pasadena and Los Angeles.
1943	M. E. Salisbury, chief engineer of County Flood District, reports to Pasadena: "We wish to report that the District has never been in a position to allocate funds for the construction or maintenance of these sections of the Arroyo Seco and that there are no District funds now available for the requested work. Should the necessary funds be made available from some outside source this office is willing to proceed with the work."
1943	Pasadena Needs \$75,000 for repair of Storm Channel; asks state to pay half
1943	Plans for post-war LA County flood control program of \$138,500,000; already \$86,000,000 spent in LAC on flood control since 1916.
1943	Pasadena asks state \$37,500 for AS channel flood repairs for damage from heavy storms last winter; two years ago the AS Channel was first damaged state and city matched funds for a partial repair of the storm water right-of-way. estimated damage from last winter's storm \$90,000
1943	Problem of silt build-up behind dams especially Devil's Gate Dam is discussed in Star News editorial. "Even the layman recognizes that accumulated silt behind Southern California dams represents one of the greatest of flood threats. Decreasing ability of these barriers to impound storm waters is revealed in almost every protracted downpour."
1943	Sixty foot tunnel or sluiceway bored through Devil's Gate Dam to de-silt thousands of cubic yards of earth and debris from the reservoir
1943	Arroyo Channel Annexation by County Flood discussed. \$250,000 needed to fix damage from recent flood and \$1,000,000 for extension. "Serious damage to the Arroyo Seco Parkway foreseen unless the channel is placed in shape. South Pasadena and LA have surrendered their jurisdiction.

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1943	Pasadena asks County to Take Over Flood Control Channel and construction of extension Arroyo Seco Parkway channel in South Pasadena.
1943	Danger to Parkway from delay in repairing the flood channel decried by Automobile Club of Southern California.
1943	Brown Canyon Barrier near completion with gunnitting of abutments of the project. Spill apron 17 feet out from barrier completed.
1943	Sups ask Governor Warren to specify Arroyo Seco annexation to Flood Control District as one of principal reasons for calling a special session of the state legislature in January. "The cities of SP and LA are expediting their repairs along the Arroyo Seco channel, fearful that the Pasadena Parkway and channel improvements may be damaged severely if heavy boulders are carried down from Pasadena by rampaging flood waters.
1943	County Flood engineers are busy making an engineering study of the existing channel to determine repairs necessary.
1943	Arroyo residents have to leave the canyon by order of the USFS as flood control and conservation measure; two more barrier dams are planned for the Arroyo Seco, but all construction will be deferred until after the war.
1943	Sediment level reaches 3.38 million cubic yards.
1944	Pasadena is spreading water in Arroyo for percolation
1944	Pasadena City Manager C. W. Koiner voices strong objection to County changing name of Devil's Gate Dam to James W. Reagan Dam.
1944	Name of Devil's Gate restored to the Dam by County Supervisors at insistence of Pasadena and the Reagan family.
1944	Tunnel boring work at DG Dam is halted until the reservoir is emptied and channel improvements south of the dam are completed.
1944	Arroyo Seco will be annexed by County Flood next Monday. Will not include the improved section from Holly Street to San Pasqual Avenue in LA.
1944	Incision 50 feet into the downstream face of the dG Dam completed as first phase of \$15,000 sluiceway.
1944	Sluiceway completed; 58 by 6 feet; will be opened to pass 1,600,000 cubic yards of silt and debris to restore reservoir capacity back to 5000 acre feet (now 4,000; designed at 5500 acre-feet)
1944	USFS is implementing \$8,000,000 upper watershed flood control program including the Arroyo Seco; "Forerunner of the Los Angeles River Basin project is the million dollar upstream flood proofing of the Arroyo Seco which was started in the autumn of 1940.
1944	\$75,000 repair work on AS channel in South Pasadena.
1944	Pasadena City Board decries flooding in basements in southern part of city and need for storm drain improvements; urges storm drain plan for post-war period.
1944	Review of Brown Canyon Dam; already proves work; debris backed up for quarter mile up to 40 foot level; stream bed no longer clogged with debris.
1944	Congress approves a billion dollar flood control bill, which provides for \$8,380,000 upstream Los Angeles River basin projects.
1944-45	Repairs to South Pasadena stretch of the channel; cost \$3448.20; Ralph A Bell Construction; work Started 10/17/44, completed 2/13/45. This is to repair a portion of the concrete lined channel near Bridewell street in South Pasadena ;
1945	Workers camp set up in Oak Grove Park for \$8,000,000 flood control project on LA River drainage.
1945	Co Flood Control Director H. E. Hedger to ask for \$1,000,000 tow ork on the Arroyo Seco Channel from Holly Street to San Pasqual Avenue in Pasadena and South Pasadena.

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1945	Corps unveils a \$270,000,000 flood control program in the LA area for immediately after the war
1945	State provides \$22,500,000 to LA County for flood control work; the first work will be in the Arroyo Seco Canyon in the construction of stream barriers, retaining walls and fire control measures.
1946	Brown Canyon Barrier Dam is viewed as a successful experiment controlling silt and sediment, "the first of a series of engineering structures with which the US Forest Service expects to control the LA River Drainage areas back of Pasadena, is proving highly successful; now one-third filled with 320,000 cubic yards of debris; expected to back up in time to three-quarters of a mile behind the dam."
1946	Reconstruction of streambed flood of the Arroyo Seco conduit channel southerly from Seco Street to Holly Street is expected to be authorized by the Board of Supervisors. "Since the heavy floods of 1938, the channel flooring has deteriorated and developed a number of pot holes" "This project is proposed to repair and protect the present channel walls and adjacent improvements which were constructed several years ago under jurisdiction of the City of Pasadena," Mr. Hedges said today. The original flooding was constructed with WPA labor and assistance.
1946	County flood budget puts aside \$387,500 to restore the Arroyo Seco channel floor from the Rose Bowl to the Colorado Street Bridge; and "improvements with permanent reinforced material from Colorado to San Pasqual Street. In addition to flood control, purpose is to halt the damaging shift of boulders downstream from the unimproved section to improved channels along the Parkway.; An additional \$249,000 is dedicated to Gould Canyon debris basin in La Canada.
1946	Repairs to invert slab of Arroyo Channel south of Rose Bowl from Seco Street to Holly Street; Obert Brothers; cost: \$110,000; work started 6/1946, completed 11/8/46.
1946	Pasadena sells Busch Garden property to residential developer
1947	Colorado Street to La Loma Street channelized; \$420,000; A. Teichert & Son, Inc. is the contractor. Work started 4-15-47 and completed 12-9-47.
1947	Gould Canyon debris basin dedication tomorrow; cost \$298,024.25.
1948	La Loma Street to San Pasqual Street channelized, completing the stretch from Colorado Street Bridge to the LA River; including the Annandale drain from Johnson Lake to the Arroyo; cost: \$460,000. Final report on the Construction of the Reinforced Concrete Channel in the Arroyo Seco from La Loma to San Pasqual: "With the completion of this work, the improved conduit was made continuous from Colorado Street in Pasadena to the Los Angeles River, a distance of 6.6 miles. This unit 5300 feet in length. 40 feet wide with walls varying in height from 10 to 11 feet. Side channel -- the Annandale Drain is part of the project -- 225 in length, it is 12 feet wide with vertical walls 7 feet high.
1964	Pasadena asks County to channelize the stretch from Holly Street to Colorado Street Bridge; included in list of projects in 1964 County-wide storm drain bond issue
1969	Fifty year storm on January 25, 1969; flow reaches 8540 cfs, second highest on record
1971	Sylmar Earthquake
1971	March – Pasadena City Council withholds easements for construction and maintenance of channel; urges DPW to consider the feasibility of covered channel rather than open one
1971	August – County Flood Control District concurs, but Pasadena must pay for extra cost
1971	Sediment level in the basin reaches 4.31 million cubic feet, the historic high.
1974	Pasadena City Council rejects open channel with bypass for the "unimproved" stretch between Holly Street and the Colorado Street Bridge

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1974	Devil's Gate Dam declared unsafe due after seismic review (Hawke) following the Sylmar earthquake; gates are opened
1978	Peak flow 5,360 cfs
1983	Very strong El Nino conditions; peak flow of 2,640 cfs
1983	A panel of the flood control channel in the Rose Bow area pops out of place and is repaired
1993	Browning Ferris begins the Lower Arroyo Stream Restoration Project which established low flow streams on each side of the flood channel for .8 miles in Pasadena's Lower Arroyo.
1995	Sediment level in the basin reaches 2.68 million cubic feet.
1997	Devil's Gate Dam is rehabilitated by County of Los Angeles in a \$10 million project that expands the spillway, and grouts and buttresses the dam to current standards
1998	Very strong El Nino conditions; peak flow of 4,380 cubic feet per second on February 23, 1998; annual discharge just over 20,000 acre-feet
2005	Storm runoff passes through the openings at the bottom (1040.5 el) of the new spillway for the first time 2005 on Jan. 09, 2005 3,540 cfs
2009	Station Fire, largest in LA County history, starts in upper Arroyo Seco and burns 67% of the upper watershed
2010	Release through spillway windows on February 6; flow of 4,620 cfs
2010	In November County Flood Control announces that it will begin a program to remove 1.67 million cubic yards on an emergency basis
2010	Flood flow; 2,260 cfs
2011	County Flood is informed by Regional Water Quality Control Board that its permit for an emergency sediment removal program at Devil's Gate is rejected.
2011	April County Supervisors vote to instruct Flood Control District to complete a full environmental impact report on its proposed removal program at Devil's Gate.
2011	Sediment level in the basin reaches 3.89 million cubic yards.
2013	After four decades, Brown Canyon Barrier Dam is removed from the National Inventory of Dams; USFS fails to report it to the USACE; states that it is just a debris barrier.
2013	CA Division of Dam Safety removes Brown Canyon Barrier Dam from the state inventory of dams reportedly at the request of Homeland Security.
2014	County Supervisors approve Flood Control District's program to remove 2.4 million cubic yards of sediment from Devil's Gate Dam basin and permanently destroy more than 50 acres of riparian habitat in the streamzone by a 4-1 vote despite strong opposition.
2014	Arroyo Seco Foundation and Pasadena Audubon file lawsuit challenging the Flood Control District's Big Dig program for the Hahamongna Basin.

This timeline was compiled by Tim Brick, Managing Director of the Arroyo Seco Foundation. Most recently updated February 6, 2017.