

2.0 Existing Projects

Within the Central Valley watershed, numerous reservoirs, channels, levees, bypasses, and related facilities reduce the threat of major flooding along the Sacramento and San Joaquin rivers and tributaries and distributaries. As early as the 1850s, the first levees were constructed by local landowners in the Central Valley. Some of these early levees eventually became part of a State-federal flood protection system that began when Congress authorized the Sacramento River Flood Control Project (SRFCP) in the Flood Control Act of 1917.

This section presents the State and federal authorizations for the State-federal flood protection projects included in the SPFC. Also mentioned are ongoing State-federal projects that are likely to become part of the SPFC upon completion and other portions of the flood management system (Sections 2.3, 2.4, and 2.5) that are important for overall flood management, but not part of the SPFC. In general, successful operation of these non-SPFC facilities is essential for successful operation of the SPFC.

This section is not a description of the history of the SPFC, but instead it describes the legal basis for the flood protection projects. Information pertaining to history of the SPFC is included in the Technical Memorandum, Draft Historical Reference Document for the State Plan of Flood Control (DWR, 2009a). At the time of this report, development of a more detailed SPFC History Report is underway.

2.1 Summary

The SPFC includes many different projects authorized in federal and State legislation. Table 2-1 summarizes these projects, organized under the Sacramento River and San Joaquin River basins. The table includes the federal acts, public law numbers, and Chief of Engineers Reports (generally printed as U.S. House documents (HD) or U.S. Senate documents (SD)) and CWC sections pertaining to each SPFC project. Figure 2-1 shows general project locations. The projects listed in Table 2-1 are completed projects that include facilities of the SPFC (Sections 2.2 and 3.0).

Table 2-1. Summary of Existing State Plan of Flood Control Projects

Project	Federal Act	Public Law	Chief of Engineers Report	State Authorization
SACRAMENTO RIVER BASIN				
Sacramento River Flood Control Project				
	FCA 1917	64-367	HD 62-81 RHCD 63-5	CWC Section 8350 and CWC Section 12648
	FCA 1928	70-391	SD 69-23	
	RHA 1937	75-392	SCCD 75th Congress	
	FCA 1941	77-205	HD 77-205	
Sacramento River and Major and Minor Tributaries Project				
	FCA 1944	78-534	HD 78-649	CWC Section 12648
	FCA 1950	81-516		
American River Flood Control Project				
	FCA 1954	83-780	HD 81-367	CWC Section 12648.1
Sacramento River – Chico Landing to Red Bluff				
	FCA 1950	81-516	HD 84-272	CWC Section 12648.2
	FCA 1958	85-500		
Adin Project				
	FCA 1937	75-352	CAP	CWC Section 12656.7 (channel clearing)
	FCA 1954	83-780		
Middle Creek Project				
	FCA 1954	83-780	HD 81-367	CWC Section 12656.5
McClure Creek Project				
	FCA 1937	75-352	CAP	CWC Section 12656.7 (channel clearing)
	FCA 1954	83-780		
Salt Creek Project				
	FCA 1937	75-352	CAP	CWC Section 12656.7 (channel clearing)
	FCA 1954	83-780		
Lake Oroville Project				
	FCA 1958	85-500	Not applicable	CWC Section 12648 and CWC Section 12649 (not specific to Lake Oroville)
Sacramento River Bank Protection Project				
	FCA 1960	86-645	SD 86-103	CWC Section 12649.1
North Fork Feather River Project				
	FCA 1968	90-483	HD 90-314	CWC Section 12648.7

Table 2-1. Summary of Existing State Plan of Flood Control Projects (contd.)

Project	Federal Act	Public Law	Chief of Engineers Report	State Authorization
SAN JOAQUIN RIVER BASIN				
Lower San Joaquin River and Tributaries Project				
	FCA 1944	78-534	FCCD 78-2	CWC Section 12651
	FCA 1950	84-327		
Buchanan Reservoir and Channel Improvement on Chowchilla River				
	FCA 1962	87-874	SD 87-98	CWC Section 12648.4
Hidden Dam and Hensley Lake Project				
	FCA 1962	87-874	SD 87-37	CWC Section 12648.3
Merced County Streams Project				
	FCA 1944	78-534	HD 78-473	CWC Section 12650
	FCA 1970	91-611		
Bear Creek Project				
	FCA 1944	78-534	HD 78-545	CWC Section 12652
Littlejohns Creek and Calaveras River Stream Group Project				
	FCA 1944	78-534	HD 78-545	CWC Sections 12652 and 12653
Farmington Reservoir Project				
	FCA 1944	78-534	HD 78-545	CWC Section 12653 (channel work only)
Mormon Slough Project				
	FCA 1962	87-874	HD 87-576	CWC Section 12648.6

Note:

Other federal authorizations for flood management projects may be included in future updates to this SPFC Descriptive Document if the projects are added to the SPFC. Similarly, some of these projects may be removed from the SPFC if they are deauthorized.

Key:

CAP = Continuing Authorities Projects

CWC = California Water Code

FCA = Flood Control Act

FCCD = Flood Control Committee Document

HD = U.S. House Document

RHA = Rivers and Harbors Act

RHCD = Rivers and Harbors Committee Document

SCCD = Senate Commerce Committee Document

SD = U.S. Senate Document

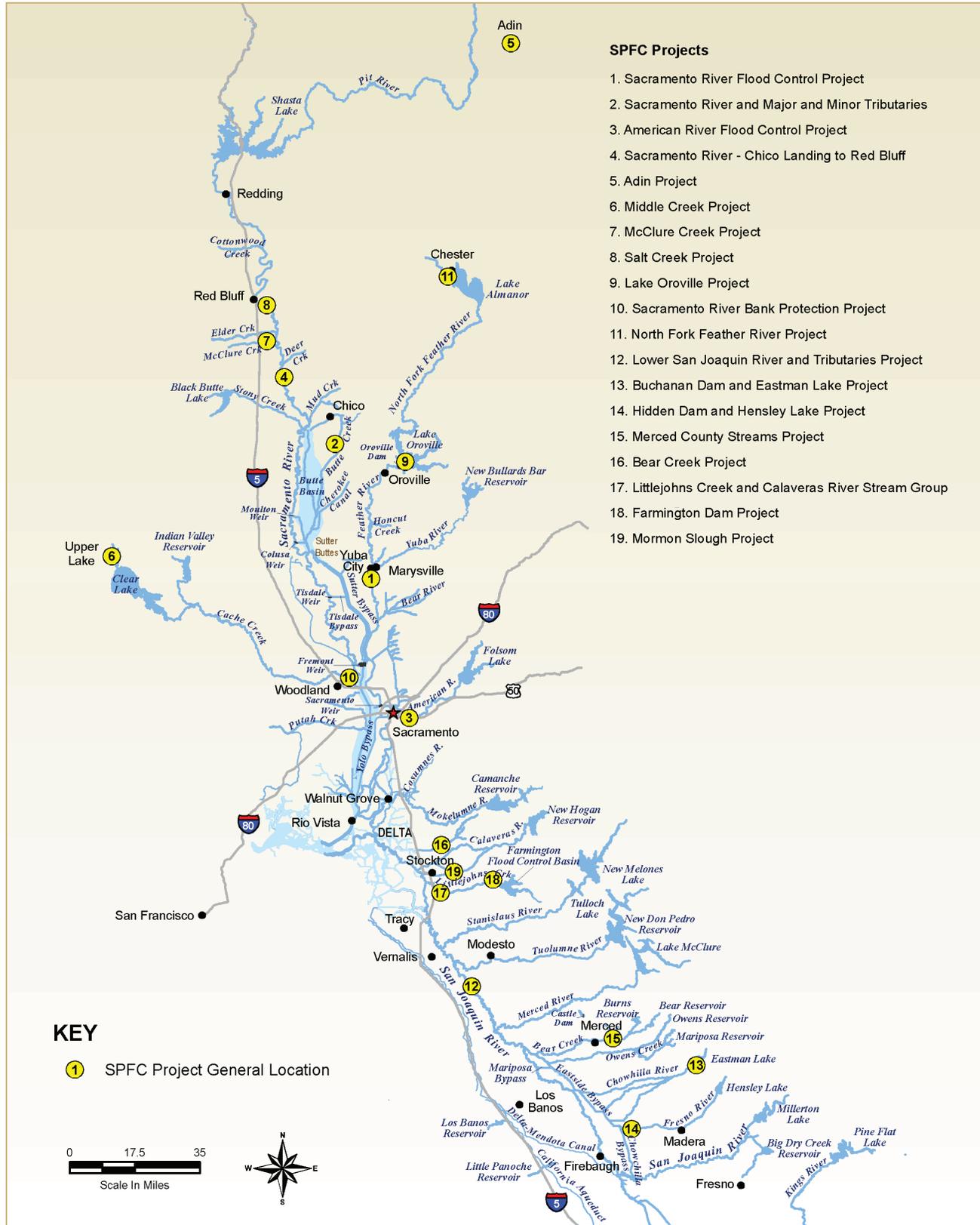


Figure 2-1. Approximate Locations of Federal/State Flood Damage Reduction Projects Within the Sacramento and San Joaquin River Basins that are included in the State Plan of Flood Control

2.2 Federal and State Authorizations for Completed State-Federal Flood Protection Projects

This section shows the federal and State authorizations for each completed State-federal flood protection project currently included in the SPFC. The projects are organized as Sacramento River Basin projects and San Joaquin River Basin projects. While each authorization covers one major project, such as the SRFCP, projects were generally implemented over time through construction of various segments of the projects. Some levees are physically disconnected from the larger system and were constructed to provide local benefits while others were constructed to provide system benefits.

While the purpose of this section is to show the federal and State authorizations, statements on each project's features are included. The statements were extracted from the Congressional authorizations and their supporting U.S. Army Corps of Engineers (USACE) Chief of Engineers Reports (included on the reference DVD).

Major SPFC project works (facilities) associated with the following State-federal authorized projects are detailed in Section 3.0.

2.2.1 Sacramento River Basin Projects

The majority of the State-federal flood protection projects that are included in the SPFC are located in the Sacramento River Basin. Federal authorizations for projects described below began in 1917 while State authorization began in 1953.

Sacramento River Flood Control Project

The SRFCP is the core of the flood protection system along the Sacramento River and tributaries. The SRFCP includes most of the levees, weirs, control structures, bypass channels, and river channels that comprise the SPFC. About 980 miles of levees were involved in the project. Portions of these levees were originally constructed by local interests, and were either included directly in the project without modification or modified to meet USACE project standards. The project was originally authorized by the Flood Control Act of 1917 and subsequently modified and extended by the Flood Control Acts of 1928, 1937, and 1941. The State of California (State) adopted and authorized the SRFCP in 1953 by add-

ing Section 12648 to the CWC. Assurances of cooperation were provided in the 1953 Memorandum of Understanding (MOU) (USACE and The Reclamation Board, 1953).

- **Flood Control Act of 1917** – Public Law 64-367 (64th Congress) is the Flood Control Act of 1917. The authorized project was in accordance with plans contained in the California Debris Commission (predecessor of the Board) report submitted on August 10, 1910, and printed as HD 81 (62nd Congress), as modified by the California Debris Commission report submitted on February 8, 1913, and printed in Rivers and Harbors Committee Document No. 5 (63rd Congress). The 1913 document provides for the rectification and enlargement of river channels and the construction of weirs.
- **Flood Control Act of 1928** – Public Law 70-391 (70th Congress) is the Flood Control Act of 1928. The 1928 act modified the Flood Control Act of 1917 in accordance with the California Debris Commission report submitted on May 1, 1924, and printed in SD 23 (69th Congress). Significant changes made by the act include the following:
 - Elimination of reclamation works in Butte Basin
 - Construction of a weir above Colusa
 - Elimination of two of the four proposed cutoffs in the stretch of river between Colusa and the mouth of the Feather River
 - Use of the existing Tisdale Weir instead of construction of a new weir
 - Relocation of certain levee lines on the Feather River and Yolo Bypass
 - Settling basin at the mouth of Cache Creek
 - Three sloughs in the Sacramento-San Joaquin Delta (Delta) to be left open instead of closed
 - Increase in levee cross-section dimensions
 - Conclusion that San Joaquin Valley flood problems are different from those of the Sacramento Valley, and that flood control in the San Joaquin Valley should be considered in a separate report, if deemed advisable
 - Federal government to carry some maintenance responsibility (enlarged channels, of weirs, and of certain gages)
 - Increase in the project cost

- Change of the cost share between the federal government and nonfederal interests
- Set design capacities
- **Rivers and Harbors Act of 1937** – Public Law 75-392 (75th Congress) is the Rivers and Harbors Act of 1937. The prior 1917 and 1928 Flood Control Acts were modified in accordance with a Senate Commerce Committee Document (75th Congress). The document concluded that maintenance by the federal government was not consistent with policies of the Flood Control Act of 1936 (Public Law 74-738, 74th Congress). Additional work was required on revetment for eroding levees, and the project cost was adjusted. Requirements were added for local interests to provide rights-of-way and hold the federal government harmless from damage claims.
- **Flood Control Act of 1941** – Public Law 77-228 (77th Congress) is the Flood Control Act of 1941. The 1941 act modified previous acts in accordance with HD 205 (77th Congress). The act authorized federal expenditures for completion of the project, and required the following local cooperation:
 - Furnish all rights-of-way, including railway, highway, and all other utility modifications
 - Hold and save the United States free from damage claims
 - Maintain and operate all works after completion in accordance with regulations prescribed by the Secretary of the Army

Construction of the SRFCP began in 1918 and continued for decades. By 1944, the project was regarded as being about 90 percent complete. The plan for completing the project was presented in the November 30, 1953, *MOU Respecting the Sacramento River Flood Control Project* between USACE and The Reclamation Board (see reference DVD) (USACE and The Reclamation Board, 1953). This MOU included levee construction standards for river project levees and bypass levees, and outlined maintenance responsibilities. The plan specified no difference in levee standards for urban versus agricultural levees. By 1961, the project was essentially completed (Kelley, 1989).

Some documents refer to the project from these authorizations as the “Old” SRFCP.

Sacramento River and Major and Minor Tributaries Project

The Sacramento River and Major and Minor Tributaries Project was initially authorized by the federal government in the Flood Control Act of 1944 (Public Law 78-534, 78th Congress), and was further amended by the Flood Control Act of 1950 (Public Law 81-516, 81st Congress). The project was a modification and extension of the SRFCP, and was to supplement reservoir storage by reducing flooding potential to certain areas along the Sacramento River. Authorizing legislation by the State of California is contained in Section 12648 of the CWC. Assurances of cooperation were provided in the 1953 MOU.

The project provided for levee construction and/or channel enlargement of the following minor tributaries of the Sacramento River: Chico, Mud and Sandy Gulch, Butte and Little Chico creeks; Cherokee Canal; and Elder and Deer creeks (Tehama County). In addition, the project also included revetment of levees for the Sutter, Tisdale, Sacramento, and Yolo bypasses. Minor tributary improvements were to reduce flood risk to about 80,000 acres of agricultural land important to the economy of the region and to the City of Chico and other smaller communities. Bypass levee revetment features of the project were to reduce flood risk to floodplain lands adjacent to the bypasses, and ideally would decrease requirements for levee repairs under emergency conditions (USACE, 1999).

American River Flood Control Project

The American River Flood Control Project was authorized by the federal government in the Flood Control Act of 1954 to reduce flood risk along the lower American River. Authorizing legislation by the State of California is contained in Section 12648.1 of the CWC. The project was constructed in 1958 by USACE, and includes approximately 8 miles of levee along the north bank of the American River between Carmichael Bluffs and the terminus of the SRFCP levee near the State Fairgrounds. It also includes about 10 miles of levee along the south bank of the American River from the confluence with the Sacramento River to Mayhew drain.

Sacramento River – Chico Landing to Red Bluff

The Sacramento River project for bank protection and channel improvements from Chico Landing to Red Bluff was authorized by the Flood Control Act of 1958 (Public Law 85-500, 85th Congress). Authorizing legislation by the State of California is contained in Section 12648.2 of the CWC. The project was authorized in accordance with recommendations by the USACE Chief of Engineers in HD 272 (84th Congress). The project was a modification and extension of the SRFCP, and was to increase bank protection along the Sacramento River from Chico Landing to Red Bluff and lower portions of its principal tributaries to reduce flood risk with discharges modified by Shasta Dam and Black Butte Dam. Black Butte Dam was planned to be constructed soon after this project was completed. The area encompassed by this project included the Sacramento River from Chico Landing to Red Bluff, and lower portions of Antelope, Mill, Deer, Pine, Elder, Thomes, and Stony creeks (USACE, 1999).

Lake Oroville Project

Federal participation in the construction of Oroville Dam was authorized by the Flood Control Act of 1958 (Section 204 of Public Law 85-500, 85th Congress). The federal interest was flood control provided by the flood control storage reservation of 750,000 acre-feet. This authorization also included the non-SPFC New Bullards Bar and the Marysville Dam (not constructed at the time of this report). Authorizing legislation by the State of California is contained in Sections 12648 and 12649 of the CWC, though these sections refer only to a project that would accomplish the same flood control purposes as proposed by the Table Mountain Dam.

Sacramento River Bank Protection Project

Erosion presents a serious ongoing threat to the SRFCP levee system. The Sacramento River Bank Protection Project (SRBPP) was authorized by Section 203 of the Flood Control Act of 1960 (Public Law 86-645, 74 Statute 498), supplemented by Section 202 of the River Basin Monetary Authorization Act of 1974 (Public Law 93-252, 88 Statute 49), as amended by Section 3031 of the Water Resources Development Act (WRDA) of 2007, and further supplemented by Section 140 of Public Law 97-377 (96 Statute 1916), to preserve the integrity of the

SRFCP levee system. Section 12649.1 of the CWC provides the State authorization for the project.

The First and Second Phases authorized construction of 915,000 linear feet of bank protection work. Construction of the First Phase began in June 1965. The Second Phase of construction was authorized in 1974 and USACE began investigation of the Third Phase in the mid-1990s.

Sacramento River Bank Protection Project, First Phase Mitigation

Environmental mitigation for the impacts of the First Phase of the SRBPP was authorized by Congress in 1986, and approved a post-project mitigation program involving the purchase, protection, and revegetation of 260 acres.

North Fork Feather River Project

The North Fork Feather River Project at Chester was authorized by Section 203 of the Flood Control Act of 1968 (Public Law 90-483, 90th Congress). Section 12648.7 of the CWC provides the State authorization for the project. The authorized local project was in accordance with recommendations by the USACE Chief of Engineers in HD 314 (90th Congress). This project, consisting of a diversion dam, channel, and levees, was intended to reduce local flood risk.

Middle Creek Project

The Middle Creek Project, upstream from Clear Lake, was authorized by the Flood Control Act of 1954, Section 203. The authorized project was in accordance with recommendations by the USACE Chief of Engineers in HD 367 (81st Congress). Authorizing legislation by the State of California is contained in Section 12656.5 of the CWC and was enacted under the California Statutes of 1955.

Snagging and Clearing Projects

The Continuing Authorities Program allows USACE to respond to a variety of flood problems without obtaining specific congressional authorization for each project. Section 208 of the 1954 Flood Control Act, as amended, allows work to remove accumulated snags and other debris, and to clear and straighten stream channels. Section 12656.7 of the CWC provides the State authorization for these types of projects. Three snag removal and stream clearing

projects in the Sacramento River Basin include the following:

- **Adin Project** – A flood control project was authorized by the federal government for Ash and Dry creeks at Adin in Modoc County in the Flood Control Act of 1937, and modified by the Flood Control Act of 1954. Ash and Dry creeks are tributary streams to the Pit River above Shasta Dam. This project was intended to reduce local flood risk.
- **Salt Creek Project** – The Salt Creek Project was authorized by Section 2 of the Flood Control Act of 1937, as amended by Section 208 of the Flood Control Act of 1954. This project was intended to reduce local flood risk.
- **McClure Creek Project** – The McClure Creek Project was authorized by Section 2 of the Flood Control Act of 1937, as amended by Section 208 of the Flood Control Act of 1954. This project was intended to reduce local flood risk.

2.2.2 San Joaquin River Basin Projects

Components of the SPFC located in the San Joaquin River Basin are the Lower San Joaquin River and Tributaries Project, Littlejohns Creek and Calaveras River Stream Group Project, including the New Hogan and Farmington projects, and the Merced County Streams Project. Federal authorizations began in 1944 while State authorization began in 1955.



The Lower San Joaquin River and Tributaries Project was authorized by the Flood Control Act of 1944, including levee and channel improvements along the San Joaquin River

Lower San Joaquin River and Tributaries Project

Improvement of lower reaches of the San Joaquin River and tributaries was authorized by the federal government in the Flood Control Act of 1944 (Public Law 78-534). Section 12651 of the CWC provides the State authorization for the project. The project provided for improvement by the federal government of the existing channel and levee system on the San Joaquin River from the Delta upstream to the mouth of the Merced River, and the on lower reaches of the Stanislaus and Tuolumne rivers, by raising and strengthening existing levees, constructing new levees, constructing revetments on riverbanks where required, and removing accumulated snags in the main river channel. The project was also intended to reduce flood risk for areas above the mouth of the Merced River through State construction of levee and channel improvements, authorized by the federal government in the Emergency Flood Control Funds Act of 1955. The project includes a State-designed and -constructed bypass system in the upper reaches of the project area. Project construction was completed by November 1968, except the left bank San Joaquin River levee between the confluence with the Merced River and the confluence with the Tuolumne River (completed in 1972).

Buchanan Dam and Eastman Lake Project

The Buchanan Dam and Eastman Lake Project, was authorized by the Flood Control Act of 1962 (Public Law 87-874, 87th Congress) in accordance with recommendations by the USACE Chief of Engineers in SD 98. Section 12648.4 of the CWC provides the State authorization for the project. The dam and reservoir are not part of the SPFC, but the channel improvements downstream from Buchanan Dam on the Chowchilla River and tributaries are included in the SPFC.

Hidden Dam and Hensley Lake Project

The Hidden Dam and Hensley Lake Project was authorized by the Flood Control Act of 1962 (Public Law 87-874, 87th Congress), substantially in accordance with recommendations by the USACE Chief of Engineers in SD 37 (87th Congress). Section 12648.3 of the CWC provides the State authorization for the project. The dam and reservoir are not part of the SPFC, but the channel improvements downstream from Hidden Dam on the Fresno River are included in the SPFC.

Merced County Streams Project

Improvement of the Merced County Streams was authorized by the Flood Control Act of 1944 (Public Law 78-534, 78th Congress). The authorization was based on HD 473 (78th Congress). Section 12650 of the CWC provides the State authorization for the project. The project includes a diversion from Black Rascal Creek to Bear Creek, a diversion between Owens Creek and Mariposa Creek, channel improvements and levees, and one retarding-type reservoir east of the City of Merced. The project reduces flood risk to agricultural areas, the City of Merced, and the towns of Planada and Le Grand and other smaller communities. Of the five authorized and constructed reservoirs, the State provided assurances to the federal government for only one reservoir, Castle Dam, authorized by the Flood Control Act of 1970 (Public Law 91-611, Section 201, Statute 1824).

Bear Creek Project

The Bear Creek Project was authorized by the Flood Control Act of 1944 (Public Law 78-534, 78th Congress). Section 12652 of the CWC provides the State authorization for the project. Bear Creek is a tributary to the San Joaquin River in the Delta near Stockton. The Bear Creek channel and levee improvements are included in USACE Chief of Engineers recommendations to the Secretary of the Army in HD 545 (78th Congress).

Littlejohns Creek and Calaveras River Stream Group Project

The Littlejohns Creek and Calaveras River Stream Group Project was authorized by the Flood Control Act of 1944 (Public Law 78-534, 78th Congress). Sections 12652 and 12653 of the CWC provide the State authorization for the project. This act authorized improvement of Littlejohns Creek and Calaveras River and tributaries in accordance with recommendations by the USACE Chief of Engineers in HD 545 (78th Congress). The project included a diversion from Duck Creek to Littlejohns Creek and other channel improvements and levees.

Farmington Dam Project

The Farmington Dam Project was authorized by the Flood Control Act of 1944 (Public Law 78-534, 78th Congress). Section 12653 of the CWC provides the State authorization for the project. This act

authorized improvement of Littlejohns Creek and tributaries in accordance with recommendations by the USACE Chief of Engineers in HD 545 (78th Congress). Farmington Dam is not part of the SPFC, but channel improvements along South Littlejohns Creek and its north and south branches are included in the SPFC.

Mormon Slough Project

The Mormon Slough Project was authorized by the Flood Control Act of 1962 (Public Law 87-874, 87th Congress). Section 12648.6 of the CWC provides the State authorization for the project. The authorization was in accordance with recommendations in HD 576 (87th Congress). The USACE Chief of Engineers concurred with these recommendations in his 1962 report. The project includes channel improvements, levees, and pumping plants.

2.3 Federal and State Authorizations for Ongoing State-Federal Flood Protection Projects

At the time of this report, there are multiple ongoing authorized State-federal flood protection projects. Upon completion, these projects are likely to become facilities (or modifications to facilities) of the SPFC (Section 7.6). Table 2-2 includes the federal acts, public law numbers, and Chief of Engineers Reports and CWC sections pertaining to each ongoing project. Brief descriptions of each project are provided below, with the status of each project as of the time of this report. Future updates to ongoing project status will be included in updates to the FCSSR.

2.3.1 Ongoing Sacramento River Basin Projects

Ongoing State-federal flood protection projects in the Sacramento River Basin include modifications to the SRFPC; American River Watershed, Common Features Project; American River Watershed, Folsom Dam Raise Project; Yuba River Basin, Marysville Ring Levee Project; Middle Creek Flood Damage Reduction and Ecosystem Restoration Project; South Sacramento County Streams Group Project; West Sacramento Project (Slip Repair); Cache Creek Settling Basin Enlargement; and Murphy Slough Habitat Restoration Project.

Modifications to the Sacramento River Flood Control Project

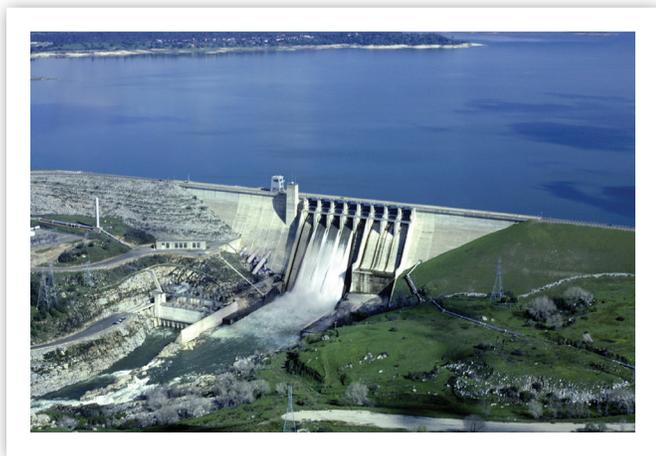
Ongoing modifications to the SRFCP include the Upper Sacramento Area Levee Reconstruction, Mid-Valley Area Levee Reconstruction, and Lower Sacramento Area Levee Reconstruction projects to restore sections of levee to design standards. Construction of these modifications is partially complete as of the time of this report, and some elements are being re-evaluated.

American River Watershed, Common Features Project

The American River Watershed, Common Features Project includes multiple proposed improvements along the lower American River downstream from Folsom Dam, Sacramento River downstream from the Natomas Cross Canal, and the Natomas Cross Canal to provide a minimum 200-year level of flood protection in combination with the Folsom Dam Raise Project. Construction of these improvements is partially complete as of the time of this report, and some elements are being re-evaluated.

American River Watershed, Folsom Dam Raise Project

The American River Watershed, Folsom Dam Raise Project includes raising Folsom Dam, other modifications to the dam facilities, environmental restoration, and a new bridge downstream from the dam to provide a minimum 200-year level of flood protection in combination with the Common Features Project. Construction of the bridge element is complete and construction of other elements is underway at the time of this report.



Construction of the American River Watershed, Folsom Dam Raise Project is underway

Yuba River Basin, Marysville Ring Levee Project

The Yuba River Basin, Marysville Ring Levee Project includes improvements to the ring levee that surrounds Marysville. The project is being constructed at the time of this report.

Middle Creek Flood Damage Reduction and Ecosystem Restoration Project

The Middle Creek flood Damage Reduction and Ecosystem Restoration Project includes removal of levees to restore vegetation and wetlands on approximately 1,650 acres in the Robinson Lakebed area. The project is about to begin the design phase at the time of this report.

South Sacramento County Streams Group Project

The South Sacramento County Streams Group Project includes levee and channel improvements on Morrison Creek and its major tributaries and, in the lower basin, the Beach Stone Lakes levees to provide a 200-year level of flood protection to the area, and enhance recreation and restore wildlife habitat. The project is under construction at the time of this report.

West Sacramento Project (Slip Repair)

The West Sacramento Project includes raising and strengthening about 5 miles of existing levees on the east side of the Yolo Bypass and south side of the Sacramento Bypass to provide a 200-year level of flood protection to West Sacramento. Construction was completed in 2005, but slips developed during high water in 2006. Design and construction are currently underway to repair the damaged levee sections at the time of this report.

Cache Creek Settling Basin Enlargement

The Cache Creek Settling Basin Enlargement includes enlargement of the settling basin facilities. Construction is mostly complete at the time of this report.

Murphy Slough Habitat Restoration Project

The Murphy Slough Habitat Restoration Project includes restoration of riparian vegetation on approximately 300 acres of fallow land and 2,000 linear feet of riverbank and to protect the area from head cuts. Construction is complete at the time of this report.

Table 2-2. Summary of Ongoing State-Federal Flood Protection Projects

Project	Federal Act	Public Law	Chief of Engineers Report	State Authorization
American River Watershed (Common Features) Project				
	WRDA 1986	99-662	American River Watershed Project, California	CWC Section 12670.10, .11, .12, .14, .16
	WRDA 1996	104-303		
	WRDA 1999	106-53		
American River Watershed (Folsom Dam Raise) Project				
	DAA 1993	102-396	American River Watershed Project, California	CWC Section 12670.11
	WRDA 1999	106-53		
American River Watershed (Folsom Dam Raise, Bridge Element) Project				
	WRDA 1999	106-53	American River Watershed Project, California	CWC Section 12670.11
	EWDA 2005	108-447		
	EWDA 2006	109-103		
Yuba River Basin, Marysville Ring Levee Project				
	WRDA 1999	106-53	Yuba River Basin Investigation, California Feasibility Report	CWC Sections 8615, 12616, and 12670.7
	WRDA 2007	110-114		
Middle Creek Flood Damage Reduction and Ecosystem Restoration Project				
	FCA 1962	87-874	HD 104-149	CWC Sections 12585.12 and 12656.5
	WRDA 2007	110-114		
South Sacramento County Streams Group Project				
	WRDA 1999	106-53	South Sacramento County Streams, California, October 6, 1998	CWC Section 12670.14
West Sacramento Project (Slip Repair)				
	WRDA 1992	102-580	Sacramento Metro Area, California, June 29, 1992	CWC Sections 12670.2 and 12670.3
Cache Creek Settling Basin Enlargement				
	WRDA 1986	99-662	Report dated April 27, 1981	CWC Section 12670
Murphy Slough Habitat Restoration Project				
	WRDA 1986	99-662	CAP	CWC Sections 8590, 8590.2, 8615, 8623, and 12841

Key:

CAP = Continuing Authorities Project

CWC = California Water Code

DAA = Defense Appropriation Act

EWDA = Energy and Water Development Appropriation Act

FCA = Flood Control Act

FCCD = Flood Control Committee Document

HD = U.S. House Document

WRDA = Water Resources Development Act

2.3.1 Ongoing San Joaquin River Basin Projects

At the time of this report, there are no ongoing State-federal flood protection projects in the San Joaquin River Basin.

2.4 Existing Federal Participation in Other Non-SPFC Flood Protection Projects

In addition to SPFC facilities, USACE has an interest and role in other flood management projects in the Central Valley. While these are not part of the SPFC, operation of these projects may influence operation of the SPFC, especially in reducing peak flood flows through the SPFC levee system. The following information is provided in an overview to help describe other projects that function along with the SPFC as a flood protection system.

2.4.1 Multipurpose Reservoir Projects

Many of the storage facilities that contribute to flood management in the Sacramento and San Joaquin river basins are also operated for other purposes, such as water supply and power generation, but are not part of the SPFC because they include no State assurances to the federal government. Debris dams in the upper Yuba River Basin contribute in a minor way to flood management in the Sacramento River Basin, and hydroelectric reservoirs in the upper American River Basin sometimes provide flood storage space that can be credited to Folsom Lake. Major multipurpose storage projects that contribute significantly to flood management are shown in Figure 2-2 and listed in Table 2-3 in chronological order of construction. USACE has been involved with each of these reservoirs by establishing (funding in most cases) seasonal flood reservation storage and developing rules for operation of flood storage. Note that Oroville Dam is the only major multipurpose project listed that is part of the SPFC.

During high-water periods, reservoir operators coordinate with DWR and USACE during daily operations conferences at the State-federal Flood Operations Center in Sacramento. These conferences sometimes lead to voluntary modifications of individual reservoir operating rules to improve overall system operation. In total, these reservoir operations significantly reduce peak flood flows to the downstream levee system.



Friant Dam is operated for multiple purposes, including flood management (photo courtesy of Anne Canright)

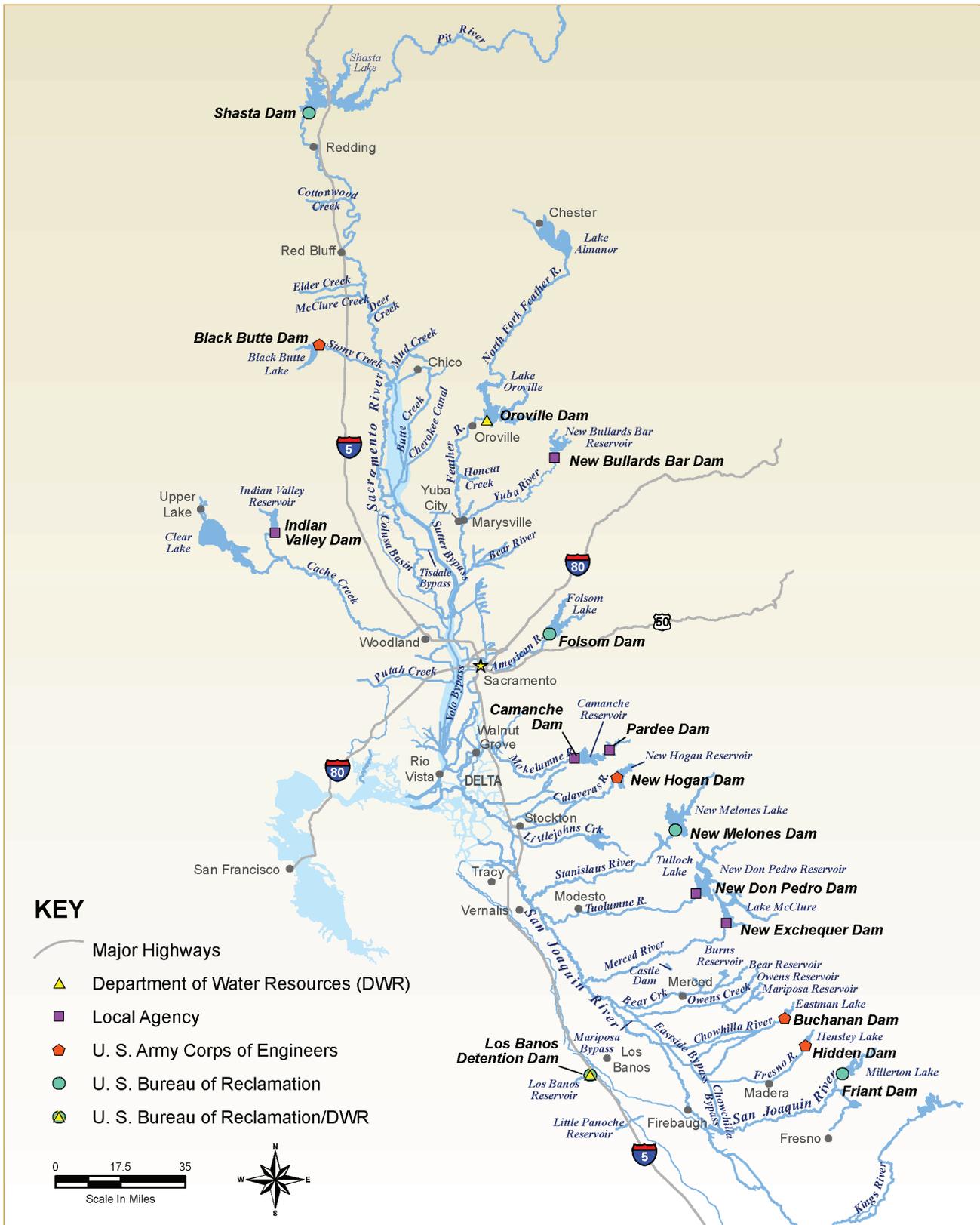


Figure 2-2. Locations of Multipurpose (Including Flood Control) Dams and Reservoirs in the Sacramento and San Joaquin River Basins

Table 2-3. Major Multipurpose Reservoir Project Summary

Reservoir	Dam	Date Completed	Total Reservoir Capacity (acre-feet)	Flood Storage Capacity (acre-feet)	Owner/Operator
SACRAMENTO RIVER BASIN					
Shasta Lake	Shasta Dam	1949	4,550,000	1,300,000	Reclamation
Black Butte Lake	Black Butte Dam	1963	160,000	137,000	USACE
Folsom Lake	Folsom Dam	1956	973,000	400,000 ²	Reclamation
Lake Oroville	Oroville Dam ¹	1967	3,540,000	750,000	DWR
New Bullards Bar Reservoir	New Bullards Bar Dam	1967	960,000	170,000	Yuba County Water Agency
Indian Valley Reservoir	Indian Valley Dam	1976	301,000	40,000	Yolo County Flood Control and Water Conservation District
SAN JOAQUIN RIVER BASIN					
Millerton Lake	Friant Dam	1949	521,000	390,000 ³	Reclamation
Lake McClure	New Exchequer Dam	1967	1,025,000	400,000	Merced Irrigation District
New Don Pedro Reservoir	New Don Pedro Dam	1970	2,030,000	340,000	Turlock and Modesto Irrigation Districts
Hensley Lake	Hidden Dam	1975	90,000	65,000	USACE
Eastman Lake	Buchanan Dam	1975	150,000	45,000	USACE
New Melones Lake	New Melones Dam	1978	2,420,000	450,000	Reclamation
Los Banos Reservoir	Los Banos Detention Dam	1965	34,600	14,000	Reclamation/DWR
Pardee Reservoir	Pardee Dam	1963	198,000	200,000 ⁴	East Bay Municipal Utilities District
Camanche Reservoir	Camanche Dam	1963	431,000		
New Hogan Reservoir	New Hogan Dam	1964	325,000	165,000	USACE

Source: USACE, 1997

Notes:

¹ Oroville Dam is part of the SPFC as is the smaller single-purpose Castle Dam in the San Joaquin River Basin. All other dams in this table are non-SPFC.

² Folsom Dam is operated with variable flood storage between 400,000 acre-feet and 670,000 acre-feet to take credit for seasonally available storage in upstream reservoirs.

³ Friant Dam operated in conjunction with Mammoth Pool and upstream reservoirs.

⁴ Camanche Dam operated in conjunction with Pardee Dam and upstream reservoirs.

Key:

DWR = California Department of Water Resources

Reclamation = U.S. Department of the Interior, Bureau of Reclamation

SPFC = State Plan of Flood Control

USACE = U.S. Army Corps of Engineers

2.4.2 Local and Regional Projects

The federal government has interest in local projects for which local or regional entities, rather than the State, provided assurances. These projects include, but are not limited to the following:

- Folsom Lake Crossing
- Yuba River Goldfields
- Chico Landing to Keswick Dam
- Indian Valley Dam and Reservoir Project
- Big Dry Creek Dam and Diversion Project
- Duck Creek Project
- Stanislaus River Local Interest Project Levees
- Kings River and Tulare Lake Basin Project
- Mariposa Dam
- Owens Dam
- Burns Dam
- Bear Dam
- North Area Local Project (Sacramento Area Flood Control Agency)

2.5 Other Non-SPFC Flood Protection Facilities

In addition to the projects described in Sections 2.4, the flood protection system in the Central Valley includes other facilities that are not part of the SPFC. They are briefly discussed here.



Nonproject levees along Bear Creek in Merced affect performance of the SPFC

2.5.1 Nonproject Levees

Nonproject levees and related facilities have been constructed by USACE and local agencies along many of the rivers, creeks, and streams in the Central Valley. Many of these facilities are operated and maintained similar to project facilities and connect to project facilities for flood management purposes. By definition, they are not part of the SPFC, and are not addressed in this report. However, it is important to recognize that these nonproject levees may affect the performance of the SPFC as part of the flood management system.

Nonproject levees include the levee system in the Delta downstream from Collinsville on the Sacramento River and downstream from the Stockton area on the San Joaquin River that consist entirely of nonproject levees maintained by USACE (e.g., levees of the Sacramento and Stockton ship channels) or local interests. These levees were not constructed for flood management purposes.

2.5.2 Other Nonproject Facilities

Numerous other flood protection facilities are owned and operated by local entities but are not part of the SPFC, including the following:

- Local levees and floodwalls within SPFC-levee-protected areas.
- Local pumping plants that discharge drainage water into SPFC-leveed channels. Examples include a number of pumping plants owned and operated by local reclamation and levee districts and communities to pump interior storm runoff into the larger waterways.

2.5.3 Designated Floodways

Designated floodways are not part of the SPFC facilities, as defined in CWC Section 9110 (f) because they are State-designated without assurances to, or participation of, the federal government. However, these floodways provide an important management tool to help the State meet its requirement for passing project design flows (see Section 6.8 for designated floodways as a condition of project operation).

Designated floodways are the primary nonstructural flood management program employed by the State of California. The program was started in 1968 to control encroachments and preserve the flow regimes of floodways to protect public improvements, lives, and land-use values (CWC Section 8609).

Designated floodways are defined as follows: (1) the channel of the stream and that portion of the adjoining floodplain reasonably required to provide for the passage of a design flood, as indicated by floodway encroachment lines on an adopted map, or (2) the floodway between existing levees, as adopted by the Board or the California State Legislature.

Designated floodways serve a critical function in protecting life and property from flood risks. The designated floodway system includes more than 60 designated floodways covering more than 1,300 miles of stream length. Figure 2-3 shows designated floodways along the Sacramento and San Joaquin rivers as well as major tributaries. There are additional designated floodways in the Tulare Lake Basin.

To designate a floodway, the Board usually completes a detailed hydraulic study to determine the design discharge associated with the design flood (usually 100-year recurrence interval) and the area needed to convey the design flood. The findings of the study are then used to delineate floodway maps, and in some cases, determine areas of shallow flooding. In other cases, floodway boundaries have been developed using analytical methods based on engineering judgment and review of historical floods. In proposing or revising designated floodways, the Board must also consider (1) flood control improvements and regulations affecting the floodplain, (2) the degree of danger from flooding to life, property, and public health and welfare, and (3) rate and type of development taking place on the floodplain (23 California Code of Regulations (CCR) Section 102).

Land uses within an adopted designated floodway are restricted to not impede the free flow of water in the floodway or jeopardize public safety (23 CCR Section 107). In general, activities such as agriculture, grazing, and recreation are allowed, as are structures and activities that can be quickly and easily removed or pose little impedance to river flow. The Board has the authority to determine additional permitted uses within the floodway on a case-by-case basis.



Figure 2-3. Location of Designated Floodways Within the Sacramento and San Joaquin River Basins

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