

California's Flood Future

Recommendations for Managing
the State's Flood Risk

Attachment I: Finance Strategies

FINAL November 2013

California's Flood Future is provided to help inform local, State, and Federal decisions about policies and financial investments to improve public safety, foster environmental stewardship, and support economic stability



PUBLIC SAFETY

ENVIRONMENTAL STEWARDSHIP

ECONOMIC STABILITY



US Army Corps
of Engineers ®

STATEWIDE FLOOD MANAGEMENT PLANNING PROGRAM



FINAL

Attachment I: Finance Strategies

November 2013

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Acronyms and Abbreviations

AB	Assembly Bill
AD	Assessment District
AER	Aquatic Ecosystem Restoration
ARRA	American Recovery and Reinvestment Act
ASCE	American Society of Civil Engineers
B/C	benefit-to-cost
Bay Delta	San Francisco Bay/Sacramento-San Joaquin River Delta
CalEMA	California Emergency Management Agency
CALFED	Collaboration among State and Federal Agencies to improve California's water supply
CDFW	California Department of Fish and Wildlife (formerly Department of Fish and Game)
CEAC	County Engineers Association of California
cfs	cubic feet per second
CIP	Capital Improvement Plan
COP	Certificate of Participation
CSA	County Service Area
CVFPB	Central Valley Flood Protection Board
CVFPP	Central Valley Flood Protection Plan
CW	Civil Works
CWA	Clean Water Act of 1972
CWC	California Water Code
DAC	disadvantaged community
Delta	Sacramento-San Joaquin River Delta
DIF	Development Impact Fee
DWR	California Department of Water Resources
EWP	Emergency Watershed Protection
FEMA	Federal Emergency Management Agency
FESSRO	FloodSAFE Environmental Stewardship and Statewide Resources Office
Flood Future Report	<i>California's Flood Future: Recommendations for Managing the State's Flood Risk</i>
FMA	Flood Mitigation Assistance
FPCP	Flood Protection Corridor Program
FY	Fiscal Year
GDP	gross domestic product
GO	general obligation

Acronyms and Abbreviations

HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
IRWM	Integrated Regional Water Management
IWM	Integrated Water Management
IWTF	Inland Waterways Trust Fund
LRB	Lease-Revenue Bond
NED	Net Economic Development
NFIP	National Flood Insurance Program
NRCS	National Resources Conservation Service
O&M	operation and maintenance
OMB	Office of Management and Budget
OMRR&R	operation, maintenance, repair, replacement, and rehabilitation
PDM	Pre-Disaster Mitigation
PL	Public Law
PRC	Public Resources Code
PSP	Project Solicitation Package
RD	Reclamation District
Reclamation	United States Bureau of Reclamation
SB	Senate Bill
SCVWD	Santa Clara Valley Water District
SDWSRF	Safe Drinking Water State Revolving Fund
SFMP	Statewide Flood Management Planning
SPFC	State Plan of Flood Control
SRF	State Revolving Fund
SSIA	State Systemwide Investment Approach
TIFIA	Transportation Infrastructure Finance Innovation Act
TM	technical memorandum
USACE	United States Army Corps of Engineers
WIFIA	Water Infrastructure Finance Innovation Act
WQA	Water Quality Act
WRDA	Water Resources Development Act

1.0 Introduction

1.1 Background

California is at risk for catastrophic flooding. All 58 California counties have experienced at least one flood event with significant consequences in the last 20 years, resulting in loss of life and billions of dollars in damages. This report, *California's Flood Future: Recommendations for Managing the State's Flood Risk* (Flood Future Report), is the first product of the Statewide Flood Management Planning (SFMP) Program. The Program was developed under the FloodSAFE Initiative to expand California's flood management planning statewide. Specifically, the purpose of the SFMP Program is to make recommendations to inform flood management policies and investments in the coming decades by:

- Promoting a clear understanding of flood risks in California
- Garnering active support for partnerships at the local, tribal, State, and Federal levels¹
- Coordinating with other California Department of Water Resources (DWR) planning efforts
- Identifying strategies and feasible next steps to better incorporate flood management into Integrated Water Management (IWM)
- Promoting an IWM approach for flood management solutions

The initial work of the SFMP Program was to collect information in support of the California's Flood Future Report, as well as to build unique partnerships with local flood management agencies, the County Engineers Association of California (CEAC), Federal Emergency Management Agency (FEMA), and the United States Army Corps of Engineers (USACE). Throughout the Flood Future Report, determinations about specific flood terms were made that may not represent the specific terms used by partner agencies. These are described in Textbox 1-1. A description of the Flood Future Report components, organization, and layout is provided in Appendix A.

1.2 Purpose

The purpose of this technical memorandum (TM), presented as Attachment I in the Flood Future Report, is to provide an understanding of the current state of flood management financing and the challenges that lie ahead as California develops recommendations to address flood management. To accomplish this, a good understanding of past expenditures on a local, State, or Federal level is needed, as well as the mechanisms that are commonly used to fund capital and operation and maintenance (O&M) projects. For Federally funded projects the definition of O&M includes the local entity's financial obligation to operate, maintain, repair, rehabilitate, and replace (OMRR&R) the implemented project. OMRR&R is a non-Federal responsibility when local, regional and/or State entities partner on a

¹ Hereafter in this document, the mention of governmental agencies is implicit to include tribal entities.

Federal project. References to O&M provided in this report include OMRR&R responsibilities when the project is a Federal/non-Federal partnership. Several considerations need to be better understood to develop a financial strategy.

1.3 Overview of TM Organization

This TM is organized into the following sections:

- Section 1: Introduction
- Section 2: Historical Funding for Flood Management in California
- Section 3: Demand for Flood Management Funding
- Section 4: Other Financial Challenges
- Section 5: Funding Mechanisms
- Section 6: Flood Management Financing Strategies
- Section 7: Financial Strategies Findings and Potential Actions
- Section 8: References

This TM is supported by the following technical appendices:

- Appendix A: Flood Future Report Components
- Appendix B: Detailed Funding Sources
- Appendix C: Propositions 13 (2000) and 218 (1996)
- Appendix D: Glossary

Textbox 1-1: Agencies Differ in Flood Terminology

One of the challenges in a multi-agency effort is resolving language and culture differences between agencies. Staff from both USACE and DWR who are responsible for developing this report have made a conscious choice to adopt certain terminology throughout the documents.

As an example, USACE has adopted ***flood risk management*** as the term to describe a broad flood program that encompasses planning, construction, and operation, maintenance, repair, rehabilitation, and replacement (***OMRR&R***). DWR executes a similar broad program, largely through its Flood Management Division. As a result, DWR uses the term ***flood management*** in much the same way USACE uses *flood risk management*.

Another term used throughout this document is ***100-year flood*** (or some other x-year flood). Although these terms are commonly used, both USACE and DWR prefer using ***1 percent chance flood*** (or a 1-in-100 chance event) to describe a flood that has a 1 percent chance of occurring in any given year. However, legislative language from 2007 directing DWR to undertake new planning using bond proceeds uses 100-year flood.

For Federally funded projects, the definition of operation and maintenance (***O&M***) includes the local entity's financial obligation for OMRR&R of the implemented project. OMRR&R is a non-Federal responsibility when local, regional and/or State entities partner on a Federal project. DWR typically uses O&M to refer simply to operation and maintenance, although repair and rehabilitation are sometimes included depending on project specifics. References to O&M provided in this report include OMRR&R responsibilities when the project is a Federal/non-Federal partnership.

For this report, both agencies agreed that, although language and cultural differences remain, it is more important to focus on the shared responsibility of performing our flood risk management or flood management missions rather than the use of specific phrases not in each agency's respective culture. A glossary is included to help the reader understand specific terms used by flood professionals and those terms that are used to define specific agency missions.

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2.0 Historical Funding for Flood Management in California

2.1 Introduction

Floods are naturally occurring phenomena in California. Floods can keep erosion and sedimentation in natural equilibrium, replenish soils, recharge groundwater, and support a variety of riverine and coastal floodplain habitats for some of California's most sensitive species. However, when floods occur where people live and work, the floods can result in tragic loss of lives and can have devastating economic impacts by damaging critical infrastructure and vital public facilities, taking valuable agricultural land out of production and disrupting California's water supply system.

Flood management is a process of preparing for, responding to, and recovering from floods that create risk for people and valued resources. Traditional approaches to flood management include developing project-specific flood infrastructure projects to reduce the chance of flooding. Flood risk is the likelihood of adverse economic and life-safety consequences from flood inundation. Although this infrastructure has helped avoid damages to lives and property, it also has led to unintended consequences, such as loss of ecological and hydrologic functions and redirection of flood risks upstream or downstream of projects. A reliance on flood infrastructure has encouraged urban and agricultural development within floodplains, which has placed people and property at risk of flooding. In the 1960s, studies found that despite investments in flood infrastructure, damage due to floods was increasing (FEMA, 2007). Continued development in floodplains was driving increased residual risk of flooding. Risks to, people, assets, lands, species, and facilities will be exacerbated by population growth, climate change, sea level rise, and further development in flood-prone areas.

Residual risk is the likelihood of damage or other adverse consequences remaining after flood management actions are taken.

Flood risk is commonly described for insurance and planning purposes using the following two flood event levels:

500-Year Flood is a shorthand expression for a flood that has a 1-in-500 probability of occurring in any given year. This also is expressed as the 0.2 percent annual chance flood.

100-Year Flood has a 1-in-100 (or 1 percent) probability of occurring in any given year.

These flood event levels indicate a percentage of probability and severity. It does not mean that such a flood would happen only every 100 or 500 years.

HISTORICAL FUNDING FOR FLOOD MANAGEMENT IN CALIFORNIA

Historically, funding for flood management in California has been provided by a combination of local, State, and Federal agencies. Figure I-1 describes the general historical spending and funding eras over the past 160 years, using broad categories. Starting with the Gold Rush, initial major infrastructure was put in place to bring land into production. Over the next several decades, multipurpose infrastructure projects were built. In the latter decades of the 1900s, investment shifted to environmental protection projects. Shifts in financing eras are a result of major events, natural and man-made, and are generally reactive in nature. This century has seen several State bonds passed for infrastructure purposes, including flood management, as well as significant Federal funding. Additional historical discussion is found in Section 2.3.

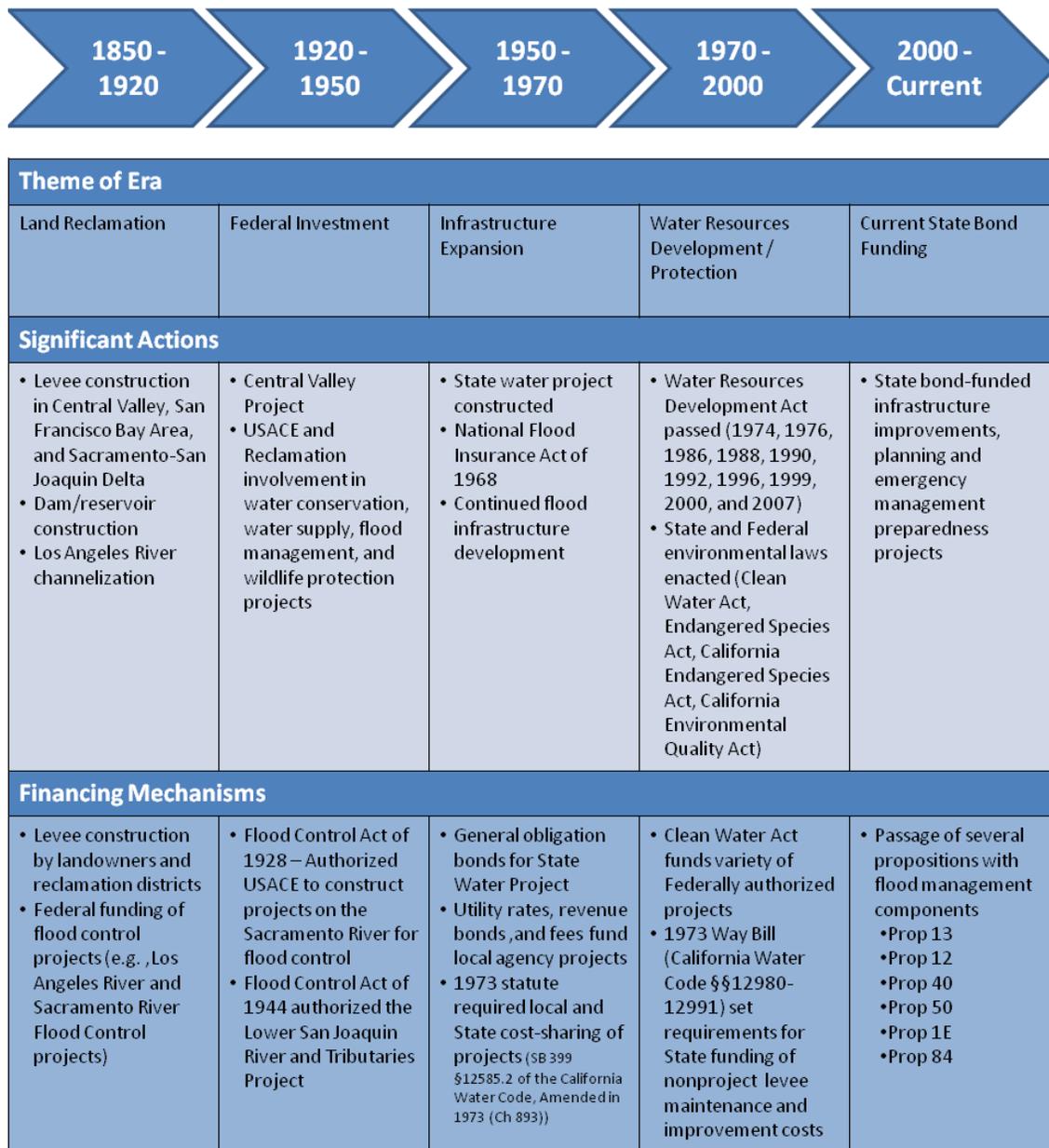


Figure I-1. History of Funding for Flood Management in California

Source: Kelley, 1998

This section of the TM will focus on identifying and describing historical funding for flood management in California. Federal funding of flood management has come primarily from USACE, FEMA, National Resources Conservation Service (NRCS), and the U.S. Bureau of Reclamation (Reclamation). State funding of flood management has come predominantly from DWR and California Emergency Management Agency (CalEMA). DWR has been responsible primarily for flood management within the State Plan of Flood Control (SPFC) area in the Central Valley and has assisted agencies statewide with funding for projects and emergency management activities. Local funding for flood management has come from cities, counties, and special districts.

2.2 Data Sources

Due to the number and different types of agencies that fund flood management in California, identifying and homogenizing funding data are challenging. Different types of agencies report financial information in different ways. For example, some agencies include planning as part of project capital costs, whereas other agencies include planning with O&M expenses. In addition, sets of data were not available for earlier periods; this TM focuses on reviewing data from 2000 through 2010.

All dollar values in this TM have been adjusted to 2010 values with the gross domestic product (GDP) Implicit Price Deflator (ERS, 2012). The Implicit Price Deflator is a measure of the level of prices of all new, domestically produced, final goods and services in an economy—in this case for the year 2010. Data in this TM are compiled at the most disaggregate level possible (e.g., administrative, maintenance, and capital spending). The level of aggregation reported in this TM depends on the format of the source data. Financial data are typically included in categories that are relevant for the reporting agency but might not suit the purposes of this TM.

Another note about the data is that a Federal Fiscal Year (FY) is from 1 October through 30 September, but the State and most local agency budgets are from 1 July through 30 June. No reapportionment of the data occurred to address this issue because the data were not refined enough to break out budget expenditures to account for this inconsistency.

One issue in identifying flood data is how to address funding for local drainage or stormwater management. Most State and Federal agencies are more focused on flooding events as opposed to local drainage issues. In this TM, stormwater and local drainage funding was included where it was available and could be clearly identified. This information was available primarily for local agencies, which is partially because the USACE uses the following as part of the decision criteria for participation in projects, although exceptions have been granted for this rule. USACE participation is based on numerous criteria, including but not limited to USACE missions, authorities, the problem(s), and a determination of Federal interest (33 CFR 238.7(a)(1),(2) or (3)):

USACE involvement in an urban flood control project is limited by the *Code of Federal Regulations* and must meet minimum requirements, which include:

... flood discharge of such a stream or waterway within an urban area is greater than 800 cubic feet per second for the 10-percent flood (one chance in ten of being equaled or exceeded in any given year). . .

... Drainage area has to be greater than 1.5 square miles in area. . .

238.7 - Decision criteria for participation.

(a) Urban flood control.

- (1) *Urban water damage problems associated with a natural stream or modified natural waterway may be addressed under the flood control authorities downstream from the point where the flood discharge of such a stream or waterway within an urban area is greater than 800 cubic feet per second for the 10-percent flood (one chance in ten of being equaled or exceeded in any given year) under conditions expected to prevail during the period of analysis. Those drainage areas which lie entirely within the urban area (as established on the basis of future projections, in accordance with § 238.5 of this part), and which are less than 1.5 square miles in area, shall be assumed to lack adequate discharge to meet the above hydrologic criteria. Those urban streams and waterways which receive runoff from land outside the urban area shall not be evaluated using this 1.5 square mile drainage area criterion.*
- (2) *A number of conditions within a drainage area may limit discharges for the 10-percent flood, without proportionately reducing discharges for larger floods, such as the one-percent flood. Examples include the presence of extremely pervious soils, natural storage (wetlands) or detention basins or diversions with limited capacity. Other conditions could result in a hydrological disparity between the 10- and one-percent flood events*
- (3) *Division Engineers, except for NED and POD, are authorized to grant exceptions to the 800 cfs, 10-percent flood discharge criterion specified in this § 238.7(a)(1) whenever both of the following criteria are met:*
 - (i) *The discharge for the one-percent flood exceeds 1800 cfs; and*
 - (ii) *The reason that the 10-percent flood discharge is less than 800 cfs is attributable to a hydrologic disparity similar to those described in § 238.7(a)(2).*

Local agencies do fund stormwater or local drainage projects with some State and Federal participation; however, these projects are often accounted for in local agency budgets under the transportation department, which made identifying stormwater funding difficult. Where stormwater funding information was identifiable, it was included in the estimated expenditures for local agencies.

2.3 Statewide Overview of Flood Management Expenditures

In California, flood management projects are generally funded through partnerships by one of the following groups:

- Local agencies or groups of local agencies
- Local agencies and the USACE
- State and local agencies
- Local, State, and Federal agencies

Typically, these funding combinations are determined for projects on a site-by-site, project-specific basis to take advantage of available funding sources. In many cases, this approach lacks a systemwide perspective and can result in a reduction of other water-related benefits. Also, this approach can induce unintended consequences, such as shifting of flood risks to other areas and/or creating negative impacts to the environment.

Figure I-2 illustrates the average proportion of flood management expenditures by local, State, and Federal agencies between 2000 and 2010. Local agencies account for the largest portion of expenditures, averaging \$2.04 billion per year, followed by Federal and State agencies at \$470 and \$330 million per year, respectively.

Expenditures vary over time, depending on factors such as State and Federal appropriations and bond measures.

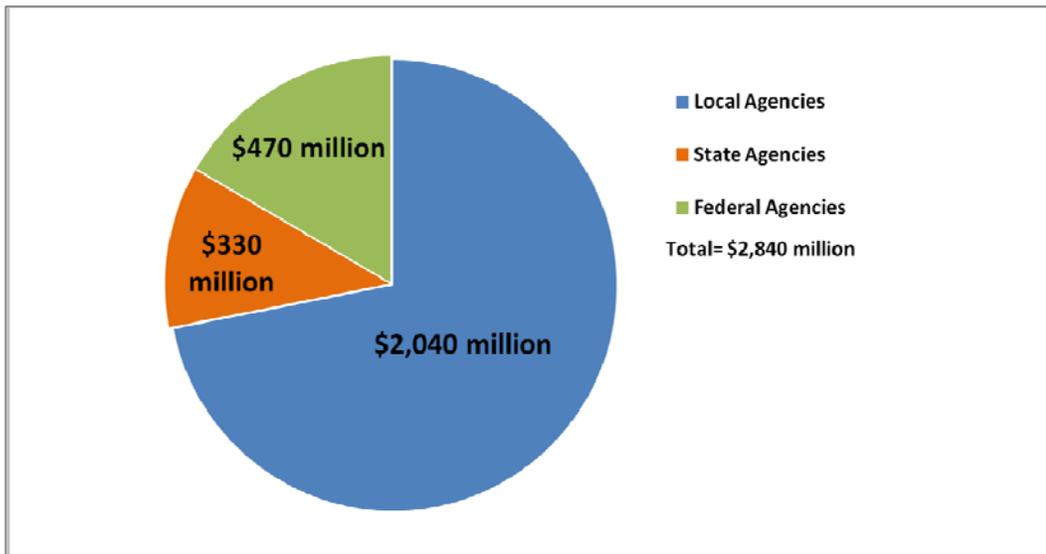


Figure I-2. Average Annual Expenditures on Flood Management in California, 2000-2010

Source: SCO, 2013a, 2013b, 2013c, 2013d; Reclamation, 2012; FEMA, 2013

Between 2000 and 2010, annual project expenditures for flood management in California ranged from approximately \$2.4 billion to \$3.9 billion, as shown in Figure I-3. This figure shows capital and O&M expenditures for flood management in California by local, State and Federal agencies. Between 2000 and 2010, there were significant short-term infusions of funding for specific State projects. In FY 2008/2009, Federal expenditures have a one-time increase for shovel-ready projects due to the passage of American Recovery and Reinvestment Act (ARRA). In California, flood management funding increased after 2007 when more than \$5 billion in funding was authorized by the passage of Propositions 1E and 84 of 2006, which also benefited O&M funding. State FY 2005/2006 includes \$500 million in one-time funding from Assembly Bill (AB) 142 (2005-2006), which appropriates funds for levee evaluation, repair, and related work, as well as for flood control system improvements.

County, DWR, and USACE budget data used in this TM did not identify capital and O&M components. For these entities, values were assigned for capital and O&M based on historical expenditures for the agency as follows:

HISTORICAL FUNDING FOR FLOOD MANAGEMENT IN CALIFORNIA

- County: assign 15 percent of total expenditures to capital and 85 percent to O&M
- DWR: 80 percent of total expenditures to capital and 20 percent to O&M
- USACE: 50 percent of the total expenditures to capital and 50 percent to O&M

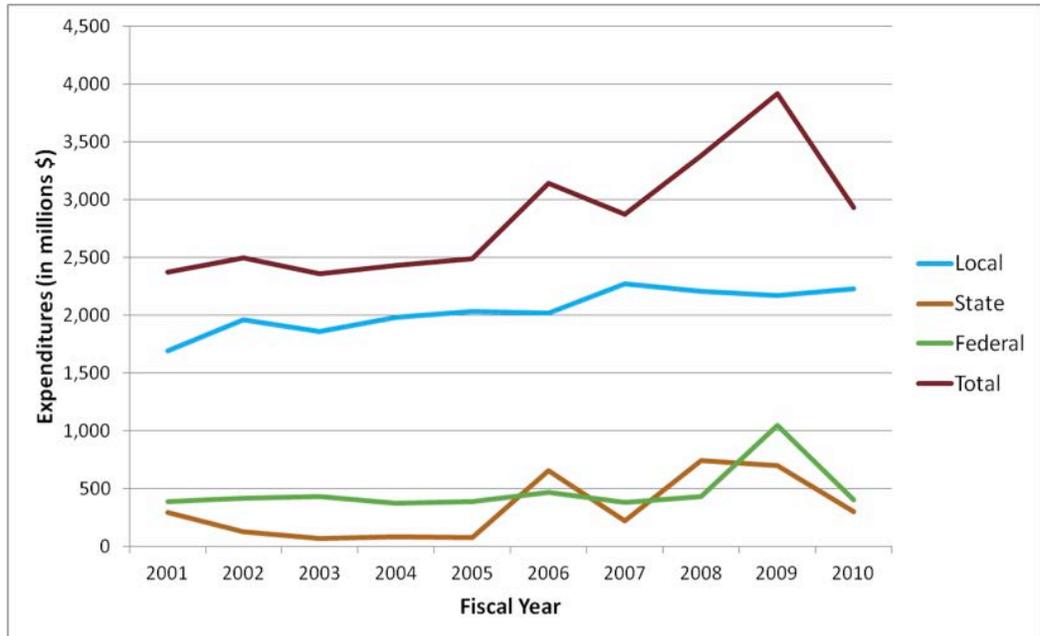


Figure I-3. Total Annual Expenditures on Flood Management in California, 2000-2010

Source: SCO, 2013a, 2013b, 2013c, 2013d; Reclamation, 2012; FEMA, 2013

Data from the United States Bureau of Reclamation (Reclamation) included expenditures on flood management O&M in the Mid-Pacific and Lower Colorado regions, but data for capital expenditures on flood management were not available. FEMA reports only total expenditures; however, historical California FEMA expenditure split cost between emergency management (34 percent of total expenditures) and funding for emergency housing and shelter (66 percent of total expenditures). These percentages were used to develop the split between O&M (66 percent) and capital (34 percent).

Figures I-4 and I-5 illustrate annual flood management expenditures by local, State, and Federal agencies for capital and O&M, respectively. Total, Capital and O&M, annual local agency expenditures statewide ranged from approximately \$1.7 billion to almost \$2.3 billion in 2007, but the funding has been slowly declining from that high point, as has the U.S. economy. This decrease in local flood management funding is a result of declining development fees, property taxes, and impact fees, as well as competition for agency general funds. The discussion in the following sections includes individual components of local, State, and Federal spending on flood management, as well as a discussion of major events that have driven funding in California.

HISTORICAL FUNDING FOR FLOOD MANAGEMENT IN CALIFORNIA

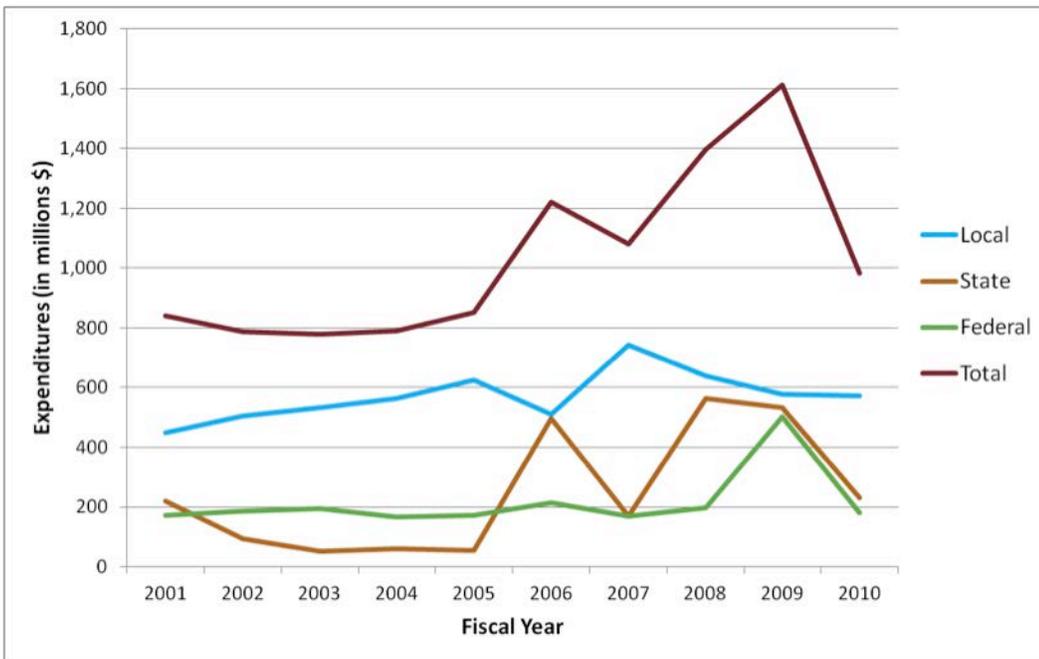


Figure I-4. Total Annual Capital Expenditures on Flood Management by Entity in California, 2000-2010

Source: SCO, 2013a, 2013b, 2013c, 2013d; Reclamation, 2012; FEMA, 2013

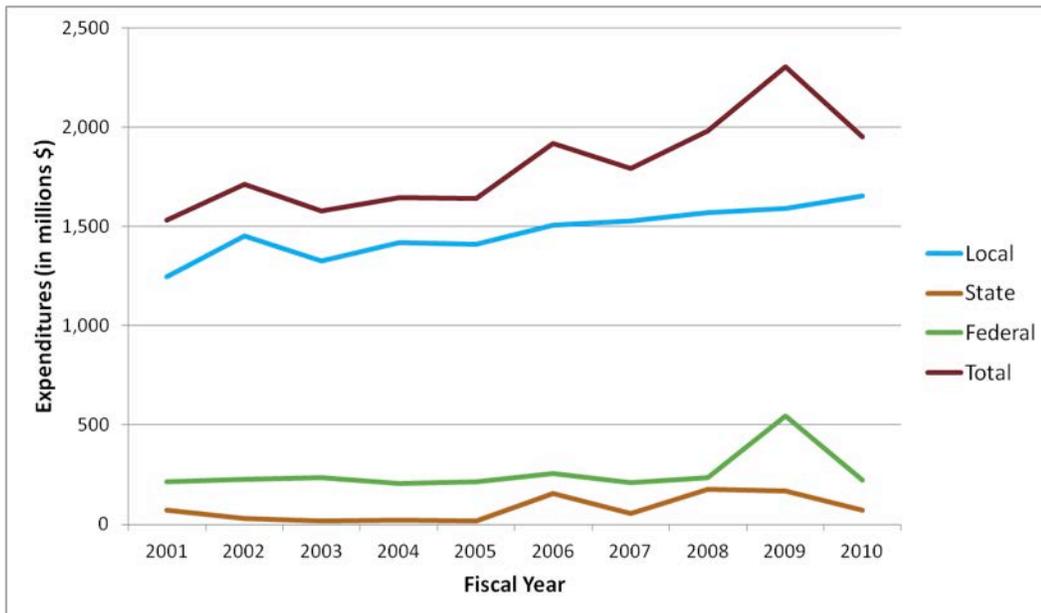


Figure I-5. Total Annual O&M Expenditures on Flood Management by Entity in California, 2000-2010

Source: SCO, 2013a, 2013b, 2013c, 2013d; Reclamation, 2012; FEMA, 2013

Capital expenditures were approximately \$11 billion for the 2000-2010 timeframe. These expenditures ranged from a low of almost \$784 million in 2003 to a high of almost \$1.64 billion in 2009. Also, local capital expenditures for flood management projects during this period increased in the years after September 11, 2001, due to increased homeland security spending. In 2005, capital expenditures increased due to the passage of Proposition 50 (2004) and due to an infusion of planning funding. In 2007, O&M expenditures increased as a result of Proposition 1E (2006). Both

capital expenditures and O&M were highest in 2008/2009 due to the infusion of Federal funding from ARRA and from California bond monies, as shown in Figures I-4 and I-5.

O&M costs ranged from a low of \$1.5 billion in 2001 to a high of over \$2.27 billion in 2009. O&M accounts for the largest proportion of flood management expenditures in the state. Capital expenditures increased following Proposition 13 (2000), AB 142 (2005-2006), and Propositions 1E (2006) and 84 (2006). O&M expenditures follow similar general trends.

2.4 Federal Expenditures on Flood Management

Flood management efforts have had Federal involvement beginning with the Alexander Commission in the 1870s and funding appropriations since the Flood Control Act of 1928. The USACE has been the primary Federal agency to administer funds for flood projects in California. The Water Resource Development Acts (WRDA) authorize the Secretary of the Army to study and/or implement various projects and programs for improvements and other purposes to rivers and harbors of the United States. A number of WRDAs contain general environmental provisions pertinent to the Civil Works water resources development program or to the management of environmental resources (Public Law [PL] 94-587, PL 99-662, PL 101-640, PL 102-580). WRDA 1986 addressed cost-sharing and crediting requirements for Federal projects and authorized hundreds of projects. Executive Order 11988 requires Federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever a practicable alternative exists (FEMA, 2013). FEMA, Reclamation, and NRCS also sponsor efforts in California related to flood management. Funding from Federal agencies is based on receiving funding as part of the Federal appropriations process. This section of the TM outlines key historical Federal funding of flood management, provides an overview of the Federal appropriations process, and summarizes flood management appropriations by Federal agency for 2000 through 2010.

2.4.1 Partial History of Federal Interest in Flood Management

Historically, levees were used to control flows in flood-prone deltas, which allowed agricultural and urban areas to thrive. Federal interest in flood management coincided with development of communities in floodplains (in the early 1900s, for example, as settlements flourished along the Mississippi River). A series of laws and policies followed, including the birth of agencies such as Reclamation, among others (Wright, 2000). Key events that have impacted flood management funding in California include the following:

- **The Federal Flood Control Act.** This act, which was passed in 1917, was the first Federal flood control act. The act specifically allotted \$5.6 million for a long-range and comprehensive program of flood management (including bypasses) on the Sacramento River. This was followed by similar acts and amendments in subsequent years, which guided the focus of flood management in the United States.
- **The Flood Control Act of 1936.** This act required non-Federal interests to pay the costs of rights-of-way and relocations for channel improvements and levee projects.
- **The Flood Control Act of 1938.** This act authorized civil engineering projects by USACE and other Federal agencies, including dams, dikes, levees, and other structural measures.
- **The Flood Control Act of 1944.** This act authorized the USACE to study and construct a number of dam and river projects in the United States, and authorized the Small Watershed Program.
- **The Flood Control Act of 1946.** This act authorized the USACE to construct a number of flood control projects in the United States.
- **The Watershed Protection and Flood Prevention Act of 1954.** This act sought to reduce flood damage through cooperation of local, State, and Federal governments. The act specifies a limit on the size of the watershed protected, amount of flood retention allowed, and the cost of the project.
- **The Flood Insurance Act of 1956.** This act established the first Federal flood insurance program; however, no program was ever established and no appropriations were made to fund the program.
- **The National Flood Insurance Act of 1968.** This act created the National Flood Insurance Program (NFIP) in the United States, which remains in effect today as the only public form of flood insurance available to homeowners. California State Water Code (CWC) section 8400, "Flood Hazard," requires that relevant local governments participate in the NFIP to receive disaster aid after flooding. Today, several cities and only one county in California, the County of Mariposa, do not participate in the NFIP.
- **Water Resources Development Act.** The original WRDA 1974 amended the Flood Control Act of 1954 and authorized USACE to undertake the design, construction, repair, improvement, and modification of specified public works on rivers and harbors for navigation, flood control, and other enumerated purposes. WRDA 1974 was amended in 1976, 1986, 1988, 1990, 1992, 1996, 1999, 2000, and 2007. WRDA 1986 established cost-sharing formulas for projects funded under the act. It also directed USACE to issue guidelines for crediting against the non-Federal share of project costs for flood control in any compatible work carried out by local interests. WRDA 1990 amends the act to include preservation and enhancement of the environment. Subsequent amendments changed cost-sharing requirements, provided project funding, and modified what types of projects could be undertaken as part of this act.

- **Executive Order 12127.**
 - This executive order established the Federal Emergency Management Agency in 1979. FEMA was established, and the NFIP was transferred to be under FEMA control.
 - In 2003, FEMA was transferred to the Department of Homeland Security as part of the Federal agency reorganization after the September 11, 2001, terrorist attacks. This reorganization corresponded to an increase in security funds for all aspects of emergency management, including flood management.
- **Executive Order 11988**
 - This executive order requires Federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.
 - The act requires that each agency shall provide leadership and take action to reduce the risk of flood loss; to minimize the impact of floods on human safety, health, and welfare; and to restore and preserve the natural and beneficial values served by floodplains in carrying out agency responsibilities for the following actions:
 - Acquiring, managing, and disposing of Federal lands and facilities
 - Providing Federally undertaken, financed, or assisted construction and improvements
 - Conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulation, and licensing activities (FEMA, 2013)
- **The American Recovery and Reinvestment Act of 2009.** ARRA included more than \$700 billion in funds to stimulate the U.S. economy. A portion of ARRA funding was for projects funded under the USACE, Reclamation, and FEMA.

An **expenditure** is a charge with an actual amount at the time services are rendered, goods are received, or cash is paid.

An **appropriation** is a legislative action authorizing an expenditure for a specific purpose and a specific amount.

2.4.2 Past Federal Expenditures

Federal expenditures from 2000 through 2010 ranged from a low of \$370 million in 2004 to a high of more than \$1 billion in 2009. A majority of this funding comes through the USACE for project-specific efforts. FEMA, Reclamation, and NRCS also have provided funding for flood management.

USACE Expenditures on Flood Management

The USACE has been an important force in implementing flood management projects across California. In fact, most major flood management projects that have been implemented have been projects in which USACE was a partner. Hundreds of projects have been cost-shared by the USACE in California. Also, DWR and the USACE have partnered with local agencies on projects in the Central Valley. This includes work on the State and Federal flood control system within the Central Valley.

Figure I-6 illustrates flood management funding by the USACE and includes funds that USACE received for planning studies, construction, and O&M for the Flood Management business line for FYs 2001 through 2010. USACE funding has ranged from approximately \$310 million to approximately \$970 million per year between 2000 and 2010. These numbers represent funding for studies, construction, and O&M for flood management. Expenditures for 2007 are work plan numbers because a Federal budget, which would include official budget numbers, was not passed by Congress. The spike in USACE funding in FY 2009 is attributable to the passage of ARRA by Congress, which funded a number of specific projects in California. Examples include Guadalupe River Project (USACE), Santa Maria River Levee Improvement Project and the Napa River Flood Control Project. These expenditures reflect funds spent by USACE but do not include project cost-shares by local and State agency cosponsors. In addition, costs were split 50 percent for capital and 50 percent for O&M.

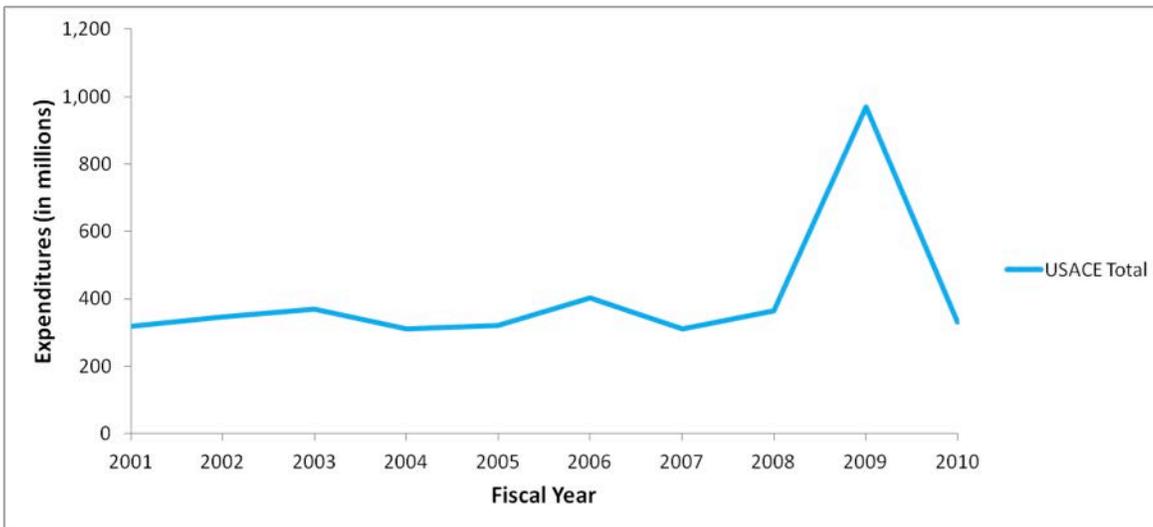


Figure I-6. USACE Expenditures on Flood Management in California

Source: USACE, 2012a

FEMA Expenditures on Flood Management

FEMA is the disaster response agency of the Federal government. As such, FEMA provides State and local governments with funding for emergency preparedness programs in the form of Non-Disaster Grants. These funds are used to enhance the capacity of State and local emergency responders to prevent, respond to, and recover from a natural or man-made emergency. FEMA programs provide assistance for issues related to flood management, including the Emergency Management Performance Grants Program and the Buffer Zone Protection Program. These grants help fund planning efforts. FEMA also has disaster assistance and grants available for emergency operations centers.

FEMA data were collected from the Department of Homeland Security website (DHS, 2012; GPO, 2012). These data were not available in an aggregated form at the State level after 2003, so the data summarized represent total expenditures across the United States. FEMA expenditures that related to flood management fit under three categories—flood mapping, flood insurance programs, and flood mitigation

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grants. Table I-1 shows the FEMA expenditures in each of these categories. Before 2003, FEMA was an independent agency and reported State-level expenditures. For FY 2001/2003, both U.S. total and California-specific expenditures are available, and this proportion was used to estimate the proportion of expenditures in California, approximately 14 percent. The California-specific expenditures also were used to split cost between capital and O&M. This was accomplished by using the ratio of emergency management (34 percent of total expenditures) and funding for emergency housing and shelter (66 percent of total expenditures) to develop the split between O&M (66 percent) and capital (34 percent).

Table I-1. FEMA Flood Expenditures—United States (total)*

Type	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Flood Mapping	21.7	37.7	345.5	226.3	219.4	213.3	207.6	224.7	222.1	220
Flood Insurance Program	2,556.8	1,811.2	2,060.1	2,123.1	2,266.0	2,735.9	2,846.8	3,006.9	3,223.5	3,231
Flood Mitigation	24.1	23.6	23.0	22.6	78.1	30.2	32.3	—	—	—
ARRA Funding	—	—	—	—	—	—	—	—	615.7	—
Total	2,603	1,873	2,429	2,372	2,564	2,979	3,087	3,197	4,061	3,451

*\$ million

Note: Discretionary funding was appropriated for the flood mitigation program in 2008 and 2009.

Source: DHS, 2012

Table I-1 shows the time-series chart of expenditures by source for total FEMA expenditures across the United States. Expenditures in California account for approximately 13 percent in any given year. Over these years, U.S. total expenditures averaged \$194 million, \$2,586 million, and \$20 million per year for flood mapping, flood insurance, and flood mitigation, respectively. Flood mapping expenditures increased from approximately \$38 million in FY 2002 to more than \$340 million in FY 2003 when funding was initially appropriated for map modernization under the National Flood Insurance Reform Act of 1994. Flood insurance expenditures increased from approximately \$2.5 billion per year in FY 2001 to more than \$3.2 billion per year in FY 2010. This trend was driven by flooding and other damage caused by severe storm events, including hurricanes and heavy rains/wind storms. Flood mitigation expenditures have remained relatively flat, except for a spike in FY 2005 when the program began placing additional emphasis on reducing repetitive losses. Repetitive losses are defined by FEMA as losses at an NFIP-insured property that has incurred flood losses conforming to one of the following criteria:

- Four or more flood insurance claim payments that each exceeded \$5,000, with at least two of those payments occurring in a 10-year period, and with the total claims paid exceeding \$20,000
- Two or more flood insurance claims payments that together exceeded the value of the property

The Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 amended section 1323 of the National Flood Insurance Act of 1968 to provide funding to reduce or eliminate the long-term risk of flood damage to structures insured under NFIP for properties that had one or more claim payment(s) for flood damages.

U.S. Bureau of Reclamation Expenditures on Flood Management

Reclamation’s primary responsibility is to manage, develop, and protect water and related resources in an environmentally and economically sound manner. Reclamation was responsible for the development of a number of canals, dams, and reservoirs in California, and as a result, Reclamation has become responsible for water and flood management in parts of California. Reclamation’s primary responsibility is not flood management, but it manages resources that are part of flood management systems.

Reclamation has two regional offices that are responsible for projects in California—the Mid-Pacific Region, which is responsible for projects in northern California, and the Lower-Colorado Region, which is responsible for projects in southern California. Data for expenditures from these Reclamation regions were collected and analyzed for flood management projects (Reclamation, 2012).

Figure I-7 presents a summary of total expenditures on flood management by both Reclamation regional offices. No capital or nonoperating cost data were available for the 2000-2010 period because no new projects for flood management were underway; therefore, Figure I-7 shows only operating costs. As shown, expenditures were relatively flat over the last 10 years. Flood management expenditures by Reclamation ranged from approximately \$25 million in FY 2005 to more than \$31 million in 2005. Average annual flood management expenditures were approximately \$29 million per year.

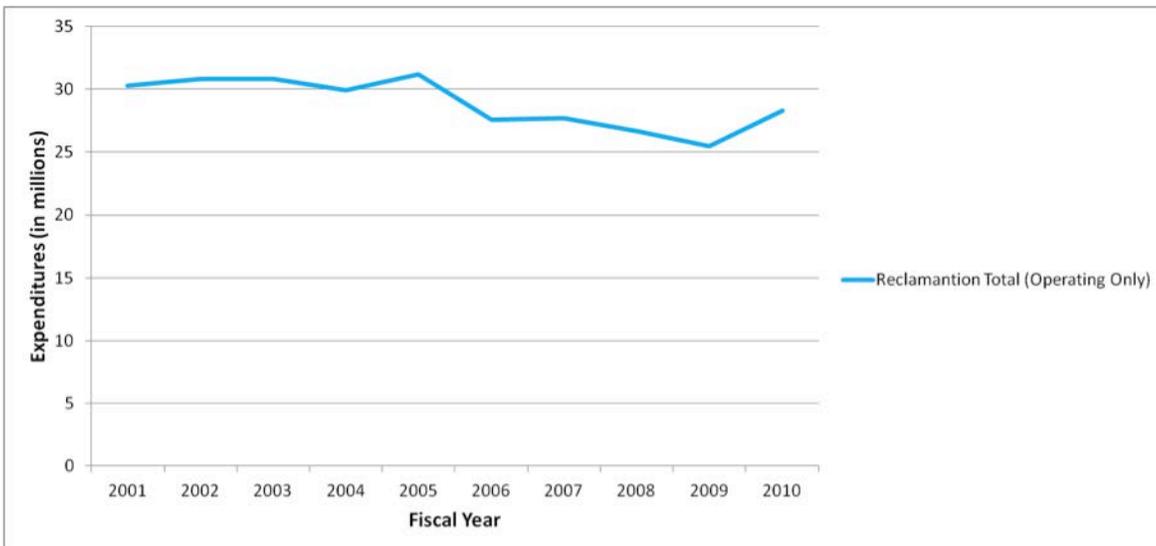


Figure I-7. U.S. Bureau of Reclamation Expenditures on Flood Management, Lower Colorado and Mid-Pacific Regions (in \$millions)

Source: Reclamation, 2012

Natural Resources Conservation Service Expenditures on Flood Management

The NRCS provides funds for flood management projects under two programs:

- Small Watershed Program in California
- Emergency Watershed Protection (EWP) Program

The Small Watershed Program in California assists local agencies in conducting watershed surveys and investigations, as well as in installing structural and land treatment measures for watershed protection. The program is limited to watersheds of 250,000 acres and smaller in California. This program was authorized by Congress as part of the Flood Control Act of 1944, to assist 11 watersheds, 2 of which were in California (the Los Angeles River and the Santa Ynez River), but it has subsequently been expanded to include all of the nation's watersheds. The Small Watershed Program has three purposes (NRCS, 2012a):

- Prevent damage from erosion, floodwater, and sediment
- Further the conservation, development, utilization, and disposal of water
- Further the conservation and proper utilization of land

The Small Watershed Program has not received funding for any new watershed plans, and no projects were funded in 2011 and 2012 (NRCS, 2012b).

The EWP Program was developed to help communities reduce imminent hazards to life and property caused by floods, fire, drought, earthquake, windstorms, and other natural disasters. This program provides two types of assistance:

- Exigency – A situation where an imminent threat exists to life and property that requires a Federal action (work should be completed immediately)
- Non-exigency – A threat exists to life or property that is high enough to constitute an emergency but is not urgent and compelling (work does not require immediate action but should be completed as soon as possible)

Under the EWP, the NRCS shares up to 75 percent of the project cost, with the remainder coming from a local partner. The NRCS can fund debris removal, stream channel clearing, repair of eroding stream banks, repair of levees or other structures, and reseeded of damaged areas. These funds cannot be used for O&M work or repair of transportation facilities. No historical data were available for this program, but the FY 2012 budget for the EWP Program in California is \$240,000 (NRCS, 2012c).

2.5 State Flood Management Expenditures

Available State funding for flood management over the past 10 years has been dependent upon legislation, bond funding, and other State initiatives as the primary source of funding. Flood management is the purview of DWR and CalEMA. DWR and the Central Valley Flood Protection Board (CVFPB) have had primary flood management responsibility in the SPFC area of the Central Valley and portions of the Sacramento-San Joaquin River Delta (Delta). DWR also has supported flood management statewide through a number of programs, including subventions funding, flood emergency management planning, and other project and planning funding mechanisms. CalEMA flood management responsibility is primarily related to emergency management activities.

2.5.1 Recent California Legislation and Bonds

Propositions

Key events, including the passage of Propositions 1E (2006) and 84 (2006), have influenced the recent availability of flood management funding in California. Important events have occurred, and pieces of legislation and bond funding have been issued to support flood management in California, including the following:

- **Proposition 204, the Bonds for Water Projects Act of 1996.** Proposition 2004 (1996) authorized \$995 million in general obligation (GO) bonds for flood management and protection of the San Francisco Bay/Sacramento-San Joaquin River Delta (Bay Delta) Region.
- **Proposition 12, the Safe Neighborhood Parks, Clean Water, Clean Air and Coastal Protection Bond Act of 2000.** Proposition 12 (2000) authorized the State to sell \$2.1 billion in GO bonds for use in local assistance grants.
- **Proposition 13, the 2000 Water Bond.** Proposition 13 (2000) authorized the State to sell \$1.97 billion in GO bonds to support safe drinking water, water quality, flood management, and water reliability projects. The Flood Protection Corridor Program (FPCP) was established when California voters passed Proposition 13 (the "Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Act") in March of 2000. This proposition provided funding for nonstructural flood management projects that include wildlife habitat enhancement and/or agricultural land preservation. Additional funding for these purposes was established under Proposition 84 (2006) and Proposition 1E (2006).
- **Proposition 40, the California Clean Water, Clean Air, Safe Neighborhood Parks, and Coastal Protection Act of 2002.** Proposition 40 (2002) authorized the State to sell \$2.6 billion in GO bonds for conservation and protection of parks, coastline, and watersheds.
- **Proposition 50, the 2002 Bonds for Water Projects Act.** Proposition 50 (2004) authorized the State to sell \$3.4 billion in GO bonds. Proposition 50 (2004) included \$825 million in funding for surface water storage, storage studies, water conveyance, levee improvements, supply reliability projects, ecosystem restoration, watershed programs, conservation, and water recycling. Part of the funding was earmarked for the agency known as the Collaboration among State and Federal Agencies to Improve California's Water Supply, or simply CALFED. CALFED was established in 1994, consisting of 12 State and 13 Federal agencies that focus on reliability and quality of water in the Delta. Historically, funding for CALFED has been a 60/40 percent split, with 60 percent coming from the State and 40 percent from Federal sources.

Authorized funds.

Those funds given the force of law by statute.

Encumbered (committed) funds.

Those funds that have been allocated for a specific purpose.

Expended funds.

Those funds that have already been spent.

- Proposition 1E, the Disaster Preparedness and Flood Prevention Bond Act of 2006.** Proposition 1E (2006) originated as AB 140 (2005-2006) and authorized the State to sell \$4.09 billion in GO bonds for flood management plus additional funding for other water projects.

Some key allocations of funds from Proposition 1E (2006) include \$211 million to four levee improvement projects:

 - Sacramento Flood Control Agency Natomas Levee Improvement Program (\$49 million)
 - Levee District No. 1 in Sutter County Lower Feather River Setback Levee at Star Bend (\$16.3 million)
 - Reclamation District (RD) 2103 Wheatland Bear River North Levee Rehabilitation Project (\$7.4 million)
 - Three Rivers Levee Improvement Authority Feather River Setback Levee (\$138.5 million)
- Proposition 84, the Safe Drinking Water Bond Act of 2006.** This proposition authorized \$5.4 billion in GO bonds for natural resource projects, including \$800 million for flood management and \$65 million for water planning and design. Approximately \$4.4 billion of Proposition 84 (2006) funds have been committed (State of California, 2010).
- AB 142 (Nunez).** AB 142 (2005-2006) provided an appropriation of \$500 million from the General Fund for flood preparedness and repair of critical levees in May 2006. This followed an Executive Order by the governor declaring a State of Emergency based on USACE’s findings of degradations within the California levee system.

State GO Bonds

State GO bonds have become an important source of water and flood management funding. Table I-2 shows total authorized State GO bonds as of 2005 and 2011. In 1999 total water bonds were \$3.8 billion, accounting for approximately 10 percent of total authorized State bonds. This increased to \$22.9 billion by 2011 or 18 percent of total authorized bonds, largely due to Propositions 1E (2006) and 84 (2006). Current GO bonds will be fully allocated by the year 2018.

Table I-2. Total Authorized GO Bond Debt in California*

Category	1999	2005	2011
Miscellaneous	1.7	2.5	3.3
Correctional	4.1	4.1	2.8
Total Water Bonds	3.8	14.0	22.9
Transportation	5.6	7.2	40.0
Education	22.4	51.1	58.6
Total	37.7	78.9	127.6
Per Capita	1,127.2	2,191.9	3,407.9

*\$ billion

Source: State of California, 2010

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Only a small portion of total bond funds is for flood management funding statewide. Proposition 84 (2006) allocates 14.8 percent or \$800 million for flood management, and Proposition 1E (2006) allocated almost 100 percent of the funds for flood management. The remaining funds for these bonds are expected to be depleted by 2017.

Figure I-8 shows that funding for IWM has gradually increased as a portion of total bond funding. In 1999, IWM accounted for only 10 percent of the total. This increased to 18 percent by 2011. This increase was due to the State's shift in focus to approach projects using a more holistically multi-objective approach. IWM is a strategic approach that combines specific flood management, water supply, and ecosystem actions to deliver multiple benefits. An IWM approach promotes system flexibility and resiliency to accommodate changing conditions such as regional preferences, ecosystem needs, climate change, flood or drought events, and financing capabilities. DWR and USACE are committed to using this approach; therefore, future funding will likely be linked to IWM.

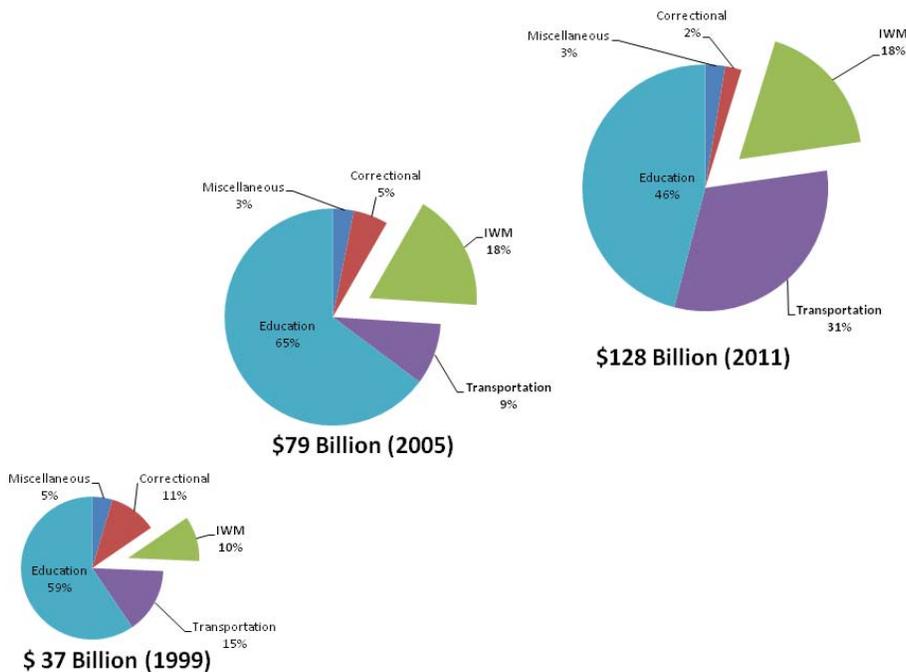


Figure I-8. Total Authorized General Obligation Bond Debt of the State of California

Source: State of California, 2010

Figure I-9 illustrates the time series of outstanding GO bond funding for water-related activities, including flood management. Annual debt service for outstanding water bonds is approaching \$80 per household because water bonds make up a larger proportion of flood and water funding. Total State annual debt service is \$365 per household (DOF, 2012). Authorized GO bonds and Federal funding accounted for approximately two-thirds of total water management expenditures in FY 2012. State bonds have provided a significant source of water and flood

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management funding in California in recent years as Federal and local expenditures decreased.

With waning local and Federal investment in flood management and a questionable climate for new GO bonds, it becomes increasingly important for the State to secure sufficient and stable funding mechanisms to reduce flood risk. If additional bonds supporting IWM or other water management components are considered, the significant flood risk in California should be taken into account.

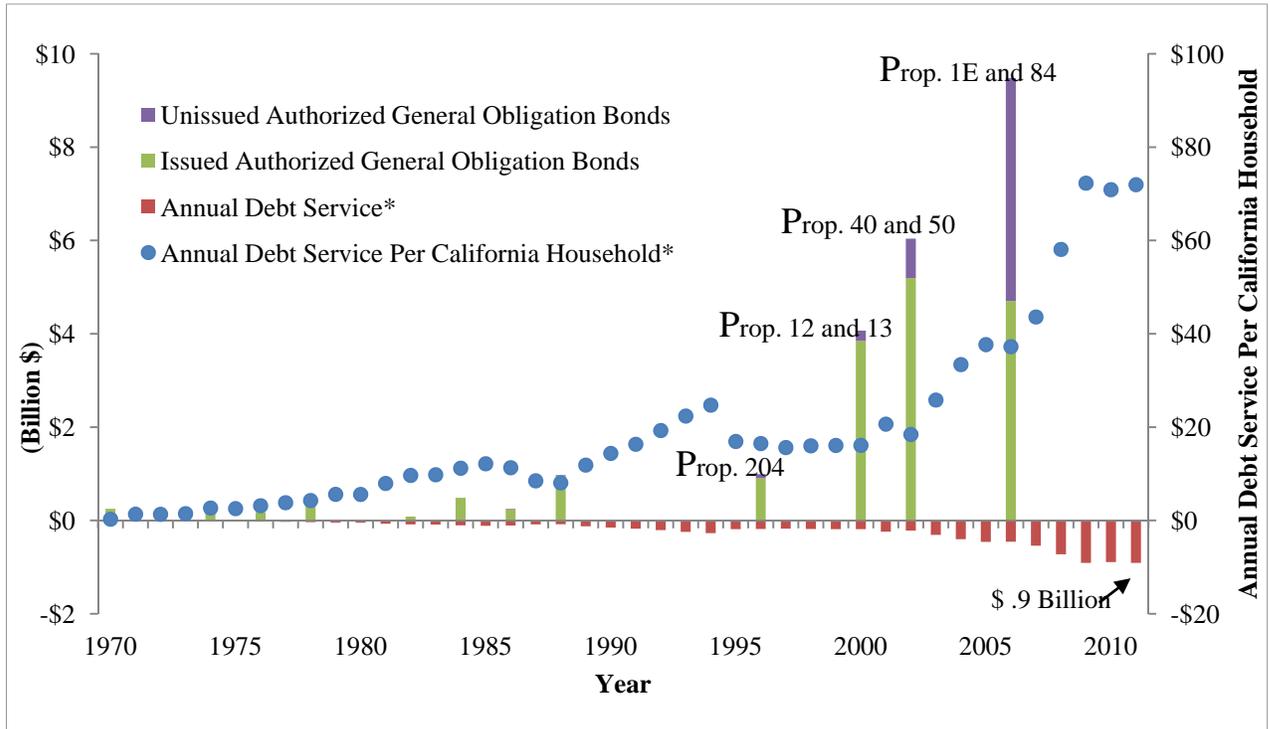


Figure I-9. General Obligation Water Bond History, 1970-2012

Figure note: Debt service is applicable to issued GO bonds only.

Source: DOF, 2012

2.5.2 Ongoing State-Initiated Flood Funding Programs

This section describes ongoing programs in California that are aimed at addressing flooding and funding flood management activities.

DWR Initiatives

Primarily using bond funds from Propositions 84 and 1E of 2006, DWR launched two major initiatives; bond funds were distributed to local agencies using grant funds.

- FloodSAFE Initiative.** In 2006, DWR launched the FloodSAFE Initiative, which focuses on flood prevention and public awareness of flood risk and prevention. The program provides grant funds to local agencies, and most of the funding is provided through Propositions 1E and 84 of 2006.
- Integrated Regional Water Management (IRWM).** The purpose of the IRWM program is to promote and fund projects that cross jurisdictional, watershed, and political boundaries; involving multiple agencies, stakeholders, individuals, and groups; and projects that attempt to address the issues and differing perspectives of all the entities involved through

mutually beneficial solutions. IRWM was expanded in 2006 to include flood management and flood prevention as additional purposes to be considered when managing water resources in a region. Proposition 84 (2006) and Proposition 1E (2006) included money for stormwater flood management, and IRWM developed grant programs for stormwater flood management.

Flood Funding in the Delta

The Delta was reclaimed by reclamation districts (public agencies representing the interests of the owners of the Delta islands) by building and maintaining the existing levee system. These RDs continue to work on the levees to protect assets on the islands. The State recognized that many of the assets protected by the Delta levees are of significant State interest. The levees are part of the infrastructure that conveys water across the Delta to the export pumps, and the levees protect other local and extended benefits. The Legislature provided authorization in 1973, for the State to provide funding to RDs to improve levee maintenance. The State makes investments in this maintenance through DWR's FloodSAFE Environmental Stewardship and Statewide Resources Office's (FESSRO) Delta Levee Maintenance Subventions (Subventions) Program. Levee upgrades can be funded under Subventions—indeed, it is the only State-supported mechanism available to most Delta islands. After FY 2008/2009, local agencies in the Delta can now compete for funds to upgrade their levees under the Special Projects Program. However, these funds are available only to protect discrete and identifiable public benefits.

Provisions of the Delta Subventions Program

The stated intent of the Legislature for the Subventions Program, per CWC section 12981, is to preserve the Delta essentially in its present form, although legislation recognizes that it might not be economically justifiable to maintain all Delta islands. The Subventions Program has been DWR's primary tool available to reclamation districts and other eligible levee maintaining agencies to minimize the risk of Delta levee failure. Each year's program is available to all eligible Delta public agencies. DWR has established Guidelines and Priorities (CVFPB, 2011) and specified eligible costs for this program, including environmental mitigation and enhancement. While the Subventions Program is primarily for nonproject levees, some project levees qualify for the program. Project levees are currently eligible for funding from the Subventions Program as long as more than 50 percent (a majority) of the island acreage is within the Delta primary zone. In the secondary zone, project levees are not eligible for Subvention Program funding. Maintenance of project levees that are not eligible for subventions continues through the efforts of reclamation and levee districts. Portions of project levees (such as Maintenance Area 9 along the Sacramento River) in the Delta and certain SPFC channels (CWC § 8361) will continue to be maintained by DWR. DWR's current administrative provisions are outlined in Procedures and Criteria (DWR, 2012a).

Prioritization of Funds

If, in any year, the total eligible costs incurred exceed the State funds available, the CVFPB will apportion the funds among those levees, or levee segments, identified by DWR as being most critical and beneficial for flood control, water quality,

A **subvention** is an amount of funding or money granted to an agency or nonprofit organization for a service based on an allocation formula.

recreation, or wildlife, in accordance with the following funding prioritization method:

- The first priority for funding is for levee maintenance, fish and wildlife, and rehabilitation up to the standards outlined in DWR Bulletin 192-82 (for geometry) associated with the existing land use at the time Senate Bill (SB) 34 (2011-2012) was signed into law.
- If available funds are sufficient to fully fund work described above for the first priority, full reimbursement of claims will be made. When claims exceed available funds, full reimbursement of each claim will be made according to the categories listed below (in the order listed) until insufficient funds are available to fund a category. The claims in this latter category will be paid on a pro-rata basis. Claims in lower categories will not be paid.
 - Category 1: CVFPB-mandated top priority funding items.
 - Category 2: Plans that make special provisions for protection or enhancement of fish and wildlife habitat, recreation opportunities, or land use changes to reduce land subsidence or erosion. These provisions must be coordinated with DWR and/or the California Department of Fish and Wildlife (CDFW).
 - Category 3: Plans based on meeting the Short-Term Hazard Mitigation Standards.
 - Category 4: Plans based on complying with Bulletin 192-82 standards or PL 84-99 standards.
- The second priority for funding is for portions of an individual district's fiscal year work in excess of an average of \$100,000 per mile of all nonproject and eligible project levees.
- The third priority for funding is for reimbursement of work in excess of Bulletin 192-82 standards.

Local Participation

The State has a significant interest in many Delta levees and contributes up to 75 percent of the qualifying costs for maintenance and improvement of the system. However, the actual work of maintaining and improving the levee is performed by the local agency. This system of working through the reclamation districts uses local knowledge of levee conditions, local administrative processes, and local labor and equipment to maintain the levees. State direct investment in nonproject levees began with the Delta Levees Maintenance Subvention Program in 1973.

Delta Levees Special Projects Program

The Delta Levee Special Flood Control Projects Program, managed by DWR's FESSRO, was initiated in 1988 to address flood problems on islands of special State interest. It is detailed in CWC sections 12310–12318. Until FY 2007/2008, the funding for Special Projects was focused on the legislated scope of levee work on eight western Delta islands and the towns of Thornton and Walnut Grove, although authorization has been available since 1996 to extend Special Projects funding to other Delta islands and to 12 miles of Suisun Marsh levees bordering northern Suisun Bay from Van Sickle Island west to Montezuma Slough. With the availability

of bond funding from Propositions 84 and 1E of 2006, that broader scope is being implemented. Any local public agency that manages eligible project or nonproject levees in the Primary Zone or nonproject levees in the Secondary Zone is eligible to apply for Special Project funding. Special Project grant applications are received in response to Project Solicitation Packages (PSPs), released in accordance with the *Delta Levees Special Flood Control Projects Final Near-Term Guidelines for Providing Funding to Local Public Agencies* (DWR, 2010), periodically offered by DWR to accomplish specific objectives of the department as discussed in the *Framework for DWR Investments in Delta Integrated Flood Management* (DWR, 2011a).

Flood Control Subventions

The DWR Flood Control Subventions Section and the CVFPB (formerly Reclamation Board) provide financial assistance to local agencies cooperating in the construction of Federally authorized flood control projects. The CVFPB administers the State financial assistance for major USACE projects in the Central Valley related to the SPFC, and the Flood Control Subventions Section is responsible for disbursing funds for all other State-authorized projects.

The Flood Control Act of 1936, which authorized the Federal government to construct levees, reservoirs, and other flood management facilities, required non-Federal interests to pay the costs of rights-of-way and relocations for channel improvements and levee projects. State law enacted in 1945 provides for reimbursements to local flood control agencies for all rights-of-way and relocation costs of channel improvement and levee projects. In 1973, the State statute was changed to one of State-local cost-sharing for flood damage prevention features of channel improvement and levee projects. State participation in the non-Federal capital costs of recreation with fish and wildlife enhancement features was added to the program in 1973. In 1988, the State statute was modified to reflect the 1986 changes in cost-sharing requirements in the Water Resources Development Act (WRDA). In 2000, the State statute was amended. The statute now requires flood management projects to comply with prescribed requirements prior to State authorization, and it creates a variable State cost-share percentage based on multipurpose objectives for the projects, ranging from a minimum of 50 percent to a maximum of 70 percent (DWR, 2012b).

Several types of projects are eligible for subventions funding, including:

- Major Flood Control Projects - These are major USACE projects, specifically authorized by Congress. Federal authorization is done through a variety of authorization mechanisms such as appropriations, omnibus bills, the WRDA, as well as others. These major USACE projects also must be specifically authorized by the California Legislature for allocation of State funds.
- Small Flood Control Projects - Public Law 80-858, 1948 Flood Control Act, Section 205 authorizes small USACE projects. State authority to partner in execution of small USACE projects is pursuant to California Water Code Section 12750 and are subject to state requirements for allocation of State funds
- Watershed Protection Projects - These are NRCS watershed protection projects that are authorized by the Administrator of the NRCS after the

reports are reviewed by the Agriculture Committees of Congress. These watershed protection projects are authorized by CWC section 12868 and are subject to completion of specified administrative actions and to findings by DWR.

AB 1147 (1999-2000) prescribed new requirements for projects authorized after January 1, 2002. AB 1147, chapter 1071 requires a flood management project that receives financial assistance under the State Water Resources Law of 1975 or the Flood Control Law of 1946 to meet prescribed requirements prior to State authorization. The following requirements must be in compliance before State funds are authorized:

- The project shall qualify for Federal financial assistance and shall be Federally authorized.
- The total annual benefit of providing flood damage protection shall exceed the annual cost of the project allocable to flood management (benefit-to-cost ratio [B/C] greater than 1 for project's flood control component).
- The local agency shall prepare a Floodplain Management Plan designed to reduce the impact of future floods within 1 year after signing a project cooperation agreement for construction. This Floodplain Management Plan must be implemented no later than 1 year after completion of the project. Also, all communities benefiting from the project shall have a floodplain ordinance consistent with the NFIP model floodplain ordinance.
- The project shall avoid, minimize, or mitigate impacts to environmental and recreational values.
- The project planning documents shall include an evaluation of opportunities to include multipurpose objectives.

Flood Protection Corridor Program

The FPCP was established when California voters passed Proposition 13, the Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Act, in March of 2000. This proposition provided funding for flood management projects that include wildlife habitat enhancement and/or agricultural land preservation. This funding was first made available to local agencies for direct expenditure projects during FY 2001/2002, followed by a competitive solicitation for grant-funded project proposals in FY 2002/2003.

Proposition 84, the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Bond Act of 2006, provides renewed funding for the FPCP. Proposition 84 (2006) provides the sum of \$40 million to be made available to continue the FPCP (Chapter 3, 75032.5).

Proposition 1E, the Disaster Preparedness and Flood Prevention Bond Act of 2006 (California Public Resources Code § 5096.800 *et seq.*), provides \$38 million additional funds for regular activities of FPCP, as well as funding for constructing new levees necessary for the establishment of a flood management corridor or bypass and relocating or floodproofing structures necessary for the establishment of a flood management corridor (DWR, 2012c).

The following points summarize grant funding to date under this program:

- 2001-2002 funding cycle: \$27 million for direct expenditure projects (funding from Proposition 13 of 2000)
- 2002-2003 funding cycle: \$29 million for competitive grants (funding from Proposition 13 of 2000)
- 2007-2008 funding cycle: \$24 million for competitive grants (funding from Proposition 84 of 2006)
- 2011-2012 funding cycle: \$48 million for competitive grants (funding from Propositions 84 and 1E of 2006)

Flood Emergency Management in the Delta

The Delta Flood Emergency Preparedness, Response, and Recovery Program is being developed as an element under the Emergency Response functional area of FloodSAFE California. The Program's purpose is to improve DWR's preparedness for, response to, and recovery from levee failure events in the Delta. DWR has two grants under the Flood Emergency Response Projects Grant Program. DWR has made more funding available for the Flood Emergency Response Projects grants. The original amount of \$5 million has been increased to \$10 million, and the geographic scope has been modified. The Flood Emergency Response Projects – Delta Communications Equipment Grant provided \$5 million to ensure that State and local agencies have a robust regional communication system in the Delta region for effective response to high-water and flood emergencies.

Stormwater Flood Management Grants

This IRWM grant funding for flood and stormwater management is a program that distributes grant funds to local agencies for stormwater flood management. Stormwater Flood Management Grants are designed for projects that manage stormwater runoff to reduce flooding and are ready, or nearly ready, to proceed to implementation. Projects must be consistent with applicable Regional Water Quality Control Board Basin Plans, cannot be part of the State Plan of Flood Control and must yield multiple benefits that could include groundwater recharge, water quality improvements, ecosystem restoration benefits, and reduction of instream erosion and sedimentation (DWR, 2013a). IRWM planning and implementation grants are funded from proceeds of three bond initiatives:

- Proposition 50, the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002, which authorized \$500 million (CWC §§ 79560-79565) to fund competitive grants for projects consistent with an adopted IRWM plan
- Proposition 84, the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006, which authorized \$1 billion (California Public Resources Code §§ 75001–75130) for IRWM planning and implementation
- Proposition 1E, the Disaster Preparedness and Flood Prevention Bond Act of 2006, which authorized \$300 million (California Public Resources Code §§ 5096.800–5096.967) for IRWM stormwater flood management

Of the \$1.8 billion in bond funding authorized by Propositions 1E (2006), 50 (2004), and 84 (2006), \$300 million, or 17 percent, is specifically dedicated to stormwater flood management projects. To date a majority of IRWM grant funds have been directed to water supply and water quality projects. Only a small fraction of total funding has been directed to flood and stormwater management. The following sections describe IRWM grants that have been awarded through 2011 under Propositions 50 (2004) and 84 (2006).

Proposition 84 IRWM Grants

DWR has awarded IRWM grants totaling \$207 million to local agencies through 2011 (DWR, 2013b). Grant awards by project category are summarized in Table I-3.

Table I-4 shows the allocation of grant funds by major project purpose. Of the \$207 million in Proposition 84 (2006) IRWM implementation grants, about \$13 million, or 6 percent of total funding, was awarded to flood management and stormwater projects.

Table I-3. Proposition 84 Grant Awards by Project Category

Project Category	Total Funding by Project Type (\$)	% of Funding
Water Quality	38,319,761	18.5
Water Supply	33,764,247	16.3
Water Conservation	33,106,178	16.0
Water Recycling	29,942,895	14.4
Groundwater Management	29,471,514	14.2
Ecosystem Restoration	13,739,622	6.6
Watershed Protection	11,668,842	5.6
Stormwater Management	8,336,821	4.0
Flood Management	4,916,770	2.4
Unspecified	4,221,142	2.0
Total	\$207,487,792	100

Source: DWR, 2013b

Local cost match varies by grant and is not reported for individual projects within a grant. Thus, it is not possible to directly calculate local spending on grant-funded flood management projects with these data. However, across all IRWM implementation grants, the average local cost match was 88 percent. Applying this average to flood management grants implies a local match of about \$59 million and total local plus State spending on flood management projects of \$72 million.

Table I-4. Proposition 84 Grant Awards by Major Purpose

Major Purpose	Funding by Major Purpose (\$)	% of Funding
Water Supply	126,284,834	61
Water Quality	38,319,761	18
Environmental	25,408,464	12
Flood Management	13,253,591	6
Unspecified	4,221,142	2
Total	\$207,487,792	100

Source: DWR, 2013b

Proposition 50 IRWM Grants

Proposition 50 (2004) provided approximately \$380 million in funds through a competitive grants program. The IRWM grants program funds both planning and implementation projects. Through Proposition 50 (2004), DWR has awarded IRWM grants totaling \$444 million through 2011. Unfortunately, the Proposition 50 (2004) data do not disaggregate grant funding by project purpose; however, the data categorize grants by primary and secondary benefits. Table I-5 shows total grants awarded by primary benefit.

Table I-6 shows the allocation of grant funding by major purpose. However, the funding shares shown in the last column of Table I-6 provide a reasonable approximation of the allocation of grant funding by major purpose. Thus, of the \$444 million in Proposition 50 (2004) IRWM implementation grants, about \$14 million, or 3 percent of total funding, was awarded to flood management projects.

Local cost match is required to be a minimum of 25 percent of total proposal costs for planning grants and a minimum of 10 percent of total proposed costs for implementation grants (DWR and SWRCB, 2004). Across all Proposition 50 (2004) grants, the average local cost match was 83 percent. Applying this average to flood management grants implies a local match of about \$68 million and total local plus State spending on flood protection projects of \$82 million.

Table I-5. Proposition 50 Grant Awards by Primary Benefit

Primary Benefit	Value of Grants
Water Supply	115,485,599
Recycle Water	66,714,435
Groundwater Extraction	29,284,600
Groundwater Recharge	35,240,244
Groundwater Monitoring	3,778,600
Water Conservation	12,778,242
Water Quality	97,854,328
Wastewater	16,300,000
Watershed Protection	33,308,226
Habitat	30,307,311
Invasive Species	5,100,479
Flood Management	14,489,615
Total	\$460,641,679

Source: DWR and SWRCB, 2004

Table I-6. Proposition 50 Grant Awards by Major Purpose

Major Purpose	Count of Grants	Value of Grants (\$)	% of Value
Water Supply	109	263,281,720	57
Water Quality	51	114,154,328	25
Environmental	51	68,716,016	15
Flood Management	7	14,489,615	3
Total		\$460,641,679	100

Source: DWR and SWRCB, 2004

Proposition 1E Stormwater Grants

Stormwater Flood Management Grants are designed for projects that manage stormwater runoff to reduce flooding and are ready, or nearly ready, to proceed to implementation. Projects must be consistent with applicable Regional Water Quality Control Board Basin Plans, not be part of the State Plan of Flood Control, and yield multiple benefits, which might include groundwater recharge, water quality improvements, ecosystem restoration benefits, and reduction of erosion and sedimentation in streams. Applicants seeking to apply for an IRWM Stormwater Flood Management Grants will need to be engaged in the IRWM Planning process (DWR, 2013a). As of December 21, 2011, DWR has awarded more than \$177 million in grant funds throughout the state (DWR, 2011b).

2.5.3 State Expenditures on Flood Management

DWR Expenditures on Flood Management

Flood management expenditures by the State of California are primarily from the DWR. DWR historically has been focused on flood management in the Central Valley due to the Plan of Flood Control facilities along the Sacramento River and San Joaquin River. Table I-7 and Figure I-10 show DWR total expenditures on flood management (LAO, 2005; DWR, 2012d). The proportional allocation between operating and capital expenses has not been differentiated. As shown in Figure I-10, expenditures rose in FY 2001 and began to drop off through FY 2005. The spike in FY 2001 largely reflected the availability of General Fund and Proposition 13 (2000) bond money. In 2005, the State initiated a concerted effort to emphasize the importance of flood management and the need to address aging flood infrastructure in California, as detailed in the Legislative Analyst’s Office reports (LAO, 2005) and in the DWR white paper entitled *Flood Warnings: Responding to California’s Flood Crisis* (DWR, 2005). In 2006, voters approved Propositions 1E and 84, authorizing the sale of bonds to finance flood projects. As a result of the bond funding, expenditures on flood management increased in FY 2007 through FY 2009.

DWR expenditures on flood management averaged \$326 million per year between 2000 and 2010.² As mentioned previously, this included spikes in spending (to \$290 million in FY 2001), which corresponded with Propositions 12 and 13 of 2000, as well as \$616 million in 2006 in general fund appropriations through AB 142 (2005-2006). Similarly, expenditures increased to more than \$700 million in FY 2008 due to Propositions 1E and 84 of 2006. DWR expenditures were split between 80 percent of total expenditures to capital and 20 percent to O&M.

Table I-7. DWR Expenditures on Flood Management*—Flood Management (all Types)

Type	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total	126.75	290.14	123.70	68.86	80.69	72.70	654.65	224.39	740.79	700.71	302.06

*\$million

Note: FY 2006 includes \$500 million in AB 142 (2005-2006) flood management appropriations from the General Fund.

Source: LAO, 2005; DWR, 2012d

² CVFPB budget is included as part of the DWR numbers.

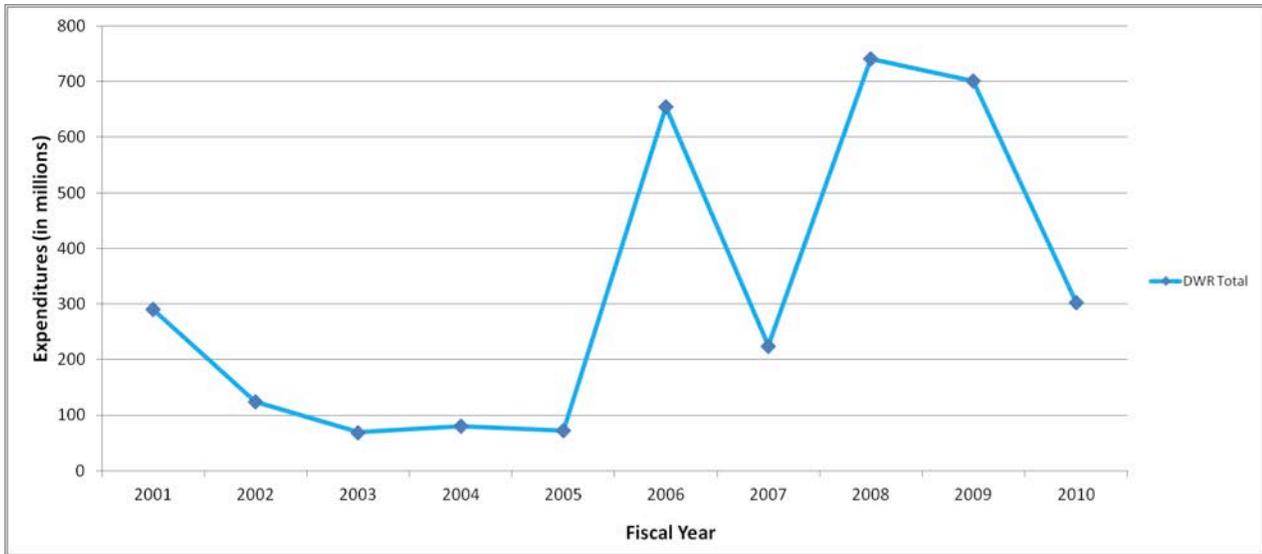


Figure I-10. DWR Expenditures on Flood Management, FY 2001 – 2010

Source: LAO, 2005; DWR, 2012d

California Emergency Management Agency

CalEMA is responsible for disaster preparedness, homeland security, disaster response, and disaster recovery in California, which includes providing to residents information about flood preparedness and available resources. CalEMA provides information and coordination with FEMA, and participates in other Federal programs, including the NFIP. In addition, CalEMA administers the FEMA grant fund programs described below. These programs receive funding on an annual basis from FEMA.

The proposed FY 2012/2013 budget eliminates CalEMA as a separate agency, making it an office that reports directly to the governor.

Pre-Disaster Mitigation Grant Program

The Federal Pre-Disaster Mitigation (PDM) Grant Program provides funds to local governments and State agencies on an annual basis for hazard mitigation planning and the implementation of mitigation projects prior to a disaster. In December 2010, CalEMA submitted 15 subapplications to FEMA for funding under the 2011 PDM Program. FEMA conducted a national review process in Washington D.C. to competitively rate applications submitted by all states and territories. The top-ranked applications were selected for further review prior to final approval and obligation of funds. In May 2011, notification was received from FEMA that the 2011 Federal allocation for the PDM Program has been substantially reduced and that four of the subapplications previously selected for further review from California had been cut from the list. As a result, CalEMA had five subapplications totaling \$6,797,680, pending further FEMA review for approval and obligation of funds. Since then, FEMA has approved four subapplications (as of March 2013). One subapplication in the amount of \$2,810,700 is still pending FEMA approval. It is the only flood control project that was selected for funding by FEMA. For the 2012 PDM Program, CalEMA received notification that 21 subapplications had been selected

for further FEMA review. Of those, 20 were subapplications to develop local hazard mitigation plans, and 1 was a flood control project in the amount of \$1,952,760. As of March 2013, the flood control project is pending FEMA review. There were no funds allocated for PDM in 2013 (DWR, 2013c).

Flood Mitigation Assistance Program

The Flood Mitigation Assistance (FMA) provides grants to assist states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP. Concurrent with the selection process for the 2012 PDM Program mentioned above, FEMA selected two flood control projects under the FMA Program for a total of \$536,638. Both projects are still under FEMA Review. There were no funds allocated for FMA in 2011 or 2013 (DWR, 2013c).

Hazard Mitigation Grant Program

The Hazard Mitigation Grant Program (HMGP) provides grants to State and local governments to implement long-term hazard mitigation measures after a major disaster declaration. California is eligible to receive HMGP funds up to 20 percent of the costs of recovery resulting from a major disaster. On May 7, 2010, President Obama signed Presidential Disaster Declaration DR-1911, declaring that a major disaster had occurred in California as a result of an earthquake that began on April 4, 2010 and continued with aftershocks for several days. The epicenter of the earthquake was just south of the Mexico-United States border, and the event was named the Baja Earthquake. As a result of the Presidential Declaration, California was eligible to submit applications for up to \$6,421,500. As of March 2013, two subapplications have been approved, and three are still pending FEMA review. One of the projects pending FEMA review is a flood control project in San Diego County in the amount of \$3,000,000.

On January 26, 2011, President Obama signed Presidential Disaster Declaration DR-1952 as a result of the 2010 severe winter storms. On August 16, 2011, FEMA sent a letter to CalEMA that \$11,149,979 was available for HMGP funding. As of March 2013, seven subapplications have been submitted for local hazard mitigation projects, including five flood control projects. All of those subapplications are still pending FEMA review.

On April 18, 2011, President Obama signed Presidential Disaster Declaration DR-1968 as a result of the tsunami waves that struck the California coastline following the earthquake in Japan. As of March 2013, four subapplications have been submitted for local hazard mitigation projects, including three flood control projects. All of those subapplications are still pending FEMA review (DWR, 2013c).

2.6 Local Agency Expenditures on Flood Management

Local governance of flood management throughout California is handled by a complex array of agencies that differ by governing authority, flooding type to

address, and geographic location of the flood. For this TM, local agency expenditures on flood management were developed using information from cities, counties, and special districts. Due to the differences among these types of agencies and within each of these categories, discussion of how specific sample agencies handle flood management funding is provided.

2.6.1 City Expenditures on Flood Management

Information for California city flood management expenditures was collected from the State Controller's Office (SCO, 2013a). Differentiating between city expenditures for flood management and storm drainage proved to be exceptionally difficult, so both are included. To obtain a useable data set for city expenditures, four categories that potentially reflect flood management expenditures were identified in city expenditure reporting documents. These categories include (1) water; (2) sewers; (3) streets, highways, and storm drains; and (4) disaster preparedness.

Review of the data revealed that water and sewer utilities data largely consisted of expenditures not directly related to flood management; therefore, these expenditures were omitted from the data. Street, highway, and storm drain expenditures were included with the caveat that a large portion of expenditures was on streets and highways, and only a portion of these costs was on flood management. For this reason, case studies of multiple cities were developed to estimate the total flood management expenditures in the category for streets, highways, and storm drains and in the category for disaster preparedness. These case studies, including the City of Los Angeles, the City of Napa, and the City of Eureka, represent cities of different sizes and geographic locations across the state.

City of Los Angeles Expenditures on Flood Management

According to data from the Office of the Controller, in FY 2009 the City of Los Angeles reported expenditures of \$520 million on streets, highways, and storm drains and \$16 million on disaster preparedness (City of Los Angeles, 2012). Los Angeles reports expenditures on flood-related items under two departments (the Bureau of Sanitation and the Emergency Management Department), different than the aggregation reported by the State Controller's Office.

The Bureau of Sanitation for the City of Los Angeles collects and disposes of city refuse and controls the discharge of wastewater, including maintenance of stormwater channels and drains. In FY 2009, the City reported total expenditures of \$267 million by the Bureau of Sanitation. This includes \$197 million in salaries and \$70 million in other expenses (\$59 million for supplies). Total expenditures in prior years ranged from \$229 million in FY 2006 to \$254 million in FY 2008.

The City of Los Angeles also provided detailed expenditures by specific tasks within the Bureau of Sanitation, including O&M of flood management facilities. In FY 2009, Los Angeles reported expenditures of \$19.8 million on O&M, which included \$9.7 million in salaries, \$1.5 million in expenses, and \$8.6 million in electricity, pension, liability, and capital finance costs, for O&M in the category of streets, highways, and storm drains.

The Emergency Management Department for the City of Los Angeles is responsible for citywide disaster preparedness activities, outreach, and financing, including securing Federal and State funding for emergency management. Flooding is a small portion of this department's budget. Total expenditures for disaster preparedness in FY 2009 were \$1.9 million, which included \$1.7 million in salaries. Expenditures for the Emergency Management Department ranged from \$1.5 million in 2006 to \$2.3 million in FY 2008. The City of Los Angeles does not report detailed expenditures by task for this department; however, funding for the department is from the General Fund (\$1.6 million) and from the Disaster Assistance Trust Fund (\$0.3 million). The latter includes provisions for spending on disaster assistance, including flooding.

Using the City of Los Angeles (FY 2009) as a case study, only 4 percent of the \$520 million budget for streets, highways, and storm drains was attributable to flood management. Specifically, the Bureau of Sanitation expenditures on flood management facilities were \$19.8 million, which was spent entirely on O&M, not capital investments. Also, the City of Los Angeles spends only a small portion of its disaster preparedness budget (total budget of \$16 million) for flood management. Only \$1.9 million was budgeted for the Emergency Management Department. The balance of disaster preparedness spending is likely spread among various departments within the City government and includes only a small portion for flood management.

City of Napa Expenditures on Flood Management

According to data from the Office of the Controller, in FY 2009, the City of Napa reported expenditures of \$20.9 million on streets, highways, and storm drains and \$0.2 million on disaster preparedness (SCO, 2013a). Expenditures in the category of streets, highways, and storm drains include \$6.4 million in operating expenses and \$14.5 million in capital outlay. The City of Napa reports expenditures on flood-related items under the Public Works Department, in addition to a separate capital outlay line item.

The core objectives of the Public Works Department are to design, construct, operate, and maintain the City's public infrastructure. This includes streets, bridges, and other city infrastructure, in addition to flood-related items. In FY 2009, the City reported total expenditures of \$8.8 million by the Public Works Department. This includes \$6.9 million from the general fund and \$1.9 million from other governmental funds.

Within the Public Works Department, the Development Engineering Division is responsible for floodplain management. This division is additionally responsible for traffic planning and operations, pollution compliance, and encroachment permits. Total expenditures by the Development Engineering Division in FY 2009 were \$1.25 million, including \$1 million in salaries and benefits and \$0.25 million in materials and services.

Within the Public Works Department, the Maintenance Division is responsible for the city storm drain system. This division is additionally responsible for streets, concrete facilities (e.g., curbs), traffic signals, street lights, and electrical systems.

Total expenditures by the Development Engineering Division in FY 2009 were \$3.5 million, including \$1.7 million in salaries and benefits and \$1.8 million in materials and services. City storm drain expenditures likely were a small portion of total expenditures within this division.

Separate from the Public Works Department, Napa reports \$13.7 million in capital projects, which includes completion of a city bridge and street resurfacing. In FY 2010 less than \$0.2 million of the capital investments was attributable to flood-related projects.

City of Eureka Expenditures on Flood Management

According to data from the Office of the Controller, in FY 2009 the City of Eureka reported expenditures of \$3.4 million for the category of streets, highways, and storm drains (SCO, 2013a). Expenditures on streets, highways, and storm drains include \$2.7 million in operating expenses and \$0.7 million in capital outlay. The City of Eureka reports expenditures on flood-related items under the Public Works Department.

The mission of the Public Works Department for the City of Eureka is to provide for the public's needs relative to water and wastewater and to maintain the harbor, as well as various recreational facilities. In FY 2009, the City reported total expenditures of \$15.8 million by the Public Works Department.

The City of Eureka reports expenditures for specific programs within the Public Works Department. Programs in which a proportion of total expenditures is related to flood management likely include stormwater, facilities operations, sewer collection, environmental programs, and equipment operations. Of the \$15.8 million in total expenditures, these programs account for \$4.4 million, or just less than 30 percent of total Public Works Department expenditures. Many of these programs likely include expenditures not related to flood control. The proportion of total expenditures attributable to flood control is likely much lower.

The City of Eureka does not report operating and capital expenses by individual programs. For the total Public Works Department expenditures, \$15.2 million is for salaries, benefits, and services, and \$0.5 million is for capital outlay. Capital outlay made up a small proportion of total expenditures in FY 2009.

Estimated City Expenditures in California

Based on the case studies, 20 percent of highway, streets, and storm drain expenditures and 12 percent of disaster preparedness expenditures were used to approximate allocations for flood management statewide by cities. Table I-8 presents a summary of flood management expenditures (capital and O&M) by cities between 2000 and 2010 based on 20 percent of the total for streets, highways, and storm drains plus 12 percent of the total for disaster preparedness. The 20 percent figure is based on the numbers from the case studies with Los Angeles at a low of 4 percent and Eureka with a high of nearly 30 percent. The Los Angeles road system is already built out, whereas other cities are still building and developing, so their costs would be greater than the 4 percent in Los Angeles. The 20 percent figure was determined to be a middle ground that could be applied across the state. The spike

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in total expenditures in FY 2002 was a result of increased homeland security expenditures. Expenditures on disaster preparedness averaged \$11 million per year, excluding the spike in FY 2002 of more than \$89 million. Total expenditures for flood management averaged \$179 million per year; however, this included an average of \$168 million per year spent on streets, highways, and storm drains.

Table I-8. Estimated City Expenditures on Flood Management, FY 2001-2010*

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Streets, Highways, Storm Drains										
Operating Expenditures	394	441	424	411	429	425	484	472	487	434
Capital Outlay	323	374	387	387	372	398	479	460	427	393
Total	718	816	811	798	801	823	963	932	914	828
Disaster Preparedness										
Operating Expenditures	14.72	89.47	8.63	9.99	8.30	7.84	15.20	8.30	4.99	8.25
Capital Outlay	0.45	0.47	0.16	0.55	2.02	3.24	5.85	2.31	1.52	7.71
Total	15.17	89.93	8.79	10.54	10.32	11.08	21.05	10.61	6.51	15.96

*\$ million

Source: SCO, 2013a

Figure I-11 illustrates total expenditures (the sum of disaster preparedness and the flood-related proportion of street, highways, and storm drains) for operating and capital outlay. As seen in this figure, expenditures for flood management have been relatively flat over the last 10 years. Two spikes have occurred, one in 2002 due to increased homeland security spending after September 11, 2001, and another in 2007 after passage of Propositions 1E and 84 in 2006.

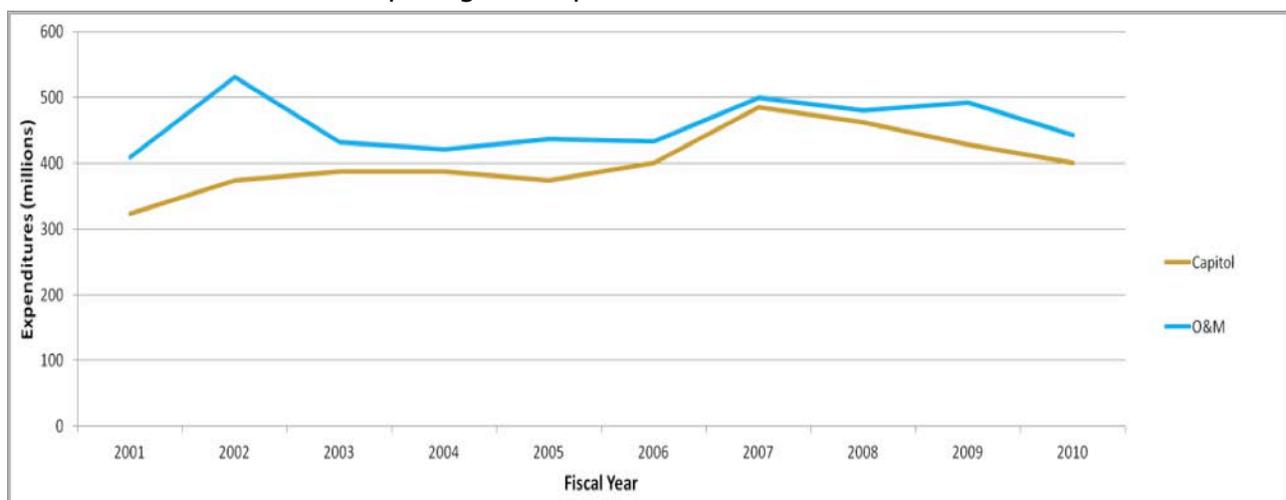


Figure I-11. Summary of Flood Management Expenditures by Cities, 1998-2010

Source: SCO, 2013a

2.6.2 County Flood Management Expenditures

Data for California county expenditures on flood management for 2000 through 2010 were collected from the State Controller's Office (SCO, 2013b). These data showed expenditures for flood management, soil, and water conservation. Total expenditures were used because a breakdown between capital and operating

expenses (or further disaggregation) was not available. Case studies for Santa Clara County and Butte County were reviewed to develop a method to disaggregate expenditures. Unfortunately, a review of these and other individual county budgets failed to identify a clear method for disaggregation. These counties were selected as case studies because their expenditures are some of the highest for flood management in the state. Expenditures for Santa Clara County, Butte County, and El Dorado County were \$1.1 million, \$2 million, and \$126.2 million in FY 2009, respectively.

Santa Clara County Expenditures on Flood Management

Santa Clara County budget data were reviewed to determine if additional disaggregation was possible (County of Santa Clara, 2013). The Office of the Controller reported that Santa Clara County spent \$1.1 million on flood management, soil, and water conservation; however, the Santa Clara County budget shows only expenditures on Public Ways and Facilities and on Public Protection. Flood management is likely a small component of this category. Expenditures for Public Ways and Facilities and for Public Protection were \$637 and \$28 million for FY 2009, respectively. This represents more than was reported in the Controller data (\$1.1 million). Furthermore, the Santa Clara County data did not distinguish between operating and capital expenditures, and consequently offered no clear method for further disaggregating the county data.

Butte County Expenditures on Flood Management

Butte County expenditures on flood management, soil, and water conservation in FY 2009 were just under \$2 million. The Butte County budget data were reviewed to determine if additional disaggregation was possible (Butte County, 2008). Butte County did not report a category for flood management, soil, and water conservation, but it did report water and resource conservation.

Butte County reported expenditures of \$2 million on water and resource conservation in FY 2009. This followed total expenditures of \$1.2 and \$0.7 million in FY 2008 and FY 2007, respectively. Of \$2 million expenditures in FY 2009, employee salaries, service and other supplies, and other charges account for \$0.5 million, \$1.5 million, and \$0.02 million, respectively. Capital expenditures on fixed assets were just over \$1,000, or less than 1 percent of total expenditures. Expenditures on fixed assets were just over \$21,000 in FY 2007. In short, almost all of the \$2 million expenditures on water and resource conservation were salaries and other operating costs. The proportion of the \$2 million in expenditures that was directly attributable to flood management could not be determined by the information collected.

El Dorado County Expenditures on Flood Management

El Dorado County budget data were reviewed to determine if additional disaggregation was possible (El Dorado County, 2012). The Office of the Controller reported that El Dorado County spent \$6.5 million in the category of flood management, soil, and water conservation in FY 2009. The El Dorado County budget shows that all of the \$6.5 million for flood management, soil, and water conservation was spent on erosion control. Erosion control might include some

flood management efforts, but El Dorado County does not report expenditures at the level of detail necessary to identify these components.

El Dorado County additionally reports aggregate expenditure data for the entire Land Use and Development Services sector. This includes erosion control in addition to a wide range of other items. Total expenditures for the sector were \$126.2 million in fiscal year 2009, which includes \$102.5 million in salaries and benefits, \$10.8 million in other charges, \$6.2 million in transfers, and \$6.7 million in fixed assets. Across the entire Land Use and Development Services sector capital outlay accounts for only 5.3 percent of total expenditures.

County Flood Management Expenditures

Figure I-12 presents a summary of total expenditures in the category of flood management, soil, and water conservation across all counties in California between 2000 and 2010. Expenditures averaged \$14.2 million per year with a high of \$21 million in FY 2002, which coincides with the spike in security and disaster preparedness spending associated with that year. The spike in expenditures also coincided with passage of Propositions 13 (2000), 40 (2002), and 50 (2004). Figure I-12 shows the impact of these propositions, with an increase of funding through 2002 and with a decline in expenditures when bond money was no longer available. Expenditures increased from 2004 through 2006 and again in 2007, which corresponds to the addition of bond funds from Propositions 1E and 84 of 2006. A ratio of 15 percent of total expenditures for capital and 85 percent for O&M was used to assign total expenditures to capital and O&M. This ratio was used to assign values for capital and O&M expenditures that are conservative estimates based on city (47/53), special district (14/86), DWR (80/20), and USACE (50/50) ratios of capital to O&M.

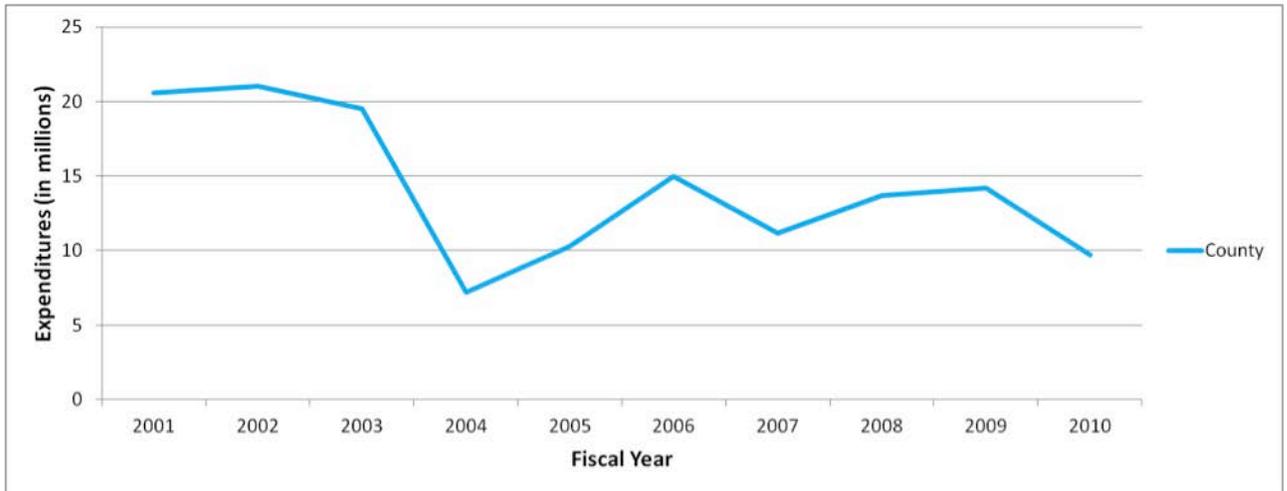


Figure I-12. Summary of Total Expenditures by Counties for Flood Management, Soil, and Water Conservation, 2000-2010

Source: SCO, 2013b

2.6.3 Special District Expenditures on Flood Management

Data on California special district expenditures for flood management were compiled from the Office of the Controller (SCO, 2013c). Reported spending on flood management and water conservation, drainage and drainage maintenance, and land reclamation and levee maintenance from 2000 to 2010 are included.

Table I-9 summarizes expenditures statewide by special districts, including flood management and water conservation, drainage and drainage maintenance, and land reclamation and levee maintenance, respectively. The data were disaggregated enough to determine expenditures on administrative costs, debt service, fixed assets, and other costs. Expenditures have been trending steadily upward since FY 2001, with a peak of more than \$1,373 million in FY 2010.

Figure I-13 illustrates the time trend of expenditures for special districts between FY 2001 and 2010.

Similar to State trends, debt service is increasing as a proportion of total annual expenditures. Administrative costs are relatively constant, and expenditures on fixed assets are correlated with increased funding available at the State level. Cities are financed by local fees, but cost-sharing with the State increases capital expenditures in years when bond money was available. For example, fixed asset expenditures increased across all categories in FYs 2007 and 2008, following passage of Propositions 1E and 84 in 2006.

Table I-9. Statewide Special District Expenditures on Flood Management,* FY 2001-2010

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Flood Management and Water Conservation										
Admin	620	658	657	694	719	732	812	733	744	793
Debt Service	52	48	47	96	58	90	55	103	63	76
Fixed Assets	99	115	136	173	244	102	153	142	138	162
Other	5	24	17	24	7	28	22	83	50	136
Total	775	845	856	988	1,027	952	1,041	1,060	995	1,168
Drainage and Drainage Maintenance										
Admin	72	86	81	74	91	102	57	60	67	60
Debt Service	6	4	7	6	9	6	3	2	2	1
Fixed Assets	21	5	2	1	4	1	11	15	1	1
Other	26	29	27	40	35	53	15	18	17	20
Total	125	124	116	121	139	162	87	95	87	81
Land Reclamation and Levee Maintenance										
Admin	33	34	33	46	40	46	52	72	140	107
Debt Service	5	18	6	9	4	5	4	5	5	12
Fixed Assets	1	8	4	1	1	3	91	17	7	5
Other	3	4	4	3	0	1	0	2	0	0
Total	41	64	47	59	46	56	146	96	152	124

*\$ million

Source: SCO, 2013c

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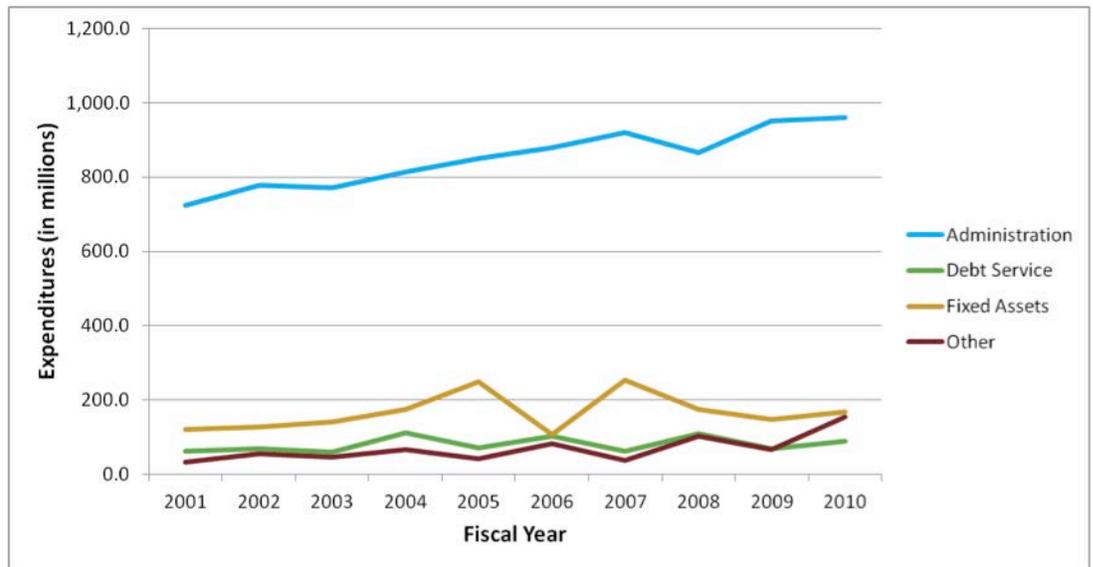


Figure I-13. Statewide Special District Total Expenditures, 2001-2010

Source: SCO, 2013c

Figure I-14 shows the funding trends for flood management and water conservation districts. Expenditures have ranged from \$820 million in 2001 to a high of about \$1 billion in 2008. Spikes in expenditures are correlated with bond measures passed in 2000, 2002, and 2006, as discussed previously. Special districts for flood management and water conservation in California had average expenditures of \$1,168 million per year between 2000 and 2010. This included average expenditures of \$716 million on administrative costs, \$69 million on debt service, \$147 million on fixed assets, and \$29 million on other costs.

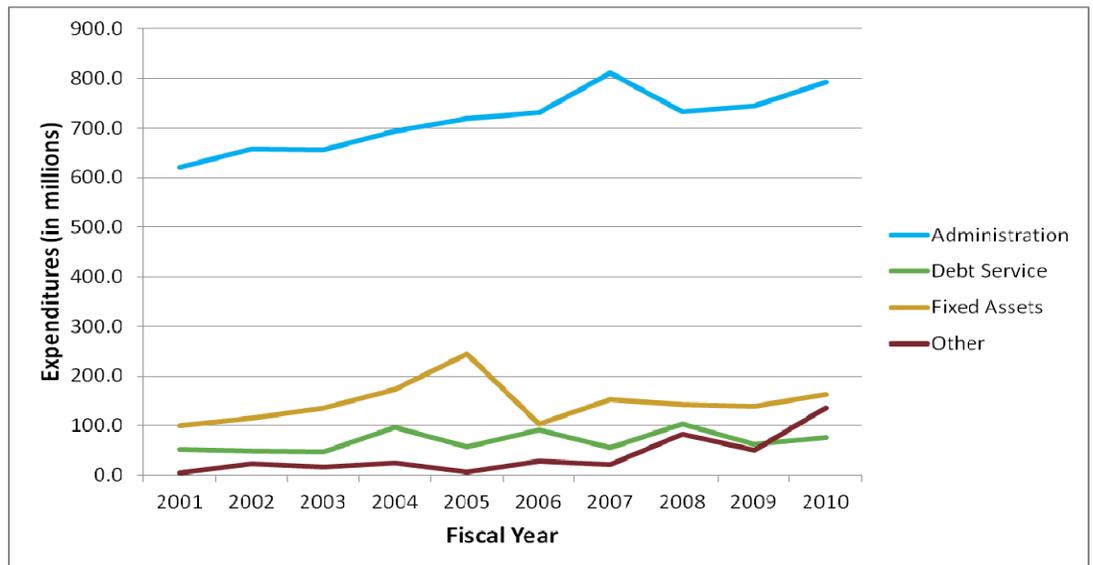


Figure I-14. Statewide Special District Expenditures on Flood Management and Water Conservation, 2001-2010

Source: SCO, 2013c

Drainage and drainage maintenance expenditures by special districts averaged \$114 million per year statewide between 2001 and 2010. Average yearly expenditures included \$77 million on administrative costs, \$5 million on debt service, \$6 million on fixed assets, and \$28 million on other costs. Administrative costs, including salaries and pensions, comprised the majority of average yearly expenditures in this category. Figure I-15 illustrates the time trend of expenditures on drainage and drainage maintenance and emphasizes spikes in spending, which correlated with bonds issued. The trend in expenditures was relatively flat, but in FY 2007 there was a decrease in expenditures, which is counterintuitive because \$7 billion in bonds were passed in 2006. The decrease might suggest that the category included items other than flood management, but further disaggregation of the data was not possible.

Figure I-16 presents a summary of statewide expenditures by special districts on land reclamation and levee maintenance. This category represented the lowest average yearly expenditures (of the three categories reported) at \$83 million, which included an average per year expenditure of \$60 million on administrative costs, \$7 million on debt service, \$14 million on fixed assets, and \$2 million on other costs. A spike to \$146 million in spending was reported in FY 2007, which correlated with State bonds for flood management. Similarly, expenditures on fixed assets increased significantly beginning in FY 2007. Specifically, expenditures on fixed assets increased from a few million dollars per year to almost \$100 million in FY 2007, returning to around \$5 million per year in FYs 2008 and 2009. The increase in total expenditures in FY 2008 and 2009 is primarily administrative costs, possibly as a result of increased oversight of fixed asset expenditures (bond money) in FY 2007. Special district expenditures were split between 80 percent of total expenditures to capital and 20 percent to O&M.

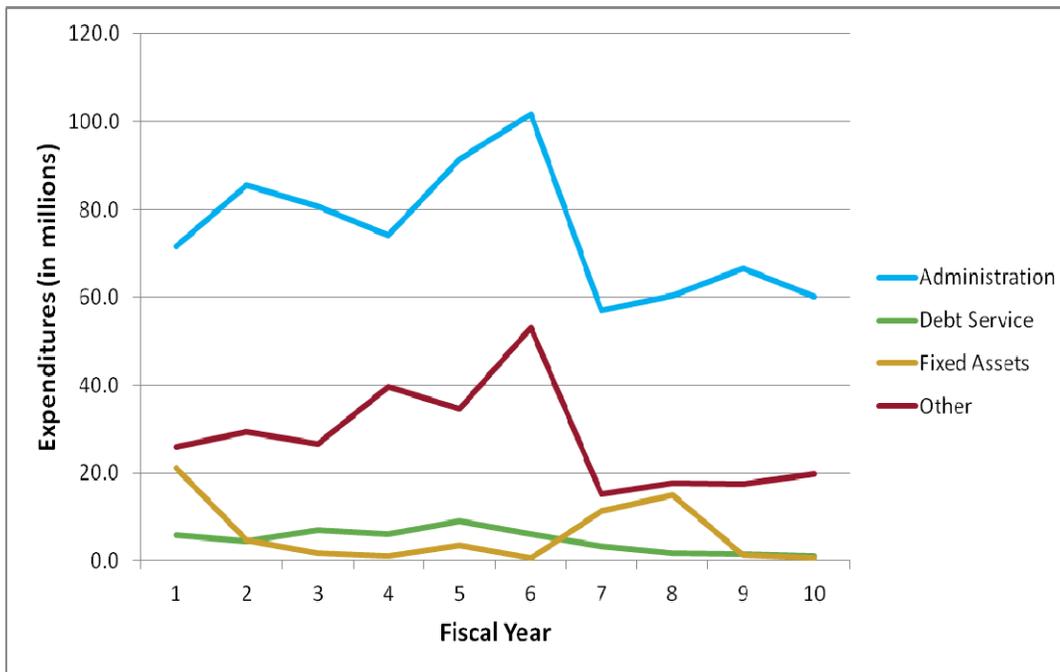


Figure I-15. Statewide Special District Expenditures on Drainage and Drainage Maintenance, 2001-2010

Source: SCO, 2013c

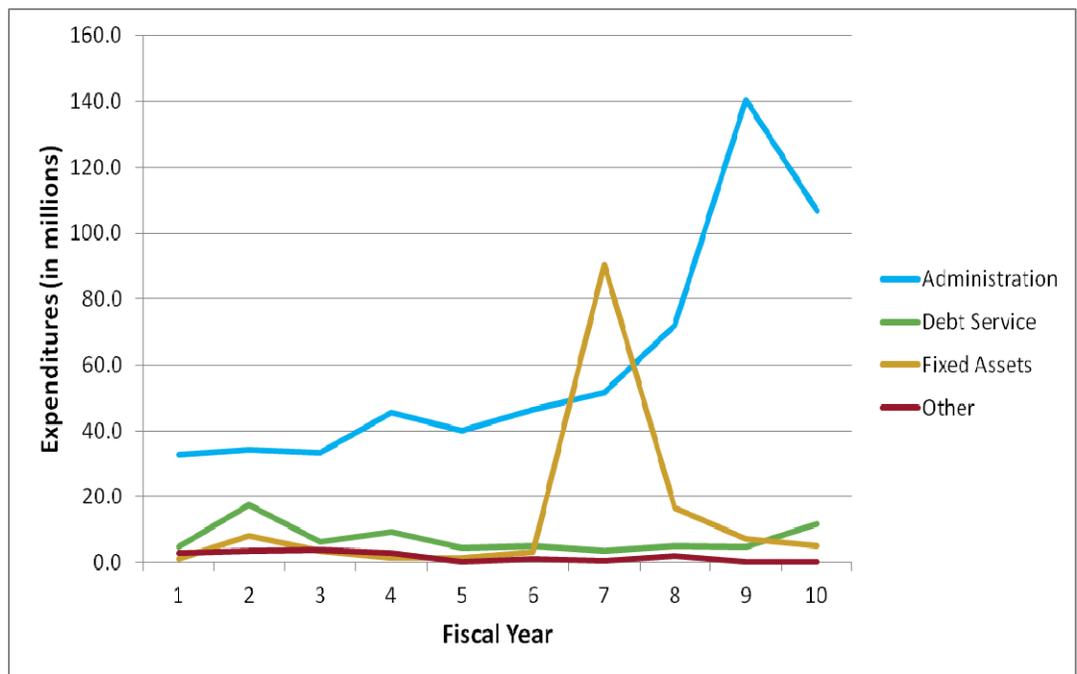


Figure I-16. Statewide Special District Expenditures on Land Reclamation and Levee Maintenance, 2001-2010

Source: SCO, 2013c

To summarize, special district expenditure data were reported with a level of disaggregation that allowed for differentiation between fixed and operating costs. Spikes in fixed asset expenditures correlated with the major water bonds passed in California in 2000, 2002, and 2006. The 2006 water bonds totaled over \$7 billion and, consequently, corresponded to the largest increases in expenditures on fixed assets.

2.7 Existing Funding Mechanisms for Flood Management

Information gathered on revenue generation was consistent across the state, not varying significantly by geographic boundaries. Some differences were observed between smaller versus larger communities and in areas that had recent growth. Smaller communities appeared to be more constrained than their larger counterparts, while agencies that had experienced growth had been able to generate funds with impact fees on new developments.

Typically, county and other local flood management agencies either receive part of the general fund of a county/agency or rely on assessments to fund projects and O&M. Agencies that are funded through a general fund have to compete with other projects and county needs (e.g., water, sewer, transportation, parks) for funding both capital projects and O&M. Some agencies are partially funded through development fees or special project assessments that can be limited by assessment zone boundaries. For example, the Contra Costa Flood Control District assessment zones will fund only projects that are within a specific assessment zone. This is an issue when upstream conditions in one assessment zone cause flooding in a

downstream assessment zone, but funds for the upstream zone cannot be used to pay for the downstream improvements. This issue can be significant when a county has upstream problems in a rural assessment zone that result in flooding in downstream urban areas.

For most local agencies, revenue is generated by a type of property tax assessment. Unlike other states, California’s ability to invest in its infrastructure is limited by voter-approved initiatives, such as Proposition 13 of 1978 (limiting property tax increases) and Proposition 218 of 1996 (requiring voter approval for new assessments). Some agencies were able to supplement local revenue with USACE Civil Works (CW) funding and/or DWR grants. Table I-10 provides a summary of the local financing methods used by the agencies that were contacted. More detailed financing descriptions are found in Appendix B.

Table I-10. Financing Mechanisms Observed in Information Gathered from More than 140 Agencies across California

Mechanism	Used for Capital (C) and Maintenance (M)	Comment
Local Financing Mechanisms		
Property assessments	C, M	Typically in place before Propositions 13 (1978) and 218 (1996) . Impacted by Proposition 13 (1978) and lower property values.
Assessment/Improvement/Community Facility Districts	C, M	Many put in place for newer developments.
Storm drainage charges	C, M	Typically put in place before Proposition 218 (1996).
Surcharge on sewer bill	C, M	Only in combined sewer areas.
General fund	C, M	Typically seen in smaller communities.
Impact fees	C	Dependent on growth.
Partner with irrigation district	M	Use irrigation district canals for drainage,
Countywide sales tax	C	Requires a vote; only for a defined period of time.
State and Federal Assistance		
Projects funded by USACE and FEMA	C	Need matching funds, difficult for some agencies to raise.
Subvention funds	C	Local agencies need approved USACE project prior to receiving funds from DWR. Local agencies would like to see additional funding for subventions.
Propositions 50 (2004), 84 (2006), and 1E (2006)	C, M	Depends on bond passage.
State Transportation Improvement Program	C	Used for drainage-related portions of transportation projects.

2.8 Funding Challenges Facing Flood Management Agencies

Flood management agencies identified several finance and funding challenges as part of the information gathering effort. These issues are described briefly below; for more detailed descriptions, see *Attachment E: Existing Conditions of Flood Management in CA (Information Gathering Finding)*.

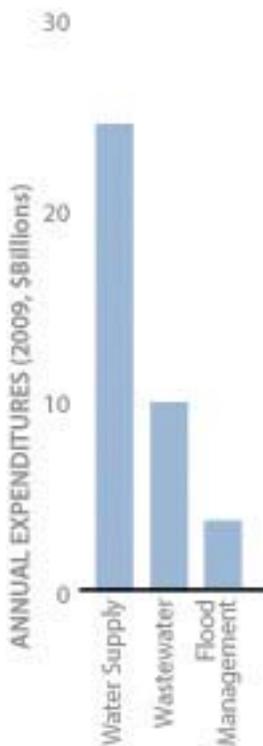


Figure I-17. Funding Expenditures for Water Supply, Wastewater, and Flood Management

Source: *Water and the California Economy - Technical Appendix*, Public Policy Institute of California, 2012

- Flood Management agencies are often supported by local agency general funds and must compete with other public demands for resources.** Other public demands for funding include water supply, wastewater (sewer), transportation, parks, social services, education, and health services. Water supply and wastewater treatment funding is augmented by user fees. In addition, water supply and wastewater have exceptions to requirements of Proposition 218 (1996). For these reasons, flood management annual expenditures are much lower than water supply and wastewater expenditures, as shown in Figure I-17.
- Flood management agencies have substantial restrictions to increasing property assessments due to Propositions 13 (1978) and 218 (1996).** The majority of flood management agencies depend on some type of property assessment as a revenue source; however, the ability to increase or initiate property assessments to satisfy revenue requirements has been restricted for some time in California. More than half of the agencies interviewed during the information gathering phase suggested that flood management and storm drainage agencies should become exempt from the requirements of Proposition 218 (1996), or be treated similar to water and wastewater utilities.
- Agencies that are partially funded through development fees or special projects assessments can be limited by assessment-zone boundaries. These assessment-zone boundaries impose substantial limitations on the uses of funds. This is important because downstream flooding can be caused by upstream activities. In addition, the solution or best management action for a flooding issue might be located outside the assessment-zone boundary.
- Funding for flood management projects is often dependent on infrequent flood events that temporarily raise public awareness. Funding for flood management usually increases only following a flood disaster and then gradually decreases, especially during economic downturns and dry water years.
- Agencies that depend upon impact fees are affected by the slowdown in growth. Although impact fees for storm drainage or flood management are a good option for growing communities, this source of revenue dries up when growth is stagnant. Approximately

one-third of the agencies interviewed involved discussions about the impacts of reduced development, along with the associated impacts on fees and the agency's funding ability.

- Flood management budgets and project planning costs often do not adequately address full life-cycle O&M needs and environmental mitigation. A significant amount of existing flood management infrastructure was constructed before the requirements for environmental mitigation were included as a component of project development. Many of these projects now face new permitting requirements with associated higher, unplanned costs. This has led to benign neglect of some infrastructure and costly repermitting for other projects. Also, many projects do not include the full life-cycle cost of O&M during project development. This funding deficit is affecting the ability of agencies to set aside replacement funds for deteriorating infrastructure.
- **Smaller agencies often do not have the resources to prepare funding applications.** Because some of the information requested on grant or loan applications is information not typically collected by the agency and not quickly developed, smaller agencies might not have the resources to prepare an effective application. Approximately one-fourth of the agency interviews resulted in a request that the State provide resources to help with applications.
- **Agencies have difficulty raising matching funds for Federal programs.** Many of the agencies are somewhat dependent on Federal or State funds for major capital improvements; however, with limited local revenue generation, many agencies cannot access some of the available Federal funds because they cannot raise the required matching funds. Approximately one-fourth of the interviewees stated that agencies were "leaving money on the table."
- **Agencies believe Federal funds are becoming scarcer.** The USACE process for identifying Federal interest in flood risk-reduction projects has historically emphasized damage-reduction benefits, while placing less emphasis on other project output such as ecosystem restoration, regional economic development, and other social benefits. With the fiscal issues facing the Federal government, most agencies believe that Federal funding programs will be reduced, if not eliminated. Reductions in Federal spending signal that USACE might not continue to fund studies or ongoing projects at the same rate as in the past. Also, funding a large number of studies and projects over long periods is inefficient and can result in delayed project implementation. USACE has recently implemented a Civil Works Planning Modernization initiative that is intended to significantly reduce the current planning study portfolio and the time/cost to complete feasibility studies.

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3.0 Demand for Flood Management Funding

The demand for flood management funding depends on factors such as the cost of providing flood management, the value of what is being protected, the likelihood of having a flood event, and the risk tolerance of those being protected. Across the state, little is known about most of these factors. In the past, the State estimated the property value of what is exposed to flood hazard, but those efforts do not consider the broader economic impacts of flood-induced disruptions or the impacts associated with potential loss of life.

This section provides an estimate of the future demand for flood management funding. The minimum demand level is represented by the current flood management projects in the planning or implementation stage. Information on the cost of projects being considered by entities across the state was compiled for analysis; local agencies have identified these projects in their short-term or long-term planning efforts. The projects, or levels of expenditure, do not represent a specific protection level for the probability of a specified flood event occurring in any given year (e.g., 100-year flood, 200-year flood, 500-year flood) statewide, or consider the other factors impacting floods. What is known, as indicated by results of the information gathering efforts, is that local entities are aware that much more needs to be done beyond the current list of planned projects.

3.1 Local Projects from Information Gathering

As part of the information gathering effort, local agencies were asked to identify planned or proposed flood management projects in California. These projects include projects focused on flood management and projects with an IWM approach. A list of Local Planned Projects was compiled from numerous available sources. Agencies identified projects in their long-term plans during their meetings with the SFMP teams. IRWM Plan reports and IWM planning documents were used as primary references for planned and ongoing flood projects in each county. Because the intent was to approximate remaining flood infrastructure funding needs, county and city capital improvement plan (CIP) budget reports and websites were also reviewed. Other sources for planned flood and/or conjunctive use projects were Proposition 1E (2006) and 84 (2006) project application lists, and American Society of Civil Engineers (ASCE) report cards.

More than 800 local projects, totaling approximately \$12 billion dollars in project costs, were identified in the planned projects list. However, this does not represent the total cost of the planned or proposed projects because approximately 20 percent of the projects listed do not have cost estimates. In addition, the project list does not capture the full picture of flood infrastructure needs to meet increased potential flood exposure (i.e., new capital projects) or rehabilitation and replacement of aging existing infrastructure. This is the result of current regulatory and financial circumstances and the changing nature of flood risk over time.

DEMAND FOR FLOOD MANAGEMENT FUNDING

In some cases, flood management may represent only a portion of the total project cost. For example, Colusa County has one large proposed project for Sites Reservoir; however, only part of the purpose of this project is for flood management. No attempt has been made to prorate the portion of costs attributable to flood management. USACE and Central Valley Flood Protection Plan (CVFPP) projects or improvements are not included in this list to avoid double counting. Table I-11 provides a summary by hydrologic region of the number and total cost of identified planned projects. Detailed information for each project is in *Attachment E: Existing Conditions of Flood Management in CA (Information Gathering Findings)*.

Several challenges were encountered while identifying local planned projects. In some instances, the agencies reported a USACE or other cost-shared project in the CIP and included the total project cost, without identifying their cost share or that of other sponsors. In other instances, agencies reported the total cost of a project, including phases that were already constructed. For many projects only the planning costs have been estimated and not total project costs (including construction).

Table I-11. Local Planned Projects by Hydrologic Region

Hydrologic Region	Total Local Planned Projects	IWM Projects	Projects with Cost	Projects without Cost	Total Cost (\$ million)
Central Coast	42	29	25	17	280
Colorado River	24	1	21	3	70
North Coast	26	15	15	11	110
North Lahontan	13	5	4	9	20
Sacramento River	159	66	80	79	2,320
San Francisco Bay	118	43	101	17	1,970
San Joaquin River	55	25	47	8	730
South Coast	335	63	325	10	5,700
South Lahontan	33	21	29	4	170
Tulare Lake	13	18	27	3	240
TOTAL	835	286	674	161	11,610

Note: All projects were identified as of January 2012.

3.2 Central Valley Flood Protection Plan Investments

As part of its State Systemwide Investment Approach (SSIA), the CVFPP has identified additional flood improvements that would include projects with multiple benefits. The SSIA is the State's preferred approach for modernizing the SPFC to address current challenges and affordably achieve the CVFPP goals of improving flood risk management, improving O&M, promoting ecosystem functions, improving institutional support, and promoting multibenefit projects. The SSIA provides guidance for future State participation in projects and programs with IWM approaches in the Central Valley.

The SSIA, as proposed in the CVFPP, consists of the following elements:

- **Urban improvements** generally consist of the reconstruction, rehabilitation, or improvement of existing urban levees to achieve protection from the 200-year (0.5 percent annual chance) flood.
- **Rural-agricultural improvements** include levee improvements, hydraulic structure upgrades, and removal of rock revetment levees and other facilities that are no longer functional.
- **Systemwide improvements** include physical actions or improvements with the potential to provide benefits across large portions of the flood management system and improve the overall function and performance of the SPFC in managing large floods.
- **Residual risk management** includes enhanced flood emergency response, enhanced O&M, and agricultural conservation easements.
- **Small community improvements** are protected by the SPFC and non-urban levee evaluations.

Future needs of \$14 to \$17 billion have been identified in the CVFPP. These investments represent the proposed/planned improvements and do not represent remedies for the complete list of flood infrastructure needs. Table I-12 presents a summary of these investments. The SPFC is of particular concern because of the responsibilities assumed by the CVFPP.

Table I-12. CVFPP Investment Approach Cost Estimates by Element

Element	Low Estimate (\$ million)	High Estimate (\$ million)
Systemwide Improvements	5,140	6,500
Urban Improvements	5,500	6,700
Rural-Agricultural Improvements	1,080	1,180
Small Community Improvements	690	690
Residual Risk Management	1,510	1,860
Total	\$13,920	\$16,910

Notes:

The cost estimates include SPFC flood management investments that already have been expended or committed during 2007 to 2011.

Some elements of locally identified projects included in the IWM Project List might be included in the CVFPP overall cost estimates.

All costs are planning-level estimates are based on 2011 price levels and will differ in the future. Actual costs will vary because of a wide range of factors, including project justification by feasibility studies, project configuration, implementation time, future economic and contractor bidding conditions, and many others.

Source: DWR, 2012e

American Society of Civil Engineers Estimate of Flood Management Needs in California

ASCE recently prepared a report entitled *California Infrastructure Report Card: A Citizen's Guide 2012*. This study estimated that to bring levees and flood control systems up to a "B" grade, \$28 billion would be required over the next 10 years to improve or replace California levees and flood control facilities statewide. This is an improvement from the 2006 ASCE Report Card, which had estimated \$42.4 billion would be needed over the next 10 years. Some of this can be attributed to planning progress accomplished over the last 5 years.

3.3 USACE Projects

For Federal FY 2012, USACE identified 60 proposed flood management projects in California, with an aggregate total of approximately \$6 billion. Of these 60 projects, 19 projects were funded for FY 2012 (see Table I-13). The projects consist of new and ongoing flood risk studies and authorized construction projects, representing a snapshot in time from USACE that was developed as part of the information gathering effort for the SFMP. Funding for the identified projects is based on appropriations from Congress; therefore, actual project funding might not match this list for Federal FY 2012. Projects from other programs, such as the Flood Plain Management Services and the Planning Assistance to States, are not captured here. Such projects are USACE recommendations for funding in California to be included in the President's budget; however, this recommendation does not imply that any project will receive appropriations. A complete list of USACE planned and ongoing flood projects is provided in *Attachment E: Existing Conditions of Flood Management in CA (Information Gathering)*.

Table I-13. USACE Planned Projects by California Hydrologic Region

Hydrologic Region	Total Number of USACE Projects	Number of Projects Funded	Total Cost (\$ million)	Number of Projects Funded in FY 2012	Funding Appropriated In FY 2012 (\$ million)
Central Coast	6	6	500	1	6
Colorado River	1	0	0	0	0
North Coast	2	1	150	0	0
North Lahontan	1	1	20	1	2
Sacramento River	3	3	230	1	10
San Francisco Bay	17	17	1,400	5	3
San Joaquin River	4	4	50	1	0.2
South Coast	19	18	2,700	7	41
South Lahontan	0	0	0	0	0
Tulare Lake	7	7	1,030	3	18
Total	60	57	\$6,080	19	80

Note: USACE Project List reflects information that is accurate for Federal FY 2012. This information was last revised as of Federal FY 2012.

Source: USACE, 2012c and USACE, 2013

3.4 Delta Project Needs

There currently is no comprehensive flood risk reduction plan for the Delta, nor associated cost estimates. Costs for future levee improvements will depend on what level of protection is shown to be cost effective for individual islands/tracts and for the network of islands/tracts. Levees for individual islands/tracts provide not only a direct benefit to the areas they protect but also a benefit as part of the network of levees that define the water channels and the configuration of the Delta. As a result, the level of protection provided by levees will vary.

Ongoing programs and investigation will influence future plans for the Delta but will not produce a comprehensive flood risk reduction plan for the Delta. Therefore, past studies can be used to show a range of potential costs to improve Delta levees to achieve different levels of flood management.

- Hazard Mitigation Plan Geometry** - The Hazard Mitigation Plan (HMP) provides for a minimum crest width of 16 feet, water-side slope of 1.5 horizontal on 1 vertical, land-side slope of 2 horizontal on 1 vertical, and only 1 foot of freeboard above the water level, within the 100-year floodplain (1 percent annual chance exceedance) defined by the 1982 USACE *Sacramento-San Joaquin Delta Stage Frequency Study* (revised 1986). The HMP provides for a levee cross-section factor of safety against sliding of about 1.0, far lower than conventional levee standards. The HMP does not address seismic loadings. A rough estimate of not more than \$100 million to improve all nonproject levees to HMP standards has been discussed by Delta levee engineers (DWR, 2012a).

- **Delta-Specific PL 84-99** - The PL 84-99 guidance flattens the side slopes (3:1 to 5:1 land side and 2:1 water side) from those that were used for the HMP geometry and increases freeboard above the 100-year floodplain (1 percent annual chance exceedance) to 1.5 feet, less than the 3.0 feet required for FEMA accreditation. This Delta-specific PL 84-99 cross section was determined by USACE to have a minimum factor of safety of 1.25. PL 84-99 does not address seismic loadings. Technical studies are not currently available to evaluate the cost of increasing most Delta levees to the Delta-specific PL 84-99 guidance; however, some initial estimates have been made:
 - The most recent available estimate was made by MBK Engineers for Delta Vision in 2008. The estimate to improve 635 miles of nonproject levees to the USACE Delta-specific PL 84-99 standard is \$0.5 billion to \$1.4 billion. The lower estimate is based on levee embankment material obtained on each island, and the larger estimate is based on imported material.
 - The CALFED Bay-Delta Program's Levee System Integrity Program Plan called for rehabilitation of 520 miles of Delta levees to Delta-specific PL 84-99 standard. The preliminary cost estimate (year 2000) to achieve this base level of protection ranges from \$0.6 billion to \$1.3 billion (DWR, 2012a).
- **Bulletin 192-82 Delta Levee Standard** – DWR conducted studies of levee design criteria suitable for use in the Delta and published the results in 1983 as DWR Bulletin 192-82. The Bulletin 192-82 cross-section recommendations produce a levee that is designed for a water level with a 300-year floodplain (0.33 percent annual chance exceedance); freeboard for levees protecting rural areas is 1.5 feet, and freeboard for levees protecting urban areas is 3 feet. The plan included 27 major islands. The estimated costs for improvements (year 1982) were about \$0.45 billion, which included environmental mitigation but did not address seismic loadings (DWR, 2012a).
- **Delta Risk Management Strategy** – The *Delta Risk Management Strategy* (URS/JBA, 2008) evaluated levee failure risks in the Delta and Suisun Marsh. Phase 1 analyzes various risks to levees, as well as the local and statewide consequences of levee failure considering subsidence, earthquakes, floods, changes due to climate change, and combinations of these factors. The analyses incorporated assumptions about flood management, Delta levees, emergency response, land use, water operations, and others termed, "business-as-usual," and a future environment projecting 50, 100, and 200 years ahead with a warming climate, ongoing subsidence, and sea level rise.

Phase 2 identified measures to reduce the risks and consequences to the State resulting from Delta levee failure. The Delta Risk Management Study evaluated seismic risks, high-water risks, and dry-weather risks. The study concluded that while hydrologic flooding remains the most significant cause of levee failure, a seismic event presents the single greatest economic risk to

the State resulting in levee failures in the Delta Region. If a moderate earthquake occurs close to the Delta, some levees would fail. The study analyzed the possible impacts of as many as 32 islands being flooded simultaneously. Depending upon many variables, this could result in statewide economic costs and impacts of \$25 billion or more. Under business-as-usual practices, coupled with climate change and sea level rise, high-water conditions could cause about 140 levee failures in the Delta over the next 100 years. Multiple island failures caused by high water likely would be less severe to the State economics than failures from a major earthquake, but the failures could still be extensive and could cause approximately \$8 billion or more in economic costs and impacts (DWR, 2012a).

All economic costs and impacts presented in this summary are expressed in 2005 dollars. It should be noted that changes in attention to the flood management system, specifically the passage of Propositions 1E and 84 in 2006, which provided a combined \$4.9 billion for flood management, including the Delta levees, represents a significant shift from the business-as-usual assumption inherent in the predictions in the Delta Risk Management Study. The evaluations in the study considered the following four different levels of improvements (scenarios) within the Delta to reduce flood risk and provide ecosystem restoration and enhancements:

- **Trial Scenario 1: Improved Levees** – Under this scenario, the central Delta island levees would be upgraded to PL 84-99 standards and urban areas would be upgraded to Federal flood control project levee standards. These levee improvements would provide up to 100-year flood management but would offer no risk reduction benefits for seismic events. Other improvements include raising highways and construction corridors to provide both seismic and flood risk reductions. Estimated costs for the improvements are about \$10.5 billion.
- **Trial Scenario 2: Armored Pathway (Through-Delta Conveyance)** – The armored pathway seismically would consist of upgrading levees along a pathway from the Sacramento River near Hood to the pumps in the south Delta, dredging channels to provide the required capacity and installing channel barriers in the south Delta to limit saltwater intrusion during multiple island-flooding events. The scenario also provides for infrastructure improvement (raising highways, developing an armored infrastructure corridor), upgrading levees to urban levee standards, and providing environmental improvements and restoration. Estimated costs for the improvements are about \$15.6 billion.
- **Trial Scenario 3: Isolated Conveyance Facility** - The scenario would provide high reliability for export water conveyance (up to 15,000 cubic feet per second [cfs]) by construction of an isolated conveyance facility on the eastern side of the Delta. This scenario also provides for infrastructure improvement (raising highways), improved

maintenance and emergency planning, levee upgrades to PL 84-99 and urban levee standards, and environmental improvements and restoration. Estimated costs for the improvements are about \$14.8 billion.

- **Trial Scenario 4: Dual Conveyance** - The scenario would provide higher reliability and flexibility for export water conveyance (up to 10,000 cfs) by construction of an isolated conveyance facility on the eastern side of the Delta (similar to Trial Scenario 3) and a through-Delta conveyance (up to 5,000 cfs) (similar to Trial Scenario 2). The scenario also provides levee upgrades to PL 84-99 and urban levee standards, enhanced maintenance and emergency planning, improvements to transportation and utility lines, and environmental restorations. Estimated costs for the improvements are about \$17.1 billion.

The above estimates show a wide range of potential improvements with estimated costs ranging from \$0.1 billion to over \$17 billion. With the lower estimate that accepts more levee failures, responsible agencies will need to place more effort on future recovery from flooded islands/tracts, or make decisions not to recover certain areas after flooding. Considering that these are the available extremes, the likely cost will fall somewhere between these estimates. More detailed site-specific technical studies are needed to select a cost-effective plan for flood risk reduction and ecosystem restoration. Implementation of a comprehensive plan must be cost-shared by local, State, and Federal interests.

3.5 Estimated Cost of Known Projects

The total cost of specific projects identified to date ranges from more than \$32 billion to \$52 billion, as shown in Table I-14. This total represents only those projects currently in the planning cycle. These numbers do not necessarily represent the investments needed to meet a specific protection level for the probability of a specified flood event occurring in any given year (e.g., 100-year flood, 200-year flood, 500-year flood) statewide or an increased level of flood management, or a locally specified level of flood risk reduction. The listed costs are limited by what the agencies can realistically fund or finance, as well as by appropriations at the State and Federal levels. Regional flood risk assessments that prioritize projects at the system level could cause some of the projects included in the \$52 billion estimate to be deferred or eliminated (not funded), it is understood that substantial flood risk reduction will require significant investments.

Table I-14. Estimated Cost of Known Projects/Improvements

Projects	Cost (\$ billion)
Local Projects	12
CVFPP Improvements	14 to 17
USACE Projects	6
Delta Improvements	0.1 to 17
Total	\$32 to \$52

3.6 Additional Cost Beyond Known Projects

Significant flood events have occurred every year in California since at least 1951. Although historical damage estimates are not available for every event, estimates are available for some events, including the following:

- March 1995 Central California.** A levee failed on the Pajaro River, causing agricultural crop damages, which were estimated at \$67 million for the 3,280 acres that were flooded, and urban damages in the unincorporated town of Pajaro, which were estimated at \$28 million. Two individuals drowned. The Salinas River inundated thousands of acres of farmland. The Carmel River washed out a bridge on State Highway 1 and combined with the Pajaro and Salinas Rivers to isolate the Monterey Peninsula. Stormwaters damaged Cambria. Santa Barbara streams, including San Antonio Creek and Sycamore Creek, damaged many homes and businesses and caused at least one death. Mudslides were common in the region.
- 1997 California Storms.** Between December 1996 and January 1997, a series of tropical storms hit northern California, spawning widespread flooding. In all, floods damaged more than 23,000 homes and businesses, and many thousands of acres of agriculture lands, as well as roads, bridges, and flood management infrastructure. Damages were valued at approximately \$2 billion. More than 120,000 people were evacuated from their homes; nine people lost their lives; more than 300 square miles of land were affected.
- June 2004 Lower Jones Tract Levee Failure.** The Lower Jones Tract levee failed, inundating the 5,894-acre island and causing approximately \$90 million in damages.
- January 2005 Southern California.** Five days of heavy rains caused widespread flooding throughout southern California, which incurred damages of \$100 million. Twelve people died as a result of this event.
- January 2006 Sonoma, Napa, and Corte Madera.** Flooding on Corte Madera Creek caused more than \$70 million in damages in the Corte Madera area. Losses estimated at \$135 million were due to flood damage by the Napa River in Napa County. Sonoma Creek damaged a mobile home park, bridge, and pipeline, and Nathanson Creek flooded 27 classrooms at Sonoma Valley High School.

- **March 2011 Crescent City Tsunami.** A tsunami generated off the coast of Japan, recorded throughout the California coast, struck Crescent City Harbor with an 8.1-foot wave, destroying much of the harbor and resulting in one death near Klamath. There was also major damage to docks and boats at Noyo Harbor. Estimated damage in the region was \$24 million.

The demand for flood management funding includes costs for those projects that are currently in the planning process, as identified during the SFMP information gathering effort and in other studies. Funding demands include the costs needed to achieve protection against a specified flood event (e.g., 100-year flood event, 200-year flood event, or 500-year flood event), and those costs are not yet identified. The Flood Future Report presents a snapshot of the current flood management activities across the state. That snapshot reveals that many areas of the state have identified neither an appropriate level of flood risk reduction nor investments to achieve these levels. In addition, risk characterization has not been performed in enough detail to develop an estimate of the amount communities might be willing to spend to achieve a specified level of flood risk reduction.

Originally, one of the objectives of the information gathering effort was to compile a complete snapshot of the demand for funding statewide, but this information was not available. Although numerous locally planned projects exist, most of the

projects contemplated were constrained by available funding and did not reflect the cost of meeting a given local or regional level of protection against a specified storm event. The projects and improvements identified by the information gathering effort represent a total of between \$32 and \$52 billion, as shown in Table I-14. Of the more than 800 local projects identified, 20 percent do not have any cost information.

In addition, these project cost estimates do not provide a consistent statewide risk reduction level. Instead, risk reduction levels range from below 100-year to 200-year level of protection in some areas. As part of the information gathering effort, a few plans provided insight into the magnitude of the flood management funding needs. For example, Orange County Flood Control District plans (\$1.5 billion) and the CVFPP (\$14 to \$17 billion) are useful plans oriented at raising the protection level against a specific storm for a specific region.

The ultimate demand for flood management funding will be a function of:

- Value of the property exposed to hazard
- Likelihood of a flood event taking place
- Estimated damages that would be caused by the event
- Potential for loss of life
- Estimated loss of broader economic functions (“ripple effects”)
- Community’s willingness to pay to avoid impacts

In California, these factors can translate into significant economic impacts that can cause expanded impacts to regions, California, interstate, and the U.S.

In the aftermath of Superstorm Sandy, Consolidated Edison Company of New York announced plans to spend \$1 billion over the next 4 years to better protect equipment from major storms.

Loss of function is a term used to describe the broader regional economic impacts (or ripple effects) caused by flood damages, such as the costs resulting from rerouting traffic and closing businesses, and from compromised services of water and wastewater treatment plants, as well as critical facilities such as hospitals. The population exposed to a 100-year event is 1.4 million people; there are five times as many people exposed to the 500-year storm with more than 7.2 million people. The value of residential and commercial properties exposed to flood hazard in the state were assessed at \$146 billion for the 100-year flood event and more than \$580 billion for the 500-year flood event. These figures do not include public infrastructure such as water and wastewater treatment plants, airports, freeways, and other key facilities. The analysis of flood hazard exposure identified over 13,000 critical facilities that are located within the area affected by a 500-year flood event. More than 137,700 acres of DoD facilities and 88,600 acres of Native American tribal lands are exposed to flooding from the 500-year storm event. In addition, floods can isolate communities by inundating roads resulting in cutting off transportation routes, which is particularly a problem in remote areas of northern California.

If flood damages disrupted the delivery of water for a significant amount of time, the economic impacts would be substantial, with the impacts reaching far beyond California. Specifically, if water supply were disrupted in the Delta, impacts would affect not only agricultural production but also commercial businesses in the San Francisco Bay area and southern California.

This estimate seems reasonable based on the costs of Hurricane Katrina and other recent storms. Direct property damages for these were estimated at between \$96 billion and \$125 billion. The total economic loss from Hurricane Katrina has been estimated as high as \$250 billion, taking into account the disruption of economic activity (*Swiss Re*, 2007). The economic impacts of Superstorm Sandy are not fully known, but local governments have estimated losses to be over \$62 billion (AP, 2013).

There are huge benefits statewide from flood management. Benefits include avoided disruptions to local and regional economies, support for continued economic development in numerous regions, and reduced losses for agricultural, commercial, and industrial production/income. Benefits also include improved public safety (life safety), as well as protection of environmental, recreational, and historical assets. Flood emergency management costs are sometimes left out of flood disaster calculations. These emergency management costs include funding for materiel, staff, and evacuations and can far exceed costs of flood infrastructure construction. These benefits, which help protect the nation's most populous state and the ninth largest economy in the world with a GDP of nearly \$2 trillion, drive the willingness to pay for improvements.

California has a significant risk of flooding, with millions of lives exposed and hundreds of billions of dollars in direct assets (structures, contents, agricultural



Figure I-18. Approximate Demand for Funding

assets, and critical public infrastructure) exposed. This exposure and the need to protect public safety, environment resources, and the State's economy are behind the demand for flood management funding in California. The Flood Future Report identified more than \$50 billion in needs for specific projects and improvements that are now in the planning cycle. These projects (mostly site specific) collectively would not provide statewide protection from the 100-year storm event. In fact, substantially more funding would be required to provide protection from a basic storm, as shown in Figure I-18. Additional engineering, economic, and risk characterization studies are needed to develop accurate and detailed projections of the State's future funding needs.

If the \$50 billion shown in Figure I-18 is assumed to represent current investments needed to provide risk reduction against a 100-year storm event, then total investment needed to reduce risk against the 500-year flood event could be assumed to be several times that amount. This is based on the 5.8 million increase in population exposed within the 500-year floodplains compared to 1.4 million in the 100-year floodplain. However, willingness to fund flood management for a 500-year storm event has not been historically demonstrated. For this reason, a conservative estimate for flood management investments based on what Californians would be willing to accept and pay for could be two times the \$50 billion estimated for existing proposed projects, or more than \$100 billion.

3.7 Future Funding Challenges

Agencies are struggling to maintain existing levels of flood management due to increased regulatory requirements, costs, lack of funding, and new development in the floodplains. Currently, most agencies in California strive to build facilities capable of withstanding a 100-year flood event (1 percent annual chance exceedance); however, most local agencies have considerable areas that do not achieve this level of flood management.

Funding for projects and O&M is a major obstacle toward improving and maintaining an adequate level of protection. Most local agency budgets are allocated to staff support and other operating expenses, leaving little funding available for rehabilitation and construction of new facilities. Even if most of the funding available for flood management could be spent on capital investments, it would take more than 10 years simply to fund the planned projects currently identified and many more years to fund projects needed to achieve protection from a 100-year flood event (1 percent annual chance exceedance) flood event, based on the findings of the information gathering for this project. In fact, Orange County estimates that it would take 90 years at current funding levels for the county to fund the approximately \$2 billion in projects necessary to bring its facilities up to protection from a 100-year flood event (1 percent annual chance exceedance). SB 5 (2007–2008) stipulates that in the Central Valley, urban areas are required to bring facilities up to protection from a 200-year flood event. Other major urban areas are facing similar challenges. ***As infrastructure ages, proper maintenance on facilities will fall behind due to funding and permitting costs, project cost increases due to environmental regulations, climate change, and increases in the competition for available funding sources based on current funding levels.***

4.0 Other Financial Challenges

4.1 Federal Budget and Project Funding Processes

Flood risk management in California is a shared responsibility among local, State, and Federal agencies. These agencies face challenges balancing their budgets. Shortfalls in local and State agency budgets are issues of great concern in planning for implementation for programs that rely on complying with Federal government cost-sharing requirements. Also, Federal agencies budgets are determined annually, and the President’s discretionary spending budget is established by policy at the Office of Management and Budget (OMB) to assist in reducing the national deficit—with a balanced budget as the goal on an annual basis. Another issue is that local, State, and Federal budgeting processes do not have the same fiscal calendars and planning horizons.

4.1.1 Federal Appropriations Process

Figure I-19 illustrates the annual appropriation cycle for USACE Civil Works Energy and Water appropriation process. USACE Civil Works budget is part of the President’s discretionary budget, a small part of the overall Federal budget.

On the surface, the preparation is fairly straightforward and follows the schedule shown in Figure I-19. In January, the OMB issues guidance to the government agencies for preparing their budget requests. In March-April, USACE finalizes guidance for the agency’s budget submission. In September, government agencies submit their requests to the OMB. In November-December, OMB issues a passback, and in January of the following year, each agency prepares its justifications and budget book for the President’s budget release. In February, the President initiates the appropriation process by submitting his annual budget for the upcoming fiscal year to Congress. The President recommends spending levels for various programs and agencies of the Federal government in the form of budgetary authority. When the President submits his budget to Congress, USACE provides detailed justification materials to the House and Senate appropriations

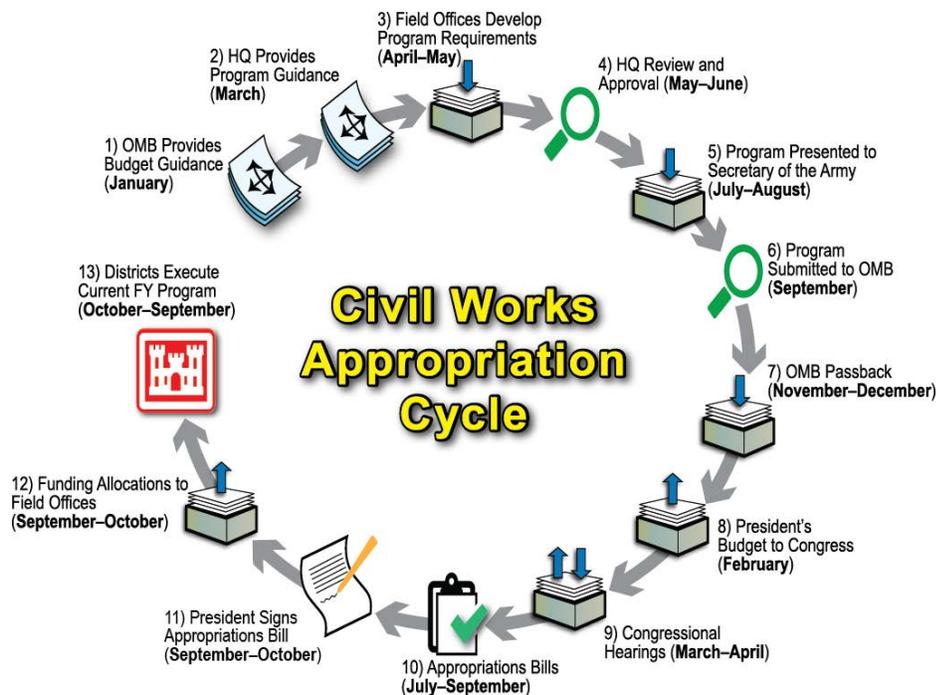


Figure I-19. Annual Appropriation Cycle

subcommittees, who then hold hearings. USACE focuses the justification details for USACE appropriations and authorizations subcommittees, and members of the agency testify. After the hearings are completed and the House and Senate appropriations committees have received their spending ceilings, the subcommittees begin to mark up the regular bills and report them to the full committees.

This report is made to the House or Senate, and then the bill is brought to the floor. Next, the bill goes to Conference, where members of the House and Senate appropriations subcommittees negotiate passed bills with the full committees between the House and Senate. Once there is an agreement, Congress sends the bill to the President to sign. The appropriations bill is passed as an Act, and USACE receives funding allocations for that fiscal year.

4.1.2 USACE Budget Development

The Government Performance and Results Act of 1993 requires that Federal government agencies develop strategic and annual performance plans for serving the nation and reporting how effective and efficient performance actually was for a given period (PL 103-62 § 4, codified at 31 U.S.C. § 1115). This law has led to the establishment of results-performance measures and targets that are tied to USACE CW Strategic Plan goals and objectives (USACE, 2011a).

A synopsis of the current CW strategic goals includes the following:

- Assist in providing for safe and resilient communities and infrastructure
- Help facilitate commercial navigation in an environmentally and economically sustainable fashion
- Restore degraded aquatic ecosystems and prevent future environmental losses
- Implement effective, reliable, and adaptive life-cycle performance management of infrastructure
- Build and sustain a high-quality, highly dedicated workforce

Per USACE Civil Works Direct Program, *Program Development Guidance, Fiscal Year 2013* (USACE, 2011b), USACE CW budgeting has evolved, based on several recent and significant shifts in policies and strategic goals. These are:

- Assist in providing for safe and resilient communities and infrastructure.
- Help facilitate commercial navigation in an environmentally and economically sustainable fashion.
- Restore degraded aquatic ecosystems and prevent future environmental losses.
- Implement effective, reliable, and adaptive life-cycle performance management of infrastructure.
- Build and sustain a high-quality, highly dedicated workforce.

USACE's prioritization of studies and projects through business line budgeting, as well as its subsequent funding, will ensure that USACE projects are both cost effective and completed in a timely manner, resulting in:

- Funding fewer studies and projects in any given budget year
- Increased funding over shorter periods for fewer, high-priority projects
- More reliance on public-private partnerships to provide an adequate funding stream over a given period
- More sophisticated prioritization methodologies that focus on economic, environmental, life safety, and social criteria to ensure that the optimal mix of critical work is funded first

4.2 Local and State Budgeting for Flood Management

Flood risk management in California is a shared responsibility among local, State, and Federal agencies. These agencies face daunting challenges in balancing their budgets. Shortfalls in agency budgets are issues of great concern in planning for implementation of programs that rely on complying with Federal government cost-sharing requirements. Local agencies believe that reductions in Federal spending could signal that USACE and other agencies might not continue to fund flood management projects at the same level. Another issue is that local, State, and Federal budgeting processes do not have the same fiscal calendars and planning horizons.

4.2.1 Local Agency Budgeting Process

Local agency budgets are determined on an annual basis. A local agency budget fiscal year is usually consistent with the State (July 1 to June 30). Typically, local flood management agencies either receive part of the general fund of an agency or rely on assessments to fund projects and O&M. Agencies that are funded through a general fund have to compete with other projects and county needs (e.g., water, sewer, transportation, parks) for funding both capital projects and O&M. Some agencies are partially funded through development fees or special project assessments that can be limited by assessment zone boundaries. This could be an issue if upstream conditions in one assessment zone cause flooding in a downstream assessment zone, but funds for the upstream zone cannot be used to pay for the downstream improvements. This issue can be significant when a county in a rural assessment zone has upstream problems that result in flooding in downstream urban areas. For most local agencies, revenue is generated by a type of property tax assessment. Unlike other states, California's ability to invest in its infrastructure is limited by voter-approved initiatives, such as Proposition 13 (1978) (limiting property tax increases) and Proposition 218 (1996) (requiring voter approval for new assessments).



Flooding in San Diego County

4.2.2 State Budgeting Process

State budgets are determined annually, and DWR puts forth a proposed budget request to the governor for a given fiscal year. The governor of California puts forward a budget in January, which is reviewed and then revised in May based on updated State revenue projections. The legislature should adopt a revised budget by June 30. The State's fiscal budget year is from July 1 to June 30. State agencies such as DWR are primarily funded under the State's general fund, but in recent decades, they have received significant funding for capital projects from bonds such as those from

Propositions 204 (1996), 12 (2000), 13 (2000), 40 (2002), 50 (2004), 84 (2006), and 1E (2006), as discussed previously. The funding process varies based on requirements of a given project or program. Some funding is set at the legislative level and others are set at the project level based on program requirements and funding availability.

4.2.3 Current Challenges and Future Direction

A paradigm shift is needed to move to sophisticated prioritization methodologies that focus on economic, environmental, and social criteria. Such methodologies would ensure that the optimal mix of critical work is funded first, budgeted from a system perspective. Although the current performance-based budgeting identifies the most effective and efficient projects in each business line (flood risk management activities, ecosystem restoration, navigation, water supply, and recreation), it largely ignores the multiple benefits and outputs associated with watershed studies and multipurpose projects. Therefore, the current budget development practices might overlook the most effective systemwide solutions.

Watershed studies and multipurpose projects are placed in the "primary" business line according to expected outputs (usually either Aquatic Ecosystem Restoration [AER] or Flood Risk Management). For example, in the AER business line, the ranking criteria evaluate studies and projects against the parameters of readiness, timeliness, cost effectiveness, and performance. Seven performance components provide an indication of the significance of the resources being restored and will have a substantial bearing on how projects are ranked. The seven performance components are as follows:

- Habitat Scarcity
- Connectivity
- Special-Status Species
- Hydrologic Character
- Geomorphic Condition
- Self-Sustaining
- Plan Recognition

Because watershed studies are developed more programmatically, not at the project level, and often identify watershed priorities for other agencies to implement, quantifying USACE-specific and project-level outputs is difficult, causing the overall scores for these projects to be lower.

In the Flood Risk Management business line, performance components include B/C ratios, population at risk, and population affected. Watershed studies and multipurpose projects can have higher overall costs associated with land requirements needed for ecosystem restoration. Furthermore, the outputs that fall outside the primary business line are not fully captured or recognized. This results in a lower rank through the “racking-and-stacking” process.

USACE is currently transforming the budget development process toward a watershed perspective, which should incorporate a broader criterion than B/C ratio for ranking flood risk reduction and multipurpose projects. An appropriate metric that honors the *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies* (USACE, 1983) would allow true compilation of project benefits that transcends business lines. Current Principles and Guidelines remain in place.³ These guidelines were established pursuant to the Water Resources Planning Act of 1965 (PL 89-80), as amended (42 U.S.C. 1962a-2 and d-1) and supersede those established in connection with promulgation of principles, standards and procedures at 18 CFR, Parts 711, 713, 714 and 716.

Per USACE Civil Works Direct Program, *Program Development Guidance, Fiscal Year 2014* (USACE, 2012b), a system perspective requires an integrated stakeholder-driven team thinking about development and management of water resources in the context of multiple purposes rather than narrowly focused purposes. Thus, a system perspective fulfills the following goals:

- Facilitates the search for comprehensive and integrated solutions
- Improves opportunities for public and private groups to identify and achieve common goals by unifying ongoing efforts and leveraging resources
- Identifies a combination of recommended actions (a Watershed Management Plan) to be undertaken by various partners and stakeholders to achieve identified national, regional, tribal, and local water resources management goals
- Leverages resources, including cost-shared collaboration, and integrates programs and activities within and among CW programs, and with other State, Federal, and nongovernmental organizations, to improve consistency and cost effectiveness

A systemwide or watershed approach is needed to ensure that investments are integrated into a holistic approach that preserves or enhances performance and sustainability at the system level. Such an approach requires consideration of the investment needs and priorities of all the business lines within the watershed. As

³ The Federal Government released the revision to the 1983 Principles and Guidelines (P&G), "Principles and Requirements" in March 2013. The USACE has been restricted from developing or implementing new rules or guidance upon issuance of the revised P&G and will continue to use the 1983 P&G until this restriction is rescinded and new guidance is developed.

watershed-based budgeting becomes better defined, USACE will be able to identify watersheds across regions of the United States and develop budget priorities that are consistent with investing in one or more of the following aspects of the system—the highest risk portions of the system that will result in the most improvement in performance, that contribute to increased navigation reliability and safety, that contribute to increased reduction of flood damages, and that address significant regional or national ecological problems. Leveraging resources through partnerships and having partners identify regional watershed-based priorities will become increasingly important to USACE project development.

4.2.4 Local and County Funding Processes (Propositions 218 and 13)

In 1978, California passed Proposition 13, which limited ad valorem taxes. In other words, a tax based on the assessed value of private property, including real estate, was limited to 1 percent of the full cash value of the property. Proposition 13 (1978) also decreased the assessed value of the properties to 1975 values, and limited increases of assessed value to 2 percent per year. Property that declines in value may also be reassessed. The enactment of Proposition 13 (1978) cut local property tax revenue significantly, causing cities and counties to raise user fees and local taxes.

In response to cities and counties shifting more revenue generation to user fees, Proposition 218 was passed in 1996. In general, the intent of Proposition 218 (1996) is to ensure that all taxes and most charges on property owners are subject to approval by two-thirds of voters. In addition, Proposition 218 (1996) seeks to curb some perceived abuses in the use of assessments and property-related fees, specifically the use of these revenue-raising tools to pay for general governmental services rather than property-related services (LAO, 1996). There was some special language that gave water, sewer, and refuse collection utilities less stringent requirements for voter approval.

The combination of Propositions 13 (1978) and 218 (1996) left local flood control agencies constrained in their options for revenue generation, a fact that was repeatedly stated in the SFMP information-gathering interviews with local agencies.

5.0 Funding Mechanisms

5.1 Existing Funding Mechanisms

Many local agencies (e.g., counties, cities, and utility districts) fund all or a portion of the cost of flood management and planning programs through their general fund budget. Although general fund revenues are collected on a regular basis with virtually no restrictions on the use of those funds for flood management and planning, most local agencies are financially challenged and cannot afford to take general fund monies away from other important programs.

Appendix B describes available local financing programs; Table I-B-1 summarizes advantages and disadvantages of these local sources.

5.2 Potential Funding Mechanisms

5.2.1 Legislative Changes to Proposition 218

Proposition 218 (1996) was passed in response to Proposition 13 (1978), which severely limited the amount of revenue that communities could generate from property taxes by requiring a two-thirds majority vote to pass special taxes or raise property taxes. To make up for the shortfall, new fees and assessments were implemented by agencies. These assessments were tax-like but did not fall under Proposition 13 (1978) requirements. In 1986, voters approved Proposition 62, the Voter Approval of Taxes Act. In essence, the initiative required that new taxes be approved by two-thirds of the local agency's governing body and a majority of voters. Cash-strapped communities continued to use assessments and property-related fees (among other fees) to pay for general government services. This approach was taken by some communities to fund general government services as a result of the new requirements of Proposition 62 (1986).

By 1996, voters approved Proposition 218, the Right to Vote on Taxes Act. Essentially, Proposition 218 (1996) ensured that voters must approve all taxes and most charges to property owners. Also, it sought to limit the use of assessments and property-related fees to fund only services that directly benefit property.

The significance of Proposition 218 (1996) to the funding of a city or county Flood Management and Planning Program is its limitations on raising revenue. Most sources of local funding, with the exception of fees for sewer, water, and refuse collection, cannot be increased without a vote. The ability for general funds to pay for the Flood Management and Planning Programs is also limited due to competition for such funds by other uses, and the requirement that any additional bond funds must be approved by two-thirds of the electorate. Unless the electorate or the property owners in an area vote in favor of a general tax, special tax, assessment, or fee, none of these funding sources can be implemented.

For local agencies, property tax assessment is the most common method for generating revenue. A relationship exists between the property size and the

amount of associated runoff; therefore, a relationship exists between property and flood management costs. However, given the restrictions of Proposition 13 (1978) and Proposition 218 (1996), revenue from property taxes has been impacted by limiting the value of the property being assessed (Proposition 13) and by encumbering assessment of new property taxes (Proposition 218) with the requirement of a two-thirds majority vote for approval.

Economic fluctuations also have affected flood management revenue. For example, the economic downturn has reduced flood management revenue because assessed property values have dropped, thereby lowering property tax revenue. Local agencies have identified this as a serious problem. If local agencies are to increase property tax revenue, they must have the ability to impose or increase assessments on those benefiting from flood management improvements. To accomplish this, new legislation or modifications to existing legislation is needed (for example, modifying Proposition 218 of 1996 to include services/utilities exemptions for storm drainage and flood management).

5.2.2 Regional Assessment Districts

Assessment Districts (ADs) are another mechanism that could be developed to assist with reliable funding for flood management projects. Different types of ADs could be utilized to fund Flood Management and Planning Program improvements and maintenance services. Under the Municipal Improvement Act of 1913 (California Streets and Highways Code § 10000 *et seq.*) and the Improvement Bond Act of 1915 (California Streets and Highways Code §§ 8500–8887), any city, county, or local public agency can establish an AD to fund certain flood improvements and the O&M of those specific improvements. Also, these same public agencies can establish ADs to finance the O&M of drainage and flood management services, as well as drainage and flood management facilities that do not need to be related to the services being financed. However, unlike the financing mechanisms discussed previously, ADs are subject to specific benefit requirements as a result of both their enabling legislation and Proposition 218 (1996).

In general, ADs:

- Spread costs equitably across a district
- Can be adopted by a county flood control district on a countywide basis
- Can be used for flood management O&M based on the Benefit Assessment Act of 1982
- Require a vote in accordance with Proposition 218 (1996) to establish
- Must provide a special, measurable, local, and direct benefit from such improvements and services to assessed properties

A special benefit is defined as (California Proposition 218 of 1996):

... a particular and distinct benefit over and above general benefits conferred on real property located in the district or to the public at large. General enhancement of property value does not constitute special benefit. . .

DWR, working together with local flood and water management agencies, could help establish regional ADs. If the State were involved in the formation of the AD, the AD might not be subject to the restrictions of Proposition 218 (1996). These ADs would help local agencies achieve self sufficiency and regional solutions for stormwater drainage and flood management within a watershed.

5.2.3 Statewide Flood Insurance

Many states have explored implementing a statewide flood insurance program; however, all the states that have investigated this approach have done so seeking a replacement program that would enable the State to opt out of the NFIP. If a statewide program simply replaced the national program, a large incremental increase in the insurance rates would be needed to generate revenue for increasing flood management expenditures.

5.2.4 Public-Private Partnerships

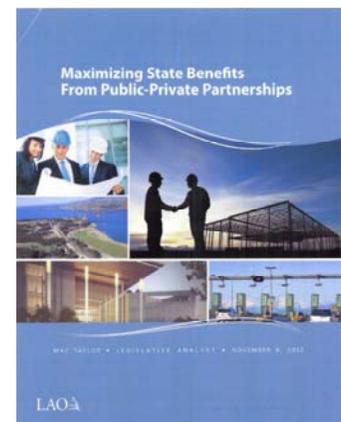
Public-private partnerships are another strategy that could be used to assist with funding of flood management. In recent years, public-private partnerships have been more prevalent in financing public infrastructure because investors have become more interested in such construction as an alternative investment opportunity that can deliver relatively predictable, income-oriented, and inflation-protected returns. Investors have provided funds for existing infrastructure (through asset monetization) and for new construction. The revenue stream is the key factor as to whether or not a public-private partnership is viable for infrastructure. If a revenue stream exists, whether from user fees, toll road fees, or elsewhere, an opportunity could exist for private funding (LAO, 2012). For a public-private partnership to be successful for flood management infrastructure, there would need to be a revenue stream, such as some form of a special assessment on property owners. The more stable the revenue stream, the more attractive the investment terms would be for investors.

5.2.5 Allocating Costs to Other Purposes/Beneficiaries

Historically, flood management agencies have developed narrowly focused projects. These projects were funded by the sponsoring flood management agency, and any repayment obligations were the responsibility of that agency. For existing projects, flood management agencies could identify other project purposes or beneficiaries that have not contributed any funds for the capital improvements or have not provided for any share of maintenance costs, and have those beneficiaries pay for these benefits.

Other benefits or purposes that have avoided cost allocations could include, but are not limited to, water supply, recreation, fisheries, ecosystem restoration, and navigation. This potential revenue or funding source might not be an obligation of the source; however, it can assist in paying for benefits that could lower the cost burden on the flood management agency.

If a revenue stream exists, an opportunity could exist for private funding.



**Legislative Analyst's Office
Report on Maximizing
State Benefits for Public-
Private Partnerships**

SRF Programs

Pros:

- ✓ *Proven to be effective*
- ✓ *Ability to leverage additional funds*

Cons:

- ✓ *Federally mandated project restrictions*
- ✓ *No private utilities*

Federal Infrastructure Trust Fund

Pros:

- ✓ *Stable financing source*

Cons:

- ✓ *Politically difficult*
- ✓ *Benefits hard to quantify for water projects*

5.2.6 Federal Programs Being Considered

The Congressional Research Service recently reviewed water infrastructure financing alternatives under consideration at the Federal level (CRS, 2012). Six key actions are under consideration, some of which may be applicable at the State level.

- Increase funding for State Revolving Fund (SRF) Programs
- Create a Federal infrastructure trust fund
- Create a Water Infrastructure Finance Innovation Act (WIFIA)
- Create a National Infrastructure Bank
- Modify Private Activity Bond Restrictions
- Reinstate Build America Bonds
- Modify Inland Waterways Trust Fund

Increase Funding for State Revolving Fund Programs

SRF programs are funded by an initial (and periodic) capital injection(s) by the Federal government and managed by individual states. Annual capital appropriations by the Federal government fund the SRFs. The SRF essentially functions as a bank, lending at low interest rates (including zero interest) for specific water projects. Loan repayments are then recycled back to individual SRF programs. SRF programs are governed by eligible project rules in addition to funding management constraints. States make loans, purchase local debt, or issue financial guarantees and are not allowed to deplete the capital of the fund. Thus, the fund operates as a “revolving” source of financing.

The Clean Water Act of 1972 (CWA) established the first water-related SRF, which was updated in 1987 under the Water Quality Act (WQA). The CWA and WQA SRF program targets financing for municipal sewage treatment and wastewater facilities. Specifically, the program allows for projects in wastewater treatment, nonpoint source pollution control, and estuary habitat. In the U.S., this program has provided over \$65 billion in (leveraged) funding to over 20,000 projects. The State Water Resources Control Board has managed the CWA SRF in California since 1987. As of 2012, approximately \$6.2 billion in funding has been issued, of which 94 percent was targeted for wastewater projects and 6 percent for pollution and estuary projects.

The Safe Drinking Water Act of 1974 established an SRF for drinking water projects. The California Department of Public Health manages the Safe Drinking Water State Revolving Fund (SDWSRF) in California. As of 2102, the SDWSRF has provided over \$16 billion in financing to over 6,000 projects in California.

Congress is considering expanding the SRF programs. SRFs have been largely successful over the last 30 years in providing funding for water infrastructure projects. States can use the SRF to secure bonds and use this money to lend to eligible programs, thereby leveraging existing capital. However, SRF funds act as a loan program, not a Federal grant. Many states impose project limits,

which increases the effectiveness of the program for smaller communities able to finance a larger portion of projects with SRF money. SRFs are affected by uncertainty around the Federal deficit and future discretionary spending due to potential decreases in capital injections by the Federal government.

Create a Federal Infrastructure Trust Fund

The Airport and Airways trust fund and Highway trust fund provide Federal financing to airport and highway infrastructure. In contrast to an SRF, a Federal trust fund for water infrastructure would be supported by a fixed annual revenue stream. Removing some of the variability associated with annual appropriations may allow State and local agencies to coordinate and better leverage Federal funding.

A trust fund will generate a steady financing stream only if Congress is able to agree on a stable revenue stream to fund the trust. This has historically worked for the Airport and Airways, the Highway, and the Harbor Maintenance Trust Funds; however, the political climate has changed significantly since these were enacted. Public focus on the Federal deficit decreases the likelihood that a trust fund could be established. However, some members of Congress propose to increase infrastructure spending.

Create a Water Infrastructure Finance Innovation Act

In 1998, Congress created the Transportation Infrastructure Finance Innovation Act (TIFIA). This program is targeted for transportation projects and has seen success in the years since implementation. TIFIA provides Federal credit assistance for up to one-third of project costs, with a minimum project cost-eligibility requirement of \$50 million. Eligible projects must have a dedicated revenue stream (typically tolls). TIFIA is supported by \$122 million in Federal money annually, administered by the U.S. Department of Transportation.

A WIFIA program would be similar to the TIFIA and potentially administered by the Environmental Protection Agency. The Water Resources and Environment Subcommittee has circulated a draft WIFIA bill (H.R. 3145) and held two hearings on the topic in 2012. One of the main benefits of the proposed program would be to provide low-cost capital to infrastructure projects. Under the TIFIA program, loan repayment does not begin until 5 years after “substantial completion” of the project, with payments ending after 35 years. This structure allows projects to be built and benefits to be realized before loan repayment starts, which would be a significant benefit to water management projects. However, a drawback is that the program requires a revenue stream. For water infrastructure projects, this would limit eligible projects to those that collect user fees or assessments based on water use.

Create a National Infrastructure Bank

In general, an infrastructure bank is an entity that manages capital and provides loans for infrastructure development. The current Administration has run on a political platform that includes increased infrastructure funding, and an

WIFIA

Pros:

- ✓ *Low-cost, long-term loans*

Cons:

- ✓ *Requires revenue stream*

Infrastructure Bank

Pros:

- ✓ *Government oversight of project selection*
- ✓ *Flexible agency alternatives*

Cons:

- ✓ *Unnecessary if WIFIA implemented*

Infrastructure Bank has been considered by Congress on several occasions. Propositions include an independent Federal agency, Federal corporation, government-sponsored private enterprise, or nonprofit corporation to establish the bank (CRS, 2011).

An infrastructure bank could provide funding to a range of infrastructure projects, with water projects as a single component. One benefit of an infrastructure bank is the ability of the Federal government to oversee approved projects and, in theory, target funds to those that are financially viable. Other selection criteria tend to focus on social benefits and other local effects rather than financial return. However, this may be a drawback for water projects because many projects are designed with various types of benefits in mind, such as ecosystem services. Many of these benefits are difficult to quantify, thus a project might not appear to be financially viable.

Modify Private Activity Bond Restrictions

Private Activity Bonds are tax-exempt bonds that are available for privately owned water facilities. The facilities are operated by a government unit or charge water rates that are approved by a subdivision of a community. Private agencies are typically not eligible for tax-exempt municipal bonds, which limits access to capital for financing new infrastructure projects. This is generally a poor outcome since private agencies are focused on returns to investors and, consequently, tend to pioneer new technologies and cost innovations.

Concerns have been raised over providing tax-exempt bonds to private agencies for public infrastructure. If only water infrastructure has access to interest-free bonds, this might attract investment from other public infrastructure. Providing tax-exempt bonds also raises the deficit, all else constant. However, the extent of the increase depends on the additional revenue generated through employment for new projects. Congress is considering changing requirements to allow more access to tax-exempt bonds for water infrastructure.

Reinstate Build America Bonds

As part of the American Recovery and Reinvestment Act, Congress created Build America Bonds to encourage job creation through infrastructure projects. Eligible projects were not limited to infrastructure but did not allow for private company participation. The bonds stopped being issued in December 2010. Congress is considering reinstating the bonds to target water infrastructure projects.

Modify Inland Waterways Trust Fund

In 1978 the Inland Waterways Trust Fund (IWTF) was created as part of the Inland Waterways Revenue Act of 1978. The IWTF helps to finance construction and major rehabilitation projects throughout the nation on inland waterways. Funds for the IWTF come from a fuel tax user fee and are used to cost-share design and construction of projects. Congress is considering new funding mechanisms to modernize funding for this program (United States Senate, 112th Congress, 2012).

6.0 Flood Management Financing Strategies

6.1 Introduction

Based on the comments of the agencies contacted during the Information Gathering effort, it appears that existing financing strategies are not keeping pace with the growing need for flood management improvements. As shown in Figure I-18, current funding levels do not meet current needs, and they fall significantly behind if we assume improvements necessary to meet a minimum target of protection from a 100-year flood event (1 percent annual chance of exceedance). This section identifies some approaches for consideration in the future to assist with closing some of the funding gaps. Other strategies, such as new partnerships and cosponsoring arrangements, will be needed to deal with the significant flooding risks statewide. A first step in identifying financing strategies is to identify guiding principles for financing.

6.2 Guiding Principles for the SFMP

Guiding principles are used to establish ground rules for developing financing strategies. These principles set limits on what is acceptable, define what should be done, identify objectives, and establish a framework for shaping the finance strategy. The following principles were developed to help establish financing strategies for the Flood Future Report:

- Flood management financing should encourage multi-objective and systemwide benefits (for example, IWM, habitat, water quality, public safety, recreation, aesthetics).
- Upstream activities that negatively change the timing or amount of downstream flows that exacerbate the flood hazard should mitigate their impacts with financial contributions or other means.
- Financing mechanisms at the State and local levels should be crafted or leveraged to maximize potential funding mechanisms and Federal participation.
- Local, State, and Federal funding decisions should be coordinated to maximize public benefit.
- Equitable and fair access to funding should be available.
- All public infrastructure investments should be cost effective and optimize risk allocation.
- The processes for any loans or grants developed should be fair, transparent, and efficient, with full public disclosure.
- Appropriate public control/ownership of public assets must be preserved—a consideration in any public-private partnerships that are explored.

Guiding principles set limits on what is acceptable, define what should be done, identify objectives, and establish a framework for shaping the finance strategy.

- A durable financing strategy should be based on developing an ongoing, sustainable local revenue source.

These guiding principles were used to vet SFMP finance strategies and approaches.

6.3 Financing Strategies

6.3.1 Optimizing State and Federal Funding Programs

Optimizing existing funding programs involves ensuring that all Federal-partnered and cost-shared projects are completed and that evaluating mechanisms to continue Federal partnering of projects as DWR moves to a more systemwide approach for flood management.

Local agencies reported that they were sometimes not able to take full advantage of Federal and/or State grants and loan programs, and that money was being “left on the table” for projects that were needed to protect people and property. At times, local agencies need a temporary, initial, or bridge partner to assist with the local cost-share on projects when local funds have not yet been allocated or when funding is temporarily unavailable. DWR could develop a program to provide short-term grants and/or low- or zero-interest loans to local agencies if local cost-shares for a project are not available. A revolving fund would also be an alternative.

Federal partners might not be able to continue using existing mechanisms while participating in systemwide projects. However, other authorities and funding sources might exist that USACE and other Federal agencies could use to partner on systemwide project planning.

To achieve cost-effective IWM, it may be prudent to focus on fewer projects with greater investment in each of these projects, with the goal of getting projects implemented sooner.

6.3.2 Prioritizing Projects

As project needs increase beyond existing funding levels, new ways are needed for identifying the best allocation of funds. Prioritizing projects is one mechanism that can be used to identify which projects should receive funding. Prioritization should occur on many levels. Federal and State investments should be coordinated and prioritized. Local agencies should be encouraged to bring their best projects forward when they are looking for Federal and State investment. Currently, some DWR grant programs are operated on a “first-come, first-served” basis, which could result in available funding going to projects with lower risk-reduction potential.

A number of methods can be used to prioritize projects. These methods range from development of guidelines and scoring criteria for a specific use to complex calculations, such as USACE Net Economic Development (NED) or B/C ratios.

A variety of approaches have been used to prioritize projects when some of the key benefits of the project are qualitative. These approaches might include benefits such as enhancement to fish habitat and reduction in the loss of life. During World War II, the Delphi method was developed to assist decision making when quantitative approaches were inadequate. This method was based on the

assumption that group judgments are more valid than individual judgments. This approach has had many modifications and is still used in some form today. The nominal group technique is somewhat similar and has been used in integrated water planning.

Many agencies have gone to using some form of prescribed decision-making process. In such a process, the key criteria for the agency are identified and ranked in order of importance, scales are developed for those criteria (the criteria are weighted), and then projects are scored based on the criteria. The resulting total scores determine an agency's prioritized projects.

Local agencies also develop criteria to evaluate projects. An example of this is the Santa Clara Valley Water District (SCVWD) use of this type of method to develop its 5-year Capital Improvement Plan. SCVWD is the primary water resource management agency for Santa Clara County. Funding for SCVWD's flood management and stream stewardship programs include ad valorem property tax, a voter-approved special parcel tax, and benefit assessment. The capital project component comprises about 41 percent of the watershed-related expenditures. To identify planned projects for the 5-year CIP, an annual CIP planning and review process is undertaken.

Key steps in this process are for the staff to propose continuing and new CIP projects, and then management reviews and prioritizes the proposed projects. Prioritization is performed using a predetermined, consistent set of criteria that prioritizes flood management and water resources stewardship projects. The subcategories of each rating sheet reflect the different emphasis between objectives of flood management and water resources stewardship, as well as the priorities set forth in the voter-approved special-tax ballot measure.

On the flood management rating sheet, flood benefits are rated based on the balance between environmental quality and cost. Specific areas evaluated include cost of average annual flood damages, size of developed area, presence of upstream and downstream improvements, rehabilitation possibility of the reach, area of proposed development, protection of the downstream reach, maintenance cost, multipurpose use, flood insurance costs, and size of historical flood areas. Nevertheless, the CIP projects are subject to the same overall weighting system, which is:

- 60 percent: Primary objective – Project's score in meeting flood management objectives or stewardship objectives
- 10 percent: Social factors – Project's score in interaction with the community and other agencies
- 15 percent: Environmental factors – Project's score in improving ecological function, water quality, or trails and open space
- 15 percent: Economic factors – Project's score in availability of other agency's funding or cost savings



All CIP projects are ranked in accordance with their respective weighted scores. The threshold for funding through that year's CIP is determined by the annual capital funding capacity. Projects below the funding threshold are deferred and reevaluated in a future CIP planning cycle.

6.3.3 Revising Grant Proposal Guidelines and Selection Criteria

Funding preference for IRWM grants is given to project proposals that satisfy one or more of the eight IRWM statewide priorities, one of which is the use of an IWM approach. The eight statewide priorities are:

1. Drought preparedness
2. Use and reuse of water more efficiently
3. Climate change response actions
4. Expansion of environmental stewardship
5. Employment of an IWM approach
6. Protection of surface water and groundwater quality
7. Improvement of tribal water and natural resources
8. Equitable distribution of benefits

These program preferences are reflected in proposal scoring criteria and are taken into consideration during the proposal selection process. For IRWM Implementation Grants, the priority for drought preparedness is given greater weight than other priorities. For the Project Grants for stormwater flood management, the priority for the use of an IWM approach is given greater weight, with only about 6 percent of historical IRWM funding going to flood management purposes.

The following sections describe some issues of the IRWM grant application process that might make it difficult for local agencies to receive funding for their flood management projects. Funding for local flood projects could be improved if the IRWM grant proposal guidelines and selection criteria were revised to address these issues.

Flood Management Not Well Integrated into Past IRWM Plans

The IRWM Plan Guidelines specifically state that flood management should be integrated into IRWM Plans in a manner similar to other types of water management. The guidelines stress the importance (and advantages with respect to grant scoring) of doing so and point out that past IRWM Plans have not sufficiently integrated flood management into the overall IRWM Plan. **The presence of this language in the guidelines suggests that there is a need for additional education and/or communication with prospective applicants regarding the role of flood management in IRWM planning.**

IRWM Project Eligibility

A project can receive an implementation grant only if it is consistent with an adopted IRWM Plan (California Public Resources Code §§ 75026(a) and 5096.827). This means that all projects must be identified in the IRWM Plan as a project or

program needed to implement the Plan. This applies to all projects for implementation and stormwater flood management. Plans can be amended to update the Plan's project list over time. **The ability to amend plans is critical to funding flood management projects given that flood management projects historically have not been well integrated into IRWM Plans.**

Also, stormwater flood management grants require a funding match minimum of 50 percent for each project. The funding match is a statutory requirement and cannot be waived or reduced. If the applicant does not identify a funding match of at least 50 percent for each project in a proposal for a stormwater flood management grant, the application will be deemed ineligible and will not be considered for funding. **The funding match minimum might act as a constraint on potential applicants. It is much higher than local cost-share requirements of other State/Federal programs. For example, the local funding requirement for the State's subventions program is between 10.5 percent and 17.5 percent.**

State Plan of Flood Control Projects Not Eligible

Neither IRWM implementation grants nor stormwater flood management grants can be used to fund projects that are part of the SPFC (PRC § 5096.827). **The exclusion from funding of projects that are part of the SPFC might discourage integration of flood management with other water management functions in the Central Valley.**

Weighting of Flood Damage Reduction Benefits in IRWM Implementation Projects

Flood damage reduction benefits are given the same weighting and score range as water supply and water quality benefits. No benefit category has a weighting or score advantage over another. Maximum scoring for program preferences requires the proposal to address long-term drought preparedness and to include one or more projects addressing a critical water supply or quality need for a disadvantaged community (DAC). Similar preference is not given to projects reducing or mitigating flood risks for a DAC. **Thus, proposals emphasizing water supply and water quality projects that benefit a DAC might receive a scoring advantage relative to proposals addressing benefits of flood damage reduction for a DAC.**

6.3.4 Invest in State and Federal Coordination

Increased State and Federal coordination could result in projects being implemented earlier than under current processes and in the leveraging of funds for the project. The State should consider setting aside funds to promote local coordination with State and Federal agencies.

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7.0 Financial Strategies Findings and Potential Actions

Financing of capital improvements and O&M projects is an ongoing challenge for agencies because funding sources are limited, and funds are unreliable due to competition among agencies for resources, reductions in property tax revenues, and costs associated with permitting and mitigation of projects. Local agencies are constrained by various statutes and restrictions that govern financing considerations. New guidelines and financial approaches should be developed to assist local agencies in addressing funding issues. Local, State, and Federal agencies should work together to identify sustainable funding mechanisms for planning, design, construction, rehabilitation, emergency response, and O&M of IWM and flood management projects.

More than \$50 billion in existing needs have been identified for flood management projects, which exceeds available funding sources. For these projects to be implemented, current and future funding must be leveraged and reliable funding provided. Five strategies were developed to identify reliable funding for flood management.

- Provide funding and in-kind credit programs for regional flood management in the context of regional planning.
 - Ø State and Federal agencies should develop financing program guidelines that encourage local agencies to collaborate on multibenefit projects. Programs such as the subventions funding by the California DWR and grant funding by FEMA could be realigned to direct more funding toward multibenefit or watershed-based projects.
 - Ø Currently, DWR's Statewide and Delta Subventions Programs are operated on a "first-come, first-served" basis. In addition to those programs, in-kind service credits could stipulate the requirement of regional, systemwide, and statewide planning. Also, grant funding processes and criteria should be simplified and standardized to reduce the level of effort and expertise required to apply.
- Develop a methodology to prioritize and implement flood management investments.
- Current funding criteria and processes are complex and hamper the development and implementation of priority projects. A new methodology should be developed and used by local, State, and Federal agencies to establish investment priorities across the state. Alignment among current and future local, State, and Federal resources is needed to implement priority flood projects and programs.
- Developing a priority for flood management funding represents a shift from the status quo. Currently, funding levels are identified, and then projects are identified to use this funding. Prioritizing projects will change this process by first identifying needs then seeking the funding to meet these needs.

- To make this new paradigm successful, local, State, and Federal agencies must work together to develop criteria for project prioritization. These criteria must have the capability of working across all areas of the state, with different types of flooding and with different types of projects. Once the criteria are developed, projects will be prioritized at a local level, then at a regional or systemwide level. Ultimately, the prioritization will be used to establish statewide priorities for flood management in California. Having a statewide set of flood management priorities will clarify needs for State and Federal governments setting investments.



Orange County, California, 1969

Assess the applicability of all potential sources and propose new options to provide sufficient and stable funding for flood management.

- Local and State flood management partners can work together to propose changes or alterations to local funding methods. For example, changes to current law (e.g., Proposition 218, the 1996 Right to Vote on Taxes Act) could include reclassification of flood management agencies as exempted public safety utilities or the establishment of regional assessment districts, in areas where these do not exist. Implementing these changes would help local agencies develop additional funding sources for O&M and capital projects. Regional assessment districts can be established where needed to support flood management.
- Identifying new sources of funding for flood management projects is critical to being able to meet future flood management needs. To identify sources of funding, all existing funding sources should be assessed by a wide range of flood and financial experts, including university partners and corporate experts. This assessment should be used to identify the best methods to fund future projects.
- Improve and facilitate access to State and Federal funding sources.
- A central online resource catalog should be developed to describe the different funding programs and provide guidance to local agencies on how to apply for funding. All potential funding sources for flood management

funding should be identified and information compiled. This information should be used to develop an online “how-to” guide explaining how to apply for funding from these programs. The guide would describe current programs, their purposes, general requirements (eligibility), resource contact information, potential funding levels, and links to websites.

- Such guidance could assist tribes, rural-urban areas, rural-agricultural areas, and disadvantaged communities with access to grant opportunities. This effort would include outreach to agencies to provide information and expertise in how to apply for grant funding and how to prepare solicitation packages. Focused outreach would build upon existing Federal and State programs that are ongoing. Workshops would be conducted to disseminate information statewide.
- Increase State and Federal funding for flood management projects.
- Local and State agencies must work together to advocate for sufficient and stable funding for regionally based IWM projects. Additional funding sources are needed to fund flood management projects and would include maximizing existing funding and identifying ways to minimize project costs, as well as researching for new sources.
- Existing funding can be maximized by implementing systemwide approaches and multibenefit projects. Using systemwide approaches enables projects to seek funding from multiple sources and to share costs among local agencies. Regional flood planning areas can be used to identify and prioritize these systemwide projects. Project prioritization can be used by Federal and State agencies to assess flood risk priorities statewide.
- Project costs can be reduced by working with resource agencies to improve project permitting, which could result in substantial cost savings. Local agencies could share costs with other entities (agencies, stakeholders groups, or private entities) that benefit from a project. Cost allocation would be developed on a case-by-case basis. Effective land use planning is another way to reduce future flood management costs by providing adequate natural system capacities for flood management.



California State Capitol

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8.0 References

- Associated Press Article (AP). 2013. "At a Glance: 3 Months Later, Sandy Losses Mount." January 29.
- Butte County, California. 2008. *FY 08-09 Final Budget*. October. Web site <http://www.buttecounty.net/Administration/County%20Budgets/FY%2008-09%20Final%20Budget.aspx>. Accessed October 2012.
- California Department of Finance (DOF). 2012. *Debt Service General Obligation Bonds and Commercial Paper*. Web site <http://2012-13.archives.ebudget.ca.gov/pdf/GovernorsBudget/8000/9600.pdf>. Accessed October 2012.
- California Department of Water Resources (DWR). 2005. *Flood Warnings: Responding to California's Flood Crisis*. January. Web site http://www.water.ca.gov/pubs/flood/flood_warnings_responding_to_california%27s_flood_crisis/011005floodwarnings.pdf. Accessed October 2012.
- California Department of Water Resources (DWR). 2010. *Delta Levees Special Flood Control Projects Final Near-Term Guidelines for Providing Funding to Local Public Agencies*. February. Web site http://www.water.ca.gov/floodsafe/fessro/docs/special_nearterm_guidelines.pdf.
- California Department of Water Resources (DWR). 2011a. *Framework for DWR Investments in Delta Integrated Flood Management*. February 14. Web site http://www.water.ca.gov/floodsafe/fessro/docs/levees_framework.pdf.
- California Department of Water Resources (DWR). 2011b. Map "Final Awards Proposition 1E Round 1 Stormwater Flood Management Grant Program." December 21. Web site http://www.water.ca.gov/irwm/grants/docs/Archives/Prop1E/Awards/Map%20SWFM_Awards_Final_12212011.pdf.
- California Department of Water Resources (DWR). 2012a. *Background / Reference Memorandum, Delta Region, Integrated Flood Management Key Considerations and Statewide Implications*. September. Web site http://www.water.ca.gov/floodsafe/fessro/docs/announce_background.pdf. Accessed January 2013.
- California Department of Water Resources (DWR). 2012b. *Flood Control Subventions Program Section*. Last modified May 16. Web site <http://www.water.ca.gov/floodmgmt/fpo/sgb/fcs/>.
- California Department of Water Resources (DWR). 2012c. *Flood Protection Corridor Program*. Last modified May 7. Web site <http://www.water.ca.gov/floodmgmt/fpo/sgb/fpcp/>.
- California Department of Water Resources (DWR). 2012d. "Detail of Appropriations and Adjustments (Reconciliation with Appropriations)." *2008-09 California Budget*. Web site <http://2008-09.archives.ebudget.ca.gov/pdf/GovernorsBudget/3000/3860RWA.pdf>. Accessed October 2012.
- California Department of Water Resources (DWR). 2012e. *Central Valley Flood Protection Plan, Attachment 8J Cost Estimates*. June. Web site http://www.water.ca.gov/cvfmp/docs/2012CVFPP_Att8J_June.pdf

- California Department of Water Resources (DWR). 2013a. *Integrated Regional Water Management Grants*. Last modified March 5. Web site <http://www.water.ca.gov/irwm/grants/stormwaterflood.cfm>. Accessed March 2013.
- California Department of Water Resources (DWR). 2013b. *Final Awards for Round 1 Implementation Grants Proposition 84, Chapter 2, Integrated Regional Water Management (IRWM)*. Web site <http://www.water.ca.gov/irwm/grants/docs/Archives/Prop84/Awards/Round1Imp/FinalP84ImplementationR1Award080511.pdf>. Accessed February 2013.
- California Department of Water Resources (DWR). 2013c. E-mail from Kirby Everhart/DWR to Terri Wegener/DWR. March 8.
- California Department of Water Resources and State Water Resources Control Board (DWR and SWRCB). 2004. *Integrated Regional Water Management Grant Program Guidelines Proposition 50 Chapter 8*. November. Web site http://www.waterboards.ca.gov/water_issues/programs/grants_loans/irwm_gp/docs/r1_guidelines.pdf. Accessed February 2013.
- California State Controller's Office (SCO). 2013a. *Cities Annual Report*. Data are from the summary section of Table 4, "Cities Annual Report – Statement of Expenditures," for the respective fiscal year. Web site http://www.sco.ca.gov/ard_locrep_cities.html. Accessed January 2013.
- California State Controller's Office (SCO). 2013b. *Counties Annual Report*. Data were collected from Table 6 "Statement of County Expenditures and Appropriation Limits Statewide Totals." Web site http://www.sco.ca.gov/ard_locrep_counties.html. Accessed January 2013.
- California State Controller's Office (SCO). 2013c. *Special Districts Annual Report*. Data are from Table 9 "Non-Enterprise Activity Revenues and Expenditures by Non-Enterprise Activity." Web site http://www.sco.ca.gov/ard_locarep_districts.html. Accessed January 2013.
- California State Controller's Office (SCO). 2013d. *Budgetary/Legal Basis Annual Reports*. Web site www.sco.ca.gov/ard_state_annual_budgetary.html. Accessed January 2013.
- Central Valley Flood Protection Board (CVFPB). 2011. *Delta Levees Maintenance Subventions Program Guidelines: Procedures and Criteria*. September 23. Web site http://www.water.ca.gov/floodmgmt/dsmo/docs/Guidelines_2011-09-23.pdf.
- City of Los Angeles. 2012. *Budget Documents*. Select Fiscal Year 2009/2010. Web site <http://cao.lacity.org/budget/>. Accessed October 2012.
- Congressional Research Service (CRS). 2011. *National Infrastructure Bank: Overview and Current Legislation*. Prepared by Claudia Copeland, William Mallett, and Steven Maguire. December 14.
- Congressional Research Service (CRS). 2012. *Legislative Options for Financing Water Infrastructure*. Prepared by Claudia Copeland, William Mallett, and Steven Maguire for CRS. April.

- County of Santa Clara. 2013. *Previous Year's Budgets*. Web site <http://www.sccgov.org/sites/scc/countygovernment/Pages/Budget-and-Finance.aspx>. Accessed January 2013.
- Department of Homeland Security (FEMA). 2013. *Budget*. Web site <http://www.dhs.gov/dhs-budget>. Accessed January 2013.
- El Dorado County. 2012. *Previous Year's Budgets*. Web site http://www.edcgov.us/Government/Auditor-Controller/Budgets/Prior_Years_County_Budget.aspx#2011-2012. Accessed December 2012.
- Federal Emergency Management Agency (FEMA). 2007. *National Flood Insurance Program (NFIP) Floodplain Management Requirements: A Study Guide and Desk Reference for Local Officials*. September 21. Web site <http://www.fema.gov/library/viewRecord.do?id=1443>.
- Federal Emergency Management Agency (FEMA). 2013. *Executive Order 11988: Floodplain Management*. Web site <http://www.fema.gov/environmental-planning-and-historic-preservation-program/executive-order-11988-floodplain-management>. Accessed March 2013.
- Kelley, R. 1998. *Battling the Inland Sea Floods, Public Policy, and the Sacramento Valley, 1850-1986*. University of California–Berkeley.
- Legislative Analyst's Office (LAO). 1996. *Understanding Proposition 218*. December. Web site http://www.lao.ca.gov/1996/120196_prop_218/understanding_prop218_1296.html. Accessed October 2012.
- Legislative Analyst's Office (LAO). 2005. *Analysis of the 2005-06 Budget Bill*. February. Web site http://www.lao.ca.gov/analysis_2005/2005_pandi/pi_part_5_6_water_policy_reforms_anl05.htm. Accessed October 2012.
- Legislative Analyst's Office (LAO). 2012. *The 2013-14 Budget: California's Fiscal Outlook*. November 14. Web site <http://www.lao.ca.gov/reports/2012/bud/fiscal-outlook/fiscal-outlook-2012.aspx>. Accessed January 2013.
- Public Policy Institute of California. 2012. *Water and the California Economy - Technical Appendix*.
- State of California. 2010. *Strategic Growth Plan Bond Accountability*. "Proposition 84 Overview." Web site <http://bondaccountability.resources.ca.gov/p84.aspx>.
- Swiss Re. 2007. "Hurricane Katrina." January 25.
- United States Army Corps of Engineers (USACE) Civil Works Direct Program. 2011. *Program Development Guidance, Fiscal Year 2013*.
- United States Army Corps of Engineers (USACE). 1982. *Sacramento-San Joaquin Delta Stage Frequency Study*. Revised 1986.
- United States Army Corps of Engineers (USACE). 1983. *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies*.
- United States Army Corps of Engineers (USACE). 2011a. *USACE Civil Works Strategic Plan 2011-2015: Sustainable Solutions to America's Water Resource Need*. Web site http://www.usace.army.mil/Portals/2/docs/civilworks/news/2011-15_cw%20stratplan.pdf.

- United States Army Corps of Engineers (USACE). 2011b. *Program Development Guidance, Fiscal Year 2013*.
- United States Army Corps of Engineers (USACE). 2012a. Email from Kim Carsell/USACE to Erika Powell/CH2M HILL. January 4.
- United States Army Corps of Engineers (USACE). 2012b. *Program Development Guidance, Fiscal Year 2014*.
- United States Army Corps of Engineers (USACE). 2012c. E-mail from Kim Carsell/USACE to Erika Powell/CH2M HILL. January 11. (Original data).
- United States Army Corps of Engineers (USACE). 2013. E-mail from Stu Townsley/USACE to Kim Carsell/USACE. March 20. (Updated data).
- United States Department of Agriculture, Economic Research Service (ERS). 2012. *International Macroeconomic Data Set*. Last modified December 21. Web site <http://www.ers.usda.gov/data/macroeconomics/>. Accessed January 2013.
- United States Department of Agriculture, Natural Resources Conservation Service (NRCS). 2012a. *Watershed and Flood Prevention Operations (WFPO) Program*. Web site http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/landscape/wfpo/?cid=nrcs143_008271. Accessed October 2012.
- United States Department of Agriculture, Natural Resources Conservation Service (NRCS). 2012b. *The Small Watershed Program in California - PL 83-566 and PL 73-534*. Web site http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ca/programs/?cid=nrcs144p2_064043. Accessed October 2012.
- United States Department of Agriculture, Natural Resources Conservation Service (NRCS). 2012c. *Emergency Watershed Protection Program (EWP)*. Web site http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ca/programs/?cid=nrcs144p2_064025. Accessed October 2012.
- United States Department of Homeland Security (DHS). 2012. *DHS Budget*. Web site <http://www.dhs.gov/xabout/budget/dhs-budget.shtm>. Accessed October 2012.
- United States Department of the Interior, Bureau of Reclamation (Reclamation). 2012. *Budget*. Select data for the Mid-Pacific and Lower-Colorado regions only. Web site <http://www.usbr.gov/budget/>. Accessed October 2012.
- United States Government Printing Office (GPO). 2012. *U.S. Government Budget*. Web site <http://www.gpoaccess.gov/usbudget/fy04/browse.html>. Accessed October 2012.
- United States Senate, 112th Congress. 2012. *Senate Report 112-075 - Energy And Water Development Appropriations Bill, Inland Waterways Trust Fund*. Web site http://thomas.loc.gov/cgi-bin/cpquery/?&sid=cp112ncvda&r_n=sr075.112&dbname=cp112&&sel=TOC_28798&
- URS/JBA. 2008. *Delta Risk Management Strategy*.
- Wright, James M. 2000. *The Nation's Response to Flood Disasters: A Historical Account*. (Ed: Wendy L. Hessler.) A report by the Association of State Floodplain Managers. 116 pp. April.

Appendix A: Flood Future Report Components

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Appendix A: Flood Future Report Components

California’s Flood Future Report is composed of three layers of documents, which were developed with different audiences and purposes, as shown in Figure I-A-1. The three main layers are the Policy Brief, Highlights, and main report including the technical attachments (or technical memoranda).

The Policy Brief document provides a high-level summary of the key information contained in the Flood Future Report and its technical attachments. This document is meant to inform legislators, legislative staff, and agency executives about the report.

The Highlights document, which is an Executive Summary of the Flood Future Report, is more detailed than the Policy Brief slightly expanding the level of detail of the information provided in the Policy Brief. The Highlights document is intended for use by legislators, legislative staff, agency executives, and the public.

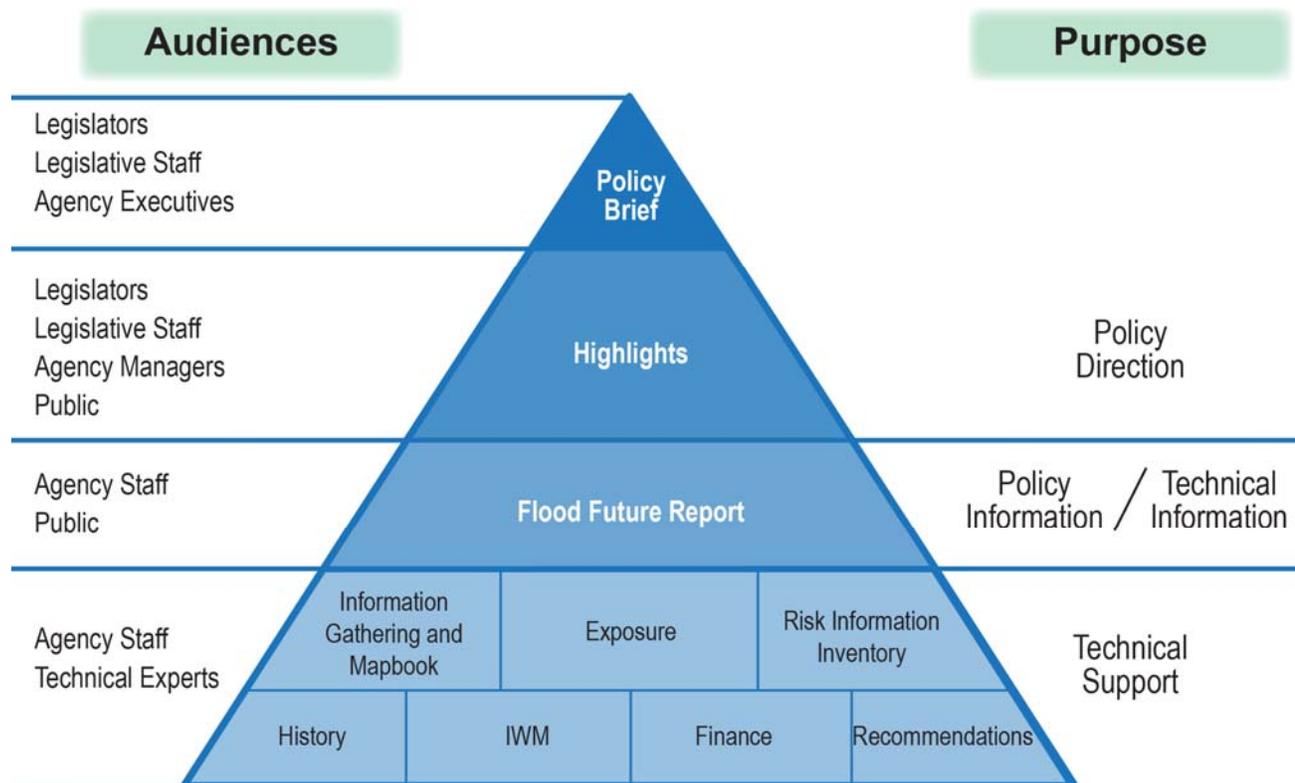


Figure I-A-1. Flood Future Report Components Diagram

The Flood Future Report provides a compilation of the information developed in the technical attachments. This document contains a comprehensive look at flooding throughout the state, and it describes the challenges and opportunities facing flood management. The Flood Future Report also provides information to make decisions about policies and financial investments to improve public safety, environmental stewardship, and economic stability.

This report is supported by eight technical attachments:

- **Attachment A: References**
- **Attachment B: Glossary**
- **Attachment C: History of Flood Management in California.** This attachment provides a detailed history of flooding in the 10 major California Water Plan hydrologic regions.
- **Attachment D: Summary of Exposure and Infrastructure Inventory by County (Mapbook).** This attachment is a mapbook organized by county providing information on exposure to flooding, flood infrastructure, flood types present, list of major floods, and information on the planned/proposed projects.
- **Attachment E: Existing Conditions of Flood Management in California (Information Gathering Findings).** This attachment provides an overview of the information gathering effort to collect flood management information from local, State, Tribal, and Federal agencies, as well as a detailed summary of the results of the information gathering effort. The purpose of this effort was to develop a better understanding of flood risk management in the State of California.
- **Attachment F: Flood Hazard Exposure Analysis.** This attachment describes the methodology used to identify flood hazard exposure statewide as well as the results of the flood hazard exposure analysis. This analysis was performed to provide insight into potential flood risks throughout the state.
- **Attachment G: Risk Information Inventory.** This attachment provides a better understanding of flood risk statewide, based on the best available information. To characterize flood risk in the California, the SFMP developed a risk exposure analysis used in conjunction with an inventory of risk-relevant information gathered from agency meetings.
- **Attachment H: Practicing Flood Management Using an Integrated Water Management Approach.** This attachment provides a description of the evolution of flood management practices toward and using an IWM approach, an overview of IWM, the benefits of using an IWM approach, and sample case studies of projects that have used an IWM approach.
- **Attachment I: Finance Strategies.** This attachment provides an understanding of the current status of flood management financing and the challenges that lie ahead as California develops recommendations to address flood management issues.
- **Attachment J: Recommendations to Improve Flood Management in California.** This attachment provides a detailed description of how the Flood Future Report recommendations were developed and outlines the recommendations along with other high-level challenges.

Each of the documents follows a color scheme that was developed for the Highlights document. The documents are formatted using different-colored headers to indicate the purpose of a given section. The color scheme follows the following coding format:

- Introduction (light blue)
- Understanding the Situation (brown)
- The Problem (goldenrod)
- The Solution (royal blue)
- Recommendations (green)
- The Path Forward (yellow)

Any and all appendices to an attachment were coded using a light blue to represent that this is background or supporting information.

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Appendix B: Detailed Funding Sources

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Appendix B: Detailed Funding Sources

Financing Programs Available to Local Agencies

This section focuses on possible local revenue sources. Federal and State funding is discussed in other sections and can be useful in funding one-time projects or coping with shortfalls, but consistent availability of such funding cannot be ensured and is often beyond the control of local public agencies. In addition, Federal and State programs often involve loans that require collateral and a local stream of revenue to repay. Local agencies should search and apply for available grants and loans; to the extent that projects are able to receive such funding, the need to undertake the local mechanisms cited below is diminished.

Overview of Funding Approaches used by Local Agencies

Many local agencies (e.g., counties, cities, and utility districts) fund all or a portion of the cost of flood management and planning programs through their general fund budget. Although general fund revenues are collected on a regular basis and there are virtually no restrictions on their use related to flood management and planning, most local agencies are financially challenged and cannot afford to take general fund monies away from other important programs.

This section summarizes financing mechanisms that could be used by local agencies in place of general fund revenues. Table I-B-1 summarizes financing alternatives that should be considered and advantages and disadvantages of the alternatives.

Table I-B-1. Available Financing Programs for Local Agencies

Financing Mechanism	Advantages	Disadvantages
1. Municipal Stormwater Utility Fee	<ul style="list-style-type: none"> • Can provide full funding • Can apply to every parcel in the area adopting the fee • Can pay O&M or capital costs • Can be implemented on municipality or drainage basin basis 	<ul style="list-style-type: none"> • Difficult to implement at the countywide level • Might require enabling legislation • Will require property owner or registered voter election
2. Sales Tax Measure	<ul style="list-style-type: none"> • Can provide a fairly consistent source of funding • Can fund facilities or services specified in ballot materials 	<ul style="list-style-type: none"> • Requires a 2/3 vote; can be regressive when calculated as a function of income • Currently preempted by State 1% sales tax increase
3. Sewer User Fee	<ul style="list-style-type: none"> • No election requirement under Proposition 218 (1996); only ballot protest process • No legal constraints on raising funds other than nexus • Can pay O&M or capital costs 	<ul style="list-style-type: none"> • Can pay for only a portion of costs related to sewer usage • Difficult to administer on a countywide basis with so many sewer agencies

APPENDIX B: DETAILED FUNDING SOURCES

Table I-B-1. Available Financing Programs for Local Agencies

Financing Mechanism	Advantages	Disadvantages
4. Refuse Collection Fee	<ul style="list-style-type: none"> • No election requirement under Proposition 218 (1996); only ballot protest process • No legal constraints on raising funds other than nexus • Can pay O&M or capital costs • Charging refuse collection firms directly through franchise fee can avoid problems with controlling rates charged to users 	<ul style="list-style-type: none"> • Can pay for only a portion of costs related to refuse collection • Difficult to administer on regional basis with numerous refuse collection firms • Public agencies can control only the rates charged to users through negotiation with private entities, so franchise fee paid directly to public agency might be preferred mechanism
5. Water User Fee	<ul style="list-style-type: none"> • No election requirement under Proposition 218 (1996); only ballot protest process • No legal constraints on raising funds other than nexus • Can pay O&M or capital costs 	<ul style="list-style-type: none"> • Can pay for only a portion of costs related to water usage • Difficult to administer on a regional basis with numerous water agencies
6. Mello-Roos Community Facilities District (CFD)	<ul style="list-style-type: none"> • Can be conditioned on all new development and redevelopment to ensure that those parcels pay the full costs of services • Can pay O&M or capital costs • Can pay capital costs anywhere within the jurisdiction forming the CFD • Simple annexation process 	<ul style="list-style-type: none"> • Requires 2/3 vote of qualified electors so would likely apply only to new development and redevelopment • Can be used to fund only increased services (not existing services) that benefit the parcels within the CFD
7. Assessment District (AD)	<ul style="list-style-type: none"> • Spreads costs equitably • Can be adopted by county flood control district on a countywide basis • Benefit Assessment Act of 1982 can be used for flood management O&M 	<ul style="list-style-type: none"> • Requires Proposition 218 (1996) vote • Must demonstrate special benefit to assessed property • More complicated and expensive to set up than municipal stormwater utility fee • Impractical unless set up on a basin-wide basis; Too complicated to establish for multiple agencies • Most ADs are unable to pay for O&M except for services related to infrastructure funded by the AD; the exception is the Benefit Assessment Act of 1982
8. County Service Area (CSA)	<ul style="list-style-type: none"> • Can provide extended public services to unincorporated county areas experiencing high growth • Politically acceptable in many communities • Additional property may be added with Local Agency Formation Commission (LAFCO) approval 	<ul style="list-style-type: none"> • Difficult to justify funding flood management and planning program costs as an extended service

Table I-B-1. Available Financing Programs for Local Agencies

Financing Mechanism	Advantages	Disadvantages
9. Certificates of Participation (COPs) and Lease Revenue Bonds (LRBs)	<ul style="list-style-type: none"> • Can be adopted by legislative body; no voter approval required • Can be used to pay for capital improvements 	<ul style="list-style-type: none"> • Need to find source of reliable revenue to pay interest and principal; interest rates charged tend to be higher if repayment revenues are not predictable • Statutory and constitutional limitations on the size of municipal debt might apply
10. Development Impact Fees (DIFs)	<ul style="list-style-type: none"> • Can be adopted by legislative body; no voter approval required • Dedicated source because funds collected cannot by law be diverted to other uses • Can be used to reimburse public agencies and developers for oversizing capital improvements 	<ul style="list-style-type: none"> • Can pay only for capital improvements • Can be applied only to future new development and redevelopment. • Slowdown in growth will delay revenue generation
11. Integrated Financing District (IGFD)	<ul style="list-style-type: none"> • Can be used to reimburse public agencies and developers for oversizing capital improvements • Places liens on parcels to ensure reimbursements 	<ul style="list-style-type: none"> • Can be used only for reimbursement, not for initial funding • Cannot be used for O&M • Must be used in conjunction with CFD or AD
12. State Gasoline Taxes	<ul style="list-style-type: none"> • Reliable revenue source is already in place • Can be used for improvements or operating expenses related to roads 	<ul style="list-style-type: none"> • Must compete with other activities for limited funding • Can be used only for road-related costs

Finance mechanisms summarized above are discussed below:

A. Municipal Stormwater Utility Fee (Item 1)

The most comprehensive approach to funding the watershed management programs would be through the use of a municipal stormwater utility fee. A stormwater utility fee could be adopted under California Health and Safety Code section 5471.

Under California Health and Safety Code section 5471, certain types of public agencies are allowed to collect fees or charges from property owners (including standby charges from owners of undeveloped properties) to pay for capital improvements, operations, and maintenance for their storm drainage, water, and sewerage systems. The public agencies authorized to levy these charges include counties, cities, sanitary districts, sewer maintenance districts, and other districts authorized to acquire, construct, maintain, and operate sanitary sewers and sewerage systems. County flood management districts do not appear to qualify, so if a fee were charged by the Orange County Flood Control District, special legislation would be required unless general legislation providing authority to all flood management districts in the state were adopted.

Revenues derived from the fees levied under California Health and Safety Code section 5471 can be used for the following:

1. The acquisition, construction, reconstruction, maintenance, and operation of storm drainage, water, and sewerage systems.
2. The repayment of principal and interest on bonds issued for the construction or reconstruction of these storm drainage, water, and sewerage systems.

As a parcel-related fee, a stormwater utility fee must be calculated according to Proposition 218 (1996) guidelines for fees. Proposition 218 requires that:

1. Revenues derived from the fee or charge shall not exceed the funds required to provide the property-related service.
2. Revenues derived from the fee or charge shall not be used for any purpose other than that for which the fee or charge was imposed.
3. The amount of fee or charge imposed upon any parcel or person as an incident of property ownership shall not exceed the proportional cost of the service attributable to that parcel.
4. No fee or charge may be imposed for a service unless that service is actually used by, or immediately available to, the owner of the property in question. Fees or charges based on potential or future use of a service are not permitted.
5. No fee or charge may be imposed for general governmental services, including police, fire, ambulance, or library services where the service is available to the public at large in substantially the same manner as it is to property owners.

A stormwater utility fee would be subject to approval by at least 50 percent of the number of parcels affected by the stormwater utility fee. Although the revenues derived from a fee under Proposition 218 (1996) cannot exceed the funds required to provide the proportional cost of the service attributable to the parcel, no “special benefit” requirement exists, which makes a stormwater utility fee preferable to a special assessment in terms of its potential for litigation. The stormwater utility fee levied on each parcel could be based on runoff coefficients, a parcel’s contribution of pollutants to stormwater, or similar data. To best meet the proportional cost requirement of Proposition 218 (1996), local agencies should consider a fee structure based on a drainage basin basis.

B. Sales Tax Measure (Item 2)

A sales tax places a consumption tax on certain goods and services. Most sales taxes are collected by the seller, who pays the tax to the public entity charging the tax. Under State law, a local agency may increase the sales tax within its jurisdiction only in increments of 0.25 percent, 0.5 percent, or 0.75 percent, unless legislation is passed stating otherwise. According to California Revenue and Taxation Code section 7251, the combined rate of all sales taxes imposed shall not exceed 200 basis points above the State’s base

tax rate (8.25 percent as of April 1, 2009). The cities of La Habra and Laguna Beach have the highest sales tax rate in the state (9.25 percent). As a result, the maximum sales tax rate that could be imposed by these cities is an additional 1 percent.

Sales tax revenues could be used to fund facilities or services specified in the ballot materials. Therefore, this type of funding could be used to fund a broad array of flood management and planning programs and O&M costs. The governing body of the city or county must place the sales tax increase on a special, primary, or general election ballot. As a special purpose tax, it would require a two-thirds majority vote.

Statewide, only 6 of 13 special purpose tax measures (those requiring a two-thirds majority vote) were approved by the relevant electorate in the November 2008 election. To be successful, local agencies would need an effective public outreach effort to demonstrate to voters the benefit to their watersheds that will be achieved through this additional tax. As a result of California's current budget crisis, the State's base sales tax rate was increased by 1.0 percent (from 7.25 percent to 8.25 percent) on April 1, 2009. The 1 percent tax rate increase expired on July 1, 2011.

C. Sewer User, Refuse Collection, and Water User Fees (Items 3, 4, and 5)

Although Proposition 218 (1996) does not require voter approval for sewer, water, and refuse collection user fees, it does require a clear nexus between costs and benefits, as well as a clear separation between existing development and future development. Therefore, to implement fees of this nature, a nexus must be demonstrated between the flood management and planning program and the demand of a household or business for water, sewer and refuse collection services.

Figure I-B-1 illustrates the paths through which non-stormwater and sewer flows and refuse could enter the storm drain system. Although the relative contributions from each source depend upon the specific characteristics of each watershed, this model can be applied to both growing and mature urban watersheds. Quantitative data can be applied to this model to not only demonstrate a nexus between sources and pollutants carried by non-storm runoff, but also to calculate appropriate percentage contributions from each of the three sources (irrigation, automotive products, and household products). These percentages can then be applied to existing sewer, water, and refuse collection fee structures to determine additional fees that could be collected from users or service providers that could be dedicated to flood management and planning programs.

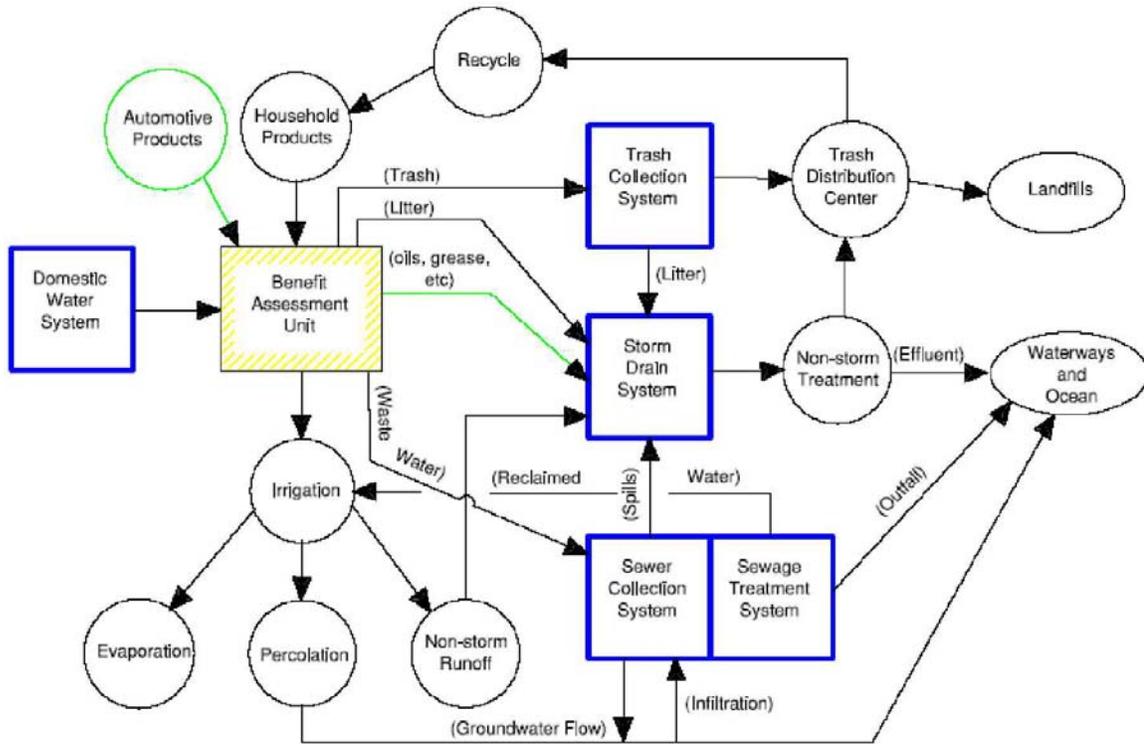


Figure I-B-1. Non-Stormwater Sources

Approximately 50 percent of domestic water demanded by households is used for irrigation. The City of San Diego (in a semi-arid setting) estimates that approximately 12 percent of urban irrigation becomes excess runoff. Runoff from excess irrigation finds its way to street gutters, catch basins, storm drains, and watercourses picking up pollutants along the way. Flood management and planning programs and water quality programs often require that water treatment devices be included as part of a responsible agency’s list of best management practices. The cost of installing and maintaining such devices is a significant component of the long-term costs addressed by the funding solution described herein.

In California, almost all local agencies maintain separate drainage and sewer collection systems. The term “storm sewers” does not apply in the sense that many older cities in the East and Midwest use storm sewers, where urban runoff and wastewater collection indeed share the same conduit. With separate systems, wastewater from sewer spills and leaks from cracked or broken sewer lines might find its way into storm drain systems. Likewise, urban runoff might find its way into sewer collection systems through inflow (such as unsealed manhole covers) and infiltration (seepage through pervious ground into sewer pipe joints and cracks). Increased sewer flow resulting from inflow and infiltration increases the burden on treatment plants and therefore the cost of treatment. Such conditions describe a nexus between urban runoff and sewer collection that can be used as justification for including an urban runoff component in the sewer rate analysis. For example, the City of Oakland funds part of its stormwater through sewer rate revenue; however, the authority for this funding program occurred prior to

Proposition 218 (1996). By City of Oakland ordinance, the stormwater component cannot exceed 5 percent of the total sewer rate revenue.

Cooking grease in wastewater discharged from food service establishments, multi-family housing, and single-family homes results in fats, oils, and grease (FOG) blockages in sewer systems. FOG blockages lead to sanitary sewer overflows, which can cause untreated sewage to flow onto streets and travel to storm drains, creeks, and other surface waters.

Additionally, refuse falls onto public streets as a result of resident, employee, and visitor litter and spillage from the collection process itself. This litter finds its way into the storm drain system as it is carried by non-storm and stormwater runoff to catch basins. Litter not controlled at the source must be removed through treatment and hauled to collection points and eventually to landfills.

With monitoring and review of historical data, a local agency could determine the percentage contributions of costs for treating non-storm runoff and sewage spills, as well as refuse removal, as they relate to the total cost of water, sewer, and refuse collection services. By adding these costs as a component of water, sewer, and refuse collection fees, agencies could gain a portion of the revenues that they need to fund their flood management and planning programs.

The exemptions for water, sewer, and refuse collection user fees from the restrictions of Proposition 218 (1996) apply only to the voter approval requirements. As parcel-related fees, these user fees must still be calculated according to Proposition 218 guidelines for fees (discussed in the following section). Written notice must still be provided to property owners of record. Also, the proposed fees are subject to a public hearing prior to receiving legislative approval. The submittal of written protests prior to the public hearing by a majority of the property owners affected by a user fee is sufficient to prevent the imposition of that fee.

Although the nexus requirements for fees are clearly less onerous than the special benefits requirement imposed on assessments by Proposition 218, legal risks are inherent in any effort to raise revenues without an election. The restriction of fees to their appropriate uses should meet that legal test: the trash fee would be used to address the impacts of trash and debris on urban runoff; the water fee would be used to address constituents carried by excess irrigation; and the sewer fee would be used to address sewer leakage and related issues. However, no “bright line” has been created by the courts related to the nexus issue on fees.

D. Mello-Roos Community Facilities District (Item 6)

A CFD can be used to pay for future development costs for a flood management and planning program. Although a two-thirds vote of the “qualified electors” is required to establish a CFD, the boundaries of a potential CFD could be set so that fewer than 12 registered voters initially

reside within the CFD. In this case, the qualified electors would be the property owners (not the registered voters), and if property owners were conditioned to form or annex to a CFD to develop their property, they would need to agree to include their property in the CFD. While this type of financing would not generate funds to pay for existing development costs for a flood management and planning program, it could cover a substantial portion of the cost of such services related to future development and redevelopment.

The Mello-Roos Community Facilities Act was enacted by the California State Legislature in 1982 (California Government Code § 53311 *et seq.*) to provide an alternate means of financing public infrastructure and services subsequent to the passage of Proposition 13 in 1978. The Act complies with Proposition 13 (1978), which permits cities, counties, and special districts to create defined areas within their jurisdictions and, by a two-thirds vote within the defined area, impose special taxes to pay for the public improvements and services needed to serve that area. The Act defines the area subject to a special tax as a CFD. If fewer than 12 registered voters reside within a proposed CFD, the property owners within the CFD are defined as the qualified electors. Therefore, if new development and significant redevelopment are required to join a CFD to gain entitlements, pull building permits, or record a final map or parcel map, the cooperation of a property owner who wishes to develop a parcel can be ensured. The Act provides a simple and inexpensive annexation process whereby vacant parcels can annex to a CFD on a parcel-by-parcel basis, as they are developed.

A CFD could provide for the purchase, construction, expansion, or rehabilitation of real or other tangible property (including land) with an estimated useful life of at least 5 years. It may also finance the costs of planning, design, engineering, and consultants involved in the construction of improvements or formation of the CFD. The facilities or real property financed by the CFD do not have to be located within the CFD. Facilities that will be publicly owned and will have a useful life of 5 years or more would qualify for this financing.

Furthermore, a CFD could pay for certain types of public services such as “flood and storm protection services, including but not limited to the operation and maintenance of storm drainage systems, and sandstorm protection systems.” However, a CFD could finance these services only to the extent that they are in addition to those provided and provide a higher level of service/protection within the area of the CFD before the CFD was created and could not supplant services already available within that area.

Formation of a CFD authorizes the public agency establishing the CFD to levy a special tax on all taxable property within the CFD, as defined in the formation documents. Property owned or irrevocably offered to a public agency could be exempted from the special tax. Mello-Roos special taxes are collected at the same time and in the same manner as regular ad

valorem property taxes, unless otherwise specified by the agency. Special tax revenues could be used to pay the debt service on bonds sold to fund the construction or acquisition of public capital facilities, or to pay directly for facilities or public services.

E. Assessment District (Item 7)

ADs could be used to fund flood management and planning program improvements and maintenance services. Under the Municipal Improvement Act of 1913 and the Improvement Bond Act of 1915, any city, county, or local public agency can establish an AD to fund flood improvements, as well as the O&M of those specific improvements. Furthermore, under the Benefit Assessment Act of 1982, these same public agencies can establish ADs to finance the operation and maintenance of drainage and flood management services, as well as drainage and flood management facilities that need not be related to the services being financed.

However, unlike the financing mechanisms discussed previously, ADs are subject to specific benefit requirements as a result of both their enabling legislation and Proposition 218 (1996). Under their enabling legislation, public works improvements and services are eligible for AD financing to the extent that properties within the AD receive a special, measurable, local, and direct benefit from such improvements and services. Traditionally, improvements to be financed using an AD include local streets and roads, water, sewer, storm drains, utility lines, and landscaping. Improvements of general benefit to a community, such as regional flood management facilities, are not eligible for AD financing.

Proposition 218 (1996) further emphasized this benefit requirement by specifying that:

An agency which proposes to levy an assessment shall identify all parcels which will have a special benefit conferred upon them and upon which an assessment will be imposed. The proportionate special benefit derived by each identified parcel shall be determined in relationship to the entirety of the capital cost of a public improvement or for the cost of the property related service being provided. No assessment shall be imposed on any parcel which exceeds the reasonable cost of the proportional special benefit conferred on that parcel. Only special benefits are assessable, and an agency must separate the general benefits from the special benefits conferred on a parcel. Parcels within a district that are owned or used by any agency, the State of California or the United States shall not be exempt from assessment unless the agency can demonstrate by clear and convincing evidence that such publicly owned parcels in fact receive no special benefit.

Proposition 218 (1996) defines “special benefit” as the following:

Special benefit means a particular and distinct benefit over and above general benefits conferred on real property located in the district or to the public at large. General enhancement of property value does not constitute special benefit.

It also places the burden of proof on the public agency in any legal action challenging the validity of an assessment:

In any legal action contesting the validity of any assessment, the burden shall be on the agency to demonstrate that the property or properties in question receive a special benefit over and above the benefits conferred on the public at large and that the amount of any contested assessment is proportional to, and no greater than, the benefits conferred on the property or properties in question.

The Santa Clara decision (discussed in Section IV.B.) reinforces the special benefit requirements of Proposition 218 (1996), making an AD less attractive for funding watershed management program costs than other funding mechanisms.

F. County Service Area (Item 8)

County Service Areas (CSAs) are provided for in the California Government Code section 25210 *et seq.* This legislation was intended to provide a mechanism to furnish extended public services to unincorporated county areas experiencing high growth. The California Government Code section 25210.4(d) authorizes a CSA to provide the following services:

Any other government services, hereinafter referred to as miscellaneous extended services, which the county is authorized by law to perform and which the county does not also perform to the same extent on a countywide basis ... (emphasis added).

To identify the services that a CSA could provide (and charge for), it is important to understand the meaning of the word “extended,” as it is applied in the California Government Code. *Choices for the Unincorporated Community, A Guide to Local Government Alternatives in California*, by Alvin D. Sokolow, Priscilla Hanford, Joan Hogan and Linda Martin, (1981) provides an excellent explanation to the meaning of the word “extended” as it relates to CSAs:

CSA service powers depend on the definition of extended. Extended services are services not provided in the same kind or amount to all residents of the county, including city dwellers. When a community wants a new service or facility which the county does not provide to any county resident currently but is authorized to, this is clearly an extended service. A CSA can be formed to provide it. Appropriate county staff calculates an equitable charge or assessment for the residents benefiting from the new service or facility. The board of supervisors decides whether or not to provide it.

When a community wants an increased level of a service, such as police protection, which the county presently provides to all county residents, the calculation becomes more difficult. What the county presently provides to the specific community and how much more service the community wants and needs must be established. The difference between the present level and the desired level must be determined and accompanying costs calculated, so that a localized fee or charge reflecting the costs of increased service to the specific community can be established. Therefore, a board of supervisors must make specific findings relating to an unincorporated community's present service level and special needs. This is done in order to justify providing through a CSA an increased level to a certain community of services, like police, which are a countywide responsibility. The board of supervisors has the final word.

A brief outline of the formation and operation of a CSA is provided below. A CSA could be established to provide one or more of the following types of extended service within a defined area:

- Extended police protection
- Structural fire protection
- Local park, recreation, or parkway facilities and services
- Any other governmental services
- Extended library facilities and services
- Television translator station facilities and services
- Low-power television services

A CSA can be initiated by a petition of registered voters or by adoption of a resolution at the county level. Once proposed, the formation of the CSA will be subject to LAFCO approval, public notice, and a public hearing. After hearing all protests, and if less than 50 percent of the registered voters file written protests, the county board of supervisors could establish the CSA, or could submit the establishment of the CSA to an election of the voters. If the board of supervisors establishes the CSA without an election, a petition opposed to the CSA signed by 10 percent of the registered voters will require the board of supervisors to either rescind the CSA, or to submit it to an election of the voters. Once approved, the CSA is normally granted limited powers, and the county board of supervisors acts as the CSA board.

In all cases, CSAs are governed by the board of supervisors. Local advisory committees are authorized pursuant to California Government Code section 31010 *et seq.* and are often established to advise the board of supervisors on the affairs of the CSA.

Services provided by a CSA are paid for with user fees, ad valorem taxes (subject to Proposition 13 [1978] constraints), special taxes, and assessments. Services not paid for with user fees must be paid for with ad valorem taxes, special taxes, or assessments. Although no statutory limitations exist on the

amount of special taxes a CSA can levy, special taxes levied by CSA apply toward the maximum effective tax rate on such property.

The most significant hurdle with using a CSA to fund flood management and planning program costs is justifying this service as an extended service. As mentioned, extended services are services not provided in the same kind or amount to all residents of the county.

G. Certificates of Participation and Lease Revenue Bonds (Item 9)

Two long-term funding alternatives that could be used to fund flood management and planning program improvements are Certificates of Participation (COPs) and Lease Revenue Bonds (LRBs). These funding mechanisms provide long-term financing for public improvements via a lease or installment sales structure, as opposed to requiring debt service payments. By establishing a lease obligation, COPs and LRBs avoid being designated as debt and therefore avoid the election requirement (and the two-thirds majority vote requirement) mandated by Proposition 13 (2000) for all bond sales. Because no voter election is required to sell these instruments, a county board of supervisors or a city council could approve a bond sale with a simple majority vote of the legislative body.

In brief, the principal parties to a COPs or LRB financing include a public agency, a non-profit corporation, and a trustee. The non-profit corporation could be formed specifically to construct and own the necessary improvements, the funds for which are generated from the proceeds of the COPs or LRB sale. The non-profit corporation could also be an existing agency, such as a redevelopment agency, a joint powers authority, or an economic development corporation. However, the actual responsibilities for managing the construction are generally delegated to the public agency. The non-profit corporation then leases or sells the land and facilities back to the public agency in return for lease or installment sales payments.

The investors who purchase the COPs or LRBs receive a specified portion of the public agency's payments to cover the principal and interest due on their COPs. The certificates or bonds are secured by the public agency's pledge to make payments to cover its lease or installment sales payments, although there is no requirement that the public agency commit its general fund to making these payments. The trustee is responsible for accepting these payments and disbursing them to the certificate or bond holders.

Two major problems are associated with COPs or LRBs. First, these instruments can be used to fund only public improvements, not O&M costs. Second, and more significantly, a source of revenues is required to repay the COPs or LRBs, so these mechanisms cannot be used without monies being generated by some other source. COPs are generally secured by the covenant of the public agency to make annual appropriations in an amount sufficient to service the certificates. The appropriations might come from

the public agency general fund or from a designated special fund, such as the enterprise fund user fees, a CFD, or a stormwater utility fee. Because of Gann Amendment limitations on general fund spending, the use of general fund monies to make payments on COPs or LRBs would be detrimental to other recipients of general fund monies. However, to the extent that one or a combination of the available funding mechanisms provide a reliable and secure ongoing revenue stream, a public agency can issue COPs or LRBs that are non-recourse to its general fund.

H. Development Impact Fees (Item 10)

Development impact fees (DIFs) are monetary exactions (other than taxes or special assessments) charged by local agencies in conjunction with approval of a development project and are usually collected at the time building permits or occupancy permits are issued. DIFs are levied to defray all or a portion of the costs of any public facility, improvement, or amenity that benefits the development required to pay the fee. However, DIFs cannot be used to pay for public services. Most agencies currently impose DIFs for a broad range of public facilities.

Assembly Bill (AB) 1600, which promulgated section 66000 *et seq.* of the California Government Code, was enacted by the State of California in 1987 to regulate the imposition of DIFs within the state. AB 1600 (1987-1988) requires that all public agencies satisfy a number of requirements when establishing, increasing, or imposing a fee as a condition of approval for a development project. These requirements include identifying the facilities to which the collected fee would be applied and determining that there is a reasonable relationship among the facilities to be financed, the benefit to be received by the development paying the fees, and the amount of the fees to be imposed.

Although DIFs typically cannot be leveraged (i.e., provide security for bonds or other debt instruments), they can be used in conjunction with debt financing to help retire bonds secured by other means (e.g., a CFD or AD). Development fees can also be used to generate reimbursement revenues to property owners or public agencies that have previously paid more than their fair share of public improvement costs. To the extent that flood management and planning program improvements could be required of future development, DIFs could be used to cover these costs for such development. However, since DIF revenue is only collected at the time the building permit is issued, DIFs cannot finance any improvements required by existing development, nor can they fund O&M costs for either new or existing development.

I. Integrated Financing District (Item 11)

The Integrated Financing District (IGFD) Act was adopted by the State Legislature in 1986 to achieve equity among landowners by providing a formal mechanism to reimburse the initial developer(s) (or public agency) for

the upfront funding of infrastructure needed prior to development. This legislation creates the ability for local governmental entities to levy contingent assessments on owners of land benefited by oversized public improvements. An IGFD is generally used in conjunction with another public financing mechanism, although it can also be used to repay a property owner for the costs of oversizing infrastructure. An IGFD can be used to finance improvements authorized in the legislation of any co-financing district, including major regional improvements and local community facilities, such as major flood management facilities, storm drains, and structural treatment controls.

In its most common use, an IGFD is formed over an area that benefits from improvements being financed by another special district, such as a CFD or AD. The benefit received by each parcel is determined and a contingent lien is placed on all parcels that benefit from the improvements, but that are not expected to immediately pay assessments or special taxes because they are currently vacant. A warrant is issued in the amount of the contingent lien on a given parcel to the party that will ultimately receive the reimbursements. Once development begins on that parcel, the contingent lien becomes due and payable to the party that holds a warrant securing the lien.

An IGFD is not by itself a mechanism for raising funds; rather, it ensures the repayment of money to developers and public agencies that front funds for improvements, which benefit other property owners. The contingent assessment is a lien against property that is not levied until the occurrence of a certain event associated with land development, such as the approval of a tentative or vesting tentative subdivision map, a zoning change, or the issuance of a building permit.

Whereas an IGFD program would be helpful should one developer build oversized municipal flood facilities and seek reimbursement, it does not establish a source of revenues for the construction of the facilities. Therefore, it would be useful only when large oversized improvements are constructed under the flood management and planning programs and reimbursements to those parties who financed the oversized facilities are appropriate.

J. State Gasoline Taxes (Item 12)

Cities and counties receive motor vehicle fuel license taxes, more commonly known as gasoline taxes, from the State. Cities and counties are apportioned these funds under the authority of California Streets and Highways Code sections 2106, 2107, and 2107.5. These revenues are distributed based on different formulae but are generally proportionate to a jurisdiction's population. Gasoline tax revenue is restricted to the construction, improvement, and maintenance of public streets. Funds from the California Streets and Highways Code section 2107.5 are restricted to engineer costs and administrative expenses with respect to city streets.

Cities and counties typically use these funds for street resurfacing and repairs, drainage system maintenance, street sweeping, and certain landscape-related maintenance (e.g., tree pruning on street medians).

Numerous local agencies rely on gasoline tax revenue to fund certain functions within their flood and water quality programs, such as street sweeping. However, like the general fund of a local agency, these funds can be used for many types of roadway improvements and maintenance costs, and flood and water quality activities would need to compete with these other costs on a yearly basis. Due to this competition, it cannot be expected that this funding would be made available for these purposes on a regular basis.

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Appendix C: Propositions 13 (1978) and 218 (1996)

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Appendix C: Propositions 13 (1978) and 218 (1996)

A Review of the Attempts to Change Proposition 13

In 1978, Proposition 13 (the People's Initiative to Limit Property Taxation) was championed by anti-tax crusader Howard Jarvis and his Taxpayer Association. At the time, the California legislature responded with its own ballot measure, Proposition 8 (1978), essentially allowing for a so-called split-roll tax. Although not as severe as Proposition 13 (1978), Proposition 8 also called for limits to taxation. It differed significantly from Proposition 13 in that it proposed that residential and commercial property should be assessed according to different criteria. Proposition 8 (1978) was unsuccessful while voters approved Proposition 13 (1978), which resulted in an amendment to the California constitution.

All efforts to reform Proposition 13 (1978) focus on splitting the tax rolls and changing the way commercial property is taxed. Although some suggest that the consequences of Proposition 13 (1978) on the residential side are unjust, no one has advanced a proposal to change the assessment of residential properties in a meaningful way. As Arnold Schwarzenegger's advisor during the recall election of 2003, Warren Buffett appears to be the only person associated with a mainstream political party to publicly criticize Proposition 13 (1978) for the way it handles both residential and commercial property assessments. He advised that Proposition 13 (1978) should be overturned. Schwarzenegger responded that it was politically unviable.

Although there are reports of a number of attempts to change Proposition 13 (1978), only one ballot initiative has gone to voters. In 1992, Proposition 167 proposed, among other revenue-generating provisions, a split-roll tax. It was defeated by a 2-to-1 margin.

In 2004 and 2005, there were several attempts to change Proposition 13 (1978) by ballot initiative, one notably by the California Teachers Association and filmmaker Rob Reiner, but they were dropped at the petition stage. Also, State legislators have made six attempts since 1991 to reform parts of Proposition 13 (1978) but have lacked Republican support, keeping a two-thirds majority out of reach. More recently, the mayor of Los Angeles, Antonio Villaraigosa, has urged an end to tax limits for businesses. He advocates a split-roll tax.

The California Tax Reform Association has long sought to change Proposition 13 (1978) and is planning a grassroots, community-based campaign in 2012 for a ballot initiative to split the tax rolls for residential and commercial properties and allow more frequent reassessments of commercial properties. Nevertheless, a Field Poll in August 2011 indicated that California voters continue to support Proposition 13 by more than a 2-to-1 ratio. However, the Tax Reform Association refers to a Public Policy Institute of California poll, which indicates that when asked more precisely about the issue of commercial property being reassessed at market value, voters said yes by about 58 to 60 percent.

Follow-on to Proposition 13: Propositions 62 (1986) and 218 (1996)

Proposition 13 (1978) severely limited the amount of revenue communities could generate from property taxes. To make up for the shortfall, new fees and assessments were implemented that were tax-like. In 1986 voters approved Proposition 62, the Voter Approval of Taxes Act. In essence, the initiative required that new taxes be approved by two-thirds of the local agency's governing body and a majority of voters. Cash-strapped communities continued to use assessments and property-related fees (among other fees) to pay for general government services. By 1996 voters approved Proposition 218, the Right to Vote on Taxes Act. Essentially, Proposition 218 (1996) ensured that voters must approve all taxes and most charges to property owners. Also, it sought to limit the use of assessments and property-related fees to fund only services that directly benefit property. There are several areas in which the implementation of this initiative has needed clarification. One example is that existing assessments for flood management were exempt from the measure's calculation and election requirements. However, if the assessment were annually re-imposed, it is unclear whether the local government must comply with requirements of Proposition 218 (1996) when it is re-imposed. Issues of this nature have been volleyed back and forth in the courts since 1996. There appear to be no explicit challenges to Proposition 62 (1986) or Proposition 218 (1996) by ballot initiative or by legislative action.

Impact of Proposition 218 on the Creation of Regional Assessment Districts

Since Proposition 13 (1978), assessment districts have been implemented as an alternative means of funding public projects. Local agencies and regional entities, such as the Sacramento Area Flood Control Agency, had the authority to form assessment districts. However, after Proposition 218 (1996) took effect, the formation of an assessment district requires the approval of the property owners who benefit from the public improvement.

Review of Proposition 218

The adoption of Proposition 218 by the voters in California in 1996 is pivotal in infrastructure financing. This constitutional amendment, which is also called the Right to Vote on Taxes Act, is arguably the most significant impediment to arise against adequate flood management and planning programs and water quality funding since the preparation of the initial financing study in 1994. Proposition 218 (1996) was a successful effort by the State's voters to ensure that local governments could not levy taxes, assessments, or user fees on property owners without the express consent of the voters in the community where such charges would be levied. Specifically, all general taxes need to be approved by at least one-half of the electorate, all special taxes need to be approved by at least two-thirds of the electorate, and all special assessments and property-related fees must be approved by at least one-half of the impacted property owners submitting mailed ballots prior

to the public hearing at which such special assessments or fees are to be approved by a local legislative body (or, at the option of the legislative body, by at least two-thirds of the registered voters). Any fee that is property-related, or that arises as a consequence of property ownership, falls under the scrutiny of Proposition 218 (1996). Furthermore, the initiative power of the electorate was confirmed by Proposition 218 (1996) to ensure that local taxes, assessments, and fees can be reduced at any time by the electorate, with the only exception being when such revenues are required to satisfy an existing contractual obligation (e.g., the payment of debt service on outstanding bond issuances). The only exceptions to these voter requirements are fees for sewer, water, and refuse collection. However, based on the California Supreme Court's decision in *Bighorn-Desert View Water Agency v. Verjil*, these types of fees are subject to Proposition 218 (1996) noticing and hearing requirements.

Although the distinction between fees, taxes, and assessments may sometimes seem blurred and overlapping, the following discussion provides the general definition of the local government "charges" discussed in this report.

A fee is a charge imposed to recover the costs of a government service or to mitigate the impacts of the fee payer's activity on the community. User fees recover the costs of service and include, for example, utility rates (enterprise fees) and facility usage (park fees). Regulatory fees are related not only to mitigation (development impact fees, capacity fees), but also to the recovery of costs to regulate fee payer activities (plan check fees, building permit fees).

A tax is a charge imposed by government to pay for general governmental purposes (general tax) or specific governmental purposes (special tax).

Assessments are charges related to special benefits that a property or business derives from the improvements or services paid for by these charges.

The significance of Proposition 218 (1996) to the funding of a city's or county's flood management and planning programs cannot be overstated. Most sources of local funding, with the exception of sewer, water, and refuse collection fees, are now effectively off-limits without an election. The ability for general funds to pay for flood management and planning programs is also limited because of competition for such funds from other uses, and the requirement that additional bond funds must be approved by two-thirds of the electorate. Unless the electorate or the property owners in an area vote in favor of a general tax, special tax, assessment, or fee, none of these funding sources can be implemented. The far-reaching impacts of Proposition 218 (1996) are probably most clearly evidenced by the case of the *Howard Jarvis Taxpayers Association v. City of Salinas* (2002).

In that case, the City of Salinas designed a flood management and planning program management utility fee that it thought was not property-related to avoid holding an election. The proposed fee was not put to a vote of the property owners or the registered voters, but instead was enacted by the city council through the adoption of two ordinances. The first ordinance imposed a flood management and planning program management utility fee within the city, while the second established fee levels. Fee levels were assigned to assessor's parcels according to

the land use types located on each parcel, with the fees themselves based on the relative amounts of impervious area typically associated with each land use type. To avoid being considered a property-related fee, the city exempted undeveloped parcels and those developed parcels not expected to access the city's storm management system. The Howard Jarvis Taxpayers Association challenged the fee, and the trial court ruled in favor of the city because it concluded that (a) the fee was not property-related, and (b) the fee was exempt from the voter requirement as a result of the sewer and water fee exemptions under Proposition 218 (1996).

The Howard Jarvis Taxpayers Association appealed to the Sixth Appellate District of the State Court of Appeals, which overturned the trial court's finding by a 3-0 vote. The basis for the Appeal Court's decision was an emphasis on the fundamental premise of Proposition 218 (1996) that "the provisions of this act shall be liberally construed to effectuate its purposes of limiting local government revenue and enhancing taxpayer consent." As a result, the Appeals Court determined that a fee based on land use was not a charge directly based on use (such as the metered use of water for a water fee), and that it was in fact a fee based on ownership of property because a property owner could not escape the fee by declining to accept the service. The Appeals Court went on to declare that flood management and planning program management activities are separate from sewer and water services and therefore would not be eligible for the voter exemption permitted under Proposition 218 (1996) for sewer and water fees. The State Supreme Court denied the city's petition to review the Appeals Court's decision. By precedent, this decision leaves cities, counties, and local agencies in the position of being forced to conduct a property owner or registered voter election should they choose to undertake a utility fee program.

A. Post-Salinas Proposition 218 Issues

While there is always the possibility that future legislation will provide authorization for public agencies to adopt well-designed flood management and planning program utility fees without an election, the Salinas decision and the proclivity of the Howard Jarvis Taxpayers Association to undertake legal action certainly suggests that public agencies take a conservative approach to the formation of such a utility.

B. Santa Clara County Proposition 218 Issues

On July 14, 2008, the State Supreme Court, in the case of *Silicon Valley Taxpayers Association v. Santa Clara County Open Space Authority*, decided two key points relating to Proposition 218 (1996). First, the State Supreme Court held that legal challenges to special assessments are subject to independent judicial review, reversing a number of pre-Proposition 218 (1996) cases, which gave more deference to the public agency that established the assessment district. Second, the State Supreme Court held that the assessments in the Santa Clara case did not meet the substantive requirements of Proposition 218 (1996) because the Santa Clara County

Open Space Authority did not demonstrate the special benefit to the assessed property and the amounts assessed were not proportional to the benefit received by each parcel.

In 2001, the Santa Clara County Open Space Authority conducted proceedings to establish a countywide assessment district to acquire, improve, and maintain regional open space. As a part of the proceedings, an engineer's report was prepared and a ballot protest procedure was conducted. The engineer's report claimed that all property within the district received special benefit from the proposed land acquisitions and set the assessment at \$20 per single family parcel (and provided a formula to determine the rates for other types of property). However, the land proposed to be acquired was not identified. Following a mailed ballot procedure, the assessment passed by more than 50 percent of the ballots returned (weighted by level of assessment). The assessments were later challenged on the basis that the Santa Clara County Open Space Authority failed to satisfy the special benefit and proportionality requirements of Proposition 218 (1996).

Although this case involves an open space assessment and many of the court's comments are related to assessments rather than fees, this case needs to be carefully reviewed and considered for its implications for any proposed flood management and planning fee. In its decision, the State Supreme Court stated that Proposition 218 (1996) requires courts to make an independent review of local agency decisions regarding assessments and property-related fees and charges. In addition, while property-related fees do not have the same special benefit restrictions (see Appendix A, Section E, Assessment Districts) that apply to assessments, Proposition 218 (1996) states that a fee or charge imposed upon any parcel or person as an incident of property ownership shall not exceed the proportional cost of the service attributable to that parcel. The State Supreme Court found that the Santa Clara County Open Space Authority failed to meet the proportionality tests because the engineer's report did not (1) identify the improvements to be funded, (2) estimate the cost of such improvements, and (3) connect the proportionate costs of the benefits received from the public improvements to the assessed parcels.

C. Legislation

The significance of Proposition 218 (1996) to the funding of flood management and planning programs cannot be overstated. Most sources of local funding, with the exception of sewer, water, and refuse collection fees, are effectively off-limits without an election. The ability for general funds to pay for flood and water quality programs is also limited because of competition for such funds for other uses, and the requirement that additional bond funds must be approved by two-thirds of the electorate. Because many Federal and State grant and loan programs require a local

match or dedicated revenue stream, the restrictions imposed by Proposition 218 (1996) also limit local agencies' ability to access this "free" money.

1. *Senate Constitutional Amendment 18*

In 2009, Senator Carol Liu (D), 21st Senate District, introduced Senate Constitutional Amendment (SCA) 18. SCA 18 (2009-2010) would amend the California Constitution to add stormwater and urban runoff management fees to the list of fees (currently only sewer, water, and refuse collection fees) exempt from the voting requirements as set forth in Proposition 218 (1996). This bill would make it easier for public agencies to fund and comply with new and increasingly stringent National Pollutant Discharge Elimination System (NPDES) and other requirements adopted by the Federal and State governments. SCA 18 (2009-2010) has been heard by the Senate Local Government Committee and the Senate Elections, Reapportionments, and Constitutional Amendments Committee.

Similar legislative efforts have been unsuccessful. SCA 18 (2009-2010) is identical to the original version of SCA 12 (authored by Tom Torlakson in 2007), which was gutted and amended to cover an entirely different matter (the California State Lottery) in September 2008. Assembly Constitutional Amendment 10 (authored by Tom Harman in 2003 when he was a member of the State Assembly) was also similar to SCA 18, but died in the inactive file after reaching the Assembly floor.

If SCA 18, or a similar bill, is approved, the funding of flood management and planning programs will become much easier and on par with the rate setting process for water, sewer, and trash.

2. *Senate Bill 310*

On February 25, 2009, Senator Denise Ducheny (D), 40th Senate District, introduced Senate Bill (SB) 310, which would allow a county, city, or special district that is a permittee or co-permittee under an NPDES permit to (1) develop a watershed improvement plan that addresses major sources of pollutants in receiving water, stormwater, urban runoff, or other surface runoff pollution within the watershed or subwatershed to which the plan applies; and (2) to impose fees on activities that generate or contribute to runoff, stormwater, or surface pollution to pay (a) the costs of the preparation of the watershed improvement plan and (b) the costs of implementation of such a plan if it is approved by a Regional Board and will facilitate compliance with one or more water quality requirements. According to the current language in SB 310, such fees (1) shall be reasonably related to the cost of mitigation of the actual or anticipated past, present, or future adverse effects of the feepayer's activities, (2) shall not be imposed solely as an incidence of property ownership, and (3) may be imposed as user-based or regulatory fees.

While it is likely that this broadening of public agencies' powers to fund flood management and planning programs will be the target of litigation by the Howard Jarvis Taxpayers Association, and it is unclear exactly how fees under SB 310 would be implemented.

SB 310 was approved by the State Senate in June 2009 and subsequently modified by the State Assembly. As of July 15, 2009, SB 310 has been read twice in the State Assembly, and most recently was re-referred to the Assembly Committee on Appropriations.

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Appendix D: Glossary

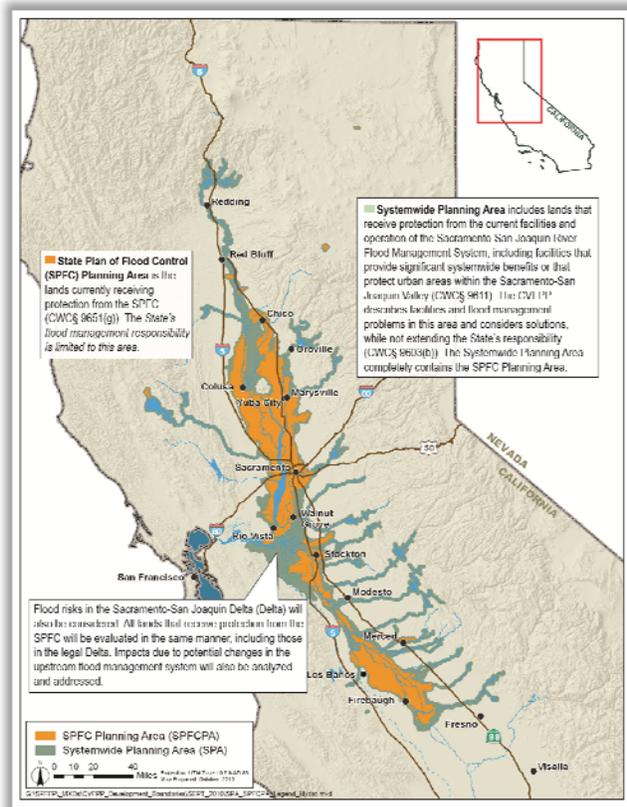
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2-year event	50 percent chance of exceedance in a given year
20-year event	5 percent chance of exceedance in a given year
50-year event	2 percent chance of exceedance in a given year
100-year event	(also known as a base flood) 1 percent chance of exceedance in a given year
200-year event	0.5 percent chance of exceedance in a given year
500-year event	0.2 percent chance of exceedance in a given year
A-Zone	The A-zone is an area of special flood hazard without water surface elevations determined. Flood insurance is mandatory in areas with a 1 percent annual chance of flooding.
Actions	Informed by tools and guided by plans, actions include activities that fund, manage, and oversee implementation of the projects. Actions also include fostering innovation and developing agency alignment to improve flood management policies, planning, governance, and investments. Actions based on IWM principles and thorough planning efforts will provide the most benefit to Californians.
Alluvial Fan Flooding	Flows of shallow depth and high velocity, with sediment transport, along uncertain flow paths on the surface and at the toe of alluvial fans. Typically caused by localized rainstorms, often with snowmelt.
Atmospheric River	A weather pattern that forms a narrow corridor of concentrated moisture in the atmosphere that drops torrential rains as it passes over land.
Base Flood Elevation	The elevation of surface water resulting from a flood that has a 1 percent chance of equaling or exceeding that level in any given year. The base flood elevation is shown on Flood Insurance Rate Maps for zones AE, AH, A1-A30, AR, AR/A, AR/AE, AR/A1–A30, AR/AH, AR/AO, V1–V30, and VE.
Benefit-to-Cost (B/C) Analysis	The B/C analysis is a formalized procedure for estimating the benefits that a project is expected to generate and the costs necessary to produce the project, and then comparing project alternatives. When planning for flood protection, there will be construction and implementation costs, as well as flood risk reduction benefits.
California Data Exchange Center (CDEC)	The CDEC provides a centralized location to store and process real-time hydrologic information gathered from different contributors statewide.
California Water Plan (CWP)	The CWP provides a collaborative planning framework for elected officials, agencies, tribes, water and resource managers, businesses, academia, stakeholders, and the public to develop findings and recommendations and make informed decisions for California's water future. The plan, updated every 5 years, presents the status and trends of California's water-dependent natural resources; water supplies; and agricultural, urban, and environmental water demands for a range of plausible future scenarios. The CWP also evaluates different combinations of regional and statewide resource management strategies to reduce water demand, increase water supply, reduce flood risk, improve water quality, and enhance environmental and resource stewardship.

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Capacity Exceedance	Capacity exceedance implies exceedance of the capacity of a water conveyance, storage facility, or damage-reduction measure. This includes levee or reservoir capacity exceeded before overtopping, channel capacity exceedance, or rise of water above the level of raised structures.
Central Valley Flood Management Planning (CVFMP) Program	CVFMP is one program within FloodSAFE California, a multi-year initiative led and managed by the California Department of Water Resources. Primary products of the CVFMP Program are the State Plan of Flood Control Descriptive Document, the State Plan of Flood Control History Document, the Flood Control System Status Report, and the Central Valley Flood Protection Plan.
Central Valley Flood Protection Plan (CVFPP)	The CVFPP is a State plan that will describe the challenges, opportunities, and a vision for improving flood management in the context of Integrated Water Management in the Central Valley. The CVFPP will document the current and future risks associated with flooding and recommend improvements to the Federal-State flood protection system to reduce the occurrence of major flooding and the consequence of flood damage that could result. The plan was submitted to the Central Valley Flood Protection Board in January 2012 for adoption by July and will be updated every 5 years. The planning area for the CVFPP is shown below.



Central Valley Flood Protection Plan (CVFPP) Floodplain	The floodplains used for the SFMP risk characterization within portions the Central Valley are the CVFPP No Action depth grid floodplains with the addition of the flood bypasses. SFMP received the draft CVFPP floodplains on October 4, 2011. The CVFPP floodplains were based on the floodplains of the <i>Sacramento and San Joaquin River Basins Comprehensive Study</i> (USACE, 2002) and modified by the CVFPP to reflect current hydrologic, hydraulic, and geotechnical information. For the SFMP analysis, the Yolo, East Side, Upper Sacramento, Mariposa, Sutter, and Tisdale bypasses were added to the CVFPP floodplains.
Coastal Flooding	Inundation at locations normally above the level of high tide. Often caused by storm surges occurring with high tides. Impacts include property damage and beach erosion.
Community	A political entity that has the authority to adopt and enforce floodplain ordinances for the area under its jurisdiction.
Consequences	Consequences are the quantitative measures of loss, such as direct tangible monetary loss or number of lives lost, when water inundates the people and property exposed.
Critical Facilities	Essential, high potential loss, lifeline, and transportation facilities, as defined by HAZUS-point shapefiles
Debris Flow Flooding	Flows made up of water, liquefied mud, and debris. Can form and accelerate quickly, reach high velocities, and travel great distances. Commonly caused by heavy localized rainfall on hillsides denuded of vegetation.
Economic Risk	Economic risk is the likelihood of flood damage to an identified area under a given climate and land use condition.
Engineered Structure Failure Flooding	Flooding as a result of dam failure or levee failure presents the potential of catastrophic impact, depending on amount of water impounded and location of populated areas downstream.
Essential Facilities	Care facilities, emergency centers, fire stations, police stations, and schools, as defined by HAZUS-point shapefiles.
Expected Annual Damage (EAD)	EAD is the value that measures the severity of flood loss in any given year. EAD does not mean that this amount of damage will occur in any particular year, but rather that over a long period, the average damages will tend to approach that amount.
Exposure	Exposure is a description of who or what is in harm's way.
Fetch	The distance along open water or land over which the wind blows, or the distance waves can traverse unobstructed.
Flash Flooding	Quickly forming floods with high-velocity flows. Often caused by stationary or slow-moving storms. Typically occurs on steep slopes and impermeable surfaces, and in areas adjacent to local streams and creeks.

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Flood Emergency Response Information System (FERIS)	FERIS is a geospatial information system that allows for integration of existing California Data Exchange Center (CDEC) systems with real-time data collection and data exchange.
Flood Hazard	The Federal Emergency Management Agency defines a flood hazard as any flood event or condition with the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, environmental damage, business interruption, or other loss.
Flood Insurance Rate Map (FIRM)	A FIRM is the official map of a community on which the Federal Emergency Management Agency has delineated the Special Flood Hazard Areas, the Base Flood Elevations, and the risk premium zones applicable to the community.
Flood Management	See <i>flood risk management</i> . Generally, the terms <i>flood management</i> and <i>flood risk management</i> are used interchangeably throughout the Flood Future Report.
Flood Risk	<p>Flood risk is the likelihood of consequence of inundation within an identified area, given a specified climate condition, land use condition, and flood management system (existing or planned) in place. The consequence may be direct or indirect economic cost, loss of life, environmental impact, or other specified measure of flood effect. Flood risk is a function of the following components:</p> <ul style="list-style-type: none">• Loading, which is the frequency and magnitude of flooding• Performance of flood management measures• Exposure and vulnerability, which are the relationship between the flood hazard (rising or flowing water) and its effect on life loss, property, and/or environmental resources• Consequence <p>Therefore, flood management actions may reduce risk by changing loading, performance, exposure, vulnerability, or consequence.</p>
Flood Risk Management	<p>Flood risk management seeks to reduce flood risks by managing the floodwaters to reduce the probability of flooding (including by levees and dams) and by managing the floodplains to reduce the consequences of flooding. Flood risk management requires integrating and synchronizing programs at various levels of government designed to reduce flood risk.</p> <p>Source: USACE, Institute for Water Resources, a dynamic resource at http://nfrmp.us/frm_terminology.cfm#def17 (accessed March 11, 2013).</p>
Floodplain	The extent of the flood hazard for a 100-year (1 percent chance of exceedance in a given year) or 500-year (0.2 percent chance of exceedance in a given year) event, as determined by the Central Valley Flood Protection Plan, Federal Emergency Management Agency, or U.S. Army Corps of Engineers.

FloodSAFE California	FloodSAFE California refers to the California Department of Water Resources multi-faceted initiative launched in 2006 to improve public safety through flood management in the context of Integrated Water Management and to reduce potential flood damages in areas of the state with the highest risk. Although led at the State level and initially funded by bond money from Propositions 1E (2006) and 84 (2006), FloodSAFE implementation relies on the cooperation and assistance of Federal partners, Tribal entities, local sponsors, and other stakeholders. The FloodSAFE vision is a sustainable system of flood management with an IWM approach and emergency response throughout California that improves public safety, protects and enhances environmental and cultural resources, and supports economic growth by reducing the probability of destructive floods, promoting beneficial floodplain processes, and lowering the damages caused by flooding.
Hazard Mitigation Plan (HMP)	A community's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage is described in an HMP. Results are accomplished through hazard mitigation, which is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards.
Hazards United States (HAZUS) – Federal Emergency Management Agency (FEMA)	FEMA has developed a Geographic Information System-based U.S. multihazard assessment software, which contains a Flood Loss Estimation Model with flood hazard analysis and flood loss estimation modules for riverine and coastal analyses. The flood hazard analysis module (HAZUS) uses characteristics such as frequency, discharge, and ground elevation to estimate flood depth, flood elevation, and flow velocity.
High Potential-Loss Facility	Facilities such as dams and hazardous material sites, as defined by HAZUS-point shapefiles.
Hydrologic Engineering Center-Flood Damage Analysis (HEC-FDA)	The U.S. Army Corps of Engineers, Hydrologic Engineering Center (HEC) Flood Damage Analysis (FDA) model is designed to perform risk analysis as part of a flood risk study. The approach explicitly incorporates descriptions of uncertainty of key parameters and functions into project benefit and performance analyses.
Hydrologic Unit Code 8 (HUC8)	A Hydrologic Unit Code 8 is a watershed address consisting of a name and a number (for example, Lower James watershed, 02080206). The 8-digit number is a Hydrologic Unit Code or HUC. The Hydrologic Unit system is a standardized watershed classification system developed by the U.S. Geological Survey in the mid-1970s. Hydrologic units are watershed boundaries organized in a nested hierarchy by size. They range in size from regions to the smaller cataloging units, which are roughly equivalent to local watersheds.
Impact Area	Impact area is a term used for convenience to describe a geographic area for which risk is assessed.
Improvement Project	A project that will improve or add facilities to the State Plan of Flood Control to increase levels of flood protection for urban areas. Funding for improvement projects is authorized by California Public Resources Code section 5096.821(b).

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Integrated Regional Water Management (IRWM)	IRWM promotes the coordinated development and management of water, land, and related resources to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.
Integrated Water Management (IWM)	IWM is a strategic approach to planning and implementation that combines specific flood management, water supply, and ecosystem actions to deliver multiple benefits. IWM relies on blending knowledge from a variety of disciplines, including engineering, economics, environmental sciences, public policy, and public information. This approach also promotes system flexibility and resiliency to accommodate changing conditions such as regional preferences, ecosystem needs, climate change, flood or drought events, and financing capabilities.
Life-Safety Risk	Life-safety risk represents the number of lives in jeopardy in an identified portion of the state, considering a given climate and land use condition, with a specified plan of flood management in place.
Loading	In the context of flood risk, loading describes the likelihood of occurrence of conditions that lead to loss of life or damage to property if the conditions are not controlled or the consequence is not managed. Loading commonly is described with a discharge-frequency function, which identifies the probability that discharge at a specified location will exceed a specified value.
Local Maintaining Agency (LMA)	LMAs include reclamation districts, State maintaining agencies, improvement districts, and individual districts like American River Flood Control District or Lower San Joaquin Levee District.
Long-Term Average (or Expected) Annual Inundation Damage	See Expected Annual Damage (EAD).
Maintenance and Inspection	Actions required for the proper care and efficient operation of various project elements. These actions may be combined or separated, as best suits the particular project. The guidance for proper maintenance and inspection are contained in ER 1130-2-303. Adaptations needed to satisfy conditions not covered in the ER are encouraged. Outlines of the maintenance and inspection records are to be maintained and available for Government inspection. Government inspections will be performed in consultation with the project's sponsor. (Source: ER 1110-2-401)
Management Action	A management action is a specific structural or nonstructural strategy, action, or tactic that contributes to stated goals and addresses identified problems. Management actions could range from potential policy or institutional changes to operational and physical changes to the flood management system. Management actions are broad (not location-specific), and they vary in their level of detail.

Modification	Project modifications include changes in project operation, changes in real estate interests, the physical change of a project feature, addition of project features, or changes in the purposes of a project. (Source: ER 1165-2-119)
National Flood Insurance Program (NFIP)	The NFIP is a Federal program created by the U.S. Congress to mitigate future flood losses nationwide. The NFIP requires local communities to enforce building and zoning ordinances in exchange for access to affordable, Federally backed, flood insurance protection for property owners.
Operation	Actions that are necessary for the safe and efficient functioning of a project to produce the benefits set forth in the project authorization. The operational requirements for nonreservoir projects are to be presented as operation plans covering essentially the who, what, where, when, and how of the various project operations. An outline of operation records is to be maintained and available for inspection. The operation of reservoirs, covered in water control manuals shall be separate from this operation and maintenance manual. (Source: ER 1110-2-401)
Operation, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R)	For Federally funded projects the definition of operation and maintenance (O&M) includes the local entity's financial obligation to operate, maintain, repair, rehabilitate, and replace (OMRR&R) the implemented project. OMRR&R is a non-Federal responsibility when local, regional and/or State entities partner on a Federal project. References to O&M provided in the Flood Future Report include OMRR&R responsibilities when the project is a Federal/non-Federal partnership.
Performance	Performance refers to the effectiveness of flood or floodplain management measures.
Plans	Plans utilize information provided by tools, as well as input from stakeholders to guide the development of the flood management strategies. Plans take into account near- and long-term actions, as well as any additional considerations, such as multiple benefits, environmental concerns, overall water management, and climate change, to formulate long-lasting resilient strategies. Plans include identifying and evaluating possible multibenefit projects and the most effective means of implementing projects using an integrated, collaborative approach.
Project Management Plan	A project management plan defines how a project is executed, monitored, and controlled. It is used to define the approach, scope, and delivery of a project.

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Public Law 84-99 (33 U.S.C. 701n)	USACE has authority under Public Law (PL) 84-99, Flood Control and Coastal Emergencies (33 U.S.C. 701n) (69 Stat. 186) for emergency management activities to protect human life and improved property, reduce human suffering, help communities recover from the effects of disasters, and mitigate damage and future threats. Under PL 84-99, the Chief of Engineers, acting for the Secretary of the Army, is authorized to undertake activities, including disaster preparedness, advance measures, emergency operations (flood response and post-flood response), rehabilitation of flood control works threatened or destroyed by flood, protection or repair of Federally authorized shore-protective works threatened or damaged by coastal storm, and provisions of emergency water due to drought or contaminated source.
California Public Resources Code section 75003.5	The people of California further find and declare that the growth in population of the State and the impacts of climate change pose significant challenges. These challenges must be addressed through careful planning and through improvements in land use and water management that both reduce contributions to global warming and improve the adaptability of our water and flood control systems. Improvements include better integration of water supply, water quality, flood control and ecosystem protection, as well greater water use efficiency and conservation to reduce energy consumption.
California Public Resources Code section 75032(a)	California Public Resources Code section 75032(a) provides funds for: The inspection and evaluation of the integrity and capability of existing flood control project facilities and the development of an economically viable flood control rehabilitation plan.
Reconstruction	Reconstruction consists of addressing the major performance deficiencies caused by a long-term degradation of the foundation, construction materials, and engineering systems that have exceeded their expected service lives and the resulting inability of the project to perform its authorized project functions. (Source: USACE, Program Guidance Letter on Reconstruction, August 16, 2005, http://planning.usace.army.mil/toolbox/library/MemosandLetters/reconstruction.pdf)
Rehabilitation	Rehabilitation refers to a set of activities necessary to bring a deteriorated project back to its original condition. (Source: ER 1110-2-401)
Repair	Repair refers to those activities of a routine nature that maintain the project in a well kept condition. (Source: ER 1110-2-401)
Replacement	Replacement covers those activities taken when a worn-out element or portion of a project is replaced. (Source: ER 1110-2-401)
Residual Risk	Residual risk is the likelihood of damage or other adverse consequence remaining after flood management actions are taken.
Results	Robust tools, thorough planning, and integrated actions deliver results that provide value to California's residents, environment, and economy. Results are tracked using performance measures and sustainability indicators that help improve investment performance and increase flood management benefits.

Severe Repetitive Loss (SRL)	<p>Any NFIP-insured residential property that has met at least one of the following paid flood loss criteria since 1978, regardless of ownership:</p> <ul style="list-style-type: none"> • Four or more separate claim payments of more than \$5,000 each (including building and contents payments) • Two or more separate claim payments (building payments only) where the total of the payments exceeds the current value of the property <p>In either case, two of the claim payments must have occurred within 10 years of each other. Multiple losses at the same location within 10 days of each other are counted as one loss, with the payment amounts added together. The loss history includes all ownership of the property since 1978 or since the building’s construction if built after 1978.</p>
Slow Rise Flooding	<p>Slow rise flooding occurs as a gradual inundation as waterways or lakes overflow their banks. Most often caused by heavy precipitation, especially with heavy snowmelt. Includes riverine flooding in deep floodplains and ponding of water in low-lying urban areas, as well as gradual flooding in areas adjacent to local streams and creeks.</p>
Special Flood Hazard Area (SFHA)	<p>SFHAs are areas subject to inundation from a flood that has a 1 percent chance of being equaled or exceeded in a given year.</p>
State Plan of Flood Control (SPFC)	<p>Collectively, the facilities, lands, programs, conditions, and mode of operation and maintenance for the State-Federal flood protection system in the Central Valley. This area is shown in the figure provided under CVFPP definition.</p>
Tools	<p>Tools include data, models, and assessments needed for decision making in all aspects of flood management. DWR continues enhancing and sharing technical resources (tools) across all programs and projects. This includes flood, environmental, and water management data gathering, modeling, and the technical aspects of flood readiness and emergency response. Technical and modeling information help inform thorough and thoughtful planning, along with accurate design of flood management facilities.</p>
Transportation Facility	<p>Runways, railway bridges, rail facilities, port facilities, light-rail facilities, highway bridges, ferry facilities, bus facilities, and airport facilities, as defined by HAZUS-point shapefiles.</p>
Tsunami Flooding	<p>Tsunami flooding occurs as a result of high-speed ocean waves triggered by mass movement that displaces a large volume of water. Causes include earthquakes and underwater landslides. Impact on land depends on wave height and inundation area.</p>
Utilities	<p>Wastewater, potable water, oil, natural gas, electric power, and communications facilities, as defined by HAZUS-point shapefiles.</p>
V-Zone	<p>The V-zone is an area inundated by 1 percent annual chance (100-year) flooding with velocity hazard (wave action); no base flood elevations have been determined.</p>

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Vulnerability	Vulnerability is the susceptibility to loss or damage of people and property exposed to the flood hazard.
Water Data Library (WDL)	The WDL is a searchable Geographic Information System (GIS) interface on the Internet. WDL allows users to access information about monitoring gauges, groundwater data, and water quality.

STATE OF CALIFORNIA
THE NATURAL RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

UNITED STATES ARMY CORPS OF ENGINEERS
FLOOD PLAIN MANAGEMENT SERVICES PROGRAM



US Army Corps
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The complete report, *California's Flood Future: Recommendations for Managing the State's Flood Risk*, including technical attachments and other supporting information is available for review at:

<http://www.water.ca.gov/SFMP>