Improving Flood Control in San Mateo County's Areas of Responsibility

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Executive Summary

The County of San Mateo (County) is responsible for flood control in the three flood control zones within the San Mateo County Flood Control District (SMCFCD) and in unincorporated areas of the County. In addition, County assets within certain incorporated areas, such as in the Coyote Point area in the City of San Mateo, are also at risk of flooding. While these flood zones and areas have flooded on numerous occasions in the past, and are subject to greater flood risks with sea level rise and anticipated extreme storm events resulting from climate change, the County currently has neither the funding nor the staff to address these flooding risks.

The SMCFCD, which is embedded in the County's Department of Public Works (Public Works), is responsible for providing flood protection in three active flood control zones: San Bruno Creek, Colma Creek and San Francisquito Creek. Revenues for the SMCFCD total approximately $3.1 million annually and are generated primarily through pre-Proposition 13 property tax assessments. The SMCFCD does not have any dedicated flood control staff and the Public Works staff assigned to flood control projects collectively equal less than one full time employee. Other than in the Colma Creek Flood Control Zone, SMCFCD revenues are barely sufficient for maintenance of the creeks and provide little funding for capital improvements within the zones. In fact, San Mateo County has one of the lowest staffed and lowest funded flood control districts in the Bay Area.

Other areas prone to flooding that are not located within a SMCFCD flood zone, but where the County has responsibility to protect unincorporated areas or County assets, include the Bayfront Canal (North Fair Oaks), Belmont Creek (Harbor Industrial Area), Butano – Pescadero Creek, the Coyote Point area, and the Daly City Vista Grande Canal (Broadmoor). See Figure 1. With the exception of Butano – Pescadero Creek, the County has invested minimal resources and staff time to address flooding problems in these areas, due in part to the lack of dedicated funding sources.

The County's limited flood control resources also places the County at a severe disadvantage in applying for state and federal grant funding. In addition, the County is not currently in a position to effectively coordinate its efforts with affected cities on specific flood control projects, or develop more extensive expertise in flood control management.

Public Works is requesting approval for a total of $6.2 million in General Fund funding to address flood risks in the County's areas of responsibility with $200,000 to be budgeted for the remainder of this fiscal year and $2 million per year budgeted for the subsequent three fiscal years. These funds are to be used to hire two full time staff members, a project manager and a technical staff member, and to retain consultants to assist in planning, environmental permitting, engineering, and design of flood control projects. Funds will also be used to install and maintain stream gauges in various creeks where the County has responsibility, and, where feasible, to deploy an early warning system and notification process to alert residents of flooding risks.

Public Works is not proposing to work on flood control projects outside of the County's areas of responsibility nor to operate as a countywide water management agency. The City/County Association of Governments of San Mateo County (C/CAG), however, has formed a Water Committee to facilitate discussion on countywide approaches to water related issues, including the potential creation of a new agency, or modification of an existing agency, to foster countywide collaboration. The County is participating in those discussions and the new hires funded by this proposal would be available to provide staff support to the Water Committee.

San Mateo County Flood Control Projects

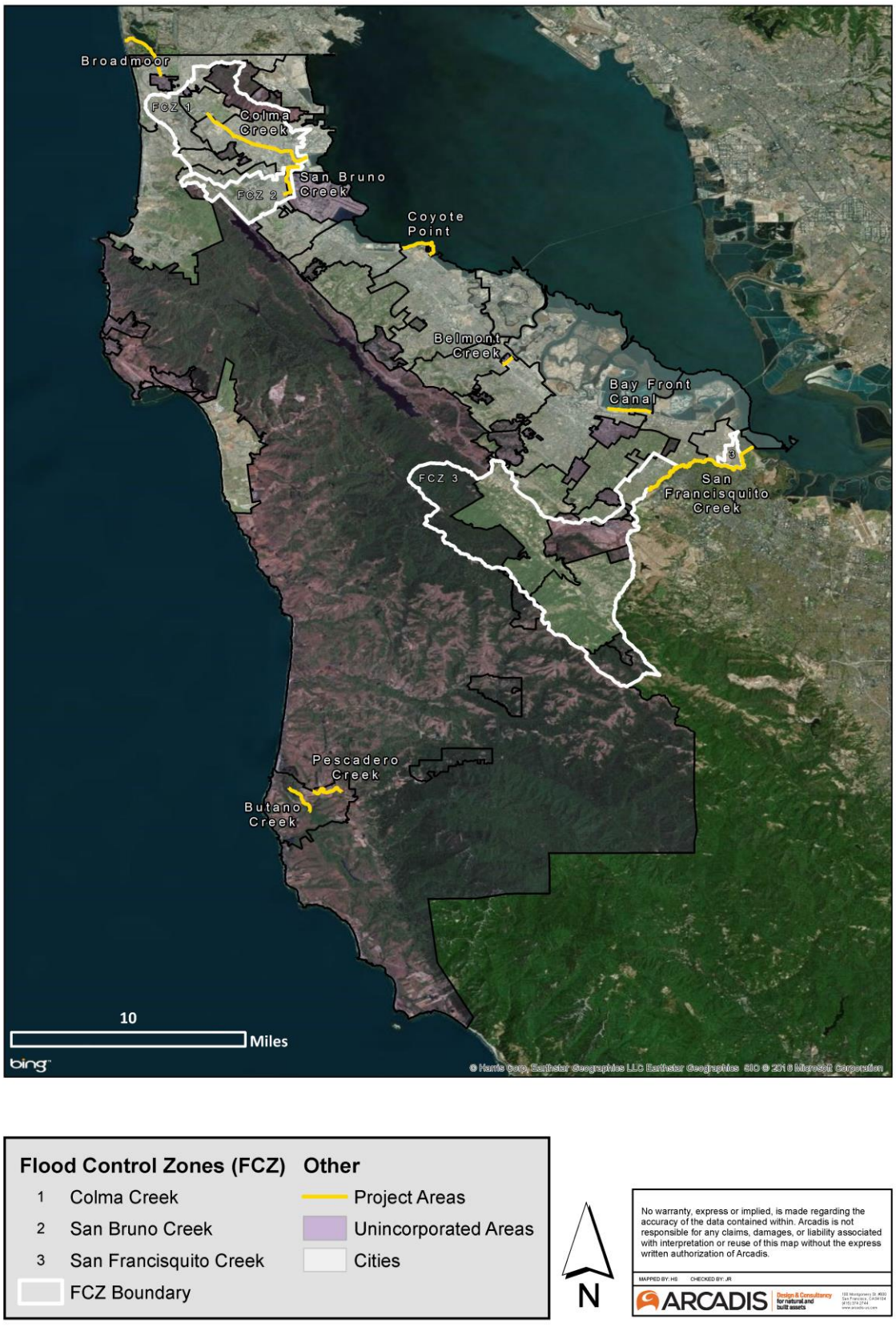


Figure 1: San Mateo County's Areas of Responsibility for Flood Control

San Mateo County Flood Control District

The SMCFCD was established in 1959 pursuant to the California Water Code [Cal. Water Code Appendix, Chapter 87]. The SMCFCD is governed by the five members of the County Board of Supervisors and staffed by Public Works employees. The SMCFCD powers are currently limited to flood control activities primarily in the following three watershed subzones, each of which is reviewed in detail below: Colma Creek, San Bruno Creek, and San Francisquito Creek. Revenue for activities within the subzones is generated by a small portion of the 1% property tax established prior to the passage of Proposition 13. Revenue generated within each subzone can only be used within the subzone.

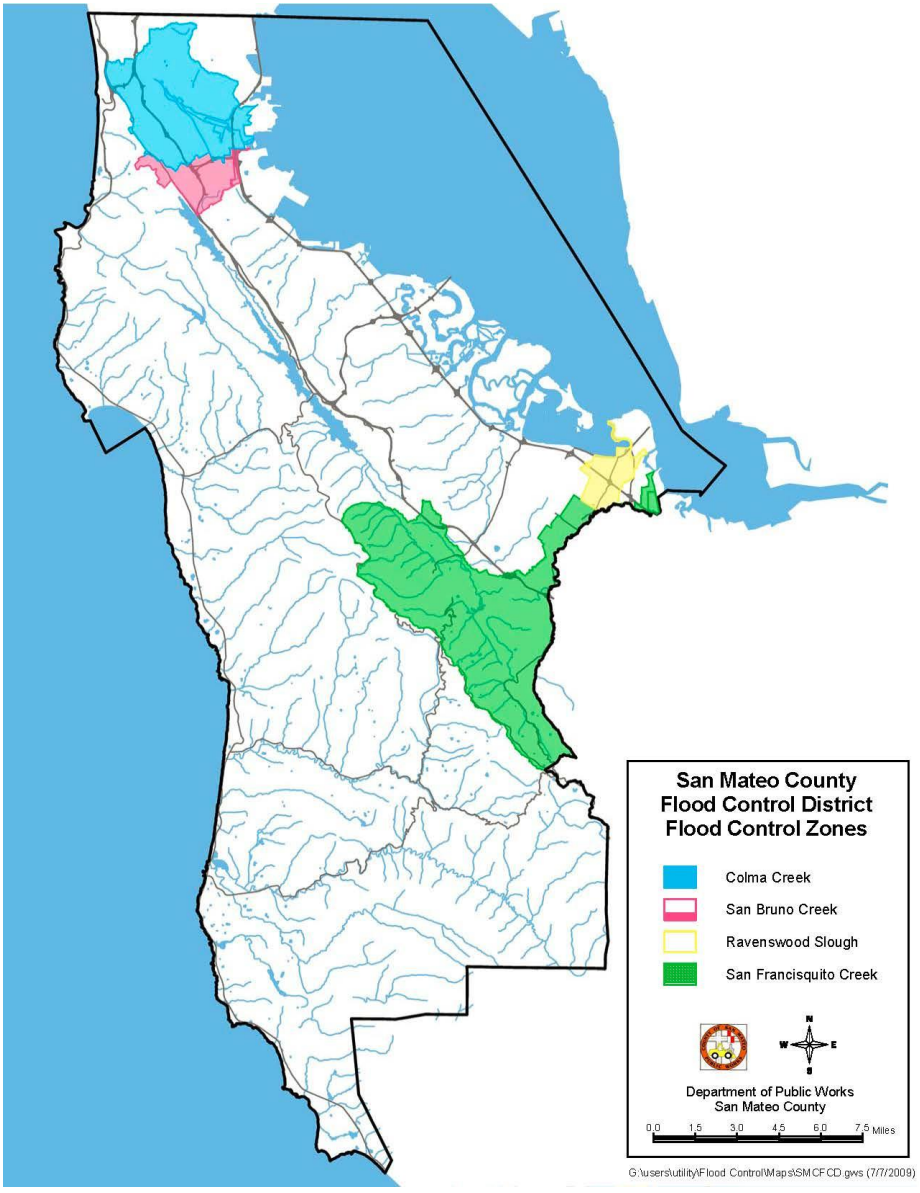


Figure 2:
San Mateo County Flood Control Zones

(Note Figure 2 includes Ravenswood Slough where no projects or maintenance are possible as it receives less than $10,000 in annual tax revenue)

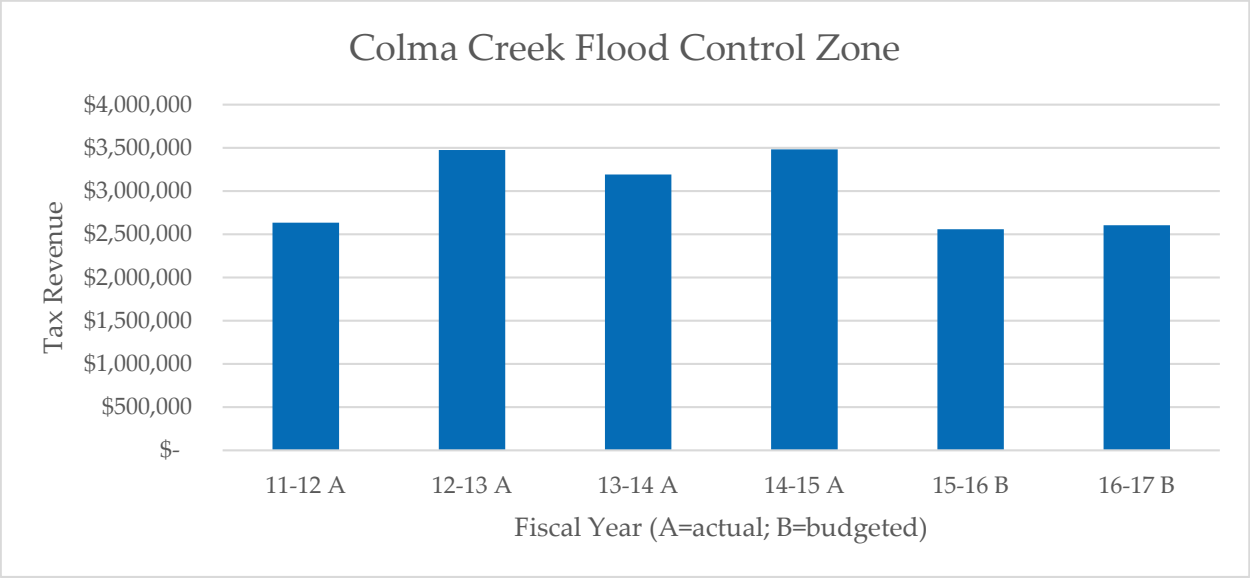
Colma Creek Flood Control Zone

The Colma Creek Flood Control Zone (Colma Creek FCZ) was established in 1964 to alleviate flooding in South San Francisco. Appendix 1 includes a complete history and description of the Colma Creek FCZ

Colma Creek FCZ is funded from a portion of the 1% base property tax and revenues average between $2.5 and $3.0 million annually. The spikes in revenue during FY 12-13, 13-14, and 14-15 resulted from the dissolution of the South San Francisco Redevelopment Agency and the transfer of unused funds to the underlying taxing entities. The Colma Creek FCZ is the only flood control zone in the SMCFCD with any meaningful revenues.

Table 1 shows the tax revenue generated (Actual – A) or budgeted (Budgeted - B) in the Colma Creek FCZ from Fiscal Year 2011-12 through FY 2016-17.

Table 1: Colma Creek FCZ Tax Revenue



Projects completed, or ongoing, in the Colma Creek FCZ over the last five years include:

- Colma Creek Flood Control Channel Wall Repair at Spruce Avenue: Replaced approximately 200 feet of deteriorated channel walls.
- Colma Creek Flood Control Channel Habitat Mitigation: Implemented mitigation measures in compliance with regulatory agency permit requirements for the wall repair at Spruce Avenue.
- Colma Creek Flood Control Channel Long-term Maintenance Project: Effort to obtain long-term environmental permits from regulatory agencies for on-going maintenance activities for the channel.
- Refinancing of Bonds. The 1997 and 2004 bonds for the Colma Creek FCZ were refinanced resulting in approximately $4 million in present value savings.

Future projects required to reduce flood risks include:

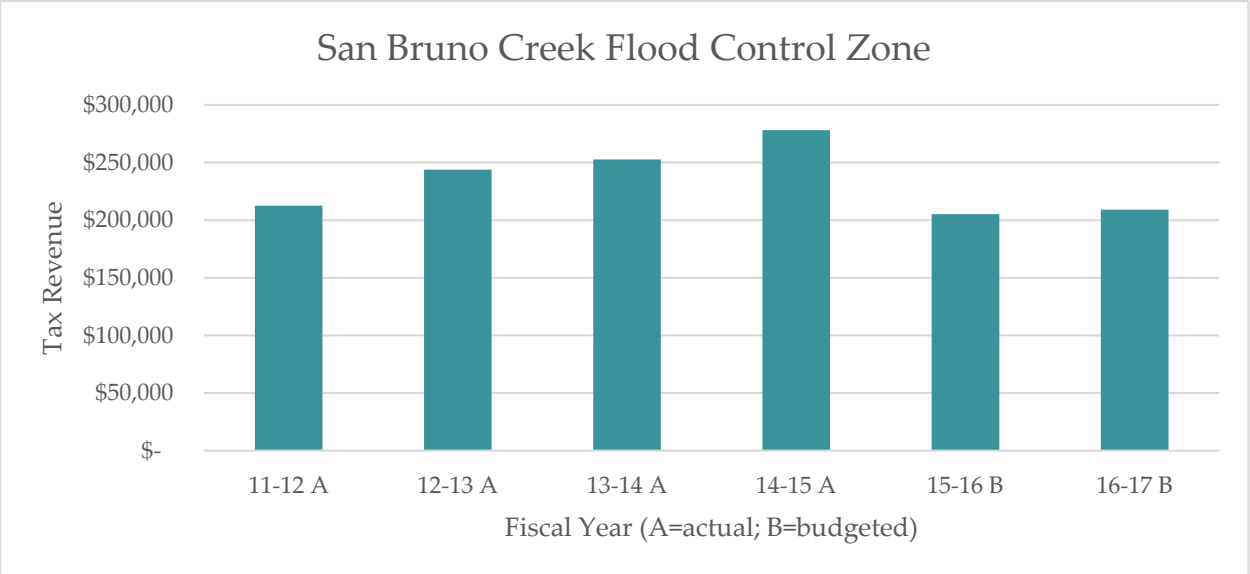
- Constructing a flood wall on the right bank of Colma Creek downstream of Utah Avenue and adding up to two feet in additional height for approximately 900 feet and 265 feet on the right and left banks, respectively.
- Developing defenses for sea level rise vulnerabilities identified in the San Bruno Creek/Colma Creek Resiliency Study completed in 2015.

San Bruno Creek Flood Control Zone

The San Bruno Creek Flood Control Zone (San Bruno FCZ) was established in 1967 and encompasses the lower reach of San Bruno Creek in the City of San Bruno below El Camino Real and lands owned by the City and County of San Francisco and Caltrans. Complex Federal and State permits are required to maintain the San Bruno Creek channel as the area is habitat for the California Red Legged Frog and the San Francisco Garter Snake, both listed as Federal Endangered Species. Appendix 1 includes a complete history and description of the San Bruno Creek FCZ.

The San Bruno Creek FCZ is funded from a portion of the 1% base property tax and revenues average between $200,000 and $250,000 annually. The spikes in revenue during FY 12-13, 13-14, and 14-15 resulted from the dissolution of the San Bruno Redevelopment Agency and the transfer of unused funds to the underlying taxing entities. Table 2 shows the tax revenue generated (Actual – A) and budgeted (Budgeted - B) in the San Bruno FCZ from FY 2011-12 through FY 2016-17.

Table 2: San Bruno Creek FCZ Tax Revenue



Projects completed, or ongoing, in the San Bruno Creek FCZ over the last five years include:

- San Bruno Creek Flood Control Zone Pump Station Evaluation: Completed the Walnut and Angus Stormwater Pumping Stations Evaluation Study and Preliminary Design Report.
- San Bruno Creek Flood Control Channel Maintenance Project: On-going annual hand vegetation clearing of the Cupid Row Canal.

Future projects required to reduce flood risks include:

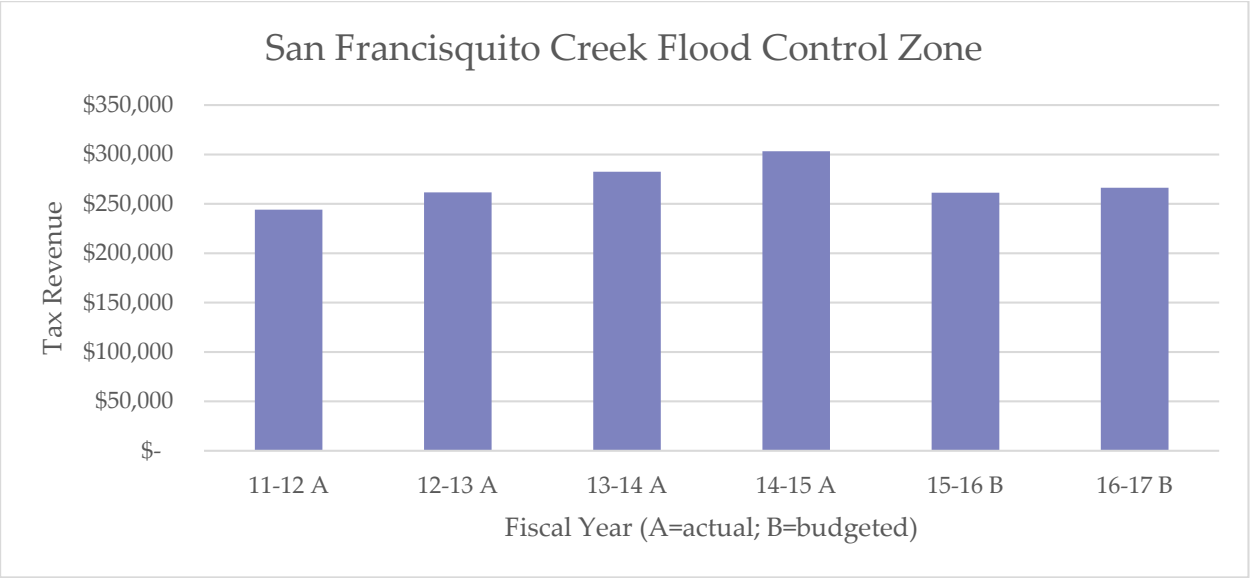
- Replacing tide gate structure.
- Replacing or retrofitting two pump stations.
- Increasing channel capacity to prepare for significant storm events and future sea level rise.

San Francisquito Creek Flood Control Zone

San Francisquito Creek forms the boundary between San Mateo and Santa Clara Counties. The San Francisquito Creek Joint Powers Authority (SFCJPA) was established in 1999 to manage the San Francisquito Creek watershed as a whole following a significant El Nino storm that damaged approximately 1,700 properties in 1998. The SFCJPA includes the cities of Palo Alto, East Palo Alto, and Menlo Park, the Santa Clara Valley Water District, and the SMCFCD. Each member agency holds a seat on the SFCJPA Board. Appendix 1 includes a complete history and description of the San Francisquito Creek Flood Control Zone (SFCFCZ).

The SFCFCZ receives revenue from a portion of the 1% base property tax and revenues average between $250,000 and $300,000 annually. Most of this revenue is paid to the SFCJPA as a member agency contribution. Table 3 shows the tax revenue generated (Actual – A) and budgeted (Budgeted - B) in the SFCFCZ from FY 2011-12 through FY 2016-17.

Table 3: San Francisquito Creek FCZ Tax Revenue



Improvements to San Francisquito Creek will occur in two phases: first from Highway 101 downstream to San Francisco Bay (Bay), and second upstream of Highway 101 towards El Camino Real. The first San Francisquito Creek flood control project associated with phase 1 will increase the capacity of the creek channel under Highway 101. This project is funded and managed by Caltrans and is now in construction.

The SFCJPA's Bay to Highway 101 project has complete design and environmental documentation, and is awaiting the issuance of all necessary permits in order to begin construction in 2016 of capacity improvements downstream of Highway 101. The cost to plan, design and construct the Bay-Highway 101 project is approximately $40 million, which has been secured from the SMCFCD, the Santa Clara Valley Water District, the City of East Palo Alto, and the SFCJPA which was awarded State grant funding. Securing funding for the Bay to Highway 101 project, however, was delayed due in part to the fact that the SMCFCD had substantially less funds to contribute to the project compared to the Santa Clara Valley Water District.

Photo 1: A house on Bay Laurel Drive in Menlo Park lost its fence to the eroding bank of the San Francisquito Creek on Feb. 19, 1998

Additional major capital projects along the creek (upstream of Highway 101) and Bay shoreline are in the planning and design phases, with construction not anticipated to begin until at least 2018. The Army Corps of Engineers has partnered

with the SFCJPA on additional creek projects upstream of Highway 101 and a federal feasibility study is anticipated to be completed in 2018.

SMCFCD Staffing and Organization

The SMCFCD does not have any employees. Instead, Public Works provides staff support for the SMCFCD and oftentimes will contract services for certain maintenance or repair activities. None of the 15 Public Works staff who support the SMCFCD work on flood control projects full time. In fact, the time collectively expended by these individuals on flood control projects is less than one full-time equivalent (FTE) employee. Appendix 2 identifies the Public Works' personnel who support the SMCFCD.

Other Flooding Risks

The County of San Mateo is also responsible for flood control in unincorporated areas of the County and for protecting County assets from flooding that are located in incorporated areas. There are five particular areas of concern, all of which are illustrated in Figure 1 and described in greater detail in Appendix 1.

Bayfront Canal and Atherton Channel (North Fair Oaks)

The Bayfront Canal and Atherton Channel, and the associated watersheds, cause periodic flooding in North Fair Oaks, Redwood City, Menlo Park, and Atherton. Mobile home properties adjacent to the Bayfront Canal have experienced frequent flooding during relatively small storm events due to insufficient hydraulic capacity of the Bayfront Canal and overtopping of the Bayfront Canal's south bank. The insufficient hydraulic capacity of the Bayfront Canal also prevents the County from pumping additional flood water from the North Fair Oaks area (e.g. in the vicinity of

Photo 2: People wade through the flooded Le Mar trailer park in Redwood City on Dec. 12, 2014

Athlone Way and San Benito Avenue) into the Bayfront Canal system as doing so would exacerbate flooding in other downstream areas.

Photo 3: Belmont Damage, December 2014 Storm Events

Belmont Creek (Harbor Industrial Area)

Periodic flooding from the Belmont Creek occurs at the Caltrain undercrossing on Harbor Boulevard near El Camino Real, along Industrial Road, along the channel on Old County Road, and along Quarry Road. Flooding in the Harbor Industrial area affects a mobile home park, Novartis Corporation, and several small businesses and County facilities along Belmont Creek.

Coyote Point Area

The City of San Mateo North Shoreview neighborhood, the San Mateo County Animal shelter, Coyote Point Park, and potentially Highway 101 are subject to flood risks in the Coyote Point area, primarily from tidal flooding that will be made worse by sea level rise.

Daly City Vista Grande Canal (Broadmoor)

Periodic flooding in Daly City and Broadmoor occurs primarily in the 400 block of 88th Street and around 89th Street in the Broadmoor Village area. Flooding occurs due to hydraulic capacity limitations of the underground tunnel beneath the Olympic Club golf course and Fort Funston that conveys stormwater between Lake Merced and the Pacific Ocean, and also from hydraulic capacity limitations of the stormwater collection system between Lake Merced and Broadmoor Village.

Pescadero and Butano Creeks

The Pescadero-Butano watershed is the largest coastal watershed between the Golden Gate and the San Lorenzo River in Santa Cruz County. Chronic flooding of roadways and properties in the Pescadero area occurs during even relatively small storm events.

Photo 4: Flooding on Pescadero Creek Road

Summary of Flood Control Challenges

The County's current organization, staffing, and funding do not support effective flood control or flood response in the County's areas of responsibility. Current funding is insufficient for most activities and is limited to maintenance or very small capital improvement projects only. This does little or nothing to reduce present or future flood risk which requires considerable capital investments.

Photo 5: Stranded cars litter the flooded streets near Embarcadero Road in Palo Alto on Feb. 3, 1998.

The Public Works staff that are assigned to flood control projects are currently fully utilized and have limited capacity to manage near and long term flood management projects. Further, there is no single County employee whose fulltime focus is on flood control.

Without sufficient personnel, it is difficult to stay up to date with the changing regulatory climate or to apply for and obtain much-needed grant funding or manage grant requirements. At present, the organizational structure, financial constraints, and staff resources available also inhibit the County from providing the leadership required to work with the affected cities that would need to be involved to address the flood risks in many of the County's areas of responsibility.

The County's flood management challenges will be exacerbated by the effects of climate change and sea level rise. A 2012 report by the Pacific Institute identified San Mateo County as one of most vulnerable counties in the state of California with estimated potential flood damages as high as $24 billion. A March 2015 report by the Bay Area Council called "Surviving the Storm" drew similar conclusions and noted that the weather variability of the last 50 years is far greater than the variability of the previous 50 years, indicating that large precipitation events may become more frequent.

How Other Bay Area Counties Address Flood Control

The nine counties in the Bay Area address flooding in a variety of ways. Flood control management is complex and inconsistent across the Bay Area.

Sonoma and Santa Clara Counties are on one end of the spectrum with robust and comprehensive water and flood control districts that manage many a variety of water issues including flood control, water supply, groundwater management, storm water treatment (e.g. National Pollutant Discharge Elimination System (NPDES) compliance), and waste water treatment. In particular, the Santa Clara Valley Water District benefits from consistent and large revenues through property taxes, a parcel tax and fees, and has a staff of over 750 employees, with approximately 192 FTEs dedicated to flood control. The Sonoma County Water Agency has a staff of over 100 employees, with approximately 10 FTEs dedicated to flood control.

Solano, Marin, Napa, Alameda, Contra Costa and San Mateo Counties are on the other end of the spectrum with more limited flood control capacity. The flood control and water districts, in these counties, as well as the Sonoma County Water Agency, were formed as part of state legislation following the post WWII building boom. These counties have created watershed based flood zones, as required by their enabling legislation. Some counties have zones covering the entire county, each with their own revenue stream. Other counties, like San Mateo County, have a limited number of zones only covering part of their county, often with some zones receiving little or no funding. As a benchmark, San Mateo County, along with Solano County, has one of the lowest staffed and lowest funded flood control districts in the Bay Area.

The initial post WWII flood control legislation enabled local flood control districts to levy property taxes based on watershed flood zones. After Proposition 13 was enacted that source of funding was restricted. In fact, prior to Proposition 13's passage, some zones had lowered their property tax assessment for flood control to zero, or had never levied property taxes for flood control purposes, because they had large reserves or there was limited development in the specified flood control zones. With the passage of Proposition 13, this left many flood zones without dedicated funding.

Restrictions on property taxes have required water and flood control districts to develop other funding sources. For example, Napa County voters enacted a sales tax in 1998 dedicated to flood control to pay for significant improvements along the Napa River and other areas in the county. Santa Clara Valley Water District passed a parcel tax in 2000,

which was renewed in 2012. This parcel tax provides substantial funding for flood control projects throughout Santa Clara County. A majority of the tax funding for the San Francisquito Creek Bay to 101 projects comes from the Santa Clara Valley Water District parcel tax. Alameda County has been successful in obtaining several million dollars annually of grant funding. Please see Appendix 3 and Appendix 4 for a more detailed discussion about how other Bay Area Flood Control Districts are operated and funded.

Proposal to Improve San Mateo County's Flood Control Efforts

Since the creation of the SMCFCD in 1959, flood risks in San Mateo County have increased significantly due to increased population and development particularly in low-lying flood prone areas along the Bay. The construction of additional impermeable surfaces (e.g. roads, pavement and buildings) has further contributed to the problem. Moreover, flooding risks will continue to increase as sea level rises. Meanwhile, funding for flood risk management has not kept up with this growth nor the rising costs of regulatory compliance, project construction, and maintenance.

In order to effectively deal with the flood control challenges in the County's areas of responsibility, greater staffing and funding resources are needed. To this end, Public Works is requesting approval for $200,000 in funding for the remainder of FY 2016 and $2 million in funding per year for the next three fiscal years for a total of $6.2 million.

Work Plan

The recommended first step is to retain two new staff members, one with program management skills and the other with technical skills to begin work on the projects and initiatives identified in this report. Once onboard, the new staff will evaluate and prioritize these projects and initiatives to ensure that staff and financial resources are appropriately allocated to address the most critical and highest needs. A detailed work plan will be provided to the Board of Supervisors once it is completed.

It is anticipated that the work plan will include the following seven key initiatives:

1. Accelerate Work in the Current SMCFCD Flood Control Zones:
    a. Perform an analysis of Colma Creek to determine required improvements and costs to increase capacity to accommodate a 1% or 2% storm event combined with sea level rise.
    b. Seek feedback from Colma Creek Flood Control Zone Advisory Committee and city partners on whether to pursue a revenue measure to fund increasing the

current channel's capacity in order to protect the community from major storm events and sea level rise.

   c. Perform analysis of San Bruno Channel to determine required improvements and costs to upsize the channel and pump stations to accommodate a 1% or 2% storm event combined with sea level rise.
   d. Seek feedback from City of San Bruno on whether to pursue a benefit assessment district to construct improvements.
   e. Perform upgrades to the San Bruno Creek Flood Control Zone pump stations for improved reliability.
   f. Certify the San Bruno Channel tide gate structure to FEMA standards for a 1% storm event combined with sea level rise.
   g. Continue supporting the work of the SFCJPA, including performing maintenance work in SMCFCD's areas of responsibility.

2. Pursue Projects Outside of the SMCFCD Flood Control Zones that Benefit Unincorporated County Areas and Assets:
   a. Begin design and planning work concerning the following projects/areas: Navigable Slough in South San Francisco; Pescadero Creek Road causeway; Coyote Point levee Improvements; Belmont Creek improvements at Harbor Boulevard; Bayfront Canal/Atherton Channel improvements; and Vista Grande Canal/Broadmoor/Daly City collection system capacity improvements.
   b. If the flood risks of concern to the County's unincorporated areas or assets also affect incorporated cities, projects will be undertaken only if the cities agree to participate.
3. Seek Grant Funding: Leverage federal, state, and other funding sources to implement flood risk reduction projects in the flood control zones and impacted areas in unincorporated San Mateo County. There are many opportunities for state and federal funding to reduce flood risk both pre-and post-flood disaster. Success in acquiring the funds often depends on both the (i) availability of personnel to apply for them, and (ii) access to the right information and analyses within a limited time frame. The County can serve as a leader in identifying and evaluating these funding opportunities, and, where appropriate, for supporting San Mateo County's cities in their own applications. Funding opportunities include California Department of Water Resources grants under the Integrated Regional Water Management Plan (IWRMP) program and FEMA's Hazard Mitigation Assistance programs.
4. Respond to Community Rating System: Work with the County Department of Planning and Building to increase San Mateo County's participation in the Community Rating System under the National Flood Insurance Program (NFIP) in order to reduce

flood losses and lower flood insurance premiums for unincorporated County residents and businesses. The County can potentially earn a higher class/rating and reduce insurance premiums by documenting current activities and programs.

5. Expand and Improve GIS capacity: Serve as the Geographic Information System (GIS) repository to support flood risk assessments, feasibility studies, and grant applications for funding either by the County or in cooperation with other jurisdictions.
6. Install Stream Flow Gauges and an Early Warning Notification System: The SFCJA has installed a sophisticated early warning system for the San Francisquito Creek watershed consisting of stream gauges, a publicly accessible website with real time water level information, and an automatic notification process to alert residents of potential flooding. Currently, San Mateo County's Office of Emergency Services has two creek monitors (located on San Francisquito Creek and Belmont Creek) and five rainfall monitors (located at San Bruno Mountain, Huddart County Park, Towne Ridge, Los Trancos, and Saratoga Summit). Additional stream and rainfall gauges should be installed in creeks where the County has responsibility, and, where feasible, an early warning system website and notification process should be deployed to alert residents of flooding risks. This work should be performed in collaboration with San Mateo County cities (as appropriate), the San Mateo County's Office of Emergency Services, and the National Oceanic and Atmospheric Administration to maximize leveraging the data for flood forecasting purposes.
7. Support C/CAG Water Committee: On October 8, 2015, C/CAG established a Water Committee to facilitate discussion on countywide approaches to water related issues such as flood control, ground water management, stormwater pollution control, and sea level rise. The Water Committee includes city councilmembers, city managers, a representative from the Bay Area Water Supply and Conservation Agency, and Supervisors Dave Pine and Don Horsley. The new staff hired by Public Works would be available to support the C/CAG Water Committee.

Until the two staff members are hired and a detailed work plan is developed, it is difficult to outline a timeline for the specific work and deliverables that will be completed with the requested additional funding. However, based on the research done in connection with the preparation of this report, a preliminary annual task list is set forth below. Due to the significant capital costs of implementing flood control projects, this list focuses primarily on assessment, planning and environmental reviews. Funding sources, in addition to the requested County funding, such as grants or the creation of assessment districts, will need to be identified before construction can commence. Where a project requires collaboration with cities, it is anticipated that some additional funding would be contributed by those cities. Annual reports will be made to the Board of Supervisors describing the work

completed in the prior year and updating the work plan and deliverables timeline for the upcoming year.

Note that Appendix 1 sets out a three year work plan to address flood risks in each of County's areas of responsibility (i.e. the three flood zones and five other areas) that is considerably more ambitious than the annual task list set forth below. In most cases, work plans were developed to illustrate what could be accomplished in each flood prone area if substantial additional funding (over and above the funding requested of the County at this time) was available and, where required, a partnership was developed with the affected cities.

Year 1

- Discuss a partnership with City of San Bruno to fund identified improvements for the San Bruno Channel tide gate structure. Retain consultant to begin environmental clearance work on improvements in partnership with San Bruno. If time permits, begin development of construction contract documents.
- Begin environmental review process and construction contract documents for improvements to the San Bruno Creek Flood Control Zone pump stations.
- Retain consultant to evaluate recommended improvements along the Navigable Slough in South San Francisco.
- Partner with Belmont and San Carlos to evaluate conceptual designs for Belmont Creek improvements at Harbor Boulevard. Enter into funding agreement with Belmont and San Carlos.
- Expand upon completed Coastal Conservancy funded San Bruno Creek/Colma Creek Resiliency Study to evaluate capital improvements to the Colma Creek and San Bruno Creek to accommodate 1% or 2% storm events combined with sea level rise.
- Retain consultant to complete Pescadero Creek Road causeway feasibility study. Assuming required permits are obtained, commence dredging of Butano Creek within the Pescadero Creek Road right of way.
- Move the Promenade Trail at Coyote Point Park (a San Francisco Bay Trail spur) inland on the order of 75 to 125 feet and move parking inland and uphill in order to accommodate high tides and future sea level rise.
- Compile and review prior reports and analyses on flooding issues associated with the Bayfront Canal. Collaborate with Redwood City, Menlo Park, Atherton, and Stanford University to develop a work plan for additional studies as needed and/or environmental review for improvements to address flooding issues affecting the various jurisdictions and Stanford facilities.

- Retain consultant to install stream and rainfall gauges for creeks and watersheds of concern and develop website for collecting the data.
- Attend Vista Grande Canal and San Francisquito Creek meetings as necessary.
- Participate in regional and statewide meetings regarding flood control and sea level rise.

Year 2

- Determine funding sources for San Bruno Creek and/or Colma Creek capacity improvements. Begin work on environmental review for highest priority project(s) based on available funding.
- Complete construction contract documents for San Bruno tide gate structure improvements subject to partnership agreement with San Bruno. Advertise for construction contract bids.
- Deploy stream and rain-fall gauges, develop website, and develop early warning system for creeks and watersheds of concern.
- Enter into a funding agreement with South San Francisco to pursue construction contract documents for Navigable Slough improvements. Begin environmental review process subject to funding agreement. Retain design consultant.
- Determine the feasibility of a causeway on Pescadero Creek Road.
- Partner with Belmont and San Carlos to perform environmental review for Belmont Creek improvements at Harbor Boulevard. Retain consultant to prepare construction contract documents and to perform permitting work.
- Commence discussions with the City of San Mateo to develop a conceptual study of berm improvements in the Coyote Point area.
- Complete environmental review of improvement projects designed to address flooding issues associated with the Bayfront Canal in collaboration with city partners and Stanford University.
- Attend Vista Grande Canal and San Francisquito Creek meetings as necessary.
- Participate in regional and statewide meetings regarding flood control and sea level rise.

Year 3

- Complete construction of San Bruno tide gate structure improvements.
- Acquire funding sources for San Bruno Creek and/or Colma Creek capacity improvements.
- Maintain stream gauges, website, and early warning system for creeks of concern.
- Begin construction of Navigable Slough improvements subject to available funding and environmental permits.

- Begin construction of Belmont Creek improvements at Harbor Boulevard subject to available funding and environmental permits.
- Commence environmental review of berm improvements in the Coyote Point area and seek grant funds.
- Attend Vista Grande Canal and San Francisquito Creek meetings as necessary.
- Participate in regional and statewide meetings regarding flood control and sea level rise.

Personnel

Public Works contemplates hiring two staff including one with program management skills and the other with technical skills to support the program manager. The two positions will retain and manage consultants to perform the vast majority of the work.

Management and staff interviews of current Public Works personnel were conducted to best understand what specific duties are required of the new positions. Table 4 lists the outcomes of these interviews and how resources can be optimized around these two distinct functional roles.

Table 4: Specific Duties Required

Specific Duties Required	Program Manager	Technical Staff Member
Project Management includes: needs assessment, scoping work, designate funding, manage projects	X	X
Project Assistance		X
Project Inventory		X
Project Prioritization	X	
Project Approval	X	
Grant writing and administration	X	X
Partnership, negotiation and coordination with Cities and Local Agencies	X	X
Coordination with Regulatory Agencies	X	X
Project Fundraising	X	X
Permitting		X
Project Community Benefits Assessment	X	X
Local Environmental Benefit Education	X	X
Community Rating System (CRS)	X	X
Public Project Status Update	X	X

Specific Duties Required	Program Manager	Technical Staff Member
Manage SMCFCD Budget	**X**	
Board of Supervisor Update	**X**	

The program manager will be responsible for: overall development, coordination, and implementation of the work plan; seeking grant funds; developing and monitoring budgets; attending regional and statewide meetings on flood control and sea level rise; coordinating projects where necessary with other affected cities; reviewing reports and construction documents prepared by consultants; and preparing various reports including regular status reports to the Board of Supervisors.

The technical staff member will be responsible for developing requests for proposals; retaining consultants and overseeing consultant contracts; providing technical review of reports and construction documents; working with permitting agencies to secure permits; and generally supporting the program manager.

Budget

Public Works is requesting approval for a total of $6.2 million in General Fund funding to address flood risks in the County's areas of responsibility. These funds will be allocated as follows:

Table 5: Requested Budget

Fully burdened cost of the proposed two new hires, and ancillary costs to support these employees, for the remainder of FY 2016	$200,000
Fully burdened cost of the proposed two new hires, and ancillary costs to support these employees, for FY 2017 - FY 2019 ($400,000 annually)	$1,200,000
Cost of consultants to assist in planning, engineering, and design of flood control projects FY 2017 - FY 2019 ($1,500,000 annually)	$4,500,000
Stream and rain-fall gauges and other minor capital costs FY 2017 - FY 2019 ($100,000 annually)	$300,000
Total	**$6,200,000**

Conclusion & Next Steps

San Mateo County has one of the lowest staffed and lowest funded flood control districts in the Bay Area. The SMCFCD is responsible for providing flood protection in the San Bruno Creek, Colma Creek and San Francisquito Creek flood zones. However, other than in the Colma Creek Flood Control Zone, the SMCFCD revenues are barely sufficient for maintenance of the creeks and provide little funding for capital improvements.

San Mateo County has even fewer resources and no dedicated funding available to protect the following flood prone areas where the County has responsibility: Bayfront Canal (North Fair Oaks), Belmont Creek (Harbor Industrial Area), Butano – Pescadero Creek (Pescadero area), the Coyote Point area, and the Daly City Vista Grande Canal (Broadmoor).

San Mateo County's limited flood control resources also places the County at a severe disadvantage in applying for state and federal grant funding. In addition, the County is not currently in a position to effectively coordinate its efforts with affected cities on specific flood control projects, or develop more extensive expertise in flood control management.

Public Works is requesting approval for a total of $6.2 million in General Fund funding to address flood risks in the County's areas of responsibility with $200,000 to be budgeted for the remainder of this fiscal year (FY 2016) and $2 million per year budgeted for the subsequent three fiscal years. While this funding is not nearly adequate to remedy the flood control problems described in this report, it will allow the County to retain the necessary staff and consultants to commence planning, engineering, and design of flood control projects; seek grant funding; and collaborate with interested cities on specific projects. Funds will also be used to install and maintain stream gauges, potentially deploy an early warning system website and notification process, and support the C/CAG Water Committee.

Following the conclusion of FY 2019, Public Works will evaluate the scope of the work completed as a result of the additional $6.2 million in funding and recommend to the Board of Supervisors next steps for moving forward. One possible outcome would be that the County's flood control work would be folded into a new, or modified existing agency, that would pursue countywide collaboration and funding to address water related issues, including flood control, in both the incorporated and unincorporated areas of the County. The C/CAG Water Committee has been convened to explore various models for developing such a broader countywide approach.

Appendix 1

FLOOD RISKS IN SAN MATEO COUNTY'S AREAS OF RESPONSIBILITY

	Colma Creek
Watershed:	Colma Creek extends from San Bruno Mountain to its outlet at the San Francisco Bay just north of the San Francisco Airport and south of Point San Bruno. Colma Creek flows through portions of Daly City, Colma, and South San Francisco, and portions of San Bruno and Pacifica are within the watershed. The western border of the basin is the San Andreas Fault while the northern edge terminates at the San Bruno Mountain ridge and the south is bounded by Interstate 380. The total drainage area is approximately 15.8 square miles and is mostly developed. The Zone's currently adopted level of protection is for a 50 year storm event with 2-feet of freeboard.
Project Boundaries:	Mission Road to Utah Avenue, City of South San Francisco. The San Mateo County Flood Control District (SMCFCD) oversees the Colma Creek Flood Control Zone, established in 1964, to alleviate flooding in the City of South San Francisco. Colma Creek flood control project originally spanned 3 miles from San Francisco Bay up to Mission Road in South San Francisco. In the period through 1978, the project included the replacement of the bridges at Utah Avenue, South Airport Boulevard, Linden Avenue, and Spruce Avenue. Recent improvements since 1995 have extended the project further upstream to Daly City. Additional projects include the 2003 replacement of the Mainline Railroad Bridge over the creek in collaboration with the Peninsula Joint Powers Board, and the raising of the San Mateo Avenue Bridge in 2006). There are multiple flood control elements in the Colma Creek watershed: • The Colma Creek Channel, which was improved in 2006 between Spruce Avenue and San Mateo Avenue near downtown City of South San Francisco. • Seven pump stations in the lower Colma Creek watershed owned and operated by the City of South San Francisco (SSF) Department of Public Works (DPW). • Navigable Slough, which is a tidal channel that is tributary to Colma Creek, and passes under Hwy-101 and South Airport Blvd. in culverts. The reach of Colma Creek upstream of Hwy-101, from the Caltrain tracks up to Spruce Avenue, has a channel capacity coinciding with approximately a 10-year flood event for the existing tidal conditions based on San Bruno Creek/Colma Creek Resiliency Study.

	Colma Creek
Flooding History:	Periodic flooding of adjacent properties and streets in S. San Francisco (1955, 1971, 1972, 1973, 1981, 1982, 1998, and 2014). Rainfall is the principal cause of flooding in South San Francisco with Colma Creek as the primary source (versus high tides). Flooding in South San Francisco is aggravated by the existing channel floodwalls and levees, which, although built to protect the floodplain area from lesser floods, would prevent the 1-percent annual chance overbank flows from re-entering the channel unless conveyed through local storm drain systems or pump stations.
Funding History:	$2.5M to $3.5M annually from the flood control zone.
Project Description:	Construct flood wall on the right bank of Colma Creek downstream of Utah Avenue and to add up to 2 feet in additional height to the left bank for approximately 900-ft and 265-ft on the right and left banks, respectively.
Current Status:	Concept design completed, but should be evaluated in light of future sea level rise. The San Bruno Creek/Colma Creek Resiliency Study recommended adding 3 feet of height for sea level rise.
Potential Flood Damages:	Commercial and residential properties. The Colma Creek system has various locations that are vulnerable to changes in flood stages due to sea level rise. The locations are listed below: • Colma Creek Floodwall Elevations- Upstream of Highway-101 • Colma Creek Floodwall Elevations - Highway-101 to Utah Avenue • Colma Creek Floodwall Elevations - Downstream of Utah Avenue to Creek Mouth • Navigable Slough – Top of Bank Elevations
Project Goals:	Reduce flooding potential. Develop a Regional Watershed Management Plan in coordination with the Cities of South San Francisco, Daly City, San Bruno and Colma.
Project Benefits:	Reduce flooding potential.

Colma Creek

Project Costs/ funding needs: $1.5M to $2M

Funding Needs: $1.5M to $2M

Policy Needs: Colma Creek Flood Control Zone

Potential Project Work Plan Should Funding be Available:

Year (start)	Description of Task	Estimated Cost	Estimated Duration of Task
1	Begin CEQA Process	$500,000	12 months
2	Complete CEQA Begin Detailed Design	$800,000	12-18 months
3	Obtain permits Complete construction documents Advertise for construction bids	$500,000	12-18 months

Potential Outcomes (1-3 years): Design channel wall to add 3 feet of height for sea level rise and increase channel capacity if determined to be appropriate after consultation with the Colma Creek Flood Control Zone Citizens Advisory Committee.

Next Steps (3+ years): Begin construction by 2018.

	San Bruno Creek Channel
Watershed:	San Bruno Creek Channel collects runoff from the City of San Bruno, a drainage area of approximately 4.5 square miles, which lies south of the Colma Creek drainage basin. Most of the San Bruno Creek watershed drains through pipes in the City of San Bruno's storm drain system. The San Bruno Creek Channel enters the San Francisco Bay approximately 1,400 feet to the south of the Colma Creek outlet. The channel exits to the Bay through a tide gate structure.
Project Boundaries:	The watershed is bounded by the City of South San Francisco and Colma Creek to the north, the City of Millbrae and the South Lomita Canal/Highline Canal to the south, the City of Pacifica and the Coast Range to the west, and the San Francisco International Airport (SFO) to the east. The San Mateo Flood Control District (SMCFCD) oversees the San Bruno Creek Flood Control Zone, which was established in 1967 to construct flood control and drainage improvements in the lower reach of San Bruno Creek. The Zone's currently adopted level of protection is for a 25- year storm event. There are multiple flood control elements in the San Bruno Creek watershed: • Two pump-stations, Walnut and Angus, which are maintained by the SMCFCD. • Two open channel sections of San Bruno Creek in the lower portion of the watershed, Cupid Row Canal and North Channel. • A tide gate structure where the North Channel exits to the San Francisco Bay that includes four, 5-feet diameter circular pipes with flap gates on the downstream side. The tide gate structure was designed for a 25-year flood event based on the 1965 watershed, with a Mean Higher High Water tidal elevation at the site. In 2014 the City of San Bruno completed a city-wide Storm Drain Master Plan (SDMP) study of the hydrology and hydraulics of the existing storm drain system.

	San Bruno Creek Channel
Flooding History:	Belle Air Neighborhood, San Bruno (1955, 1972, 1973, 1977, 1983, 1998, 2002) Shallow flooding occurs between Bayshore Freeway and the mainline of the railroad from overland flows from San Bruno The San Bruno/Colma Creek Resiliency Study found that the reach of North Channel downstream of the Hwy-101 culverts is able to contain approximately a 10-year flood event due to a few low-spots on the channel banks. However, the flood elevations in this lower reach are being moderated by the overbank flooding that occurs in the San Bruno Creek system upstream of the Hwy-101 culverts. The majority of this flooding occurs on the west side of Cupid Row Canal, adjacent to the Belle Air neighborhood, and to a lesser degree in the reach of North Channel between San Bruno Avenue and Hwy-101. Cupid Row Canal is located on City and County of San Francisco property and is included in the area covered by the Recovery Action Plan for the San Francisco Garter Snake, West of Bayshore Property (Recovery Action Plan). The Recovery Action Plan was approved by the US Fish and Wildlife Service and the California Department of Fish and Wildlife.
Funding History:	Approximately $200,000 to $250,000 annually from the flood control zone.
Project Description:	Replace existing tide gate structure. Restore channel flow capacity to 25-year storm event or increase to meet FEMA certification.
Current Status:	Reviewing the feasibility of FEMA certification of tide gate structure. San Bruno Creek/Colma Creek Resiliency Study recommended adding three feet of height for sea level rise.
Potential Flood Damages:	Belle Air Neighborhood, San Bruno
Project Costs/ funding needs:	Two pump stations - $1.6M to $11M
Policy Needs:	Insufficient funding

San Bruno Creek Channel

Potential Project Work Plan Should Funding be Available:

Year (start)	Description of Task	Estimated Cost	Estimated Duration of Task
1	Complete conceptual design study on tide gate structure. Begin environmental review process for tide gate structure. Prepare report on costs of increasing capacity of channel. Evaluate whether to retrofit or replace pump stations.	$200,000 for Channel and $200,000 for the two pump stations	12-18 months
2	Prepare construction contract documents and seek permits for tide gate structure. Seek funding for channel capacity improvements.	$300,000 for the channel	12 months
3	Design preferred alternative(s) for two pump stations. Complete environmental review for pump stations. Seek grant funding.	$0.2M - $1M	12-24 months

Potential Outcomes (1-3 years): Replace tide gate structure. Begin work on pump stations improvement project.

Next Steps (3+ years): Complete pump stations improvement project. Begin work on channel capacity improvement project.

	San Francisquito Creek
Watershed:	San Francisquito Creek and its tributaries totaling approximately 50 square miles.
Project Boundaries:	Cities of East Palo Alto, Menlo Park, and Palo Alto, and parts of unincorporated San Mateo County.
Flooding History:	Multiple times over the past century. Flooding in 1998 damaged approximately 1,700 properties in the cities of Palo Alto, East Palo Alto, and Menlo Park. The most recent flooding in December 2012 was part of a County and State disaster declaration.
Funding History:	Approximately $250,000 to $300,000 annually from the San Francisquito Creek Flood Control Zone, largely going to the operations and projects of the San Francisquito Creek Joint Powers Authority (SFCJPA). The San Mateo Flood Control District (SMCFCD) is a member agency of the SFCJPA, along with the cities of East Palo Alto, Menlo Park and Palo Alto, and the Santa Clara Valley Water District.
Project Description:	The project under construction at Highway 101 will increase creek capacity from a 20-year storm event to a 100-year event with future sea level rise in an area currently impacted by tides. The Bay-Highway 101 project awaiting permits will achieve the same level of protection by widening the creek and creating approximately 15 acres of new marshland and enhanced trails. The cost to plan, design and construct the Bay-Highway 101 project is approximately $40 million, which has been secured from the SMCFCD, the Santa Clara Valley Water District, the City of East Palo Alto, and the SFCJPA which was awarded State grant funding.

	San Francisquito Creek
Current Status:	The first flood protection project, funded and managed by Caltrans, is underway where the creek travels under Highway 101. An adjoining project of the SFCJPA between the Bay and Highway 101 has completed design and environmental documentation, and is awaiting the issuance of all necessary permits in order to begin construction in 2016. Additional major capital projects along the creek (upstream or west of Highway 101) and Bay shoreline are in the planning and design phases, with construction not anticipated to begin until at least 2018. The Army Corps of Engineers is a partner on the additional creek projects upstream of Highway 101 through a federal feasibility study that is anticipated to be completed in 2018.
Potential Flood Damages:	Cities of Palo Alto, East Palo Alto, Menlo Park and parts of unincorporated San Mateo County
Project Goals	Significantly reduce flooding, enhance ecosystems, and expand recreational opportunities
Project Costs/ funding needs:	Continued operational support for the SFCJPA from the SMCFCD in collaboration with its other member agencies, and continued contributions for project planning, design and construction pursuant to inter-agency agreements.
Funding Needs:	$200K annually for operations; various amounts for projects.
Policy Needs:	The San Francisquito Creek Flood Control Zone generates insufficient revenue to participate in funding construction. In fact, securing funding for the Bay to Highway 101 project was delayed due in part to the fact that the SMCFCD did not have remotely near the funds to contribute compared to the Santa Clara Valley Water District.

San Francisquito Creek

Work Plan – Maintain Current Contribution to the SFCJPA

Year (start)	Description of Task	Estimated Cost	Estimated Duration of Task
1	Participate in funding SFCJPA. Provide staff support as needed.	$200,000	12 months
2	Participate in funding SFCJPA. Provide staff support as needed.	$200,000	12 months
3	Participate in funding SFCJPA. Provide staff support as needed.	$200,000	12 months

Potential Outcomes (1-3 years):	Continue funding and supporting SFCJPA operations and projects.
Next Steps (3+ years):	Continue funding and supporting SFCJPA operations and projects.

	Bayfront Canal (Unincorporated North Fair Oaks Area)
Watershed:	Woodside, Atherton, North Fair Oaks area, Redwood City, and Menlo Park
Project Boundaries:	Bayfront Canal in eastern Redwood City, Bayfront Salt Marshes. Potentially the Atherton Channel/Marsh Road Box would require modifications.
Flooding History:	Periodic flooding in North Fair Oaks, Redwood City, Menlo Park, and Atherton. Properties adjacent to the Canal have experienced frequent flooding during moderate (2014) to severe storm events (1955, 1958, 1973, 1987, 1998) due to overtopping of the Canal's south bank and limited capacity of the Bayfront Canal and Atherton Channel. Discharge from the Bayfront Canal is controlled by tide gates. High tides coupled with a significant storm event can cause flooding.
Funding History:	Unknown
Project Description:	A major study was conducted in 1983 and again in 2013 by BKF Engineers. Due to multiple jurisdictions and lack of funding, little action has been taken. Ultimately, extend culverts from Bayfront Canal to Salt Ponds, use Salt Ponds as retention ponds or "wet wells" for large pump station(s), and then pump water to the SF Bay.
Current Status:	Redwood City has proposed a project to improve flood water conveyance to approximately 5-year storm event funded in part by a Proposition 84 Integrated Regional Water Management Plan (IRWMP) grant funding. Atherton is proposing to reconstruct the Atherton Channel along Marsh Road from Middlefield Road to Fair Oaks Avenue.
Potential Flood Damages:	Flooding of trailer parks, residential and commercial properties, local roadways, and potentially highways 84 and 101.
Project Goals:	End flooding

Bayfront Canal (Unincorporated North Fair Oaks Area)

Project Costs/ funding needs: Unknown

Policy Needs: Not within a San Mateo County Flood Control District Zone. Insufficient funding available. Requires coordination with the cities of Redwood City, Menlo Park, and Atherton.

Potential Project Work Plan Should Funding be Available:

Year (start)	Description of Task	Estimated Cost	Estimated Duration of Task
1	Review current hydraulic studies Retain EIR/EIS Consultant	$500,000	9-12 months
2	Develop Preferred Project Option Seek grant funding Begin Environmental Certification Work	$1,000,000	12-24 months
3	Certify EIR/EIS Seek Easements Begin Project Design	$1,000,000	12-24 months

Potential Outcomes (1-3 years): Coordination with adjacent jurisdictions is vital and key to making progress after decades of limited action. Develop project technical advisory committee (TAC) comprised of representatives from Redwood City, Menlo Park, San Mateo County, Stanford, and possibly Cargill. Retain consultant to compile existing studies completed to date, prepare project summary report and assess proposed options for addressing flooding. TAC to recommend preferred alternative. Prepare CEQA/NEPA documents. Seek additional funding.

Next Steps (3+ years): Certify EIR/EIS, seek permanent and temporary easements for construction, and develop plans and specifications. Obtain permits. Seek construction bids.

	Belmont Creek (Harbor Industrial Area)
Watershed:	City of Belmont, Unincorporated San Mateo County (Harbor Industrial Area), and a portion of San Carlos
Project Boundaries:	Harbor Boulevard from Old County Road to San Francisco Bay
Flooding History:	Periodic flooding at Caltrain undercrossing on Harbor Boulevard, flooding on Industrial Road and along channel on Old County Road and along Quarry Road. Flooding in trailer park along HWY 101. This overland flow can follow a myriad of routes, and the entire area on the bayside of the railroad tracks is subject to shallow flooding. At the railroad, the overland flow is split and the greater part is diverted to the east. Additional overflow occurs near Harbor Boulevard and Old County Road at a railroad loading spur. The Highway 101 and Holly Street off-ramp form a barrier to the easterly flow, causing shallow ponding in the Industrial Road area. (1955, 1973, 1980, 1982, 1998, 2010, 2014).
Funding History:	Novartis Corporation, situated adjacent to Belmont Creek, funded an approximately $100,000 study on conceptual drainage solution – two 8′ x 10′ box culverts in Harbor Boulevard.
Project Description:	Two new 8′ x 10′ box culverts in Harbor Boulevard.
Current Status:	On hold pending funding to develop CEQA document.
Potential Flood Damages:	Belmont Trailer Park, Novartis Corporation, HSA building on Quarry Road, various businesses on Quarry Road
Project Goals:	End flooding. Coordination with cities of Belmont and San Carlos.
Project Costs/ funding needs:	Approximately $24M
Policy Needs:	Not within a San Mateo County Flood Control District Zone. No funding available. Requires coordination with the cities of San Carlos

Belmont Creek
(Harbor Industrial Area)

and Belmont.

Potential Project Work Plan Should Funding be Available:

Year (start)	Description of Task	Estimated Cost	Estimated Duration of Task
1	Confirm preferred alternative Retain environmental consultant	$500,000	9-12 months
2	Begin environmental review	$500,000	12 months
3	Complete environmental review Begin detailed design and seek grants	$1,500,000	12-24 months

Potential Outcomes (1-3 years): Review proposed conceptual plan for flood control improvements.

Next Steps (3+ years): Complete detailed design. Construction.

	Daly City Vista Grande Canal (Unincorporated Broadmoor)
Watershed:	Western Daly City/Broadmoor: The watershed area is estimated to be 976 acres. The unincorporated area of Broadmoor Village is surrounded by the City of Daly City. The watershed area is primarily residential. The few commercial developments, all within Daly City are the Westlake Shopping Center located on John Daly Boulevard, the Broadway Center along Junipero Serra Boulevard, and the Mission Street business district. Other public and institutional uses within the watershed area include schools and golf courses. Two storm drain systems carry storm water through the 400 block of the 88th Street area from the upper reaches of the watershed in Daly City as well as from the unincorporated Broadmoor Village area. The systems discharge to Daly City's drainage systems.
Project Boundaries:	Lake Merced Boulevard at the south end of Lake Merced to the Pacific Ocean at Fort Funston
Flooding History:	Periodic in Daly City and Broadmoor. Primarily in the 400 block of 88th Street, which was a low lying open field until 1964 (a natural surface water storage area), and around 89th Street, in the Broadmoor Village area.
Funding History:	$5M to date spent on EIR/EIS
Project Description:	Daly City: Construct high flow diversion structure from Vista Grande Canal to Lake Merced, upsize tunnel beneath Fort Funston to 150 cubic feet per second. The storm drain system, as a whole, is under capacity for large storm events (beyond 10 year storm events).
Current Status:	Draft EIR/EIS with Daly City.
Potential Flood Damages:	Commercial and residential properties, particularly in the 400 block of 88th Street and around 89th Street, in the Broadmoor Village area.

Daly City Vista Grande Canal (Unincorporated Broadmoor)

Project Goals: Reduce flooding

Project Costs/ funding needs: $100M to $120M

Policy Needs: Not within a San Mateo County Flood Control District Zone. No funding available. Coordination with City of Daly City required on storm drain improvements.

Potential Project Work Plan Should Funding be Available:

Year (start)	Description of Task	Estimated Cost	Estimated Duration of Task
1	Provide support to Daly City and SFPUC as needed	$20,000	12 months
2	Provide support to Daly City and SFPUC as needed	$20,000	12 months
3	Provide support to Daly City and SFPUC as needed	$20,000	12 months

Potential Outcomes (1-3 years): Complete draft EIR/EIS. Identify and acquire preliminary funding. Begin detailed design and acquire permits.

Next Steps (3+ years): Complete construction by 2022.

Reference: San Mateo County Department of Public Works Hydrological Study - TRS Consultants, Inc., May 1999.

	Coyote Point Area
Watershed:	City of San Mateo (Poplar and San Mateo Creeks) and Burlingame (Cherry Canyon/Burlingame Creek). All creeks have been put into culverts or channeled.
Project Boundaries:	Border areas of Coyote Point Park with City of San Mateo along the bayshore line.
Flooding History:	Periodic flooding of adjacent properties, primarily in the North Shoreview neighborhood of the City of San Mateo (south of Coyote Park) (1955, 1973, 1982, 1983, 1998). The North Shoreview neighborhood is currently in the FEMA 1% flood zone and therefore flood insurance is required for federally insured homes.
Funding History:	City of San Mateo
Project Description:	City of San Mateo: Pump station upgrades and improvements to berms. County: Berm improvements along perimeter. Move the Promenade Trail (a San Francisco Bay Trail spur) inland on the order of 75 to 125 feet and move parking inland and uphill in order to accommodate high tides and future sea level rise.
Current Status:	
Potential Flood Damages:	City of San Mateo North Shoreview neighborhood, San Mateo County Animal shelter, Coyote Point Park, and potentially Highway 101
Project Goals:	Reduce flooding potential
Project Costs/ funding needs:	Unknown
Policy Needs:	Not within a San Mateo County Flood Control District Zone. Requires coordination with the City of San Mateo.

Coyote Point Area

Potential Project Work Plan Should Funding be Available:

Year (start)	Description of Task	Estimated Cost	Estimated Duration of Task
1	Prepare conceptual study of berm improvements. Select preferred alternative	$700,000	12-18 months
2	Work with San Mateo and Burlingame on SLR berm improvement coordination. Begin EIR/EIS Seek grant funding.	$2M	12-36 months
3	Complete EIR/EIS and seek grants	$500,000	12-16 months

Potential Outcomes (1-3 years): Preliminary design to upgrade pump stations. EIR/EIS for berm improvements as needed. Conceptual design of berm improvements.

Next Steps (3+ years): Begin construction by 2020.

	Pescadero and Butano Creeks
Watershed:	The Pescadero-Butano watershed is the largest coastal watershed between the Golden Gate and the San Lorenzo River. The watershed's two principal streams, Pescadero Creek and Butano Creek, which have their confluence in Pescadero Marsh, drain 81 square miles of the Santa Cruz Mountains.
Project Boundaries:	Pescadero and Butano Creeks
Flooding History:	Chronic flooding of Pescadero Creek Road during relatively small storm events and town of Pescadero during large storms (1955, 1982, 1986, and 1998).
Funding History:	Approximately $400,000 to date spent on studying flooding of Pescadero Creek Road, developing long and short terms solutions, and pursuing dredging permits, with an additional $150,000 encumbered in January, 2015. The County budgeted $500,000 in FY15-16, $300,000 in FY16-17 and $300,000 in FY17-18 for the Causeway Feasibility Study.
Project Description:	Sediment removal from 100 feet of Butano Creek beneath the Pescadero Creek Road Bridge and road right of way immediately upstream and downstream of the bridge as a temporary solution. Feasibility study to determine potential project to construct a causeway over floodplain. Prior study indicated that work upstream to connect flood plains to Creek and reduce creek incising as well as downstream work in State Parks would help reduce flooding.
Current Status:	Sediment removal project: Awaiting permits from regulatory agencies. Feasibility Study: Working on RFP for consultant selection.
Potential Flood Damages:	Restricted or complete cut-off of access for residents, visitors, and emergency vehicles
Project Goals:	Provide 24/7 access between Pescadero and Highway 1. Would allow uninterrupted Public Safety access for Pescadero.

Pescadero and Butano Creeks

Project Costs/ funding needs:

Sediment Removal Project: $500,000 to $700,000. Causeway: $15M to $30M

Policy Needs:

Not within a San Mateo County Flood Control District Zone. Current funding from Road Fund/General Fund.

Potential Project Work Plan Should Funding be Available:

Year (start)	Description of Task	Estimated Cost	Estimated Duration of Task
1	Annual sediment removal Retain consultant for causeway study	$700,000	12-24 months
2	Annual sediment removal Complete causeway study	$700,000	12-24 months
3	Annual sediment removal Receive BOS direction on causeway construction	$700,000	12-24 months

Potential Outcomes (1-3 years):

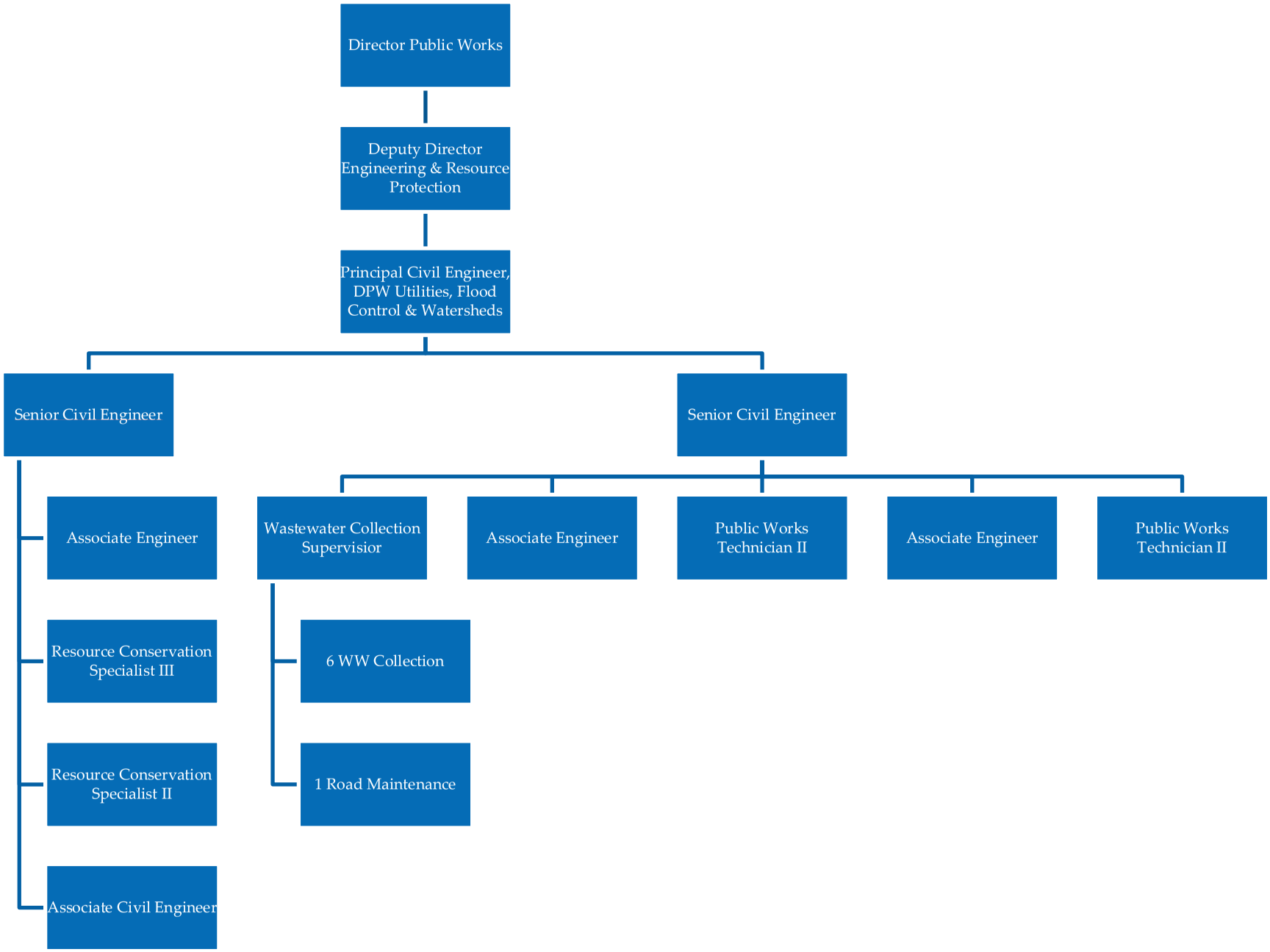
Permit for annual maintenance dredging. Completed causeway study. Direction on whether to move forward with a causeway. Coordination with San Mateo County Resource Conservation District (RCD) work upstream ($1,000,000 already committed by Peninsula Open Space District (POST) to the reconnect Creek with the flood plain) and work downstream to reconnect with the creek and marsh.

Next Steps (3+ years):

Possible design and construction of causeway.

Appendix 2

EXISTING SAN MATEO COUNTY DEPARTMENT OF PUBLIC WORKS FLOOD CONTROL ORGANIZATION STRUCTURE


Director Public Works
Deputy Director Engineering & Resource Protection
Principal Civil Engineer, DPW Utilities, Flood Control & Watersheds
Senior Civil Engineer
Senior Civil Engineer
Associate Engineer
Resource Conservation Specialist III
Resource Conservation Specialist II
Associate Civil Engineer
Wastewater Collection Supervisior
6 WW Collection
1 Road Maintenance
Associate Engineer
Public Works Technician II
Associate Engineer
Public Works Technician II

Appendix 3

HOW OTHER BAY AREA FLOOD CONTROL DISTRICTS OPERATE

Alameda County Flood Control District

The Alameda County Flood Control District (Alameda FCD) was established in 1949 to address flood challenges, and zones were added over time. There are nine zones within Western Alameda County that comprise the area served by the Alameda FCD. The Alameda FCD manages 170,323 acres all of which is in a designated zone except the City of Oakland and City of Berkeley. Figure 3 illustrates the Alameda FCD flood control zones.

Most of the cities in Alameda County are within the Alameda FCD sub-zones. As a result, most flood control work in Alameda County is coordinated by the Alameda FCD. The Alameda FCD does not have any projects in partnership with the US Army Corps of Engineers at this time.

Figure 3 Alameda County Flood Control Zones

Funding

The Alameda County Flood Control District has annual revenues of approximately $6.5 million. Revenue sources included taxes, grants, interest, stormwater assessments, permitting, and the clean water program

Organization

The Alameda FCD resides within the County Department of Public Works. The Alameda FCD is responsible for planning, engineering and design, while construction is done within the construction branch of the Department of Public Works. Project prioritization is based on the reduction of loss of life and availability of funds. Projects are generally

prioritized from downstream to upstream. Much of the Alameda FCD's funding goes toward desilting and dredging. Alameda County FCD does not have any dedicated grant writers. Instead engineers within the organization write and manage grant proposals. The Alameda FCD has a total of approximately 86 FTEs dedicated to flood control work.

Contra Costa County Flood Control District

The Contra Costa County Flood Control District (Contra Costa FCD) was founded in 1951. Within both incorporated and unincorporated Contra Costa County, the Contra Costa FCD coordinates drainage planning, financing and implementation; provides flood risk reduction planning; reviews land development plans, calculations and studies; provides hydrology information and services; and oversees the Contra Costa Clean Water Program (NPDES) activities. Within the unincorporated County it oversees the County Watershed Program. Figure 4 below shows the flood control zones within the Contra Costa County.

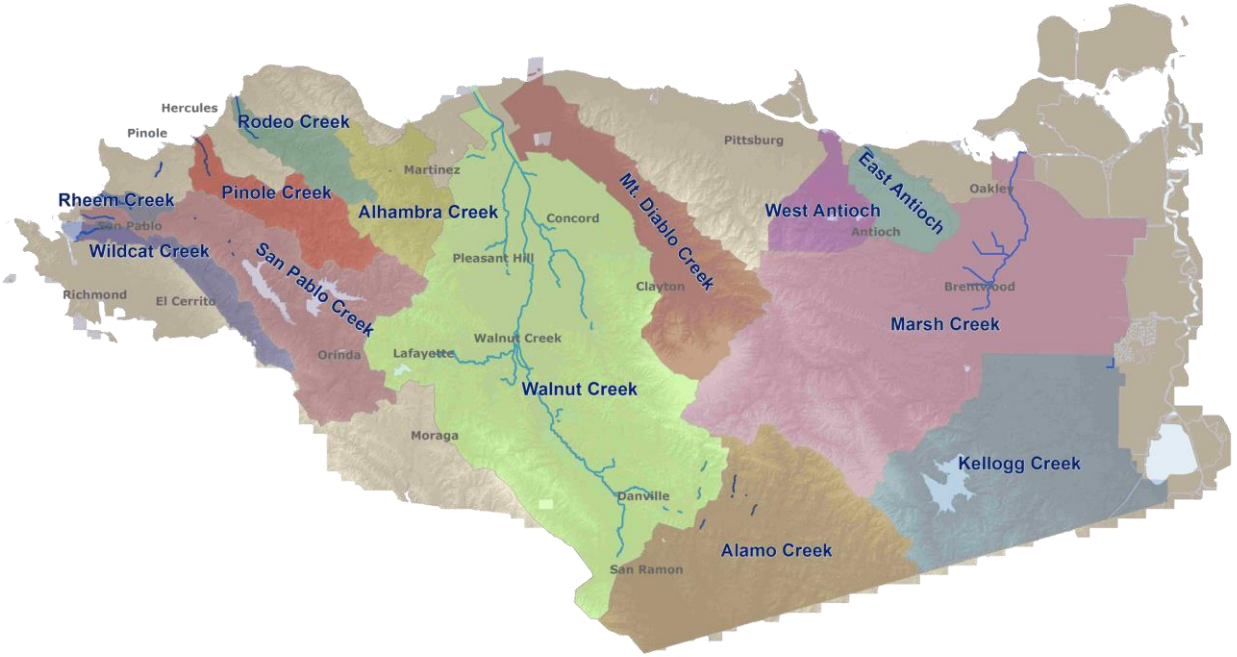


Figure 4 Contra Costa County Flood Control Zones

Funding

Contra Costa FCD's assets are valued at over $1 billion (in 2010 dollars). Most of the funding for construction (90-95%) comes from Federal and State grants. Maintenance and capital funding for facilities comes primarily from: a share of the 1% ad valorem property tax put in place prior to the passage of Proposition 13; funding for community drainage facilities from stormwater utility assessments; and funding for road system drainage from a portion of the local share of gas taxes. In addition, each city typically funds maintenance for their drainage systems with stormwater utility fees. The Contra Costa FCD's revenue is about $11.5 million.

Organization

The Watershed Planning Engineering Section (Capital Improvements Program) within the Contra Costa Department of Public Works prepares conceptual plans for regional drainage systems and identifies and prepares ordinances for drainage fee areas. It also develops federal flood control projects with US Army Corps of Engineers and provides flood control standards. The Contra Costa FCD has a total of approximately 15 FTEs dedicated to flood control work.

Santa Clara Valley Water District

The Santa Clara Valley Water District (SCVWD) was initially formed in 1929 by an act of the California Legislature in the northern valley and has expanded in scope and function over the years. In 2006, it became an independent special district with the removal of County's oversight of the SCVWD's budget. The SCVWD is the primary water resource agency for Santa Clara County, supplying wholesale water, providing flood protection and serving as environmental steward for clean, safe creeks and healthy ecosystems.

The SCVWD encompasses all of Santa Clara County's 1,300 square miles, including 15 cities (Campbell, Cupertino, Gilroy, Los Altos, Los Altos Hills, Los Gatos, Milpitas, Monte Sereno, Morgan Hill, Mountain View, Palo Alto, San Jose, Santa Clara, Saratoga, Sunnyvale) and unincorporated areas of the county. The County is divided into districts as shown in Figure 5.

Figure 5 Santa Clara Valley Water District Board Directorial Districts

Funding

The SCVWD has a total annual budget of approximately $593 million, of which approximately $12.5M ($9.8M operating and $2.7M annual capital funds from parcel tax) is allocated to flood control activities. Approximately $97M was spent on Capital Improvement Projects in FY2015.

Organization

The Santa Clara Valley Water District manages 10 dams and surface water reservoirs, 3 water treatment plants, an advanced recycled water purification center, a water quality laboratory, 400 acres of groundwater recharge ponds, and 275 miles of streams. It provides wholesale water and groundwater management services. The SCVWD has a total of approximately 192 FTEs dedicated to flood control work.

Sonoma County Water Agency

The Sonoma County Water Agency (SCWA) was created in 1949 by a special act of the California Legislature. Its original responsibilities include water supply and flood protection, as well as more recently assumed responsibilities for wastewater treatment and disposal. The SCWA is a separate legal entity from Sonoma County with its own taxation powers and sources of revenue. The SCWA owns, or has easements to maintain hydraulic capacity, approximately 75 miles of engineered flood control channels. The channels are primarily located in the vicinity of Santa Rosa, Rohnert Park, Cotati, Petaluma, and Sonoma. The SCWA also has easements to maintain hydraulic capacity over approximately 100 miles of modified or natural channels.

Funding

The SCWA's has an annual budget of $75 million, of which approximately $6.5 is allocated to flood control activities. Flood protection and stream maintenance activities are funded primarily from a share of the 1% ad valorem property tax put place prior to the passage of Proposition 13. In 1986 and again in 1996, the electorate of two flood control zones authorized the levying of benefit assessments within these two zones for 10 years to augment funds received from general property taxes. These assessments have now expired.

Organization

In 1958, nine geographical flood control zones were adopted, each encompassing a major watershed, as a means of financing the construction and maintenance of flood protection works within Sonoma County. Three zones were never officially formed. Three of the six active zones have Zone Advisory Committees that annually prioritize and approve capital improvement projects for their respective zones. The SCWA has a total of approximately 10 FTEs dedicated to flood control work.

Appendix 4

SUMMARY CHART OF OTHER BAY AREA FLOOD CONTROL DISTRICTS

Agency Name	Structure	Scope of Work in Addition to Flood Control	Governance	Funding Sources	Budget for Flood Control Work	FTEs for Flood Control Work
Alameda County Flood Control District	9 zones, plus 1 independent zone (Zone 7 "Water Agency" with separate governance).	Water conservation and stormwater management and	Board of Supervisors	Property taxes, assessments, and fees	$39.5M: Approximately $6.5M in annual operating revenues district wide and approximately $33M across the 9 zones.	86 FTEs: 56 maintenance and operations, 30 engineering
Contra Costa County Flood Control District	7 active zones	Water conservation and stormwater management and	Board of Supervisors	Very limited property taxes since pre-Prop 13 funding was close to zero	Approximately $11.5M in annual operating revenues.	Approximately 15 FTEs
Marin County Flood Control and Water Conservation District	8 zones managed by "Land Use and Water Resources Division" of Public Works.	Watershed management and stormwater management.	Board of Supervisors	Property taxes, special taxes, assessments, and fees	Approximately $3.5M in annual operating revenues.	Approximately 18 FTEs

Agency Name	Structure	Scope of Work in Addition to Flood Control	Governance	Funding Sources	Budget for Flood Control Work	FTEs for Flood Control Work
Napa Flood Control and Water District	There are no active zones in Napa County. The County manages County areas and manages the City of Napa's portion of Measure A work.	Watershed management, stormwater management, and some water supply	Board of Supervisors, 5 city mayors, and 1 City of Napa Councilmember (Total of 11)	Special benefit property assessments and a 1/2 cent sales tax (Measure A - expires in 2018 - not scheduled for renewal) for the Napa River project	$10.7M: Approximately $1.2M in annual operating revenues. Approximately $9.5M in capital funds (from the Measure A sales tax) for the Napa River project.	Approximately 8 FTEs, not including 2 FTEs hired through the Army Corps of Engineers for the Measure A Napa River project
San Mateo County Flood Control District	3 active zones	None	Board of Supervisors	One zone is relatively well funded and two have limited funding	$3.1M	Less than 1.0 FTE

Agency Name	Structure	Scope of Work in Addition to Flood Control	Governance	Funding Sources	Budget for Flood Control Work	FTEs for Flood Control Work
Santa Clara Valley Water District	7 districts	Wholesale water supply, watershed management, and stormwater management	Independently elected 7 member board	Property taxes, assessments and fees, and parcel tax.	$9M operating budget. $97M capital budget, which includes approximately $16M in federal, state and local matches.	Approximately 192 FTEs in Watershed Operations (primarily flood control)
Solano County Water Agency	2 project areas	Wholesale water supply, and habitat conservation.	Board of Supervisors, the 7 mayors of the cities in Solano County, and a director from each of the three agricultural districts that provide retail agricultural water supply (Total of 15)	Property taxes and limited grants.	Approx. $1.2M annually in the two project areas.	1 FTE

Agency Name	Structure	Scope of Work in Addition to Flood Control	Governance	Funding Sources	Budget for Flood Control Work	FTEs for Flood Control Work
Sonoma County Water Agency	9 zones (6 active).	Wholesale water supply, wastewater treatment and reuse, groundwater management, and watershed management	Board of Supervisors	Property taxes, assessments and fees	Approx. $8.0M annually across the County.	Approximately 10 FTEs and 15 to 20 seasonal/contract employees.

Note: Chart does not include San Francisco as it is both a city and a county