SEA LEVEL RISE VULNERABILITY ASSESSMENT

The County of San Mateo's Vulnerability Assessment aimed to understand how sea level rise will affect San Mateo County residents, businesses, and the community services and infrastructure we all rely on. The main project goals were to assess vulnerability and provide actionable results, while at the same time building awareness and facilitating collaboration around the issue of sea level rise.

Area Map

The assessment focuses on the entire eastern Bayshore and along the western coast from north of Half Moon Bay.

Timeline

PHASE I: CONTINUE TO ASSESS VULNERABILITY (2018-2019)

- Complete risk and impact assessment for the South Coast and unincorporated areas of San Mateo County
- Evaluate vulnerability of key County facilities, including health facilities and parks, and countywide infrastructure, such wastewater treatment plants and pump stations. Support partners with evaluating sea level rise risks and impacts at the city level and by sector

PHASE II: DEVELOP ADAPTATION PLAN FRAMEWORK AND STRATEGY (2018-2019)

- Establish guidelines to help cities and the County address sea level rise in existing plans, policies and operations
- Identify priority areas to implement sea level rise adaptation actions and develop a strategic action plan
- Develop a menu of adaptation strategies to initiate planning efforts in identified priority areas
- Continue to conduct outreach and educational programs to engage youth and other County residents
- Create sea level rise policy guidance and framework for cities and the County to adopt

PHASE III: IMPLEMENTATION AND MONITORING (2019-2020)

- Update County plans and policies to address and plan for sea level rise
- Select adaptation strategies and develop project concepts for flood, erosion, and sea level rise preparedness
- Conduct a cost and benefit analysis on a range of project concepts to understand economic and development feasibility
- Develop a menu of funding strategies to pay for planning, building, and maintenance of future projects

Partners

The planning and design efforts were led by County Supervisor Dave Pine, the Office of Sustainability Sea Change SMC Initiative, Arcadis, AECOM, and CirclePoint.

Engagement efforts focused on collaboration with civic and elected leaders, municipal staff, and representatives from agencies, special districts, environmental groups, business, and community groups from the 20 cities in the county.

The Assessment was funded by a grant from the California State Coastal Conservancy, in-kind staff support from the Army Corps of Engineers Interagency Flood Risk Management Project, and funding from the County.

Funding

$550,000

Results

The San Mateo County Sea Level Rise Vulnerability Assessment provides a foundation for continued coordination between the County and its cities in climate change preparedness and adaptation planning. The assessment's key findings point to the need for both near- and long-term actions to protect the County's networked infrastructure; actions at multiple geographic scales focused on emergency preparedness, policy, planning, and procedure updates; strategies to support residents' mental and physical health when sea levels rise and prevent post-flood health hazards; and coordinated collaborative action across multiple jurisdictions.

The next steps involve implementing a Climate Change Preparedness Action Plan.

Website

http://seachangesmc.com/

SILICON VALLEY CLEAN WATER (SVCW)

ReNUWIt (the National Science Foundation (NSF) funded Engineering Research Center (ERC) for Re-inventing the Nation's Urban Water Infrastructure) is working with regional stakeholders to begin discussions on water sustainability for the Bay Area, including potable reuse. Based on efforts in southern California, potable reuse projects can take a significant amount of time and investment before a project can be realized.

Area Map

San Francisco Bay Area

Timeline

To meet water supply projections and address drought, California established a recycled water policy in 2013 to develop recycled water. The goals are to increase recycled water use over 2002 levels of 1 million acre-feet of water per year (AFY) and 2 million AFY for 2020 and 2030 respectively. An acre-foot is the amount of water that will cover an acre of land in a foot of water. So far, California has recycled approximately 700,000 AFY and will need to develop potable reuse to reach these goals.

Partners

Recognizing demands for imported water in the Bay Area are just as high as southern California, all wastewater and water agencies will need to work together with Bay Area stakeholders to develop Bay Area recycled water supplies to reduce our demands on imported water.

Funding

Project stakeholders are working on obtaining grant funding to assist in the development of regional partnerships and local coordination to support the development of potable reuse projects and water supply sustainability.

Results

So far 156 people and 87 different organizations from the Bay Area attended the Bay Area Regional Partnerships for Sustainable Water: Part 1 Potable Reuse Workshop held at Stanford University on March 9, 2018.

Website

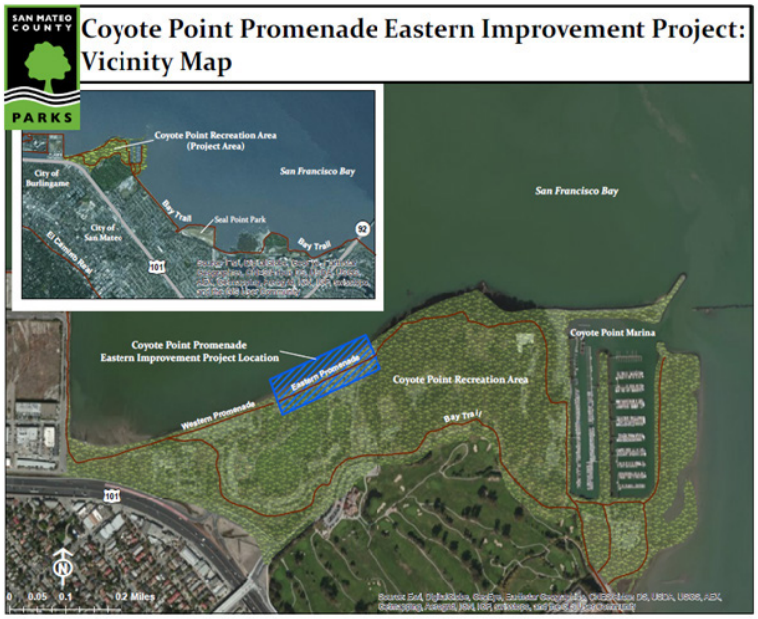
http://renuwit.org/about-us/events/

COYOTE POINT RECREATION AREA PROMENADE

San Mateo County Park's Coyote Point Recreation Area Eastern Promenade Project consists of five major components:

1. **SANDY BEACH: Creation of a perched sandy beach that will be used for recreation including a safe place to have a beach experience along the San Francisco Bay. The beach will allow year-round multi-purpose public access to the beach and water for beach play, swimming, and access for kayakers, windsurfers, and other non-motorized use.**
2. **BAY FRONT TRAIL: Creation of a wide curved promenade trail along the Bay that will connect to the Bay Trail.**
3. **IMPROVED PARKING LOT: Improvements to parking including resurfacing and restriping of the lower, middle, and upper parking areas adjacent to the beach.**
4. **NEW RESTROOM: Demolition of the old restroom building and construction of a new restroom out of the flood inundation zone.**
5. **LANDSCAPING: Improvements to landscaping including the planting of native, low maintenance, and drought tolerant plants.**

Area Map



Timeline

Design and permitting is complete. Additional funding will be secured in early 2019, followed by an RFP process for construction in mid-2019. Construction is expected to occur through 2020 with a ribbon cutting event in late 2020.

Partners

San Mateo County Parks Foundation, California State Coastal Commission, California Department of Boating and Waterways, and California Natural Resources Agency

Funding

Construction Project Cost = $5.5 to $6.0 million

1. Grants acquired = $1.5 million
2. Grants applied for = $650,000

Results

OUTCOME

- The design, permitting, and environmental compliance for this project is complete.
- Public outreach and engagement is complete.

GOAL

- Manage retreat from rising sea level by moving infrastructure out of the sea level rise inundation zone.
- Create a sandy beach on the bayside to bring fun back to the bay known as "Crissy Field South."
- Reflect the history of the area, including Pacific City.
- Add to the bayside experience by creating a promenade, seatwall, and amenities to nurture the community engagement with San Francisco Bay and its resources.

Website

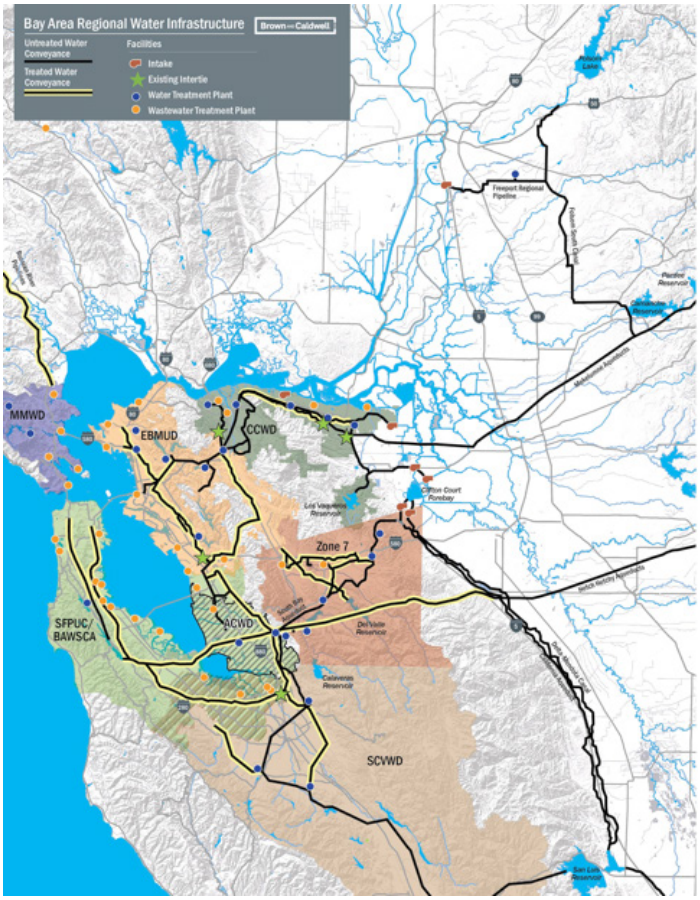
https://parks.smcgov.org/coyote-point-eastern-promenade-rejuvenation-project

BAY AREA CLEAN WATER AGENCIES (BACWA)

As part of the studies required by the Nutrient Watershed Permit through the San Francisco Bay Regional Water Quality Control Board, BACWA produced a draft analysis of 37 of our member agencies' risk due to sea level rise. Silicon Valley Clean Water is included in this report and provides wastewater services to more than 200,000 people and business in our service area, which includes Redwood City, West Bay Sanitary District, City of San Carlos, and the City of Belmont. Many Publicly Owned Treatment Works (POTWs) are already making adaptation plans. At the same time, regulatory agencies at the state and regional levels are considering alternatives for requiring or encouraging sea level rise planning by public agencies.

Area Map

This project includes the entire Bay Area.



Timeline

This project considers sea level rise impacts over the next 100 years. The analysis is due to the San Francisco Bay Regional Water Board on July 1, 2018.

Partners

37 POTWs that discharge to the San Francisco Bay participated in BACWA's Nutrient Optimization and Upgrade Studies, including the sea level rise analysis, required by the Nutrient Watershed Permit. Future regulatory requirements are expected to impact all POTWs in the region and the state.

Funding

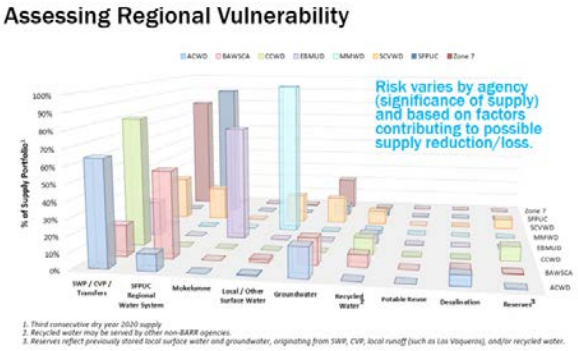
Funding was provided through BACWA's nutrient surcharge on its member agencies to fund activities to comply with the Nutrient Watershed Permit.

Results

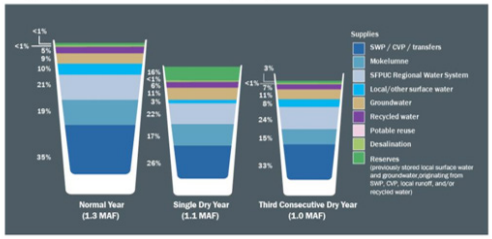
Because they are largely sited near the Bay, most POTWs in the Bay Area will need to make plans to address sea level rise in the decades ahead when considering capital improvements.

Website

The final report will be published at http://bacwa.org on July 1, 2018.



Total supply and composition of the Bay Area's projected 2020 regional portfolio varies over hydrologic conditions.



"...diversified regional water portfolios will relieve pressure on foundational supplies and make communities more resilient against drought, flood, population growth and climate change."
- Governor Brown's California Water Action Plan (2016 Update)

CLEAN WATER PROGRAM
WASTEWATER TREATMENT PLANT EXPANSION

The San Mateo Clean Water Program is a 10-year, comprehensive, capital improvement program designed to upgrade the aging wastewater treatment plant and collection system with advanced infrastructure to meet regulatory requirements, add capacity assurance, and protect public health and the environment.

Area Map

Funding

The project is undergoing a budget analysis to determine funding needs.

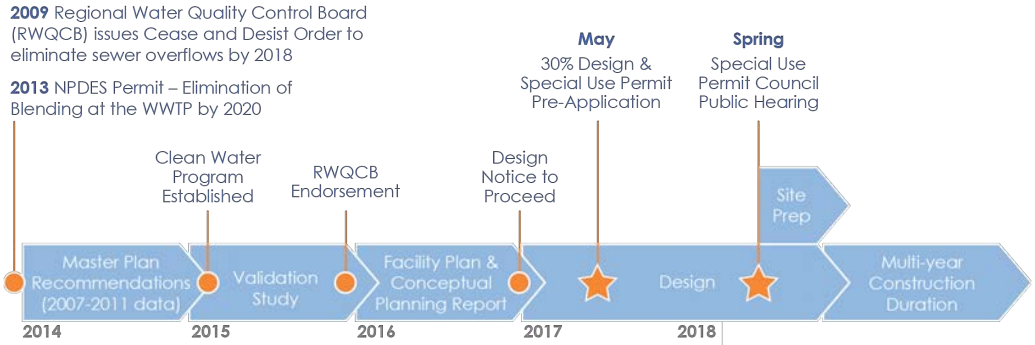
Results

The design of wastewater treatment plant expansion is underway with the expectation that construction will begin in 2018 or 2019.

Website

http://www.CleanWaterProgramSanMateo.org

Timeline



Partners

Lead Agency: City of San Mateo

Wastewater Treatment Plant Partners: San Mateo and Foster City/EMID

Program Management: Jacobs (formerly CH2M HILL)

WWTP Construction Manager at Risk: Sundt

WWTP Design: HDR

GREEN INFRASTRUCTURE – DELAWARE STREET

The Delaware Street Green Infrastructure project involved narrowing Delaware Street from four to three lanes between Charles Lane and Sunnybrae Boulevard and adding Class II bicycle lanes (bicycle lanes on the roadway not shared with pedestrians) along with pedestrian enhancements such as widening of sidewalks, installation of pedestrian scale streetlights, storm drain improvements, and bioswales.

Area Map

DELAWARE ST

Timeline

Construction of the project began in April 2013 and was completed in April 2014.

Partners

Lead Agency: City of San Mateo

Partners included the following: for planning/design, RBF Consulting; for construction, Golden Bay Construction; for funding, Metropolitan Transportation Commission (MTC) and the adjacent site Station Park Green's developer (as per below).

Funding

The $1.6 million project ($0.2 million design, $1.4 million construction) was primarily funded by a MTC Transportation for Livable Communities Capital Program grant (for construction) and the developer's (Arjax Railroad Associates II, LLC) Development Agreement Contribution (for design and construction).

Results

The length of the street improvement is about 1,200 feet with Class II bicycle lanes and irrigated bioswales on both sides of the street. In addition, we installed 15 pedestrian-scale lights and widened the sidewalks from 5' to 8'.

PHOTO SHOWS VIEW ON DELAWARE STREET FACING SOUTH TOWARDS THE POST OFFICE, HIGHLIGHTING THE BIOSWALES BESIDE THE WIDENED SIDEWALKS.

GREEN INFRASTRUCTURE - HUMBOLT STREET, NORTH CENTRAL NEIGHBORHOOD

The North Central Pedestrian Improvements Project is part of the City of San Mateo's Pedestrian Master Plan. It encompasses pedestrian improvements at three intersections and pedestrian scale lighting along major corridors through the North Central neighborhood. The intersection improvements include permeable curb bulb-outs that allow rain water to flow through them and pedestrian refuge islands to reduce the distances at pedestrian crosswalks.

Area Map

Timeline

After seeking proposals in May 2016, construction began on the project in September. The project was completed in August of 2017.

Partners

Lead Agency: City of San Mateo

A grant from the Association of Bay Area Governments (ABAG) provided the bulk of the funding for the project. Additional contributions came from the Lifeline Transportation Program via the Metropolitan Transportation Commission (MTC). Design services were performed by Questa and construction inspection was delivered by Caltrop.

Funding

The $1.3 million project was primarily funded by a $1 million ABAG grant.

Results

The pedestrian scale lighting improves safety for sidewalk users, and the bulb-outs and refuge islands make it easier to safely cross these high-traffic intersections. The bulb-outs also include permeable sections to help drainage during wet weather events.

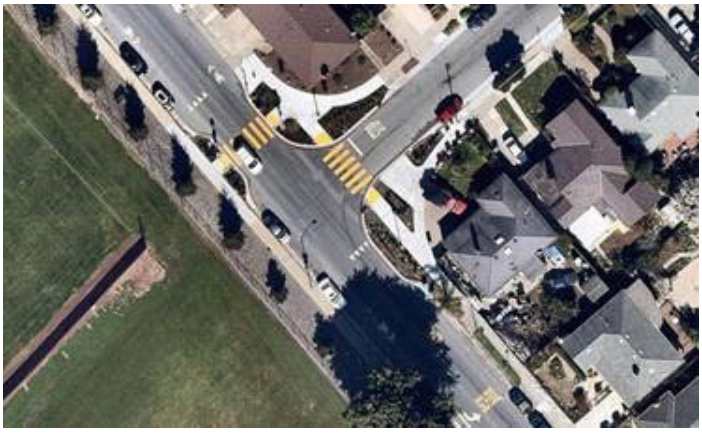
PHOTO SHOWING INTERSECTION WITH BIOSWALE BULB-OUTS

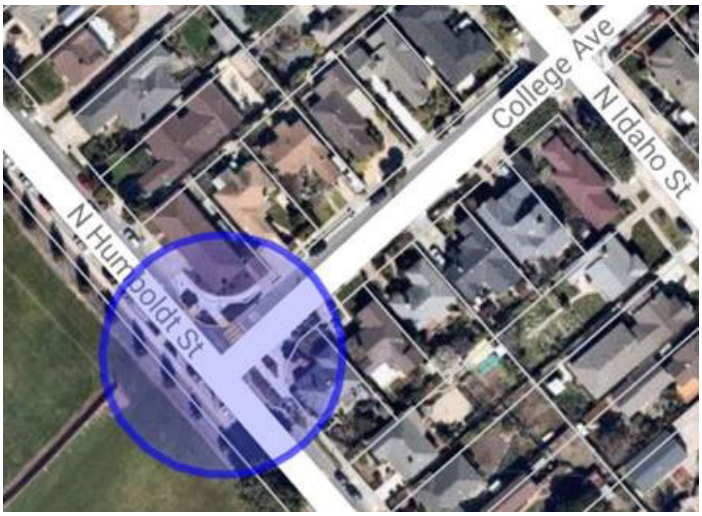
GREEN INFRASTRUCTURE – POPLAR AVENUE

As part of the larger Poplar Avenue/North Amphlett Boulevard interchange project, the City of San Mateo took the opportunity to install green bulb-outs on Humboldt Street. This also included enhanced crosswalks and visibility markings on the street.

Area Map

Project map shows interchange improvements and the Humboldt corridor where green infrastructure was installed.





Timeline

Design work was completed in March of 2016. The construction contract was awarded in June of that year, with work beginning in late July. The project was completed by June 2017.

Partners

The Transportation Authority (TA) provided Measure A funds which paid for much of the project construction.

Funding

For the $1.6 million project, significant funding ($1.1 million) came from Measure A funds via TA. In addition to construction costs, this includes $250,000 for design and engineering and over $50,000 in environmental review and permit fees.

Results

While the primary focus of the project was the interchange at Poplar Avenue and North Amphlett Boulevard, the pedestrian improvements have increased permeability and aesthetic appeal while the bulb-outs and crosswalk improvements are protecting pedestrians as they walk along and cross Humboldt Street.

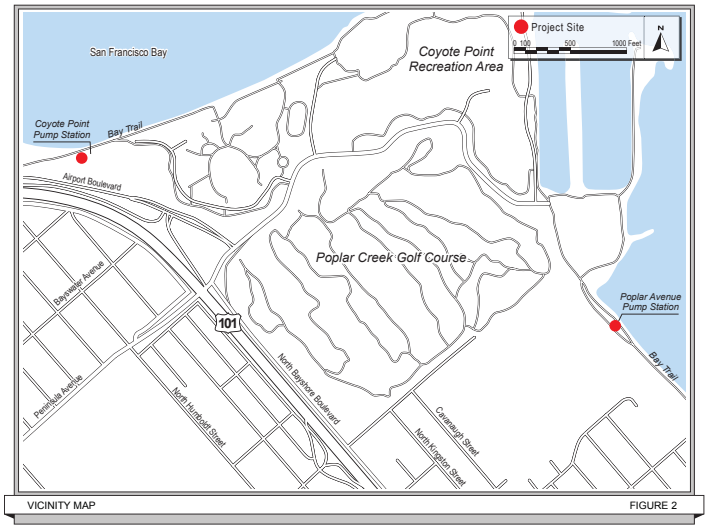
PHOTO SHOWING INTERSECTION WITH BIOSWALE BULB-OUTS

NORTH SHOREVIEW FLOOD CONTROL

The North Shoreview Flood Improvements consist of a 1,300-foot levee improvement at Coyote Point near the Burlingame and San Mateo border and two (2) pump station upgrades to increase pump discharge capacity during heavy rainfall events. The project is designed to protect residential properties from inundation during 100-year storm events.

Area Map

This project includes the North Shoreview Neighborhood.



VICINITY MAP FIGURE 2

Timeline

Project planning occurred between 2014 and 2016 and design from 2016 to 2018. Construction is expected to occur between 2018 and finish in 2021.

Partners

The project designer is Schaaf and Wheeler. Community engagement is provided by the North Shoreview Neighborhood Association and the Home Association of North Central San Mateo. The construction company will be determined as the project progresses.

Funding

Funding was provided by the Special Assessment District ($2.5 million) and Local Tax Measure S ($21 million).

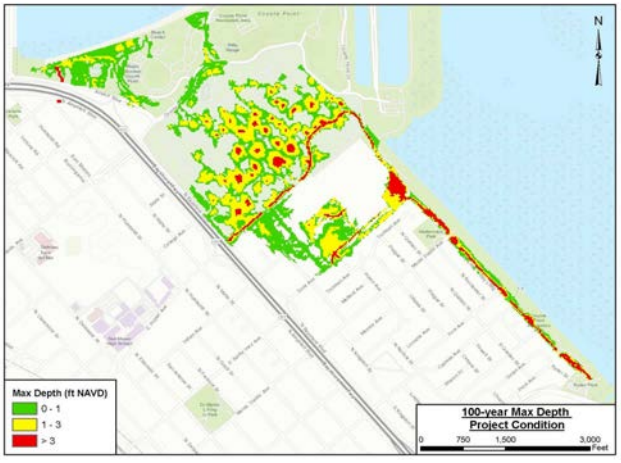
Results

Design has been completed and permitting will be approved by Regional Water Quality Control Board, California Department of Fish and Wildlife, US Army Corp of Engineers, and Bay Conservation Development Commission in Spring/Summer 2018. Next steps include securing right-of-way interest from the County of San Mateo for construction and favorable review from the Federal Emergency Management Administration (FEMA) on project improvements.

COYOTE POINT EXISTING STRUCTURE

POPLAR AVENUE EXISTING STRUCTURE

EXISTING FLOOD DEPTH

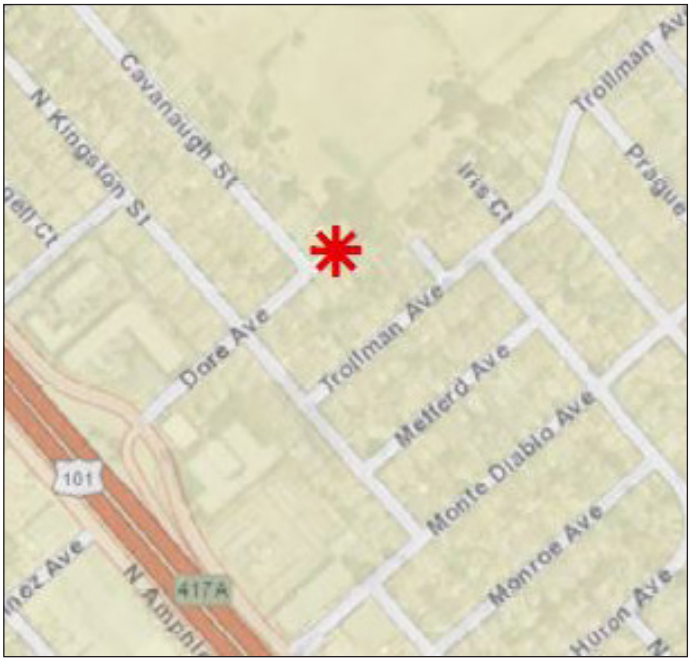


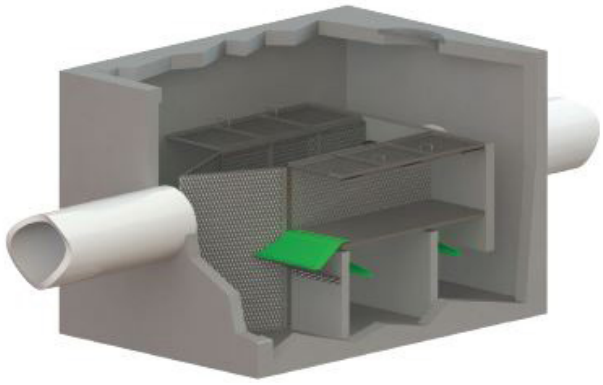
FINAL FLOOD DEPTH WITH IMPROVEMENTS

TRASH CAPTURE – DORE AVENUE

The project will install two trash capture devices along two storm sewer lines before the outfall on Dore Avenue.

Area Map





SPECIFICATIONS SHEET SHOWING THE TRASH CAPTURE DEVICES SELECTED FOR THIS PROJECT

Timeline

Construction is anticipated to begin in May 2018.

Partners

Lead Agency: City of San Mateo

Schaaf and Wheeler were engaged for design services.

Funding

This project is estimated to cost a total of $480,000, to be paid out of the City of San Mateo's Solid Waste fund.

Results

This project is one piece of the City of San Mateo's efforts to meet the Municipal Regional Stormwater Permit requirements mandating a 100% reduction of trash reaching the bay through storm sewers by 2022. This project is estimated to supply a 15% trash reduction. Additional trash capture devices are planned for future years.

SAN MATEO PLAIN SUBBASIN GROUNDWATER STUDY

San Mateo County is working on a groundwater basin assessment of the San Mateo Plain Subbasin to assess the groundwater resources and current condition of the subbasin and identify potential groundwater management strategies.

Area Map

The San Mateo Plain Subbasin underlies the bayside of San Mateo County from approximately the City of San Mateo on the north, to approximately the County boundary at San Francisquito Creek on the south.

Timeline

Work on the assessment commenced in April 2016; the assessment is scheduled to be completed by June 2018. The project is being completed in three phases.

Partners

The project is a joint effort between San Mateo County Environmental Health Services and the Office of Sustainability. There are 15 land use agencies and 13 water districts in the subbasin who have been selected for individual meetings, public workshops, and presentations to their elected officials.

Funding

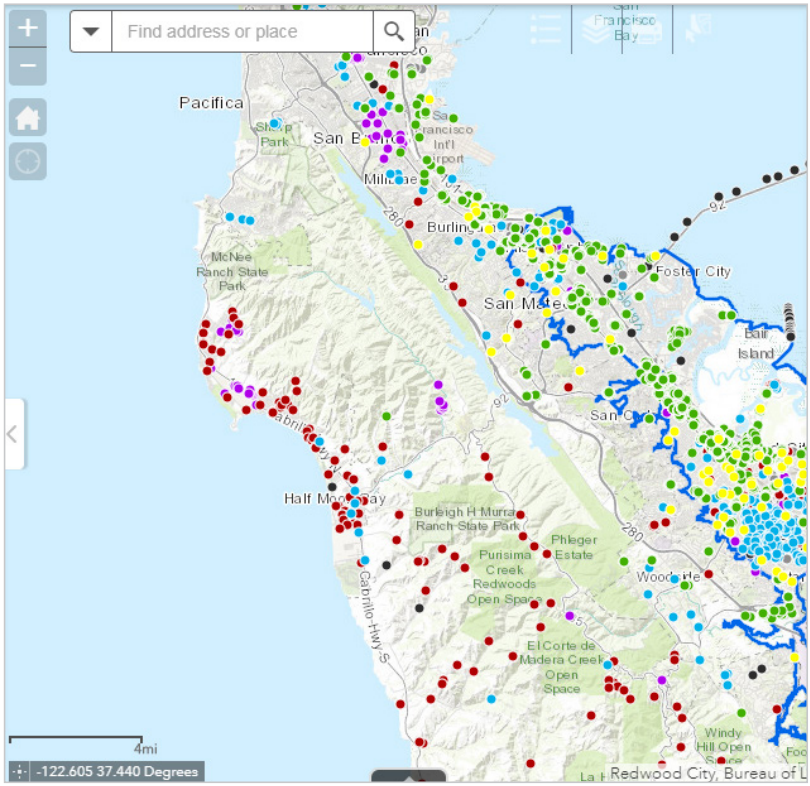
The project is funded by Measure K (formerly Measure A), a countywide half-cent general sales tax passed by voters, and the Office of Sustainability. The total not to exceed amount is $934,931.

Results

Project outputs to-date include data compilation, a basin conceptual model, a basin groundwater numerical model, and identification of basin management strategies. Outcomes to be delivered before the project's end include scenario evaluations and a final report.

Website

http://smcsustainability.org/smplain



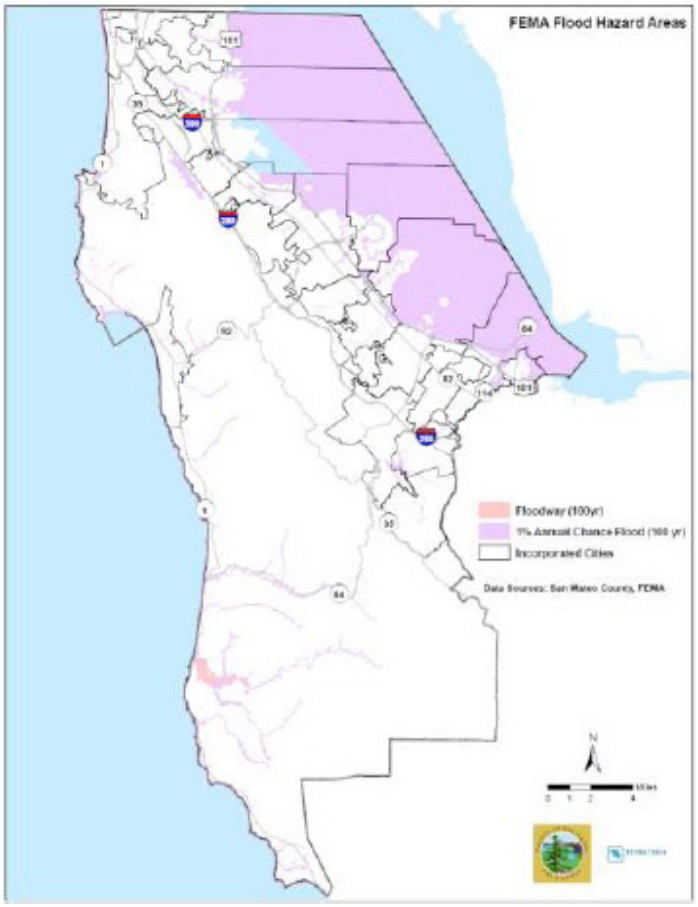
INTERACTIVE MAPS HAVE BEEN DEVELOPED SUMMARIZING DATA COLLECTED AS PART OF THE STUDY.
ONE SUCH MAP DISPLAYS ALL WELLS BASED ON WELL TYPE.

LOCAL HAZARD MITIGATION PLANNING

The San Mateo County Office of Emergency Services coordinates countywide preparedness, response and protection services and activities for large-scale incidents and disasters.

The San Mateo County Local Hazard Mitigation Plan is a set of long-term and short-term policies, programs, projects, and other activities to alleviate the death, injury, and property damage that can result from a disaster.

Area Map



FEMA DIGITAL FLOOD INSURANCE RATE MAP (DFIRM) FLOOD HAZARD AREAS, SAN MATEO COUNTY

Timeline

The San Mateo County Local Hazard Mitigation Plan was adopted in 2016. The plan is required to be updated every 5 years. The County and other participating agencies have an annual maintenance plan to update the Plan in between the 5 year cycles.

The San Mateo County Office of Emergency Services maintains ongoing preparedness in response to any natural or man-made disaster, including flooding.

Partners

The San Mateo County Office of Emergency Services works with the County, all cities, specials districts, non-profits, businesses, and all residents to help prepare for and respond to disasters.

The San Mateo County Local Hazard Mitigation Plan was created in coordination with 18 of the County incorporated municipalities and multiple special districts.

Funding

The San Mateo County Local Hazard Plan was funded using $70,000 in grant funds.

Results

The disaster mitigation, response, and recovery plans look to reduce the loss of life and property due to disasters.

Website

San Mateo County Office of Emergency Services:
http://hsd.smcsheriff.com/sheriffs-office-oes

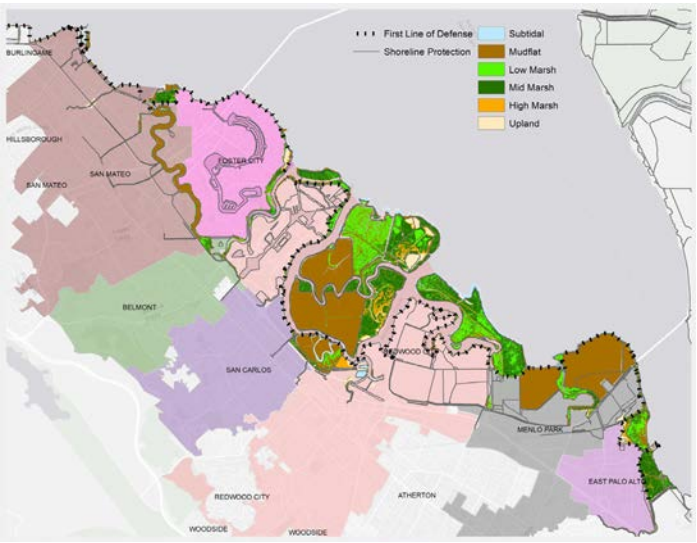
San Mateo County Local Hazard Mitigation Plan:
https://planning.smcgov.org/local-hazard-mitigation-plan

SAN MATEO BAYSIDE WETLANDS VULNERABILITY ASSESSMENT

Point Blue Conservation Science, in partnership with San Mateo County's Office of Sustainability, the California State Coastal Conservancy, and local stakeholders, is quantitatively evaluating the broader ecosystem functions and services of tidal marshes along San Mateo County baylands, and modeling how services are projected to change with sea level rise. The goal is to provide actionable information to support decisions on where to prioritize adaptation efforts to maximize ecological and human community benefits. The team is engaging with decision-makers to integrate this more detailed risk assessment of tidal wetlands in parallel with vulnerability and adaptation planning efforts occurring at local and regional scales. The assessment is expected to provide additional information on the risks of wetland loss and value to ecosystems and communities as sea levels rise and marsh heights change.

Area Map

The Study area includes existing tidal wetlands along the bayside of San Mateo County, which are concentrated south of the San Mateo bridge.



Timeline

The assessment is occurring from February 2017 through September 2018

Partners

The project and modeling lead is Point Blue Conservation Science.

The planning/design/stakeholder engagement and integration of project results includes Point Blue Conservation Science, San Mateo County Office of Sustainability, and the State Coastal Conservancy.

The local stakeholder Steering Committee includes San Mateo County (Sustainability, Public Works, Board of Supervisors), City of Menlo Park, City of Redwood City, City of East Palo Alto, Coastal Conservancy, San Francisquito Creek Joint Powers Authority, South Bay Salt Ponds, United States Fish and Wildlife Service Refuge, and the Natural Capitol Project.

Results

The project assessed six future sea level rise and sediment scenarios that supported needs identified by the Steering Committee. Ecosystem benefits quantified included projected changes in tidal marsh habitat, abundance of tidal marsh indicator bird species, coarse-level changes in above ground carbon stock, and wave reduction benefits. The team is currently developing wave reduction metrics linked to the first line of defense (typically a levee or berm behind a fronting wetland) and then a combined index that spatially integrates the bird, carbon, and wave attenuation ecosystem benefits.

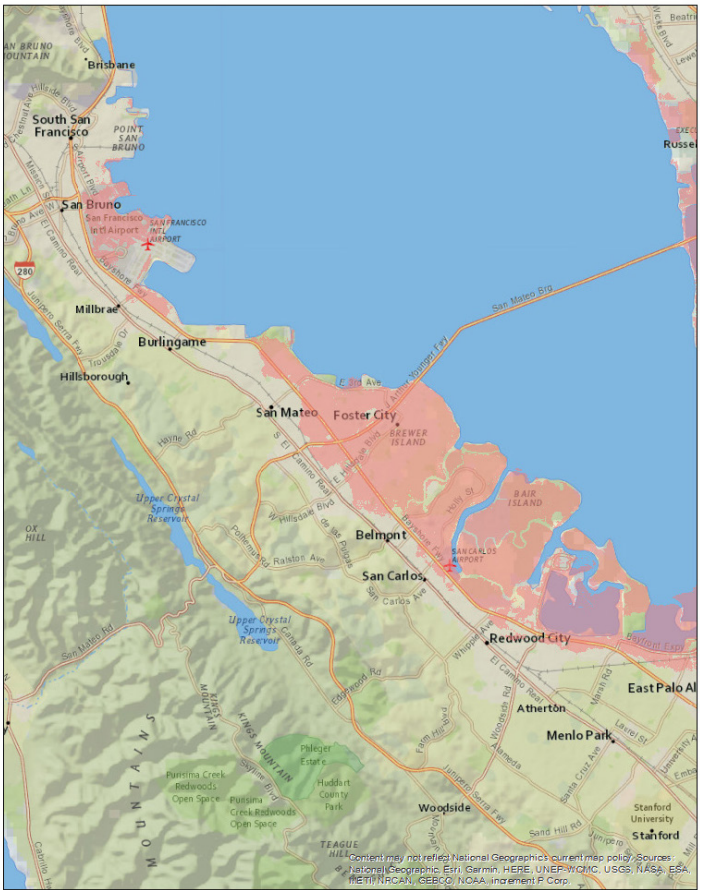
The project will produce maps that show the change from current conditions, and highlight areas that are valuable (i.e., retain high function across a breadth of future scenarios) as well as areas projected to be vulnerable. Results will be presented over the summer of 2018 at various local and regional forums, and disseminated online. For example, the maps will be incorporated into San Mateo County's planned StoryMap platform for communicating about the broader sea level rise vulnerability assessment and adaptation planning activities.

ECONOMIC AND SOCIAL COSTS OF SEA LEVEL RISE IN SAN MATEO COUNTY: STANFORD SUSTAINABLE URBAN SYSTEMS SMC RISK STUDY

Stanford's Sustainable Urban Systems (SUS) Initiative is running a year-long project-based learning course in partnership with the San Mateo County Office of Sustainability to help assess and plan for coastal flood risk. The SUS urban risk methodology focuses on the estimation of average annualized loss (the amount we would expect to pay each year in losses from flood damage) for buildings in the county, as well as indirect losses in the form of commute and business disruption, and cascading impacts on vulnerable communities. This framework can be used to evaluate the system impacts of a wide range of policy and infrastructure interventions available to the County and its jurisdictions and constituents.

Area Map

Project estimates of the direct coastal flood damages for the entire bayside of San Mateo County.



AECOM DATA REPRESENTING THE REGION OF SMC INUNDATED BY 100-YR COASTAL FLOODING EVENT WITH 1.6 FEET OF SEA LEVEL RISE.

Timeline

The project is a year-long endeavour which will assess the risks of coastal flooding and sea level rise in the San Francisco bay area. Between October and December of 2017 a baseline risk assessment for a set of cities in the west and south bay regions was conducted, ranging from Burlingame in the north to San Jose in the south. Estimates of average annualized losses for these regions were provided, as well as some indirect losses and cascading impacts associated with flood events were explored.

Between January and March of 2018, SUS partnered with the San Mateo County Office of Sustainability and refined the analysis for the county for the period 2020-2040. More accurate estimates of average annualized loss were provided by refining tools and data. The team assessed the uncertainty in the data, analyzed impacts to vulnerable communities and assessed the impacts of flooding to commutes.

Between April and June of 2018, the goal is to further refine the analysis by incorporating current and future coastal protection projects, as well as studying the potential risks to the major utilities and infrastructures in the county such as the wastewater treatment plants.

Partners

SUS completed the assessment for the San Mateo County Office of Sustainability in coordination with the Stanford Public Policy Team, a group that studied the policy landscape for sea level rise and corresponding adaptation measures in the bay area. The work included representatives from local municipalities and community groups.

Results

The analysis of the risk of coastal flooding and sea level rise to San Mateo County show that the average annualized loss, i.e. the expected damage to buildings per year, while accounting for the uncertainty in flood events and sea level rise, may rise to $530 million by the year 2040. The distribution of these losses is studied based on the residential-commercial sector divide and the effects of flood insurance and the residual burden of costs faced by homeowners is explored.

In addition to direct damage losses, we study the broader indirect losses that results from potential network effects as well as underlying socioeconomic vulnerabilities of communities is examined. The project analyzes the cascading impacts of residential damage to households of various income brackets and highlights the tipping point vulnerabilities of the households with the lowest discretionary incomes.

The inundation of roads can lead to potential commute disruption that impacts businesses due to the delay and absence of employees. With the preliminary analysis, the project quantifies this commute disruption and highlights potential regions in San Mateo County, both near the bay as well as further inland, where workplaces may face substantial commute disruption due to flood events.

Website

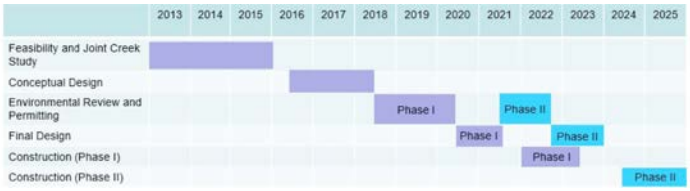
http://www.sus.stanford.edu/resilience

SAN FRANCISCO INTERNATIONAL AIRPORT
SHORELINE PROTECTION PROGRAM

The scope of the program is to plan, permit, design, and construct a comprehensive shoreline protection system and associated storm drainage improvements. The goal is to mitigate against flooding and provide protection and adaptability against future sea level rise along the Airport's 8-miles of bay front shoreline.

Area Map

Timeline



Partners

- Planning/Design: AECOM, AGS, ESA, LEAN Engineering, LSA, Moffat & Nichol, Mott MacDonald, Ricondo, Schaaf & Wheeler, and Telamon
- Engagement: California Coastal Conservancy, County of San Mateo, U.S. Coast Guard, U.S. Army Corps of Engineers, Bay Conservation & Development Commission, National Maritime Fisheries, State Historic Preservation Office, U.S. Fish & Wildlife Service, California Department of Fish & Wildlife, Federal Aviation Administration, Regional Water Quality Control Board, City of Burlingame, City of South San Francisco, SamTrans, City of Millbrae, and City of San Bruno
- Funding: California Coastal Conservancy – Joint Creek Study (San Bruno Creek/Colma Creek Resiliency Study)

Funding

The program is funded by Airport Revenue Bonds.

Phase I: $58 million from current Capital Budget

Phase II: $325 million anticipated funding by Revenue Bonds

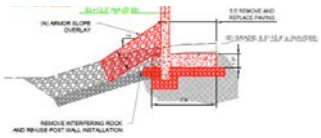
Results

SFO completed a Feasibility Study and Joint Creek Study in 2015 that provided an assessment of system deficiencies in respect to flooding and climate change and recommended remedial solutions. In 2016, SFO started to develop a Conceptual Design report that took these solutions and explored additional alternatives based on 2012 science from the National Research Council. With the release of the new State of California Sea Level Rise Guidance 2018 document, SFO is scheduled to complete the final Conceptual Design report and start the environmental permitting process in June 2018.

Website

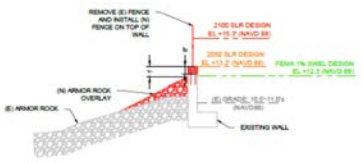
https://www.flysfo.com/community/floodplain

EXISTING GAP AT REACH 2-TREATMENT PLANT



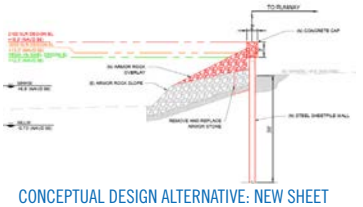
CONCEPTUAL DESIGN ALTERNATIVE: UPGRADE EXISTING WALL WITH CONCRETE CAP EXTENSION AND ARMOR ROCK REVETMENT

EXISTING DIKE AND VINYL SHEET PILE PROTECTION AT R7-19 ENDS



CONCEPTUAL DESIGN ALTERNATIVE: UPGRADE EXISTING WALL WITH CONCRETE CAP EXTENSION AND ARMOR ROCK REVETMENT

EXISTING CONCRETE WALL WITH RIPRAP PROTECTION AT R11-28R



CONCEPTUAL DESIGN ALTERNATIVE: NEW SHEET PILE WALL WITH ARMOR ROCK REVETMENT

FOSTER CITY LEVEE IMPROVEMENTS

The Foster City Levee Project is being conducted to maintain Federal Emergency Management Agency (FEMA) accreditation and the levee must be raised. The project must be designed to meet Year 2050 sea level rise requirements in order to obtain the necessary construction permits from the regulatory agencies.

Area Map

Timeline

The Ballot Measure to consider a $90 million General Obligation Bond is scheduled for June 5, 2018.

If the Ballot Measure is successful, construction is anticipated to take approximately 2 years, beginning in Spring 2019.

Partners

The Environmental Impact Report (EIR) will be completed by Urban Planning Partners. Huffman-Broadway Group will serve as the environmental consultant. The engineering team consists of Schaaf and Wheeler (Civil), Biggs Cardosa (Structural), Engeo (Geotech), and BFS (Landscape).

Funding

$90 million General Obligation Bond.

Results

The project design is at 80%. The City Council has adopted the Ordinance calling for a municipal bond election on a measure providing for the issuance of not more than $90 million of general obligation bonds for the Levee Improvements project on the June 2018 elections. If successful, bidding will begin in October 2018 with construction starting in the spring 2019.

Website

Keep Foster City Safe and Dry: https://www.keepfostercitysafeanddry.org/

City of Foster City Project Page:
https://www.fostercity.org/publicworks/project/levee-protection-planning-and-improvements-project-cip-301-657

A FRAMEWORK FOR GREEN INFRASTRUCTURE PERFORMANCE ASSESSMENT

We focus on incentivizing funding for green infrastructure (GI) projects through the development of an adaptable framework that comprehensively tracks the multi-sector benefits of GI projects.

Area Map

Our work focuses on 14 case studies from around the world. This includes 7 U.S. based locations and 7 international locations.

Timeline

We are in the publication phase of our project and seeking partners in determining what useful next steps might be.

Partners

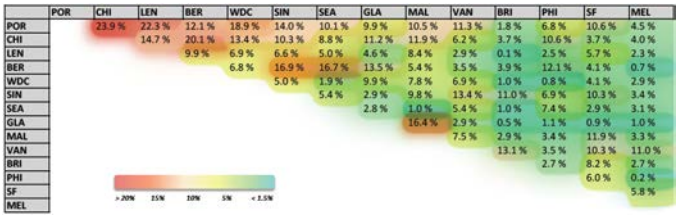
Dr. Newsha Ajami, Kim Quesnel, Robin Abs, Stanford Woods Institute, S.D. Bechtel Jr. Foundation, ReNUWIT, Stanford University Department of Civil and Environmental Engineering

Results

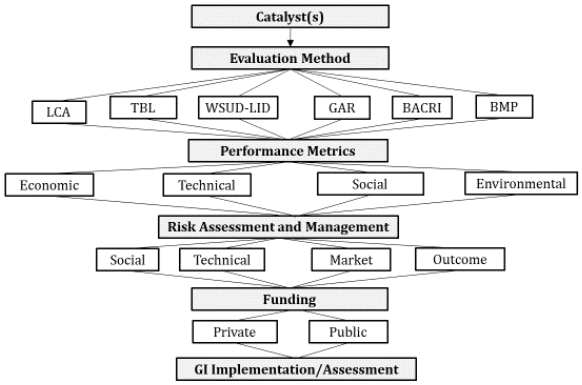
Our results suggest that: 1) many GI projects already incorporate one or more evaluation methods; 2) a number of highly specific metrics—particularly social and economic performance metrics—exist that are capable of capturing a wide-range of benefits that can be easily integrated into a model; 3) the incorporation of risk and risk management technique identification could be emphasized to increase investor confidence; 4) at least some degree of standardization across projects exists already and may not be difficult to achieve.

Website

http://waterinthewest.stanford.edu/about/people/newsha-ajami



HEAT MAP OF THE PERCENT PROXIMITY BETWEEN THE FOURTEEN SELECTED CASE STUDIES BASED ON EVALUATION METHODS, PERFORMANCE METRICS, RISK IDENTIFICATION, AND RISK MANAGEMENT IDENTIFICATION.



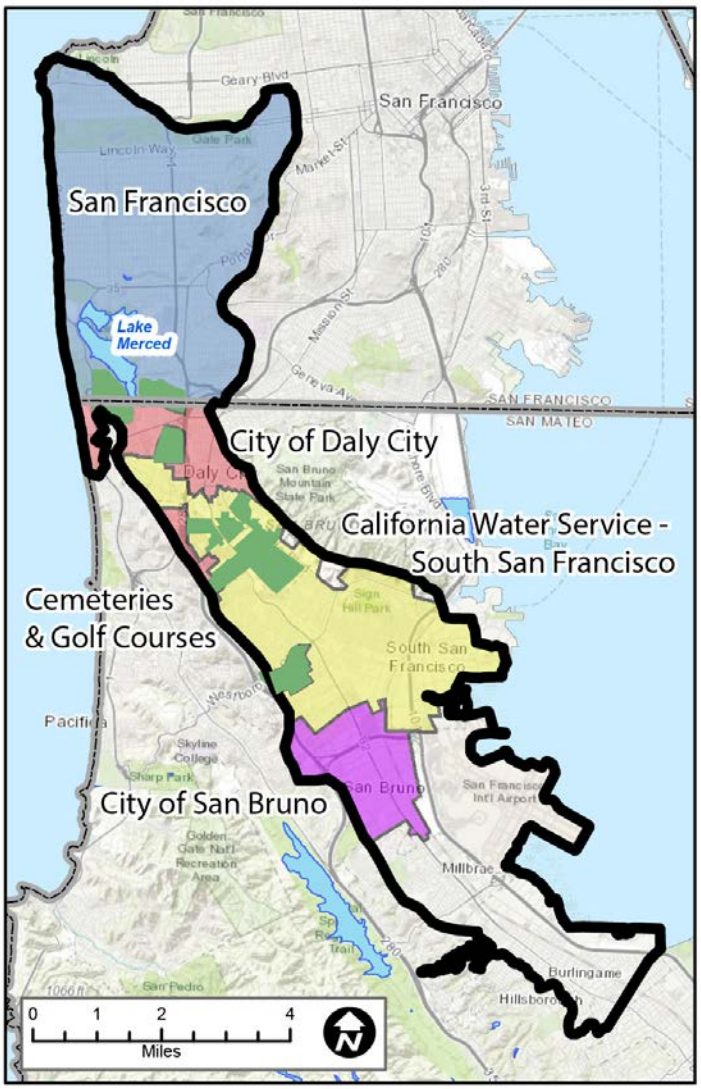
CONCEPTUAL MODEL REFINED WITH THE INCLUSION OF RESULTS FROM THE FOURTEEN CASE STUDIES.

WESTSIDE BASIN GROUNDWATER MODELING

The Westside Basin Groundwater-Flow Model was initially developed in 2003 and has undergone continual improvement during the ensuing 15-years to reflect new data and information. The model has been an important consensus building tool between stakeholders and has improved data sharing, creative insights about basin characteristics, model use, and identification of model limitations.

Area Map

The Westside groundwater basin extends from the Bayside of San Mateo County in Burlingame to the Ocean-side of San Francisco City/County.



Timeline

- **2002-2003** • Westside Basin Groundwater Flow Model development
- **2003-2007** • Improved Conceptual Hydrogeological Model guided updates to model discretization and layering
- **2007-2009** • The Daly City Tertiary Recycled Water Project implementation provided measured water use by area golf courses and was used to improve estimated historical irrigation demand and groundwater use by large turf areas in the basin
- **2009-2011** • Newly installed monitoring well cluster sites refined modeled geology and basin geometry and provided discrete water level measurements with depth in the basin profile
- **2011-2017** • Routine water level measurements at the monitoring well cluster sites provide long-term records that show seasonal increases and decreases in groundwater levels and improve the reliability of modeled water transmitting and storage properties
- **2017-present** • The model can estimate groundwater storage available for extraction as part of aquifer storage and recovery project operations

Partners

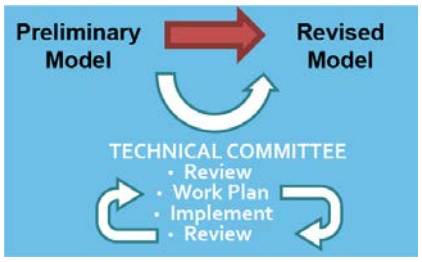
City of Daly City, San Francisco Public Utilities Commission, California Water Service, and City of San Bruno

Funding

Total (2002-2017): $462,000 including funding from AB 303 Local Groundwater Assistance Grant ($51,000) and Local funds ($411,000).

Results

The model supported the Regional Groundwater Storage and Recovery Project and the San Francisco Groundwater Project planning efforts, and is a tool for estimating groundwater storage volumes available for extraction as part of aquifer storage and recovery project operations.



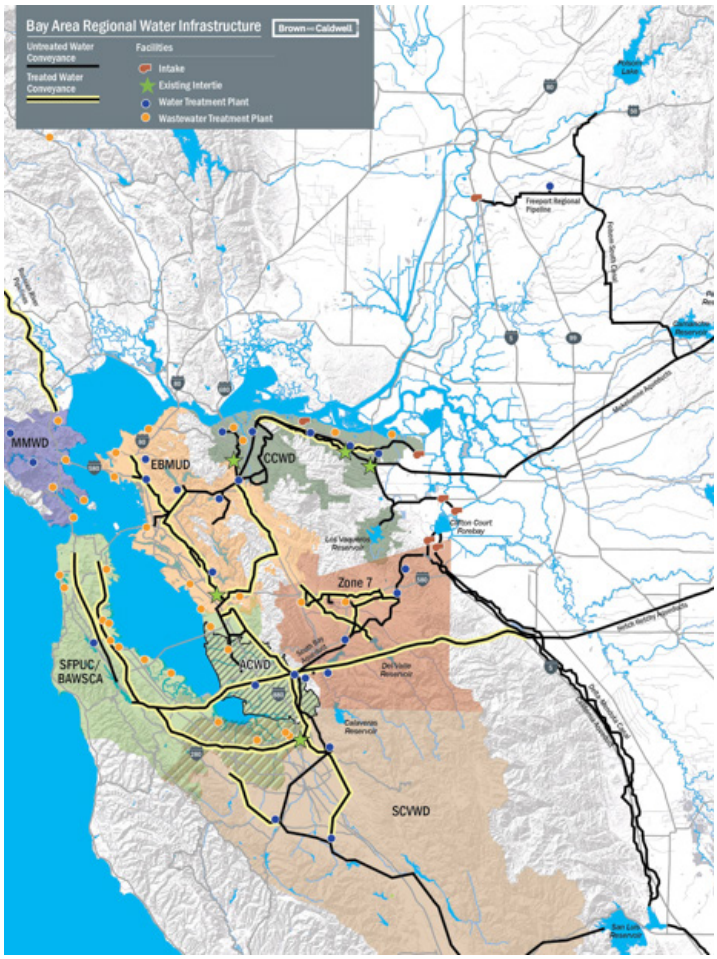
EACH MODEL UPDATE IS REVIEWED AND REFINED BASED ON STAKEHOLDER REVIEW. TECHNICAL CONSENSUS AND MODEL TRANSPARENCY PRODUCE GREATER UNDERSTANDING OF MODEL STRENGTHS AND LIMITATIONS, WHICH DIRECT FUTURE DATA COLLECTION AND MODEL IMPROVEMENT EFFORTS.

BAY AREA REGIONAL RELIABILITY

As underscored by the recent unprecedented drought, the Bay Area is more resilient when the region's water agencies work collaboratively, rather than individually. Inspired by opportunities to better leverage existing resources and assets, eight of the region's largest water agencies formed the Bay Area Regional Reliability (BARR) partnership to improve integrated regional water management and drought mitigation.

Area Map

Together, BARR agencies are pursuing measures and actions that would use existing infrastructure and water resources more fully to produce greater efficiencies and improved reliability for the entire region.



Timeline

After adopting principles in 2014 to guide the partnership, the agencies executed a Memorandum of Agreement in 2015. In 2016 through 2017 the BARR agencies collaboratively developed a Drought Contingency Plan (DCP)—a project funded in part by the U.S. Bureau of Reclamation—to approach drought mitigation and response from a regional, integrated perspective. In 2018 through 2020, the agencies are partnering on the Bay Area Water Market Program to explore water transfer and exchange opportunities in the region. The grant funded project will develop an implementation plan for establishing a water market in the Bay Area, identifying the various pathways under which the agencies could secure and exchange/transfer existing and supplemental supplies. The project will define the various processes for moving water and then identify and attempt to resolve associated barriers, maximizing the efficient use of existing assets. This program will increase flexibility to deliver water from different sources to facilitate voluntary exchanges and transfers, thereby helping to promote long-term drought resilience. This project will not only help to secure a more stable water supply to support the Bay Area's strong economy, but it will also provide a model for other water suppliers in California.

Partners

The Bay Area Regional Reliability (BARR) Partners include Alameda County Water District, Bay Area Water Supply and Conservation Agency, Contra Costa Water District, East Bay Municipal Utility District, Marin Municipal Water District, San Francisco Public Utilities Commission, Santa Clara Valley Water District, and Zone 7 Water Agency.

Funding

The BARR DCP and the upcoming Bay Area Water Market Program are funded by contributions from each of the agencies and also a grant from the U.S. Bureau of Reclamation.

Results

The Bay Area's largest water agencies are working together to develop a regional solution to improve the water supply reliability for over 6 million area residents and the thousands of businesses and industries located therein. The BARR Partners have joined forces to leverage existing facilities and, if needed, build new ones to bolster regional water supply reliability.

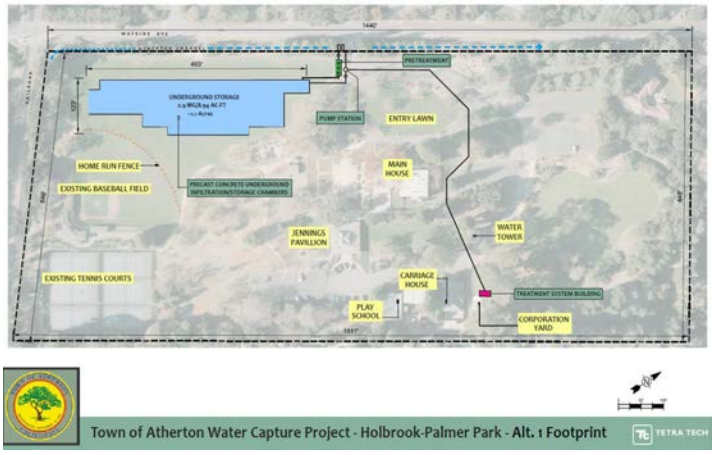
Website

http://www.bayareareliability.com/

REGIONAL STORMWATER
HOLBROOK PALMER PARK, ATHERTON

The Town of Atherton is designing a water capture facility in Holbrook-Palmer Park to capture all dry-weather urban runoff, and wet-weather flows to address water quality and flood control requirements. The facility will divert water from Atherton Channel into a pre-treatment device to remove trash, debris, and sediment before conveying the water into a subsurface multi-chambered storage/infiltration facility with a target volume of 8-10 acre-feet.

Area Map



Timeline

Project is in preliminary design. Final design is estimated to be complete December 2018. Permitting will go through January 2018. The project will go out to bid in May 2019, with construction to go from June 2019 through early 2021.

Partners

The Town of Atherton is the lead agency. Rick Smelser (Interwest Group) is the Municipal Engineer. Tetra Tech is responsible for planning and design. Caltrans provides the funding and Richard Watson Associates is the funding liaison.

Funding

The Town of Atherton entered into a Cooperative Implementation Agreement (CIA) with Caltrans to fund a water capture project at Los Lomitas Elementary School. Due to location constraints, the project was moved to Holbrook-Palmer Park. The estimated funding breakdown is $11.1 million for Construction and $2.4 million for Planning and Permitting ($13.5 million total).

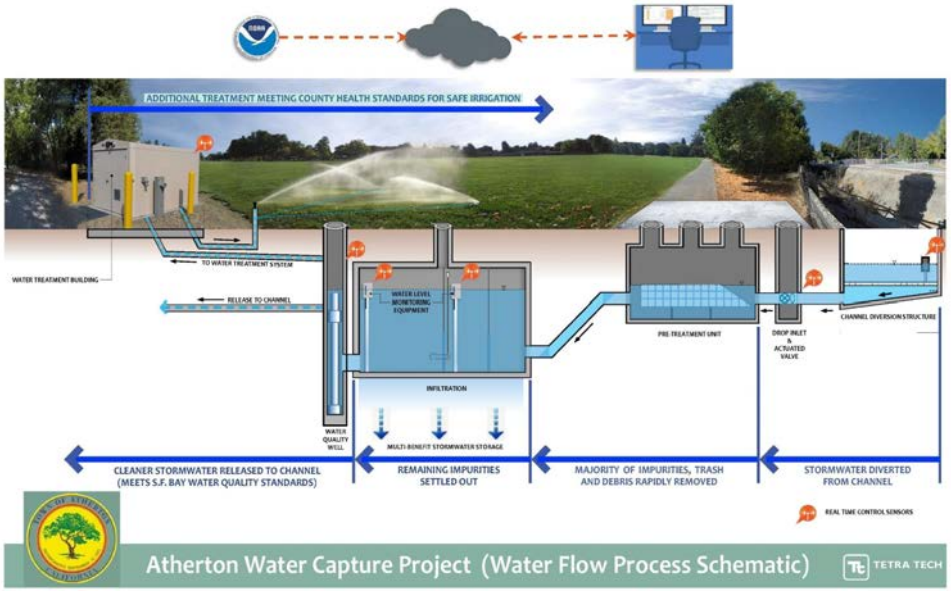
Results

The project is currently in the site alternative assessment and preliminary design phase. The planning team has completed geotechnical, surveying, and structural assessments for the Park and are actively in the process of leveraging this information to identify the most cost-effective and beneficial site configuration for the Town.

Next steps include finalizing the site configuration and optimizing the diversion rate, storage, and use to maximize water quality and flood control benefits.

Website

http://www.ci.atherton.ca.us/index.aspx?NID=484



REGIONAL STORMWATER
ORANGE MEMORIAL PARK, SOUTH SAN FRANCISCO

The project envisions a regional multi-benefit water capture facility at Orange Memorial Park which would divert, treat, and store dry-weather urban runoff and the first flush of wet-weather runoff from the Colma Creek Channel. The water will be infiltrated and/or used to offset drinking water demands. The project will contribute significantly to San Mateo County's regulatory requirement to reduce the discharge of trash, mercury, and Polychlorinated Biphenyls (PCBs) to San Francisco Bay.

Area Map

Timeline

The 8-month project planning phase wraps up in late September 2018 with selection of a preferred project concept to carry forward into the design phase. Project construction is expected to begin in late 2019 and last for one year.

Partners

In addition to the Cooperative Implementation Agreement with Caltrans, the City is implementing the project in cooperation with the Colma Creek Flood District, who owns the channel, and the South San Francisco Parks and Recreation Department, who owns Orange Memorial Park.

Funding

This Project is primarily funded by a contribution of $9.5 million from Caltrans with the City of South San Francisco serving as the lead agency. Preliminary budget estimates break out funding into seven buckets:

Project Management: $176,400

Project Approval & Environmental Document: $529,200

Plans, Specifications, & Estimate: $588,000

Permitting: $147,000

Construction Administration: $352,800

Construction: $5,880,000

Contingency: $1,462,000

Results

The primary project objective is to implement green infrastructure to improve water quality in Colma Creek and the San Francisco Bay via infiltration, biofiltration, and reuse of water for uses other than drinking water. Additional project goals include flood reduction, consistency with the park Master Plan, and minimizing ongoing operations and maintenance requirements.

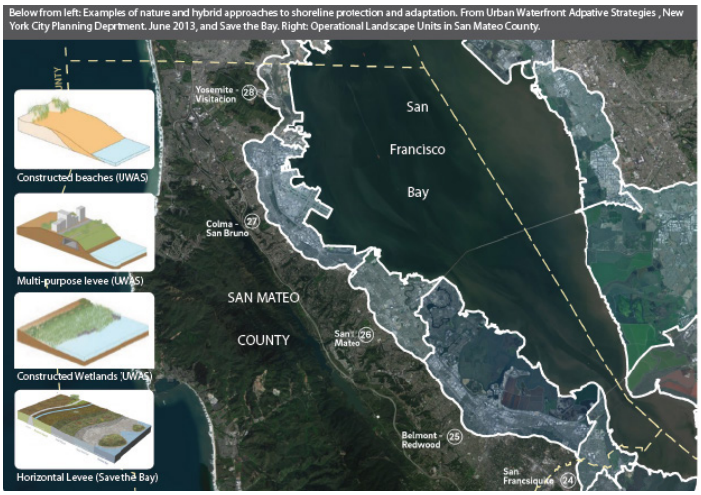
BUILDING A FRAMEWORK FOR LOCAL ACTION ON SEA LEVEL RISE PREPAREDNESS AND ADAPTATION IN SAN MATEO COUNTY

San Mateo County's Sea Change program is now in the Planning Phase of their climate preparedness action plan. As part of this phase, the County would like to develop a stakeholder driven, science-based framework for local action on sea-level rise preparedness and adaptation. San Mateo County has partnered with the San Francisco Estuary Institute and the Natural Capital Project of Stanford University to develop a framework that provides guidance and a standardized process for San Mateo County cities to explore and evaluate different future visions for their Bay shoreline.

Exploring the use of nature-based strategies for sea level rise adaptation is a priority for the County, and this work will focus specifically on identifying the feasibility of nature-based strategies along the Bayshore and in developing methods for evaluating the trade-offs of hardened versus natural (and hybrid) approaches to shoreline protection.

Area Map

San Mateo County Bay Shore



Timeline

Through November 2018.

Partners

San Mateo County Sea Change Program, San Francisco Estuary Institute (SFEI), and The Natural Capital Project of Stanford University.

Funding

Funded by the Gordon and Betty Moore Foundation.

Results

This project has several main components and the work to date has focused on delineating planning units within San Mateo County, building on SFEI's Operational Landscape Unit (OLU) framework that groups locations based on similarities. Upcoming work will focus on identifying sea level rise adaptation measures that may be feasible in different OLUs and developing an approach to evaluate trade-offs between different options.

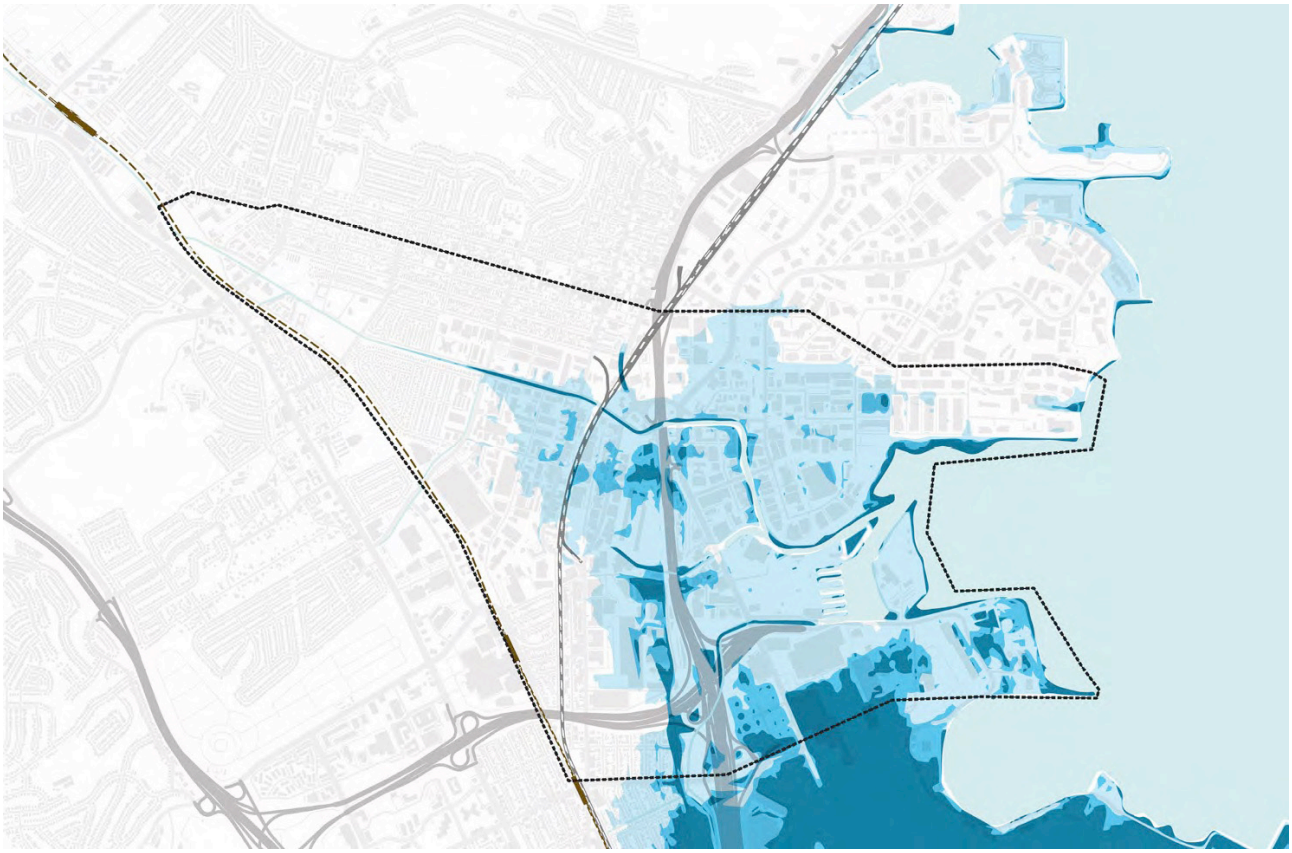
SAN MATEO COUNTY STAKEHOLDERS PLAYING THE GAME OF FLOODS TO LEARN ABOUT THE TRADE-OFFS ASSOCIATED WITH SEA LEVEL RISE ADAPTATION.

RESILIENT BY DESIGN – SOUTH SAN FRANCISCO

Through collaboration and coordination with the government and community groups, we are focused on connecting the community to Colma Creek and South San Francisco shoreline while co-designing solutions to reduce flooding and build resiliency to sea level rise. We are attempting to create benefits for water management, community/mobility, and disaster response systems.

Area Map

Map of 4.9 feet of sea level rise combined with a 100 year flood event.



Timeline

The project is funded until mid-May of 2018 when we will give a report of our findings and potential solutions. After May we will be looking for more funding to move forward.

Partners

The project is guided by a partnership with San Mateo County and the City of South San Francisco. We have also partnered with three community groups: the South San Francisco Historical Society, San Bruno Mountain Watch and the Youth Leadership Institute (with South San Francisco High School students).

Results

Through the community shopfront (located in the old bank building on Grand Ave, South San Francisco) we have situated ourselves right in the middle of downtown making it easily accessible for the community to come in to learn and give feedback on what we are doing. We are gathering local data of people's experiences and thoughts of South City, especially in relation to the creek. Through listening and engaging we have a better understanding on what matters to the community as a whole and will use this input to move forward with the project.

Website

http://www.facebook.com/ResilientSouthCity/

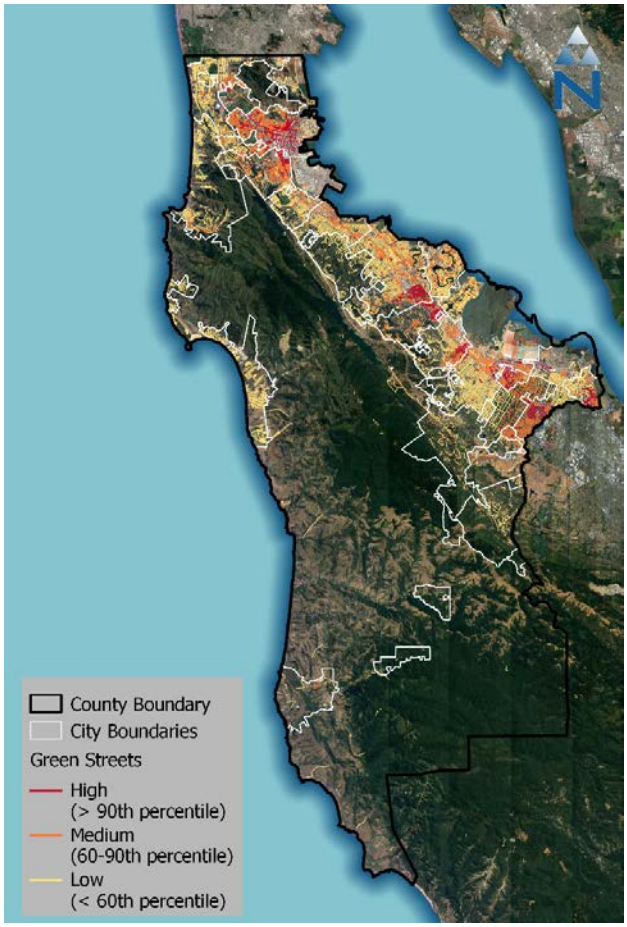
SUPPORTING THE FUTURE OF STORMWATER MANAGEMENT IN SAN MATEO COUNTY

The City/County Association of Governments (C/CAG) through the San Mateo Countywide Water Pollution Prevention Program (The Program) is implementing comprehensive planning and modeling efforts to support its 21 member agencies manage stormwater more sustainably to improve water quality, increase infiltration, reduce flooding and build resiliency. The Program has created the following planning and modeling tools:

- **SAN MATEO COUNTYWIDE STORMWATER RESOURCE PLAN – a watershed-based prioritization tool for ranking potential stormwater capture projects throughout the county.**
- **COUNTYWIDE HYDROLOGY AND SEDIMENT TRANSPORT MODELS – continuous simulation hydrology and sediment transport modeling help estimate pollutant loading and establish a quantitative relationship between green infrastructure implementation and pollutant load reduction.**
- **MODELING GREEN INFRASTRUCTURE SCENARIOS – through a Reasonable Assurance Analysis (RAA), C/CAG is modeling cost-optimized green infrastructure scenarios at a subwatershed level to identify the most cost effective "recipe" of green infrastructure control measures to meet countywide pollutant load reductions by 2040.**
- **GREEN INFRASTRUCTURE PLANS – C/CAG is supporting each agency in developing Green Infrastructure Plans which will include targets for green infrastructure capacity and associated impervious areas treated, as well as a new "GreenSuite" of design guidance to ensure green infrastructure is designed correctly, well-built and maintained.**

Area Map

These efforts are being conducted countywide and behalf of C/CAG's member agencies. Below is the green streets prioritization map from the San Mateo Countywide Stormwater Resource Plan.



Timeline

C/CAG completed and approved the Countywide Stormwater Resource Plan (SRP) in December, 2017. The Program initiated countywide hydrology and sediment transport modeling in 2017 and produced preliminary results of cost-optimized green infrastructure scenarios in early 2018. San Mateo County co-permittees must submit Green Infrastructure Plans to the San Francisco Regional Water Quality Control Board by Sept 30, 2019.

Partners

Coordination is led by C/CAG and its 21 member agencies (towns, cities and County unincorporated).

Supporting consultants include Paradigm Environmental, Eisenberg, Olivieri and Associates, Inc., Larry Walker Associates, Community Design + Architecture, and Urban RainlDesign.

Additional project partners include C/CAG member agencies (towns, cities and County unincorporated) and Caltrans.

Project Funding

Countywide Stormwater Resource Plan: $250,000

Countywide hydrology/sediment model and green infrastructure scenarios for Reasonable Assurance Analysis: $650,000

Green Infrastructure Plan Support (including GreenSuite): $650,000

Next Steps

C/CAG will continue to facilitate the gradual transition from "gray" to "green" infrastructure for stormwater management throughout San Mateo County. Specifically, C/CAG plans to develop a web-based project tracking platform, create additional green infrastructure project concepts, assist with grant opportunities for pilot project implementation, and advance relevant funding initiatives.

Website

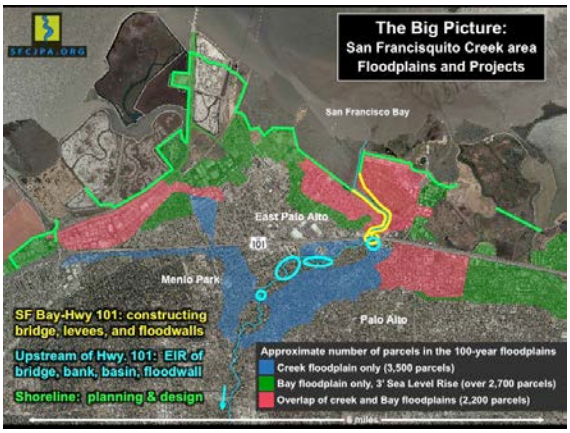
San Mateo Countywide Stormwater Resource Plan: http://ccag.ca.gov/srp/

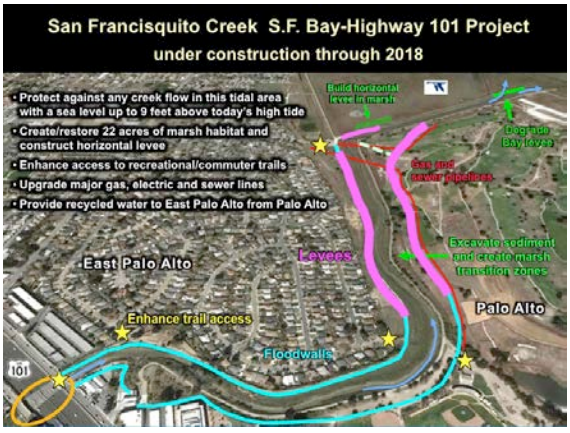
Stormwater Resource Plan web viewer:
http://54.183.214.51/maps/SMC_project_prioritization

SAN FRANCISQUITO CREEK JOINT POWERS AUTHORITY (SFCJPA) FLOOD PROTECTION, ECOSYSTEM RESTORATION, AND RECREATION PROJECT

Provides flood protection, ecosystem restoration and recreation to the communities divided by San Francisquito Creek and unified by its watershed and floodplain.

Area Map





Timeline

San Francisco Bay-Highway 101: Construction of almost 2 miles of creek, marsh, and highway through 2018. Upstream of Highway 101: Environmental Impact Report (EIR) in 2018; construction from 2020-2022. San Francisco Bay Shoreline: Design and EIR through 2022; construction from 2023-2026.

Partners

SFCJPA, Santa Clara Valley Water District, San Mateo County Flood Control District, Cities of East Palo Alto, Palo Alto, and Menlo Park. Additional contributions by Caltrans, PG&E, East Palo Alto Sanitary District, California Department of Water Resources, and Facebook.

Funding

Bay-Hwy 101: Planning/Design $2.5 million, Construction $63 million, Permitting and Restoration $1.5 million.

Results

Upstream of Hwy 101: Near-term protection against record flow (70-year event); long-term flow protection (100-year). Shoreline Strategy to Advance Flood protection, Ecosystems and Recreation (SAFER) Bay Project: Same sea level rise protection as San Francisco Bay-Highway 101.

Website

http://sfcjpa.org

IT TAKES A WATERSHED

The Pescadero Watershed has complex impairments with wide ranging impacts requiring coordinated, integrated, comprehensive solutions at a landscape scale involving multiple partners across public and private lands that leverage local, state, federal, and private resources. The result is restoration of a watershed.

Area Map

The Pescadero and Butano Creeks flow westerly and drain approximately 81 square miles of the Santa Cruz Mountains in western San Mateo and Santa Cruz Counties and enter the Pacific Ocean near the town of Pescadero.

Timeline

Out of six watershed projects the Fish Passage, Preventing Fish Kills and Water Conservation projects have been completed. The other ongoing projects include floodplain restoration, channel reconnection, and managing erosion.

Partners

San Mateo Resource Conservation District, San Mateo County Parks, U.S. Department of Agriculture Natural Resources Conservation Service (NRCS), California State Parks, National Oceanic and Atmospheric Administration (NOAA), California Water Boards, Peninsula Open Space Trust (POST), Coastal Conservancy, California Department of Fish and Wildlife, Trout Unlimited, private landowners, and citizens.

Funding

The projects total over $10 million.

Results

The overall output is a high level of collaboration for landscape level restoration of a watershed addressing multiple complex impairments.

Website

http://www.sanmateorcd.org

CHANNEL RECONNECTION

MANAGING EROSION

FISH PASSAGE

PREVENTING FISH KILLS

WATER CONSERVATION, STORAGE

PLAN PRINCETON SHORELINE RESILIENCE

Plan Princeton is an effort by the San Mateo County Planning and Building Department to provide policy and zoning updates for the unincorporated Princeton area that will guide future development in a manner that prioritizes coastal-dependent and coastal-related development, enhances coastal access and recreation, and protects coastal resources. Plan Princeton will include a Shoreline Management Plan to ensure coastal and beach habitats, public recreation, coastal access, and development stands resilient to coastal erosion and flooding from sea level rise and storms.

The Shoreline Management Plan will provide clear policies and a process for the development and design of a shoreline management implementation strategy that protects habitat resources, increases recreational values, protects property, and addresses sea level rise in a sustainable, environmentally acceptable, and economically viable manner.

Area Map

Plan Princeton Area Map

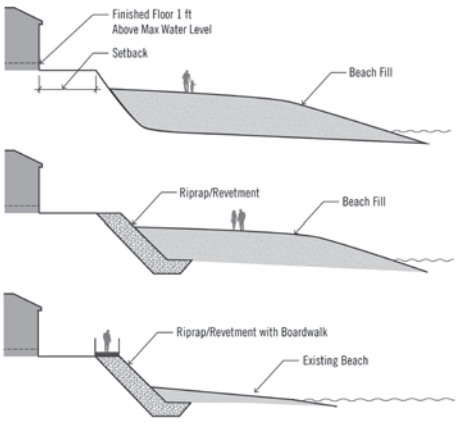
Results

The Shoreline Management Plan will protect development, habitats, and public access in a manner that addresses human induced processes and natural hazards, including erosion and sea level rise, until managed retreat or other strategies become necessary based on identified thresholds of change.

Website

http://www.planprinceton.com

VULNERABILITIES FROM BLUFF EROSION AT PILLAR POINT BLUFF: TRAILS, HABITATS, DEFENSE FACILITY, BEACH SAFETY MANAGEMENT OPTIONS: POTENTIAL MANAGED RETREAT



VULNERABILITIES FROM FLOODING AND EROSION ALONG PRINCETON WATERFRONT: INFRASTRUCTURE, DEVELOPMENT, HABITATS, SHORELINE, PUBLIC ACCESS, COASTAL-DEPENDENT

BUILDING RESILIENCE ONE WATERSHED AT A TIME

On February 23, 2016, the San Mateo County Board of Supervisors approved $6.2 million over three years to begin to address flood risks in areas with cross-jurisdictional challenges. This launched the Flood Resilience Program, a team of two fully dedicated staff to hire consultants to design and implement flood resilience projects, seek grant funding, and collaborate with interested cities and other County water initiatives. Since its inception, the Program has partnered with multiple jurisdictions to build a repeatable and sustainable process for prioritizing and implementing flood resilience projects.

Under the Program's leadership, these "Collaboratives" can leverage local agency relationships, share decision-making responsibilities, enable potential funding partnerships, and apply for grant funding for the ultimate goal of improved project development. The Program's current projects include: Bayfront Canal and Atherton Channel Flood Management and Habitat Restoration, Belmont Creek Flood Management Plan, Navigable Slough Feasibility Study, and the County-wide Flood Monitoring and Emergency Response Project.

Timeline

The Flood Resilience Program is a 3-year effort beginning in fiscal year 2016-2017 through fiscal year 2018-2019. The three Memorandum of Understanding (MOU) agreements were signed in the summer and fall of 2017. With these collaboratives in place, progress on all projects has accelerated. The projects have parallel implementation schedules for planning and design, with construction anticipated to begin in Spring 2019.

Partners

The County has enacted 3 MOUs with the following seven agencies: Cities of Belmont, Menlo Park, Redwood City, San Bruno, San Carlos, South San Francisco, and Town of Atherton (the Collaboratives). The County Department of Public Works also manages Colma Creek and San Bruno Flood Control Districts. Other project partners and stakeholders include but are not limited to: South Bay Salt Pond Restoration Project, Cargill, Sherriff's Office of Emergency Services (OES), OES Joint Powers Authority (JPA) including the County and 20 Cities, Resilience by Design, San Francisco International Airport, Harbor Industrial Area Businesses, Novartis Pharmaceutical, Stanford, and multiple disadvantaged communities.

Funding

The projects are being funded by cost sharing agreements (MOUs) between the agency partners and the Flood Resilience Program budget. The total value of the three MOUs cost sharing agreements for planning, design, and permitting is $1.4 million. Funding strategies are being developed for each Flood Resilience Program Project. On behalf of the Collaboratives, the Program has applied for approximately $6 million in grant funding from local, state, and federal sources.

Results

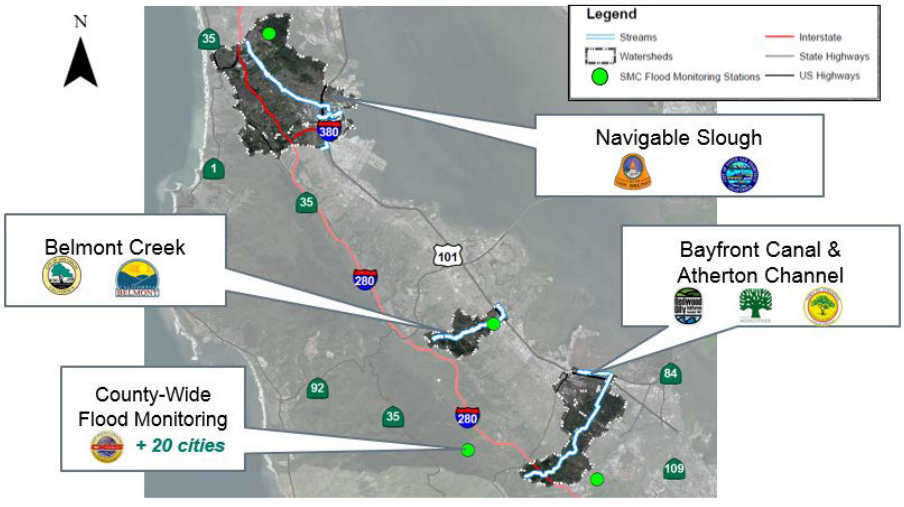
Each of Flood Resilience Program's projects are regional collaborative projects that aim to develop and implement flood mitigation solutions across the County to build a repeatable and sustainable cadence and process for prioritizing and implementing resilient flood risk reduction measures. To date, the Program has entered into 3 MOU Agreements with 7 Cities, has applied for approximately $6 million in grant funding, and has developed a repeatable process for ongoing and future collaborations.

Website

https://publicworks.smcgov.org/flood-resilience

BELMONT CREEK FLOOD MANAGEMENT PLAN

COUNTY-WIDE FLOOD MONITORING AND EMERGENCY RESPONSE PROJECT



NAVIGABLE SLOUGH FEASIBILITY STUDY

BAYFRONT CANAL AND ATHERTON CHANNEL FLOOD MANAGEMENT AND HABITAT RESTORATION