
San Bruno Creek One Watershed Climate Resilience Plan Pilot Study

Prepared for

City/County Association of Governments of San Mateo County
555 County Center, Suite 5
Redwood City, California 94063

Prepared by

Geosyntec Consultants, Inc.
1111 Broadway, 6th Floor
Oakland, California 94607

with assistance from

Climate Resilient Communities
3921 East Bayshore Road, Suite 208
Palo Alto, CA 94303

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CA Governor’s Office of
**Land Use and
Climate Innovation**

As communities in California experience more frequent, prolonged, and severe impacts from climate change, communities and governments at all scales are developing strategies and implementing actions to build a climate-resilient future. However, many jurisdictions, especially under-resourced communities in California, lack the capacity, tools, guidance, and resources to effectively prepare for climate change impacts. The APGP addresses this capacity gap by providing funding to help fill planning needs, providing communities with the resources to identify climate resilience priorities, and supporting the development of climate resilience projects across the state. The APGP enables communities to take climate risk and adaptation considerations into planning activities and prepare for climate readiness and resilience in the long term.

The APGP is an initiative of the Integrated Climate Adaptation and Resiliency Program (ICARP) housed within the Governor’s Office of Land Use and Climate Innovation. ICARP advances statewide climate adaptation and resilience by coordinating investments, partnerships and climate science to ensure people, natural systems, and the built environment are protected, prepared, and thrive in the face of climate change. Through direct and equity-focused investments and resources, ICARP helps build climate-adapted and equitable communities in California, with a focus on solutions that both address the impacts of climate change and reduce greenhouse gas emissions. ICARP works to advance these priorities across all levels of government by developing actionable science and research; providing guidance, tools, and technical assistance; and administering climate resilience-focused grant programs. Learn more: <https://opr.ca.gov/climate/icarp/>

Project Management Team

Reid Bogert, C/CAG

Daniel Sternkopf, C/CAG

Hae Won Ritchie, City of San Bruno

Ibraheem Mosa, City of San Bruno

Sultan Henson, San Mateo County Office of Sustainability

Summer Bundy, OneShoreline

Ari Simon, Inner and Outer Engagement

Tom Francis, BAWSCA

Brian Schumaker, South San Francisco – San Bruno Water Quality Control Plant

Cade Cannedy, Climate Resilient Communities

Elizabeth Diaz-Jacobo, Climate Resilient Communities

Kae Jensen, Climate Resilient Communities

Theo Gress, Climate Resilient Communities

John Promani, Craig Communications

Brandon Harrell, Governor’s Office of Land Use and Climate Innovation

Sarah Samdin, Governor’s Office of Land Use and Climate Innovation

Abby Edwards, Governor’s Office of Land Use and Climate Innovation

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ACRONYMS AND ABBREVIATIONS

APGP	California Adaptation Planning Grant Program
BAWSCA	Bay Area Water Supply & Conservation Agency
C/CAG	City/County Association of Governments
CalFire	California Department of Forestry and Fire Protection
Caltrans	California Department of Transportation
CRC	Climate Resilient Communities
CVA	Community Vulnerability Assessment
FEMA	Federal Emergency Management Agency
ICARP	Integrated Climate Adaptation and Resilience Program
LID	low impact development
LHMP	Local Hazard Mitigation Plan
OneShoreline	San Mateo County Flood and Sea Level Rise Resiliency District
PMT	Project Management Team
RAP	Resource Agency Permit
RCP	representative concentration pathway
SFO	San Francisco International Airport
SMCWPPP	San Mateo Countywide Water Pollution Prevention Program
TAC	Technical Advisory Committee
USGS	United States Geological Survey

1. INTRODUCTION

In 2023, the City/County Association of Governments of San Mateo County (C/CAG) received a grant from the California Integrated Climate Adaptation and Resilience Program (ICARP) Adaptation Planning Grant Program to develop and pilot the *OneWatershed Climate Resilience Framework and Community-Led Plan*, an equitable climate adaptation approach focused on integrated watershed management. The ICARP-funded project is led through a collaborative partnership of agencies and community partners, including C/CAG, Climate Resilient Communities (CRC), the San Mateo County Flood and Sea Level Rise Resiliency District (OneShoreline), City of San Bruno, County of San Mateo Sustainability Department, City of South San Francisco’s South San Francisco-San Bruno Regional Water Quality Control Plant, and the Bay Area Water Supply & Conservation Agency (BAWSCA).

In collaboration with the partner agencies, C/CAG developed the OneWatershed Framework (“Framework”), which is detailed in the *OneWatershed Framework Report* (C/CAG, 2025), as a method to assess the regional and shared climate change hazard exposure to water infrastructure and resources (sewer, water, and stormwater). The Framework was also developed to establish a cross-sector institutional foundation to build adaptive capacity to reduce risks and increase resilience to climate change hazards for the most vulnerable communities in San Mateo County through climate resilience-focused programs, policies, and green and/or gray infrastructure projects. The OneWatershed Framework is intended to be a model that can be applied to watersheds throughout San Mateo County. The Framework was piloted in the San Bruno Creek watershed, shown in Figure 1 below.

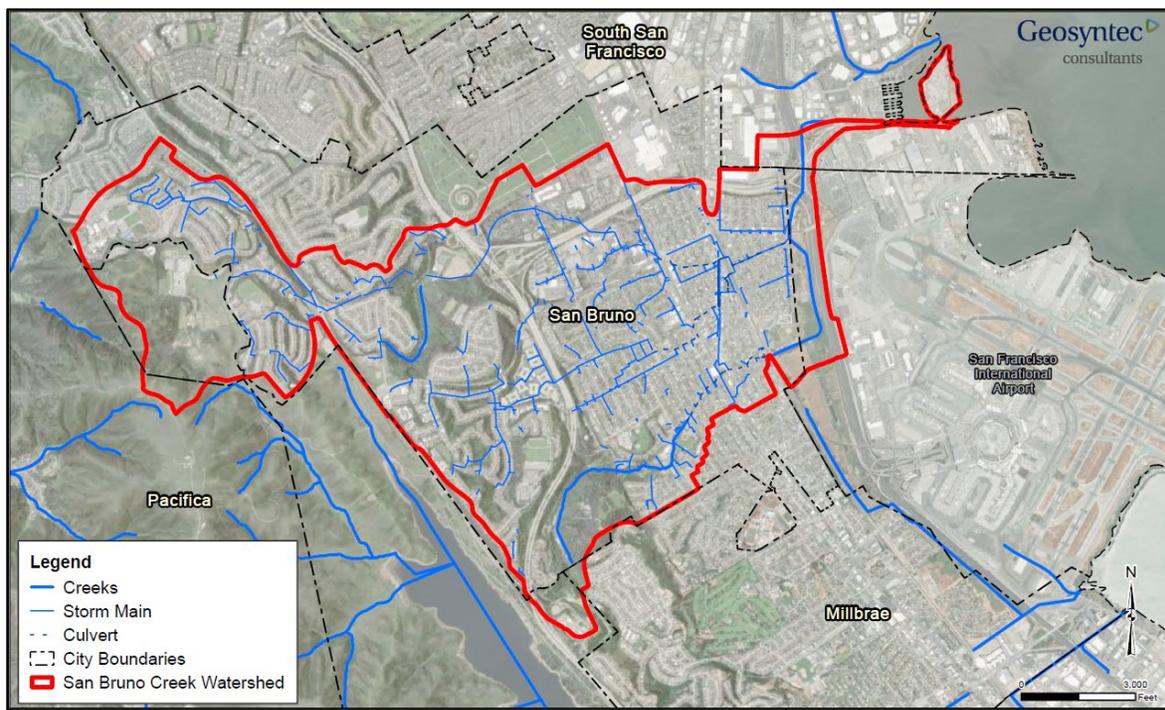


Figure 1. San Bruno Creek Watershed

This *San Bruno Creek OneWatershed Climate Resilience Plan Pilot Study* (“Pilot Study”) describes the community-led process for applying the OneWatershed Framework at the watershed scale through (1) combining the CRC-led Community Vulnerability Assessment (CVA) with shared localized climate change hazard exposure results, (2) gaining input from community members on the priorities for vulnerable OneWatershed infrastructure assets and potential mitigation measures, (3) identifying potential projects, policies, and programs to address the identified needs, and (4) selecting one project for conceptual design. This Pilot Study is organized as follows:

- Section 2 provides relevant background information on the OneWatershed Framework and the San Bruno Creek Watershed.
- Section 3 details how the OneWatershed Framework was applied to the San Bruno Creek watershed, including community outreach.
- Section 4 summarizes ten prioritized projects, programs, and policies that resulted from the OneWatershed Framework application to the San Bruno Creek watershed.
- Section 5 describes the San Bruno Creek OneWatershed Concept Design.
- Section 6 provides a conclusion and lessons learned in the context of OneWatershed Framework application to other watersheds.
- Section 7 includes document references.

2. BACKGROUND

The OneWatershed Framework is both a conceptual framework and a data-driven method intended to support the collaborative efforts of San Mateo County (County) agencies and interested parties, working across jurisdictions/organizations and watershed boundaries to achieve long-term and strategic climate resilience. Many existing data sources, previously developed methodologies, regulations, and studies related to climate adaptation and resilience strategies in San Mateo County and beyond were compiled and referenced through the development of the Framework. This section describes the Framework and introduces its application to the San Bruno Creek watershed Pilot Study.

2.1 OneWatershed Framework

The OneWatershed Framework was designed to employ a community co-creation approach, listening to the lived experiences of community members and weighing this input alongside available quantitative climate change hazard exposure data and projections regarding the potential impacts of climate change on water infrastructure and resources.

Several groups were formed to support the development of the Framework, including the Project Management Team (PMT), which leads the Project; the Technical Advisory Committee (TAC) comprised of public agency staff from C/CAG's member agencies, as well as other public agencies and organizations in San Mateo County involved in water infrastructure and climate adaptation; the Equity Priority Community Workgroup, comprised of community-based organizations, nonprofits, and interested County residents; and the Resilient San Bruno Team, which is the local Climate Change Community Team made up motivated and interested residents, community leaders, and/or community organization representatives from the San Bruno Creek watershed. These groups and representatives were engaged throughout the development of the Framework through interactive meetings and review and comment opportunities on project deliverables.

Key objectives of the Framework approach are to use community-scale input and climate change hazard exposure assessment data to identify the most vulnerable infrastructure, water resources, and community amenities at a watershed scale. This information can then be used to develop a suite of multi-benefit projects that address the climate resilience and regulatory needs of multiple water infrastructure sectors with potential for funding through innovative partnership approaches. The Framework is intended to be used on a longer-term basis to advance broad-scale equitable watershed-based climate resilience throughout the County.

The Framework defines a stepwise process designed to be used on a watershed basis for any watershed in the County. The process is intended to yield hyper-local watershed-specific OneWatershed Climate Resilience Plans (or studies) that leverage Countywide tools but are guided by the lived experiences and priorities of the local community. The overall Framework approach is illustrated in Figure 2. This Pilot Study will demonstrate the Framework approach as applied in the San Bruno Creek watershed.

STEP
1

Identify multiagency, multi-stakeholder collaborative partnerships specific to the communities in the target watershed.



STEP
2

Assess watershed-scale vulnerability of water infrastructure and assets to climate hazards:

2a



Compile climate change hazard and community vulnerability data available in the OneWatershed Dashboard along with local studies.

2b



Conduct a Community Vulnerability Assessment to understand community:



2c

Use the outcomes of 2a and 2b to identify vulnerable infrastructure assets within the watershed.



Location Description	OneWatershed Assets	Exposure	Sensitivity	Impact	Adaptive Capacity

STEP
3

Identify and prioritize climate resilience projects.



Image courtesy of C/CAG

Figure 2. OneWatershed Framework Approach

2.2 San Bruno Creek Watershed

The low-lying San Bruno Creek watershed collects runoff from a 4.5-square-mile drainage area encompassing most of the City of San Bruno and is largely located within the San Bruno Creek Flood Control Zone, which was established by the former San Mateo County Flood District in 1967 and now overseen by OneShoreline. The watershed is bounded by the City of South San Francisco to the north, San Francisco International Airport (SFO) to the east, the City of Millbrae to the south, and the City of Pacifica and Coast Range to the west.

In the western hillside neighborhoods, residents live among winding streets and homes tucked into the slopes of the Santa Cruz Mountains. Here, rainfall quickly gathers momentum as it flows downhill through residential streets and storm drains. As the topography flattens toward the Bay, the watershed transitions into densely developed commercial corridors and compact residential neighborhoods where families live in close-knit communities, many within walking distance of

schools, parks, and local businesses. In these low-lying areas, particularly the Belle Air neighborhood near Belle Air Elementary School and Lions Park, stormwater has nowhere to go but through an engineered network of channels, pipes, and pumps.

Runoff generally flows from the Santa Cruz Mountains in the western suburban hillside upper reaches of the watershed into the San Bruno Creek and/or storm drain pipes, where it is conveyed east towards the flatter, more urban areas of the watershed. The flood management infrastructure reflects a complex multi-jurisdictional landscape where no single entity controls the entire system. Two pump stations, Walnut and Angus, constructed by the former Flood Control District and now owned and operated by OneShoreline, provide critical drainage by lifting stormwater from low-lying areas into the North Channel and Cupid Row Canal, respectively. During heavy rains, residents in the flatlands depend entirely on these pumps working properly, a vulnerability many neighbors became acutely aware of during past flood events. Caltrans owns and operates a stormwater detention basin along 7th Avenue beneath Interstate 380 that provides temporary storage and conveys flows to the North Channel. Flow discharges into Cupid's Row Canal and North Channel before entering the San Francisco Bay through a tide gate structure originally constructed by SFO in 1948 and last repaired by OneShoreline in 2022. Flood management infrastructure in the watershed is owned and operated by the City of San Bruno, BART, SFO, OneShoreline, and Caltrans (San Francisco International Airport [SFO], 2015).

Portions of the San Bruno Creek corridor, including areas adjacent to Cupid's Row Canal and SFO properties, are subject to a Resource Agency Permit (RAP) covering the endangered San Francisco garter snake and California red-legged frog. The RAP establishes specific operational, maintenance, and reporting requirements intended to avoid and minimize impacts to covered species and their habitat. The watershed was chosen for this Pilot Study because it is relatively small, highly urbanized, adjacent to the San Francisco Bay, and houses underserved communities that face multiple climate hazards. Families in these neighborhoods live at the convergence of multiple environmental stressors: major highways like Interstate 380 and U.S. 101 bring traffic noise and air pollution, SFO's proximity increases such pollution with flight paths overhead and the rising water levels of the San Francisco Bay create significant flood risk. The low-lying Belle Air neighborhood, in particular, faces a compounding challenge. Here, residents live within the Federal Emergency Management Agency's (FEMA) 100-year floodplain, where chronic flooding already disrupts daily life during winter storms. Climate projections show this will only worsen as rising sea levels, more extreme and frequent precipitation, and resulting storm surge converge on one of the watershed's most vulnerable areas. The *San Bruno Creek / Colma Creek Resiliency Study* (SFO, 2015) summarizes an analysis of flood vulnerabilities in the watershed.

3. ONEWATERSHED FRAMEWORK APPLICATION

In 2025, the Consultant Team and PMT worked collaboratively with Resilient San Bruno and other watershed residents to pilot the following three steps of the Framework in the San Bruno Creek watershed:

- Step 1: Identify multi-agency, multi-stakeholder collaborative partnerships specific to communities in the target watershed.
- Step 2: Assess watershed-scale vulnerability of OneWatershed infrastructure and assets to climate change hazards.
- Step 3: Identify and prioritize climate resilience projects.

3.1 Step 1: Identify Multi-Agency, Multi-Stakeholder Collaborative Partnerships

In the San Bruno Creek Watershed, the lead community group is the Resilient San Bruno Team, established by CRC in early 2024. The group meets monthly to discuss a range of community resilience topics and works collaboratively with the San Bruno Creek Watershed partners who led the Pilot Study (shown in Figure 3). These partners bring distinct but complementary roles to watershed resilience: the City of San Bruno provides stormwater management, roadways, parks, and other essential municipal services; OneShoreline holds San Bruno Creek Flood Zone responsibility and leads multi-jurisdictional projects addressing water-related impacts of climate change; the Bay Area Water Supply and Conservation Agency (BAWSCA) provides regional water supply reliability planning and coordinates water conservation programs for 26 member agencies that purchase water wholesale from the San Francisco Regional Water System; the City of South San Francisco operates a wastewater treatment plant serving South Francisco and San Bruno residents; and the City/County Association of Governments (C/CAG) coordinates regional stormwater management and planning efforts across San Mateo County.



Figure 3. San Bruno Creek OneWatershed Pilot Study Project Partners

3.2 Step 2: Assess Watershed-Scale Vulnerability of OneWatershed Infrastructure and Assets to Climate Change Hazards.

3.2.1 Step 2A: Assess Climate Hazards

Available climate hazard data were mapped and reviewed to identify the locations of flood, drought, extreme heat, and wildfire hazard exposure to OneWatershed infrastructure, including water, wastewater, and stormwater, within the watershed. The Framework assessed four climate scenarios. Of these, this Pilot Study applied the Mid-Century – Intermediate climate scenario. This scenario was selected because it reflects the intermediate emissions trajectory and represents the most urgent climate risks expected to materialize within the lifetime of community members participating in the CVA, making it the most relevant timeframe for understanding personal and community-level/system-wide impacts. Geospatial climate change hazard and social vulnerability layers provided from Cal-Adapt, USGS CoSMos and other state and regional datasets, along with additional watershed-specific layers requested from local and regional agencies or publicly available online, were compiled and mapped (Table 1).

The climate hazard data and OneWatershed infrastructure layers were compiled into four climate hazard exposure maps (i.e., flooding, drought, extreme heat, wildfire), and vulnerable communities, which are provided in Appendix A. The maps were used to incorporate anecdotal observations of flooding collected during CVA workshops 1 and 2 and stakeholder input on watershed sensitivities and impacts to holistically understand vulnerability throughout the watershed (as presented at CVA workshop 3).

Table 1. Datasets Supporting Climate Hazards and OneWatershed Infrastructure

Data Type	Dataset(s) Assessed	Reference(s)
Climate Hazards		
Flooding	0.8 feet sea level rise with 100-year coastal flood extent projections (2050 timeframe)	US Geological Survey (USGS) Coastal Storm Modeling System v2.1; (Barnard et al., 2019), accessed via the Our Coast Our Future web platform (Point Blue Conservation Science and USGS 2021 [2025]).
	1% annual chance flood hazard	FEMA, 2019
	Stakeholder flood reports	CRC Workshops held in 2025 (see Section 3.2.2).
	Stormwater problem areas	City of San Bruno, 2014a
	Groundwater for 0.8 feet sea level rise (2050 timeframe)	USGS Coastal Storm Modeling System-Groundwater model (Befus et al., 2020).
Extreme Heat	Representative Concentration Pathway (RCP) 4.5 (2040-2049 timeframe)	City Systems, 2023
	California urban canopy	US Department of Agriculture and US Forest Service, 2025

Data Type	Dataset(s) Assessed	Reference(s)
Wildfires	Fire hazard severity zones in state responsibility areas	California Department of Forestry and Fire Protection (CalFire), 2024
	Fire hazard severity zones in local responsibility areas	CalFire, 2025
	Historic fire perimeters	National Interagency Fire Center, 2024
OneWatershed Infrastructure		
Groundwater	Westside groundwater basin	California Department of Water Resources, 2022
Water Supply System	Reservoirs, supply lines, turnouts, interties, storage tanks, treatment plants	City of San Bruno and San Francisco Public Utilities Commission provided upon request in 2025.
Wastewater System	Private laterals, sewer main pipes, lift stations, wet wells and detention facilities, treatment plants, recycled water distribution system	South San Francisco and San Bruno Sewer District provided upon request in 2025.
Storm Drain System	Inlets, storm drainpipes, pump stations, channels, detention facilities, outfalls, stormwater treatment assets (e.g., green stormwater infrastructure)	City of San Bruno and OneShoreline provided upon request in 2025.
Other Supporting Datasets		
Vulnerable Communities	CalEnviroScreen 4.0	California Office of Environmental Health Hazard Assessment, 2021
	Community vulnerability	San Francisco Bay Conservation and Development Commission, 2023

Note: Extreme precipitation scenario data were not applied to the San Bruno Creek OneWatershed Pilot Study, since watershed and combined flood modeling was outside the scope of the available budget. Additionally, the Framework also found that “the impact of climate change to local water sources will not significantly alter the total supply reliability to San Mateo BAWSCA agencies” due to the City’s reliance on regional water systems and other drought resilience measures. Therefore, the mid-century intermediate water supply scenario was considered homogeneous throughout the Pilot Study area.

3.2.2 Step 2B: Assess Community Vulnerabilities

Step 2B, the Community Vulnerability Assessment, was designed to compile experiential (lived experience) data from residents in the San Bruno Creek watershed with known climate hazard data. The objective was to identify where residents experience flooding, drought, extreme heat, and wildfire (and tangentially air quality issues related to wildfire-generated smoke or other subregional factors), what resources are currently being used to prevent and recover from these climate change impacts, and what additional resources are needed to mitigate these vulnerabilities or better support recovery. Workshops and a community survey were employed to facilitate CVA data collection and evaluation.

Community Workshops

Four community-wide workshops, hosted in both English and Spanish, were designed to gather the data described above, and crucially, rely on information gathered through working closely with the Resilient San Bruno Team. These workshops are described in more detail below. Two additional workshops were hosted to present the CVA results and garner input on the suite of proposed climate resilience projects. The presented results are discussed under Step 2C in Section 3.2.3, and the proposed climate resilience projects are discussed in Section 4.

*Workshops 1 and 2 – March 10, 2025 (English) & March 20, 2025 (Spanish)
Belle Air Elementary School (450 3rd Avenue, San Bruno, CA 94066)*

Background information was presented on identified climate change hazards for the City of San Bruno. Experiential data were collected from workshop participants. A survey was also distributed to collect additional data from workshop participants, as well as their families, friends, and colleagues within the watershed, to learn about the location of climate hazards, their impacts, and community preparedness for the four climate hazards. During workshops, residents also placed stickers on maps to indicate locations of observed flooding.



Figure 4. Photos from Workshops 1 and 2

Workshops 3 and 4 – April 14, 2025 (English) & April 28, 2025 (Spanish)
One Love Café (486 San Mateo Ave, San Bruno, CA 94066)

Workshops were held with the goal of identifying resources and information that community members currently use to prepare for and recover from extreme weather events to better understand existing adaptive capacity and areas of additional need. Attendees were divided into small groups to discuss current resources, unmet needs, and aspirational programs or projects beneficial to the community. Each group ranked their confidence in their ability to recover from extreme weather events. Attendees noted known resources on sticky notes. Each group selected their top five resources and categorized them into physical, informational, financial, service, or location needs. At the end of the session, each community member voted on their top three resources.

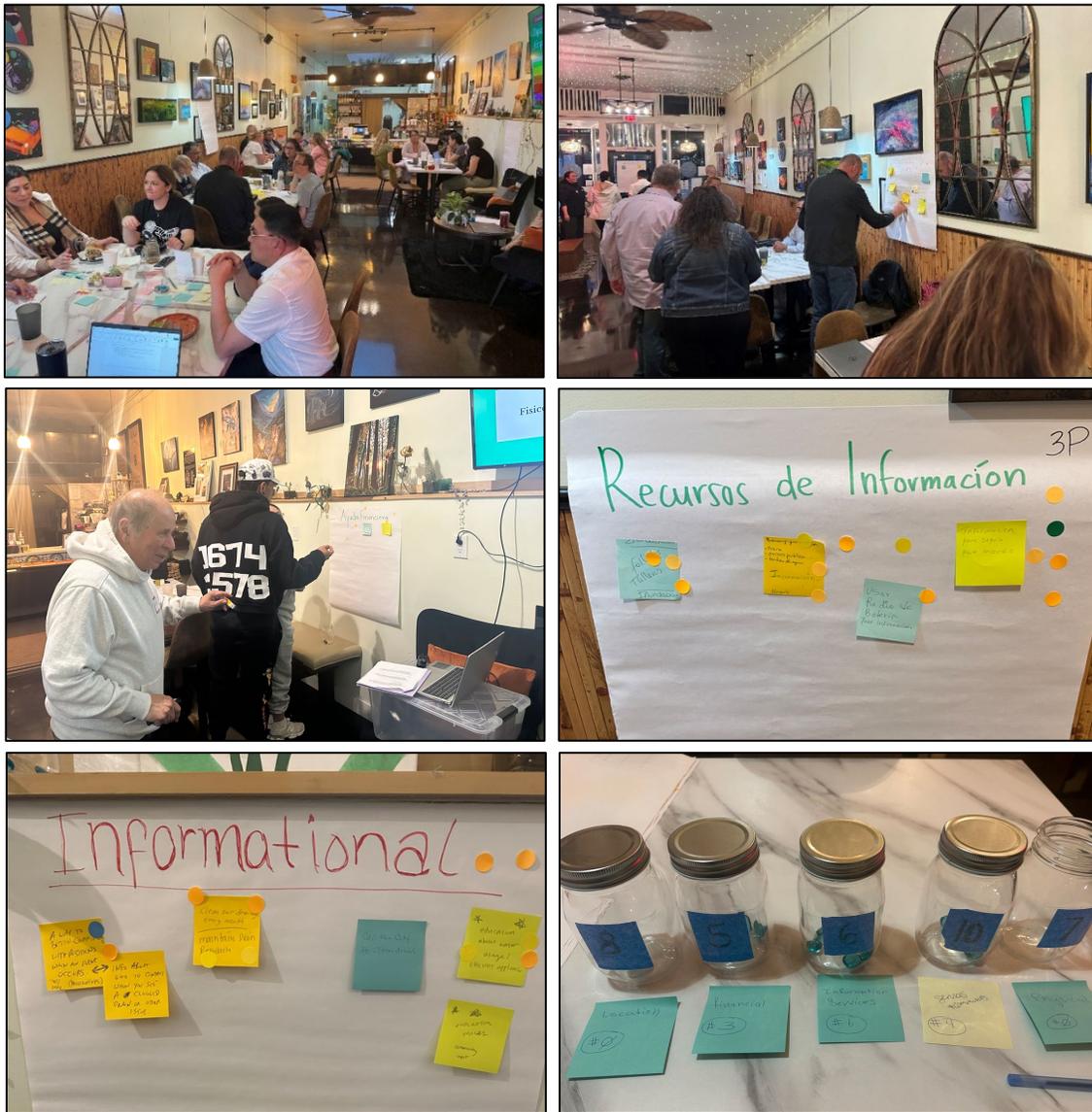


Figure 5. Photos from Workshops 3 and 4

CVA Survey

A community survey was also distributed both electronically and in person at the community workshops, as well as during pop-up events at other community events throughout San Bruno, to further assess neighborhood-specific concerns regarding climate hazards. A total of 173 surveys were collected, with the two largest represented communities including San Bruno Park (25% of respondents), and Belle Air (16% of respondents) (Figure 6). Results for the top two neighborhoods are shown in Figure 7 and Figure 8. In San Bruno Park, air quality, wildfire, and heat were the hazards noted as having the highest level of concern. In Belle Air, flood, heat, and air quality were the hazards noted as having the highest level of concern.

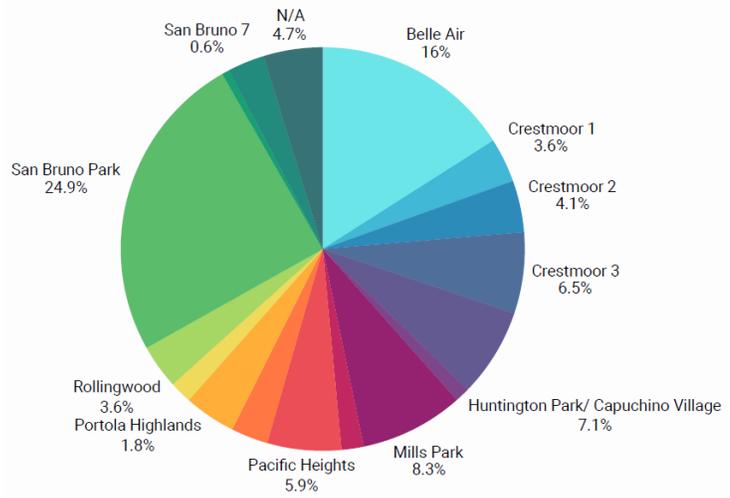


Figure 6. Distribution of CVA Survey Respondents

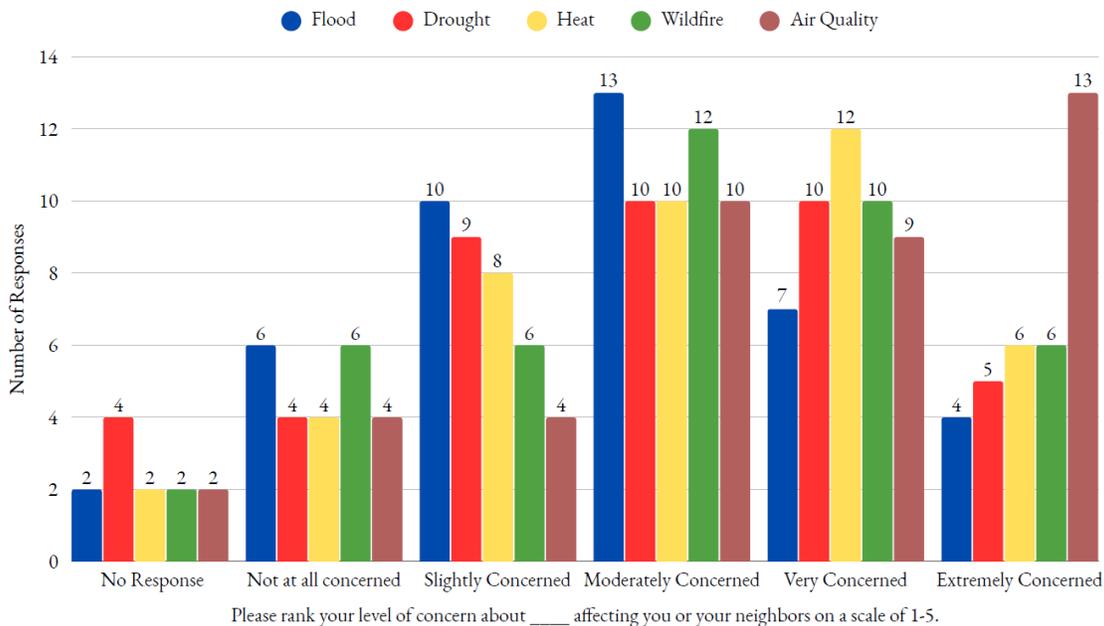


Figure 7. Survey Results - San Bruno Park Neighborhood Climate Hazard Concerns

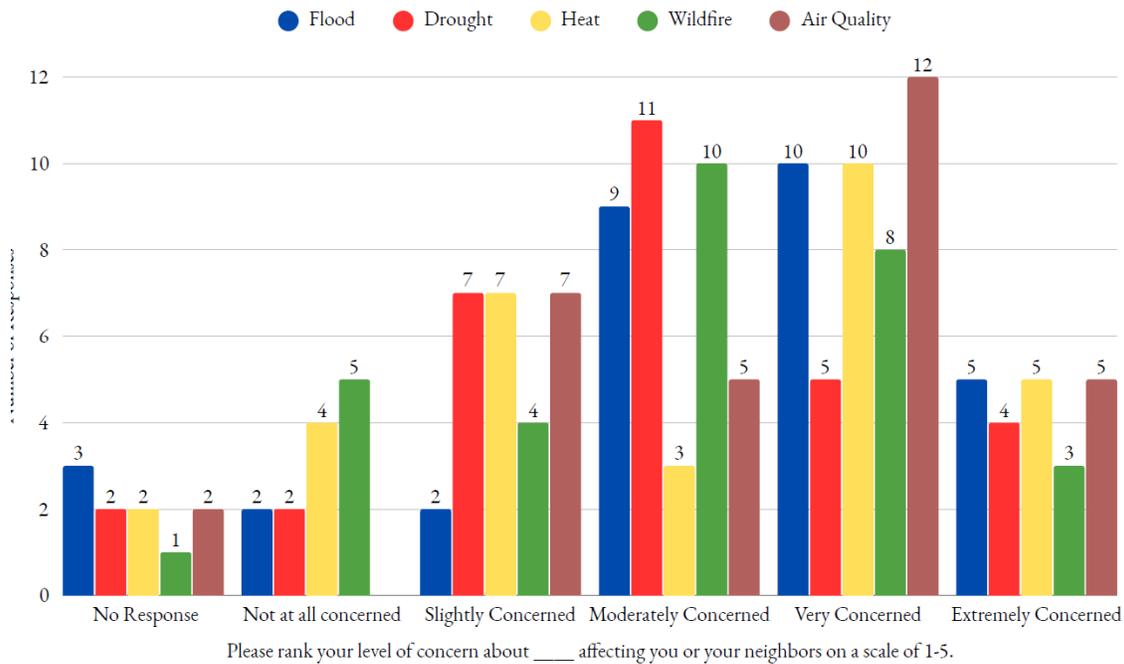


Figure 8. Survey Results - Belle Air Neighborhood Climate Hazard Concerns

3.2.3 Step 2C: Integrate Climate Hazard Vulnerabilities and Resident Experiences

A semiquantitative approach was used to assess vulnerability, whereby the gathered data and information were compiled into a narrative community vulnerability assessment table to describe and prioritize key vulnerabilities (see Appendix B). The table summarizes impacted OneWatershed assets, their location, exposure, sensitivity, existing and planned adaptive capacity to specific climate hazards, as well as any planned projects that could reduce the vulnerability, infrastructure resource gaps, whether the asset and hazard were identified by the community during CVA workshops, and a vulnerability score based on California Governor's Office of Emergency Services guidance (2020). Results from the CVA process are also shown on the climate hazard maps in Figures 9 through 12.

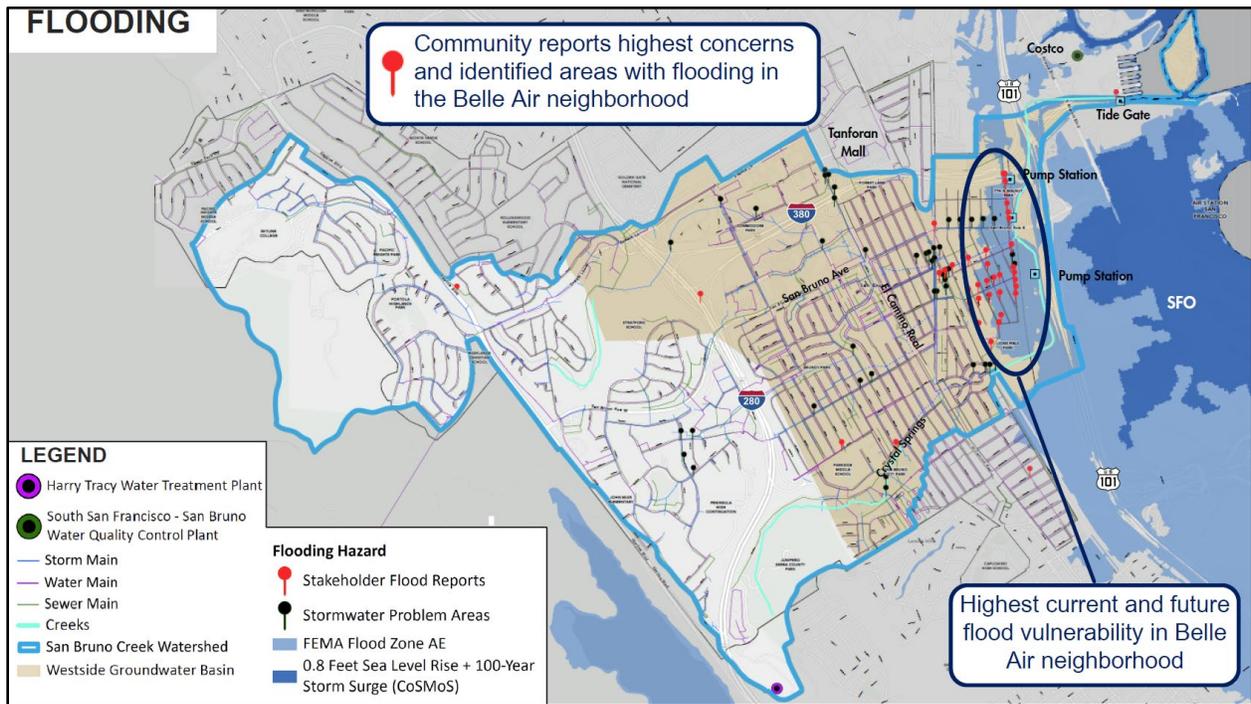


Figure 9. Coastal Flood Hazard Exposure and Community Flooding Concerns

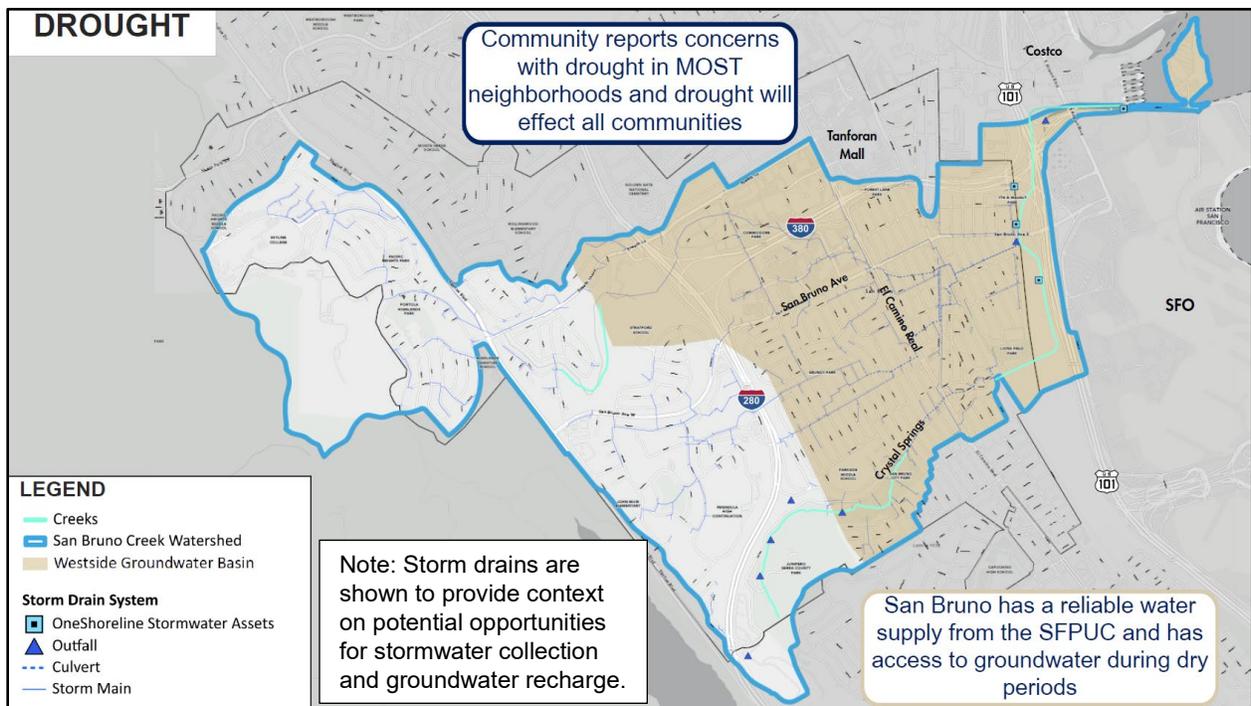


Figure 10. Drought Hazard and Related Community Concerns

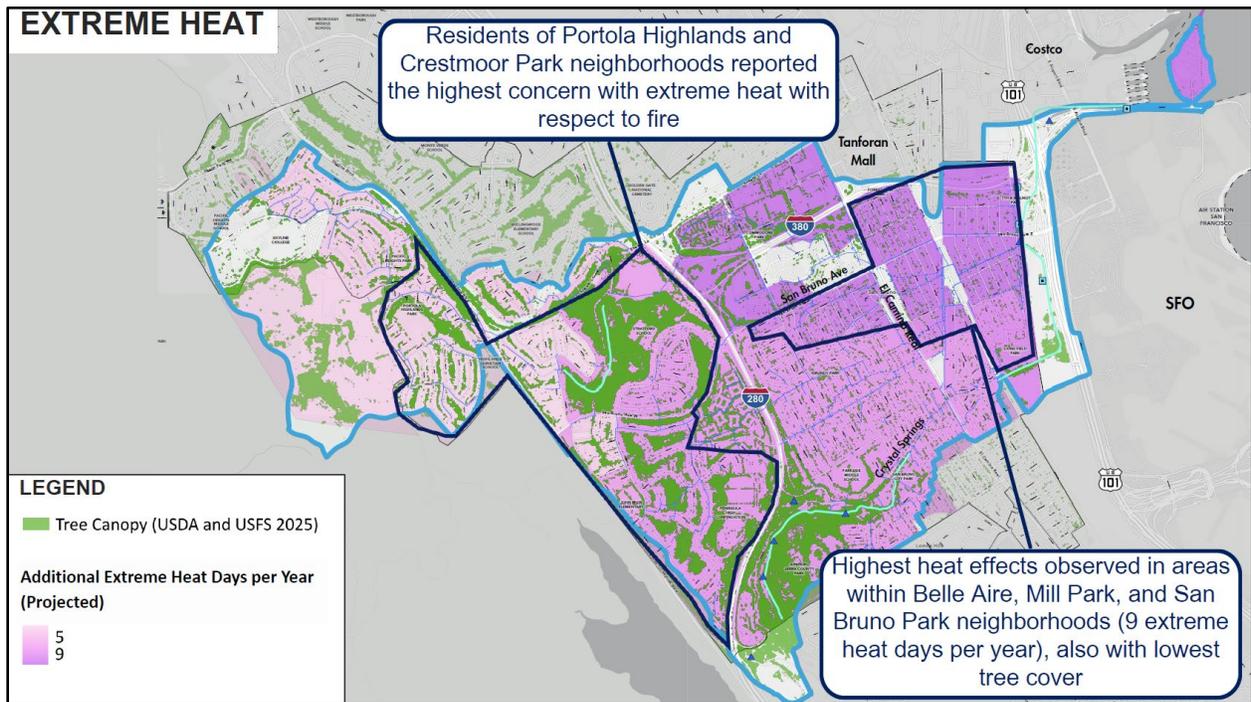


Figure 11. Extreme Heat Hazard and Related Community Concerns

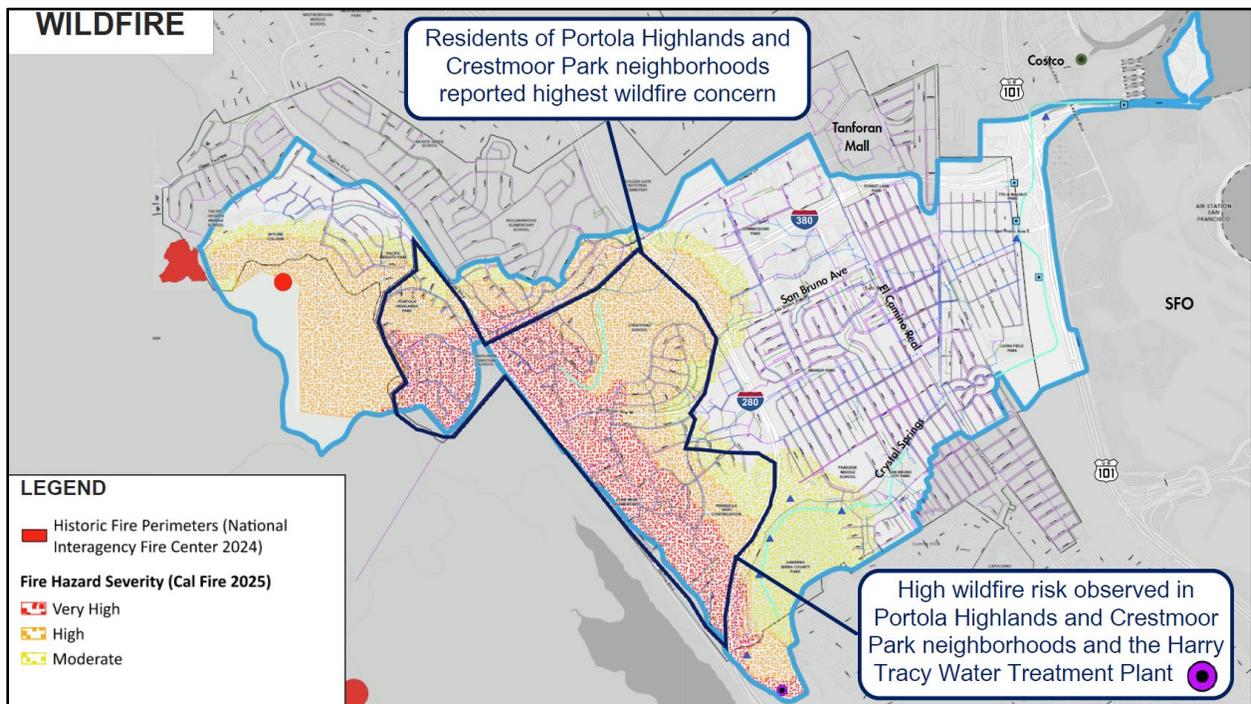


Figure 12. Wildfire Hazards and Related Community Concerns

*Workshops 5 and 6 – October 22, 2025 (English) & November 3, 2025 (Spanish)
Belle Air Elementary School (450 3rd Avenue, San Bruno, CA 94066)*

The community vulnerability assessment findings were presented. Residents were invited to engage in an interactive activity featuring 10 potential project posters (Appendix C), each summarizing a different project type for San Bruno that can reduce climate change impacts. Some projects were planned/ongoing and already partially or fully funded, while others were conceptual and would require funding for implementation. Projects that were based on previous community comments during the CVA process and Resilient San Bruno meetings had a “Community Idea” sticker. Workshop attendees made several rounds visiting different project posters and engaged in dialogue with practitioners representing each project type. Each participant was given a survey booklet to assess different projects and share their project priorities. Importantly, the data collected in these CVA workshops were incorporated into the project prioritization scoring discussed in Section 3.3.



Figure 13. Photos from Workshops 5 and 6

3.3 Step 3: Identify and Prioritize Potential Climate Resilience Projects

Previously identified project opportunities from local and regional plans were first compiled into a preliminary list of project opportunities. Reviewed local and regional watershed-specific plans included the following:

- City of San Bruno Water System Master Plan (City of San Bruno, 2012 and 2022)
- City of San Bruno Storm Drain Master Plan (City of San Bruno, 2014a)
- City of San Bruno Sewer Master Plan (City of San Bruno, 2014b)
- City of San Bruno Safe Routes to School Plan (City of San Bruno, 2023a)
- City of San Bruno Local Roadway Safety Plan (City of San Bruno, 2023b)
- City of San Bruno Walk ‘n Bike Plan (City of San Bruno, 2016)
- City of San Bruno Green Infrastructure Plan (City of San Bruno, 2019)
- San Bruno Creek/Colma Creek Resiliency Study (SFO, 2015)
- San Mateo County Stormwater Resource Plan (San Mateo Countywide Water Pollution Prevention Program [SMCWPPP], 2017)
- San Mateo Countywide Sustainable Streets Master Plans (City/County Association of Governments of San Mateo County [C/CAG] and California Department of Transportation [Caltrans], 2021)
- Caltrans District 4 Adaptation Priorities Report (Caltrans, 2020)

In addition, the TAC provided input on planned and ongoing capital projects, maintenance activities, and related resilience initiatives within the watershed to ensure the project opportunity list reflected the current context from a risk reduction and infrastructure planning standpoint among the local partner agencies. This input included major efforts such as OneShoreline’s San Bruno Creek Resilience Project, OneShoreline’s Household Flood Supplies Pilot Project, and the City of San Bruno’s update to its Storm Drain Master Plan.

Thirty-two project opportunities from the local and regional watershed-specific plans were preliminarily identified for prioritization based on project type and location (i.e., projects should provide benefits in areas with identified climate hazard vulnerabilities). The PMT reviewed and refined the preliminary list by providing feedback on which projects were already funded, underway, designed, or built, or were no longer feasible or supported based on the latest available information and local planning input. Additional community-identified projects, based on the CVA analysis and workshops, were also added to the potential suite of projects and programs. After PMT review, 23 project opportunities remained for prioritization.

The projects in the refined opportunity list were prioritized to determine whether they address key vulnerabilities within the watershed, receive community and partner support, and provide multiple benefits. The prioritization process used a scoring matrix where projects were evaluated using best professional judgment on high-level checks rather than detailed analysis to determine whether they

met the requirements in Table 2 below. Note that the qualitative approach specified in the OneWatershed Framework was enhanced to include quantitative metrics and weighting factors associated with the OneWatershed Framework project benefits, allowing for a numerical comparison between projects. Projects and programs were assigned a score ranging from 2 (high benefit) to 0 (low to no benefit) for each prioritization question. Scores for questions were weighted based on PMT technical review and community feedback from CVA workshops to confirm that the high-priority solutions also align with community and stakeholder priorities. If this approach were to be used in other watersheds, the multipliers and weighting would be expected to look different, framed around the local needs of that unique community. The completed prioritization matrix with scored opportunities is provided as Appendix D.

Table 2. Climate Resilience Project Prioritization

Category	Prioritization Question	Multiplier (Weighting)	Maximum Points Achieved
Scale (Estimated)	How impactful is the project scale? (systemwide vs. neighborhood/ block benefit)	3	6
Climate Hazards Addressed	PRECIPITATION: Will improvement partially reduce precipitation-caused localized flooding?	2	4
	SEA LEVEL RISE: Will improvement partially reduce tidal or sea level rise-based flooding?	2	4
	DROUGHT: Would project recharge a groundwater basin?	1	2
	DROUGHT: Would project conserve water or otherwise augment water supply?	1	2
	EXTREME HEAT: Would project reduce urban heat and/or increase urban greening?	2	4
	WILDFIRE: Would project reduce wildfire risk to OneWatershed asset(s)?	1	1
Funding	Is project currently planned or co-located with another project?	1	1
	Project cost	2	4
Other Benefits	Would project provide water quality benefit?	1.5	3
	Would project re-establish natural hydrology?	1.5	3
	Would project create or enhance habitat?	1	2
	Would project serve a City-designated low resource area?	1	1
	Would project improve pedestrian or traffic safety?	1.5	1.5
	Would project improve local air quality?	3	3
Alignment with CVA	Would project provide opportunities for community education?	3	6
	Would project provide near-term adaptive capacity?	3	3

Note: The maximum points achieved for each question are unique to the suite of projects scored under this Pilot Study.

4. CLIMATE RESILIENCE PROJECTS

The OneWatershed Framework was ultimately designed to identify a variety of cross-water sector, cross-agency/partner climate resilience projects that could reduce priority vulnerabilities and increase resilience on a watershed-scale by providing multiple benefits where they are needed most. A brief description of the top ten projects is provided in Table 3. Figure 14 illustrates the proposed location of each project or program within the Pilot Study area.

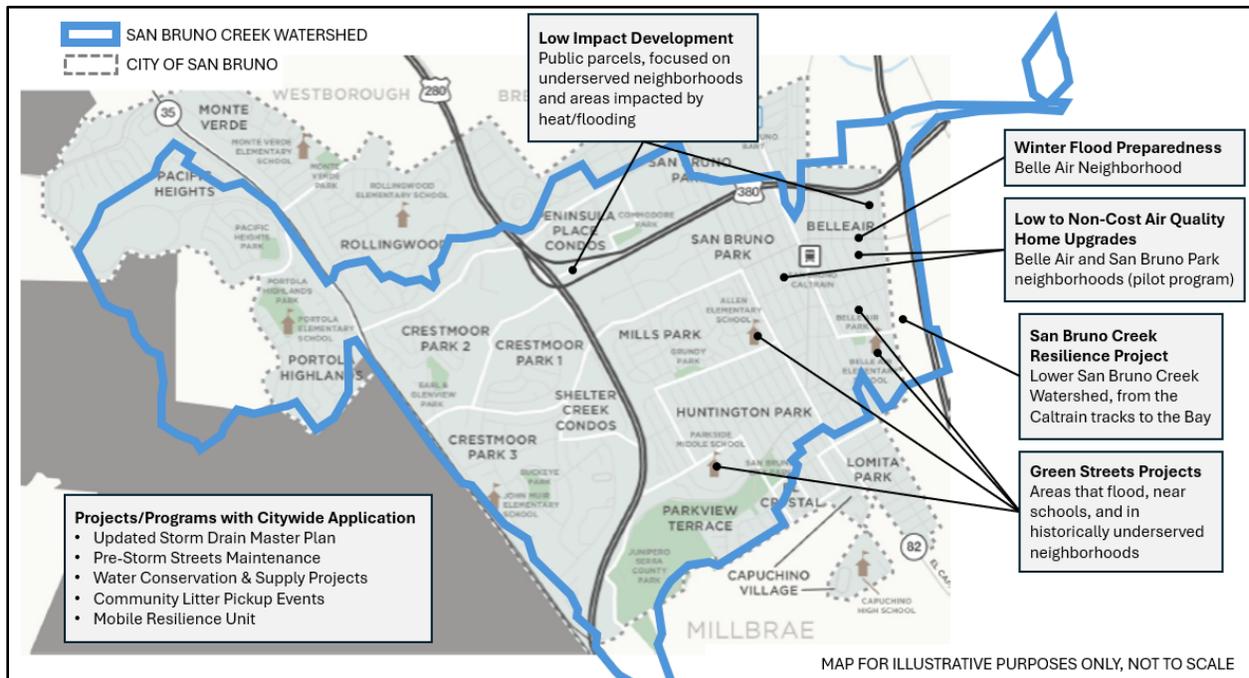
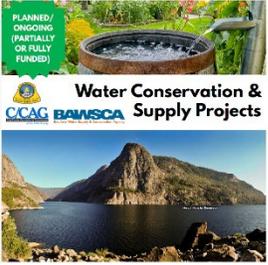


Figure 14. Potential Locations of Top Ten Climate Resilience Projects and Programs within the San Bruno Creek Watershed

As part of the scope for the Pilot Study, the Project Team proposed a concept design for a pilot “OneWatershed project” in the San Bruno Creek Watershed, based on the outcome of the CVA process. The selected project was intended to demonstrate the most holistic benefit with respect to the various climate hazards addressed in the OneWatershed Framework and with the greatest level of community support from the CVA process. Given that large-scale flood risk reduction projects were outside the scope and budget of this effort (and were already being comprehensively addressed through the OneShoreline San Bruno Creek Resilience Project), the focus naturally narrowed to green streets and low-impact development (LID) projects that could provide multiple benefits within the available resources. Among the green street concepts identified in local and regional plans, the Belle Air Elementary Safe Routes to School and Lions Park Stormwater Capture project, sourced from the City of San Bruno Safe Routes to School Plan (City of San Bruno, 2023a) and the San Mateo County Stormwater Resource Plan (SMCWPPP, 2017), received the highest prioritization score. As a result, this project was selected for development of a concept design. The concept design is described in more detail in Section 5.

Table 3. Top Ten Climate Resilience Projects and Programs Identified for the San Bruno Creek Watershed

	Scale of Impact		Climate Hazard Addressed				
	Systemwide	Neighborhood/Block	Precipitation	Sea Level Rise	Drought	Extreme Heat	Wildfire
 <p>OneShoreline is currently leading the development of the San Bruno Creek Resilience Project, which aims to identify mid- and long-term flood projects in the lower San Bruno Creek watershed. The plan will include the advancement of a priority “first project” to approximately 30% design and CEQA review.</p>	✓		✓	✓		✓	
 <p>Rebates, incentives, and projects to capture and store rainwater to promote recycled water reuse and reduce flooding impacts in communities. Examples include rain barrel/cistern rebates and incentives for transforming lawns into water-conserving landscapes.</p>	✓		✓		✓		
 <p>A van or trailer with supplies, solar-power charging, water, and outreach materials that would drive through neighborhoods and support ongoing outreach and education for climate resilience adaptive capacity. This program would strengthen community resilience and preparation for seasonal climate impact hazards and risks.</p>		✓	✓		✓	✓	✓
 <p>The City of San Bruno plans to apply advanced modeling to update and assess system deficiencies. The Plan will guide the development of a prioritized list of stormwater infrastructure improvements, to be developed in coordination with other agencies, including OneShoreline, C/CAG, Caltrans, and SFO.</p>	✓		✓	✓	✓	✓	

	Scale of Impact		Climate Hazard Addressed				
	Systemwide	Neighborhood/Block	Precipitation	Sea Level Rise	Drought	Extreme Heat	Wildfire
 <p>Green Streets</p> <p>Green streets are nature-based pervious systems located in the right-of-way that treat urban runoff from roadways and provide urban greening and potential public safety benefits (e.g., bulbouts for traffic calming or medians to protect cyclists). They can also support groundwater recharge via infiltration.</p>		✓	✓		✓	✓	
 <p>Pre-Storm Streets Maintenance</p> <p>Annual inspection and cleaning of storm drain inlets, pipes, and trash capture devices to prevent roadway flooding during large storm events and maintain water quality in local waterbodies. The City of San Bruno currently performs ongoing inspections and maintenance of its stormwater infrastructure but would benefit from increased resources.</p>	✓		✓	✓			
 <p>Community Litter Pickup Events</p> <p>Community litter pickup events have been held in the past on a volunteer basis in San Bruno and are accessible events led by community members to remove litter along neighborhood roadways. These efforts encourage community cohesion and stewardship and support pre-storm streets maintenance in flood-prone areas.</p>		✓	✓				✓
 <p>Low Impact Development</p> <p>LID is a nature-based pervious stormwater treatment system located on public or private parcels to treat urban runoff from surrounding impervious areas. LID often also includes elements of urban greening, pedestrian safety, and groundwater recharge and can be implemented at the regional or parcel scale.</p>	✓	✓	✓		✓	✓	

		Scale of Impact		Climate Hazard Addressed				
		Systemwide	Neighborhood/Block	Precipitation	Sea Level Rise	Drought	Extreme Heat	Wildfire
  <p>Low to Non-Cost Air Quality Home Upgrades</p> 	<p>Indoor air quality upgrades to homes and community centers, such as weather stripping and air monitors/purifiers, to improve community health. Upgrades may improve public health in areas adjacent to the airport and major highways as well as more broadly, to help mitigate impacts from wildfire smoke.</p>	-	-					✓
  <p>Winter Flood Preparedness</p> 	<p>Workshops to provide San Bruno residents with hands-on training and local preparedness checklists. Content would focus on OneShoreline’s “flood warning system” alerts and guidance on accessing supplies and rebates such as flood barriers, sump pumps, and shovels. Workshops would be focused in the Belle Air Neighborhood, which is known to have a higher risk for flooding.</p>	-	-	✓	✓			

5. ONEWATERSHED PROJECT CONCEPT

Of the projects and programs identified in Table 3, a multi-benefit, LID, or green streets project located in the vicinity of the Belle Air Elementary School was selected to move ahead to the concept stage. This process began with consideration of three alternatives, followed by the development of a project concept for the preferred alternative.

5.1 Alternative Analysis

Three high-level alternatives were proposed to the PMT for review and selection of a preferred alternative to advance to the concept stage.

Alternative 1 (Figure 15) focused on green streets and pedestrian safety improvements along 1st Avenue south of Angus Avenue East, south to the Lions Park and Belle Aire Elementary parking lot. Potential improvements included crosswalks, bioretention, street trees with subsurface storage, and a protected sidewalk. Potential benefits would include localized flood reduction, pedestrian safety in line with the San Bruno Safe Routes to School Plan (City of San Bruno, 2023a), cooling via shade trees, and stormwater quality improvement.

Alternative 2 (Figure 16) focused on Belle Aire Elementary itself, which is known to have flooding issues. Potential elements included permeable pavement with underground storage, rain barrels to collect runoff from rooftops for irrigation of school gardens or landscaping, and the replacement of some impervious area on the school blacktop for the creation of natural play areas and pathways. Potential benefits would include reduced stormwater runoff, localized flood reduction, additional cooling via shade trees and blacktop reduction, educational signage/interactive learning opportunities, and water supply.

Alternative 3 (Figure 17) was framed around Lions Park. Potential elements included a diversion from the existing storm drain to subsurface storage. The collected runoff could either be treated and used for onsite irrigation at Lions Park and/or the adjacent San Bruno Community Garden, or held for temporary flood reduction and reintroduced to the adjacent channel after the peak storm had passed. Other elements included permeable pavement, bioretention, and the refurbishment of existing swales. Benefits of this alternative would include educational signage, water supply (if used for irrigation), stormwater quality improvement, and additional cooling via shade trees.

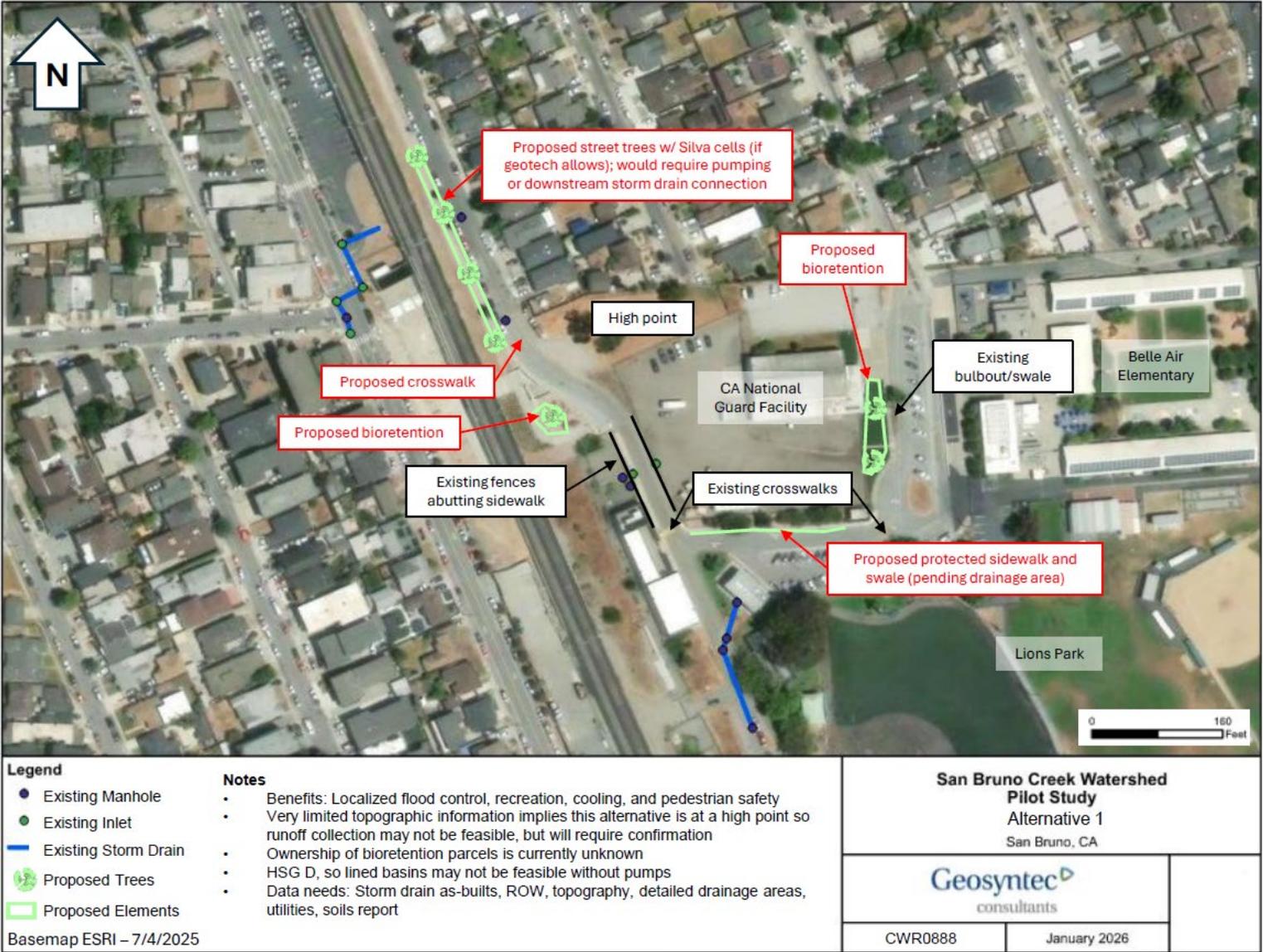


Figure 15. San Bruno Creek OneWatershed Pilot Study: Alternative 1

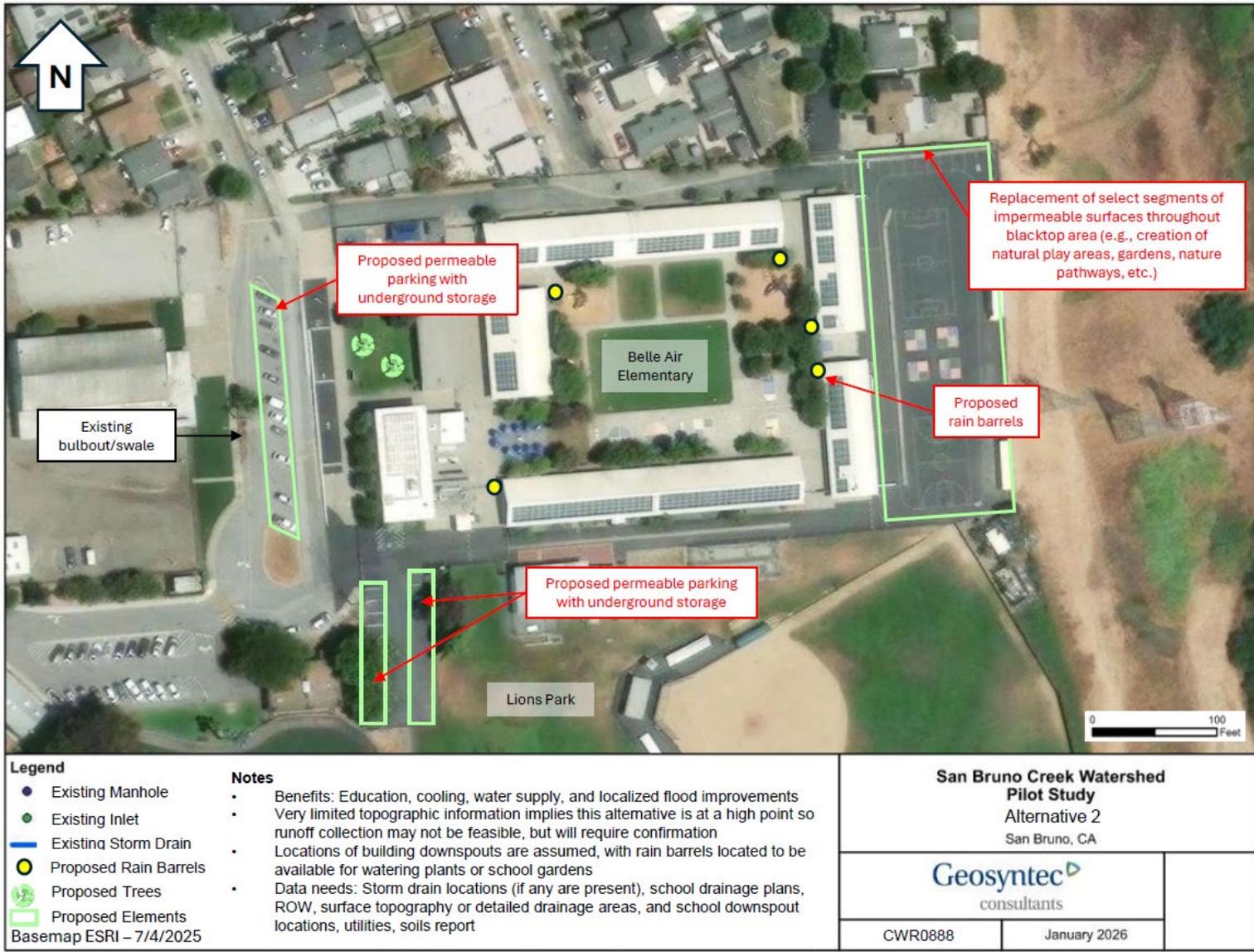


Figure 16. San Bruno Creek OneWatershed Pilot Study: Alternative 2

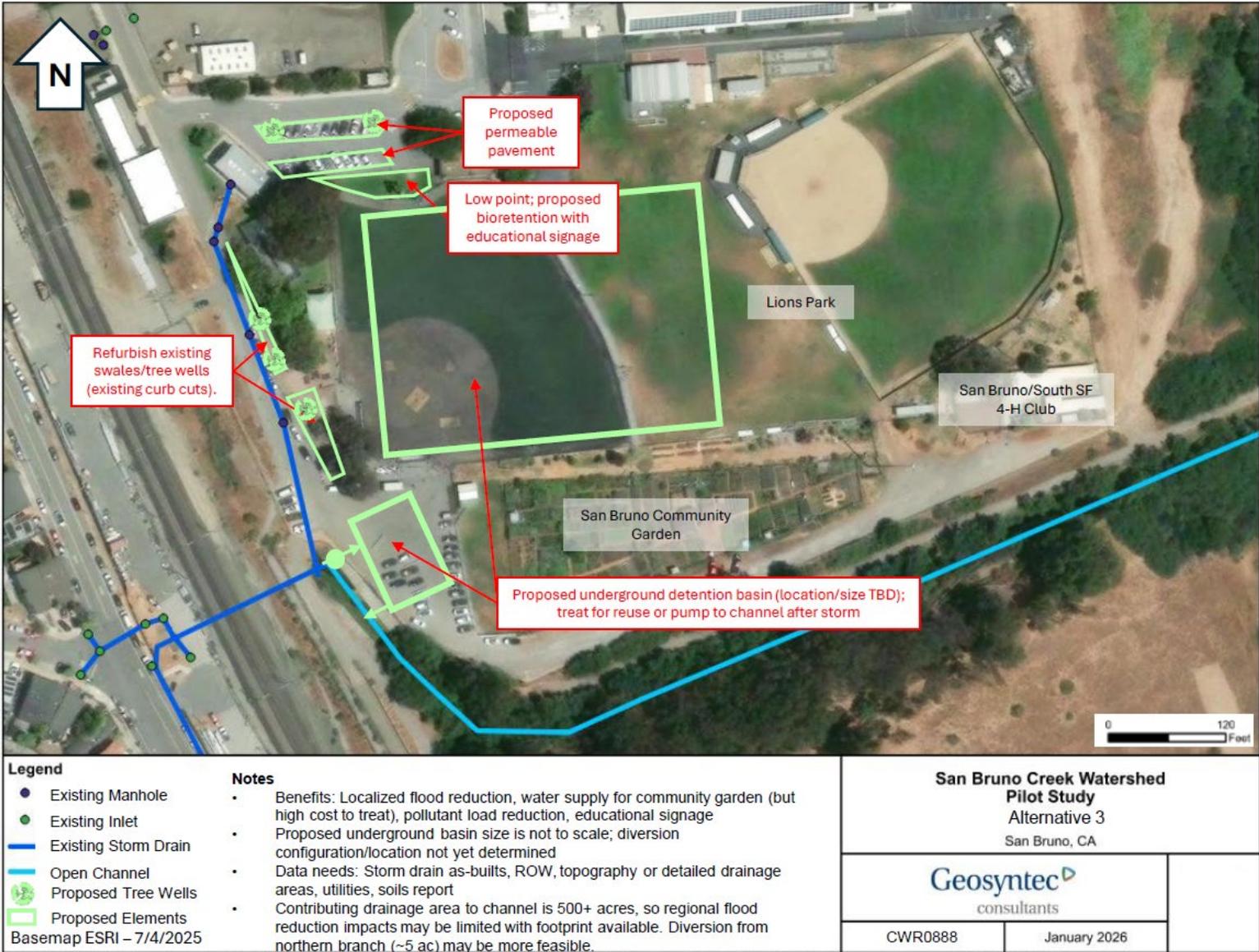


Figure 17. San Bruno Creek OneWatershed Pilot Study: Alternative 3

5.2 Concept Development

Following exploratory discussions with both the City of San Bruno and the San Bruno Park School District, elements from both Alternatives 1 and 2 were selected for advancement. The combined concept design (Figure 18 and Appendix E) introduces potential conceptual ideas that would address multiple climate hazards while also providing other benefits to Belle Air Elementary students and the community members who rely on the school for events (e.g., the Second Harvest food distribution service that takes place behind the school on the fourth Wednesday of each month).



Figure 18. Belle Air Elementary and Lions Park One Watershed Project Concept Design

5.2.1 Description of Design Elements

The school site and the surrounding areas often experience localized flooding during precipitation events. Notably, runoff pools on the lawn just west of the school's baseball field sometimes remain for months at a time. This observation is consistent with the area's location in FEMA's 1% annual chance flood hazard zone and the projection of high, possibly emergent, groundwater by 2050.

To mitigate localized flooding, an EPIC detention system providing shallow (1-2 feet below ground surface) underground storage is proposed within Lions Park¹. The system would capture stormwater and provide a means to reuse it for irrigation without using spray heads, reducing demands on potable water (EPIC Total Water Solutions, 2020). The EPIC system is sized to meet the 80 percent capture method (San Mateo Countywide Water Pollution Prevention Program [SMCWPPP], 2023) for the system’s estimated 18.8-acre drainage area. This drainage area includes runoff from 11.4 acres of impervious school buildings, surfaces, and roadways. The system is supplemented by additional storage from the proposed bioretention area along 3rd Avenue, a green roof on the building next to the school’s baseball diamond, and permeable pavement in the Lions Park and Belle Air Elementary staff parking lots. **Figure 19** provides a visualization of the proposed bioretention area with a protected sidewalk and the permeable pavement in the Lions Park parking lot. In total, 21,600 square feet of impervious area is proposed to be removed and replaced with pervious materials such as native landscaping.



Figure 19. 3rd Avenue: Potential Protected Sidewalk, Bioswale, and Permeable Parking – Existing (left) and Proposed (right)

Within Belle Air Elementary, proposed elements include a (1) demonstration rain garden in the courtyard with a three-dimensional relief map showing the natural flow of water within the San Bruno Creek Watershed, (2) large nature play zone with new trees and an outdoor classroom or amphitheater along the eastern edge of the school property, (3) bioswale feature with wood bridges in the play yard, (4) nine 200-gallon rain barrels to capture and reuse roof runoff, and (5) four Silva Cell tree wells within the courtyard. Educational signage is proposed at key features. Similar schoolyard elements are shown in Figure 20, sourced from the Resilient San Carlos Schoolyards

¹ In lieu of on-site groundwater information, it has been assumed that groundwater levels would be sufficient to keep the EPIC system trenches unsaturated. If site-specific data indicate that they would be submerged, other subsurface storage options should be explored, but may not be feasible.

Final Report (C/CAG, 2023). C/CAG’s prior work with resilient schoolyards will be an asset in working with the San Bruno School District during the next stage of the planning process.



Figure 20. Design Elements Considered for Belle Air Elementary – From left to right: Relief watershed map, play yard bioswale, and demonstration rain garden

To also address some concerns from the San Bruno Safe Routes to School Plan (City of San Bruno, 2023a), a paver pedestrian path along the south side of the southern classroom building is proposed to delineate a pedestrian walkway and create separation from vehicle traffic without reducing the total width of the driveway (i.e., by not introducing a raised sidewalk), so the full width can still be used during off hours. A raised crosswalk across 3rd Avenue at the north end of the school is also proposed to slow traffic.

The rough order-of-magnitude construction cost for the proposed improvements is approximately \$10.5 million. This estimate includes a 30% contingency, typical of early concept-level cost estimates, and an escalation rate that assumes construction occurs in fiscal year 2028-2029. This estimate also assumes high dewatering due to the assumed high water table. The rough order-of-magnitude construction cost table is provided in Attachment E.

5.2.2 Climate Resilience and Co-Benefits Achieved

The proposed project helps to address multiple climate hazards, namely precipitation-associated flooding, drought, and extreme heat, as well as other co-benefits as follows:

- **Localized Flooding:** The replacement of 21,600 square feet of impervious surfaces with pervious areas, the collection of 1,600 gallons of roof runoff in rain barrels, and the inclusion of 42,300 acre-feet of subsurface storage will help alleviate onsite ponding by reducing the volume of runoff conveyed to existing stormwater conveyance systems and low-lying areas subject to flooding. Reducing peak flows to San Bruno Creek, potentially by offloading runoff from the channel to storage facilities below the school fields, could also provide some flood mitigation to downstream areas, which have capacity limitations. It is also recommended to assess the expansion of the channel that runs south of Lions Park (under OneShoreline’s San Bruno Creek Resilience Project), and the capacity of the City’s contributing storm drain west of Lions Park (under the City’s storm drain master plan update).
- **Extreme heat:** The inclusion of over 20 new trees and the replacement of 21,600 square feet of impervious surface with pervious green space will help provide shade to students and community members, while also reducing the urban heat island effect.

- **Drought:** The collection of stormwater in rain barrels and several subsurface storage systems may provide a water source that can be used to irrigate landscaping, rain gardens, and turf, thus offsetting the demand for potable water.
- **Water quality:** Several proposed bioswales, tree filters, rain barrels, and subsurface collection systems will treat stormwater runoff through filtration and evapotranspiration. This will reduce the loading of pollutants conveyed to San Bruno Creek and the San Francisco Bay.
- **Education:** This project would provide direct educational benefits to Belle Air Elementary students on rain barrels and water conservation, native plants and habitats (via rain gardens and swales), watersheds (via the relief map), and endangered species (via the educational sign located in the nature play area, which would also connect the school campus to more directly experience the adjacent native habitat of the endangered San Francisco garter snake and California red-legged frog). An outdoor classroom is proposed on the eastern blacktop, which could also serve as a community meeting space.
- **Recreation:** This project would improve the quality of existing recreational facilities, including the school yard and baseball fields. Use of the baseball fields is currently limited during flooding or saturated conditions. The project also provides new nature play areas, interaction with natural elements (e.g., viewing the bioswales from small traversing bridges), a relief watershed map for tangible exploration, and, importantly, shade provided by new trees, allowing for cooling during rest periods between play.
- **Pedestrian safety:** Several features are being explored to better protect students and community members from traffic. The design includes a new crosswalk, a higher visibility walkway that is currently demarcated from the travel lane by cones, and the inclusion of a bioswale on the western blacktop to more clearly delineate the vehicle travel path and incorporate a physical barrier between vehicles and pedestrians. These benefits align with the goals of San Bruno’s Safe Routes to Schools Plan (City of San Bruno, 2023).

5.2.3 Limitations

The concept design has been developed based on the resources available, given the abbreviated timeline. To advance design components beyond the current state, it would be necessary to obtain additional information, such as topographical surveys to more closely assess drainage patterns, geotechnical information on the current and seasonal high depth to groundwater, and potholing and utility investigations to confirm elevations and alignments of existing storm drains. Additional conversations with both operations and facilities staff at Belle Air Elementary would also help to further refine the concept.

6. CONCLUSION AND NEXT STEPS

The *San Bruno Creek OneWatershed Climate Resilience Plan Pilot Study* demonstrates how a community co-created approach can yield hyper-local, watershed-specific projects, policies, and programs informed by the lived experiences and priorities of the local community. Objectives included using community-scale input and climate change hazard exposure assessment data to identify the most vulnerable OneWatershed infrastructure, private, and community amenities at a watershed scale, and develop a suite of multi-benefit projects that address climate resilience and regulatory needs of multiple water infrastructure sectors that could be funded through innovative partnership approaches.

6.1 Lessons Learned

Several lessons learned from the Pilot Study application should be considered for future applications of the OneWatershed Framework, as described below.

- Step 2 of the OneWatershed Framework included climate hazard exposure mapping and conducting a Community Vulnerability Assessment to understand the community's sensitivity to, potential impact from, and adaptive capacity to moderate harm from climate hazards. Lessons learned associated with Step 2 include:
 - **Exposure mapping and alignment with City planning processes:** Due to the timeline associated with the grant award, the OneWatershed effort developed exposure maps concurrently with the City's Safety Element and Environmental Justice mapping efforts (which are required by State law). Earlier coordination or delaying the Pilot Study to follow the other efforts would have better aligned the scope, schedule, and approach to avoid duplication. Additionally, the exposure mapping largely confirmed existing local knowledge of climate hazards, so less resource-intensive approaches may be better suited for future applications if similar data are available.
 - **Non-water-related impacts of climate hazards:** During the CVA, some climate hazards noted by community members were not necessarily directly related to OneWatershed infrastructure (e.g., air quality). This valuable information was integrated into the Pilot Study, although it did not directly tie to a OneWatershed water-related infrastructure project to mitigate vulnerabilities, as originally envisioned in the Framework. An ideal engagement process would be able to offer residents potential next steps for addressing concerns that naturally arise from the engagement process; therefore, data on other priorities has been preserved to leverage into parallel resilience projects in the community. If the outcome/project in a future Framework application is preferred to be limited to infrastructure, it is recommended to frame community expectations around this outcome from the start of the process, and to include fire and air quality-related infrastructure partners in the PMT from the start.

- Step 3 of the OneWatershed Framework included the identification and prioritization of conceptual climate resilience projects. Lessons learned associated with Step 3 include:
 - **Project Identification:** Most initial project types were drawn from earlier studies and reports that were scheduled for update in the near term. Additional work approaches or resources to allow for earlier, targeted consultation with implementation agencies could have helped identify current priorities and projects under consideration, ensuring that project concepts were grounded in ongoing planning efforts. A more careful evaluation of which project types fit under a “OneWatershed” program should be considered in the future, as there is a wide range of potential project types, and this Pilot Study may not reflect all potential relevant projects.
 - **Wildfire risks to water infrastructure:** The CVA inputs related to wildfire hazards focused primarily on air quality impacts to residents rather than fire risks to water distribution systems and infrastructure. Consequently, potential projects to address wildfire vulnerabilities to water systems (e.g., system hardening or backup supply for firefighting) were not prioritized. This gap was partly due to the concurrent Safety Element update, as the City was not prepared to advance wildfire-related projects ahead of that planning process. For future applications, it is recommended to systematically assess infrastructure vulnerabilities for all identified climate hazards, even when community input emphasizes other impact areas.
 - **Project evaluation and prioritization:** The prioritization process was initially framed to use a binary yes/no approach to evaluating each metric. This Pilot Study expanded on the initial list of metrics and applied qualitative screening and weights to better reflect community-expressed vulnerabilities and allow for the numeric assessment of results. A similar approach in another watershed would be expected to include different metrics, scores, and weights tailored to the local needs of that community.
 - **Project scoring and prioritization process:** A significant success of the Framework was the project scoring and prioritization process, which benefited greatly from the extensive groundwork laid in earlier phases. Because the PMT had worked through challenging discussions about community vulnerabilities, project types, and partner roles in previous steps, the group was able to move efficiently through the evaluation process with a shared understanding of priorities and constraints. This demonstrated the value of investing time upfront in building common ground, even when those early discussions felt slow or difficult, because the effort paid dividends when it came time to make decisions about which projects to advance.
- Consensus decision-making within the PMT involved partners with varying statutory responsibilities and authorities, depths of understanding of infrastructure

vulnerabilities and parallel efforts, and perspectives on the framing and priorities for conceptual and ongoing/planned efforts in the watershed. Lessons learned associated with communication throughout the Framework application include:

- **Governance structure and decision-making dynamics:** A challenge emerged in the sequencing of how project concepts were vetted, including the timing of input on planned infrastructure projects during the CVA process. It is recommended that future applications of Step 3 of the OneWatershed Framework include early, targeted meetings with individual agencies prior to discussion with the full PMT. This will enable a more efficient path to project vetting and prioritization.
- **Managing community expectations:** Some partners with implementation responsibility were hesitant to present ideas for unfunded projects or programs to the community, concerned that this could create expectations leading to frustration or loss of trust if the projects did not ultimately move forward. This concern was particularly acute when ideas for potential project concepts were advanced by participants without implementation authority or budget, as implementing agencies felt they could be held accountable for delivering on ideas they had not initiated or vetted. Additionally, there was concern that project concepts for non-water-related risk mitigation did not have a clear owner, creating similar reluctance to advancing projects out of scope of the initial intent of the Framework. Partners also noted the importance of carefully communicating that resilience projects are meant to reduce climate risks rather than eliminate them entirely, to ensure realistic community understanding of what these investments can achieve.
- **Cross-agency collaboration and knowledge sharing:** A significant benefit of the OneWatershed process was the creation of a multi-agency working group that included community-based organizations, which facilitated knowledge sharing and collaboration across traditional organizational boundaries. This structure provided valuable opportunities for agencies and community-based organizations to better understand each other's priorities, capabilities, and ongoing efforts, fostering relationships and coordination mechanisms that extended beyond the immediate scope of the project. This cross-boundary collaboration represents an important outcome of the Framework, even where other aspects of the process faced challenges.
- **Recommendations:** To mitigate these potential challenges, it is recommended that the watershed-specific stakeholder group communicate upfront about the desired outcomes, potential risks, cross-departmental information needs, and the time commitments and budget required to apply the Framework. Additionally, the governance structure should ensure that agencies with implementation authority are engaged early in concept development to avoid downstream course corrections, and that the PMT engagement strategy includes targeted consultation with relevant implementation partners before full PMT presentations. Lastly, for large-scale, complex, and collaborative planning processes such as this, it would be beneficial to allocate additional resources to further facilitate coordination across agency

partners and community-based partners, especially as part of the overall community engagement process.

6.2 Next Steps

The San Bruno Creek OneWatershed Pilot Study project partners are committed to continuing to collaborate with the community and Resilient San Bruno to advance the projects and programs prioritized using the OneWatershed Framework. Several efforts, many of which were planned or initiated prior to the start of the OneWatershed pilot study, are underway, including:

- OneShoreline’s San Bruno Creek Resilience Project, initiated in November 2025, is a primary vehicle for advancing climate resilience planning and implementation. The two-year planning effort aims to achieve flood risk reduction, ecosystem restoration, and community amenities within a coordinated, watershed-scale program, and provides the governance, technical analysis, and regulatory pathway needed to move priority flood-related concepts into design, permitting, and construction. The two-year project is funded by a grant from Federal Emergency Management Agency (FEMA) and property taxes collected from the San Bruno Creek Flood Zone.
- OneShoreline's Home Protection and Insurability Initiative includes the Fiscal Year 2025-26 7th Ave Flood Protection Supplies Pilot Program. This pilot provides no-cost flood hardening supplies to residents along 7th Avenue, the lowest-lying and most flood-prone area near San Bruno Creek. Up to 30 of the approximately 80 households may receive up to \$1,500 in eligible supplies—such as sump pumps, shelving, utility platforms, gutter upgrades, and dehumidifiers—on a first-come, first-served basis. Total pilot funding, including administrative costs, is \$50,000. OneShoreline has partnered with Stanford researchers and CRC to implement the program. Trusted neighborhood community leads assist with outreach, communication, supply delivery, and ongoing feedback.
- The City is updating its storm drain master plan to inform capital investments funded in part through its Measure Q bond.
- The City is, at the time of this report, updating its Safety Element and Environmental Justice Elements.
- Resilient San Bruno, facilitated by CRC, will continue to engage San Bruno residents about climate change and environmental issues. The community-led team will continue to meet monthly and can consistently host a group of 25 or more residents. This group of community leaders provides increased opportunities for direct resident participation in creating projects and programs that benefit the San Bruno community.
- BAWSCA, the City of San Bruno, and C/CAG will continue to provide the rain barrel rebate program and rain garden incentives as part of the ongoing effort to support water conservation and resilience in San Bruno.
- Both OneShoreline and the City are participating in the 2026 update of the County’s multi-jurisdictional Local Hazard Mitigation Plan (LHMP), which will establish the region’s official risk profile, vulnerability assessment, and prioritized mitigation

actions for the next five-year planning cycle. The updated LHMP will determine which flood, sea level rise, stormwater, and shoreline projects are formally recognized as high-priority mitigation actions and, therefore, eligible to compete for FEMA Hazard Mitigation Assistance, Building Resilient Infrastructure and Communities, Flood Mitigation Assistance, and related federal and state funding programs. Inclusion in the LHMP is a prerequisite for most of these funding sources, and the 2026 update provides the primary opportunity to ensure that the City's and OneShoreline's shoreline and creek resilience projects, capital improvement priorities, and community-identified risks are accurately reflected and positioned for future implementation funding. For OneShoreline and the City, participation in the 2026 LHMP update also creates a shared, federally recognized framework for coordinating investments, sequencing projects, and demonstrating regional consistency to funding agencies and regulators.

Projects and programs will be advanced either as already planned or as new resources become available. Project partners will also engage additional agencies that are integral to the implementation of specific projects, such as the San Bruno Park School District for the advancement of the Belle Air Elementary and Lions Park conceptual design. The Partners will also continue to explore funding mechanisms, including grants, low-interest loans, and public-private partnerships to support the implementation of priority projects and programs identified in this Pilot Study.

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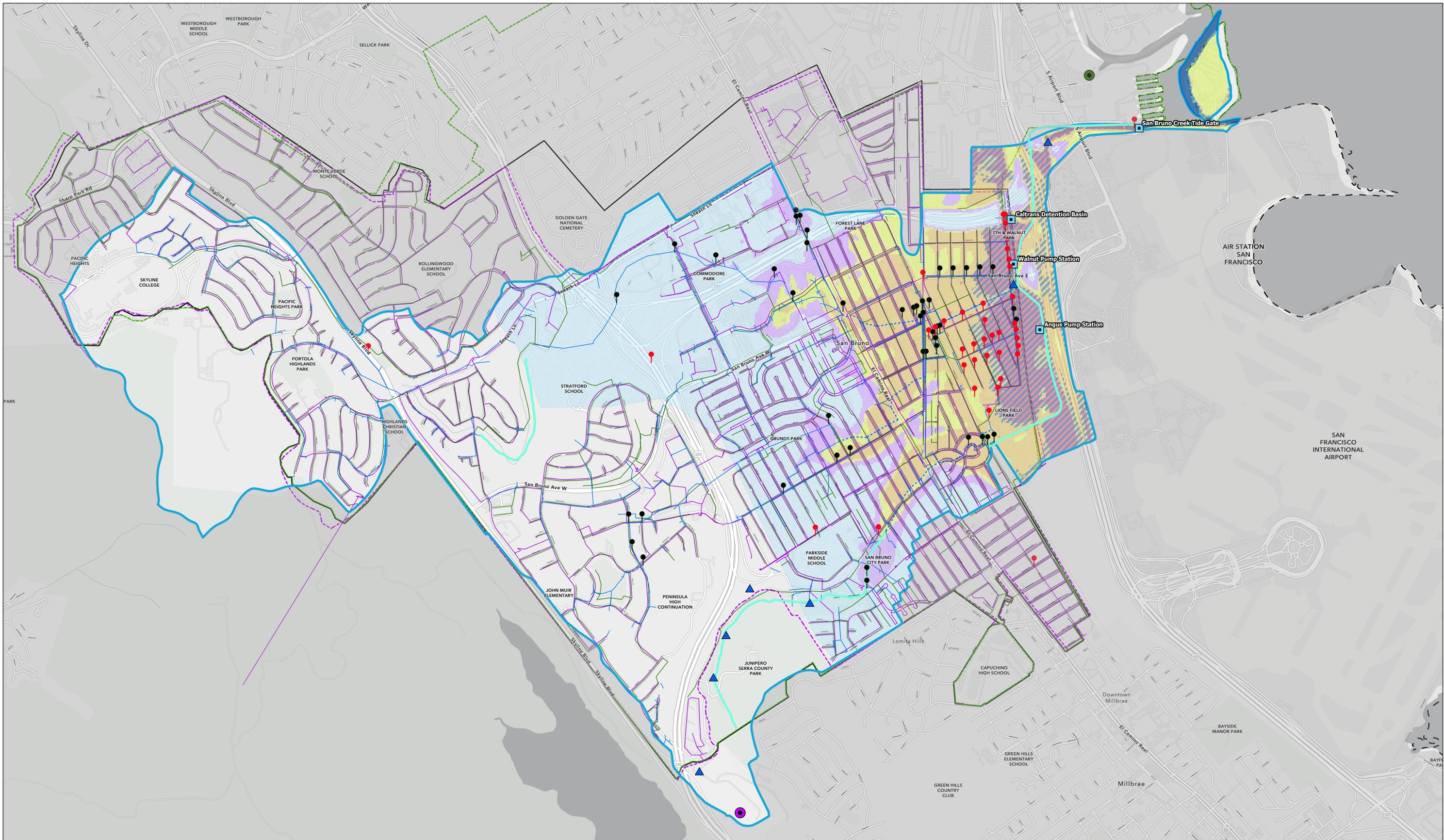
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APPENDIX A

Climate Hazard Maps

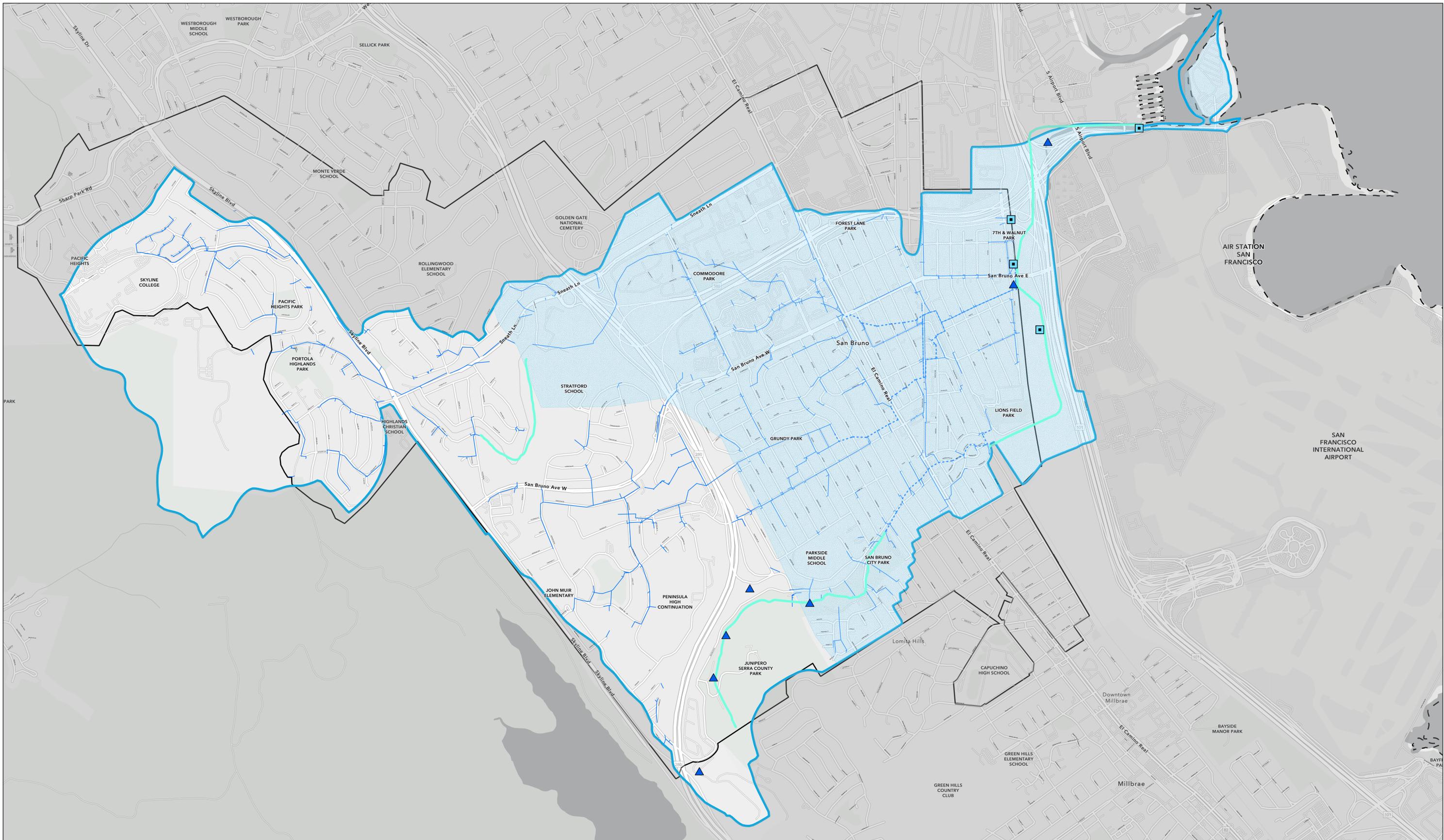


<p>Legend</p> <ul style="list-style-type: none"> — Creeks San Bruno Creek Watershed City of San Bruno San Mateo County 	<p>Storm Drain System</p> <ul style="list-style-type: none"> OneShoreline Stormwater Assets ▲ Outfall - - - Culvert — Storm Main 	<p>Water Supply System</p> <ul style="list-style-type: none"> ● Harry Tracy Water Treatment Plant — Water Main City of San Bruno Water System Service Area 	<p>Wastewater System</p> <ul style="list-style-type: none"> ● South San Francisco - San Bruno Water Quality Control Plant — Sewer Main South San Francisco and San Bruno Sewer District 	<p>Flooding Hazard</p> <ul style="list-style-type: none"> ● Stakeholder Flood Reports¹ ● Stormwater Problem Areas² — 1% Annual Chance Flood Hazard (FEMA) 0.8 Feet Sea Level Rise + 100-Year Storm Surge (CoSMoS³) 	<p>Groundwater Hazard (CoSMoS³)</p> <ul style="list-style-type: none"> GW Table at Surface (Emergent) GW Table Between 0-1 m Depth (Very Shallow) GW Table Between 1-2 m Depth (Shallow) GW Table Between 2-5 m Depth (Moderate) Westside Groundwater Basin
---	--	--	--	--	--

¹Stakeholder flood reports hazard location obtained from community workshops hosted by Climate Resilient Communities (CRC) in January and February 2025.
²From City of San Bruno Storm Drain Master Plan (GHD 2014)
³Layers downloaded from Our Coast Our Future (CoSMoS 2014).



<p>Flooding Hazards and One Watershed Assets San Bruno Creek Watershed 2050 Intermediate Climate Scenario (i.e., 0.8 feet Sea Level Rise)</p> <p style="text-align: center;">City of San Bruno, California</p>	
	<p>Figure 1</p>
CWR0888	June 2025

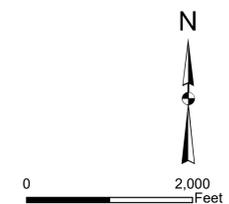


Legend

- Creeks
- San Bruno Creek Watershed
- Westside Groundwater Basin
- City of San Bruno
- San Mateo County

Storm Drain System

- OneShoreline Stormwater Assets
- ▲ Outfall
- - - Culvert
- Storm Main



**Drought Hazard and OneWatershed Assets
San Bruno Creek Watershed**

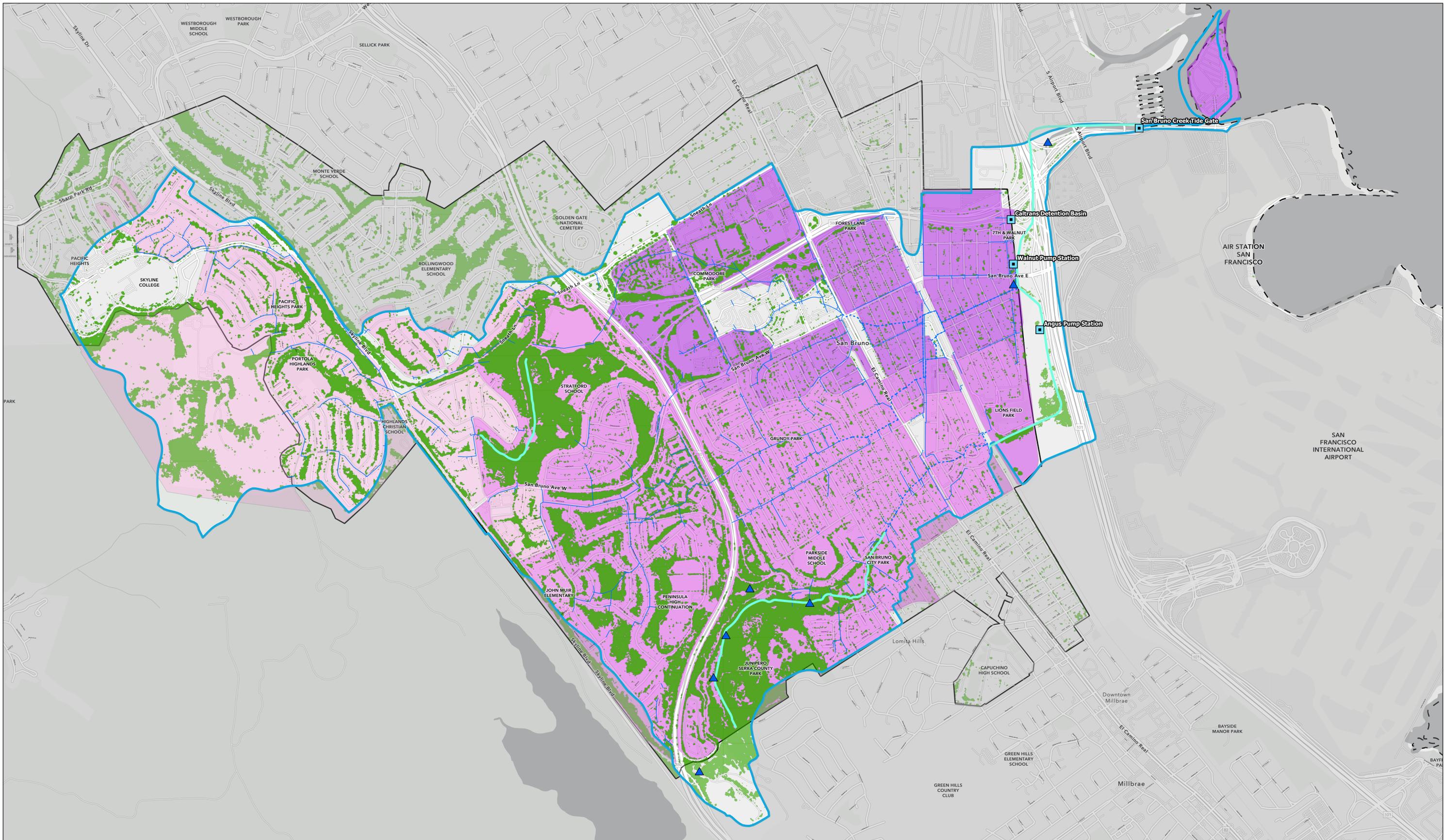
City of San Bruno, California

Geosyntec
consultants

CWR0888 June 2025

**Figure
2**

\\oakland-01\data\GIS\CCAG\Project\OneWatershed\Task 4\FINAL_aprx\Map2_Drought 6/24/2025 4:57 PM (Emily Meyers)



Legend

- Creeks
- Tree Canopy (USDA and USFS 2025)
- San Bruno Creek Watershed
- City of San Bruno
- San Mateo County

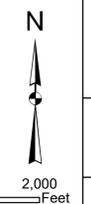
Storm Drain System

- OneShoreline Stormwater Assets
- ▲ Outfall
- - - Culvert
- Storm Main

Extreme Heat Days¹

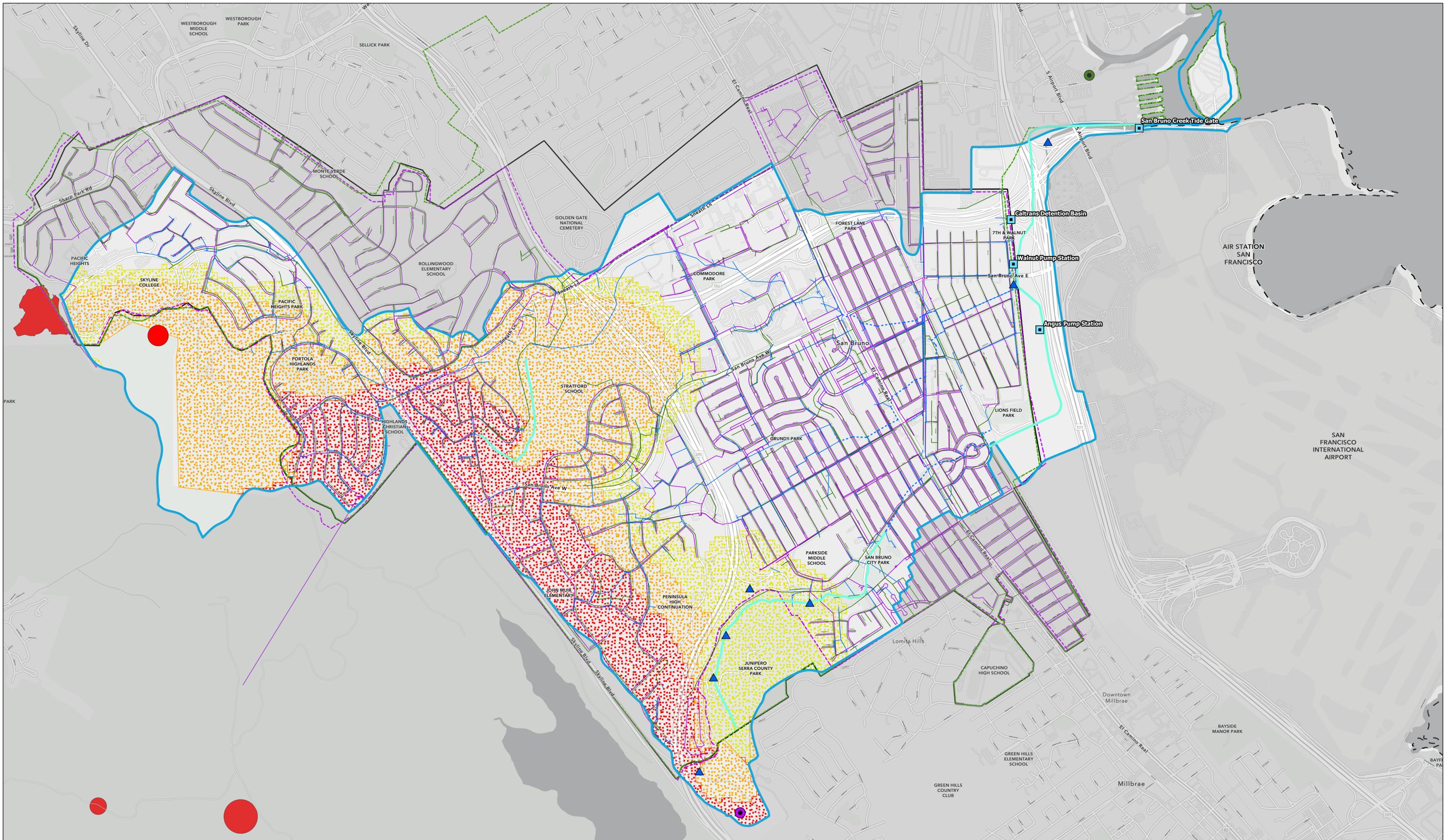
- 5
- 9

¹Number of days above 85 degrees Fahrenheit from San Mateo County Extreme Heat Dashboard (provides projections from Cal-Adapt)(City Systems 2023).



Extreme Heat Hazard and OneWatershed Assets
San Bruno Creek Watershed
 2050 Intermediate Climate Scenario (i.e. Year Range 2040-2049, RCP 4.5)
 City of San Bruno, California

	Figure 3
CWR0888	June 2025



<p>Legend</p> <ul style="list-style-type: none"> — Creeks ■ Historic Fire Perimeters (National Interagency Fire Center 2024) San Bruno Creek Watershed City of San Bruno San Mateo County 	<p>Storm Drain System</p> <ul style="list-style-type: none"> OneShoreline Stormwater Assets ▲ Outfall - - - Culvert — Storm Main 	<p>Water Supply System</p> <ul style="list-style-type: none"> ● Harry Tracy Water Treatment Plant — Water Main City of San Bruno Water System Service Area 	<p>Wastewater System</p> <ul style="list-style-type: none"> ● South San Francisco - San Bruno Water Quality Control Plant — Sewer Main South San Francisco and San Bruno Sewer District 	<p>Fire Hazard Severity (Cal Fire 2025)</p> <ul style="list-style-type: none"> ■ Very High ■ High ■ Moderate
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**Wildfire Hazard and OneWatershed Assets
San Bruno Creek Watershed**

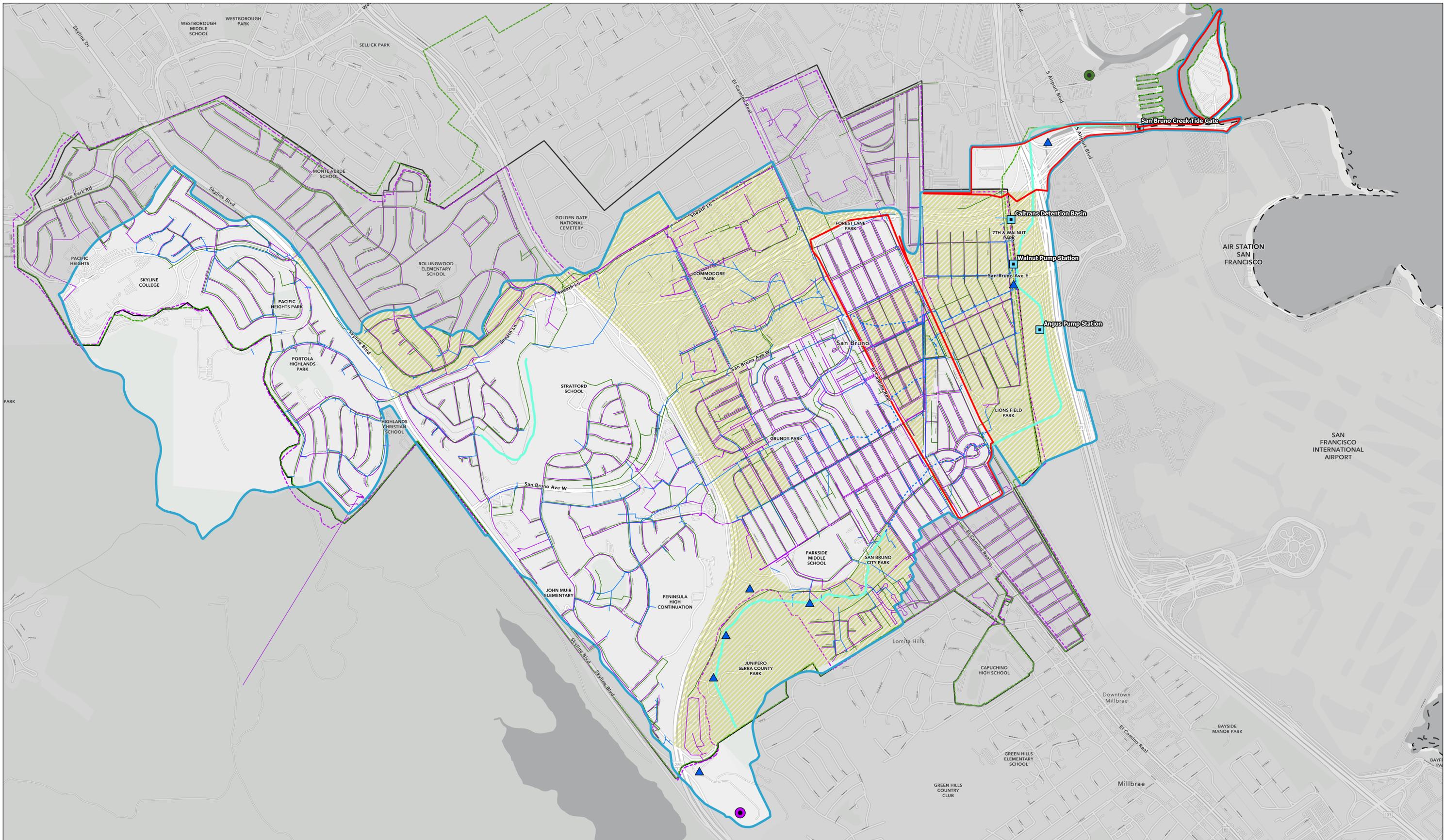
City of San Bruno, California

Geosyntec
consultants

0 2,000
Feet

Figure
4

CWR0888	June 2025	
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Legend

- Creeks
- City of San Bruno
- San Mateo County
- Storm Drain System**
- OneShoreline Stormwater Assets
- ▲ Outfall
- Culvert
- Storm Main
- Water Supply System**
- Harry Tracy Water Treatment Plant
- Water Main
- City of San Bruno Water System Service Area
- South San Francisco - San Bruno Water Quality Control Plant
- Sewer Main
- South San Francisco and San Bruno Sewer District
- Wastewater System**
- Vulnerable Communities**
- BCDC (2023)¹
- CalEnviroScreen 4.0 (2021)²

¹Block groups that rank from Moderate to Highest Social Vulnerability according to BCDC's Community Vulnerability Map (2023).
²Communities receiving the highest 25 percent of overall scores in CalEnviroScreen 4.0 (2021).
³There are no MTC Plan Bay Area 2050+ Equity Priority Communities within the San Bruno Creek Watershed.



**Vulnerable Communities
San Bruno Creek Watershed**

City of San Bruno, California



**Figure
5**

CWR0888

June 2025

APPENDIX B
San Bruno Creek Watershed Vulnerability
Assessment

Community Vulnerability Assessment

OneWatershed Framework Application - San Bruno Creek Watershed

Asset Category	Climate Hazard	Location	Exposure/Impact	Sensitivity	Adaptive Capacity - Existing	Adaptive Capacity - Planned	Planned Projects	Resource Gap	Vulnerability Score	Validated by Community
<i>Describe or list the potentially impacted OneWatershed assets.</i>	<i>Specify climate hazards (i.e., flooding, drought, wildfires, extreme heat).</i>	<i>Based on specific impact sources or anticipated location of exposure.</i>	<i>Describe the potential impact to the asset from exposure to climate change hazards.</i>	<i>Describe degree to which asset is impacted (High, Medium, or Low) based on 2050 intermediate climate scenario.</i>	<i>High, Medium, or Low score based on existing resources available to mitigate impacts.</i>	<i>High, Medium, or Low score based on planned solutions to be implemented by 2030</i>	<i>List planned projects or applicable projects identified in local or regional plans.</i>	<i>List resource gaps or potential projects.</i>	<i>Number (1 to 5) based on OES Vulnerability Score Matrix.</i>	<i>X if asset/hazard was identified by community during workshops.</i>
Stormwater Infrastructure	Flooding	Belle Air Neighborhood	Inundation of stormwater infrastructure (if undersized or not maintained)	High	Low	Medium	City of San Bruno Storm Drain Master Plan (2014) Proposed Improvements at Project ID's F-1, AD-1, and E-1. Consider addition of detention basin with Caltrans D4 Adaptation Priorities Report (2020) high-priority bridge project ROUTE 380/101 SEPARATION. Consider addition of green infrastructure to Local Roadway Safety Plan (2023) Project ID C and Walk n' Bike Plan (2016) San Bruno Ave project. High-priority regional opportunities on APN 092020060, 020155040, and 020320020 and green street opportunities on 1st Ave and E San Bruno Ave identified in SMCWPPP Stormwater Resource Plan (2017).	- Green infrastructure - Detention basins	5	X
Stormwater Infrastructure	Flooding	Belle Air Neighborhood	Emergent groundwater reducing stormwater infrastructure capacity/conveyance.	High	Low	High	OneShoreline major planned projects (Angus and Walnut Pump Station replacements) to mitigate hazard.	-	5	X
Stormwater Infrastructure	Flooding	San Bruno Park Neighborhood	Inundation of stormwater infrastructure (if undersized or not maintained)	High	Low	Low	Consider inclusion of green infrastructure in Safe Routes to School Plan (2023) Belle Air Elementary School Improvements. High-priority regional opportunities on APN 092020080 and 092020150 identified in SMCWPPP Stormwater Resource Plan (2017).	- Green infrastructure - Detention basins - Belle Air Elementary regional capture project	5	X
Stormwater Infrastructure	Flooding	Parkview Terrace Neighborhood	Inundation of stormwater infrastructure (if undersized or not maintained)	High	Low	Low	City of San Bruno Storm Drain Master Plan (2014) Proposed Improvements at Project ID B-2 and BD-1. Consider inclusion of GSI in Safe Routes to Schools (2023): Parkside Intermediate Concept. SMCWPPP Stormwater Resources Plan (2017) APN 020320030 high priority regional project. Consider inclusion of green infrastructure in Safe Routes to School Plan (2023) Parkside Intermediate Improvements.	- Green infrastructure - Detention basins - Drywells - Additional inlet piping	5	X
Stormwater Infrastructure	Flooding	Angus Pump Station	Reduction in capacity	High	Low	High	OneShoreline major planned project (pump station replacement) to mitigate hazard. Surface detention and set-back levees in Cupid Row Canal identified in San Bruno Creek/Colma Creek Resiliency Study (2015).	-	5	
Stormwater Infrastructure	Flooding	Caltrans Detention Basin	Overflow and damage to infrastructure	High	Low	High	Caltrans/OneShoreline major planned project (check valve and maintenance) to mitigate hazard.	-	5	
Stormwater Infrastructure	Flooding	San Bruno Creek Tide Gate	Bypass, resulting in upstream flooding	High	Low	High	OneShoreline major planned project (upsizing tide gate, adding pump station and force main, and bank improvements) to mitigate hazard. Floodwalls on North Channel identified in San Bruno Creek/Colma Creek Resiliency Study (2015).	-	5	
Stormwater Infrastructure	Flooding	Walnut Pump Station	Reduction in capacity	High	Low	High	OneShoreline major planned project (pump station replacement) to mitigate hazard. Surface detention and set-back levees in Cupid Row Canal identified in San Bruno Creek/Colma Creek Resiliency Study (2015).	-	5	

Community Vulnerability Assessment

OneWatershed Framework Application - San Bruno Creek Watershed

Asset Category	Climate Hazard	Location	Exposure/Impact	Sensitivity	Adaptive Capacity - Existing	Adaptive Capacity - Planned	Planned Projects	Resource Gap	Vulnerability Score	Validated by Community
<i>Describe or list the potentially impacted OneWatershed assets.</i>	<i>Specify climate hazards (i.e., flooding, drought, wildfires, extreme heat).</i>	<i>Based on specific impact sources or anticipated location of exposure.</i>	<i>Describe the potential impact to the asset from exposure to climate change hazards.</i>	<i>Describe degree to which asset is impacted (High, Medium, or Low) based on 2050 intermediate climate scenario.</i>	<i>High, Medium, or Low score based on existing resources available to mitigate impacts.</i>	<i>High, Medium, or Low score based on planned solutions to be implemented by 2030</i>	<i>List planned projects or applicable projects identified in local or regional plans.</i>	<i>List resource gaps or potential projects.</i>	<i>Number (1 to 5) based on OES Vulnerability Score Matrix.</i>	<i>X if asset/hazard was identified by community during workshops.</i>
Stormwater Infrastructure	Drought	Citywide	Accelerated shedding of leaf litter, resulting in debris clogging drainage facilities	High	Medium	-	-	- Climate-adapted trees with minimal leaf litter - Green infrastructure	4	X
Wastewater Infrastructure	Flooding	Belle Air Neighborhood	Inundation of subsurface sewer (via I&I)	Medium	Low	Medium	San Bruno Sewer Master Plan (2014) Project ID R-2.	- Septic to sewer connections - relining/resealing pipes	4	
Water Supply Infrastructure	Wildfire	Harry Tracy Water Treatment Plant	Damage to infrastructure	High	Medium	TBD	TBD	To be determined based on conversation with SFPUC	4	
Stormwater Infrastructure	Wildfire	Neighborhoods West of I-280	Damage to infrastructure and reduction in capacity due to increased erosion and debris	Medium	Low	-	-	- Increased post-fire maintenance	4	
Wastewater Infrastructure	Wildfire	Neighborhoods West of I-280	Damage to infrastructure	Medium	Low	-	-	- Operational contingency plans	4	
Water Supply Infrastructure	Wildfire	Neighborhoods West of I-280	Damage to infrastructure	Medium	Low	-	-	- Operational contingency plans	4	
Water Supply Infrastructure	Drought	Citywide	Reduction in aquifer storage for private and municipal wells.	Medium	Medium	Medium	I-280/I-380 regional stormwater capture project (SMCWPPP 2017).	- Rainwater collection for subsurface irrigation - Capture and treat - Groundwater recharge (with engineered or amended soils) - Water conservation practices	3	X
Stormwater Infrastructure	Extreme Heat	Belle Air Neighborhood	Heat-related impacts can be mitigated with increased tree canopy	-	-	-	Consider inclusion of trees in planned CIP projects.	- Sustainable streets - Climate resilient schools	-	X
Stormwater Infrastructure	Extreme Heat	Peninsula Place Condos Neighborhood	Heat-related impacts can be mitigated with increased tree canopy	-	-	-	Consider inclusion of trees in planned CIP projects.	- Sustainable streets - Climate resilient schools	-	X
Stormwater Infrastructure	Extreme Heat	San Bruno Park Neighborhood	Heat-related impacts can be mitigated with increased tree canopy	-	-	-	Consider inclusion of trees in planned CIP projects.	- Sustainable streets - Climate resilient schools	-	X

APPENDIX C
CVA Project, Program, and Policy Posters

**PLANNED/
ONGOING
(PARTIALLY
OR FULLY
FUNDED)**



San Bruno Creek Resilience Project

WHAT IS THE CREEK RESILIENCE PROJECT?

- Develop a plan for mid- and long-term flood projects.
- Complete early engineering design for a “first project” and apply for construction grants.

WHY:

- Chronic flooding, especially in the Belle Air neighborhood, has worsened in recent years, demanding long-term, coordinated solutions as climate change accelerates.

WHERE:

- Lower San Bruno Creek Watershed, from the Caltrain tracks to the Bay (including the tide gate, pump stations, and creek channel).

COST:

- Medium (planning): \$1.5m for planning (funded)
- High (final design & construction): Unfunded.

TIMELINE:

- A plan will be developed over the next two years.
- OneShoreline is planning for construction of a “first project” starting in 2030.



Flood Risk Reduction



Increased Cooling via Shade



Improve Water Quality



Community Education Opportunity



Habitat Enhancement





Updated Storm Drain Master Plan



WHAT IS THE **UPDATED STORM DRAIN MASTER PLAN?**

- An engineering tool that guides how the City manages the stormwater system.
- Advanced modeling to evaluate the stormwater system under current and future storm conditions.
- A prioritized list of stormwater improvements.
- Integration of projects into City's Capital Improvement Plan.

WHY:

- Engineering analysis is needed to: understand system deficiencies, develop projects in coordination with other agencies, including OneShoreline, C/CAG, Caltrans, and SFO, and determine the most impactful and cost-effective investments.

WHERE:

- Citywide

COST:

- Medium (develop plan); Measure Q funding

TIMELINE:

- Short term

**PLANNED/
ONGOING
(PARTIALLY
OR FULLY
FUNDED)**



Flood Risk Reduction



Improve Water Quality



Habitat Enhancement



Groundwater Recharge

Before



WHAT IS **PRE-STORM STREETS MAINTENANCE**?

- Routine maintenance and inspections of the City stormwater infrastructure.
- Annual inspection and cleaning of all storm drains, catch basins, and trash capture devices.
- Visual inspections of known flooding areas to proactively identify and address potential issues.

WHY:

- Keep storm drains clear ahead of major storms.
- Protects public safety and prevents water backflow into streets and private property.
- Helps to maintain environmental quality in local waterways

WHERE:

- Citywide

COST:

- Medium (funded with City local funds)

TIMELINE:

- Ongoing



Pre-Storm Streets Maintenance

After



**PLANNED/
ONGOING
(PARTIALLY
OR FULLY
FUNDED)**



Flood Risk
Reduction



Improve
Water
Quality

**PLANNED/
ONGOING
(PARTIALLY
OR FULLY
FUNDED)**



WHAT ARE **WATER CONSERVATION & SUPPLY PROJECTS?**

- Rebate offers on rain barrels/cisterns (up to \$200).
- Incentives for transforming lawns into water conserving landscapes, including an option to install a rain garden with an additional \$300 incentive.
- Projects help capture/store rainwater and reduce the impact of individual properties on the stormwater system.

Water Conservation & Supply Projects



WHY:

- A great way to more sustainably manage stormwater at home.
- Reduce water quality and flow impacts in communities and can be used to irrigate gardens and landscaping.
- Reduce use of drinking water supply for outdoor uses.

WHERE:

- Citywide

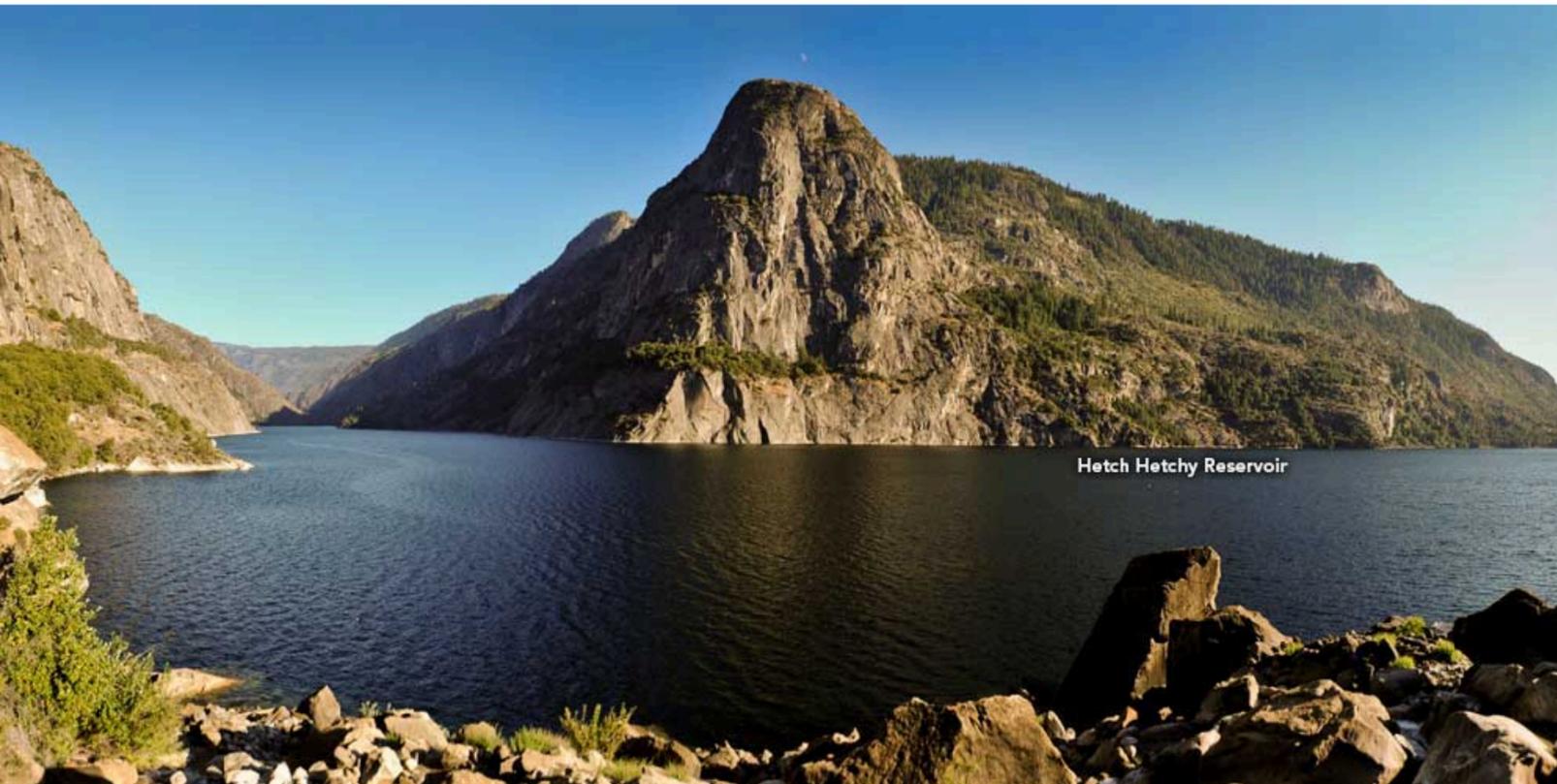
COST:

- Low/medium (funded through City, C/CAG, BAWSCA)

ONGOING

TIMELINE:

- Available annually. Opportunities to participate in pre-order programs for rain barrels (www.flowstobay.org/barrels).



Flood Risk
Reduction



Improve
Water
Quality



Community
Education
Opportunity



Groundwater
Recharge



Habitat
Enhancement



Winter Flood Preparedness



WHAT IS FLOOD PREPAREDNESS?

- Workshops to provide San Bruno residents with hands-on training and local preparedness checklists
- Community user testing of OneShoreline’s “flood early warning system” alerts

WHY:

- Residents have asked for increased access to flood warning information and more support to reduce flood risk, including clearer guidance on best practices and access to supplies and rebates for tools like flood barriers, sump pumps, and shovels.

**PLANNED/
ONGOING
(PARTIALLY
OR FULLY
FUNDED)**

WHERE:

- Belle Air neighborhood

COST:

- Low

TIMELINE:

- Short-term





WHAT ARE GREEN STREETS?

- Stormwater capture through nature-based designs.
- Integrated with roadway projects.
- Include rain gardens, pervious pavement, or vegetated buffers to manage runoff and protect cyclists/pedestrians from traffic.



Green Streets



WHY:

- Green streets collect and clean runoff from roadways.
- Improve local drainage problems.
- Enhance public safety and climate resilience.
- Can provide shade and cooling when designed with trees.

WHERE:

- Focused in areas that flood, near schools, and in historically underserved neighborhoods.

COST:

- Medium/High (\$1M+, not funded)



TIMELINE:

- A pilot project could be conceptually designed this fall.





WHAT IS **LOW IMPACT DEVELOPMENT**?

- Integrates stormwater capture and nature based designs on public property (e.g., parks, schools, parking lots)
- Includes rain gardens, infiltration trenches, above or below ground retention areas, pervious pavement, green roofs, and systems for stormwater capture and use.

WHY:

- Helps protect water quality and keep excess rainwater from impacting the storm drain system.
- Reduces localized flooding for smaller storms.
- Provides shade and cooling using trees and green roofs.

WHERE:

- Public parcels, focusing on underserved neighborhoods and areas impacted by heat/flooding.

COST:

- Medium (not funded)

TIMELINE:

- A pilot project could be conceptually designed this fall.

**CONCEPTUAL
(NOT
FUNDED)**

Low Impact Development



Flood Risk Reduction



Increased Cooling via Shade



Improve Water Quality



Community Education Opportunity



Improve Air Quality



Wildfire Risk Reduction



Habitat Enhancement



Groundwater Recharge



Low to Non-Cost Air Quality Home Upgrades



WHAT ARE AIR QUALITY HOME UPGRADES?

- Upgrades/renovations to homes and community centers such as weatherstripping, electric appliances, air monitors and air purifiers.

WHY:

- San Bruno faces high rates of asthma and significant air pollution from its proximity to airport infrastructure and major highways.
- Adapting homes and community centers can improve indoor air quality and community health by reducing air pollutants.

WHERE:

- Potential to pilot this program in the Belle Air and San Bruno Park neighborhoods, where residents are actively engaged.

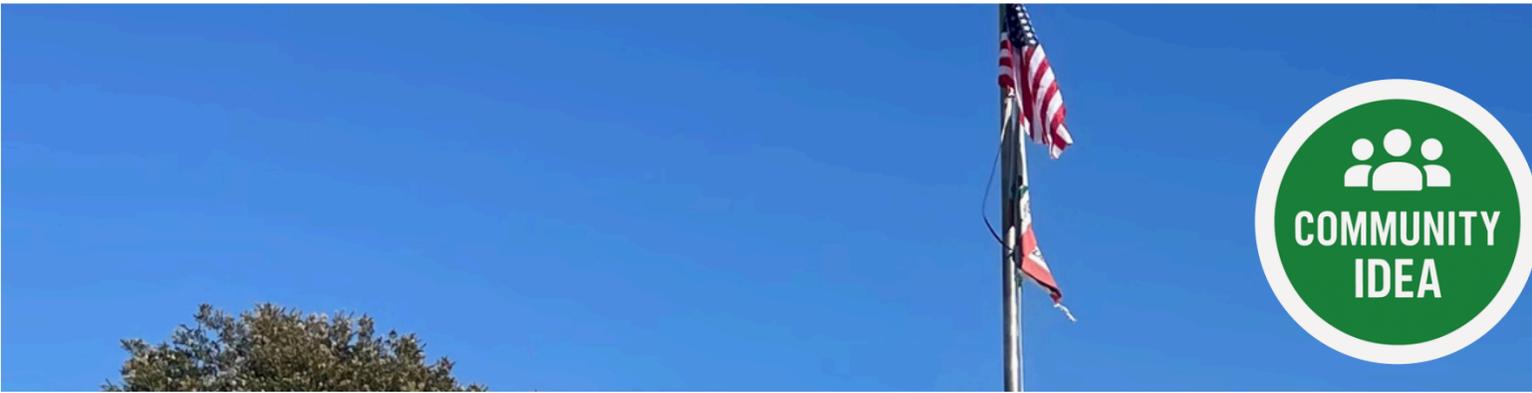
COST:

- Low/medium: dependent on number of sites/recipients, and potential for partnership with Peninsula Clean Energy (not funded).

TIMELINE:

- Short- to Medium-term (2-5 years)





Community Litter Pickup Events



WHAT IS A **Community Litter Pickup Event**?

- Community Litter Pickup Events are fun and accessible volunteer events led with a group of community members to pick up litter along neighborhood streets.

WHY:

- Community members identified litter along roads and sidewalks as a potential impact on storm drains. Litter cleanups can also encourage community cohesion and stewardship.

WHERE:

- Select locations around the city (neighborhoods, near parks and schools)

COST:

- Low (not funded)

TIMELINE:

- Short-term and ongoing (e.g., quarterly)



Mobile Resilience Unit



WHAT IS A **MOBILE RESILIENCE UNIT**?

- A van or trailer equipped with supplies, solar-powered charging, water, and outreach materials. Can rotate through neighborhoods and focus on seasonal climate impact hazards and risks.

WHY:

- Climate adaptation and resilience programming and resources strengthen community resilience and preparation.
- Supports ongoing outreach and education for adaptive capacity.

WHERE:

- Flexible deployment, especially useful in flood- or fire-prone areas

COST:

- Medium/Low (not funded)

TIMELINE:

- Short- to medium-term (2-5 years)



Flood Risk Reduction



Community Education Opportunity



Improve Air Quality



Wildfire Risk Reduction



Increased Cooling via Shade

**CONCEPTUAL
(NOT FUNDED)**

APPENDIX D
Prioritization Matrix for Climate Resilient
Projects

Prioritization Matrix for Climate Resilient Projects
OneWatershed Framework Application - San Bruno Creek Watershed

Name	Score	Source(s)	Description	Project Type	Status	Multiplier --> Maximum Points Achieved -->	OneWatershed Climate Hazards Addressed							Funding		Other Benefits						Alignment with CVA			
							Scale	2		1		2		1		1	2	1.5	1.5	1	1	1.5	3	3	3
							3 6	4	4	2	2	2	1	1	1	4	3	3	2	1	1.5	3	3	6	3
How impactful is the project scale? (systemwide vs. neighborhood/block benefit)	PRECIPITATION: Will improvement partially reduce precipitation-caused localized flooding?	SEA LEVEL RISE: Will improvement partially reduce tidal or sea level rise-based flooding?	DROUGHT: Would project recharge a groundwater basin?	DROUGHT: Would project conserve water or otherwise augment water supply?	EXTREME HEAT: Would project reduce urban heat and/or increase urban greening?	WILDFIRE: Would project reduce wildfire risk to OneWatershed asset(s)?	Is project currently planned or co-located with another project?	Project Cost	Would project provide water quality benefit?	Would project re-establish natural hydrology?	Would project create or enhance habitat?	Would project serve a City-designated low resource area?	Would project improve pedestrian or traffic safety?	Would project improve local air quality?	Would project provide opportunities for community education?	Would project provide near-term adaptive capacity?									
<i>San Bruno Creek Resilience Project Implementation</i>	33.5	OneShoreline	Mid- and long-term flood projects	Flood Control	Planned / Ongoing		2	2	2	0	0	1	0	1	0	1	2	2	1	0	0	2	1		
Belle Air Elementary Safe Routes to School and Lions Park Stormwater Capture (INCLUDED AS GREEN STREETS PROJECT EXAMPLE)	30.5	2023 City of San Bruno Safe Routes to School Plan (p 44), 2017 San Mateo County Stormwater Resources Plan (App B, APN 020430020)	Incorporate GSI into proposed improvements	Green Street	Conceptual		1	2	1	0	1	2	0	1	0	1	1	1	1	1	0	2	1		
<i>Water Conservation and Supply Projects</i>	26.0	C/CAG, BAWSCA, and City of San Bruno	Rebates and incentives	Water Supply	Planned / Ongoing		1	1	0	0	2	0	0	1	2	1	1	1	1	0	0	2	1		
<i>Mobile Resilience Unit</i>	26.0	CVA Workshop #5 and #6	Mobile resilience unit	Outreach	Conceptual		1	1	0	0	1	1	1	0	2	0	0	0	0	1	0	1	2	1	
<i>Updated Storm Drain Master Plan Implementation</i>	25.5	City of San Bruno	Advanced modeling to prioritize stormwater improvements	Flood Control	Planned / Ongoing		2	2	1	1	0	1	0	1	0	1	1	1	1	1	1	0	1	0	
<i>Green Streets Implementation</i>	23.5	C/CAG and City of San Bruno	Stormwater capture through nature-based designs along roads	Green Street	Conceptual		1	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	1	0	
<i>Pre-Storm Streets Maintenance</i>	22.0	City of San Bruno	Routine maintenance and inspections for City infrastructure	Flood Control	Planned / Ongoing		2	1	1	0	0	0	0	1	2	1	0	0	0	1	1	0	0	1	
<i>Community Litter Pickup Events</i>	21.5	CRC, OneShoreline, C/CAG	Community litter collection events	Outreach	Conceptual		1	1	0	0	0	0	1	0	2	1	0	0	0	1	0	0	2	1	
<i>Low Impact Development Implementation</i>	21.0	CVA Workshop #5 and #6	Stormwater capture through nature-based designs on public property	LID	Conceptual		1	1	0	1	0	1	0	0	1	1	1	1	1	1	0	1	1	0	
<i>Low to Non-Cost Air Quality Home Upgrades</i>	19.0	CRC	Assume City-wide	Air Quality	Conceptual		0	0	0	0	0	0	1	1	2	0	0	0	0	1	0	1	2	1	
<i>Winter Flood Preparedness</i>	19.0	OneShoreline	Workshops and flood early-warning system	Outreach	Planned / Ongoing		0	1	1	0	0	0	0	1	2	0	0	0	0	1	0	0	2	1	
Regional Stormwater Capture Project at I-280 and I-380 (Subsurface) (INCLUDED AS REGIONAL SCALE LID PROJECT EXAMPLE)	15.5	Caltrans, 2019 City of San Bruno Green Infrastructure Plan (p 123)	Infiltration gallery with storm drain improvements and new pump station	LID	Conceptual		2	0	0	2	1	0	0	1	0	2	1	0	0	1	0	0	0	0	

Notes:
1. Project Names in *blue italics* reflect posters presented at last CVA #3 Workshop
2. For Relative Scoring: Low = 0, Medium = 1, High = 2; OR 1 = "yes", 2 = "no"

APPENDIX E

One Watershed Concept Design



- ### LEGEND
- Parcels
 - Existing SD Channel
 - Existing SD Inlet
 - Existing SD Manhole
 - Existing SD Pipe
 - Existing Valley Gutter
 - Existing Downspout
 - Existing Downspout (Splash Pad Only)
 - Proposed SD Manhole
 - Proposed SD Pipe
 - Traffic Flow
 - Existing Trees
 - Proposed Trees
 - 1 Rain Garden/Bioswale and Protected Sidewalk
 - 2 Permeable Pavement
 - 3 Demonstration Rain Garden
 - 4 Educational Sign
 - 5 Nature Play Zone
 - 6 Outdoor Educational Space
 - 7 EPIC System
 - 8 Rain Barrel
 - 9 Existing Rain Garden/Bioswale
 - 10 Watershed Relief Map
 - 11 Bioswale with Bridges
 - 12 Green Roof
 - 13 Raised Crosswalk
 - 14 Silva Cell Tree Well
 - 15 Walking Path
 - 16 Existing School Garden



City and County of San Francisco

REVIEW STORM DRAIN CAPACITY

EVALUATE POTENTIAL FLOOD REDUCTION
IMPACTS OF VEGETATION REMOVAL AND
CHANNEL WIDENING



Belle Air Elementary and Lions Park Project Concept

San Bruno Creek Watershed Pilot Study

January 2026

OneWatershed San Bruno Creek Watershed Pilot Study

Belle Air Elementary and Lions Park Project Concept

Fact Sheet



Current Conditions: The proposed concept design addresses chronic localized flooding at Belle Air Elementary and adjacent areas caused by low-lying topography, high groundwater, and location within the FEMA 1% annual chance flood zone.

Proposed Improvements: The project centers on an EPIC underground detention system under the school's baseball field that provides shallow stormwater storage, captures runoff from an 18.8-acre drainage area, and enables non-potable reuse for subsurface irrigation, reducing flooding and potable water demand. The project integrates stormwater management with educational and community benefits through rain gardens, a green roof, tree wells, permeable pavement, bioswales, nature-based play and outdoor learning spaces, rainwater harvesting, and new tree plantings with interpretive signage.



Along 3rd Ave and within Lion's Park parking lot, a bioretention area with a protected sidewalk and the permeable pavement will help protect students walking to school and direct runoff to the subsurface storage system under the school's baseball field. These right-of-way improvements are shown in the images below.



Project Benefits

- ✓ **Reduced Flooding:** Replacing 21,600 square feet of impervious surfaces with pervious area. Green infrastructure and subsurface stormwater storage will reduce onsite ponding, lower peak flows, and help relieve pressure on downstream drainage systems and San Bruno Creek.
- ✓ **Extreme Heat Reduction:** Over 20 new trees and expanded green space will increase shade, reduce the urban heat island effect, and improve thermal comfort for students and the surrounding community.
- ✓ **Water Supply Resilience:** Captured stormwater stored in rain barrels and subsurface systems can be reused for landscape irrigation, reducing reliance on potable water during dry periods.
- ✓ **Improved Water Quality:** Bioswales, tree filters, rain gardens, pervious pavement, and subsurface systems will treat stormwater runoff, reducing pollutants entering San Bruno Creek and San Francisco Bay.
- ✓ **Educational Value:** Hands-on learning features—including rain gardens, watershed maps, native habitat signage, and an outdoor classroom—support environmental education and community use.
- ✓ **Recreation and Safety:** Reduces flooding on play fields, creates new nature-based play areas, and enhanced pedestrian walkways with roadway separation and increased visibility to promote student safety in alignment with Safe Routes to School goals.

**San Bruno Creek OneWatershed Pilot Study
Belle Air Elementary and Lions Park Project Concept
Rough Order of Magnitude Cost Estimate**

Scope: Replace campus sports field grass areas irrigation system with EPIC system and replace the grass/turf removed from these locations. Green infrastructure and natural infrastructure elements, such as bioswales, permeable pavement, tree wells, rain barrels, green roof demonstration, and educational elements.

Project Manager: Megan Otto

Project Engineer: Fiona McHenry-Crutchfield

AACE Class Type of Estimate: **Class 4**

Description	Quantity	Unit	Unit Price	Item Total
General				
Dewatering	1	LS	\$ 1,500,000	\$ 1,500,000
Construction Fence	1	LS	\$ 150,000	\$ 150,000
Traffic Control	1	LS	\$ 250,000	\$ 250,000
Pothole Existing Utilities	1	LS	\$ 50,000	\$ 50,000
Remove and Replace Grass/Sod	1	LS	\$ 450,000	\$ 450,000
Existing Irrigation System Removal	1	LS	\$ 8,000.00	\$ 8,000
Green Infrastructure				
Bioswale, Permeable Pavement, and associated elements in the Parking Lot	1	LS	\$ 443,623	\$ 443,623
Silva Cell Tree Well	1	LS	\$ 87,500	\$ 87,500
Green Roof	1	LS	\$ 50,000	\$ 50,000
EPIC System				
EPIC System (as provided by vendor)	1	LS	\$ 2,000,000	\$ 2,000,000
Pump System	1	LS	\$ 500,000	\$ 500,000
Electrical System	1	LS	\$ 500,000	\$ 500,000
Natural Infrastructure Elements				
Main Play Yard Bioswale/Rain Garden/Landscape Boulders	1	LS	\$ 59,443	\$ 59,443
Demonstration Rain Garden	1	LS	\$ 15,480	\$ 15,480
Nature Based Elements - Main Play Yard	1	LS	\$ 38,700	\$ 38,700
Multi Lingual Interpretive Elements (Manufacture, Install)	1	LS	\$ 5,418	\$ 5,418
Watershed Relief Map	1	LS	\$ 25,000	\$ 25,000
Other Improvements				
Raised Crosswalk	1	LS	\$ 15,000	\$ 15,000
Pavers for Pedestrian Path	1	LS	\$ 15,000	\$ 15,000
Rain Barrels	1	LS	\$ 20,000	\$ 20,000
Outdoor Classroom/Ampitheater	1	LS	\$ 100,000	\$ 100,000
Subtotal				\$ 6,283,000
GC/GR and Mobilization - 15% of Subtotal				\$ 942,450
Permitting - 1% of Subtotal				\$ 62,830
Escalation 5% per year of Subtotal (assumes construction in FY 28/29)				\$ 990,358
Contingency - 10% to 30% of Subtotal (2), used 30% of Subtotal + Escalation				\$ 2,182,007
Total Estimated Project Construction Cost				\$ 10,460,000

Prepared by: Meaghan Wagner

Date: 1/27/2026

Checked by: Levi Walden

Date: 1/28/2026