



Santa Cruz County

2025 Multi-Jurisdiction Hazard Mitigation Plan Update

Volume 2, Section 4: Soquel Creek Water District (SCW)

Special District Annex

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Adoption Resolution

To comply with the Federal Disaster Mitigation Act of 2000 (DMA 2000), the Soquel Creek Water District has officially adopted this 2025 Santa Cruz County Multi-Jurisdictional Hazard Mitigation Plan, including Volume 1 in its entirety as well as this Volume 2 Special District annex. The adoption of the MJHMP recognizes the district's commitment to reducing the impacts of natural hazards within its jurisdiction and across Santa Cruz County.

A copy of the district's adoption record is provided on the following pages. Adoption records for all jurisdictions are summarized in Volume 1, Table ES-1.



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RESOLUTION NO. 26-04

**RESOLUTION OF THE BOARD OF DIRECTORS OF SOQUEL CREEK WATER DISTRICT
ADOPTING THE SANTA CRUZ COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN 2025
UPDATE**

WHEREAS, Santa Cruz County Multi-Jurisdictional Hazard Mitigation Plan 2025 Update (“the Plan”) recognizes the threat that natural hazards pose to people, property, infrastructure, and natural resources within our community; and

WHEREAS, the implementation of hazard mitigation actions can significantly reduce the risk of injury, loss of life, property damage, and disruption caused by future natural hazard events; and

WHEREAS, the federal Disaster Mitigation Act of 2000 (DMA 2000) requires all cities, counties, and special districts to adopt a Hazard Mitigation Plan in order to receive pre-and post-disaster mitigation funding from the Federal Emergency Management Agency (FEMA); and

WHEREAS, Soquel Creek Water District (“District”) fully participated in the FEMA-prescribed mitigation planning process to prepare the Plan; and

WHEREAS, a coalition of Santa Cruz County local governments and special districts embarked on a planning process to prepare for and lessen the impacts of specified hazards by updating the Plan; and

WHEREAS, each participating jurisdiction, including the District, has been responsible for reviewing and approving its respective Jurisdictional Annex within the Plan, and the Plan compiles individual annexes into a unified framework to ensure a comprehensive and coordinated hazard mitigation strategy for the entire Santa Cruz County planning area, aligned with the goals, objectives, and priorities of the Plan; and

WHEREAS, the Santa Cruz County Multi-Jurisdictional Hazard Mitigation Plan 2025 Update is comprised of two volumes, including Volume 1: Base Plan, which contains the countywide hazard mitigation framework and risk assessment, and Volume 2: Jurisdictional Annexes, which document the hazard profiles, vulnerabilities, and mitigation actions of participating jurisdictions; and

WHEREAS, a public involvement process, consistent with the requirements of DMA 2000, was conducted to develop the Plan; and

WHEREAS, the California Governor’s Office of Emergency Services (Cal OES) has reviewed and approved the Plan and has forwarded the plan to FEMA Region IX for final review and approval; and

NOW, THEREFORE, BE IT RESOLVED AND ORDERED that the Soquel Creek Water District hereby adopts the Santa Cruz County Multi-Jurisdictional Hazard Mitigation Plan 2025 Update as an official plan of the jurisdiction. The Soquel Creek Water District adopts Volume 1 of the Plan in its **entirety and**

acknowledges that the District's Jurisdictional Annex contained in Volume 2, Section 4 represents the District's specific hazard mitigation strategies and responsibilities.

BE IT FURTHER RESOLVED, the District's Board of Directors authorizes staff to make minor technical edits or administrative corrections to the Plan, as necessary to address FEMA review comments, prior to final adoption; and

BE IT FURTHER RESOLVED, the District's Board of Directors further encourages the respective departments identified in the implementation strategy of the plan to carry out the recommended mitigation actions assigned to them; and

BE IT FURTHER RESOLVED, the adoption of the Plan is exempt under the "common sense" exemption because it can be seen with certainty that there is no possibility that it may have a significant effect on the environment. (State CEQA Guidelines, § 15061(b)(3).) The adoption of the Plan is a planning-level action that does not itself approve, fund, or commit the District to any specific project or physical change to the environment. In addition, and to the extent applicable, the adoption of the Plan qualifies under Guidelines section 15262 (Feasibility and Planning Studies) because the Plan evaluates possible future mitigation actions without approving or funding any specific activity. Any future project will be subject to separate CEQA review as appropriate. The District's Board of Directors directs Staff to file a Notice of Exemption with the County Clerk for the County of Santa Cruz.

BE IT FURTHER RESOLVED, this Resolution will be submitted to Cal OES on behalf of the District by Santa Cruz County Staff to enable the Plan's final approval by Cal OES and FEMA.

PASSED AND ADOPTED, by the Board of Directors of the Soquel Creek Water District on April 21, 2026, by the following vote:

AYES: Directors LaHue, Christensen, Balboni, Jaffe

NOES: None

ABSENT: Director Lather

ABSTAIN: None



Dr. Tom LaHue, President

ATTEST:



Sophia Sholtz, Acting Board Clerk

Audit Trail

Request Details

Request ID: 78d562648c7025c31bce28d79c6572

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Number of Signers: 2

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Company Name: Soquel Creek Water

Request Status: Fully Signed

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Sent By: Emmaw@soquelcreekwater.org

Completed On: 24-04-2026 16:11:35 PDT

Approver 1 Details



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Signature

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Section 4. Soquel Creek Water District



4.1 Scope & Purpose

This annex details the elements specific to the Soquel Creek Water District (SqCWD) in the 2025 Santa Cruz County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP). This annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document (Volume 1). As such, all sections of the umbrella plan, including the planning process and other procedural requirements, apply to and were met by SqCWD. This annex provides additional information specific to SqCWD, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this jurisdiction.

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4.2 Jurisdictional Setting

SqCWD is a public water agency established in 1961 under California law. It provides potable water service across a 17-square-mile area along the central coast of Santa Cruz County, California. The district's service area includes the City of Capitola and several unincorporated communities including Aptos, La Selva Beach, Rio Del Mar, Seascapes, Soquel, and Opal Cliff. The district covers approximately seven miles of coastline and extends inland into the foothills of the Santa Cruz Mountains. SqCWD serves a population of approximately 30,000 through over 16,000 service connections and maintains a complex water system that includes more than 160 miles of distribution pipeline, 18 storage tanks, 15 active production wells, and over 80 groundwater monitoring wells.

The district relies entirely on groundwater extracted from the Santa Cruz Mid-County Groundwater Basin and CA Basin 3-001 and produces an annual 3,348 acre-feet of water, which the California Department of Water Resources has designated as a critically overdrafted groundwater basin. Water use includes about 80% residential (single-family and multi-family), and nearly 20% non-residential (commercial, industrial, schools, governmental, landscape irrigation). There are currently no agricultural accounts.

SqCWD has developed a wide array of plans and strategies to address natural hazards and risks. These include its 2020 Urban Water Management Plan, Water Shortage Contingency Plan, 2021 Emergency Response Plan, 2021 Risk and Resilience Assessment, and an annually updated Capital Improvement Program (CIP). These plans incorporate hazard-specific mitigation strategies for drought, earthquake, coastal hazards, and fire-related disruptions. The district's flagship Pure Water Soquel project is a groundwater replenishment and advanced



treatment initiative that aims to protect the basin from seawater intrusion by injecting highly purified water into the aquifer. In addition, the district collaborates with the City of Santa Cruz on surface water transfers and is engaged in ongoing groundwater management planning through its participation in the Mid-County Groundwater Sustainability Agency (GSA).

The district has adopted a FEMA-compliant Emergency Response Plan and participates in the National Incident Management System (NIMS) and Standardized Emergency Management System (SEMS). SqCWD's public outreach and conservation programs are well-established, and its financial structure, which is supported by Proposition 218-compliant rate studies, ensures the sustainability of its water supply and hazard mitigation investments.

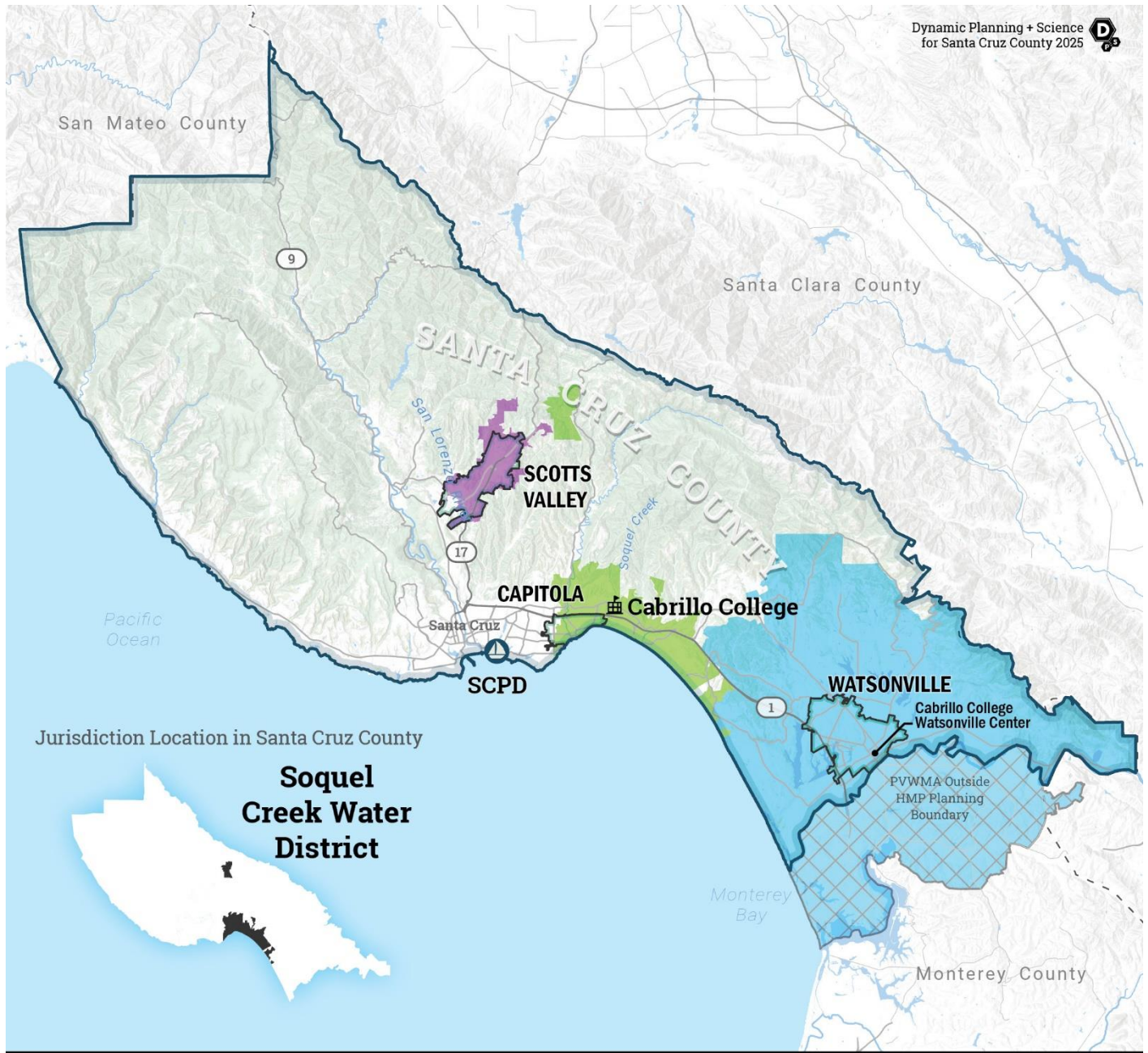
- **Year of Incorporation:** 1961
- **2023 Population Served:** 30,061 (CAS 5-Year, 2018-2023)
- **Coverage Area:** approximately seven miles long along the coast and extends inland one to three miles, covering approximately 17 square miles

4.2.1 Geography & Climate

SqCWD is located along California's central coast in Santa Cruz County. The district's service area spans approximately 17 square miles, extending about seven miles along the Pacific Ocean coastline and between one and three miles inland into the foothills of the Santa Cruz Mountains. Figure 4-1 identifies the district boundary within Santa Cruz County. This area includes diverse topography, ranging from low-lying coastal neighborhoods such as Aptos, Rio Del Mar, and La Selva Beach to elevated inland communities such as Soquel and portions of Seascape and Aptos Hills. Much of the service area is characterized by blufftop terrain, coastal terraces, wooded hillsides, and steep slopes, some of which are subject to landslides and erosion. Several key infrastructure assets, such as wells, pipelines, and tanks, are located in or near areas mapped for liquefaction, slope instability, or tsunami inundation.

The climate of the district's service area is classified as Mediterranean coastal, with cool, wet winters and dry, warm summers. Precipitation is highly seasonal, with the majority falling between November and April. Average annual rainfall varies between 25 to 35 inches (Figure 4-2), depending on elevation and proximity to the coast. Coastal fog and marine layer effects are common in summer, moderating temperatures along the shoreline. Average high temperatures in the summer range from the mid-60s to low 70s °F, while winter highs are generally in the mid-50s °F. Inland areas experience slightly warmer summer temperatures and cooler winter nights compared to the coast. (2020 Urban Water Management Plan , 2020)

Climate variability has increased in recent years, with extreme weather events such as atmospheric river storms, heatwaves, and prolonged drought that pose growing risks to water supply reliability, infrastructure, and public safety. The Santa Cruz Mid-County Groundwater Basin, the sole source of supply for the district, is especially sensitive to precipitation deficits and overdraft, with ongoing seawater intrusion near the coast due to historic overpumping.



Geographic Overview - Santa Cruz County HMP Participants

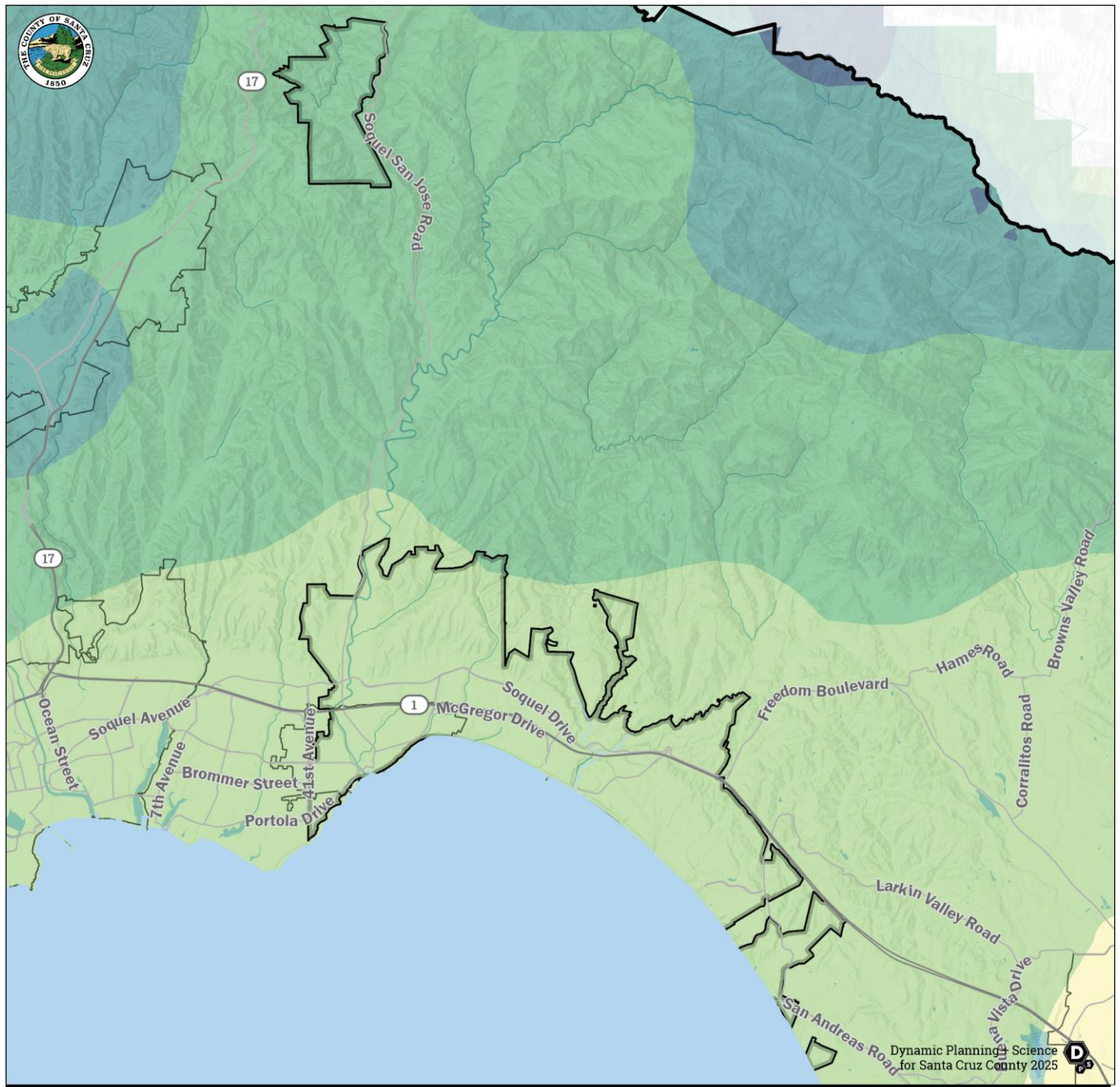
- Cabrillo College
- Participating Jurisdiction
- Pajaro Valley Water Management Agency
- Santa Cruz Port District
- Scotts Valley Water District
- Soquel Creek Water District

Santa Cruz County Resource Conservation District

Geographic extent is generally coterminous with the unincorporated county, with various incorporated areas excluded from the District's jurisdiction.



Figure 4-1: SqCWD Sphere of Influence



Average Annual Precipitation (1991-2020, Inches)

Soquel Creek Water District

*Data sources: PRISM 30-Year Normals 1991-2020.

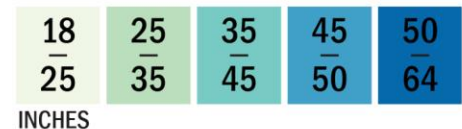


Figure 4-2 SqCWD Average Annual Precipitation Map

4.2.2 Historic Overview

SqCWD traces back to the early 1960s, a time of rapid growth and environmental challenges along the central coast of Santa Cruz County. Amid recurring flood damage and increasing water demand, residents of Soquel and nearby communities recognized the need for a public agency to manage both flood control and water supply. In 1961, a local ballot measure led to the formation of the Soquel Creek County Water District under California's County Water District Law (Division XII, California Water Code, Section 30000 et seq.), establishing a five-member elected Board of Directors to guide the new agency's mission.

The district was initially tasked with addressing chronic flooding in areas like downtown Soquel, where overflowing creeks routinely damaged roads, homes, and farmland. Winter storms often transformed local waterways into dangerous torrents filled with debris, and although various flood control efforts had been attempted, they lacked coordination and long-term vision. At the same time, communities including Soquel, Aptos, Capitola, Rio Del Mar, and La Selva Beach were experiencing rapid population growth, which placed new demands on the region's water supply. Prior to the District's formation, residents largely relied on unregulated private wells that tapped the overused coastal aquifer.

The district's first major milestone came in 1964 with the acquisition of the Monterey Bay Water Company, a private utility that provided service to many customers in the region. This transition significantly expanded the district's operational footprint and marked a pivotal shift from a flood-control agency to a full-fledged municipal water provider. Flood control responsibilities were formally discontinued, and the district shifted focus entirely to water supply and resource management.

Throughout the 1960s and 1970s, SqCWD invested in infrastructure development and groundwater protection. The district constructed new wells, expanded water main capacity, and implemented early groundwater monitoring efforts. The devastating drought of 1976–77 and a 1977 U.S. Geological Survey report warning of seawater intrusion into the coastal aquifer highlighted the region's vulnerability. These events prompted the district to declare a Water Emergency in 1979 and accelerate conservation efforts. During this period, the district also initiated a coastal monitoring network to measure groundwater levels, salinity, and water quality, establishing a foundation for its future sustainability programs.

The district continued to modernize throughout the 1980s and 1990s, eventually serving more than 30,000 residents across four primary service zones with a centralized team of engineers, operators, and policy staff. The district remains a not-for-profit special district, governed by its Board of Directors, and continues to engage the public through transparent governance, conservation initiatives, and long-term water resource planning.

Today, SqCWD provides drinking water exclusively from the Santa Cruz Mid-County Groundwater Basin, which has been identified as critically overdrafted by the California Department of Water Resources. With no imported or surface water sources, the district is wholly dependent on local groundwater, making the management of this resource a cornerstone of its operations.



4.2.3 Demographics & Vulnerable Populations

This section describes the demographic characteristics of SqCWD to guide hazard mitigation planning efforts. Natural disasters affect communities both physically and socially, with demographic composition playing a central role in determining how impacts are distributed, particularly among vulnerable groups facing greater challenges in preparedness, response, and recovery. Understanding the area's social and economic landscape also helps assess potential social costs from infrastructure damage, including housing, industry, public facilities, essential services, and transportation.

Exploring local demographic data may help to identify groups and geographic areas with specific vulnerability to hazard events. In the context of all-hazards preparedness and response planning, at-risk individuals (often used interchangeably with “vulnerable populations”) are defined federally as “children, pregnant women, senior citizens, and other individuals who have access or functional needs in the event of a public health emergency.” (42 U.S.C. § 2802(b)(4)(B) (2019)) These populations may include, but are not limited to, individuals who are economically disadvantaged, living with disabilities, dependent on caregivers, from historically marginalized communities, have limited English proficiency or are non-English speaking, lack access to transportation, are experiencing homelessness, or have chronic medical conditions.

Certain populations face greater risk following a natural hazard event due to age, economic mobility, physical disability, geographic location, or a combination of factors. Vulnerability in the face of a hazard event is not a fixed characteristic; the same individual may be at risk for some hazards but not at risk for others. Planning for vulnerable populations in the context of hazard mitigation can help communities to prioritize limited resources where they will be the most effective. Refer to Volume 1, Section 1.4.3, for a more in-depth discussion of planning for vulnerable populations, at-risk individuals with access and functional needs, and environmental justice.

4.2.3.1 Income & Housing

Low-income households and communities face disproportionate financial burden from costs associated with disaster preparedness, response, and recovery. Disasters create unexpected expenses which may serve as “tipping points” for families and individuals living on the edge of poverty or homelessness. Low-income residents and renters are also less likely to purchase insurance, meaning that those with the most to lose during an event are also the least prepared to deal with potential losses. Renters are also more vulnerable to natural hazards because the decision to make major structural or property improvements typically lies with the property owner. Major hazard events in recent history, such as the CZU Lightning Complex Fire and the 2022 tsunami, emphasize the need for inclusive planning that addresses systemic vulnerabilities, improves access to recovery resources, and fosters community resilience to reduce future disparities during hazard events.

According to ACS data, much of the SqCWD service area has a median household income above \$119,300, especially in neighborhoods like Seascape, La Selva Beach, and portions of Soquel and Aptos. These areas

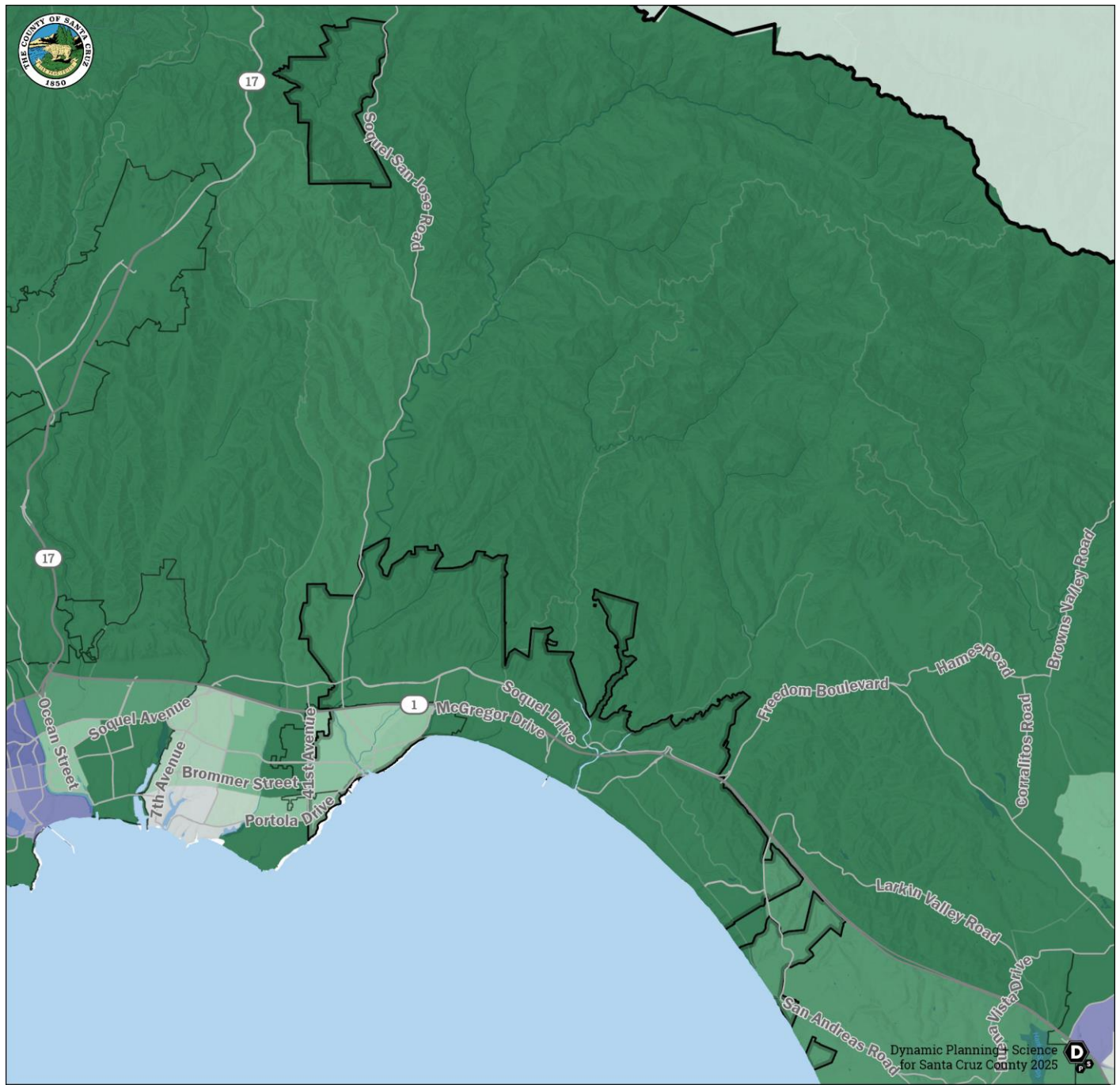
are shaded dark green, indicating relatively affluent residential zones. However, certain census tracts closer to Capitola and the urban corridor along Highway 1 show lighter green, reflecting median household incomes below \$100,000 in some cases. Figure 4-3 shows the degree of economic disparity within the district's boundaries

Figure 4-4 shows concentrations of poverty greater than 24% (deep red) in the western part of Capitola and areas bordering Live Oak, which fall within or adjacent to SqCWD's boundaries. Other parts of the district, such as inland Aptos and La Selva Beach, show significantly lower poverty rates (pale beige), with fewer than 1% of residents below the poverty line. These disparities suggest that while the district serves many affluent communities, it also includes neighborhoods with vulnerable populations who may be disproportionately affected by water costs, hazard exposure, and service disruptions.

Figure 4-5 displays the percentage of owner-occupied housing units across the SqCWD service area. Darker purple shades indicate census blocks with high rates of homeownership (greater than 88%), while lighter areas reflect lower homeownership, and consequently, a higher prevalence of renters.

Within the SqCWD boundaries, particularly in coastal and urbanized areas such as Capitola, Aptos, and parts of Soquel, many census tracts exhibit significantly lower homeownership rates, often below 41%. This suggests a high concentration of renters in these more densely populated neighborhoods. These areas are also more likely to be impacted by housing affordability issues and displacement pressures, given their proximity to coastal amenities and tourism.

In contrast, more inland portions of the service area, such as those east of Highway 1 and closer to the Soquel Hills, show a much higher proportion of owner-occupied housing units. These communities may face different vulnerabilities, such as wildfire exposure or limited access to public transit, but are generally characterized by higher household income levels and more stable housing tenure.



ACS Median Household Income Soquel Creek Water District

*Data sources: ESRI Demographics Service, ACS.

Median Household Income

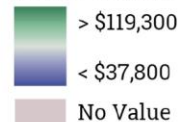
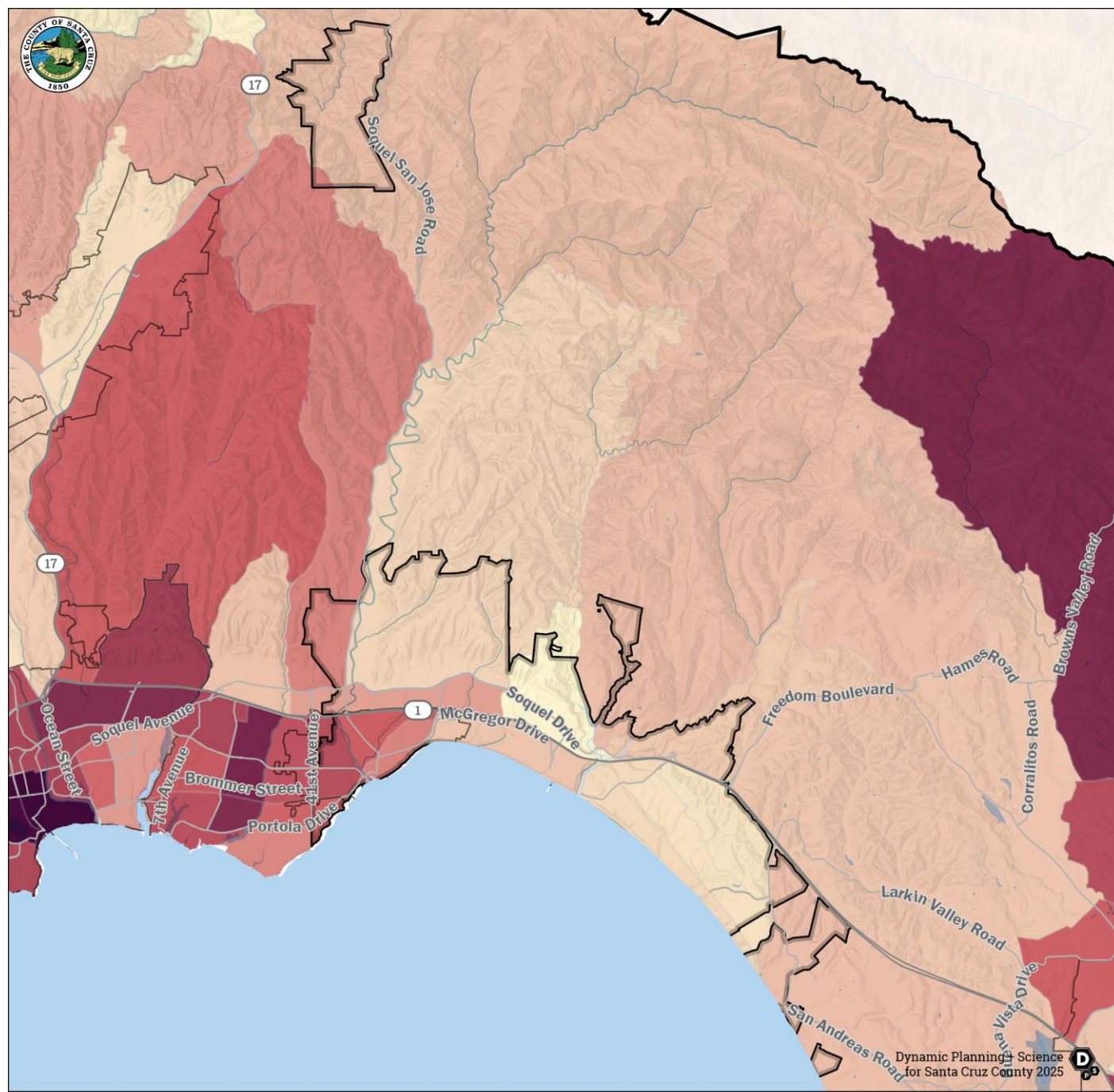


Figure 4-3: SqCWD Median Household Income Map



ACS Poverty Status

Soquel Creek Water District

*Data sources: ESRI Demographics Service, ACS.

Percent of Population Whose Annual Income is Below Poverty

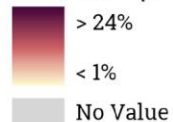
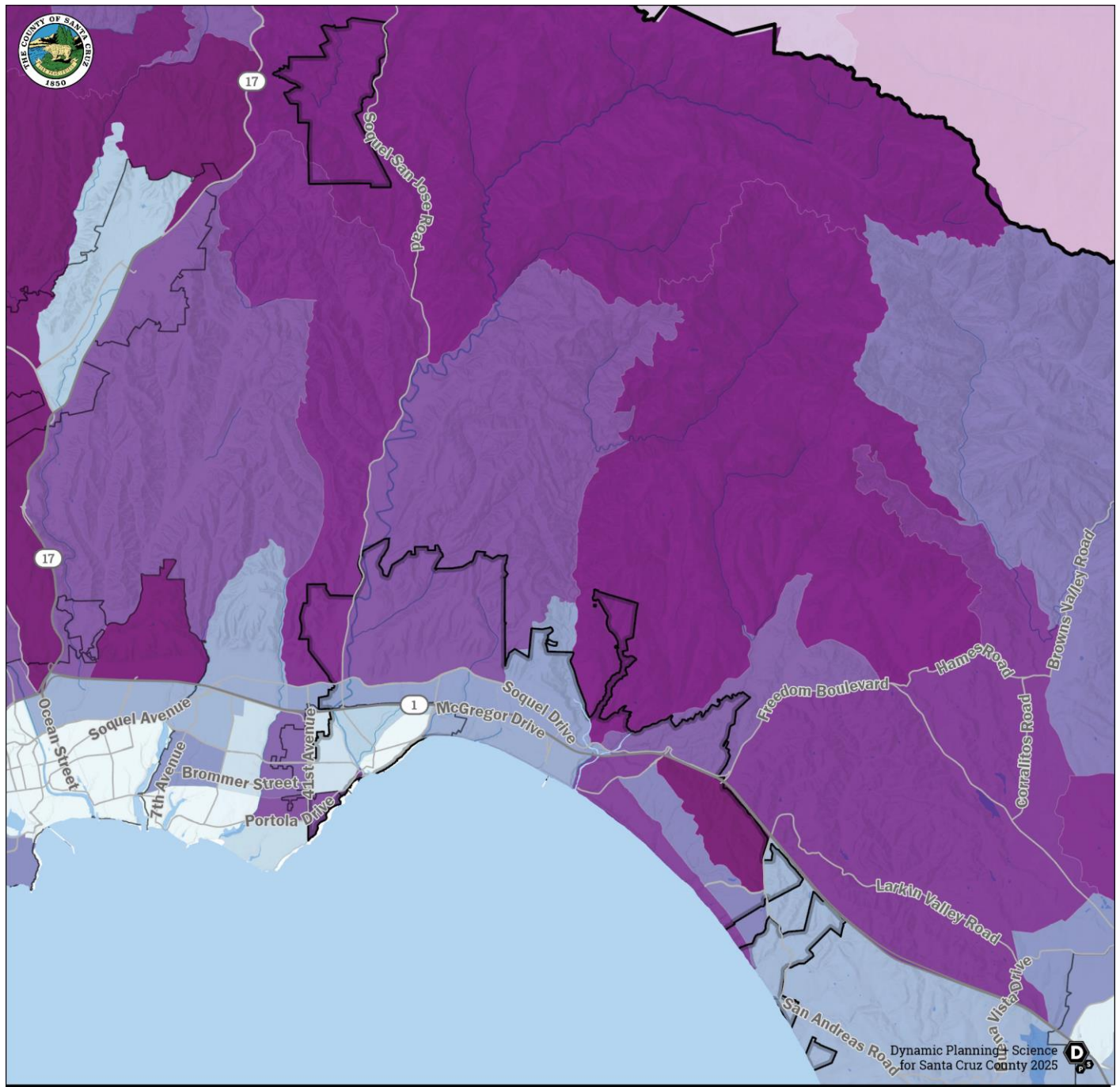


Figure 4-4: SqCWD Poverty Status Map



ACS Housing Occupancy Soquel Creek Water District

*Data sources: ESRI Demographics Service, ACS.

Percent of Housing Units that are Owner-Occupied

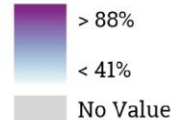


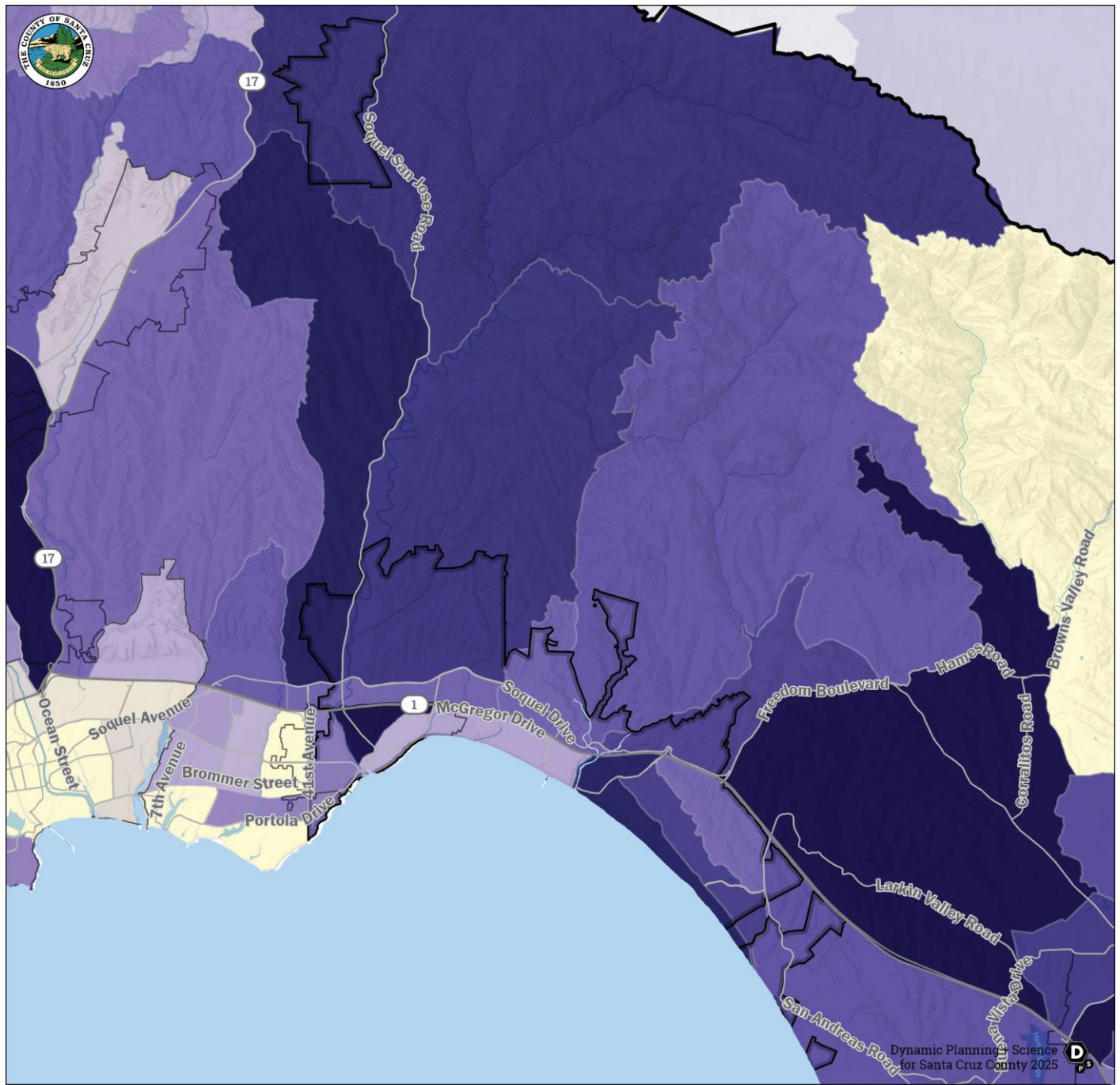
Figure 4-5: SqCWD Owner-Occupied Housing Units Map

4.2.3.2 Dependent & Disabled Populations

Age and disability status play significant roles in vulnerability to natural hazards, as seniors, children, and many who experience disabilities are dependent populations who rely on caregiver networks for support and protection. Seniors and disabled persons may have mobility challenges and increased health concerns, necessitating additional assistance during evacuations and recovery. Similarly, children have limited ability to protect themselves and depend on caregivers to ensure their safety and well-being during emergencies. When combined with factors such as poverty, these vulnerabilities can be further compounded, highlighting the importance of targeted interventions to address the unique needs of dependent and disabled populations.

Figure 4-6 shows a large portion of the SqCWD service area, especially the inland and northeastern census tracts, has over 48% of the population in dependent age categories. These age groups include children under 18 and seniors over 65, both of whom typically require greater assistance during emergencies. The prevalence of these populations underscores the need for targeted planning strategies such as accessible evacuation protocols, emergency shelters with pediatric and elder care capacity, and educational outreach tailored to guardians and caregivers. This demographic distribution suggests that in parts of Aptos, Soquel, and surrounding areas, nearly 1 in 2 residents may need additional support during a disaster, amplifying the demand on emergency response and community resilience programs.

Figure 4-7 further highlights vulnerabilities among residents over 65 years old living with disabilities. Within central Soquel and parts of Live Oak and Capitola, the percentage of elderly individuals with disabilities exceeds 47%, placing them among the most at-risk populations for harm during hazards. These disabilities may limit mobility, sensory perception, or cognitive functioning, which can delay evacuation and impede access to emergency services, particularly in events like wildfires requiring rapid evacuation, earthquakes that damage roads and utilities, and extended power outages that impact medical equipment use. Given this context, the SqCWD and regional emergency planners should prioritize investment in accessible hazard communication, transportation resources for mobility-limited residents, and coordination with home health and caregiver networks to support continuity of care during hazard events.



ACS Dependent Age Groups Soquel Creek Water District

*Data sources: ESRI Demographics Service, ACS.

Percent of Population in Dependent Age Groups

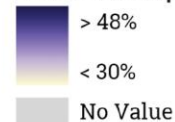
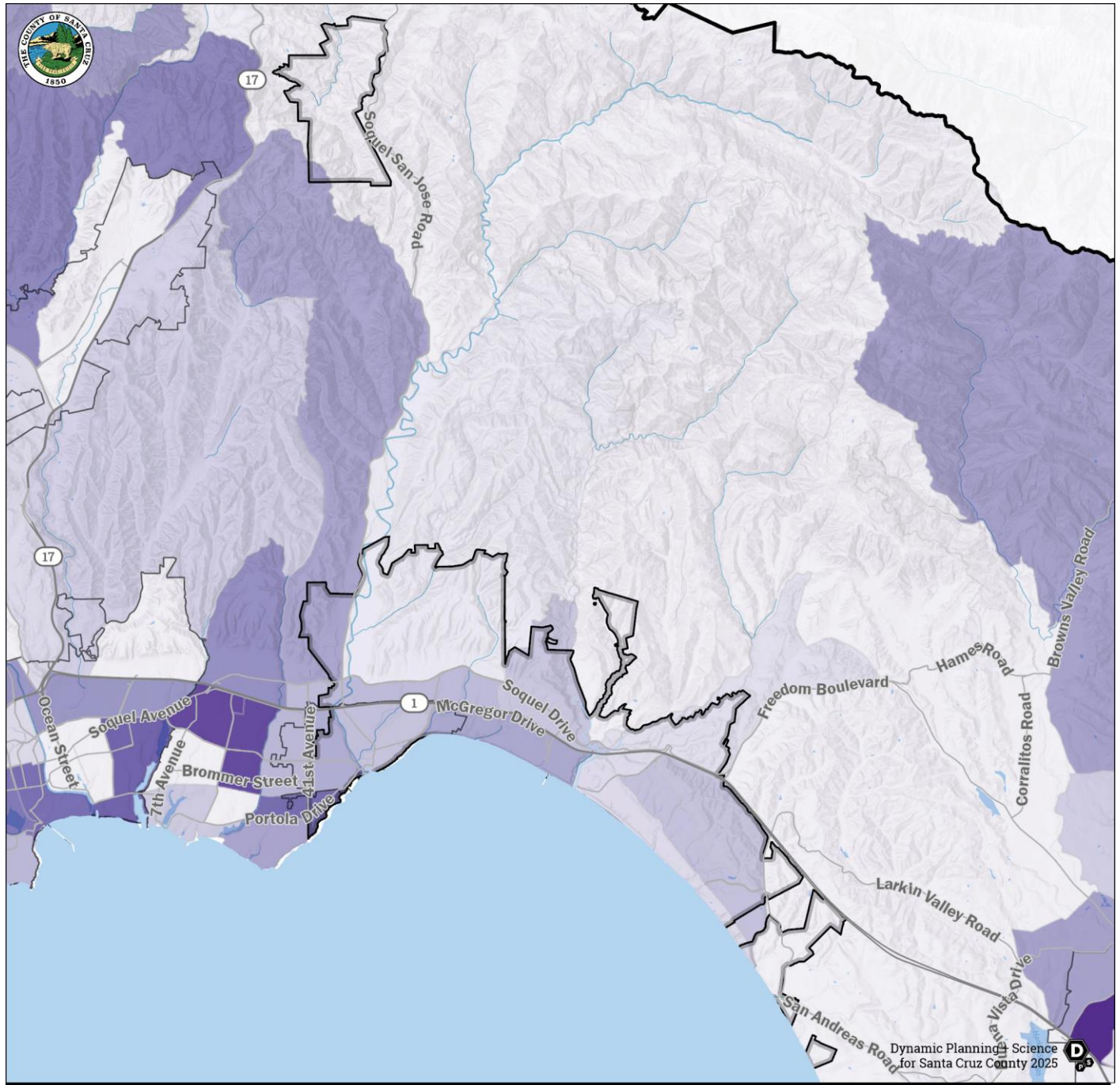


Figure 4-6: SqCWD Economically Dependent Age Groups Map



ACS Disabled Elderly

Soquel Creek Water District

*Data sources: ESRI Demographics Service, ACS.

Percent of Elderly Population (65+) with a Disability

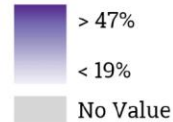


Figure 4-7: SqCWD Disabled Elderly Map



4.2.3.3 Race, Ethnicity & Language

Natural disasters compound racial disparities; non-white individuals and communities receive less recovery aid from FEMA than their white counterparts, even where the amount of damage is the same. (Howell & Elliott, 2019) (National Advisory Council, 2020) The recent COVID-19 pandemic was a testament to racial disparities in disaster outcomes, with non-white persons facing morbidity rates from COVID-19 infections anywhere from 70% to 350% higher than white, non-Hispanic persons. (CDC, 2020)

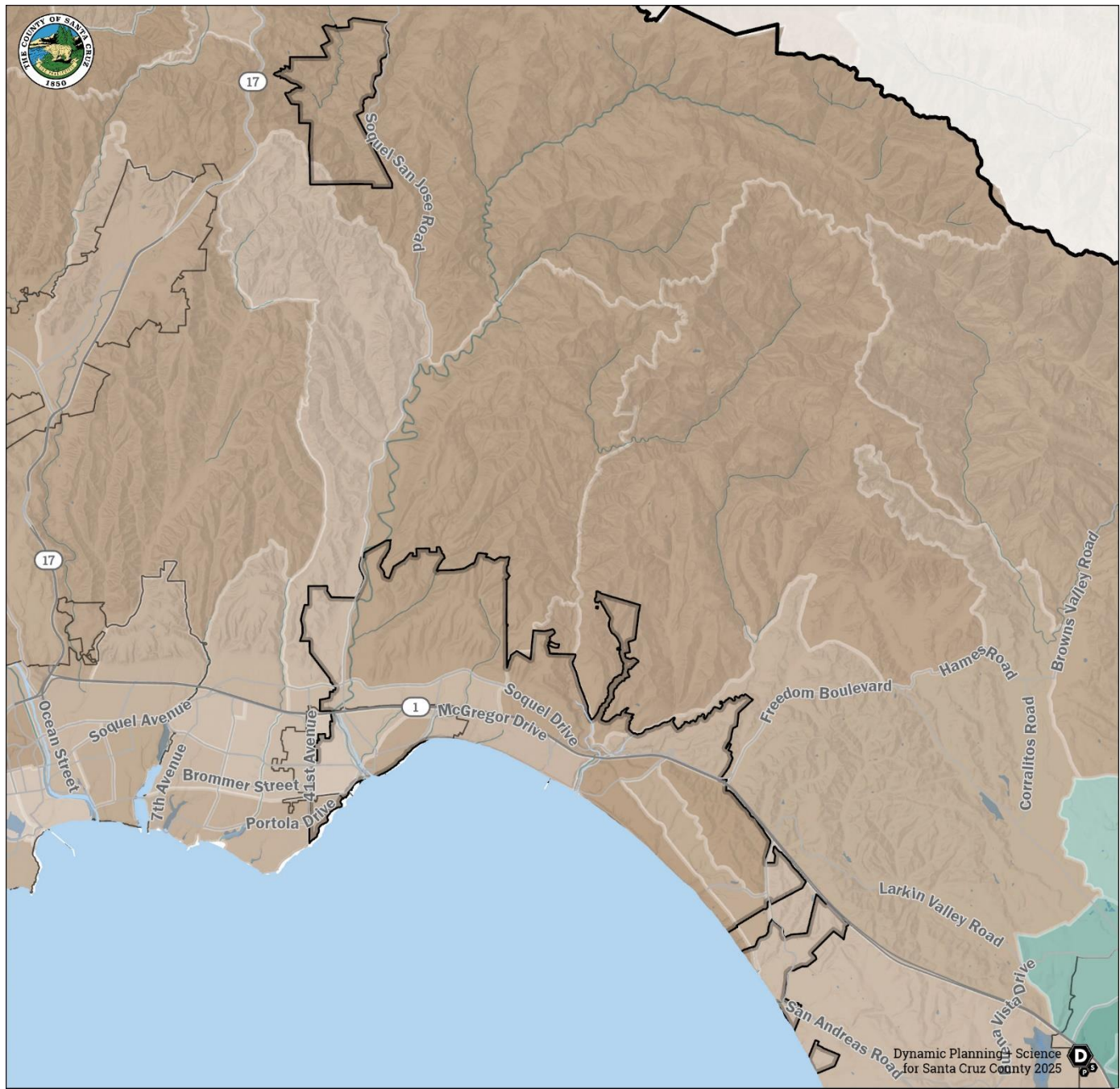
These disparities are evidence of the complicated relationship between disaster recovery and overlapping social vulnerabilities including race, income, language, and health. Black and Latinx residents are more likely to be low income and renters, conditions which create barriers to navigating FEMA's Individual Assistance programs. Communities with more non-white residents may have lower tax revenue and property values, which means less investment in mitigation and rebuilding efforts before and after an emergency.

It should be noted that rural ACS estimates are often less accurate than those for urban areas because the geographic representation, broken down by smaller Census Block Groups or Tracts, becomes insignificant and the margin of error increases within these smaller sample pools. This is particularly true when referencing minority demographic groups. As such, race and ethnicity are discussed as part of a more comprehensive approach using the Center for Disease Control's (CDC) Social Vulnerability Index (SVI) in the following section. In addition, some minority households may avoid participating in Census surveys due to mistrust of government agencies or concerns about immigration status. This can lead to underreporting, further obscuring the true extent of racial, ethnic, language-related vulnerabilities.

The racial and ethnic composition of the SqCWD service area is predominantly non-Hispanic White, as shown by the brown shading throughout the district on Figure 4-8. According to ACS data almost all census tracts within the SqCWD boundary reflect White alone, not Hispanic or Latino, as the predominant racial group. Despite this majority, pockets of ethnic diversity are likely present within smaller neighborhoods or in renter-heavy and coastal areas. These subtler trends might be masked by the predominance metric used in the map.

Figure 4-9 reveals significant linguistic diversity in the SqCWD service area. Some areas near Capitola, Aptos, and southeastern coastal tracts, show that more than 33% of the population aged 5+ speak Spanish at home. These are areas with darker blue shading on the map. Other parts of the district, especially inland, show lower Spanish-speaking populations (<1%), shown in light blue.

This linguistic pattern indicates a need for multilingual hazard communication, particularly in Spanish. It also reinforces the importance of tailoring emergency alerts, preparedness materials, and community engagement to reach Limited English Proficiency (LEP) populations, many of whom may be renters or frontline service workers in high-risk areas.



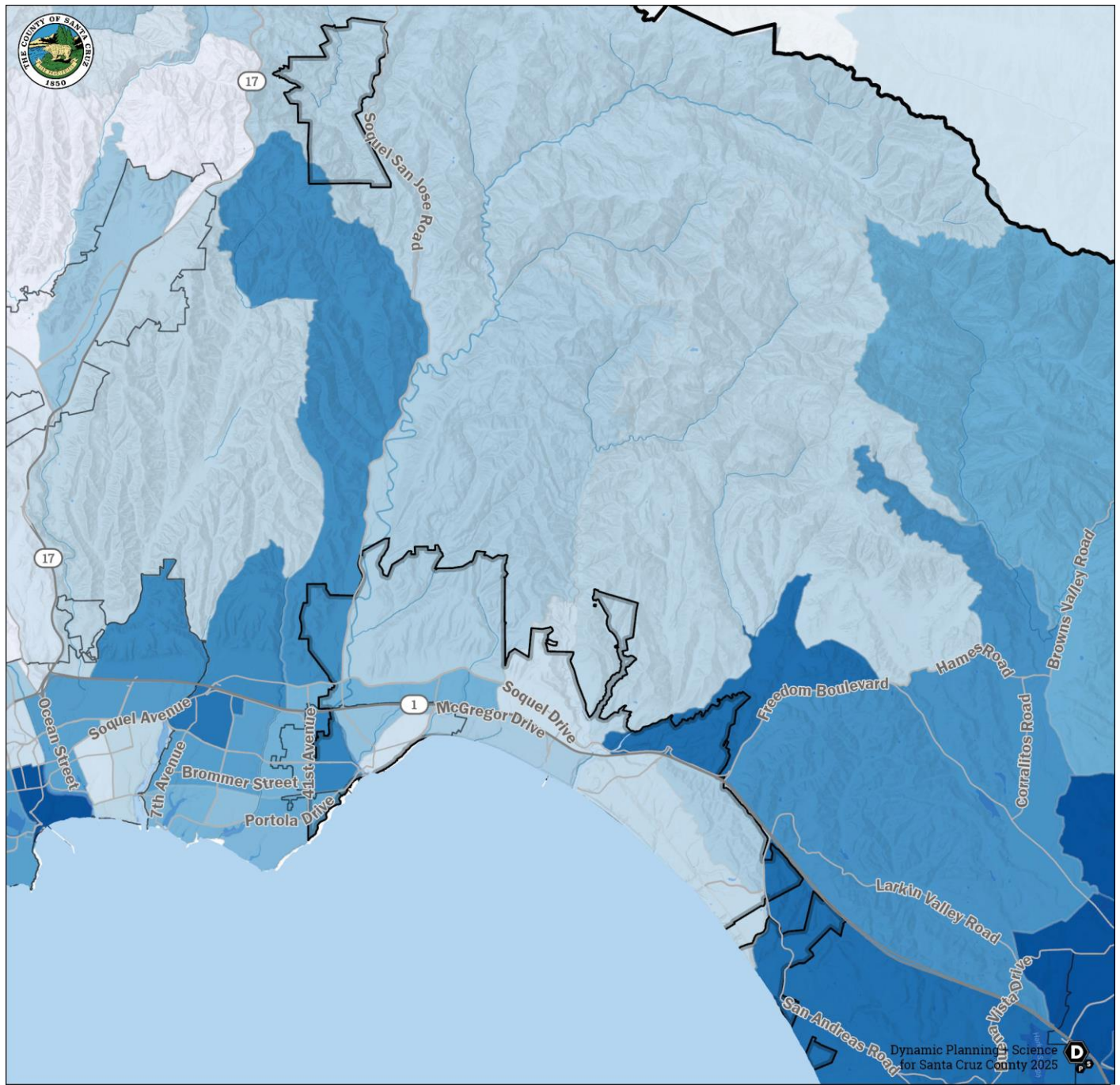
ACS Race and Ethnicity Soquel Creek Water District

*Data sources: ESRI Demographics Service, ACS.

ACS Race and Ethnicity Predominance

White alone, not Hispanic or Latino	Asian alone, not Hispanic or Latino	Native Hawaiian and other Pacific Islander alone, not Hispanic or Latino
Hispanic or Latino	American Indian and Alaska Native alone, not Hispanic or Latino	Some other race alone, not Hispanic or Latino
Black or African American alone, not Hispanic or Latino	Two or more races, not Hispanic or Latino	

Figure 4-8: SqCWD Race and Ethnicity Predominance Map



ACS Language Spoken Soquel Creek Water District

*Data sources: ESRI Demographics Service, ACS.

Percent of Population (5+) Who Speak Spanish at Home



Figure 4-9: SqCWD Spanish-Speaking Population Map

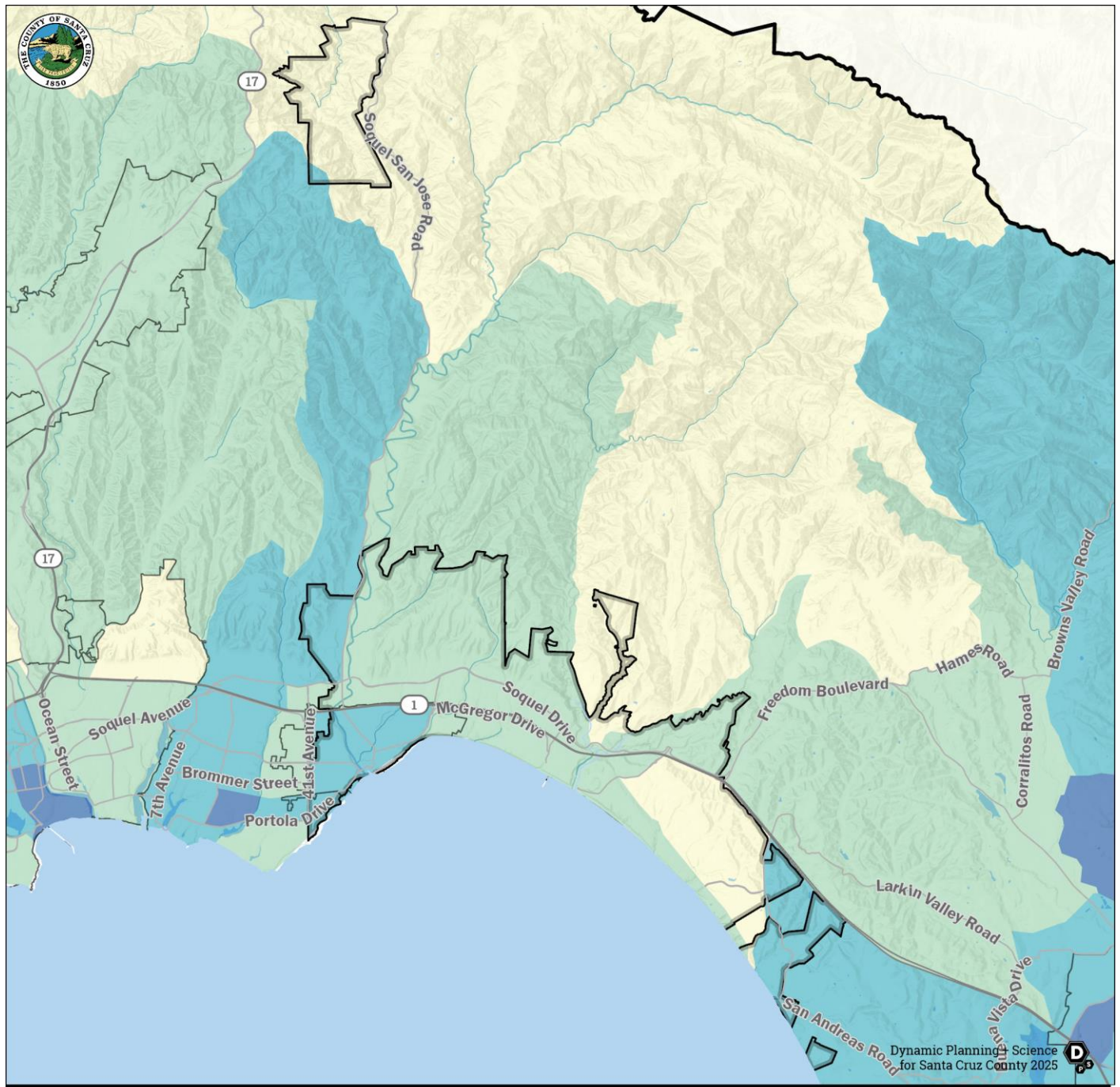
4.2.3.4 Social Vulnerability Index (SVI)

The Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) for SqCWD reveals important spatial and demographic patterns that have direct implications for equitable hazard mitigation planning. As discussed in detail in Volume 1, Section 1.4.3.6, the SVI is a composite measure developed by the CDC to identify communities that are more likely to require support before, during, and after a disaster. It incorporates a range of factors across four key dimensions: socioeconomic status, household composition and disability, minority status and language, and housing type and transportation access. The resulting index score ranges from 0 (lowest vulnerability) to 1 (highest vulnerability).

Figure 4-10 shows that within the SqCWD service area, vulnerability is unevenly distributed. The highest levels of social vulnerability are concentrated in the southern and eastern portions of the district. These areas, which include neighborhoods in and around Watsonville and parts of eastern Aptos, reflect overlapping challenges such as limited English proficiency, lower educational attainment, reduced household income, and higher population densities. Communities in these areas are more likely to face barriers in emergency preparedness and response, such as difficulty accessing timely hazard warnings, limited transportation options during evacuations, and slower recovery times following a disaster. This is consistent with other indicators of vulnerability, such as high percentages of Spanish-speaking households, residents with less than a high school education, and households without internet access.

In contrast, the inland and northern portions of the district, particularly in the more forested or mountainous areas, show considerably lower SVI scores. These communities may benefit from higher household incomes, higher education levels, and greater access to resources such as reliable internet, transportation, and healthcare. However, these lower vulnerability scores do not negate the importance of hazard mitigation in those areas, especially given their potential exposure to wildfire, slope failure, and drought-related impacts.

Mid-range SVI scores are common along the central coastal corridor of the district, particularly around Soquel and Capitola. These areas demonstrate a mix of vulnerability factors and may benefit from targeted interventions that address specific gaps in emergency communication, outreach, or service accessibility.



CDC Social Vulnerability Index 2022

Soquel Creek Water District

*Data sources: ESRI Demographics Service, ACS.

CDC Social Vulnerability Index

0.0000 - 0.2500	0.7501 - 1.0000
0.2501 - 0.5000	No data
0.5001 - 0.7500	

Figure 4-10: SqCWD Social Vulnerability Index Map

4.2.4 Economy

The economy of the SqCWD is closely tied to the broader economic profile of central Santa Cruz County, particularly the coastal communities of Capitola, Soquel, Aptos, and parts of unincorporated areas that fall within the district's service boundaries. While SqCWD is not an economic entity in itself, its service area plays a vital role in supporting a range of economic activities that include residential, commercial, institutional, and recreational, that depend on reliable water infrastructure.

4.2.5 Growth Trends & Future Development

SqCWD serves a largely built-out area along Monterey Bay in Santa Cruz County, where substantial urban expansion is limited by geographic constraints and urban growth boundaries. Although large-scale development is not expected, incremental residential infill and accessory dwelling unit (ADU) construction remain ongoing. According to the 2020 Urban Water Management Plan, SqCWD anticipates modest population growth of approximately 2% to 4% over a 20-year planning horizon. This growth will primarily result from small-scale residential intensification rather than expansion into undeveloped land.

Development patterns within the district's boundaries are heavily influenced by water supply availability and sustainability mandates. Because the district relies solely on groundwater from the Santa Cruz Mid-County Basin, water supply availability is a limiting factor on new development. The 2023 Well Master Plan and the Pure Water Soquel advanced water purification project are designed to support existing and future demands while protecting against further degradation of the groundwater supply.

While major annexation or growth is unlikely, climate change resilience and hazard mitigation planning are increasingly central to SqCWD's infrastructure and land use coordination. New infrastructure, including pipelines, production wells, and recharge basins associated with Pure Water Soquel, have been planned with seismic resilience and coastal hazards in mind, ensuring long-term viability of service to a growing and increasingly vulnerable population.

4.3 Planning Process

SqCWD followed the planning process detailed in Volume 1, Section 2, including participating in the county-wide Hazard Mitigation Planning Team (HMPT) and formulating their own internal planning group to support the broader planning process.

The district's representatives in the Steering Group led stakeholder and public engagement efforts alongside the Consultant Team, with assistance from the HMPT and their internal planning team. This engagement process is described in Volume 1. Specifically, for Soquel Creek Water District, this included postings to the district website and social media as well as outreach events, as documented in Appendix B. Examples of Key Stakeholders engaged by Santa Cruz County on behalf of the district with relevance to the development of SqCWD's mitigation strategy include the USDA and other federal agencies; CalOES and other state agencies; the City of Santa Cruz and other neighboring jurisdictions; local Fire Safe Councils; community-



based organizations like Watsonville Wetlands Watch; utility providers like AT&T; UC Santa Cruz and other academia; and local businesses.

All Key Stakeholders that were invited to participate in the planning process are listed in Volume 1, Section 2, and the input received from stakeholders was integrated into the district's annex, as described in Volume 1 Table 2-9. The district's internal planning participants, their positions, and how they participated in the planning process are shown in Table 4-1.

Table 4-1: SqCWD Participants

Planning Group Members	Title	Description of Involvement
Skyler Murphy	Water Resources Planner	Lead Point of Contact; attended Kickoff Meeting, HMPT Meetings #1, #2, and #3 and Breakouts #1 and #2
Taj Dufour	Engineering Manager	Alternate Point of Contact; attended Breakouts #1 and #2
Connor Pollard	Associate Engineer	Participating Stakeholder and Breakouts #1 and #2
Melanie Mow Shumacher	General Manager	Participating Stakeholder; attended Breakouts #1 and #2
Nicholas Emmert	Operations & Maintenance Manager	Participating Stakeholder and Breakouts #1 and #2
Shelley Flock	Water Resources Manager	Participating Stakeholder; attended Kickoff Meeting, HMPT Meetings #1, and Breakouts #1 and #2

SqCWD participated in a comprehensive hazard mitigation planning process as part of the 2025 Santa Cruz County MJHMP update. This included a series of breakout meetings, listed in Table 4-2 that engaged the district's planning team, which included key district personnel and stakeholders in evaluating hazards, identifying local vulnerabilities, and prioritizing mitigation strategies

The kickoff meeting held on January 27, 2025, launched the planning process by introducing the project scope and clarifying the roles of the Steering Group and participating jurisdictional teams. In the months that followed, a series of structured meetings addressed foundational elements of the plan, including a review of key changes since previous planning efforts, an overview of hazard mitigation principles, and exercises to prioritize local hazards. On July 30, 2025, participants engaged in a hexagon mapping activity designed to visually identify mitigation actions that could benefit from or require inter-jurisdictional coordination. These collaborative efforts helped shape a refined set of mitigation alternatives, establish shared planning goals, and align local strategies with FEMA's Hazard Mitigation Assistance (HMA) funding framework.

Throughout the series of breakout meetings, SqCWD engaged in a structured and collaborative planning process focused on assessing hazard risks, identifying vulnerabilities, and developing targeted mitigation strategies. The meetings began with recaps of the county-wide HMPT meetings to ensure alignment of goals and progress.

During the April 10, 2025, breakout meeting, discussions concentrated on community engagement outcomes, initial risk assessments, and the integration of demographic data to better understand vulnerable populations. Jurisdictional teams reviewed their specific hazard exposures using the Risk Assessment Mapping Platform (RAMP) and participated in prioritization exercises to identify their top hazards.

The July 22, 2025, breakout meeting shifted toward reviewing local capabilities and defining specific areas of concern, which informed the drafting of problem statements. Teams worked collaboratively to refine mitigation alternatives, align actions with FEMA guidelines, and develop a shortlist of priority mitigation actions and inter-jurisdictional collaboration opportunities.

The meetings also included consensus-building activities around hazard rankings, capabilities, and planned actions, while providing regular updates on the overall project schedule.

Table 4-2: Jurisdictional Breakout Meeting Records

Meeting & Date	Agenda / Topics	Goals / Key Inputs
County-Wide Steering Group and HMPT Meetings #1 & #2 January – March 2025		
SqCWD Planning Team Breakout Meeting #1 April 10, 2025	- County-wide HMPT meetings #1 and #2 recaps - Community engagement progress and results - Risk assessment and community vulnerability - Demographics and vulnerable populations - Overview of jurisdiction-specific hazard risks and exposure - Introduction to Risk Assessment Mapping Platform (RAMP) - Jurisdiction-specific hazard risk ranking exercise - Project schedule updates and next steps	- Consensus on jurisdiction-specific priority hazards - Identify capabilities and potential mitigation actions - Community engagement volunteers
County-Wide HMPT Meeting #3 June 2025		
SqCWD Planning Team Breakout Meeting #2 July 22, 2025	- Breakout Meeting #1 and HMPT #3 recaps - Review capabilities assessment - Review areas of concern and define problem statements - Principles of effective mitigation strategies and actions, and mitigation alternatives - Refine and align jurisdiction-specific mitigation actions exercise - Project schedule updates and next steps	- Consensus on jurisdiction-specific capabilities - Consensus on jurisdiction-specific areas of concern - Consensus on priority mitigation actions and collaboration opportunities - Community engagement volunteers



Meeting & Date	Agenda / Topics	Goals / Key Inputs
County-Wide HMPT Meeting #4 August 2025		

4.3.1 Public Input & Draft Review

As detailed in Volume 1, Section 2, the draft plan was available for public review and comment from September 29 to October 20, 2025. Public comments received during that time were similar to those gathered throughout the public engagement process, including the need for more equity in the distribution of mitigation activities and funding and the need for enhanced cooperation among jurisdictions, utility providers, and state agencies. These comments were incorporated into the city’s mitigation strategy, as appropriate; although, most were already addressed by the Mitigation Action Plan which was based on previous public input.

Public and stakeholder input was gathered and incorporated throughout the plan development process, before the public review period, such as from the online public survey (see Volume 1, Section 2.1.2 and Appendix B, for details). During the review period, jurisdictional staff and stakeholders that participated in the plan development also reviewed the public draft and provided comments on minor corrections and revisions, which were addressed in the final plan.

4.4 What’s New

This section offers an overview of the hazard mitigation planning efforts for the planning area and highlights the updates made in this 2025 MJHMP. This is the first time SqCWD has participated in the MJHMP process. While not included in the 2021 plan, the district has since strengthened its focus on resilience through key efforts. Through this MJHMP process, SqCWD has identified its highest-priority hazards, developed hazard-specific problem statements, and proposed actionable mitigation strategies.

4.4.1 Mitigation Activities

Although SqCWD has not previously participated in a formal hazard mitigation plan, it has proactively implemented a range of projects that align with FEMA’s mitigation goals and reduce vulnerability to natural hazards. One of the most significant efforts is the Pure Water Soquel project. This project is an advanced water purification and groundwater recharge initiative designed to combat seawater intrusion and ensure long-term drought resilience. The district also developed a comprehensive Emergency Response Plan (2021) to enhance preparedness and guide coordination with local emergency services during disasters.

To strengthen operational continuity, SqCWD installed backup generators at critical wells and pump stations, reducing the risk of service interruptions during wildfire-related power shutoffs or storms. The district also completed a Well Master Plan (2023) to evaluate and upgrade aging well sites, with a focus on seismic safety and system redundancy. As part of its long-term drought strategy, the district adopted a

Water Shortage Contingency Plan that outlines phased demand reduction measures and public outreach protocols. These efforts are complemented by ongoing conservation programs, multilingual public education campaigns, and community engagement initiatives aimed at improving water security and emergency readiness.

As a first-time participant in a hazard mitigation plan, SqCWD had no formally adopted mitigation actions from a previous plan. However, the district continues to advance a range of ongoing and planned efforts that support hazard mitigation, climate resilience, and long-term water security. These are highlighted in this section, reflecting the district's continued dedication to long-term risk reduction.

4.4.2 Mitigation Successes

Although SqCWD is participating in a formal hazard mitigation plan for the first time, multiple important mitigation actions and other efforts to increase the district's resilience to hazards have been completed. Some of these endeavors in which the district collaborated with Santa Cruz County are described in Volume 1, Section 2. This section describes additional district-specific success stories, which highlight SqCWD's commitment to reducing risks and building a more resilient community in the face of natural hazards.



Pure Water Soquel Program

Pure Water Soquel (PWS) is SqCWD's flagship project to replenish the Mid-County Groundwater Basin and prevent seawater intrusion. The project, Figure 4-11, captures highly treated wastewater that would otherwise be discharged into the Monterey Bay National Marine Sanctuary and further purifies it through a proven three-step advanced treatment process: microfiltration, reverse osmosis, and ultraviolet disinfection with hydrogen peroxide. The resulting purified water is then injected into the groundwater basin, Soquel Creek's sole source of drinking water, to protect against saltwater contamination and provide a sustainable, drought-resilient water supply.



Figure 4-11: Pure Water Purification Center Construction

2021 Emergency Response Plan (ERP)

The ERP outlines roles, responsibilities, and response protocols for a wide range of hazard events, including wildfire, earthquakes, PSPS events, and drought. This FEMA-aligned ERP is integrated with the district's broader risk reduction strategy and is updated regularly based on operational changes and new threat assessment.

Well Master Plan

In 2023, the district finalized its Well Master Plan, a strategic assessment of aging groundwater infrastructure that identifies upgrades needed to improve reliability, seismic safety, and water quality

performance. This planning effort ensures that well field operations remain resilient under drought and earthquake conditions and that capital investments are guided by long-term risk profiles.

Water Shortage Contingency Plan (WSCP)

The WSCP defines clear response stages for varying drought conditions, including conservation targets, public outreach, and emergency supplies. This plan ensures consistent and equitable water use reductions during shortage events, while protecting vulnerable populations and critical customers

Grants & Funding

SqCWD has secured substantial federal and state funding to advance its resilience and water sustainability initiatives. These projects include a \$21 million WaterSMART grant, a \$50 million Groundwater Implementation Grant under California's Proposition 1, a \$9 million prior grant from the Bureau of Reclamation, \$2 million in state planning funds, and low-interest loans via the State's Seawater Intrusion Control Loan Program and the EPA Water Infrastructure Finance and Innovation Act (WIFIA) Program. (Soquel Creek Water District, 2025)



Public Outreach & Education Programs

These programs include multilingual conservation campaigns, school partnerships, and emergency alerts, which have increased community awareness of water-related hazards and built support for long-term mitigation efforts.



Figure 4-12: Santa Cruz Earth Day Festival-2024

4.5 Risk Assessment

This section focuses on profiling coastal and other hazards specific to SqCWD and assessing their vulnerability independent of the broader county-wide planning area, which has been evaluated in Section 3 of Volume 1. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describe relevant plans, policies, and regulations; past events; location; frequency and probability of future occurrences; severity and extent; warning time; secondary hazards; and climate change impacts. For more information on risk assessment methodologies, see Volume 1, Appendix A.

This section includes a tailored vulnerability assessment, analyzing assets at risk such as population, property, and critical facilities and infrastructure unique to the district, and information on district-specific differences in hazard vulnerability across the planning area. It also identifies total district assets at risk, including people, property, and critical facilities and infrastructure within the district. In addition, this section presents growth and development trends for the communities served, offering insights into vulnerabilities and risks that represent the broader context of assets at risk.

4.5.1 Hazard Screening & Prioritization

Members of the planning team from each participating jurisdiction came together to collaboratively decide which county-wide hazards would be included in the MJHMP and which would be excluded. The hazard screening and prioritization took place early in the process and integrated historic data, local knowledge, and consensus opinions to create a risk assessment matrix for the county as well as for each participating jurisdiction. These matrices indicate the priority of hazards prior to further refinement. Details about this process, the results of the discussion, and in-depth profiles for county-wide hazards can be found in Volume 1, Sections 2 and 3.

The final results of the hazard screening and prioritization exercises are summarized in Table 4-4, including which specific subhazards were selected by SqCWD's planning team.

The SqCWD's internal planning group used the same hazard identification and prioritization process as the county-wide Planning Team. They reviewed previously prepared relevant documents and past events to determine the realm of natural hazards that have the potential to affect the district. Table 4-3 provides a crosswalk of hazards identified in select planning documents, including the district's 2021 Risk and Resilience Assessment, the 2021 Santa Cruz County LHMP, and the 2023 State of California HMP. The crosswalk was used to develop a preliminary hazards list, providing a framework for the group to evaluate which hazards were truly relevant to the district and which ones were not.

The internal planning group then ranked hazards based on their probability of affecting SqCWD and potential impacts on the communities it serves. Figure 4-13 displays the results of the hazard risk ranking exercise that was performed before further refinement. All hazards have been profiled in Volume 1 of this document. The purpose of this annex is to specifically address SqCWD's vulnerability to specifically identified hazards.



Table 4-3: SqCWD Document Review Crosswalk

Hazard	SqCWD Risk and Resilience Assessment 2021	Santa Cruz County LHMP 2021	2023 California SHMP
Agricultural Pests			■
Avalanche			■
Climate Change		■	■
Coastal		■	■
Dam Failure		■	■
Drought		■	■
Earthquake / Liquefaction	■	■	■
Extreme Cold		■	■
Extreme Heat		■	■
Extreme Weather / Storms	■	■	■
Flood	■	■	■
Geologic / Mass Movement	■	■	■
Human-Caused			■
Insects			■
Levee Failure			■
Pandemic Disease			■
Sea Level Rise			■
Soil			■
Subsidence			■
Tornado			■
Tsunami / Seiche Wave	■		■
Volcano			■
Wildfire	■	■	■

Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY	Highly Likely	Highly likely - 100% annual probability. Or Likely to occur every year in your lifetime.
	Likely	Likely - between 10 & 100% annual probability. Or will occur several times in your lifetime.
	Possible	Possible - between 1 & 10% annual probability. Or Likely to occur some time in your lifetime.
	Unlikely	Unlikely - less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

To concentrate resources, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards. These hazards have the higher probability and greater impact as it relates to the jurisdictions planning area.

Hazard definitions are included in **Vol. 1** of this plan. Some hazards are discussed as subset hazards— e.g., "Dam Failure" within the "Flood" hazard profile. If a hazard is not present on the risk matrix or are grey in color, the jurisdictional planning team felt the hazard had a minimal footprint within their planning area and was not ranked.

Hazard Information / Legend:



Climate Change impacts will be addressed at the end of each hazard section and as a stand alone section for each jurisdiction.

For County and Municipal governments you will be required to address climate change impacts in the Safety Element of your General Plan. Climate change may change the frequency, duration and intensity of hazards listed above.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT			
Minor	Limited	Critical	Catastrophic
Minor - very few injuries, if any. Only minor property damage & minimal disruption on quality of life. Temporary shutdown of critical facilities.	Limited - minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.	Critical - multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.	Catastrophic - high number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

Soquel Creek Water District Risk Matrix

		IMPACT			
		Minor	Limited	Critical	Catastrophic
PROBABILITY	Highly Likely	Medium	 	Extreme	Extreme
	Likely	 Medium	 	 	Extreme
	Possible	Low	Medium		High
	Unlikely	Low	Low	Medium	Medium

Figure 4-13: SqCWD Risk Assessment Matrix



Table 4-4: SqCWD Hazards Prioritization Summary

Hazard	Priority	Explanation
Wildfire	High	Profiled in Volume 1, Section 3.2.1, and Section 4.5.2.1 in this annex
Flood	High	Profiled in Volume 1, Section 3.2.2, and Section 4.5.2.2 in this annex (not including Levee Failure due to being outside jurisdictional mission and authority)
Earthquake	Extreme	Profiled in Volume 1, Section 3.2.3, and Section 4.5.2.3 in this annex, including Liquefaction
Severe Weather	-	Not a priority due to being outside jurisdictional mission and authority
Coastal Hazards	High	Profiled in Volume 1, Section 3.2.5, and Section 4.5.2.4 in this annex, including Coastal Erosion and Tsunami (Coastal Storm and Wave Run-Up and Surge recognized as compounding hazards but are not SqCWD's focus)
Slope Failure	High	Profiled in Volume 1, Section 3.2.6, and Section 4.5.2.5 in this annex
Dam Failure	-	Not a priority due to no exposure
Drought	High	Profiled in Volume 1, Section 3.2.8, and Section 4.5.2.6 in this annex
Extreme Heat	-	Not a priority due to being outside jurisdictional mission and authority
Climate Change	High	Profiled in Volume 1, Section 3.2.10, and Section 4.5.2.7 in this annex, including Sea-Level Rise

4.5.2 Vulnerability to Specific Hazards

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within SqCWD are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities in more depth. Using these methods, the district's planning group estimated vulnerable populations, properties, and assets, and potential losses, primarily to coastal hazards. In addition, the exposure of district assets to drought, geological, earthquake, wildfire and flood hazards was also considered.

Many of the hazard profiles include a snapshot map and damage estimation tables that illustrate the district's vulnerabilities to those specific hazards. These maps assisted the planning group in understanding the hazard exposure of populations, parcels, and critical facilities and infrastructure. Each snapshot map contains an exposure summary that displays the percentage of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed. For hazards without geospatial extents, such as drought, narratives are provided instead of exposure maps and tables.

Based on the hazard prioritization exercise, this vulnerability assessment focuses on seven hazards for SqCWD, some of which encompass subhazards such as Liquefaction and Coastal Erosion.

Wildfire
SECTION 4.5.2.1



Flood
SECTION 4.5.2.2



Earthquake
SECTION 4.5.2.3



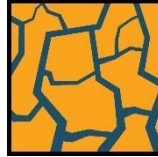
Coastal Hazards
SECTION 4.5.2.4



Slope Failure
SECTION 4.5.2.5



Drought
SECTION 4.5.2.6



Climate Change
SECTION 4.5.2.7





4.5.2.1 Wildfire Hazard

SqCWD faces a mixture of wildfire hazard conditions based on its geographic position and proximity to wildland-urban interfaces (WUIs). According to the CAL FIRE-based maps, Figure 4-14 shows much of the inland and northeastern portions of the District are exposed to Moderate to High Fire Hazard Severity Zones (FHSZs) within the Local Responsibility Area (LRA), particularly along forested and hilly terrain where development borders vegetated lands.

Specifically, the wildfire risk exposure map shows that moderate wildfire hazard dominates the northern and eastern areas of the district, while high wildfire hazard affects a band of wildland-urban interface along the northern boundary and eastern edge of the service area. There are a few smaller areas at the edges near forested canyons that fall within very High hazard zones, typically adjacent to steep slopes and wildland vegetation.

Southern and coastal parts of the district, including urban and suburban zones along Highway 1 and near the coast, fall outside of the mapped hazard zones, suggesting a much lower risk of direct wildfire exposure.

Despite the mapped hazard designations, the exposure summaries in Figure 4-14 indicate that zero population, parcels, or parcel value lie within the "Very High" hazard areas. Critical infrastructure including essential facilities, high-potential loss sites, and lifeline systems are also shown as having 0% exposure in these highest risk areas.

This suggests that while the SqCWD service area includes regions mapped with higher wildfire hazard levels, developed assets and critical facilities are not currently located within the highest risk zones.

The Mean Fire Return Interval (MFRI) map, Figure 4-15 for SqCWD shows how often wildfires have historically occurred across the area. Coastal and urban parts of the district, such as Capitola and Soquel, generally have long fire return intervals over 100 years indicating lower natural wildfire risk. In contrast, inland and forested areas, particularly near Nisene Marks State Park and the district's northern edge, show much shorter intervals (as low as 6–15 years), reflecting higher wildfire potential.

However, SqCWD includes areas designated as "High" wildfire hazard within both Local Responsibility Areas (LRA) and State Responsibility Areas (SRA). Approximately 3,900 residents live within these high-risk zones, primarily concentrated along the district's northern boundary. Within this same hazard area, roughly 2,200 parcels are exposed, representing an estimated \$2.5 billion in combined structure and content value. In addition, critical infrastructure is at risk, including approximately 235 key assets such as storage tanks, production wells, pump stations, and emergency interties, as well as approximately 31 miles of essential infrastructure lines located within the "High" wildfire hazard zones.

WILDFIRE RISK EXPOSURE

SOQUEL CREEK WATER DISTRICT

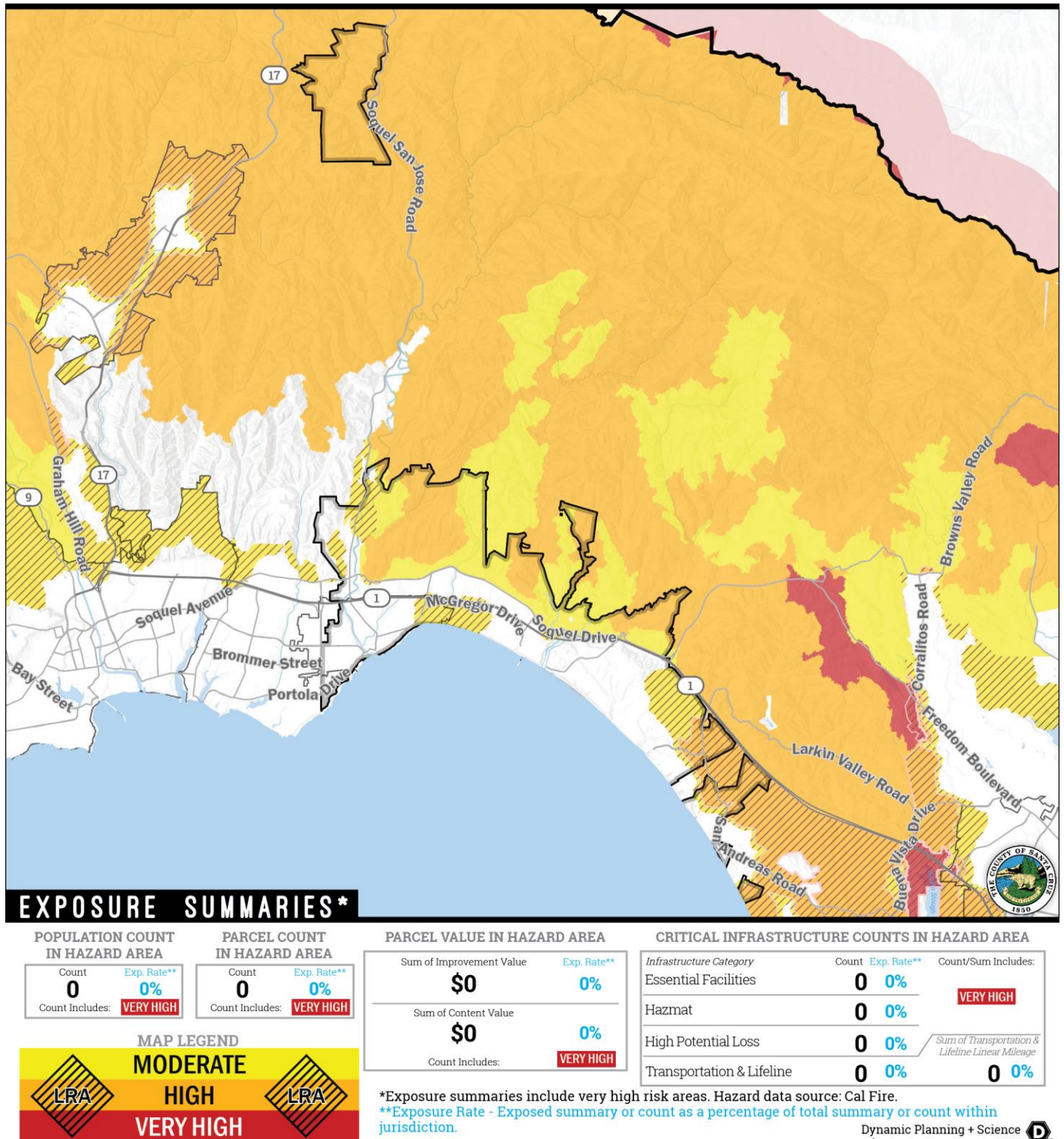
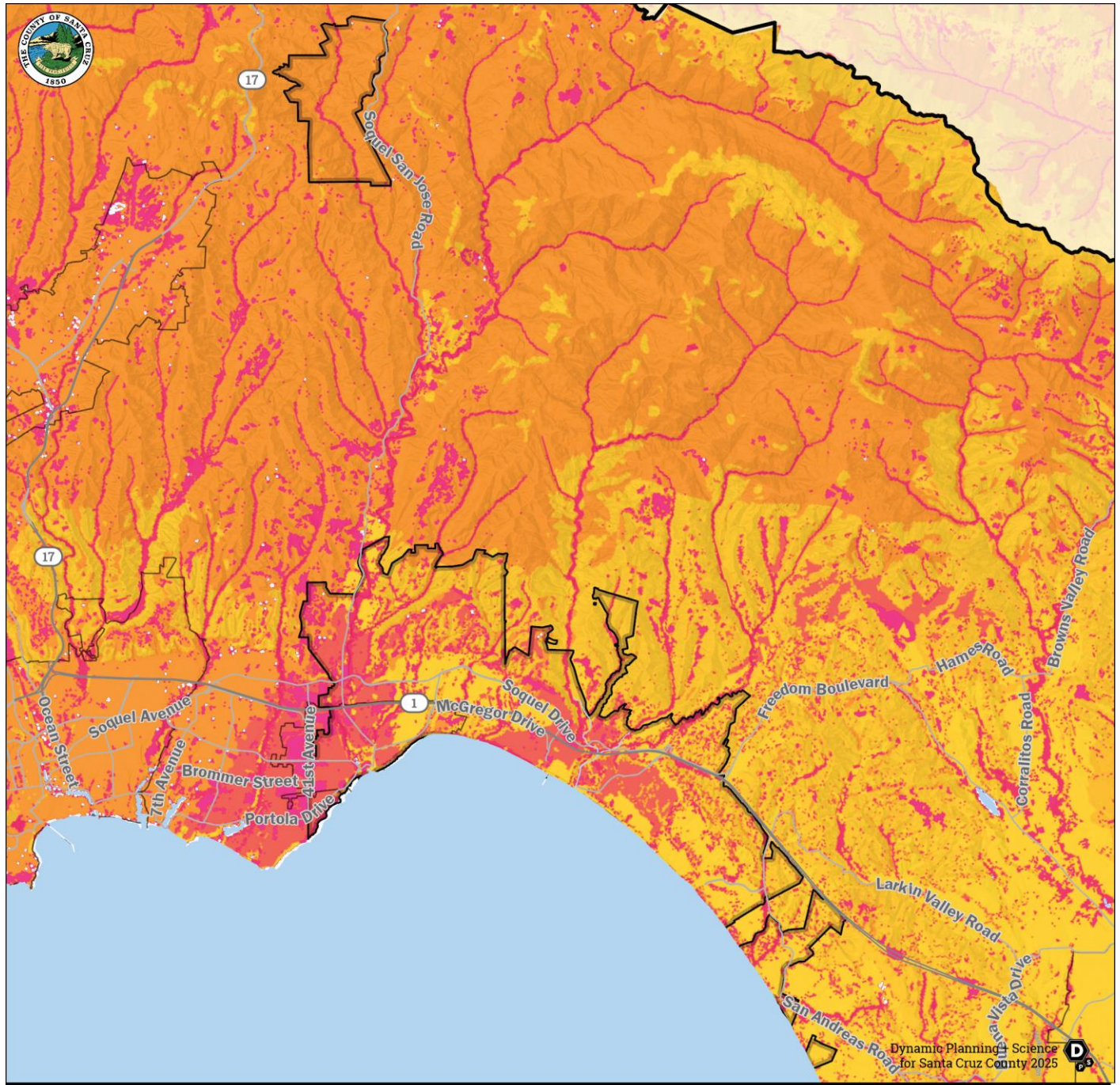


Figure 4-14: Exposure Summary - SqCWD Wildfire Risk



Mean Fire Return Interval Soquel Creek Water District

*Data sources: USGS LANDFIRE.

average period between fires (Years)

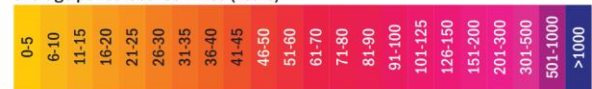


Figure 4-15: SqCWD Mean Fire Return Interval Map

4.5.2.2 Flood Hazard

Flood hazards present a significant concern for the SqCWD, particularly given the region's topography, watershed characteristics, and proximity to the coast. According to FEMA floodplain data, Figure 4-16 shows portions of the district lie within the 100-year and 500-year flood zones, including coastal areas and riverine floodways. The FEMA flood risk maps in Figure 4-16 indicate that approximately 1,700 people reside within these designated flood hazard areas, and roughly 800 parcels are located within the 100-year and 500-year flood zones, amounting to an estimated \$624 million in structural improvement value and roughly \$380 million in content value at risk. These exposures account for 5% and 6% of the district's total respective values.

SqCWD's critical infrastructure exposure is also notable. There are approximately 11 miles of water mains, more than 60 hydrants, and one production well located within mapped flood hazard areas, as well as many miles of non-district transportation infrastructure used to access, maintain, and repair these assets. These areas are primarily along Soquel Creek within and to the north of the City of Capitola and in the Aptos Creek watershed through the unincorporated communities of Aptos Village and Rio Del Mar. Many district assets are also exposed to coastal flooding along the beach between Capitola and the unincorporated community of Seascapes, with water mains and hydrants on Las Olas Drive, Beach Drive, and Potbelly Beach Road vulnerable to flooding compounded by coastal erosion and sea level rise, as discussed in other profiles. The exposure of these lifelines and associated access routes underscores the potential for flood events to disrupt the delivery of the district's essential services and delay repairs and maintenance.

Beyond FEMA-designated flood zones, additional areas of concern are identified through DWR's Flood Awareness Zones (Figure 4-17). These areas capture flood-prone zones that may not be mapped under FEMA but still represent meaningful flood risks due to local hydrology and terrain. While the exposure levels in these awareness zones are lower, Figure 4-17 showing only around three parcels in the district's service area being affected, these areas are still important for planning purposes, particularly in regions where future floodplain expansion is anticipated due to climate change or updated hydrologic modeling.

Collectively, this data highlights that SqCWD's flood vulnerability is concentrated along coastal areas and near stream corridors, with significant infrastructure exposure in low-lying areas.

As a special district and not a municipality, SqCWD does not participate in the National Flood Insurance Program (NFIP); however, the SqCWD complies with all minimum floodplain development standards and environmental review requirements established by the county and municipalities where its projects are located.



FEMA FLOOD RISK EXPOSURE

SOQUEL CREEK WATER DISTRICT

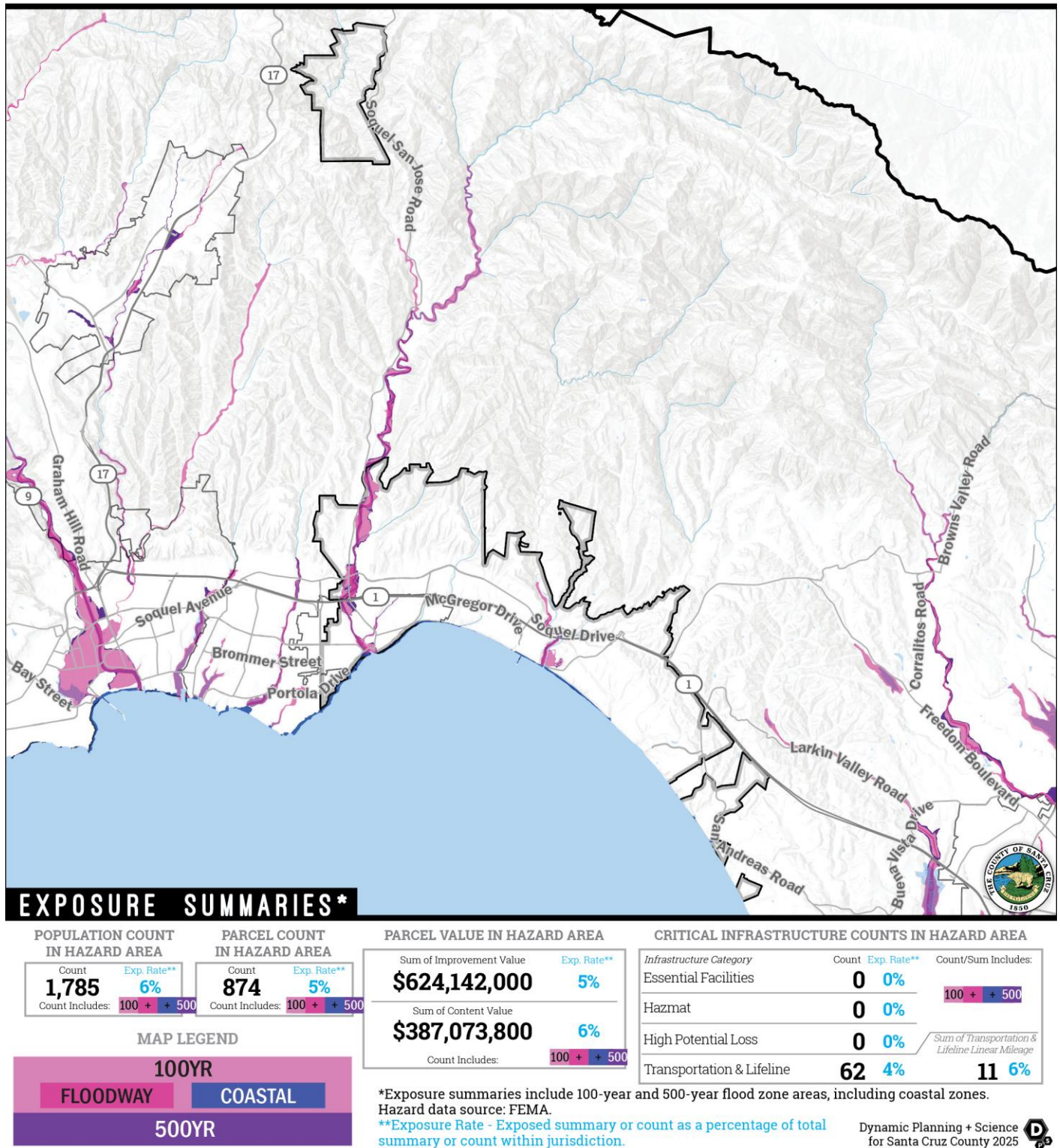
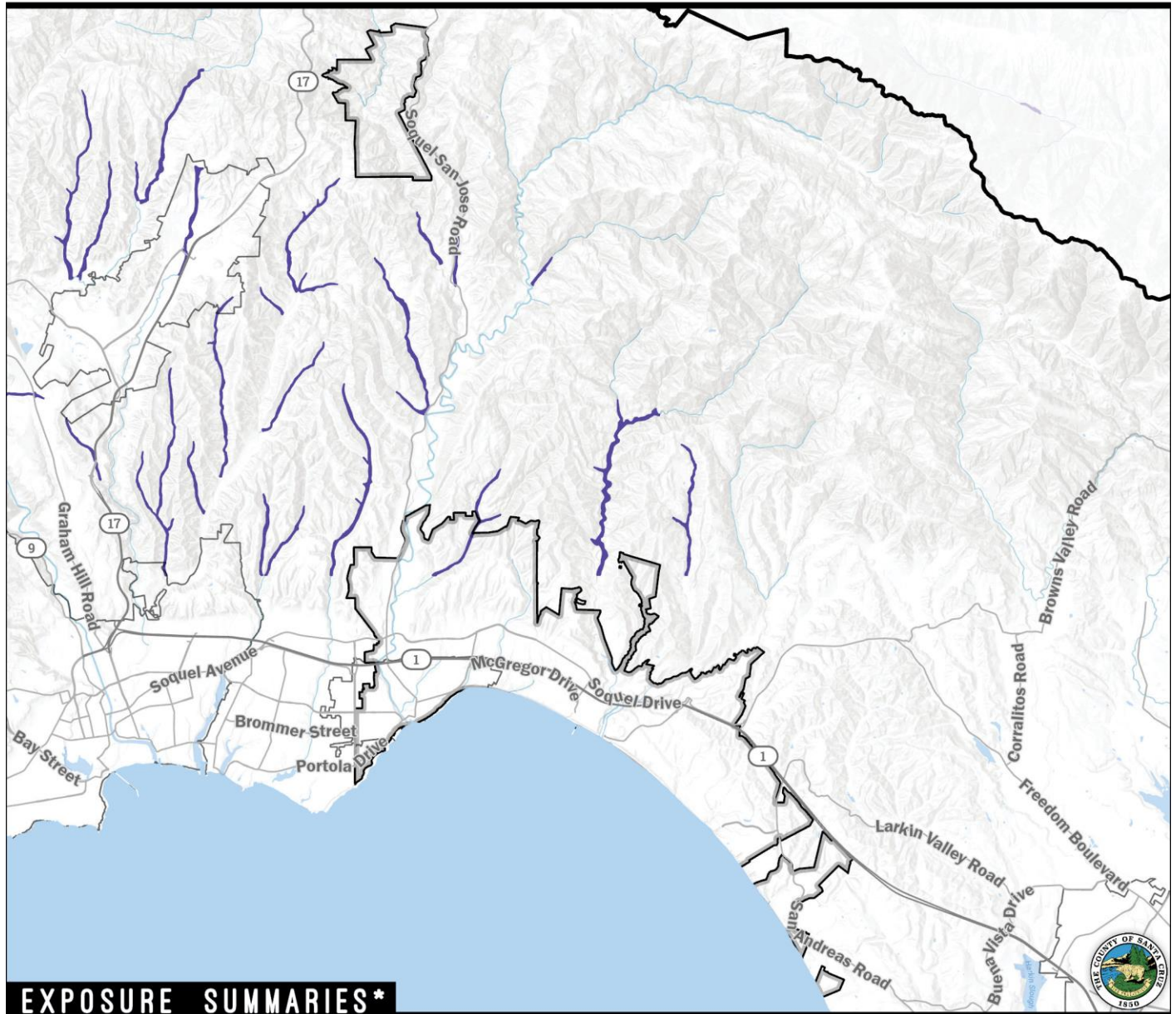


Figure 4-16: Exposure Summary - SqCWD Flood Risk (FEMA Zones)

FLOOD AWARENESS ZONES - BAM

SOQUEL CREEK WATER DISTRICT



EXPOSURE SUMMARIES*

POPULATION COUNT
IN HAZARD AREA

Count	Exp. Rate**
7	0%
Count Includes: AZ	

PARCEL COUNT
IN HAZARD AREA

Count	Exp. Rate**
3	0%
Count Includes: AZ	

PARCEL VALUE IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$1,102,000	0%
Sum of Content Value	
\$551,000	0%
Count Includes: AZ	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	AZ
Hazmat	0	0%	
High Potential Loss	0	0%	
Transportation & Lifeline	0	0%	
		Sum of Transportation & Lifeline Linear Mileage	0 0%

MAP LEGEND

Awareness
Zone

*Exposure summaries include within flooding awareness zone. Hazard data source: USACE BAM.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 4-17: Exposure Summary - SqCWD Flood Risk (DWR Awareness Zones)



4.5.2.3 Earthquake Hazard

SqCWD faces widespread and significant risk from earthquake hazards due to its location near the active San Andreas Fault system. Figure 4-18 shows that the entire district lies within zones of strong to very strong ground shaking under the magnitude (M) 7.1 North San Andreas Santa Cruz Mountains earthquake scenario chosen for this vulnerability assessment. According to scenario mapping, approximately 27,000 people (90% of the population within the district) and 15,000 parcels (also around 90%) are exposed to these seismic intensities (Figure 4-18). The combined structure and content value of exposed parcels exceeds \$16 billion, with most falling within Modified Mercalli Intensity (MMI) zones VII and VIII, indicating the potential for structural damage, utility disruption, and injury.

A significant earthquake event has the potential to damage all of the district's critical facilities and infrastructure, including all production wells, treatment facilities, tanks, pump stations, pressure valves, and emergency interties with other water systems. Approximately 180 miles of water mains and 1,300 hydrants are also exposed, increasing the risk posed by post-earthquake fires.

In addition to strong ground motion, SqCWD faces significant risks from liquefaction across most of its service area, in low-lying areas near creeks, floodplains, and the coastal plain. Liquefaction-prone zones in the district are shown in Figure 4-19 and include the Aptos and Soquel Creek corridors. Over 4,200 people, nearly 2,750 parcels, and over \$3 billion in total parcel value are exposed to the possibilities of liquefaction. Approximately 250 critical facilities—hydrants, production wells, treatment facilities, tanks, and pump stations—and almost 34 miles of water main lie within the most vulnerable areas, with high to very high liquefaction potential. In addition, one emergency intertie is exposed to very high liquefaction risk next to Valencia Creek. Even a moderate seismic event could severely affect the district's capacity to maintain water service due to damage to these critical assets.

Although direct surface rupture risk is relatively low and no mapped faults run directly beneath SqCWD facilities or infrastructure, the proximity to the Zayante–Vergeles and San Andreas fault systems presents a credible threat of severe shaking and associated cascading hazards such as landslides, liquefaction, and service outages as shown in Figure 4-20. Moreover, the watershed from which the district draws its water and its customers fall within the Earthquake Fault Zones of Required Investigation, which may trigger secondary impacts such as reduced water quality from earthquake-triggered landslides or challenges in post-disaster reconstruction. Areas identified are shown in Figure 4-20, and include approximately 130 residents and 20 parcels affected totaling nearly \$24 million.

N SAN ANDREAS - SANTA CRUZ MTN EARTHQUAKE SCENARIO M7.1

SOQUEL CREEK WATER DISTRICT

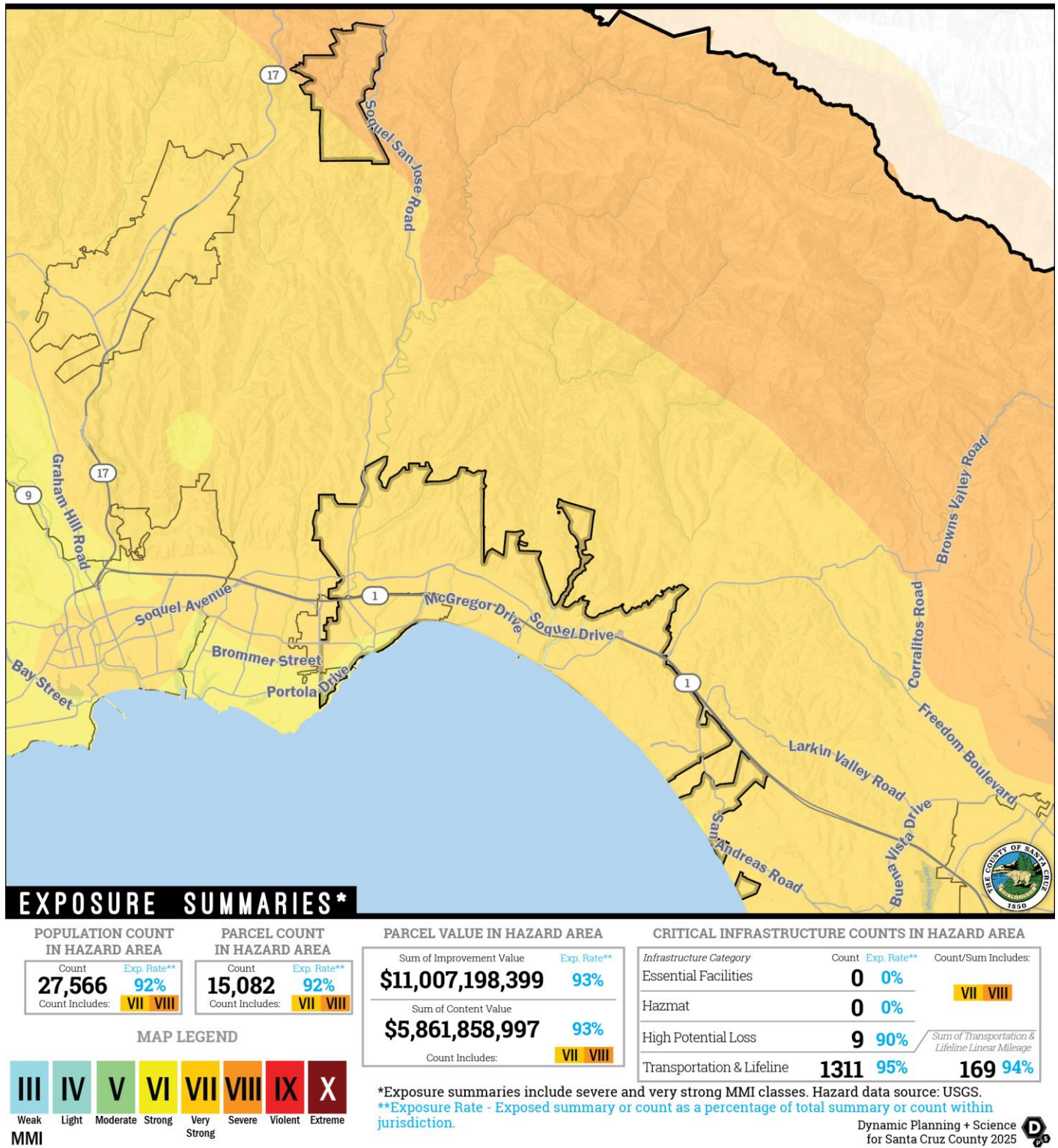
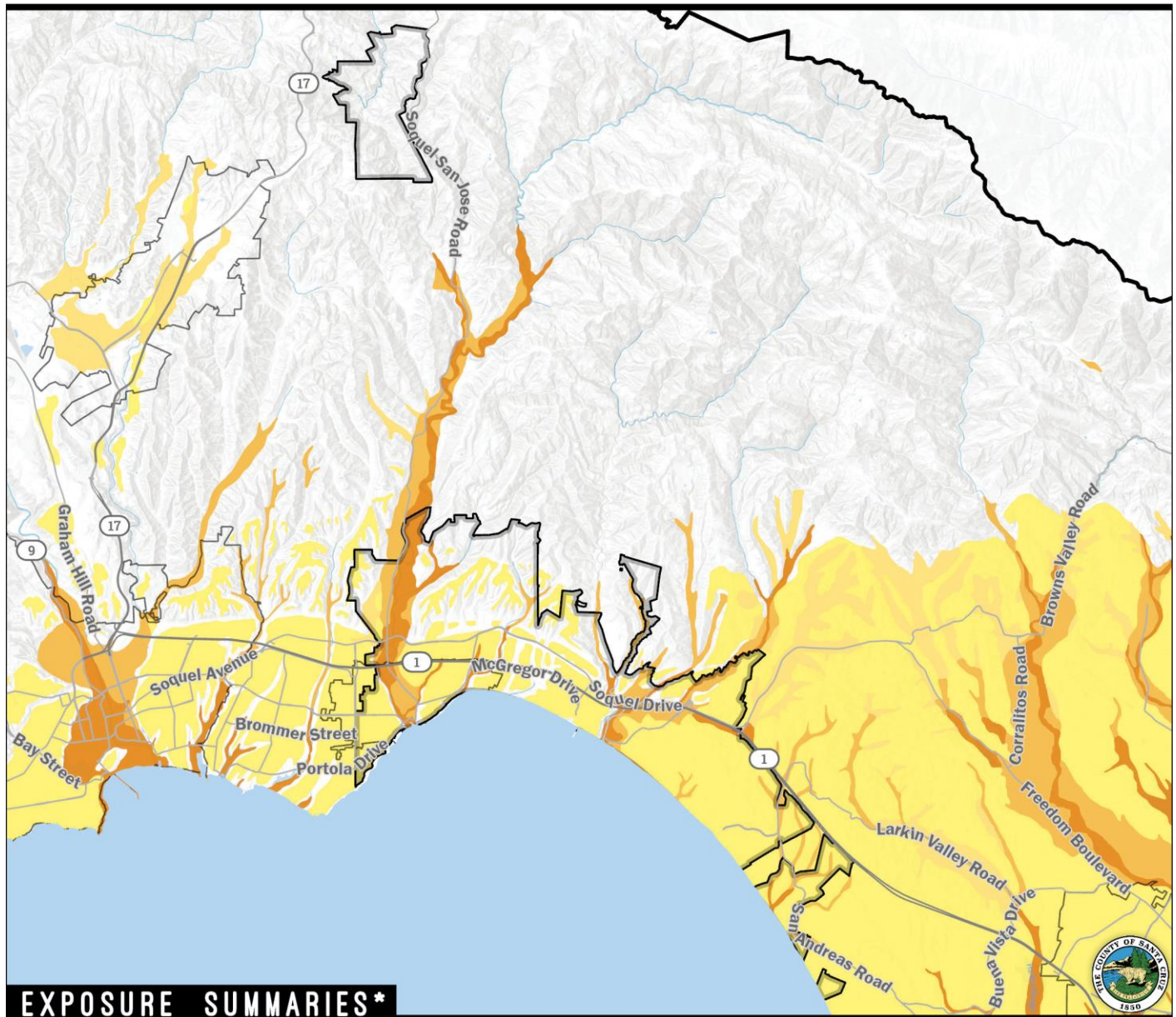


Figure 4-18: Exposure Summary - SqCWD Earthquake Risk (M7.1 San Andreas Shaking)



AREAS WITH POTENTIAL FOR LIQUEFACTION

SOQUEL CREEK WATER DISTRICT



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
4,297	14%	2,744	17%	\$1,964,238,398	17%	Essential Facilities	0	0%	M+V
Count Includes:	M+V	Count Includes:	M+V	Sum of Content Value		Hazmat	0	0%	
				\$1,140,124,198	18%	High Potential Loss	4	40%	Sum of Transportation & Lifeline Linear Mileage
				Count Includes:	M+V	Transportation & Lifeline	252	18%	
									37 21%

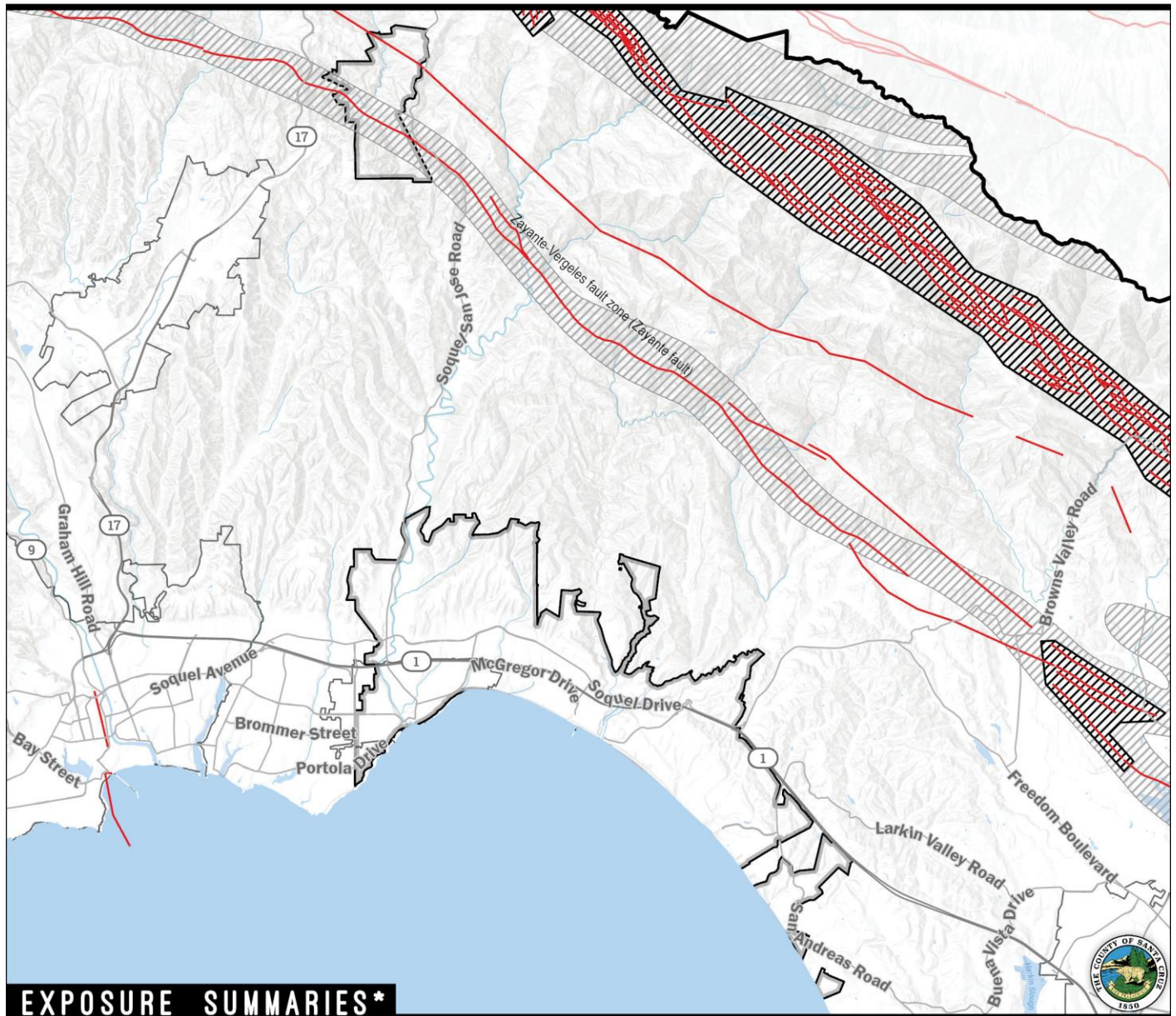
*Exposure summaries include very high, high, and moderate. Hazard data source: County, W.R. Dupre 1975.
**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 4-19: Exposure Summary - SqCWD Liquefaction Risk

FAULT ZONE AREAS OF REQUIRED INVESTIGATION

SOQUEL CREEK WATER DISTRICT



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA		
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**
132	0%	24	0%	\$16,007,200	0%	Essential Facilities	0	0%
Count Includes:		Count Includes:		Sum of Content Value		Hazmat	0	0%
				\$8,003,600	0%	High Potential Loss	0	0%
				Count Includes:		Transportation & Lifeline	0	0%

MAP LEGEND

Quaternary Faults (USGS)

Earthquake Fault Zone of Required Investigation

CGS County Delineated

*Exposure summaries include within zone of investigation. Hazard data source: CGS.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 4-20: Exposure Summary - SqCWD Earthquake Risk (Fault Zones)



4.5.2.4 Coastal Hazards

SqCWD faces growing risks from coastal hazards, including coastal erosion and tsunami events. These threats are intensified by climate change and sea level rise, as discussed in Section 4.5.2.7, as well as the district's proximity to the Pacific Ocean and vulnerable low-lying areas such as the Soquel Estuary, lower Soquel Creek, and the Capitola shoreline.

Coastal Erosion

SqCWD continually faces risks from coastal erosion, and increasingly so with the compounding effects of climate change, severe weather and sea level rise. As a natural and ongoing process, coastal erosion involves the gradual loss of beaches, bluffs, and land due to wave action, storm surges, tidal forces, and rising sea levels. However, in recent decades, the rate and severity of erosion have accelerated due to climate change, stronger storm events, and rising seas. The coastline within and adjacent to SqCWD around Capitola Beach, the Soquel Estuary, New Brighton State Beach, and Seacliff State Beach, features unconsolidated soils and low-lying development, making it particularly vulnerable to erosion-related impacts.

The erosion threat in Santa Cruz County is driven by multiple factors. Strong wave activity, particularly during El Niño years, regularly undermines coastal bluffs. Sediment starvation caused by upstream damming and human development further reduces natural beach replenishment. In response, some areas have installed protective structures such as seawalls and revetments; however, these can worsen erosion in adjacent unprotected areas. Portions of Santa Cruz County have experienced erosion rates of 1 to 2 feet per year on average, with localized hotspots seeing over 5 feet of retreat annually during severe winter storms (California Coastal Commission, 2024).

For SqCWD, the implications of ongoing coastal erosion are significant. Erosion threatens a significant portion of the district's critical infrastructure and facilities, much of which is located along the coastline and stream outlets into the Monterey Bay where coastal erosion is most pronounced. Erosion can also damage roadways and recreation trails that provide the district access to these assets for maintenance and repairs. For SqCWD, coastal erosion threatens to compromise the structural stability of many miles of water mains, as well as numerous hydrants, pump stations, and valves located along the coast. As climate change and sea level rise progress, coastal infrastructure will require relocation or hardening to maintain service reliability.

Tsunami

Tsunamis pose a rare but potentially catastrophic hazard to SqCWD and its surrounding communities along the central coast of Santa Cruz County. While the likelihood of a tsunami is low compared to other coastal hazards, the consequences of a major tsunami event can be devastating due to the district's coastal proximity, low-lying terrain, and the concentration of development in vulnerable shoreline areas.

As shown in Figure 4-21, a significant portion of the district's coastal area lies within mapped tsunami run-up zones. Specifically, approximately 2,500 residents or about 9% of the district's total population, live within the tsunami hazard area. The same exposure zone contains nearly 1,500 parcels, also totaling roughly 9% of the district's parcel count. The total value of improvements in the tsunami zone is estimated at nearly \$1 billion while content value exposure is approximately \$560 million. These figures underscore the high potential for economic loss in the event of a tsunami.

The district's critical facilities and infrastructure are also at risk. The district has about 12 miles of water main, 90 hydrants, a pressure valve, and a production well located within the tsunami run-up area, all of which could be severely damaged and rendered inoperable from a significant tsunami event. Further, a sizable tsunami is likely to wash out, bury, or otherwise damage transportation infrastructure in the area, reducing SqCWD's ability to repair assets following an event. This exposure highlights the extent of impairment that could occur for essential water delivery, emergency response, and post-disaster recovery capabilities if damaged.

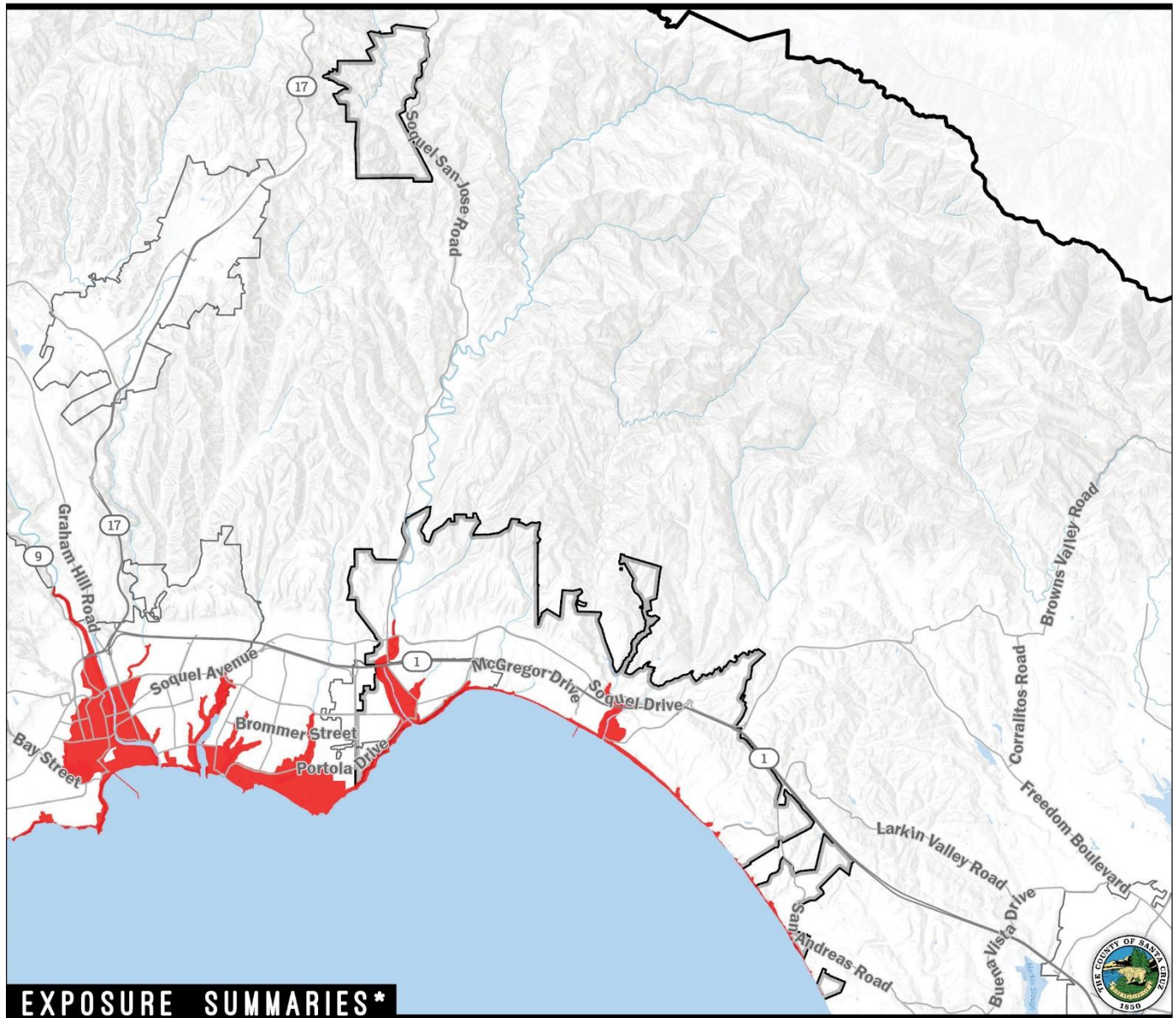
Tsunamis in this region would likely be generated by distant subduction zone earthquakes, such as those occurring along the Aleutian or Cascadia Subduction Zones. These events could provide limited warning time for evacuation, with inundation depths and flow velocities capable of sweeping away structures, vehicles, and above-ground utility assets. Communities such as Capitola and the surrounding urbanized coastal corridors are especially at risk due to their concentration of residential and commercial development near beaches, estuaries, and the mouths of creeks and rivers.

The California Geological Survey (CGS) and National Tsunami Hazard Mitigation Program (NTHMP) provide updated inundation modeling and maps, which inform local emergency planning, evacuation signage, and community outreach.



TSUNAMI RUNUP AREA EXPOSURE

SOQUEL CREEK WATER DISTRICT



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**
2,565	9%
Count Includes: Tsunami	

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**
1,494	9%
Count Includes: Tsunami	

PARCEL VALUE IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$996,729,200	8%
Sum of Content Value	
\$564,111,800	9%
Count Includes: Tsunami	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	Tsunami
Hazmat	0	0%	
High Potential Loss	0	0%	
Transportation & Lifeline	92	7%	Sum of Transportation & Lifeline Linear Mileage
			16 9%

MAP LEGEND

Tsunami Run-Up

*Exposure summaries include tsunami runup inundation area. Hazard data source: County.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 4-21: Exposure Summary - SqCWD Tsunami Risk

4.5.2.5 Slope Failure Hazard

SqCWD faces slope failure hazards within its jurisdiction which could severely impact critical infrastructure and service reliability. While bluff failure associated with coastal erosion is also a significant concern for the district, this section concentrates on inland slope failure risks; coastal erosion is discussed in Section 4.5.2.4.

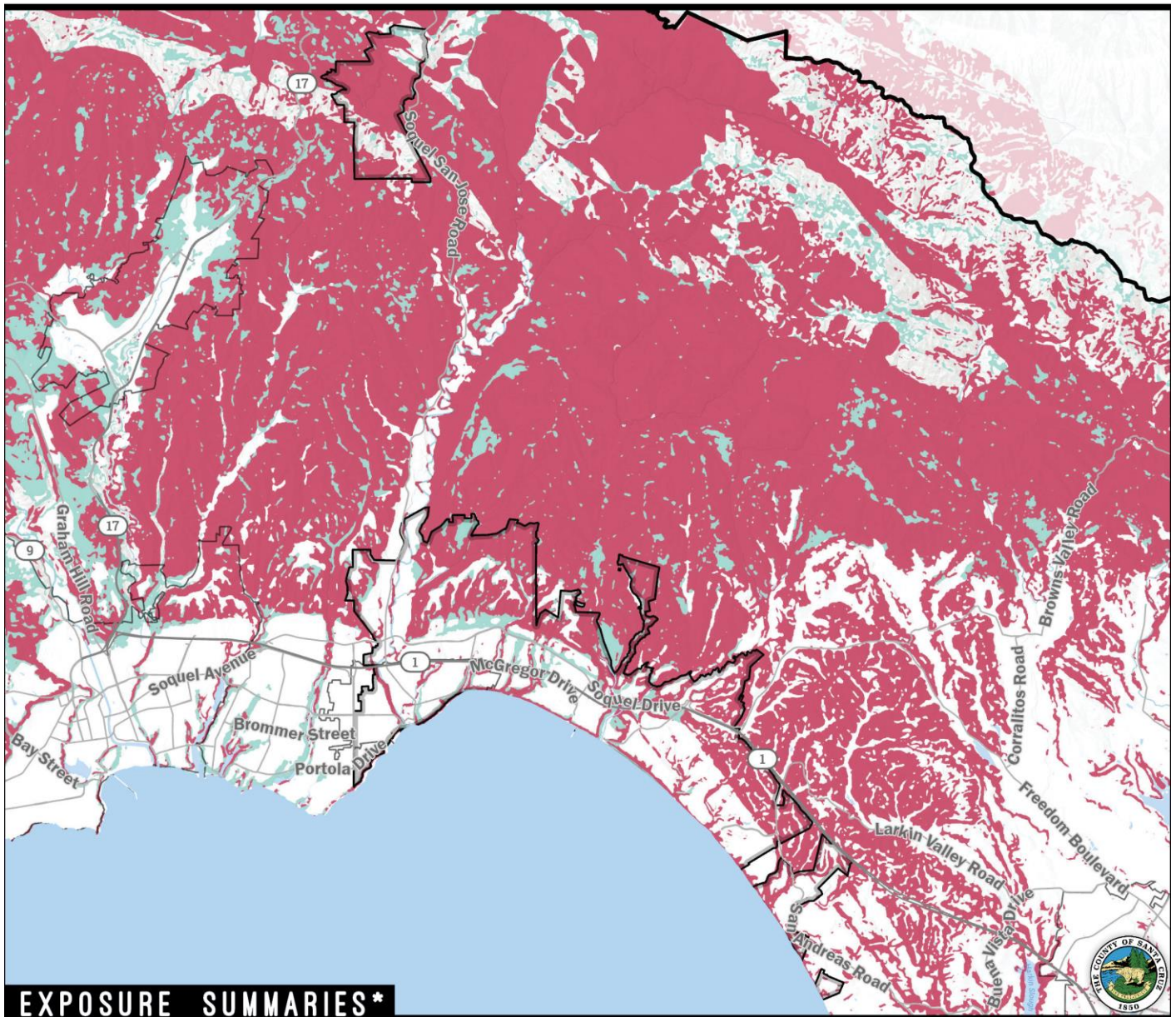
Slope failure-prone areas are extensive across the district, especially in the foothills of the Santa Cruz Mountains as they merge with the shallow coastal plain (Figure 4-22). These areas are mapped as having high susceptibility to landslides, debris flows, and other types of slope failure, with the highest risk concentrated in areas of steep topography along waterways and other drainages.

Figure 4-22 shows approximately 7,500 people, around 25% of the district's population, reside in areas susceptible to landslides, and approximately 3,000 parcels, around 20% of the total, with a combined structural and content value exceeding \$3 billion are also located in these areas. Critical infrastructure exposure is also significant. More than 230 critical facilities—accounting for approximately 17% of the district's total infrastructure—fall within mapped landslide susceptibility zones. This includes about 30 miles of water mains, almost 200 hydrants, two production wells, three emergency interties, and many pump stations, tanks, and valves. Slope failures can lead to water main breaks and service disruptions, and incur significant repair costs in the long-term, particularly after periods of heavy rainfall or seismic activity. In addition, slope failures often block or damage access roads upon which SqCWD depends to access, maintain, and repair its assets to ensure delivery of water to its customers.



LANDSLIDE RISK EXPOSURE

SOQUEL CREEK WATER DISTRICT



EXPOSURE SUMMARIES*

POPULATION COUNT
IN HAZARD AREA

Count	Exp. Rate**
7,584	25%
Count Includes:	HIGH

PARCEL COUNT
IN HAZARD AREA

Count	Exp. Rate**
3,042	19%
Count Includes:	HIGH

PARCEL VALUE IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$2,457,632,800	21%
Sum of Content Value	
\$1,253,170,401	20%
Count Includes:	HIGH

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	HIGH
Hazmat	0	0%	
High Potential Loss	0	0%	
Transportation & Lifeline	236	17%	
			Sum of Transportation & Lifeline Linear Mileage
			30 17%

MAP LEGEND

LOW
MODERATE
HIGH

*Exposure summaries include high susceptibility only. Hazard data source: CGS, DPS.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 4-22: Exposure Summary - SqCWD Slope Failure Risk



4.5.2.6 Drought Hazard

The National Drought Monitor provides drought data and maps nationally and on a localized, watershed scale. The National Drought Monitor is the product of 11 agencies, including the NDMC, NOAA and USDA, and is available at <http://droughtmonitor.unl.edu/>. The National Drought Monitor categorizes the level of drought from D0 through D4, with D4 being the highest “exceptional drought.” Table 4-5 depicts drought classifications and impacts from the level of drought occurrence in California, while Figure 4-23 shows a time series of the level of drought in Santa Cruz County from 2000 to 2024 according to the National Drought Monitor.

SqCWD is particularly vulnerable to drought due to its heavy reliance on local groundwater basins and a limited surface water supply. The district serves communities that are highly dependent on sustainable water management strategies, especially as the frequency and severity of drought conditions increase.

SqCWD relies almost entirely on groundwater pumped from the Santa Cruz Mid-County Groundwater Basin, a critically overdrafted basin identified under California’s Sustainable Groundwater Management Act (SGMA). The district does not have access to imported water, and its service area lacks large surface reservoirs, meaning that prolonged droughts pose direct and immediate risks to water supply availability.

During drought conditions, groundwater levels may decline more rapidly, increasing the risk of saltwater intrusion, especially in coastal zones. The basin has already experienced seawater intrusion due to long-term overdraft, and further droughts would intensify this hazard, compromising the long-term viability of groundwater as a safe drinking water source.

Drought conditions reduce recharge rates and can increase the concentration of contaminants such as nitrates, naturally occurring minerals, and volatile organic compounds (VOCs). This may place additional stress on water treatment systems and create higher costs for water quality compliance. Moreover, as aquifers are drawn down further, infrastructure such as wells and pumps are subjected to greater operational demands, increasing the risk of mechanical failures or emergency outages during high-demand periods.

Persistent droughts also place significant pressure on water agencies to meet state-mandated conservation requirements. SqCWD has implemented tiered water pricing, drought surcharges, and aggressive conservation messaging in past droughts. Future droughts may require stricter demand-side restrictions, including water rationing, which can generate public resistance and logistical challenges.

Table 4-5: Drought Classifications and Impacts

Category	Description	Possible Impacts
D0	Abnormally Dry	- Soil is dry; irrigation delivery begins early - Dryland crop germination is stunted - Active fire season begins



Category	Description	Possible Impacts
D1	Moderate Drought	▪ Dryland pasture growth is stunted; producers give supplemental feed to cattle ▪ Landscaping and gardens need irrigation earlier; wildlife patterns begin to change ▪ Stock ponds and creeks are lower than usual
D2	Severe Drought	▪ Producers increase water efficiency methods and drought-resistant crops ▪ Grazing land inadequate ▪ Fire season is longer, with high burn intensity, dry fuels, and large fire spatial extent; more fire crews on staff ▪ Lake- and river-based tourism declines; boat ramps close ▪ Trees are stressed; plants increase reproductive mechanisms; wildlife diseases increase ▪ Water temperatures increase; programs to divert water to protect fish begin ▪ River flows decrease; reservoir levels are low and banks are exposed
D3	Extreme Drought	▪ Federal water not adequate to meet irrigation contracts; extracting supplemental groundwater is expensive ▪ Fire season lasts year-round; fires occur in typically wet parts of the state; burn bans are implemented ▪ Ski and rafting business is low; mountain communities suffer ▪ Low water levels impede fish migration and cause lower survival rates ▪ Wildlife encroach on developed areas; little native food and water is available for bears, which hibernate less ▪ Water sanitation is a concern; reservoir levels drop significantly; surface water is nearly dry, flows are very low; water theft occurs ▪ Livestock need supplemental feed, cattle and horses are sold; little pasture remains ▪ Well and aquifer levels decrease; homeowners drill new wells
D4	Exceptional Drought	▪ Fire season is very costly; number of fires and areas burned are extensive ▪ Many recreational activities are affected ▪ Fields are left fallow; orchards are removed; vegetable yields are low; honey harvest is small; agricultural unemployment is high, food aid is needed ▪ Fish rescue and relocation begins; pine beetle infestation occurs; forest mortality is high; wetlands dry up; wildlife death is widespread; algae blooms appear ▪ Poor air quality affects health; greenhouse gas emissions increase as hydropower production decreases; West Nile outbreaks rise ▪ Water shortages are widespread; surface water is depleted; federal irrigation water deliveries are curtailed; water prices are extremely high; wells are dry, more and deeper wells are drilled; water quality is poor

Source: Adapted from U.S. Drought Monitor Drought Classifications and Impacts

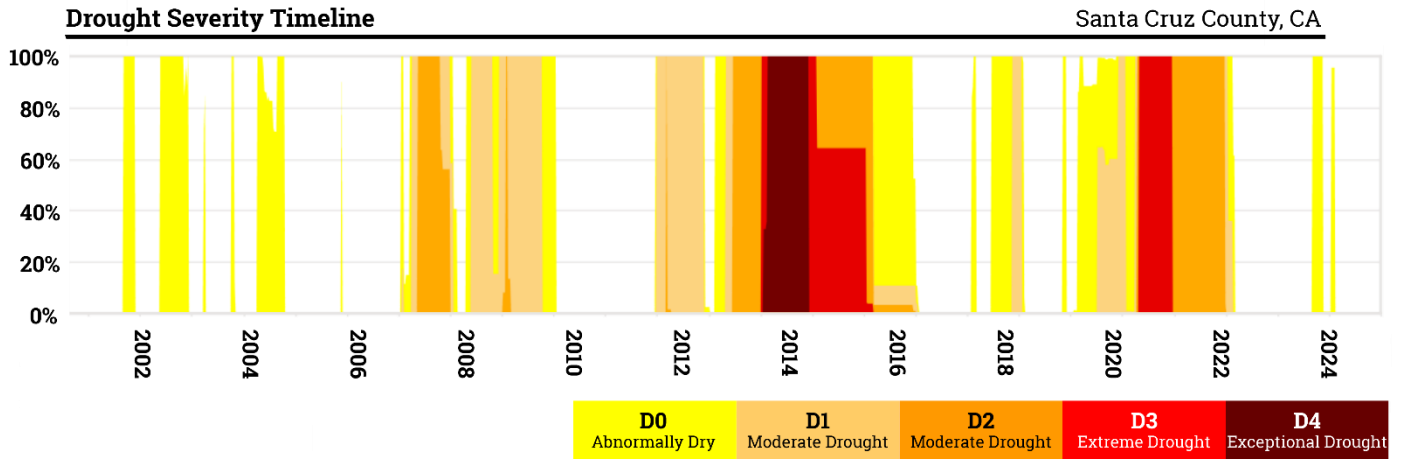


Figure 4-23: Drought Severity Timeline 2000-2024

4.5.2.7 Climate Change Hazard

Average annual temperatures across most of California have already increased by more than 1°F, with some areas experiencing rises of over 2°F when comparing the 1901–1960 average to that of 1986–2016. Daily maximum temperatures—a key indicator of extreme heat—are projected to increase by 4.4°F to 5.8°F by 2050 and by 5.6°F to 8.8°F by 2100. Heat waves that impact public health, known as heat-health events, are also expected to intensify across the state. By 2050, these events are projected to last up to two weeks longer in the Central Valley and occur four to ten times more often in the Northern Sierra region (California Natural Resources Agency, 2022).

California is already experiencing significant impacts from climate change, including prolonged drought, a lengthened wildfire season, increased coastal flooding and erosion, and widespread tree mortality. The state has observed rising average temperatures, more extreme heat days, fewer cold nights, a longer growing season, and shifts in the water cycle, with less winter precipitation falling as snow. In addition, summertime fog has declined by approximately 33%, and both snowmelt and rainwater runoff are occurring earlier in the year (Cal OES, 2018).

Long-term trends indicate a 12% to 20% decline in fog across California from 1900 through projections to 2070. Climate experts suggest that warming temperatures reduce the ability of air masses to cool enough to produce fog, which plays a critical role in supporting California's ecosystems (Grantham, Theodore; University of California, Berkeley, 2018).

SqCWD faces a range of hazards intensified by climate change. These include sea level rise (SLR), drought, coastal erosion, and wildfire, all of which directly threaten the district's water infrastructure and groundwater-dependent service area. Although SqCWD has not previously framed these hazards explicitly under a "climate change" lens in past mitigation plans, the nature, frequency, and severity of these threats are projected to increase due to a warming climate.



Drought conditions are becoming more frequent and severe under climate change. SqCWD's sole reliance on groundwater heightens its vulnerability, especially during prolonged dry periods. As precipitation patterns shift and snowpack in the Sierra Nevada declines, statewide water availability becomes more uncertain. This increases demand on local groundwater systems and challenges long-term supply reliability.

Although SqCWD's service area is mostly urban and coastal, the northern boundary of the district extends into areas designated as "High" wildfire hazard by Cal Fire. Climate change is increasing wildfire risk through hotter temperatures, drier vegetation, and longer fire seasons. These fires can threaten water quality, destroy critical facilities, and cause prolonged service interruptions.

Sea Level Rise

Sea levels along the Central Coast could rise by approximately 1 ft by 2050 and up to nearly 12 ft by 2150 under medium to high emissions scenarios. Sea level rise (SLR) increases the risk of coastal inundation, saltwater intrusion into freshwater aquifers, and damage to coastal infrastructure. (California Ocean Protection Council, 2025) Within SqCWD's service area, the COSMOS v3.1 model (Figure 4-24) shows that SLR impacts are concentrated along the immediate coastline and tidal zones, including areas adjacent to key infrastructure corridors such as Highway 1 and coastal neighborhoods. Exposure summary data on Figure 4-24 indicate that approximately 400 residents and 60 parcels lie within the districts service area and the SLR hazard zone, with a total structure and content value exposure of nearly \$57 million. While the exposure rate is low (<1%), these zones represent vital coastal corridors and resources for the district. SLR further compounds coastal erosion risks, threatening bluff stability, beach retreat, and inundation of facilities and infrastructure during king tide and flood events. Chronic erosion along the coast is projected to intensify with accelerating SLR and more frequent storm surge events. As such, the district will likely face increasing maintenance needs for any lifelines that traverse or are adjacent to these erosion-prone coastal zones and are not relocated or hardened in the long term.

Very little of SqCWD's assets are directly exposed to SLR, but FEMA floodplain maps help demonstrate how the compounding hazards of SLR, flooding, and coastal erosion may significantly impact portions of the district's service area (Figure 4-16).

SEA LEVEL RISE EXPOSURE

SOQUEL CREEK WATER DISTRICT

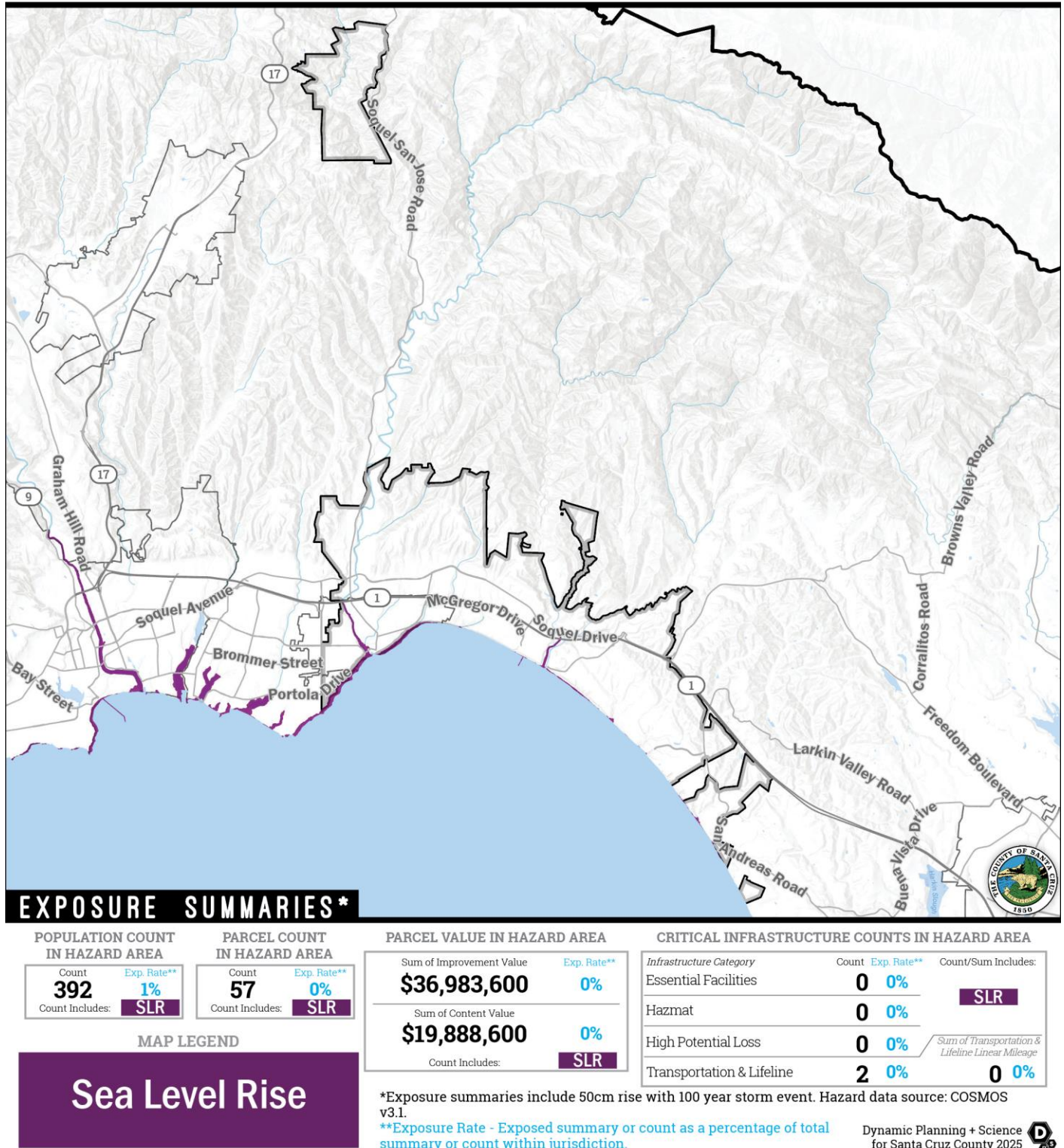


Figure 4-24: Exposure Summary - SqCWD Sea Level Rise Risk



4.5.3 Planning for Hazards & Growth

SqCWD integrates hazard mitigation and resilience planning directly into its long-term infrastructure and development strategies to ensure a sustainable and secure water supply system for current and future customers.

One of the foundational documents supporting this integration is the 2020 UWMP which projects population growth and water demand through 2040. The UWMP outlines how water efficiency, groundwater protection, and recycled water use will meet demand even during multiple dry years, ensuring that future development does not outpace the district's water resource capacity. The district's water demand projections are synchronized with land use patterns and expected housing growth in its four primary service areas of Soquel, Aptos, Capitola, and La Selva Beach, allowing hazard-aware planning to guide decisions about system expansion and infrastructure siting.

Central to SqCWD's future-proofing efforts is Pure Water Soquel, a landmark groundwater replenishment and seawater intrusion prevention project. This advanced water purification initiative will supply purified water to recharge the Santa Cruz Mid-County Groundwater Basin, the District's sole drinking water source. By increasing the long-term reliability of the water supply, the project supports future residential and commercial development in a way that is resilient to climate change, drought, and regulatory restrictions under the Sustainable Groundwater Management Act (SGMA). The project also enables the district to comply with basin sustainability goals without relying on additional groundwater pumping or external water imports, both of which would be vulnerable to climate impacts or infrastructure failure.

SqCWD also actively incorporates hazard data into infrastructure decision-making through documents such as its 2021 Risk and Resilience Assessment and 2023 Well Master Plan. These assessments evaluate the vulnerability of critical infrastructure such as wells, pump stations, treatment facilities, and storage tanks, to a wide range of threats including earthquakes, power outages, wildfires, and sea level rise.

To enhance system readiness and ensure continuity of operations during emergencies, the district adopted a comprehensive ERP in 2021. This plan outlines hazard-specific procedures for wildfire, drought, seismic events, and public safety power shutoff (PSPS) scenarios. As new development areas are incorporated into the district's service boundary or experience infrastructure upgrades, the ERP serves as a framework for evaluating how emergency response capabilities can scale alongside population and asset growth.

In parallel, the district's WSCP uses a tiered drought response structure to protect supplies and maintain equitable service delivery. This plan ensures that as development proceeds, water allocation and conservation messaging can be swiftly scaled up during extreme droughts.

Equity also plays a growing role in SqCWD's future development strategy. Several communities within or adjacent to the district's service area have been identified as Disadvantaged Communities (DACs) under state guidelines. Although formal planning processes specific to these populations are limited in scope, the district's major resilience investments, including Pure Water Soquel and its demand management programs, are explicitly designed to minimize the financial and environmental burdens on low-income

residents. These efforts ensure that vulnerable populations are not disproportionately affected by rate increases or service disruptions during emergencies or climate-related events.

Lastly, SqCWD's Capital Improvement Program (CIP) and 2023 Rate Study incorporate hazard mitigation into the financial and logistical planning for future development. The CIP prioritizes projects such as seismic tank retrofits and new interties to support system redundancy, that both support long-term growth and reduce risk exposure while the rate study ensures that future development costs are distributed fairly and sustainably across user groups.

4.5.3.1 Development & Hazard Considerations

SqCWD faces significant hazard risks that are directly influenced by past and ongoing patterns of urban development. While the district itself is not a land use authority, residential, commercial, and infrastructure growth within its service area has increased exposure to multiple hazards, including drought, wildfire, flooding, and coastal threats like sea level rise and saltwater intrusion.

Historically, urban development in the unincorporated areas of Santa Cruz County, the City of Capitola, and the Live Oak community have placed critical infrastructure and housing in areas prone to wildfire, flooding, and seismic activity. For example, new construction in the wildland-urban interface (WUI), especially in the district's northern service area, has increased the number of people and properties exposed to high fire hazard severity zones.

Additionally, residential development in low-lying coastal areas and near the Soquel Creek floodplain has expanded the number of structures vulnerable to flooding. Growth in the district's coastal areas, including portions of Capitola Village, now overlaps with tsunami evacuation zones, and will face escalating risk from sea level rise and coastal erosion as projected by the California Ocean Protection Council and the U.S. Geological Survey. New homes and businesses near bluffs or on unstable soils also increase the likelihood of damage from slope failures and expansive soils, particularly during heavy rainfall years.

As development pushes further into hazard-prone areas, the district must plan for a more complex and distributed infrastructure network that remains resilient to disaster. Longer distribution lines, more dispersed customer bases, and increased reliance on pump stations and tanks in remote areas create vulnerabilities, especially during power outages, earthquakes, or wildfires. Expansion into hilly or geologically unstable terrain further complicates emergency access and response.

4.5.4 Hazard Problem Statements

As part of the mitigation action identification process, the internal planning group for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis. Problem statements focused on the impact, victim, and the threat that the hazard could create in the jurisdiction, as described in Table 4-6. Identifying common issues and



weaknesses through these problem statements assisted the planning group in understanding the realm of resources needed for mitigation.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 4-8 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 4-6 and Table 4-8.

Table 4-6: SqCWD Problem Statements

Hazard	Sub-Hazard	Area of Concern	Problem IS	Description	Related Mitigation Actions
Coastal Hazards	Coastal Erosion	Threat	ps-CE-SCW-01	Bluff erosion along the coastline threatens the long-term stability of buried pipelines and surface infrastructure in erosion-prone areas of Capitola and near Soquel Creek.	ma-CE-CPT-01, ma-CE-SCW-01, ma-CE-SCW-02, ma-CE-SCW-03
Coastal Hazards	Coastal Erosion	Impact	ps-CE-SCW-02	Coastal erosion can undermine the structural integrity of water infrastructure and access roads, increasing the risk of equipment damage or service outages.	ma-CE-SCW-01
Coastal Hazards	Coastal Erosion	Victim	ps-CE-SCW-03	Communities and facilities located along coastal bluff areas may face reduced water service reliability due to damage or relocation of infrastructure caused by erosion.	ma-CE-SCW-01
Drought		Impact	ps-DR-SCW-01	Prolonged drought periods may reduce groundwater recharge rates, stressing Soquel Creek Water District's well-based supply system.	ma-DR-SCW-01, ma-DR-SCW-02, ma-DR-SCW-03, ma-DR-SVW-01, ma-DR-CBC-03
Drought		Victim	ps-DR-SCW-02	Customers relying on groundwater and recycled water from the Pure Water Soquel project may experience decreased service reliability during severe drought conditions.	ma-DR-SCW-01
Drought		Threat	ps-DR-SCW-03	Climate change is increasing the frequency and severity of droughts, putting long-term strain on the District's water supply resilience and planning.	ma-DR-CBC-03
Drought		Impact	ps-DR-SCW-04	Drought stress may trigger over-extraction from local aquifers, risking saltwater intrusion and long-term damage to groundwater quality.	ma-DR-SCW-01, ma-DR-SPD-01
Drought		Threat	ps-DR-SCW-05	Existing water conservation messaging and drought response protocols may be insufficient for future extreme drought scenarios.	ma-DR-SCW-02, ma-DR-CBC-01



Hazard	Sub-Hazard	Area of Concern	Problem IS	Description	Related Mitigation Actions
Earthquake		Impact	ps-EQ-SCW-01	Some water tanks within the District have not yet been seismically retrofitted and may experience sloshing, structural damage, or failure during earthquakes.	ma-EQ-SCW-01
Earthquake		Victim	ps-EQ-SCW-02	Earthquake-induced service disruptions may isolate communities reliant on Soquel Creek Water District, especially if key pipelines, tanks, wells or pump stations? fail.	ma-AH-SCW-01, ma-EQ-SCW-01, ma-EQ-SCW-02
Earthquake		Threat	ps-EQ-SCW-03	The District lacks fully developed earthquake scenario planning for infrastructure interties and emergency water supply coordination with partner agencies.	ma-EQ-SCW-03
Flood		Impact	ps-FL-SCW-01	Flooding in the Bates Creek and North Main Street area has previously damaged critical water infrastructure, highlighting ongoing vulnerabilities where water lines intersect with creeks, culverts, or bridges.	ma-FL-SCW-01
Flood		Threat	ps-FL-SCW-02	Water lines that intersect or run adjacent to undersized or deteriorating county culverts are increasingly vulnerable to failure during flooding triggered by heavy storm events.	ma-FL-SCW-01
Flood		Victim	ps-FL-SCW-03	Flood-prone areas near production wells and pump stations are at risk of service disruption and damage, especially in floodplains and low-lying coastal zones.	ma-FL-SCW-02
Flood		Threat	ps-FL-SCW-04	Limited coordination between culvert condition assessments and water infrastructure siting reduces the District?s ability to proactively address flood hazards.	ma-FL-SCW-03
Liquefaction		Threat	ps-LQ-SCW-01	Several critical infrastructure assets, including pump stations and production wells, are located in areas with high liquefaction risk, threatening operational continuity during a seismic event.	ma-AH-SCW-01
Slope Failure		Threat	ps-SF-SCW-01	Water infrastructure throughout SqCWD service area are at risk from landslides and bluff failures, which can cause service disruptions or require costly relocations.	ma-SF-SCW-01
Slope Failure		Impact	ps-SF-SCW-02	Slope instability may damage tanks, pipelines, and access roads, increasing maintenance costs and posing safety hazards for crews.	ma-SF-SCW-02, ma-SF-SCW-03



Hazard	Sub-Hazard	Area of Concern	Problem IS	Description	Related Mitigation Actions
Slope Failure		Victim	ps-SF-SCW-03	Residents and facilities in slope-prone areas may experience delayed restoration of water service following landslide-related damage to District infrastructure.	ma-SF-SCW-02, ma-SF-SCW-01
Sea Level Rise		Impact	ps-SLR-SCW-01	Rising sea levels pose a threat to coastal hydrants, pipelines and other water infrastructure located near beaches, increasing exposure to corrosion, wave action, and inundation.	ma-SLR-SCW-01
Sea Level Rise		Victim	ps-SLR-SCW-02	Residents and facilities in low-lying coastal zones are vulnerable to service disruptions as sea level rise threatens pipelines, wells, and valves in the vicinity.	ma-SLR-SCW-01, ma-SLR-SCW-02
Sea Level Rise		Threat	ps-SLR-SCW-03	Sea level rise and storm surge increase the risk of sand deposition and debris accumulation around key valve access points, limiting emergency operations and maintenance.	ma-SLR-SCW-01, ma-SLR-SCW-02, ma-SLR-SCW-03
Sea Level Rise		Impact	ps-SLR-SCW-04	Sea level rise increases groundwater levels, which can corrode and infiltrate buried pipes and appurtenances, while also driving seawater intrusion that threatens the long-term reliability of groundwater supply.	ma-SLR-SCW-02, ma-SLR-PVW-02
Coastal Hazards	Tsunami	Threat	ps-TS-SCW-01	Coastal infrastructure such as hydrants, valves, and pipelines are vulnerable to inundation and debris impacts during a tsunami event.	ma-TS-SCW-01, ma-TS-SCW-02, ma-TS-SCW-03
Coastal Hazards	Tsunami	Impact	ps-TS-SCW-02	A tsunami could cause significant physical damage to coastal water infrastructure and obstruct access routes needed for emergency response and repair.	ma-TS-SCW-02
Coastal Hazards	Tsunami	Victim	ps-TS-SCW-03	Customers in low-lying areas near beaches may face prolonged service outages following a tsunami due to loss of access and compromised infrastructure.	ma-TS-SCW-02
Wildfire		Threat	ps-WF-SCW-01	Critical water infrastructure, such as tanks, production wells and pump stations in high fire severity zones are surrounded by flammable vegetation such as eucalyptus trees and lack sufficient defensible space.	ma-WF-SCW-01



Hazard	Sub-Hazard	Area of Concern	Problem IS	Description	Related Mitigation Actions
Wildfire		Victim	ps-WF-SCW-02	Water infrastructure in the Santa Cruz hills is increasingly exposed to wildfire risk, threatening service continuity for residents during fire emergencies.	ma-AH-RCD-01
Wildfire		Impact	ps-WF-SCW-03	Fire hydrants are designed for structure protection and may not be adequately sized, equipped, or located to support wildfire suppression in high-risk areas.	ma-WF-SCW-04
Wildfire		Threat	ps-WF-SCW-04	Limited coordination between Soquel Creek Water District and Central Fire may delay emergency response access or inhibit efficient resource deployment during wildfires.	ma-WF-SCW-03

4.5.4.1 Climate Change Impacts & Vulnerable Populations

The impacts of climate change in Santa Cruz County disproportionately burdens vulnerable populations, exacerbating challenges in water access, housing resilience, and emergency preparedness. Rising temperatures and extended droughts strain water supplies, with limited recharge mechanisms and insufficient mapping compounding the risks. These issues are particularly acute for low-income households, which often lack the resources to address water well failures, waterline repairs, or contingency planning. Many of these residents face financial barriers to implementing proactive mitigation measures or recovering from water shortages.

Within the SqCWD service area and the broader Santa Cruz Mid-County Groundwater Basin, several communities are classified as Disadvantaged Communities (DACs) under California law with median household incomes less than 80% of the statewide average. Two DAC census block groups fall entirely within SqCWD's area, housing approximately 880 and 530 residents, respectively. Additionally, nearby regions within the groundwater basin include further DACs and even Severely Disadvantaged Communities (SDACs) with populations up to 1,490, which stand to benefit indirectly from the district's resilience projects. (REGION, 2023)

These communities face heightened risk from water scarcity and potential rate impacts, particularly if groundwater supplies remain stressed. A cost-benefit analysis associated with the Pure Water Soquel initiative revealed that without the project water rates could escalate to unsustainable levels reaching nearly \$12,000 per acre-foot in order to satisfy overdraft regulations. (REGION, 2023)

By advancing projects like Pure Water Soquel and integrating community-specific mitigation actions, SqCWD is not only enhancing regional water sustainability but also supporting environmental justice and equitable access to clean and affordable water. These efforts are foundational to ensuring that all residents are protected from the escalating risks of water insecurity and climate-driven hazards.



SqCWD faces multiple risks from climate change, with direct consequences for vulnerable populations in its service area. Rising seas, more intense storms, prolonged droughts, and wildfire threats compound existing infrastructure challenges, and residents who are elderly, low income, linguistically isolated, or medically dependent on uninterrupted water service are disproportionately affected when service is disrupted.

Drought: SqCWD relies heavily on groundwater, which is highly sensitive to reduced recharge during prolonged droughts. Climate change is expected to intensify these cycles, stressing the District's wells and recycled water supply from Pure Water Soquel. Over-extraction during drought increases the risk of seawater intrusion, threatening long-term drinking water quality. Vulnerable households, particularly renters and low-income residents, may be disproportionately impacted by surcharges, water-use restrictions, or service interruptions, while those with limited English proficiency may not fully benefit from drought communication campaigns.

Coastal Erosion and Sea Level Rise: Bluff erosion and rising seas pose significant risks to buried pipelines, pump stations, and valves along Capitola's coastline and near Soquel Creek. Sea level rise also raises groundwater levels, increasing pipe corrosion and seawater intrusion risks. These threats are compounded during storm surge and coastal flooding, which may leave low-lying residents and businesses without reliable water service. Vulnerable populations in coastal neighborhoods face the dual risk of property damage and water service disruption, limiting their ability to shelter in place or recover quickly.

Earthquake and Liquefaction: SqCWD infrastructure, including tanks, wells, and pump stations, lies within high seismic risk zones, with some assets also located in liquefaction-prone soils. Although not impacted by climate change, damage from earthquakes could disrupt service for entire neighborhoods, isolating vulnerable residents without access to clean water for drinking, sanitation, or medical needs. Older, lower-income households are especially at risk because they are less likely to have storage capacity, earthquake retrofits, or financial means to recover quickly.

Flooding and Slope Failure: Flooding in Bates Creek, North Main Street, and other low-lying areas has previously damaged water lines where they intersect creeks and culverts, risks that are projected to worsen with more intense atmospheric river events. Slope failures and bluff instability in hillside areas also endanger tanks, pipelines, and access roads, causing service delays and costly relocations. These risks particularly impact hillside residents who may face evacuation challenges or long delays in water restoration following storms.

Tsunami: Coastal infrastructure—including hydrants, valves, and pipelines—remains vulnerable to inundation and debris damage during tsunami events. Residents and businesses in Capitola's low-lying beachfront areas may experience prolonged service outages following an event, with renters, seniors, and tourism-dependent workers facing outsized recovery challenges.

Wildfire: Climate change is increasing fire weather conditions and vegetation stress across the Santa Cruz Hills, placing District assets in Wildland Urban Interface areas at risk. Tanks, wells, and pump stations surrounded by flammable vegetation, such as eucalyptus, are particularly vulnerable. Limited water storage

in some service zones may constrain firefighting capacity during wildfire events, endangering residents who rely on the District for fire suppression. Populations with mobility challenges or limited financial resources are less able to evacuate quickly or recover from wildfire-related service disruptions.

Overall, SqCWD's climate-related vulnerabilities illustrate how infrastructure risks translate into disproportionate impacts for sensitive populations. Integrating climate adaptation into infrastructure planning, enhancing coordination with fire and emergency partners, and ensuring equitable outreach to disadvantaged residents will be critical to protecting both water supply reliability and community resilience.

4.6 Mitigation Strategy

This section provides the framework for how the SqCWD will reduce hazard risk within its service area while supporting the broader goals of the Santa Cruz County MJHMP. It includes an overview of existing capabilities and opportunities for expanding resilience, and the district's prioritized mitigation actions. Together, these elements demonstrate how the district integrates hazard awareness into its conservation mission and contributes to a coordinated countywide approach.

Within the Santa Cruz County MJHMP, the mitigation strategy serves as the guidebook for future hazard mitigation efforts. For the SqCWD, the strategy within this annex reflects the outcomes of the countywide planning process while also capturing the district's unique priorities and program areas. The strategy is designed to reduce the vulnerabilities identified in the risk assessment, including the problem statements developed for wildfire, flood, earthquake, slope failure, drought, and climate change.

Mitigation actions identified in this annex are both policy and project oriented, advancing conservation-based approaches that directly support hazard reduction. Actions are structured to align with FEMA's requirements and to integrate with existing county and regional planning mechanisms. Each action outlines responsible parties, potential funding sources, and required resources to ensure successful implementation.

For the SqCWD, this strategy serves as a roadmap for delivering mitigation through technical assistance, watershed restoration, and partnerships with landowners. By combining its project-based capacity with the broader coordination of the countywide plan, the district contributes to a unified framework that reduces hazard risk across Santa Cruz County while also advancing its mission to protect natural and working lands. The subsections that follow describe these elements in detail:

- **Section 4.6.1 Aligning the Action Plan** provides a summary of the district's capacity to address natural hazards.
- **Section 4.6.3 Mitigation Action Plan** presents the SqCWD's prioritized actions that will guide implementation in coordination with countywide strategies.



4.6.1 Aligning the Action Plan

This section connects the SqCWD's mitigation actions with its existing capabilities and areas for growth. Capability assessments are a required element of hazard mitigation planning under the Disaster Mitigation Act of 2000 and FEMA's 2023 guidance, ensuring that actions are realistic, achievable, and aligned with available resources.

The section begins with a summary of the SqCWD's capabilities across four areas: planning and regulatory, administrative and technical, fiscal, and education and outreach. This overview highlights the tools and strengths that the district already uses to reduce hazard risk. The section then provides a detailed analysis of each capability area, identifying both current practices and opportunities to expand resilience.

4.6.1.1 Capabilities & Opportunities Assessment

To develop a realistic and actionable mitigation strategy, it must account for existing jurisdictional capabilities and what future opportunities there are to enhance those capabilities for purposes of hazard mitigation. This section provides an assessment of SqCWD's existing capabilities and future opportunities, including planning and regulatory, administrative and technical, fiscal, and public outreach and education capabilities. This assessment also identifies opportunities to integrate this MJHMP into future planning, policies, or programs to weave mitigation efforts into daily operations and address hazard problems holistically. Capabilities are categorized into four groups and include various mechanisms.

- **Planning and Regulatory Capabilities:** Existing long-range plans, emergency response plans, hazard-specific plans, land use policies, and building and development standards.
- **Administrative and Technical Capabilities:** Available expertise in emergency services, engineering, grant management, and community planning.
- **Fiscal Capabilities:** Budgetary capacity, taxing authority, grants, and other funding mechanisms that can support mitigation projects.
- **Outreach and Education Capabilities:** Existing programs for providing technical assistance, community education, public warnings, and stakeholder engagement.

A full description of the process used to develop the capabilities assessment is provided in Volume 1, Section 2.3.3.

This capabilities and opportunities assessment for SqCWD lists the various types of capabilities along with how they have been, currently are, or will in the future be integrated into hazard mitigation planning efforts. The three "HMP Integration" columns that identify the capability's status and usage are color-coded with green, yellow, or orange shading to communicate the following:

- **Status:** If the capability is present at all and what level of use it has generally.
- **Current Mitigation Use:** If the capability is currently being used in mitigation efforts, specifically, and at what level.
- **Future Opportunity:** If there is a future opportunity to integrate the capability into mitigation efforts and at what level.

Planning & Regulatory Capabilities

As a special district with limited authority and not a municipality, SqCWD does not maintain traditional planning or regulatory tools, such as hazard-specific ordinances or development standards. That said, SqCWD possesses a range of capabilities that support its ability to manage hazard mitigation planning and implementation. From a planning and regulatory perspective, the district has established emergency response plans, water management plans, and water shortage contingency plans that form a foundation for addressing hazards and guiding development in a safe and sustainable manner. These frameworks provide essential guidance for risk reduction and resilience.

Further, SqCWD complies with all development standards and environmental review requirements for the State of California, including the California Environmental Quality Act (CEQA), and within the county and municipalities where its projects are located. These local regulatory environments are described in Volume 1 for Santa Cruz County and in the City of Capitola's municipal annex of Volume 2.

Future integration of the MJHMP will occur through various processes and mechanisms outlined across multiple mitigation actions (Table 4-8). Key opportunities for future hazard mitigation integration with SqCWD's existing planning mechanisms are to update its Capital Improvement and Asset Management Plans to account for projected coastal erosion rates, overlay current flood hazard data, and integrate sea level rise modeling (ma-CE-SCW-03, ma-FL-SCW-03, and ma-SLR-SCW-02).

Administrative & Technical Capacity

In terms of administrative and technical capabilities, the district benefits from the expertise of its staff in emergency services, public works, engineering, and community planning. This internal capacity allows the district to design and implement technical solutions, coordinate response efforts, and integrate hazard mitigation into everyday operations.

Warning Systems & Services

The SqCWD does not manage formal warning systems for hazards such as floods, wildfires, or earthquakes. Emergency notification and public alerting remain the responsibility of county and state agencies. The SqCWD's role is to support these systems by providing education, preparedness resources, and technical assistance to landowners.

Fiscal Capabilities

Fiscal capabilities are also a critical strength. The district has access to budgetary resources, state and federal grants, and other funding mechanisms that can be leveraged to finance mitigation projects. This financial flexibility enables both proactive planning and rapid response when hazard events occur.



Education & Outreach Capabilities

Lastly, the district has strong outreach and education capabilities. Existing programs for public education, community engagement, and emergency alerts help inform residents about risks and preparedness strategies. These outreach efforts play a key role in building public awareness and fostering a culture of safety throughout the community.

CAPABILITY ASSESSMENT LEGEND HMP Integration

Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Table 4-7: SqCWD Capabilities Assessment

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				Major capital investments are planned annually, including Pure Water Soquel, backup generators, tank upgrades, new wells, and interties
Annual Fire Prevention Plan				Fire suppression support is described; system maintains minimum pressures; not a standalone fire plan; utilize hydraulic modeling software to evaluate fire flow capacity
Seismic Safety Program (Non-structural)				Seismic risk addressed in Risk & Resilience Assessment and tank siting
Earthquake Modernization Plan (Building Safety)				Building-specific retrofits are not detailed but tank seismic upgrades are planned
Stormwater Management Program (Annual Inspections)				Stormwater not managed by SqCWD; under county or city jurisdictions



Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Hazard Plans and Programs				
Floodplain Response Plan				Flooding risks noted but no formal response plan; addressed generally in ERP
Community Wildfire Protection Plan (CWPP)	N/A	N/A	N/A	Not applicable to water district
Ground Water Management Planning / Plans				Active leader in Santa Cruz Mid-County Basin GSP; co-founder of MGA
Climate Action Plan				Community Water Plan incorporates long-term sustainability, GHG reduction, and recycled water reuse
Drought Mgmt/ Contingency Plan				Detailed Water Shortage Contingency Plan includes 6 stages and mandatory conservation triggers
FireWise Communities within District				No FireWise designations in SqCWD service area
Hazard-Related Public Outreach Program				Robust outreach via WaterSmart portal, multilingual signage, direct mail, and board updates
Administrative and Technical				
Staff Capacity				
Emergency Manager				ERP assigns emergency responsibilities to designated management staff and Incident Command
Civil Engineer				Engineering Department supports infrastructure design, seismic risk review, and project delivery
Dedicated Public Outreach Personnel				Communications and Conservation staff provide public education, newsletters, and crisis messaging
GIS Specialist and Capability				GIS is used for asset management, pipeline replacement planning, and infrastructure vulnerability
Grant Manager, Writer, or Specialist				No designated grant specialist but district has secured state and federal funding for Pure Water Soquel and drought projects
Other				Technical experts and consultants are used for seismic, groundwater, and climate planning
Warning Systems/Services				
General				ERP details use of Everbridge alerts, CalWarn, SC County dispatch, and local news for alerts
Flood				District not responsible for flood response; relies on County for alerts
Wildfire				ERP considers wildfire risk, but warnings are issued via County OES and CalFire
Geological Hazards				Seismic hazard mitigation protocols in ERP and RRA, but no dedicated earthquake early warning system
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				



Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Levy for Specific Purposes with Voter Approval				District has used ballot measures and property-related fees to support capital investments
Utilities Fees				Water service charges fund operations, CIP, and drought response
System Development Fee				Capacity charges collected for new connections to fund infrastructure
General Obligation Bonds to Incur Debt				District prefers revenue-based financing; GO bonds are rare or not used recently
Special Tax Bonds to Incur Debt				Not used by SqCWD as of latest reports
Withheld Spending in Hazard-Prone Areas				Not applicable; facilities are driven by water resource needs
Stormwater Service Fees				Not under District's jurisdiction; handled by other local entities
Capital Improvement Project Funding				Regularly updated multi-year CIP that includes major projects such as Pure Water Soquel, seismic upgrades, and new interties. Planning efforts also consider tank sizes, locations, and main replacement sizing to ensure sufficient capacity and pressure for fire suppression.
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				Emergency updates, drought, conservation, PFAS, and Pure Water Soquel all prominently featured
Dedicated Social Media				Actively used to distribute public alerts and promote conservation programs
Hazard Info. Avail. at Library/ Planning Desk				Print outreach and brochures available, but not centralized at libraries
Annual Public Safety Events				Participates in outreach events and workshops (e.g., Water Harvest Festival, National Night Out, Fire Station Open Houses, workshops)
Ability to Field Public Tech. Assistance Requests				Dedicated Customer Service staff provide support
Public Safety Newsletters or Printed Outreach				Regular newsletters, multilingual bill inserts, and annual Water Quality Report
Fire Safe Councils				Not applicable to district's role or service area
Resource Conservation Districts				Partner with RCD on conservation and stormwater capture pilot projects
Other				Technical experts and consultants are used for seismic, groundwater, and climate planning



4.6.2 Soquel Creek Water District Mitigation Action Plan

Mitigation actions were developed based upon the jurisdiction's priorities, risk assessment results, and mitigation alternatives. The mitigation action prioritization method used by all participating jurisdictions is described in Section 4 of Volume 1. Table 4-8 lists each priority mitigation action, responsible party, time frame, potential funding source, implementation steps, and resources need to implement based upon consensus among the SqCWD's planning group members. All mitigation actions across jurisdictions are accessible through MAST (Mitigation Action Support Tool), providing comprehensive details including the mitigation goal, responsible party, timeline, potential funding sources, implementation steps, and required resources. As a dynamic document, hazard problem statements and mitigation activities will be regularly updated through MAST to reflect evolving needs and circumstances.

As a first-time participant in the Santa Cruz County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP), SqCWD did not have any existing mitigation actions from a prior plan to evaluate. Therefore, all mitigation actions identified in this planning cycle are newly developed based on the district's updated risk assessment, local capabilities, and areas of concern identified during stakeholder engagement and interagency collaboration. These new actions were crafted to address the district's highest priority hazards, align with FEMA's hazard mitigation guidance, and reflect local infrastructure vulnerabilities and water resource challenges. The development of these mitigation strategies marks an important step in integrating resilience into the district's operations and long-term planning. All mitigation actions are documented in Volume 2, Table 4-8.

The SqCWD developed unique mitigation actions, tailored to their own unique priorities, vulnerabilities, and capabilities. Each action contains a level of detail that meets the regulatory requirements of FEMA and DMA 2000, including identifying the responsible party, time frame, potential funding source, implementation steps, and resources needed to implement. It is important to note that SqCWD is a small agency with a mostly horizontal structure. Therefore, there are no specific departments or divisions responsible for overseeing these mitigation actions; instead, responsibilities for actions will be shared across all positions in the district.

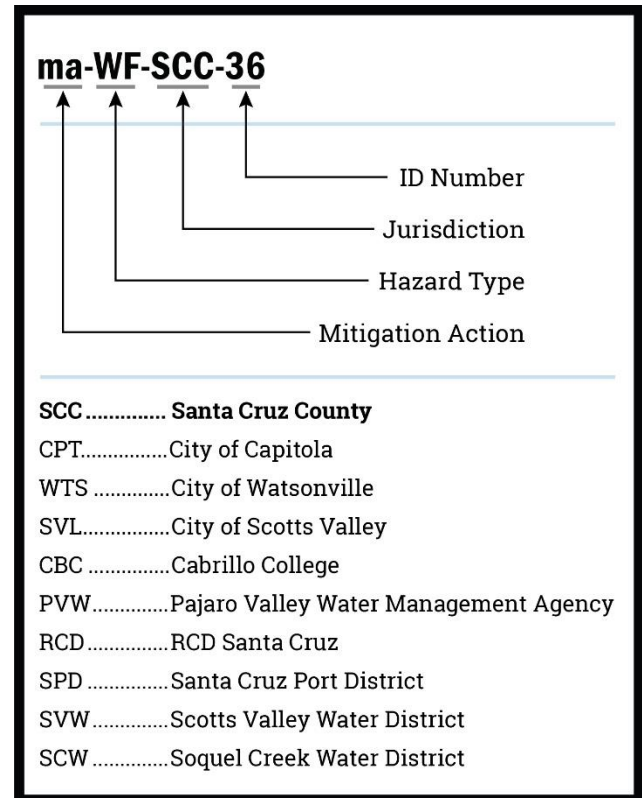


Figure 4-25: Mitigation Action Number Key



All actions are assigned a unique identification number, as illustrated in MAST and Figure 4-25, using alphanumeric characters that denote specific attributes of the action, including the type of hazard being mitigated, facilitating easy reference and management. Table 4-8 lists each mitigation action for the district.

Table 4-8: SqCWD Mitigation Action Plan

Hazard	Action ID	Action Title	Description	FEMA Mitigation Alternative	Timeline	Responsibility	Cost	Benefit	Internal Funding Source	External Funding Source	Priority (Based on Criteria)	Problems Addressed
All Hazard	ma-AH-SCW-01	Emergency Power Readiness	Install backup generators, batteries, or solar hybrid systems at key facilities (e.g., wells, tanks, booster stations) and establish fuel storage and contracts to support extended operation.	ES, PPRO, SP	Short 1-3 Years	SCWD + consultants	High	High	Staff Time (limited) General Fund via CIP (limited)	HMGP EPA FEMA (BRIC)	High	ps-EQ-SCW-02, ps-LQ-SCW-01
Coastal Hazards (Coastal Erosion)	ma-CE-SCW-02	Relocate Critical Assets from Eroding Bluffs	Relocate or protect critical assets, such as pipelines or tanks, currently located near actively eroding coastal bluffs in areas like Capitola.	SP	Medium 3-5 Years	SCWD + County, Cities	High	High	Staff Time (limited) General Fund via CIP (limited)	Prop 4 HMGP EPA FEMA (BRIC)	Medium	ps-CE-SCW-01, ps-CE-SCW-02, ps-CE-SCW-03
Coastal Hazards (Coastal Erosion)	ma-CE-SCW-03	Integrate Bluff Erosion Risk into Long-Range Planning	Update capital improvement and asset management plans to account for projected erosion rates and realignment needs.	PRV	Short 1-3 Years	SCWD + County	Low	High	Staff Time (limited) General Fund via CIP (limited)	N/A	Medium	ps-CE-SCW-01, ps-CE-RCD-03, ps-CE-SCW-02, ps-CE-SCW-03
Coastal Hazards (Coastal Erosion)	ma-CE-SCW-01	Conduct Infrastructure Risk Assessment in Bluff Erosion Zones	Identify and assess at-risk pipelines, tanks, and service roads in areas prone to coastal bluff erosion, and develop relocation or retrofit strategies.	PRV, PPRO	Short 1-3 Years	SCWD + County, RCD	Medium	High	Staff Time (limited) General Fund via CIP (limited)	Prop 4	High	ps-CE-CPT-02, ps-CE-SCW-01, ps-CE-SCW-02, ps-CE-SCW-03
Drought	ma-DR-SCW-01	Expand Recycled Water & Aquifer Recharge Projects	Expand the Pure Water Soquel program and pursue additional recycled water and managed aquifer recharge efforts to improve drought resilience and reduce groundwater overdraft.	PRV, NRP, SP	Short 1-3 Years	SCWD + RCD, County	High	High	General Fund via CIP (limited)	Measure Q EPA Prop 4 DWR BOR (WaterSMART)	High	ps-DR-PWV-01, ps-DR-PWV-02, ps-DR-RCD-01, ps-DR-SCW-01, ps-DR-SCW-02, ps-DR-SCW-04, ps-DR-SVW-02, ps-DR-CPT-02, ps-DR-SCW-03, ps-DR-SCW-05,ps-SLR-SCW-03
Drought	ma-DR-SCW-02	Improve Drought Response Communications	Strengthen drought communication plans, including multilingual alerts and conservation education during drought stages.	PE&A	Short 1-3 Years	SCWD + County	Low	High	Staff Time (limited) General Fund via CIP (limited)	DWR, Measure Q	High	ps-DR-SCW-01, ps-DR-SCW-05, ps-SF-SVW-05, ps-DR-SCW-02, ps-DR-SCW-03, ps-DR-SCW-04
Drought	ma-DR-SCW-03	Evaluate Long-Term Supply Diversification Options	Conduct feasibility studies for supply diversification options such as interties, additional storage, and stormwater capture to reduce drought vulnerability.	PRV	Short 1-3 Years	SCWD + County, City of Santa Cruz, other water providers	Low	Medium	Staff Time (limited) General Fund via CIP (limited)	Measure Q, DWR	High	ps-DR-SCW-01, ps-DR-SCW-02, ps-DR-SCW-03, ps-DR-SCW-04, ps-DR-SCW-05, ps-SLR-SCW-03
Earthquake	ma-EQ-SCW-02	Assess & Harden Infrastructure in Liquefaction Zones	Identify and retrofit pipelines, pump stations, and pressure zones located in high liquefaction hazard areas to minimize rupture and service failure.	PRV, SP	Short 1-3 Years	SCWD + consultants	High	High	Staff Time (limited) General Fund via CIP (limited)	HMGP BRIC	Medium	ps-EQ-SCW-02, ps-EQ-SVW-05, ps-EQ-SCW-01, ps-LQ-SCW-01
Earthquake	ma-EQ-SCW-01	Retrofit Seismically Vulnerable Water Tanks	Retrofit remaining water storage tanks to meet seismic performance standards and reduce sloshing risks during earthquake events.	SP	Short 1-3 Years	SCWD + consultants	High	High	General Fund via CIP (limited)	HMGP EPA FEMA (BRIC)	High	ps-EQ-SCW-01, ps-EQ-SCW-02, ps-LQ-SCW-01
Earthquake	ma-EQ-SCW-03	Develop Earthquake Scenario & Intertie Response Plan	Create a coordinated response plan for earthquake events, including fallback strategies for using interties with Central Water District and City of Santa Cruz. Assess pipeline vulnerability to model likely failure scenarios.	ES, PRV	Short 1-3 Years	SCWD + County, City of Santa Cruz, other water providers	Medium	High	Staff Time (limited) General Fund via CIP (limited)	N/A	High	ps-EQ-SCW-03, ps-EQ-SPD-02, ps-EQ-SCW-02, ps-EQ-SCW-01, ps-LQ-SCW-01

Hazard	Action ID	Action Title	Description	FEMA Mitigation Alternative	Timeline	Responsibility	Cost	Benefit	Internal Funding Source	External Funding Source	Priority (Based on Criteria)	Problems Addressed
Flood	ma-FL-SCW-01	Coordinate with County to Retrofit Flood-Prone Culvert Crossings	Work with Santa Cruz County to identify and retrofit or upslope culverts and bridge crossings that intersect with water mains and pipelines vulnerable to erosion and flood damage.	SP, PRV	Medium 3-5 Years	SCWD + County, RCD	High	High	Staff Time (limited) General Fund via CIP (limited)	HMGP EPA FEMA (BRIC)	Medium	ps-FL-SCW-01, ps-FL-SCW-02, ps-FL-SCW-03, ps-FL-SCW-04
Flood	ma-FL-SCW-02	Floodproof Production Wells & Pump Stations	Elevate or floodproof wells and pump stations located in floodplains or coastal areas vulnerable to rising waters.	SP, PPRO	Short 1-3 Years	SCWD + consultants	High	High	General Fund via CIP (limited)	Measure Q	Medium	ps-FL-SCW-03, ps-FL-SCW-01, ps-FL-SCW-04
Flood	ma-FL-SCW-03	Integrate Floodplain Data into Infrastructure Planning	Overlay FEMA and County floodplain data with pipeline and valve GIS layers to prioritize future maintenance, upgrades, and siting decisions.	PRV	Short 1-3 Years	SCWD + County	Low	High	Staff Time (limited) General Fund via CIP (limited)	N/A	High	ps-FL-SCW-04, ps-FL-SCW-01, ps-FL-SCW-02, ps-FL-SCW-03
Sea Level Rise	ma-SLR-SCW-01	Relocate or Harden Coastal Infrastructure	Relocate, elevate, or harden vulnerable coastal hydrants, pipelines, and valve access points at risk from sea level rise, inundation, and sand deposition.	SP, PPRO	Medium 3-5 Years	SCWD + County, Cities	High	High	General Fund via CIP (limited)	HMGP EPA FEMA (BRIC) Measure Q	High	ps-SLR-PVW-02, ps-SLR-SCW-01, ps-SLR-SCW-02, ps-SLR-SCW-03, ps-SLR-SPD-02, ps-SLR-SCW-04
Sea Level Rise	ma-SLR-SCW-02	Update Flood & Sea Level Rise Vulnerability Mapping	Integrate current sea level rise and coastal flood modeling into GIS systems to improve planning and prioritization of mitigation projects.	PRV	Short 1-3 Years	SCWD + County	Low	High	Staff Time (limited) General Fund via CIP (limited)	HMGP	High	ps-SLR-PVW-02, ps-SLR-RCD-01, ps-SLR-SCW-02, ps-SLR-SCW-03, ps-SLR-SCW-04, ps-SLR-SPD-02, ps-SLR-CPT-02, ps-SLR-SCW-01
Sea Level Rise	ma-SLR-SCW-03	Improve Coastal Maintenance Access	Identify and protect access routes to valves, hydrants, and tanks in beach areas that are periodically buried by sand or obstructed by coastal debris.	SP, ES	Short 1-3 Years	SCWD + County	Medium	High	Staff Time (limited) General Fund via CIP (limited)	Measure Q	High	ps-SLR-SCW-03, ps-SLR-SCW-01
Slope Failure	ma-SF-SCW-01	Identify & Monitor Landslide-Prone Infrastructure Sites	Conduct field inspections and geotechnical assessments of water infrastructure located near steep slopes or active landslide zones to identify stability risks.	PRV	Short 1-3 Years	SCWD + consultants	Medium	High	Staff Time (limited) General Fund via CIP (limited)	HMGP	Medium	ps-SF-SCW-03, ps-SF-SCW-01, ps-SF-SVL-03, ps-SF-SCW-02
Slope Failure	ma-SF-SCW-02	Stabilize or Relocate Infrastructure at Risk from Slope Failure	Based on assessment results, retrofit, relocate, or stabilize pipelines, tanks, or roads at high risk of damage from slope movement.	SP	Short 1-3 Years	SCWD + County, RCD	High	High	General Fund via CIP (limited)	HMGP EPA FEMA (BRIC)	Medium	ps-SF-CBC-02, ps-SF-SCW-02, ps-SF-SCW-03, ps-SF-SCW-01
Slope Failure	ma-SF-SCW-03	Integrate Slope Failure Risk into Planning Documents	Update Capital Improvement and Emergency Operations Plans to reflect known slope instability areas and critical infrastructure routes.	PRV	Short 1-3 Years	SCWD	Low	High	Staff Time (limited) General Fund via CIP (limited)	N/A	Medium	ps-SF-CBC-03, ps-SF-SCW-02, ps-SF-SCW-01
Coastal Hazards (Tsunami)	ma-TS-SCW-01	Assess & Retrofit Coastal Assets in Tsunami Inundation Zones	Identify and retrofit or relocate pipelines, valves, and hydrants within mapped tsunami hazard zones to withstand inundation and debris impact.	SP, PPRO	Medium 3-5 Years	SCWD + County, Cities	Medium	Medium	Staff Time (limited) General Fund via CIP (limited)	HMGP	Medium	ps-TS-SCW-01, ps-TS-SCW-02, ps-TS-SCW-03
Coastal Hazards (Tsunami)	ma-TS-SCW-03	Improve Access to Buried Infrastructure in Coastal Areas	Install markers and access improvements for valves and pipelines at risk of burial from tsunami debris or sand movement, ensuring post-disaster operability.	SP, ES	Short 1-3 Years	SCWD + County, Cities	Medium	High	Staff Time (limited) General Fund via CIP (limited)	Measure Q Prop 4 DWR	Medium	ps-TS-SCW-01, ps-TS-SCW-02, ps-TS-SCW-03

Hazard	Action ID	Action Title	Description	FEMA Mitigation Alternative	Timeline	Responsibility	Cost	Benefit	Internal Funding Source	External Funding Source	Priority (Based on Criteria)	Problems Addressed
Coastal Hazards (Tsunami)	ma-TS-SCW-02	Develop a Tsunami Infrastructure Response Plan	Create protocols for shutoff, rapid assessment, and phased restoration of coastal infrastructure following a tsunami event.	ES, PRV	Short 1-3 Years	SCWD + County	Low	Medium	Staff Time (limited) General Fund via CIP (limited)	Measure Q	Low	ps-TS-SCW-01, ps-TS-SCW-02, ps-TS-SCW-03
Wildfire	ma-WF-SCW-01	Maintain & Expand Defensible Space Around Infrastructure	Clear flammable vegetation and establish defensible space zones around water tanks, pump stations, and other critical infrastructure in high fire severity areas, including Larkin Valley.	NRP, SP	Short 1-3 Years	SCWD + Central Fire	Medium	High	Operating Budget	Measure Q CalFire EPA	Medium	ps-WF-SCW-01, ps-WF-SVL-04, ps-WF-SVW-01, ps-WF-WTS-03, ps-WF-SCW-02, ps-WF-SCW-03
Wildfire	ma-WF-SCW-02	Install Fire Department Connections (FDCs) at Storage Tanks	Equip water storage tanks in wildland-urban interface (WUI) areas with accessible FDCs to support tactical water supply for firefighting operations.	SP, ES	Short 1-3 Years	SCWD + Central Fire	High	High	Staff Time (limited) General Fund via CIP (limited)	Measure Q Prop 4	Medium	ps-WF-SVW-01, ps-WF-SCW-02, ps-WF-SCW-03, ps-WF-SCW-04
Wildfire	ma-WF-SCW-03	Improve Wildfire Coordination with Central Fire District	Formalize procedures and communication protocols with Central Fire for shared data, response coordination, and pre-fire planning in high-risk areas.	ES, PRV	Short 1-3 Years	SCWD + Central Fire	Low	High	Staff Time General Fund via CIP (limited)	Measure Q Prop 4	High	ps-WF-SCW-04, ps-WF-SCW-01,ps-WF-SCW-02, ps-WF-SCW-03
Wildfire	ma-WF-SCW-04	Water Supply & Pressure Maintenance	Partner with Santa Cruz Water and Central Water Districts to design and install interties that allow emergency water transfers during wildfire events, enhancing regional reliability and fire suppression support in high-risk zones. Also develop other strategies to reduce system strain during high demand periods, such as pre-filled water tanks ahead of red flag warnings, establishing isolation zones to protect capacity and pressure in critical areas, and fire flow strategies in coordination with fire districts.	SP, ES, PPRO	Medium 3-5 Years	SCWD + County, City of Santa Cruz, other water providers	High	High	Staff Time General Fund via CIP (limited)	Measure Q Prop 4 DWR	High	ps-WF-SCW-03



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