



WILDFIRE & CLIMATE CHANGE | FACTSHEET

Climate change is expected to increase the frequency, intensity, and duration of wildfire events impacting San Mateo County. Wildfires can claim lives, destroy property, force mass evacuations, and expose large populations to unhealthy levels of smoke for days to weeks at a time. Simulations of large wildfires using statistical models developed for the Fourth California State Climate Assessment show that the probability of a large fire—which burns more than 1,000 acres—in San Mateo County increases rapidly with a warming climate, with an eight-fold increase in the probability of a large wildfire by 2070. The probabilities of even larger wildfires occurring, or of two fires that burn more than 1,000 acres occurring in the same year, are also projected to increase to over four percent per year by 2070. This factsheet discusses the growing wildfire risks caused by climate change and proposes strategies to enable communities to adapt to this threat.

Project Description and Modeling Overview

In 2019, the Climate Ready San Mateo County (SMC) Initiative launched a study to understand how climate change impacts could affect transportation systems and vulnerable communities in the County. Funded by Caltrans and led by the County of San Mateo's Office of Sustainability, the study evaluated extreme heat, wildfire, and sea level rise impacts. This factsheet gives an overview of existing state wildfire modeling that can be used to develop risk reduction strategies, develop policies and plans, and inform decision-makers and community leaders.

Cal-Adapt Wildfire Modeling

As part of California's Fourth Climate Change Assessment, the State developed models to project future fire risk areas across the state based on historical data of climate, vegetation, population density, and fire history, combined with regionally downscaled climate projections. To view projected fire models for San Mateo County, visit Cal-Adapt.org, navigate to "Climate Tools" and select "[Wildfire](#)." The map allows users to zoom into local areas and view projected acres burned and decadal fire probability, at a relatively low, six-kilometer resolution that should be used to understand high-level trends in wildfire risk.

The Cal-Adapt wildfire model viewer also allows users to toggle between greenhouse gas emissions scenarios, different climate models, annual or monthly simulations, and ten-year time ranges up to the year 2099. To download this data for use, navigate to "Data Download," and select "Wildfire Simulations for California's Fourth Climate Change Assessment".

Using the Cal-Adapt Tool

The Cal-Adapt tool allows users to explore projections for acres burned and decadal wildfire probability across different time ranges, climate models, and emissions scenarios.

"Area Burned"

"Area Burned" refers to the projected geographic area at risk of burning on an annual basis in terms of hectares. In San Mateo County, area burned is projected to rise substantially over time, with areas along the mid- and south coast, as well as the inland region near Woodside and Portola Valley, projected to experience dramatic increases in hectares burned over time.

"Decadal Wildfire Probability"

"Decadal Wildfire Probability" refers to the probability that a single grid cell, which represents an area of six square kilometers, will experience at least one wildfire during a ten-year period. The higher the value of a grid cell, the higher the probability that the geographic area it represents will burn during a given decade. In San Mateo County, decadal probabilities rise substantially for the region around Half Moon Bay, Woodside, and Portola Valley for the years 2040-2049 and continue to rise in decades thereafter.

The Importance of Scale

Fire modeling data available through Cal-Adapt is presented at a relatively coarse (six square kilometers) scale, meaning that the value associated with the grid as a whole might not represent specific areas within the grid cell, and more site-specific analysis may be necessary to understand local risk levels for smaller geographic areas. The Cal-Adapt wildfire model should be used to understand general trends in wildfire risk, and not to make site-specific statements of wildfire risk.

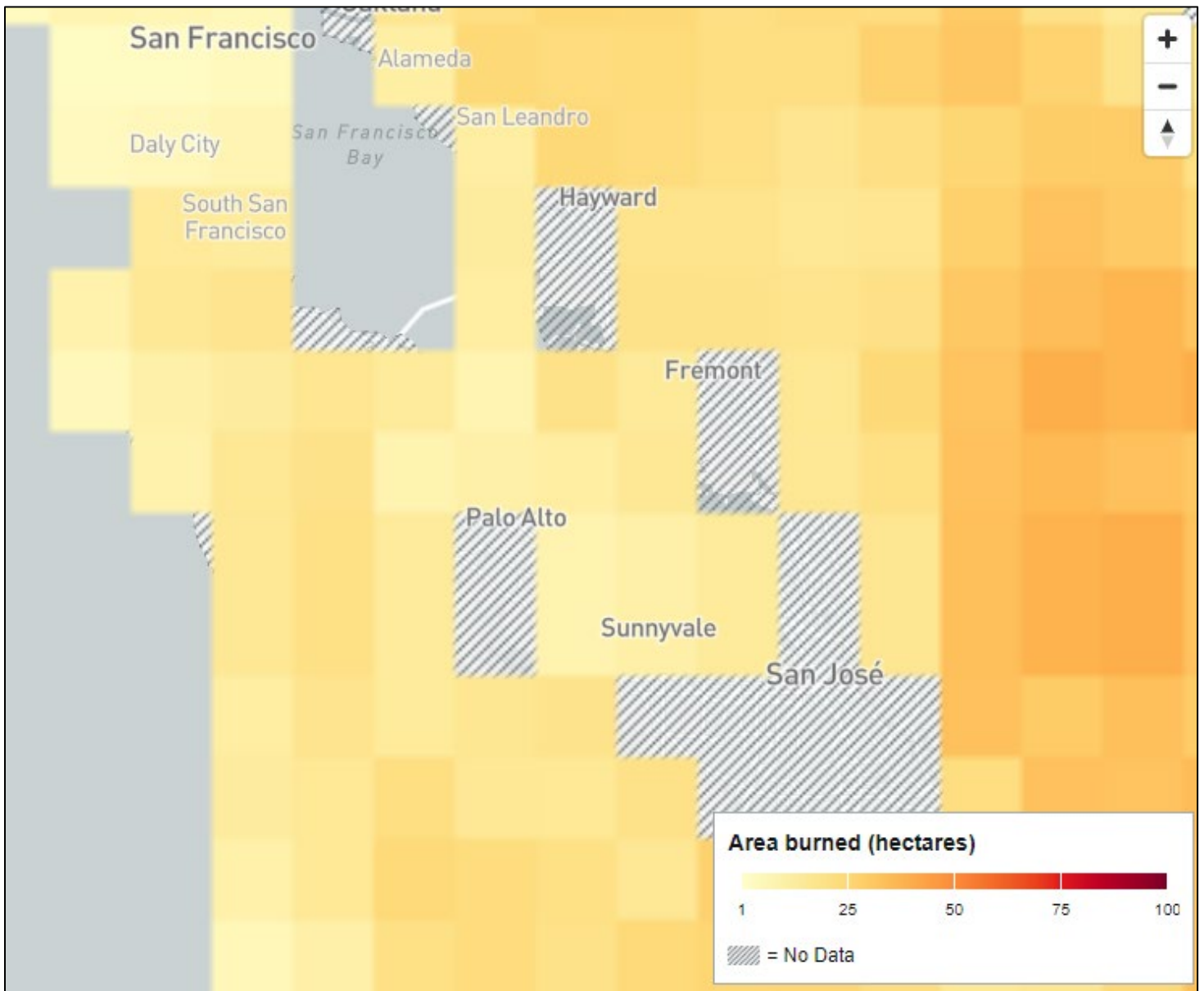


Figure 1. The Cal-Adapt wildfire model provides projections of area burned and decadal wildfire probability. This data is available to view at www.cal-adapt.org, and is also available for download.

WILDFIRE IMPACTS

Impacts on Transportation Infrastructure

Wildfire events threaten the safety of those using nearby roadways and railways. Low visibility from smoke and ash can result in road and rail closures. The need to evacuate communities, while also providing access for firefighters, can lead first responders to limit traffic.

The logistics of quickly evacuating large populations are difficult and may overload the capacity of road systems. These issues are compounded for isolated communities with only one way in or out or people that do not have access to personal vehicles. In a coastal fire, the most extensive traffic queuing and intersection delays would be in the northeast section of Half Moon Bay along State Route 1 near El Granada. With a San Francisco Bayside wildfire event, roadway closures would result in major increases in traffic delays in the County and regionally. Key connections such as I-280, SR-92, and SR-84 could be severed.

Impacts on Historically Underserved Communities

Wildfire events disproportionately impact historically underserved communities, exposing them to greater health and safety risks, costs, and barriers to evacuation. These groups may be pressured to continue working and may lack access to emergency notifications (due to lack of phone or internet service, lack of cell coverage, or language barriers), lack personal vehicles, and lack access to temporary housing or be unable to relocate. People with disabilities may face challenges finding accessible ways to evacuate or places where they can bring assistive devices and service animals. Low-income residents tend to be renters and have limited control over how or when their housing may be repaired or rebuilt in the aftermath of a fire. Homeowners may not be able to afford fire insurance or may be unable to create defensible space physically or financially. In the aftermath of a fire, low- to moderate income homeowners may not be able to rebuild.

Impacts on the Environment

Parks and open spaces throughout the county are more vulnerable to wildfires than urbanized areas. A wildfire event in these areas may result in the loss of biodiversity, such as endangered or threatened plants and butterflies. However, well-managed, controlled wildfire burns can provide numerous environmental benefits, such as pest control and renewal of nutrients in the soil.

Impacts on Public Health and Safety

In a worst-case scenario, rapidly moving and unpredictable flames may trap people in their homes or cars, resulting in burn injuries or death. Yet wildfires are harmful to health even to those nowhere near the flames. Particulate matter from wildfire smoke can reach areas hundreds of miles away from the burn area, negatively affecting air quality and exacerbating respiratory issues. Children, the elderly, people with respiratory conditions, and outdoor workers are particularly vulnerable to high levels of airborne particulate matter.

Communities may be faced with repeated, temporary power outages due to public safety power shutoffs by utility companies. These shutoffs can be life-threatening when people cannot operate medical devices, refrigerate food or medication, or access running water as a result. Without power, people are unable to charge cellphones, which limits basic communication and impedes emergency notification.

Smoke Inhalation

Wildfire smoke is primarily composed of carbon dioxide, water vapor, particulate matter, hydrocarbons, and other organic chemicals. Smoke composition will vary depending on fuel type, fire temperature, and wind conditions. Of these constituents, particulate matter (PM) is the most harmful to humans because the small size of the PM allows it to travel deep into the lungs. According to the United States Environmental Protection Agency, PM can cause burning eyes, runny nose, and illnesses such as bronchitis. Fine particles also can aggravate chronic heart and lung diseases.

Impacts on the Economy

Wildfires have negative economic impacts due to the displacement or disruption of day-to-day activities of residents, tourists, employees, and businesses. For many small businesses, the impacts of closure or loss of property may prove too great to recover from, and the business may close permanently. Historically underserved populations are more likely to lose jobs or income, experience prolonged unemployment, and face challenges finding affordable housing when attempting to return to their communities. Increased displacement risk disrupts vital social support networks that further isolate community members from resources.

FIRE PREPAREDNESS MEASURES

In March 2019, stakeholders from San Mateo County convened to discuss growing wildfire risks across the county and evaluate adaptation solutions. Stakeholders also discussed lessons learned from previous wildfires across California and used these lessons to develop risk reduction and communication strategies for wildfire events. Here is an overview of strategies for County and city officials to consider.

Improved Evacuation Routes:

Proactive planning of evacuation routes and signage will minimize impacts when roads and railways are blocked. Advance planning of detour routes around the worst-case scenario boundary of the wildfire will provide rapidly deployable options when primary evacuation routes are blocked, thus improving evacuation times. Additional planning options include:

- Installing signage for “emergency only” evacuation routes and have community evacuation plans and community organization partnerships in place.
- Training Community Emergency Response Teams (CERTs) and other community leaders on protocols and procedures for neighborhood wildfire evacuation, including procedures for neighborhood wildfire evacuation, procedures for persons with disabilities, seniors, and culturally/linguistically competent recruitment and training.
- Leveraging animal welfare groups and CERT to create evacuation plans for animals.

Improved Emergency Shelters:

- Establish temporary refuge areas and emergency shelters. Plan for inclusive and nondiscriminatory practices through training, partnerships with trusted community organizations, and through meeting population-specific needs, such as developing respectful practices for transgender individuals, not requiring proof of citizenship, providing translation services, and improving access to the shelters for individuals with limited mobility.
- Develop a short-term shelter and long-term housing strategy for displaced residents and animals.

Improved Emergency Communication

Proactive communication and outreach planning, performed through partnerships with trusted community organizations, is a key component of wildfire emergency planning because communication pathways may be compromised during a wildfire.

- Install fire detection cameras to assess speed of fire travel and provide a live feed to community members.
- Develop or update a communication plan and warning system that includes multiple or tiered approaches designed to reach diverse population groups and those with language or other access barriers. This includes providing multilingual messages via cellphone, online social media, and radio. These measures can provide information ahead of an emergency to alert community members, prevent panic, and coordinate orderly evacuation.
- Establish neighborhood teams and community working groups for public outreach and/or incident response. Work with trusted community organizations and local governments to secure and store emergency supplies, especially in underserved communities.
- Assess skills and resources that can be deployed to support special needs and vulnerabilities at the neighborhood level.
- Increase the strength of the cell network in rural Coastal areas to reduce likelihood of service loss during wildfires.

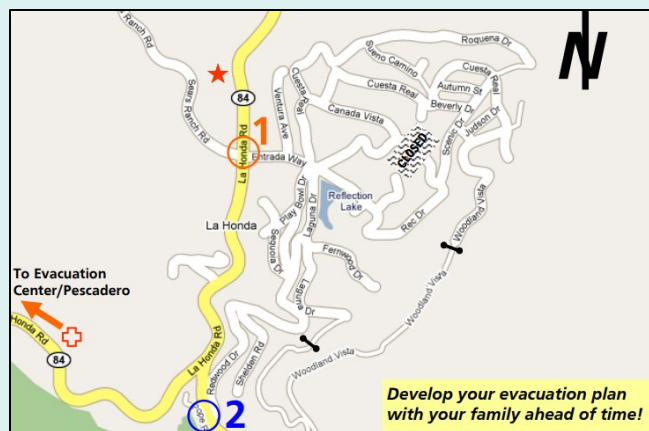


Figure 2. Evacuation planning is key to wildfire preparedness. This evacuation plan was developed for Central La Honda.

Vegetation Management and Defensible Space

- Reduce vegetation along roadways for critical evacuation routes in high-risk Wildland Urban Interface (WUI) areas.
- Work with the community to manage vegetation and reduce fuel loading.
- Expand residential education, support, and building retrofit programs to promote defensible space and assist members of vulnerable communities to access these programs. Programs could include measures to reduce home ignitions from faulty electrical connections, illegal fireworks, barbecues, illegal burns, and lawn mowing and power equipment.
- Implement smart corridors with remotely controlled traffic signals to aid evacuation.

Policy Changes

- Restrict development in the Wildland-Urban Interface (WUI)
- Work to improve fire code and building standards for safer buildings.
- Work to develop and market more stringent fire resilient building materials.
- Require flame and heat resistant materials and approaches for new buildings and infrastructure.
- Retrofit key buildings, shelters, and infrastructure to the extent possible.
- Work with insurance companies to co-develop incentives for homeowners to modify buildings with fire-safe materials, for example fire resistant venting for eaves.

EXISTING FIRE RISK REDUCTION PROJECTS

ZoneHaven Evacuation Tool

In 2020, the County began efforts to develop a real time evacuation map through the Zonehaven tool. During emergencies, first responders and the public can consult the [Zonehaven map](#), which will have information about the location of hazards, locations of evacuation sites, and evacuation routes. The map is integrated with the County's dispatch system and [SMCAAlert](#). These standardized evacuation measures will play a major role in improving communications, services, and safety during evacuations. As of 2022, Zonehaven is fully deployable in emergencies.

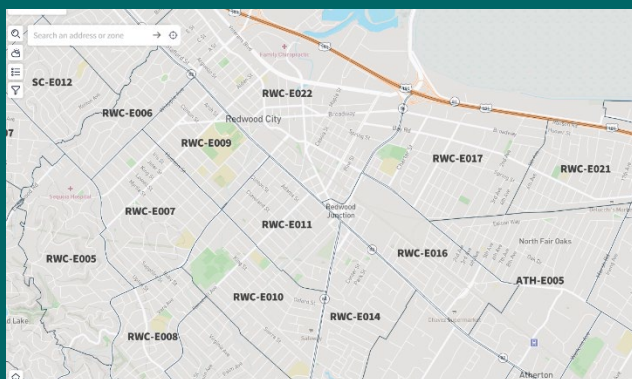


Figure 3. The Zonehaven tool for San Mateo County.



Fire Safe San Mateo County

San Mateo County provides its residents with information on wildfire preparedness and safety. Their website includes information on home hardening, defensible space, and evacuation. Fire Safe San Mateo County implements fuel reduction projects and encourages fuel reduction practices across communities through their neighborhood chipper program, which allows residents to drop off brush and vegetation for the County to haul off.

To learn more, visit: <https://firesafesanmateo.org/>