



Extreme Heat Factsheet | Impacts & Adaptation Solutions

Extreme heat has disproportionate impacts on individuals who do not live or work in climate-controlled conditions, who rely on public or multi-modal means of transportation like walking or biking, or that have pre-existing medical conditions. San Mateo County will experience an increase in the frequency and duration of extreme heat events due to climate change, impacting public health, vulnerable communities and infrastructure. This factsheet provides an overview of the risks facing San Mateo County from extreme heat and outlines adaptation strategies to build resilience.

Key Definitions

Extreme Heat or High Heat Days: Occurs when air temperature reaches 100°F. The National Weather Service suggests a heat advisory be issued when temperature in a region is expected to be 100°F for 48 hours.

Heat Wave: Five consecutive days when air temperatures exceed 100° Fahrenheit (F).

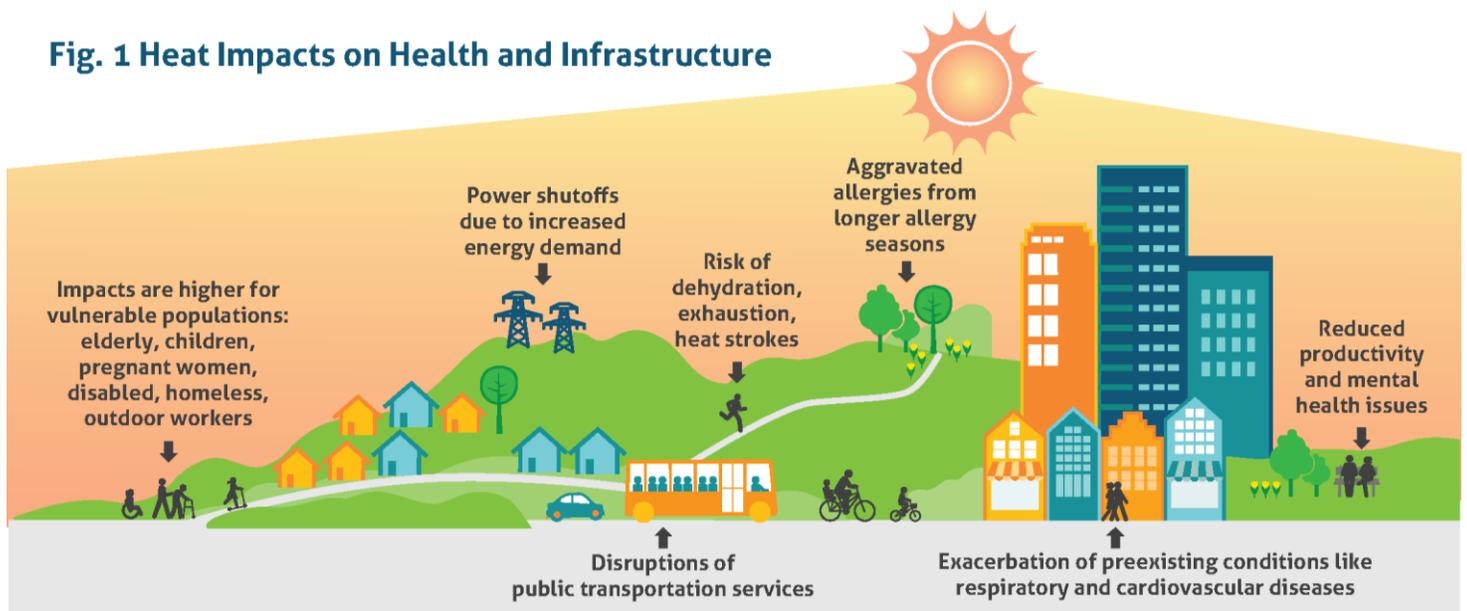
Heat related illness: Health conditions, such as heat stress, exhaustion, heat stroke, and respiratory problems in response to a hot environment. Health risks exist when temperatures rise above 80°F, and risks varies depending on who is exposed and how long the exposure lasts.

Socially Vulnerable Communities: Populations with increased vulnerability due to existing inequities, including people with disabilities, people who live in more polluted neighborhoods, and people whose race, religion or sexual orientation is targeted for discrimination.

Key Messages

1. Extreme heat is the deadliest climate hazard in the U.S., but impacts are preventable with adequate preparation.
2. Heat is already an issue in San Mateo County, even smaller increases in high heat can affect residents through the county. Coastal areas where residents are less adapted to heat might be more vulnerable. North Fair Oaks, Redwood City, East Palo Alto will be the most affected areas (EDIT)
3. Heat risks are higher for older adults, children, people experiencing homelessness, and outdoor workers.
4. Adaptation solutions to heat include community sites serving as cooling centers, urban forestry programs, adding tree cover to transit stations, adopting building codes to address rising heat, and battery backups to address power shutoffs.

Fig. 1 Heat Impacts on Health and Infrastructure



Climate Ready San Mateo County (SMC) Initiative

In 2019, the Climate Ready 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 Office of Sustainability, the study evaluated extreme heat, wildfire, extreme precipitation, and sea level rise impacts. The County continues to address the challenge of heat through an Extreme Heat Task Force, a cross sector and community effort to prepare for heat impacts on vulnerable communities. Learn more at climatereadysmc.org.



SMC Extreme Heat Data and Modelling

Extreme heat or high heat days are days that reach or exceed 100°F. Note that there are varying thresholds for heat, and impacts can occur at temperatures much lower than 100°F, especially in areas with relatively cooler temperatures, such as the coastal and northern parts of San Mateo County. Due to climate change, the average number of high heat days the county is expected to increase annually from one per year in 1995 to three per year in 2070 (Table 1). To develop the extreme heat models, the Climate Ready team collected temperature data from Cal Adapt and the California Department of Water Resources. The data were analyzed to identify changes between a baseline year of 1995 and projected changes due to climate change over a 35-year period (2030) and a 75-year period (2070). The heat-specific datasets were then integrated into a model that assessed how temperature increases would negatively impact communities, key infrastructure, and facilities across the County.

High heat days pose significant risks to public health and transportation infrastructure. While health risks exist when temperatures rise above 80°F, the severity of those risks varies depending on who is exposed and how long the exposure lasts. The San Mateo County Health Behavioral Health and Recovery Services Division has developed a [protocol](#) to manage heat risks that will be triggered by predicted temperatures of 85 degrees or higher.

Average Number of High Heat Days in SMC

The following table and maps show the average number of high heat days (above 100°F), by jurisdiction as observed in 1995 (baseline year) and projected for the years 2030 and 2070. Modeling suggests the average number of high heat days will increase for many jurisdictions across the county, some by as many as four days. The greatest change in number of high heat days from 1995 to 2070 are projected to occur in Atherton, East Palo Alto, Foster City, Menlo Park, North Fair Oaks, and Redwood City (Table 1). Impacts in these areas could be especially severe if all six days of high heat occurred consecutively, resulting in a heat wave.

Table 1 Average Number of High Heat Days in SMC

| Jurisdiction Name | Year 1995 | Year 2030 | Year 2070 |
|------------------------------|-----------|-----------|-----------|
| Atherton | 2 | 3 | 6 |
| Belmont | 1 | 2 | 4 |
| Brisbane | 1 | 1 | 1 |
| Burlingame | 1 | 1 | 1 |
| Colma | 1 | 1 | 1 |
| Daly City | 1 | 1 | 1 |
| East Palo Alto | 2 | 3 | 6 |
| Foster City | 2 | 3 | 6 |
| Half Moon Bay | 1 | 2 | 3 |
| Hillsborough | 1 | 1 | 2 |
| Menlo Park | 2 | 3 | 6 |
| Millbrae | 1 | 1 | 1 |
| North Fair Oaks* | 2 | 3 | 6 |
| Pacifica | 1 | 1 | 1 |
| Pescadero* | 2 | 3 | 5 |
| Portola Valley | 1 | 2 | 4 |
| Princeton | 1 | 2 | 3 |
| Redwood City | 2 | 3 | 6 |
| San Bruno | 1 | 1 | 1 |
| San Carlos | 2 | 3 | 5 |
| San Mateo City | 1 | 2 | 4 |
| South San Francisco | 1 | 1 | 1 |
| Woodside | 2 | 3 | 5 |
| Unincorporated County | 1 | 2 | 3 |
| Average days per year | 1 | 2 | 3 |

Key:

*Unincorporated San Mateo County

Note:

For small unincorporated areas consult projections for adjoining cities or use the [Climate Impact Viewer](#).



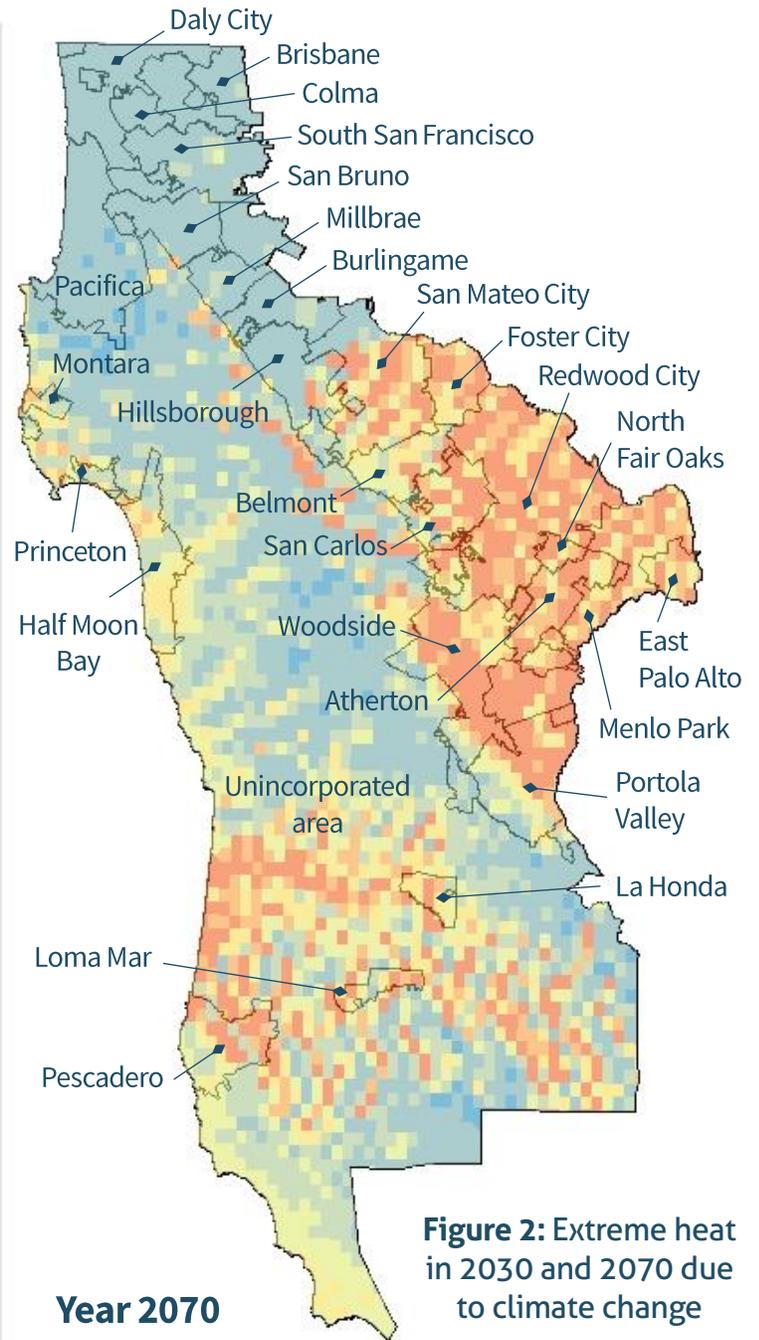
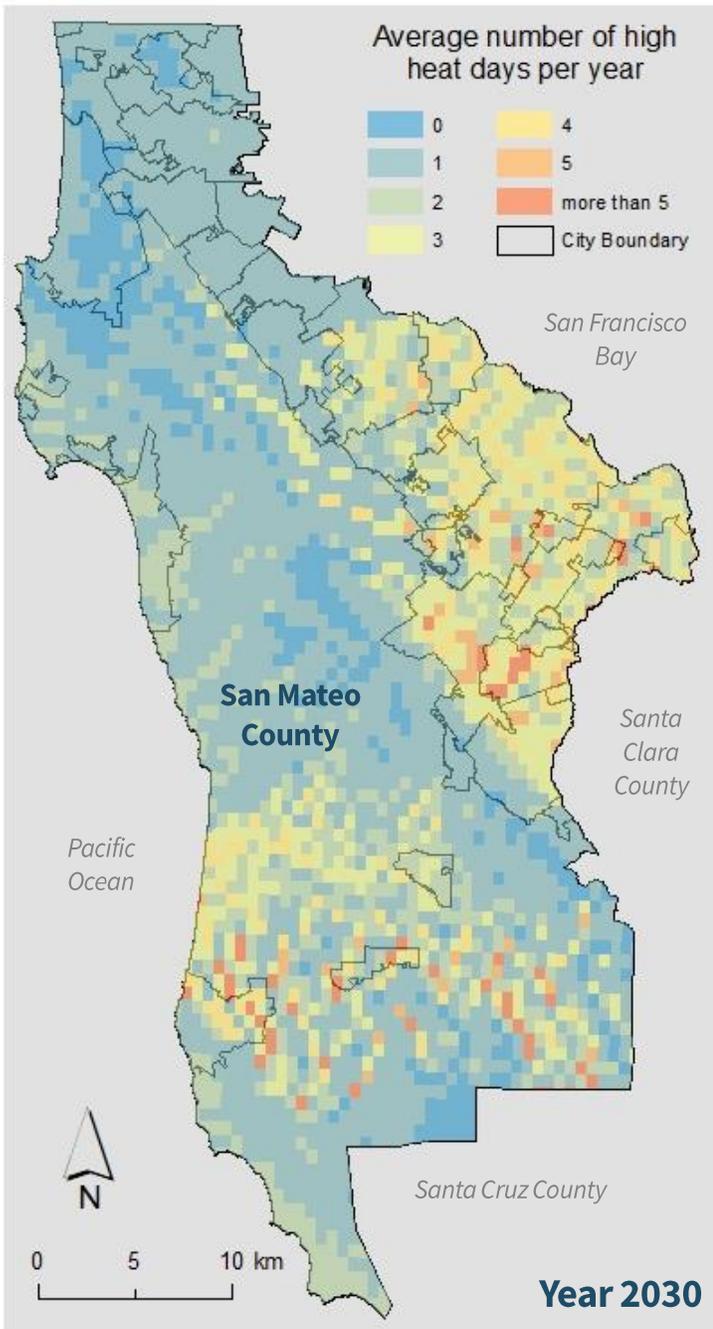


Figure 2: Extreme heat in 2030 and 2070 due to climate change

The maps in Figure 2 were developed using the [Climate Ready Visualization Tool](#), which can be used to identify communities in San Mateo County that will be most affected by extreme heat in the future due to climate change. The color blocks show number of high heat days (above 100°F) projected for 2030 and for 2070. The blue and light green colors show less than 2 high heat days a year, the yellow colors show 3-4 days, while the orange color show 5 or more high heat days a year. Warming trends across the County are expected to result in increased energy consumption and costs associated with cooling homes and businesses, further increasing greenhouse gases that cause climate change.

The data in this factsheet is meant to be used for:

- Informing decision-makers, community and cross-sector leaders about heat impacts and solutions;
- Planning and to help prioritize heat hotspots, opportunities for action and for collaboration;
- Developing heat climate adaptation strategies, policies and plans (e.g., General Plans).

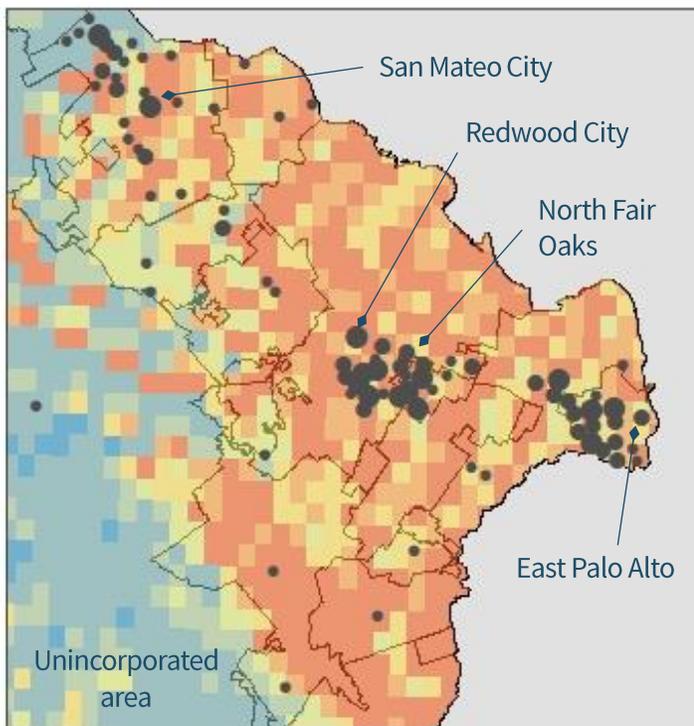
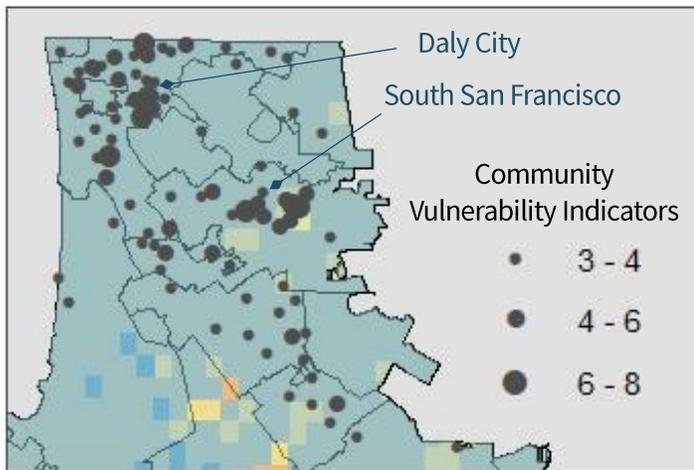
Use the **Climate Ready Viewer** to learn more about climate impacts in San Mateo County and to access the maps and data in this factsheet: <https://gis.smc.gov/apps/climaterady/>.



Extreme Heat Impacts on Public Health and Vulnerable Communities in San Mateo County

Figure 3 below shows vulnerable communities in San Mateo County and the expected number of high heat days (above 100°F) by 2070. The gray dots indicate the number of social vulnerability indicators (such as low income, no health insurance and does not own a car), based on the SMC Community Vulnerability Index that uses data from the Association of Bay Area Governments and the American Community Survey. Blue and light green colors in Daly City and north county show 2 high heat days or fewer. The orange color from San Mateo to East Palo Alto and on the south coast show 5 or more high heat days a year.

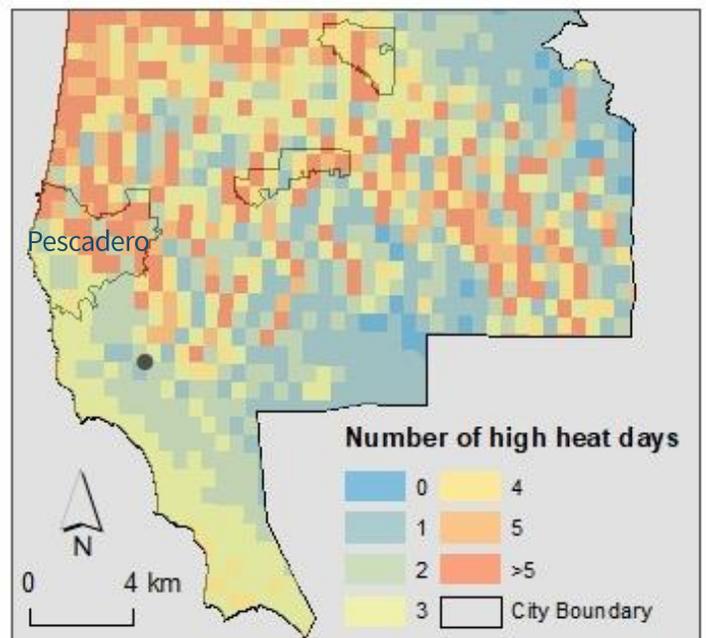
Figure 3: Vulnerability index and extreme heat in 2070



Extreme Heat can be dangerous to anyone without proper hydration or cooling, and can trigger health conditions, such as heat exhaustion, heat stroke and respiratory problems. One reason for this is that higher temperatures contribute to the build-up of harmful air pollutants. The impacts of heat are higher for vulnerable populations, including elderly, children, pregnant women, people with disabilities and homeless people.

Socially vulnerable communities may be particularly at risk due to increased risk of preexisting health conditions and greater reliance on public transportation. Extreme heat will also have disproportionate impacts on outdoor workers and individuals who do not reside in climate-controlled conditions, who rely on public transportation, or have pre-existing medical conditions. In many cases, outdoor workers are lower-income and perform jobs without sick or hazard pay. Furthermore, socially vulnerable communities may not be able to afford to cool work or living spaces or may be forced to choose between air conditioning and necessities like food and rent.

People with limited English proficiency are also more vulnerable as they may not receive heat outreach information and emergency notifications due to language or other accessibility obstacles. In general, socially vulnerable populations are more at risk of climate impacts due to inequitable community conditions, individual physical challenges, lack of resources, and discrimination. Extreme heat-related illnesses and fatalities are preventable if adequately prepared for. Next, we discuss adaptation strategies to address heat risks in San Mateo County.



Adaptation Solutions to Extreme Heat

Emergency Preparedness and Response

- **Centrally located community sites, or resilience hubs, could serve as cooling centers**, stocked with appropriate supplies and trained staff to serve community members that are unable to shelter from extreme heat in their own homes or workplaces. Staging temporary triage centers and emergency vehicles could save lives.
- **Multilingual and community-specific communications** and continuity of operations plans could be developed by trusted community organizations to plan for the impacts of extreme heat events on vulnerable communities in a way that is culturally and linguistically competent.
- **Battery backup systems** could improve the electrical system reliability and provide alternate capacity to minimize the risk of disruption of power for medical needs.
- **Community Emergency Response Teams (CERT)** and community organizations could check on vulnerable and isolated residents and facilitate access to cooling centers or medical support, when needed.
- **Extreme heat plans** could be created by establishing temperature thresholds requiring public communication and implementation of cooling stations.

City of Daly City: Project Green Space

The City of Daly City and 700+ volunteers have partnered to plant over 800 trees, 11 rain gardens and a California native mini park. This citizen engagement initiative is both growing and adapting the urban forest to future climate changes by planting species that thrive in drier conditions. The new green spaces absorb and purify stormwater, filter air pollution, reduce erosion, capture and store carbon dioxide and provide wildlife and pollinator habitat. Daly City's urban forest provides close to \$19M in ecosystem and energy efficiency benefits annually.

www.DalyCity.org/ProjectGreenSpace

Buildings and Open Space

- When strategically planted, **trees can provide shade** at transit stops, keep homes cool, bring utility costs down, and provide relief from heat for outdoor workers or business patrons.
- **Establishing urban forestry or tree planting programs** and a countywide urban forestry plan could lead to protections from heat. This could be supported with tree and landscape protection ordinances, street trees, parking lot shade, green roofs, and cool roofs.



- **Building codes** could be modified to address rising heat. Construction standards and requirements for building materials that can withstand evolving temperature conditions would reduce the risk of infrastructure failure.
- **Grants and technical assistance** could support low or no-cost weatherization efforts to enhance the energy efficiency for the homes of the socially vulnerable.



This Menlo Park apartment building received upgraded windows and insulation thanks to BayREN (program described below).

Bay Area Regional Energy Network (BayREN): Cooler, Healthier Homes



BayREN provides funding support for energy efficiency updates for apartments. These updates can lower utility bills, reduce summer heat and cold winters, improve air quality, and reduce street noise. Updated windows, insulation, and repairs can keep cool air in and warm air out with rising temperatures. **Learn more:** <https://bayren.org>