SAN FRANCISCO ENVIRONMENTAL JUSTICE COMMUNITIES MAP: TECHNICAL DOCUMENTATION

Background

California Senate Bill 1000 ("SB 1000") requires jurisdictions that have Disadvantaged Communities (DACs)[1] to incorporate environmental justice into their general plans upon the next revision to two or more elements. SB 1000 cites CalEnviroScreen, a statewide mapping tool from California Protection Agency (CalEPA) and Office of Environmental Health Hazard Assessment (OEHHA), to identify DACs. Using 20 pollution, health, and socioeconomic indicators, CalEnviroScreen identifies the top 25% of census tracts in the state as DACs. DACs are used to administer grant funding from the State's Cap-and-Trade Program, prioritize toxic site cleanup, and promote sustainable economic development. In San Francisco, portions of Bayview Hunters Point, SoMa, Treasure Island, and Tenderloin are identified as DACs. A common critique of CalEnviroScreen among San Francisco environmental justice advocates and City agencies is that several other neighborhoods with health and environmental challenges do not meet the criteria to be considered disadvantaged.

In compliance with SB 1000 and guidance from the Governor's Office of Planning and Research (OPR), the San Francisco Planning Department ("Department") chose to conduct additional analysis to better understand environmental justice in San Francisco. Municipalities are encouraged to define additional areas facing environmental and health challenges in their jurisdiction that should be considered as part of General Plan policies to address environmental justice.[2]

The Department has developed the Environmental Justice Communities Map ("EJ Communities Map") to identify areas in the City that face disproportionate burden of environmental health challenges, informed by state and local data. The EJ Communities Map is included in the Environmental Justice Framework ("EJ Framework"), a set of visions and priorities to ensure all residents and workers live in and enjoy healthy, clean

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[1] Disadvantaged Communities" means an area defined by the California Environmental Protection Agency. These areas are pursuant Health and Safety Code §39711 OR areas that are low-income and disproportionately affected by environmental pollution and other hazards that can lead to negative health effects, exposure, or environmental degradation (Government Code §65302(h)(4)(A)). The statute further defines "low-income area" to mean "an area with household incomes at or below 80 percent of the statewide median income OR with household incomes at or below the threshold designated as low income by the Department of Housing and Community Development's list of state income limits adopted pursuant to §50093" (Government Code §65302(h)(4)(C)).

[2] Although communities are encouraged to conduct analysis and define additional areas facing environmental and health challenges, this analysis would only apply to local policies and programs. CalEnviroScreen will continue to be the official map for state policies and programs.

environments.[3] The EJ Framework is meant to highlight policy priorities that can explicitly improve health in EJ Communities.

Methodology

OPR published guidelines to encourage municipalities to incorporate local data on pollution burden and health risk factors in their analysis of DACs in their own jurisdictions (Figure 1).[4]
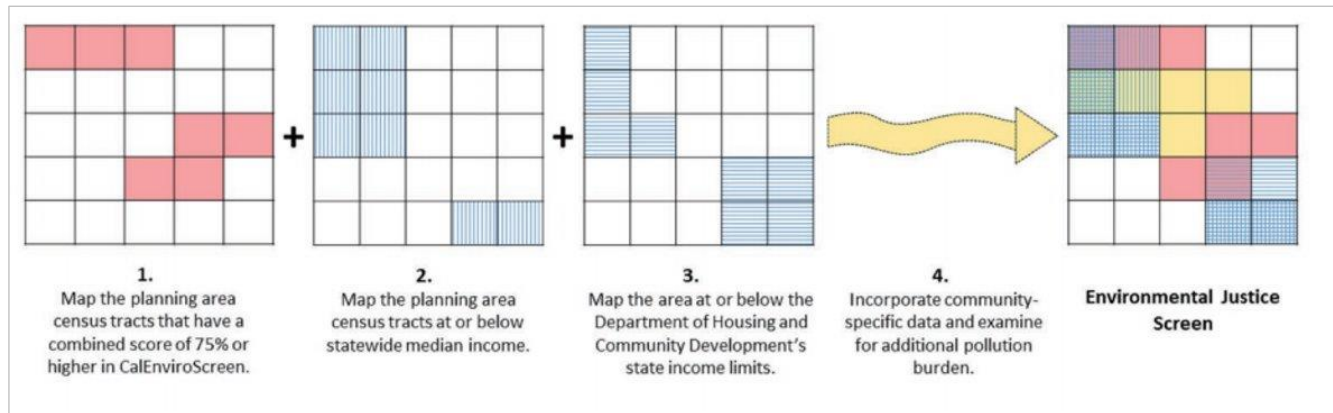

1.
Map the planning area census tracts that have a combined score of 75% or higher in CalEnviroScreen.

2.
Map the planning area census tracts at or below statewide median income.

3.
Map the area at or below the Department of Housing and Community Development's state income limits.

4.
Incorporate community-specific data and examine for additional pollution burden.

Environmental Justice Screen

Figure 1. OPR's Recommended Screening Process for Identifying Additional Disadvantaged Communities

Goals of San Francisco's EJ Communities Map:

The Department had several goals in developing the EJ Communities Map:

- Use local data to show additional areas that are lower-income and face high pollution and other health challenges; and,
- Create a map that better aligns with maps by the Metropolitan Transportation Commission, San Francisco Department of Public Health, San Francisco Recreation & Parks, and other local agencies; and,
- Designate areas where policies and resources could be directed to promote community health; and,
- Develop an analysis that could be easily replicated in the future; and,
- Reflect community feedback on areas of high need.

The Department considered over 100 data sets and indicator maps for inclusion in the EJ Communities Map. This included maps that provide an index or composite of other data, such as the Communities of Concern Map (San Francisco County Transportation Authority) and the Community Vulnerability Map (Bay Conservation and
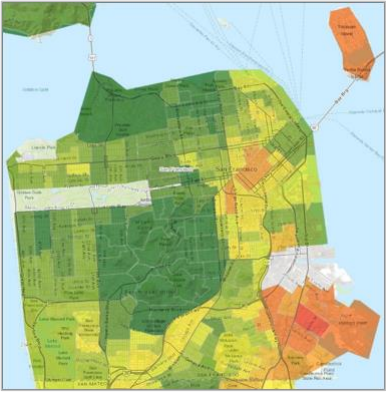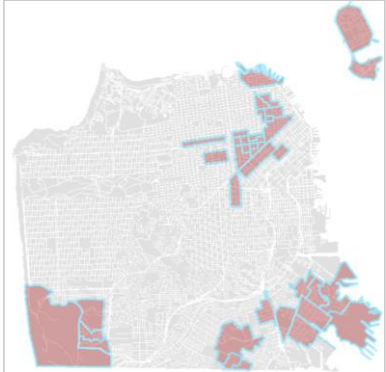
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[3] The EJ Framework outlines key environmental justice priorities that City policymakers should work to address. It is a state-mandated component of the General Plan, and it includes a set of visions and priorities in strong alignment with citywide racial and social equity goals. For more information: https://sfplanning.org/project/environmental-justice-framework-and-general-plan-policies#engagement
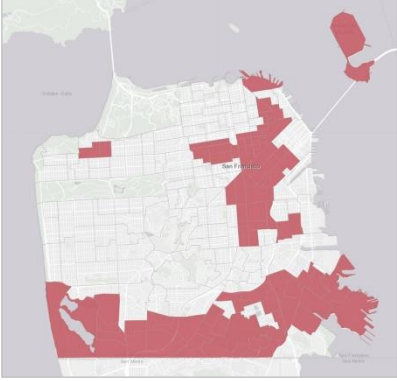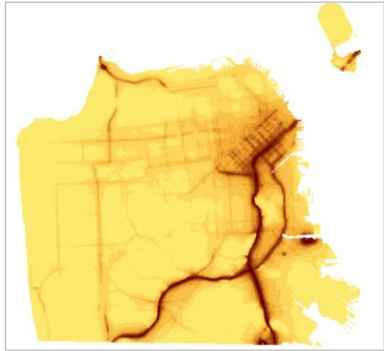
[4] General Plan Guidelines. Chapter 4: Required Elements. July 2020. Governor's Office of Planning and Research. Last accessed January 2023: https://opr.ca.gov/docs/20200706-GPG_Chapter_4_EJ.pdf

Development Commission), as well as individual datasets on related topics (e.g., housing, transportation, and climate).

After thorough review of data applicability, the Department used the following data sets for the EJ Communities Map:

Table 1. **EJ Communities Map Datasets & Weights**

Dataset and Weight (see "Raster Analysis & Symbology" for more)	Indicator(s)
CalEnviroScreen 4.0 – 60% Source: CalEPA, OEHHA 	Pollution exposure: • Ozone • PM2.5 • Diesel particulate matter • Pesticide use • Toxic release from facilities • Cleanup sites • Hazardous waste generators and facilities • Solid waste sites and facilities • Drinking water contaminants • Traffic density Population characteristics: • Educational attainment • Linguistic isolation • Poverty • Unemployment • Housing burdened low-income household • Asthma • Cardiovascular disease • Low birthweight infants
State Housing Income Limits: median household income – 10% Source: CA HCD 	Median HH income below $69,600 (San Francisco threshold for very low-income, two-person household)

Areas of Vulnerability (AOV) – 10% Source: SF DPH 	• Poverty • Persons of color • Youth • Seniors • Unemployment • High school or less • Limited English proficiency persons • Linguistically isolated households • Disability
Air Pollution Exposure Zone (APEZ) – 20% SF DPH, SF Planning 	Data included: PM2.5 concentrations greater than 10µg/m3 (including ambient levels)

Raster Analysis & Symbology

The EJ Communities Map was developed by conducting a raster analysis in ArcGIS that combined multiple layers of data into a final raster map. A raster analysis is a type of spatial and quantitative analysis that places two or more thematic maps on top of one another to form a new map.

In a raster analysis, geographic areas are broken up into individual cells or pixels, and each cell is assigned a numerical value. For the EJ Communities Map, these values are computed as a weighted average of the underlying datasets, as indicated in Table 1. For instance, CalEnviroScreen 4.0 is the most heavily weighted dataset at 60%. (Or put another way, 60% of the final map is a result of this dataset.)

To display the final map, the Department grouped the raster analysis results into categories and assigned a color ramp that was modeled on CalEnviroScreen 4.0 (with green indicating the lowest cumulative environmental burden, and red indicating the highest environmental burden). The final symbology of the map reflects 30 classes, grouped into seven categories, arranged from least to highest cumulative environmental burden (Figure 2).

The colors used for symbolizing the values are meant to be very similar with the colors used in CalEnviroScreen 4.0 to identify the tracts with the lowest scores (green and yellow colors) and highest scores (orange and red colors) of environmental burden. The values between 21 and 30 represent areas that approximately scored in the top one-third (32.3%) of burdened areas and are deemed Environmental Justice Communities. In other words, these are the areas with the highest cumulative environmental burdens. These areas are symbolized with the red color.

The value 999 represents the major parks and industrial areas in San Francisco. This is Golden Gate Park, Lincoln Park, McLaren Park, and the industrial area around Islais Creek. These areas are symbolized with the grey color.

Please note that there is missing data for the census tract around Islais Creek. The statewide data set, CalEnviroScreen 4.0, excludes this tract, due to the small population size, even though the area is known to contain multiple sources of pollution (which is also reflected in CalEnviroScreen's underlying datasets). Therefore, the Department decided to symbolize this area with a red and grey hatching pattern to reflect the high environmental burdens in this area.

Figure 2. EJ Communities Map Legend

- Dark Green (least environmental burden): 0, 1, 2, 3
- Medium Green: 4, 5, 6, 7
- Green: 8, 9, 10
- Light Green: 11, 12, 13
- Yellow: 14, 15, 16
- Orange: 17, 18, 19, 20
- Red (top one-third of environmental burden): 21, 22, 23, 24, 25, 26, 27, 28, 29, 30

Feedback

The draft EJ Communities Map was released in December 2020. The map received public feedback for refinement throughout the community engagement process. Overall, the public feedback was positive on the draft map, and it also received positive reception from other City agencies. In particular, the Environmental Justice Working Group appreciated the opportunity to think collectively about neighborhoods that are facing various health and economic challenges.[5]

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[5] The Environmental Justice Working Group is a group of community and City government leaders who collaborated to co-create policy recommendations for the EJ Framework, identify community needs and assets, and provide feedback on specific needs for its implementation. The Working Group met on a monthly basis from June to January 2022. The Working Group developed a list of policy recommendations for the City to consider as part of the EJ Framework. For more information: https://sfplanning.org/project/environmental-justice-framework-and-general-plan-policies#engagement

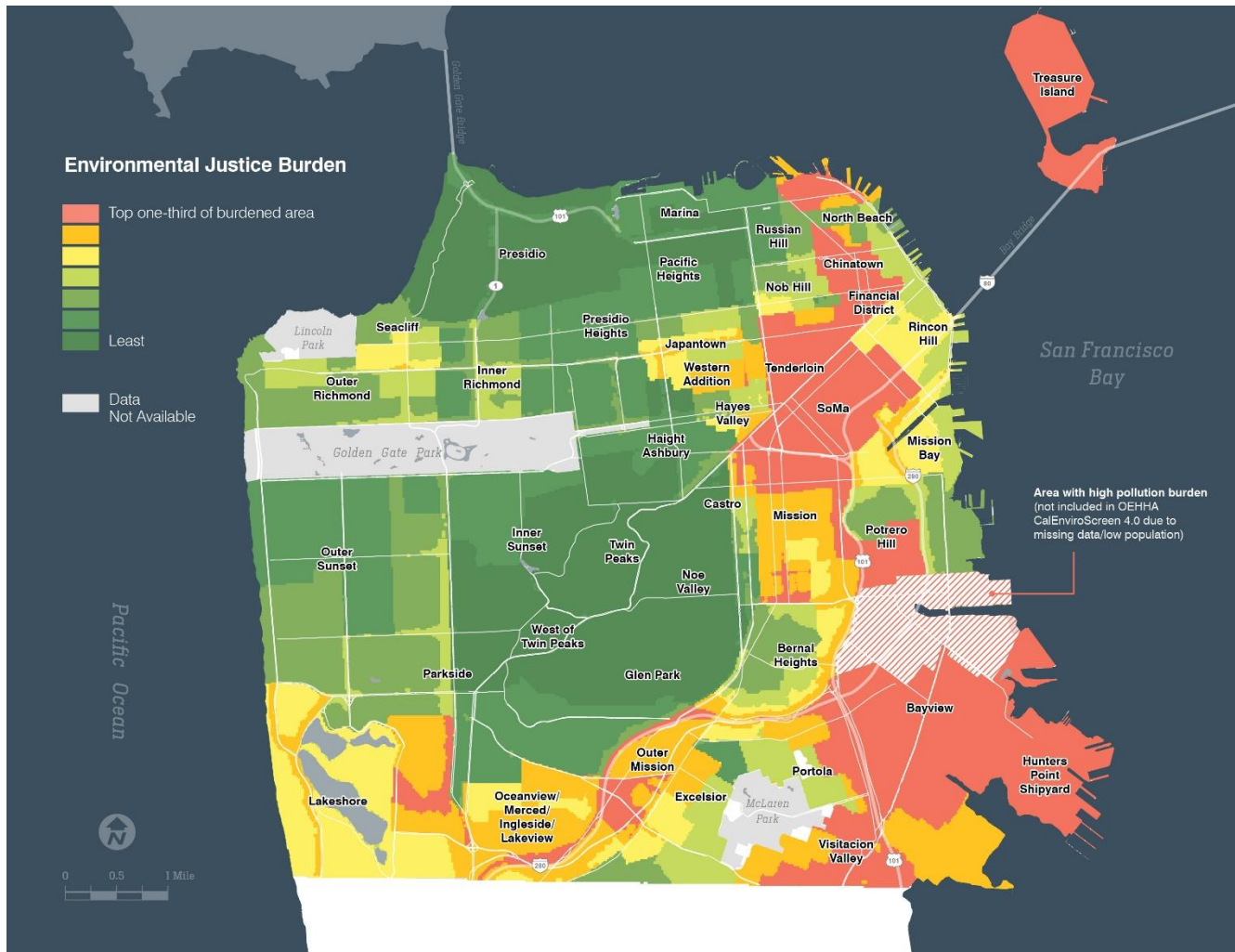# Final Environmental Justice Communities Map

Figure 3. Environmental Justice Communities Map

Source: SF Planning, 2023

NOTE: This map was created to meet the requirements of CA Senate Bill 1000. The legislation requires that municipalities identify where "Disadvantaged Communities" are located, defined as areas facing elevated pollution burden coupled with a high incidence of low-income residents. This map is based on the Office of Environmental Health Hazard Assessment (OEHHA) CalEnviroScreen 4.0 Map, modified to incorporate additional local data on pollution burden and socioeconomic disadvantage.

The Environmental Justice Communities Map (Figure 3) identifies the top one-third of areas experiencing environmental burden in San Francisco. These Environmental Justice Communities include the Bayview Hunters Point, Chinatown, Excelsior, Japantown, Mission, Ocean View-Merced Heights-Ingleside, Outer Mission, Potrero Hill, SoMa, Tenderloin, Treasure Island, Visitacion Valley, and Western Addition. Environmental Justice Communities are often low-income communities and communities of color. As environmental justice is defined

by remedying past harms and enabling community-led solutions,[6] it is important to focus policies and resources to these communities, which are often overlooked in local decision-making processes.

The Department has also prepared versions of the map that are more visualized and for presentation purposes (Appendix A).

Next Steps and Future Applications

As the map methodology was designed with easy replicability in mind, the map can be updated whenever any of the four data sets is updated. In practice, the most logical opportunity to update the map would be whenever CalEnviroScreen is updated, which has generally occurred every 2-5 years.

Additionally, the Department created an interactive ArcGIS StoryMap (Data Portal) that allows users to explore other data relevant to environmental justice, such as housing, transportation, climate, public services, etc. The Data Portal also includes excerpts from interviews with residents and workers in EJ Communities.

The primary function of the EJ Communities Map is to guide the San Francisco General Plan. EJ Communities are referenced within General Plan policies, including the Safety & Resilience Element (adopted 2022) and the Housing Element (adopted 2023). However, the map may be used by a range of City agencies and partners to support programs and policies that can advance environmental justice and equity. For instance:
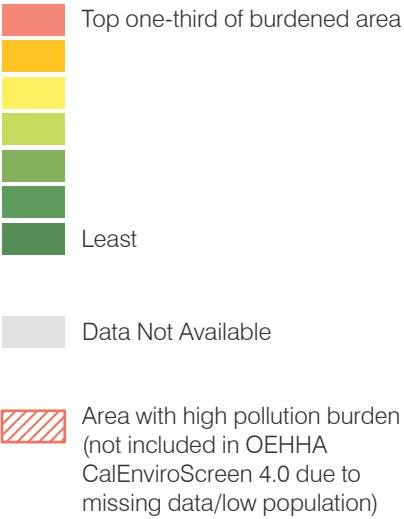
- The Department is using the map for other processes, including the Budget Equity Assessment Tool, Racial & Social Equity Plan, and the Environmental Justice Analysis of the Housing Element 2022 Update.

- The Department is coordinating with other City agencies who are interested in using the map for similar mapping efforts and programs, including the Equity Zones (Recreation and Parks Department), Green Infrastructure Grant Program (San Francisco Public Utilities Commission), Waterfront Resilience Program (Port of San Francisco) and others.

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[6] For the purposes of the EJ Framework, the City defines environmental justice as follows: Environmental Justice is the equitable distribution of environmental benefits and elimination of environmental burdens to promote healthy communities where everyone in San Francisco can thrive. Government should foster environmental justice through processes that address, mitigate, and amend past injustices while enabling proactive, community-led solutions for the future.
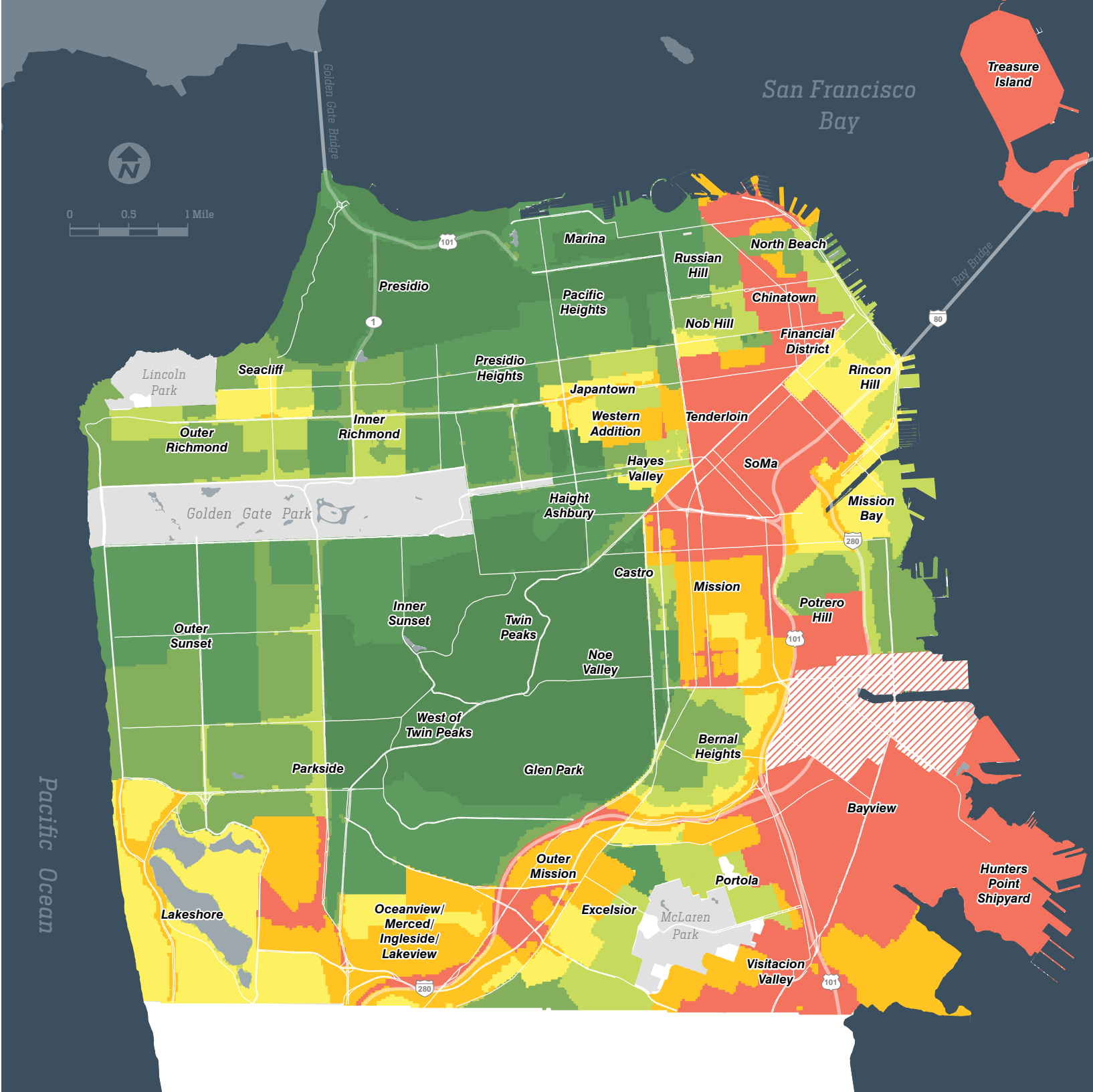
APPENDIX A: ADDITIONAL FULL COLOR AND OUTLINE VERSIONS OF ENVIRONMENTAL JUSTICE COMMUNITIES MAP

Environmental Justice Communities

Environmental Justice Burden

Top one-third of burdened area

Least

Data Not Available

Area with high pollution burden (not included in OEHHA CalEnviroScreen 4.0 due to missing data/low population)

NOTE: This map was created to meet the requirements of CA Senate Bill 1000. The legislation requires that municipalities identify where "Disadvantaged Communities" are located, defined as areas facing elevated pollution burden coupled with a high incidence of low-income residents. This map is based on OEHHA's CalEnviroScreen 4.0 Map, modified to incorporate additional local data on pollution burden and socioeconomic disadvantage.

JANUARY 2023

San Francisco Bay

Pacific Ocean

Treasure Island

Golden Gate Bridge

Bay Bridge

Lincoln Park

Presidio

Seacliff

Outer Richmond

Inner Richmond

Golden Gate Park

Marina

Pacific Heights

Russian Hill

North Beach

Chinatown

Financial District

Nob Hill

Presidio Heights

Japantown

Western Addition

Tenderloin

SoMa

Rincon Hill

Mission Bay

Hayes Valley

Haight Ashbury

Castro

Mission

Potrero Hill

Outer Sunset

Inner Sunset

Twin Peaks

Noe Valley

Bernal Heights

West of Twin Peaks

Parkside

Glen Park

Bayview

Hunters Point Shipyard

Lakeshore

Outer Mission

Portola

Excelsior

McLaren Park

Oceanview/ Merced/ Ingleside/ Lakeview

Visitacion Valley

Environmental Justice Communities

Environmental Justice Burden

- Top one-third of burdened area
- Data Not Available
- Area with high pollution burden (not included in OEHHA CalEnviroScreen 4.0 due to missing data/low population)

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JANUARY 2023

0   0.5   1 Mile

San Francisco Bay

Pacific Ocean

Golden Gate Bridge

Bay Bridge

Treasure Island

Marina
North Beach
Russian Hill
Chinatown
Presidio
Pacific Heights
Nob Hill
Financial District
Rincon Hill
Seacliff
Presidio Heights
Lincoln Park
Japantown
Western Addition
Tenderloin
Outer Richmond
Inner Richmond
Hayes Valley
SoMa
Mission Bay
Haight Ashbury
Golden Gate Park
Castro
Mission
Potrero Hill
Inner Sunset
Twin Peaks
Noe Valley
Outer Sunset
Bernal Heights
West of Twin Peaks
Glen Park
Bayview
Parkside
Hunters Point Shipyard
Outer Mission
Portola
Lakeshore
Oceanview/ Merced/ Ingleside/ Lakeview
Excelsior
McLaren Park
Visitacion Valley