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## DESIGNATION OF DISADVANTAGED COMMUNITIES PURSUANT TO SENATE BILL 535 (DE LEÓN)

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### I. INTRODUCTION

The California Global Warming Solutions Act of 2006 required the Air Resources Board (ARB) to adopt a statewide program that could include market-based compliance mechanisms to reduce greenhouse gas emissions in the state to at least 1990 levels by 2020. The Board subsequently developed several programs under this authorization, including a market based Cap-and-Trade Program. Funds received by the State from the distribution of emissions allowances as part of this program are deposited in the Greenhouse Gas Reduction Fund and, upon appropriation by the Legislature, must be used to further reduce emissions of greenhouse gases. The State Budget for Fiscal Year 2014-2015 included \$832 million in appropriations from this Fund to administering agencies for investment in a number of specified programs.

In 2012, the Legislature passed SB 535 (De León, Chapter 830, Statutes of 2012) and directed that, in addition to reducing greenhouse gas emissions, 25 percent of the moneys allocated from the Greenhouse Gas Reduction Fund also must go to projects that provide a benefit to disadvantaged communities. A minimum of 10 percent of the funds must be for projects located directly within disadvantaged communities, which may be the same projects that benefit disadvantaged communities. Therefore, for the current fiscal year, \$83.2 million must be expended in, and \$208 million must benefit, these communities. The California Environmental Protection Agency (CalEPA or Agency) was given the responsibility for identifying disadvantaged communities for purposes of this legislation.

After reviewing the *California Communities Environmental Health Screening Tool* (CalEnviroScreen) prepared by the Office of Environmental Health Hazard Assessment, CalEPA has decided on a designation of disadvantaged communities as required by SB 535. Maps identifying these communities are attached to this document. These areas are identified by census tract and scored at or above the 75<sup>th</sup> percentile using the methodology in CalEnviroScreen for ranking communities burdened by environmental and socioeconomic issues.<sup>1</sup>

This document describes how CalEPA arrived at its decision to identify disadvantaged communities pursuant to SB 535. Administering agencies approving projects using appropriations

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<sup>1</sup> Maps and other supporting documents are available at <http://www.calepa.ca.gov/EnvJustice/GHGInvest/>

from the Greenhouse Gas Reduction Fund must use this designation of disadvantaged communities in determining how to satisfy the project funding requirements of this legislation.

## II. STATUTORY REQUIREMENTS

In 2012, the Legislature passed and Governor Brown signed into law two bills – AB 1532 (Pérez, Chapter 807, Statutes of 2012) and SB 1018 (Budget and Fiscal Review Committee, Chapter 39, Statutes of 2012) – that provide the framework for how the Cap-and-Trade program’s auction proceeds will be appropriated and expended.

These statutes require that the State portion of the proceeds from the auction of allowances under the Cap-and-Trade program be used to facilitate the achievement of greenhouse gas emission reductions and, where applicable and to the extent feasible, to further additional goals of AB 32 and the Legislature. In addition, expenditures must comply with the requirements contained in SB 862 (Leno, Chapter 836, Statutes of 2014), the trailer bill which establishes requirements for agencies receiving appropriations of Greenhouse Gas Reduction Fund monies.

Currently, expenditures are limited to projects identified in the 2014-15 Budget Act and SB 103 (Budget Act of 2013, Chapter 2, Statutes of 2014). The funds, including the portion allocated to benefit disadvantaged communities, will be available according to criteria established by several implementing agencies for grants, rebates and other programs. The projects identified in the Budget Act include: new and expanded local rail and bus transit systems and capital improvement projects; affordable housing and sustainable communities projects; the High Speed Rail project; low-carbon transportation projects, including passenger zero-emission vehicle rebates, heavy duty hybrid/zero-emission trucks and buses, freight demonstration projects, and car sharing and other pilot projects; Installation of energy efficiency and renewable energy projects in single and multifamily low-income housing units; energy efficiency and energy generation projects in public buildings, including the University of California, the California State University, and courts; agricultural energy and operational efficiency projects; water use efficiency and conservation projects, including leak detection and repair projects; wetlands and watershed restoration projects; urban forests and forest health restoration and reforestation projects; and new or expanded clean composting and anaerobic digestion facilities. CalEPA’s identification of disadvantaged communities will be incorporated into the requirements developed by the agencies implementing these programs.

In addition, SB 535 directs CalEPA to identify disadvantaged communities for purposes of the Cap-and-Trade funding program based on geographic, socioeconomic, public health, and environmental hazard criteria.<sup>2</sup> These communities may include, but are not limited to:

- Areas disproportionately affected by environmental pollution and other hazards that can lead to negative public health effects, exposure, or environmental degradation.

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<sup>2</sup> Health and Safety Code section 37911.

- Areas with concentrations of people that are of low income, high unemployment, low levels of home ownership, high rent burden, sensitive populations, or low levels of educational attainment.

Senate Bill 862 requires CalEPA to hold at least one public workshop prior to the identification of disadvantaged communities.

Together, both SB 535 and SB 862 provide direction on what constitutes a disadvantaged community and the public process required to gather input on the identification of these communities. Because circumstances may change, it is anticipated that the identification of disadvantaged communities may also need to be adjusted in future years.

### III. CALENVIROSCREEN

The question of how to identify California communities burdened by environmental, social and economic issues is not new. In 2004, CalEPA adopted an *Environmental Justice Action Plan*<sup>3</sup> that called for the development of guidance to analyze the impacts of multiple pollution sources in California communities.<sup>4</sup> In furtherance of this plan and state environmental justice policies generally, CalEPA and the Office of Environmental Health Hazard Assessment (OEHHA) published a report in 2010, *Cumulative Impacts: Building a Scientific Foundation*.<sup>5</sup> This report described a methodology for ranking and identifying the areas of the state that face multiple pollution and socioeconomic burdens so programs and funding could be targeted appropriately toward improving the environmental health and economic vitality of the state's most impacted communities.

Building on the methodology described in the *Cumulative Impacts* report, the Agency and OEHHA produced the *California Communities Environmental Health Screening Tool* (CalEnviroScreen), a science-based tool for evaluating multiple pollutants and stressors in communities. It was designed to assist the Agency in carrying out its environmental justice mission to conduct its activities in a manner that ensures the fair treatment of all Californians, including minority and low-income populations. The development of the tool was a major step in the implementation of the 2004 *Action Plan*.

The public process for developing CalEnviroScreen was a multi-year effort that included consultation with other state agencies and stakeholders representing a wide cross-section of interest groups, multiple publicly released drafts, workshops and comment periods. The process ensured transparency and the meaningful participation of all stakeholders, including low-income

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<sup>3</sup> Environmental Justice Action Plan. The California Environmental Protection Agency, Sacramento, CA <http://www.calepa.ca.gov/envJustice/ActionPlan/Documents/October2004/ActionPlan.pdf>.

<sup>4</sup> State law defines environmental justice to mean "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies." Government Code section 65040.12(e).

<sup>5</sup> Cumulative Impacts: Building a Scientific Foundation. The Office of Environmental Health Hazard Assessment, Sacramento, CA <http://oehha.ca.gov/ej/pdf/CIReport123110.pdf>

and minority populations, by holding workshops at convenient locations and times and providing language interpretation services to facilitate discussion with non-English speakers.

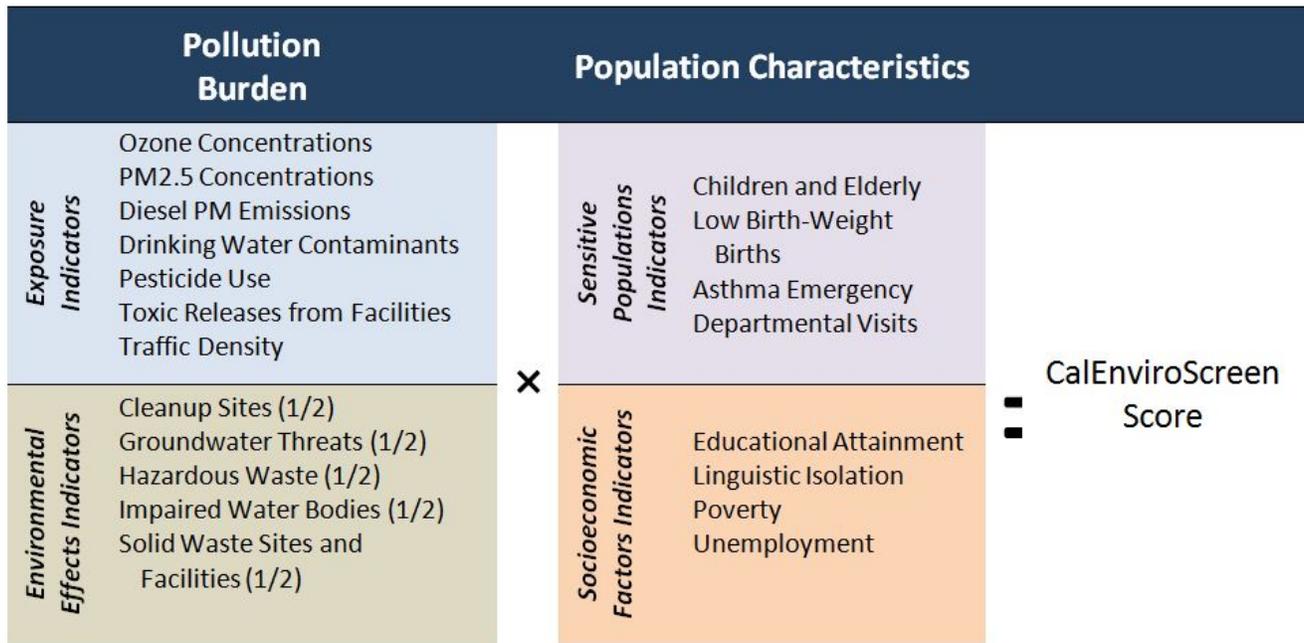
CalEPA released the first draft of CalEnviroScreen (CalEnviroScreen 1.0) for public review and comment in July 2012. The tool used existing environmental, public health, and socioeconomic data to develop 17 indicators that were used in turn to create a screening score for communities across the state. An area with a high score would be expected to experience much higher impacts than areas with low scores.

Before finalizing CalEnviroScreen 1.0, CalEPA and OEHHA carried out an extensive public process that included 12 public workshops, webinars, legislative briefings and nearly 1000 comments. We also considered input from our boards and departments that were evaluating the tool for their use. A slight revision to the tool, CalEnviroScreen 1.1, was released in September 2013.

Responding to many of the comments received on the earlier versions of the tool, CalEnviroScreen 2.0 was released for public review in April 2014. This version refined the tool by incorporating additional indicators for drinking water and unemployment rate, enhancing the geographic scale by using census tracts, and improving the current indicators by incorporation of the most up-to-date information. These changes improved the scientific basis of the tool and made it more useful to CalEPA and to others. After further changes were made to the tool to reflect suggestions made during the comment period, CalEnviroScreen 2.0 was adopted in August 2014.

CalEnviroScreen 2.0 uses a quantitative method to evaluate multiple pollution sources and stressors, and vulnerability to pollution, in California's approximately 8000 census tracts. Using data from federal and state sources, the tool is made up of four components in two broad groups. Exposure and Environmental Effects components comprise a Pollution Burden group, and the Sensitive Populations and Socioeconomic Factors components comprise a Population Characteristics group. The four components are made up of environmental, health, and socioeconomic data from 19 indicators (see Figure 1). The CalEnviroScreen score is calculated by combining the individual indicator scores within each of the two groups, then multiplying the Pollution Burden and Population Characteristics scores to produce a final score. Based on these scores the census tracts across California are ranked relative to one another.

**Figure 1. CalEnviroScreen 2.0 Indicator and Component Scoring**



The methodology used in CalEnviroScreen is based on:

1. **Scientific Literature:** Existing research on environmental pollutants has consistently identified socioeconomic, age and other sensitivity factors as “effect modifiers” that can increase health risk by factors ranging from 3-fold to 10-fold or greater, depending on the combination of pollutants and underlying susceptibilities.
2. **Risk Assessment Principles:** Risk assessments, using principles advanced by the National Academy of Sciences, apply numerical multipliers to account for variability in human sensitivity to pollutants (as well as other factors such as data gaps) in deriving health risk levels.
3. **Established Risk Scoring Systems:** Priority-rankings done by various emergency response organizations to score threats use scoring systems with the formula: Risk = Threat x Vulnerability.

As suggested by the various iterations of CalEnviroScreen, CalEPA and OEHHA intend that the tool will be a dynamic document that will be revised over time as circumstances change and as new information becomes available. For more information on CalEnviroScreen scores, see the CalEnviroScreen 2.0 report.<sup>6</sup>

<sup>6</sup>California Communities Environmental Health Screening Tool, Version 2 (CalEnviroScreen 2.0). Guidance and Screening Tool. Office of Environmental Health Hazard Assessment and the California Environmental Protection Agency, Sacramento, CA <http://oehha.ca.gov/ej/pdf/CES20Finalreport2014.pdf>. Available in English and Spanish.

Given the strong, accepted scientific foundation for the CalEnviroScreen methodology, it is appropriate to use this tool to identify disadvantaged communities pursuant to SB 535. Moreover, it is also significant to note that this legislation was adopted after the initial version of CalEnviroScreen had been released. The factors evaluated in CalEnviroScreen, including exposure to hazards and environmental effects, as well as the indicators rating census tracts according to health and economic issues, match up well with the direction in SB 535 that CalEPA should identify disadvantaged communities based on geographic, socioeconomic, public health, and environmental hazard criteria. It may be inferred that the Legislature intended that CalEnviroScreen be used to designate disadvantaged communities for purposes of SB 535.

#### **IV. APPROACHES TO IDENTIFYING DISADVANTAGED COMMUNITIES**

While CalEnviroScreen provides a reasoned, scientific base from which to work, identifying disadvantaged communities remains a challenging task. In general, the term *disadvantaged* is commonly associated with economic indicators related to poverty and income. Many of the comments received from our SB 535 workshops and public comment period focus on poverty as being the most important factor in determining whether an area should be considered disadvantaged. At the same time, the term *community* has numerous definitions ranging from a neighborhood within a city, to a small town or unincorporated area. In some cases, communities have been identified as an entire region. A few public comments pointed out that the use of census tracts as a proxy for a community might not give an accurate snapshot of an area where people associate with some type of commonality.

In practice as well, there is no universal definition for disadvantaged communities. For instance, California has used the term disadvantaged communities in several state laws, but the underlying criteria used to identify these communities have not been consistent. As an example, disadvantaged communities are defined in the Safe Drinking Water Act as the entire area of a water system or community where the median household income is less than 80 percent of the statewide average.<sup>7</sup> A number of state programs also use a median household income threshold to identify disadvantaged communities.<sup>8</sup> Similarly, the Housing-related Parks Program administered by the California Department of Housing and Community Development implements a statutory definition for disadvantaged communities as census tracts designated by the United States Department of Housing and Urban Development with at least 51 percent of its residents at low- or moderate-income levels.<sup>9</sup>

In contrast to these other definitions, SB 535 requires CalEPA to take a multi-pronged approach to identifying disadvantaged communities that includes socioeconomic, public health and environmental hazard criteria. In this context, therefore, CalEPA has been directed to consider, but look beyond poverty and income statistics, to identify those areas of the state that are also disproportionately impacted by environmental pollution and negative public health effects.

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<sup>7</sup> Health and Safety Code section 116275(ab).

<sup>8</sup> Public Resources Code sections 4799.09(a); 75005(g).

<sup>9</sup> Health and Safety Code section 50700(b).

## A. Identifying a Methodology

Although CalEnviroScreen already ranks communities in California using the factors specified in SB 535, broad consideration was given to several approaches to designating disadvantaged communities in lieu of simply relying on the scores in the tool. In the document on *Approaches to Identifying Disadvantaged Communities* released in August 2014, OEHHA and CalEPA outlined five different methods for using data in CalEnviroScreen to identify census tracts as disadvantaged communities:

### **Method 1:** Combined Pollution Burden and Population Characteristics

This is the method that OEHHA used to rank census tracts in the CalEnviroScreen 2.0 report and ZIP codes in last year's CalEnviroScreen 1.0 and 1.1 reports. Here, the overall score is calculated by combining the individual indicator scores within each of the two groups, then multiplying the Pollution Burden and Population Characteristics scores to produce a final score. Based on these final scores the census tracts across California are ranked relative to one another.

### **Method 2:** Pollution Burden

This method would rank census tracts based only on their pollution burden scores and does not include socioeconomic factors

### **Method 3:** Population Characteristics

This method would rank census tracts only on their population characteristics scores and does not include environmental hazard considerations.

### **Method 4:** Equal fractions of the highest scoring areas for both Pollution Burden and Population Characteristics

While using both Pollution Burden and Population Characteristics scores, Method 4 differs from Method 1 in one critical aspect. In Method 1, there is a relationship between the overall Pollution Burden and the Population Characteristics groups of measures, with the overall score determined by multiplying the Pollution Burden and Population Characteristics scores. Method 4 considers these two groups individually, taking census tracts with the highest scores from the Pollution Burden group and the highest scores from the Population Characteristics group.

### **Method 5:** High scores in Pollution Burden *and* Population Characteristics, plus medium-high scores in Pollution Burden *or* Population Characteristics

This method is like Method 4, but included medium-high scores from either the Population Burden and Population Characteristics groups.

## **B. Identifying a Percentage Threshold**

In addition to considering different methodologies, consideration must also be given to the percentage threshold that should be used to determine how many census tracts and how large a population should be defined as disadvantaged. SB 535 provided four categories of criteria that CalEPA must consider in making a determination on how to designate disadvantaged communities, but it did not specify how many communities or what percentage of the population should be included.

Version 1.0 of CalEnviroScreen, the version in circulation at the time of adoption of SB 535, suggested that the highest ranking 10 percent of zip codes should be used for identifying the most impacted communities in California. Because of the relatively larger size of zip-codes in comparison to census tracts, this recommendation included approximately 20 percent of the state population in an impacted community. The Legislature was likely aware of the CalEnviroScreen results at the time SB 535 was adopted; however, it did not set a percentage threshold in SB 535. Instead, it directed CalEPA to make the designation of disadvantaged communities according to the criteria listed in the statute.

Setting a threshold in the range of 20 to 25 percent would be consistent with other legislation and studies regarding disadvantaged communities. For instance, in contrast to SB 535, the Legislature has in one other situation determined that CalEPA should identify 20 percent of the most impacted disadvantaged communities. SB 43 (Wolk, Chapter 413, Statutes of 2013) created the Green Tariff Shared Renewables Program to allow consumers to voluntarily purchase electricity from renewable energy facilities through major utility companies. This program is intended to allow low income Californians, generally renters, to participate in the market for renewable energy. The pilot program is limited to 600 megawatts statewide, to be shared proportionally by the major utility companies that implement the program. One hundred megawatts of that maximum are reserved for smaller facilities (no larger than one megawatt generating capacity) that are located in areas “identified by the California Environmental Protection Agency as the most impacted and disadvantaged communities.”<sup>10</sup>

Like SB 535, the statute tacitly references CalEnviroScreen by requiring these communities to be identified using a screening methodology designed to identify areas (1) disproportionately affected by pollution and environmental hazards and (2) with socioeconomic vulnerability. This provision encourages renewable energy facility development in disadvantaged communities to realize the socioeconomic and environmental benefits of that development and provide those communities access to renewable energy.

Unlike SB 535, however, SB 43 not only asserts that the communities shall be identified by census tract, but also states that the communities shall be the most impacted 20 percent. By setting aside program funds to benefit disadvantaged communities, SB 43 provides CalEPA with general guidance on where to establish a percentage threshold for identifying disadvantaged communities.

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<sup>10</sup> Public Utilities Code section 2833.

It is not determinative, however, of the precise threshold for communities identified as disadvantaged for the purposes of SB 535.

In addition to looking at legislative approaches, CalEPA also considered the portion of the state's population, families and households that represent traditional markers of being disadvantaged:

- In 2011, the California Poverty Measure developed by the Public Policy Institute of California and the Stanford Center on Poverty and Inequality identified about 22 percent of California residents were living in poor families.<sup>11</sup>
- In 2011, the United States Department of Labor and the Bureau of Labor Statistics found that 21 percent of the California civilian labor force was unemployed.<sup>12</sup>
- Prior to implementation of the Affordable Care Act, 21 percent of California residents lacked health insurance between the years 2010 and 2012.<sup>13</sup>
- In 2012, 20 percent of California children between the ages of 5 to 19 years received food stamps.<sup>14</sup>
- In 2011, about 20 percent of California households spent more than half of their income on rent.<sup>15</sup>

While these data points do not represent a complete list of comparative markers related to being disadvantaged, these figures provide CalEPA some instruction in determining a practical percentage threshold for disadvantaged communities.

In view of this legislative history and these comparative markers, OEHHA and CalEPA discussed several possible thresholds in *Approaches to Identifying Disadvantaged Communities*. In addition

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<sup>11</sup> Sarah Bohn, & Matt Levin. (August 2013). Poverty in California. Policy Institute of California. Retrieved from [http://www.ppic.org/main/publication\\_show.asp?i=261](http://www.ppic.org/main/publication_show.asp?i=261).

<sup>12</sup> United States Department of Labor Bureau of Labor Statistics. (2014). Measures of Labor Underutilization, California – 2013 [Data File]. Retrieved from <http://www.bls.gov/ro9/altca.htm>.

<sup>13</sup> Rachel Licata, Rachel Arguella, & Rachel Garfield. (February 2014). The Uninsured at the Starting Line in California: California findings from the 2013 Kaiser Survey of Low-Income Americans and the ACA. The Henry J. Kaiser Family Foundation. Retrieved from <http://kff.org/uninsured/report/the-uninsured-at-the-starting-line-in-california-california-findings-from-the-2013-kaiser-survey-of-low-income-americans-and-the-aca/>.

<sup>14</sup> Supplemental Nutrition Assistance Program Quality Control Data, Food and Nutrition Service, U.S. Department of Agriculture, U.S. Census Bureau (February 2014). California's Children are Most Likely To be CalFresh Recipients. Retrieved from [http://www.ppic.org/main/popup.asp?u=./content/images/Figure\\_FoodStamp2.png&t=California percent20children percent20are percent20most percent20likely percent20to percent20be percent20CalFresh percent20recipients](http://www.ppic.org/main/popup.asp?u=./content/images/Figure_FoodStamp2.png&t=California%20children%20are%20most%20likely%20to%20be%20CalFresh%20recipients).

<sup>15</sup> California Health Care Foundation. (2013). California Health Care Almanac. Retrieved from [http://www.chcf.org/~media/MEDIA\\_percent20LIBRARY\\_percent20Files/PDF/M/PDF\\_percent20MediCalFactsAndFigures2013.pdf](http://www.chcf.org/~media/MEDIA_percent20LIBRARY_percent20Files/PDF/M/PDF_percent20MediCalFactsAndFigures2013.pdf).

to discussing the five methodologies described above, the report included maps and charts that illustrated the use of three percentage thresholds covering 15 percent, 20 percent, and 25 percent of the state population.

## V. PUBLIC INPUT

In August and September 2014, CalEPA hosted public workshops in Fresno, Los Angeles and Oakland. An additional community briefing was held in Mecca for Coachella Valley residents. The purpose of these workshops was to gather input from the public on how CalEPA should identify disadvantaged communities. To facilitate comments from the public, CalEPA and OEHHA released *Approaches to Identifying Disadvantaged Communities*.<sup>16</sup>

The workshops were held in the evening and well attended, with over 400 people participating in total. The format of these workshops was designed to maximize public input through small group discussions. Most of the comments focused on the method and percentage threshold used to identify disadvantaged communities.

In general, Fresno workshop participants preferred Method 1 (the original established CalEnviroScreen method) and were to a lesser degree supportive of Method 4. Comments on the preferred percentage threshold ranged from 15-25 percent of the highest scoring census tracts. Los Angeles participants also preferred Method 1 and supported Method 4. Comments from the Los Angeles workshop on the preferred threshold were more restrictive, with a substantial amount of participants preferring 20 percent or fewer of the highest scoring census tracts.

At the Oakland workshop, the Bay Area Air Quality Management District (BAAQMD), concerned that an insufficient number of Bay Area census tracts might be identified as disadvantaged and might therefore be at a disadvantage when competing for grants, presented an alternative approach to the five methods presented by CalEPA and OEHHA. This approach, referred to as Method 6, uses a statistical methodology originally developed for microbiology experiments. A community's rankings for each of the 19 CalEnviroScreen indicators are reversed in their rank order, transformed into fractions, multiplied against each other, and then taken to the 19<sup>th</sup> root power (like a square root, but more complex) to produce a final score.

Although Method 6 and CalEnviroScreen's approaches identify many of the same census tracts as top scoring, there are some major differences between the two methods. As examples, in the BAAQMD's method:

- The ranking scores emphasize individual extreme values instead of cumulative impacts. A very small number of high scoring indicators can drive the overall ranking of a tract into a high percentile, even if most of the indicators for that census tract are in a low range.

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<sup>16</sup> Approaches to Identifying Disadvantaged Communities. The California Environmental Protection Agency and Office of Environmental Health Hazard Assessment, Sacramento, CA  
<http://oehha.ca.gov/ej/pdf/ApproachesIdentifyDisadvantagedCommunitiesAug2014.pdf>.

- Because a small number of high-scoring indicators have a large impact on a census tract's score, a tract can score high even if it has a low Population Characteristic score or low Pollution Burden score. Thus a community that has several high population characteristic indicator scores can have a high overall score even if the pollution scores are low. Similarly, an affluent community with a few high pollution burden scores can have a high overall score.
- Individual indicators are weighted equally, regardless of the group they are in. Since 12 of the 19 indicators are in the Pollution Burden group, these indicators have a greater influence on the score by the BAAQMD method than the Population Characteristics indicators.
- Environmental Effects indicators are given full weighting, in contrast to the other methods, which give those indicators only half-weighting. The half-weighting for the Environmental Effects indicators in CalEnviroScreen was determined as a result of stakeholder and expert input. Thus indicators such as solid waste sites, nearby impaired water bodies, and underground storage tanks have much more influence on the score using Method 6 than in any of the other methods.

Nonetheless, the methodology would increase the number of San Francisco Bay Area census tracts that might be considered disadvantaged and most Oakland participants voiced a preference for this method. Comments on the threshold also were generally more inclusive, promoting 25-30 percent of the highest scoring census tracts.

In addition to comments at the workshops, CalEPA received over 100 formal written comments related to the identification of disadvantaged communities. Many of the written comments raised concerns similar to those identified in the public workshops. Others, however, called for additional indicators, including: rent burden; home ownership; access to parks; race; life expectancy; and a poverty indicator adjusted for cost of living. As discussed in the attached *Responses to Public Comments* prepared by OEHHA, many of these indicators were considered during the development of CalEnviroScreen, or may be considered for future versions of this tool as better information becomes available. The major issue presented by many of these proposed indicators is that we do not have sufficient data on a census tract level.

Finally, another large portion of comments focused on specific communities that did not receive high rankings or scores for certain indicators. In some cases, especially for census tracts along the border with Baja California, questions were raised about the accuracy or adequacy of the information used to derive a ranking or score.

## VI. DESIGNATING DISADVANTAGED COMMUNITIES

### A. The Methodology

After reviewing the comments received at the workshops and considering the various methodologies that might be used to identify disadvantaged communities, we have determined that Method 1 is the most suitable choice for identifying disadvantaged communities pursuant to SB 535. This is the method that OEHHA used to rank census tracts in the CalEnviroScreen 2.0 report and ZIP codes in last year's CalEnviroScreen 1.0 and 1.1 reports. Here, the overall score is calculated by combining the individual indicator scores within each of the two groups, then multiplying the Pollution Burden and Population Characteristics scores to produce a final score. Based on these final scores the census tracts across California are ranked relative to one another.

The primary reason this method has been selected is that it most clearly meets the statutory requirements in SB 535 that disadvantaged communities be identified based on a variety of environmental hazard, geographic, socioeconomic and public health criteria. In addition, because it has been used in the three CalEnviroScreen reports, Method 1 offers the advantage of having been subject to extensive public review over a period of 2 ½ years by community groups, businesses, and government agencies across California, and by the technical experts that participated in the 2012 academic workshop on the then-draft CalEnviroScreen 1.0 document. The method is consistent both with published scientific studies showing the interactions between population characteristics and health risks from pollution, and with established risk assessment methods that call for using multipliers based on population vulnerability as “modifying factors” when calculating acceptable exposure levels.

Of the remaining methodologies, although Method 3 could potentially be useful in circumstances where disadvantage is defined solely based on poverty and other social factors (as recommended by some commenters), and Method 2 could be useful if the sole considerations were environmental, neither method meets the provisions of SB 535. This legislation requires that disadvantaged communities be identified based on geographic, socioeconomic, public health and environmental hazard criteria. Instead, Method 2 ranks census tracts based only on their pollution burden scores and does not include socioeconomic factors, while Method 3 ranks census tracts only on their population characteristics scores and does not include environmental hazard considerations.

In contrast, Methods 4 and 5 consider both pollution and socioeconomic factors, but look at them individually, taking census tracts with the highest scores from the Pollution Burden group and the highest scores from the Population Characteristics group (Method 4) or the high scores from both groups plus the medium-high scores from either group (Method 5). While a substantial number of the same highest scoring census tracts are identified by each of these two methods as compared to Method 1, Methods 4 and 5 depart from CalEnviroScreen's basic premise that population characteristics can affect a community's vulnerability to pollution. Method 1 accounts for this by multiplying the Pollution Burden and Population Characteristics scores; Methods 4 and 5 on the other hand, simply look at communities that score relatively high in both categories. In so doing, they fail to account for the many scientific studies showing that health outcomes in a community

are influenced by a multiplicative combination of pollution and population vulnerability factors. Thus although both Method 4 and Method 5 would satisfy the statutory criteria in SB 535, Method 1 is closely aligned to the findings of scientific studies in the field of environmental health.

Finally, while Method 6, suggested by the Bay Area Air Quality Management District warrants future consideration and study, it relies on a novel approach that has not undergone substantial public or academic review and departs in several significant ways from approaches that have been the subject of more rigorous analysis and comment. Importantly, it appears to emphasize extreme values of single indicators at the expense of combined factors, with the result that communities may be identified as disadvantaged based on a few individual issues. This seems to explain why it appears to identify several relatively affluent communities as disadvantaged. For example, using the BAAQMD method, census tracts in Newport Beach, Simi Valley, and the western slope and summit of Potrero Hill in San Francisco, would score in the top 25 percent, even though their CalEnviroScreen population characteristics scores are in the lowest 5 percent and poverty indicator scores are in the lowest 10 percent of the state. Santa Catalina Island would also score in the top 25 percent using this method, apparently due primarily to a high solid waste score, even though it scores low on most indicators (see attached *Responses to Comments*).

In sum, Method 6 does not provide an appropriate basis for identifying disadvantaged communities at this time. For these reasons, CalEPA will use Method 1 in identifying disadvantaged communities pursuant to SB 535.

## **B. The Percentage Threshold**

Any method selected to identify disadvantaged communities requires CalEPA to choose a threshold. As noted above, the percentage thresholds associated with the approximately 8,000 census tracts identified in CalEnviroScreen generally correspond with the same percentages of the total California population of about 37 million. For example, a 20 percent threshold represents approximately 20 percent of the state's population. Similarly, a 25 percent threshold represents approximately 25 percent of the state's population.

During our public process, we received suggestions on what percentage of the highest scoring census tracts should be considered disadvantaged for purposes of SB 535. The following percentages were suggested: 15, 20, 25, and 30 percent. CalEPA considered these recommendations and also relied on legislative direction, comparative markers of being disadvantaged, and principles of fairness, all detailed below, to determine that a percentage threshold of 25 percent should be used to designate disadvantaged communities at the present time.

Identifying only the top scoring 15 percent of census tracts as disadvantaged would concentrate funding from the Cap-and-Trade program on the areas of the state most in need, but it appears that this threshold would be narrower than contemplated by the Legislature and would miss segments of the population identified as disadvantaged in other studies.

CalEPA received comments that asserted that the percentage of the population targeted for funding should be equal to or less than the percentage of funds allocated to disadvantaged communities in SB 535. These commenters suggested that a threshold greater than 25 percent, such as 30 percent, would be regressive for disadvantaged communities because SB 535 requires that only 25 percent of Greenhouse Gas Reduction Fund monies benefit those communities. This reasoning supports a designation of a threshold less than 30 percent.

A threshold of 25 percent is closer to the approach taken in earlier versions of CalEnviroScreen and in legislation regarding projects in disadvantaged communities. Additionally, traditional markers of disadvantaged communities have generally found that slightly over 20 percent of the population may be adversely affected by unemployment, poverty, or a lack of access to proper healthcare or nutrition.

A number of comments, however, have noted that a threshold of 20 percent might exclude communities commonly associated with environmental justice concerns, such as the Bayview community in San Francisco, areas around the Port of Oakland, portions of the City of Richmond and regions along the border with Mexico. In several instances, we have been asked to look at the underlying data that went into the scoring for these specific census tracts.

Setting the threshold at 25 percent while we continue to refine the information and methodologies used to develop CalEnviroScreen will provide a margin of safety that ensures that communities close to the threshold are not inappropriately excluded. Moreover, having a broader landscape of disadvantaged communities distributed throughout the various regions of the state increases the potential for project proposals that reduce greenhouse gases and maximizes benefits to disadvantaged communities. Indeed, CalEPA recognizes that because this is the first year of the Auction Proceeds program, flexibility should be provided to ensure the ability to match projects with disadvantaged communities. A wide variety of projects are authorized to use monies from the Greenhouse Gas Reduction Fund and, as we are learning, developing projects in certain census tracts can be challenging.

Therefore, after taking into consideration legislative direction, comparative markers of being disadvantaged and basic principles of fairness, CalEPA will use a 25 percent threshold to identify disadvantaged communities. Maps of the top 25 percent highest scoring census tracts are provided as an attachment to this document.

## **VII. ONGOING PROCESS**

CalEnviroScreen is the result of an iterative, public process that included input from a wide cross-section of interested groups across the state. We remain committed to further improve and refine this innovative tool. Recent comments focus on the merits of different indicators included or not included in CalEnviroScreen. Suggestions include adding indicators on rent burden or home ownership, or refining existing indicators, such as adjusting the poverty indicator to account for cost

of living. These recommendations are addressed in the attached response to comments, but we will also evaluate these proposals as we develop the next version of CalEnviroScreen.

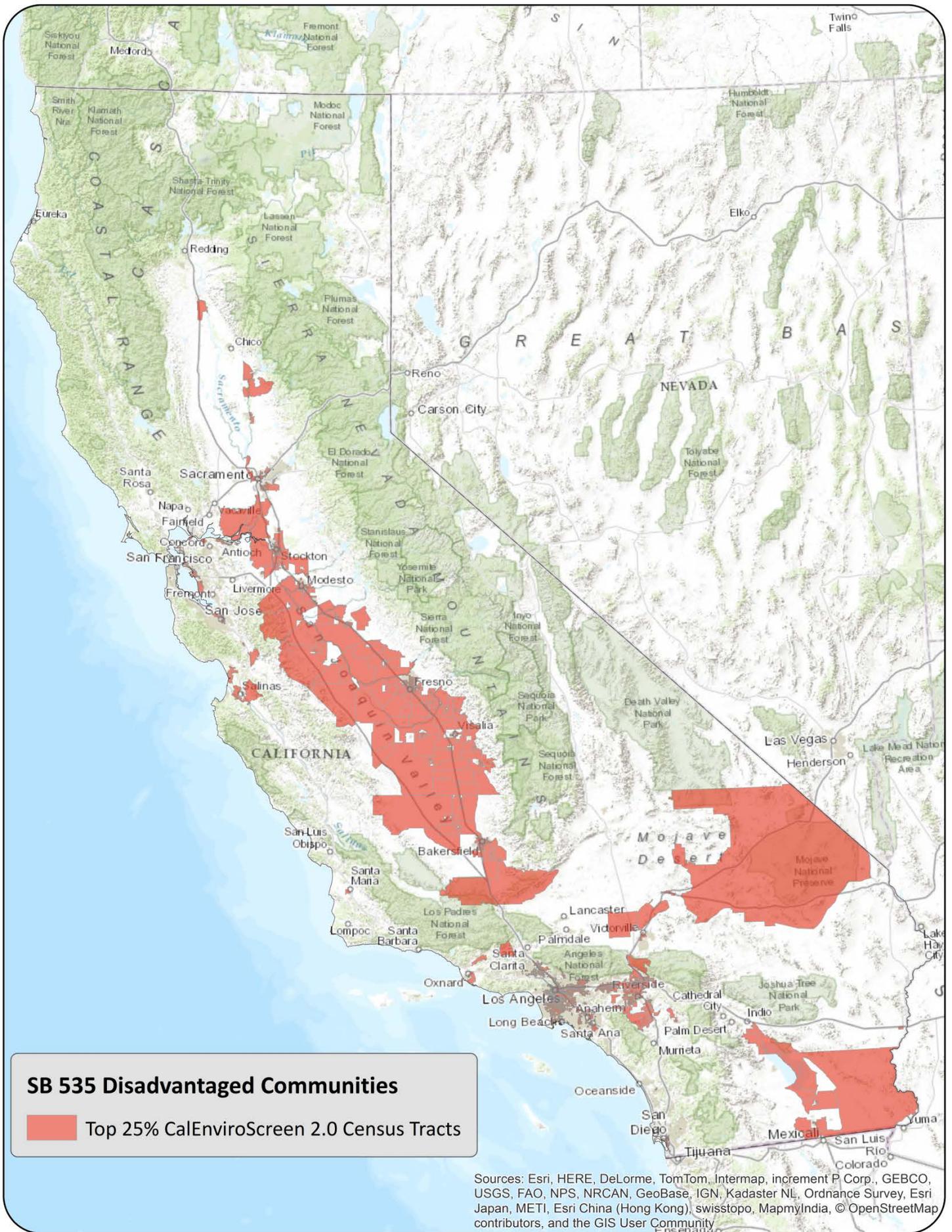
We recognize that in assigning CalEnviroScreen scores for each of the approximately 8,000 census tracts in California, important data may be missing or errors may have occurred for individual tracts. We will work with local and regional jurisdictions to review our data and verify results. If recalculation of a community's CalEnviroScreen 2.0 score shows that it should have been identified as a disadvantaged community, we will add that community to the list for this designation. And we will not remove a community from the list for the current designation if recalculation of their CalEnviroScreen 2.0 score shows that they were incorrectly identified as a disadvantaged community. Accordingly, any changes to the current version of CalEnviroScreen 2.0 will have no bearing on funding decisions already in process.

Finally, this decision, while important, is one step in the process of ensuring that these investments yield significant benefits to California's disadvantaged communities. Much of the success depends on the implementation by administering State agencies. ARB has provided valuable guidance to these agencies for how they can maximize benefits to disadvantaged communities while meeting statutory requirements. It is critical that agencies make the most of this unique opportunity to have a transformative impact on California's most disadvantaged communities.

Attachments:

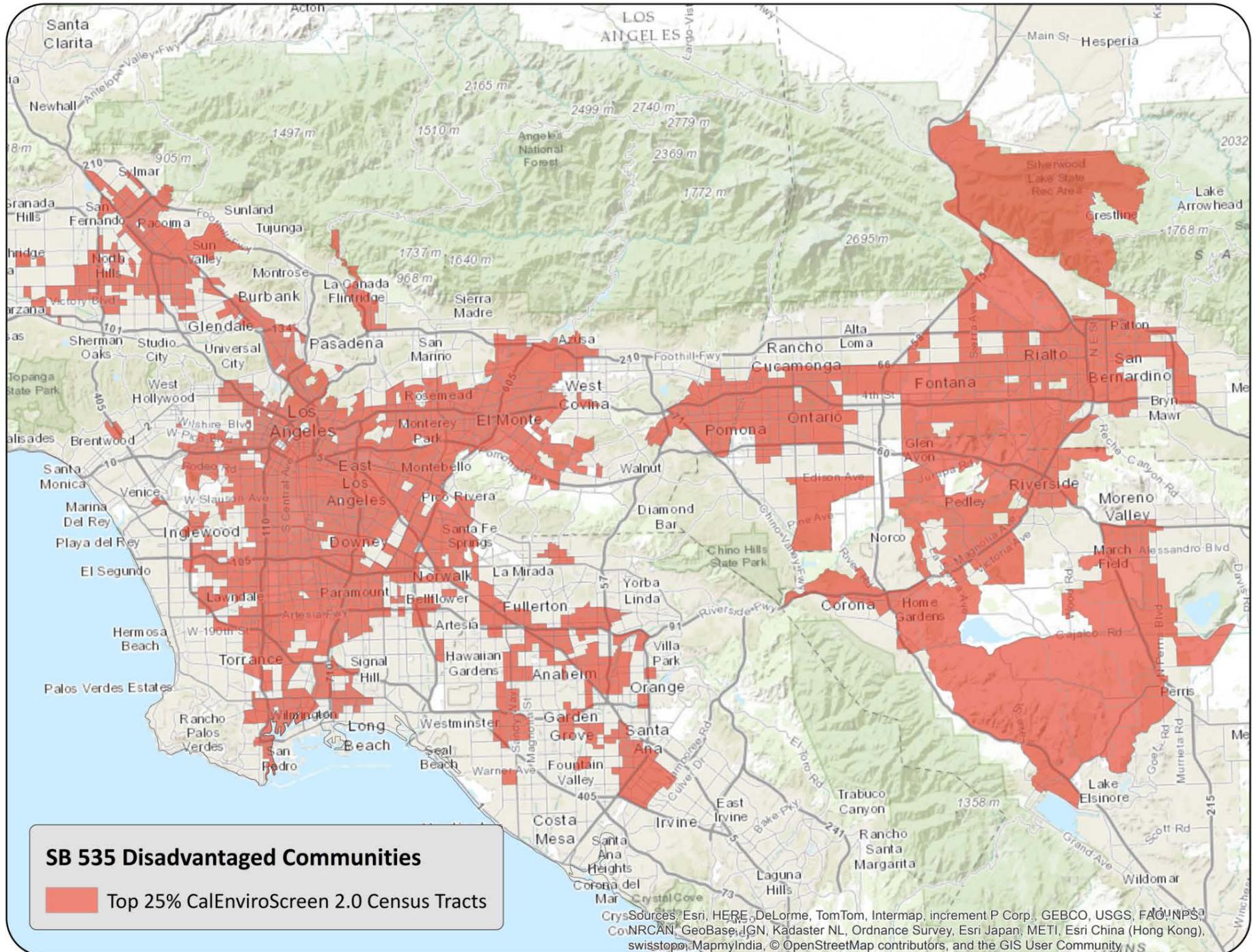
SB 535 disadvantaged communities maps

Responses to comments prepared by the Office of Environmental Health Hazard Assessment

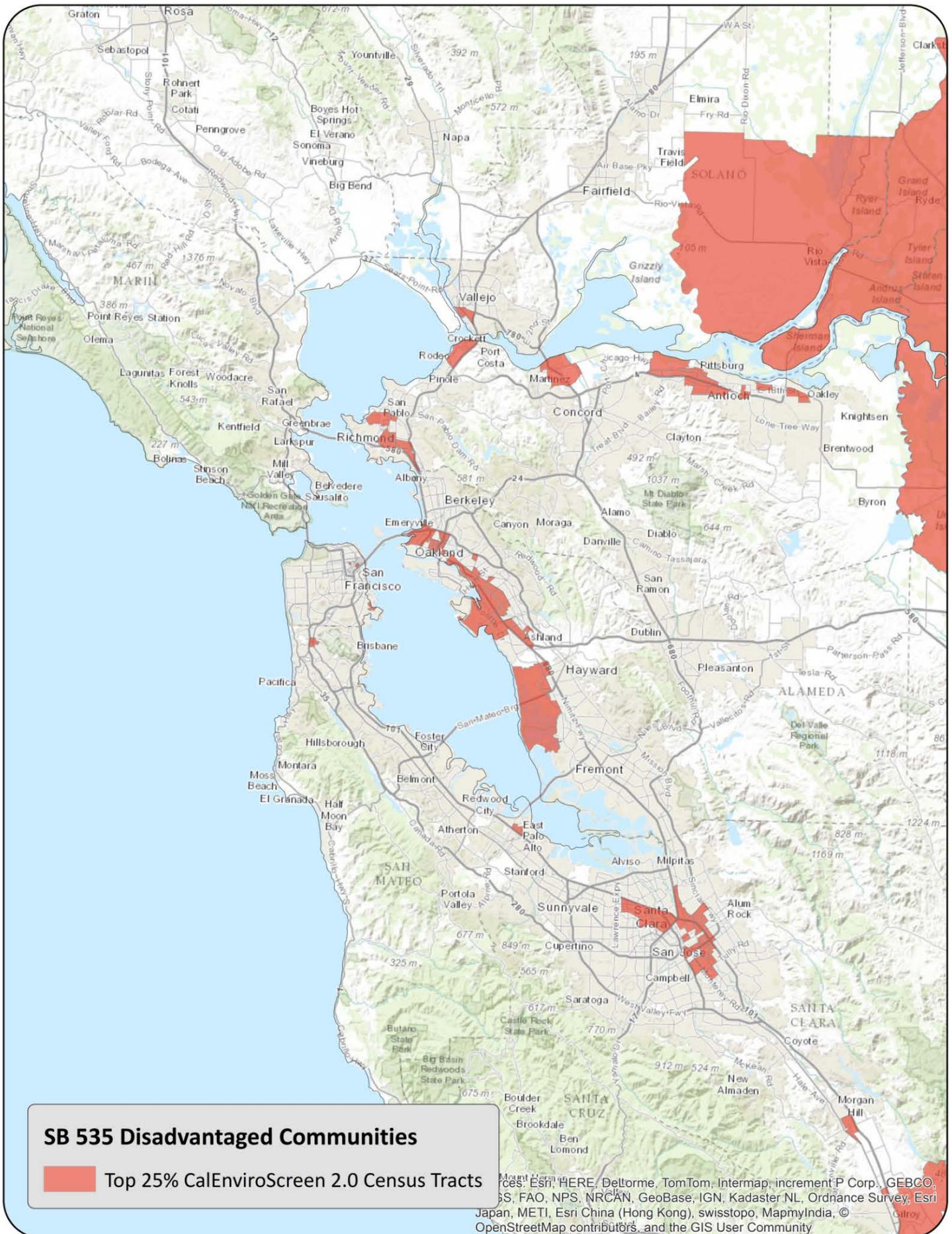


Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

# Los Angeles Area

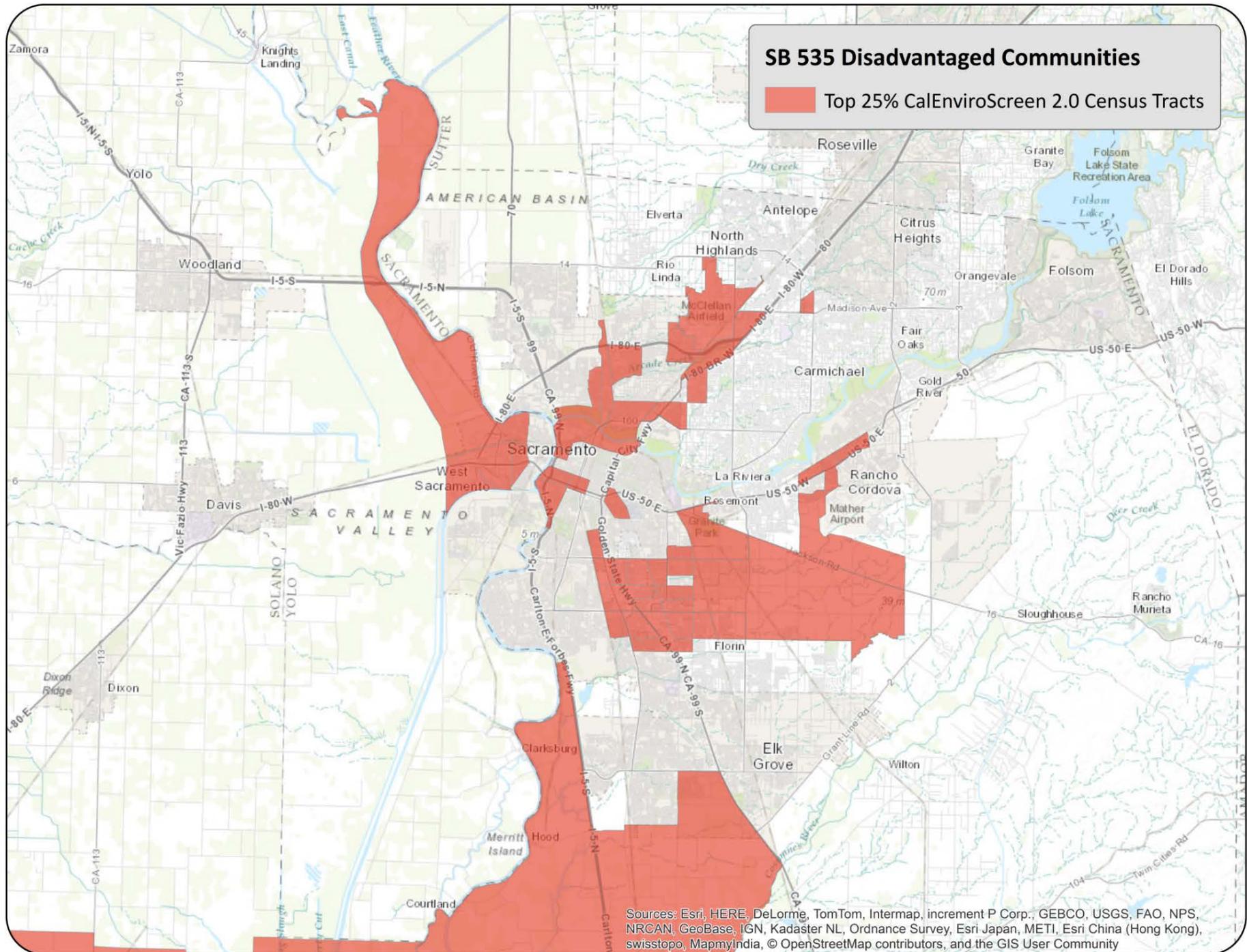


# San Francisco Area





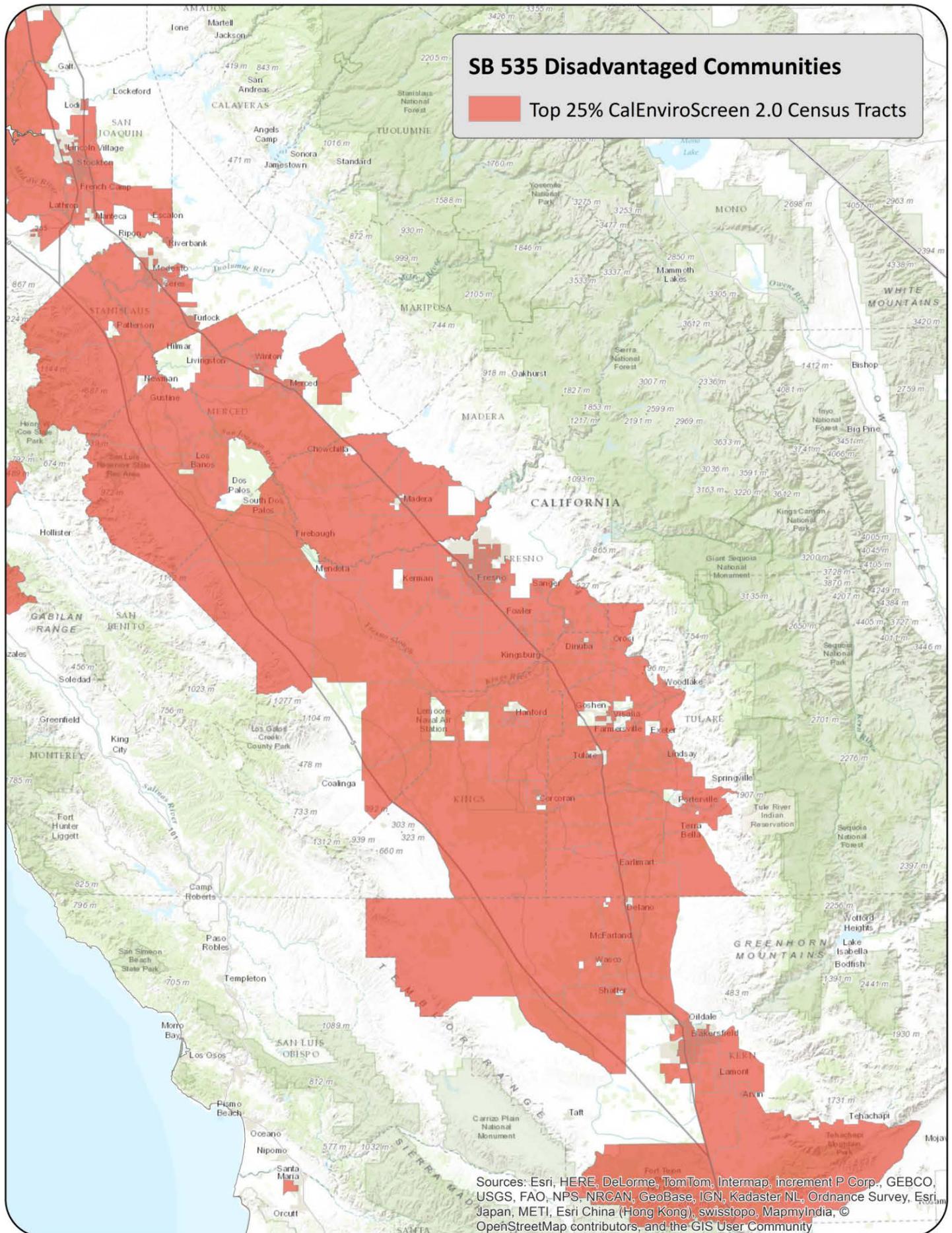
# Sacramento Area



# San Joaquin Valley

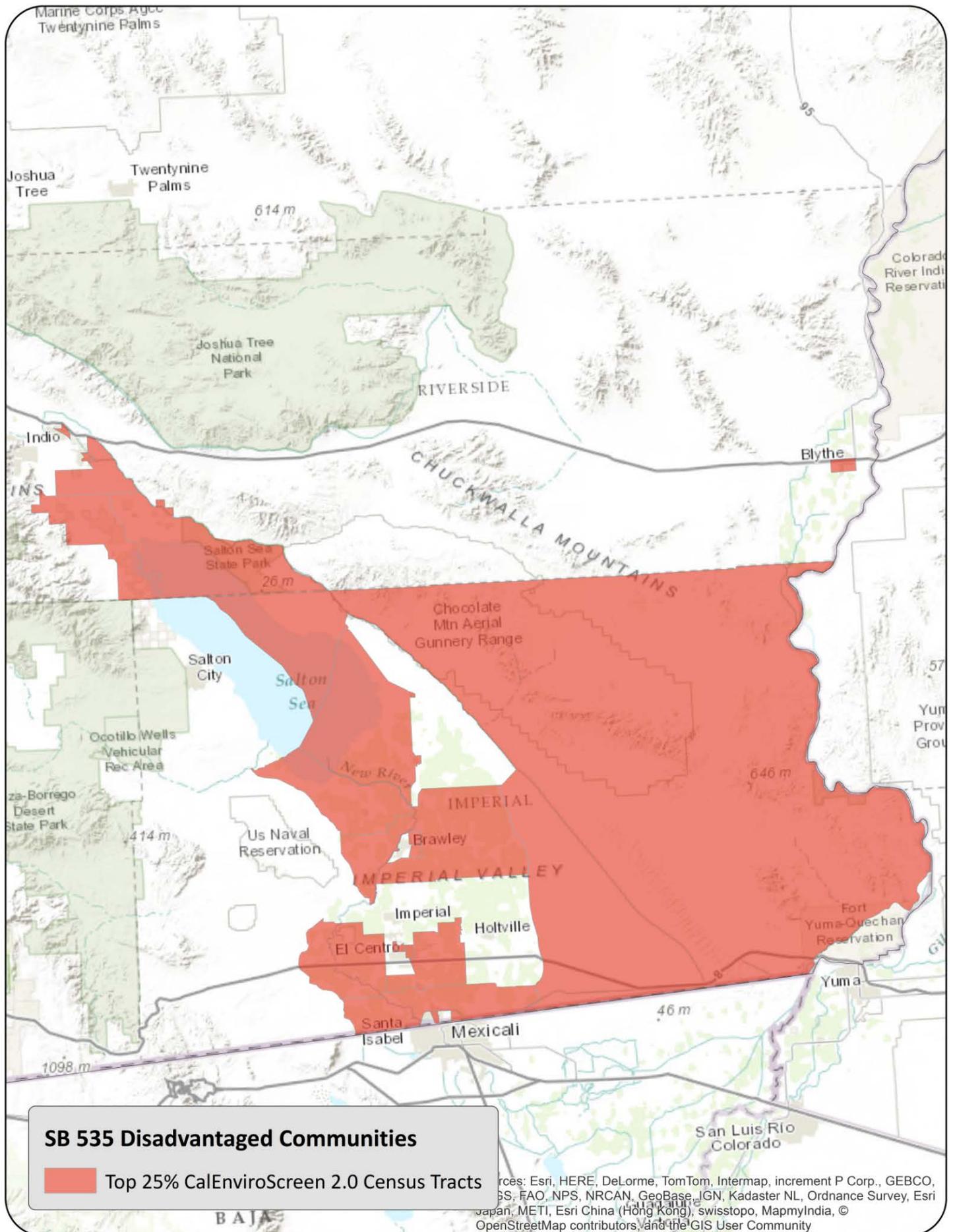
## SB 535 Disadvantaged Communities

Top 25% CalEnviroScreen 2.0 Census Tracts



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

# Coachella & Imperial Valleys



# RESPONSES TO PUBLIC COMMENTS ON THE METHOD TO IDENTIFY DISADVANTAGED COMMUNITIES UNDER SENATE BILL 535

Prepared by the Office of Environmental Health Hazard Assessment  
for the California Environmental Protection Agency's Office of the Secretary

*October 2014*

In August and September 2014, the California Environmental Protection Agency (CalEPA), the Office of Environmental Health Hazard Assessment (OEHHA) and the Air Resources Board (ARB) held three public workshops (in Fresno, Los Angeles and Oakland) and provided a written comment period on the proposed identification of disadvantaged communities as required by Senate Bill 535 (De León, Chapter 830, Statutes of 2012). OEHHA presented five possible methods using data from the CalEnviroScreen 2.0 screening tool to identify disadvantaged communities. At the Oakland workshop and in its written comments, the Bay Area Air Quality Management District proposed a sixth method.

This document provides responses to the major comments received. These comments include:

- Add a cost-of-living adjustment to the CalEnviroScreen 2.0 poverty indicator.
- Expand the CalEnviroScreen 2.0 pesticide indicator to include non-agricultural pesticide use.
- Use the method proposed by the Bay Area Air Quality Management District to identify disadvantaged communities based on CalEnviroScreen 2.0 data.
- Add an indicator for rent burden to CalEnviroScreen 2.0.
- Address gaps in the data used by CalEnviroScreen 2.0 to evaluate how pollution originating in Mexico contributes to pollution burden in census tracts along the California-Mexico border.
- Various comments on the methodology used by CalEnviroScreen 2.0 and criteria for identifying disadvantaged communities.

## COST OF LIVING

**Comment:** CalEnviroScreen 2.0 should include a cost of living adjustment to the poverty indicator.

**Response:**

OEHHA evaluated a cost of living-adjusted poverty indicator for inclusion in CalEnviroScreen 2.0. We evaluated four possible approaches to doing a cost of living adjustment, but none of these were feasible to include at this time at the census tract scale. In our evaluation of alternative poverty measures, the California Poverty Measure developed by the Public Policy Institute of California (PPIC) appears to have the greatest potential for incorporation into CalEnviroScreen. At this time, for reasons described below, we will continue to use the current poverty indicator, but we will explore the possibility of working with PPIC to develop a new indicator that includes a cost of living adjustment at the census tract level. New resources would be required to develop the data and a new indicator. If a new indicator were

developed, there would be an opportunity for public and scientific review prior to incorporating it into a future version of CalEnviroScreen.

One of four socioeconomic indicators used in CalEnviroScreen 2.0 is the percentage of a census tract's population living below twice the Federal Poverty Level. The data come from the 2008-2012 American Community Survey of the US Census Bureau. In 2012, the poverty threshold for a family of four was \$23,050, and twice the poverty level was \$46,100, as established by the U.S. Department of Health and Human Services. The selection of twice the poverty level was intended to account for the higher cost of living in California compared to other states; however, it does not account for regional differences within the state or the needs of sensitive populations such as the elderly.

OEHHA evaluated the feasibility of incorporating cost of living considerations in the poverty measure in the CalEnviroScreen analysis. We evaluated four alternative measures that might provide a way to account for differences in cost of living within California. These four measures are described below, along with considerations regarding their use for adjusting for cost of living in the CalEnviroScreen poverty indicator.

- 1 **Cost of Living index** from the Census Bureau measures the relative price levels for consumer goods and services for selected urban areas of the country. It provides an index, greater than 100, for selected areas' cost of living to compare to the national average. The index is available for fewer than 15 cities or urban areas in California. Thus it appears to have limited applicability for incorporation in the CalEnviroScreen poverty index since cost of living adjustment information would not be available for a large number of communities in the state.
- 2 **Supplemental Poverty Measure (SPM)** from the Census Bureau compares income to poverty thresholds and bases the thresholds on government programs that assist low-income families, and other economic factors. The SPM has only been calculated for different states, age groups, races and genders, so the available SPM statistics do not provide the basis for cost of living adjustments for different geographical areas within the state.
- 3 **California Poverty Measure (CPM)** builds upon the SPM by incorporating California-specific information and adjusting for regional costs of living. Developed by the Public Policy Institute of California (PPIC) in 2013, it provides adjusted poverty rates and thresholds for California counties. It uses household expenditures (food, clothing, utilities, housing) and government assistance program data (SNAP, welfare income, tax credits and liabilities, housing subsidies, and school lunch and breakfast programs) that are similar to those used in the SPM, but CPM also incorporates California data on enrollment in CalWORKs and CalFresh welfare programs, as well as adjusting for the county-level cost of owning or renting a home. While the CPM provides county-scale estimates that take cost of living into consideration, the use of these values to adjust poverty on the census-tract scale carries with it considerable uncertainties (see example below).
- 4 **Elder Index**, developed by the University of California at Los Angeles and the California Department of Aging, is an index that quantifies the costs in the private market for meeting the basic needs of elders, including, but not limited to, the costs of essential household items, food, health care, shelter, transportation, and utilities. The data are also only available at the county

scale, and while they focus on the elderly population's economic needs, they do not adjust for economic needs of children and other sensitive groups. Therefore, they present an incomplete picture of differences in cost of living. Further, using county-scale Elder Index data to adjust census-tract scale poverty estimate presents a similar problem as that described for the CPM above.

While none of these measures provided a basis for adjustment at the census-tract scale analysis, the CPM developed by the PPIC appears to have the greatest potential for incorporation into a future version of CalEnviroScreen. It may be possible to combine the data underlying the CPM with additional economic information to achieve an appropriate adjustment to the poverty index at the census tract scale.

### **ANALYSIS BASED ON COUNTY-SCALE DATA ON COST OF LIVING**

To evaluate the potential practical impact of adjusting for cost of living, we explored a crude adjustment to census tract data of the poverty indicator using county-level adjustment factors from the CPM indices.

**Rationale:** The PPIC provides a comparison of county-scale CPM poverty level rates to the county-scale Federal Poverty Level (FPL) rates (available at URL: <http://www.ppic.org/main/publication.asp?i=1070>). We used the ratios of these two county-scale poverty measures to create a crude adjustment factor to the poverty rate for each census tract.

**Method:** We calculated a California to Federal poverty ratio for each county in California by dividing the CPM rate by the FPL rate. We then multiplied the FPL rate for each census tract by the CPM/FPL ratio for the county in which that census tract is located. We replaced the CalEnviroScreen poverty indicator data with the adjusted poverty rate data and recalculated the overall CES scores.

**Results:** In looking at the highest-scoring 25 percent of census tracts with both the CalEnviroScreen 2.0 method and CalEnviroScreen method using the CPM-adjusted poverty rates, 96 percent of the census tracts identified are the same.

There are a total of 82 census tracts that differ in the highest-scoring 25 percent using these two methods. When the county-adjusted poverty indicator is included, there are a few census tracts added in the San Francisco Bay Area and San Diego County, while several census tracts drop out of Imperial County. The majority of the changes occur in the San Joaquin Valley, which loses 35 tracts and the Los Angeles area, which gains 42 tracts. Below is a table containing the breakdown of highest-scoring 25 percent census tracts for different areas of California, with and without the adjustment for cost of living at the county scale.

Region	Number of Top 25% Highest Scoring Census Tracts		
	CES 2.0	CES with adjusted poverty indicator	Census tracts gained (+) or lost (-)
<i>California</i>	1993	1993	0
<i>San Joaquin Valley</i>	431	396	-35
<i>Nine San Francisco Bay Area Counties</i>	85	94	+9
<i>Los Angeles, Ventura, and Orange Counties</i>	1113	1155	+42
<i>Riverside and San Bernardino Counties</i>	38	39	+1
<i>San Diego County</i>	26	31	+5
<i>Imperial County</i>	12	8	-4

While this reanalysis may provide a general idea of how a crudely-adjusted poverty rate could affect the top-scoring census tracts, the application of this method at the county-scale will not be used at this time to modify CalEnviroScreen. An underlying assumption in this method is that all census tracts in a county are equivalent in terms of the way their adjusted poverty rates differ from their federal poverty rate. Because many counties cover a large geographic area and are made up of numerous census tracts with vastly different demographics, it is inappropriate to adjust individual census tract poverty rates based on county-scale data.

## NON-AGRICULTURAL PESTICIDE USE

**Comment:** CalEnviroScreen 2.0 should include non-agricultural pesticide use.

**Response:**

The California Department of Pesticide Regulation maintains pesticide use data in its Pesticide Use Reporting system that falls into three broad categories:

1. *Production agricultural uses:* Includes production of crops, milk, eggs, livestock, poultry, fish, and forests/timber.
2. *Other agricultural uses:* Includes applications to parks and recreational lands, rights-of-way, golf courses, water bodies and cemeteries.
3. *Non-agricultural uses:* Includes application by professional services in the home, industrial, institutional, or structural settings; or for vector control or veterinary uses.

Of these three, only production agricultural pesticide use data are publicly available for small geographic areas (*i.e.*, one square mile geographic areas, namely sections in the Public Land Survey System). The

other two types of uses are only available at the county scale, so these data sets do not provide information on pesticide use in census tracts within each county. No statewide data at any scale are available for household and other personal use of pesticides from retail purchases.

CalEnviroScreen currently only considers pesticide use for production agriculture because accurate data at the local level for other pesticide uses are not available. However, OEHHA conducted a screening analysis of agricultural and non-agricultural pesticide use in California counties to get a general idea of the rankings that an expanded pesticide indicator might produce.

The current pesticide indicator focuses on 69 pesticides selected because of their health hazards and volatility. Reflecting the dominance of production-agricultural uses of pesticides in California, 91.5 percent of reported use of these 69 pesticides is for production agriculture. Only 7.9 percent of the use of these pesticides is for non-agricultural purposes, and 0.6 percent is for other agricultural uses. However, 31 of the 69 pesticides had at least some reported uses outside of production agriculture during the time period covered by the indicator. All of the 31 pesticides are used for structural pest control, a major urban use of pesticides, although some have other uses as well. One of the 31 pesticides, sulfuryl fluoride, is often used as a structural fumigant and is one of the most heavily used pesticides reported in Santa Clara and San Francisco Counties.

For each California county, we added the total pounds of pesticide applications reported for production agriculture, non-production agriculture and non-agricultural uses. The 12 counties with highest totals – led by Fresno, Kern, Monterey, Ventura, Santa Barbara, and Merced Counties – are also the 12 counties with the highest levels of production agriculture use, consistent with the dominance of pesticide use for production agriculture in California. Los Angeles County, however, has the 13<sup>th</sup> highest level of total pesticide use, while being ranked in 29<sup>th</sup> place for production-agriculture use. Other counties whose rankings would move up if pesticide uses outside production agriculture were incorporated include Orange, San Diego, and Santa Clara Counties. The other Bay Area counties would still have low rankings.

The counties with the highest non-agricultural pesticide use were Los Angeles, Orange, San Diego, Stanislaus, Santa Clara and Yolo, and the counties with the highest agricultural pesticide uses other than for production were Tulare, Kern, Fresno, San Joaquin, Stanislaus, and Kings. San Francisco County ranked 43 out of 58, with 2,021 pounds of high-hazard pesticides applied on average annually in the entire county as compared to 881,562 pounds applied on average in Los Angeles County for non-agricultural uses. In contrast, the top county for agricultural pesticide use is Fresno, with an annual average of 6.2 million pounds applied and an additional 113,693 pounds applied for non-production agriculture.

The analysis suggests that the highest-ranked communities for pesticide use with the current indicator would also receive high rankings with an expanded pesticide indicator covering uses other than production agricultural use. Since pesticide use in California is predominantly for production agriculture, agricultural communities will tend to be ranked highest for pesticide use. Nevertheless, it is hard to draw firm conclusions from this analysis. Counties vary greatly by size and population, and therefore

ranking counties based on total pounds of pesticide applications provides only limited information on potential pesticide exposures for residents of those counties.

We believe that incorporating the non-agricultural and other agricultural uses of pesticides would improve the indicator. However, the limitation of only having county-scale data for these uses presents challenges to allocating the use of these pesticides to individual census tracts within counties by a sound method. Counties in California can be large and diverse with respect to size, geography, and land use. The different types of pesticide use are unlikely to occur evenly across counties. Non-agricultural pesticide uses are more likely to occur in residential and commercial environments, while other agricultural uses (non-production) are more likely to occur in non-residential environments (parks, roadways, etc.). While there are potentially promising ways to evaluate the allocation of these types of pesticide use, such as through land use data, they are not readily available, and would take additional time and resources to develop.

Collection of non-agricultural and non-production agricultural related pesticide use at the same scale as agricultural pesticide use in California may require a statutory change. Absent such change, CalEPA and OEHHA can work with the relevant agencies to identify ways to improve the allocation of pesticide use data collection at a finer scale than the county. If such data become available, they can be evaluated for possible inclusion in a future version of CalEnviroScreen.

## **BAY AREA AIR QUALITY MANAGEMENT DISTRICT METHOD**

**Comment:** The BAAQMD Rank-Product method better identifies Bay Area disadvantaged communities

**Response:**

OEHHA does not recommend the use of the Bay Area Air Quality Management District (BAAQMD) method for the identification of disadvantaged communities at this time. By producing high scores for census tracts with a small number of high-ranking indicators, the method allows just a few factors to drive final scores, which is inconsistent with principles of environmental justice that emphasize combinations of multiple impacts in individual communities. In some cases this ranking method allows relatively affluent communities to be identified as disadvantaged. OEHHA will continue to work with BAAQMD staff to evaluate the reasons for differences observed between CalEnviroScreen and the BAAQMD Rank-Product method. If a ranking method were developed using this radically different approach, there should be an opportunity for thorough public and scientific review prior to incorporating it into a future version of CalEnviroScreen.

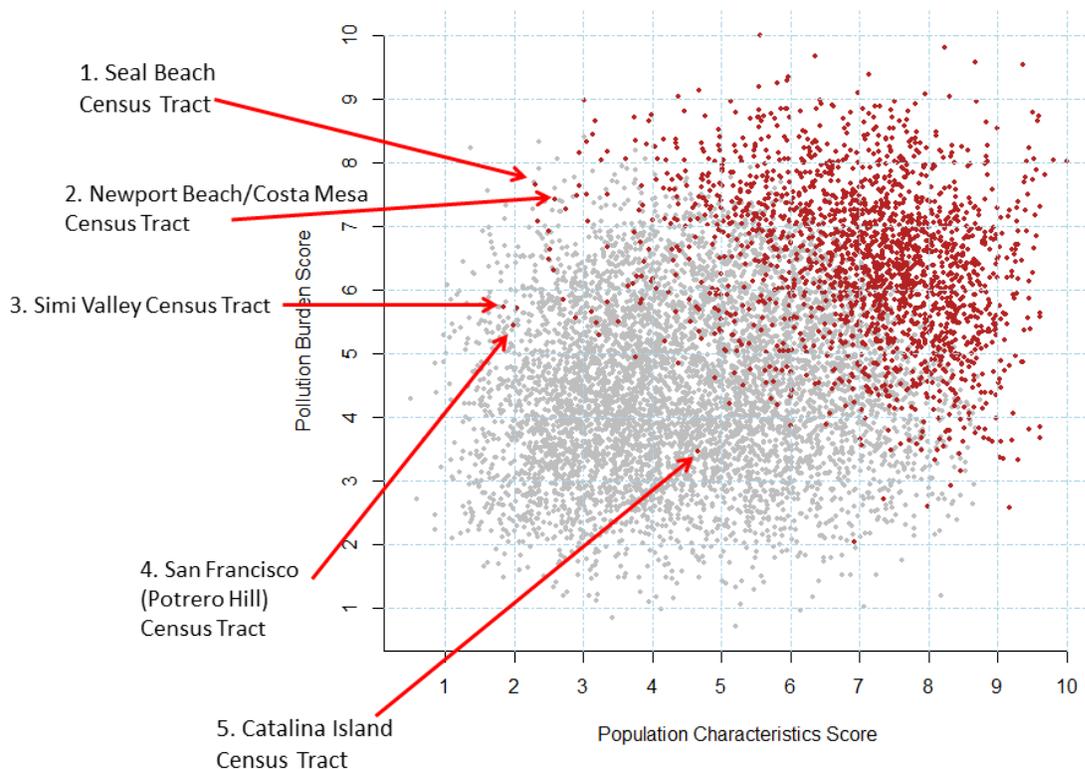
BAAQMD's proposed alternate method uses CalEnviroScreen 2.0 indicator data to identify disadvantaged communities. The approach multiplies a census tract's inverse ranking for each indicator, and is also referred to as the "Inverse Rank-Product" method. The multiplication of individual inverse indicator rankings utilizes a complex statistical methodology originally developed for microbiological studies. Indicator rankings are converted to fractions and the final score is determined by a calculation

involving exponents. This has the disadvantage of not being transparent to many stakeholders. In contrast, the CalEnviroScreen method involves a relatively straightforward multiplication of Pollution Burden and Population Characteristics scores that received support from a 2012 academic review. The BAAQMD and CalEnviroScreen methods identify many of the same top-scoring census tracts. However, there are several differences between the BAAQMD method and CalEnviroScreen:

- The BAAQMD method emphasizes extreme indicator rankings even if only a small number of indicators have high rankings. Some census tracts scoring highly under the BAAQMD method have only a couple of very high-ranking indicators. In contrast, the CalEnviroScreen method averages rather than multiplies indicator ranks, and therefore it produces relatively moderate scores for census tracts that only have a few high-ranking indicators. The CalEnviroScreen method gives the highest scores to tracts with above-average rankings on a greater number of indicators, thereby better capturing communities that face a combination of multiple impacts from a large number of environmental and socioeconomic stressors. The recommendations from communities and advisory groups prior to the creation of the CalEnviroScreen emphasized the importance of looking at combinations of multiple factors as a way of evaluating environmental justice.
- The BAAQMD method weights individual indicators equally, regardless of the type of indicator. By multiplying all indicator rankings, the 12 Pollution Burden indicators have a greater influence on the score than the seven Population Characteristics indicators. In contrast, by multiplying the average of the 12 Pollution Burden indicators by the average of the seven Population Characteristics indicators, the CalEnviroScreen method gives equal weight to the Pollution Burden indicators as a group and the Population Characteristics indicators as a group. CalEnviroScreen places greater weight on the individual socioeconomic and health-related factors that reflect a community's vulnerability to pollution.
- The BAAQMD method gives the five Environmental Effects indicators full weight, in contrast to the CalEnviroScreen method, which gives those indicators only half weight. The decision to half-weight the Environmental Effects indicators was made as a result of stakeholder input arguing that the seven indicators of direct contact with pollutants should have a greater influence on the overall score.

In order to directly and visually compare the BAAQMD method with the CalEnviroScreen method, we identified the top 25 percent of census tracts according to the BAAQMD method on the same scatterplot presented for each of the other five methods in *Approaches to Identifying Disadvantaged Communities* released in August 2014. Due to differences in calculating scores, some census tracts scored rather differently in each of the two methods. The scatterplot enabled us to visually identify some individual census tracts that scored high on the BAAQMD method that would not have scored high on the CalEnviroScreen method (See Figure below).

Plot of BAAQMD top 25% impacted census tracts in red on CES  
Pollution and Population score axis



Because a small number of high-scoring indicators have a large impact on a census tract’s score under the BAAQMD method, a census tract can score highly even if it has a low Population Characteristic score or low Pollution Burden score. This can result in some relatively affluent communities being identified as among the most disadvantaged. For example, using the BAAQMD method, census tracts in Simi Valley, and the western slope and summit of the Potrero Hill neighborhood of San Francisco would score in the top 25 percent, even though their CalEnviroScreen Population Characteristics scores are in the lowest 5 percent and poverty indicator scores are in the lowest 10 percent of the state. A census tract covering parts of Newport Beach and Costa Mesa would receive a BAAQMD-method score in the top 20 percent, even though that tract’s CalEnviroScreen Population Characteristics score is in the bottom 10 percent statewide, with a poverty indicator score in the bottom 35 percent. A census tract on Santa Catalina Island would score in the top 25 percent in the BAAQMD method, even though its Pollution Burden Score in CalEnviroScreen is in the 19<sup>th</sup> percentile statewide. These anomalous results suggest a need for additional review of this methodology, and indicate that it would not be appropriate to use it to replace the CalEnviroScreen method at this time.

## **RENT BURDEN**

**Comment:** CalEnviroScreen 2.0 should include an indicator for rent burden.

**Response:**

OEHHA evaluated rent burden as a potential indicator for inclusion in CalEnviroScreen 2.0, but decided not to include it at this time for reasons described below.

Data are available on rent burden at the census tract level from the 2008-2012 American Community Survey (ACS) 5-Year Estimates. The ACS variable is: “gross rent as a percentage of income” (GRAPI). The estimates are available only as grouped categories with cut-off values of less than 15%, 15-20%, 20-25%, 25-30% and greater than 35% of income.

In California almost half of rental households fall into the highest category with greater than 35% of income paid to rent. As a result, a very high fraction of the renter population of many census tracts would be designated as rent-burdened, limiting the utility of this indicator for discerning disadvantaged communities. We also noted that 571 (7 percent) of the 8,000 census tracts in California do not have usable data available for rent burden, often because there are very few renters in the census tract. These tracts would therefore receive no score for this indicator.

In selecting indicators of social vulnerability, we prioritized indicators that have been associated in the scientific literature with worsened health outcomes from environmental exposures. Although there are some studies on this issue, the scientific evidence on the link between rent burden and health vulnerability from environmental factors is somewhat limited and is mostly associated with poverty. We already have a poverty indicator in CalEnviroScreen 2.0.

Finally, although we would have expected significant portions of the San Francisco Bay Area to be ranked as highly rent burdened, our preliminary analysis failed to show a high concentration of rent burden in that region. In addition to this unexpected result, some of the Bay Area census tracts that were most rent burdened are located in areas such as Marin County, along San Francisco’s Ocean Beach, and in the Alamo, Danville, and Walnut Creek areas of Contra Costa County, which are not traditionally associated with disadvantage.

We will continue to investigate and refine rent burden as a potential indicator although it is unclear whether it would produce a change in the relative rankings of most census tracts. Further, before any new indicator can be added to CalEnviroScreen, it must be subject to the same opportunity for public and scientific review as other indicators in the tool.

## **GAPS IN U.S.-MEXICO BORDER ENVIRONMENTAL DATA**

### **OZONE AND PM2.5**

**Comment:** CalEnviroScreen should include air monitoring data for ozone and PM2.5 from Mexico to account for the air quality impacts from Mexico on U.S. border communities.

**Response:** The California Air Resources Board (ARB) determined that air quality measurements from stations in Mexico are incomplete and are not of sufficient quality compared to the more robust and consistent datasets currently used in CalEnviroScreen. These data should not be combined with the current air quality data for ozone and PM2.5 included in CalEnviroScreen.

A better understanding of the binational transport of air pollutants is important. Although the historical data cannot be included due to their unreliability, efforts to monitor air pollutants (specifically PM2.5) in these border areas are being put in place by the US EPA. The data quality will be assessed by ARB and will potentially be included in future updates of CalEnviroScreen. Two new PM2.5 monitors will be placed in Mexicali (near the border at Calexico) and one at the San Ysidro Port of Entry. Completion is estimated to be in Spring 2017. PM2.5 updates from these new monitors will capture concentration gradients at two of the six border stations. This data should be evaluated to determine whether there is a need for additional data collection at other border stations.

**Comment:** Ozone concentrations from the old air monitoring station in Otay (1100 Pasco International; AIRS Number 060732007) should be incorporated into CalEnviroScreen.

**Response:** Ozone data from the Otay Mesa site is already included in CalEnviroScreen. This site has some of the lowest ozone concentrations in San Diego County, with only one day exceeding the State ambient air quality standard.

**Comment:** Data on PM10 concentrations from the Richard J. Donovan Correctional Facility air monitoring station in Otay Mesa (AIRS Number 060731014) should be converted to PM2.5 to provide estimates for that area.

**Response:** ARB evaluated the potential for scaling the PM10 data at the Donovan site in Otay Mesa to estimate PM2.5 concentrations. However, variability in the trends in PM2.5 versus PM10 concentrations and differences in emission sources that affect PM2.5 to PM10 ratios at the border as compared to other locations in the County limit the ability to develop an estimate suitable for use in CalEnviroScreen.

The San Diego Air Pollution Control District was granted permission by the US EPA to decommission the air monitoring station located at 1100 Paseo International and relocate it to the Donovan Correctional Facility. Although PM2.5 was not collected at the old station, the relocation will include PM2.5 air monitoring. Currently PM10 is being collected at the Donovan site. The start date for PM2.5 data collection is unknown. Having PM2.5 data will allow for more accurate assessments of PM2.5 in future versions of the CalEnviroScreen tool. OEHHA will track the development and collection of these data.

## **DIESEL PARTICULATE MATTER**

**Comment:** The diesel particulate matter (DPM) impacts from idling trucks at the border crossings should be incorporated in CalEnviroScreen.

**Response:** To account for additional DPM emissions from idling commercial trucks waiting in line on the Mexico side to cross into the U.S., we adjusted the DPM emissions estimates for areas near the border crossings. Of the six ports of entry from Mexico into California, there are four border crossings that accept commercial trucks—Otay, Calexico East, Tecate and Andrade. Data from the San Diego Association of Governments (SANDAG) shows that on average approximately 2,400 trucks cross per day in Otay, 832 in Calexico East, 151 in Tecate, and less than one in Andrade. Due to the minimal number of trucks crossings for Tecate and Andrade, only Otay and Calexico East crossings were adjusted. ARB provided OEHHA with an equation to calculate the additional emissions associated with the idling that uses information supplied by SANDAG on the number of trucks crossing the border each day, the idling experienced per truck at the border using data from the University of California, San Diego, and a San Diego fleet average emission rate for idling estimated by ARB:

$$(\text{trucks/day}) \times (\text{idling hours}) \times (\text{grams of DPM/Idling hour}) = \text{g/day of DPM}$$

These estimates were accounted for in the CalEnviroScreen DPM indicator by adding them to the existing DPM emission estimates for the Otay and Calexico East border crossing areas that were previously generated by ARB.

As a result, the two census tracts at these border crossings were updated with new DPM emissions. This adjustment represents a “point source” of DPM coming from stationary, idling trucks waiting to cross the border at a given location.

There are several efforts in place to measure vehicle emissions at the California-Mexico border crossings, specifically for Calexico West, Calexico East, and San Ysidro. US EPA has funded an emissions study for Calexico West and Calexico East, and the California Energy Commission has funded an emissions study for San Ysidro. ARB may be able to utilize this data for incorporation into CalEnviroScreen. There is currently no funding for a comparable emissions study at the Otay border crossing but the data produced at Calexico may be applicable for Otay Mesa, based on the number of truck crossings and other factors.

## **TRAFFIC DENSITY**

**Comment:** The traffic density from roads in Mexico in close proximity to communities along the U.S.-Mexico border should be incorporated into CalEnviroScreen.

**Response:** The San Diego Association of Governments (SANDAG) provided traffic and road network data for Tijuana, Mexico. This information included traffic volume and length for two major roadways within 150 meters of the California-Mexico border and that run parallel to the border. Traffic density data for these road segments were allocated to the appropriate California census tracts (consistent with the CalEnviroScreen 2.0 methodology) resulting in a traffic density update for three census tracts. (Refer to the blue column in the table below.)

Additionally, OEHHA took the average-annual-daily-traffic (AADT) for the six port of entry roads on the U.S. side of the border (which was already captured in CalEnviroScreen) and accounted for the border crossing traffic impacts by extending the road distance 150 meters south of the border into Mexico. The six ports of entry included San Ysidro, Otay, Tecate, Calexico West, Calexico East, and Andrade. This resulted in a traffic density update for seven census tracts on the border. The traffic density update was incorporated into revised CalEnviroScreen scores for each of those tracts.

Census Tract	Port of Entry	Original Traffic Percentile	Border Volume Adjustment	Parallel Road Adjustment	Updated Percentile for Traffic
6073010009	San Ysidro	89	Yes	Yes	99.99
6073010109	San Ysidro West Tract	62	NA	Yes	100.00
6073010015	Otay Mesa	66	Yes	Yes	99.79
6073021100	Tecate	12	Yes	NA	12.16
6025012200	Calexico West (West tract)	8	Yes	NA	36.46
6025012100	Calexico West (East tract)	21	Yes	NA	45.38
6025011900	Calexico East	3	Yes	NA	3.34
6025012400	Andrade	6	Yes	NA	6.09

OEHHA recognizes that there are other major roadways within 150 meters of the U.S.-Mexico border. Resources permitting, OEHHA will work with the California Department of Public Health (the source of data for CalEnviroScreen’s traffic density indicator) to look into whether additional traffic information is available and of sufficient quality to use in future versions of CalEnviroScreen.

**TOXIC RELEASES AND HAZARDOUS WASTE SITES**

**Comment:** The toxic releases and hazardous waste from Mexican facilities in proximity to the U.S.-Mexico border and their potential for adverse effects should be integrated into CalEnviroScreen.

**Response:** Mexico has a Pollutant Release and Transfer Registry (PRTs) under the Registro de Emisiones y Transferencia de Contaminantes (RETC) program that is maintained by Mexico’s Ministry of Environment and Natural Resources (La Secretaria de Medio Ambiente y Recursos Naturales, or SEMARNAT). While there may be information that could potentially be integrated into CalEnviroScreen

indicators, we have not yet acquired the data or evaluated whether it is sufficient to include with confidence in a future version of CalEnviroScreen.

Resources permitting, OEHHA could consult with US EPA and the Department of Toxic Substances Control to determine the feasibility of incorporating Mexican PRTR data into CalEnviroScreen indicators.

## OTHER COMMENTS

1. **Comment:** Air quality monitoring is incomplete across the state. There is insufficient monitoring for ozone and the ozone monitoring is not done on the scale of CalEnviroScreen. Air monitors don't capture air flow in mountainous areas. PM2.5 monitors do not accurately represent air quality in parts of San Francisco with heavy traffic.

**Response:** We will continue to work with the Air Resources Board to obtain the most up-to-date air quality data. If new monitors are added and incorporated into the Air Resources Board's monitoring system, we will include them and coverage will improve. It is important to note that in CalEnviroScreen the ozone and PM2.5 are considered measures of regional rather than local exposures. The Traffic Density indicator is designed to capture areas of local heavy traffic and associated pollutants.

2. **Comment:** Include wildfire emissions.

**Response:** We recognize that fires can be a significant source of air pollution in some areas. CalEnviroScreen presently includes wildfire emissions when they are captured by the air quality monitoring system.

3. **Comment:** CalEnviroScreen excludes all communities with good air quality.

**Response:** Air quality is measured by multiple CalEnviroScreen indicators. The total score, however, is based on a combination of results from all 19 indicators. Census tracts that have good air quality, and thus score low on these indicators, might receive relatively low total CalEnviroScreen scores if they also have low scores on other indicators.

4. **Comment:** The Asthma indicator is biased toward areas with emergency departments and may undercount asthma cases in rural areas.

**Response:** We are aware of some potential bias in the results toward areas underserved by emergency departments for treatment. There are also potential biases in areas where populations rely on primary care, rather than emergency departments for management of asthma symptoms. We received the data from the California Department of Public Health and are continuing to consult with them regarding adjustments of asthma emergency department visit rates that can tell us something about differences in asthma prevalence across the state.

5. **Comment:** Cleanups sites on tribal lands may be missing.

**Response:** We agree that sources of impact from pollution may exist on tribal lands that are not currently captured by the state and federal databases from which we draw information for the

CalEnviroScreen indicators. We have made efforts to identify such sites and were able to incorporate some in the most recent version of CalEnviroScreen 2.0 based on information we received from the US EPA.

**6. Comment:** Unique farmworker exposures are missing.

**Response:** While occupational exposures, including farmworker exposures, are excluded from CalEnviroScreen, some exposures of farmworker families living in proximity to fields are taken into account through the Pesticide Use indicator.

**7. Comment:** The Census may undercount rural populations (e.g., migrant populations).

**Response:** We recognize that the Census undercounts mobile populations such as migrant workers. However, this currently is the best publicly available data. We will watch for improvements in data on migrant populations, and will make best efforts to include reliable new information if it becomes available.

**8. Comment:** Low birth weight data may miss populations with post office (P.O.) boxes and in rural areas.

**Response:** We recognize that rural populations and people with P.O. boxes are more likely than others to have incomplete data in some areas. We received the data on low birth weight from the California Department of Public Health (CDPH). It currently is the best data available for this indicator.

**9. Comments:**

- Add a rural designation.
- Include EJSM (Environmental Justice Screening Method) land use methodology and climate change indicators.

**Response:** Rural and other land use designations and climate-change information are beyond the current scope of CalEnviroScreen, which focuses on pollution burden as well as population characteristics that can affect a community's vulnerability to pollution.

**10. Comment:** Pollution and other urban measures are over-weighted.

**Response:** While rural areas have some unique issues, pollution is not limited to urban areas. CalEnviroScreen is based on statewide sources of data as much as possible in an effort to obtain complete coverage of the state.

**11. Comment:** Data gaps are responsible for Eastern Coachella communities that don't score highly.

**Response:** CalEnviroScreen is based on publicly available statewide data. We are aware of a number of potential data gaps. Unless data are systematically collected and evaluated it would be difficult to incorporate them into CalEnviroScreen.

**12. Comment:** Include “economically distressed areas” from Proposition 1.

**Response:** CalEnviroScreen is an environmental health screening tool that estimates pollution burdens in individual communities as well as a community’s vulnerability to pollution’s health effects. The socioeconomic indicators are included to estimate a community’s vulnerability to pollution and were selected based on scientific evidence showing that communities with those characteristics may have an increased vulnerability to pollution. Using general economic data would erode the tool’s ability to estimate vulnerability to pollution. If all economically distressed areas are designated as disadvantaged communities, environmental projects in some communities with the highest pollution burdens and vulnerabilities might not be prioritized for funding from the state’s Greenhouse Gas Reduction Fund, which would undermine the program’s goal to benefit communities most burdened by health, economic and environmental issues.

**Comment:** Include benefits to the economy, environment and public health.

**Response:** The purpose of CalEnviroScreen is to help CalEPA identify disadvantaged communities so that they can benefit from investments in projects that improve economic, environmental and public-health conditions. If specific indicators are suggested based on available data we can consider them.

**13. Comment:** The Groundwater Threats indicator is incomplete (no non-point sources).

**Response:** Data on nonpoint sources are hard to obtain and not systematically tracked.

**14. Comment:** Superfund sites, closed landfills and large power stations should be included.

**Response:** Superfund sites and closed landfills are included in CalEnviroScreen. All sources of toxic emissions in U.S. EPA’s Risk Screening Environmental Indicators database, including power plants, are also included.

**15. Comment:** Include remediation activities, adaptive reuse, transit hub planning.

**Response:** Remediation activities are taken into account in some Environmental Effects indicators. CalEnviroScreen does not currently include planning or transit availability.

**16. Comment:** CalEnviroScreen can’t measure actual impacts on communities.

**Response:** CalEnviroScreen is a screening tool that provides a relative rather than absolute measure of contributions to impacts on communities from multiple sources.

**17. Comments:**

- Set the threshold for disadvantaged communities at 40%/ 30%/ 25% / <25%. Prioritize the most disadvantaged, e.g., the top 5% of CalEnviroScreen scores. The cutoff should be adjusted to avoid excluding deserving communities.
- Modify the threshold percentile for Title 1 schools.

**Response:** The percentile cutoff for funding eligibility will be determined by CalEPA.

## 18. Comments:

- SB 535 allows CalEPA to use either population or environmental metrics to define disadvantaged communities. Disadvantage should be defined based primarily on social determinants of health or population characteristics.
- Combine screening methods to include all communities identified as disadvantaged by any method.
- Use the Active Transportation Program definition: median household income < 80% of statewide median, or ≥75% of students eligible for free/reduced cost lunch, or top 10% in CalEnviroScreen.

**Response:** CalEnviroScreen was developed by OEHHA at the request of CalEPA to identify California's most pollution-burdened and vulnerable communities. The methodology used in this tool complies with SB 535, which specifies that a combination of criteria, many of which are indicators in CalEnviroScreen, should be used to designate disadvantaged communities. According to SB 535, these communities "shall be identified based on geographic, socioeconomic, public health, and environmental hazard criteria." Relying solely on health or income considerations would be inconsistent with this direction.

**19. Comment:** Communities smaller than census tracts should be able to meet disadvantaged community definition. Some tracts have wide range of incomes, which can skew results and leave out disadvantaged residents.

**Response:** We agree that there can be variability in population and pollution measures within census tracts. However, the census tract is currently the smallest scale of analysis we can reliably describe with respect to the US Census measures that are included in CalEnviroScreen. At smaller scales, there is much more uncertainty about the different measures, particularly those that are based on households and are evaluated by statistical sampling in the American Community Survey.

**20. Comment:** Several comments were received regarding the weighting of indicators:

- Health impact indicators should be given more weight.
- Exposure indicators should be weighted based on local or regional importance.
- Pollution burden and population characteristics should be weighted by their contribution to mortality and morbidity / impact on health.
- Increase weights for Diesel PM and Traffic indicators.
- Remove ½-weighting from Environmental Effects indicators.
- Weight population characteristics twice as much as pollution burden indicators.

**Response:** As CalEnviroScreen is updated, we will consider whether to alter the weighting scheme based on new criteria. The weightings of the various indicators were discussed at length in the public process leading up to finalization of CalEnviroScreen 1.0 and reflect the comments and advice received during this process. They have not changed in Version 2.0. These new suggestions would constitute major changes to CalEnviroScreen and cannot be adequately reviewed and evaluated in the timeframe needed for the 2014 identification of disadvantaged communities.

**21. Comment:** Focus on mobility (i.e., commute distance or commute time) rather than residence location alone.

**Response:** Currently CalEnviroScreen indicators attempt to describe pollution burdens in different places across California and the potential vulnerabilities of people that live in those places. Commuting and other types of movement of people for work, school, and recreation may place them in harmful environments other than where they live. However, we do not currently have a way to access or incorporate this type of information in the screening tool.

**22. Comment:** Include tree canopy or access to nature.

**Response:** Data on tree canopy in California are available, and would be a possible indicator although it doesn't fall into our current categories (pollution burden or population characteristics). This indicator may not function as well for some parts of the state – such as desert areas or coastal scrub – that naturally have fewer trees. It is difficult to construct an indicator that quantifies access to nature in California. We are considering several indicators for possible inclusion in a future version of CalEnviroScreen, including an indicator on the urban heat island effect, which would include data on vegetation.

**23. Comment:** Include life expectancy.

**Response:** We are evaluating the feasibility of calculating life expectancy by census tract in response to numerous public comments requesting this information. We do not plan to include life expectancy as an indicator in CalEnviroScreen, but we do plan to evaluate how differences in life expectancy relate to the pollution and population vulnerability factors that are included in the tool.

**24. Comment:** Polluted waterways across the border from Imperial County are not factored into CalEnviroScreen.

**Response:** Locations along the US-Mexico border present a special challenge, particularly with respect to sources of impact that originate outside of California for which there are not reliable and comparable quantitative measures. Some contributions are included in CalEnviroScreen, such as rivers designated by U.S. government entities as impaired that flow into the U.S. from Mexico. However, water bodies that lie entirely outside of the U.S. are not necessarily evaluated by comparable criteria that can be incorporated into CalEnviroScreen.

**25. Comment:** Rank pesticides by health risks and toxicity.

**Response:** These properties have already been partially captured by selecting the subgroup of 69 pesticides included in the pesticide indicator measure based on their toxicity and volatility. However, information comparing the relative toxicity of the different pesticides included in the indicator is not readily available for incorporation.

**26. Comment:** Include proximity to largest sources of greenhouse gas emissions (e.g., refineries).

**Response:** Greenhouse gas emissions are a serious global concern, and impact health indirectly through global climate change impacts (e.g., increased heat, frequency of environmental disasters such as wildfires and storm surges). While climate change impacts can differentially affect

communities, greenhouse gas emissions in and of themselves do not directly impact human health at the community level. Thus they remain outside of CalEnviroScreen's current focus on sources of environmental health concern from pollution.

**27. Comment:** Include environmental quality violations.

**Response:** We have included some measures of environmental quality violations in current CalEnviroScreen indicators such as the Solid Waste Sites and Facilities indicator and the Drinking Water Contaminant indicator. We will evaluate violation data for possible inclusion in other indicators in the future.

**28. Comment:** Most babies in Glenn County are born in hospitals outside the county.

**Response:** The Low Birth Weight indicator is based on mother's residence address, not location of the birth.

**29. Comment:** Many rural domestic wells are not tested for contaminants.

**Response:** It is true that testing data are not available for many rural domestic wells in California. In such areas CalEnviroScreen uses data on the water quality of nearby wells to approximate likely groundwater quality for people residing in these areas who are not served by public water systems. The U.S. Geological Survey publishes data on groundwater quality that we have used where we have no test results and know that well water is the primary or only source of drinking water. The Drinking Water Contaminants indicator uses the best available combination of data for each census tract.

**30. Comment:** Include race, ethnicity and national origin as an indicator. Proposition 209 does not prohibit this.

**Response:** We recognize that the disproportionate exposure to pollution faced by certain racial and ethnic groups is a legitimate environmental justice concern. A race/ethnicity indicator was included in the first version of CalEnviroScreen 1.0 at the ZIP code scale. This indicator was later removed to facilitate the broader use of the tool by government entities that may be restricted from using race/ethnicity when making certain decisions. However, we continue to analyze and make publicly available information on how the racial and ethnic composition of communities relates to CalEnviroScreen scores. This information will help us to better understand the correlation between race/ethnicity and the pollution burdens facing California communities. An analysis of CalEnviroScreen 2.0 scores and race/ethnicity is available on OEHHA's web site at <http://www.oehha.ca.gov/ej/pdf/CES20FinalRaceEthnicity.pdf>.