

CalEnviroScreen Draft 5.0 Review Comments from Bay Area Air District

The Bay Area Air District appreciates the opportunity to provide comments on the Office of Environmental Health Hazard Assessment's (OEHHA's) draft version 5.0 of CalEnviroScreen (CES). We recognize the continued effort to improve the tool and acknowledge the updates in this version, including the incorporation of more recent data, refinements to indicator methodologies, alignment with updated tract boundaries, and the addition of new indicators such as Small Air Toxic Sites and Diabetes Prevalence.

At this point, the Air District is limiting our comments to data and methodology. We may have additional comments for CalEPA as they undergo the designation process. The Air District is concerned about the emphasis that is placed on composite scores in determining funding allocations. We are concerned that many communities in the Bay Area which have significant and widely recognized needs may find themselves excluded from funding sources due to changes in designations.

As with prior versions, the Bay Area Air District supports the goal of identifying and prioritizing communities that are disproportionately burdened by pollution. We continue to value CES as an important screening tool that has advanced the state's ability to direct resources and attention to these communities. We offer the following comments to help strengthen its further improvement and application.

The Bay Area Air District has also requested and obtained certain indicator layers, such as the gridded air pollution data for PM_{2.5} and diesel PM used in CES draft 5.0. We plan to conduct further review of these indicator layers and may provide additional comments to OEEHA at a later time.

1. Unpacking and Accounting for Differences Compared to Previous Scores

A supplemental swipe-map provided after the draft CES 5.0 release provides a useful way to determine *where* some overall changes have occurred and for inspecting *what* has changed there (e.g., via tract-level popups showing updated indicator percentiles). These are important and welcome improvements in transparency and usability.

However, it remains difficult (if not effectively infeasible) for users to understand *why* visually apparent changes in overall scores or rankings have occurred and what the driving factors are. This is compounded by the multi-layered, addition-and-multiplication, percentile-transformed complexity of the core CalEnviroScreen formula. The current tools do not readily support tracing changes back to their underlying causes, such as shifts in specific indicators, updates to data sources, changes in tract boundaries, or interactions among components of the scoring framework.

The current supplemental tools can be more helpful to flag areas where overall scores show little to no change due to the "offsetting" of changes in important sub-scores or indicators. Because the overall score is derived from combining component scores, changes in individual indicators can offset one another, leading to no apparent change at the summary level. Substantial changes in policy-relevant conditions—such as increases in one set of indicators and decreases in another—may "cancel out," resulting in little or no

apparent change in the final score or percentile. This can be especially relevant to specific policies or interventions that are properly focused on subsets of indicators, and sometimes as important as cases where drastic changes are readily apparent.

At present, no straightforward way is available for users to identify these dynamics. For example, it is difficult to: (a) unpack changes in overall scores into contributions from individual indicators or components; (b) detect cases where meaningful changes in underlying indicators have offset each other; (c) distinguish between changes driven by new data versus those driven by methodological updates; or (d) systematically summarize patterns of change across regions or types of communities.

We recommend that OEHHA consider developing additional tools, outputs, and technical documentation that help users interpret *why* changes have occurred, especially at small spatial scales (e.g. individual tracts or city-sized aggregations of tracts), in:

- Overall rankings
- Composite sub-scores, specifically:
 - Pollution Burden and Population Characteristics
 - Exposures, Environmental Effects, Sensitive Populations, and Socioeconomic Factors
- Individual indicators

Potential approaches could include:

- Decomposition analyses that attribute changes in overall scores or composite sub-scores (see above) to specific indicators or sets of indicators;
- Flags or summaries highlighting tracts or clusters with large underlying indicator changes but minimal net score changes;
- Side-by-side comparisons of composite sub-scores and individual indicators across versions; and
- Documentation or visualization tools that clarify the respective roles of updated data, methods, and geography in driving observed differences.

Improving the interpretability of changes across versions would support more informed use of CES, particularly in contexts where understanding the drivers of change is as important as identifying where change has occurred.

2. Uncertainty, Reliability, and Interpretation of Indicator Data

Many CES indicators are derived from datasets with varying degrees of uncertainty, including modeled estimates and survey-based data such as those from the American Community Survey. At finer geographic scales, these uncertainties can be substantial.

While the technical documentation acknowledges uncertainty in general terms, it remains difficult for users to assess how uncertainty affects comparisons between communities or the stability of rankings over time. This is particularly important in contexts where small differences in percentiles may be impactful.

We recommend that OEHHA expand its treatment of uncertainty in CES by:

- Providing quantitative measures of uncertainty where available (e.g., margins of error, confidence intervals, or posterior distributions);
- Evaluating the sensitivity of rankings (percentiles) to uncertainty in key indicators; and
- Offering guidance on how CES results and maps should and should not be interpreted considering these uncertainties.

Improving transparency in this area would help users avoid over-interpreting small differences and support more responsible use of the tool.

3. Climate and the Scope of CES

We appreciate that OEHHA has identified climate-related indicators as an area for future development. We agree that climate risks such as extreme heat, wildfire, flooding, and sea level rise are increasingly important drivers of vulnerability.

At the same time, we encourage careful consideration of how climate is incorporated into CES. Climate-related risks can differ in important ways from other pollution burden indicators, including their temporal dynamics, spatial patterns, and policy implications. Attempts to integrate these into CES without a clear conceptual framework may reduce interpretability and dilute the importance of existing components.

We suggest that OEHHA, at an appropriate time or when the information is available:

- Clearly articulate whether climate is intended to be integrated into a future version of CalEnviroScreen or addressed through any complementary tools;
- Evaluate the implications of each approach for interpretability and use; and
- Engage stakeholders in defining the most appropriate structure for incorporating climate-related vulnerability.

4. Transparency and Reproducibility

Finally, we encourage continued progress toward transparency and reproducibility in CES. Given the importance of the tool in policy decisions, it is essential that technical users can understand and, where possible, reproduce key aspects of the CES analysis.

We recommend that OEHHA consider:

- Publishing reproducible code or workflows for indicator data and post-processing;
- Providing access to intermediate data products where feasible; and
- Documenting key methodological choices, particularly where reasonable alternatives exist.

These steps would support broader understanding, facilitate independent evaluation, and enhance reliability of the tool application.

Again, the Bay Area Air District appreciates the opportunity to comment on CES draft 5.0 and welcomes continued collaboration with OEHHA to improve the tool and its

application. We wish to note that, given the number of concurrent CES updates and limited public comment timeframe, the Air District staff have not been able to engage in a deeper and more systematic review. However, we will continue the communication on technical questions and engage further discussions with OEHHA as the tool evolves.