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October 17, 2012

Mr. George Alexeev,
Director,
Office of Environmental Health Hazard Assessment
California EPA

Dear Mr. Alexeev,

I am pleased to provide this review as part of the formal public comment process on Cal EPA/ OEHHA's Draft California Communities Screening Tool (CalEnviroScreen) Proposed Methods and Indicators, dated July 31, 2012. These comments reflect my own professional opinion, and do not necessarily reflect any position of the University of California as a whole.

I first wish to commend CalEPA and OEHHA for undertaking this important and ambitious task. Developing a comprehensive cumulative impacts approach is a critical component of environmental and health policy that is holistic, transparent, and democratic. Such an approach is necessary to ensure that public policies are equal to the task of regulating the complex and cumulative character of environmental and health problems that cannot be addressed by a chemical-by-chemical method of risk assessment. Furthermore, a cumulative impacts approach can document the interactions of environmental and social disparities that create a "double jeopardy" of environmental injustice in which the people with the fewest social, economic and political resources experience the greatest concentrations of environmental threats to their health and well-being.

In particular, factors such as historical patterns of housing segregation, limited political and social capital, and policy processes that are inaccessible by grassroots constituencies have been shown to combine to create what Morello Frosch and colleagues (2001) call an inequitable "risks-cape" that systematically places communities with lower incomes and greater concentrations of people of color in harm's way from a wide range of environmental hazards. In the face of these conditions, advocates call for three dimensions of environmental justice: *distributional justice* for addressing disproportionate burdens of environmental hazards and the absence of environmental goods, *procedural justice* for meaningful access to decision-making, and *cognitive justice* to consider local knowledge legitimate in the assessment and mitigation of environmental hazards (Schlossberg 2007).

If done correctly, a cumulative impacts approach to environmental policy can address all three of these dimensions of environmental justice. However, there are a number of qualities of the CI approach that are necessary to achieve these goals. It is to help CalEPA/ OEHHA as well as other state, federal, and local government agencies meet this potential of cumulative impacts that I offer my comments.

Before turning to a set of technical comments on the methodology itself, I want to focus on the functional quality of the tool. Because a tool is only good to the extent that it serves the purpose for which it is designed (a hammer is only good to the extent that it drives in nails) it is critically important that the CalEnviroScreen be evaluated based on its stated purposes of focusing public resources (funding, enforcement, clean up, mitigation, monitoring, economic development investments) in ways that reduces environmental injustices. At the same time, it is also useful to assess the uses, which OEHHA has excluded from its list of intended uses (obligating agencies to conduct additional CI on rulemaking, substituting for risk assessment or for CEQA reviews, or specifying potential impacts of environmental exposures) to assess whether these exclusions are appropriate. Finally, it is important to identify other potential uses that ought to be added to the current list.

Starting with the first set of current applications, there are several characteristics of the current tool that may make it difficult to achieve these goals.

**1. The use of Zip Code Tabulation Areas (ZCTAs) versus census tracts**
While this unit has a number of advantageous qualities, there are also some important short-comings. The most important short-coming is that, especially in rural areas with more disperses populations, the granularity of ZCTAs is not sufficient to pick up on disparities between places within a given zip code. One example – among many – is the inclusion of Mecca and Northshore within one zip code, with the latter unincorporated community suffering from far greater disparities that are masked within the combined zip code unit. The use of zip codes is also problematic in certain rural areas where many residents do not live along postal routes, and instead receive mail in a centrally-located post box, often far from their homes. This is especially true in the "forested areas" of the state that it OEHHA has apparently excluded from its analysis, but which are the home to many of the state's poorest Native American and other residents.

Instead of ZCTAs, OEHHA should consider using Census Tracts, which have a granularity more suited to its stated aims of highlighting disparities by place. The problem faced by OEHHA of integrating health and other data that is available at the zip code level can be addressed by using spatially weighted averages to distribute the zip code data into the component census tract units. Likewise, while zip codes do have the benefit of being more publically recognizable that tract numbers, this problem can be addressed by including place names and road labels that can be used to orient viewers. Using census tracts would also allow the OEHHA tool to be directly compared to other – and used to complement – other census-tract based approaches, including the

Environmental Justice Screening Method and the Cumulative Environmental Vulnerability Assessment.

**2. The use of a relative versus an absolute scoring system.**

While OEHHA's relative ranking approach has the benefit of identifying the most vulnerable communities, it has several significant short-comings. The first is that is makes assessing change over time difficult, thus preventing the use of the tool to measure progress (or lack thereof) in achieving environmental justice goals and therefore cutting against its use as an accountability mechanism. This is because in a relative rubric, the changes in the score of any one place can be masked by changes in the state as a whole. For example, a given community could experience a degradation of its total and/or component scores, but if the state as a whole has experienced a greater degradation, the area will show up, incorrectly, as having improved. Another problem with a relative rubric is that, because the places with the highest scores are allocated to the top of the scale, it cannot be used to assess the status of the system as a whole. That is, how good are the best scores?

As an alternative to this relative score, OEHHA should consider the use of absolute measures. In order to create compatible data elements, a linear scaling transformation (Booysen 2002) can be used in which each item is converted to a percentage of the best possible score (100%). For example, with a scale ranging from 1-3 and an average response of 2.4, the resulting percentage would account for the score minus the lowest possible score (2.4-1) divided by the range of possible scores (3-1) to equal 70%. This allows both for tracking real progress over time and showing the gap between the highest score at any one time and the highest possible score overall. For example, if in 2012 the zip code with the highest score was 91%, instead of only showing this to be in the top decile, it would also clearly show the 9 percentage points of possible improvement. The UC Davis Center for Regional Change has used this approach for our indices of youth vulnerability and youth well-being ( http://pyom.ucdavis.edu) and found this to be very effective in communicating the results and applying them to policy and strategy.

**3. The use of a single state-wide rubric versus including regionally-specific tools**

A tool that can be used state-wide is clearly of great value in informing state-level policy and strategy. However, the rationale for adopting a hybrid approach that combines a state-wide tool with a set of regionally-specific tools is also strong. First, there are significant differences in environmental conditions across the state, (such as the variation of applications of specific pesticides to the range of crops and cropping systems in the state, the variation in types of drinking water contaminants) as well as the socio-economic profile (such as the prevalence of Native American populations in the north coast, Sierra foothills, and inland empire; indigenous Mexican farmworkers in the Central Valley and Coachella Valley; wealthy rural enclaves on the Sierra crest and so on). Second, a suite of regionally-specific tools can promote more effective buy-in and application by regional agencies such as air districts, city and county government agencies, as well as environmental and health advocates. These levels of policy and advocacy are likely to become ever more important in the contexts of regional water quality planning, regional transportation plans under SB 375, regional air quality plans for criteria pollutants and so on. Developing regional tools (or adapting existing tools such as EJSM or CEVA) would complement a statewide tool. Using its statewide tool in concert with a suite of regional tools would allow OEHHA and other agencies to set statewide priorities while also enabling it to go into further depth on regionally-specific issues. Examples of these regionally-specific tools include London, Huang and Zagofsky 2011 and a working draft of more recent work in Eastern Coachella Valley. Please see the attached appendix for a description of this most recent project methodology. *It is important to note that that this project is still in development, and the methodology is offered as an example, not as a definitive statement about conditions in the region.*

**Better specifying collaborative applications of the tool.**
While OEHHA has listed a number of important applications of its proposed tool, there are others that would also be beneficial. Acknowledging that permitting and rule making are probably the most controversial applications of such a tool, there are ways inform agency actions in these domains. For example, in permitting decisions, there is always the need for regulators to set informal priorities about how much staff time to devote to specific permits. These decisions are primarily made on technical grounds (the complexity of the facility and the science related to its potential impacts) but there are also institutional factors that influence these priorities (availability of personnel, attention from elected officials, litigation and so on.) In this context, the application of a screening tool can provide a more rational and transparent rubric for allocating scarce agency time and resources for reviewing facility permits. Likewise, agencies can apply screening tools in the context of rule making by considering the impacts of a given state rule on the communities identified as most vulnerable. This adds an analytical layer to the rule making that is not available when only a regional or statewide lens is applied.

Other important potential uses of the tool could include the formation of multi-agency and multi-disciplinary teams with the necessary regulatory authorities and expertise to address the specific profile of the cumulative impacts associated with a given community, rule, or facility. For example, in communities where the environmental hazard scores are driven by poor water quality, a concentration of hazardous waste recyclers, and an apparent cluster of particular health conditions, a science and policy team composed of experts from the regional water quality control board, Department of Toxic Substances Control and the Department of Public Health would be identified. Given the inclusion of socio-economic issues in the tool, expanding the multi-agency collaboration to include agencies outside of CalEPA and Resource Agency, such as those within the California Business, Transportation & Housing Agency, California Economic Strategy Panel, and Governor’s Office of Economic Development, the Department of Education, and so on.

A parallel application can focus active outreach efforts to engage the advocacy organizations with the most relevant expertise with the issues and populations indicated in the screening tool results. Such outreach can include ensuring culturally-competent and public participation processes (such as interpretation but also hiring personnel with relevant cultural competencies), capacity-building for advocates on the technical elements of policies and regulation, and efforts to integrate community knowledge and expertise with the regulatory and academic science used by the agencies (Lievanos, London and Sze 2011). The latter element could be achieved through community mapping activities as used by the developers of the EJSM, CEVA and other community-engaged research approaches (London, Zagofsky, Saklar, and Huang 2011).

This enhanced engagement with representatives of environmental justice, health and equity organizations should be a top priority of CalEPA and its BDOs in the application of the screening tool if it is to carry out the intentions of state and federal policies on environmental justice. It is also a priority that would provide significant benefits to agencies whose relationships with these key public stakeholders have been marked by mistrust and antagonism that often result in litigation and other means of expressing opposition to agency practice outside of the formal policy process (London, Sze, Lievanos 2008).

Enhanced collaboration across agencies and with public stakeholders could be incentivized by state policies that appropriated enhanced resources to agencies that incorporated such screening tools into their operations. Such resources could come in the form of “loaner” personnel from other agencies with requisite expertise, special funding for outreach and engagement activities, and possibly increases in the base budgets of the agencies themselves.

By attending to the implementation process of the new CI tools and the changes in institutional contexts necessary to successfully apply these tools, OEHHA and CalEPA can not only innovate on methodology but also promote actual progress on environmental justice and health equity where it really matters: in the lives of the most vulnerable people in the state.

Thank you for this opportunity to contribute to OEHHA’s important work on cumulative impacts.

Most Sincerely,

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Assistant Professor, Department of Human Ecology
Director, UC Davis Center for Regional Change

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| Index | Measure | Indicator | Source |
|---|---|---|---|
| Environmental Vulnerability | Pesticide application | Total amount of active ingredient pesticide application, agricultural only. We included the most toxic pesticides in the indicator, using the list developed by OEHHA. In addition, we added several pesticides identified by experts familiar with the county. A complete list will be made available. | Department of Pesticide Regulation, 2008-2010 |
| | Cancer risk from inhaled air toxics | National Air Toxics Assessment: Total Cancer Risk. | U.S. EPA, 2005 |
| | Air pollutants | Annual mean concentration of PM 2.5 (average of quarterly means), over three years (2008-2010). We used GIS to interpolate the means for tracts near measurement sites, up to a distance of 30 miles. | Cal EPA Air Resources Board, 2008-2010 |
| | | We used the maximum 8-hour ozone concentrations for each day from March to October, averaged over three years (2008-2010). We used GIS to interpolate the means for tracts near measurement sites, up to a distance of 30 miles. | Cal EPA Air Resources Board, 2008-2010 |
| | Water Quality Assessment | Using six years of data, we calculated an average concentration by well for six chemicals: arsenic, lead, manganese, nitrates, Chromium 6, perchlorates. We selected the wells that had an average concentration above MCL for any of the six chemicals. We then determined the number of these wells that were located within 2 miles of a census tract and assigned the count to those tracts. | CDPH: PICME and WQI/WQM Data systems, 2006 through June 2011. |
| | Point source pollution emission sites | Percent of Tract within 1 mile of a toxic release inventory sites, hazardous waste treatment, storage and disposal facilities, leaking underground storage tanks, Superfund, RCRA sites. Sites were scored, grouped into high, medium and low/unknown, and weighted in the calculation of the index. | US EPA, 2010 and Department of Toxic Substances Control |
| | Risk-Screening Environmental Indicators (RSEI) | Percent of tract within 1 mile of a RSEI-scored facility. Similar to point source emission sites, RSEI-scored facilities were scored, grouped into high, medium and low/unknown, and weighted in the calculation of the index. | US EPA,2008 ,2009, 2010 |

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| Index | Measure | Indicator | Source |
|---|---|---|---|
| Social Vulnerability | Sensitivity of receptors | Percent of people younger than 5 or older than 65 in a census tract | Census 2010 |
| | | Percent of census tract within one mile of a healthcare facilities | Cal-Atlas, CA Office of Statewide Health Planning and Development, 2010 |
| | | Percent of census tract within one mile of a K-12 schools | California Dept of Education |
| | Availability of social/economic resources | Median Household Income | ACS 2006-2010 |
| | | Percent of population of color | Census 2010 |
| | | Percent of population older than 25 with no HS diploma | ACS 2006-2010 |
| | | Percent who speak English "not very well" | ACS 2006-2010 |
| | | Foster care entry rates | Child Welfare Services, 2011 |
| | | Percent of population unemployed who are 16 or older, civilian only | ACS 2006-2010 |
| | | Percentage of renter and owner occupied units paying more than .5 of household income in housing costs | ACS 2006-2010 |
| | | Percentage of owner occupied units paying more than .5 of household income in housing costs | ACS 2006-2010 |
| | | Percentage of owner and renter-occupied housing units with 1.01 or more occupants per room. | ACS 2006-2010 |

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| | | | |
|---|---|---|---|
| Health | Health Condition | Low birth weight rate | CA Dept of Public Health |
| | | Age-adjusted Asthma Rates | CA Office of Statewide Health Planning and Development, 2008-2010 |
| | | Mortality rate (TBD). | CA Dept of Public Health |
| | | Population to provider ratio available for limited zip codes. | County of Riverside Health Agency, 2007 |

| Layer | Data Type | Indicator | Source |
|---|---|---|---|
| Civic Engagement | Latino Voter Turnout Rates, 2008 | Percent of Latinos who voted in 2008 election, by zip code. | CCEP |
| Education | Dropouts | Percent graduating from high school | CDE, 2011 |
| | A-G | Percent completing requirements for CSU/UC attendance | CDE, 2011 |
| Land Use | Tribal Lands | | Riverside County Planning Office |
| | Farmland, watersheds, parcels, ag preserve, water lines | | Riverside County Planning Office |
| | Parks, school districts, public sites | | Riverside County Planning Office |
| | Mobile Home Parks | | Ryan Sinclair, Loma Linda University |
| Transit | Roads, Highways, railroads | | Riverside County Planning Office, US Census Bureau (Tiger) |
| | Locations of transit stops and transit lines | | South Coast Air Quality Management District |
| | Transportation Injuries | | Transportation Injury Mapping System |
| Nutrition | Food Deserts | | USDA Economic Research Service |
| Other | Major points as identified by partners | TBD | |

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# Creating the CEVA Index

1. Created numeric ranges for both CEHI and SVI that consisted of the highest 20% of values for the “High” category, middle 60% of values in the “Medium” category, and the lowest 20% of values in the “Low” category.

2. Using the Select by Attributes tool, selected values that fell in each range, resulting in 9 different combinations of ranges, such as “Low CEHI, Low SVI; Low CEHI, Medium SVI…”

3. Gave each category of selected value a numeric value between 1-9.

| | | |
|---|---|---|
| **7**=High CEHI/ Low SVI | **8**= High CEHI/ Med SVI | **9**= High CEHI/ High SVI |
| **4**=Med CEHI/ Low SVI | **5**= Med CEHI/ Med SVI | **6**= Med CEHI/ High SVI |
| **1**=Low CEHI, Low SVI | **2**=Low CEHI/ Med SVI | **3**=Low CEHI/ High SVI |

4. Displayed map based on the 1-9 values.

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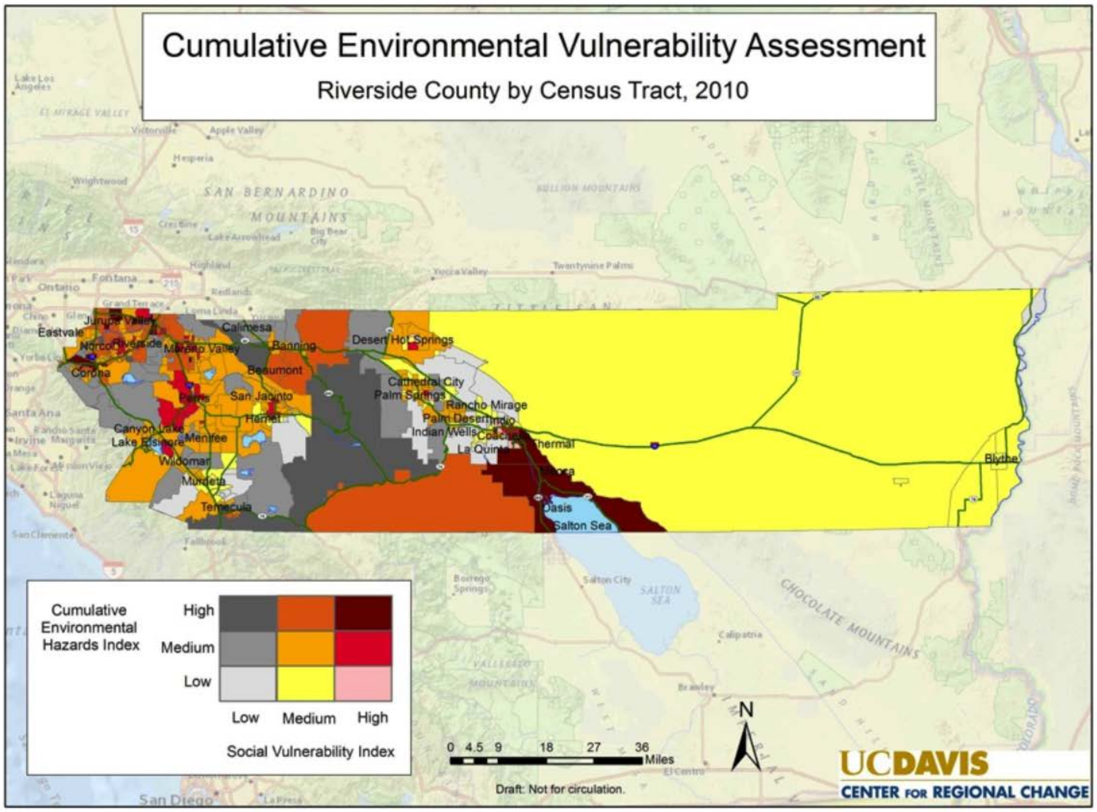
**DRAFT: For Illustration Purposes Only**

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