

ARTICLE

ANOTHER GAME CHANGER IN THE MAKING? LESSONS FROM STATES ADVANCING ENVIRONMENTAL JUSTICE THROUGH MAPPING AND CUMULATIVE IMPACT STRATEGIES

by Charles Lee

Charles Lee was the principal author of the landmark report Toxic Wastes and Race in the United States.

I. Introduction

During the past several years, I have devoted considerable energy to laying the groundwork for advancing environmental justice (EJ) at the state level.¹ State agencies make most of the decisions under both federal and state environmental laws, and activists and pundits alike have argued for a stronger focus on state EJ efforts.² States can be robust laboratories³ for experimenting with ways to advance EJ,

Editor's Note: This Article is excerpted from 50 ELR10203 (Mar. 2020). A true pioneer in the arena of environmental justice, Charles Lee was principal author of the landmark report Toxic Wastes and Race in the United States, the first national study on the demographics associated with the location of hazardous waste sites, and organized the First National People of Color Environmental Leadership Summit. The author wishes to thank the many individuals who spearheaded the work described in this Article, as well as those who provided helpful comments. The ideas put forth in this Article are the author's own. They do not represent the views of the U.S. Environmental Protection Agency or any agency in the federal government, and no such representation should be inferred.

1. "Advancing EJ" means realizing principles of EJ (such as fair treatment, meaningful involvement, and the achievement of healthy, equitable, resilient, and sustainable communities) in the ways government programs are carried out, and in the results these programs deliver.
2. Ever since the 1990s, EJ activists, scholars, and policy analysts have advocated for more attention to advancing EJ at the state level. For example, the U.S. Government Accountability Office's (GAO's) 2011 report made systematic state engagement one of its five strategic recommendations. See U.S. GOV'T ACCOUNTABILITY OFF., GAO-12-77, ENVIRONMENTAL JUSTICE: EPA NEEDS TO TAKE ADDITIONAL ACTIONS TO HELP ENSURE EFFECTIVE IMPLEMENTATION 32 (2011).
3. U.S. Supreme Court Justice Louis Brandeis popularized the concept of the "50 laboratories of democracy" in describing how a "state may, if its citizens

and some transformative advances have taken place.⁴ It is critical that those of us working to advance EJ systematically expand the discourse within all levels of government. Under the federalist system of governance in the United States, lessons from one level can cross-fertilize and inform work at other levels. Critical attention to the role of non-governmental players in driving transformative change in government is also necessary.

This Article will focus on lessons learned from state practice in EJ mapping and screening, and their relationship to addressing the central issue of cumulative impacts. Identifying appropriate geographic areas of concern has emerged as a recurring issue because it is a practice essential to federal and state environmental programs. A rich history of approaches and applications in this area is beginning to emerge, and I hope to offer useful lessons for EJ practitioners—including advocates, researchers, policymakers, funders—and staff from community and advocacy organizations, academia, and government, seeking to advance work in their own states.

These lessons are based on work in California and the development, use, and impact of the California Environmental Protection Agency's (CalEPA's) CalEnviroScreen tool. In addition, I discuss the U.S. Environmental Pro-

choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country." See *New State Ice Co. v. Liebmann*, 285 U.S. 262, 311 (1932).

4. Beside developing CalEnviroScreen, California has passed legislation on the human right to water and on incorporating EJ in general plans, created the Community Air Protection Program, and directed resources to disadvantaged communities through its Greenhouse Gas Reduction Fund, Transformative Climate Communities, and green energy programs. These represent an unprecedented body of work to advance EJ. See generally Charles Lee et al., *California Environmental Justice Resources* (Aug. 2019), <http://graham.umich.edu/media/files/California-Environmental-Justice-Resources-Aug2019.pdf>.

tection Agency’s (EPA’s) EJSCREEN because of the ways that federal policies, tools, and data influence activities across all states. A formal definition of “cumulative impacts” is provided later in the Article, but briefly speaking, this concept refers to the reality that communities burdened by EJ issues typically suffer from a concentration of pollution sources and negative land uses as well as health and social vulnerabilities.

Five key lessons are discussed here:

- (1) Addressing cumulative impacts is a core strategy for advancing environmental justice, and this is embodied in EJ mapping tool development.
- (2) Guiding principles for successfully developing an EJ mapping tool can be articulated.
- (3) EJ mapping tools can help to facilitate resource investment to promote health and sustainability in environmentally overburdened and disadvantaged communities.
- (4) Emerging EJ mapping efforts provide a useful, straightforward, and replicable model that future EJ mapping development at the state and local government levels can emulate.
- (5) Progress in advancing EJ at the state level, including EJ mapping tool development, has come from the combined efforts of communities, academia, and government.

Before I discuss each lesson in detail, I will first provide an overarching perspective on why I believe the current discourse on EJ mapping is so important, followed by a summary of CalEnviroScreen and EJSCREEN. In addition, the lessons discussed in this Article inform my suggestion in the conclusion that we may in fact be witnessing the emergence of yet another “true game changer” for advancing EJ in the United States.⁵

II. Importance of the Current EJ Mapping Discourse

The current discourse on EJ mapping tools is extremely critical for three reasons. First, identifying and prioritizing environmentally burdened and vulnerable communities is a fundamental first step to integrate EJ in government decisionmaking. While locating areas of high exposure and vulnerability is a critical and necessary first step, merely identifying them is insufficient. Our imperative is to have this information drive decisionmaking. Prioritizing vulnerable communities for attention, engagement, and resources is a good first use of this information and can

5. See Brooks Berndt, *An Interview With Charles Lee*, POLLINATOR: UNITED CHURCH CHRIST ENV’T JUST. BLOG (Sept. 8, 2017), https://www.ucc.org/pollinator_an_interview_with_charles_lee/.

yield significant benefits. It is also a gateway to exploring other substantive actions.

Second, the EJ mapping discourse holds the potential to more precisely characterize and operationalize the concept of disproportionate impacts. However, EJ mapping tools can now combine data on environmental burdens, demographic, and other vulnerability factors in ways that enable us to directly confront disproportionate impacts in the course of governmental decisionmaking. Once an agency can map cumulative impacts, it is better equipped to characterize, visualize, and operationalize an understanding of disproportionate impacts.

Third, the EJ mapping topic is extremely timely. Many states and others across the country are seeking to apply EJSCREEN and CalEnviroScreen methodologies. We are now beginning to see efforts in states that are proactively building on the CalEnviroScreen and EJSCREEN methodologies and data, as represented by Washington’s Environmental Health Disparities (EHD) Map, Illinois’ methodology for identifying environmental justice communities under the Future Energy Jobs Act (FEJA), and others yet to be developed.⁶

III. Summary of CalEnviroScreen and EJSCREEN

Developed by CalEPA’s Office of Environmental Health Hazard Assessment (OEHHA) and released in 2013, CalEnviroScreen is a mapping tool that identifies California communities that are most affected by multiple sources of pollution and are most vulnerable due to their health and socioeconomic status. CalEnviroScreen combines 20 indicator data sets categorized into four broad groups—exposures, environmental effects, sensitive populations, and socioeconomic status. These indicators are analyzed at a census tract level to produce a combined score that enables relative ranking at all census tract levels across the state.

EJSCREEN, released publicly as a draft in 2015 by EPA and in final form in 2016, is EPA’s nationally consistent EJ mapping and screening tool.⁷ EPA uses EJSCREEN to identify areas that may be candidates for additional consideration, analysis, or outreach as EPA develops programs, policies, and activities that may affect communities. The core elements of EJSCREEN are 11 environmental indicators and six demographic indicators, as indicated by Figure 2.⁸ EJSCREEN provides information at an extremely high resolution (i.e., the census block group level).

6. See *Washington Environmental Health Disparities Map*, WASH. STATE DEP’T OF HEALTH, <https://www.doh.wa.gov/DataandStatisticalReports/EnvironmentalHealth/WashingtonTrackingNetworkWTN/InformationbyLocation/WashingtonEnvironmentalHealthDisparitiesMap> (last visited Jan. 12, 2020); see also *Environmental Justice Communities*, ILL. SOLAR FOR ALL, <https://www.illinoisfa.com/environmental-justice-communities/> (last visited Jan. 12, 2020).

7. See *EJSCREEN: Environmental Justice Screening and Mapping Tool*, U.S. ENV’T PROT. AGENCY, <https://www.epa.gov/ejscreen/> (last updated Jan. 12, 2021).

8. See *Environmental Justice Indexes in EJSCREEN*, U.S. ENV’T PROT. AGENCY, <https://www.epa.gov/ejscreen/environmental-justice-indexes-ejscreen> (last

Figure 1. CalEnviroScreen Indicators and Methodology

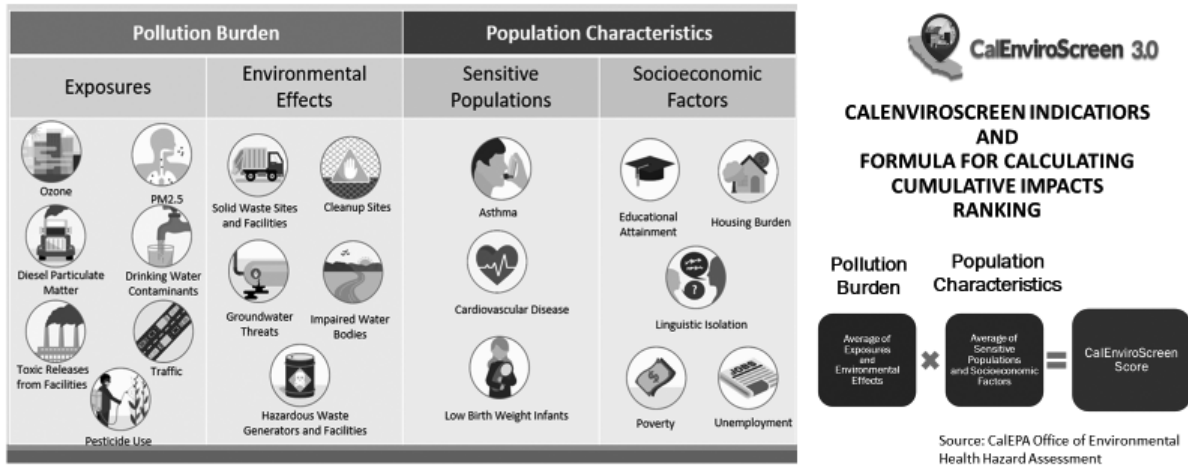


Figure 2. EJSCREEN Indicators

EJSCREEN INDICATORS

Environmental Indicators	Demographic Indicators
<input type="checkbox"/> PM 2.5 <input type="checkbox"/> Ozone <input type="checkbox"/> NATA Diesel PM <input type="checkbox"/> NATA Air Toxics Cancer Risk <input type="checkbox"/> NATA Respiratory Hazard Index <input type="checkbox"/> Lead Paint (pre-1960s Housing) <input type="checkbox"/> Traffic Proximity <input type="checkbox"/> Proximity-NPL Sites <input type="checkbox"/> Proximity-RMP Facilities <input type="checkbox"/> Proximity-TSD Facilities <input type="checkbox"/> Proximity-Waste Water Dischargers	<input type="checkbox"/> Low-Income <input type="checkbox"/> Minority <input type="checkbox"/> Less than High School Education <input type="checkbox"/> Linguistic Isolation <input type="checkbox"/> Individuals under Age 5 <input type="checkbox"/> Individuals over Age 64 Index: Calculated as (Low income + minority) / 2

Source: U.S. Environmental Protection Agency

EJSCREEN is a web-based tool accessible to all, offering a powerful range of interactive functions. Users can define an area of interest, such as a point, line, buffer, or polygon, and access a wide array of environmental and demographic data as well as the location of sensitive populations like schools, day care centers, hospitals, and public housing projects. The availability of user-defined areas is an extremely powerful function. For example, adding this feature to CalEnviroScreen would be the most important step in the future to support its use in local- or regional-level decisionmaking, including facility siting, zoning, and permitting.

I will conclude this section by outlining three big-picture observations about CalEnviroScreen and EJSCREEN that can get lost in more detailed analyses of these two tools. First, both CalEnviroScreen and EJSCREEN use a combination of environmental and demographic factors. Second, data in EJSCREEN is available for all states; hence, EJSCREEN offers a solid set of indicators for use by

states that do not have the capacity to develop their own cumulative impacts tool. This creates options for states to approach the need for second-generation EJ mapping. Third, somewhat different conceptual frameworks guided the development of CalEnviroScreen and EJSCREEN. CalEnviroScreen provides a single (cumulative) ranking score, while EJSCREEN provides a ranking score for each of its 11 individual environmental indicators. However, it should not be overlooked that the concept of cumulative impacts is embedded in EJSCREEN’s core design by virtue of its combining environmental and demographic factors. This enables the user to apply the tool in a cumulative manner as well as to adapt it for analyzing cumulative impacts.

IV. Lessons for EJ Practitioners

Lesson 1: Addressing cumulative impacts is a core strategy for advancing environmental justice, and this is embodied in EJ mapping tools development

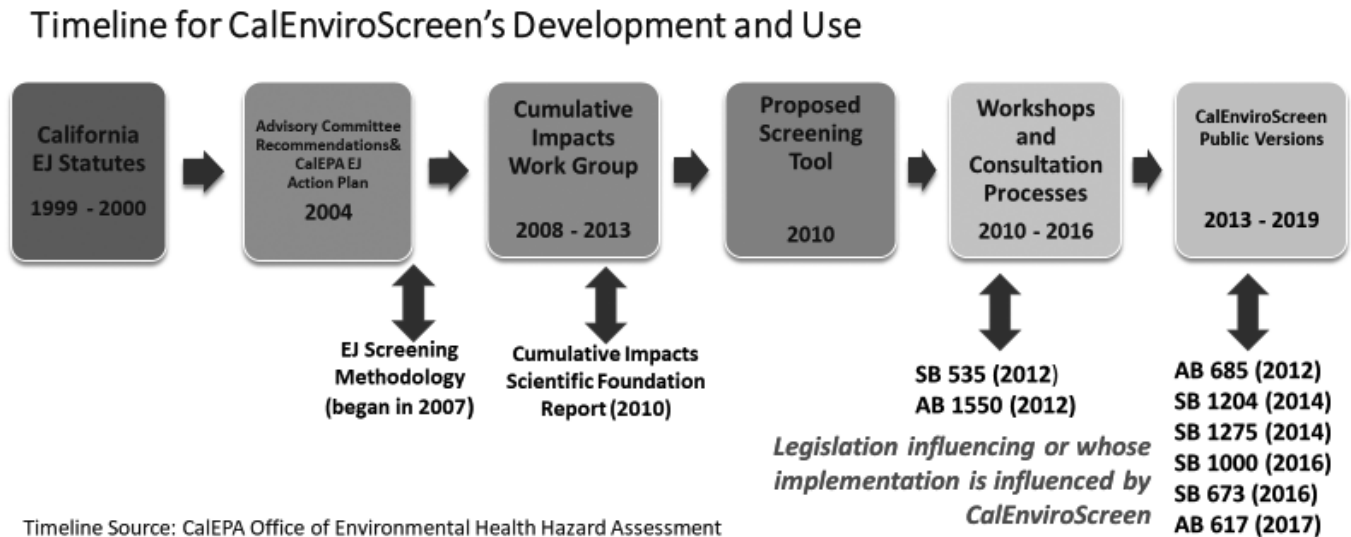
First and foremost, CalEnviroScreen is the direct result of a bottom-up strategy from EJ community organizations to define cumulative impacts and move public policy to address the issue. Ultimately, it involved actors from academia, the legislature, and government agencies.

The rationale for this strategy is summed up elegantly by Arsenio Mataka, former Assistant Secretary for Environmental Justice and Tribal Affairs at CalEPA when CalEnviroScreen was first released and significantly incorporated into California policies: “We were somehow driven by the belief that if we could somehow figure out how to quantify the cumulative pollution burden and vulnerabilities in poor communities and communities of color, it would change the course and future of those communities forever.”⁹ Mataka’s statement sums up a central tenet of the EJ movement in California, which has spanned several

updated Dec. 2, 2019) (providing the formula for calculating EJSCREEN’s EJ indexes).

9. Arsenio Mataka, California Attorney General’s Office, EJ Town Hall Address at the American Public Health Association’s Annual Meeting (Nov. 10, 2018) (video available at *EJ and Public Health Leaders Describe Struggle and Progress*, GRAHAM SUSTAINABILITY INST., <http://graham.umich.edu/ca-env-justice/leaders> (last visited Jan. 12, 2020)).

Figure 3. Timeline for CalEnviroScreen’s Development and Use



decades of phased development. Community-level actions built power and models. These led to efforts to influence the political process and secure unprecedented legislation, followed by the implementation of cutting-edge programs. Progress has not been easy. Many challenges were overcome in the face of consistent political opposition. Progress has been the result of leadership from many communities, sometimes in collaboration with public agencies and sometimes in conflict. We will treat these developmental phases together so the reader can see them as a continuum and how they interface and reinforce each other as part of a holistic strategy to address cumulative impacts.

EJ community leaders on CalEPA’s EJ Advisory Committee such as Diane Takvorian, along with strong support from local government representatives such as Barbara Lee and Barry Wallerstein, provided the following definition of cumulative impacts, adopted formally by CalEPA in 2005:

Cumulative impacts means exposures, public health or environmental effects from the combined emissions and discharges, in a geographic area, including environmental pollution from all sources, whether single or multi-media, routinely, accidentally, or otherwise released. Impacts will take into account sensitive populations and socio-economic factors, where applicable and to the extent data are available.¹⁰

It is also important to note the critical role of academia in developing cumulative impacts assessment methodology. The prototype for CalEnviroScreen was in fact developed outside of government. Renowned EJ scholars and researchers Manuel Pastor, Rachel Morello-Frosch, and James Sadd developed the Environmental Justice Screening Method (EJSM) in conjunction with community organizations through a community-based participatory research process. The EJSM generates cumulative impact scores that combine hazard proximity, health risks and exposure, social vulnerability, and climate change vulnerability.¹¹ Academia will be an abiding and critical player in the development and refinement of EJ and cumulative impact mapping tools in virtually all states. We cannot overlook the important contributions of persons who work in government to advance cumulative impacts assessment and EJ mapping tool development. Shankar Prasad and the late George Alexeeff were two government officials who played key roles in supporting the development of CalEnviroScreen.

Figure 3 provides a time line for CalEnviroScreen’s development, as developed by OEHHA and augmented with other milestones related to the items described above. Many of these milestones highlight the critical role of the legislative process in providing impetus for advancing the concept of cumulative impacts and use of CalEnviroScreen, which I will discuss in detail in Lesson 3.

10. See *California Environmental Justice Policies*, ENV’T HEALTH COAL., <https://www.environmentalhealth.org/index.php/en/where-we-work/state-of-california/california-environmental-justice> (last visited Jan. 12, 2020).

11. See generally James Sadd et al., *Playing It Safe: Assessing Cumulative Impact and Social Vulnerability Through an Environmental Justice Screening Method in the South Coast Air Basin, California*, 8 INT’L J. ENV’T RSCH. & PUB. HEALTH 1441 (2011).

Lesson 2: Guiding principles for successfully developing an EJ mapping tool can be articulated

Mataka provided six guiding principles for successfully developing an EJ mapping tool.

- (1) science-based
- (2) informed by community experience
- (3) government to endorse and utilize it
- (4) available statewide to everybody
- (5) thorough public participation
- (6) serve as a third-party validator

Lesson 3: EJ mapping tools can help to facilitate resource investment to promote health and sustainability in environmentally overburdened and disadvantaged communities

In 2012, Gov. Jerry Brown signed S.B. 535 into law. This mandated dedicating 25% of the proceeds from the Greenhouse Gas Reduction Fund (GGRF) established under the Global Warming Solutions Act of 2006 to benefit disadvantaged communities. It provided the statutory basis for codifying cumulative impacts and directed CalEPA to develop a methodology for designating these communities. When CalEPA decided to employ CalEnviroScreen to identify these communities, a new arena for considering cumulative impacts in environmental decisionmaking was created.

As mentioned earlier, Prasad left CalEPA in 2008 to pursue his vision of securing legislation that would tie the allocation of resources to the use of a cumulative impacts mapping and screening tool. He believed that resource allocation on a large scale is necessary to bring about change in frontline communities, and that an early stake in the allocation of GGRF proceeds was essential to achieve this goal. It took almost five years of coalition-building and policy debate before state Sen. Kevin de León’s bill S.B. 535 was signed into law. Although many are unaware of the behind-the-scenes work done, Prasad is generally known as the “Father of SB 535.”¹²

With S.B. 535 signed into law and CalEPA-designated CalEnviroScreen as the method to identify disadvantaged communities, an important shift in the discourse regarding EJ and CalEnviroScreen took place. Whereas previously the tool was viewed with suspicion in many quarters, such as business and local government, it is now embraced as a way of securing more resources for redressing past environmental and social inequities. Instead of the debate focusing around how to ensure restrictions on the use of CalEnviroScreen to nonregulatory purposes and clarifying that it was not to be used for risk assessment purposes, the debate shifted to why certain disadvantaged areas were not

being identified through the tool. This linkage of CalEnviroScreen and cumulative impacts to procuring resources for areas of greatest need has much to do with the current generally positive public acceptance of the tool.¹³

GGRF proceeds total approximately \$12.14 billion to date, at least 25% of which is dedicated to disadvantaged communities. Table 1 summarizes where these resources are being devoted by program.¹⁴

Program	Total Appropriations to Date (\$M)
Sustainable Communities and Clean Transportation	\$9,757
Energy Efficiency and Clean Energy	\$506
Supporting Investments	\$138
Natural Resources and Waste Diversion	\$1,738

In addition to targeting investment from GGRF proceeds to disadvantaged communities, the CalEnviroScreen tool has become embedded into the operation of a number of state programs. These include program planning, incorporation of EJ in California municipalities’ development of general plans, CalEPA’s EJ Enforcement Task Force, the California Air Resources Board’s Community Air Protection Program, and identifying areas of vulnerability for tracking progress in implementing the human right to water. At the end of the day, the measure of success must be a positive impact in communities. One example is the Paradise Creek Apartments in National City, a 201-unit affordable housing complex built on a remediated brownfield that received \$9 million from the GGRF to ensure its completion.¹⁵

With respect to the all-important issue of cumulative impacts in the permitting process, there are two examples of serious public policy advances. First, in 2008, the state of Minnesota amended the Minnesota Pollution Control Agency’s air permitting authority to include

13. One should note that S.B. 535 came about in the throes of controversy. It was meant to fill the gap created by A.B. 32’s overlooking EJ concerns. Additionally, the issue of emissions trading, otherwise known as cap and trade, was and continues to be a sore point for EJ advocates in climate policy.

14. See *Appropriations From the Greenhouse Gas Reduction Fund*, CAL. CLIMATE INVS. (2019), https://ww3.arb.ca.gov/cc/capandtrade/auctionproceeds/summary-appropriationtable_10-15-19.pdf?_ga=2.25355529.115422816.1578323144-864493257.1444232167 (last visited Jan. 12, 2020); see also *About California Climate Investments*, CAL. CLIMATE INVS. <http://www.caclimateinvestments.ca.gov/about-cci> (last visited Jan. 12, 2020).

15. Diane Takvorian, Environmental Health Coalition, EJ Town Hall Address at the American Public Health Association’s Annual Meeting (Nov. 10, 2018) (video available at *EJ and Public Health Leaders Describe Struggle and Progress*, GRAHAM SUSTAINABILITY INST., <http://graham.umich.edu/ca-env-justice/leaders> (last visited Jan. 12, 2020)).

12. See Charles Lee, *Asian American Pacific Islander Environmental Leadership for 2040*, 14 UCLA ASIAN AM. & PACIFIC ISLANDERS NEXUS J. 130, 137 (2016).

the analysis and consideration of “cumulative levels and effects of past and current environmental pollution from all sources on the environment and residents of the geographic area within which the facility’s emissions are likely to be deposited.”¹⁶ The statute pertains to air permits for a portion of South Minneapolis within Hennepin County that has historic and current EJ issues. Methodologies for assessing cumulative risks and levels have been developed and are being implemented.¹⁷

The second is S.B. 673 in California. Currently, the California Department of Toxic Substances Control is developing rulemaking and related protocols for considering cumulative impacts in permitting decisions, as outlined in the *Draft SB 673 Cumulative Impacts and Community Vulnerability Draft Regulatory Framework Concepts* document, issued in October 2018.¹⁸ It will be instructive to evaluate the results of both efforts.

Lesson 4: Emerging EJ mapping efforts provide a useful, straightforward, and replicable model that future EJ mapping development efforts at the state and local government levels can emulate

Efforts in multiple states are working on second-generation EJ mapping tools. As we distill the key elements of this progress, we will find that there is a set of distinctly common approaches that will prove instructive for future efforts in other states. Two efforts that have made significant progress on a policy level have taken place in Washington and Illinois. While each took place under very different circumstances, they followed a similar trajectory with respect to the core methodological approaches and data. Moreover, efforts in Michigan and Maryland are following the same template.¹⁹ This section will provide

important features about these developments and discuss this common methodological thread.

In January 2019, a collaboration consisting of Front and Centered, a coalition of community and advocacy organizations from communities of color, University of Washington, Puget Sound Clean Air Agency, and the Washington Departments of Health and Ecology released a Washington EHD Map and an accompanying interactive web-based mapping tool.²⁰ The effort was triggered by the desire of Front and Centered to build out climate policies that focus on equitable reinvestment. They learned about CalEnviroScreen from groups such as the California-based Asian Pacific Environmental Network and through consultations with CalEPA’s OEHHA. Morello-Frosch mentioned to Front and Centered that a University of Washington professor had worked on CalEnviroScreen.²¹

The resulting two-year effort involved an extensive public engagement process, with 11 listening sessions across the state, Front and Centered leading the work group and community engagement, graduate student Esther Min doing the methodological and data work as part of her Ph.D. project, and institutional support from state agencies. The core methodology employed the CalEnviroScreen’s scoring formula and EJSCREEN data.

In 2016, Illinois passed the FEJA to increase solar energy jobs and renewable development projects across the state. The law included \$750 million in low-income programs for solar, solar work force, and energy efficiency.²² The FEJA also created the Solar for All program and mandated that 25% of its resources be allocated for use in environmental justice communities. The program initiated a public participation process, during which community organizations such as the Little Village Environmental Justice Organization (LVEJO) provided leadership on thinking behind the methodologies and data for identifying disadvantaged areas. Again, the methodology adopted was use of CalEnviroScreen scoring formula and EJSCREEN data. Notably, a mechanism for self-identification as EJ communities was also added.²³

Cumulative impacts has been a long-standing issue for communities and academics in Michigan, as symbolized by advocacy around the heavily polluted 48217 zip code in Southwest Detroit.²⁴ Paul Mohai, the pioneering EJ academic who organized the first-ever academic symposium on race and environmental hazards at the University of Michigan, has helped to advance EJ mapping and cumulative impact assessment efforts at both EPA and CalEPA. Mohai’s recent University of Michigan graduate students

16. Telephone Interview with Karen Clark, Minnesota State Representative (Apr. 27, 2017). A three-year community organizing campaign in the East Phillips neighborhood of Minneapolis led Rep. Karen Clark to introduce H.F. 2393. See H.F. 2393, 85th Leg. (Minn. 2007), available at https://www.revisor.mn.gov/bills/text.php?number=HF3293&version=2&session=ls85&session_year=2008&session_number=0. The community organizing included a collection of maps showing environmental and demographic data layers and manually laying them on top of one another. See the maps collected for legislative debate at <https://www.gis.leg.mn/pdf/bills/hf3293.pdf> (last visited Jan. 12, 2020).

17. See generally Kristie M. Ellickson et al., *Cumulative Risk Assessment and Environmental Equity in Air Permitting: Interpretation, Methods, Community Participation, and Implementation of a Unique Statute*, 8 INT’L J. ENV’T RSCH. & PUB. HEALTH 4140 (2011), available at https://pdfs.semanticscholar.org/64ea/a77f689802f6e81db0e11da3cb9fee39a5b4.pdf?_ga=2.111720900.1957124788.1578585786-1391638390.1551285865.

18. See *SB 673 Permit Criteria—Community Protection*, CAL. DEP’T OF TOXIC SUBSTANCES CONTROL, <https://dtsc.ca.gov/sb-673-permit-criteria-for-community-protection/> (last visited Jan. 12, 2020); *Draft: SB 673 Cumulative Impacts and Community Vulnerability Draft Regulatory Framework Concepts*, CAL. DEP’T OF TOXIC SUBSTANCES CONTROL & CAL. ENV’T PROT. AGENCY (Oct. 2018), <https://dtsc.ca.gov/wp-content/uploads/sites/31/2015/09/DRAFT-CI-Regulatory-Frameworks-Concepts-10-15-2018.pdf>.

19. The North Carolina Department of Environmental Quality (NCDEQ) is currently developing the new Community Mapping System With Environmental Justice Tool. Public input was an important part of the mapping tool’s development, with NCDEQ conducting listening sessions throughout the state. A beta version is available at <https://deq.nc.gov/outreach-education/environmental-justice/deq-north-carolina-community-mapping-system> (last visited Jan. 12, 2020), and NCDEQ envisions an iterative development process. The tool provides access to both demographic and environmental data but does not combine them.

20. Esther Min et al., *The Washington State Environmental Health Disparities Map: Development of a Community-Responsive Cumulative Impacts Assessment Tool*, 16 INT’L J. ENV’T RSCH. & PUB. HEALTH 4470 (2019), available at <https://www.mdpi.com/1660-4601/16/22/4470>.

21. Interview with Deric Gruen, Program Director, Front and Centered (Nov. 7, 2019).

22. See *Future Energy Jobs Act*, ILL. CITIZENS UTIL. BD., <https://www.citizensutilityboard.org/future-energy-jobs-act/> (last visited Jan. 12, 2020).

23. See ILL. SOLAR FOR ALL, *supra* note 6.

24. See Bill Kubota & Detroit Journalism Cooperative, *Toxic Town: Michigan’s Most Polluted Zip Code*, MICH. RADIO, June 19, 2017, <https://www.michiganradio.org/post/toxic-town-michigan-most-polluted-zip-code>.

project in support of the Michigan Environmental Justice Coalition produced a report, *Assessing the State of Environmental Justice in Michigan*. University of Maryland students, with support from Profs. Sacoby Wilson and Devon Payne-Sturges, developed the Maryland Environmental Justice Screen Tool (MD EJSCREEN) in partnership with the National Center for Smart Growth and the Maryland Environmental Health Network.²⁵ The tool's envisioned long-term purpose is twofold. First, it is to highlight areas with EJ issues, areas that need additional investments. Second, it is to be used in permitting, regulatory, zoning, and development decisions. Once again, the core methodology used was based on the CalEnviroScreen scoring formula and EJSCREEN and local data.

The central lesson from these emerging EJ mapping efforts is that there now exists a useful, straightforward, and replicable model that future EJ mapping development at the state and local government levels can emulate. Simply stated and illustrated in Figure 4 (see next page), it involves the use of the California definition of cumulative impacts, CalEnviroScreen methodology, and EJSCREEN data in combination with additional available state or local data. The approach is highly elegant and easy to understand. Communities, universities, and/or state agencies in virtually all 50 states can initiate such efforts. In fact, they can provide opportunities for students and young professionals who yearn to make a difference with their lives by making important real-world contributions.

Notably, the use of a cumulative impacts mapping methodology need not be limited to the state level, as evidenced by the project cited earlier that includes the Natural Resources Defense Council (NRDC) and community partners (LVEJO, Southeast Environmental Task Force, Southeast Side Coalition to Ban Petcoke, and the Ironbound Community Corporation). In addition to Chicago, the same methodology was applied in Newark and several other locations. For all these efforts, NRDC had community partners on the ground who verified that the results resonated with their understandings and lived experience.²⁶ Additionally, it is noteworthy that statutes for addressing cumulative impacts now exist on the local level. For example, the city of Newark passed the first-ever in the nation Environmental Justice and Cumulative Impacts Ordinance in 2016.²⁷

25. See generally Aubree Driver et al., *Utilization of the Maryland Environmental Justice Screening Tool: A Blandensburg, Maryland Case Study*, 16 INT'L J. ENV'T RSCH. & PUB. HEALTH 348, 348 (2019).

26. Communications with Yukyan Lam, Staff Scientist, NRDC (Dec. 12, 2019).

27. See City of Newark, N.J., Environmental Justice and Cumulative Impact Ordinance (July 7, 2016), available at <https://newark.legistar.com/LegislationDetail.aspx?ID=2770971&GUID=D0C566D0-463A-482D-A4AC-78884351DA79&FullText=1> (last visited Jan. 12, 2020).

Lesson 5: Progress in advancing EJ at the state level, including EJ mapping tool development, has come from the combined efforts of communities, academia, and government

By this point, this final lesson is fairly evident. Many examples illustrate how a combined effort from communities, academia, and government has been essential to the progress made to date. Continued collaboration is absolutely necessary not only for meaningful advances in EJ mapping tools, but in how those tools are applied to address environmental injustice. Much of the experiential knowledge and technical expertise that informs second-generation EJ mapping comes from sources outside government agencies. This is true in all the cases of successful EJ mapping tool development that has fully incorporated a cumulative impacts policy base.

On the other hand, having government endorsement and utilization is critical to the viability and impact of such tools. In some ways, the groundwork laid and the data and GIS tools now available make such EJ mapping efforts easily within reach of a well-constructed partnership of communities and universities pretty much anywhere in the nation. However, such efforts will likely languish on the shelves without putting in the hard work of obtaining government buy-in, endorsement, and utilization.

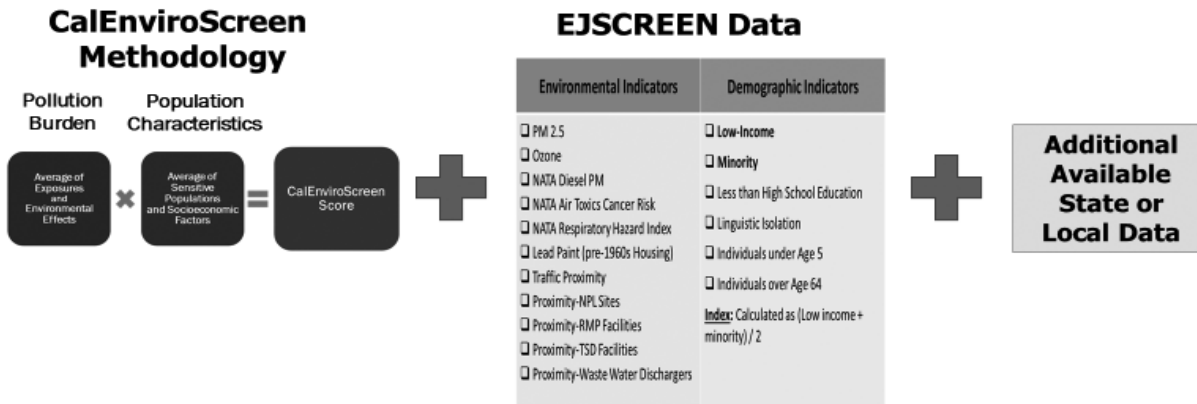
Government left to itself does not typically undertake or initiate actions to make meaningful advances of a transformative nature. This is true on all levels of government. In California, the concept of cumulative impacts was initially advanced from external nongovernmental sources. It was met with some executive-level support in CalEPA as well as skepticism and resistance to change in other quarters. The unique combination of effective advocacy from outside of government, unswerving dedication to the passage of S.B. 535, and a new generation of leaders inside government who brought their lived experience to the challenge resulted in the progress to date.

V. Conclusion

In the same way that I described *Toxic Wastes and Race* on its 30th anniversary, I believe that we may in fact be witnessing the emergence of yet another “true game changer” on the national level.²⁸ I cannot overemphasize how significant it is that the emerging paradigm for EJ mapping and cumulative impacts is relatively straightforward to replicate from a technical perspective. Given the availability of a scientifically sound model from CalEnviroScreen and easily accessible data from EJSCREEN, groups in virtually all states and localities have the means to develop their own cumulative impacts map. Just as when hundreds of studies on the demographics of communities associated with environmental hazards have sprouted up after the publication of *Toxic Wastes and Race*, I can see a “thousand flowers blooming” in the area of EJ mapping and cumulative impacts. Of course, such an upsurge will take concerted

28. Berndt, *supra* note 5.

Figure 4. Emerging Paradigm Common to EJ Mapping Efforts at State and Local Levels



effort, and I urge all people concerned about environmental justice to help make it happen.

However, we are only beginning to level the playing field. Much work still needs to be done. There are major chapters of the story on EJ mapping and cumulative impacts yet to be written. Two of them are (1) use of EJ mapping tools to address cumulative impacts in land use planning, zoning, and facility siting and permitting; and (2) use by local government and business. Moreover, state and local lessons can be transferred to the federal levels of government. Hence, it will be interesting to see whether the paradigm adopted by state and local government practitioners will inform future iterations of EPA’s EJSCREEN. Finally, the cumulative impacts paradigm described in this Article makes it possible to begin filling in the gaps for environmental decisionmaking created by the limitations of traditional risk assessment.

Ultimately, this Article is a call to action. The reader should realize that nothing described here just fell into place. The highlighted accomplishments resulted from concerted action by committed individuals who persevered to overcome tremendous obstacles. Therefore, the Article is also a celebration of committed people whose actions have resulted in transformative change. In my opinion, they offer immense hope because a process growing out of many decades of work by people from all quarters in many parts of the nation has begun to coalesce into a potentially workable strategy to tackle what is arguably one of the most vexing EJ challenges confronting the nation. Given the urgent challenges of our times for building truly healthy, equitable, resilient, and sustainable communities, all people concerned about EJ should take notice.