Revealing the INVISIBLE Coachella Valley

Putting Cumulative Environmental Vulnerabilities on the Map

Jonathan London, Ph.D.,
Teri Greenfield, M.Ed., and Tara Zagofsky, M.S.

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Executive Summary

To support community capacity building and mobilization on issues of environmental justice and public health in the Eastern Coachella Valley, The California Endowment invited UC Davis through a partnership with CIRS to partner with local advocates in documenting the often-invisible patterns of cumulative environmental vulnerability in this region. In response, this report gathers the latest available public data sets for Riverside County and compiles them into two multi-indicator indices: a Cumulative Environmental Hazards Index (CEHI) and a Social Vulnerability Index (SVI). Together, the CEHI and SVI indices form the basis of a Cumulative Environmental Vulnerability Assessment (CEVA). The CEVA reveals that residents in the Eastern Coachella Valley face significant and overlapping environmental hazards and social vulnerability that far exceed those in the Western Coachella Valley and the county as a whole. In particular, agricultural pesticide applications, drinking water quality, and housing quality are key challenges to community well-being. The intention of this report is to help leaders better understand and target increased investment in environmental protection, health promotion, and community well-being in this sometimes forgotten but vital corner of California. The Eastern Coachella Valley represents an important opportunity for developing innovative approaches to smart growth and regional equity that can support flourishing rural communities.

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Revealing the Invisible Valley

On September 11, 2012, as the nation observed another tragic anniversary, powerful storms brought the Eastern Coachella Valley, an often-forgotten corner of Southern California, into sharp relief. Storm winds stirred up the stench of decomposing organic matter from the depths of the dying Salton Sea, wafting all the way to the Los Angeles basin. The same storms flooded many of the residential mobile home parks of the Eastern Coachella Valley, further contaminating drinking water supplies and overflowing already over-burdened septic systems. For the primarily Latino, low-income working families inhabiting this expanse of Riverside County, the state of emergency declared was just another in a long series of chronic threats to their health and well-being that typically go unnoticed and unaddressed.

Severe flooding in Mecca and Thermal submerged homes, schools, and overwhelmed sewage and waste water systems.

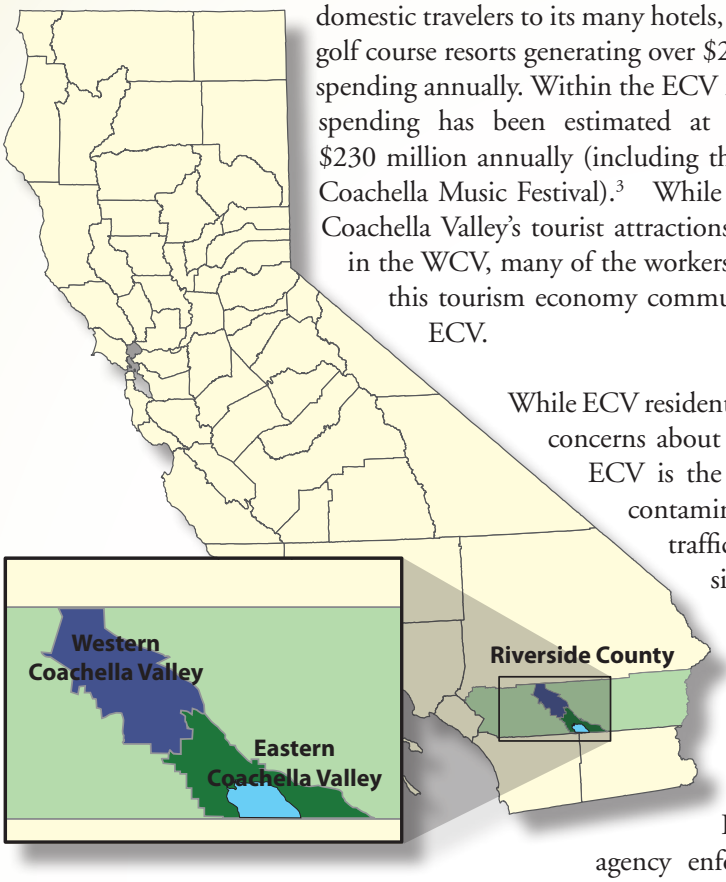
The Coachella Valley is a land of stark contrasts. The lush golf courses, exclusive resorts, and celebrity sightings of the renowned Western Coachella Valley (WCV) communities, such as Palm Springs, are worlds apart from the unpaved streets, failing septic systems, and unauthorized waste dumps of the Eastern Coachella Valley (ECV). The ECV, as defined by local advocates, includes the disadvantaged and environmental justice communities of Indio, Coachella, Thermal, Oasis, Mecca, and North Shore, with a total population of approximately 88,000 residents, while the WCV extends from the northern neighborhoods of Indio to Palm Springs and includes 324,000 residents (see Figure 1).

Across both the Eastern and Western expanse of the Coachella Valley, Native American populations from the Cabazon Band of Mission Indians, Twenty-Nine Palms Band of Mission Indians, the Torres Martinez Band of Cahuilla Indians, St. Augustine Band of Mission Indians, and other tribes, steward the remains of ancestral lands (much of which had been expropriated in earlier decades).[1] Despite recent economic development initiatives including several casinos, the majority of Native Americans in the region live in poverty as does the indigenous Mexican population (including many Purhépecha people).

Dead fish and noxious odors have degraded once thriving recreation areas and wildlife habitat at the Salton Sea.

The concentrated poverty of the ECV contrasts with the significant contributions by the hard working residents to the region's and state's vital agriculture, tourism, and goods movement industries. The Coachella Valley (primarily the rural ECV) is a major hub for agricultural production in Riverside County and California as a whole, representing $526 million in gross agricultural value.[2] The Coachella Valley also attracts roughly 8.2 million visitors each year, including international and

Figure 1: The Coachella Valley



domestic travelers to its many hotels, casinos, and golf course resorts generating over $2.5 billion in spending annually. Within the ECV itself, tourist spending has been estimated at upwards of $230 million annually (including the renowned Coachella Music Festival).[3] While most of the Coachella Valley's tourist attractions are located in the WCV, many of the workers who power this tourism economy commute from the ECV.

> ***"Those smells …you feel like you don't have worth. …You think that you have to endure it here because it's Mecca…. Sure we're in Mecca, but we're not animals. We're human beings."***

While ECV residents have a strong pride of place, they also have considerable concerns about the region's environmental and health challenges. The ECV is the site of chemical intensive agriculture, drinking water contamination, and significant air pollution from interstate traffic and the associated goods movement industry. Dump sites and waste processing facilities also lace the area.[4] One Mecca resident expressed the concerns of many, stating, "Those smells …you feel like you don't have worth. …You think that you have to endure it here because it's Mecca…. Sure we're in Mecca, but we're not animals. We're human beings."[5]

Limited air and water quality monitors,[6] over-stretched agency enforcement capacities, and large swaths of open land with unregulated land uses keep many of these environmental hazards "off the map." Checker-boarded Native American reservation and trust land with sovereign tribal governments, and the many unincorporated communities that lack local governments create a landscape of complex jurisdictions making coordinated environmental, land use and health regulation challenging. Conflicts between some community advocates and local Native American tribes over environmental, land use, and housing issues have begun to be resolved through collaborative forums.[7] The non-citizen status of many residents (both legal residents and undocumented residents) reduces the political representation of the local communities. Recent elections of dynamic local leaders from the ECV in the state Assembly and Congress have begun to increase the voice of the majority Latino communities at the state and federal levels.

> ***A vibrant group of residents and community advocacy organizations draws strength from roots in faith-based, farm worker, public health, public interest law, and community development social movements to addresses the region's challenges.***

In the face of these many challenges, a vibrant group of residents and community advocacy organizations draws strength from roots in faith-based, farm worker, public health, public interest law, and community development social movements. Coachella Valley stakeholder initiatives exemplify the power of local communities seeking environmental and social justice, including: Eastern Coachella Valley Building Healthy Communities, Raices del Valle Youth Empowerment Program, California Rural Legal Assistance's Community Equity Initiative on unincorporated communities, Pueblo Unido's efforts in mobile home parks, the Inland Congregations United for Change's grassroots organizing, the Environmental Justice Taskforce and its on-line environmental reporting system IVAN, and environmental regulation by the Twenty-Nine Palms Band of Mission Indians[8] and other tribal governments that integrate western and cultural science.[9]

Building on these significant regional assets, the Coachella Valley represents an important opportunity for developing innovative approaches to smart growth and regional equity that can support flourishing rural communities.

400 residents from Our Lady of Soledad Church (part of ICUC) ask for reasonable rates for clean water in the city of Coachella.

Mapping for Environmental Justice

The Advocates Coalition of Coachella Valley built strong collaborations with project consultants.

The intention of this report is to help local leaders to better target increased investment in environmental protection, health promotion, and community well-being. It seeks to inform local efforts to define a new model of smart and equitable development suitable for rural communities. Towards these ends, this study gathers the latest available public data sets for Riverside County and compiles them into two multi-indicator indices: a Cumulative Environmental Hazards Index (CEHI) and a Social Vulnerability Index (SVI). These indices are mapped at the Census Tract level, a relatively reliable unit of analysis that generally aligns with community boundaries. Together, the CEHI and SVI indices form the basis of a Cumulative Environmental Vulnerability Assessment (CEVA). **A CEVA Technical Report, additional maps, and resources can be accessed at regionalchange.ucdavis.edu/ceva-coachellavalley.**

Table 1: CEVA Measures and Indicators

INDEX	MEASURE	INDICATOR
Cumulative Environmental Hazards	**Pesticide application**	Total amount of active ingredient pesticide application, agricultural only. Included high priority chemicals based on toxicology, volatility, transport/fate, and application rates
	Point source pollution	Summed score of pollution point sources located in tract (within a 250 meter buffer). Types include cleanup sites, leaking underground storage tanks, Superfund sites, hazardous waste sites, solid waste disposal, transfer and processing sites, and permitted hazardous waste sites
	Risk-Screening Environmental Indicators (RSEI)	Hazard weighted score of all toxic waste emitting facilities
	Air Quality (Ozone)	Maximum 8-hour ozone concentrations for each day from March to October, averaged over three years (2008-2010)
	Impaired Water Bodies	Sum of the number of individual pollutants in an impaired water body that fell within or bordered the tract
	Levels of Contaminants in Drinking Water	Average concentrations of five chemical contaminants (arsenic, chromium 6, lead, nitrates, perchlorates) per well, averaged over six years, scored and aggregated to tract level.
Social Vulnerabilities	**Sensitivity of receptors**	Percent of people younger than 5 or older than 65 in a census tract
	Availability of social/economic resources	Percent living below 200% of Federal Poverty Level
		Percent of population of color
		Percent of population older than 25 with no high school diploma
		Percent of people who speak English "not very well"
		Foster care entry rates
		Percent of population unemployed who are 16 or older, civilian only
		Percentage of renter and owner occupied units paying more than 50% of household income in housing costs
		Percentage of owner and renter-occupied housing units with more than one occupant per room
	Health Condition	Low birthweight rate
		Emergency department visits due to asthma

Mapping for Environmental Justice

The methods used to create the CEVA are based on best practices in the field (including the Environmental Justice Screening Method[10] and CalEnviroScreen developed by the California Office of Environmental Health Hazard Assessment[11]) as well as input from community partners about their highest priority social and environmental challenges. The CEVA has incorporated several important innovations to tailor this analysis especially to the Coachella Valley.

Community partners contributed crucial local knowledge to the mapping project.

- The pesticides indicator is comprised of the most toxic and drift-prone chemicals including several that are applied more heavily in this region.
- The pollution point source indicator uses a weighting method to score sites based on type, status, and activity, also accounting for the incidence of multiple pollution points in a tract.
- The drinking water indicator is a ranking based on the six-year average measurements of target chemicals with significant possible health effects in each tract.
- We have minimized the possibility for double-counting of toxic and hazardous waste sites by extensively cleaning the data sets to eliminate duplicate records within and across data sets.

There are several limitations to the study methodology. We used census tracts as the unit of analysis. We were not able to use the finer-grained census block groups in this analysis because the data are not reliable enough at this spatial level in such largely rural areas. Census tracts are drawn to have a standard population range: therefore, there will be larger tract sizes in areas with small and dispersed populations. A related effect of this approach in low population density areas is that all areas of a tract are mapped with the same CEVA score, even if the environmental and/or social conditions are concentrated in one area of the tract. This analysis also is not weighted for population, and instead shows the magnitude of the challenges, not the number of people affected.


Farm workers attempt to escape summer heat that can exceed 120 degrees.

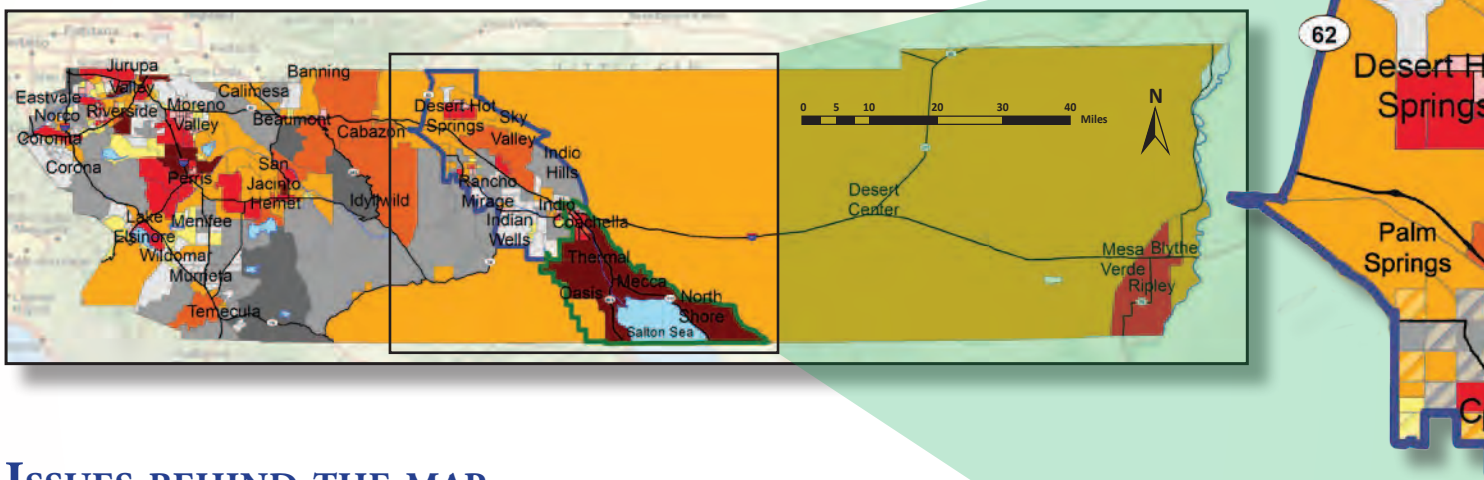
Other limitations include using data from the American Community Survey, which has been shown to undercount key populations prevalent in the ECV such as farm workers and rural residents.[12] Although we aggregate the data from water quality measurements taken at the well level to the tract level for the purpose of constructing the CEVA, it is important to note that actual water quality is likely to vary across the tract. We were not able to use water system polygons for a more precise boundary and better linkage of well level data to sites water consumption because these data were not available for the entire county at the time of this study. We distributed health data that are reported at the zip code level to the contiguous census tracts, creating an approximation, but not a direct measure of health conditions in each census tract. Lastly, several data sets could not be included in the CEHI; most notably the CEVA does not include Particulate Matter (PM) because the air quality monitoring stations are located too far from many census tracts in Riverside County, particularly in Eastern Coachella Valley, to allow for accurate data.

Cumulative Environmental Vulnerability Assessment: CEVA

The CEVA map demonstrates the interaction of the CEHI and SVI across Riverside County and highlights disparities between places in the Coachella Valley using a simple color scheme (see Figure 2). In the CEVA map, the light gray color designates census tracts in the lowest categories of CEHI and SVI, followed by the medium gray and yellow colored census tracts signifying low to medium CEHI and SVI. The light orange colored areas identify the medium CEHI and SVI categories.

The areas with the highest degrees of both CEHI and SVI are colored in dark orange, red, and crimson on the upper right extent of the matrix. Residents in these dark colored areas on the map contend with both the highest relative levels of environmental hazards and the fewest economic and/or social resources to avoid or mitigate these hazards. These areas are considered Cumulative Environmental Vulnerability Action Zones (CEVAZ), to call out the need for strategic and coordinated action to protect the community health and well-being. Nearly the entire ECV is included in the highest combined CEHI and SVI, colored in crimson, therefore calling for the highest priority actions.

Figure 2: Riverside County CEVA Map by Census Tract, 2010



Issues behind the map

Limited health care access

A few, small health clinics are the only local options for those without health insurance (up to 70% in some communities[13]) and the doctor-to-resident ratio is more than 4 times below the federally recommended level.[14] Limited access to primary and emergency care push many residents to travel across the border to Mexicali for health services and may also result in skewed data on local health problems. Promotores de Salud, mobile health clinics, and other community-based health strategies represent promising practices for increasing access and education.

Failing water infrastructure

Public water districts provide very limited service to rural residents. Many residents rely on private well water contaminated by arsenic, lead, nitrates, chromium 6, and perchlorates. Residents of some mobile home parks with failing septic systems face health risks from contact with raw sewage. Local advocacy and litigation have resulted in legislation supporting emergency funding for water filtration systems and restitution for water overcharges. Pueblo Unido CDC is pioneering a reverse osmosis water filtration system for ECV communities where municipal water is unavailable.

Gaps in public transportation

Limited bus routes, sidewalks, and bike lanes limit residents' safe and affordable access to education, health services, employment, and other important resources. County and regional transportation planning has tended to focus resources in the wealthier WCV.[15] A mismatch between the location of affordable housing and the location of low-wage jobs means that lower-income people must commute far distances for work. Local advocates have prioritized equitable access to transportation as a top regional priority.

Concentrated Hazardous Waste

Multiple hazardous waste treatment storage and disposal facilities dot the region, many next to schools and residences. After noxious odors from a soil remediation facility at Western Environmental Inc. sickened students and teachers at a nearby school, state and federal agencies restricted future operation.[16] Constructive dialogue between the Cabazon Band of Mission Indians, public agencies, and local advocates offers hope for future redevelopment of the site.

Unauthorized Dumping

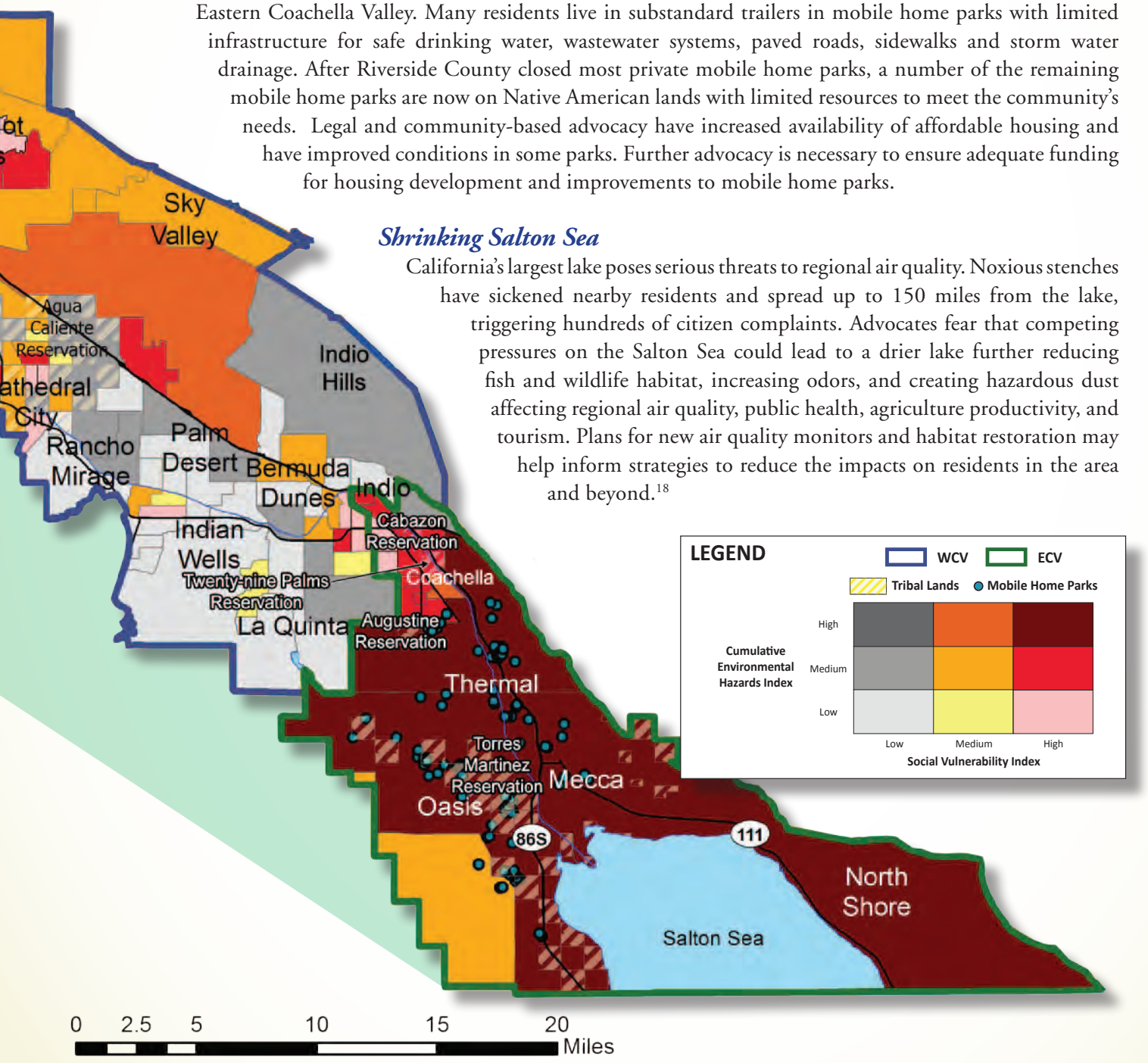
Unauthorized dumping sites pervade the landscape. Lawson Dump and Mount San Diego are the largest of the originally unauthorized sites in the region.[17] Now closed, Lawson Dump's remaining debris is over 50 feet high and with an estimated one million tons of waste. Since 2006, the Torres Martinez Solid Waste Collaborative closed and cleaned several major dumps and continues to crack down on unauthorized dumping on the reservation.

Inadequate and Unaffordable Housing

Lack of affordable and quality housing options and low-wage labor place decent housing out of reach for many in the Eastern Coachella Valley. Many residents live in substandard trailers in mobile home parks with limited infrastructure for safe drinking water, wastewater systems, paved roads, sidewalks and storm water drainage. After Riverside County closed most private mobile home parks, a number of the remaining mobile home parks are now on Native American lands with limited resources to meet the community's needs. Legal and community-based advocacy have increased availability of affordable housing and have improved conditions in some parks. Further advocacy is necessary to ensure adequate funding for housing development and improvements to mobile home parks.

Shrinking Salton Sea

California's largest lake poses serious threats to regional air quality. Noxious stenches have sickened nearby residents and spread up to 150 miles from the lake, triggering hundreds of citizen complaints. Advocates fear that competing pressures on the Salton Sea could lead to a drier lake further reducing fish and wildlife habitat, increasing odors, and creating hazardous dust affecting regional air quality, public health, agriculture productivity, and tourism. Plans for new air quality monitors and habitat restoration may help inform strategies to reduce the impacts on residents in the area and beyond.[18]



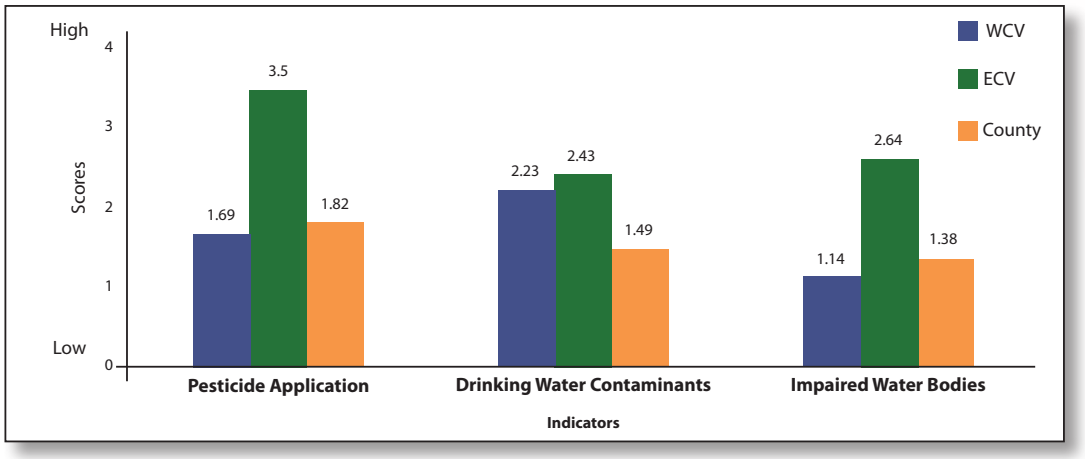
Disparities: East Meets West

The Cumulative Environmental Vulnerability Assessment (CEVA) map (Figure 2) highlights the concentration of both environmental hazards and social vulnerability in the Eastern Coachella Valley (ECV) relative to the county as a whole, and even more dramatically compared to the Western Coachella Valley (WCV). This integrated analysis is necessary to understand the ways in which the greatest concentration of environmental hazards tend to confront the people and places with the fewest social, economic, and political resources to address to these hazards. Both the cumulative environmental hazards and social vulnerability factors vary greatly from east to west. This is illustrated in Table 2 and Figure 3.

Table 2: Demographic Comparison

	WCV	ECV	Riverside County Total
Percent People of Color	49%	94%	60%
Percent limited English speakers	16%	45%	16%
Percent Below 200% Poverty Line	37%	65%	36%
Percent Unemployed	6%	14%	8%
Total Population	324,381	88,193	2,189,641

Figure 3: Environmental Indicator Comparison

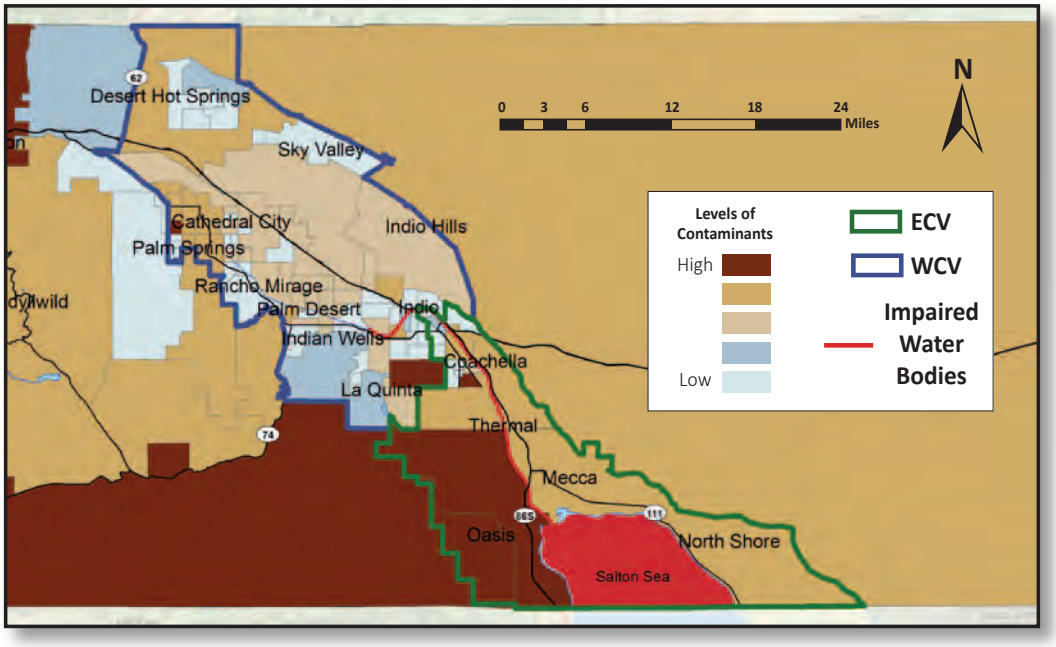


The key findings from this analysis include the following:

- The ECV has much higher rates of poverty, unemployment, and limited English proficiency as well as concentrations of non-white residents compared to the WCV and the county as a whole.
- The ECV has much higher agricultural pesticide applications than the WCV and the county as a whole.
- The ECV has much higher concentration of impaired water bodies than the WCV and the county as a whole. There are drinking water wells in the ECV with average chemical concentrations far above the state and federal Maximum Contaminant Levels for arsenic, chromium 6, perchlorate, and nitrates. In addition, some areas in the WCV, such as La Quinta, have elevated levels of chromium 6. (See Figure 4.)
- While the drinking water quality from ECV wells is similar to that in the WCV, the limited drinking water sanitation capacity in the ECV amplifies the potential health impacts on ECV residents.
- Based on the high degrees of both Cumulative Environmental Hazards and Social Vulnerability factors in the ECV, the vast majority (81%) of area residents live in places that are considered Cumulative Environmental Vulnerability Action Zones compared to the WCV and the county as a whole.
- As indicated in Figure 2, there are portions of WCV that also show high degrees of cumulative environmental hazards and social vulnerability. These areas include Desert Hot Springs and parts of Cabazon, Sky Valley, West Garnet, and Desert Edge.

School bus stop in Mecca with mounds of contaminated waste visible in the background.

Figure 4: Levels of Contaminants in Drinking Water and Impaired Water Bodies



From Research into Action

The extensive and overlapping environmental hazards and social vulnerabilities in the Eastern Coachella Valley may seem overwhelming, but local residents and leaders have begun to develop a cohesive action agenda to improve conditions in their communities. The Cumulative Environmental Vulnerability Action Zones (CEVAZ) identified here can serve as target areas for coordinated action and investments by public agencies, elected officials, foundations, businesses, advocates, and residents. No one entity or sector can accomplish this change agenda alone. Success will require new forms of collaboration between all of these who are committed to a future for the Coachella Valley and rural California that is healthy, prosperous, and sustainable. The following is an action framework that agencies and advocates in the region can use to develop specific collaborative strategies to improve the health and well-being of the region.

Public Agency Action

State and Federal Government Agencies

- Prioritize mitigation, permitting, monitoring, and enforcement actions on existing and potential future hazards to protect overburdened communities.
- Improve coverage of air quality monitoring, water quality testing, pesticide drift monitoring, and identification of unregulated dumpsites to reveal the region's hidden hazards.
- Enhance consultation processes with the region's sovereign tribal governments to promote collaborative solutions to environmental management conflicts.

Senator Barbara Boxer and US EPA Regional Administrator Jared Blumenfeld listen to residents describe their environmental justice challenges and demands.

City, County, and Regional Government Agencies

- Utilize key planning processes and documents (community plans, housing, transportation, and economic development elements of general plans) to improve environmental and social conditions in the most vulnerable communities, including unincorporated areas.
- Implement proactive infrastructure investment strategies to promote a healthy built environment through affordable, energy-efficient, housing; drinking water testing and filtration, waste water management; community economic development; transportation/ transit; and parks and recreation facilities to help build community opportunity, health and well-being.

All levels

- Enhance community engagement of the populations most at risk in the planning and decision-making on environmental, health, and housing issues to increase community self-empowerment and collaborative relationships with public agencies.

From Research into Action

Small-scale drinking water purification systems installed at mobile home parks by the Pueblo Unido CDC are addressing this major threat to public health.

Community Organization Action

- Implement community participatory mapping to draw on unique local knowledge and experiences to help put hidden hazards "on the map" and to share "community treasures" of cultural wealth.
- Support leadership development and civic engagement with youth, immigrants, residents of unincorporated communities, and other under-represented populations to participate in solving the region's economic, environmental, and social challenges.
- Integrate environmental monitoring with existing research and community engagement mechanisms such as the IVAN system and the Environmental Justice Task Force to help build local capacity.

Private Sector Action

- Prioritize the recruitment and retention of good quality jobs (living wage, environmentally-friendly, and contributing value to the local economy).
- Support job training to lend a "hand up" for low-wage workers, youth, and other under-served populations to gain access to new and future high quality jobs.
- Partner with public agencies and community organizations to pursue federal, state, regional, and other funding resources.

Lifting Up the Invisible Coachella Valley

Young people are obscured by blowing dust on their way to school, part of the multiple environmental and social challenges they face every day.

Youth leaders are taking action to promote a healthy and equitable future for their communities.

By documenting the cumulative environmental hazards and social vulnerabilities in the Coachella Valley, this report has revealed an often invisible, but vital part of California. The hard-working residents of the rural communities of the Eastern Coachella Valley are seeking the resources and opportunities necessary to make their own lives, their desert region, and the state as a whole, flourish. Supporting local residents to implement the action framework above will promote a future where health, prosperity, sustainability, and equity are as clearly visible as the magnificent mountains that ring the valley.

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[19] Disclaimer: EPA did not fund or guide the conclusions of the UC Davis report. The report is not a product of the U.S. Government or of the EPA. The views expressed are those of the authors only and do not necessarily represent those of the U.S. Government or those of the EPA. Comments submitted by EPA do not constitute concurrence with nor endorsement of the UC Davis report or any views, findings or conclusions contained therein. EPA's comments are also not intended to be an EPA sanction or endorsement or the view, findings, or conclusions expressed by UC Davis or any other individual, agency, institution, or organization in conjunction with the UC Davis report.

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UC Davis Research Team
Jonathan London, Ph.D. Principal Investigator and primary study author
Teri Greenfield, M.Ed. Director of Informatics/GIS and study co-author
Tara Zagofsky, M.S. Doctoral Candidate. Project Manager and study co-author
Evan Schmidt, M.S. GIS Specialist
Morgan Beryl, Graduate student intern
Rachel Goldstein, B.A. Research Assistant
Ana Quiroz, Allison Ferrini, and Jannette Ramirez, Student Assistants

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Ryan Sinclair, Professor, and MPH graduate students Melisa Custer and Jessica Jaeger, Loma Linda University

Peer Reviewers
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