POLICY BRIEF
September 2025

UCR Inland Empire Labor and Community Center

Protecting Workers from Climate Hazards in Southern California's Inland Empire

EXECUTIVE SUMMARY

Southern California's Inland Empire – comprising Riverside and San Bernardino counties – is one of the fastest-growing regions in the state and a vital economic hub for the nation's logistics industry. It is also at the epicenter of two converging crises: escalating climate change and rapid industrial expansion. With projections for more frequent and intense heatwaves, wildfires, droughts, and floods, the region's workers are facing an unprecedented "cocktail" of occupational hazards.[1,2] These threats are compounded by the significant air pollution generated by the region's growing logistics sector, which disproportionately impacts low-income communities of color.[3,4,5]

This policy brief investigates the urgent need for a comprehensive and proactive approach to worker protections in the face of these challenges. It outlines how climate-related hazards, including extreme heat and poor air quality, are actively harming the physical and mental well-being of the Inland Empire's labor force.[6,7,8,9,10,11,12] Drawing on existing research and publicly available data, this brief identifies the most vulnerable workers—including farmworkers, construction crews, and warehouse employees—and highlights the existing social and economic inequities that amplify the workplace risks to health and safety associated with extreme heat and air pollution.

Findings indicate an increased need for worker training and education, coupled with robust monitoring and enforcement mechanisms designed to protect workers' health and safety. While some state regulations and local initiatives are in place along with a statewide Extreme Heat Action plan, greater policy coordination, enforcement, and other policy improvements are essential to fully address worker vulnerability from climate-related threats.

KEY FINDINGS

1. **The Inland Empire is already experiencing more extreme weather events** than two decades ago, with projections for more extreme heat, wildfires, droughts, and flooding.
2. **Climate change introduces and exacerbates a wide range of physiological and mental health risks to workers**, including heat exhaustion, heat stroke, and respiratory disease.
3. **Outdoor workers** (e.g., agriculture, construction, transportation, and other industrial-related occupations) **are generally more vulnerable to the impacts of climate change** than those in indoor workplaces, although some indoor workers lack access to temperature control and clean air. **Over 150,000 workers in the Inland Empire are in high-risk, climate-vulnerable occupations**, compared to 1.5 million statewide; nearly 1 in 10 of the high-risk workers in California are from the Inland Empire. Across the state, **these workers are disproportionately Black and Latino and earn lower wages** than other occupations identified as low-risk from climate change impacts.
4. **Staff shortages at the California Division of Occupational Health and Safety (Cal/OSHA) are undermining the effectiveness of extreme heat and air quality mitigation policies**. In response, some local jurisdictions have established strategic partnerships with worker centers, community-based organizations, and labor unions to train and educate at-risk workers.

OVERVIEW OF CLIMATE HAZARDS IN THE INLAND EMPIRE

The Inland Empire is experiencing significant climate changes. California's most recent Climate Change Assessment reports that "the region's climate is becoming more extreme, with daily average high temperatures projected to increase" along with more dramatic variations in precipitation by the end of the century (p. 5).[13,14] California's Cal-Adapt tool identifies an increasing number of extreme heat days, an increased number of high-risk wildfire days, and other climate-related hazards for Riverside and San Bernardino counties (see Appendix A, Table A-1).

The Inland Empire has also emerged as a major economic hub for Trans-Pacific trade, particularly in the warehousing and logistics industry.[15] This rapid industrial expansion has brought significant environmental and social costs, exacerbating existing climate hazards, and creating a critical need for policies that protect its workforce and communities.[16,17,18] The region's many logistics hubs generate significant air pollution from diesel truck traffic, leading to widespread health impacts.[19,20] The compounding effects of these climate and environmental hazards disproportionately affect outdoor workers and low-income communities of color, particularly those living near warehouse clusters.[21,22,23,24,25]

KEY CLIMATE-RELATED HEALTH CONCERNS FOR WORKERS

Climate change introduces and exacerbates significant hazards for workers, leading to a wide array of adverse physical and mental health outcomes.[26] A comprehensive understanding of these threats is critical for developing effective protective policies.

Extreme Heat and Its Physiological and Mental Health Impacts

Extreme heat is a pervasive and escalating threat, impacting an estimated 70% of the world's workforce annually.[27,28] The physiological effects are well-documented, ranging from moderate conditions to life-threatening emergencies. Two common health-related illnesses are heat exhaustion and heatstroke. With the addition of other related illnesses (e.g., cramps, fainting, rash, and muscle breakdown), heat-related illnesses can affect workers in both indoor and outdoor environments (see Appendix A, Table A-2).

Hotter temperatures have been shown to significantly increase workplace accidents and injuries for both indoor and outdoor settings, with an estimated social cost of $1 billion nationally.[29,30,31] Heat exposure is estimated to contribute to as many as 2,000 worker fatalities and up to 170,000 injuries annually in the U.S.[32]

Extreme heat also impairs mental health. Research shows that high temperatures can lead to increased stress, anxiety, depression, and irritability;[33,34] as well as can impair cognitive function, reduce concentration, and increase the risk of workplace errors and accidents.[35,36] The psychological toll can be substantial for workers experiencing prolonged heat exposure or climate-related job insecurity, negatively affecting both their mood and ability to make decisions.[37]

The Pervasive Threat of Poor Air Quality

The Inland Empire's air quality is severely impacted by both climate change and the logistics industry, posing a significant health risk to its workforce. In particular, the region is especially susceptible to wildfire smoke, diesel and industrial pollutants, and drought-related dust and pathogens (see Appendix A, Table A-3).

OCCUPATIONS AND POPULATIONS MOST AT-RISK

The impacts of climate change are not felt equally across the workforce. Certain occupational groups are exceptionally vulnerable due to their work environment, physical duties, and pre-existing health conditions.[38]

Outdoor and Indoor Workers in High-Risk Environments

Outdoor workers, due to the nature of their jobs, face direct and prolonged exposure to climate hazards.[39,40,41,42] For example, research finds that

farmworkers die from heat stroke at a rate nearly 20 times greater than the general population[43] and are highly vulnerable to wildfire smoke.[44] Similarly, construction workers, emergency responders, and transportation workers—including the commercial delivery truck drivers who are a critical part of the Inland Empire's economy—are at high risk from extreme heat and air pollution.[45]

Some indoor workers are also at significant risk, including those employed in the Inland Empire's burgeoning logistics sector. Warehouse workers in facilities without adequate air conditioning or ventilation are highly vulnerable to heat-related illnesses.[46,47] They are also exposed to airborne pollutants from the high concentration of diesel vehicles in their work environment.[48]

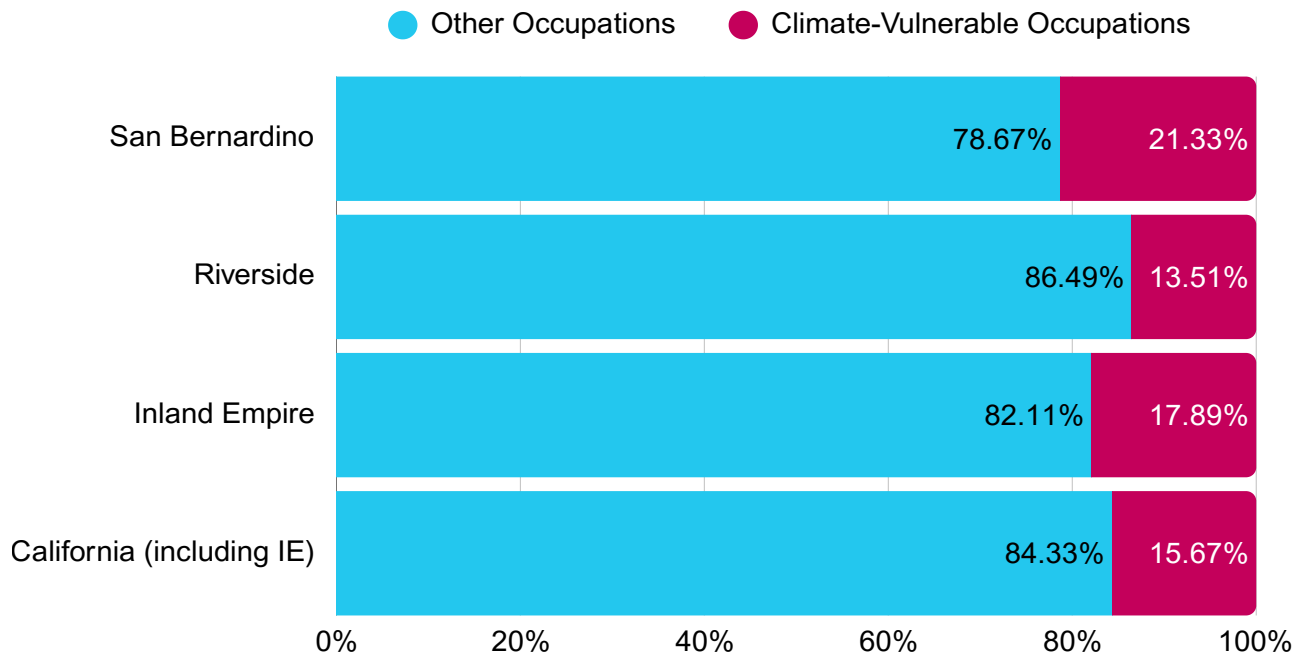
For purposes of this brief, we include outdoor workers and indoor workers in high-risk environments in our analysis of "climate-vulnerable" workers. Across the state, these workers represent nearly 16% of all workers (see Appendix B, Table B-1 for occupation list). The proportion of climate-vulnerable workers is slightly higher than the state level in San Bernardino county and the Inland Empire; however, that number is much lower in Riverside county (see Figure 1).

The occupations that employ the 4 largest number of climate-vulnerable workers across all geographies (by rank) within the state are drivers/sales workers, laborers and freight stock material movers - hand, janitors and building cleaners, and construction workers. Several of these occupations involve some level of both indoor and outdoor work (see Figure 2).

FIGURE 1. CLIMATE-VULNERABLE OCCUPATIONS VERSUS OTHER OCCUPATIONS BY GEOGRAPHY

More than 20% of San Bernardino County's Workforce is Employed in Climate-Vulnerable Occupations, Higher than California and Riverside County

Share of total climate-vulnerable workers, by geography

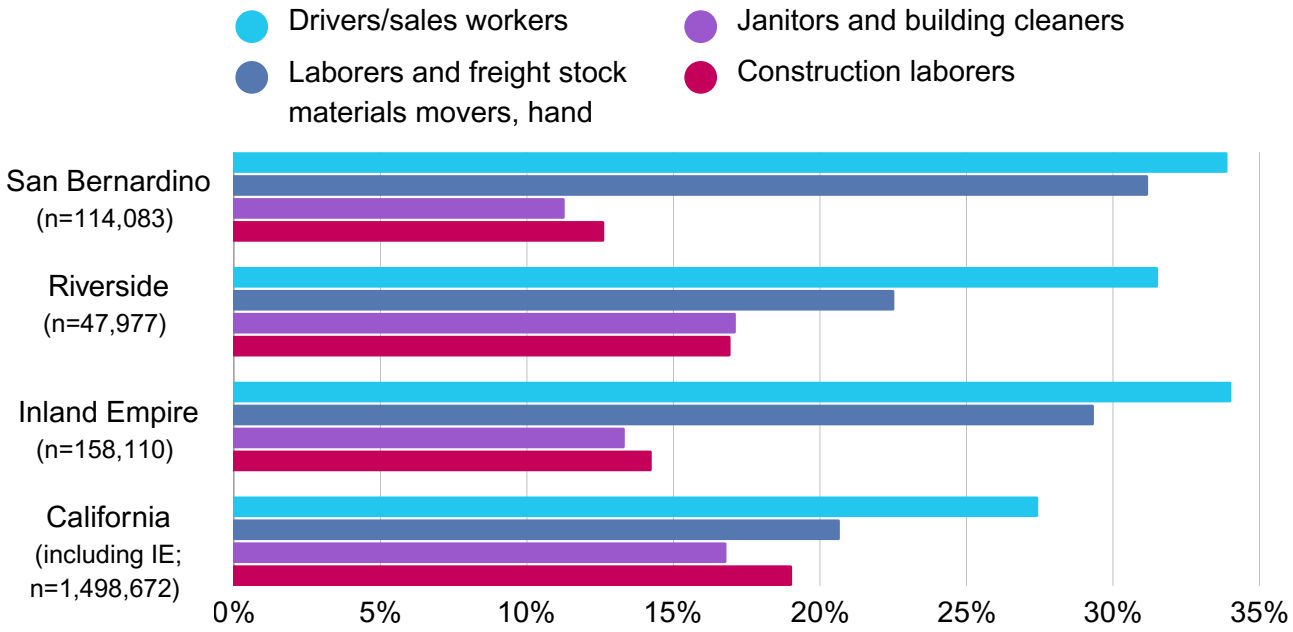


Source: 2023 American Community Survey 5-Year Estimates via IPUMS.
Note: Not in labor force and unemployed excluded.

FIGURE 2. THE FOUR MOST COMMON CLIMATE-VULNERABLE OCCUPATIONS BY GEOGRAPHY

California and the Inland Empire Share the Same Four Most Common Climate-Vulnerable Occupations

Share of total climate-vulnerable workers, by geography



Source: 2023 American Community Survey 5-Year Estimates via IPUMS

Disproportionately Affected Populations

Existing social and economic inequities amplify the health risks posed by climate change. A disproportionate number of Latino, Black, and Native Hawaiian or Pacific Islander workers are in high-risk occupations, leading to greater exposure and amplified economic hardship.[49,50,51] In the Inland Empire, Latino residents make up about 60% of those living within a quarter of a mile of a warehouse, bearing the brunt of the associated pollution and environmental injustice.[52]

Low-income and non-unionized workers are also highly vulnerable. Many warehouse workers, for instance, work long hours, earn less than a living wage, and rely on public assistance benefits; they often lack the resources necessary to address health challenges.[53,54] Immigrant and undocumented workers face higher risks due to factors such as lack of safety training, language barriers, and fear of retaliation from employers.[55]

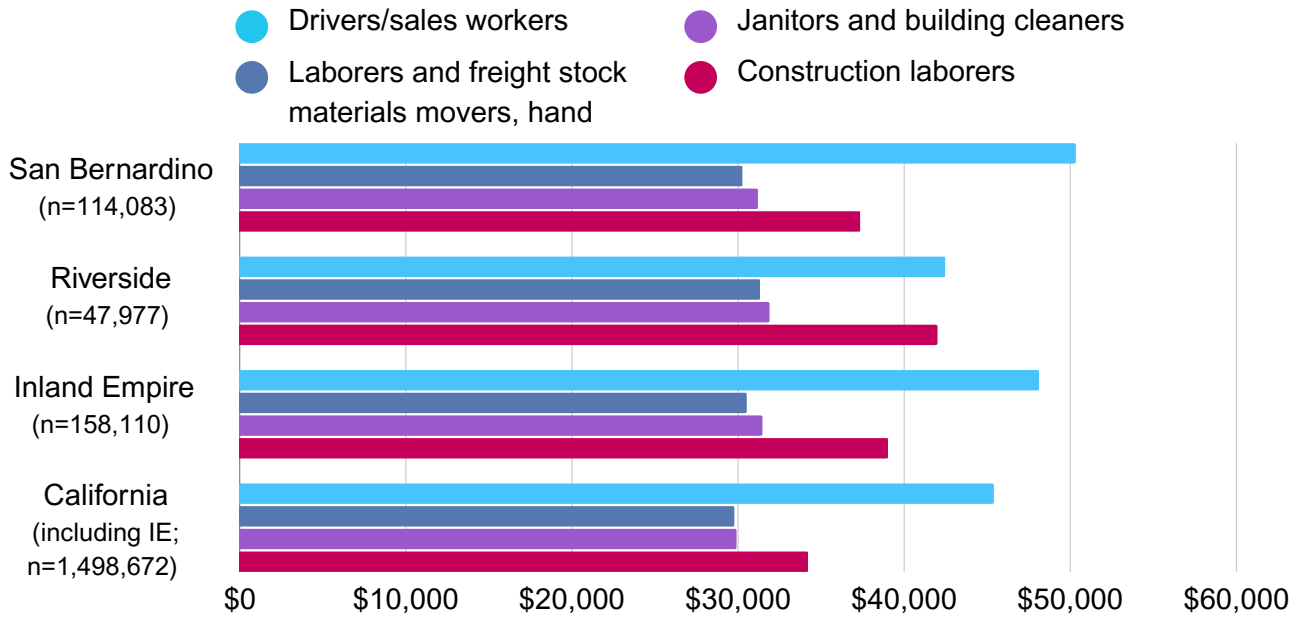
Based on our analysis of data from the American Community Survey, every single occupation of the top four most represented climate-vulnerable occupations for every geography fell below the mean salary/wage across the Inland Empire ($56,835) and the state ($65,850). Drivers and sales workers tended to be paid the most, while laborers and freight workers were paid the least (see Figure 3).

As Figure 4 shows, Latino workers make up the majority of climate-vulnerable workers across every geographic region we identified across California except Riverside. Over two-thirds of climate-vulnerable workers are Latino in San Bernardino, while just over one-third are Latino in Riverside County. We also note that the majority of climate-vulnerable workers in the Inland Empire (n=158,110) were employed in San Bernardino (n=114,083), compared to only 47,977 in Riverside.

FIGURE 3. THE MEAN SALARY/WAGES OF THE FOUR MOST COMMON CLIMATE-VULNERABLE OCCUPATIONS BY GEOGRAPHY

All Four Most Common Climate-Vulnerable Occupations Earned Less than the Statewide Average ($65,850)

Mean salary/wages of workers, by occupation and geography

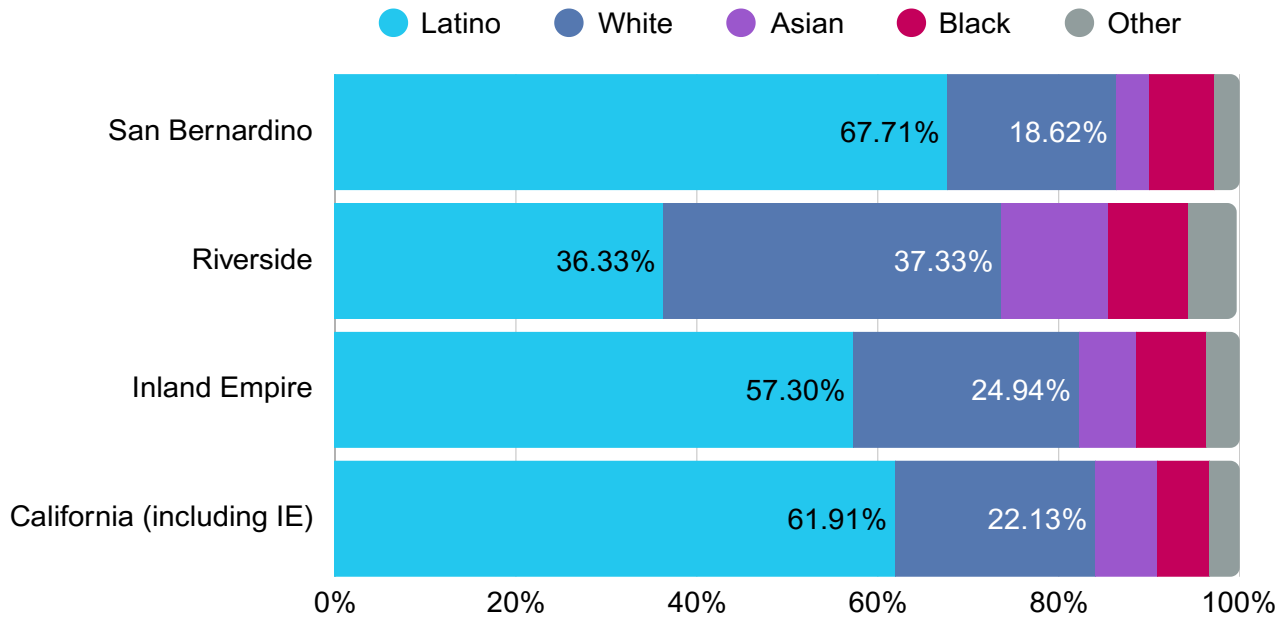


Source: 2023 American Community Survey 5-Year Estimates via IPUMS

FIGURE 4. THE SHARE OF CLIMATE-VULNERABLE OCCUPATIONS BY RACE/ETHNICITY AND GEOGRAPHY

The Demographics of Climate-Vulnerable Occupations Varies by Geography

Share of workers employed in climate-vulnerable occupations, by race/ethnicity and geography



Source: 2023 American Community Survey 5-Year Estimates via IPUMS

EXISTING REGULATIONS AND WORKPLACE INTERVENTIONS

Current occupational safety and health protections often struggle to adapt to these evolving climate risks, highlighting a critical gap between the scale of the problem and the available solutions.[56] California stands as a national leader in worker protection, having an enforceable state occupational heat standard that has successfully reduced heat-related injuries.[57,58] After years of advocacy from organizations like the Warehouse Worker Resource Center, this standard has recently expanded protections to most indoor workers.[59] The state also has regulations related to wildfire smoke protection that cover both outdoor and indoor workers.[60] On a local level, Riverside County has adopted protocols for supervisors to minimize the risk of heat-related illnesses among county employees.[61] In contrast, the federal Occupational Safety and Health Administration's (OSHA) longstanding failure to implement an enforceable national workplace heat hazard rule leaves many workers across the country unprotected.[62]

At the workplace level, interventions such as provision of cool drinking water, adequate breaks in shaded areas, and acclimatization procedures for new workers have been identified as crucial for worker safety.[63,64,65,66] Adjusting work schedules to avoid the hottest hours of the day is also recommended, and is commonly practiced in agriculture.[67] Furthermore, comprehensive worker training on hazard identification and prevention is vital, with programs from organizations like the UCLA Labor Occupational Safety and Health Program (LOSH) and the recently established Los Angeles County Department of Public Health's Office of Worker Health and Safety providing community-based outreach and education.[68,69]

While California's occupational heat standard is a vital tool, its effectiveness is being undermined by a lack of enforcement capacity. A recent California State Auditor's report found that Cal/OSHA is critically understaffed, with a 32 percent vacancy rate in its enforcement branch.[70] This shortage significantly limits the agency's ability to perform on-site inspections and ensure compliance with the outdoor and new indoor heat standards and other health and safety regulations. The report also identified inconsistent documentation and a lack of follow-up to confirm that employers have abated hazards. Therefore, a critical step to improving worker safety is to provide Cal/OSHA with the necessary funding and staffing to fully enforce existing regulations and ensure that all workers, especially those in high-risk environments, are protected.

Advocacy and Community-Based Efforts

A variety of advocacy and community-based efforts are working to fill the gaps in regulatory protection in the Inland Empire and beyond. Organizations like the Warehouse Worker Resource Center advocate for improved conditions by collaborating with researchers to document unsafe working conditions and support injured workers.[71] Community-based participatory research is also being used to engage workers in understanding their own health experiences and to identify potential points of intervention.[72] For example, a study on wildfire risk communication in the Eastern Coachella Valley highlighted the importance of tailored communication strategies to effectively reach non-English-speaking communities and workers.[73] Amazon warehouse workers in San Bernardino have also successfully organized around workplace safety issues by negotiating paid days off when air quality is compromised due to nearby wildfires.[74] On a broader scale, community organizations are demanding moratoriums on new warehousing and advocating for policies that reduce air pollution to protect the health of workers and communities and slow the pace of climate change, such as investing in zero-emissions technology.[75,76]

Federal Funding Threats

The effectiveness of state and local efforts to address climate-related hazards depends on federal-level policies. Proposed federal budget plans have included significant cuts to agencies like the National Institute for Occupational Safety and Health (NIOSH) and the Occupational Safety

and Health Administration (OSHA). These proposals include an 8% budget cut for OSHA, which is likely to reduce its workforce by about 200 staff members[77] and reduce support for critical programs that support research on and enforcement of worker safety.[78] Given that Cal/OSHA receives federal funds, these proposed cuts pose a direct and imminent threat to the agency's capacity to enforce heat safety standards.

RECOMMENDATIONS

In line with existing research on climate-related health impacts, we find that the Inland Empire's workforce is susceptible to life-threatening illnesses and injuries from ongoing and projected extreme weather events. We recommend the following suite of actions at the local, state, and federal levels to prioritize workers' health and well-being.

Local

- Bolster local outreach, education, and training programs related to workplace and climate-related health and safety through strategic partnerships with worker centers, labor unions, community-based organizations, and business associations
- Partner with state agencies to support the enforcement of heat and other occupational safety standards
- Apply for state and federal grants, such as California's Extreme Heat and Community Resilience Program, to increase local capacity for emergency preparedness and explore options to establish cooling centers

State

- Expand the Cal/OSHA workforce to ensure employers are complying with heat and other occupational safety standards
- Regularly monitor the impact and improve as needed Cal/OSHA's heat safety and wildfire protection standards
- Continue funding worker outreach and climate resilience programs, such as the California Workplace Outreach Program (CWOP) and 99 Calor Campaign
- Explore options for hazard pay for days when it's too dangerous to work, with a priority on low-wage workers, to discourage employment in unsafe conditions and protect workers from climate-related income losses
- Strengthen, update, and implement the state's Extreme Heat Action Plan

Federal

- Reverse planned staff reductions at NIOSH and OSHA
- Establish a federal heat standard for both indoor and outdoor workers and further strengthen federal OSHA regulations related to wildfire smoke

CONCLUSION

The Inland Empire's dual identity as a logistics hub and a climate-vulnerable region creates a unique and escalating health and safety crisis for its workforce. Existing research demonstrates that extreme heat, poor air quality, and other climate hazards are not distant threats. They are present, intensifying, and actively harming the health and safety of the region's workers, particularly those who are already marginalized. The current patchwork of state regulations, local initiatives, and advocacy efforts provides a foundation, but a more comprehensive, proactive, robust, and equitable policy approach is urgently needed to address the full spectrum of these challenges.

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ACKNOWLEDGEMENTS

This project was made possible with support from the James Irvine Foundation, UC Worker Rights Policy Initiative, the Minority Serving Institution Research Academy (MSIRA), and the California Medical Scholars Program (CSMP) at UC Riverside. We thank Michael Khvat for his research assistance. We also thank Beth Tamayose and Cheylynda Barnard for feedback on earlier drafts. The opinions and conclusions expressed herein are solely those of the authors and do not necessarily represent the views of our funders, our staff, our advisory board and committees, or the University of California.

MISSION STATEMENT

The Inland Empire Labor and Community Center at UC Riverside brings together workers, students, faculty, labor and community organizations, and policymakers to address critical issues facing working people and their communities in the Inland Empire and California. By Inland Empire, we refer to the communities within Riverside and San Bernardino Counties, including High Desert communities and other areas. Through our research and our engagement with local communities and UCR students, we seek to promote good jobs and to improve employment opportunities for all workers in the region and state and to do so in ways that are beneficial to our communities and are environmentally sustainable. Through our activities, we also strive to educate and empower the next generation of community and labor leaders, to promote diversity, equity, and inclusion within our regional and state economy, and to expand and improve the rights of workers and immigrants.

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APPENDIX A

Table A-1. Projected Climate Hazards in San Bernardino and Riverside Counties by 2050

Hazard Category	San Bernardino County	Riverside County
Extreme Heat	27 - 50 additional days per year above 105.7ºF by mid-century compared to a historical baseline of 4 days per year (1961 - 1990)	19 - 25 additional days per year above 106ºF by mid-century compared to a historical baseline of 4 days per year (1961 - 1990)
Wildfire Risk	High; 14% increase in extreme wildfire risk days	High; 12% increase in extreme wildfire risk days
Flood Risk	Substantial; increase in intense precipitation events	Substantial; increase in intense precipitation events
Drought	2-inch reduction in annual precipitation by mid-century	2-inch reduction in annual precipitation by mid-century

Source: Cal-Adapt. (2022). Climate Tools [Web tool]. University of California, Berkeley's Geospatial Innovation Facility. https://v2.cal-adapt.org/tools/

Table A-2. Summary of Key Heat-Related Illnesses and Symptoms

Illness	Symptoms & Description
Heat Exhaustion	Characterized by profuse sweating, a rapid pulse, faintness, dizziness, fatigue, nausea, and muscle cramps. It is a precursor to heatstroke.
Heatstroke	A life-threatening medical emergency where the body's core temperature reaches 104°F (40°C) or higher. Symptoms include high body temperature, confusion, agitation, slurred speech, seizures, and altered sweating patterns. Untreated heatstroke can lead to irreversible organ damage or death.
Other Heat-Related Illnesses	Includes heat cramps (muscle pains/spasms), heat syncope (fainting), heat rash (red clusters of pimples), and rhabdomyolysis (muscle cell breakdown due to extreme exertion).

Source: International Labour Organization. (2024, April 22). Ensuring safety and health at work in a changing climate. https://www.ilo.org/publications/ensuring-safety-and-health-work-changing-climate

Table A-3. Air Quality Hazards and Health Impacts

Air Quality Hazard	Source & Health Impacts
Wildfire Smoke	Wildfire emissions contribute to degraded air quality with smoke fine particulate matter (PM2.5) linked to hundreds of thousands of deaths globally. Smoke inhalation causes significant respiratory and cardiovascular issues, particularly impacting outdoor workers.*
Diesel & Industrial Pollutants	The rapid expansion of warehouses and associated influx of diesel trucks generate alarming levels of nitrogen oxides and particulate matter, causing devastating health impacts including asthma, cancer, and chronic obstructive pulmonary disease (COPD). Asthma and cancer rates are higher closer to distribution centers.**
Drought-Related Dust & Pathogens	Droughts increase dust and airborne particulate matter, which exacerbates respiratory conditions. This can also increase exposure to pathogens like those causing Valley Fever, a fungal infection spread through spores in dry soil.***

Sources: *Marlier, M. E., Brenner, K. I., Liu, J. C., Mickley, L. J., Raby, S., James, E., Ahmadov, R., & Riden, H. (2022). Exposure of agricultural workers in California to wildfire smoke under past and future climate conditions. *Environmental Research Letters, 17*(9), 094045.

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APPENDIX B

Data & Methodology

We reviewed scholarly and applied literature, government publications, news articles, and field-based assessments to analyze the climate hazards facing workers in the Inland Empire. We also utilized descriptive statistics to estimate the number and demographics of workers in the region's climate-vulnerable occupations. Using 5-year estimates from the American Community Survey (ACS) via Integrated Public Use Microdata Series (IPUMS) and based on previous research,* we identified jobs with high exposure to climate hazards and analyzed workforce composition across sectors such as agriculture, construction, and transportation. Our estimates only include members of the workforce between the ages of 16 and 64.

*Sources: Dahl, K., & Licker, R. (2021); Petek, G. (2022); Ndugga et al. (2023)

Table B-1. Climate-Vulnerable Occupations List

ACS Occupation Code	ACS IPUMS Name
6010	Agricultural inspectors
9110	Ambulance drivers and attendants, except emergency medical technicians
3900	Animal control workers
2721	Athletes and sports competitors
6210	Boilermakers
6220	Brickmasons, blockmasons, stonemasons, and reinforcing iron and rebar workers
9121	Bus drivers, school
9130	Bus drivers, transit and intercity
6230	Carpenters
6250	Cement masons, concrete finishers, and terrazzo workers
9610	Cleaners of vehicles and equipment
2722	Coaches and scouts
7510	Coin, vending, and amusement machine servicers and repairers
1640	Conservation scientists and foresters
6660	Construction and building inspectors
6305	Construction equipment operators
6260	Construction laborers

Table B-1. Climate-Vulnerable Occupation List (Continued)

ACS Occupation Code	ACS IPUMS Name
9570	Conveyor, dredge, and hoist and winch operators
9510	Crane and tower operators
3940	Crossing guards and flaggers
6800	Derrick, rotary drill, and service unit operators, and roustabouts, oil, gas, and mining
4950	Door-to-door sales workers, news and street vendors, and related workers
9130	Driver/sales workers and truck drivers
7410	Electrical power-line installers and repairers
6355	Electricians
6835	Explosive workers, ordnance handling experts, and blasters
6710	Fence erectors
3750	Fire inspectors
3740	Firefighter
3840	Fish and game wardens and parking enforcement officers
6115	Fishing and hunting workers
6120	Forest and conservation workers
6040	Graders and sorters, agricultural products
6720	Hazardous materials removal workers
7315	Heating, air conditions, and refrigeration mechanics and installers
6600	Helpers, construction trades
6730	Highway maintenance workers
9600	Industrial truck and tractor operators
4220	Janitors and building cleaners
9620	Laborers and freight, stock, and materials movers, hand
4251	Landscaping and groundskeeping workers

Table B-1. Climate-Vulnerable Occupation List (Continued)

ACS Occupation Code	ACS IPUMS Name
9210	Locomotive engineers and operators
6130	Logging workers
7350	Maintenance workers, machinery
9825	Military enlisted tactical operations and air/weapons specialists and crew members
7360	Millwrights
9150	Motor vehicle operators, all other
6050	Other agricultural workers
6765	Other construction related workers
6950	Other extraction workers
4255	Other grounds maintenance workers
9720	Other material moving workers
3960	Other protective service
9265	Other rail and transportation workers
9430	Other transportation workers
9350	Parking attendants
9415	Passenger attendants
4240	Pest control workers
6441	Pipelayers
6460	Plasterers and stucco masons
3870	Police officer
5550	Postal service mail carriers
9650	Pump station operators
7020	Radio and telecommunications equipment installers and repairers
6740	Rail-track laying and maintenance equipment operators
9240	Railroad conductors and yardmasters

Table B-1. Climate-Vulnerable Occupation List (Continued)

ACS Occupation Code	ACS IPUMS Name
4622	Recreation workers
9720	Refuse and recyclable materials collectors
7560	Riggers
6515	Roofers
9300	Sailers and marine oilers, and ship engineers
3946	School bus monitors
3930	Security guarding and gaming surveillance workers
6520	Sheet metal workers
9310	Ship and boat captains and operators
9141	Shuttle drivers and chauffeurs
6540	Solar photovoltaic installers
6350	Structural iron and steel workers
6825	Surface mining machine operators and earth drillers
1560	Surveying and mapping technicians
9142	Taxi drivers
7420	Telecommunications line installers and repairers
4540	Tour and travel guides
9410	Transportation inspectors
9365	Transportation service attendants
4252	Tree trimmers and pruners
2723	Umpires, referees, and other sports officials
6850	Underground mining machine operators

Note: All first-line supervisors for several occupations were excluded from our list since our analysis focuses on non-supervisory roles.

Data Source: Ruggles, S., Flood, S., Sobek, M., Backman, D., Cooper, G., Rivera Drew, J. A., Richards, S., Rogers, R., Schroeder, J., Williams. K. C. W. (2025) *IPUMS USA: Version 16.0* [dataset]. Minneapolis, MN: IPUMS.