January 26, 2022

Douglas L. Parker, Assistant Secretary of Labor
U.S. Department of Labor
Occupational Safety and Health Administration
200 Constitution Avenue, NW
Room Number N3626
Washington, D.C. 20210

Re: Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings
Docket No. OSHA–2021–0009

Submitted via Regulations.gov.

Dear Assistant Secretary Parker:

The Natural Resources Defense Council (NRDC) appreciates the opportunity to comment on the Occupational Safety and Health Administration's (OSHA) Advanced Notice of Proposed Rulemaking (ANPRM) regarding Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings.

Heat has been a known occupational threat to the lives and livelihoods of U.S. workers for most of OSHA's 50-year history.[1] But even now, workers from restaurants in the Pacific Northwest, to warehouses in California's Inland Empire, to construction sites in Texas, to farm fields in Florida, are experiencing unnecessary and preventable illnesses, injuries, and deaths from heat stress.

Climate change will make the existing situation even worse,[2] which is why NRDC has been working with partners since 2018 to advocate for a federal occupational heat safety standard.[3] The deep vulnerability of lower-wage workers and workers of color to extreme heat is a particularly salient example of the urgent need to address climate-related health harms in the pursuit of a safer, healthier, and more just and equitable society.

Broadly, our comments address the need for OSHA to:

---

[1] National Institute of Occupational Safety and Health, "Criteria for a Recommended Standard: Occupational Exposure to Hot Environments," 1972, https://www.cdc.gov/niosh/docs/72-10269/default.html.
[2] E.g., R. Licker et al., "Quantifying the Impact of Future Extreme Heat on The Outdoor Work Sector in the United States," *Elementa: Science of the Anthropocene* 10, no. 1 (2022): https://doi.org/10.1525/elementa.2021.00048.
[3] Juanita Constible, Vijay Limaye, and Kim Knowlton, "American Workers Need Better Safeguards from Extreme Heat," NRDC, July 17, 2018, https://www.nrdc.org/experts/juanita-constible/american-workers-need-better-safeguards-extreme-heat.

- Provide protections for *all* workers, not just those outdoors or in known high-heat industries and occupations;
- Use multiple data sources to better understand the scale of the problem, but also to proceed with the understanding that existing estimates of occupational heat-related mortality and morbidity are conservative;
- Ensure that standards fully incorporate the future impacts of climate change; and
- Go beyond the starting point of existing state heat stress standards to be more protective, including specific provisions such as employee acclimatization plans, tailored training, as-needed paid rest breaks, and protection from retaliation.

Our detailed responses to selected questions from the ANPRM are below.

ANPRM Question 1: **What are the occupational health or safety impacts of hazardous heat exposure?**

The occupational health and safety impacts of hazardous heat on workers include:[4,5,6,7,8,9,10,11,12]

- Premature mortality from conditions such as heat stroke and cardiovascular disease;
- Emergency room visits and hospital admissions for issues such as kidney failure and mental health conditions;
- Adverse pregnancy and birth outcomes such as early term birth and stillbirth;
- Injuries associated with falling from heights or other accidents associated with heat-related losses in cognition, attention, and coordination; and
- Long-term disability from cognitive or organ dysfunction.

[4] Kristie L. Ebi et al., "Hot Weather and Heat Extremes: Health Risks," *The Lancet* 398, no. 10301 (2021): 698-708, https://doi.org/10.1016/S0140-6736(21)01208-3.
[5] Marina Romanello et al., "The 2021 Report of the Lancet Countdown on Health and Climate Change: Code Red for a Healthy Future," *The Lancet* 398, no. 10311 (2021): 1619–62, https://doi.org/10.1016/S0140-6736(21)01787-6.
[6] Senthold Asseng et al., "The Upper Temperature Thresholds of Life," *The Lancet Planetary Health* 5, no. 6 (2021): e378-e385, https://doi.org/10.1016/S2542-5196(21)00079-6.
[7] Camilo Mora et al., "Twenty-Seven Ways a Heat Wave Can Kill You: Deadly Heat in the Era of Climate Change," *Circulation: Cardiovascular Quality and Outcomes* 10, no. 11 (2017), https://doi.org/10.1161/CIRCOUTCOMES.117.004233.
[8] Matthew Francis Chersich et al., "Associations between High Temperatures in Pregnancy and Risk of Preterm Birth, Low Birth Weight, and Stillbirths: Systematic Review and Meta-Analysis," *BMJ* (2020): m3811, https://doi.org/10.1136/bmj.m3811.
[9] R. Thompson et al., "Associations between High Ambient Temperatures and Heat Waves with Mental Health Outcomes: A Systematic Review," *Public Health* 161 (2018): 171-191, https://doi.org/10.1016/j.puhe.2018.06.008.
[10] R. Jisung Park, Nora Pankratz, and A. Patrick Behrer, "Temperature, Workplace Safety, and Labor Market Inequality," IZA Institute of Labor Economics, 2021, https://www.iza.org/publications/dp/14560/temperature-workplace-safety-and-labor-market-inequality.
[11] Syeda Hira Fatima et al., "Extreme Heat and Occupational Injuries in Different Climate Zones: A Systematic Review and Meta-Analysis of Epidemiological Evidence," *Environment International* 148 (2021): 106384, https://doi.org/10.1016/j.envint.2021.106384.
[12] Blesson M. Varghese et al., "The Effects of Ambient Temperatures on the Risk of Work-Related Injuries and Illnesses: Evidence from Adelaide, Australia 2003-2013," *Environmental Research* 170 (2019): 101-109, https://doi.org/10.1016/j.envres.2018.12.024.

Multiple occupational factors increase the likelihood that workers will experience unhealthy heat stress, including:[13,14,15,16,17,18]

- Unavoidable exposure to high temperatures, particularly at worksites that are outdoors, have insufficient ventilation and/or cooling, involve hot machinery or equipment (e.g., ovens and kilns), or involve confined spaces;
- Metabolic heat production associated with sustained physical activity;
- Requirements to wear specific uniforms or protective clothing or equipment that impede natural cooling mechanisms;
- Inflexible work hours that limit the ability of workers to avoid the hottest times of day;
- Incentive or penalty structures that discourage workers from taking needed rest or hydration breaks; and
- Employer/worker power dynamics that make it challenging for workers to assert their rights to a safe and healthy workplace, such as retaliation, intimidation, and wage theft by employers. This dynamic is particularly relevant for immigrant workers,[19] substantial numbers of whom are undocumented in industries such as agriculture, construction, and meatpacking.[20,21]

Hot conditions also may increase the likelihood of harm from other occupational hazards, such as pesticides or wildfire smoke.[22] For example, heat can negatively affect the fit of respiratory

---

[13] Kristie L. Ebi et al., "Hot Weather and Heat Extremes: Health Risks," *The Lancet* 398, no. 10301 (2021): 698-708, https://doi.org/10.1016/S0140-6736(21)01208-3.
[14] Ann Rosenthal, "Death by Inequality: How Workers' Lack of Power Harms Their Health and Safety," Economic Policy Institute, April 2021, https://www.epi.org/unequalpower/publications/death-by-inequality-how-workers-lack-of-power-harms-their-health-and-safety/.
[15] Syeda Hira Fatima et al., "Extreme Heat and Occupational Injuries in Different Climate Zones: A Systematic Review and Meta-Analysis of Epidemiological Evidence," *Environment International* 148 (2021): 106384, https://doi.org/10.1016/j.envint.2021.106384.
[16] Nathan B. Morris et al., "The HEAT-SHIELD Project — Perspectives from an Inter-Sectoral Approach to Occupational Heat Stress," *Journal of Science and Medicine in Sport* 24, no. 8 (2021): 747-755, https://doi.org/10.1016/j.jsams.2021.03.001.
[17] G. P. Kenny et al., "Climate Change and Heat Exposure: Impact on Health in Occupational and General Populations," in *Exertional Heat Illness*, Adams W., Jardine J. (eds), 2020, https://doi.org/10.1007/978-3-030-27805-2_12.
[18] U.S. Environmental Protection Agency, "Appendix F. Labor," in "Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts," 2021, www.epa.gov/cira/social-vulnerability-report.
[19] E.g., Stephen Groves and Sophia Tareen, "U.S. Meatpacking Industry Relies on Immigrant Workers. But a Labor Shortage Looms," *Los Angeles Times*, May 26, 2020, https://www.latimes.com/food/story/2020-05-26/meatpacking-industry-immigrant-undocumented-workers.
[20] Nicole Prchal Svajlenka, "Protecting Undocumented Workers on the Pandemic's Front Lines," Center for American Progress, December 2, 2020, https://www.americanprogress.org/article/protecting-undocumented-workers-pandemics-front-lines-2/.
[21] Angela Stuesse and Nathan T. Dollar, "Who are America's Meat and Poultry Workers?" Economic Policy Institute, September 20, 2020, https://www.epi.org/blog/meat-and-poultry-worker-demographics/.
[22] Union of Concerned Scientists, "Farmworkers at Risk: The Growing Dangers of Pesticides and Heat," 2019, https://ucsusa.org/sites/default/files/2019-12/farmworkers-at-risk-report-2019-web.pdf.

personal protective equipment (PPE) or make workers more reluctant to wear PPE in the first place.[23]

***ANPRM Question 6:* What factors lead to the underreporting of occupational heat-related illness, injuries, and fatalities of which OSHA should be aware?**

There are myriad reasons for underreporting of occupational heat-related illnesses, injuries, and deaths, many of which are not specific to heat. Examples include:[24,25,26,27,28,29]

- Fear of retaliation from employers, which can take the form of cutting work hours, firing, initiating deportation proceedings, and more.
- Lack of worker understanding about employer responsibilities regarding heat safety.
- Economic, performance management, or other incentives to keep working through heat-related illness or to underreport illnesses or injuries.
- Insufficient recordkeeping procedures in workplaces.
- Failure by employers, workers, and/or medical professionals to recognize and report heat-related symptoms, especially those that are initially mild.
- Failure to recognize and report heat-related diagnoses as work-related, especially when workers have personal risk factors that make them more sensitive to heat in the first place.
- Failure by medical professionals or employers to credit or note, where appropriate, the contributing role of heat in health outcomes such as heart attacks or injuries sustained from a fall.
- Employer medical management practices.

---

[23] Claudia Narocki, Heatwaves as an Occupational Hazard: The Impact of Heat and Heatwaves on Workers' Health, Safety and Wellbeing and on Social Inequalities," European Trade Union Institute, 2021, https://www.etui.org/sites/default/files/2021-11/Heatwaves%20as%20an%20occupational%20hazard%20The%20impact%20of%20heat%20and%20heatwaves%20on%20workers%E2%80%99%20health%2C%20safety%20and%20wellbeing%20and%20on%20social%20inequalities-2021.pdf.
[24] National Academies of Sciences, Engineering, and Medicine, *A Smarter National Surveillance System for Occupational Safety and Health in the 21st Century*, 2018, https://doi.org/10.17226/24835.
[25] Diane M. Gubernot, G. Brooke Anderson, and Katherine L. Hunting, "The Epidemiology of Occupational Heat Exposure in the United States: A Review of the Literature and Assessment of Research Needs in a Changing Climate," *International Journal of Biometeorology* 58, no. 8 (2014): 1779-1788, https://doi.org/10.1007/s00484-013-0752-x.
[26] John S. Luque et al., "'I Think the Temperature was 100 Degrees!': Work Safety Discussions Among Hispanic Farmworkers," *Journal of Agromedicine*, 24, no. 1 (2019): 15-25, https://www.tandfonline.com/doi/abs/10.1080/1059924X.2018.1536572.
[27] Taylor J. Arnold et al., "Heat-Related Illness Among Latinx Child Farmworkers in North Carolina: A Mixed-Methods Study," *NEW SOLUTIONS: A Journal of Environmental and Occupational Health Policy* 30, no. 2 (2020): 111-126, https://doi.org/10.1177/1048291120920571.
[28] Sara E. Wuellner and David K. Bonauto, "Exploring the Relationship Between Employer Recordkeeping and Underreporting in the BLS Survey of Occupational Injuries and Illnesses," *American Journal of Industrial Medicine* 57, no. 10 (2014): 1133-1143, https://onlinelibrary.wiley.com/doi/full/10.1002/ajim.22350.
[29] Federico Castillo et al., "Environmental Health Threats to Latino Migrant Farmworkers," *Annual Review of Public Health* 42, no. 1 (2021): 257-276, https://www.annualreviews.org/doi/abs/10.1146/annurev-publhealth-012420-105014.

- Reporting exemptions, including for small agricultural producers and many federal government employees.

***ANPRM Question 2:* What sources of data are important to consider when evaluating occupational heat-related illnesses, injuries, and fatalities? *ANPRM Question 4:* Are there quantitative estimates of the magnitude of occupational illnesses, injuries, and fatalities related to hazardous heat, beyond what is described in this ANPRM?**

As discussed above in our response to Question 6, current quantitative estimates of workplace heat-related injuries, illnesses, and death greatly underestimate the scale of the problem. Heat-related illnesses often are not recognized by employees, employers, and medical professionals, making accurate quantification difficult. Fortunately, the use of multiple data sources can help to establish the extent of the problem and aid in the monitoring and prevention of heat illness. These data sources include:

- *Workers' compensation claims.* Heinzerling et al. 2020 used workers' compensation data systems to identify the burden of occupational heat-related illness in California.[30] They identified over 15,000 cases from 2000 to 2017. When compared, the California cases were three to six times higher annually than the numbers reported by the Bureau of Labor Statistics (BLS). Hesketh et al. 2020 also used workers' compensation claims to identify heat-related cases in Washington, finding 918 confirmed heat-related illness claims.[31] The heat illness cases in their study population were also higher than those reported by the BLS (170 cases).[32]
- *Hospital admission and discharge data.* Harduar Morano et al. 2015 used both emergency department and inpatient hospitalization data to identify numbers and rates of occupational heat-related illness.[33] The data also allowed researchers to collect demographic characteristics such as race and ethnicity that often are not included in other data sets.
- *Military Health System.* The Military Health System Data Repository (MDR) is a centralized repository that contains healthcare data from over 260 Department of Defense

[30] Amy Heinzerling et al., "Risk Factors for Occupational Heat-Related Illness Among California Workers, 2000-2017," *American Journal of Industrial Medicine* 63, no. 12 (2020): 1145-1154, https://doi.org/10.1002/ajim.23191.
[31] Matrell Hesketh et al., "Heat Related Illness Among Workers in Washington State: A Descriptive Study Using Workers' Compensation Claims, 2006-2017," *American Journal of Industrial Medicine* 63, no. 4 (2020): 300-311. https://doi.org/10.1002/ajim.23092.
[32] U.S. Bureau of Labor Statistics, "Nonfatal Cases Involving Days Away from Work: Selected Characteristics (2011 forward)", 2022, https://www.bls.gov/iif/data.htm. U.S. Bureau of Labor Statistics, "Census of Fatal Occupational Injuries (2011 forward)," 2021, https://www.bls.gov/iif/data.htm.
[33] L. Harduar Morano et al., "Occupational Heat- Related Illness Emergency Department Visits and Inpatient Hospitalizations in the Southeast Region, 2007-2011," *American Journal of Industrial Medicine* 58, no. 10 (2015): 1114-1125, https://doi.org/10.1002/ajim.22504.

healthcare facilities. The MDR has been used to identify trends in heat-related illness and deaths among military members, as well as predictors of heat stress.[34,35]

- *Ambulatory healthcare data.* Emergency Medical Services (EMS) ambulance dispatch data and other ambulatory healthcare data can provide critical public health surveillance data on heat-related illness.[36] EMS dispatch and related hotlines have been used to identify infectious disease epidemics and can be similarly used to identify clusters of occupational heat illnesses.[3738]

ANPRM Question 3: **Beyond the studies discussed in this ANPRM, are there other data that provide more information about the scope and magnitude of injuries, illnesses, and fatalities related to occupational heat exposure?**

We refer OSHA to the following sources in addition the ones cited in the footnotes of this letter:

- Matthew A. Borg et al., "Occupational Heat Stress and Economic Burden: A Review of Global Evidence," *Environmental Research* 195 (2021): 110781, https://doi.org/10.1016/j.envres.2021.110781.
- Shouro Dasgupta et al., "Effects of Climate Change on Combined Labour Productivity and Supply: An Empirical, Multi-Model Study," *The Lancet Planetary Health* 5, no. 7 (2021): e455-e165, https://doi.org/10.1016/S2542-5196(21)00170-4.
- Zaw Maung and Aaron W. Tustin, "The Heat Death Line: Proposed Heat Index Alert Threshold for Preventing Heat-Related Fatalities in the Civilian Workforce," *New Solutions: A Journal of Environmental and Occupational Health Policy* 30, no. 2 (2020): 138-145, https://doi.org/10.1177/1048291120933819.
- Margaret C. Morrissey et al., "Heat Safety in the Workplace: Modified Delphi Consensus to Establish Strategies and Resources to Protect the US Workers," *GeoHealth* 5, no. 8 (2021), https://doi.org/10.1029/2021GH000443.
- Anton Orlov et al., "Economic Costs of Heat-Induced Reductions in Worker Productivity Due to Global Warming," *Global Environmental Change* 63 (2020): 102087, https://doi.org/10.1016/j.gloenvcha.2020.102087.

---

[34] Alan D. Nelson et al., "Timing and Predictors of Mild and Severe Heat Illness Among New Military Enlistees," *Medicine and Science in Sports and Exercise* 50, no. 8 (2018): 1603. https://dx.doi.org/10.1249%2FMSS.0000000000001623.
[35] Matthew D. Ward et al., "Biochemical Recovery from Exertional Heat Stroke Follows a 16-Day Time Course," *PLoS one* 15, no. 3 (2020): e0229616. https://doi.org/10.1371/journal.pone.0229616.
[36] Jane Somsel Rodman, Floyd Frost, and Walter Jakubowski, "Using Nurse Hot Line Calls for Disease Surveillance," *Emerging Infectious Diseases* 4, no. 2 (1998): 329-332, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2640146/pdf/9621209.pdf.
[37] K. H. Bork et al., "Surveillance of Ambulance Dispatch Data as a Tool for Early Warning," *Eurosurveillance* 11, no. 12 (2006): 13-14, https://doi.org/10.2807/esm.11.12.00669-en.
[38] Richard Heffernan et al., "New York City Syndromic Surveillance Systems," *Morbidity and Mortality Weekly Report* 53 suppl. (2004): 25-27, https://www.jstor.org/stable/23315683.

- Cora Roelofs, “Without Warning: Worker Deaths from Heat 2014–2016,” *New Solutions: A Journal of Environmental and Occupational Health Policy* 28, no. 2 (2018): 344-157, https://doi.org/10.1177/1048291118777874.
- Jeffrey Shire et al., “Association Between Work-Related Hyperthermia Emergency Department Visits and Ambient Heat in Five Southeastern States, 2010–2012—A Case-Crossover Study,” *GeoHealth* 4, no. 8 (2020), https://doi.org/10.1029/2019GH000241.

***ANPRM Question 8:* Are there industries, occupations, or job tasks that should be considered when evaluating the health and safety impacts of hazardous heat exposure in indoor and outdoor work environments? Please provide examples and data.**

OSHA should consider the following specific occupations and vulnerabilities when evaluating the health and safety impacts of hazardous heat:

- *Industries not typically associated with heat.* As noted in the ANPRM, heat-related injury, illness, and death can occur in both indoor and outdoor workers employed in almost any industry. This includes industries not typically associated with heat related-illness, such as those in the education services sector.[39] Educators in many U.S. school districts regularly work in conditions that increase their risk of heat-related illness, including buildings that are not fully air-conditioned.[40] Additionally, teachers in some districts lack access to bathrooms and proper break times to use them, leading educators to avoid drinking water to limit trips to the restroom.[41]
- *Temporary and precarious workers.* With the rapid growth of precarious employment, employees hired by temporary staffing agencies should also be considered when evaluating the health and safety impacts of hazardous heat. It has been well documented that temporary workers have higher overall injury rates than permanently employed workers in the same role.[42] Temporary workers often face higher levels of job insecurity than permanent workers, as well as a lack of benefits, union representation, and safety

[39] Tim Walker, “The Heat is On: Educators, Students Forced to Deal with Sweltering Classrooms,” *National Education Association News*, July 20, 2018, https://www.nea.org/advocating-for-change/new-from-nea/heat-educators-students-forced-deal-sweltering-classrooms.
[40] Matt Barnum, “Exclusive: Too Hot to Learn: Records Show Nearly a Dozen of the Biggest School Districts Lack Air Conditioning,” *The 74*, June 14, 2017, https://www.the74million.org/article/exclusive-too-hot-to-learn-records-show-nearly-a-dozen-of-the-biggest-school-districts-lack-air-conditioning.
[41] Eric Mock, “Union: Survey Shows Teachers Not Getting Bathroom Breaks,” *Spectrum News*, October 13, 2019, https://www.mynews13.com/fl/orlando/education/2019/10/31/union-survey-shows-teachers-not-getting-bathroom-breaks.
[42] Fernando G. Benavides et al., “Associations Between Temporary Employment and Occupational Injury: What are the Mechanisms?” *Occupational and Environmental Medicine* 63, no. 6 (2006): 416-421, http://dx.doi.org/10.1136/oem.2005.022301.

training and personal protective equipment.[43] Temporary staff also regularly include young workers and workers of color.[44] Both groups are particularly vulnerable to extreme heat, with higher incidences of heat-related illnesses and fatalities documented.[45,46]

- *Pregnant workers*. Pregnant workers experience heat-related illnesses such as heat exhaustion and heat stroke much sooner than non-pregnant workers.[47] The increased body weight and blood volume that occurs during pregnancy means that pregnant workers are more likely to struggle with high temperatures. Exposure to high temperatures can lead to poor birth outcomes including preterm birth, low birth weight, and stillbirth.[48] Additionally, some pregnant workers face discrimination at the workplace and are denied work accommodations that are crucial to their health and that of their fetus.[49]

ANPRM Question 25: **How should climate change be factored into an OSHA heat illness and injury prevention standard?**

2021 was the fourth hottest year on record in the contiguous United States. The nation also experienced its second highest number of billion-dollar disasters since 1980, including an extended drought and heat event in the west.[50] In addition to increases in average temperatures,[51] multi-day heat waves have gotten longer, more frequent, and more intense.[52] Even with deep cuts in greenhouse gas pollution, the United States will continue to warm until at least the middle of this century.[53]

---

[43] Ibraheem S. Al-Tarawneh, Steven J. Wurzelbacher, and Stephen J. Bertke, "Comparative Analyses of Workers' Compensation Claims of Injury Among Temporary and Permanent Employed Workers in Ohio," *American Journal of Industrial Medicine* 63, no. 1 (2020): 3-22, https://doi.org/10.1002/ajim.23049.

[44] Dave DeSario and Jannelle White, "Race to the Bottom: The Demographics of Blue-Collar Temporary Staffing," Temp Worker Justice, December 2020, https://www.tempworkerjustice.org/post/race-to-the-bottom.

[45] Diane M. Gubernot et al., "Characterizing Occupational Heat-related Mortality in the United States, 2000–2010: An Analysis Using the Census of Fatal Occupational Injuries Database." *American Journal of Industrial Medicine* 58, no. 2 (2015): 203-211, https://doi.org/10.1002/ajim.22381.

[46] Blesson M. Varghese et al., "Are Workers at Risk of Occupational Injuries Due to Heat Exposure? A Comprehensive Literature Review," *Safety Science* 110 (2018): 380-392, https://doi.org/10.1016/j.ssci.2018.04.027.

[47] The National Institute for Occupational Safety and Health, "Heat – Reproductive Health," https://www.cdc.gov/niosh/topics/repro/heat.html, (accessed January 25, 2022).

[48] Lara Cushing, Rachel Morello-Frosch, and Alan Hubbard, "Extreme Heat and its Association with Social Disparities in the Risk of Spontaneous Preterm Birth," *Paediatric and Perinatal Epidemiology* 36, no. 1 (2022): 13-22, https://onlinelibrary.wiley.com/doi/10.1111/ppe.12834.

[49] Carly McCann and Donald Tomaskovic-Devey, "Pregnancy Discrimination at Work," Center for Employment Equity, May 26, 2021, https://www.umass.edu/employmentequity/sites/default/files/Pregnancy%20Discrimination%20at%20Work.pdf.

[50] National Oceanic and Atmospheric Administration, "U.S. Saw Its 4th-Warmest Year on Record, Fueled by a Record-Warm December, January 10, 2021, https://www.noaa.gov/news/us-saw-its-4th-warmest-year-on-record-fueled-by-record-warm-december.

[51] U.S. Environmental Protection Agency, "Climate Change Indicators: U.S. and Global Temperature," updated April 2021, https://www.epa.gov/climate-indicators/climate-change-indicators-us-and-global-temperature (accessed January 25, 2021).

[52] U.S. Environmental Protection Agency, "Climate Change Indicators: Heat Waves," updated April 2021, https://www.epa.gov/climate-indicators/climate-change-indicators-heat-waves (accessed January 25, 2021).

[53] IPCC 2021, "Summary for Policymakers," in *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, V. P. Masson-Delmotte et al. (eds.), https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf.

To fully protect workers from heat, OSHA will need to consider future changes in baseline temperatures *and* extreme heat events. This is particularly important given how long it can take for OSHA to develop or amend rules. The standard will be more protective and give employers more regulatory certainty over a longer period if it is designed at the outset to accommodate expected changes in temperature, humidity, and health outcome. As a recent review of heat-related illness in *The Lancet* noted, "Historical burdens of disease from the first two decades of the 21st century will be poor predictors of risks over coming decades."[54]

One important implication of climate change is that a national heat illness prevention standard must be in force all year round, not just during historical "warm season" months as in Washington State.[55] Occupational heat-related illnesses already occur in every month of the year in states such as California,[56] which has also seen heat-related deaths[57] and hospitalizations[58] in winter months in the general population. As summers continue to lengthen across the country and all seasons become increasingly variable,[59,60] workers will face an increasing likelihood of heat-related illnesses and deaths outside the May through September period.

Finally, elements of the standard applicable to indoor worksites and duties should consider the potential for climate change to increase the frequency and duration of power outages, which can be associated with increased heat-related mortality[61] and may make it harder for employers to comply with heat rules.[62] These can include:

- *Planned outages to minimize the risk of wildfire.* In California, for example, utilities have the authority to pre-emptively shut off electricity to prevent wildfires during severe weather.[63]

---

[54] Kristie L. Ebi et al., "Hot Weather and Heat Extremes: Health Risks," *The Lancet* 398, no. 10301 (2021): 698-708, https://doi.org/10.1016/S0140-6736(21)01208-3.
[55] Washington State Department of Labor & Industries, "Be Heat Smart," 2021, https://www.lni.wa.gov/safety-health/safety-training-materials/workshops-events/beheatsmart (accessed December 21, 2021).
[56] Amy Heinzerling et al., "Risk Factors for Occupational Heat-related Illness among California Workers, 2000–2017," *American Journal of Industrial Medicine* 63, no. 12 (2020): 1145-1154, https://doi.org/10.1002/ajim.23191.
[57] Adam J. Kalkstein et al., "Heat/Mortality Sensitivities in Los Angeles during Winter: A Unique Phenomenon in the United States," *Environmental Health* 17, no. 1 (2018): 45, https://doi.org/10.1186/s12940-018-0389-7.
[58] Lara Schwarz et al., "The Health Burden Fall, Winter and Spring Extreme Heat Events in Southern California and Contribution of Santa Ana Winds," *Environmental Research Letters* 15, no. 5 (2020): 054017, https://doi.org/10.1088/1748-9326/ab7f0e.
[59] Jiamin Wang et al., "Changing Lengths of the Four Seasons by Global Warming," *Geophysical Research Letters* 48, no. 6 (2021): e2020GL091753, https://doi.org/10.1029/2020GL091753.
[60] U.S. Environmental Protection Agency, "Seasonality and Climate Change: A Review of Observed Evidence in the United States," www.epa.gov/climate-indicators/seasonality-and-climate-change.
[61] E.g., C. Dominianni et al., "Health Impacts of Citywide and Localized Power Outages in New York City," *Environmental Health Perspectives* 126, no. 6 (2018): 067003, https://pubmed.ncbi.nlm.nih.gov/29894117/.
[62] David Metz, Shannon Prier, and Benjamin M. Miller, "Standardized Regulatory Impact Assessment (SRIA) of the Proposed California Regulation for Heat Illness Prevention in Indoor Places of Employment," RAND Corporation, 2021, https://doi.org/10.7249/WRA1386-1.
[63] PG&E, "PSPS Large Business and Critical Infrastructure," 2021, https://www.pge.com/en_US/large-business/outages/public-safety-power-shuttoff/learn-about-psps.page (accessed December 21, 2021).

- *Increased demand associated with increased cooling load, potentially leading to brownouts or blackouts*. In 2020, high demand for electricity during a severe heat wave helped drive widespread rolling blackouts across California for the first time since 2001.[64,65]
- *Extended power outages associated with extreme events.* Establishments may not have sufficient cooling after an extreme weather event, even if they are able to operate on generator power. For instance, healthcare workers in Lake Charles, Louisiana endured extreme heat when emergency generators could no longer keep air conditioning running in the wake of Hurricane Laura.[66]

***ANPRM Question 15:* How does geographic region contribute to occupational heat hazards and the outcomes experienced by workers? Please provide examples and data. *ANPRM Question 24:* How will climate change affect the risk of occupational heat-related illness and mortality in the different regions of the United States? *ANPRM Question 22:* Are there data sources available to assess how climate change is altering hazardous heat exposure in outdoor and indoor work environments?**

As noted in the ANPRM, undercounts of heat-related illnesses, injuries, and deaths have made it challenging to understand regional patterns in occupational heat-health outcomes, let alone to project how those patterns may intensify or shift in future. Examples of other major data and information gaps are below.

- There is no good national count of workers engaged in outdoor vs. indoor occupations. The method used in a recent analysis of California's proposed indoor heat safety standard to estimate heat-vulnerable indoor workers[67] may be a useful starting point for a wider regional or national analysis.
- Publicly available data on adaptation measures such as air conditioning in commercial buildings[68] are unavailable, insufficiently granular in geographic scale, or out of date.

[64] "California Heat Spurs 1st Rolling Power Outages Since 2001," *Associated Press,* August 15, 2020, https://apnews.com/article/business-health-environment-and-nature-california-coronavirus-pandemic-f3357dc4bf75ea982aaeebbe65622ad9.
[65] California ISO, *Final Root Cause Analysis: August 2020 Extreme Heat Wave,* 2021, http://www.caiso.com/Documents/Final-Root-Cause-Analysis-Mid-August-2020-Extreme-Heat-Wave.pdf.
[66] Ariel Wittenberg, "With Lives at Stake, Nurses Faced Harrowing Choices," *E&E News,* September 24, 2020, https://subscriber.politicopro.com/article/eenews/1063714635.
[67] David Metz, Shannon Prier, and Benjamin M. Miller, "Standardized Regulatory Impact Assessment (SRIA) of the Proposed California Regulation for Heat Illness Prevention in Indoor Places of Employment," RAND Corporation, 2021, https://doi.org/10.7249/WRA1386-1.
[68] E.g., U.S. Energy Information Administration, "2018 Commercial Buildings Energy Consumption Survey Building Characteristics Results," https://www.eia.gov/consumption/commercial/ (accessed December 12, 2021).

- To our knowledge, little to no research has been done to understand regional patterns in the relationship between indoor and outdoor temperatures in commercial buildings. These patterns will depend on both climate and building stock characteristics in each region.
- Little is known about how extreme heat will interact with other regional climate-driven hazards such as wildfires to complicate heat illness prevention efforts or to exacerbate heat-related health harms.[69]

Despite the need for additional research, existing investigations of occupational heat exposure and heat-related losses of labor productivity (which can have indirect health impacts on lower-wage workers[70]) give a relatively consistent picture of more severe threats to workers in the Southeast, Southern Great Plains, Midwest, and parts of the Southwest. Please see the table below for a sample of recent U.S. studies.

Analysis	**Indicator**	**Emissions or temperature scenario**	**Timeframe**	**Regions most affected**
Mukherjee et al. 2021[71]	Exposure of general population to heat stress events lasting 1 to 7 days	RCP8.5	2060–2099	Northeast, Southeast Piedmont, Midwest, and parts of the Desert Southwest
Dahl and Licker 2021[72]	Exposure of outdoor workers to days with a heat index above 100°F	RCP8.5	2036-2065	Southeast, Southern Great Plains, Midwest
Tigchelaar et al. 2020[73]	Exposure of crop workers to days with a daily mean May through September heat index above the Threshold Limit Value for a variety of scenarios	2°C	N/A	Southern California and Arizona, Southern Great Plains, Southeast

[69] Elena Austin et al., "Combined Burden of Heat and Particulate Matter Air Quality in WA Agriculture," *Journal of Agromedicine* 26, no. 1 (2021): 18-27, https://doi.org/10.1080/1059924X.2020.1795032.
[70] Juanita Constible et al., "On the Front Lines: Climate Change Threatens the Health of America's Workers," NRDC, 2020, https://www.nrdc.org/sites/default/files/front-lines-climate-change-threatens-workers-report.pdf.
[71] Sourav Mukherjee et al., "Anthropogenic Warming and Population Growth May Double US Heat Stress by the Late 21st Century," *Earth's Future* 9, no. 5 (2021): e2020EF001886, https://doi.org/10.1029/2020EF001886.
[72] Kristina Dahl and Rachel Licker, "Too Hot to Work: Assessing the Threats Climate Change Poses to Outdoor Workers," Union of Concerned Scientists, 2021, https://doi.org/10.47923/2021.14236.
[73] Michelle Tigchelaar, David S Battisti, and June T Spector, "Work Adaptations Insufficient to Address Growing Heat Risk for U.S. Agricultural Workers," *Environmental Research Letters* 15, no. 9 (2020): 094035, https://doi.org/10.1088/1748-9326/ab86f4.

Zhang and Shindell 2021[74]	Costs of labor supply losses due to extreme heat	RCP8.5	2050s	Texas, California, Arizona, Midwest, Southeast
EPA 2021[75]	Lost labor hours due to heat	2°C	N/A	Southeast, Southern Great Plains, Southwest

It is important to recognize, however, that extreme heat events in "unexpected" places may put workers at even greater risk than in areas accustomed to high temperatures. A perfect example comes from the June 2021 heat dome in the Pacific Northwest, during which indoor workers across the region were exposed to dangerously hot working conditions in facilities without adequate cooling or ventilation.[76] OSHA's heat stress standard must ensure heat protections are afforded to workers everywhere in the country, not just in the hottest regions.

ANPRM Question 23: **How will climate change affect existing inequities in occupational heat exposure and related health outcomes? Please provide relevant data.**

Climate change will deepen existing inequities in exposure and outcomes in several critical ways.

- Low-wealth counties in the United States already experience larger losses in income on hot days (> 32 °C / > 90 °F) than do high-wealth counties. Absent adaptation measures, the richest counties could lose the equivalent of a tenth of a year of pay over the period of 2040 to 2050, compared to about half a year of pay in the poorest counties.[77]
- Relatedly, a recent U.S. Environmental Protection Agency analysis found that under 2°C (3.6°F) of warming, people of color are 35 percent more likely than white people to live in areas of the United States with the highest labor losses from extreme heat. Low-income people are 25 percent more likely than higher-income people to live in those areas.[78]

[74] Yuqiang Zhang and Drew T. Shindell, "Costs from Labor Losses Due to Extreme Heat in the USA Attributable to Climate Change," *Climatic Change* 164, no. 3–4 (2021): 35, https://doi.org/10.1007/s10584-021-03014-2.
[75] U.S. Environmental Protection Agency, "Appendix F. Labor," in *Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts*, 2021, www.epa.gov/cira/social-vulnerability-report.
[76] Dave Jamieson, "Oregon Workers Feared for Their Lives During Heat Wave, OSHA Complaints Show," *HuffPost*, July 16, 2021, https://www.huffpost.com/entry/oregon-workers-heat-wave-osha_n_60f148b6e4b0a771e802f616.
[77] A. P. Behrer et al., "Heat Has Larger Impacts on Labor in Poorer Areas," *Environmental Research Communications* 3, no. 9 (2021): 095001, https://doi.org/10.1088/2515-7620/abffa3.
[78] U.S. Environmental Protection Agency, *Climate Change and Social Vulnerability in the United States*: A Focus on Six Impacts, 2021, www.epa.gov/cira/social-vulnerability-report.

- Workers' compensation does not cover all costs associated with workplace injuries or illnesses.[79,80] This means that healthcare costs associated with increases in heat-related injuries and illnesses[81,82,83] will fall heavily on workers who do not have paid time off and/or health insurance. The situation will be even worse for lower-wage workers and workers of color who are ineligible for workers' compensation (e.g., farmworkers in many states[84]), live in Texas (where employers are not required to carry workers' compensation insurance[85]), are unaware of their right to workers' compensation, or have difficulty applying for compensation due to fear of retaliation or other barriers.[86]
- The likelihood of heat-related health harms increases in the absence of a cool place to rest during non-work hours.[87,88] Unfortunately, many of the same workers who are disproportionately represented in highly heat-vulnerable industries and occupations also experience disproportionate heat exposure in their neighborhoods or homes. In 2020, for example, Hispanic/Latino workers accounted for about 30 percent of each of the Crop Production and Construction industries, compared to nearly 18 percent of the total workforce. Black/African-American workers accounted for nearly 21 percent of Transportation and Warehousing and more than 15 percent of Telecommunications, compared to about 12 percent of the total workforce.[89] Multiple studies have found that on average, people of color in the United States experience higher temperatures than non-Hispanic whites.[90,91]

---

[79] Jeanne M. Sears, Amy T. Edmonds, and Norma B. Coe, "Coverage Gaps and Cost-Shifting for Work-Related Injury and Illness: Who Bears the Financial Burden?" *Medical Care Research and Review* (2019): 107755871984572, https://doi.org/10.1177/1077558719845726.
[80] Leslie I. Boden, "The Occupational Safety and Health Administration at 50—the Failure to Improve Workers' Compensation," *American Journal of Public Health* 110, no. 5 (2020): 638-639, https://doi.org/10.2105/AJPH.2019.305549.
[81] Kim Knowlton et al., "Six Climate Change-Related Events in the United States Accounted for About $14 Billion in Lost Lives and Health Costs," *Health Affairs* 30, no. 11 (2011): 2167-2176, https://doi.org/10.1377/hlthaff.2011.0229.
[82] Vijay S. Limaye et al., "Estimating the Health-Related Costs of 10 Climate-Sensitive U.S. Events During 2012," *GeoHealth* 3, no. 9 (2019): 245-265, https://doi.org/10.1029/2019GH000202.
[83] Berhanu Y. Wondmagegn et al., "What Do We Know about the Healthcare Costs of Extreme Heat Exposure? A Comprehensive Literature Review," *Science of the Total Environment* 657 (2019): 608-618, https://doi.org/10.1016/j.scitotenv.2018.11.479.
[84] Farmworker Justice, "Workers' Compensation," 2021, https://www.farmworkerjustice.org/advocacy_program/workers-compensation/ (accessed December 21, 2021).
[85] Texas Workforce Commission, "Workers' Compensation," https://www.twc.texas.gov/news/efte/workers_compensation.html#:~:text=Texas%2C%20unlike%20other%20states%2C%20does,are%20set%20in%20the%20law (accessed December 21, 2021).
[86] Naomi J. Anderson, Caroline K. Smith, and Michael P. Foley, "Work-related Injury Burden, Workers' Compensation Claim Filing, and Barriers: Results from a Statewide Survey of Janitors," *American Journal of Industrial Medicine* (2021): ajim.23319, https://doi.org/10.1002/ajim.23319.
[87] Jacob F. Piil et al., "High Prevalence of Hypohydration in Occupations with Heat Stress—Perspectives for Performance in Combined Cognitive and Motor Tasks," *PLoS ONE* 13, no. 10 (2018): e0205321, https://doi.org/10.1371/journal.pone.0205321.
[88] Sean R. Notley et al., "Heat Loss is Impaired in Older Men on the Day After Prolonged Work in the Heat," *Medicine & Science in Sports & Exercise* 50, no. 9 (2018): 1859-1867, https://doi.org/10.1249/MSS.0000000000001643.
[89] U.S. Bureau of Labor Statistics, "Table 18. Employed Persons by Detailed Industry, Sex, Race, and Hispanic or Latino Ethnicity, 2020," updated July 30, 2021, https://www.bls.gov/cps/cpsaat18.htm.
[90] E.g., Angel Hsu et al., "Disproportionate Exposure to Urban Heat Island Intensity across Major US Cities," *Nature Communications* 12, no. 1 (2021): 2721, https://doi.org/10.1038/s41467-021-22799-5.
[91] E.g., Susanne Amelie Benz and Jennifer Anne Burney, "Widespread Race and Class Disparities in Surface Urban Heat Extremes Across the United States," *Earth's Future* 9, no. 7 (2021), https://doi.org/10.1029/2021EF002016.

***ANPRM Question 27:* Are OSHA's existing efforts and authorities adequate or effective in protecting workers from hazardous heat in indoor and outdoor work settings? *ANPRM Question 29:* What are the gaps and limitations of existing applicable OSHA standards, as well as existing campaign, guidance, enforcement, and other efforts for preventing occupational heat-related illness in indoor and outdoor work settings?**

Current OSHA workplace heat initiatives have not been enough to fully protect the health of workers. In some industries and locations, heat illnesses and deaths have even increased over time.[92] While OSHA has worked to revamp its Heat Illness Prevention Campaign with updated materials, there are still major gaps that need to be addressed. These include:

- *The lack of a specific, enforceable heat standard.* The General Duty Clause has been one of OSHA's sole regulatory tools to protect workers from preventable heat-related illnesses. The lack of specificity in the General Duty Clause has created evidentiary hurdles for OSHA to issue citations and opened the agency to court challenges. In fact, an Administrative Law Judge on the Occupational Safety and Health Review Commission (OSHRC) recently took advantage of the lack of a specific and enforceable heat standard to reverse several heat stress citations.[93] The heat stress standard should be prescriptive enough to withstand court challenges, but also to provide employers with a regulatory floor.
- *Insufficient penalties for unsafe employers.* Employers who fail to ensure that workers are provided a safe and healthy working environment should be fined appropriately. This can be accomplished, in part, by revising the process to reduce citations through informal settlements.[94]
- *Deficiencies in the OSHA-NIOSH Heat Safety Tool App.* While the app is a useful tool, studies have identified areas for improvement. Dillane and Balanay 2020 found the app was reliable in minimal heat risk conditions, but that reliability decreased as conditions became more severe.[95] Luque et al. 2019 recommended that the app incorporate acclimatization information and procedures.[96]

---

[92] Xiuwen Sue Dong et al., "Heat-related Deaths Among Construction Workers in the United States," *American Journal of Industrial Medicine* 62, no. 12 (2019): 1047-1057, https://doi.org/10.1002/ajim.23024.
[93] Bruce Rolfsen, "Judge Rejects 5 OSHA Heat Danger Cases Against Postal Service," *Bloomberg Law*, July 20, 2020, https://news.bloomberglaw.com/safety/judge-rejects-5-osha-heat-danger-cases-against-postal-service.
[94] Martha T. McCluskey et al., "OSHA's Discount on Danger," Center for Progressive Reform, June 2016, http://progressivereform.org/our-work/workers-rights/oshas-discount-danger/.
[95] Danielle Dillane and Jo Anne G. Balanay, "Comparison Between OSHA-NIOSH Heat Safety Tool App and WBGT Monitor to Assess Heat Stress Risk in Agriculture," *Journal of Occupational and Environmental Hygiene* 17 no. 4 (2020): 181-192. https://doi.org/10.1080/15459624.2020.1721512.
[96] John S. Luque et al., "Knowledge and Practices to Avoid Heat-Related Illness Among Hispanic Farmworkers Along the Florida-Georgia Line," *Journal of Agromedicine* 25, no. 2 (2020): 190-200. https://doi.org/10.1080/1059924X.2019.1670312.

ANPRM Question 28: **What additional efforts or improvements should be undertaken by OSHA to protect workers from hazardous heat in indoor and outdoor work settings?**

The development of a strong, enforceable heat standard is an important step that protects the rights of workers to a safe and healthy working environment. In addition to the development of the heat standard, OSHA should also make the following improvements:

- The standard development process needs to start with workers, who should have a seat at the table to determine the best solutions for them. There should be better public engagement during the process and a balanced advisory committee of workers, advocates, and researchers to weigh in on recommendations.
- Tracking of heat-related illnesses and deaths remains limited, due to a systemic lack of comprehensive and coordinated reporting. A comprehensive system to gather, organize, analyze, and interpret the occupational health data is needed. OSHA should work closely with the BLS, the Centers for Disease Control and Prevention, and the Office of Personnel Management to develop and maintain such a system, and the database should be publicly available.
- Workers, particularly those who are vulnerable, may be reluctant to report workplace noncompliance with heat standards. OSHA should increase education and outreach of their Whistleblower Protection Program. Additionally, anti-retaliation and whistleblower protection training for managers and workers should be mandatory in the heat standard.
- Increased staffing across the board at OSHA, but in particular inspectors to adequately boost heat-related inspections, improve responses to heat-related complaints, and increase enforcement measures.

ANPRM Question 30: **What are the most effective aspects of existing state standards aimed at preventing occupational heat-related illness?** ***ANPRM Question 33:*** **What components of a state standard or program should be included in Federal guidance or regulatory efforts on heat-related illness prevention?** ***ANPRM Question 35:*** **Do any of these existing standards contain elements that should be considered for a Federal standard?**

To date, only three states have developed permanent workplace heat stress standards: California, Washington, and Minnesota.[97,98,99] In addition to these states, Oregon has adopted temporary

[97] Department of Industrial Relations, State of California (DIRSC), "California Code of Regulations, Title 8, Section 3395: Heat Illness Prevention," www.dir.ca.gov/title8/3395.html (accessed January 24, 2021).
[98] Minnesota Administrative Rules, "Indoor Ventilation and Temperature in Places of Employment," Office of the Revisor of Statutes, https://www.revisor.mn.gov/rules/5205.0110 (accessed January 24, 2021).
[99] Lora Shinn, "Washington State Adds Emergency Rules to Protect Workers from Heat and Wildfire Smoke," NRDC, August 13, 2021, https://www.nrdc.org/stories/washington-state-adds-emergency-rules-protect-workers-heat-and-wildfire-smoke.

rules to protect workers from heat with the aim of making these rules permanent. It is paramount for OSHA to develop a federal standard that surpasses the most protective state standard.

The following are some of the most important elements of existing permanent and proposed state standards to include in a federal standard.

- *Acclimatization plans*. Acclimatization plays a large part in the body's ability to cope with heat exposure. Worker heat fatalities often occur within the first few days of working in hot environments. While both the California and Washington standards address acclimatization, neither standard includes a detailed plan for employers to implement. Oregon's draft rule currently includes more detailed language on an acclimatization regimen.
- *Rest breaks*. Rest breaks are an important way to allow the body time to cool down when working in heat. California's standard includes language on rest breaks with a minimum recommendation of ten minutes every two hours. OSHA's standard should include language on taking regular and preventative cool-down breaks in the shade or other cool areas for as much time as needed for the employee to cool down. These breaks should be paid to encourage employees to take necessary breaks without fear of losing wages. Additionally, OSHA should include recommendations on work rate and activity adjustments.
- *Training*. All the state standards include a training component with provisions of what should be included. While this is a good first step, they do not include specific enough information on training content. Blanket training will not address the specific needs of different workforces. OSHA's federal standard should also address the timing and frequency of when heat training should occur, such as before or during extreme heat events or when employees move worksites.

***ANPRM Question 31*: What are the challenges with the implementation of existing state standards aimed at preventing occupational heat-related illness? *ANPRM Question 32:* Of the existing state standards, have any been more effective or challenging in their implementation than others? Why?**

The following challenges should be addressed when implementing the heat standard:

- *Unclear or vague standard provisions*. When standard components are vague or unclear, they can cause confusion during implementation. Having the most prescriptive standard possible gives employers clear guidelines to follow and provides the strongest protection for workers. For example, even though employee acclimatization is key in preventing heat-related illnesses, no state standard provides a specific employee acclimatization plan.[100]

- *Outreach and education*. It is paramount for OSHA to ensure that employers and workers are aware of the standard. To do so, there needs to be an extensive outreach and education campaign. Cal/OSHA developed a Heat Illness Prevention Special Emphasis Program (SEP) with a comprehensive approach to heat education and outreach that could serve as a model.[101] The state also developed a campaign for the standard that included print ads, billboards, radio ads, and other means of communication. In addition to a campaign, materials distributed by OSHA should be available in numerous languages. For example, many farmworkers in California speak Mixteco, Zapoteco, or Triqui instead of Spanish, but there are few heat materials translated to these languages.[102]
- *Staffing and enforcement*. As mentioned in our response to Question 28, improved responses to heat-related complaints require increased staffing and enforcement. Additionally, OSHA should prioritize the hiring of inspectors that are bilingual to broaden the agency's reach and effectiveness in heat-vulnerable communities such as farmworkers.

We recognize that this rulemaking comes at a difficult time for OSHA, given the COVID-19 pandemic and long-standing staffing and resource challenges at the agency. However, workers cannot wait a decade or more for stronger heat stress protections, especially as the climate continues to warm. We urge you to minimize preventable heat-related illnesses, injuries, and deaths by expeditiously finalizing a standard and rigorously enforcing it.

Thank you for your efforts to ensure workers get home safely. If you have questions or desire further information about aspects of this letter, please contact Juanita Constible (jconstible@nrdc.org).

Respectfully,

Juanita Constible and Teniope Adewumi-Gunn
Natural Resources Defense Council

---

[100] National Institute for Occupational Safety and Health, "Heat Stress: Acclimatization," 2017, https://www.cdc.gov/niosh/mining/userfiles/works/pdfs/2017-124.pdf (accessed January 20, 2022).
[101] California Division of Occupational Safety and Health, "Heat Illness Prevention Special Emphasis Program," April 2020, https://www.dir.ca.gov/DOSHPol/Heat-SEP.pdf.
[102] Alena Uliasz, "Not Everyone Speaks Spanish! The Need for Indigenous Language Interpreters in California's Agricultural Workforce," *UC Davis Western Center for Agricultural Health and Safety*, July 19, 2018, https://aghealth.ucdavis.edu/news/not-everyone-speaks-spanish-need-indigenous-language-interpreters-californias-agricultural.