

## Selected References on Cumulative Impacts

This document is a living document; Air District staff will continue to update as needed. This short list of selected references is intended to provide concise, broad information on the subject. It may also serve as a starting point for a more formal or extensive review.

**Last updated: 2024-08-01.** [New entries are formatted in blue and marked with “+”.](#)

### Conceptual Frameworks, Theory, Methods, Approaches, Tools

- Payne-Sturges, D. C., Sangaramoorthy, T., & Mittmann, H. (2021). Framing Environmental Health Decision-Making: The Struggle over Cumulative Impacts Policy. *International Journal of Environmental Research and Public Health*, 18(8), 3947.
- Payne-Sturges, D. C., Scammell, M. K., Levy, J. I., Cory-Slechta, D. A., Symanski, E., Carr Shmool, J. L., ... & Clougherty, J. E. (2018). Methods for evaluating the combined effects of chemical and nonchemical exposures for cumulative environmental health risk assessment. *International Journal of Environmental Research and Public Health*, 15(12), 2797.
- Gee, G. C., & Payne-Sturges, D. C. (2004). Environmental health disparities: a framework integrating psychosocial and environmental concepts. *Environmental health perspectives*, 112(17), 1645-1653.
- Sexton, K. (2012). Cumulative risk assessment: an overview of methodological approaches for evaluating combined health effects from exposure to multiple environmental stressors. *International journal of environmental research and public health*, 9(2), 370-390.
- McHale, C. M., Osborne, G., Morello-Frosch, R., Salmon, A. G., Sandy, M. S., Solomon, G., Zhang, L., Smith, M. T., & Zeise, L. (2018). Assessing health risks from multiple environmental stressors: Moving from G×E to I×E. *Mutation Research/Reviews in Mutation Research*, 775, 11-20.
- Geronimus 2023. Weathering: The Extraordinary Stress of Ordinary Life on the Body in an Unjust Society.
  - *Note: A shorter NPR interview is also available*
- US EPA 2021. Health Impact Assessment.
  - See EPA 2021a, 09/15/2021 *below*.
- Tolve, N. S., Geller, A. M., Hagerthey, S., Julius, S. H., Lavoie, E. T., Mazur, S. L., ... & Frey, H. C. (2024). Challenges and opportunities for research supporting cumulative impact assessments at the United States environmental protection agency's office of research and development. *The Lancet Regional Health–Americas*, 30.

### **Items Specifically Addressed to Policymakers or Government Staff**

- Sprinkle, R. H., & Payne-Sturges, D. C. (2021). Mixture toxicity, cumulative risk, and environmental justice in United States federal policy, 1980–2016: Why, with much known, was little done? *Environmental Health*, 20(1), 104.
- Zrzavy, A., Blondell, M., Kobayashi, W., Redden, B., & Mohai, P. (2022). Addressing cumulative impacts: lessons from environmental justice screening tool development and resistance. *Env't L. Rep.*, 52, 10111.
- Morello-Frosch, R., Zuk, M., Jerrett, M., Shamasunder, B., & Kyle, A. D. (2011). Understanding the cumulative impacts of inequalities in environmental health: implications for policy. *Health affairs*, 30(5), 879-887.
- Solomon, G. M., Morello-Frosch, R., Zeise, L., & Faust, J. B. (2016). Cumulative environmental impacts: science and policy to protect communities. *Annual review of public health*, 37, 83-96.
- US EPA. 2022. Cumulative Impacts: Recommendations for ORD Research. U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-22/014a, 2022.
- + Chiger, A. A., & Nachman, K. E. (2024). Invited perspective: Advancing cumulative approaches in regulatory decision making. *Environmental Health Perspectives*, 132(3).

### **Multi-Stressor Studies or Assessments**

- + Coffman, E., Rappold, A. G., Nethery, R. C., Anderton, J., Amend, M., Jackson, M. A., Roman, H., Fann, N., Baker, K. R., & Sacks, J. D. (2024). Quantifying multipollutant health impacts using the Environmental Benefits Mapping and Analysis Program-Community Edition (BenMAP-CE): A case study in Atlanta, Georgia. *Environmental Health Perspectives*, 132(3).
- + Canterbury, A., Echouffo-Tcheugui, J. B., Shpilsky, D., Aiyer, A., Reis, S. E., & Erqou, S. (2020). Association between cumulative social risk, particulate matter environmental pollutant exposure, and cardiovascular disease risk. *BMC Cardiovascular Disorders*, 20(1).
- + Erqou, S., Clougherty, J. E., Olafiranye, O., Magnani, J. W., Aiyer, A., Tripathy, S., Kinnee, E., Kip, K. E., & Reis, S. E. (2018). Particulate matter air pollution and racial differences in cardiovascular disease risk. *Arteriosclerosis, Thrombosis, and Vascular Biology*, 38(4), 935–942.
- + Stafoggia, M., Michelozzi, P., Schneider, A., Armstrong, B., Scortichini, M., Rai, M., et al. (2023). Joint effect of heat and air pollution on mortality in 620 cities of 36 countries. *Environment International*, 181.
- + Rai, M., Stafoggia, M., de'Donato, F., Scortichini, M., Zafeiratou, S., Vazquez Fernandez, L., et al. (2023). Heat-related cardiorespiratory mortality: Effect modification by air pollution across 482 cities from 24 countries. *Environment International*, 174.

**Air District Advisory Council**  
**Key References on Cumulative Impacts**

- + Liu, C., Chen, R., Sera, F., Vicedo-Cabrera, A. M., Guo, Y., Tong, S., et al. (2023). Interactive effects of ambient fine particulate matter and ozone on daily mortality in 372 cities: Two-stage time series analysis. *BMJ*, 383.

### **Studies Focused on the Bay Area, California, and/or Air Pollution**

- CBE 2008. Cumulative Impacts in East Oakland: Findings from a Community-Based Mapping Study.
- Houston, D., Wu, J., Ong, P., & Winer, A. (2004). Structural disparities of urban traffic in Southern California: implications for vehicle-related air pollution exposure in minority and high-poverty neighborhoods. *Journal of Urban Affairs*, 26(5), 565-592.
- Lane, H. M., Morello-Frosch, R., Marshall, J. D., & Apte, J. S. (2022). Historical redlining is associated with present-day air pollution disparities in US cities. *Environmental science & technology letters*, 9(4), 345-350.

### **Work of Other Agencies in the United States**

#### *National Institute of Environmental Health Sciences*

- + Carlin, D. J., & Rider, C. V. (2024). Combined exposures and mixtures research: An enduring NIEHS priority. *Environmental Health Perspectives*, 132(7).

#### *Department of Energy*

- National Environmental Policy Act. Cumulative Effects.  
[https://ceq.doe.gov/publications/cumulative\\_effects.html](https://ceq.doe.gov/publications/cumulative_effects.html)

#### *Minnesota Pollution Control Agency*

- Minnesota Pollution Control Agency. (2018). Cumulative impact analysis. Minnesota Pollution Control Agency.  
[Cumulative impacts | Minnesota Pollution Control Agency \(state.mn.us\)](#)  
[Cumulative Impacts Rule—Request for Comments \(state.mn.us\)](#)  
[Cumulative Impacts Rule—Comments Received in Response to Request for Comments \(state.mn.us\)](#)

#### *Massachusetts Department of Environmental Protection*

- Massachusetts Department of Environmental Protection. (2021). Cumulative Impact Analysis in Air Quality Permitting.  
[Cumulative Impact Analysis in Air Quality Permitting | Mass.gov](#)  
DRAFT Guidance for Conducting Cumulative Impact Analysis For Air Quality Comprehensive Plan Applications [download \(mass.gov\)](#)

#### *New Jersey Department of Environmental Protection*

- New Jersey Department of Environmental Protection Environmental Justice  
[Department of Environmental Protection | Environmental Justice](#)

## Air District Advisory Council Key References on Cumulative Impacts

### New York State

- Senate Bill S8830 (passed in Jan 2023): <https://www.ncelenviro.org/articles/new-york-legislature-passes-cumulative-impacts-bill/>

### City of Chicago

- Chicago Department of Public Health: Chicago's Cumulative Impact Assessment. [https://www.chicago.gov/city/en/depts/cdph/supp\\_info/Environment/cumulative-impact-assessment.html](https://www.chicago.gov/city/en/depts/cdph/supp_info/Environment/cumulative-impact-assessment.html)

### Office of Environmental Health Hazard Assessment

- Office of Environmental Health Hazard Assessment. (2010). *Cumulative Impacts: Building a Scientific Foundation*. Retrieved from <https://oehha.ca.gov/media/downloads/calenviroscreen/report/cireport123110.pdf>

### The White House

- White House Environmental Justice Advisory Council 2014  
[White House Environmental Justice Advisory Council | US EPA](#)
- National Environmental Justice Advisory Council 2004  
[National Environmental Justice Advisory Council Recommendations | US EPA](#)

### United States Environmental Protection Agency

- EPA. (1999). *Consideration Of Cumulative Impacts In EPA Review of NEPA Documents* (EPA 315-R-99-002). Retrieved from [epa.gov/sites/default/files/2014-08/documents/cumulative.pdf](https://epa.gov/sites/default/files/2014-08/documents/cumulative.pdf)
- EPA. (2011). *Plan EJ 2014: Legal Tools*. Retrieved from [epa.gov/sites/default/files/2015-02/documents/ej-legal-tools.pdf](https://epa.gov/sites/default/files/2015-02/documents/ej-legal-tools.pdf)
- EPA. (2015). *Proctor Creek's Boone Boulevard Green Street Project Health Impact Assessment (HIA)*. Retrieved from [epa.gov/sites/default/files/2015-07/documents/final\\_bbgsp\\_hia\\_report.pdf](https://epa.gov/sites/default/files/2015-07/documents/final_bbgsp_hia_report.pdf)
- EPA. (2016). *Environmental Justice Research Roadmap*. Retrieved from [epa.gov/sites/default/files/2017-01/documents/researchroadmap\\_environmentaljustice\\_508\\_compliant.pdf](https://epa.gov/sites/default/files/2017-01/documents/researchroadmap_environmentaljustice_508_compliant.pdf)
- EPA. (2017). Using a Total Environment Framework (Built, Natural, Social Environments) to Assess Lifelong Health Effects of Chemical Exposures. *Grantee Research Project* Retrieved from [cfpub.epa.gov/ncer\\_abstracts/index.cfm/fuseaction/recipients.display/rfa\\_id/630/records\\_per\\_page/ALL](https://cfpub.epa.gov/ncer_abstracts/index.cfm/fuseaction/recipients.display/rfa_id/630/records_per_page/ALL)
- EPA. (2019a). *Guidelines for Human Exposure Assessment* (EPA/100/B-19/001). Retrieved from [epa.gov/sites/default/files/2020-01/documents/guidelines\\_for\\_human\\_exposure\\_assessment\\_final2019.pdf](https://epa.gov/sites/default/files/2020-01/documents/guidelines_for_human_exposure_assessment_final2019.pdf)

**Air District Advisory Council**  
**Key References on Cumulative Impacts**

- EPA. (2019b). *Integrated Science Assessment (ISA) for Particulate Matter* (EPA/600/R-19/188). Retrieved from [epa.gov/isa/integrated-science-assessment-isa-particulate-matter](https://epa.gov/isa/integrated-science-assessment-isa-particulate-matter)
- EPA. (2020). Center for Early Lifestage Vulnerabilities to Environmental Stressors. *Grantee Research Project* Retrieved from [cfpub.epa.gov/ncer\\_abstracts/index.cfm/fuseaction/recipient.display/rfa\\_id/669/records\\_per\\_page/ALL](https://cfpub.epa.gov/ncer_abstracts/index.cfm/fuseaction/recipient.display/rfa_id/669/records_per_page/ALL)
- EPA. (2021a, 09/15/2021). Health Impact Assessments. Retrieved from [epa.gov/healthresearch/health-impact-assessments](https://epa.gov/healthresearch/health-impact-assessments)
- EPA. (2021b). *U.S. Environmental Protection Agency Board of Scientific Counselors Executive Committee: Virtual Meeting Summary*. Retrieved from [epa.gov/system/files/documents/2021-10/bosc\\_ec\\_summary\\_10-06-2021-amg\\_lbj.pdf](https://epa.gov/system/files/documents/2021-10/bosc_ec_summary_10-06-2021-amg_lbj.pdf)
- EPA. (2022a). *EPA Legal Tools to Advance Environmental Justice*. Retrieved from [epa.gov/system/files/documents/2022-05/EJ%20Legal%20Tools%20May%202022%20FINAL.pdf](https://epa.gov/system/files/documents/2022-05/EJ%20Legal%20Tools%20May%202022%20FINAL.pdf)
- EPA. (2022b). *FY 2022-2026 EPA Strategic Plan*. Retrieved from [epa.gov/system/files/documents/2022-03/fy-2022-2026-epa-strategic-plan.pdf](https://epa.gov/system/files/documents/2022-03/fy-2022-2026-epa-strategic-plan.pdf)
- EPA. (2022c). *Supplement to the 2019 Integrated Science Assessment for Particulate Matter (Final Report, 2022)* (EPA/635/R-22/028). Retrieved from [cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=354490](https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=354490)
- EPA. (2022d). *Using Participatory Science at EPA: Vision and Principles*. Retrieved from [epa.gov/system/files/documents/2022-06/EPA%20Vision%20for%20Participatory%20Science%206.23.22.pdf](https://epa.gov/system/files/documents/2022-06/EPA%20Vision%20for%20Participatory%20Science%206.23.22.pdf)
- EPA. (2022e). *Cumulative Impacts: Recommendations for ORD Research*. Retrieved from [cfpub.epa.gov/si/si\\_public\\_record\\_report.cfm?dirEntryId=357832&Lab=ORD&simplesearch=0&showcriteria=2&sortby=pubDate&searchall=357832&timstype=&datebeginpublishedpresented=05/17/2021](https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=357832&Lab=ORD&simplesearch=0&showcriteria=2&sortby=pubDate&searchall=357832&timstype=&datebeginpublishedpresented=05/17/2021)