

# Overview of Cumulative Impacts Policy Landscape

Pennsylvania Department of Environmental Protection  
Citizens Advisory Council and EJ Advisory Board  
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# What are cumulative impacts?

Total burden of co-existence of multiple environmental and social vulnerability stressors, and their effects on health, well being and quality of life

Disproportionate impacts

Concentration of burdens

Social determinants of health

Includes lack of benefits

Communities know issue, not term

Pollution Burden

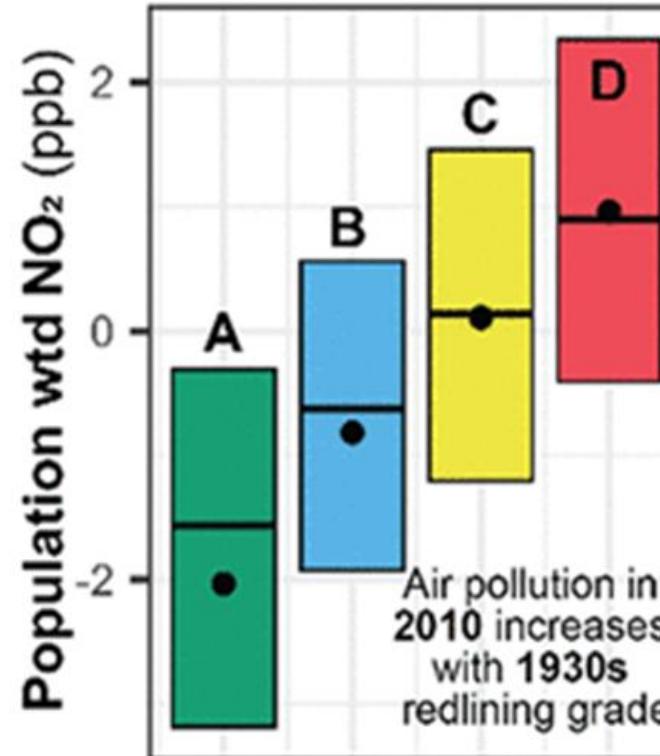
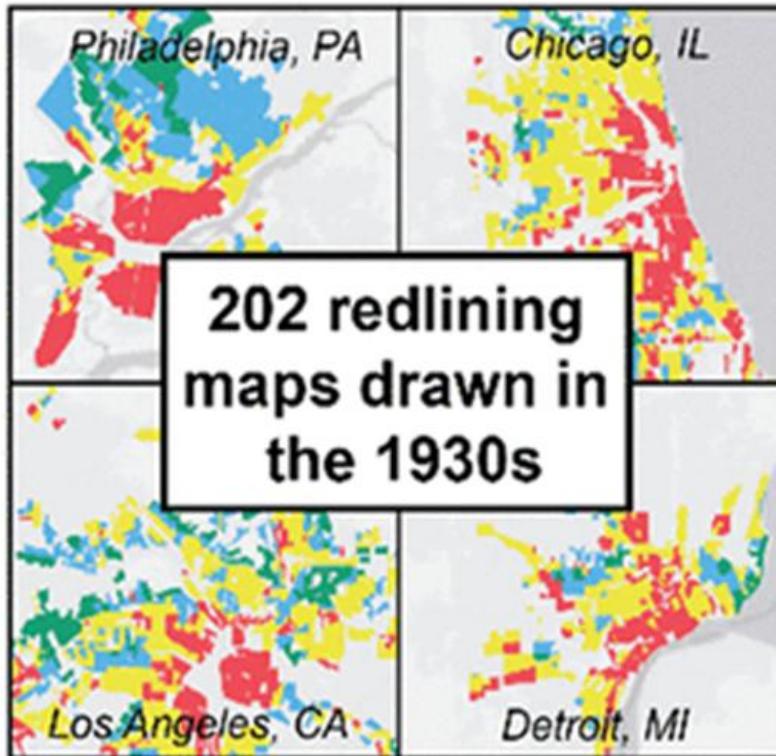
Cumulative Impacts

Social Vulnerability



# Why is working on cumulative impacts important?

## Modern air pollution disparities in historically redlined areas



- Substantial scientific evidence
- Key to understanding accurate health impacts
- Long-standing testimony from communities
- Government policies/practices leading to inequitable distribution

Lane, et al. Environ. Sci. Technol. Lett. 2022, 9, 4, 345–350

# Definitions of Cumulative Impacts: Key Concepts

California EPA

Cumulative impacts means exposures, public health or environmental effects from the combined emissions and discharges, in a geographic area, including environmental pollution from **all sources...**

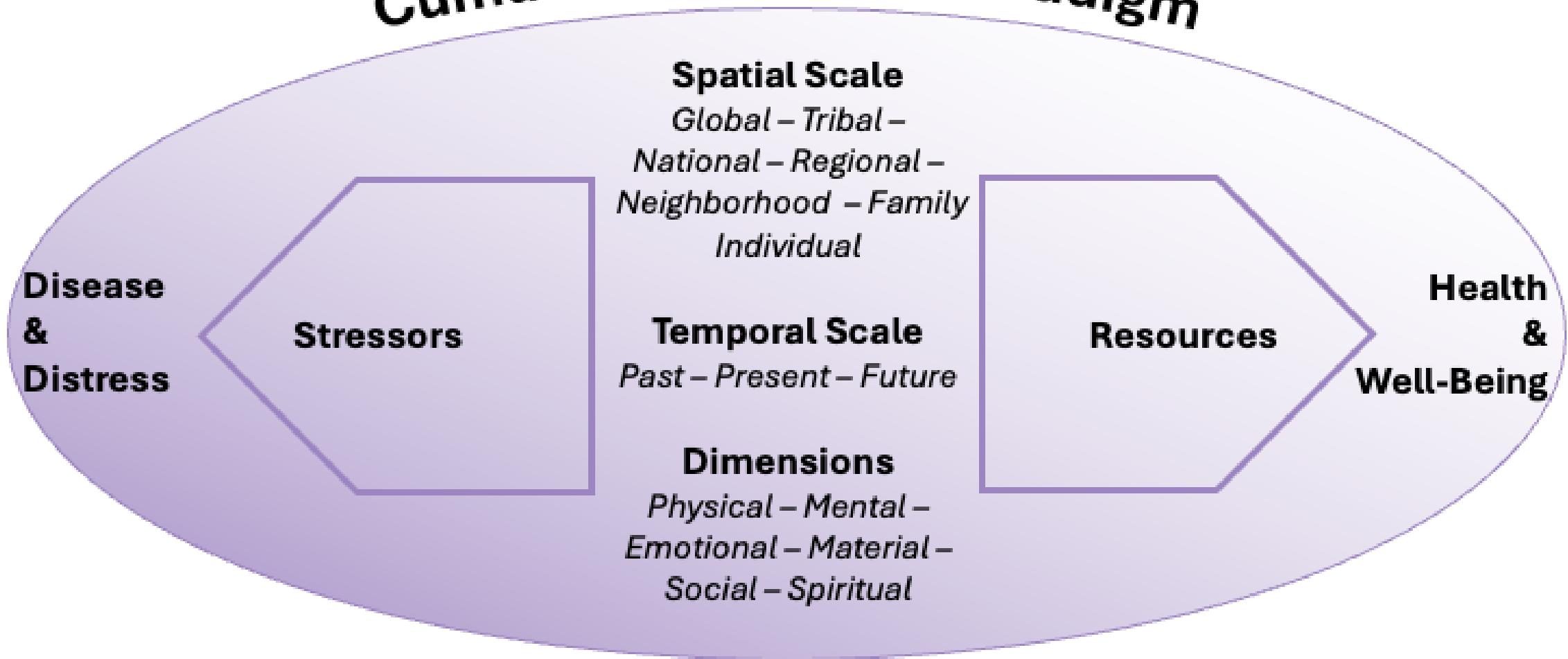
US EPA

Cumulative Impacts (CI) are defined as the **totality of exposures** to combinations of chemical and nonchemical stressors and their effects on health, well-being, and quality of life outcomes... (including **distributional factors**)

Tishman Center

Cumulative impacts (CI) are the **co-occurrence of multiple environmental pollution burdens** alongside socioeconomic stressors... (and reflect **lived reality**)

# Cumulative Impacts Paradigm



Source: NASEM, State of the Science and Future of Cumulative impacts Assessment, October 2025

# Key Moments

**2004**

NEJAC issues CI recommendations report

**2010**

CalEPA releases *CI: Building a Scientific Foundation* report

**2012**

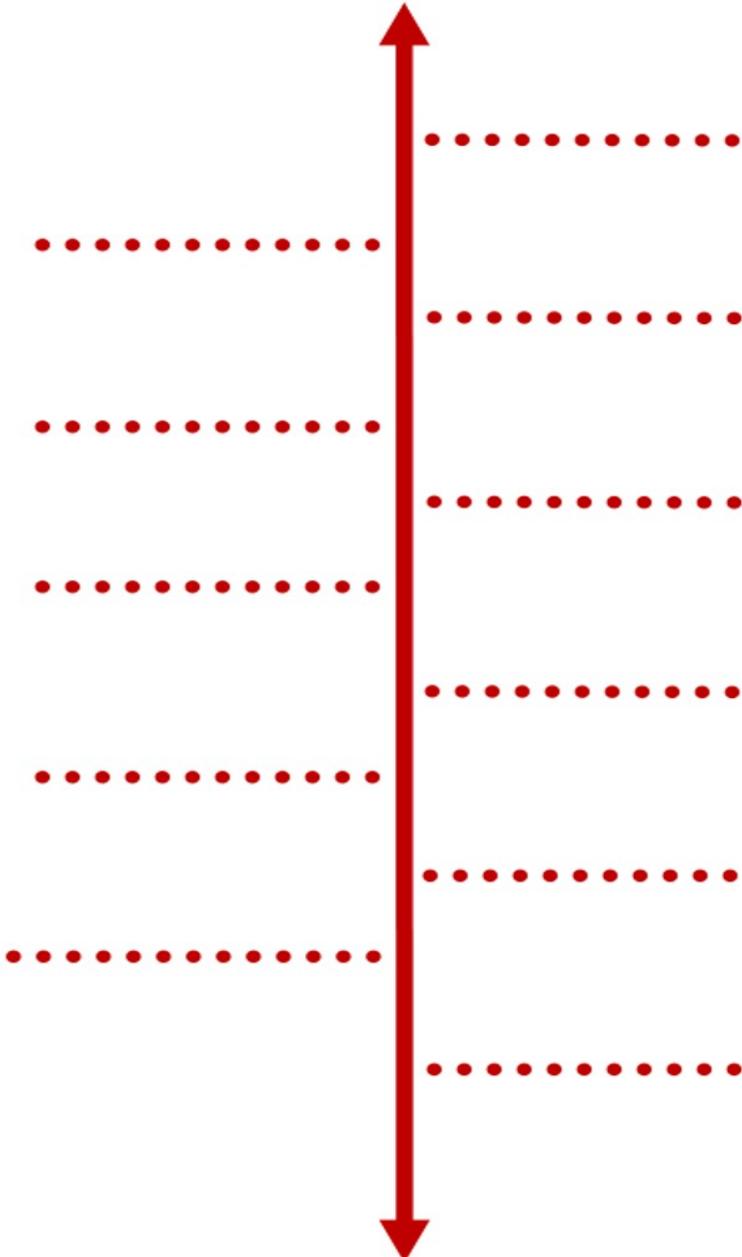
EPA issues EJScreen tool for internal use

**2020 & 2023**

NJ incorporate CI in EJ Law and Regulations

**2024**

EPA adopts CI Framework



**2004 & 2009**

CA and NJ EJ Councils issue CI recommendations

**2008**

MN adopts CI permitting law

**2012**

CA issues CalEnviroScreen tool

**2012**

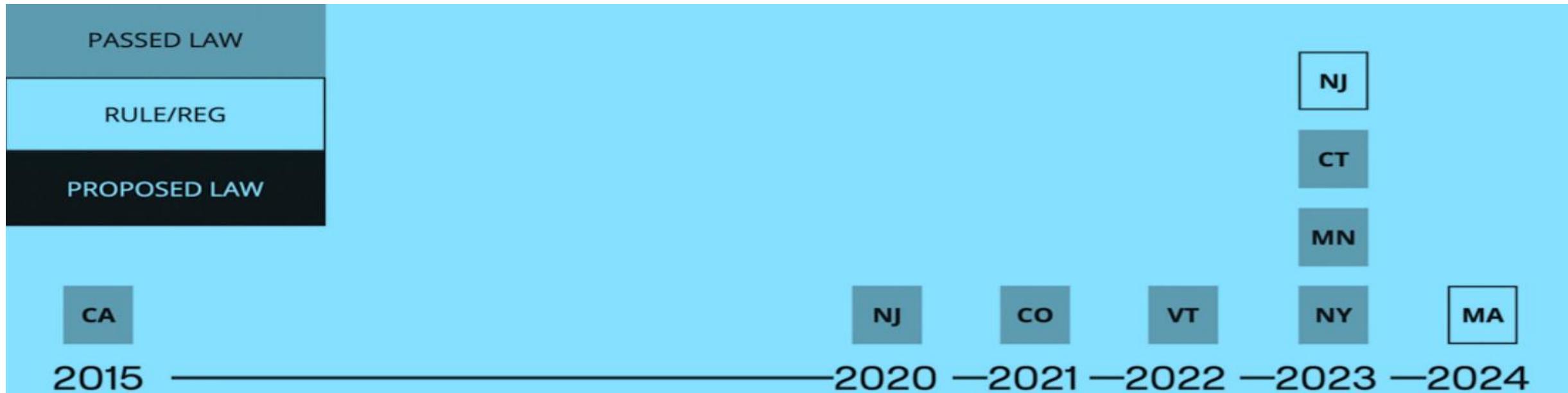
CA passes SB 535—California Climate Investments to Benefit Disadvantaged Communities

**2022 & 2023**

Chicago issues General Iron Health Impact Assessment/permit denial; subsequent Citywide CI Assessment

**2025**

NASEM issues CI State of the Science Report



# State Cumulative Impacts Laws and Regulations

Source: Tishman Center, The New School

# State and Local Cumulative Impacts Approaches: Major Prototypes

- California: Single score
- New Jersey: Matrix
- Massachusetts: Risk based thresholds focused on health endpoints
- Chicago: Health impact assessment



Overburdened Community Stressor Summary								
Block Group: 540100070001			County: Essex					
SOC Criteria: Low Income, Minority, and Limited English								
Combined Stressor Total								
Block Group Value	Combined Stressor Total	35	Block Group Value	Combined Stressor Total	35			
County Non OBS 50m	0	County Non OBS 50m	0	Geographic Point of Comparison	0			
State Non OBS 50m	0	State Non OBS 50m	0	Geographic Point of Comparison	0			
Geographic Point of Comparison	0	Geographic Point of Comparison	0	Adverse Stressor	Yes			
Adverse Cumulative Stressors	Higher than 65th Percentile							
Consolidated Areas of Air Pollution								
Stressor	Block	County Non OBS 50m	State Non OBS 50m	Geographic Point of Comparison	Adverse Stressor			
Ground-Level Ozone (3-year average days above standard)	Value	0	0	0	Yes			
Fine Particulate Matter (PM2.5) (3-year average days above standard)	Value	0	0	0	Yes			
Cancer Risk from Diesel Particle Matter (estimated cancer cases/yr)	290	174	95	96	Yes			
Cancer Risk from Air Toxics Excluding Diesel Particle Matter	64	51	40	40	Yes			
Non-Cancer Risk Air Toxics (Combined Hazard Quotient)	0.85	1.67	2.05	2.05	Yes			
Mobile Sources of Air Pollution								
Stressor	Block	County Non OBS 50m	State Non OBS 50m	Geographic Point of Comparison	Adverse Stressor			
Traffic - Cars, Light and Medium-Duty Trucks (Annual Average Daily Traffic (AADT) in cars/square mile)	Value	10429	28421	10429	Yes			
Traffic - Heavy Duty Trucks (Annual Average Daily Traffic (AADT) in heavy-duty trucks/square mile)	Value	2166	232	2166	Yes			
Railways (train/mile/square mile)	Value	0.0	0.0	0.0	Yes			
Contaminated Sites								
Stressor	Block Group	County Non OBS 50m	State Non OBS 50m	Geographic Point of Comparison	Adverse Stressor			
Known Contaminated Sites (estimated sites/square mile)	Value	1.09	1.81	1.43	Yes			
Known Contaminated Sites (estimated sites/square mile)	Count	1	2	1	Yes			
Ground Water Classification Exceeds/Exceeds/Exceeds Known	Value	3.81	0.0	0	Yes			
Exempt Restrictions (percent area)	Value	0.0	0.0	0.0	Yes			
Transfer Stations, or Other Solid Waste Facilities, Recycling Facilities, Scrap Metal Facilities								
Stressor	Block	County Non OBS 50m	State Non OBS 50m	Geographic Point of Comparison	Adverse Stressor			
Landfill (sites/square mile)	Block Group	0	0	0	Yes			
Landfill (sites/square mile)	Value	0.0	0.0	0.0	Yes			
Landfill (sites/square mile)	Count	0	0	0	Yes			
Landfill (sites/square mile)	Geographic Point of Comparison	0	0	0	Yes			
Point Sources of Water Pollution								
Stressor	Block	County Non OBS 50m	State Non OBS 50m	Geographic Point of Comparison	Adverse Stressor			
Surface water (percent of sites impaired)	Value	100.0	100.0	100.0	Yes			
Concentrated Sewage (count)	Value	0	0	0	No			
May Cause Potential Public Health Impacts								
Stressor	Block Group	County Non OBS 50m	State Non OBS 50m	Geographic Point of Comparison	Adverse Stressor			
Drinking water (count of public drinking water violations or exceedances, or percent of private well testing exceedances)	Value	18	NA	18	Yes			
Exceedances (percent of private well testing exceedances)	Value	21.40	59.73	18.38	Yes			
Lack of Recreational Water (percent of open space with water recreation)	Value	129.81	20.38	19.14	Yes			
Lack of Tree Coverage (percent lack of tree canopy)	Value	94	51	63	Yes			
Pollution (percent urban and use area)	Value	44	30	34	Yes			
Pollution (Urban Land Cover) (percent urban and use area)	Value	74	0	2	Yes			
Demographic/Environmental Stressors								
Stressor	Block Group	County Non OBS 50m	State Non OBS 50m	Geographic Point of Comparison	Adverse Stressor			
Emergency/Facility Sites (sites/square mile)	Block Group	0.00	0.00	0.00	Yes			
Emergency/Facility Sites (sites/square mile)	Value	1.88	0.17	0.04	Yes			
Emergency/Facility Sites (sites/square mile)	Count	0	1	0	Yes			
NUHEDS Sites (sites/square mile)	Value	0.00	0.02	0.0	Yes			
Social Determinants of Health								
Stressor	Block Group	County Non OBS 50m	State Non OBS 50m	Geographic Point of Comparison	Adverse Stressor			
Unemployment (percent unemployed)	Value	3.15	3.3	3.7	No			
Unemployment (percent without high school diploma)	Value	39.75	14.9	35.9	Yes			

# Uses of cumulative impacts assessment

Single Scoring	Matrix Approaches	Community-Based Approaches	Epidemiological Toxicological/ Exposure Modeling Approches
<ul style="list-style-type: none"><li>• CalEnviroScreen</li><li>• MiEJScreen</li><li>• MI EJScreening</li><li>• Chicago EJ Index</li><li>• CDC EJ Index</li><li>• WA Health Disparities Map</li></ul>	<ul style="list-style-type: none"><li>• New Jersey Regulations</li><li>• MassDEP Methods</li><li>• CEQ CEJST</li></ul>	<ul style="list-style-type: none"><li>• Health Impact Assessment</li><li>• EJ Collaborative Problem Solving grants</li><li>• Environmental Benefits Districts</li><li>• Green zones</li></ul>	<ul style="list-style-type: none"><li>• Identifying modifying factors in risk characterization</li><li>• Epigenetic approaches</li></ul>
<p>Inform decisions in</p> <ul style="list-style-type: none"><li>• siting</li><li>• permitting</li><li>• enforcement</li><li>• infrastructure improvement</li></ul>	<ul style="list-style-type: none"><li>• Permit decisions (e.g., NJ, MA)</li><li>• Prioritizing allocation of resources (CEQ CEJST)</li></ul>	<ul style="list-style-type: none"><li>• Community participatory research, place-based planning to revitalize communities</li><li>• Identify how project influences health</li></ul>	<ul style="list-style-type: none"><li>• Risk assessment</li><li>• Cumulative risk assessment</li></ul>

# Fit-for-Purpose for Different Decision Contexts

Different decision contexts need different types of analyses.

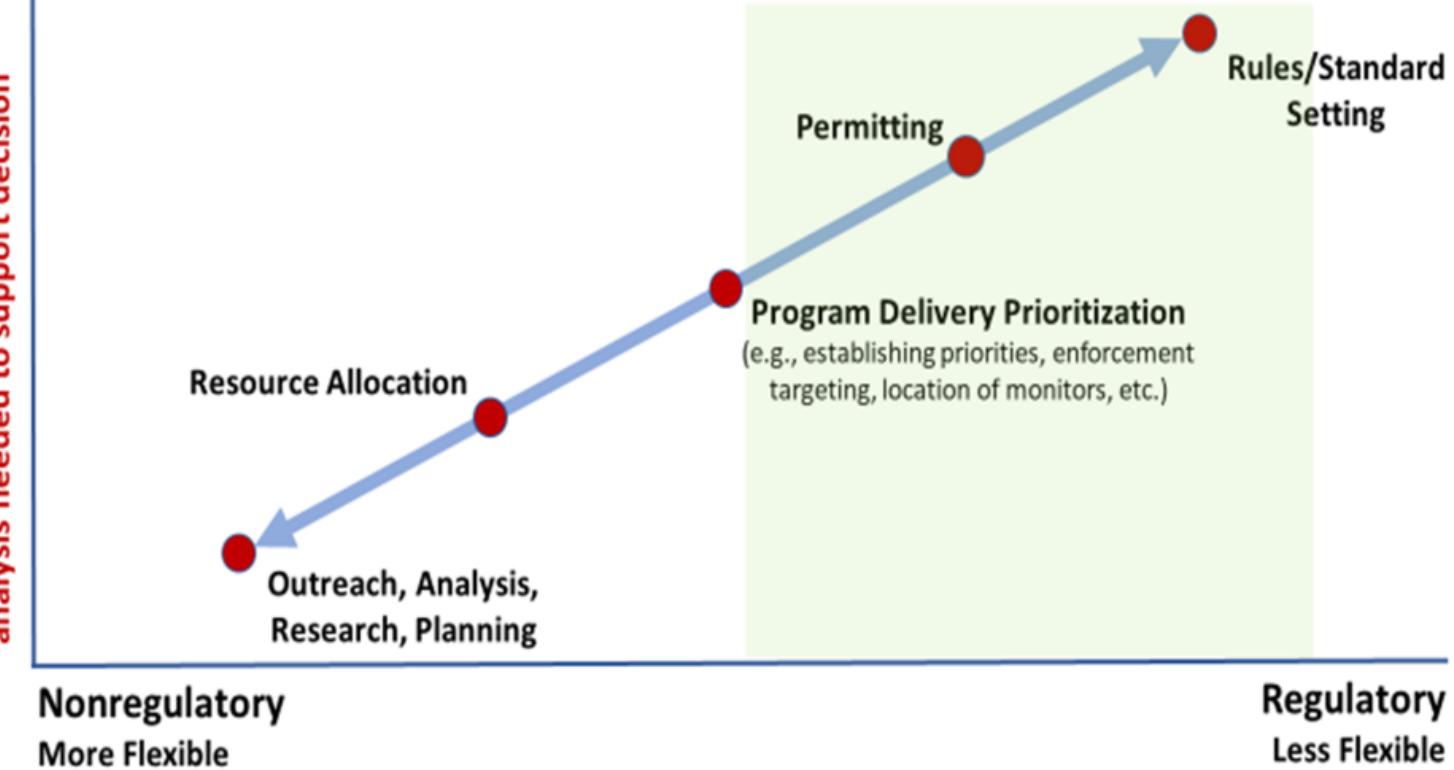
Cumulative impacts analysis already used in significant ways (e.g., resource allocation/ program prioritization)

Regulatory contexts (e.g., permits, rules) require new approaches

New developments represent challenges and opportunities for cumulative impacts assessment.

## Decision Contexts for Use of Cumulative Impacts Assessment Tools – A “Fit-for-Purpose” Continuum

Type/scale/quantification of analysis needed to support decision



Graphic Source: Lee, "Confronting Disproportionate Impacts and Systemic Racism"

CalEnviroScreen  
CDC EJ Index  
EJScreen  
CEJST

NJDEP CI Regs  
MassDEP Regs

# Recent Developments and Resources

Cumulative impacts regulations development in NY, MN and CN. Statutes enacted and bills proposed in many other states and cities

Johns Hopkins University studies on [SE Pennsylvania](#) and [Cancer Alley](#)

Tishman Center [database](#) on state cumulative impacts laws, regulations and policies

NASEM [Report](#) on State of the Science and Future of Cumulative Impacts Assessment

Harvard Environmental and Energy Law Program [CleanLaw Podcast](#) and analysis of state regulations (November 2025, forthcoming)

Environmental Justice Journal [Special Issue](#) on Cumulative Impacts and Government Decision-Making (December 2025, forthcoming)