

Introduction to Environmental Justice: Empirical Approaches and Methodologies in EJ

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a **disparity** in environment-related outcome and/or process

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a **disparity** in environment-related outcome and/or process

- How do we **measure** this disparity?
- What are the **tradeoffs** in alternative approaches to measuring?
- How do **methodological choices** connect to policy objectives?
- What are the **mechanisms generating** the disparity?

Objectives

1. Methodological decision points in documenting disparities
2. Recent research advancements and gaps in the literature
3. Connections to climate justice
4. Mechanisms generating disparities
5. Concluding thoughts

Full citations and more detail in: Cain, Hernandez-Cortes, Timmins, and Weber (2024)

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Significant body of work seeking to document the gap—involves:

- **Comparison groups** and populations of interest
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- **Statistical metric** to base differences
 - above/below mean vs limiting extremes
 - choice of metric relates to how damages are generated

Broad takeaways of research documenting gap

- Clear **descriptive differences** across environmental hazards by and sub-groups
- Robustness of findings a function of **data availability**
→ air vs water
- Improvements in **assigning hazards and damages to people**
→ advancements in pollution dispersal modeling for air
→ increasing analysis of inter-generational effects Gilmore et al. 2019, Voorheis 2017a, 2017b, Colmer and Voorheis 2020
→ Moving from coincidence to damages can be sub-group specific Hsiang, Oliva, and Walker (2019)
- Mixed approaches on **conditioning** (statistically) comparisons
→ context dependent
- Need more on **cumulative impacts** Morello-Frosch, Pastor, and Sadd 2001, Su et al. 2009, Sad et al. 2011

Climate justice

- Urban heat islands Hsu et al. 2021, Hoffman, Shandas, and Pendleton (2020)
- Residential sorting into climate-induced high risk zones Bakkensen and Ma (2020), Keenan, Hill, and Gumber (2018), Bin, Bishop, and Kousky (2017)
- Intensify existing disamenities—heat and air pollution, incidence of erratic events Zeighami et al. (2023)
- Climate policy costs and benefits Pizer and Sexton (2019), Chen, Goulder, and Hafstead (2018), Doremus, Jacqz, and Johnston (2022), Dauwalter and Harris (2023)
→ Implications for pushes electrify homes and vehicles Holland et al. 2019

Climate justice

Key intersections:

- Co-production of GHGs and local pollutants
- Incidence of policy costs
- Exacerbate existing hazards and inequities—heat and air pollution, incidence of weather events
- Systematically related vulnerabilities and adaptation channels
→ Moving costs, health care access, defensive investments, gentrification channels

Mechanisms generating the gaps

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Banzhaf, Ma and Timmins (2019), Mohai, Pellow, and Roberts (2009):

1. Residential sorting—*coming to the nuisance*
2. Firm sorting
3. Discriminatory politics and enforcement—procedural justice
4. Market coordination of all of the above

Residential location choices: what we've learned

- **Historical development** shapes current residential locations Hoffman, Shandas, and Pendleton (2020); Nardone et al. (2020)
- **Pure discrimination in housing choice set** Chistensen and Timmins (2020, 2022)
- Different implications for **renters vs owners**, including time-horizon Bayer et al. (2016)
- Lack of **information** can aggravate EJ disparities Hausman and Stolper (2021)
- Though consequence of **information disclosures** can vary Wang (2021)
- Policy induced clean-ups can improve the local environment, but can lead to **out-migration** of priority groups Gamper-Rabindran and Timmins (2021)

Residential locations: knowledge gaps

- Gentrification patterns largely hard to predict and evidence is mixed
- Potential over emphasis on residential environmental burdens
→ occupation, time use, adaptive behaviors
- Lacking empirics on connection between residential exposures, vulnerabilities, and damages
- Full welfare impacts — tradeoffs of higher prices and lower pollution

Location of polluting firms: what we know

- Firms look for **low costs** land/housing, labor
→ magnify residential location effects
- **Strategically locate** to avoid regulation Morehouse and Rubin (2021)
- Siting processes engage regulatory agencies across levels, **NIMBY**-motivated public participation Bell and Carrick (2018), Gray and Shadbegian (2004, 2012), Ho (2022)
→ issues in procedural justice
- **Dynamics**: timing at siting versus operation, historical drivers Wolverton (2009), Heblich, Trew, and Zylberberg (2021)

Location of polluting firms: looking ahead

- Permitting processes:
 - communities that are better able to **organize politically** are less likely to see local firms expand hazardous waste processing
 - differential **negotiating power** Hamilton (1993), Timmins and Vissing 2022
- Renewable energy
 - Land area required will necessitate much **land use debate**
 - **Disamenity** for some, **amenity** for others Dauwalter and Harris (2023)

Concluding thoughts

- Last decade has seen a **surge of interest** in this area; this talk highlighted findings from work in economics and EJ
- No common choice of comparison group or metric of justice—needs to be **context specific**
- **Key advances** include pollution dispersal, documentation and use of new data sources, and bias in these sources
- Environmental hazards studied limited to **data availability** – administrative agencies can help
- Discussions on **mechanisms and welfare** are growing, but empirical documentation is limited

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For full citations: see Cain, Hernandez-Cortes, Timmins, and Weber (2024)