

Day 11: Air Pollution

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Road map

- Consider why air pollution remains a problem in the United States
- Discuss the approaches used to tackle major air pollution problems

Why Is Air Quality So Bad in the US?

https://youtu.be/3_IoGGijsu4

What is PM_{2.5}?

- Many sources
- Direct emissions and atmospheric interactions (e.g., acid rain)
- Deep lung penetration and circulatory system penetration

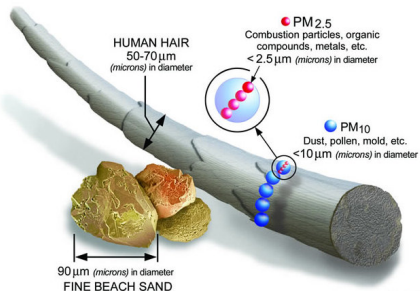


Image courtesy of the U.S. EPA

Air Quality Over Time

Changes in PM 2.5

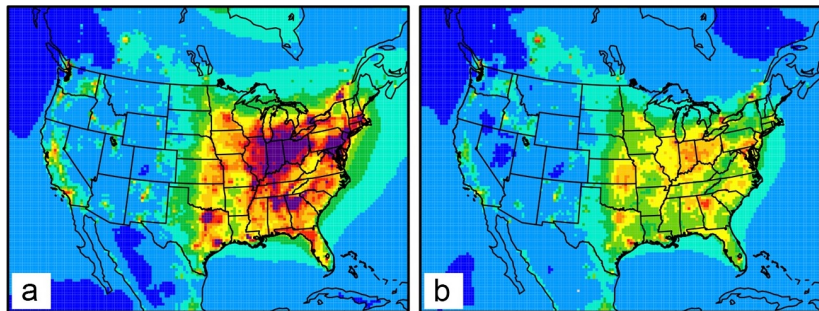


Figure: Nasa, 1990(a) and 2010 (b)

Global Context

Ozone Concentrations

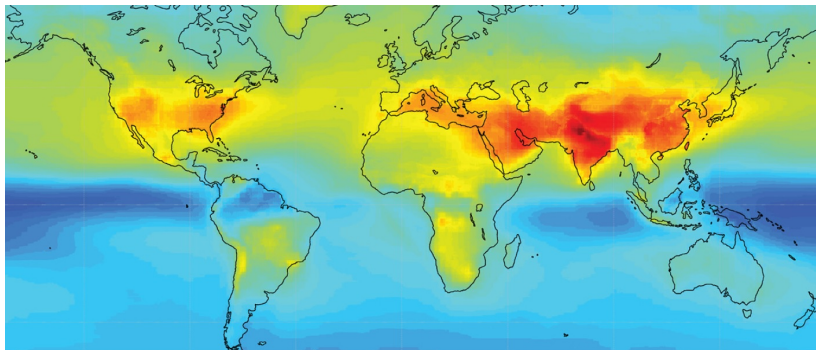


Figure: Nasa, 2015

Global Context

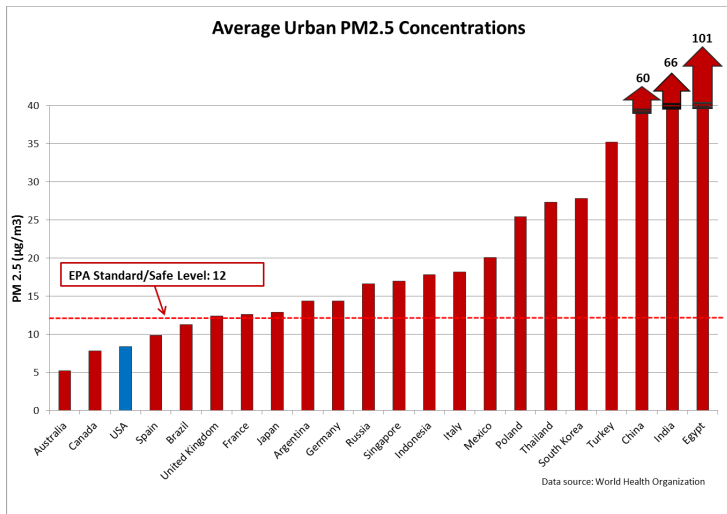


Figure: Global Energy Institute, 2018

Global Context

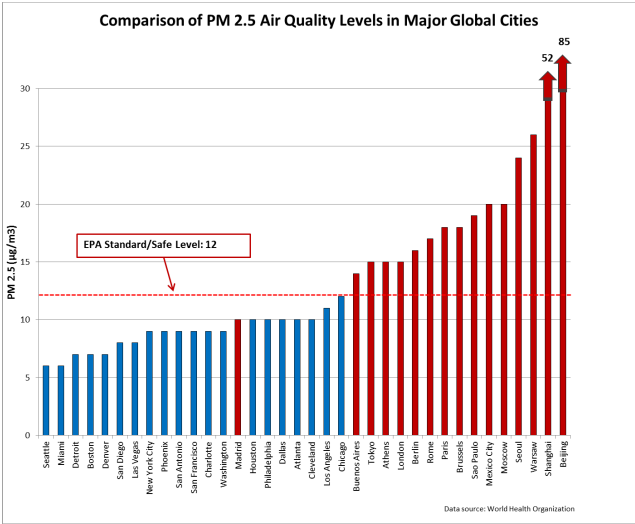
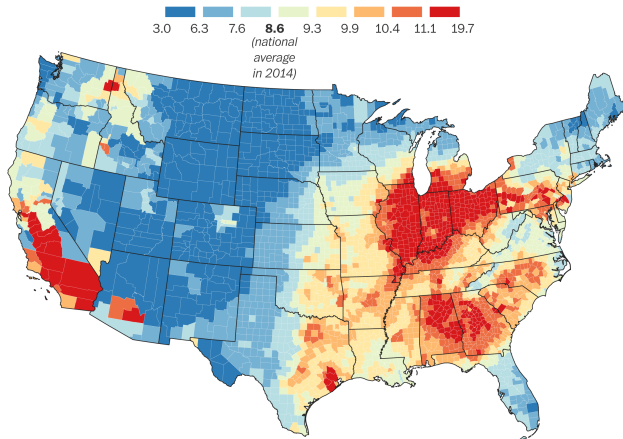


Figure: Global Energy Institute, 2018

Variation Across the US

The map of American air pollution

Daily average small particulate matter (PM2.5) concentration in 2014



Source: Robert Wood Johnson Foundation County Health Rankings

THE WASHINGTON POST

Figure: Ingraham 2019

Policy Tools

Emissions Trading Systems

- Netting
- Offsets (cap and trade)
- Bubbles (trading allowed)
- Banking

Challenges in setting caps, adjusting caps, and avoiding leakage

Major Air Pollution Problems

- Toxic Air Pollution
- Acid Rain
- Stratospheric Ozone
- Climate Change

What are the greatest political, policy design, and practical challenges facing each of these problems?