



Air Pollution and Public Health



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Air Pollution has a Compelling History



Donora – 1948



London – 1952



New York City – 1966

Events of health consequence and nagging health adversities



Birmingham – 1972



Los Angeles – 1988



Atlanta – 1996



...The Recovery is also Compelling

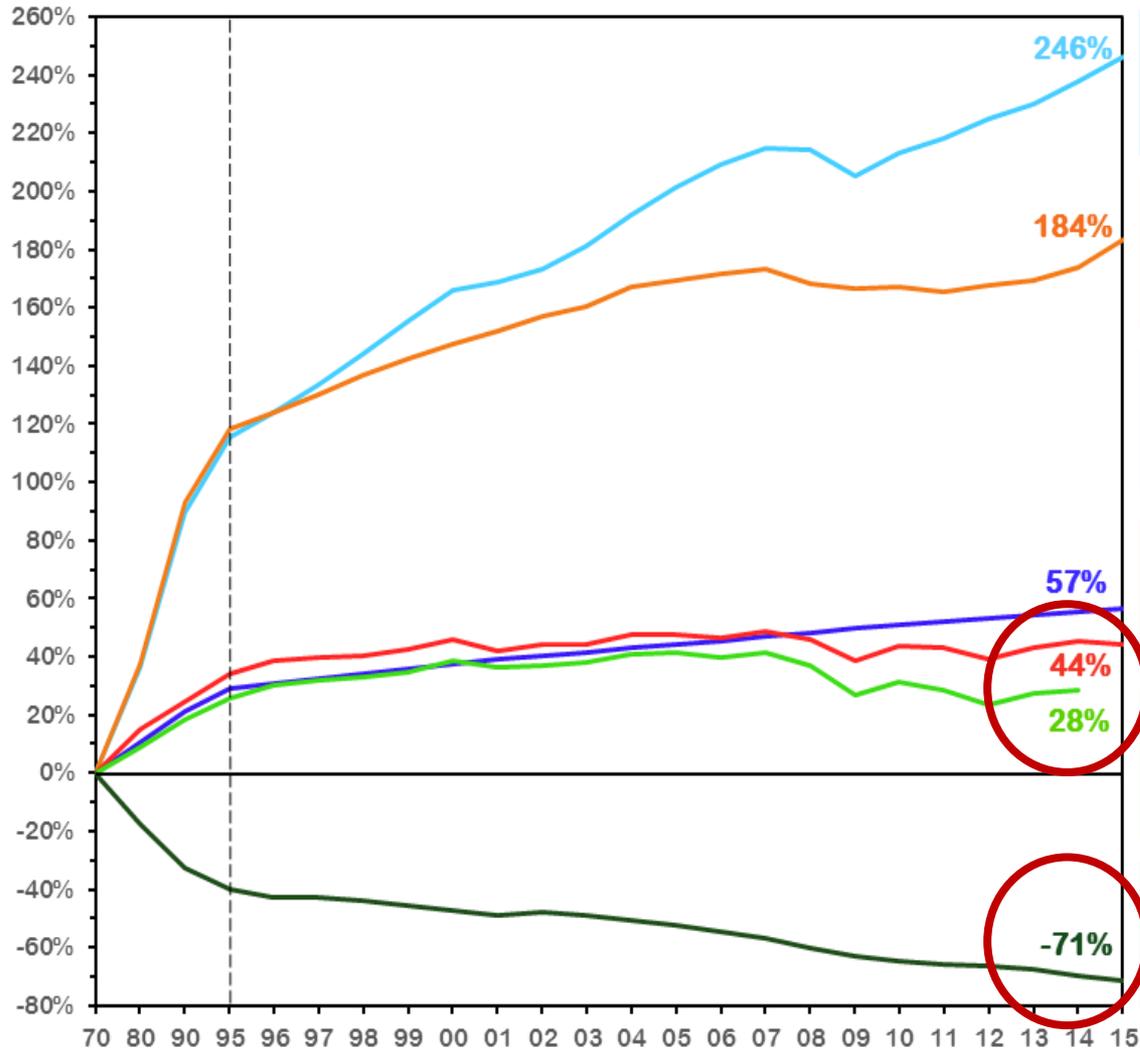


A new era for cities – places to live, work and play



A Good News Story...

Comparison of Growth Areas and Emissions, 1970-2015



Gross Domestic Product



Vehicle Miles Traveled



Population



Energy Consumption



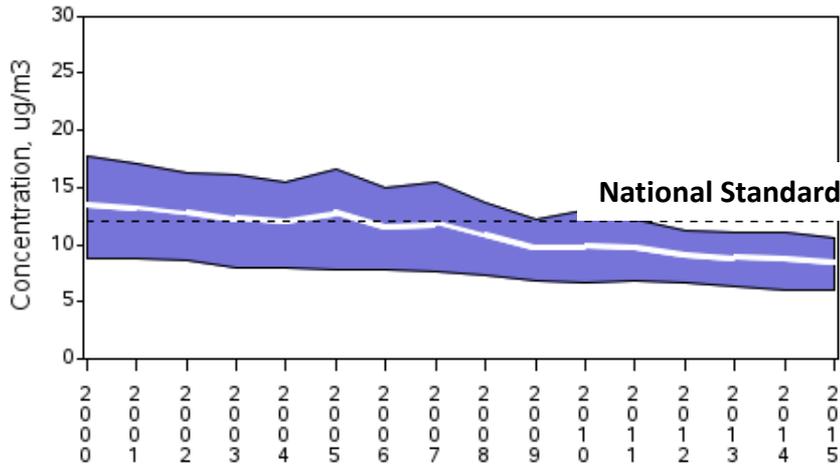
CO₂ Emissions



Aggregate Emissions
(Six Common Pollutants)

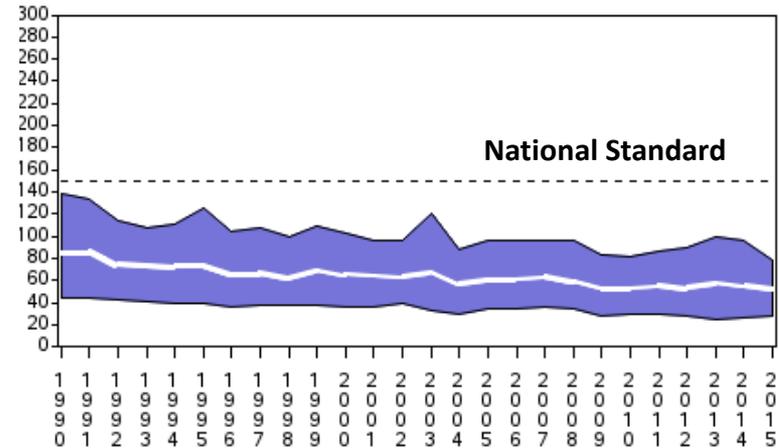
PM Trends

PM2.5 Air Quality, 2000 - 2015
(Seasonally-Weighted Annual Average)
National Trend based on 480 Sites



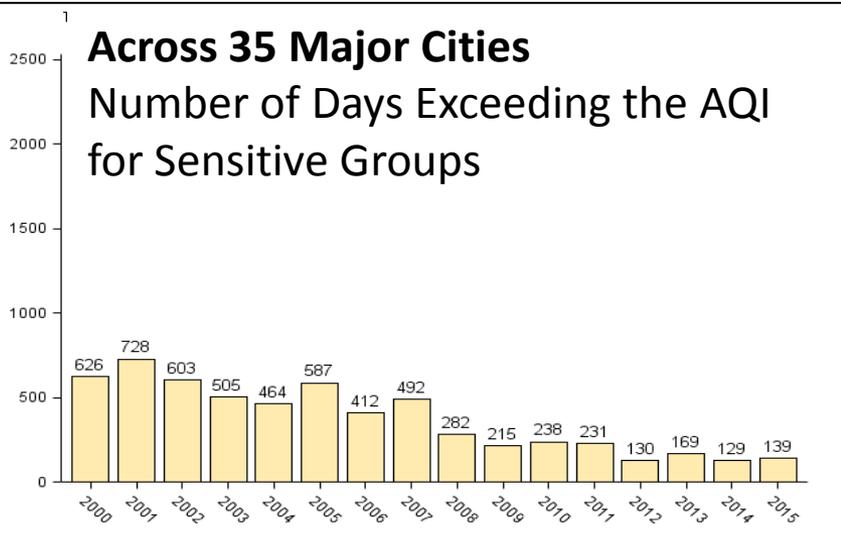
2000 to 2015 : 37% decrease in National Average

PM10 Air Quality, 1990 - 2015
(Annual 2nd Maximum 24-Hour Average)
National Trend based on 171 Sites

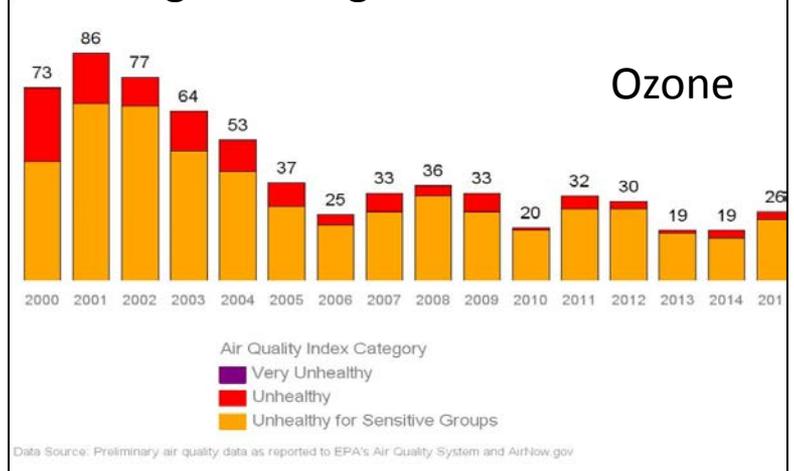


1990 to 2015 : 39% decrease in National Average

Across 35 Major Cities
Number of Days Exceeding the AQI
for Sensitive Groups



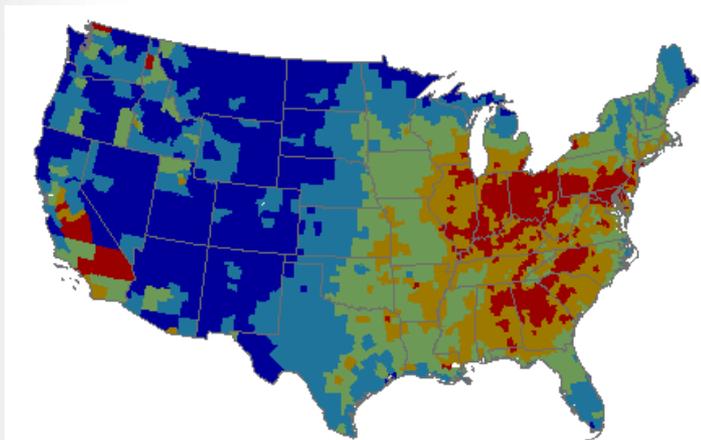
Los Angeles Long Beach - AQI



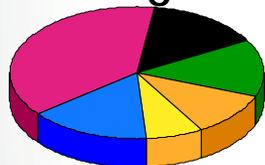


U.S. Public Health Burden of PM_{2.5}

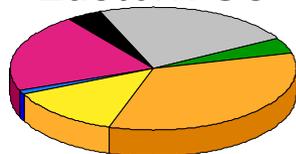
Percentage of PM_{2.5} related deaths due to 2005 air quality levels by county



Los Angeles



Eastern US



- Minerals
- Sulfate
- Ammonium
- Nitrate
- Elemental Carbon
- Organic Carbon
- Unknown

Summary of National PM_{2.5} impacts due to 2005 air quality

Excess mortalities (adults) ^A	130 to 320,000
Percentage of all deaths due to PM _{2.5} ^B	5.4%

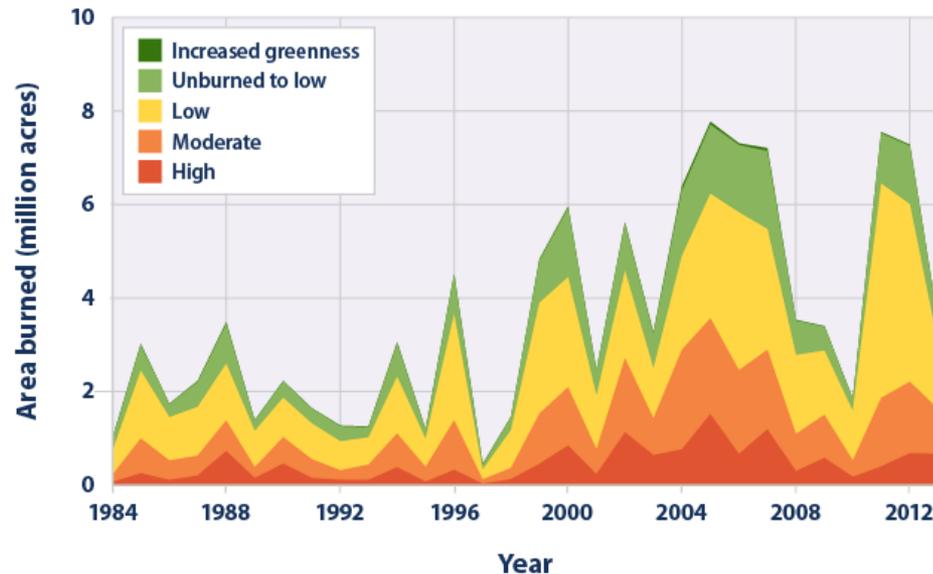
Impacts among Children

ER visits for asthma (<18 yr)	110,000
Acute bronchitis (age 8-12)	200,000
Exacerbation of asthma (age 6-18)	2,500,000

^A Range reflects use of alternate PM mortality estimates
^B Population-weighted value using Krewski et al. (2009) PM mortality estimates



Damage Caused by Wildfires in the United States, 1984–2013



Data source: MTBS (Monitoring Trends in Burn Severity). 2015. MTBS data summaries. www.mtbs.gov/data/search.html.

For more information, visit U.S. EPA's "Climate Change Indicators in the United States" at www.epa.gov/climatechange/indicators.

- The United States spends more than \$1 billion every year to fight wildfires
- According to National Interagency Fire Center data, of the 10 years with the largest acreage burned, nine have occurred since 2000 (as of 2012)
- NEI: ~38% of the 2014 $PM_{2.5}$ annual avg. resulted from wildland fires



Some Issues on National Concern

Transportation sources can be of particular concern because of ubiquitous use and people come into close contact with vehicle emissions on a daily basis

Studies show that children and adults living, working and going to school near highways and large transportation facilities face increased health risks

- Asthma and other respiratory diseases
- Cardiovascular effects
- Birth and developmental effects
- Premature Mortality
- Cancer





Today's Goal

- The protection and improvement of public health is one that is more than regulation
 - To achieve this goal, a more proactive role is needed in outreach and communication working with the public health community and the public at large bringing information and tools to empower the public and when possible provide insights for intervention.
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- U.S. Air Quality Index New Communication Tools – Susan Stone (EPA/OAQPS)
 - Wildland Fire Smoke and Public Health – Ana Rappold (EPA/ORD)
 - Environmental and Public Health Air Pollution and the Healthcare System – Wayne Cascio (EPA/ORD)
 - Pilot Study on Maternal Exposure to Traffic-related PM_{2.5} Air Pollution – Joe Ziestman (Texas A&M Transportation Institute)