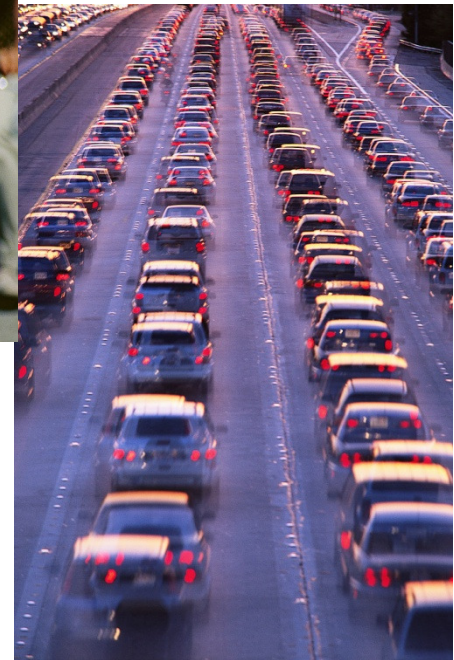


Improving  
Kids'   
Environment

# Air Pollution and Public Health

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Improving Kids' Environment  
[www.ikecoalition.org](http://www.ikecoalition.org)





# Overview

- Overview
- How does air pollution affect health and other values we care about?
- Sources and causes of air pollution
- Where to get information about air quality
- How do we protect public health from air pollution?

# Why Do We Care?

- Protect public health
- Ecological damage
- Economic impacts
- Quality of life
- Future of the Planet



# Public Health

- Route of Exposure

- Inhalation

- The average adult breathes 3000 gallons of air per day





# Public Health

- Lung diseases and respiratory effects
  - Asthma
  - Chronic Obstructive Pulmonary Disease
  - Asbestosis/mesothelioma (70-80% of people with mesothelioma have had exposure to asbestos)
  - Cardiovascular effects
- Cancer
  - Benzene, vinyl chloride, PCBs
  - Skin cancer
  - Lung cancer—from smoking, radon

<http://www.cdc.gov/nceh/airpollution/>



# How Does Air Pollution Affect Children's Health?

- SMOG: Particles and Ozone

- Asthma

- 15.7% of Indiana households reported that at least one child had been diagnosed with asthma (2002 BRFSS)
    - Responsible for more missed school days than any other illness
    - Pre-puberty more boys than girls; post-puberty more girls than boys

Source: ISDH and Indiana Joint Asthma Coalition, *The Burden of Asthma in Indiana* (2004) ([www.in.gov/isdh/programs/asthma/pdfs/BurdenAsthmaIndiana1-24-05.pdf](http://www.in.gov/isdh/programs/asthma/pdfs/BurdenAsthmaIndiana1-24-05.pdf))

# Ecological Damage – Acid Rain



	pH 6.5	pH 6.0	pH 5.5	pH 5.0	pH 4.5	pH 4.0
TROUT	Light Blue	Light Blue	Light Blue	Light Blue	Dark Blue	Dark Blue
BASS	Red	Red	Red	Dark Blue	Dark Blue	Dark Blue
PERCH	Blue	Blue	Blue	Blue	Blue	Dark Blue
FROGS	Green	Green	Green	Green	Green	Green
SALAMANDERS	Light Green	Light Green	Light Green	Light Green	Dark Blue	Dark Blue
CLAMS	Yellow	Yellow	Dark Blue	Dark Blue	Dark Blue	Dark Blue
CRAYFISH	Pink	Pink	Pink	Dark Blue	Dark Blue	Dark Blue
SNAILS	Olive	Olive	Dark Blue	Dark Blue	Dark Blue	Dark Blue
MAYFLY	Red	Red	Red	Dark Blue	Dark Blue	Dark Blue

# Economic Damage

## Building damage

The Acropolis



## Recreation/tourism

The Great Smoky Mountains



## Crop Damage



# Quality of Life

Odor



Wood Smoke



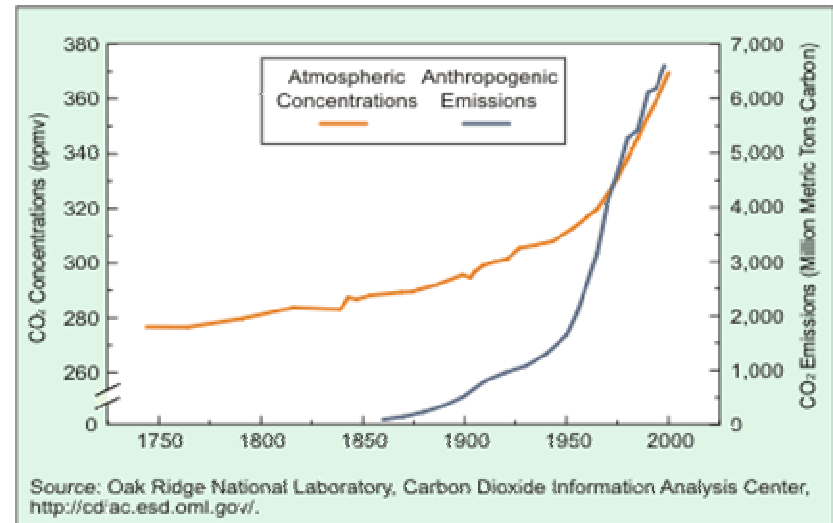
Urban Smog

# The future of the planet

- Global Warming
- Climate Change



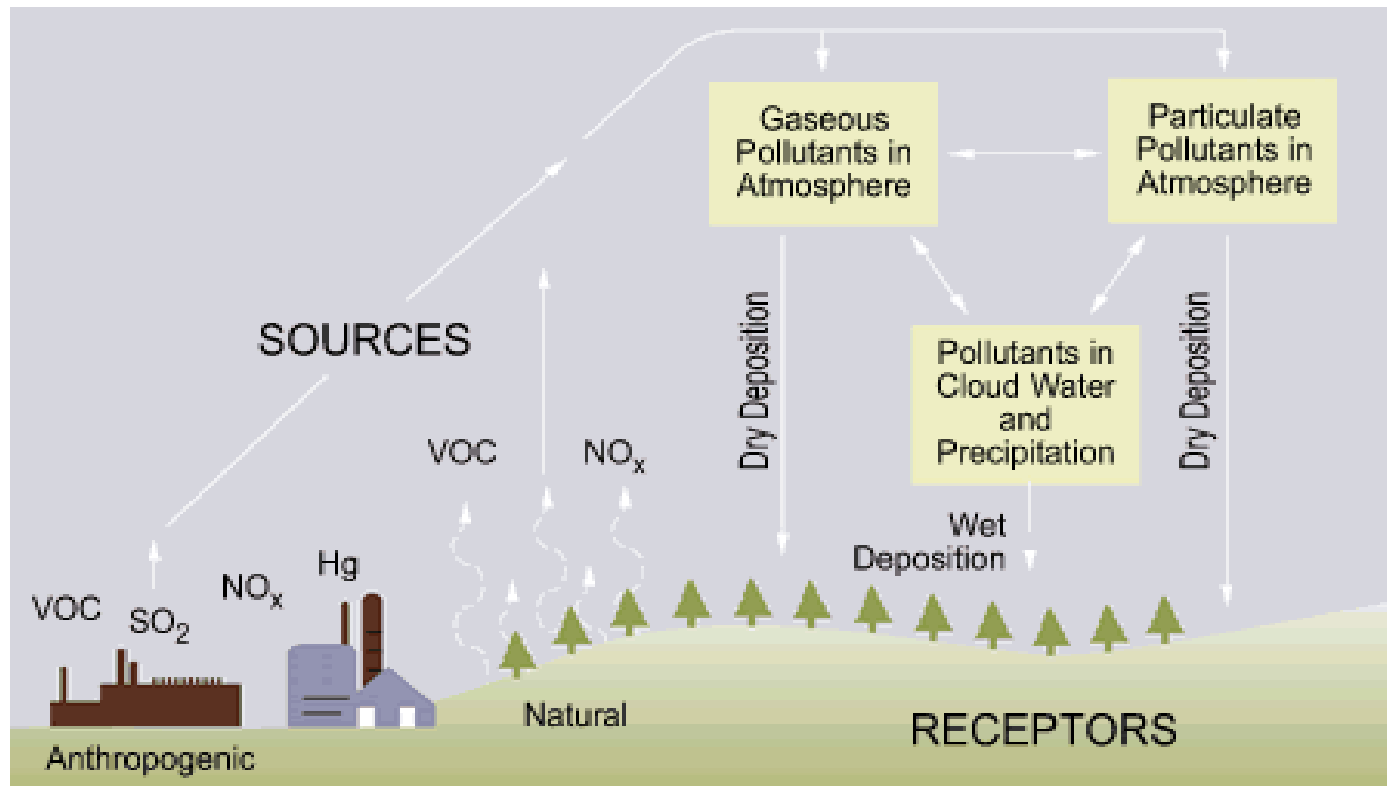
70 meters thinning in 5 years





# Sources and Causes of Air Pollution

- Natural sources: volcanoes, forest fires, dust storms, radon
- Human sources:
  - Motor vehicles
  - Industry (factories, power plants)
  - Agriculture (animal feeding lots)
  - Small businesses (e.g., dry cleaners, printing, gas stations)
  - “People” activities (painting, lawn mowing, consumer products, open burning)



The path of air pollutants



# Types of air pollutants

## ■ Gaseous pollution, e.g.

- Ozone – a gas formed when air pollutants from cars and factories mix with sun and heat in the atmosphere; a summertime pollutant
- Sulphur dioxide – a gas from power plants that causes acid rain

## ■ Solid (particle) pollution, e.g.

- Dust
- Metals



# Ozone

- Formed when pollutants from cars, factories, even small engines like lawn mowers, mix in the presence of heat and sunlight (summertime)
- Can travel long distances; very weather dependent
- Has substantial public health effects



# Particles

- A complex mixture of extremely small particles and liquid droplets, made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles
- They can travel long distances
- They have substantial health impacts and impair visibility
  - The size of the particle is critical

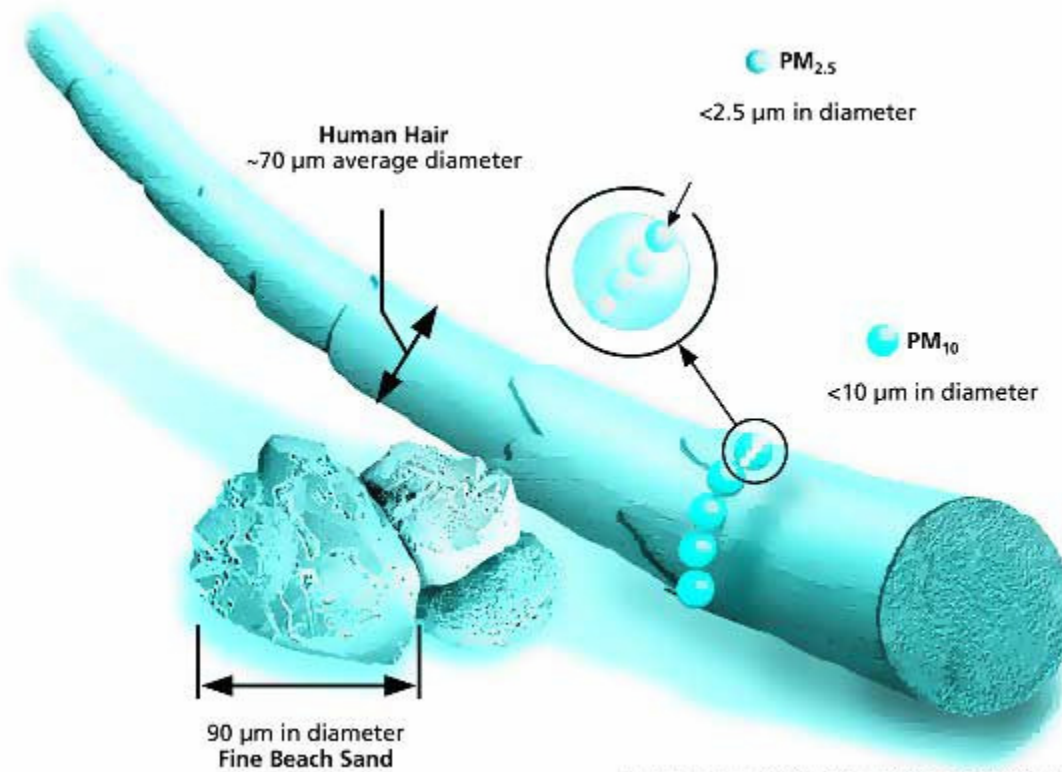
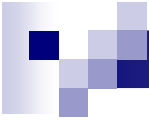
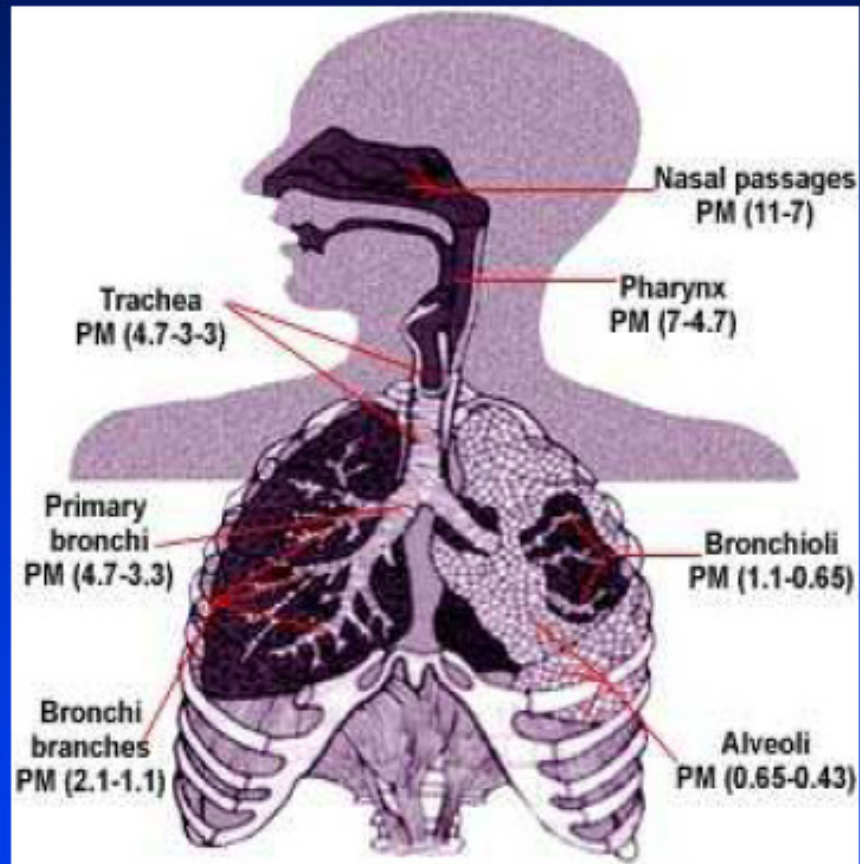


Image courtesy of EPA, Office of Research and Development

# Penetration of the lung





# What are “air toxics?”

- Pollutants that are known or suspected to cause cancer or other serious health effects (reproductive, neurological, developmental, respiratory, etc.)
- The government regulates 188 “hazardous air pollutants” (e.g. benzene, dioxin, asbestos), but there are no known “safe” levels





# How to find out about Air Quality

- Air Quality Index
- Smogwatch
- Hazecam
- Local Media



### Current Conditions for Indianapolis/Metro Area:

<b>Date:</b>	04/02/06
<b>Time:</b>	2:00 p.m.
<b>AQI:</b>	29
<b>Category:</b>	 Good
<b>Pollutant:</b>	Fine Particles
<b>Groups Affected:</b>	None
<b>Tomorrow's Forecast:</b>	 Moderate

[www6.indygov.org/cgi-bin/ermd/aqi.cgi](http://www6.indygov.org/cgi-bin/ermd/aqi.cgi)



## IN Department of Environmental Management – air quality forecasts

- Forecasts available by phone: **1-800-631-2871**  
or **(317) 233-2318 (IDEM Smogwatch line)**
- Forecasts available by computer:  
[www.in.gov/apps/idem/smog/](http://www.in.gov/apps/idem/smog/)

Region	Health Level	Primary Pollutant
<a href="#">Eastcentral</a>	Moderate	PM2.5
<a href="#">Northcentral</a>	Moderate	PM2.5
<a href="#">Northeast</a>	Good	PM2.5
<a href="#">Northwest</a>	Moderate	PM2.5
<a href="#">Southeast</a>	Moderate	PM2.5
<a href="#">Southwest</a>	Moderate	PM2.5
<a href="#">Westcentral</a>	Moderate	PM2.5



Description	Who's Affected
Good 0 - 50	Nobody
Moderate 51 - 100	Unusually sensitive individuals
Unhealthy for sensitive groups 101 - 150	Sensitive Groups <ul style="list-style-type: none"><li>• Children</li><li>• The elderly</li><li>• Asthmatics</li><li>• People with lung disease</li><li>• People with heart disease</li><li>• Adults who are active outdoors</li></ul>
Unhealthy 151 - 200	General public and especially sensitive groups



[www.mwhazecam.net/indianapolis.html](http://www.mwhazecam.net/indianapolis.html)



# How Do We Control Air Pollution?

- Federal Laws
- State Laws
- Local requirements
- Voluntary programs and public education
- Scientific research
- Control technology, pollution prevention, renewable/alternative fuels, changed behavior



# Government Responsibilities

- Monitor the air to see how much air pollution in it
- Issue permits to businesses that emit air pollutants, which require air pollution controls
- Inspect businesses and enforce requirements of laws and permits
- Develop plans for areas not meeting health standards, such as new pollution laws, education



# What to do if Air Quality is Poor?

- Limit or postpone activity and exercise; rest periodically
- Postpone activities that create air pollution (refueling, lawn mowing, painting)
- Avoid highly polluted areas
- Have medication handy



# How can you help?

- Be conscious of your own behavior and model it for your children
  - Limit driving; carpool; don't idle or use drive-thrus; pay attention to gas mileage
  - Conserve energy and recycle
  - Be aware of air quality forecasts
  - Never open burn

