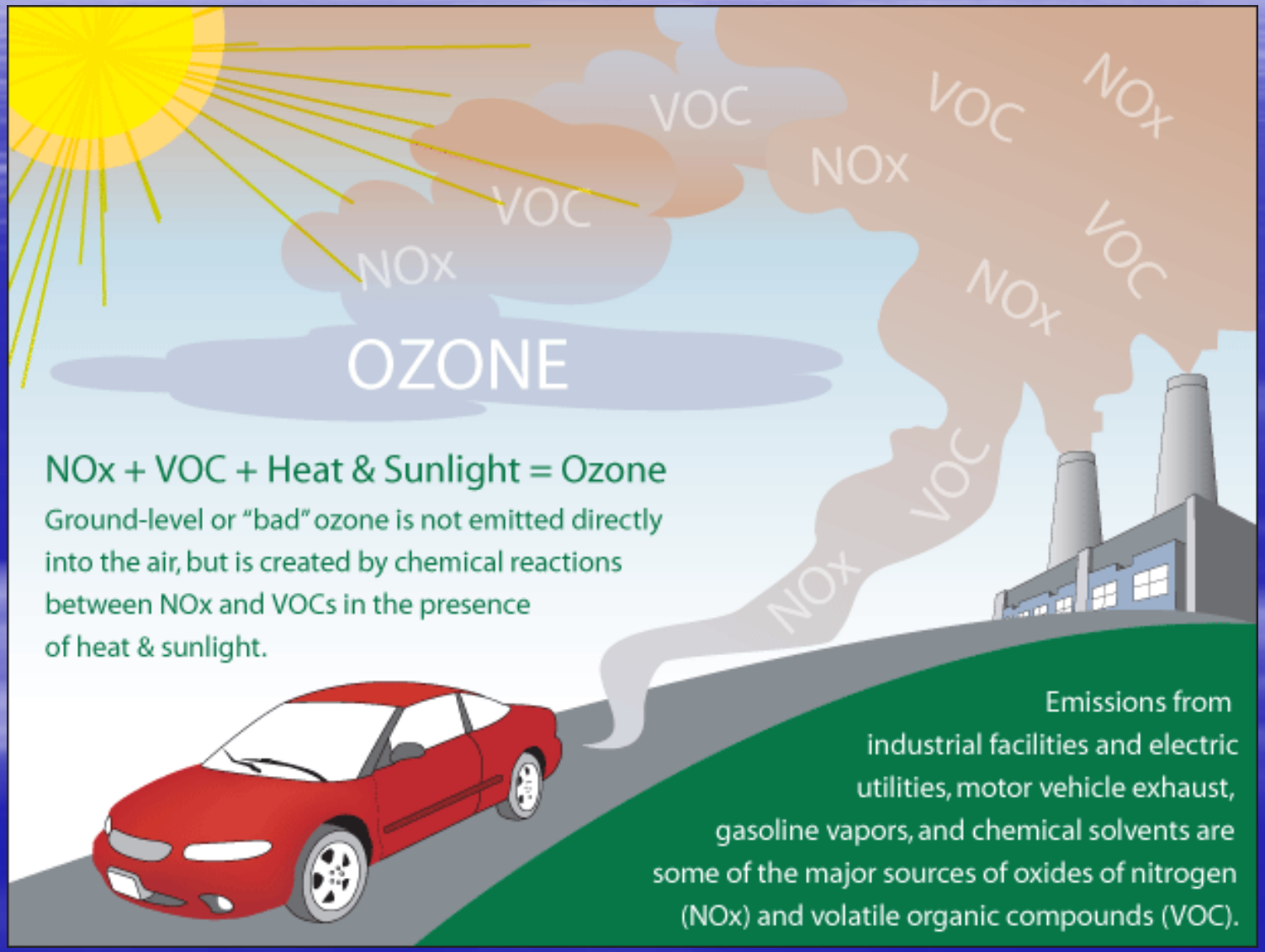
Air Pollution: Impacts and Sources

What is the role of recreational fires?

Minneapolis Air Pollutants of Concern

- **Carbon Dioxide**
  - Climate Change (Global Warming)
- **Ground level Ozone**
  - Health impacts, damages vegetation, nonattainment
- **Particulate Matter**
  - Health impacts, nonattainment
- **Air Toxics**
  - Health impacts

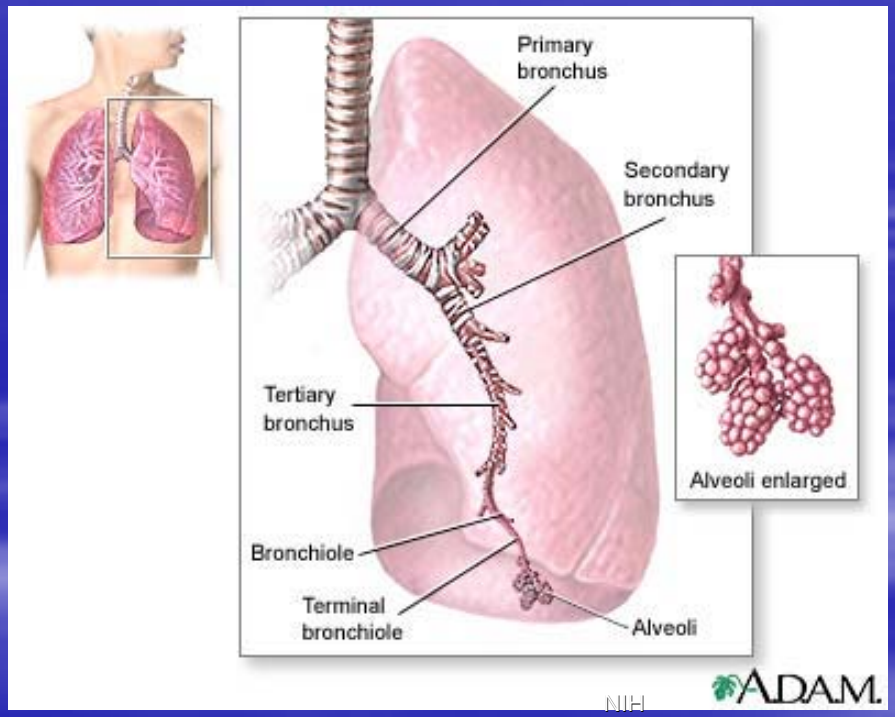
Ground level Ozone



http://www.earthlyissues.com/images/ozoneform.gif

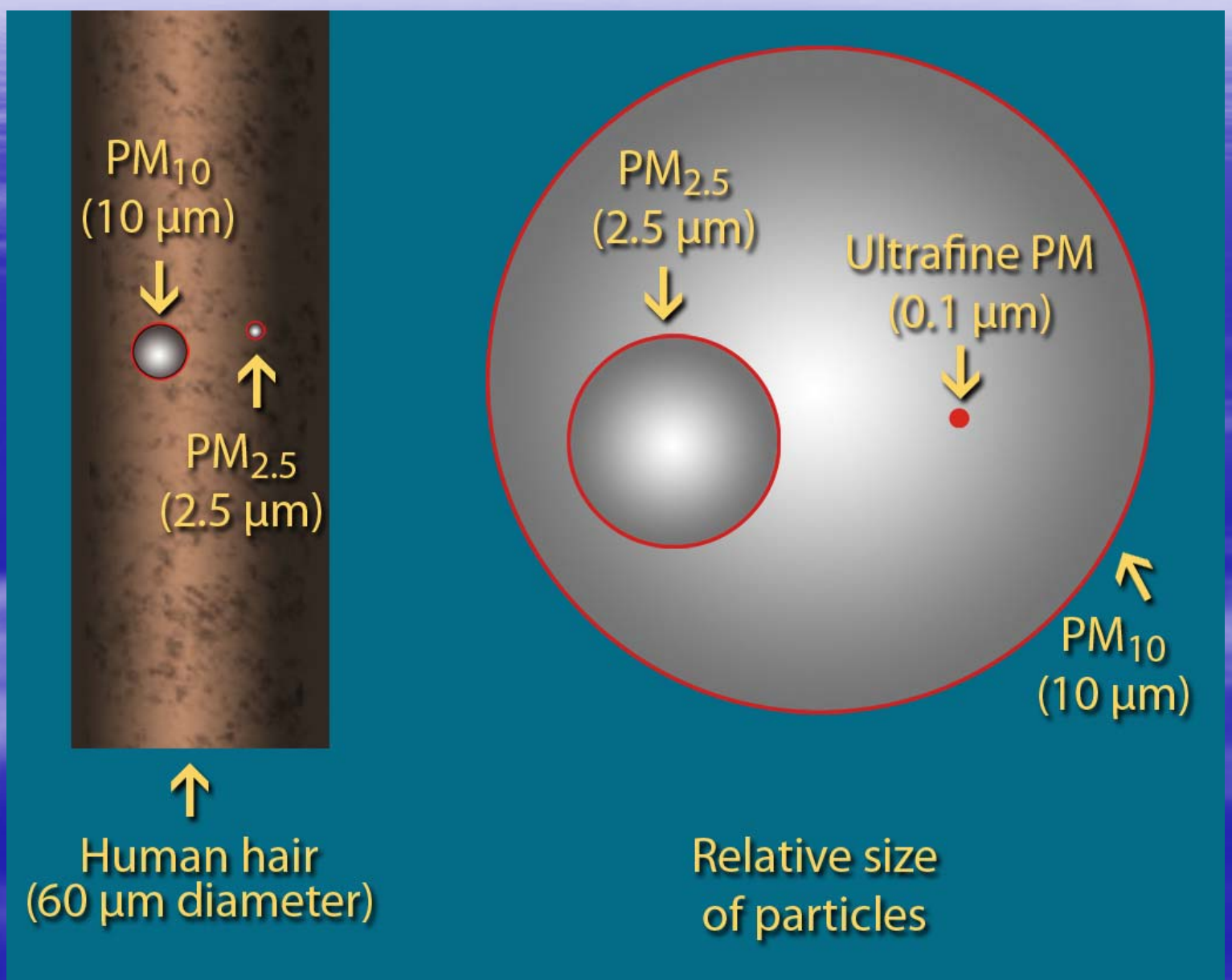
Ground Level Ozone

USDA

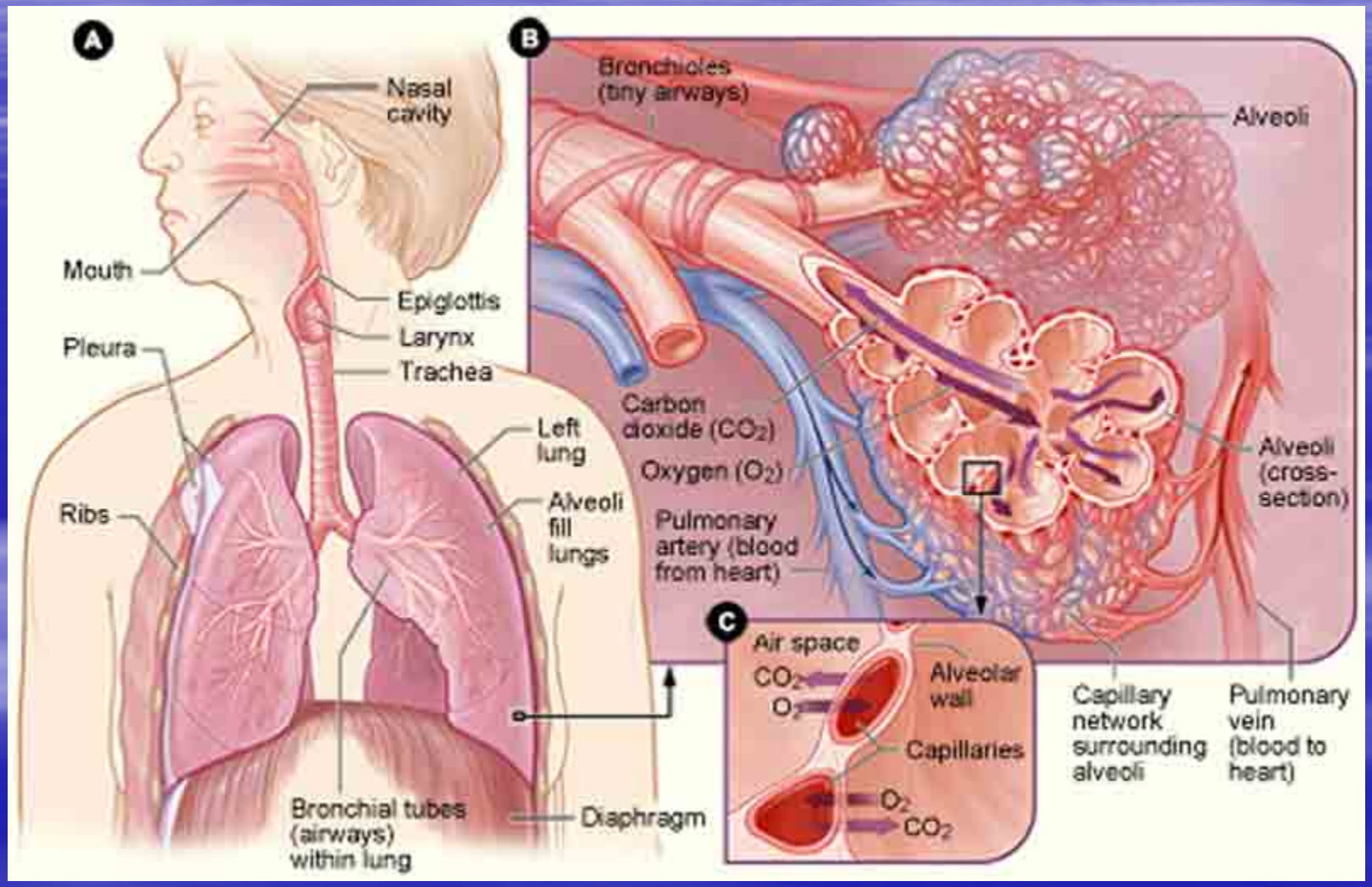


NIH

Particulate Matter



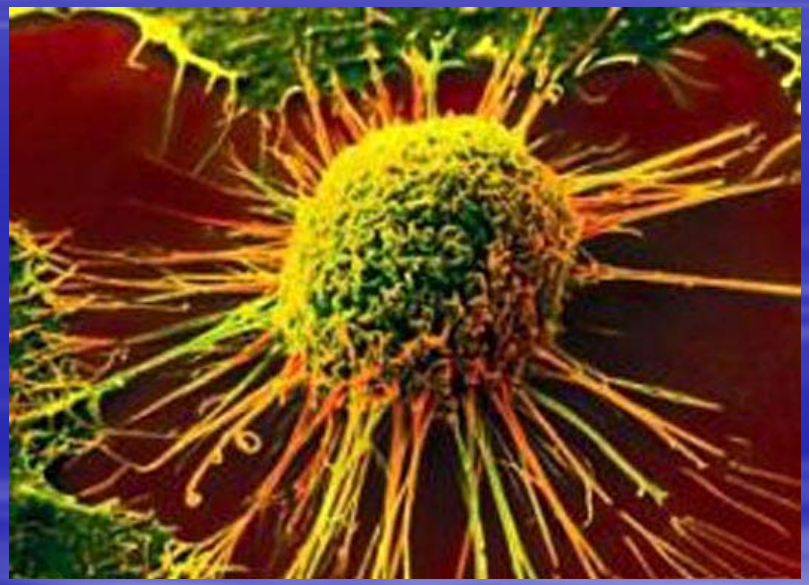
Particulate Matter impairs lung and cardiovascular function



Air toxics

- Diesel particulate
- Formaldehyde
- Acrolein
- Polycyclic aromatic hydrocarbons (PAHs)
- Dioxins & furans
- Benzene

Air toxics



UTMB.edu

Toxic

Nonattainment

- Failure to meet federal clean air standards
- Added regulation on pollution-generating activities

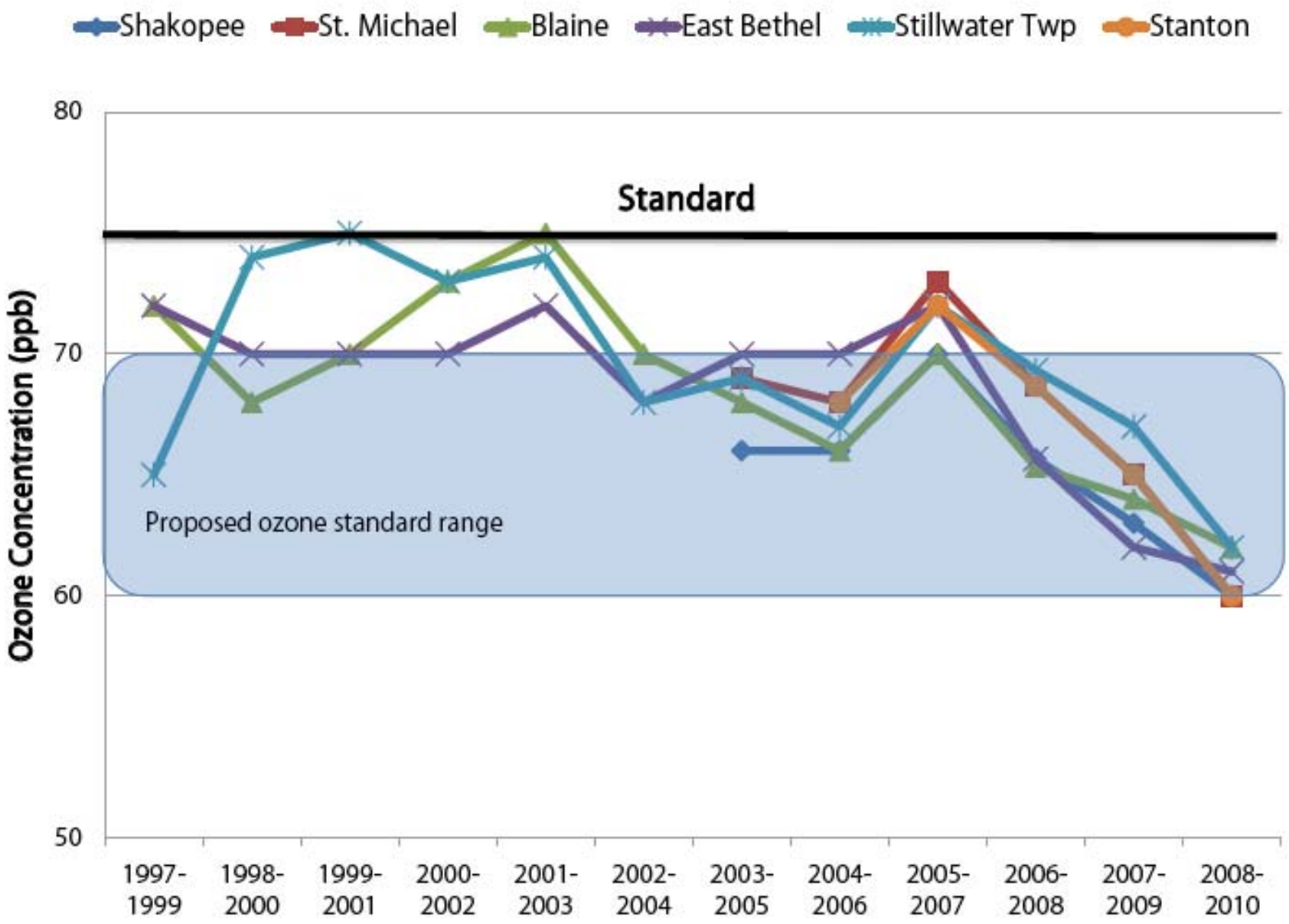
SCP-01: Submittal Cover Page

Permit Application/Notification/
Determination Request Fee Submittal

Air Quality Permit Program

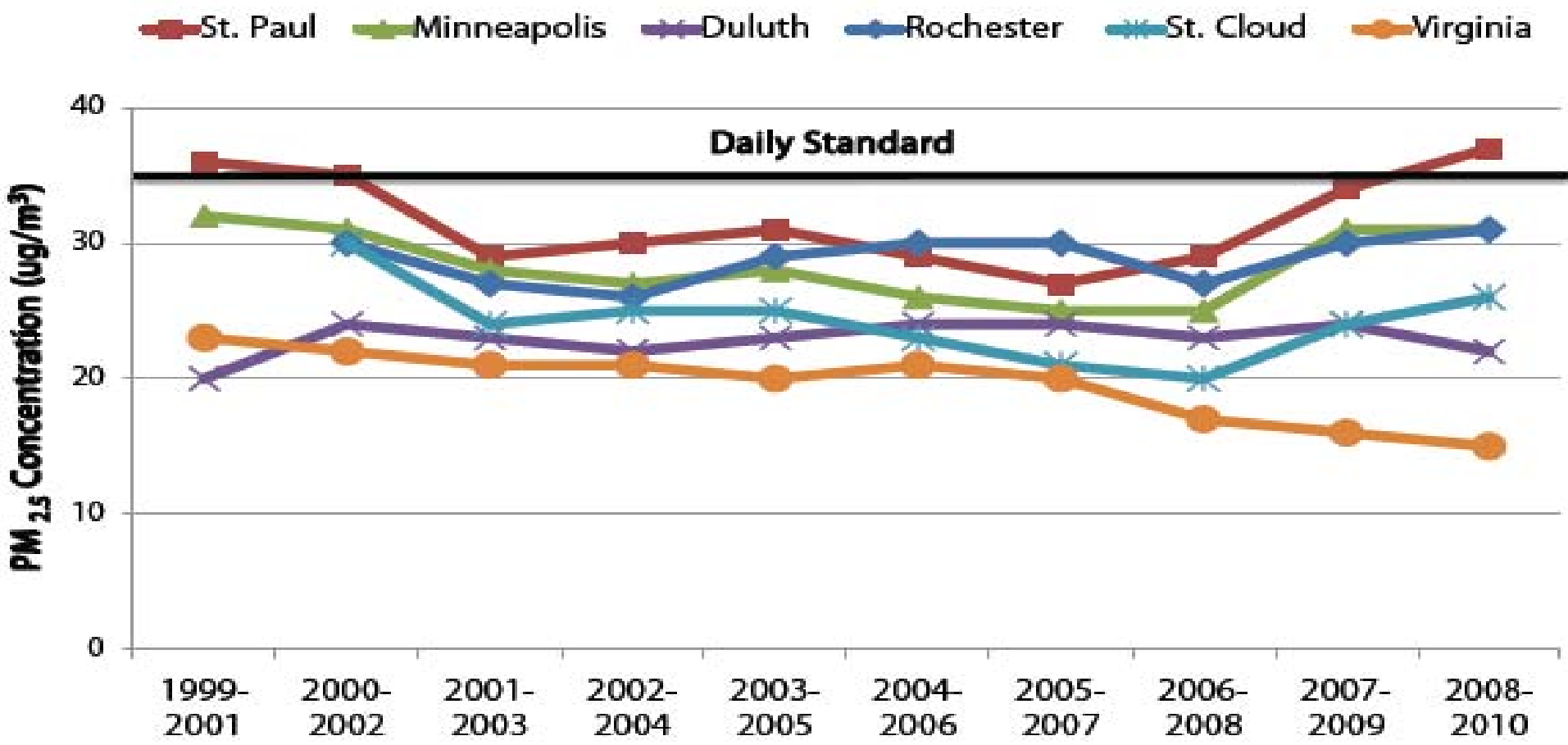
Doc Type: Permit Application

Twin Cities ozone trends (1997-2010)



Source: MPCA air monitoring data

Minnesota daily $PM_{2.5}$ trends (1999-2010)



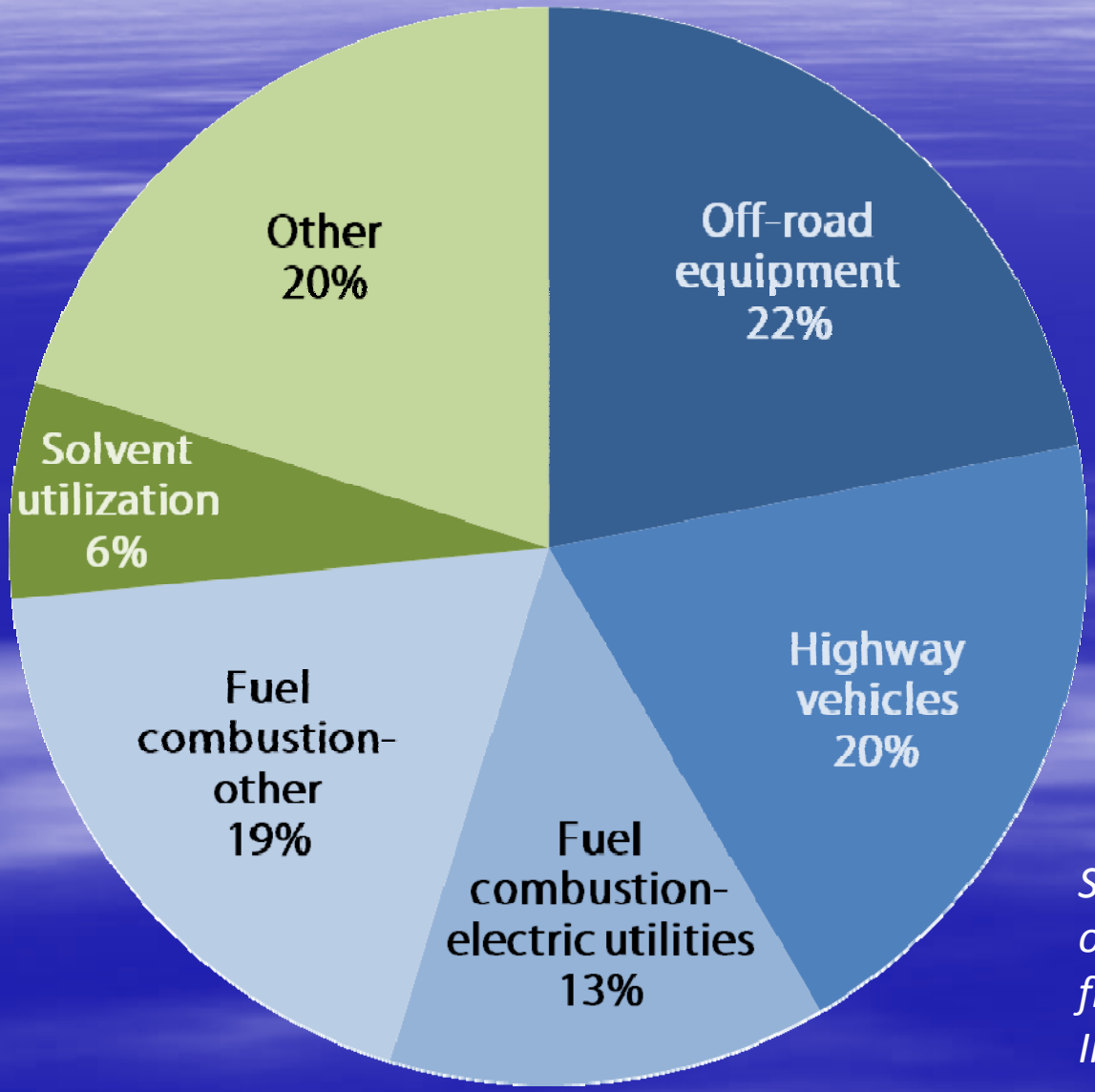
Source: MPCA air monitoring data

** 2010 data is incomple*

Primary Source of Air Pollution

Laurie Beirre

Sources of key air pollutants



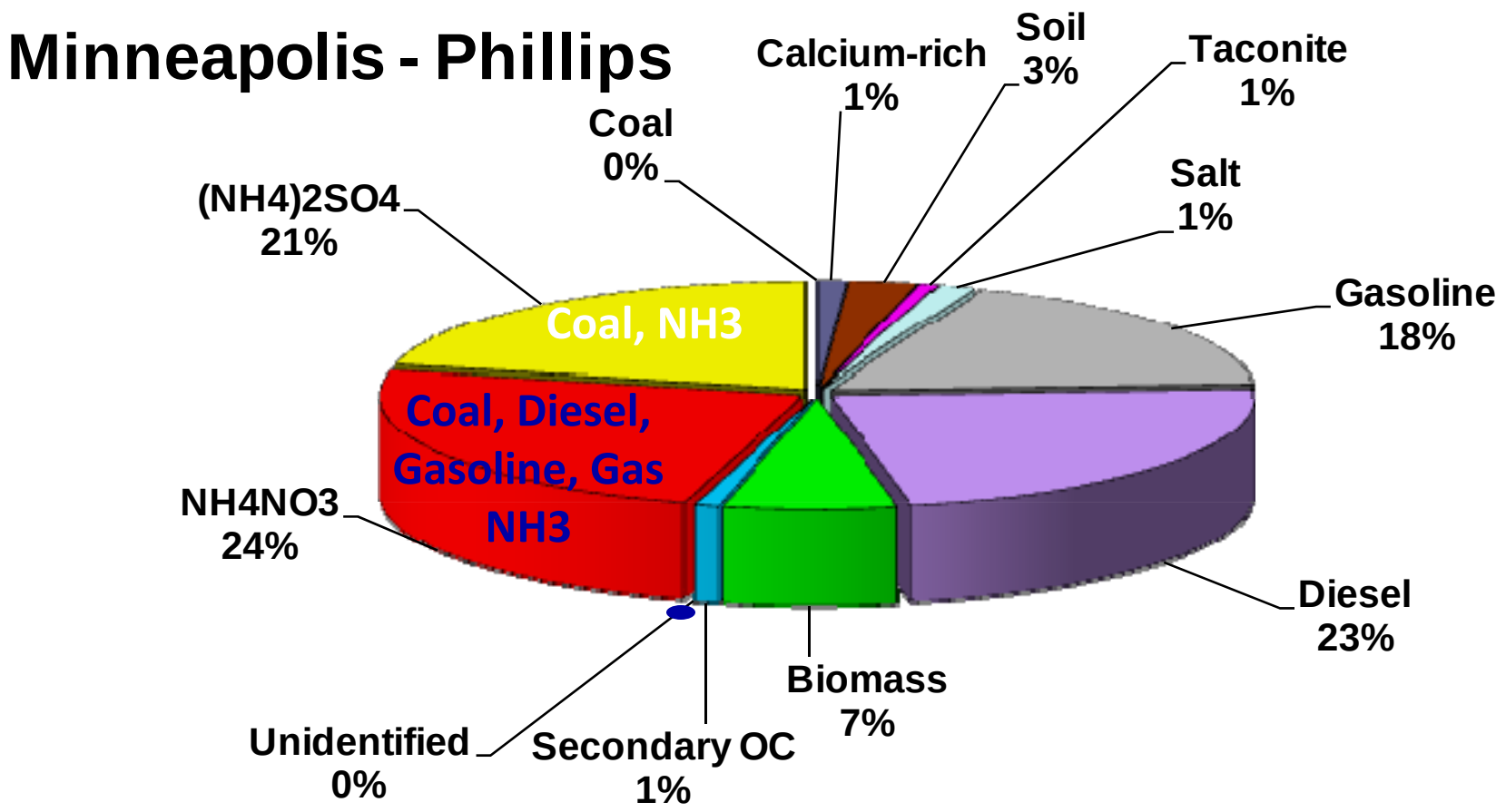
75% of key air pollutants come from burning fuels

Source: 2008 emission estimates of NO_x, $PM_{2.5}$, SO_2 and VOCs from EPA's National Emissions Inventory Database

Recreational Fires

- Particulate matter
- Toxics – PAHs, VOCs
- NOx
- Carbon Monoxide

Sources of PM2.5



Effective Variance Chemical Mass Balance (CMB) Model

Conclusions

- Air quality is a health and economic issue
- Burning of fossil fuels is the major source of air pollution
- Burning wood is a source of air pollution
- Recreational fires may have a significant impact on neighbors. There appears to be an impact upon regional air quality but significance is not well determined

Best Practices

- Do not burn on Air Alert Days
- Burn only clean, seasoned, untreated **dry** wood (no plywood, painted wood, trash etc.)
- Burn less, be considerate of neighbors
- Be aware of weather conditions
- Maintain your appliance