# Air Quality:
## Local, Regional, and Global Perspectives

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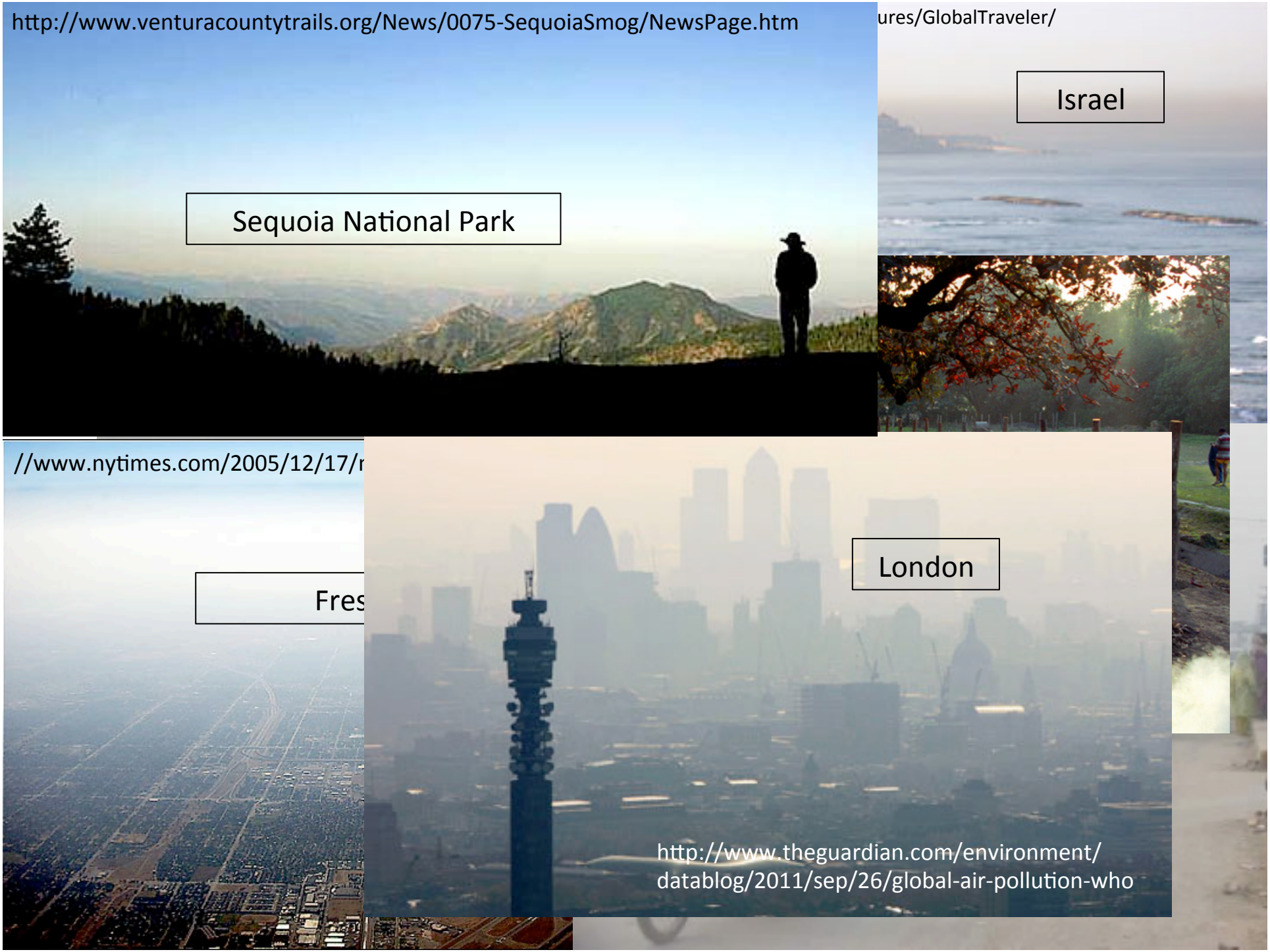

http://www.venturacountytrails.org/News/0075-SequoiaSmog/NewsPage.htm
Sequoia National Park
ures/GlobalTraveler/
Israel
//www.nytimes.com/2005/12/17/r
Fres
London
http://www.theguardian.com/environment/
datablog/2011/sep/26/global-air-pollution-who

# Poor air quality: a modern problem?

llustration: Peat fuelled glass manufacturing in the Netherlands, 1700s.

http://www.lowtechmagazine.com/2011/09/peat-and-coal-fossil-fuels-in-pre-industrial-times.html

# London, 1800s: World's Largest City

"At the beginning of the 1600s, coal accounted for three quarters of fuel consumption in London, which caused extensive air pollution."

*- http://www.lowtechmagazine.com/*

**Monet painting showing Victorian smog (1900)**
[Baker and Thornes, 2006]

http://www.feast.org/articles/?ID=331

**London, late 1800s**

from www.london-architecture.info/LO-gal1.htm

# London, 1800s: World's Largest City

"At the beginning of the 1600s, coal accounted for three quarters of fuel consumption in London, which caused extensive air pollution."

*- http://www.lowtechmagazine.com/*

**"smog" = fog intensified by smoke**

*(Henry Antoine Des Voeux, treasurer of the Coal Smoke Abatement Society, who first used it in 1905 to describe British urban areas)*

**Monet painting showing Victorian smog (1900)**
[Baker and Thornes, 2006]

http://www.feast.org/articles/?ID=331

**London, late 1800s**; from www.london-architecture.info/LO-gal1.htm

# The Great London Smog of 1952

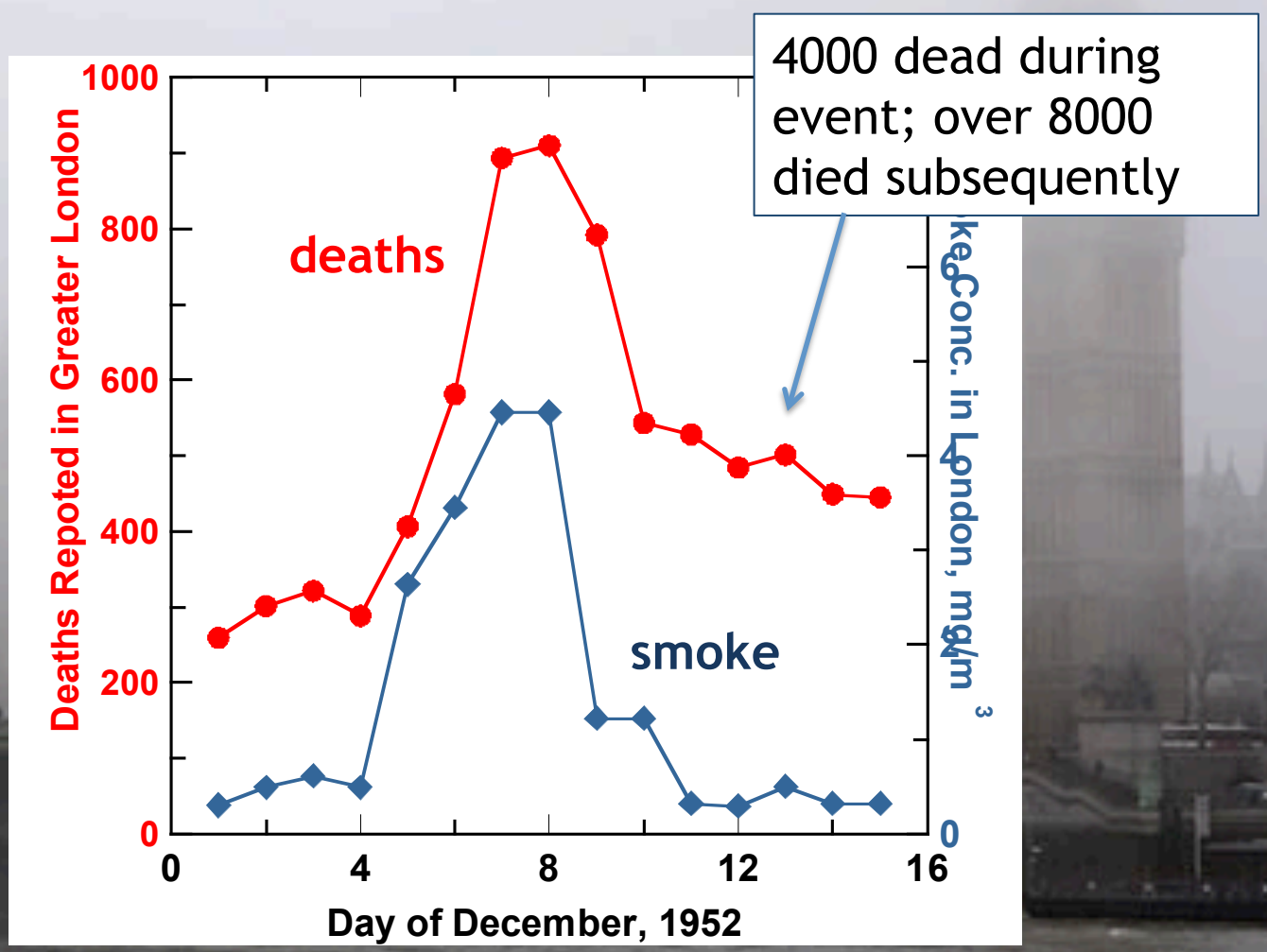

http://www.martinfrost.ws/htmlfiles/great_smog.html


**December 5-9, 1952**

- Stagnant air mass with strong inversion
- Cold fog + (high sulfur) coal + diesel buses = "pea souper"
- 4000 "excess deaths" in one week
- IMPETUS FOR ENVIRONMENTAL ACTION
  - Clean Air Acts of 1956 and 1968 and City of London Act of 1954

*Slide courtesy Prof. Colette Heald*

# The Great London Smog of 1952




Getty Images; dowloaded from http://www.history.com/news/the-killer-fog-that-blanketed-london-60-years-ago

# Donora, PA: October 27-31, 1948

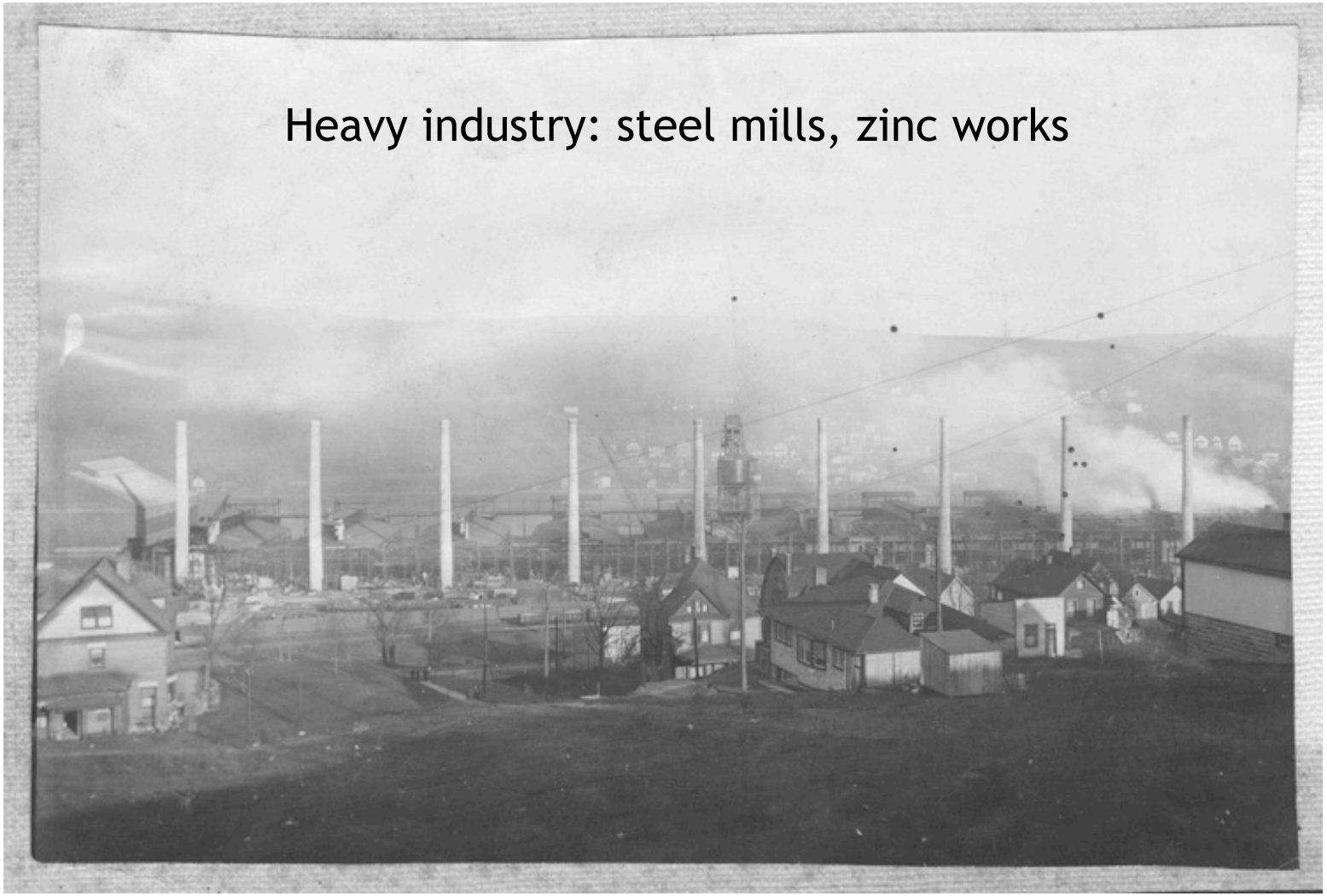



*Photo from the Donora Digital Collection, California University of Pennsylvania*

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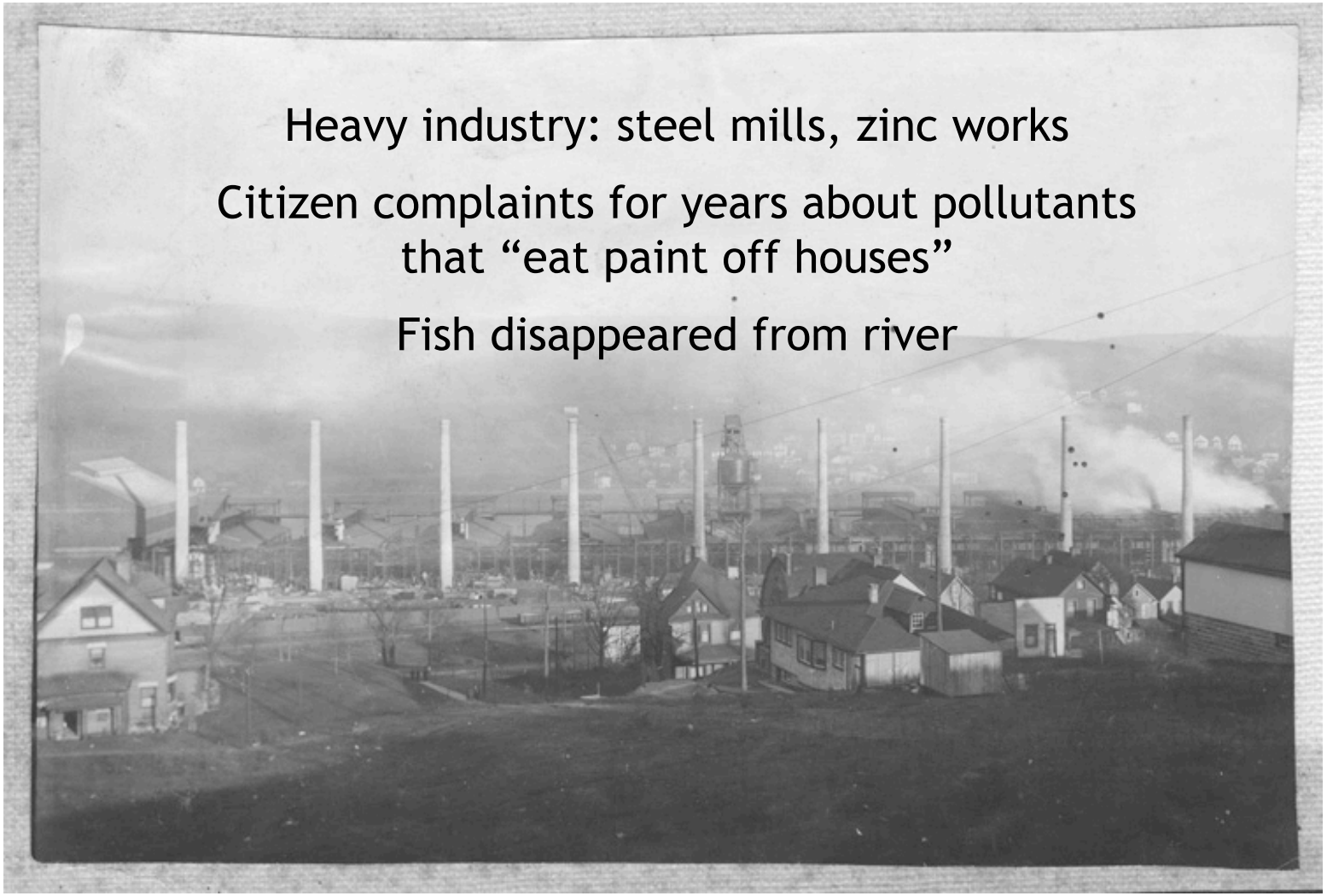
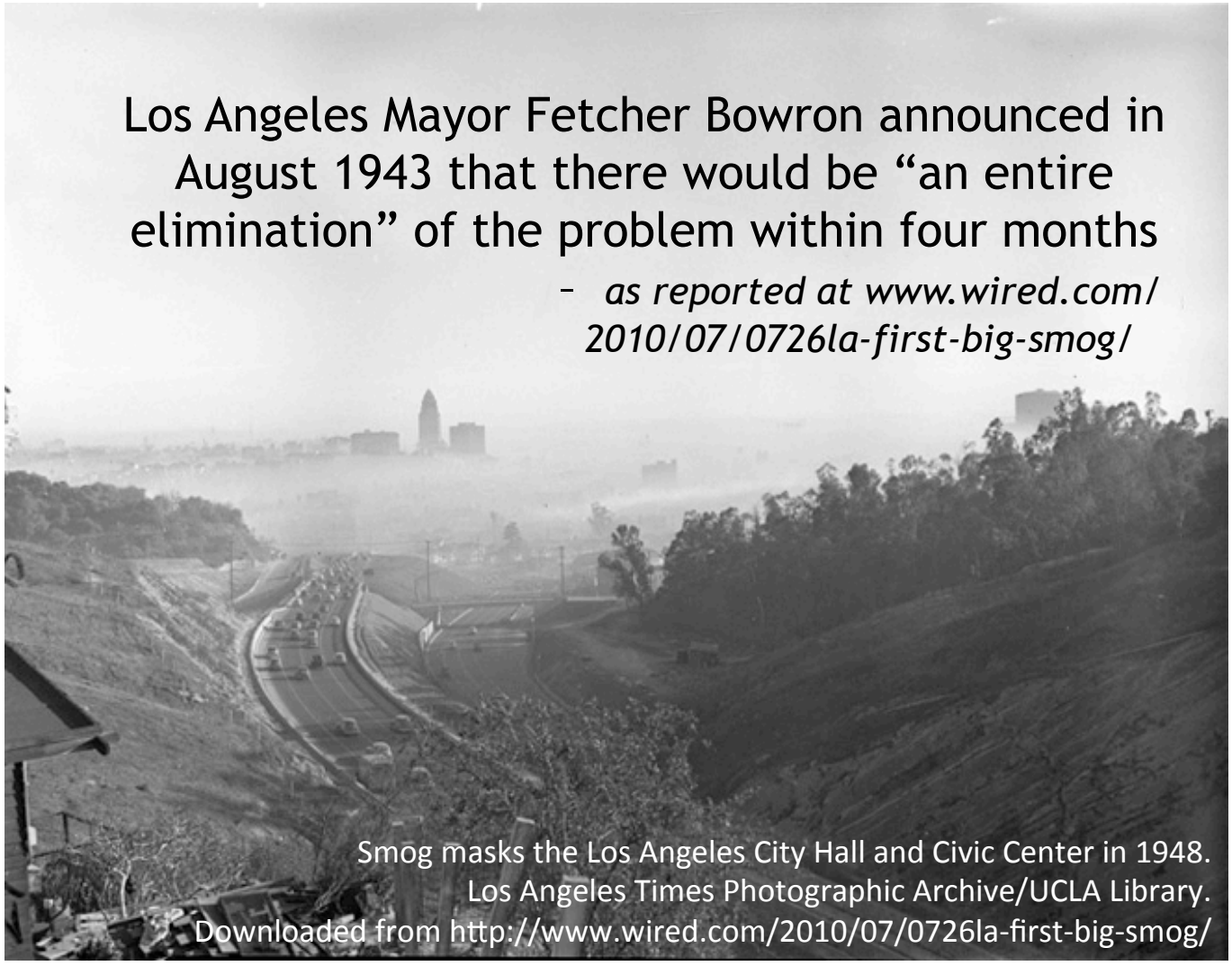



*Photo from the Donora Digital Collection, California University of Pennsylvania*

# Downtown Donora, Noon, October 29, 1948


*Photo courtesy NOAA Oceanservice Education, downloaded from http://pabook.libraries.psu.edu/palitmap/DonoraSmog.html*

# Los Angeles, July 26, 1943: smog event mistaken for chemical warfare



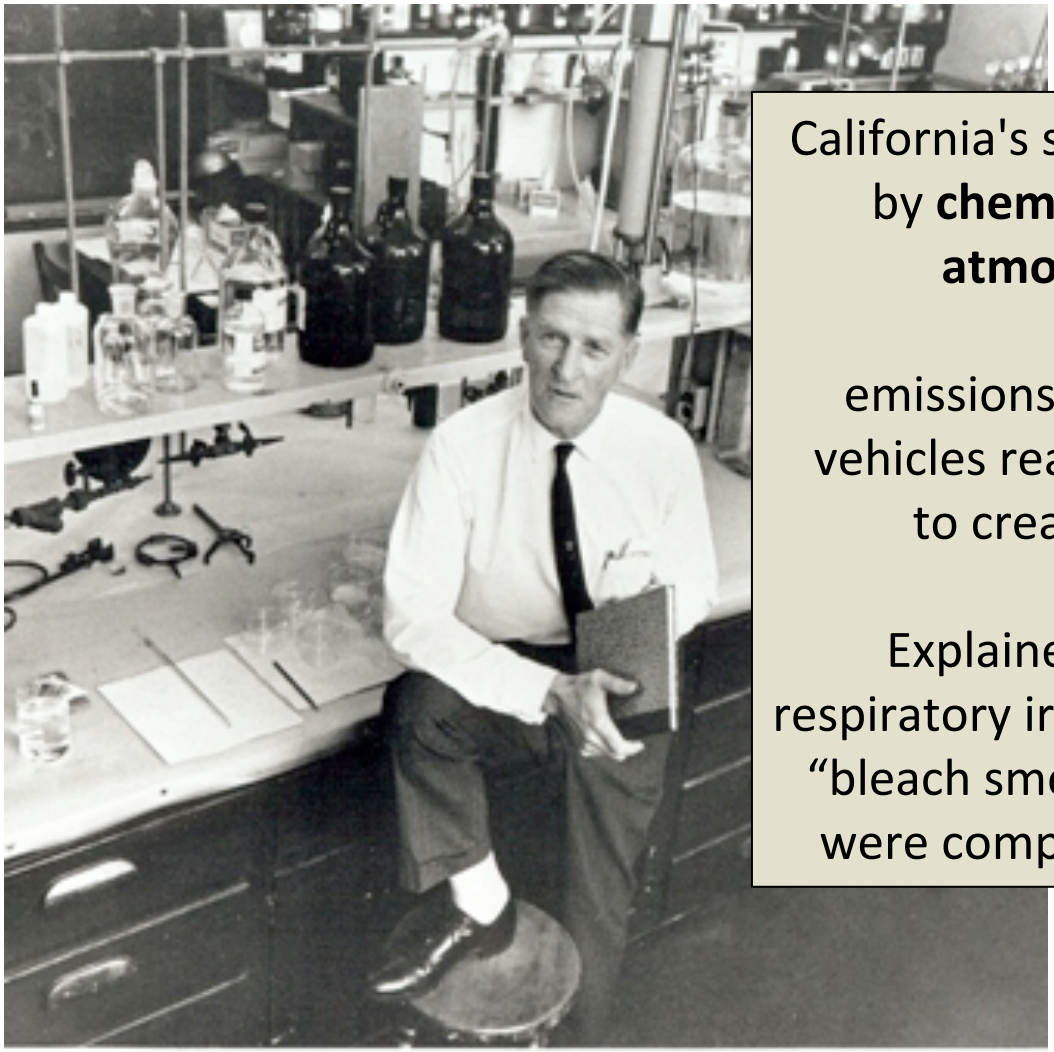
# What was the source of this chemical haze?

"It took them to the early 1950s for a scientist to tell Californians that the car they loved was really a death chamber, because the fumes from tailpipes were the source of their smog problem," Jacobs said. "It wasn't some factory or a slip-up at some oil plant:
**It was the cars that were streaming into Los Angeles."**

– *as reported at www.wired.com/2010/07/0726la-first-big-smog/*

**"The Southland's War on Smog:
Fifty Years of Progress Toward Clean Air"**
http://www.aqmd.gov/news1/archives/history/marchcov.html

# Insights of Prof. Arie Haagen-Smit,
## California Institute of Technology



California's smog is formed by **chemistry in the atmosphere**:

emissions from motor vehicles react in **sunlight** to create ozone

Explained eye and respiratory irritation and the "bleach smell" Angelenos were complaining about

http://www.arb.ca.gov/research/images/ariehs_lab1.jpg

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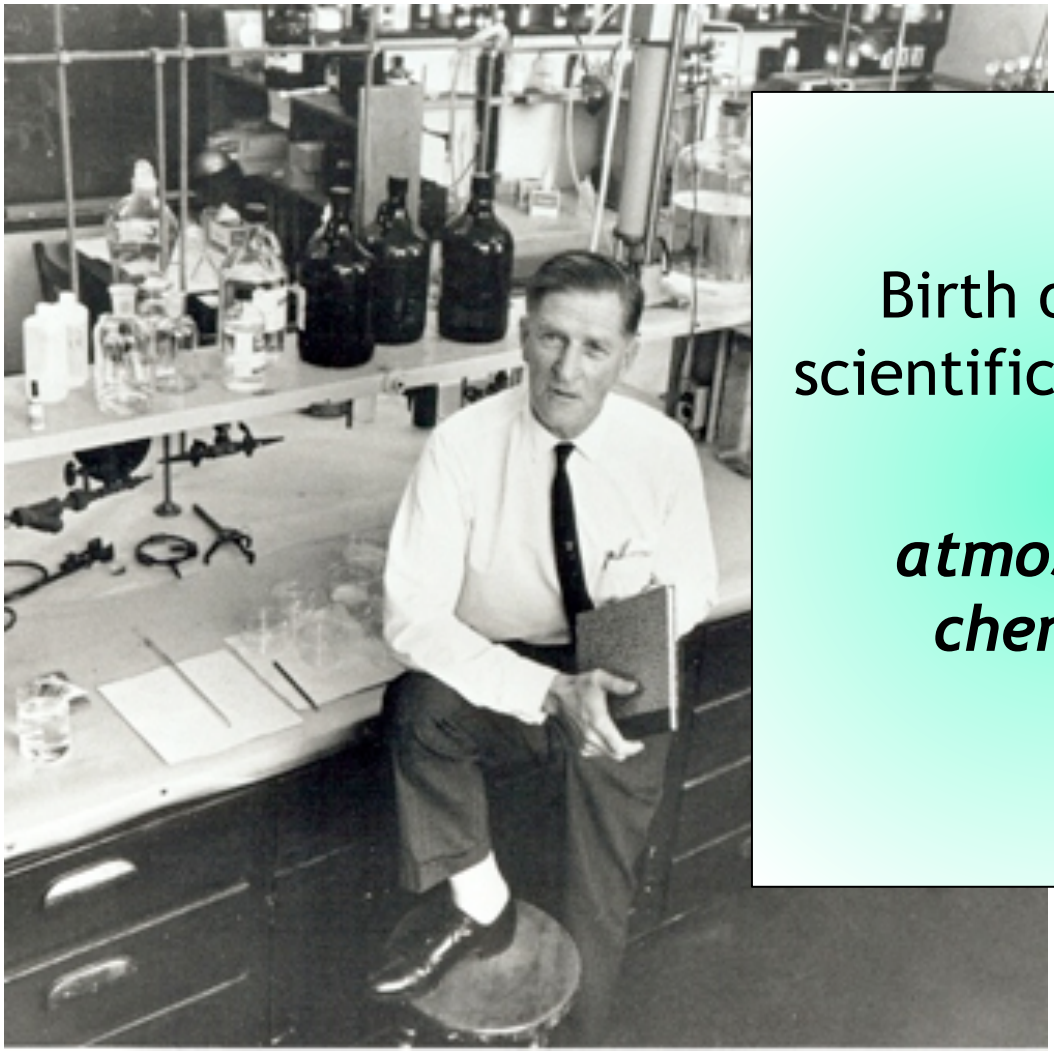
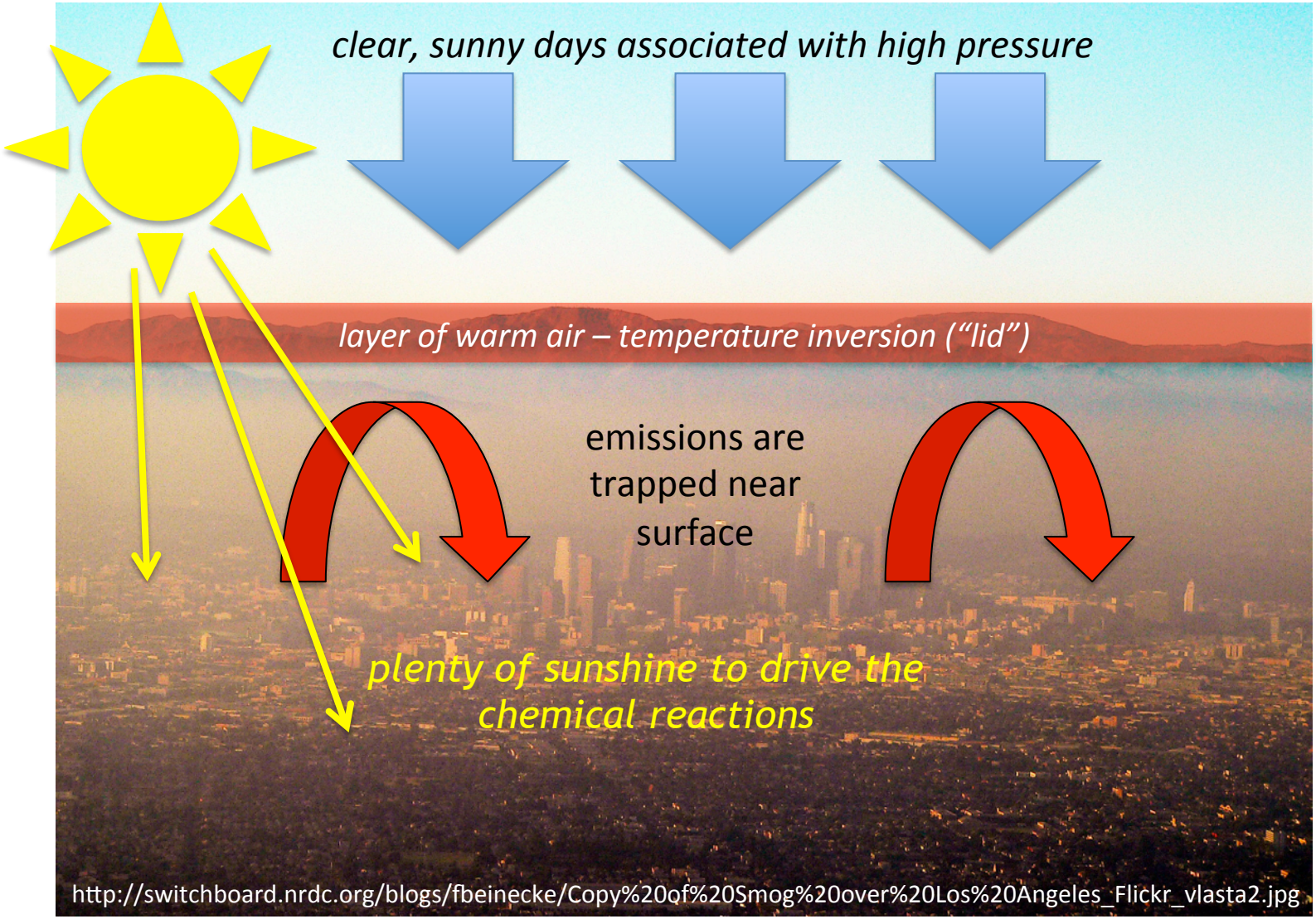


Birth of a new scientific discipline:

***atmospheric chemistry***

http://www.arb.ca.gov/research/images/ariehs_lab1.jpg

# The role of weather and topography



# Why blame cars??

unburned and partially burned fuel (hydrocarbons) + $NO_x$ (created from nitrogen in air during high-temperature combustion) = OZONE

# Ozone formation often accompanied by particle formation

# SMOG
# (Sulfurous vs. Photochemical Pollution)

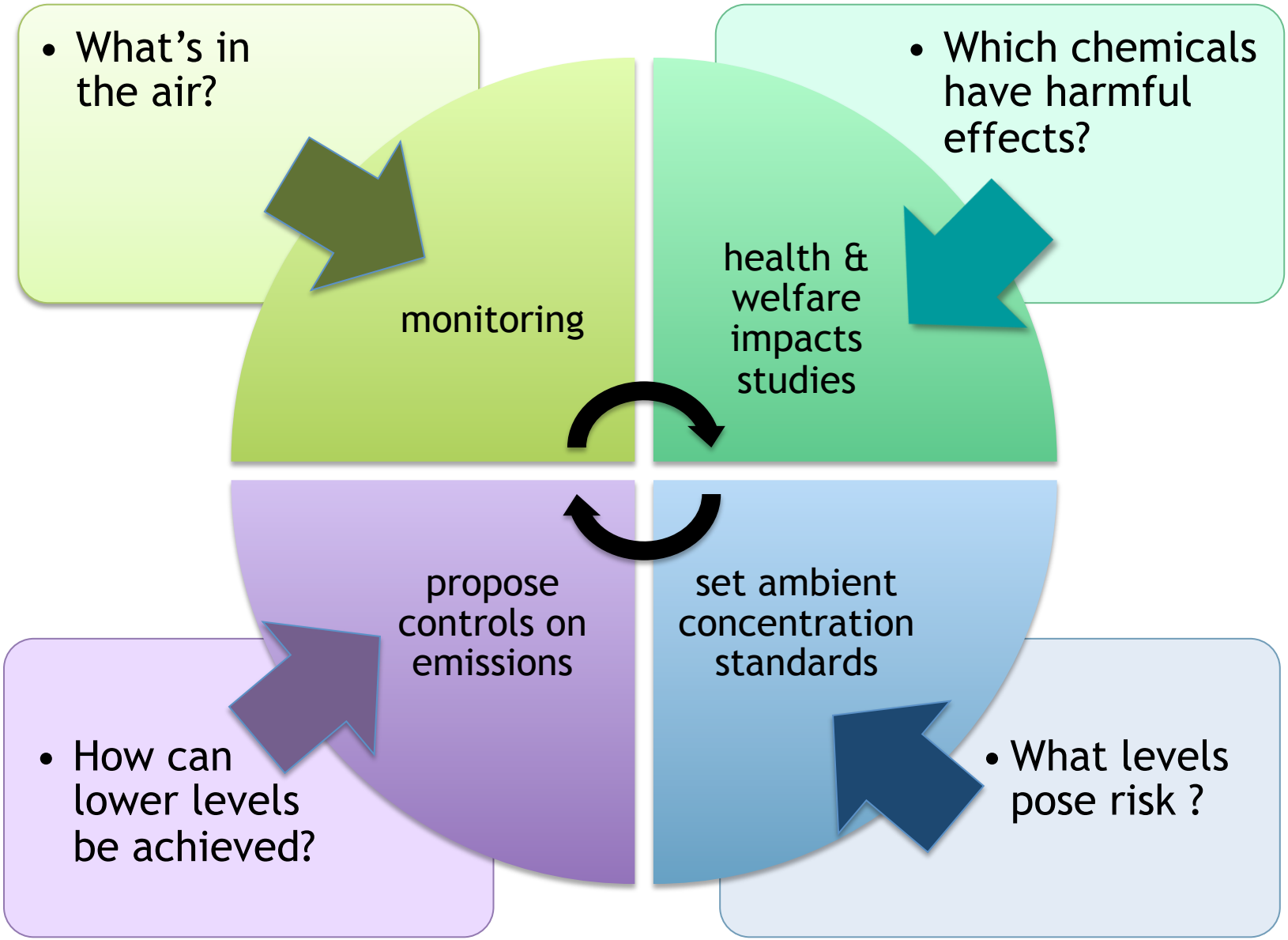

**Example: London (also Eastern US)**

- smoke + fog
- $SO_2$ + "soot", sulfuric acid particles
- characterized by ground level inversions, cool weather, coal burning

**Example: LA**

- sunlight, hydrocarbons, NOx
- characterized by hot dry sunny weather, reduced visibility and high oxidant levels

The Environmental Protection Agency (EPA) is established in 1970 to address US air quality problems at the national level


• What's in the air?
monitoring
• Which chemicals have harmful effects?
health & welfare impacts studies
propose controls on emissions
set ambient concentration standards
• How can lower levels be achieved?
• What levels pose risk ?

# National Ambient Air Quality Standards

| Pollutant [final rule cite] | | Primary/ Secondary | Averaging Time | Level | Form |
|---|---|---|---|---|---|
| Carbon Monoxide [76 FR 54294, Aug 31, 2011] | | primary | 8-hour | 9 ppm | Not to be exceeded more than once per year |
| | | | 1-hour | 35 ppm | |
| Lead [73 FR 66964, Nov 12, 2008] | | primary and secondary | Rolling 3 month average | 0.15 µg/$m^3$ (1) | Not to be exceeded |
| Nitrogen Dioxide [75 FR 6474, Feb 9, 2010] [61 FR 52852, Oct 8, 1996] | | primary | 1-hour | 100 ppb | 98th percentile, averaged over 3 years |
| | | primary and secondary | Annual | 53 ppb (2) | Annual Mean |
| Ozone [73 FR 16436, Mar 27, 2008] | | primary and secondary | 8-hour | 0.075 ppm (3) | Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years |
| Particle Pollution Dec 14, 2012 | $PM_{2.5}$ | primary | Annual | 12 µg/$m^3$ | annual mean, averaged over 3 years |
| | | secondary | Annual | 15 µg/$m^3$ | annual mean, averaged over 3 years |
| | | primary and secondary | 24-hour | 35 µg/$m^3$ | 98th percentile, averaged over 3 years |
| | $PM_{10}$ | primary and secondary | 24-hour | 150 µg/$m^3$ | Not to be exceeded more than once per year on average over 3 years |
| Sulfur Dioxide [75 FR 35520, Jun 22, 2010] [38 FR 25678, Sept 14, 1973] | | primary | 1-hour | 75 ppb (4) | 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years |
| | | secondary | 3-hour | 0.5 ppm | Not to be exceeded more than once per year |

as of October 2011

# National Ambient Air Quality Standards

**6**

"criteria pollutants"

*gases*:
CO, $NO_2$, $SO_2$, ozone

*particles*:
"PM"
lead

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Primary standards: protect human health

Secondary standards: protect *welfare* (visibility; crop damage; …)

as of October 2011

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Levels to be met, along with how to average

as of October 2011

# The Air Quality Index

| Air Quality Index (AQI) Values | Levels of Health Concern | Colors |
|---|---|---|
| *When the AQI is in this range:* | *...air quality conditions are:* | *...as symbolized by this color:* |
| 0 to 50 | Good | Green |
| 51 to 100 | Moderate | Yellow |
| 101 to 150 | Unhealthy for Sensitive Groups | Orange |
| 151 to 200 | Unhealthy | Red |
| 201 to 300 | Very Unhealthy | Purple |
| 301 to 500 | Hazardous | Maroon |

Calculated for each of
4 pollutants;
scaled so
100 = level of standard

# More on each pollutant…

# Carbon monoxide, CO


http://www.gassaferegister.co.uk

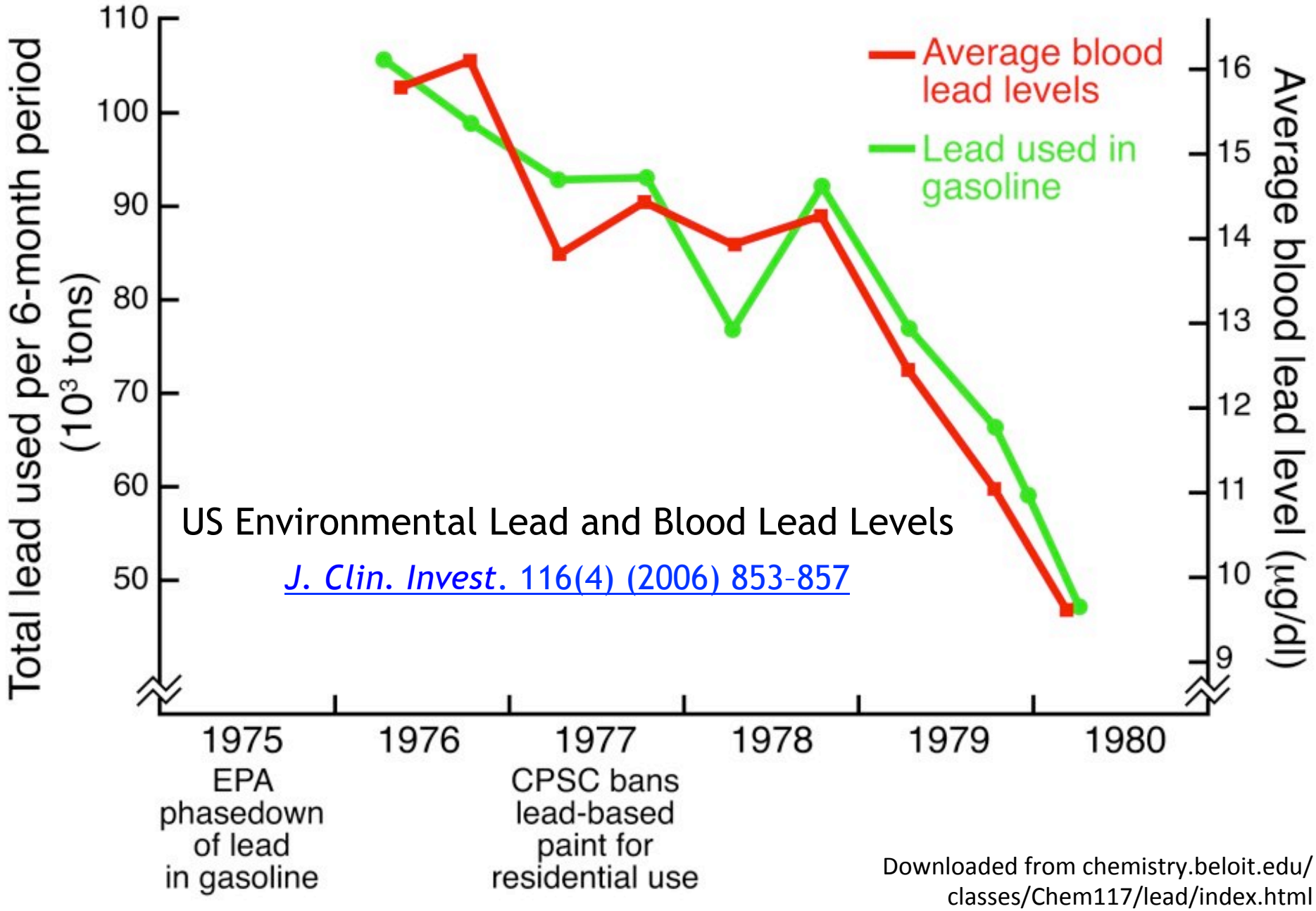
# Carbon monoxide, CO


http://i79.photobucket.com/albums/j133/gwnkids/Summer2011115.jpg

https://www.wisconsinhistory.org/w

http://media.kcrg.com/images/7557543+-+LAS+-+IOWA+CITY+LANDFILL+FIRE+-+05_29_2012+-+12.14.14.jpg


www.leadfreefrisco.com

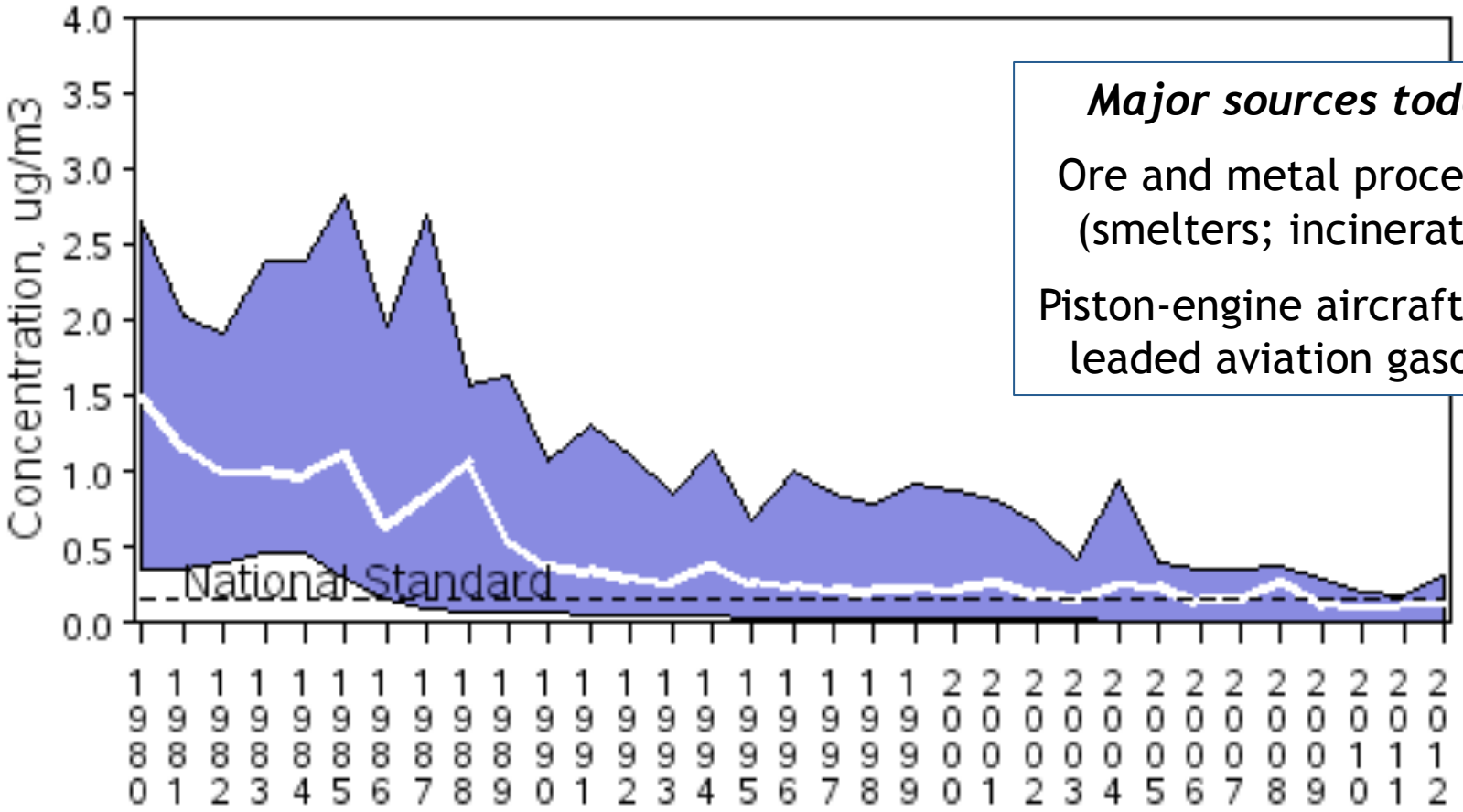



US Environmental Lead and Blood Lead Levels

*J. Clin. Invest*. 116(4) (2006) 853-857

# Lead Air Quality, 1980 - 2012

(Annual Maximum 3-Month Average)
National Trend based on 13 Sites




***Major sources today:***

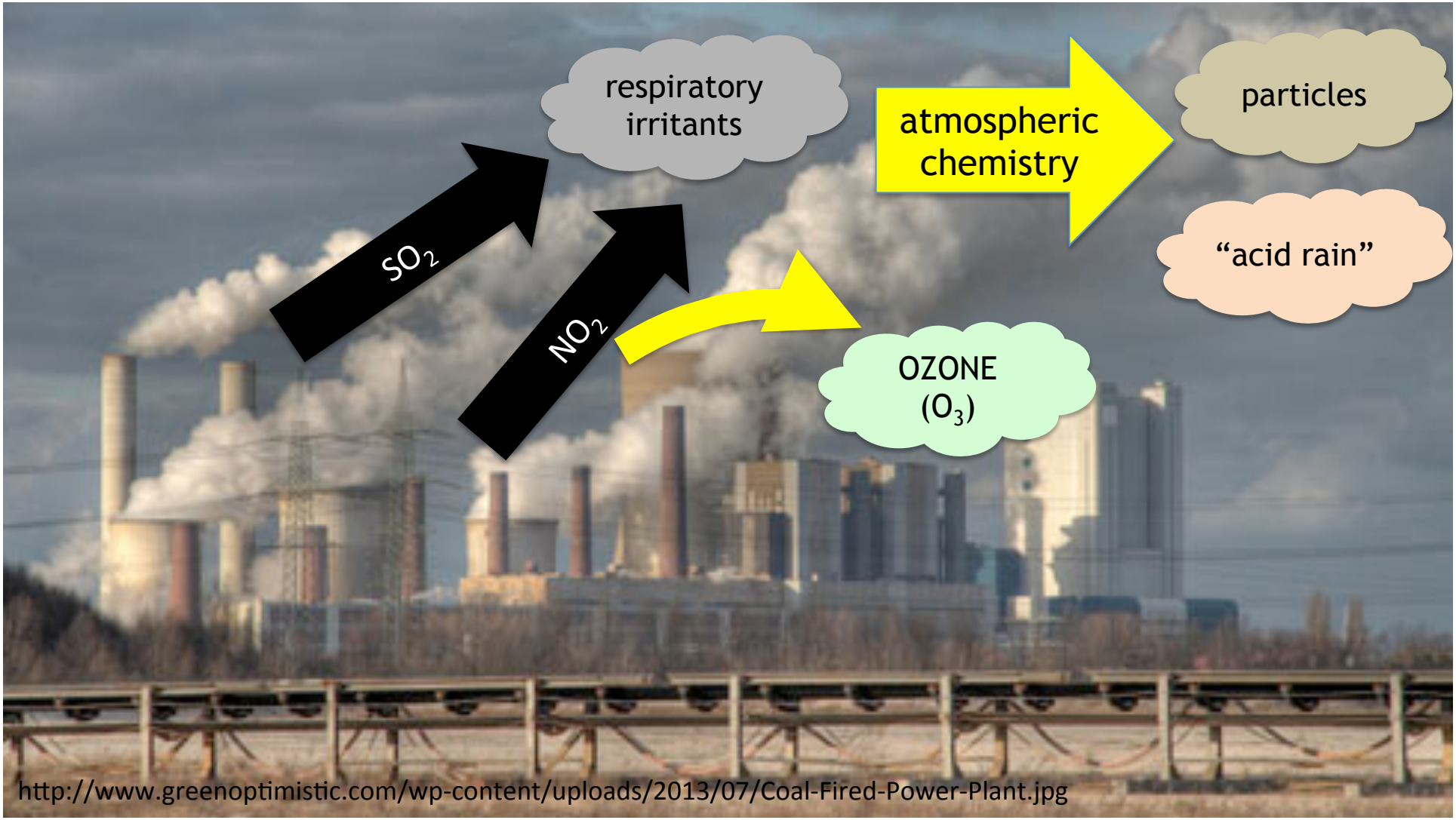
Ore and metal processing (smelters; incinerators)

Piston-engine aircraft using leaded aviation gasoline

1980 to 2012 : 91% decrease in National Average

http://www.epa.gov/airtrends/lead.html

# Sulfur dioxide and nitrogen dioxide ($SO_2$ and $NO_2$)



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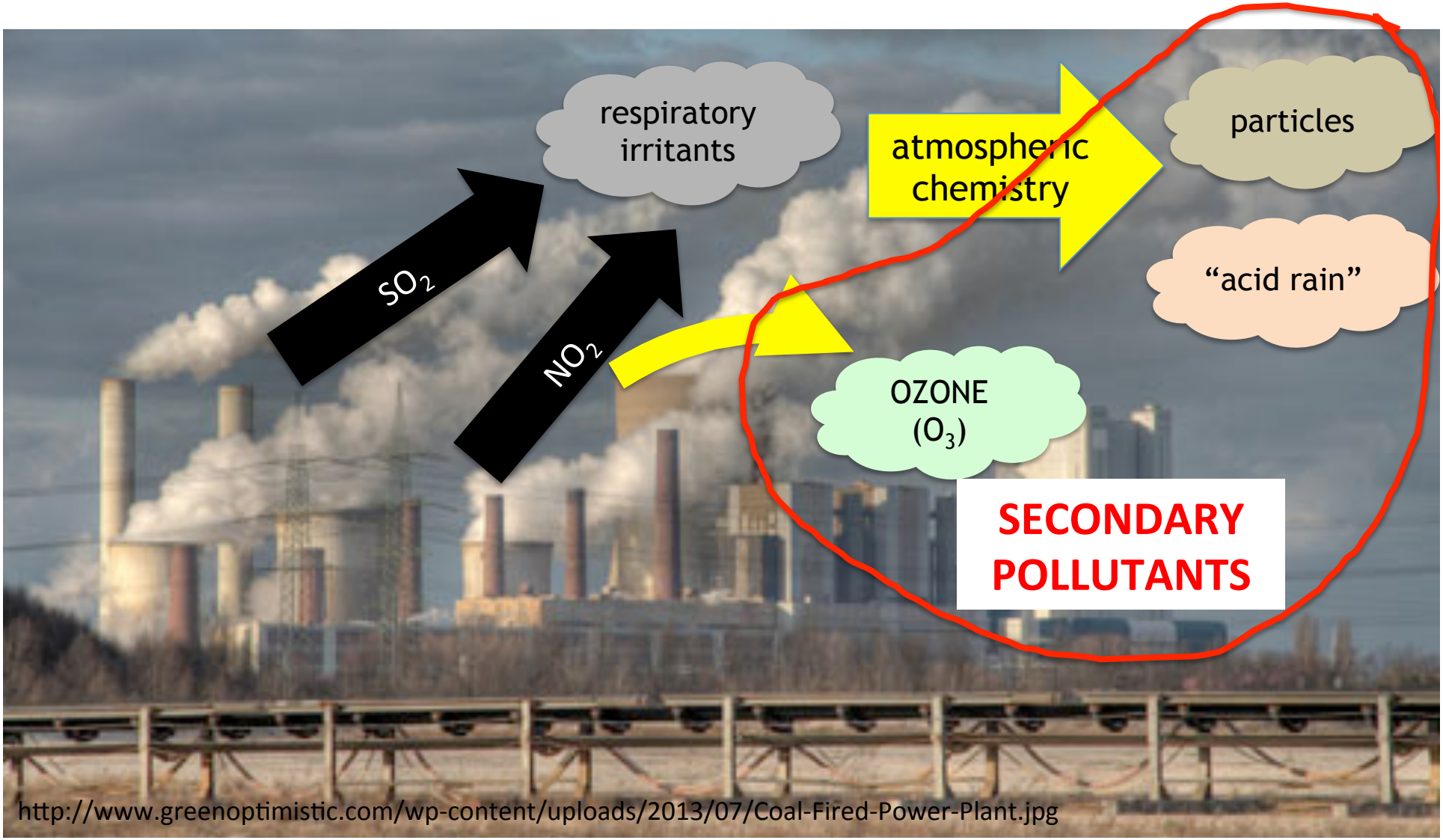
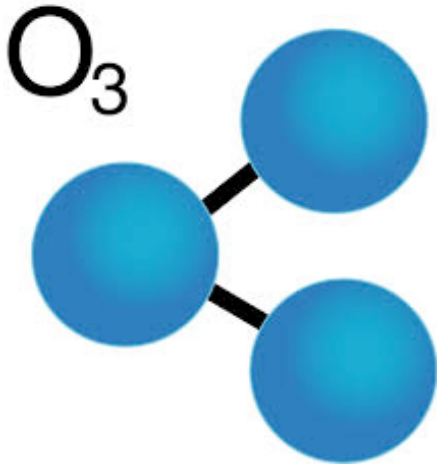


# Ozone's detrimental effects




http://images.books24x7.com/bookimages/id_21519/fig6-1.jpg

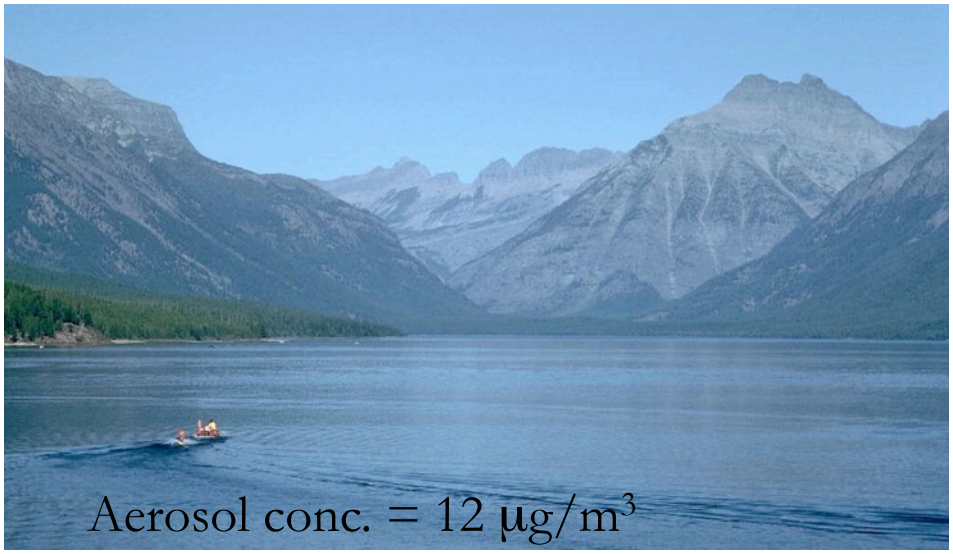
http://i.livescience.com/images/i/000/003/960/i02/070724_leaf_damage_02.jpg?1296081687

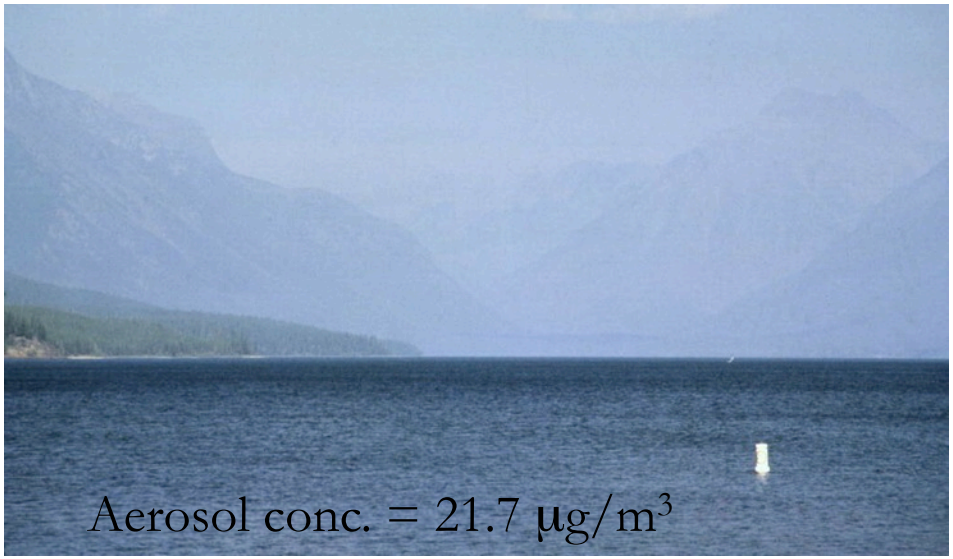
# “good up high, bad nearby”

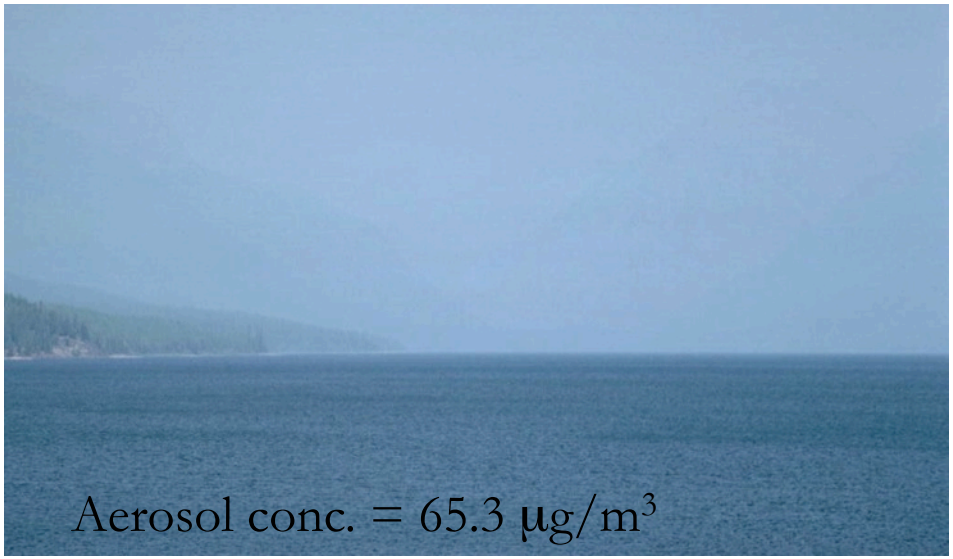

http://www.epa.gov/oar/oaqps/gooduphigh/good.html#2

# Particles affect visibility

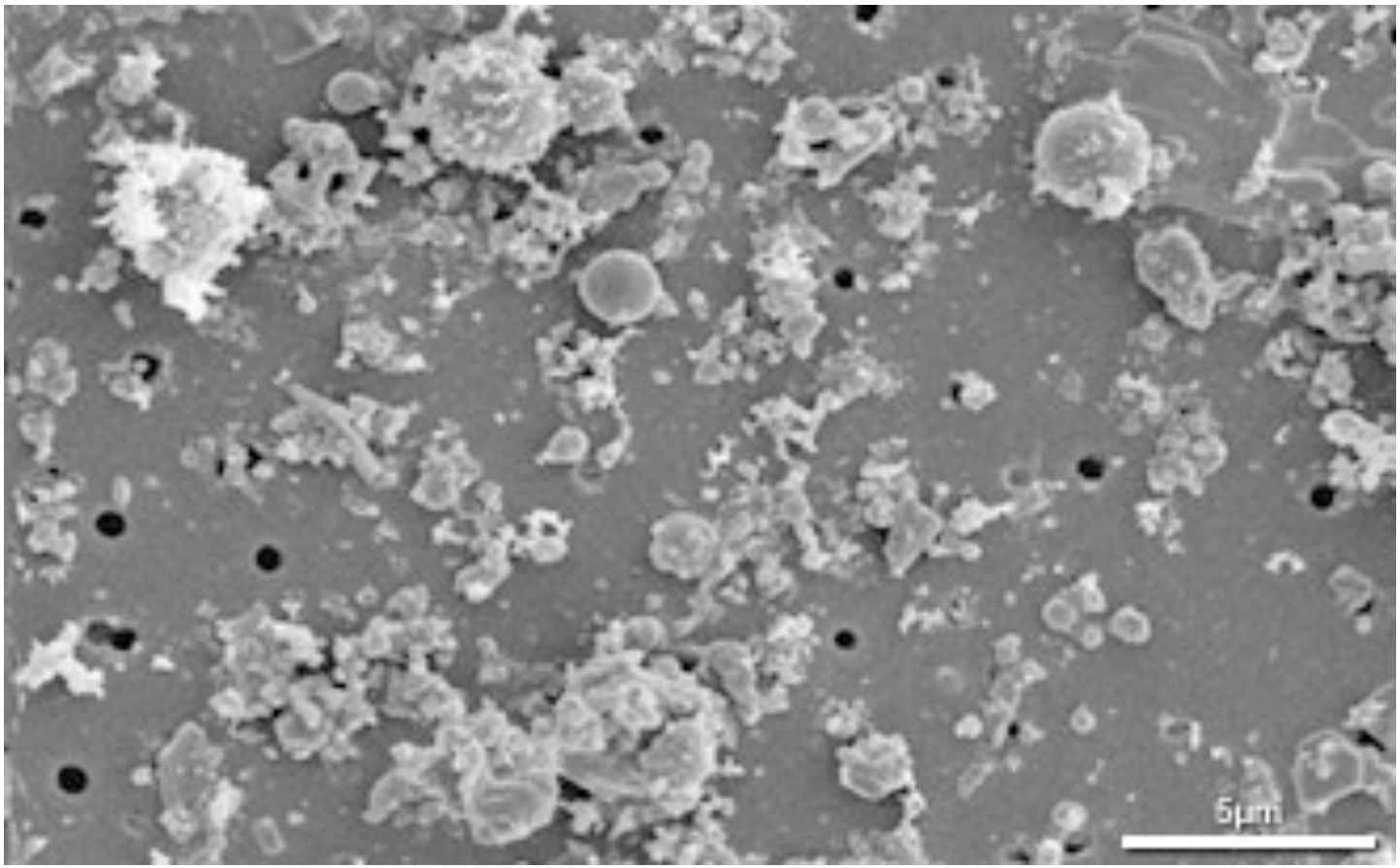
*slide courtesy Tom Moore*



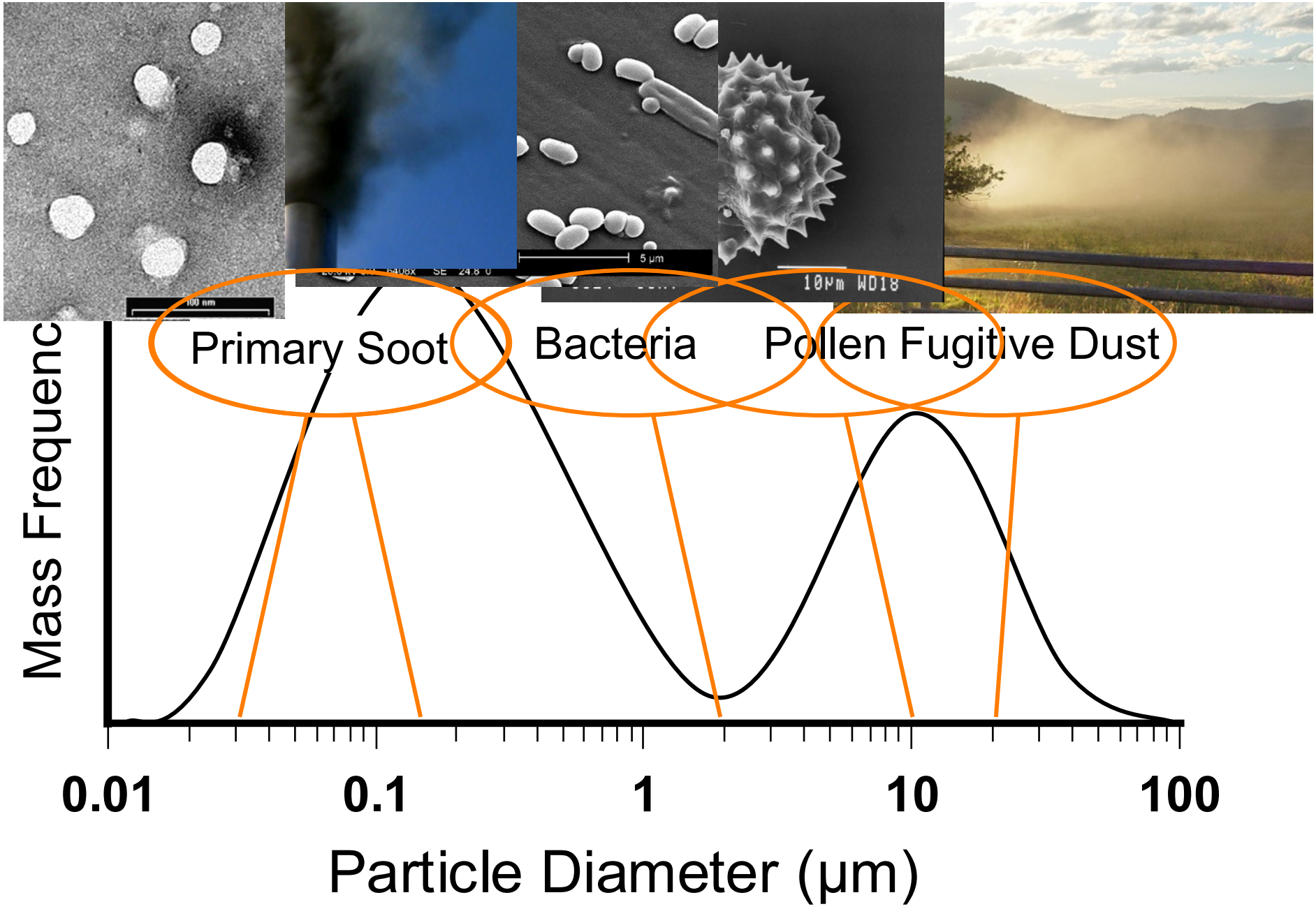



# Particles have varied sizes and sources

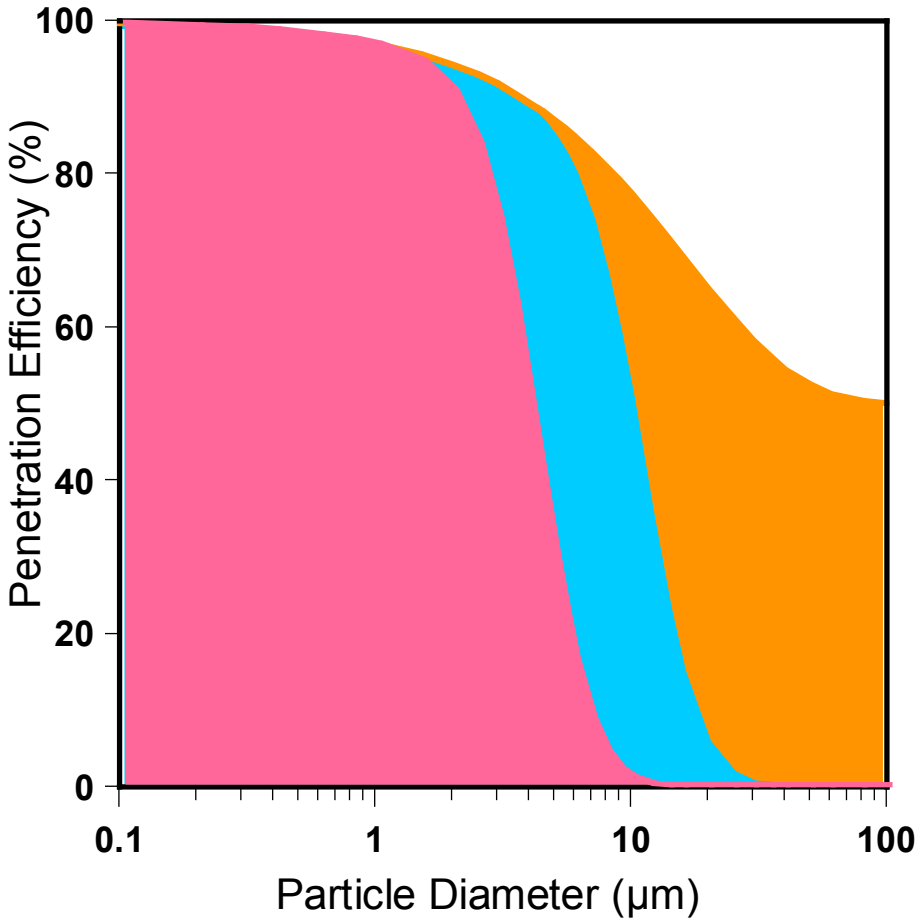


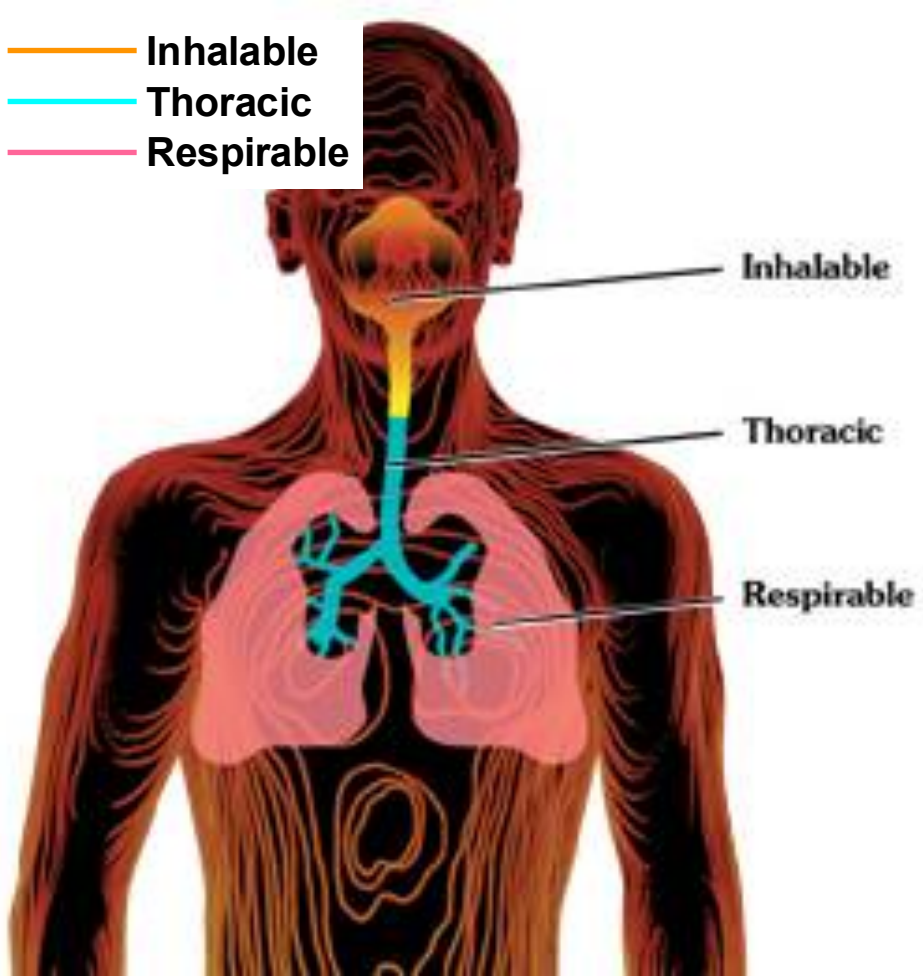

Aerosol particles collected in the industrial city of Port Talbot, England.

*(Micrograph courtesy MRC Institute for Environment and Health, and posted at http://www.nasa.gov/vision/earth/environment/New_IDEA_Air_Quality_Monitoring.html)*


Primary Soot
Bacteria
Pollen Fugitive Dust
Mass Frequenc
0.01
0.1
1
10
100
Particle Diameter (µm)

# Inhalability and Particle Size Are Important




*Slide courtesy Prof. John Volckens*

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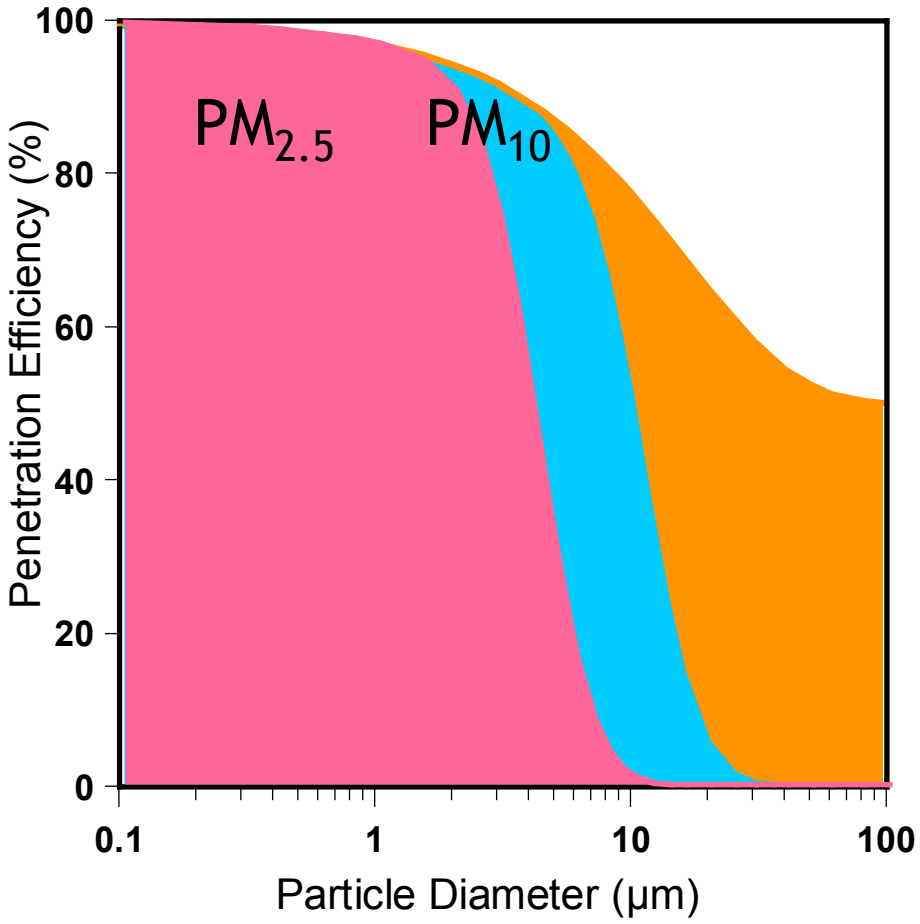


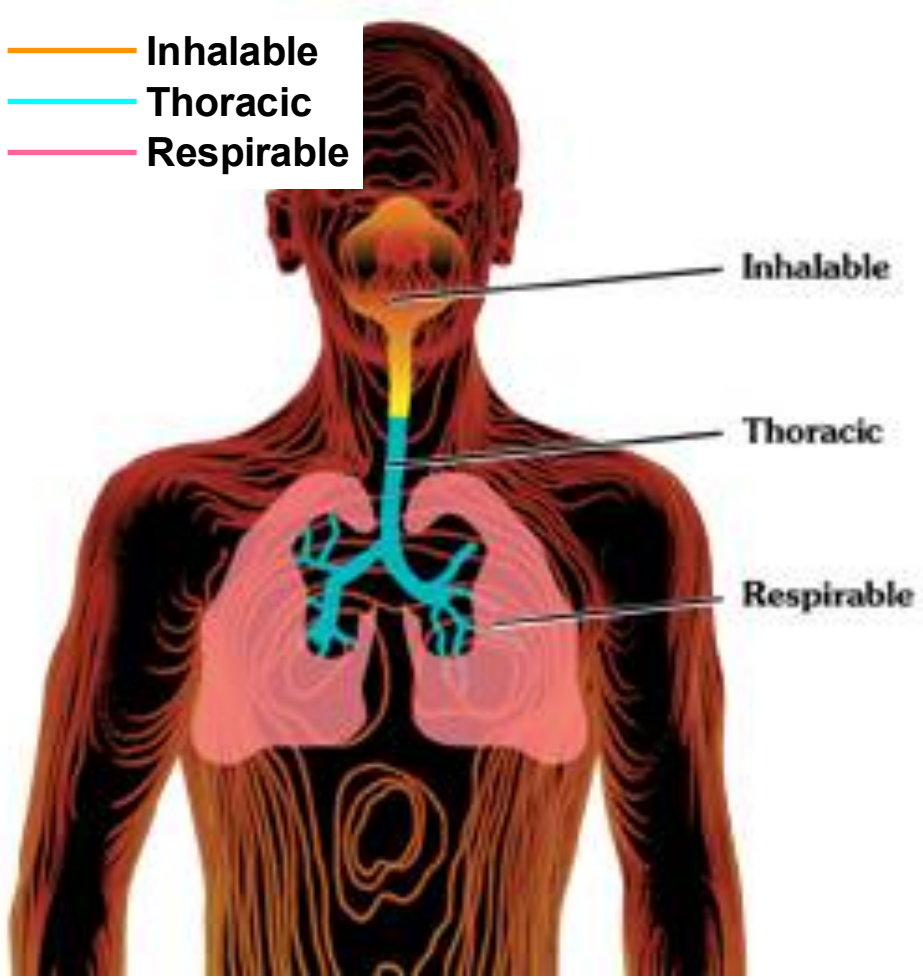


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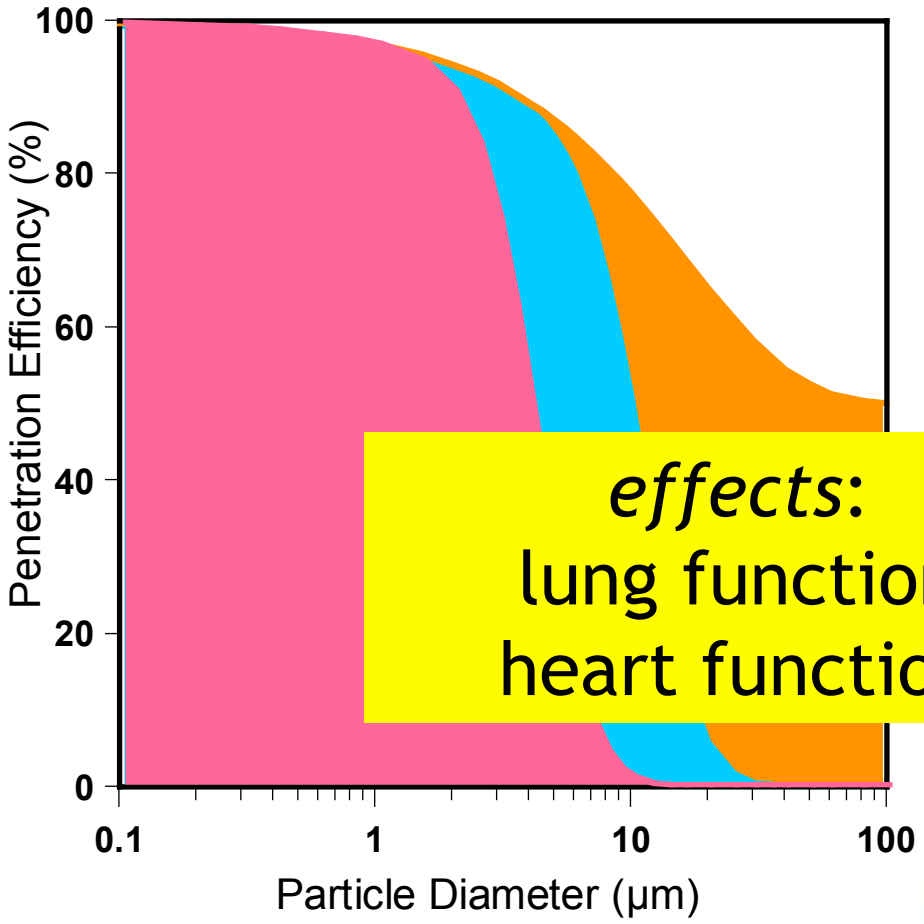
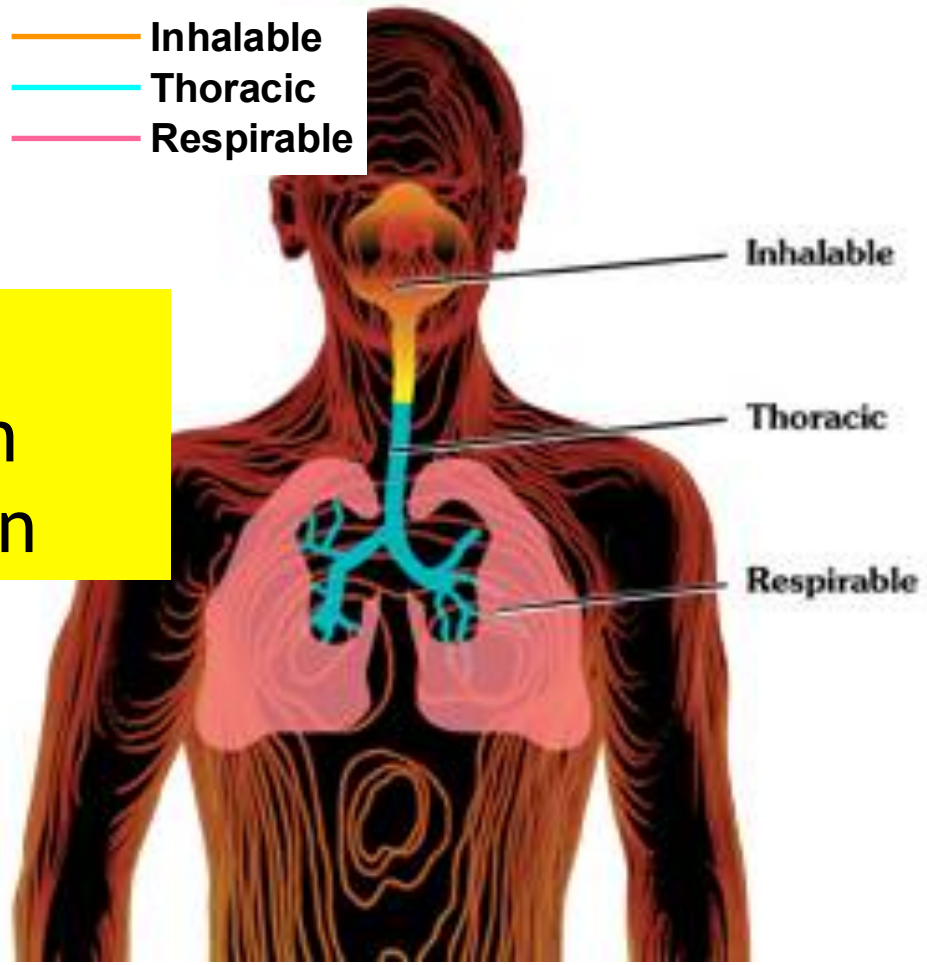
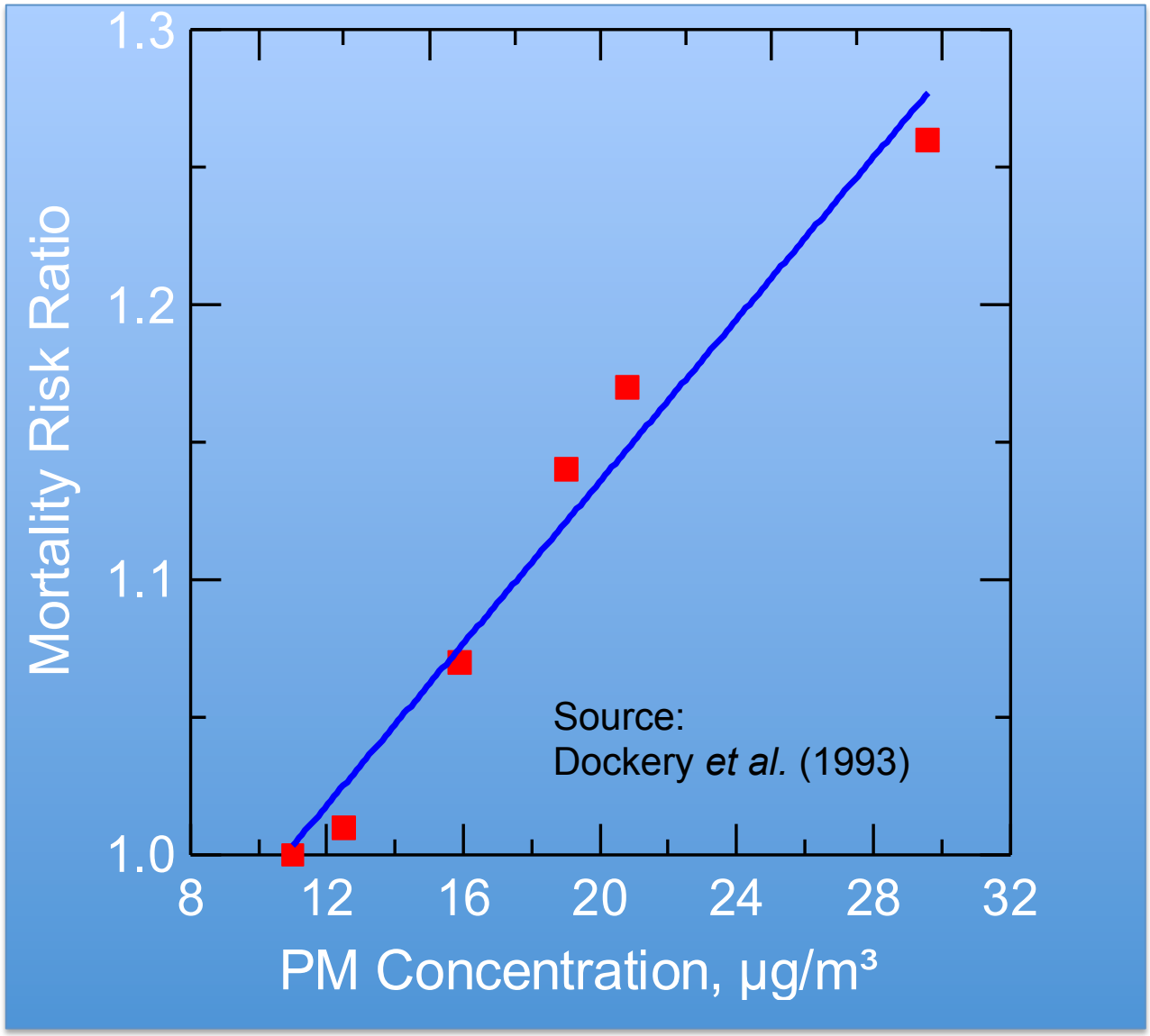



*effects*:
lung function
heart function




*Slide courtesy Prof. John Volckens*

# Harvard Six Cities Study (1993)

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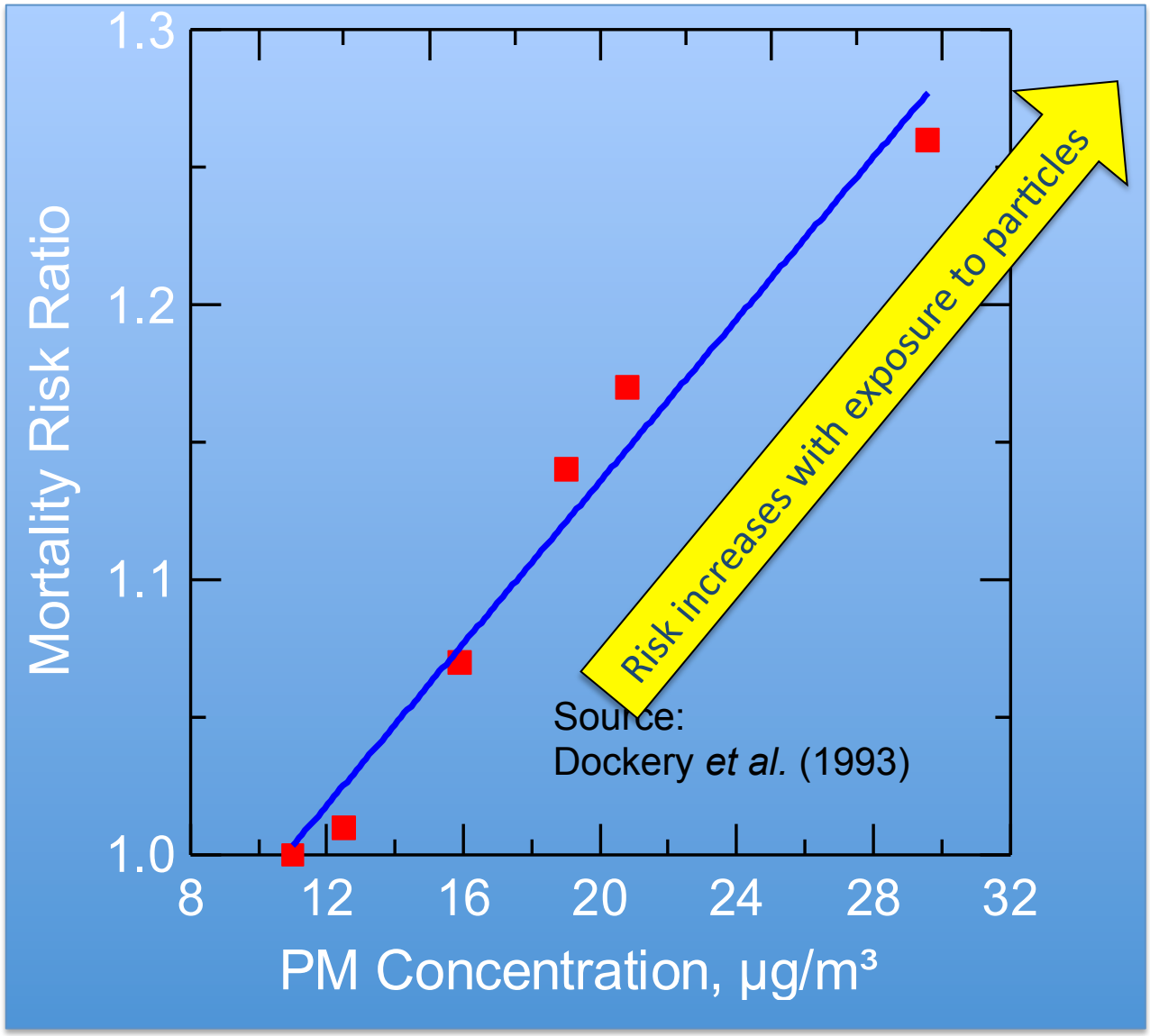
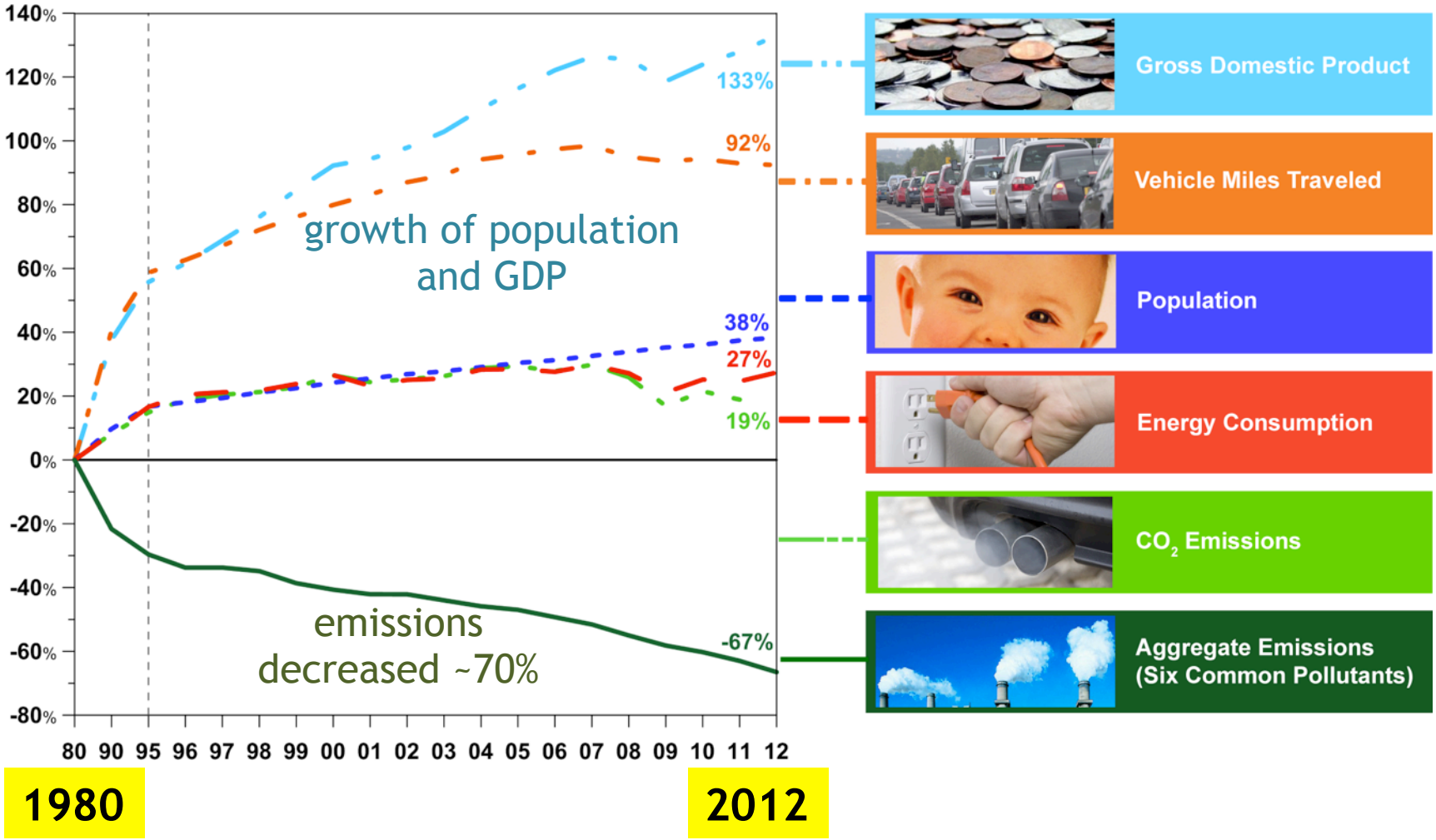



Slide courtesy Prof. John Volckens

# Great strides in improving air quality….



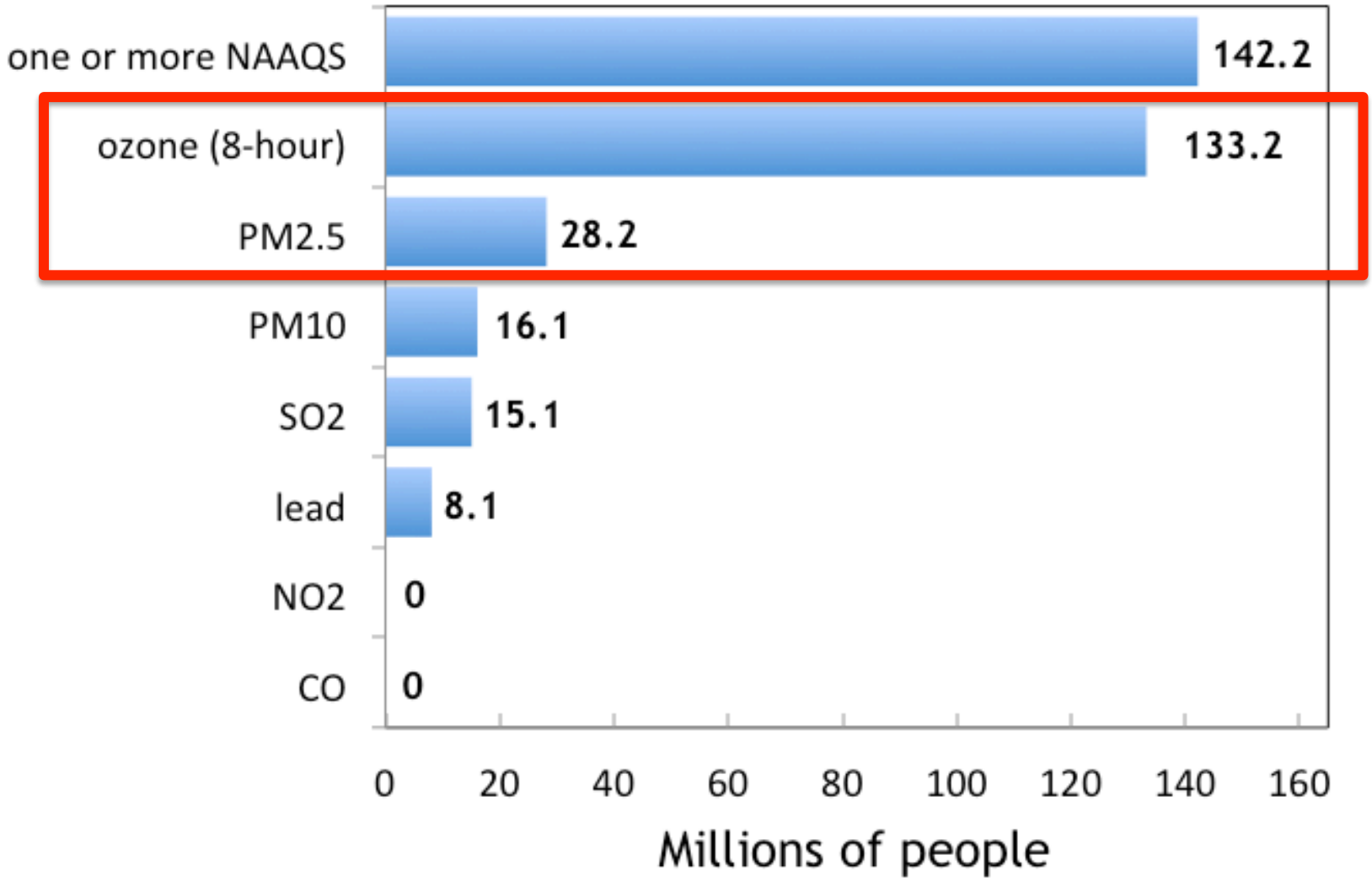

http://www.epa.gov/airtrends/aqtrends.html#comparison

# Visibility improvement 2000 to 2008


**Figure 6.7.12. Split-image of visibility conditions in Linville Gorge, NC (LIVO) for 50$^{th}$ percentile speciated aerosol levels in 2000 (left-side) and 2008 (right-side). Images were generated using WinHaze 2.9.9.**

Hand et al., IMPROVE Report V, 2011

# Number of people in U.S. living in counties having pollutant concentrations above the NAAQS (2012)

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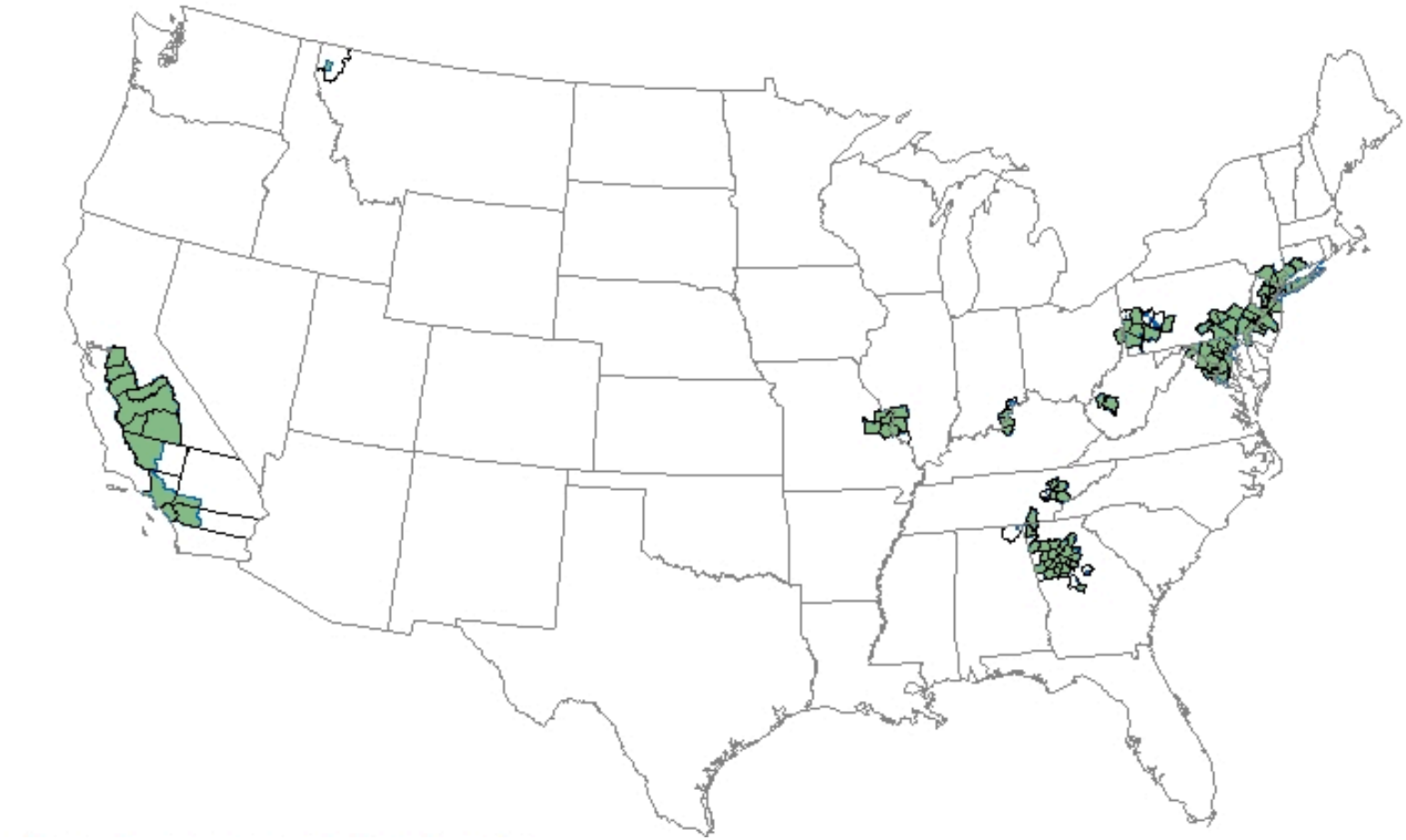
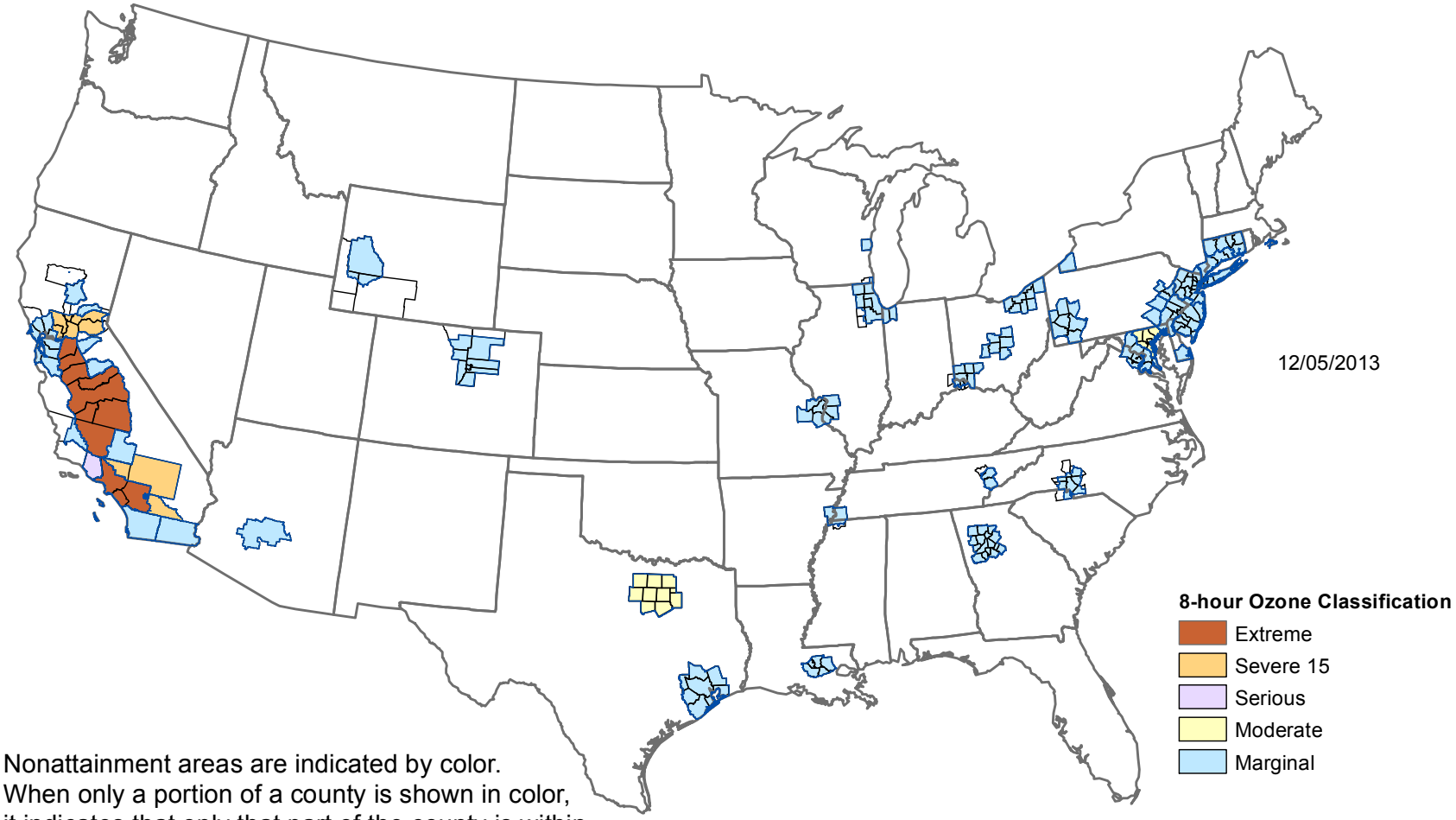
# $PM_{2.5}$ nonattainment areas (1997 standard)



Source: EPA
(http://www.epa.gov/oar/oaqps/greenbk/map8hr_2008.html)

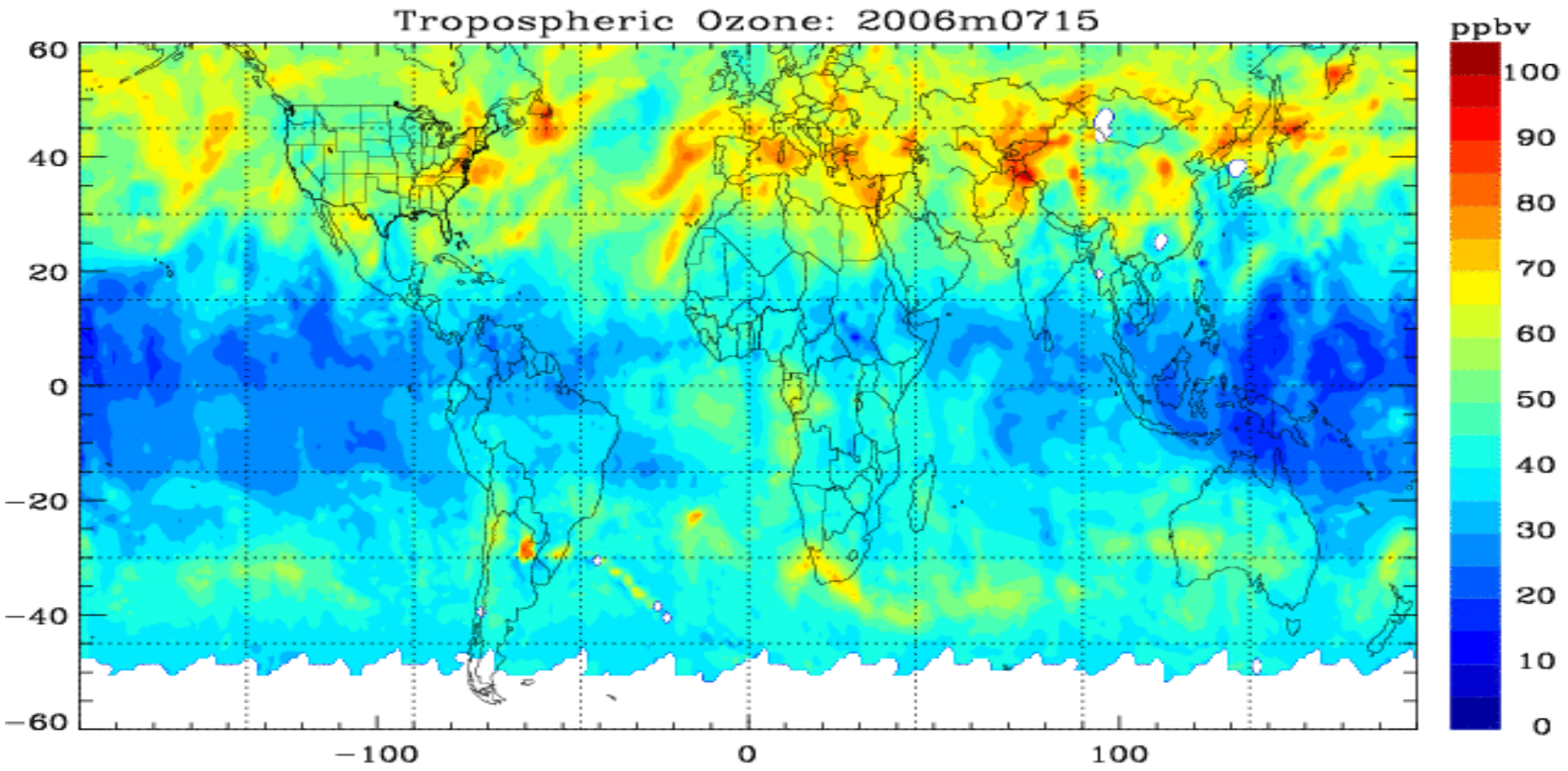
# 8-hour ozone nonattainment areas (2008 standard)




Nonattainment areas are indicated by color. When only a portion of a county is shown in color, it indicates that only that part of the county is within a nonattainment area boundary.

Source: EPA
(http://www.epa.gov/oar/oaqps/greenbk/map8hr_2008.html)

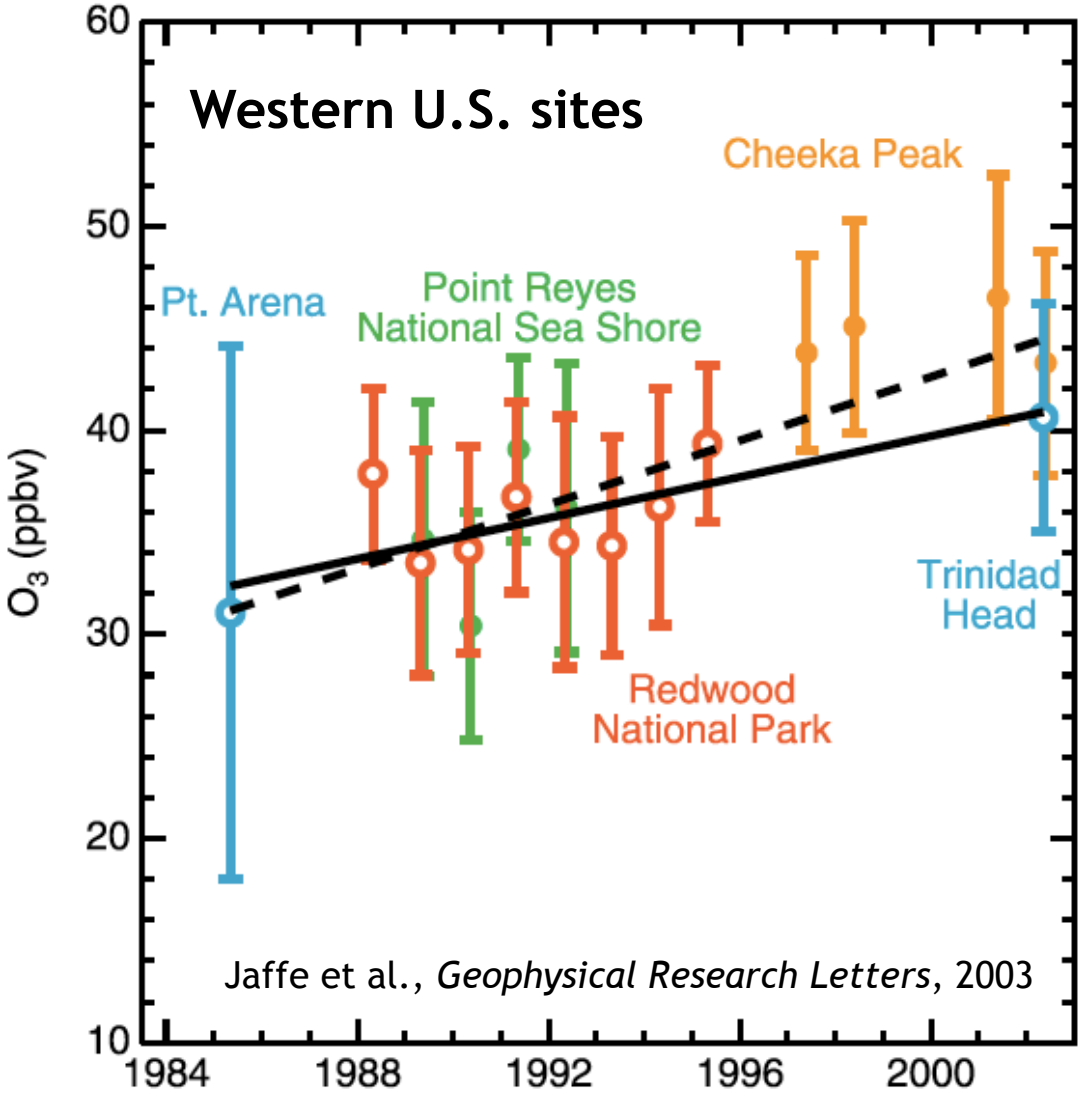
# Challenge for future: Ozone export




Satellite view of near-surface ozone

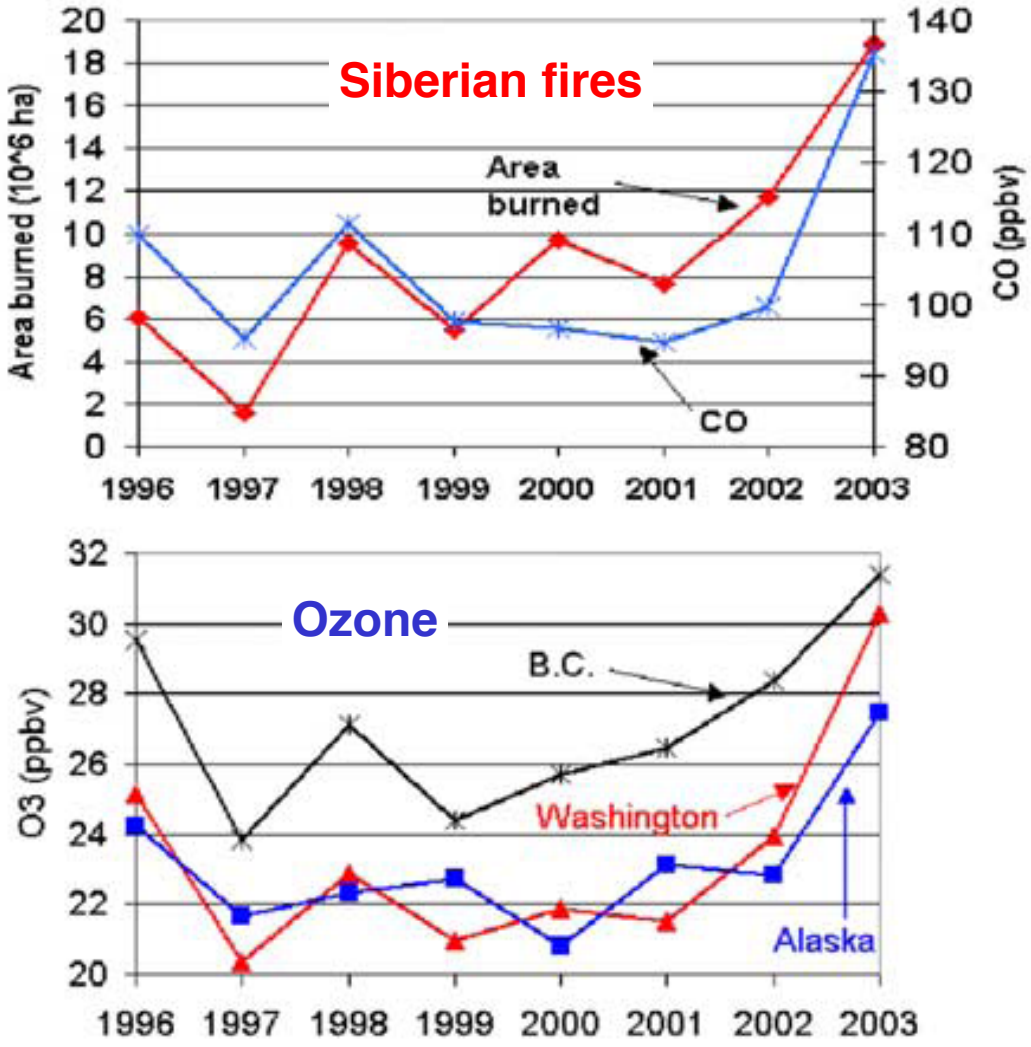
http://www.cfa.harvard.edu/atmosphere/links/tom_jul1506-sep0706.gif

# Export of pollutants: a “rising background”?

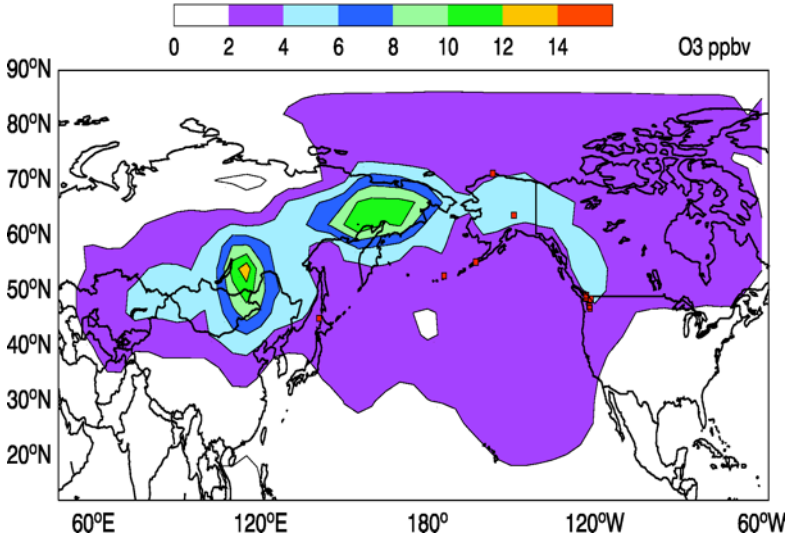


# EFFECT OF INCREASING SIBERIAN FOREST FIRES ON SUMMER SURFACE OZONE IN PACIFIC NORTHWEST

**Observations**



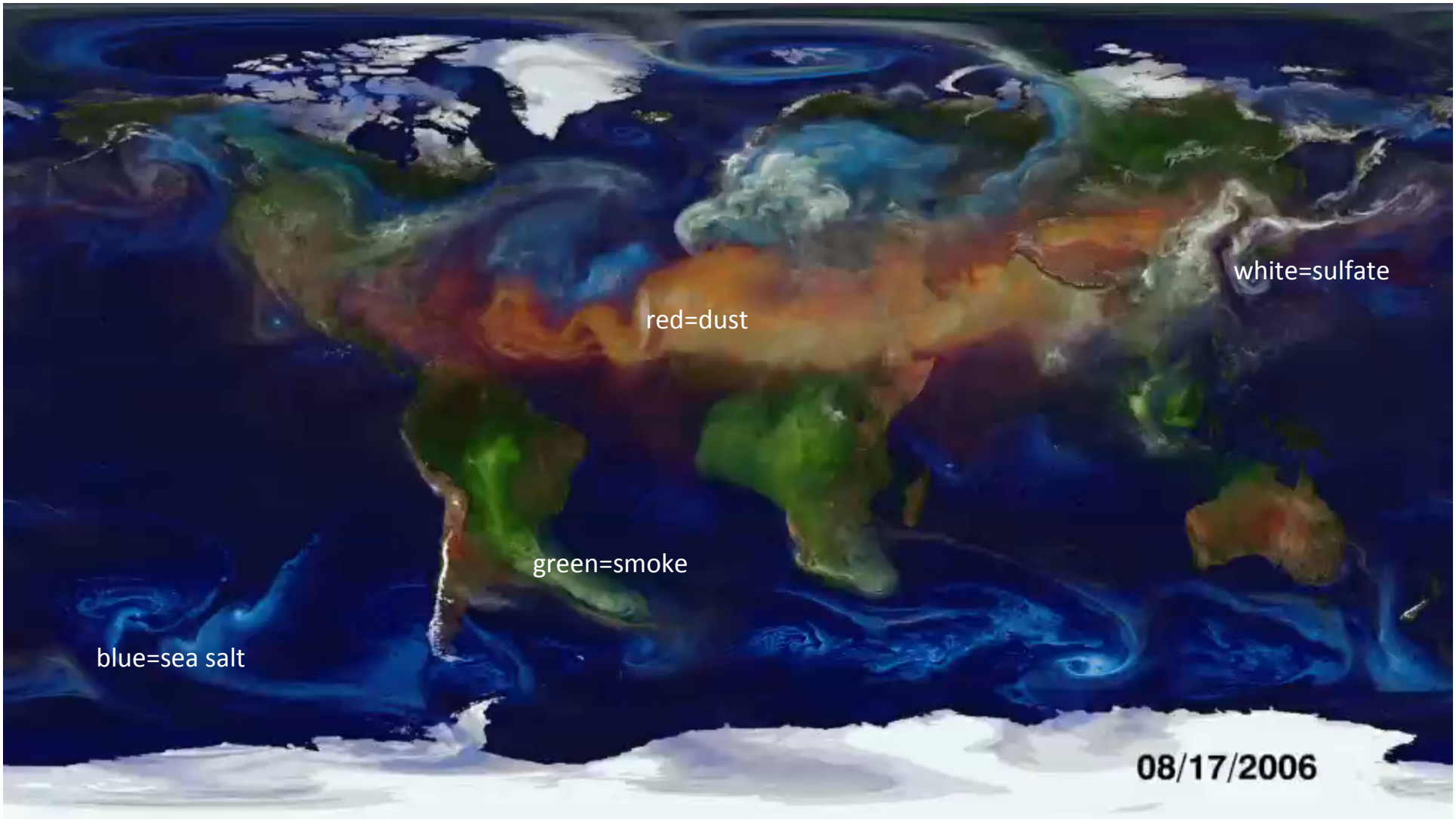

**Modeled ozone enhancements**




*Jaffe et al. [2004]*

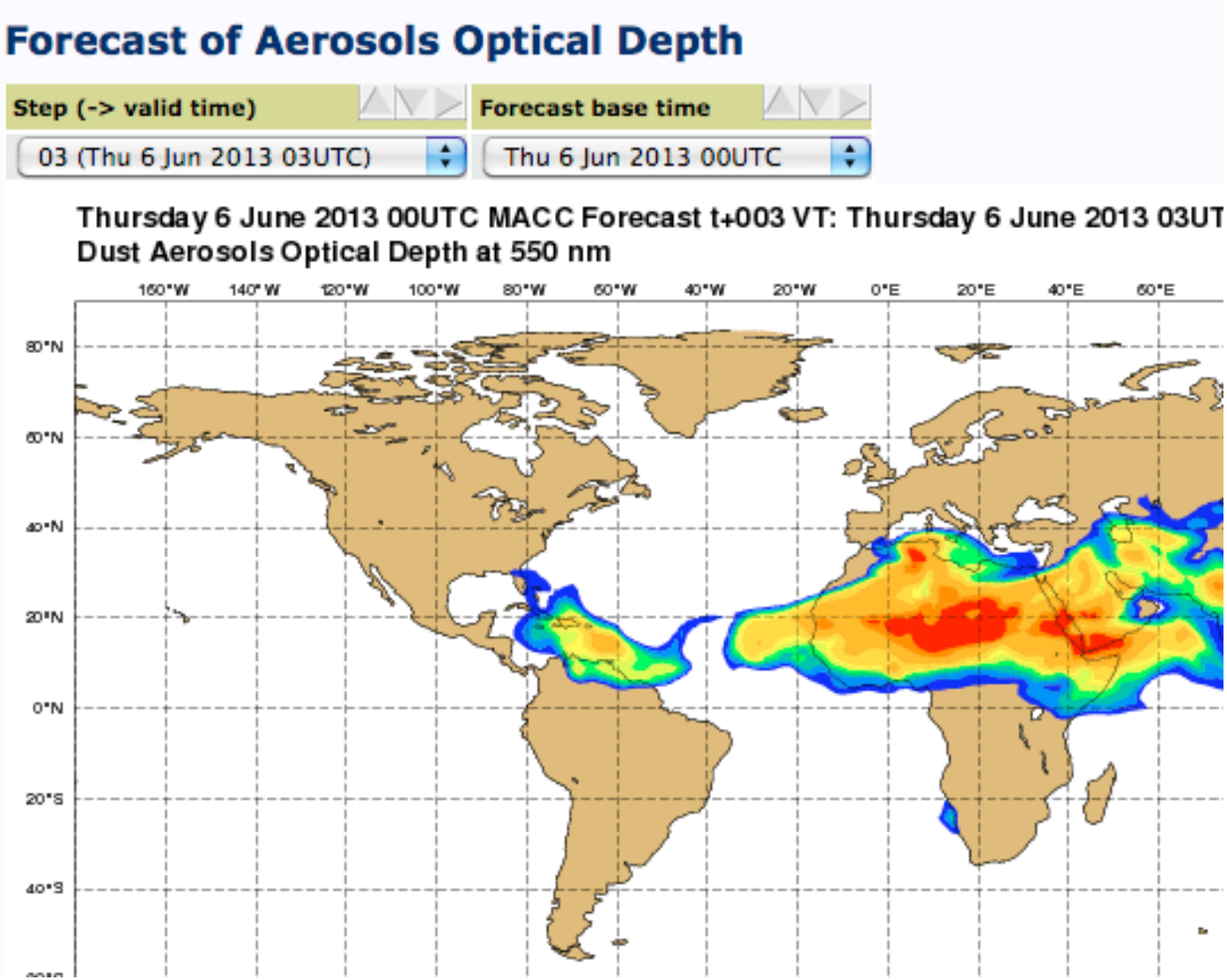
*Slide courtesy Prof. Colette Heald*

# Particles in the atmosphere



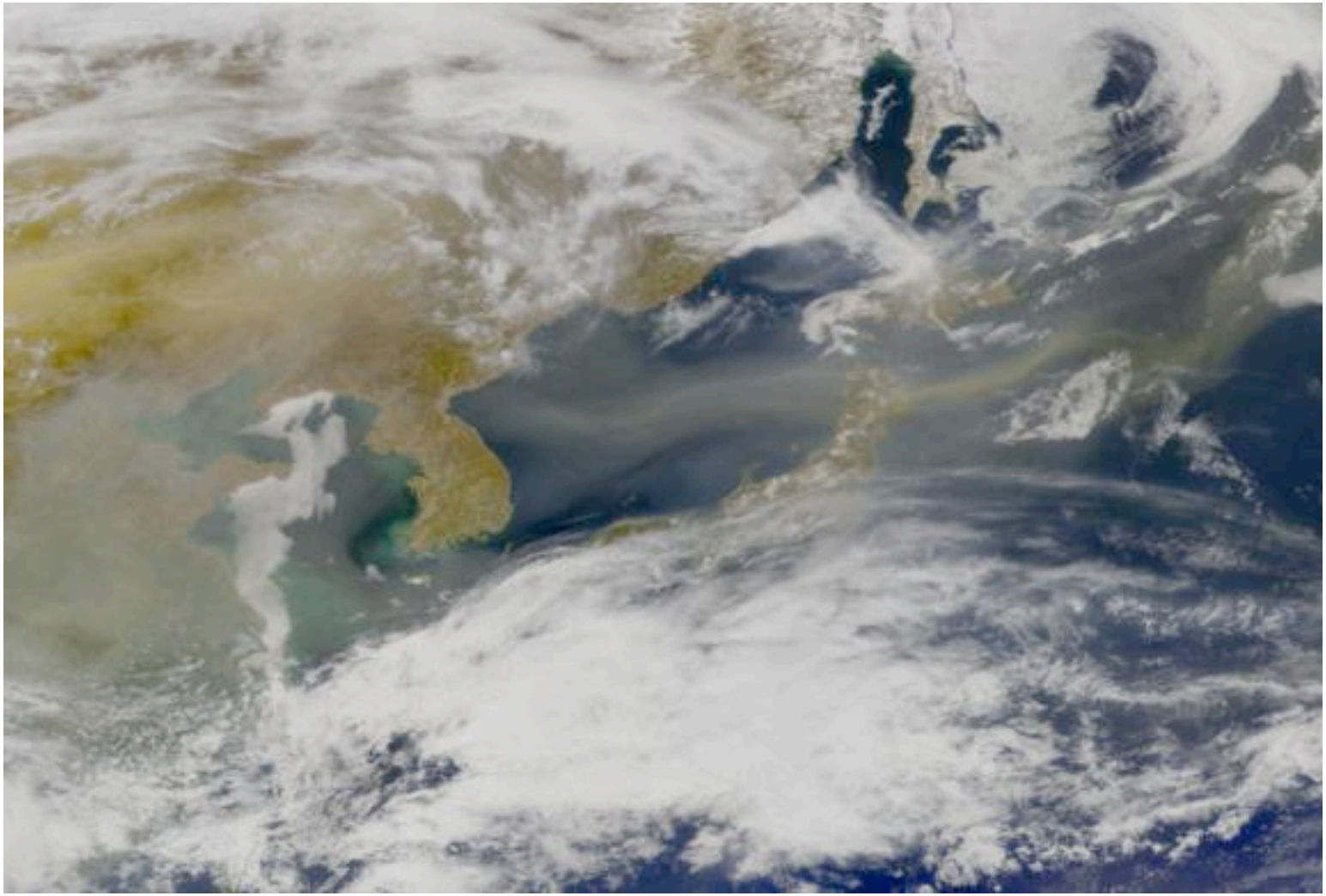

NASA; https://www.youtube.com/watch?v=oRsY_UviBPE

# Summertime North African dust in SE US




http://alg.umbc.edu/usaq/images/20130608_MACC_Dust.png

# Asian dust storms

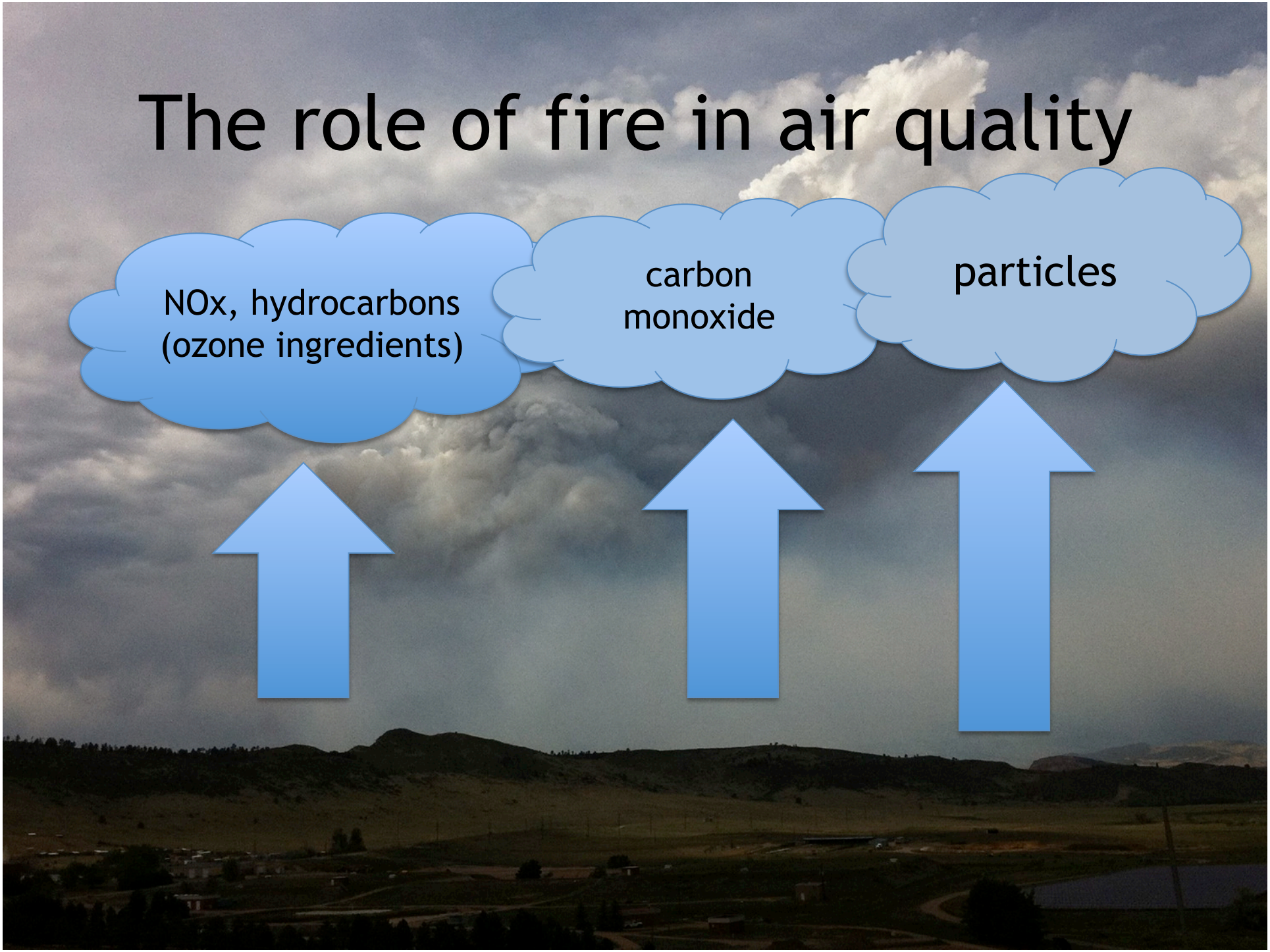


http://science1.nasa.gov/science-news/science-at-nasa/2001/ast17may_1/

# Asian dust in western U.S.

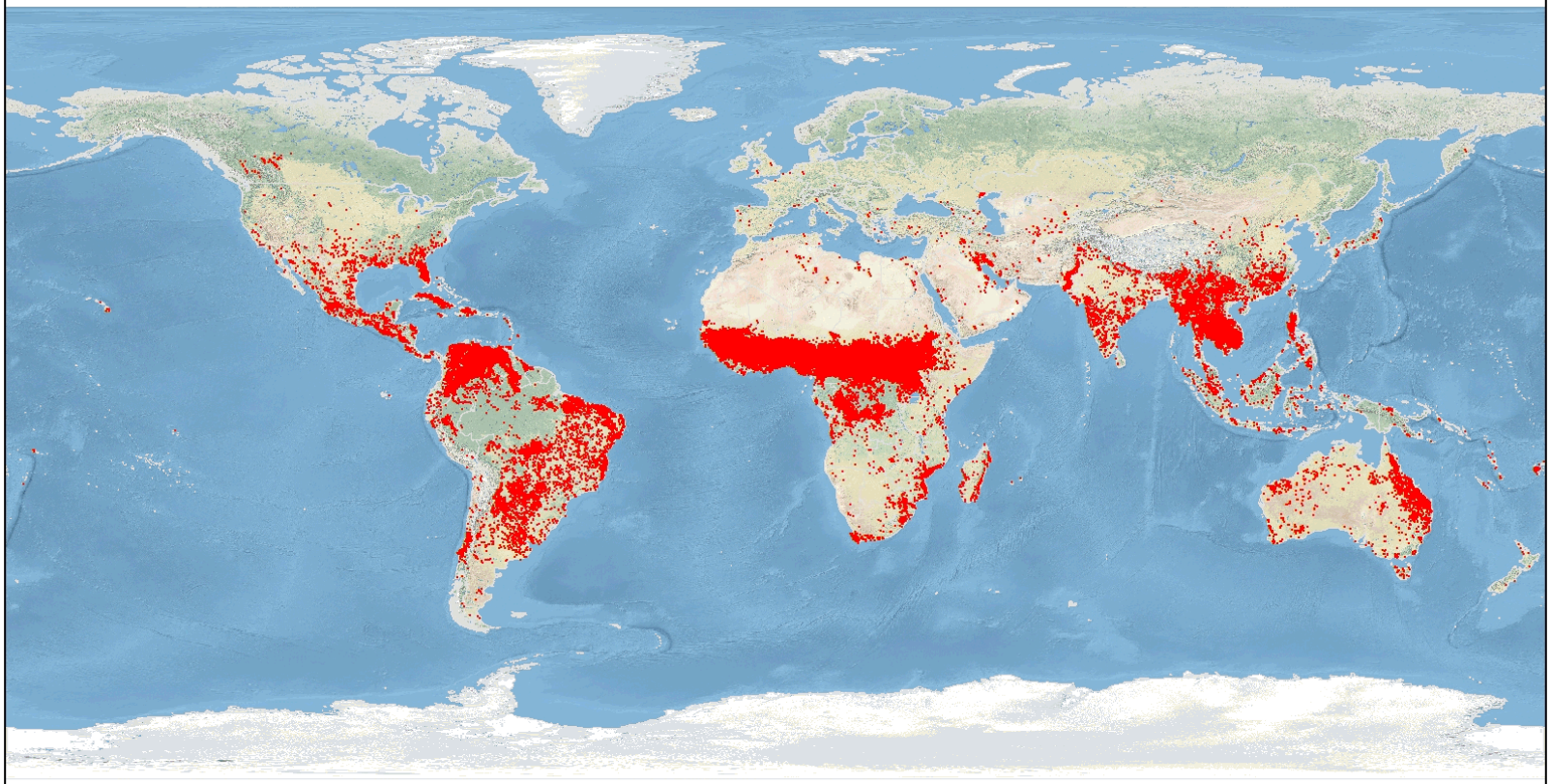

Page, Arizona Looking East Toward Navajo Mountain
*http://www.lakepowell.net/impact2001.htm*

# The role of fire in air quality



# Fires: a global concern

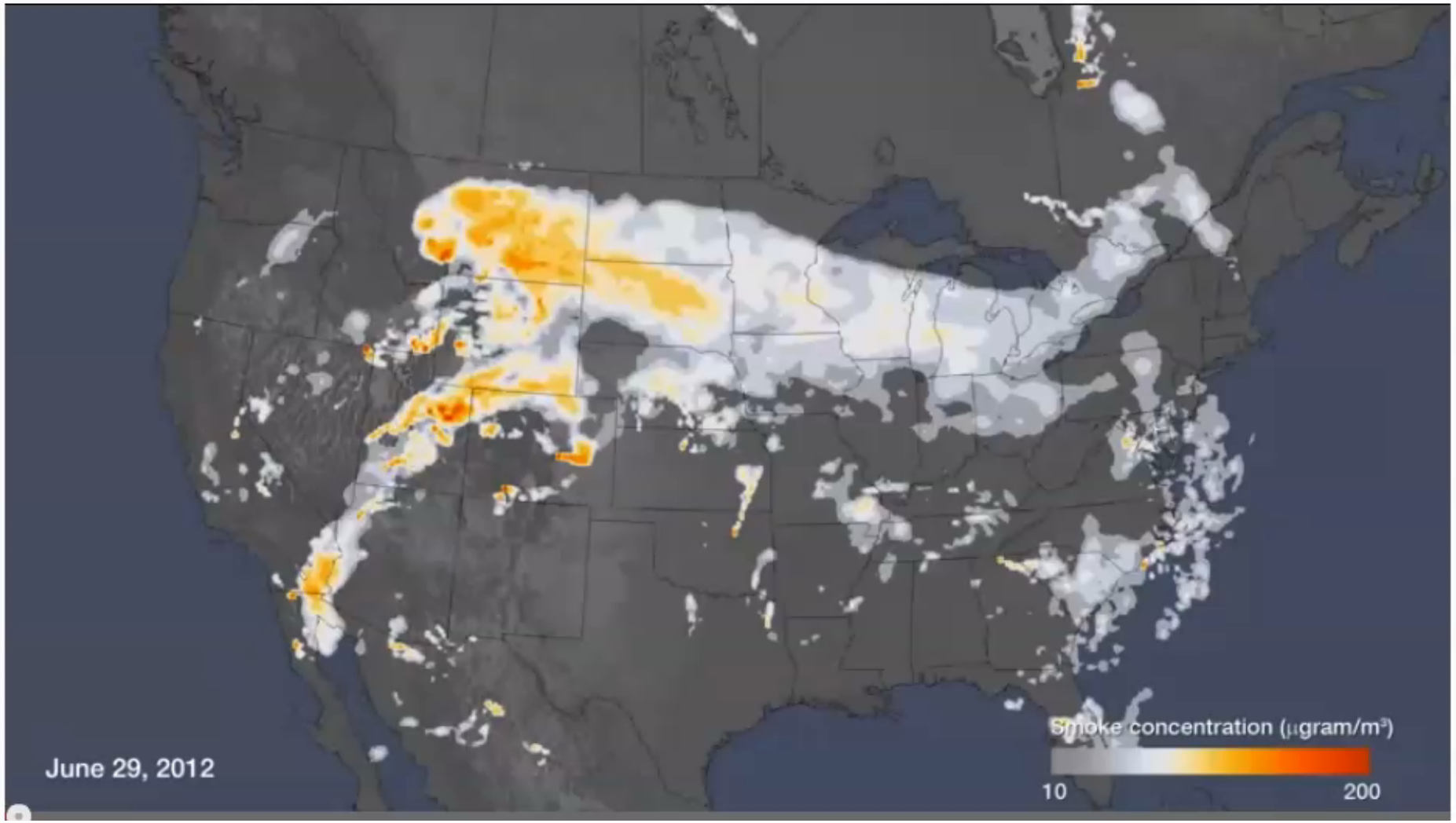
2010 MODIS Active Fire Detections



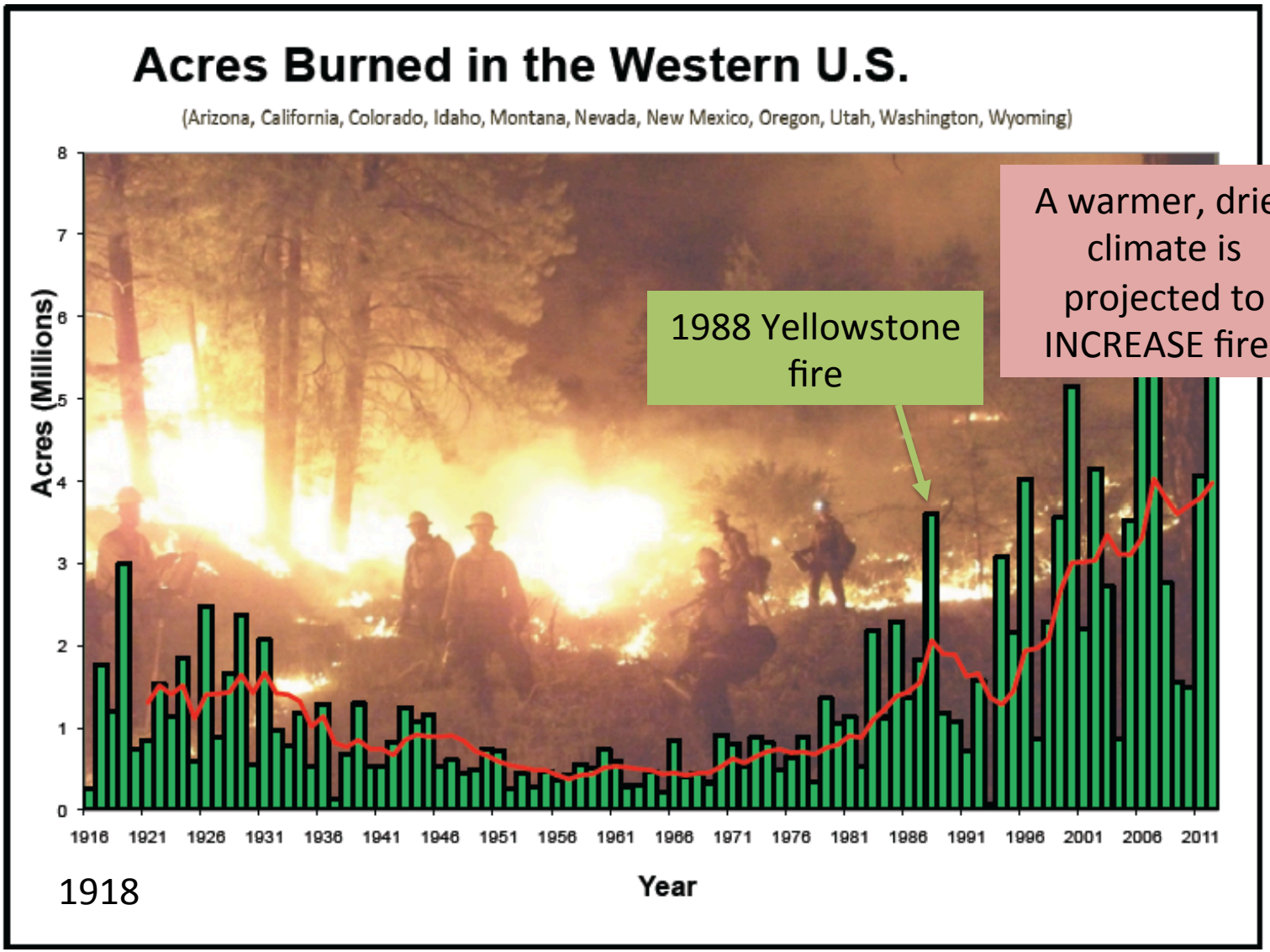
January February March April May June July August September October November December

Active fires, shown in red, are detected using MODIS data from the Terra and Aqua Satellites.
Source: Fire Information for Resource Management System (FIRMS)
http://maps.geog.umd.edu/firms/;
MODIS Rapid Response System
http://rapidfire.sci.gsfc.nasa.gov/; and MODAPS

# NOAA Smoke Forecasting



# Concern for the future…

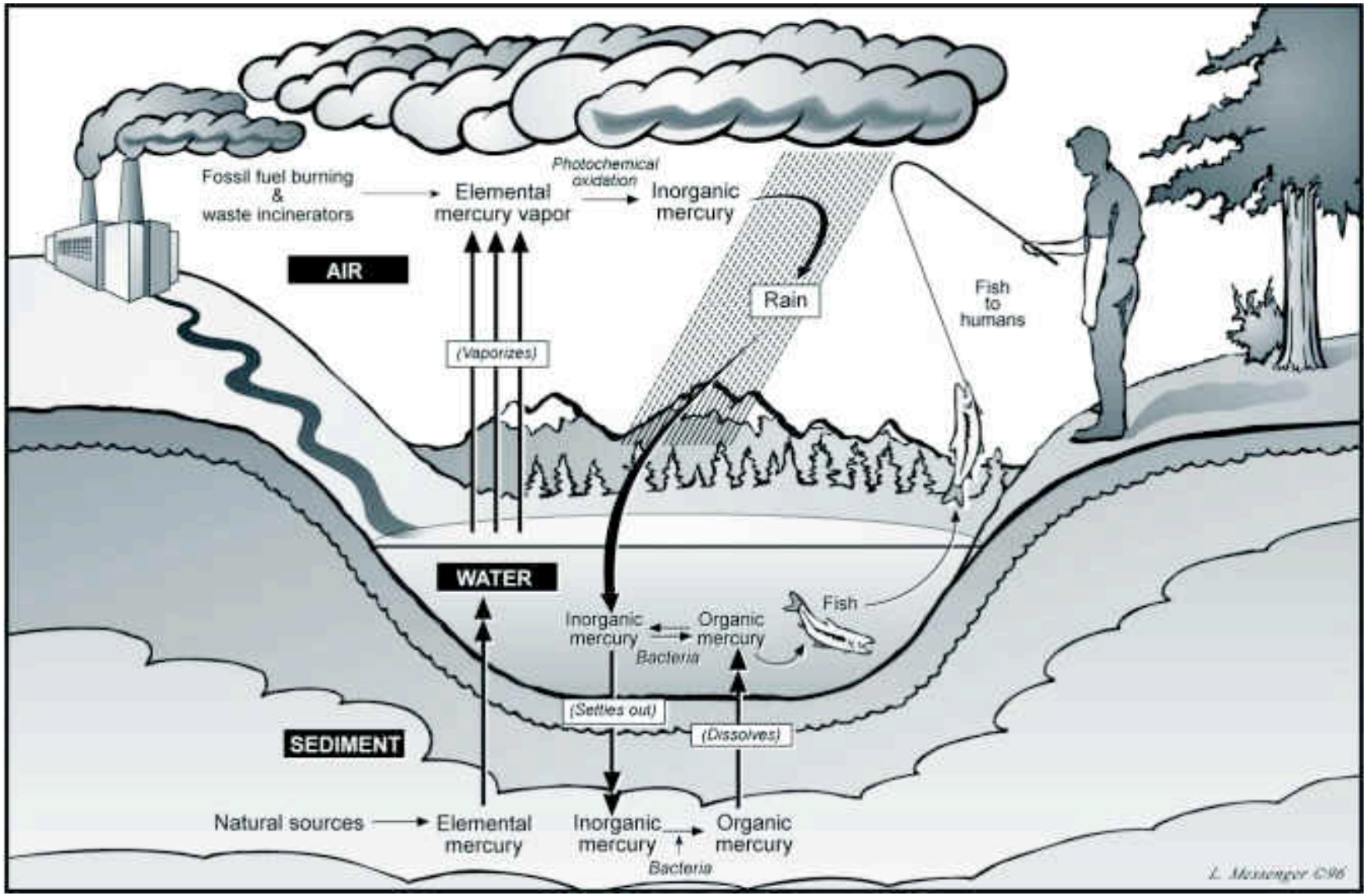



From a presentation by Running & Reinhardt, http://ametsoc.org/atmospolicy/climatebriefing/

# What about…?

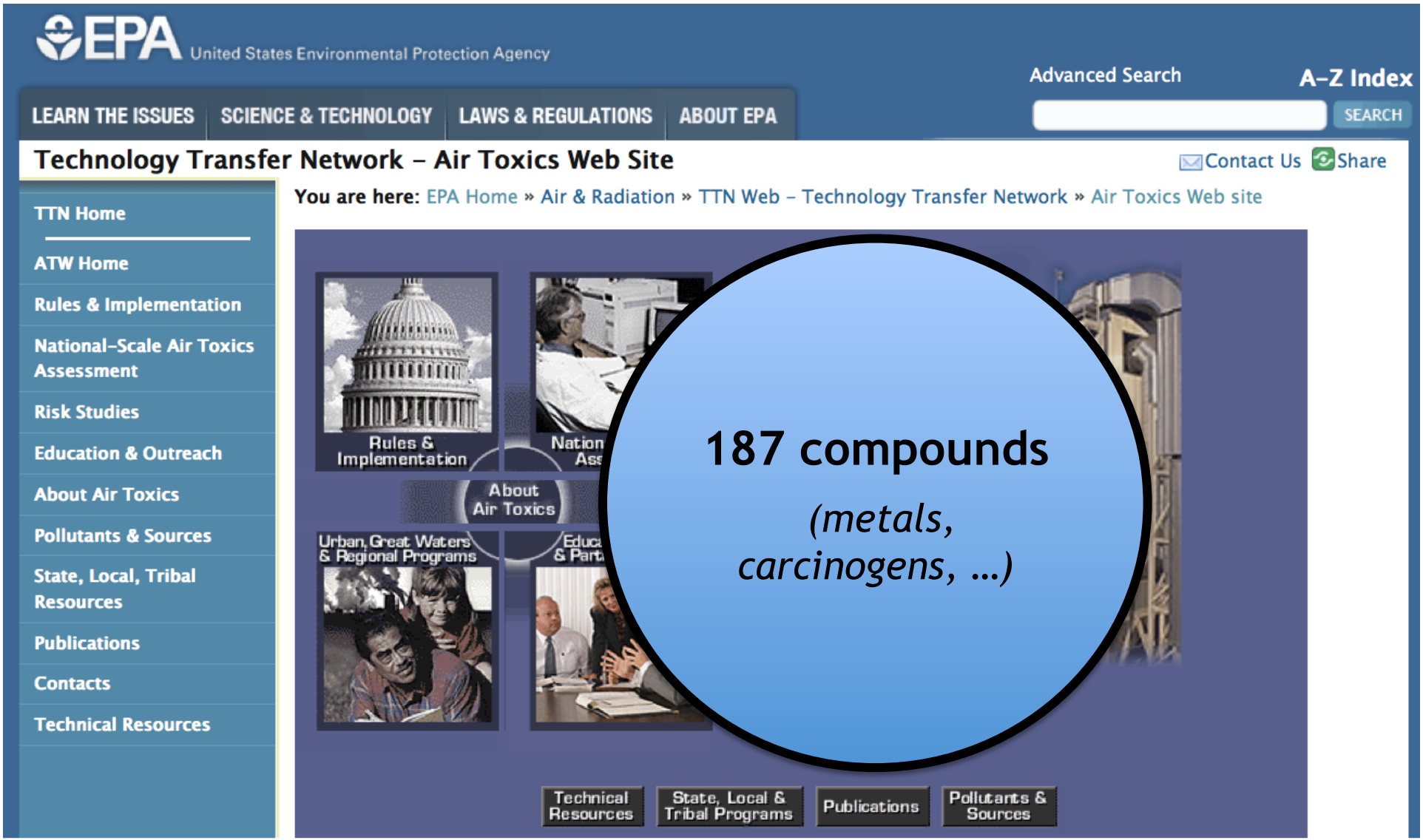

Image: markmaynard.com

# Coal burning is a source of mercury to the atmosphere

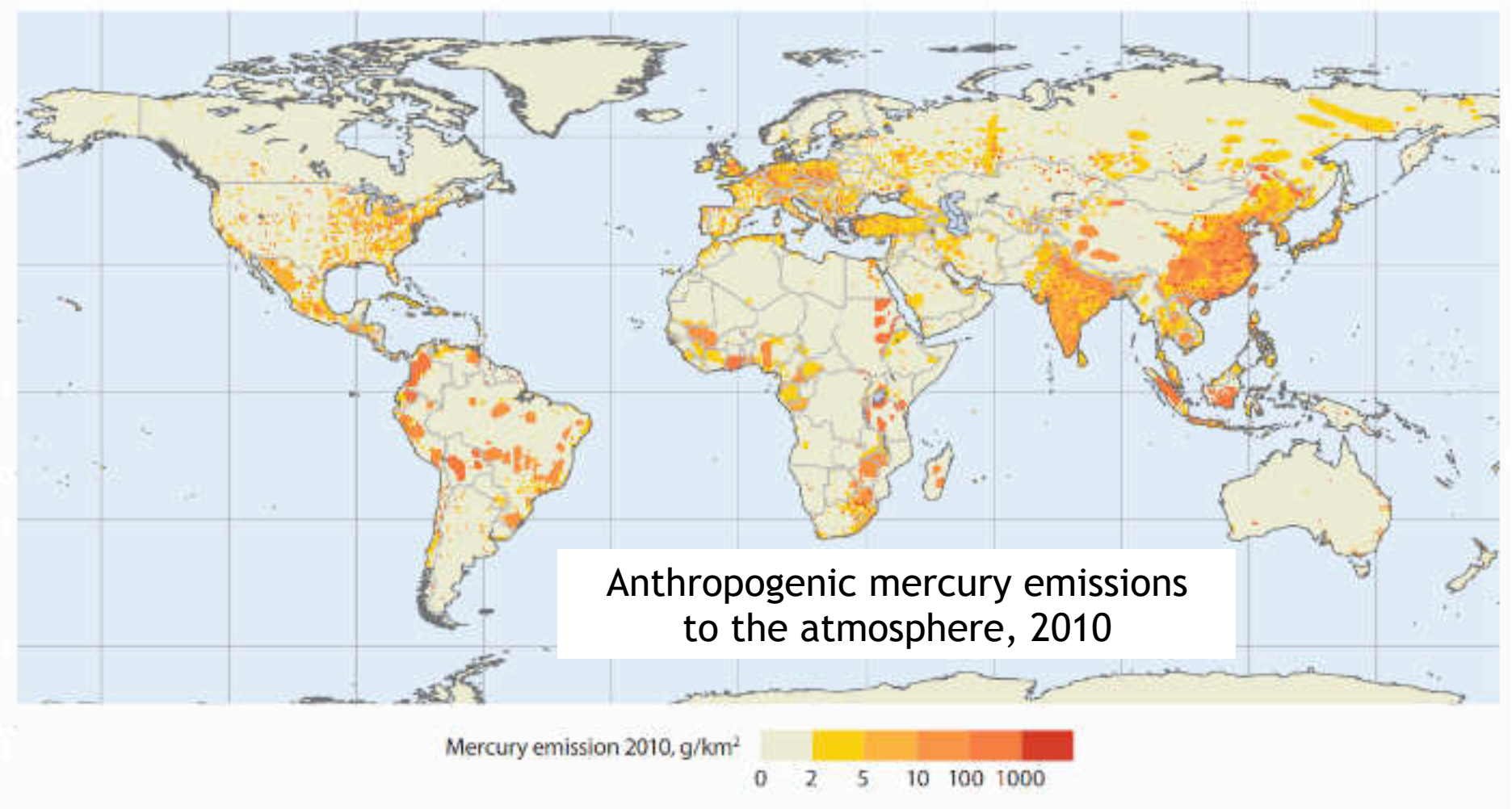



http://people.uwec.edu/piercech/hg/mercury_water/cycling.htm

# Air Toxics
# (Hazardous Air Pollutants, HAPs)



# HAPs:
## inventories and emissions reductions strategies




http://epa.gov/oia/toxics/mercury/mercury_context.html

# Occupational Exposures (OSHA)

- Most occupational exposures far exceed those encountered outdoors in the natural environment
  - Construction
  - Mining
  - Manufacturing
  - Agriculture

*Slide courtesy Prof. John Volckens*

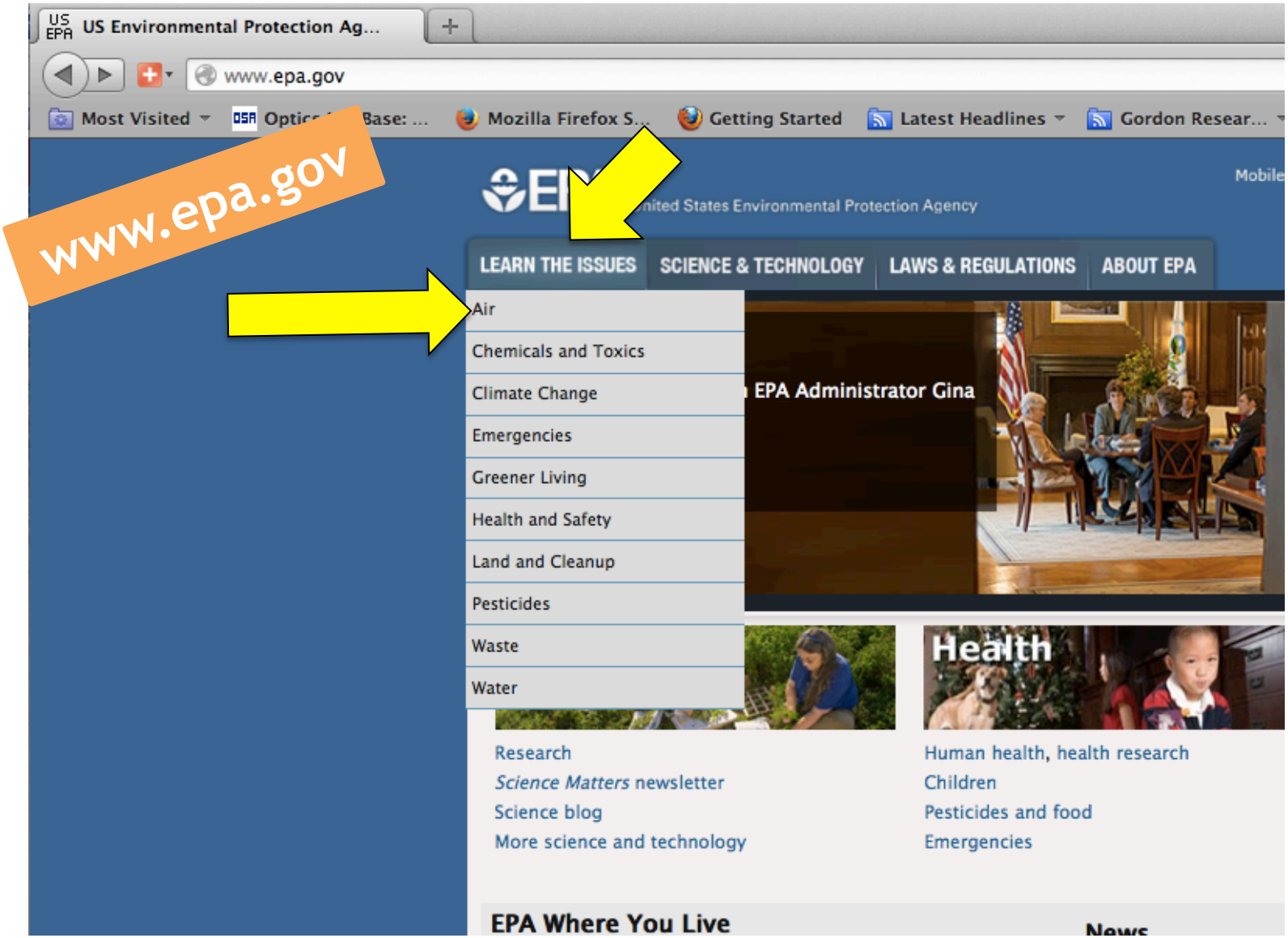
# Indoor air quality


http://www.floridahealth.gov/chdlee/eh/iaq.html

# Poor indoor air quality is responsible for more premature deaths worldwide


http://www.greenchipstocks.com/articles/x-prize-calls-for-efficient-cookstoves/1101

# For more information …



# Learn about Air

Learn about the many ways air pollution can harm both your health and the atmosphere and what you can do to help protect the air we breath. See all air resources.

## Air Pollution

- National Ambient Air Quality Standards (NAAQS)
- Ozone Layer Protection
- Toxic Air Pollutants

More Air Pollution Resources

## Indoor Air

- An Introduction to Indoor Air Quality
- A Citizen's Guide to Radon
- A Brief Guide to Mold, Moisture, and Your Home

More Indoor Air Resources

## Greenhouse Gases

- Greenhouse Gas (GHG) Emissions
- Greenhouse Gas Endangerment Finding
- Reducing GHG Emissions

More Greenhouse Gas Resources

## Acid Rain

- What is Acid Rain?
- EPA Acid Rain Program
- Acid Rain Site for Students

More Acid Rain Resources

### Frequent Questions

- Which places have the best and worst air quality?
- What are the biggest sources of mercury air emissions in the U.S.?

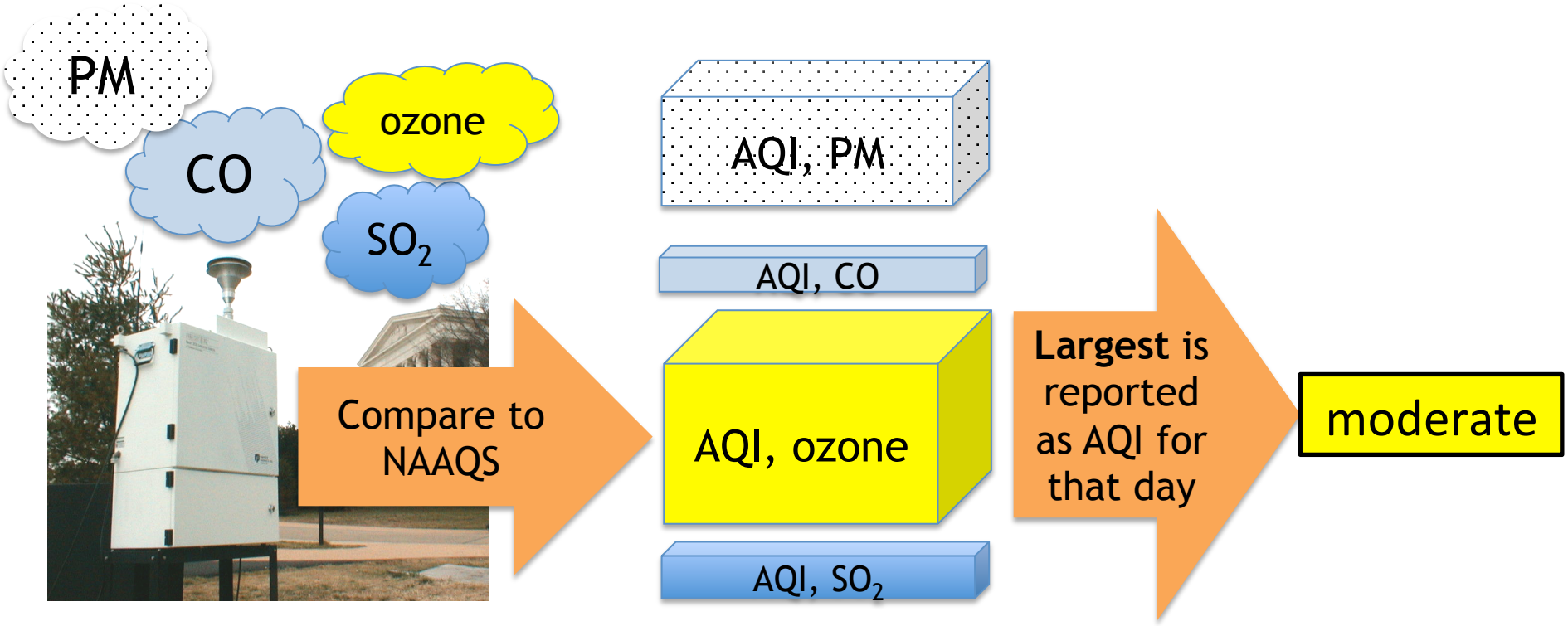
Ask a Question

### What You Can Do

- Consumer's Guide to Radon Reduction
- Ways to Reduce Air Pollution
- Fuel Economy (MPG) Guide

Learn more

# More about the AQI



| Air Quality Index Levels of Health Concern | Numerical Value | Meaning |
|---|---|---|
| Good | 0 to 50 | Air quality is considered satisfactory, and air pollution poses little or no risk |
| Moderate | 51 to 100 | Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution. |

All under the ambient air quality standard

| Air Quality Index Levels of Health Concern | Numerical Value | Meaning |
|---|---|---|
| Good | 0 to 50 | Air quality is considered satisfactory, and air pollution poses little or no risk |
| Moderate | 51 to 100 | Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution. |
| Unhealthy for Sensitive Groups | 101 to 150 | Members of sensitive groups may experience health effects. The general public is not likely to be affected. |

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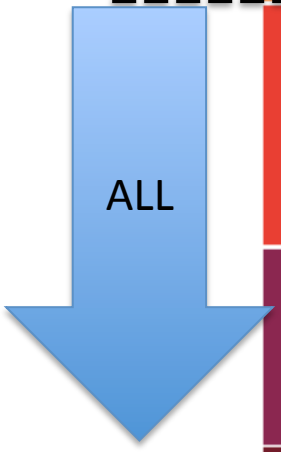
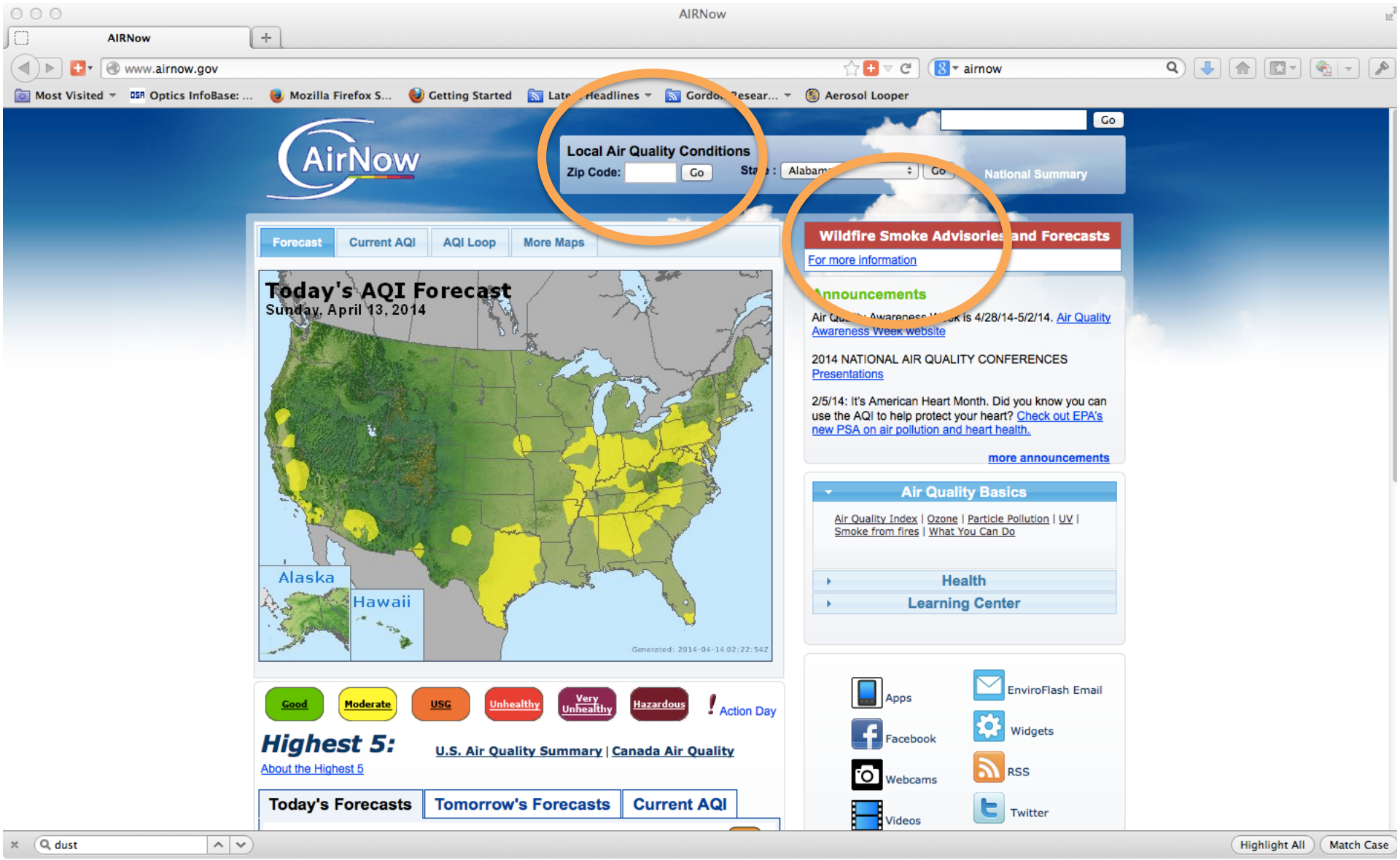
|---|---|---|
| Good | 0 to 50 | Air quality is considered satisfactory, and air pollution poses little or no risk |
| Moderate | 51 to 100 | Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution. |
| Unhealthy for Sensitive Groups | 101 to 150 | Members of sensitive groups may experience health effects. The general public is not likely to be affected. |
| Unhealthy | 151 to 200 | Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects. |
| Very Unhealthy | 201 to 300 | Health warnings of emergency conditions. The entire population is more likely to be affected. |
| Hazardous | 301 to 500 | Health alert: everyone may experience more serious health effects |



# www.airnow.gov

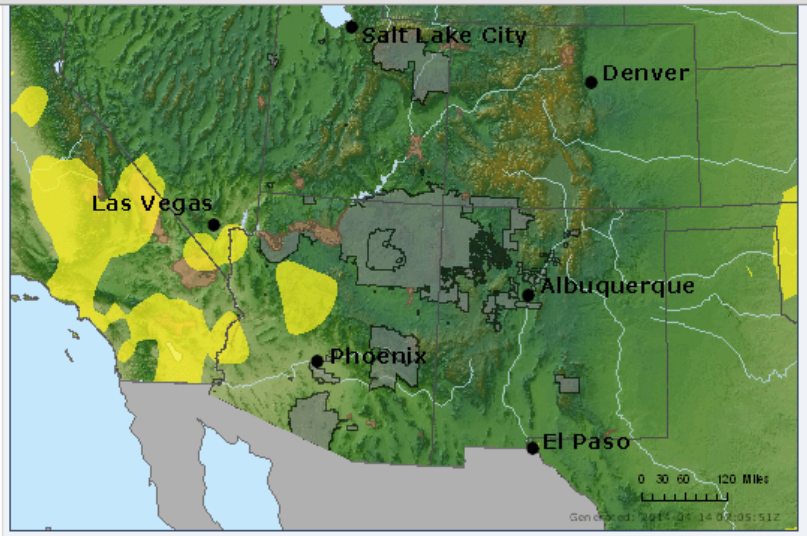


AIRNow

AIRNow | Air Pollution Control Division – ...

www.airnow.gov/?action=airnow.local_city&zipcode=80528&submit=Go#tabs-2

Most Visited | Optics InfoBase: ... | Mozilla Firefox S... | Getting Started | Latest Headlines | Gordon Resear... | Aerosol Looper




National Parks/Monuments  Tribal Boundaries

The tribal boundaries shown here are provided by the Bureau of Indian Affairs and are intended to be used as a general spatial reference only. They are not a formal determination of tribal boundaries by the EPA.

Good | Moderate | USG | Unhealthy | Very Unhealthy | Hazardous | ! Action Day

## Local Air Quality Resources

Action Day Program

## State Air Quality Resources

American Lung Association (ALA) of Colorado
Colorado Air Quality Summary
Colorado DPHE - Air Pollution Control Division
Colorado DPHE - Contact Information
Colorado Department of Public Health & Environment (DPHE)

State info

Good
Health Message: None

Good
Health Message: None

### AQI - Pollutant Details

| | | | | | |
|---|---|---|---|---|---|
| Particles (PM2.5) | | Good | Particles (PM2.5) | | Good |
| Ozone | | Good | Ozone | | Good |

## Current Conditions

Air Quality Index (AQI)
observed at 20:00 MDT

31 Good

Health Message: None

### AQI - Pollutant Details

| | | |
|---|---|---|
| Ozone | 31 | Good |
| Particles (PM2.5) | 18 | Good |

## Past Air Quality Maps and Data

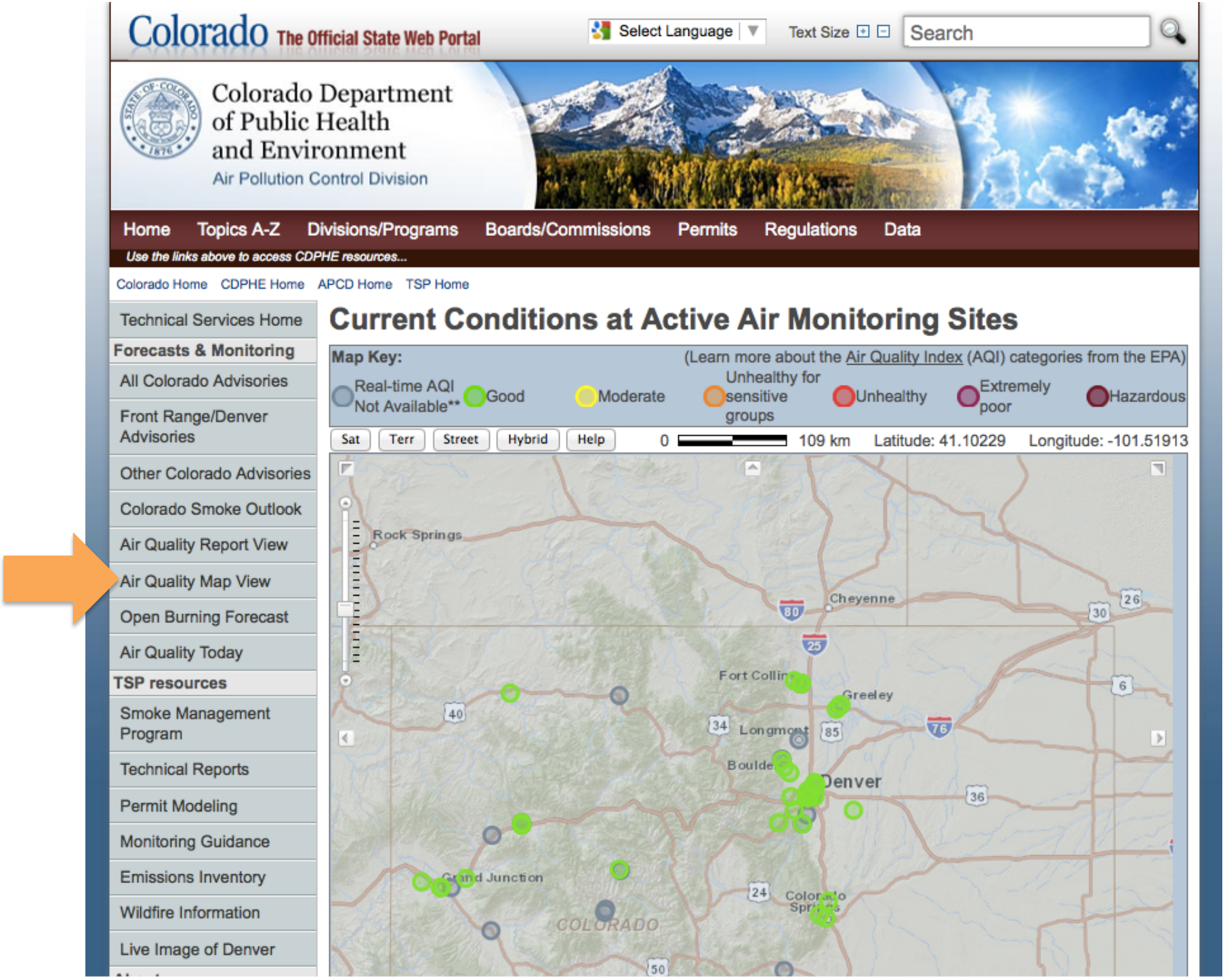
Yesterday's Maps and Data

Air Quality Maps Archives (by region)

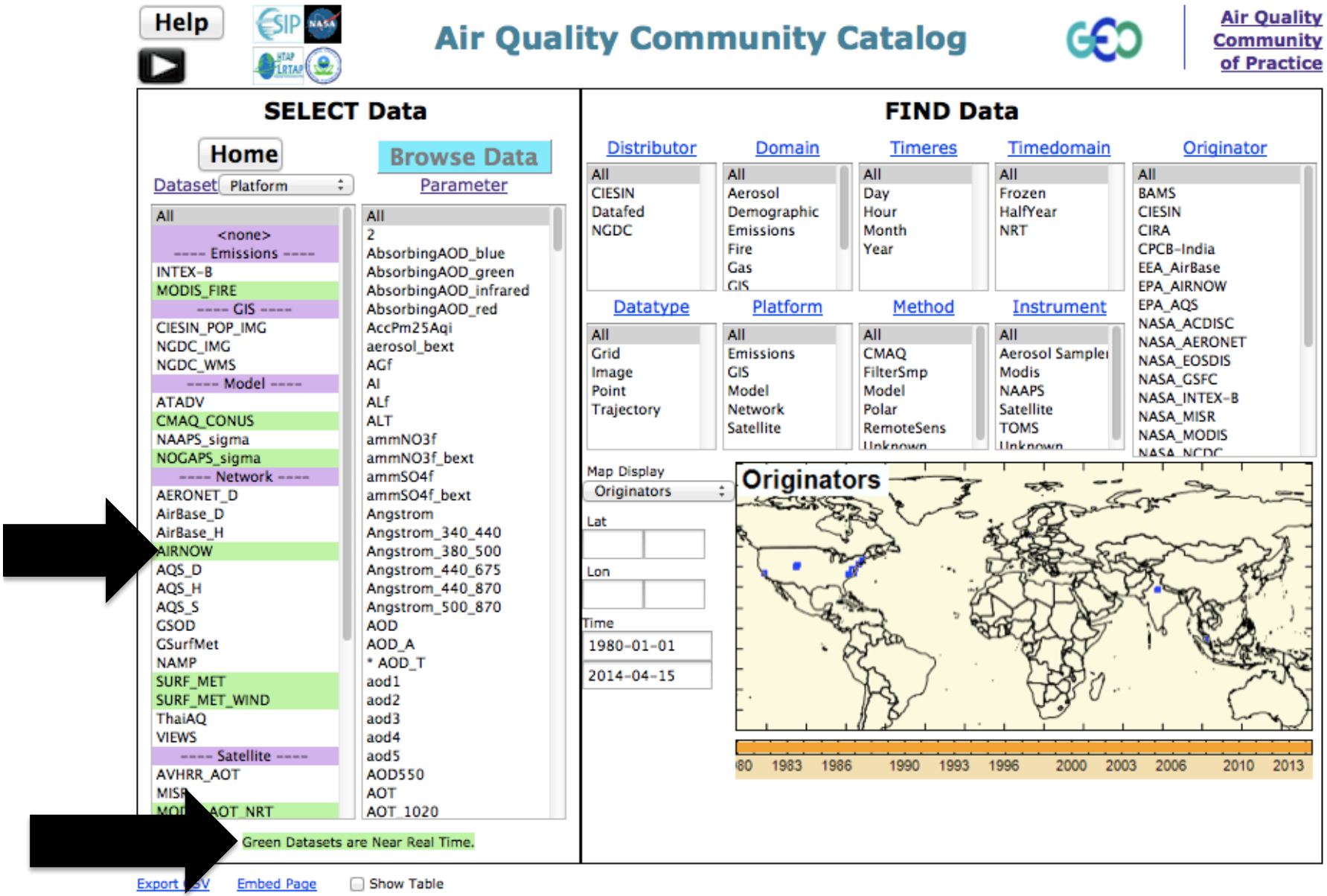
## E-Mail Notification

EnviroFlash

**EnviroFlash** provides air quality information such as forecasts and action day notifications via email for your area of interest. Sign-Up


Colorado The Official State Web Portal
Select Language
Text Size
Search
Colorado Department of Public Health and Environment
Air Pollution Control Division
Home
Topics A-Z
Divisions/Programs
Boards/Commissions
Permits
Regulations
Data
Use the links above to access CDPHE resources...
Colorado Home
CDPHE Home
APCD Home
TSP Home
Technical Services Home
Forecasts & Monitoring
All Colorado Advisories
Front Range/Denver Advisories
Other Colorado Advisories
Colorado Smoke Outlook
Air Quality Report View
Air Quality Map View
Open Burning Forecast
Air Quality Today
TSP resources
Smoke Management Program
Technical Reports
Permit Modeling
Monitoring Guidance
Emissions Inventory
Wildfire Information
Live Image of Denver
Current Conditions at Active Air Monitoring Sites
Map Key:
(Learn more about the Air Quality Index (AQI) categories from the EPA)
Real-time AQI Not Available**
Good
Moderate
Unhealthy for sensitive groups
Unhealthy
Extremely poor
Hazardous
Sat
Terr
Street
Hybrid
Help
0
109 km
Latitude: 41.10229
Longitude: -101.51913
Rock Springs
Cheyenne
Fort Collins
Greeley
Longmont
Boulder
Denver
Grand Junction
COLORADO


DATAFED.NET
For Access and Analysis of Distributed Spatial-Temporal Data.
Data Catalog
Page Catalog
Console Catalog
About
DataFed Wiki
Tools
May 28 2012: Exceptional Event DSS beta available
Sponsors
Membership
Technologies
NSF
NASA
OGC
ESIP
Web
XML
Services
SOA


Help
Air Quality Community Catalog
Air Quality Community of Practice
SELECT Data
Home
Browse Data
Dataset
Platform
Parameter
All
<none>
---- Emissions ----
INTEX-B
MODIS_FIRE
---- GIS ----
CIESIN_POP_IMG
NGDC_IMG
NGDC_WMS
---- Model ----
ATADV
CMAQ_CONUS
NAAPS_sigma
NOGAPS_sigma
---- Network ----
AERONET_D
AirBase_D
AirBase_H
AIRNOW
AQS_D
AQS_H
AQS_S
GSOD
GSurfMet
NAMP
SURF_MET
SURF_MET_WIND
ThaiAQ
VIEWS
---- Satellite ----
AVHRR_AOT
MISR
AOT_NRT
2
AbsorbingAOD_blue
AbsorbingAOD_green
AbsorbingAOD_infrared
AbsorbingAOD_red
AccPm25Aqi
aerosol_bext
AGf
AI
ALf
ALT
ammNO3f
ammNO3f_bext
ammSO4f
ammSO4f_bext
Angstrom
Angstrom_340_440
Angstrom_380_500
Angstrom_440_675
Angstrom_440_870
Angstrom_500_870
AOD
AOD_A
* AOD_T
aod1
aod2
aod3
aod4
aod5
AOD550
AOT
AOT_1020
Green Datasets are Near Real Time.
Export CSV
Embed Page
Show Table
FIND Data
Distributor
All
CIESIN
Datafed
NGDC
Domain
All
Aerosol
Demographic
Emissions
Fire
Gas
GIS
Timeres
All
Day
Hour
Month
Year
Timedomain
All
Frozen
HalfYear
NRT
Originator
All
BAMS
CIESIN
CIRA
CPCB-India
EEA_AirBase
EPA_AIRNOW
EPA_AQS
NASA_ACDISC
NASA_AERONET
NASA_EOSDIS
NASA_GSFC
NASA_INTEX-B
NASA_MISR
NASA_MODIS
Datatype
All
Grid
Image
Point
Trajectory
Platform
All
Emissions
GIS
Model
Network
Satellite
Method
All
CMAQ
FilterSmp
Model
Polar
RemoteSens
Instrument
All
Aerosol Sampler
Modis
NAAPS
Satellite
TOMS
Map Display
Originators
Lat
Lon
Time
1980-01-01
2014-04-15
Originators
1980
1983
1986
1990
1993
1996
2000
2003
2006
2010
2013

Help

# r Quality Community Catalog

Air Quality Community of Practice

## SELECT Da

Home | Browse Data

Dataset: Platform | Parameter: All

| | |
|---|---|
| All | All |
| ---- Network ---- | pm10 |
| AIRNOW | pmfine |
| | super |

Green Datasets are Near Real Time.

## Data Summary

### AIRNOW : AIRNOW - Realtime PM

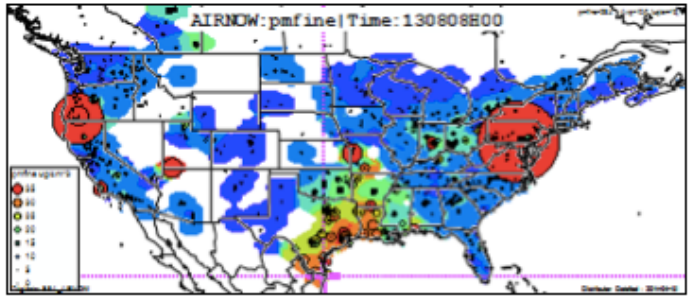
Originator: EPA_AIRNOW
Dataspace

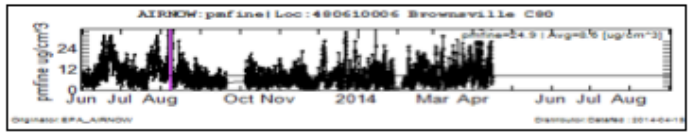
Citation Access

Access Constraints: NONE

| | |
|---|---|
| Parameter: | pmfine |
| Distributor: | Datafed |
| Domain: | Aerosol |
| Timeres: | Hour |
| Timedomain: | NRT |
| Datatype: | Point |
| Platform: | Network |
| Method: | Unknown |
| Instrument: | Unknown |
| Lat Lon | 19,64 -158,-53 |
| Time | 2002 - 2014 |

AIRNOW is an EPA project to gather and distribute near-realtime data from several hundred continuous PM2.5 and ozone monitors. From the point of view of the FASTNET project the AIRNOW system establishes the spatial and temporal patterns of the key pollutants PM2.5 and ozone.

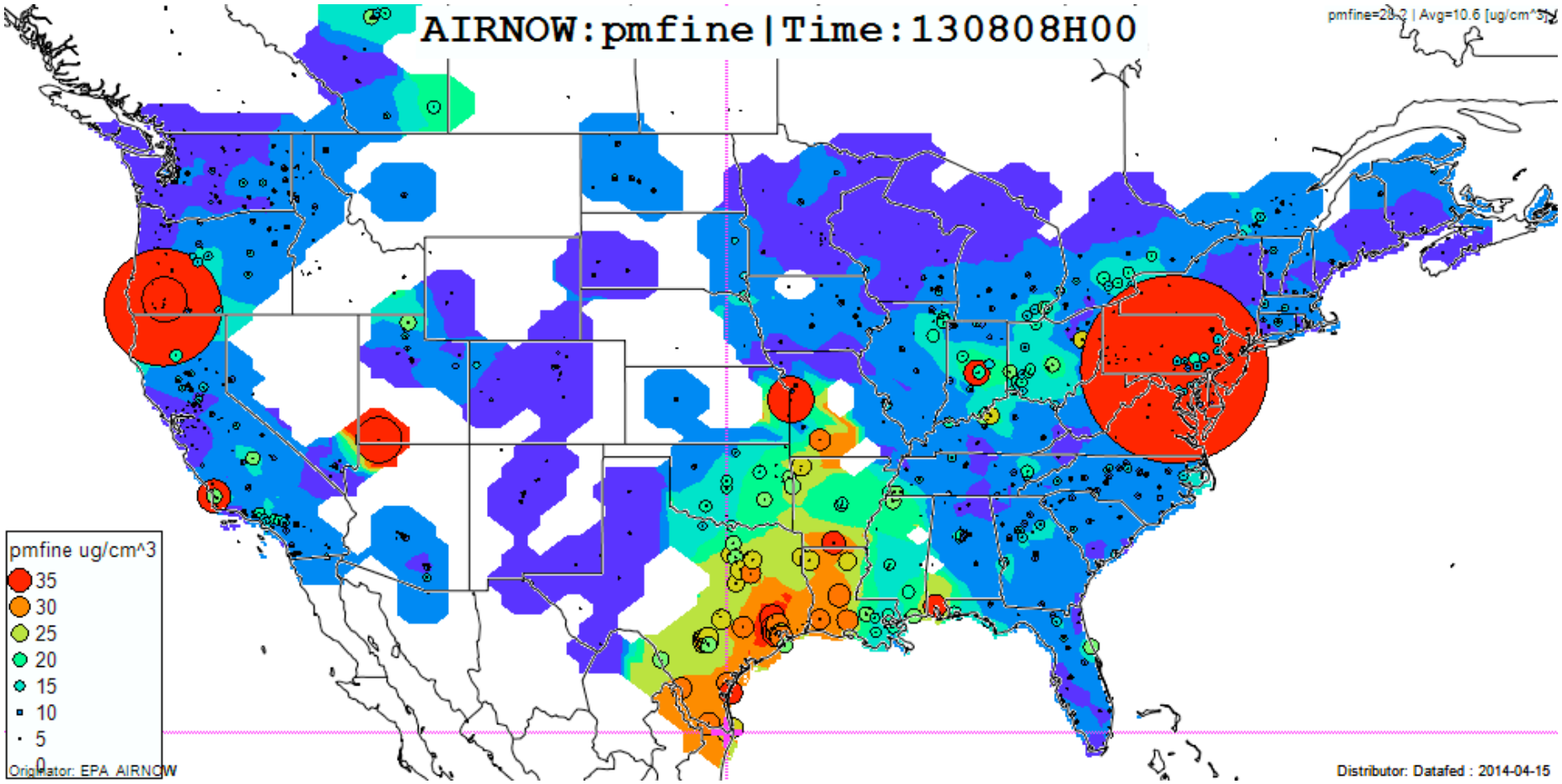



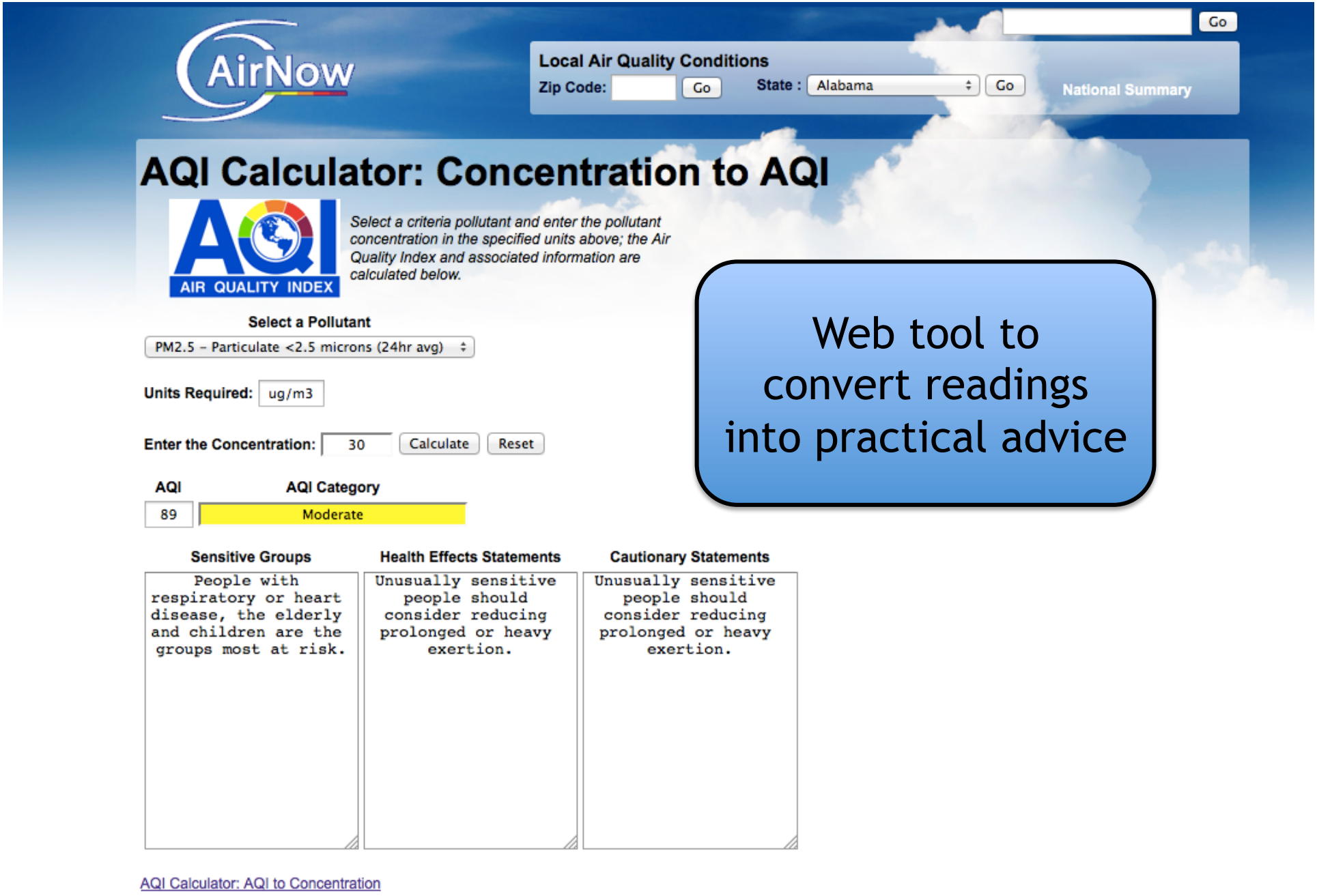

### pmfine: Particulate Matter 2.5

Particulate matter below 2.5 um

Export CSV | Embed Page | Show Table

# Particulate matter concentrations across the US from real-time monitors






Web tool to convert readings into practical advice

# The Smog Blog (alg.umbc.edu/usaq/)

U.S. Air Quality

AIRNow | Air Pollution Control Division – ... | U.S. Air Quality

alg.umbc.edu/usaq/

Most Visited | Optics InfoBase: ... | Mozilla Firefox S... | Getting Started | Latest Headlines | Gordon Resear... | Aerosol Looper

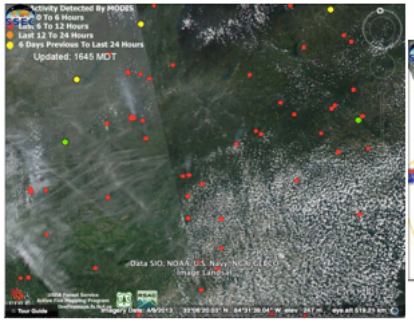
## U.S. Air Quality
**The Smog Blog**

UMBC JCET NASA GSFC UMBC AN HONORS UNIVERSITY IN MARYLAND

### April 12, 2014

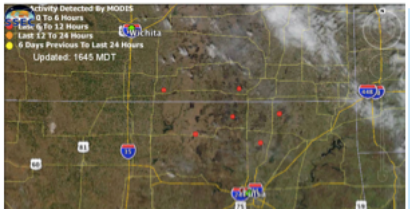
**WEEKEND EDITION: SPRING FIRE SEASON IS ON IN OKLAHOMA AND GEORGIA**

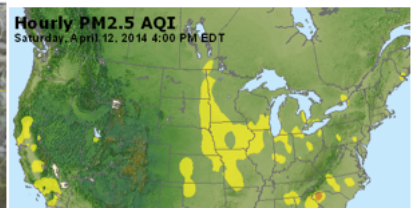
In the spring of every year, fire clusters break out in Kansas and Oklahoma and in the US southeast. While some of these can be lightning generated, burning of fields which can get out of control can also be a cause. The USFS Large Incident page has classified fires of over 100 acres in size in forests and over 300 acres of grass fires. These clusters are showing up on satellite imagery. A wide angle view of the southeast shows the fire hotspots over the daytime hours of Saturday in Georgia and Alabama (left) and zoomed in around Atlanta with roads superimposed to make the location of the fires more obvious.





In Oklahoma, the large number of wildfires has narrowed to about a half dozen fire hotspots on MODIS thermal channels. The hazy image is not just smoke, however, as there is an overlaying layer of cirrus cloud. On the right below, the AIRNOW AQI loop is shown and indicates moderate air quality is seen over much of the southeast. The AQI reaches unhealthy for sensitive groups in Nebraska today and that is likely from transported smoke.




#### About the U.S. Air Quality Weblog

USAQ is a daily diary of air quality in the U.S. prepared using information from satellites, ground-based measurements, and models. Interpretation and analysis are provided by the staff of the
**University of Maryland, Baltimore County Atmospheric Lidar Group.**

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# Ambient (outdoor) air quality and health

Fact sheet N°313
Updated March 2014

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### Key facts

- Air pollution is a major environmental risk to health. By reducing air pollution levels, countries can reduce the burden of disease from stroke, heart disease, lung cancer, and both chronic and acute respiratory diseases, including asthma.
- The lower the levels of air pollution, the better the cardiovascular and respiratory health of the population will be, both long- and short-term.
- The "WHO Air quality guidelines" provide an assessment of health effects of air pollution and thresholds for health-harmful pollution levels.
- Ambient (outdoor air pollution) in both cities and rural areas was estimated to cause 3.7 million premature deaths worldwide in 2012.
- Some 88% of those premature deaths occurred in low- and middle-income countries, and the greatest number in the WHO Western Pacific and South-East Asia regions.
- Policies and investments supporting cleaner transport, energy-efficient housing, power generation, industry and better municipal waste management would reduce key sources of urban outdoor air pollution.
- Reducing outdoor emissions from household coal and biomass energy systems, agricultural waste incineration, forest fires and certain agro-forestry activities (e.g. charcoal production) would reduce key rural and peri-urban air pollution sources in developing regions.
- Reducing outdoor air pollution also reduces emissions of $CO_2$ and short-lived climate pollutants such as black carbon particles and methane, thus contributing to the near- and long-term mitigation of climate change.
- In addition to outdoor air pollution, indoor smoke is a serious health risk for some 3 billion people who cook and heat their homes with biomass fuels and coal.

**For more information contact:**

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**Related links**

WHO Air quality guidelines - 2005 global update

WHO Global Health Observatory
Recent data on air quality.

Air pollution and cancer: IARC's 2013 assessment

Review of evidence on the health aspects of air pollution (REVIHAAP)

Health in the green economy – series

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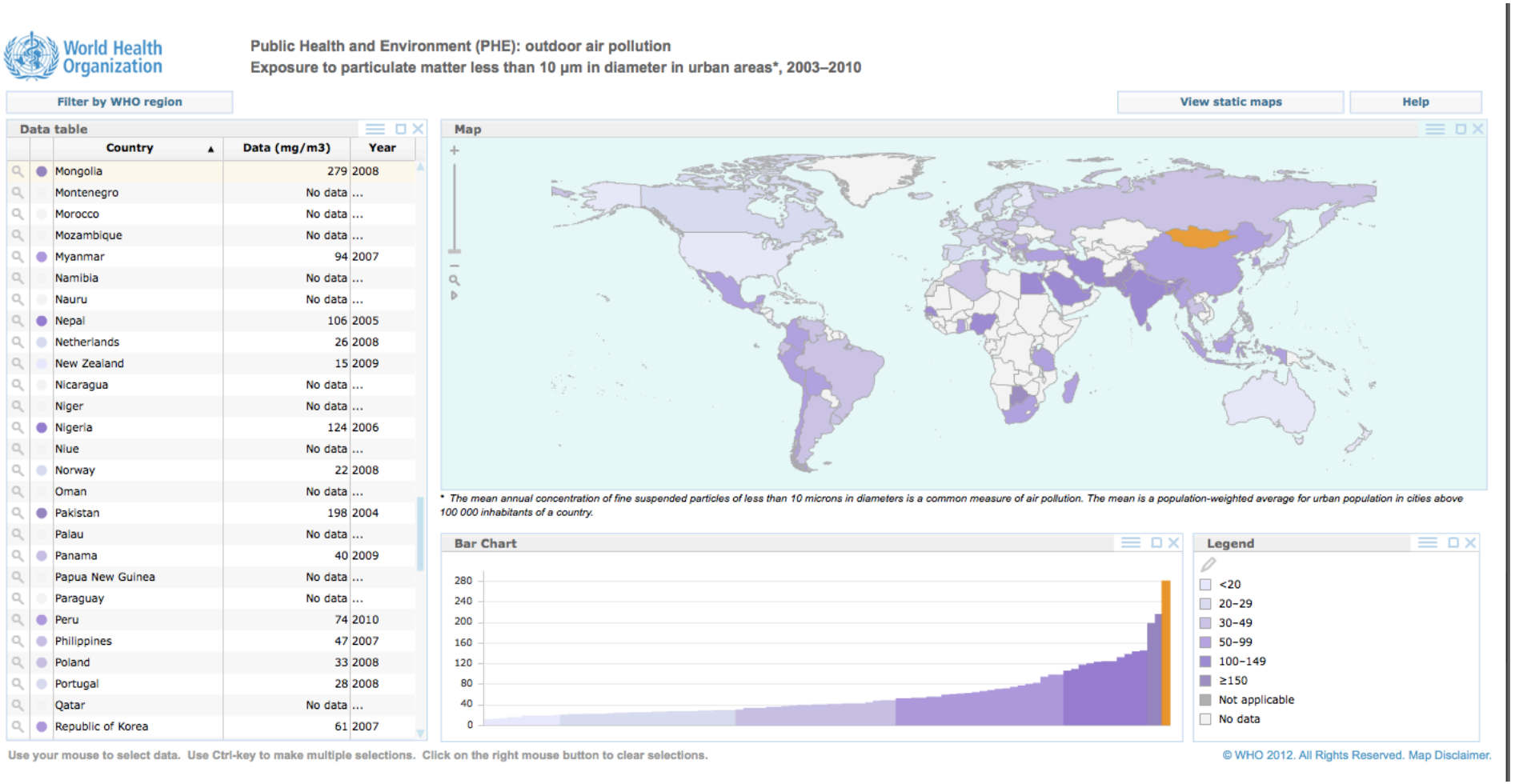
WHO's work on indoor air

# WHO $PM_{10}$ exposure assessment



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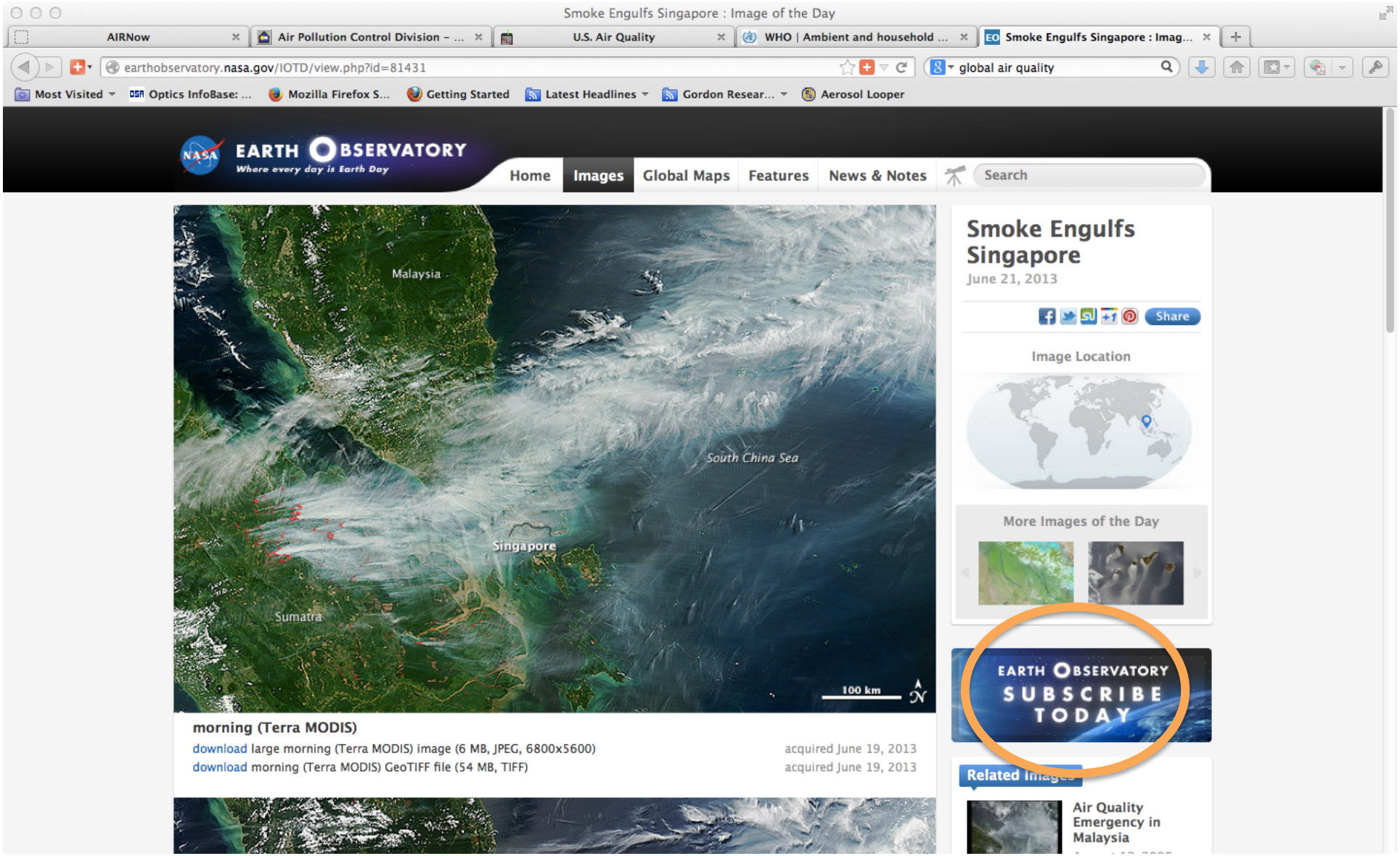

# Air Quality Awareness Week
## April 28 – May 2, 2014


AirNow.gov | Tools for Teachers | Tools for Weathercasters | State & Local Activities | State & Local Resources

Sign-up for EnviroFlash Facebook Twitter

Learn how air quality affects your health during **Air Quality Awareness Week, April 28 - May 2, 2014**.

**Monday: Do Your Part: Reduce Your Contribution to Air Pollution**

Nearly every day, each of us contributes a little to air pollution – but we don't always realize it. Take a few minutes to think about how you contribute to air pollution. Then come up with a plan to make some changes. Here are some tips from one of our partner agencies, the Maricopa County Air Quality Department in Arizona. Try out their suggestions during Air Quality Awareness week! More

http://www.epa.gov/airnow/airaware/

# Comments & Questions?