

EPA PM_{2.5} NAAQS is Not Justified in California

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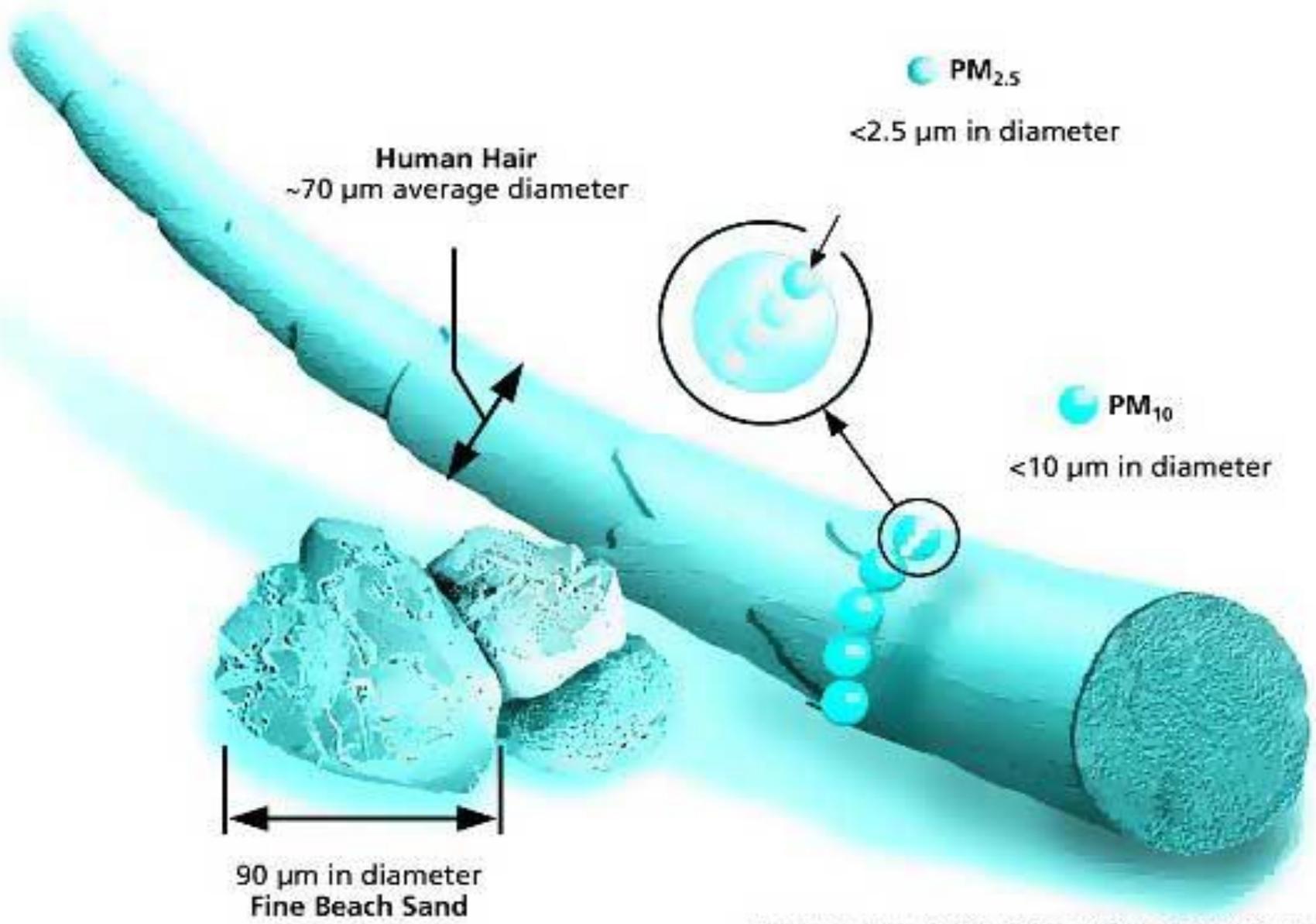
June 5, 2014

Fine Particulate Matter (PM_{2.5})

PM_{2.5} is defined by particle size ($\leq 2.5 \mu\text{m}$ in diameter) and not by chemical composition. PM_{2.5} is generated mainly by combustion processes. The major sources of PM_{2.5} in California are forest fires, agricultural dust, industrial combustion, residential burning, diesel engines (about 5%), and China (up to 30%).

PM_{2.5} epidemiology has been used to establish the following scientifically contested regulations that have had and still have multi-billion dollar economic impacts in California and the US:

- 1) 1997 & 2012 US EPA Annual National Ambient Air Quality Standard (NAAQS) for PM_{2.5} : $15 \mu\text{g}/\text{m}^3$ and now $12 \mu\text{g}/\text{m}^3$
- 2) 2008 CARB Truck and Bus Regulation for Diesel Vehicles
- 3) 2003-2007-2012 SCAQMD Air Quality Management Plans



Human Hair
~70 μm average diameter

PM_{2.5}

<2.5 μm in diameter

PM₁₀

<10 μm in diameter

90 μm in diameter
Fine Beach Sand

Image courtesy of EPA, Office of Research and Development

Inhaled Fine Particulate Matter (PM_{2.5})

**Amount of Air Inhaled by an Adult Breathing at Rest:
~ 10,000 liters/day = 10 m³/day ~ 292 M m³/80 years**

**PM_{2.5} Inhaled at NAAQS Level of 15 µg/m³:
292 M m³/80 years x 15 µg/m³ ~ 4.38 grams/80 years
4.38 grams/80 years = 0.88 teaspoons/80 years**

**Diesel PM Inhaled, Assuming 5% of Total PM_{2.5}
0.22 grams/80 years = 0.044 teaspoons/80 years**

PM_{2.5} Inhaled from 1 Cigarette ~ 0.04 grams

PM_{2.5} Inhaled from 100 Cigarettes ~ 4.0 grams

PM_{2.5} & Total Mortality Relationship

Ongoing Epidemiologic Controversy Since 1993

Dockery, Pope, et al. NEJM 1993 “An association between air pollution and mortality in six U.S. cities” (Harvard)

Pope, Thun, et al. AJRCCM 1995 “Particulate air pollution as predictor of mortality in prospective study of U.S. adults” (ACS)

Wall Street Journal April 7, 1997

“Pollution study sparks debate over secret data”

SCIENCE July 25, 1997 “Showdown Over Clean Air Science”
& “Researchers and Lawmakers Clash Over Access to Data”

Robert F. Phalen “The Particulate Air Pollution Controversy”
2002 Book and 2004 Paper

Lamar Smith Wall Street Journal July 30, 2013

“The EPA’s Game of Secret Science”

Weaknesses of PM_{2.5} Epidemiology

- 1) **Ecological Fallacy:** ambient PM_{2.5} measurements from selected monitoring stations are assumed to apply to all individual subjects within defined geographical areas
- 2) **Confounding Variables:** numerous confounding variables, including other pollutants, influence the PM_{2.5} mortality relationship in observational cohort studies
- 3) **Secret Data:** investigators controlling major PM_{2.5} databases (ACS and Harvard) refuse to allow independent analysis of these databases, in spite of repeated requests
- 4) **Definition of PM_{2.5}:** PM_{2.5} is defined as particles less than 2.5 μm in diameter, but its composition varies greatly across US, from mineral dust to coal burning to diesel soot

Recent Criticism of EPA PM_{2.5} NAAQS

**August 1, 2013 US House Science Committee
Subpoena of EPA “Secret Science” Data (ACS CPS II)**

**February 6, 2014 US House Science Committee
Introduces “Secret Science Reform Act” (H.R. 4012)**

**March 7, 2014 EPA Administrator Letter Confirming
Failure to Comply with August 1, 2013 Subpoena**

**March 19, 2014 US Senate Environment Committee
Minority Staff Report “*EPA’s Playbook Unveiled:
A Story of Fraud, Deceit, and Secret Science*”**

Issues of Concern to SCAG re PM_{2.5}

November 21-22, 2013 CSUSB Symposium on
“Sustainable Goods Movement” co-sponsored by SCAG

April 10, 2014 2020 Commission Report “*A Time for Action*”
Ports of Los Angeles & Long Beach Losing Market Share

April 14, 2014 LA Times Article on SCAQMD Rule
for More PM_{2.5} Reduction Measures at Ports

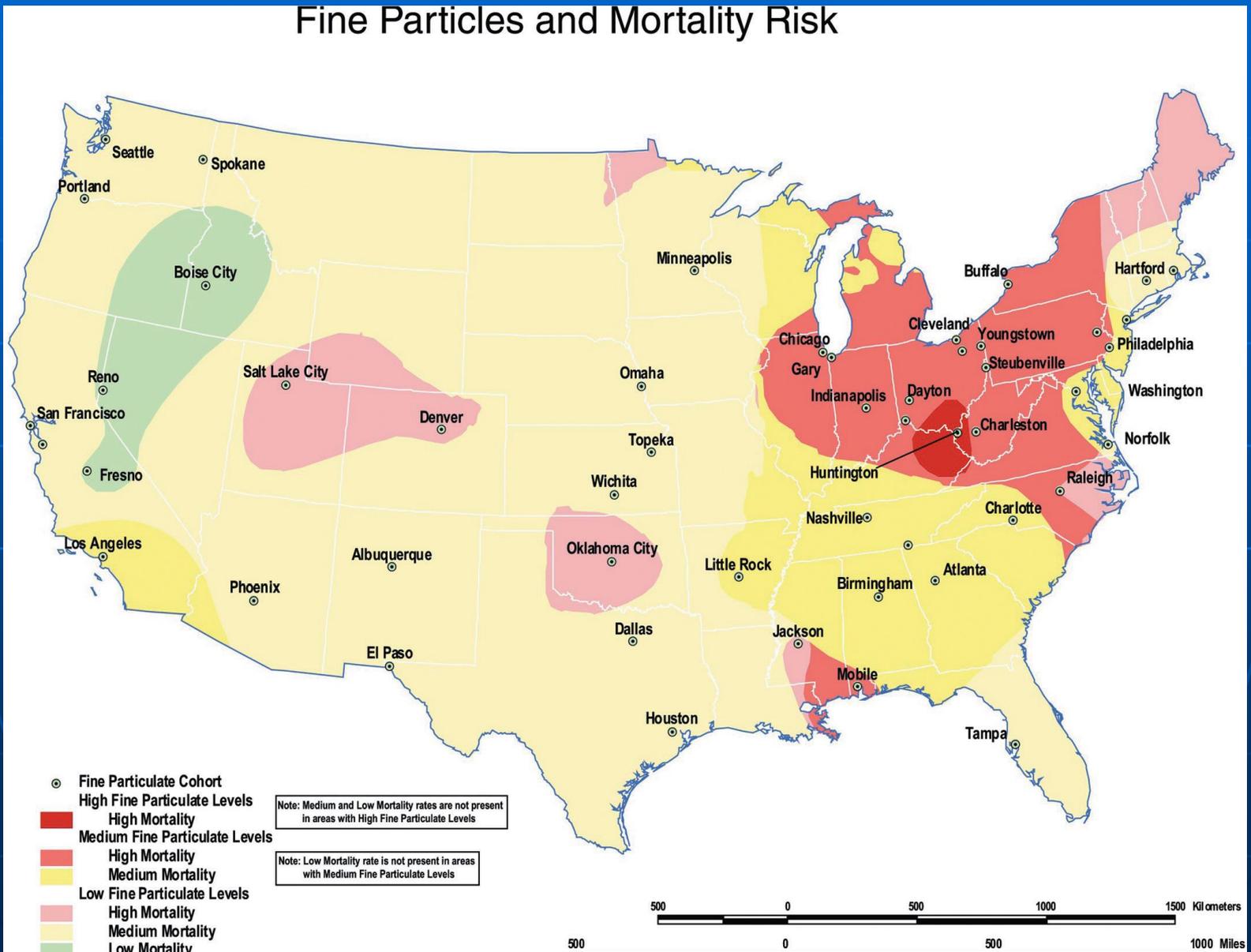
April 25, 2014 Modifications & Time Extensions
of CARB Truck and Bus Regulation

May 2, 2014 SCAQMD EO Goals to
Further Implement 2012 AQMP on PM_{2.5}
& Begin Developing 2016 AQMP on Ozone

2000 Krewski Jerrett HEI Report Figure 21

1982-1989 ACS CPS II PM_{2.5} Mortality Risk Low in CA

Fine Particles and Mortality Risk



PM_{2.5} & Total Mortality in California: RR (95% CI)

(<http://www.scientificintegrityinstitute.org/ASAS092812.pdf>)

Krewski 2000 (4 MSAs, reported in 2010)	CA CPS II	RR = 0.87 (0.81-0.94)	1982-1989
McDonnell 2000 (9 air sheds)	AHSMOG	RR ~ 1.03 (0.95-1.12)	1976-1992
Enstrom 2005 (11 cos & 25 cos)	CA CPS I	RR = 1.00 (0.98-1.02)	1983-2002
Zeger 2008 (CA + OR + WA)	MCAPS "West"	RR = 0.99 (0.97-1.01)	2000-2005
Krewski 2010 (4 MSAs)	CA CPS II	RR = 0.96 (0.92-1.00)	1982-2000
Jerrett 2010-11 (Nine Model Average)	CA CPS II	RR = 1.00 (0.99-1.01)	1982-2000
Lipsett 2011	CA Teachers	RR = 1.01 (0.95-1.09)	2000-2005
Jerrett 2013 (Conurbation LUR Model Only)	CA CPS II	RR = 1.06 (1.00-1.12)	1982-2000
Enstrom Unpub	NIH AARP	RR ~ 1.00	1995-2010

Ratio of 2009 Age-Adjusted Total Death Rates in California Compared with US (Annual Deaths/100,000) CDC NCHS Wonder Database (<http://wonder.cdc.gov/ucd-icd10.html>)

California / U.S.	$652.2 / 741.1 = 0.880 = 88.0\%$
'South Coast Air Basin' / U.S.	$650.8 / 741.1 = 0.878 = 87.8\%$
Los Angeles County / U.S.	$637.3 / 741.1 = 0.860 = 86.0\%$
Orange County / U.S.	$570.9 / 741.1 = 0.770 = 77.0\%$

California PM_{2.5} Coming from China

December 1, 2010

California Pollution: Made in China?

<http://blogs.wsj.com/chinarealtime/2010/12/01/california-pollution-made-in-china/>

January 17, 2013

US cities suffer impact of downwind Chinese air pollution

<https://www.chinadialogue.net/article/show/single/en/5615-US-cities-suffer-impact-of-downwind-Chinese-air-pollution>

January 19, 2013

How China's air pollution disaster is coming to America

<http://www.examiner.com/article/how-china-s-air-pollution-disaster-is-coming-to-america>¹²

Action Items for SCAG re PM_{2.5}

- 1) Understand Scientific Evidence That Invalidates EPA PM_{2.5} NAAQS in CA and SCAB
- 2) Examine US House Science Comm “Secret Science Reform Act” (H.R. 4012) & US Senate Enviro Comm Report on EPA PM_{2.5} NAAQS Flaws
- 3) Conduct SCAG CHSC 40471 (b) Hearing on Health Impacts of Particulate Matter in SCAB
- 4) Put PM_{2.5} Regulations into Health & Economic Context Given Healthy CA & PM_{2.5} from China
- 5) Stop Supporting Further EPA & SCAQMD PM_{2.5} Regulations Until Above Issues Are Addressed¹³