

The Health and Safety Considerations of Dust, or (as we call it) Particulate Matter



Dust Assessment, Management and Mitigation
Conference

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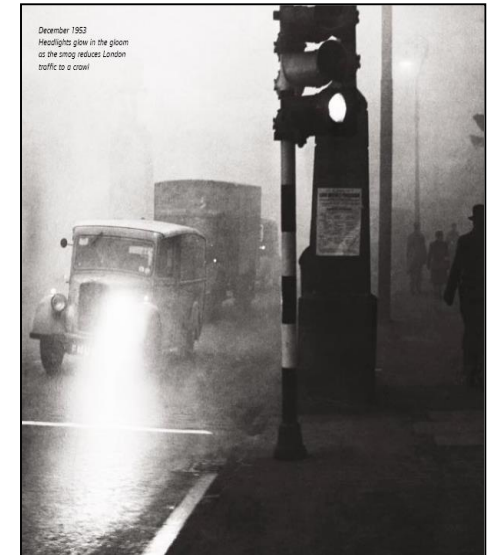
Awareness of air pollution



1930's dust bowl



1943 - Los Angeles
1st recorded photo of smog



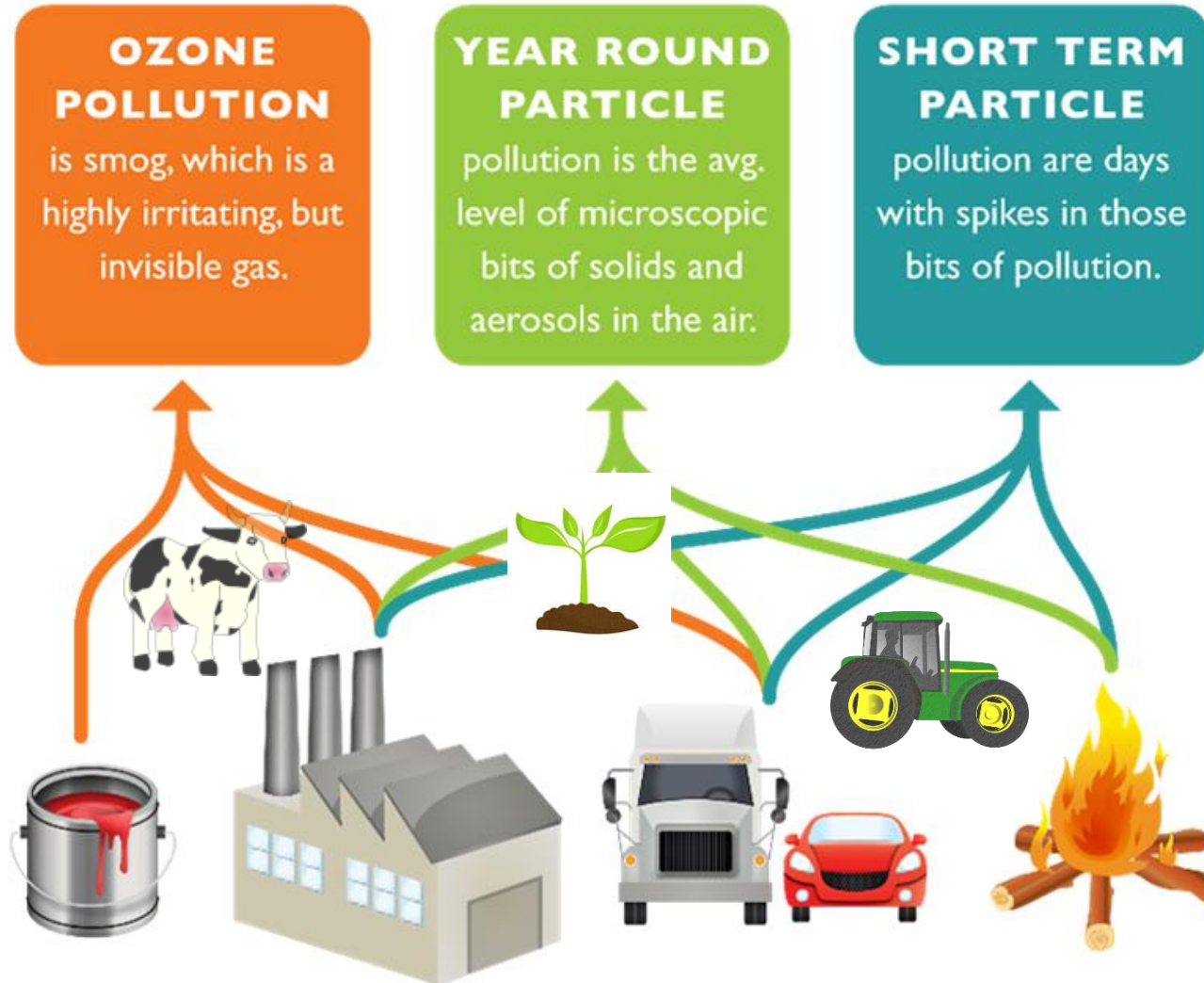
1953 – London nearly
4,000 suffocate

U.S. EPA's Mission



“Protect Human Health and the Environment”

Many Sources of Smog and Air Particles



The average adult breathes 3,000 gallons of air every day.

Particulate Matter (PM)

PM 10 (microns in diameter): health-based standard is 150 ug/m³ on a 24-hour basis

PM 2.5 (microns in diameter): health-based standard is 35 ug/m³ on a 24-hour basis and 12 ug/m³ on an annual basis

Size of Particle Pollution

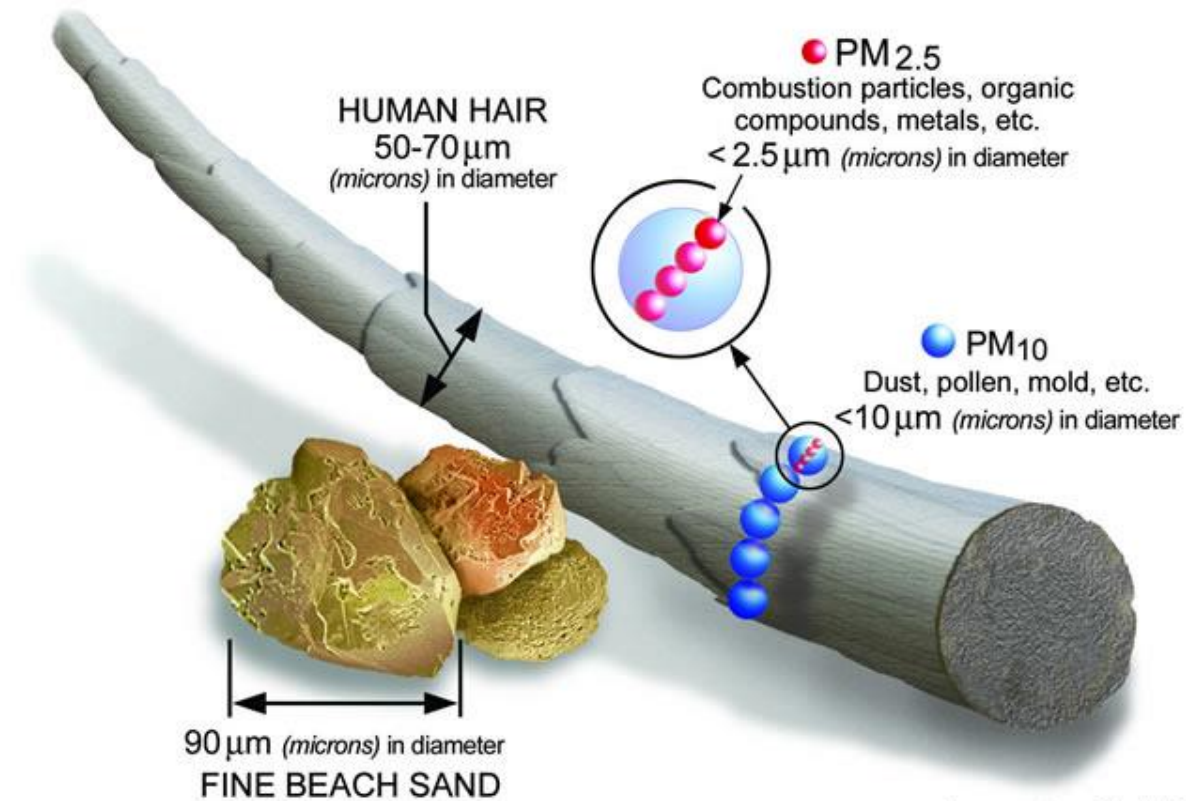


Image courtesy of the U.S. EPA

Particulate Matter -- Lungs and Heart

- difficulty breathing, irritated airways
- aggravated asthma
- decreased lung function
- nonfatal heart attacks, irregular heartbeat
- premature death in people with heart or lung disease

In Arizona , 750,000 people have asthma. Between 780 – 1700 are estimated to die prematurely each year from cardiopulmonary disease as a result of exposure to particle pollution.



NAAQS and Nonattainment Areas

If an area **exceeds** (does not “attain”) **the NAAQS** ...

“Nonattainment Area”

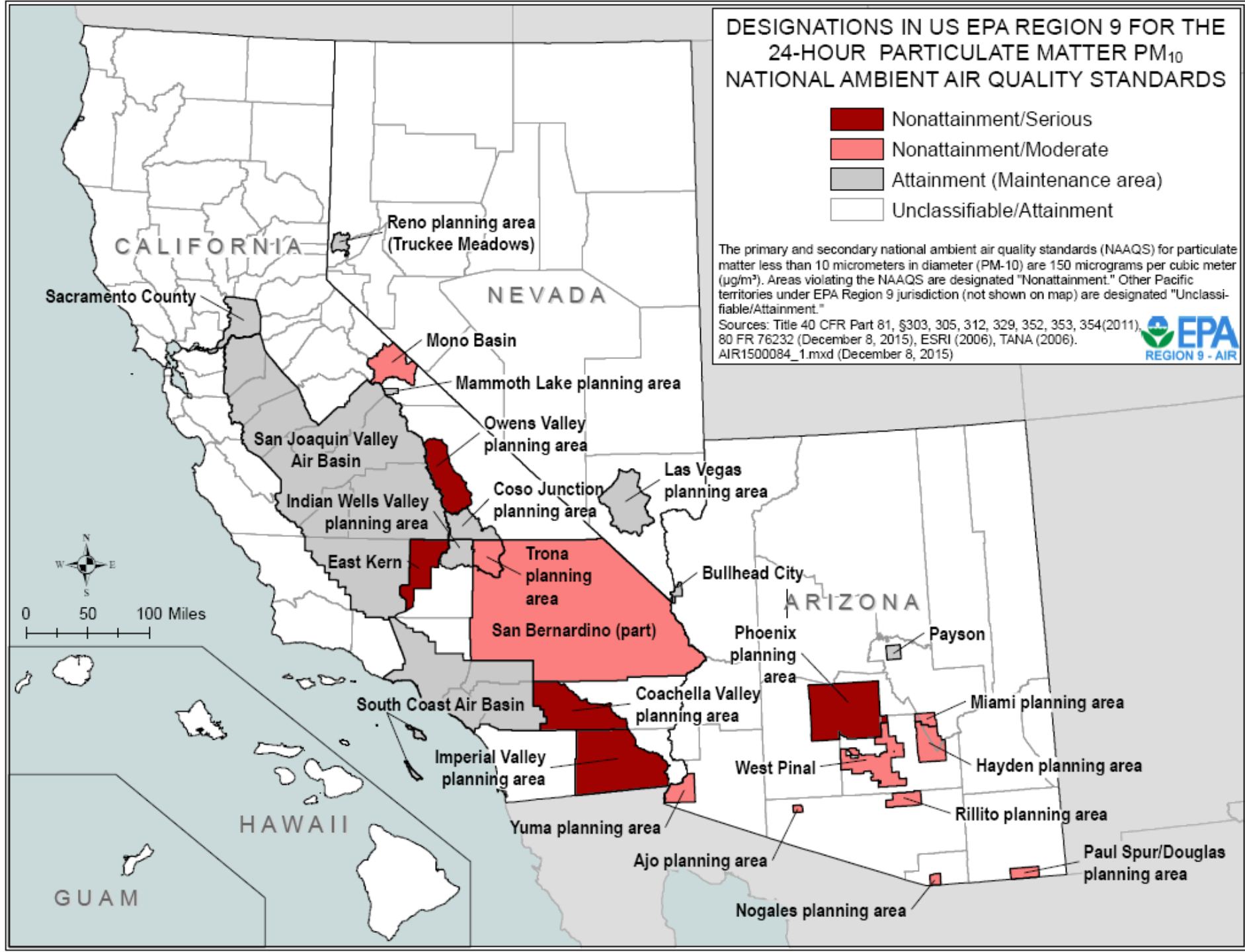
An area is “nonattainment” if it violates the NAAQS or contributes *to a nearby area* that violates.

DESIGNATIONS IN US EPA REGION 9 FOR THE 24-HOUR PARTICULATE MATTER PM₁₀ NATIONAL AMBIENT AIR QUALITY STANDARDS

- Nonattainment/Serious
- Nonattainment/Moderate
- Attainment (Maintenance area)
- Unclassifiable/Attainment

The primary and secondary national ambient air quality standards (NAAQS) for particulate matter less than 10 micrometers in diameter (PM-10) are 150 micrograms per cubic meter (µg/m³). Areas violating the NAAQS are designated "Nonattainment." Other Pacific territories under EPA Region 9 jurisdiction (not shown on map) are designated "Unclassifiable/Attainment."

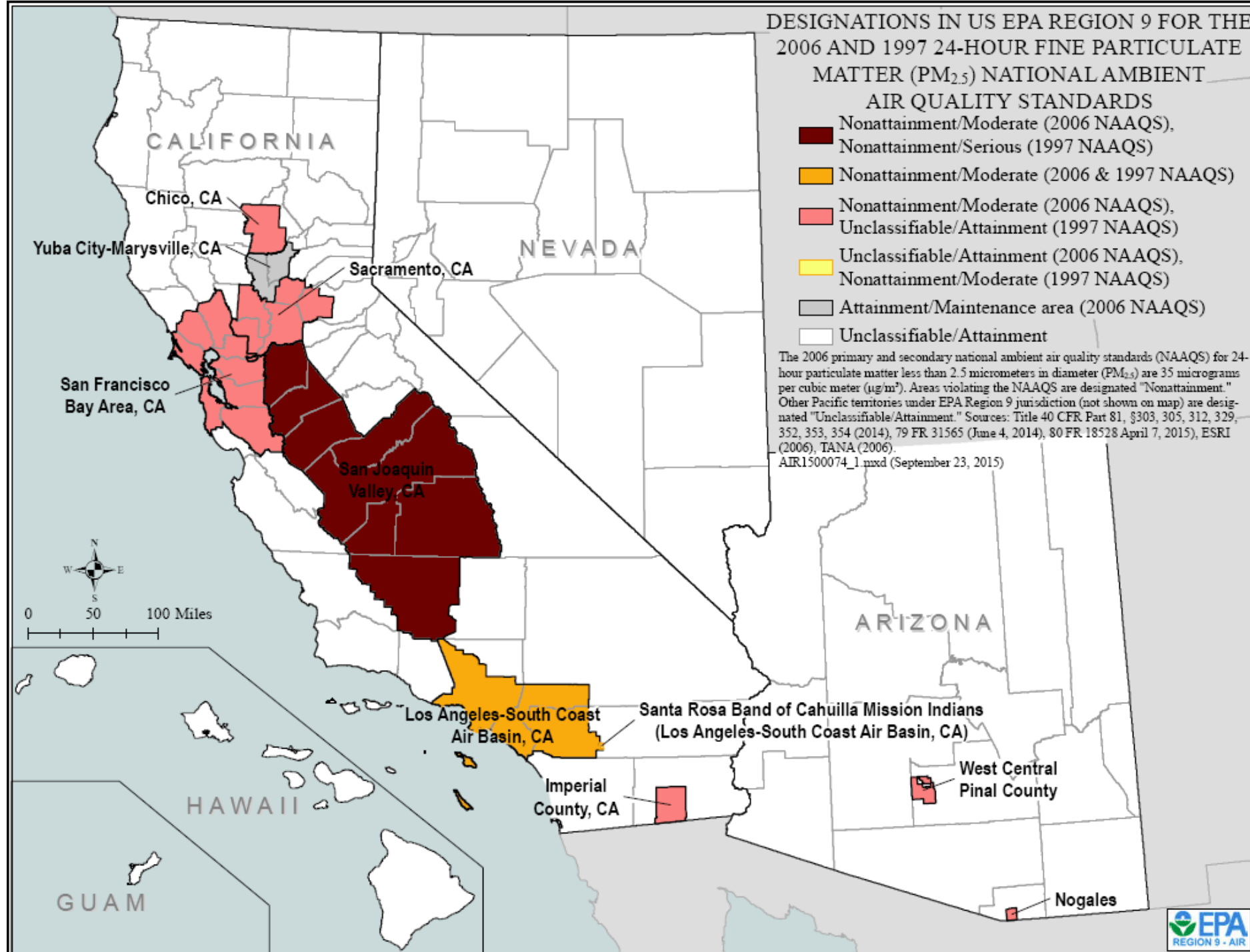
Sources: Title 40 CFR Part 81, §303, 305, 312, 329, 352, 353, 354(2011), 80 FR 76232 (December 8, 2015), ESRI (2006), TANA (2006).
AIR1500084_1.mxd (December 8, 2015)



DESIGNATIONS IN US EPA REGION 9 FOR THE
2006 AND 1997 24-HOUR FINE PARTICULATE
MATTER (PM_{2.5}) NATIONAL AMBIENT
AIR QUALITY STANDARDS

- Nonattainment/Moderate (2006 NAAQS),
Nonattainment/Serious (1997 NAAQS)
- Nonattainment/Moderate (2006 & 1997 NAAQS)
- Nonattainment/Moderate (2006 NAAQS),
Unclassifiable/Attainment (1997 NAAQS)
- Unclassifiable/Attainment (2006 NAAQS),
Nonattainment/Moderate (1997 NAAQS)
- Attainment/Maintenance area (2006 NAAQS)
- Unclassifiable/Attainment

The 2006 primary and secondary national ambient air quality standards (NAAQS) for 24-hour particulate matter less than 2.5 micrometers in diameter (PM_{2.5}) are 35 micrograms per cubic meter (µg/m³). Areas violating the NAAQS are designated "Nonattainment." Other Pacific territories under EPA Region 9 jurisdiction (not shown on map) are designated "Unclassifiable/Attainment." Sources: Title 40 CFR Part 81, §303, 305, 312, 329, 352, 353, 354 (2014), 79 FR 31565 (June 4, 2014), 80 FR 18528 April 7, 2015), ESRI (2006), TANA (2006).
AIR1500074_1.mxd (September 23, 2015)



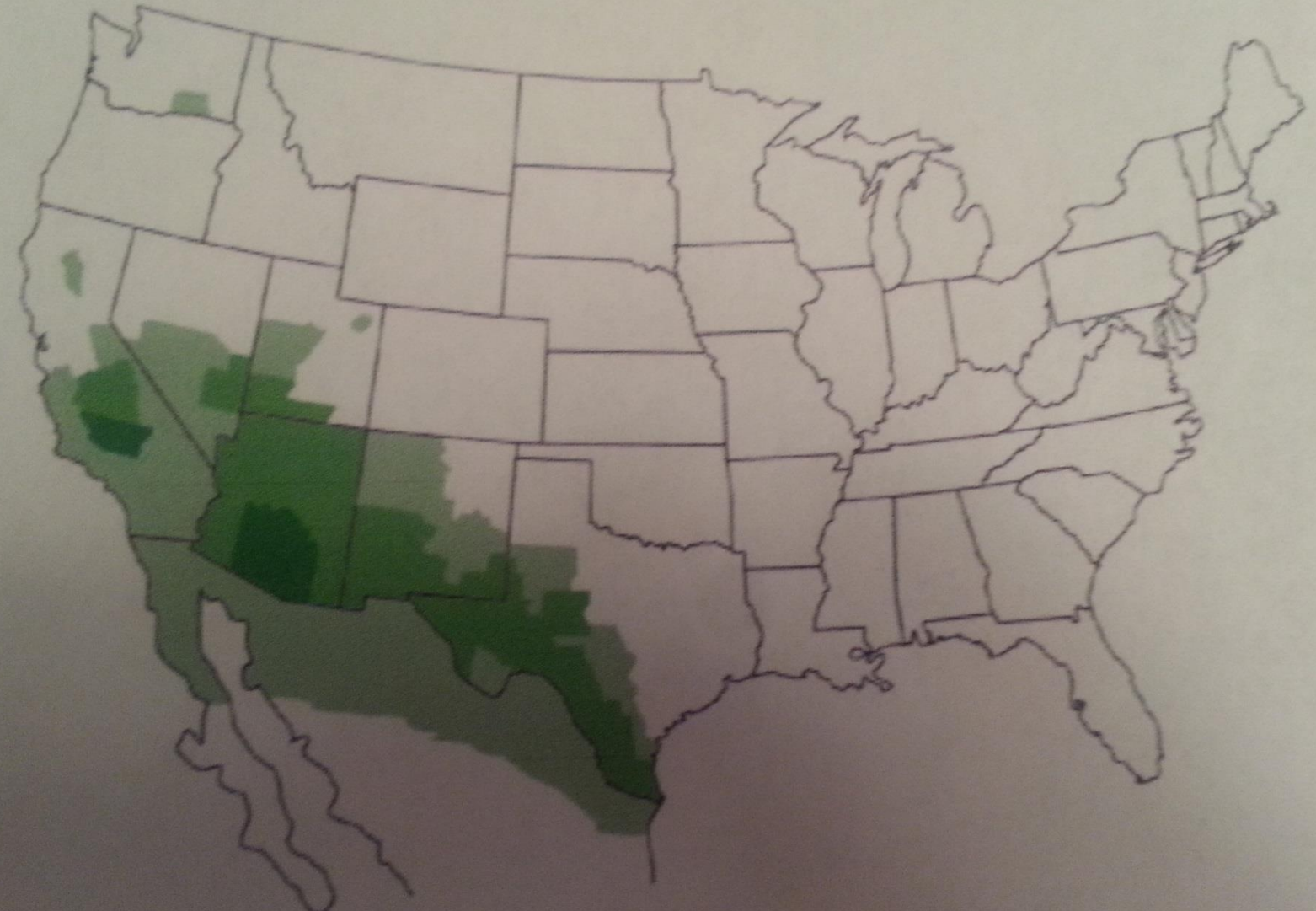
Nonattainment Area Consequences

- Residents not breathing healthy air
- Area is subject to a State Implementation Plan (SIP) that requires particulate emission reductions
- SIP requires pollution controls on sources that cause and contribute to the pollution problem
- In Arizona, paved and unpaved roads, unpaved parking lots, construction, agriculture, disturbed vacant land all contribute as do certain activities like off-roading and wood burning
- More stringent air permitting requirements for new sources

II. Valley Fever



Areas Endemic for Coccidioidomycosis



■ Highly endemic ■ Established endemic ■ Suspected endemic

Valley Fever

- Caused by a fungus that lives in the soil
- Symptoms are usually similar to the flu but some people get a more severe form which requires antifungal treatment
- Common in Arizona (65 % of all cases)
- Reported cases have increased
- Since spores live in the soil, they get distributed when the soil is disturbed either naturally or by human activity

III. Safety Considerations



Twitter contributor flyinflowers captured this image just after takeoff from Sky Harbor Airport.



Chain reaction crashes on I-10 in Ariz. dust storm kill 3



