

Health Effects of Dust

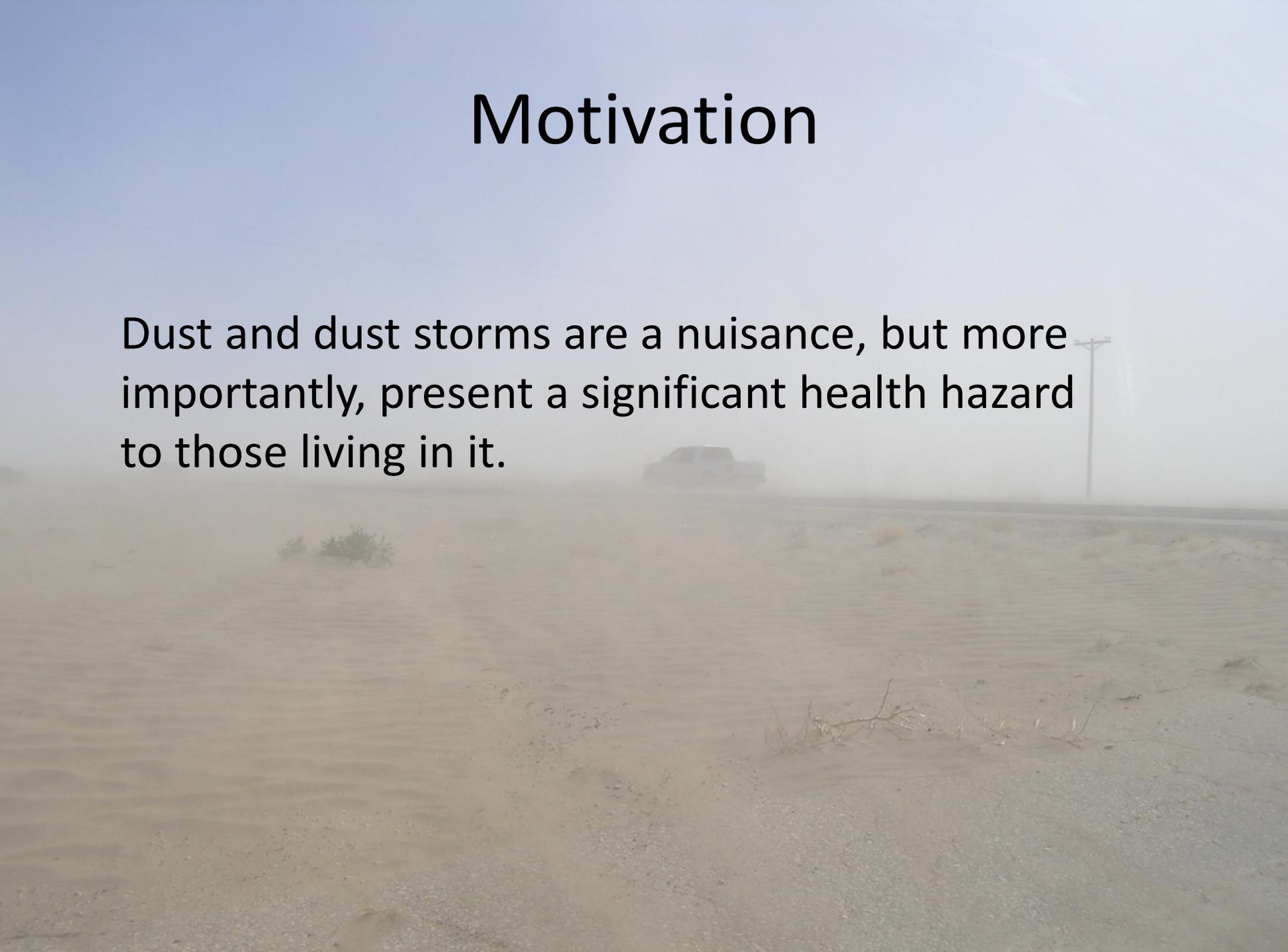
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Motivation

Dust and dust storms are a nuisance, but more importantly, present a significant health hazard to those living in it.





June 2, 2013 Haboob over Las Cruces

Small Dust Particles

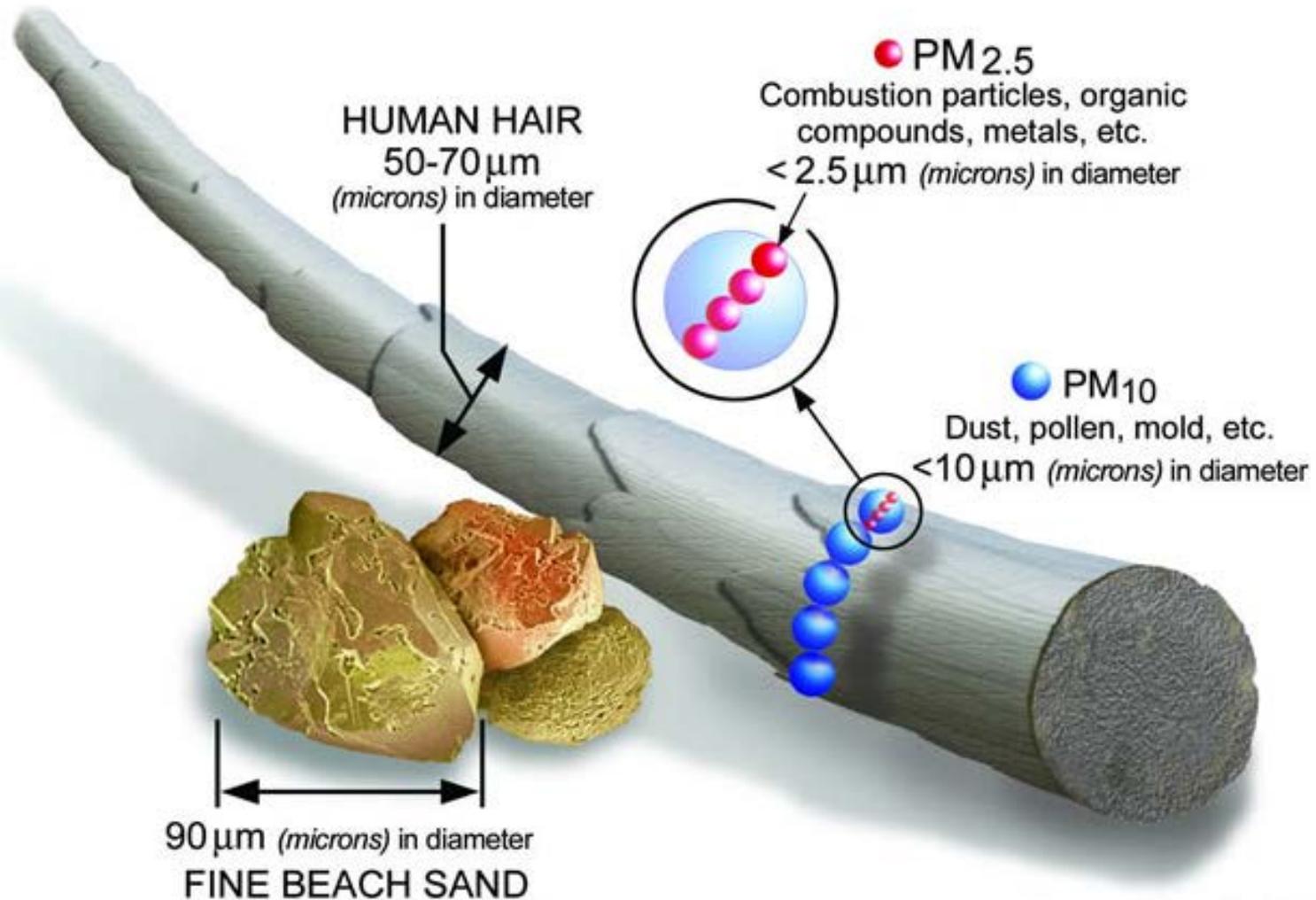
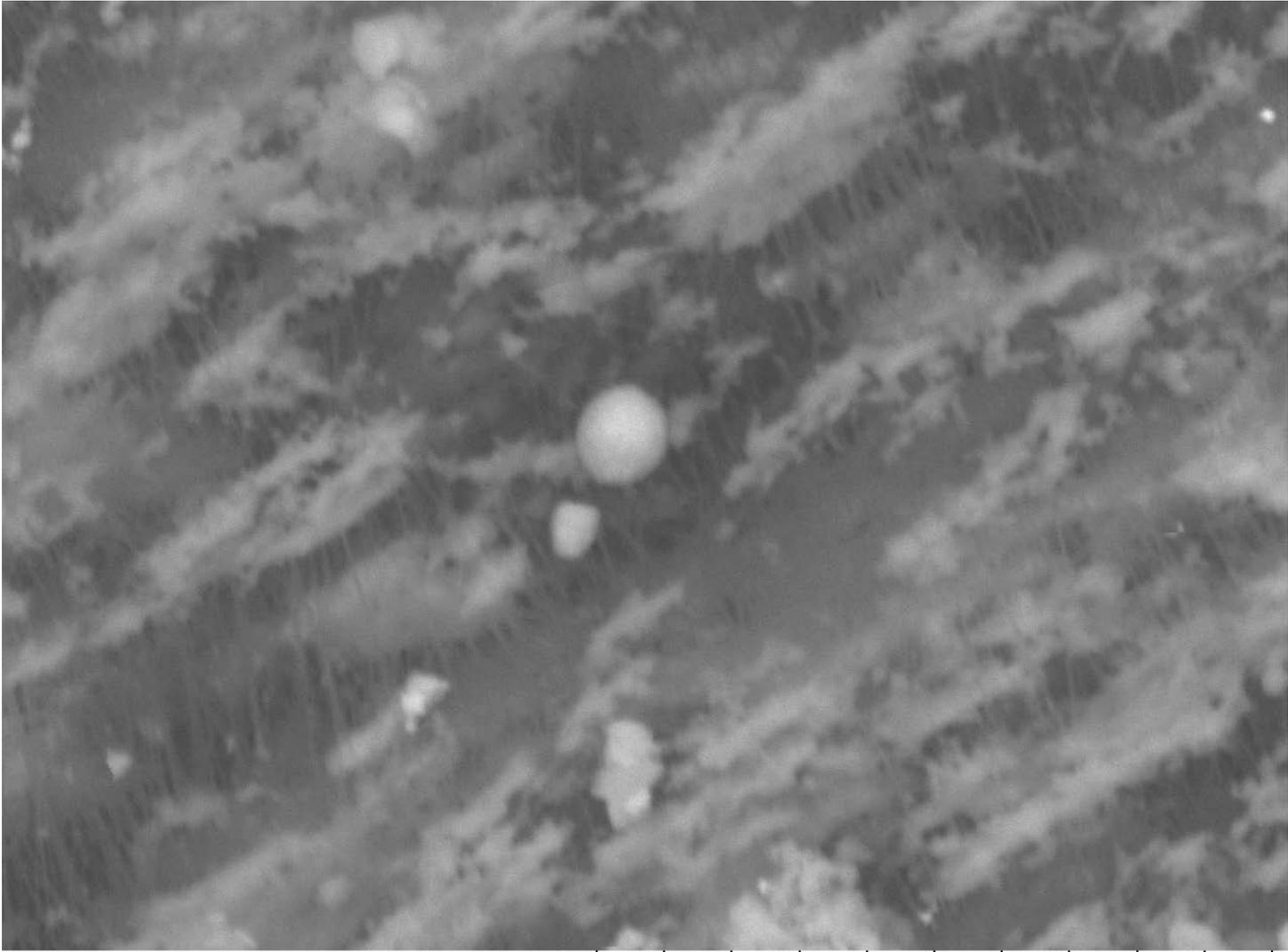
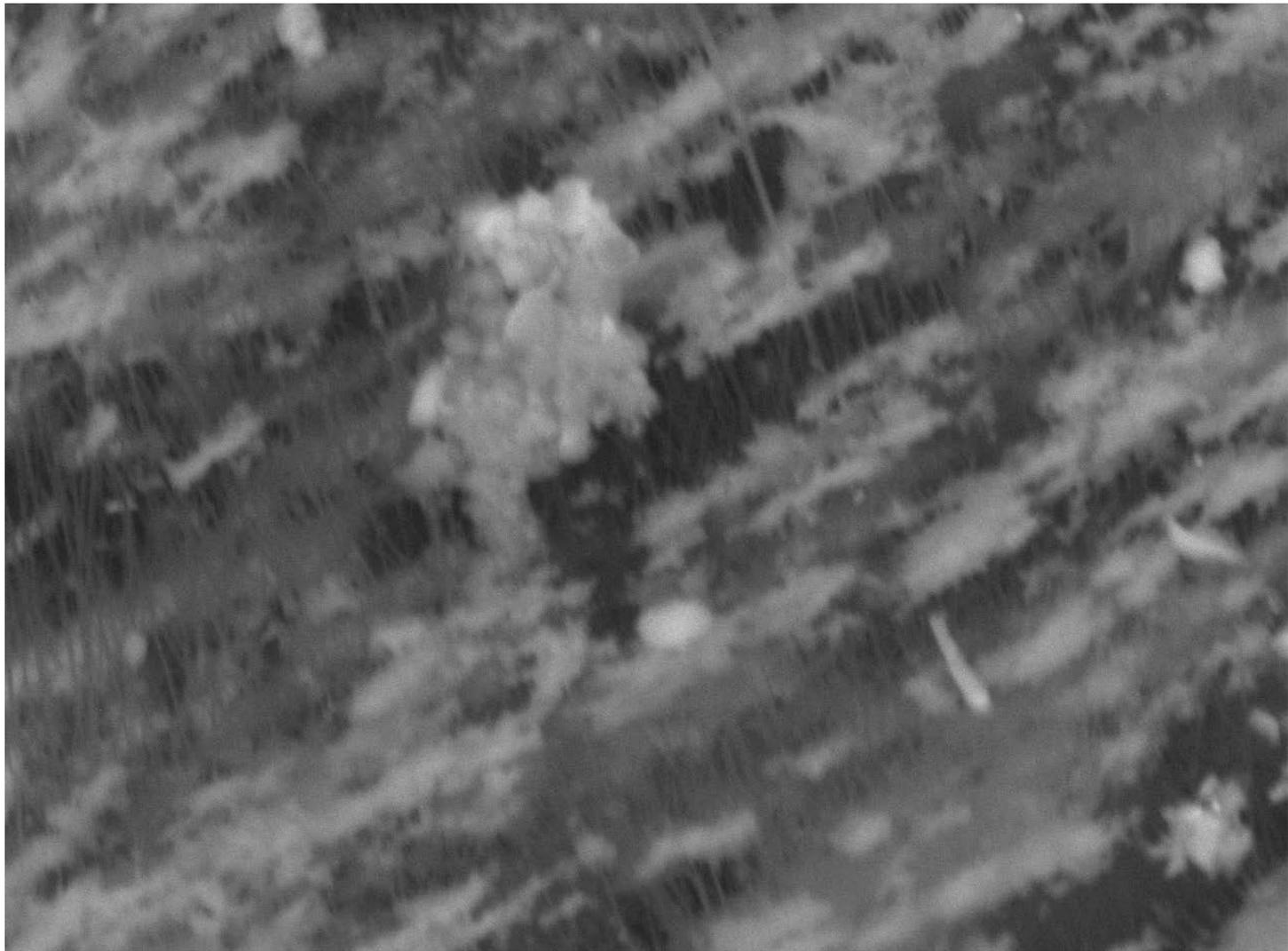


Image courtesy of the U.S. EPA



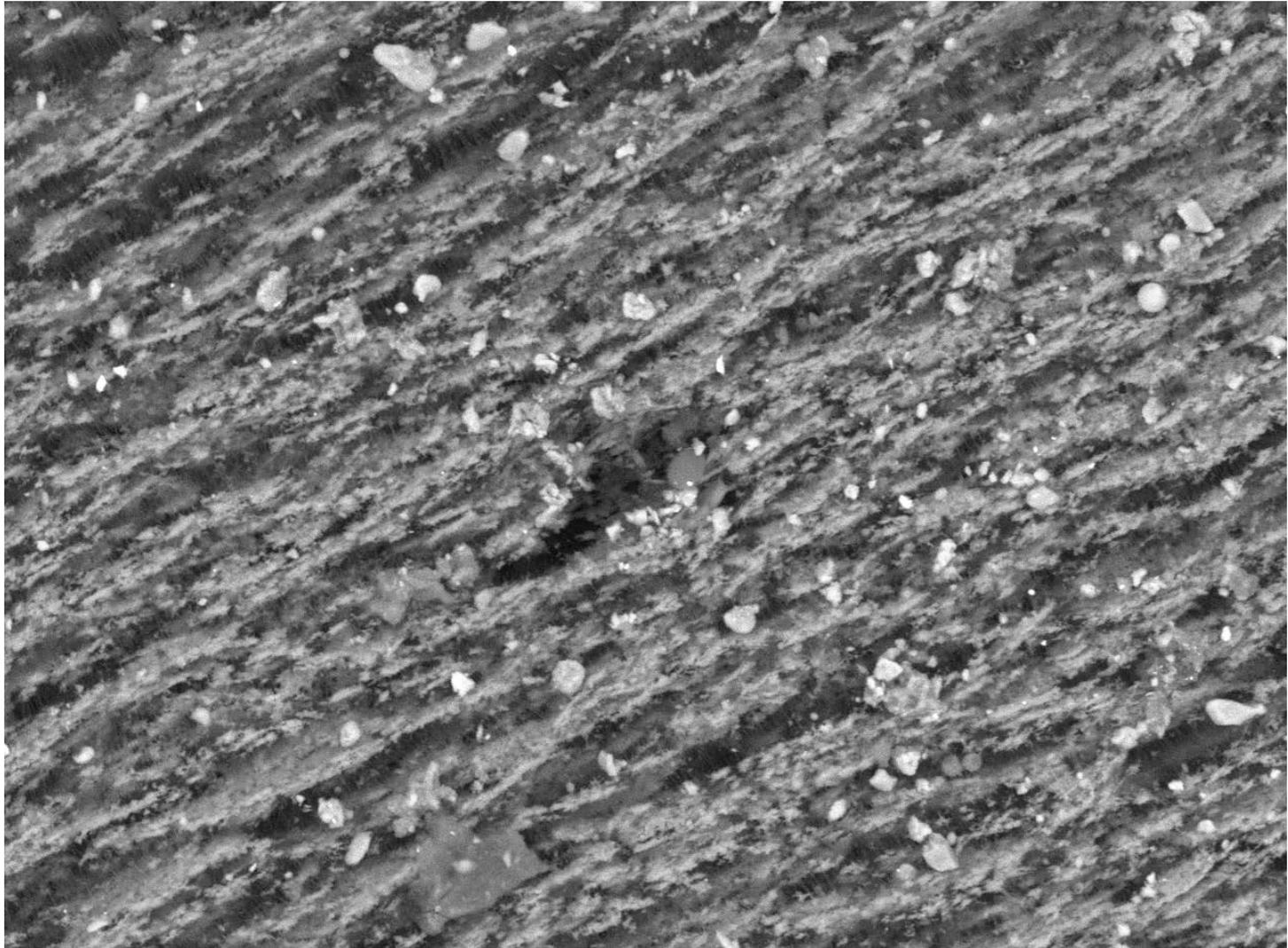
L x5.0k 20 um

DuBois Class



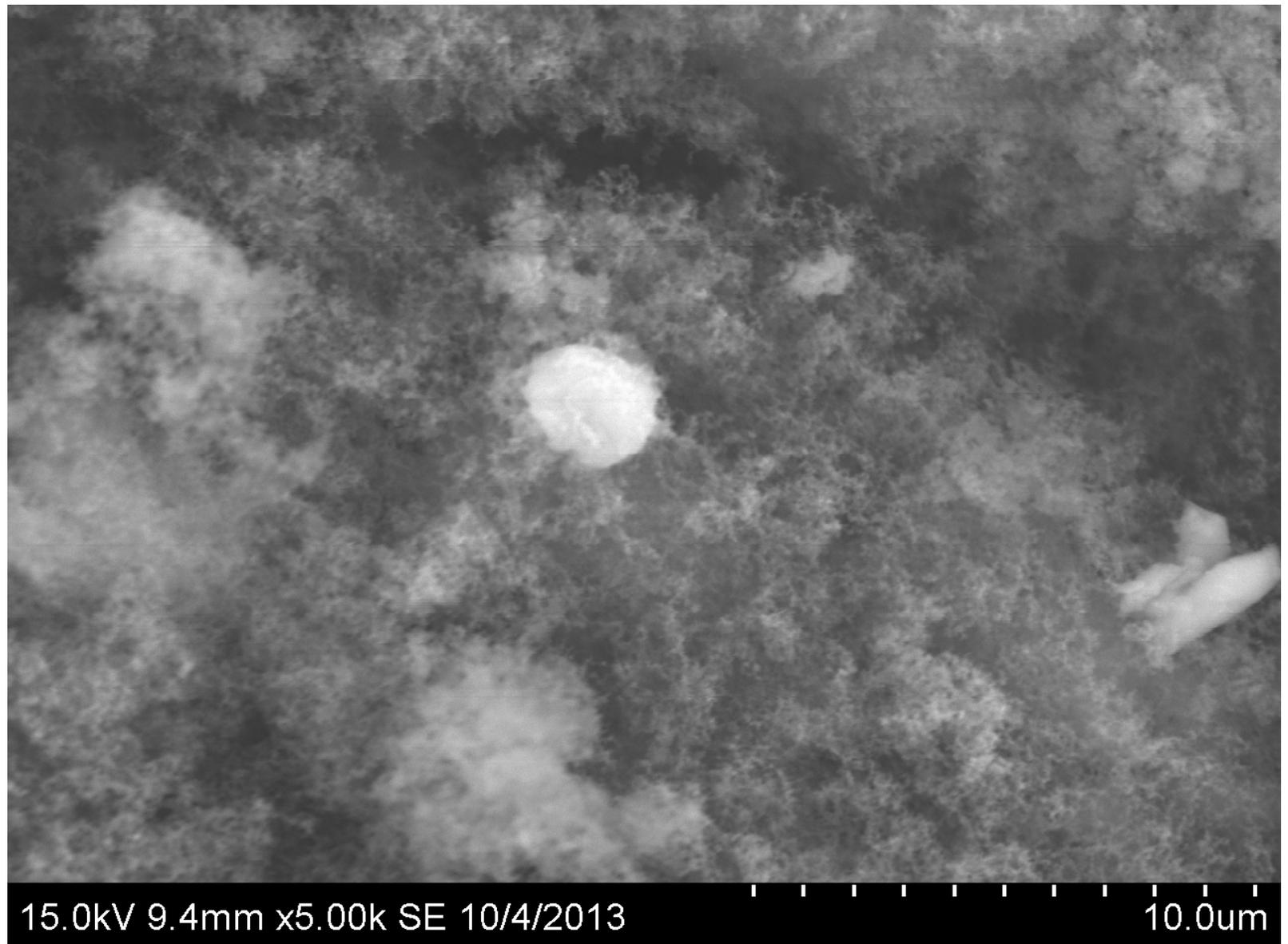
L x5.0k 20 um

Neurgal4-SKYIR



L x1.0k 100 um

DuBois Class



Dust Inhalation Pathways

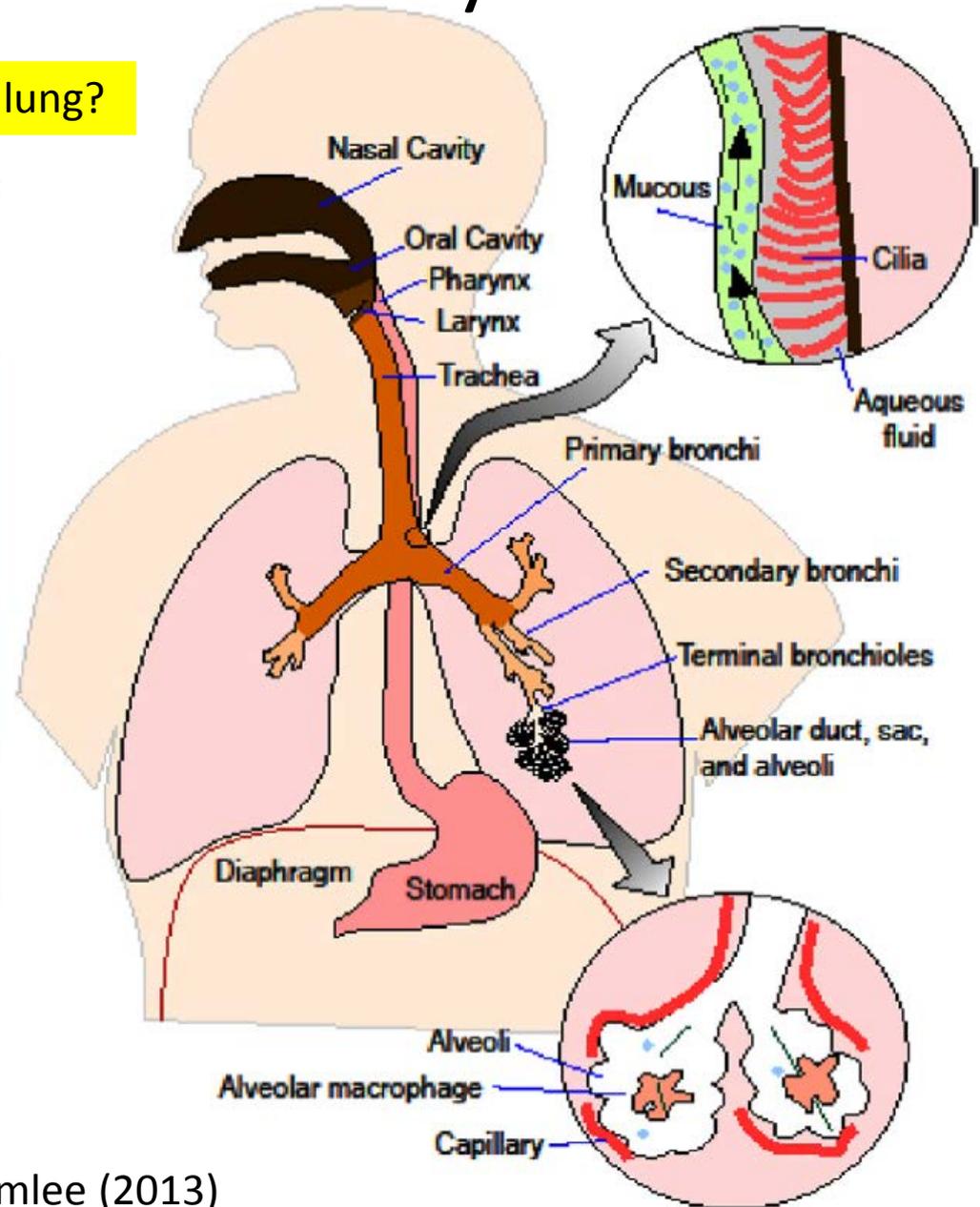
How far do dust particles go into the lung?

Upper respiratory tract filters out large particles

Lower respiratory tract important for small particles

Approximate particle size deposition in respiratory tract (microns)

7-10
5-7
3-5
2-3
1.0-2.5
0.5-1.0



People Most Sensitive to Air Pollution

- Infants
- Children
- Elderly
- Asthmatics
- People with existing lung and heart disease, COPD, emphysema

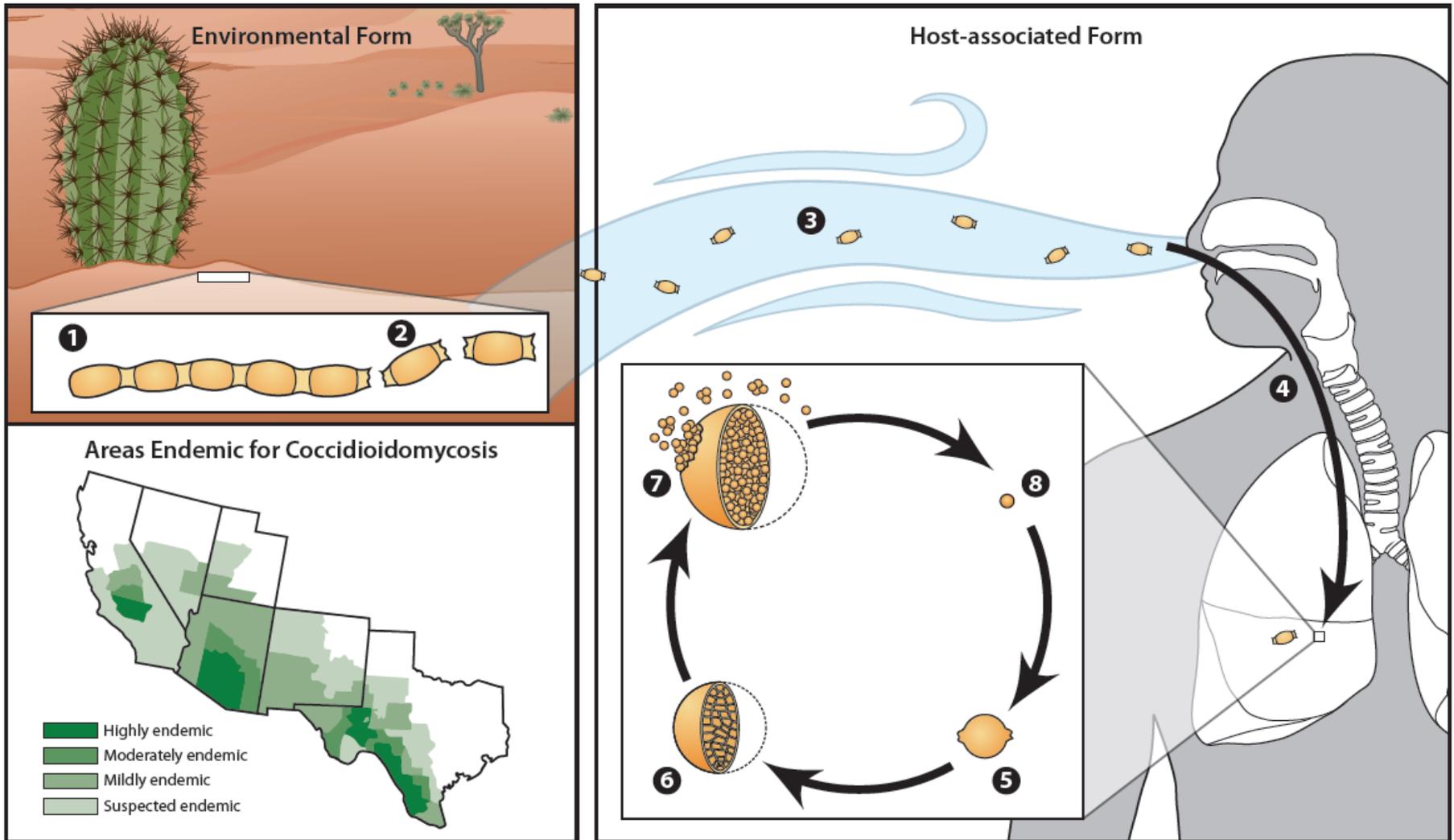
Health Effects of Air Pollutants in Las Cruces

- Using data from Memorial Medical Center 2007-2010 linking air pollutants in Las Cruces with emergency room visits (Rodopoulou et al. 2014)
 - 12.4% increase in cardiovascular ER visits for PM10 for all adults in the warm season (April-September)
 - 5.2% increase in respiratory ER visits for PM2.5 excluding high wind days

Health Effects in El Paso

- A recent study linking dust levels in El Paso with hospital admissions (Grineski et al. 2010)
 - Dust events were significantly associated with children's acute bronchitis admissions
 - Dust and low wind events were associated with increased odds of hospital admissions for asthma and acute bronchitis amongst all ages and children, and the same was true for adults and dust

Coccidioidomycosis “Valley Fever”



Cocci in New Mexico

- Expected that Coccidioidomycosis (Valley Fever) is underreported in New Mexico

- Misdiagnosed (pneumonia, COPD, bronchitis, asthma, TB, lung cancer)
- Ineffective treatments (often antibiotics)

- Education and awareness campaign for clinical providers in New Mexico and public

- Increase testing and diagnosis
- Increase reporting

Coccidioides endemic zone



Fisher et al. 2007

What should you do?

- During dust storms
 - Limit time outside of house
 - Avoid strenuous work outside
 - Keep children inside
 - Keep windows closed
 - Remember pull aside and stay alive when driving
 - Minimize indoor pollutants during this time
- Plant native plants around where people live
- Avoid disturbing soil & native vegetation



Driving in a Dust Storm: What you should do to be safe!

Pull Aside and Stay Alive!

If you encounter extremely low visibility in a dust storm:

- 1. PULL OFF** the road as far as safely possible
- 2. LIGHTS OFF** (Turn OFF your headlights)
- 2. FOOT OFF** (Place the car in Park or engage the parking brake and take your foot **OFF** the brake pedal)

<http://www.pullasidestayalive.org/>



Image Source: KVOA News Channel 4

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