



Air Quality and Drought in the Southwest

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New Mexico State Climatologist

Southwest Drought and Public Health, February 26, 2020

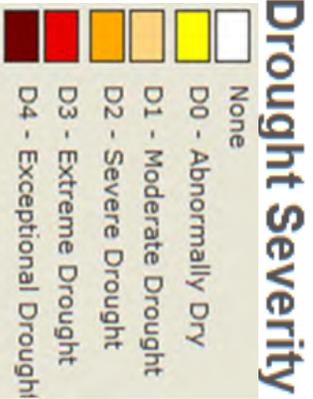
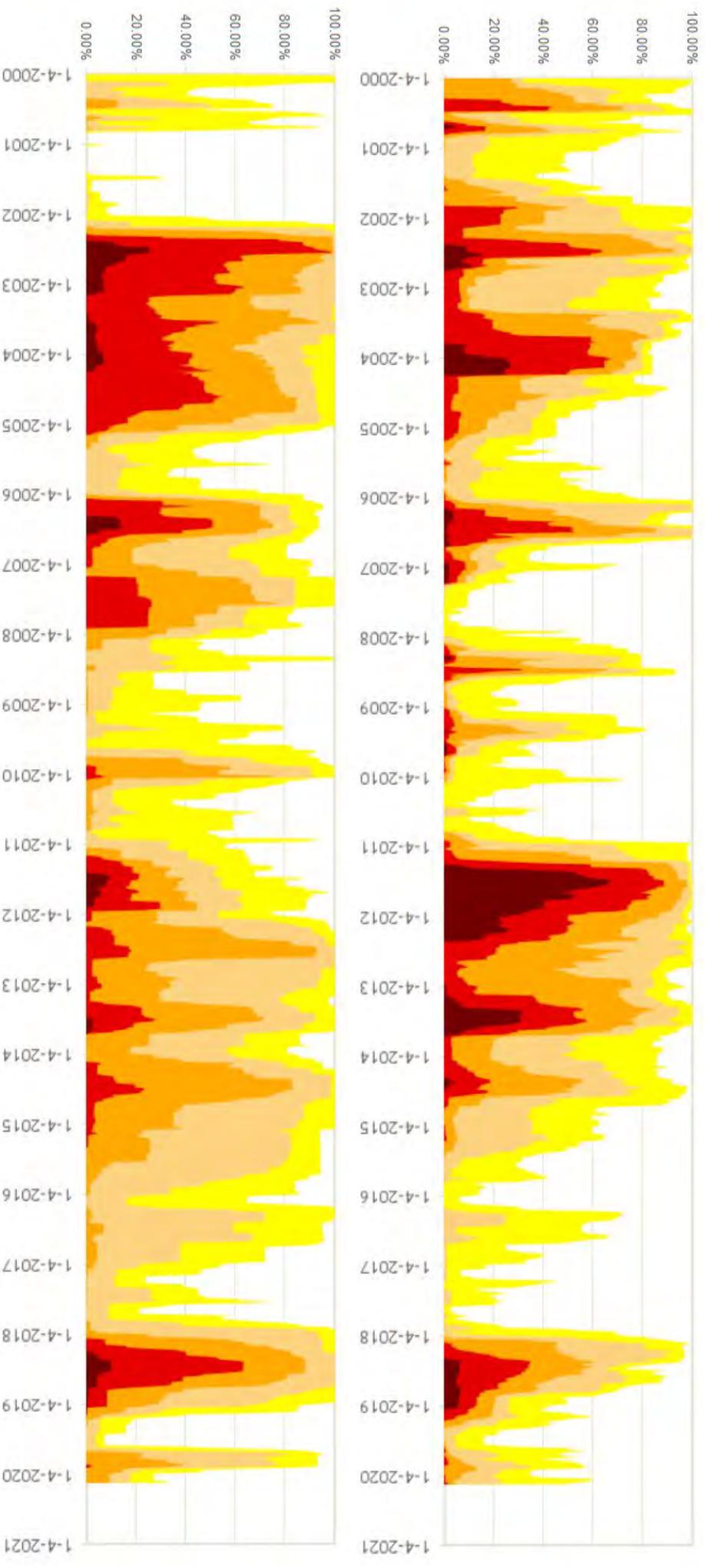


Air Quality

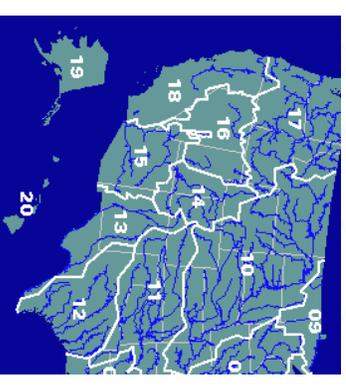
- Ozone and its precursors (NO_x, VOC)
- Particulate matter
 - Biomass burning, dust, exhaust
 - Visibility hazards on highways due to dust & smoke
- Air toxics
- Aeroallergens such as pollen and fungi
 - distribution, and seasonal timing of aeroallergens
- Indoor concentrations of pollutants

US Drought Monitor: Rio Grande Basin & Lower Colorado

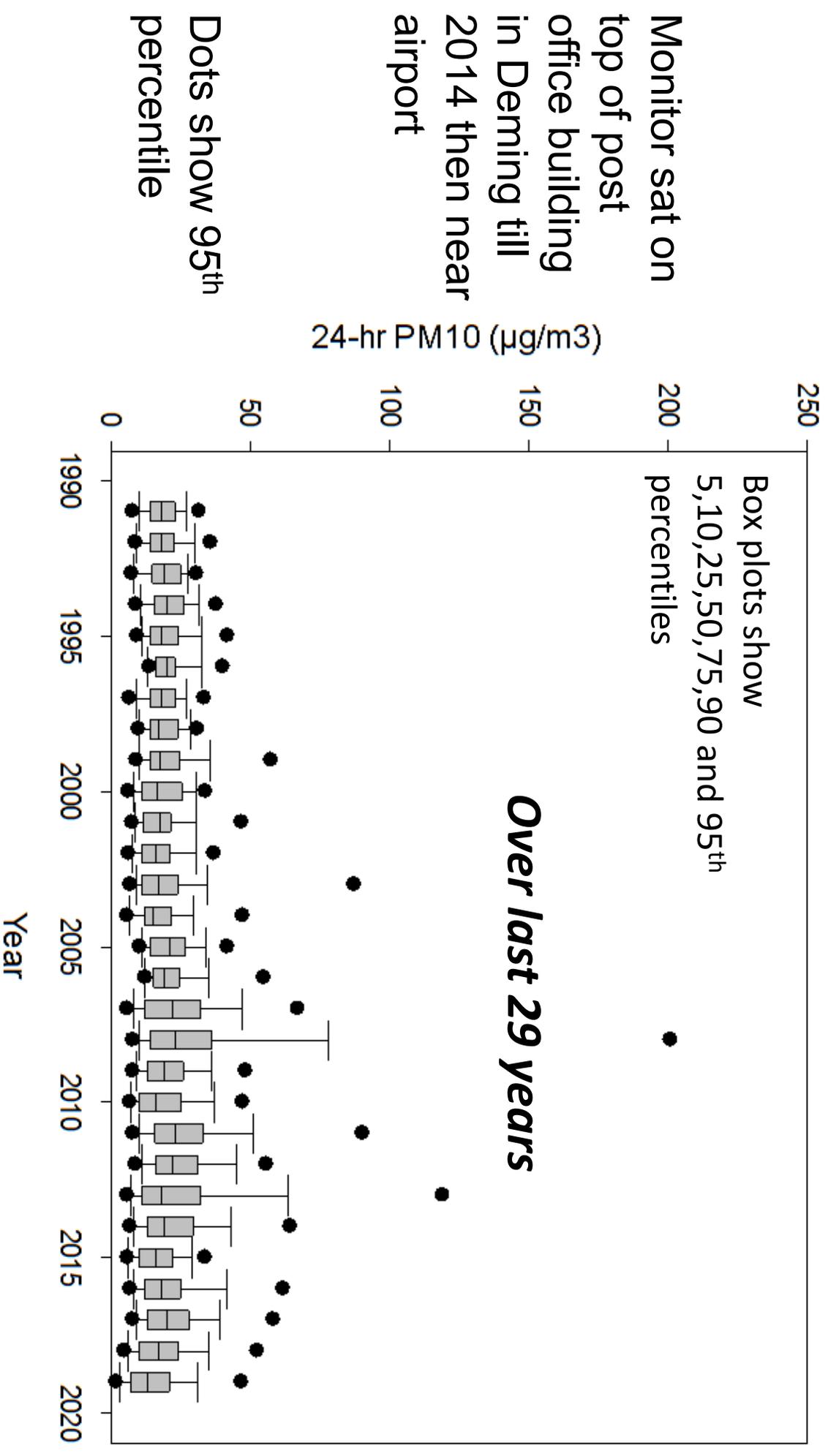
Percent area in each drought category



We've seen state-wide drought ebb and flow over the last 20 years

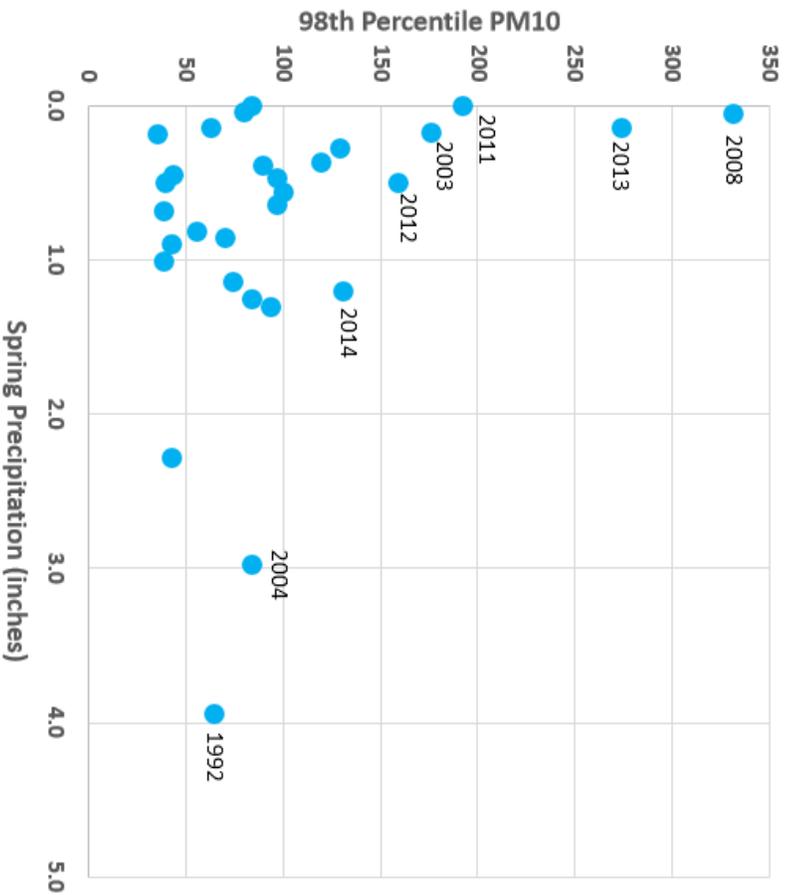


PM₁₀ in Deming

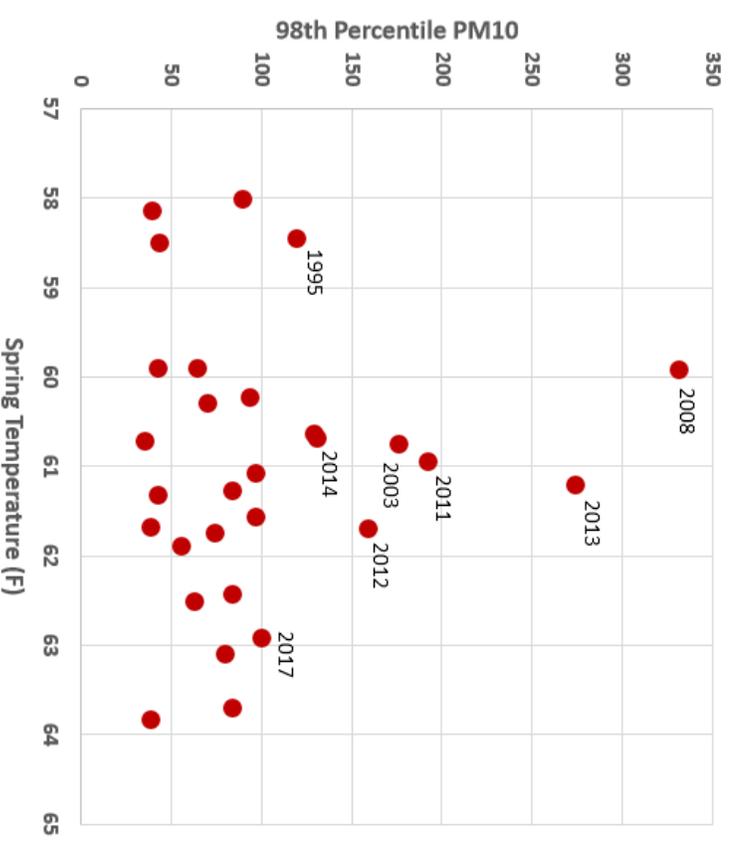


Climate and Particulate Levels

Our highest PM₁₀ occurs during our driest years. Average spring precipitation shown

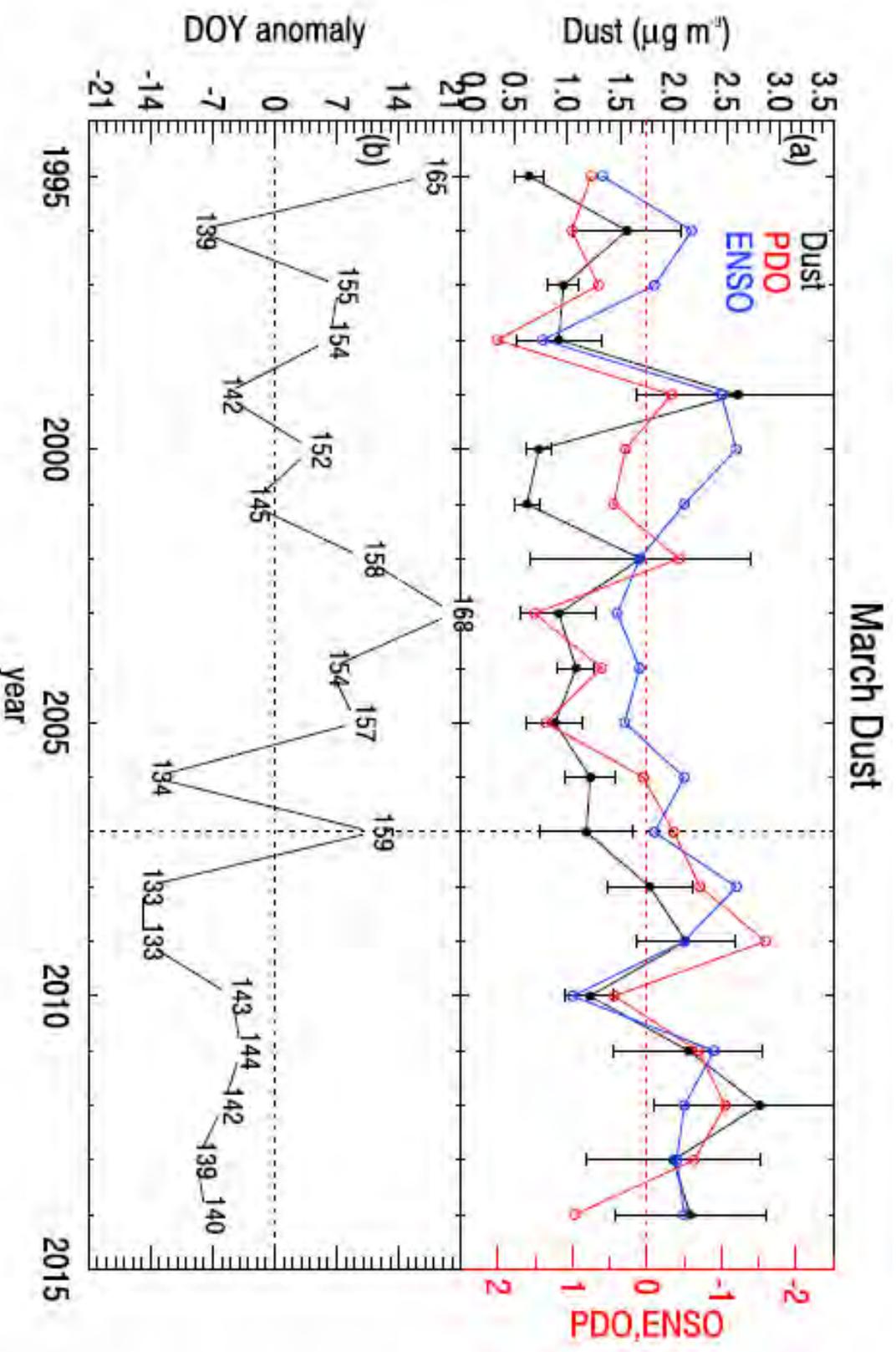


Deming, NM



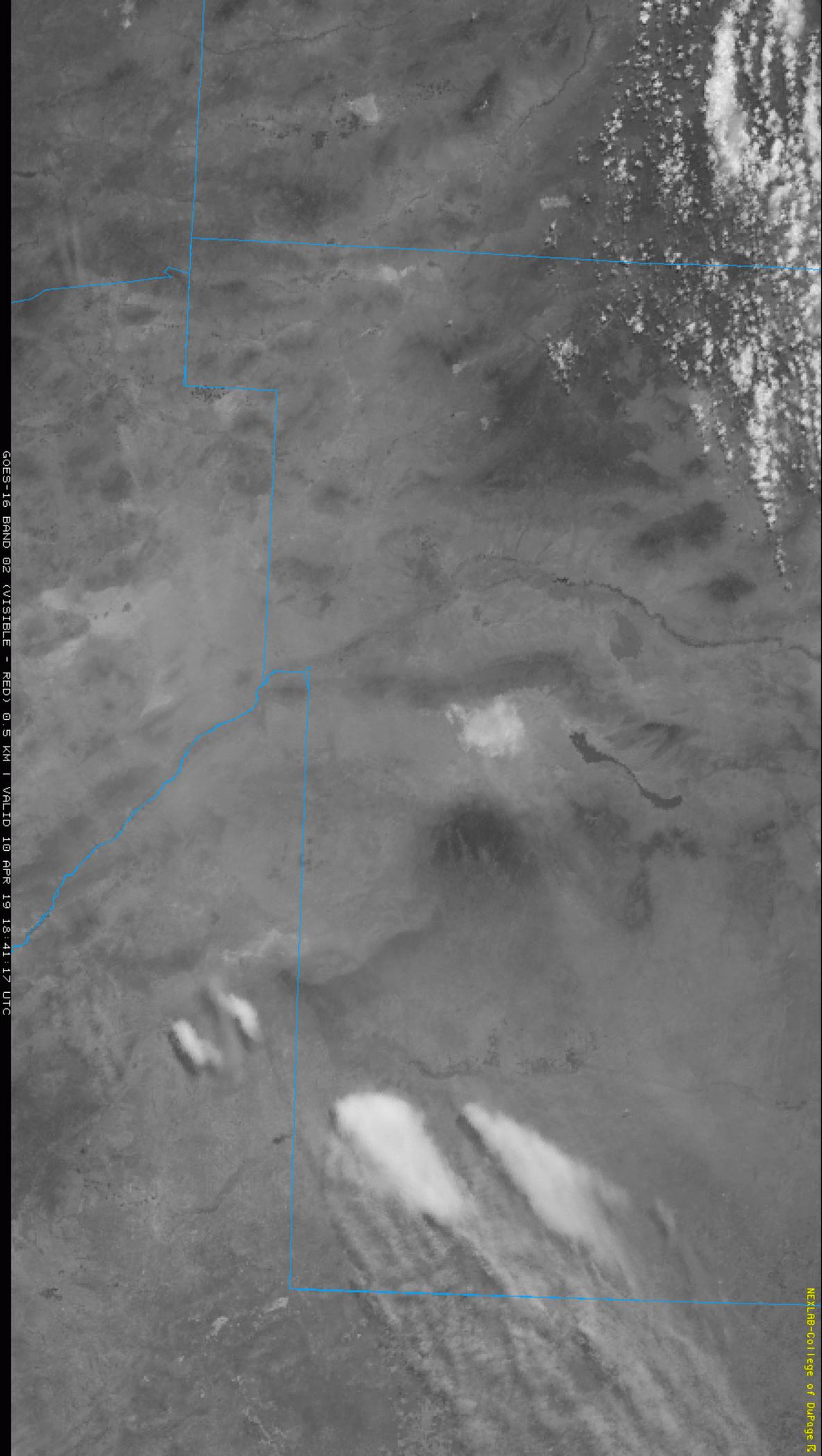
...but not necessarily during our warmest years

Fine dust concentrations have increased across the southwestern US in spring



The onset of the spring dust season has shifted earlier by 1 to 2 weeks

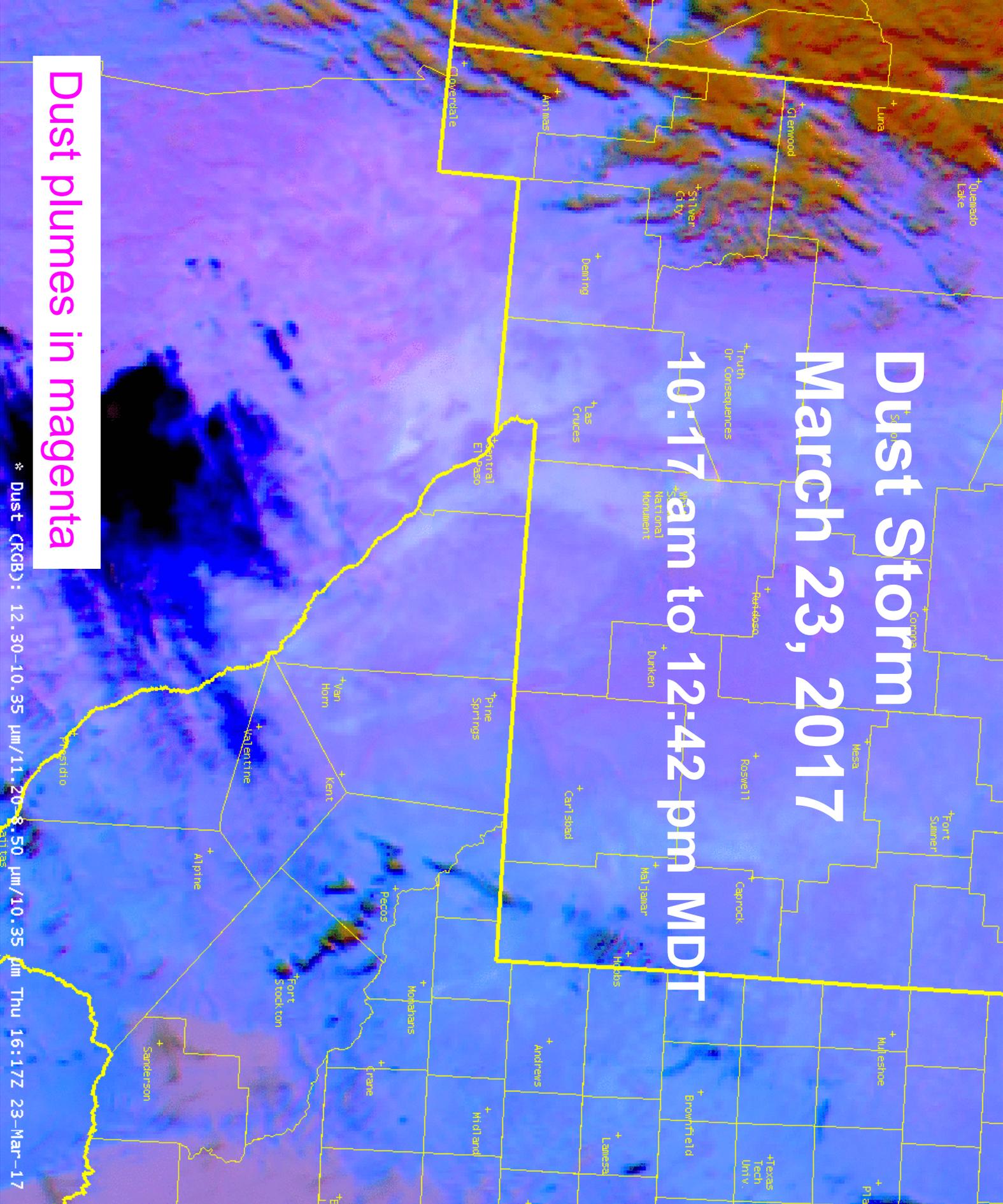
Synoptic dust storm on April 10, 2019



Dust Storm March 23, 2017

10:17 am to 12:42 pm MDT

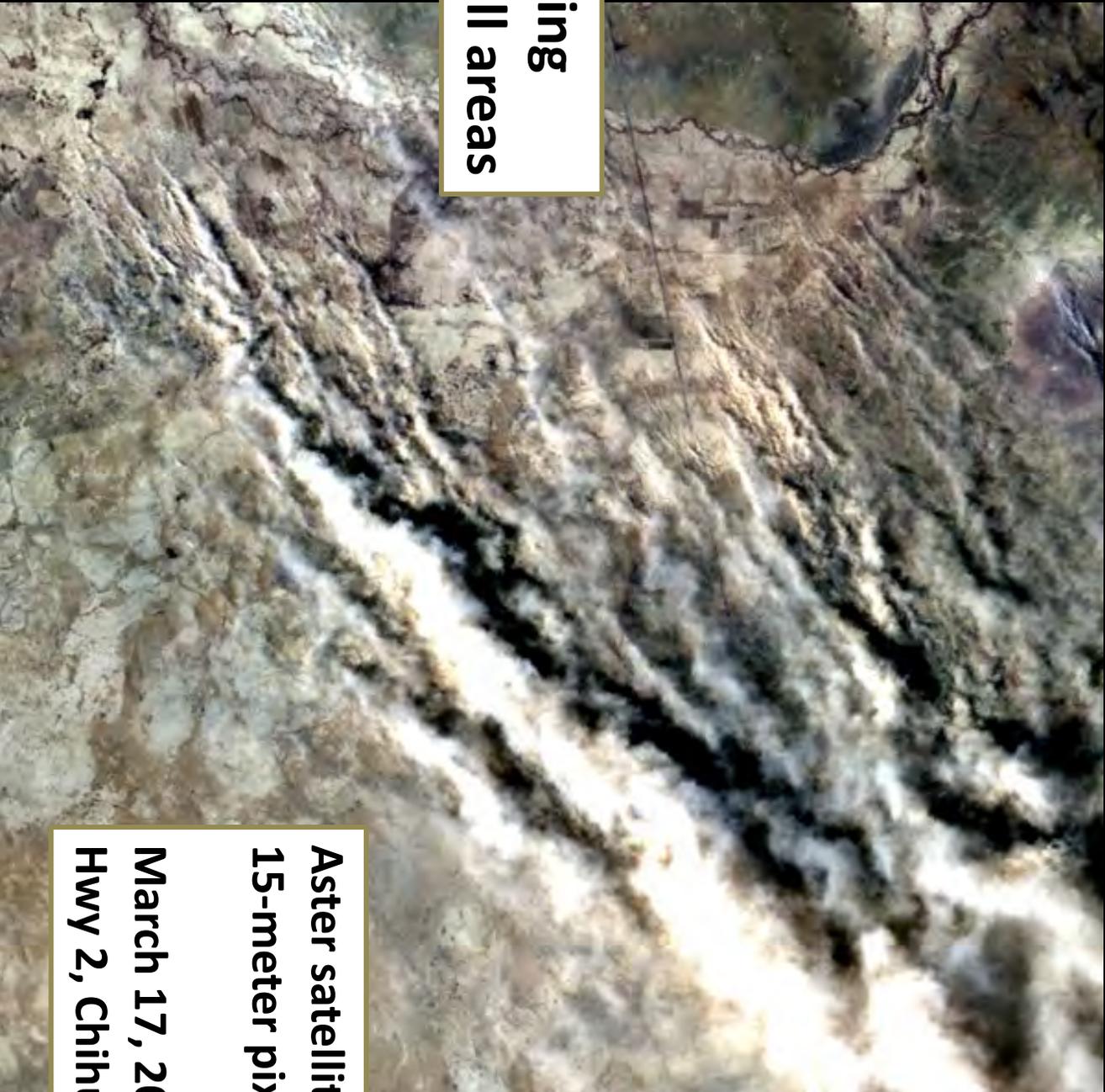
Dust plumes in magenta



* Dust (RGB): 12:30-10:35 $\mu\text{m}/11.20$ 8:50 $\mu\text{m}/10.35$ μm Thu 16:17Z 23-Mar-17

High resolution satellite image

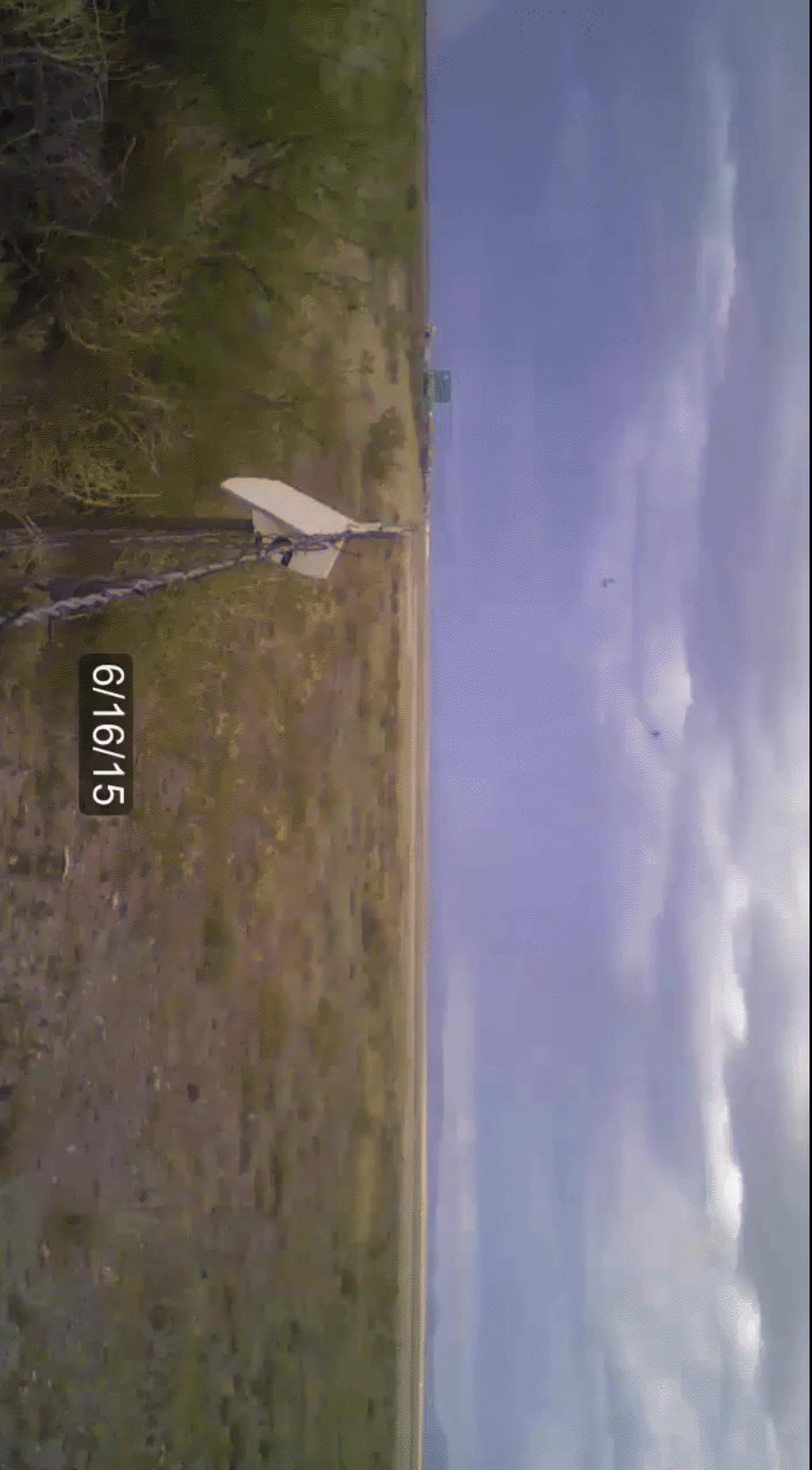
**Dust coming
from small areas**



**Aster satellite
15-meter pixel**

**March 17, 2012
Hwy 2, Chihuahua, Mexico**

Haboob (clearly defined “wall” of dust)



6/16/15

PLOTWATCHER PRO

06/16/2015 05:33:06PM 60% 109F

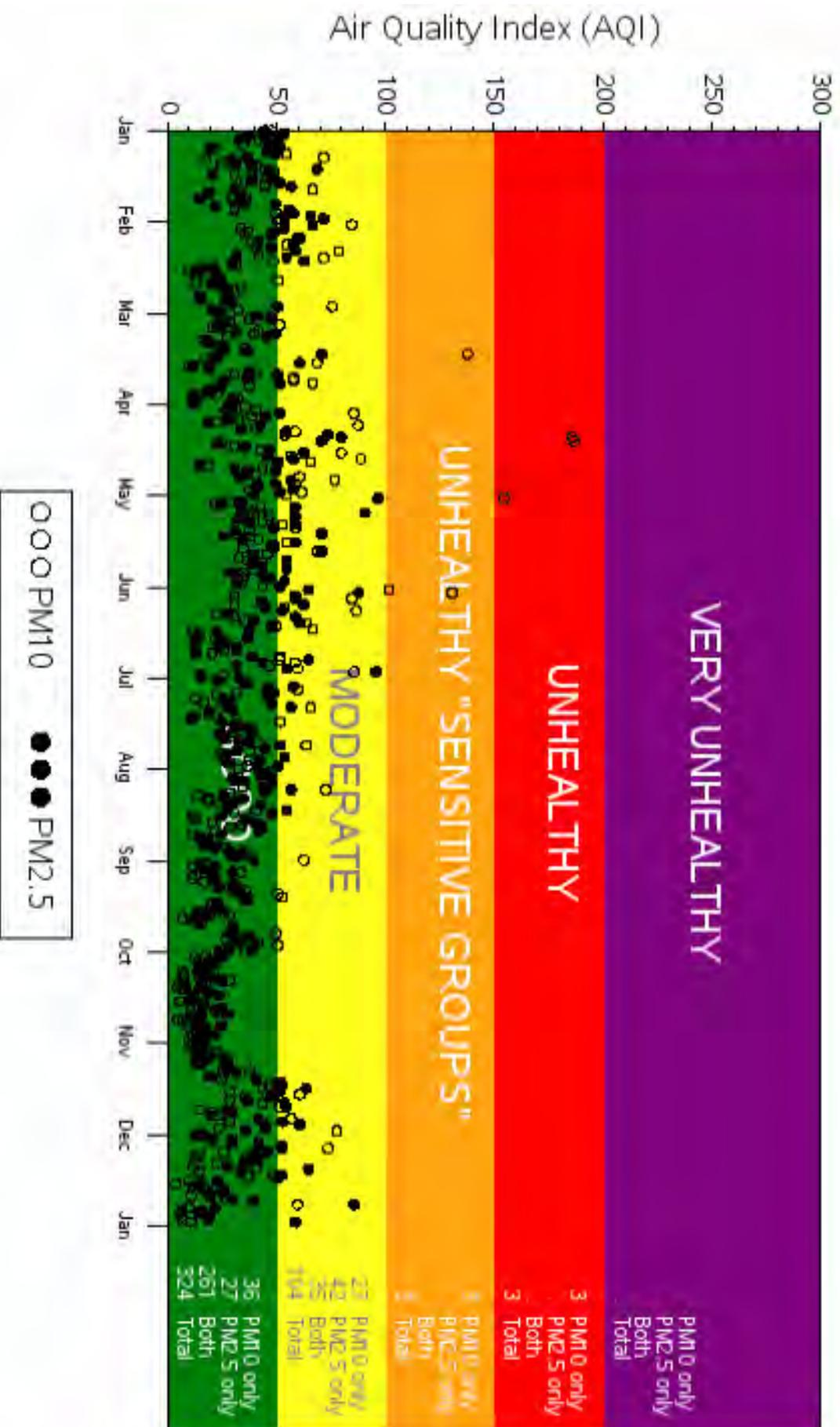
Health Effects of Air Pollutants in Las Cruces, NM

- 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 PM_{2.5}
excluding high wind days

(Percent increase for every 10 µg/m³ increase in PM₁₀ and PM_{2.5})

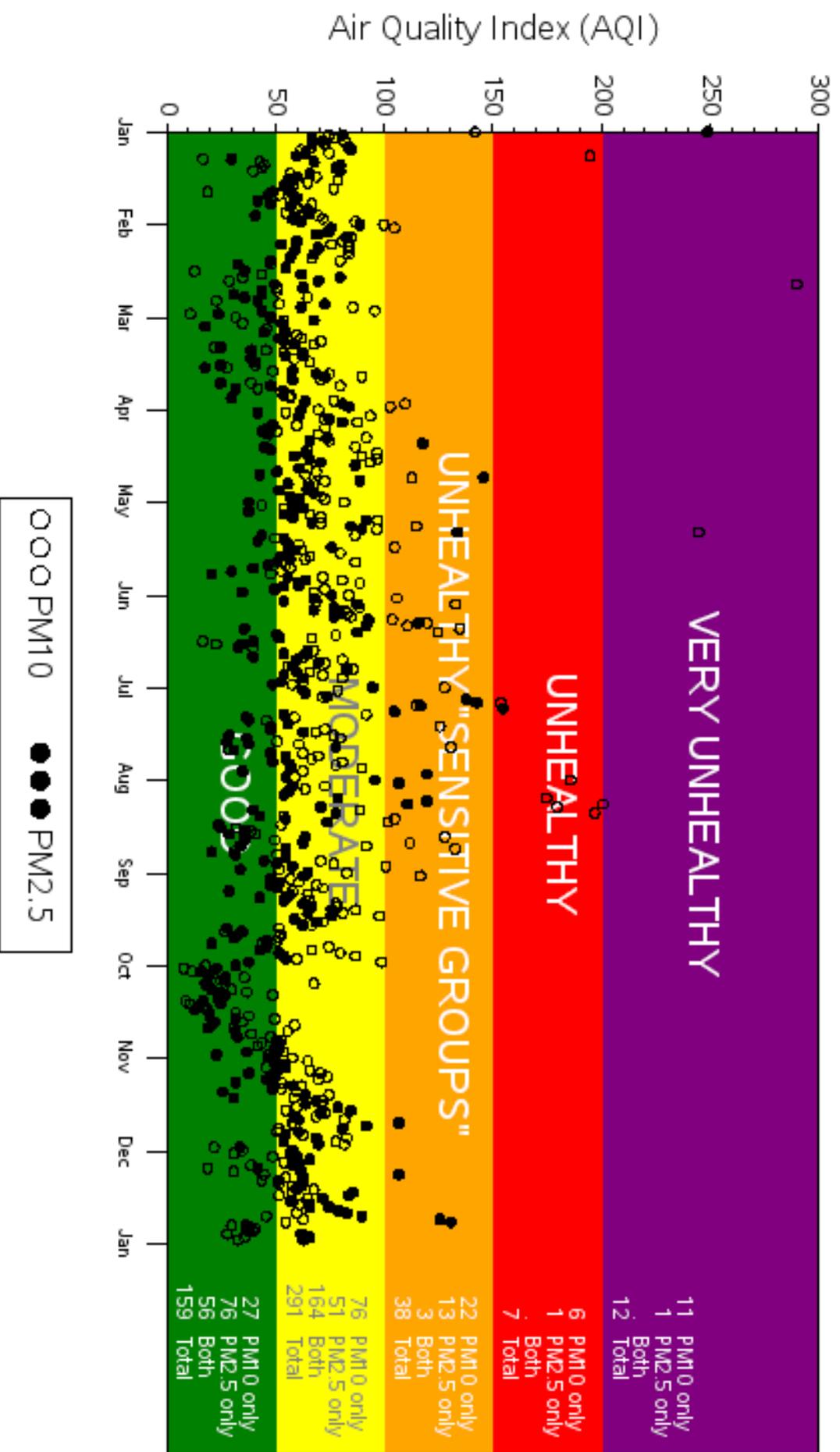
Daily PM10 and PM2.5 AQI Values in 2018

Las Cruces, NM



Daily PM10 and PM2.5 AQI Values in 2018

Phoenix-Mesa-Scottsdale, AZ





Beware the spore: Fungus in New Mexico soils causes serious illness

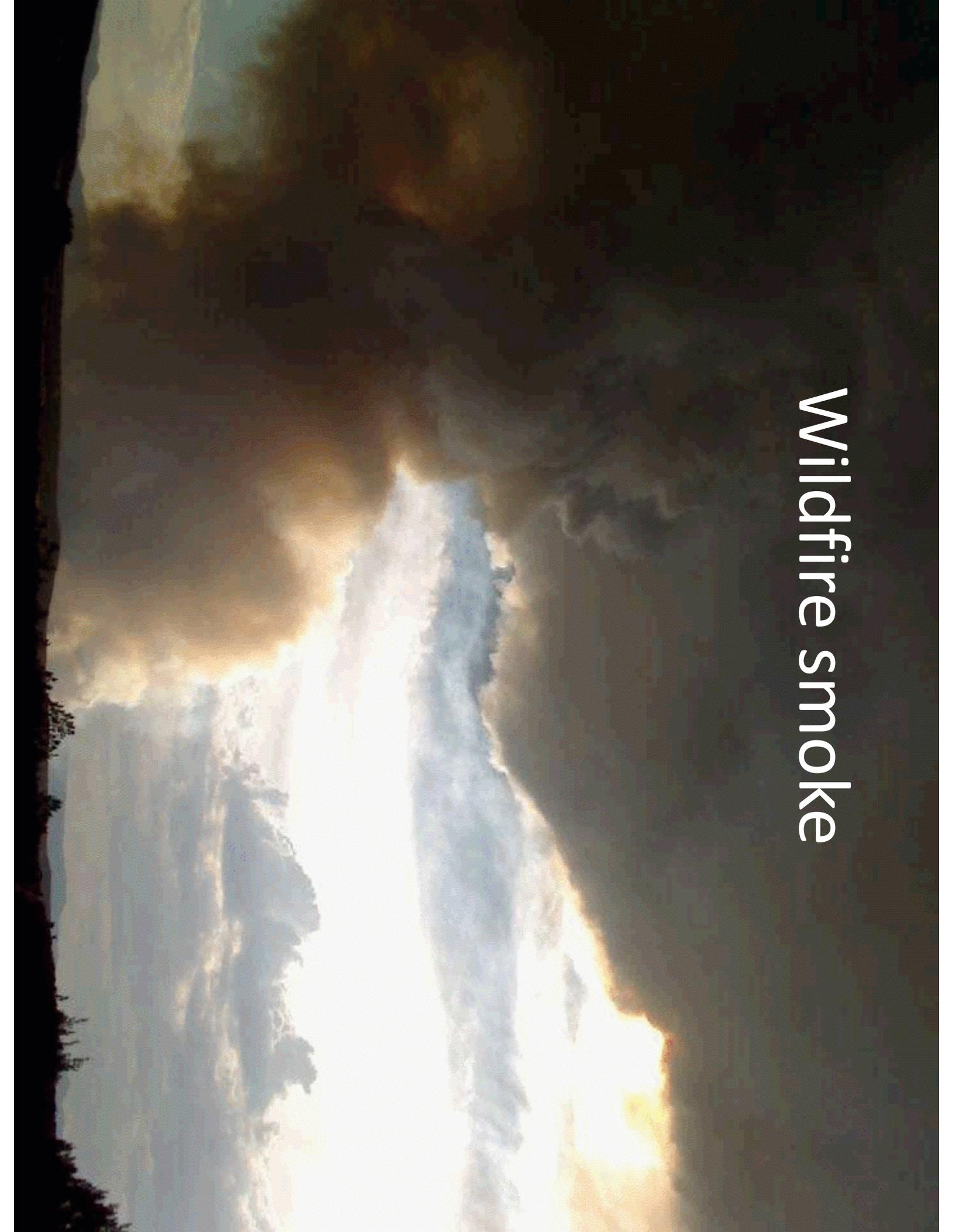
VALLEY FEVER, CAUSED BY A SPORE THAT RESIDES IN THE SOILS OF THE SOUTHWEST, IS MORE PREVALENT IN NEW MEXICO THAN MANY REALIZE. IT CAN BE DEADLY.

Blake Gumprecht, Las Cruces Sun-News

Published 6:00 a.m. MT March 11, 2019 | Updated 12:30 p.m. MT March 12, 2019

<https://www.lcsun-news.com/story/life/wellness/2019/03/11/soil-fungus-serious-illness-new-mexico/2711787002/>

Wildfire smoke



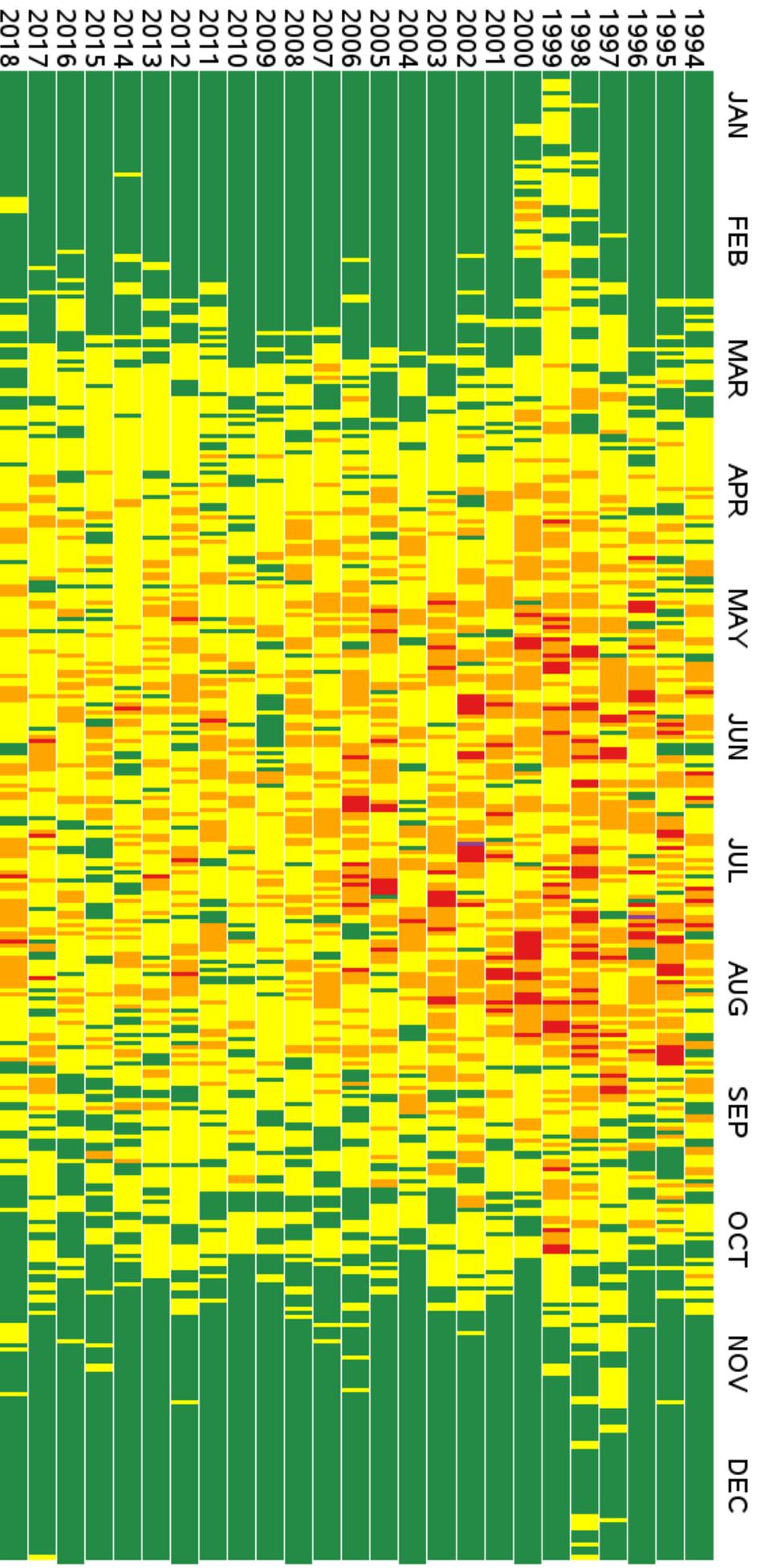
Smoke, pushed by winds are carried 1000s of miles from their source



Analysis Day: 20170905
Map Generated: 1937 GMT 20170905

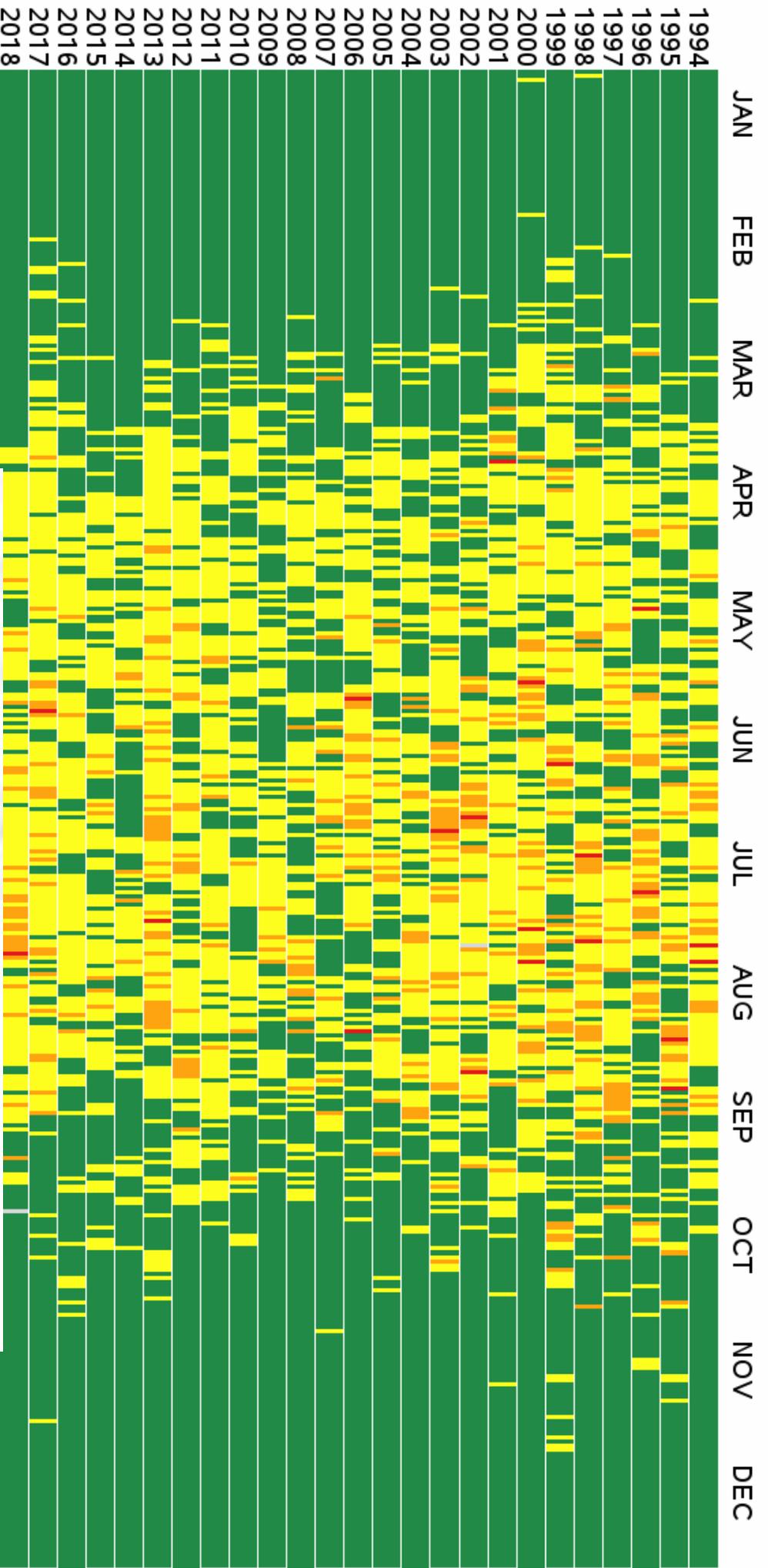
Ozone Daily AQI Values, 1994 to 2018

Phoenix-Mesa-Scottsdale, AZ



- Good (<=0.054 ppm)
- Moderate (0.055-0.070 ppm)
- Unhealthy for Sensitive Groups (0.071-0.085 ppm)
- Unhealthy (0.086-0.105 ppm)
- Very Unhealthy (0.106-.200 ppm)
- Hazardous (>=0.405 ppm 1-hour)

Ozone daily AQI from 1994-2018 in Las Cruces



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