Ozone and Particulate Matter Levels in Albuquerque – Bernalillo County

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ONE ALBUQUERQUE environmental health

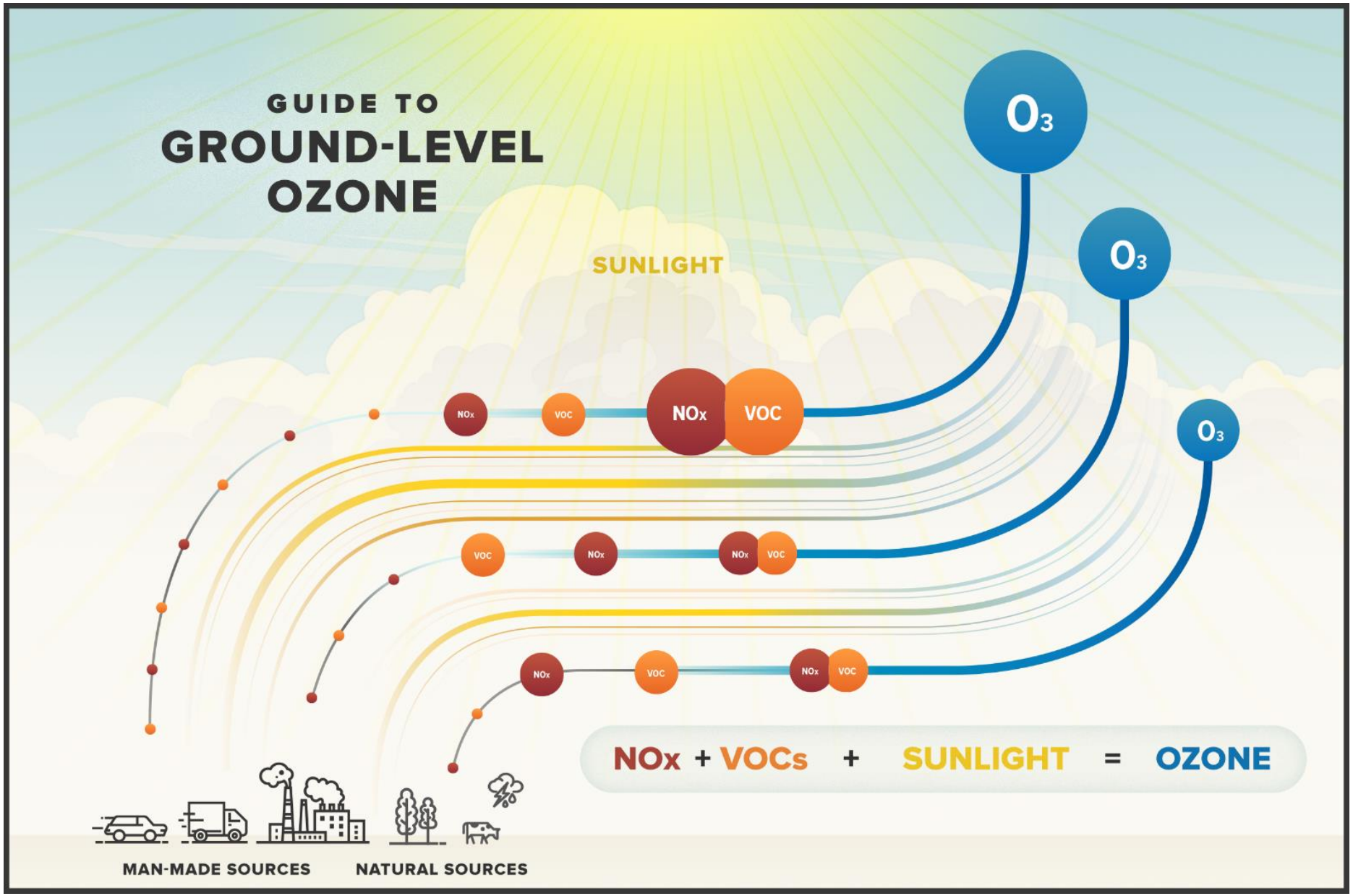
Purpose of this Presentation

- Ozone
  - Description, it's effects, and how it is formed
  - Where it occurs in the atmosphere
  - Ozone in Albuquerque/Bernalillo County
  - Initiatives to address ozone
- Particulate Matter
  - Description, it's effects
  - How it behaves in the air
- Current Ozone and PM Levels

What Is Ozone?

- Highly reactive gas composed of three oxygen atoms
- Natural and a man made product
- Occurs in the Earth's upper atmosphere (the stratosphere) and lower atmosphere (the troposphere)
- Can be good or bad depending on where it is in our atmosphere
  - Can damage the lungs, aggravate respiratory diseases
  - Damage plants, crops, ecosystems
  - Protects us from harmful ultraviolet rays

How Is Ozone Formed?



Ozone Precursors from Mobile Sources

Image Courtesy of Shutterstock

Ozone in Albuquerque-Bernalillo County

- Photochemical Modeling of June and July 2017 Ozone Episodes
    - June 2017 episode was driven largely by emissions outside Albuquerque/Bernalillo County
    - July 2017 episode was driven more strongly by local emissions from within Albuquerque/Bernalillo County
    - Local emission controls (if required) less effective for long-range pollutant transport from outside Albuquerque/Bernalillo County
    - Local emission controls will be more effective at reducing ozone when ozone is driven more strongly by local emissions
  - The takeaway from this report is that it is both a transport and local problem
  - Photochemical modeling report available at: https://www.cabq.gov/airquality/documents/air-quality-modeling-of-2017-ozone-episodes-in-the-city-of-albuquerque.pdf

EHD Initiatives to Address Ozone

- Current Initiatives:
  - EHD supports State NMED proposed oil & gas ozone pre-cursor rules
  - Exceptional events demonstration to EPA
    - Events that may influence measurements in the air monitoring network
  - EPA Ozone Advance program
    - Voluntary EPA program for ozone attainment areas
- Future Initiatives:
  - Proposed photochemical assessment monitoring (“PAMS”)
    - Enhanced monitoring of ozone, NOx, and VOCs
  - Additional modeling of VOC role in ozone formation

Particulate Matter

What Is Particulate Matter?

- Mixture of solid particles and liquid droplets found in the air
- Can be seen with the naked eye but can also be so small that it can only be detected using an electron microscope.
- Chemically diverse
- Can injure the respiratory tract and harm health
- Large particulate comes from wind-blown dust, unpaved roads, rock crushing & screening
  - Large enough to fall within 1000 feet or less
- Fine particulates primarily come from combustion sources
  - So light that they may travel for thousands of miles

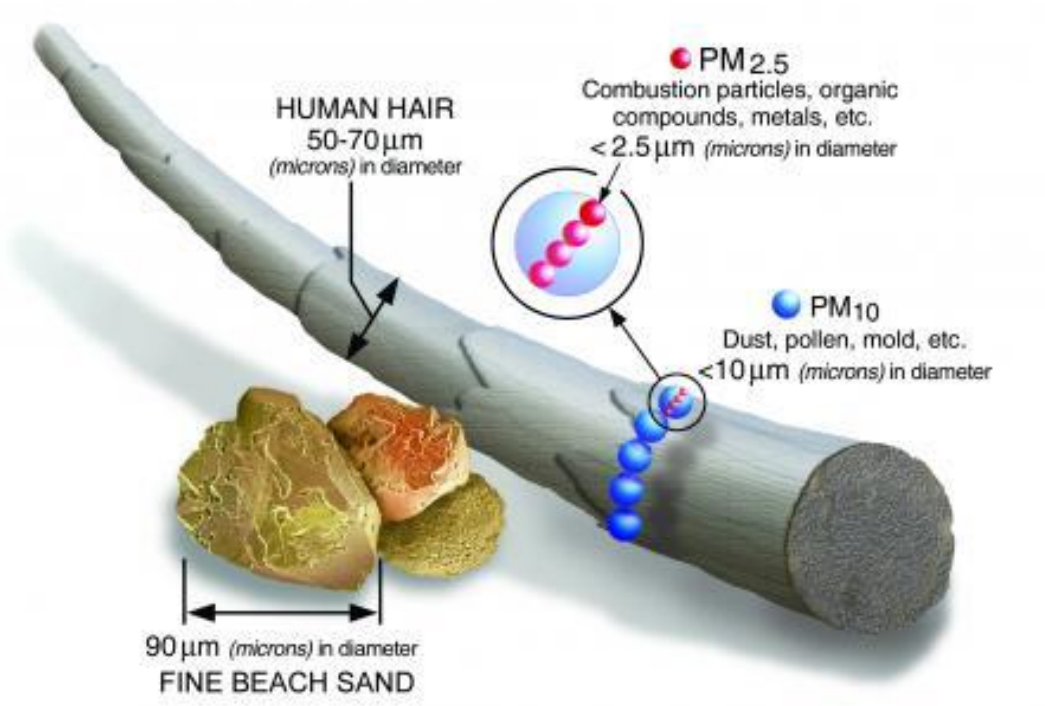


Image Courtesy of The US EPA

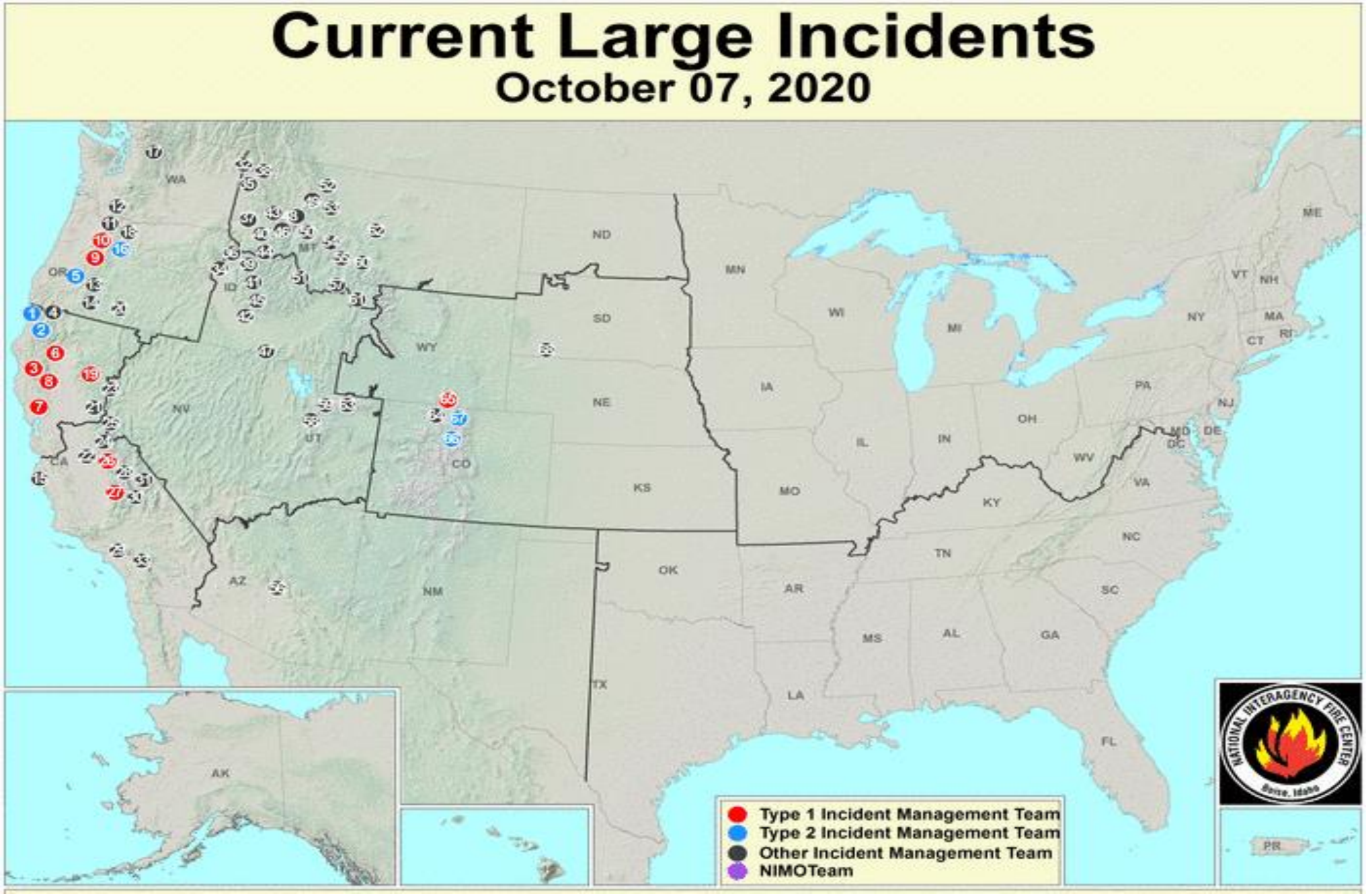


Image courtesy of the USDA Forest Service

August 19, 2020 NOAA Satellite Imagery Loop

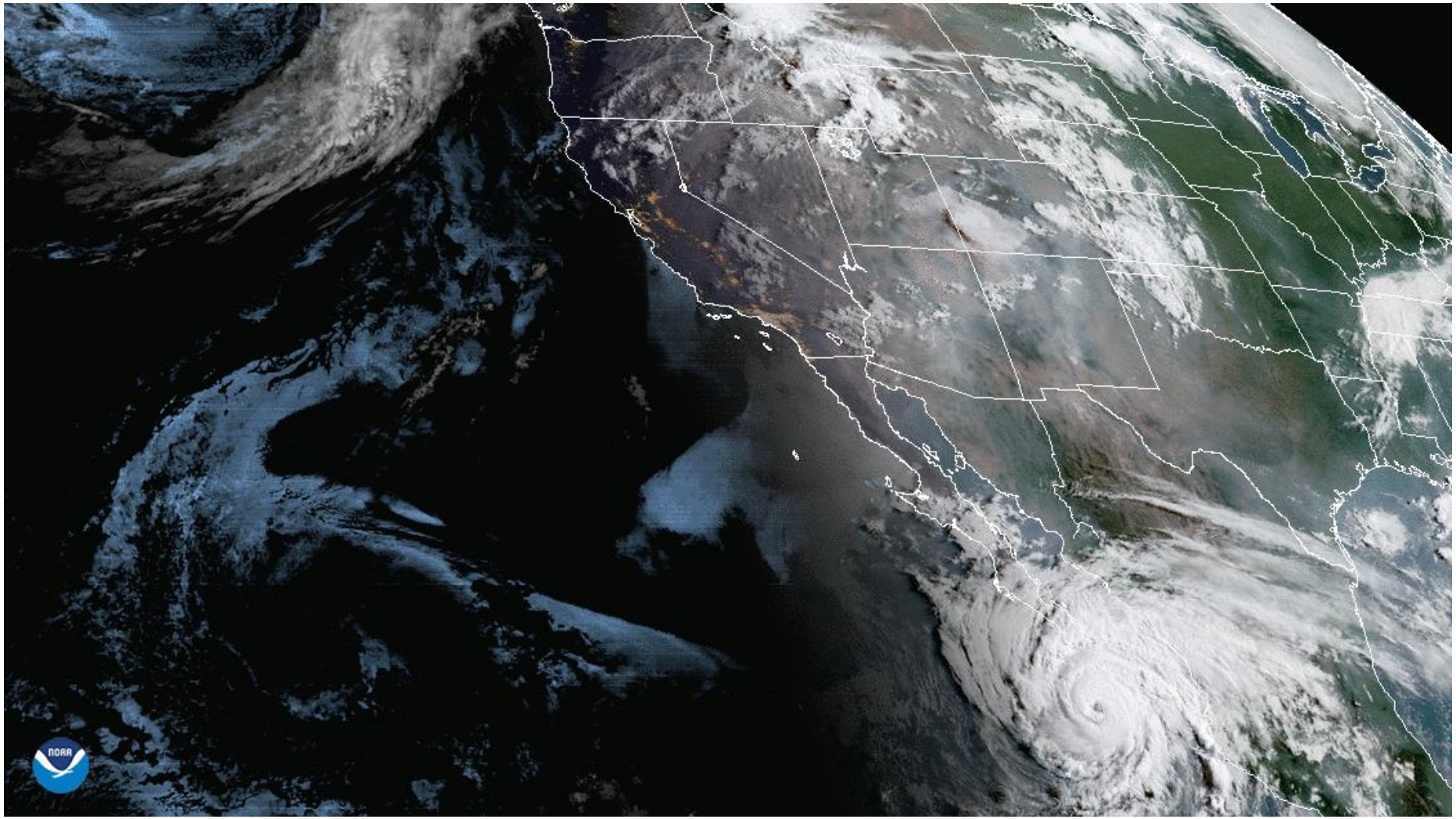


Image courtesy of the NOAA

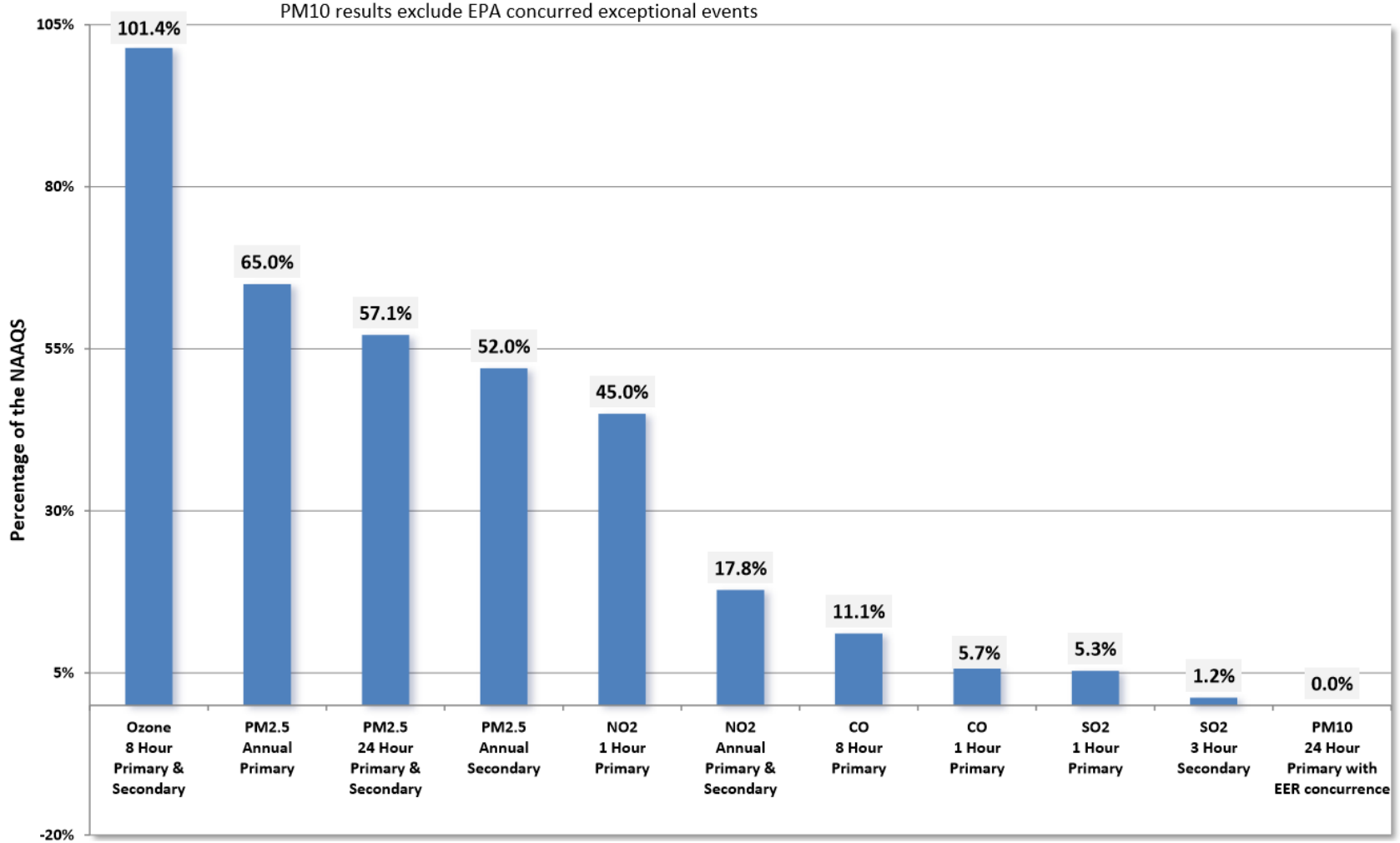
Current Ozone and PM levels

- Ozone:
  - Federal standard: 0.070 parts per million, measured by EPA methods
  - Official current level: 0.071 ppm for calendar year 2019, exceedance of the Federal Standard
- PM10
  - Federal standard: 150 micrograms per cubic meter, measured by EPA methods
  - Official current level: Attainment
- PM2.5
  - Federal standard: 12 micrograms per cubic meter, measured by EPA method
  - Official current level 7.8 micrograms per cubic meter, Attainment

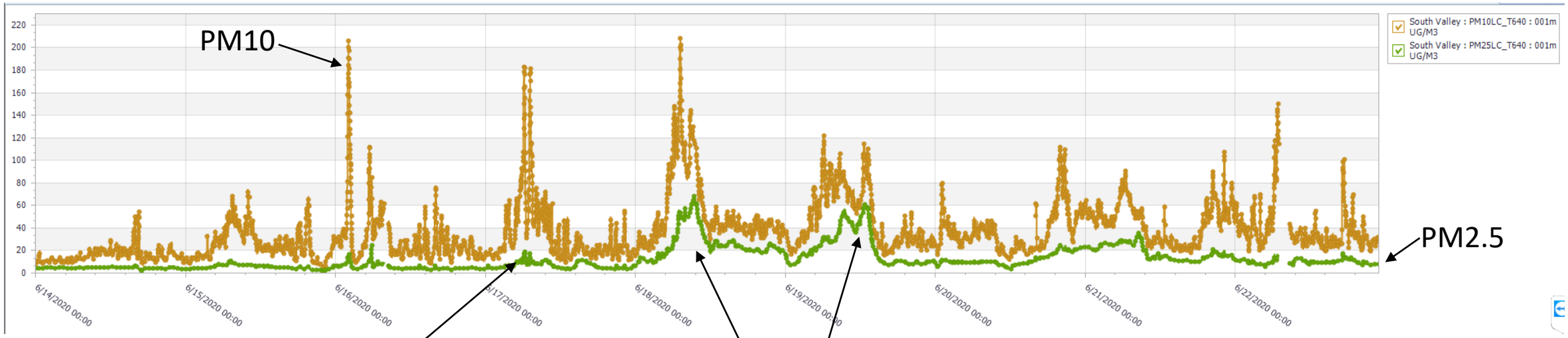
City of Albuquerque/Bernalillo County
Criteria Pollutant Design Values as a percentage of the current National Ambient Air Quality Standards (NAAQS) for Year 2019

Data from the EPA AQS Database Reports AMP440, AMP450 and AMP480 - July 6, 2020

PM10 results exclude EPA concurred exceptional events



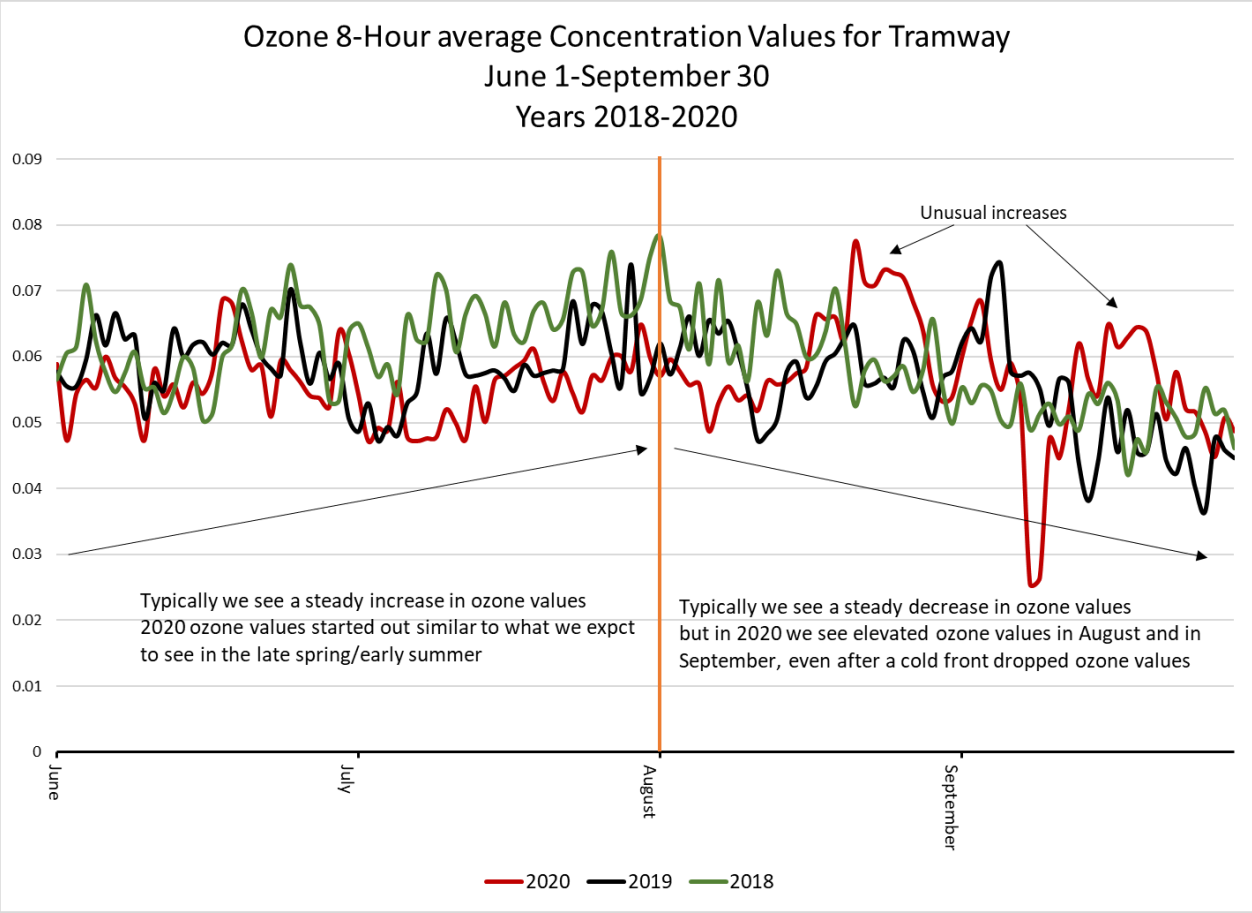
Elevated PM Levels Due to Wildfire Smoke

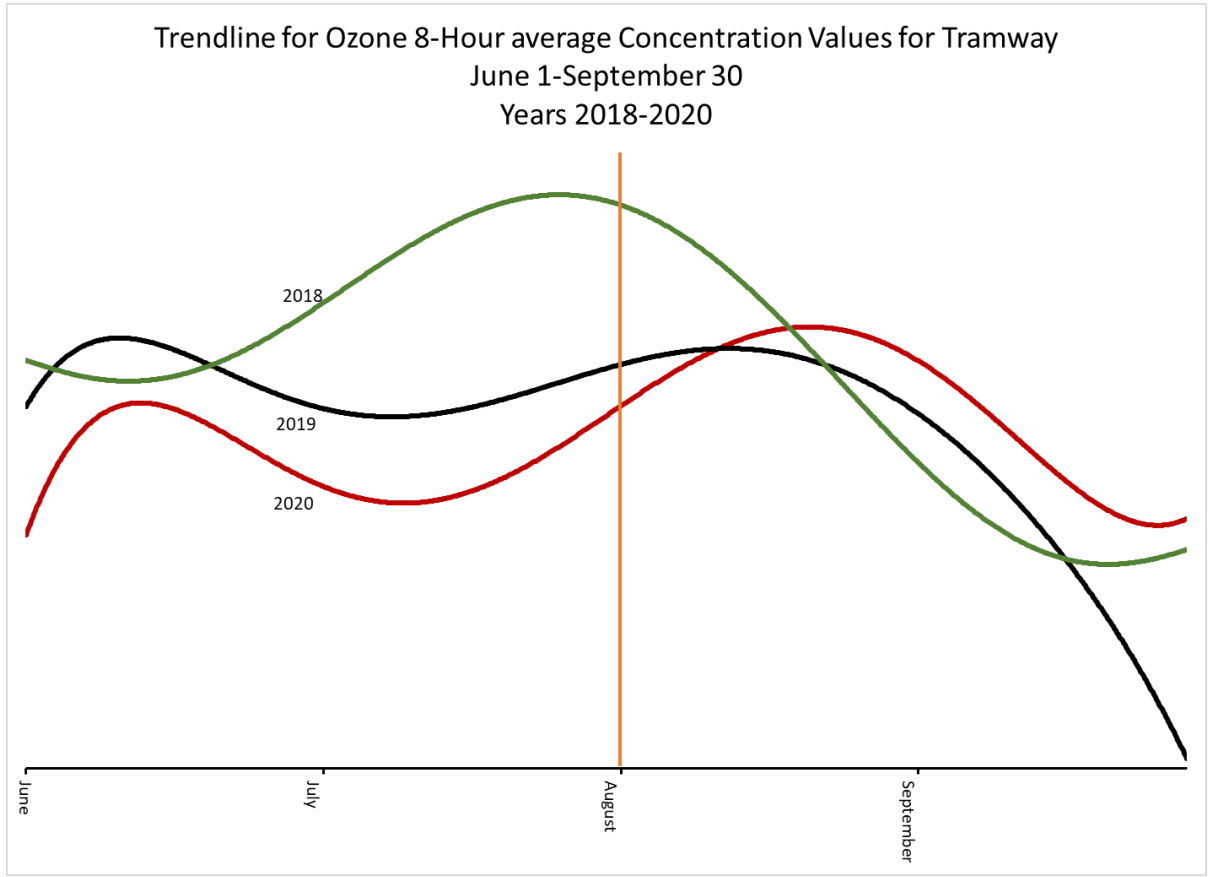


We can see increased smoke impact when PM2.5 becomes a larger percentage of PM10

Here we see increased PM10 that is likely not due to smoke

Ozone Levels From June thru September 2020





Health Alerts for Ozone and PM (last 3 years)

DATE	REASON	RESULT
JUNE 18, 2020	SMOKE	24-hour PM2.5 average was above 35 µg/m^3 at Foothills monitor
AUGUST 22, 2020	OZONE	8-hour Ozone average > 70 PPB at the Foothills monitor
AUGUST 25, 2020	OZONE	8-hour Ozone average > 70 PPB at the Foothills monitor
AUGUST 26, 2020	OZONE	8-hour Ozone average > 70 PPB at the Foothills monitor
SEPTEMBER 8, 2020	BLOWING DUST	24-hour average > 150 µg/m^3 at South Valley monitor
JULY 30, 2019	OZONE	8-hour Ozone average > 70 PPB at the Foothills monitor
SEPTEMBER 5, 2019	OZONE	8-hour Ozone average > 70 PPB at the Foothills monitor
SEPTEMBER 6, 2019	OZONE	8-hour Ozone average > 70 PPB at the Foothills monitor
JANUARY 15, 2018	BLOWING DUST	24-hour average > 150 µg/m^3 at South Valley monitor
FEBRUARY 12, 2018	BLOWING DUST	24-hour average > 150 µg/m^3 at South Valley monitor
APRIL 19, 2018	BLOWING DUST	24-hour average > 150 µg/m^3 at South Valley monitor

THANK YOU!