Ozone in Albuquerque – Bernalillo County

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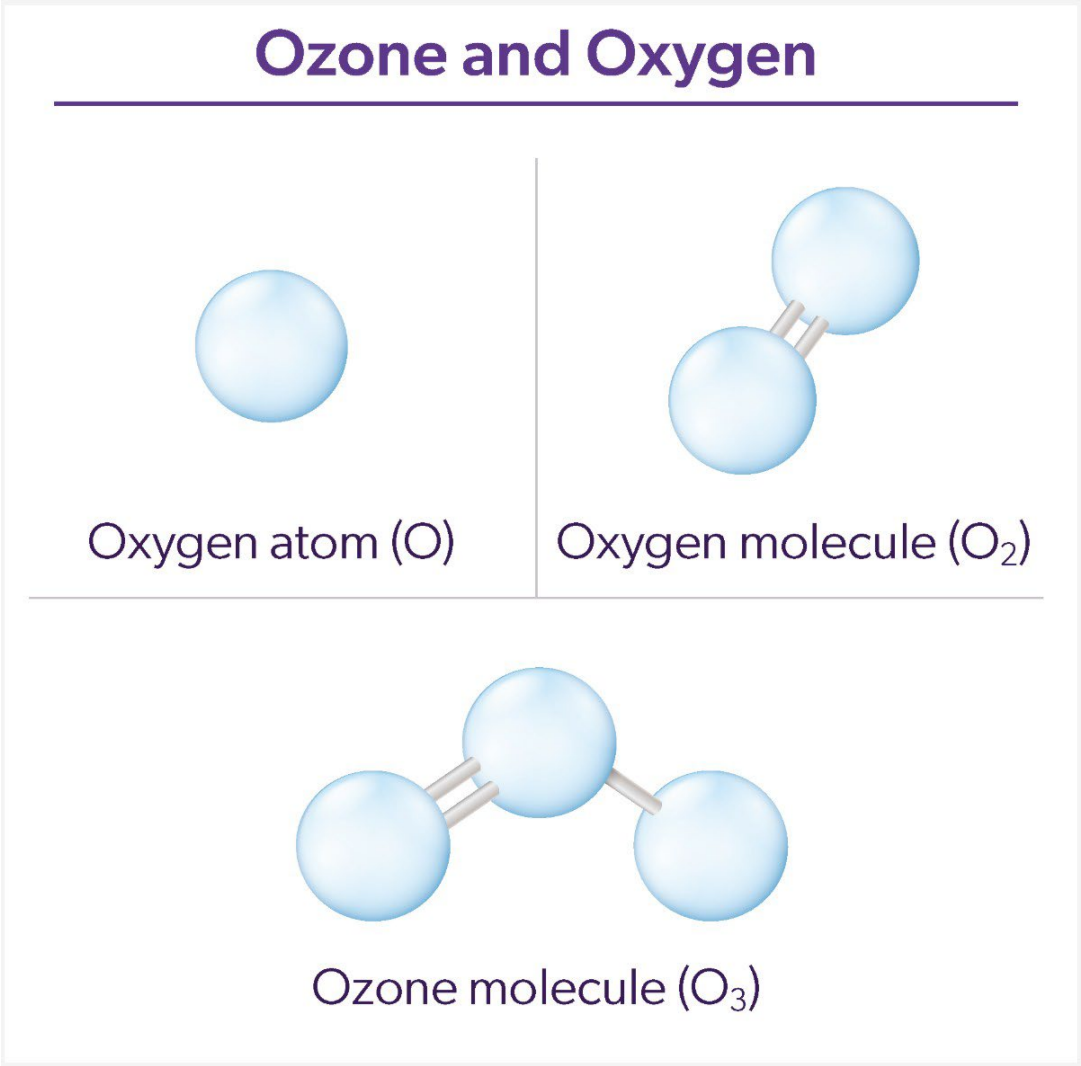
ONE ALBUQUERQUE environmental health

What is ozone?

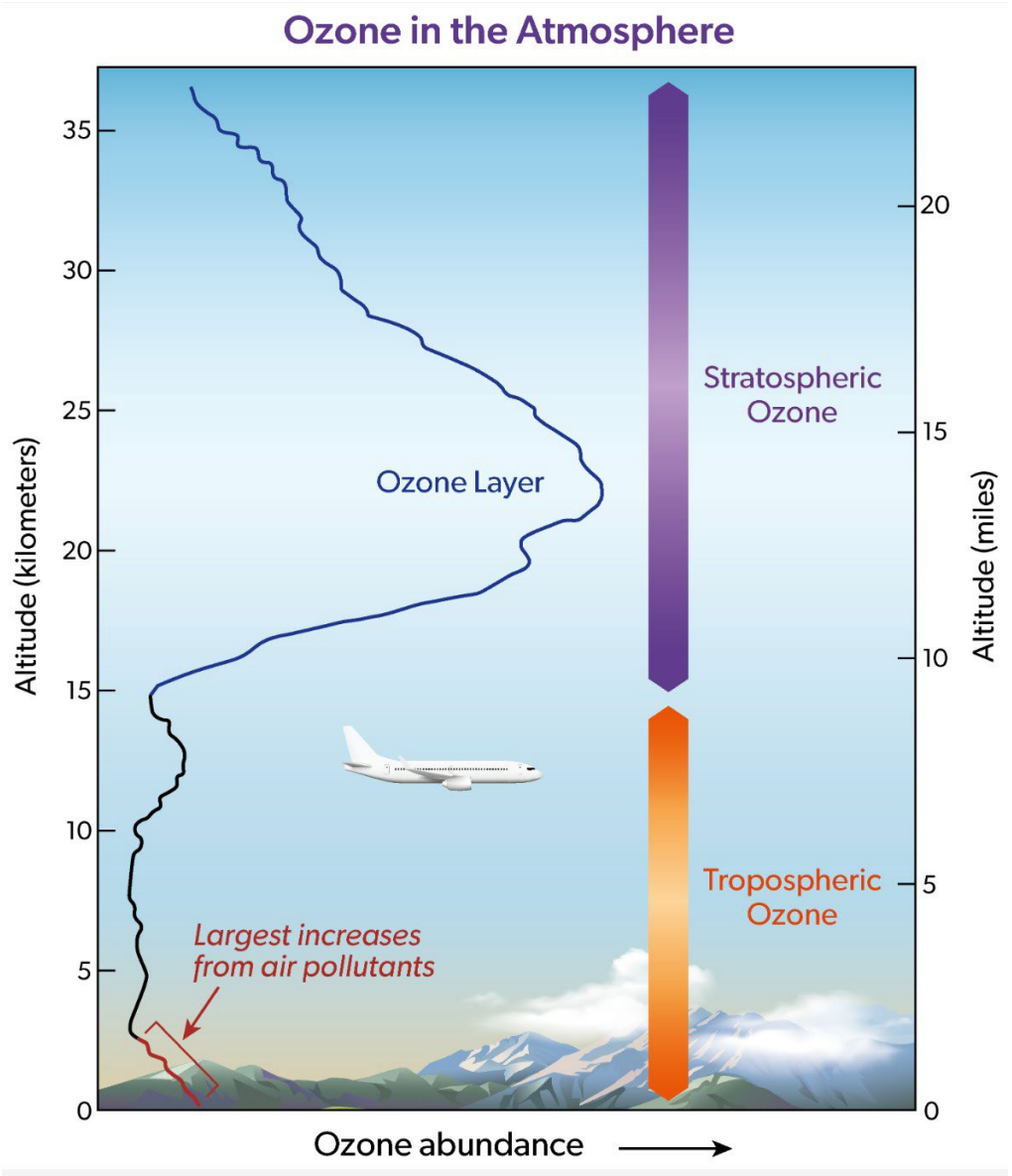
- Ozone is a gas composed of three oxygen atoms in a triplet state.
- Ozone is highly reactive and corrosive.
- EPA recognizes ozone as a criteria air pollutant based on health risks associated with long-term exposure.
  - Ozone can contribute to respiratory and cardiovascular problems.
  - Ozone is a main ingredient of smog



From NOAA Chemical Sciences Laboratory

Where is ozone?

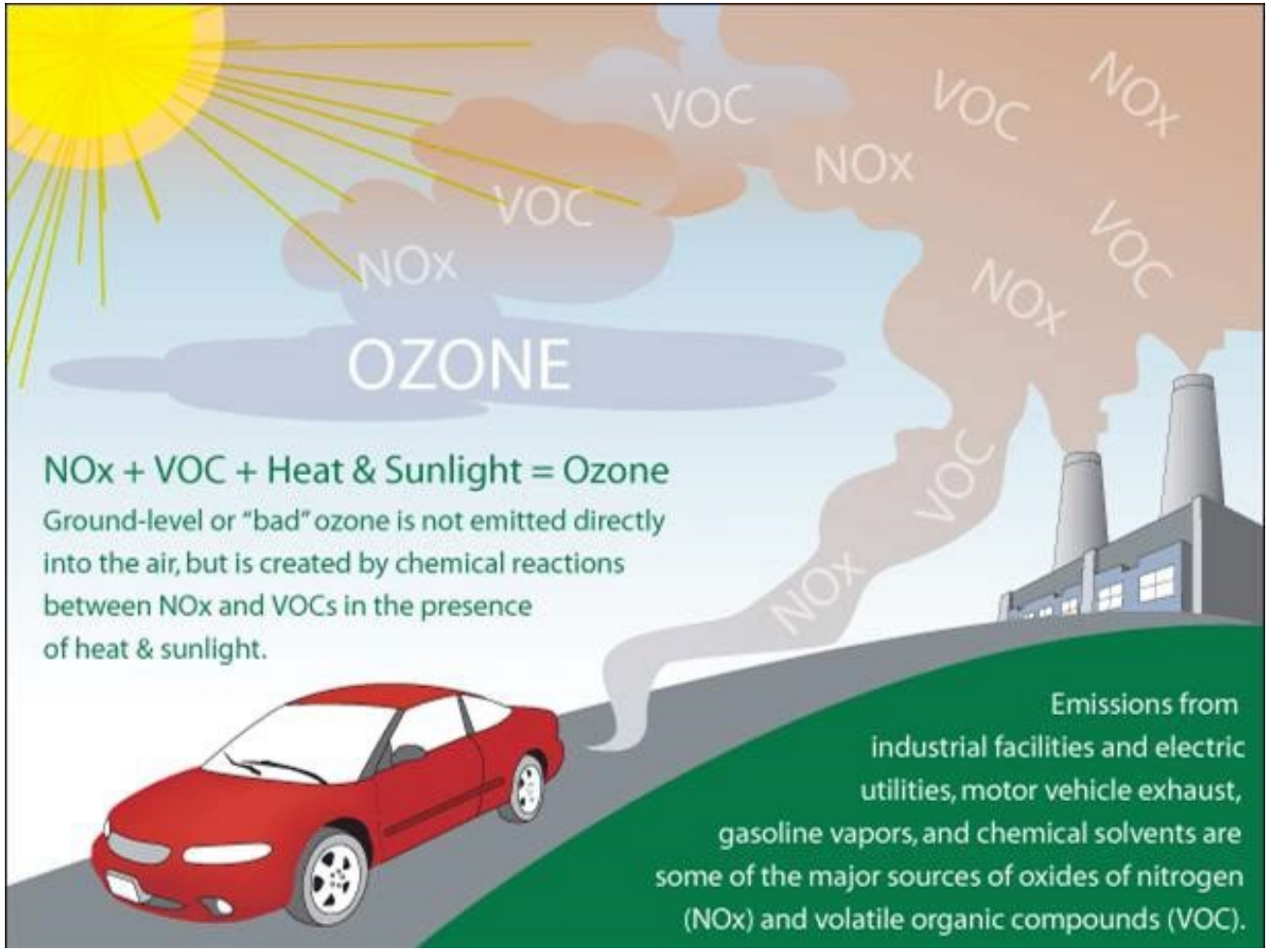
- Ozone occurs in both the stratosphere and the troposphere.
- stratospheric ozone can migrate into the troposphere (intrusions).



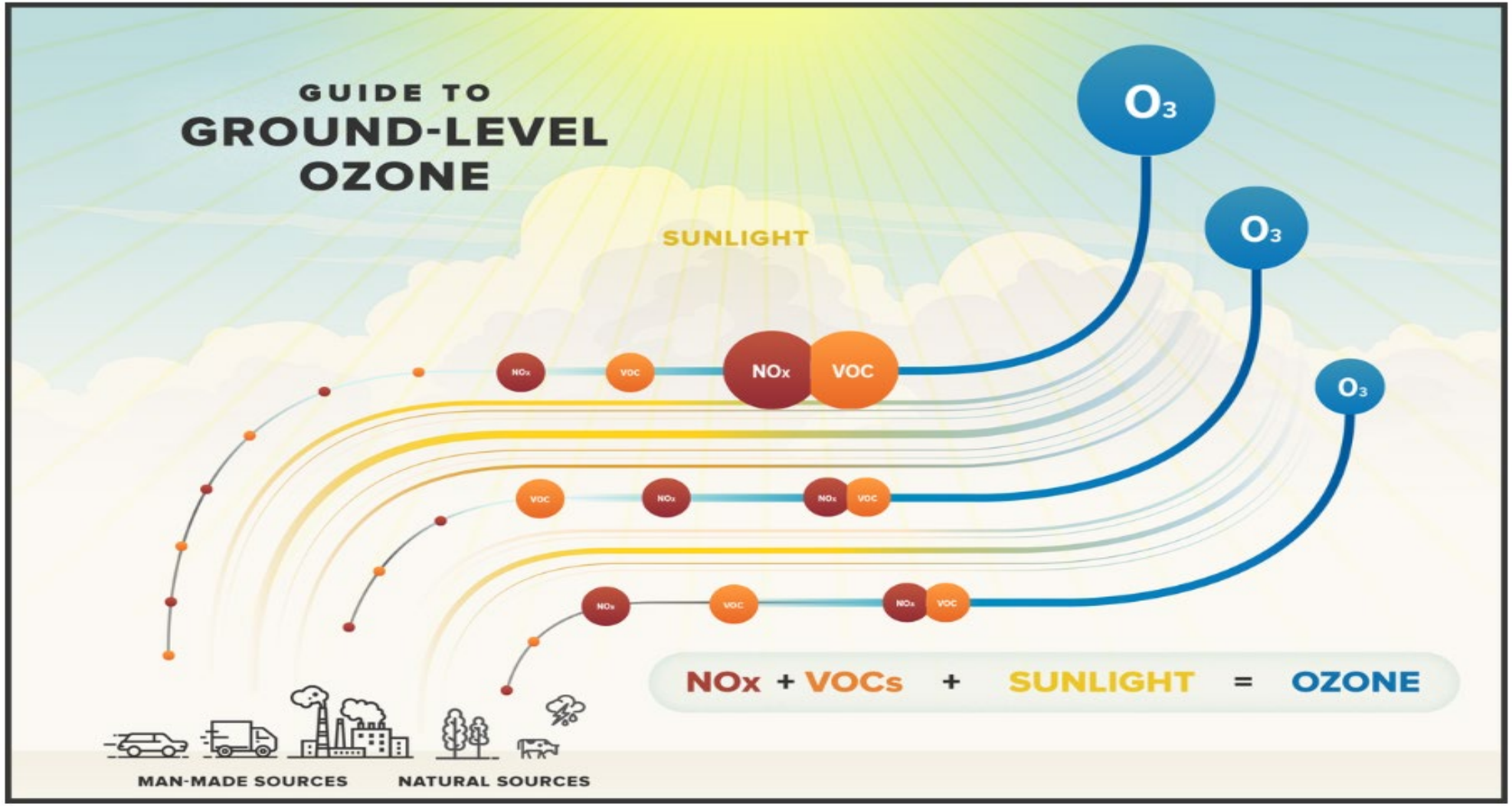
From NOAA Chemical Sciences Laboratory

Ozone Formation

- Ozone is a secondary, photochemically-formed pollutant driven by NOx, Volatile Organic Compounds (VOCs), heat, and ultraviolet light.

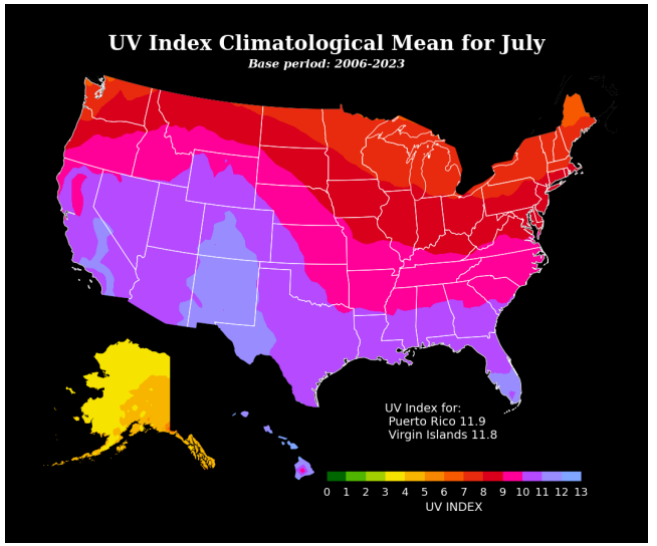


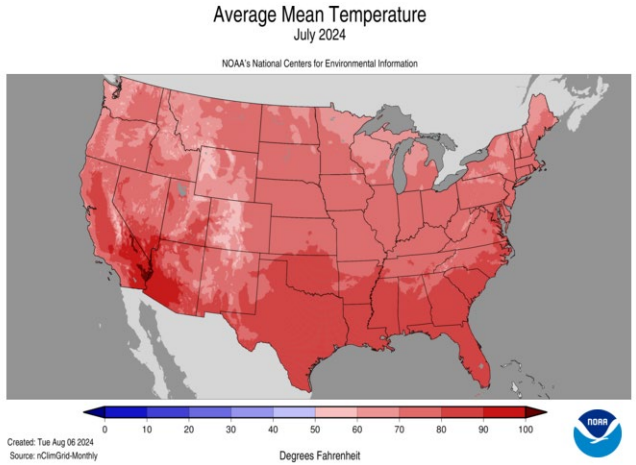
Ozone Formation



Where does ozone originate?

- Albuquerque meets requisite conditions for ozone formation.
  - High UV, high temperatures, NO_X from urban fossil fuel combustion are all present.
- Albuquerque receives ozone from other regional sources, including urban corridors (Phoenix, Denver) and wildfires.
  - O_3 residence time fluctuates seasonally, generally lasting a few weeks in summer- ample time for atmospheric transport.





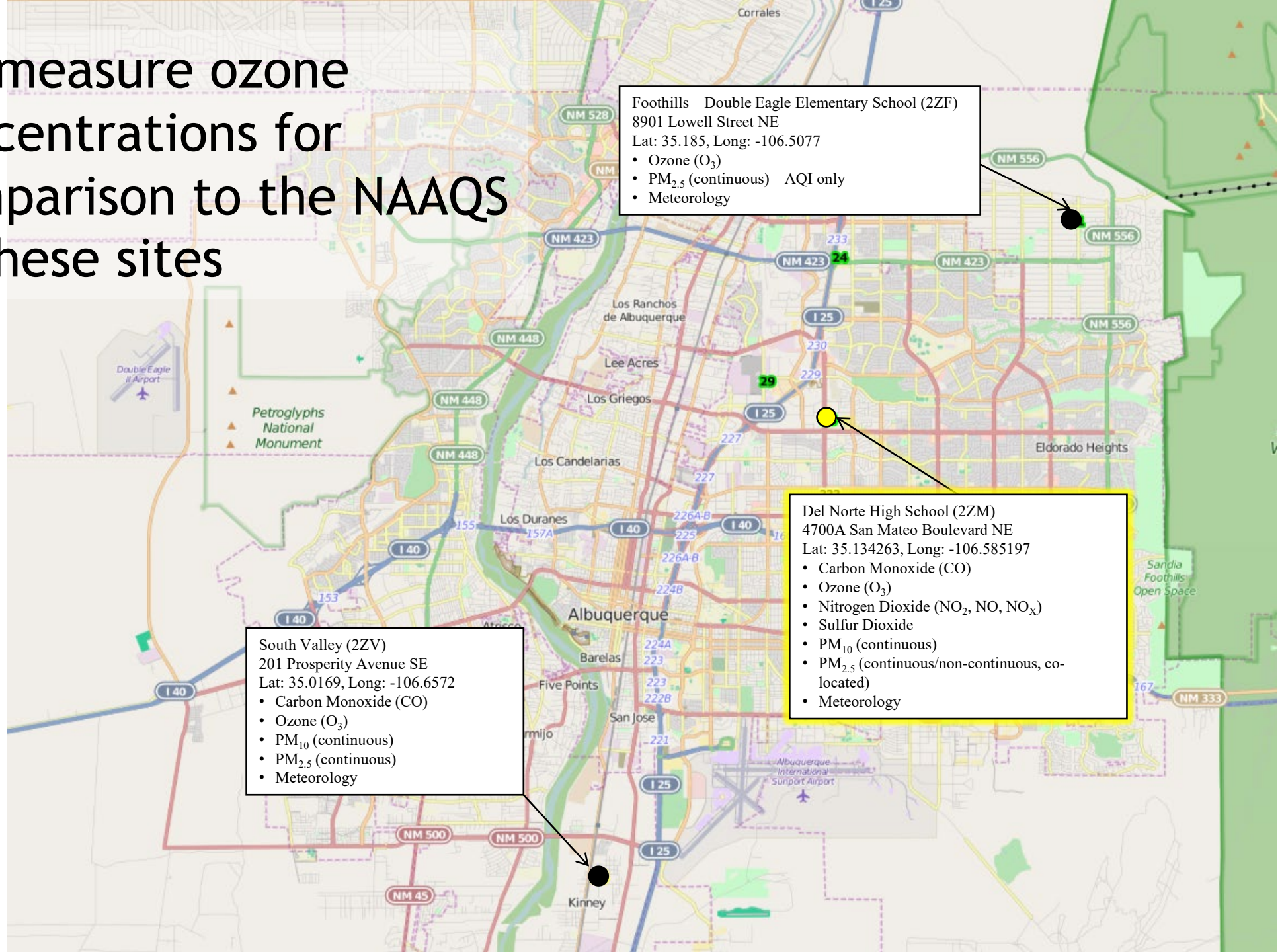
What is the National Ambient Air Quality Standard (NAAQS) for ozone?

- The Clean Air Act requires EPA to set NAAQS for ozone. The Clean Air Act established two types of NAAQS for ozone:
  - Primary standards define levels of air quality which the Administrator judges are necessary, with an adequate margin of safety, to protect public health (**currently at 0.070 parts per million for ozone**); and
  - Secondary standards define levels of air quality which the Administrator judges necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant (**currently at 0.070 ppm for ozone**).
- Ozone standards are based on 8-hour averages
  - (00:00 – 08:00, 01:00 – 09:00,…, 15:00 – 23:00)

How do we measure ozone?

- AQP uses UV absorption analyzers to monitor ozone concentrations in ambient air
- Analyzers make multiple measurements per minute
  - Measurements are aggregated to 1-min and 1-hour intervals
  - AQP reports 1-hour data to EPA Air Quality System (AQS)
    - AirNow.gov uses this data to provide hourly air quality index values
- To ensure compliance with EPA performance regulations, ozone analyzers undergo:
  - weekly quality control (QC) checks
  - Annual quality assurance (QA) performance evaluation audits
  - Periodic performance evaluation audits by EPA

We measure ozone concentrations for comparison to the NAAQS at these sites



What is the ozone design value?

- The EPA ozone design value (DV) is the metric (i.e., statistic) that is used to compare ambient ozone concentration data measured at a site to the NAAQS.
- All DV calculations are implemented on a site-level basis.

2ZM – Del Norte

2ZF – Foothills

2ZV – South Valley

How are ozone DVs calculated?

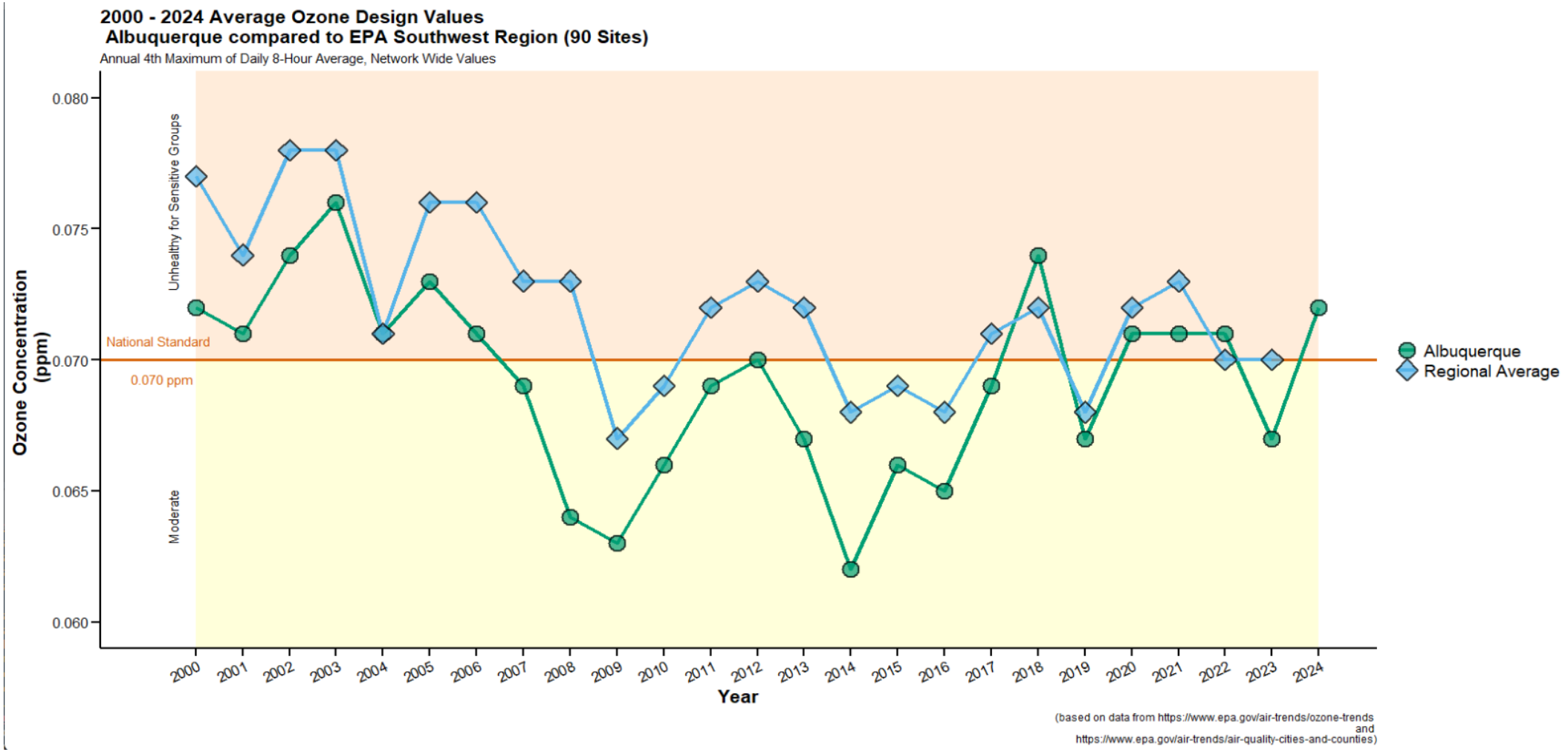
- The DV for a calendar year depends on the data collected from that year and the previous three (3) years
  - In each of the three years, the 4th highest 8-hour average [O_3] value is selected.
  - These three selected values are averaged to generate the DV.
- The highest DV from any site in the ambient air monitoring network is designated as the official DV for the network.
- DVs are calculated by the EPA and released in succeeding years (*i.e.*, the 2025 DV will be, but has not yet been, released in 2026).

Albuquerque – Bernalillo County's most recent ozone DV

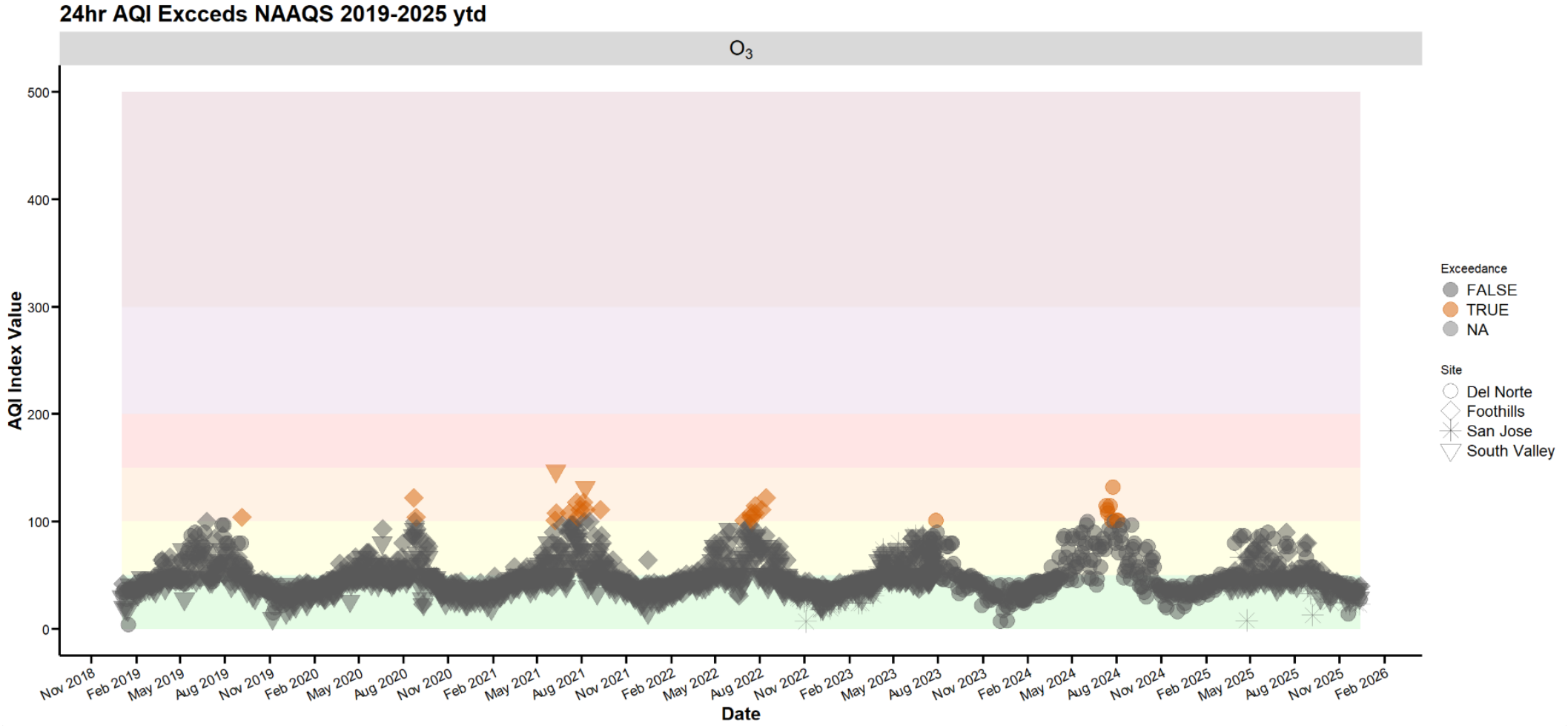
Ozone Design Value by site, parts per million (ppm)

Site Name AQS #	2022 4th highest 8-hr avg. (ppm)	2023 4th highest 8-hr avg. (ppm)	2024 4th highest 8-hr avg. (ppm)	3-year DV (ppm)
Del Norte 35-001-0023	0.070	0.069	0.076	0.071
Foothills 35-001-1012	0.074	0.066	0.076	0.072
South Valley 35-001-0029	0.068	0.063	0.066	0.065

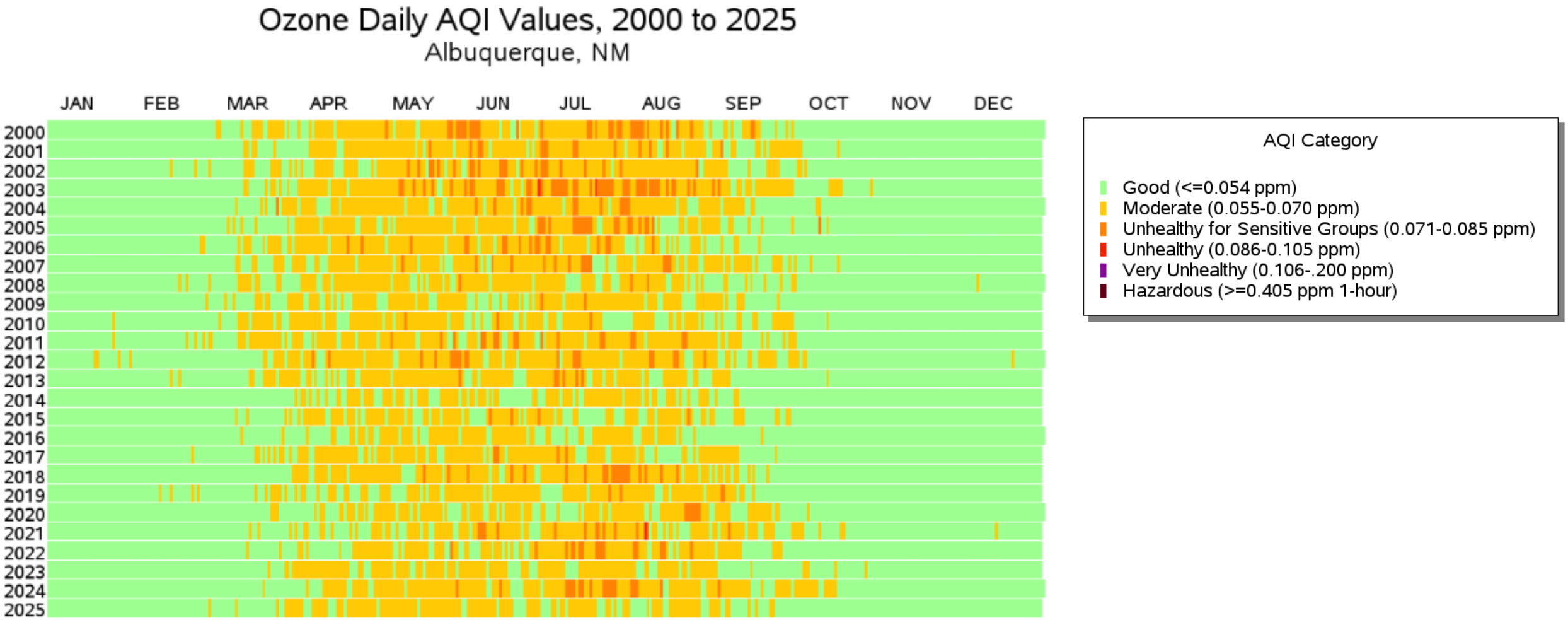
Albuquerque – Bernalillo County's historical ozone DVs



Albuquerque – Bernalillo County's historical ozone trends at current monitoring sites



Albuquerque – Bernalillo County's historical ozone trends



Thank you. Questions?