Technical Information Meeting

Houston-Galveston-Brazoria Eight-Hour Ozone Design Values

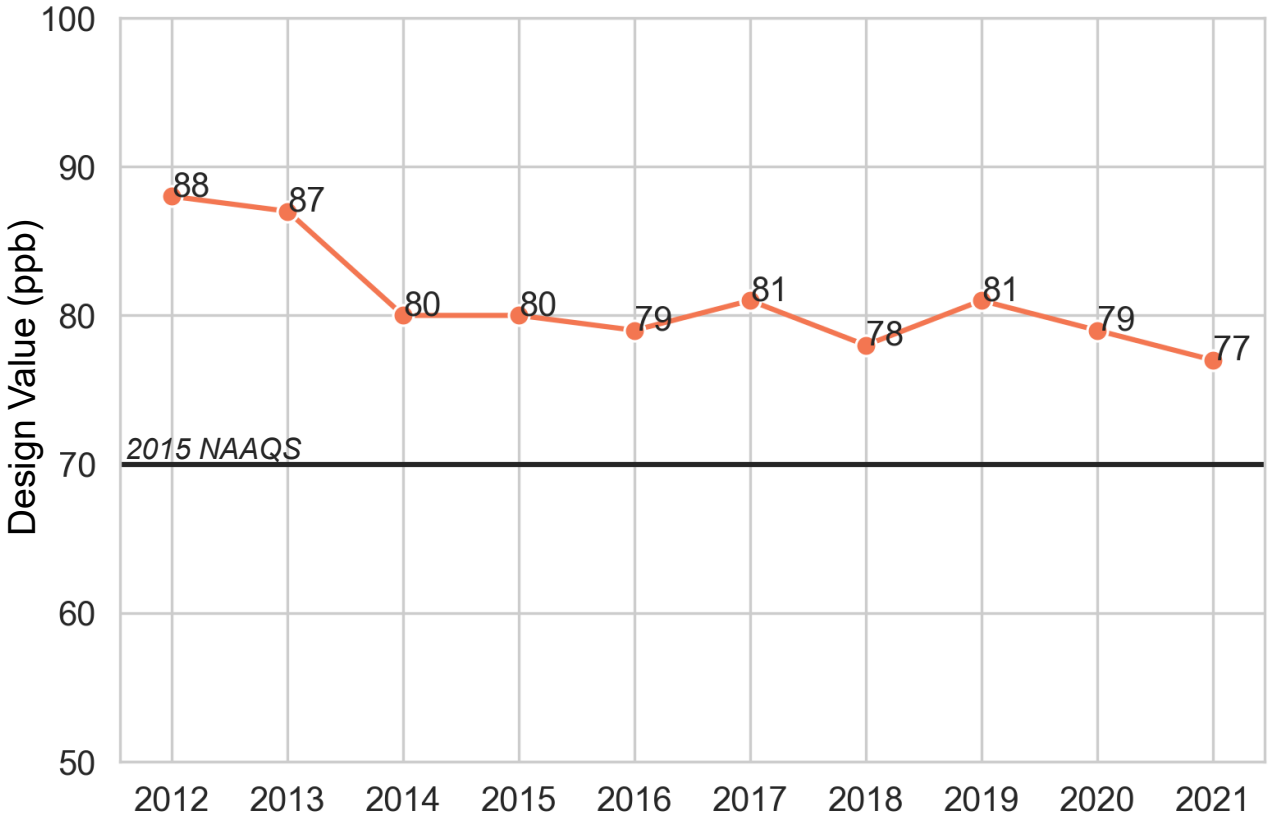
Emily Stashak

Outline

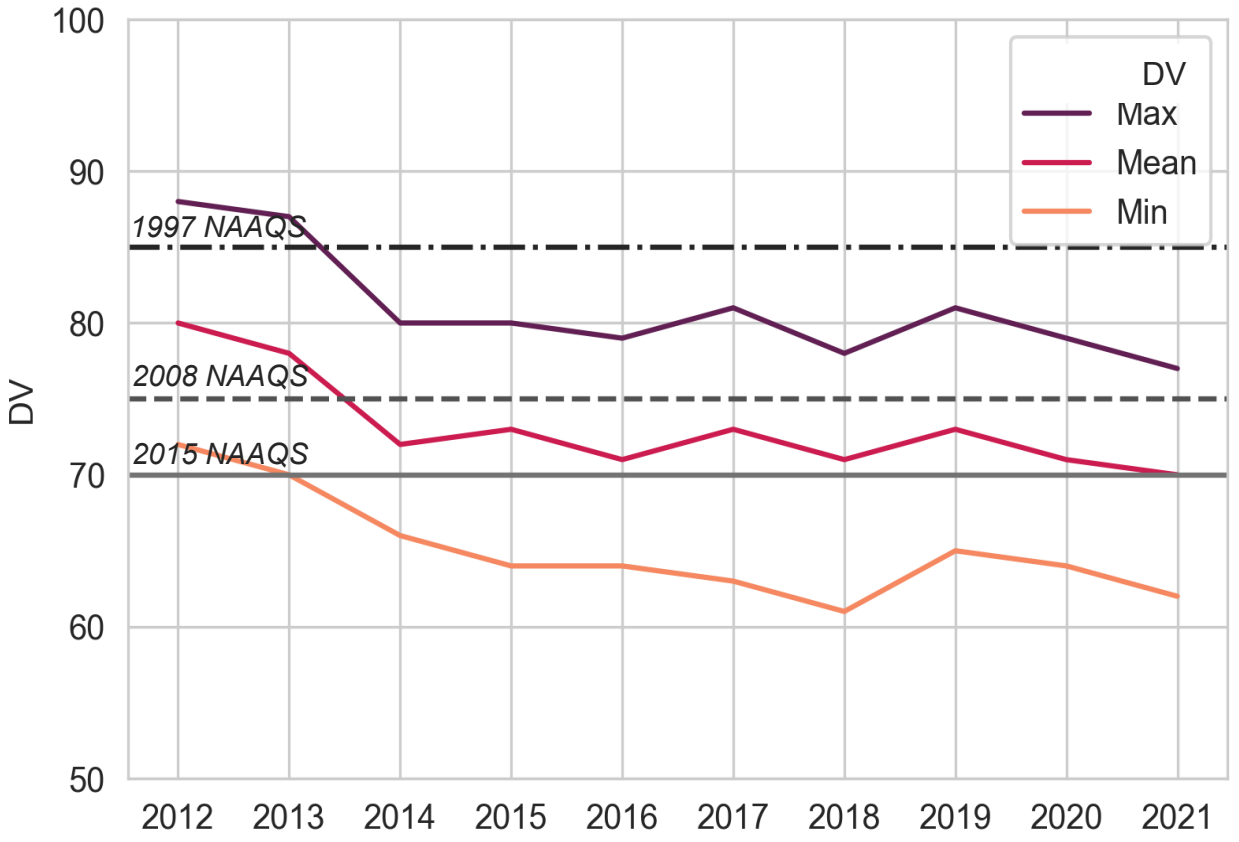
- Eight-Hour Ozone trends over the most recent decade with complete years of verified data (2012-2021).
- Displaying design value trends within the Houston-Galveston-Brazoria (HGB) area at large and at the individual monitor level by both month and year.
  - Exceedance Days
  - 4th Highest Eight-Hour Ozone Values
  - Background Ozone Estimates

Eight-Hour Design Value Trends

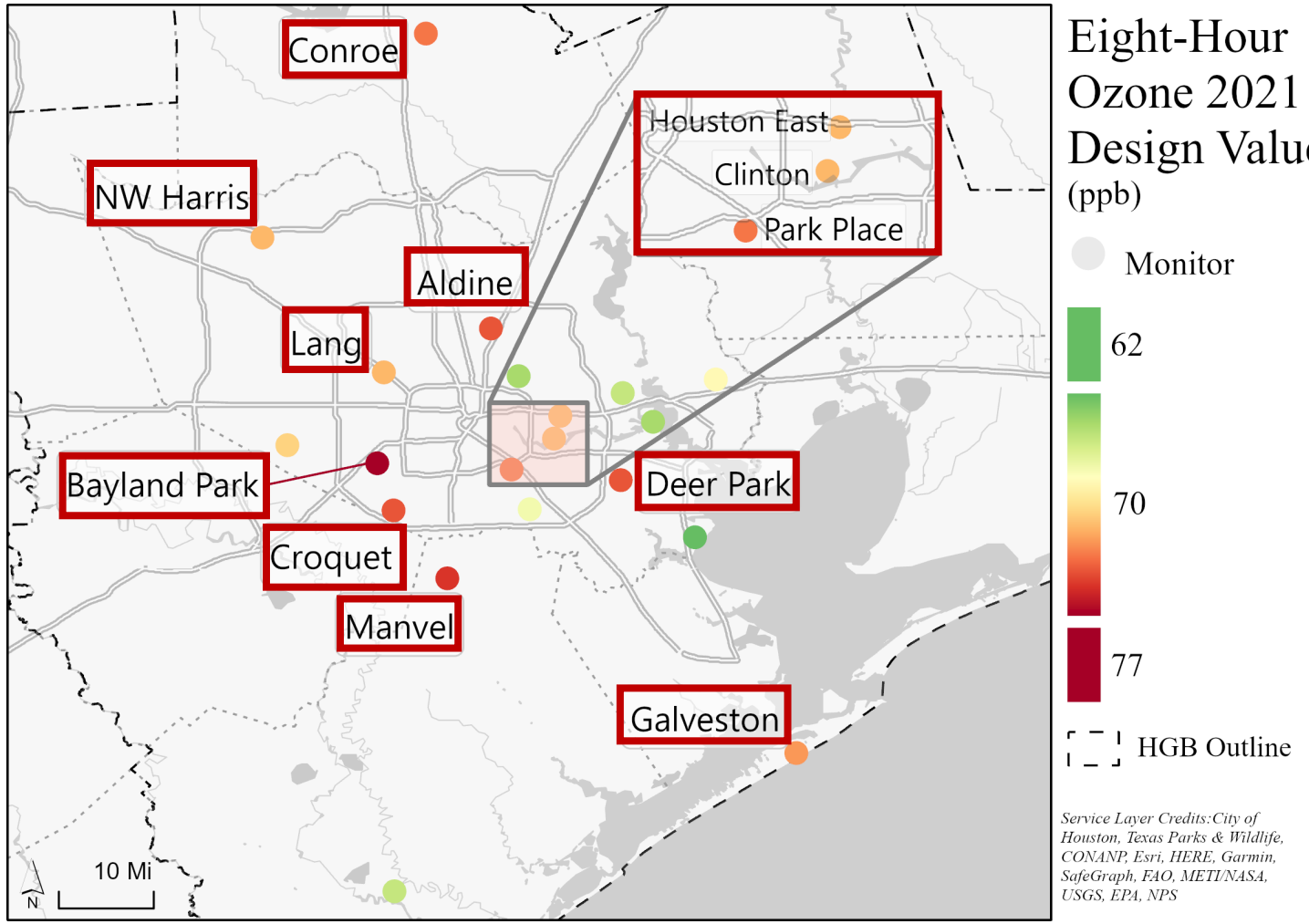
HGB Area Design Values



HGB Monitor Design Value Trends



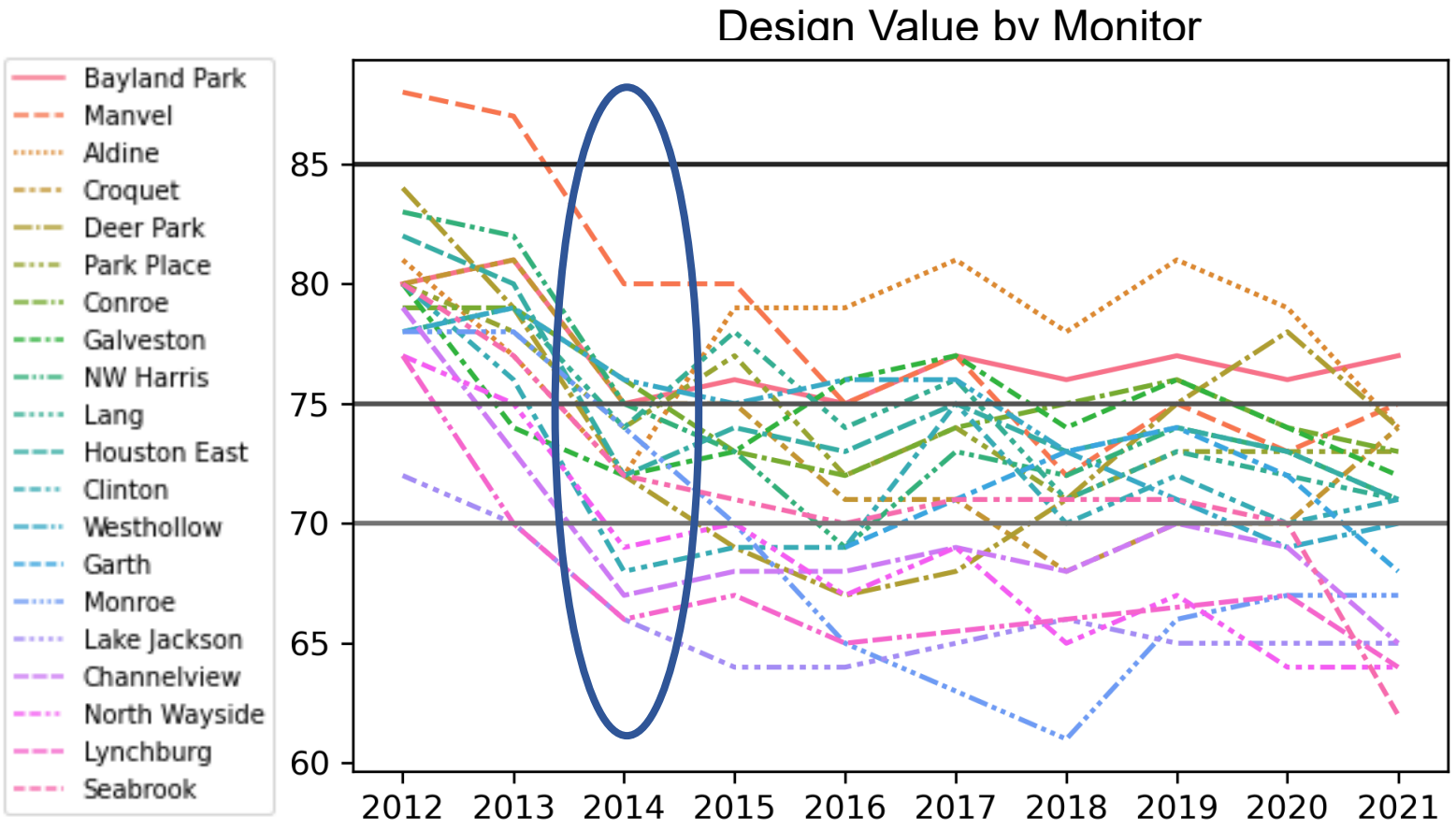
2021 Eight-Hour Design Value Trends by Monitor



Labels generated for monitors with DVs exceeding 70 ppb

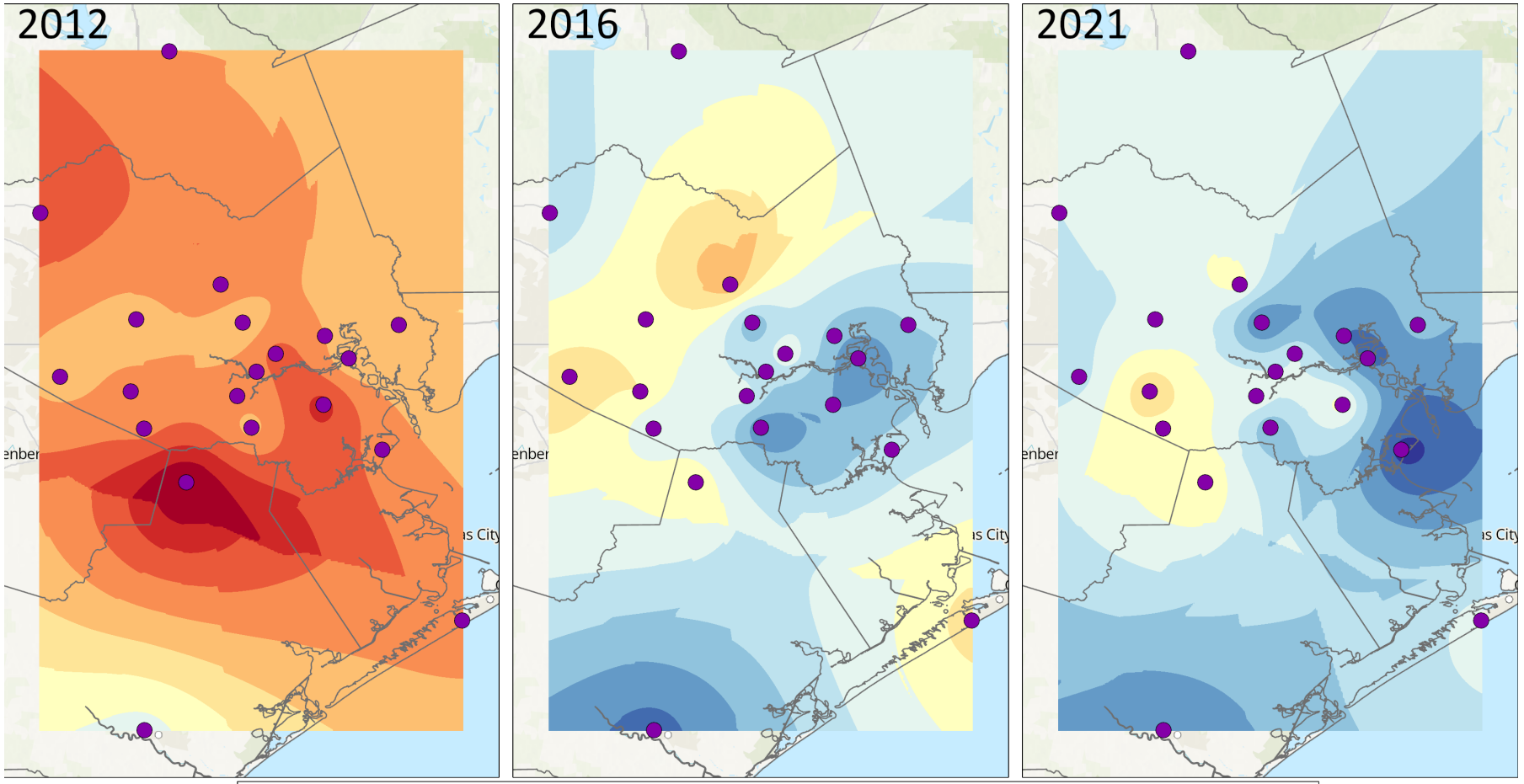
NAAQS Exceedances	Number of Monitors	Percentage of Monitors
Exceeds 1997 – 85 ppb	0	0%
Exceeds *2008 – 75 ppb*	1	5%
Exceeds *2015 – 70 ppb*	11	58%
Meets *2015 – 70 ppb*	8	37%

Eight-Hour Ozone DV Monitor Trends



Site Name	% Change 2012 to 2021
Bayland Park	-4%
Manvel	-15%
Aldine	-9%
Croquet	-8%
Deer Park	-12%
Park Place	-9%
Conroe	-8%
Galveston	-10%
NW Harris	-14%
Lang	-9%
Houston East	-13%
Clinton	-11%
Westhollow	-10%
Monroe	-14%
Lake Jackson	-10%
Channelview	-18%
North Wayside	-17%
Lynchburg	-17%
Seabrook	-23%

Eight-Hour Ozone Design Value Heat Maps



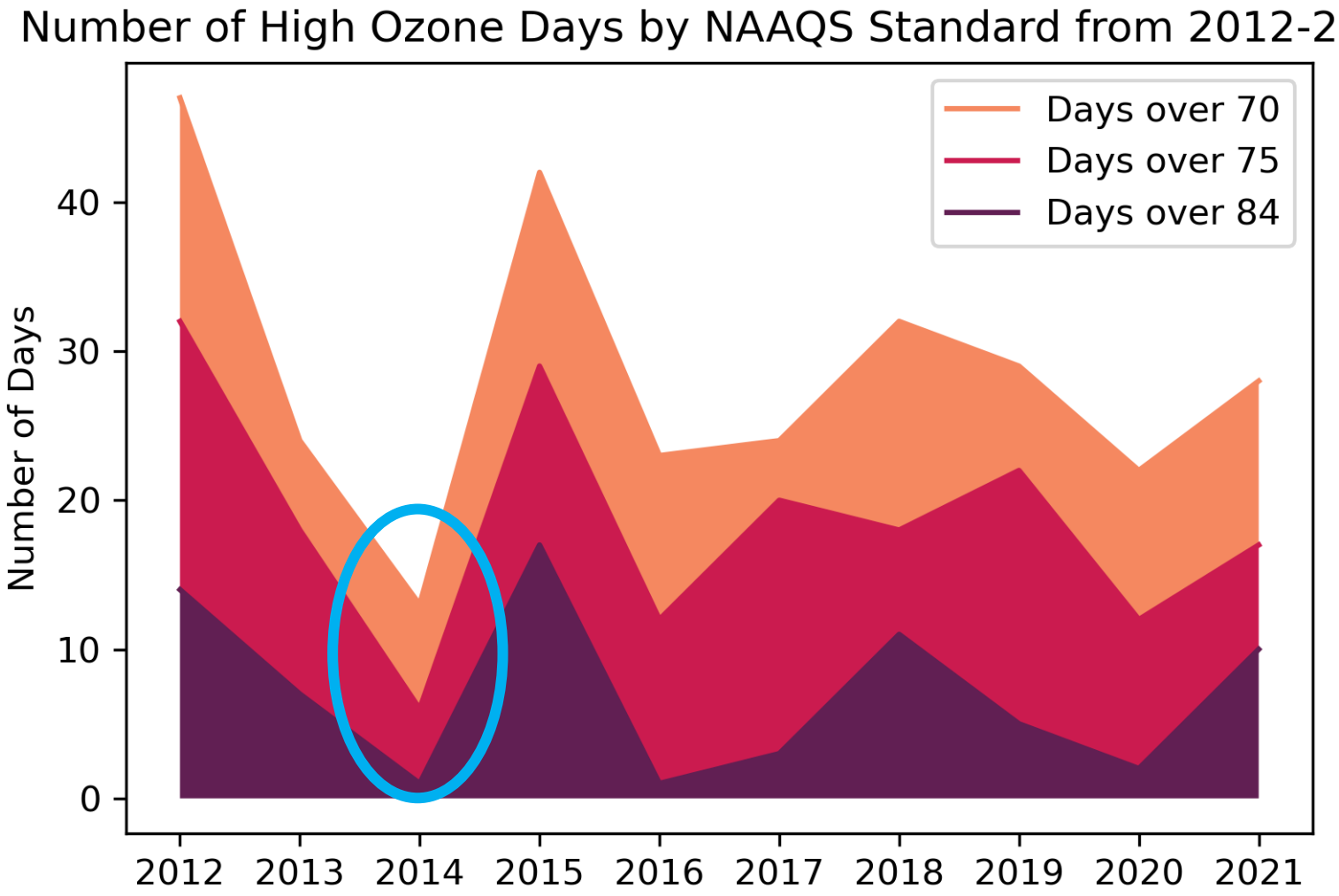
Eight-Hour Ozone Design Value (ppb)

- ≤ 63
- 63 - 65
- 65 - 67
- 67 - 69
- 69 - 71
- 71 - 73
- 73 - 75
- 75 - 77
- 77 - 79
- 79 - 81
- 81 - 83
- 83 - 85
- > 85

City of Houston, Texas Parks & Wildlife, CONANP, Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS, Esri, USGS

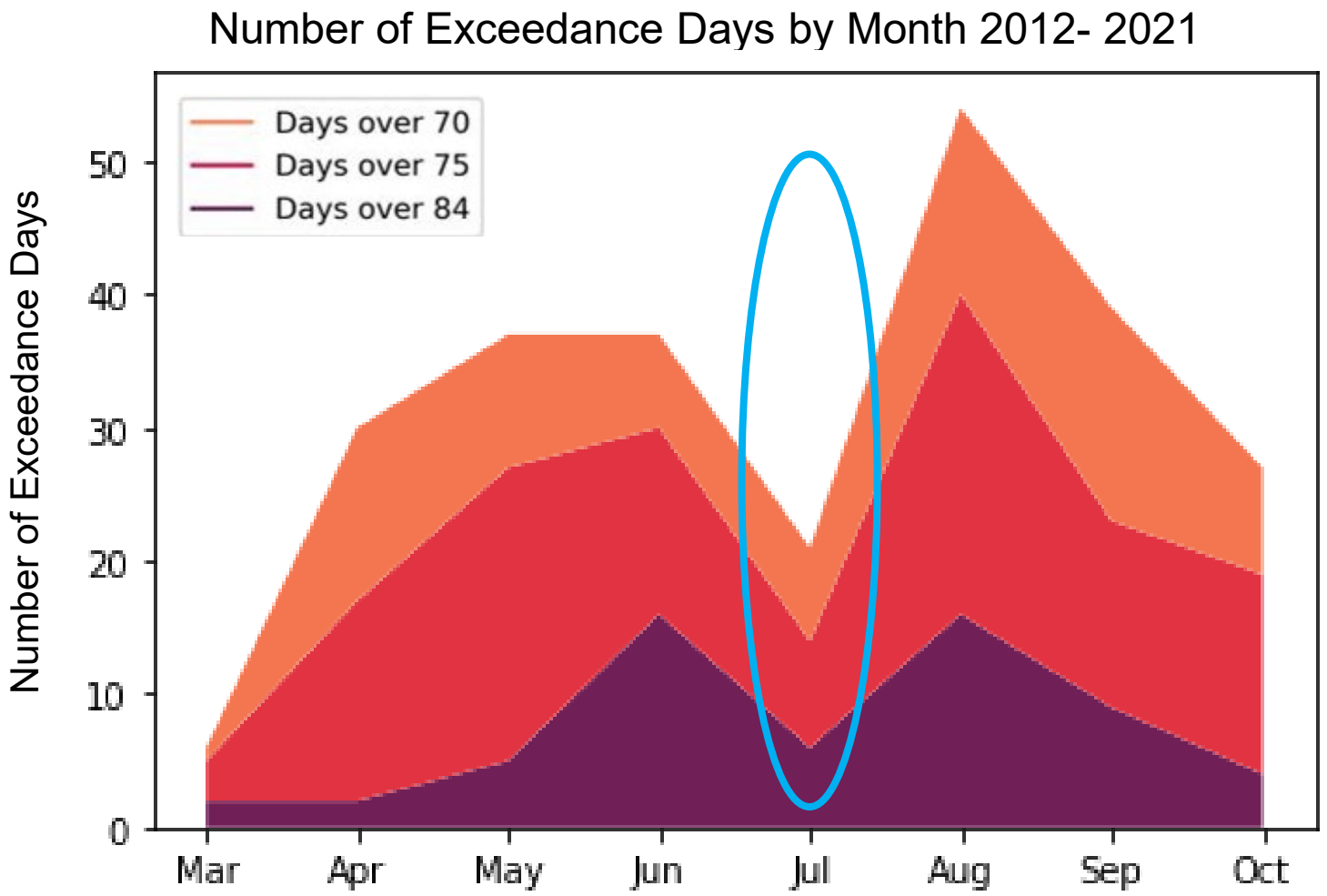
Ordinary kriging method applied to interpolate ozone DVs in areas without monitors utilizing three years of data per map generated.

Ozone Season Eight-Hour Ozone Exceedance Day Trends



NAAQS Standard	Percent Change 2012-2021
Days > 70	**- 40%**
Days > 75	**- 47%**
Days > 84	- 29%

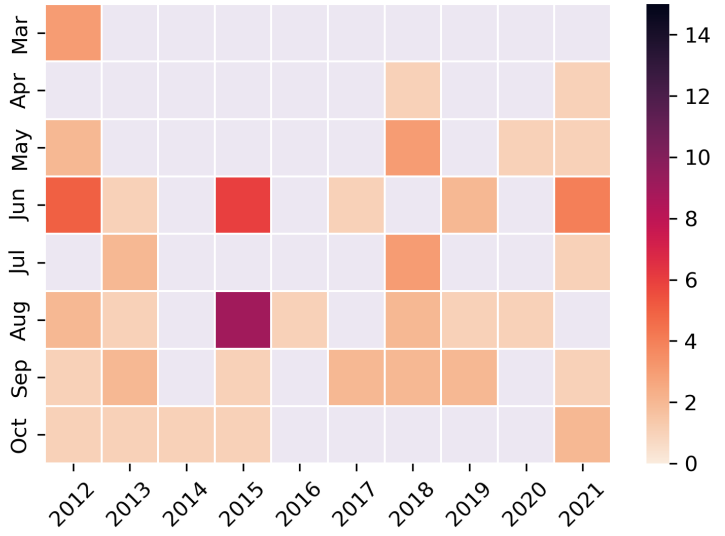
Ozone Season Eight-Hour Ozone Exceedance Day Trends



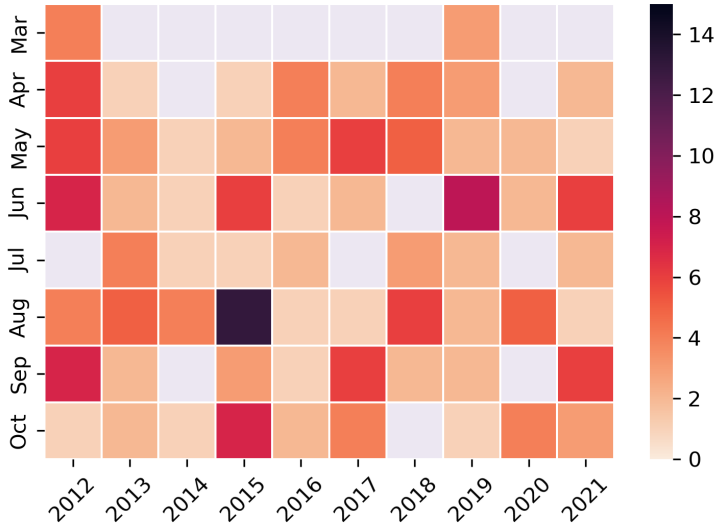
- The month of July typically has fewer exceedance days than other summer months. This is generally attributed to the impacts of a high-pressure system, the Bermuda High. The impacts of this system on local meteorology vary annually.

Ozone Season Eight-Hour Ozone Exceedance Heatmap Calendars

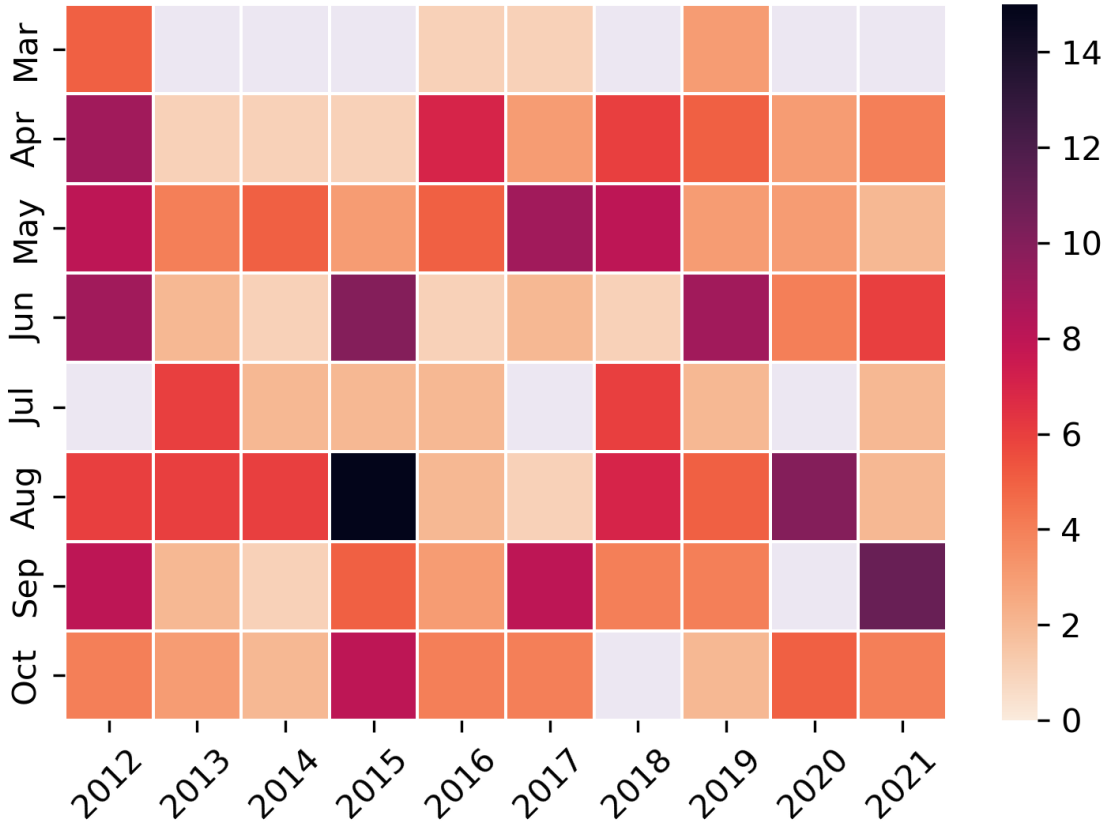
1997
NAAQS
85 ppb



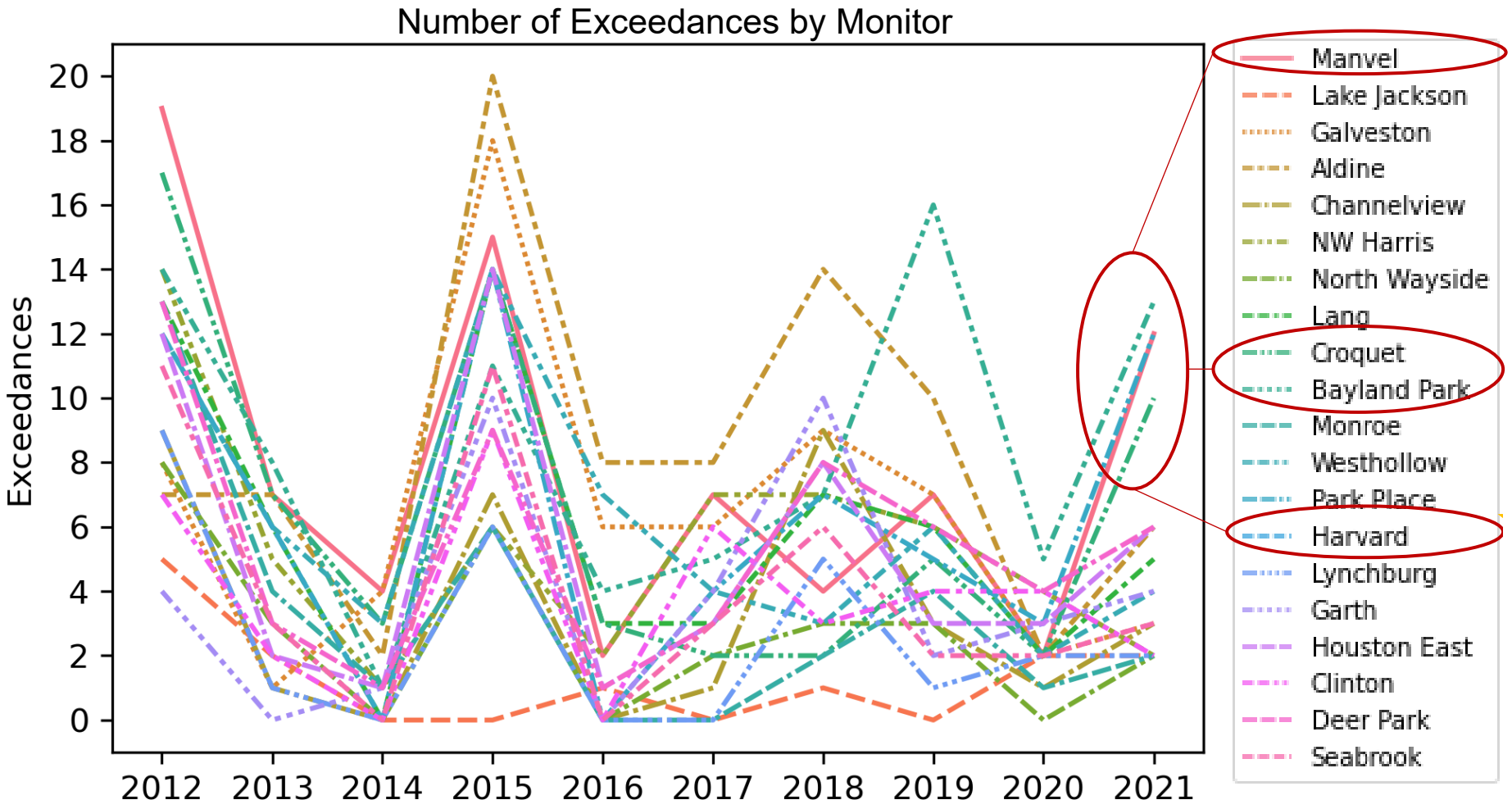
2008
NAAQS
75 ppb

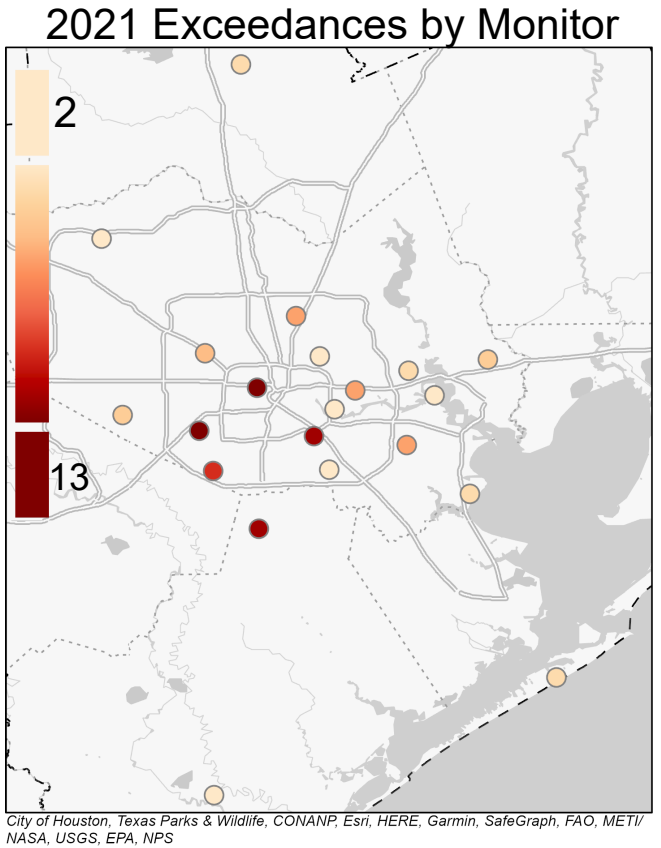


2015 NAAQS 70 ppb

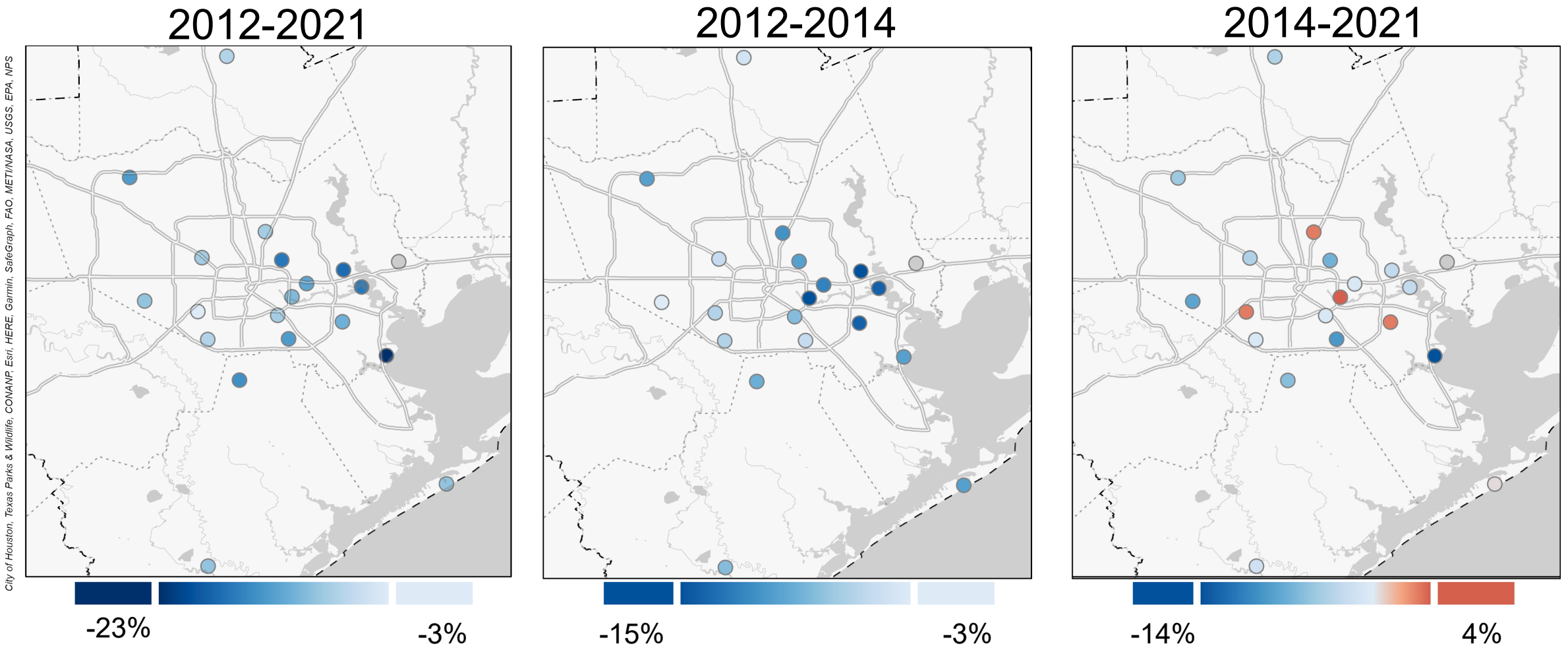


Eight-Hour Ozone Exceedance Days (70 ppb) by Monitor

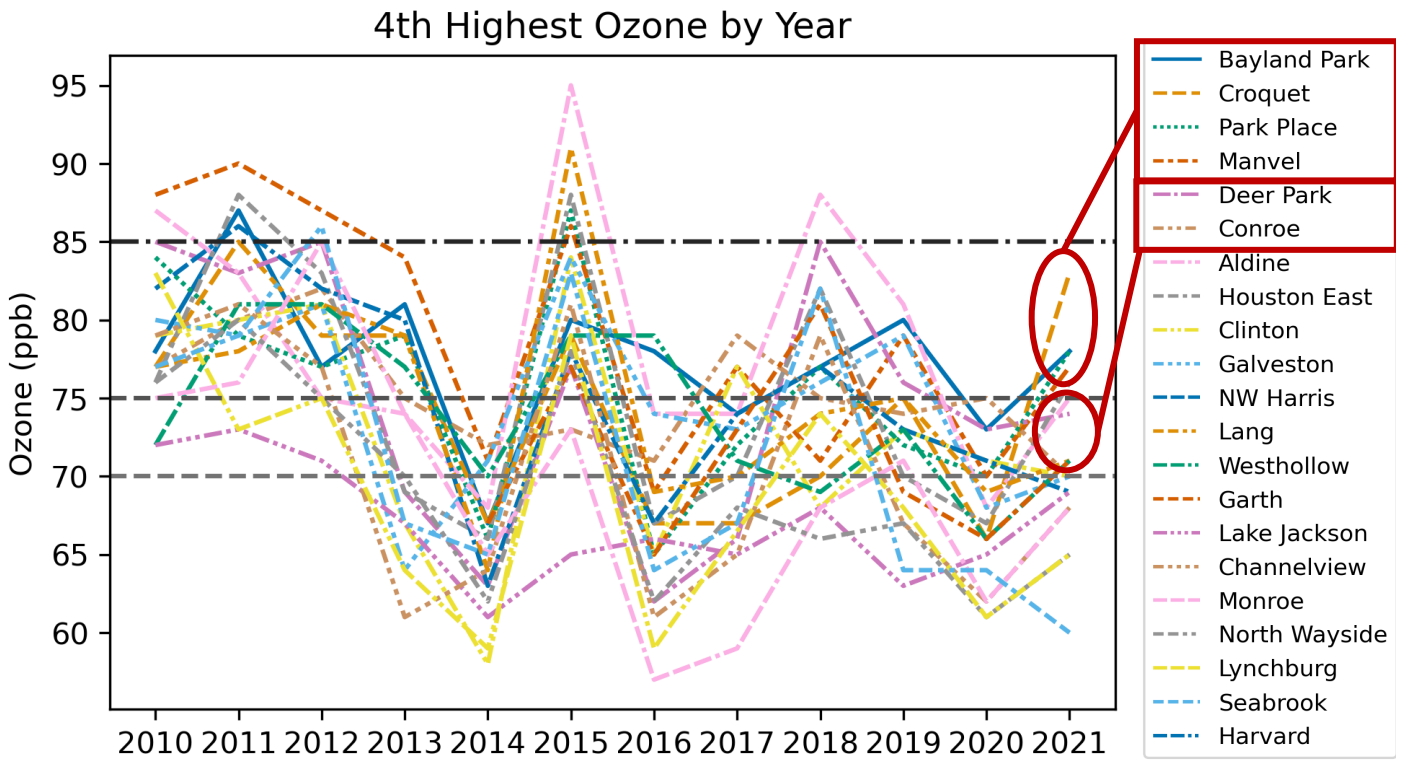


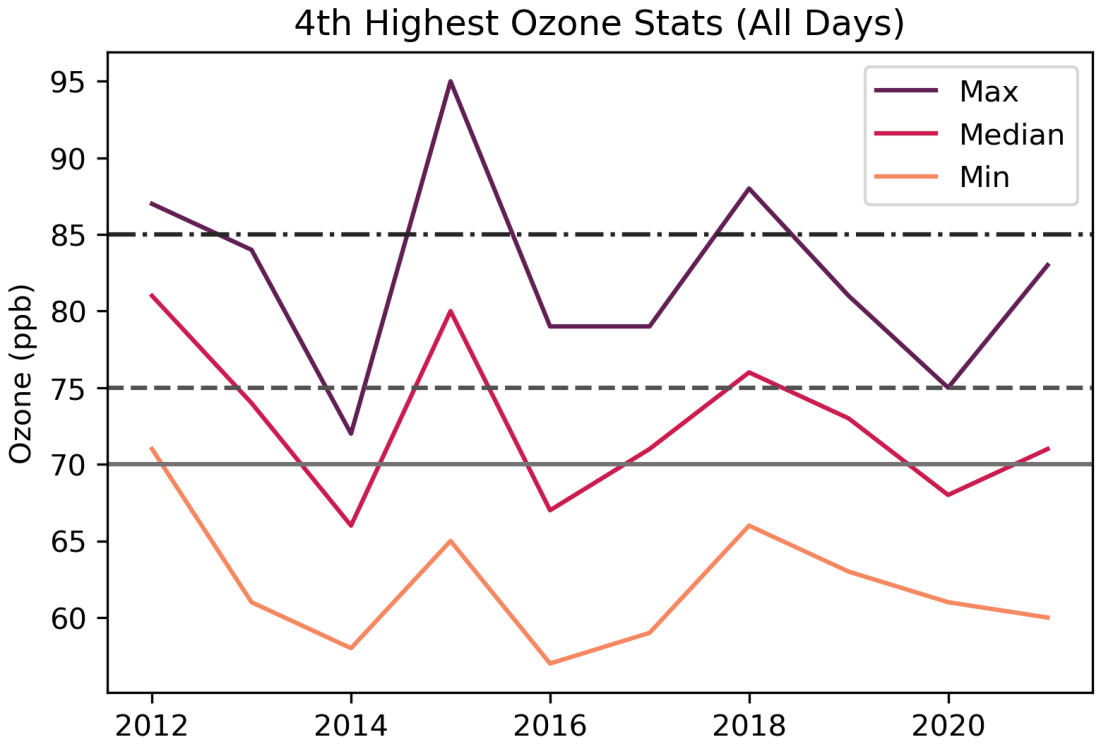


Percent Change of Exceedance Days by Monitor



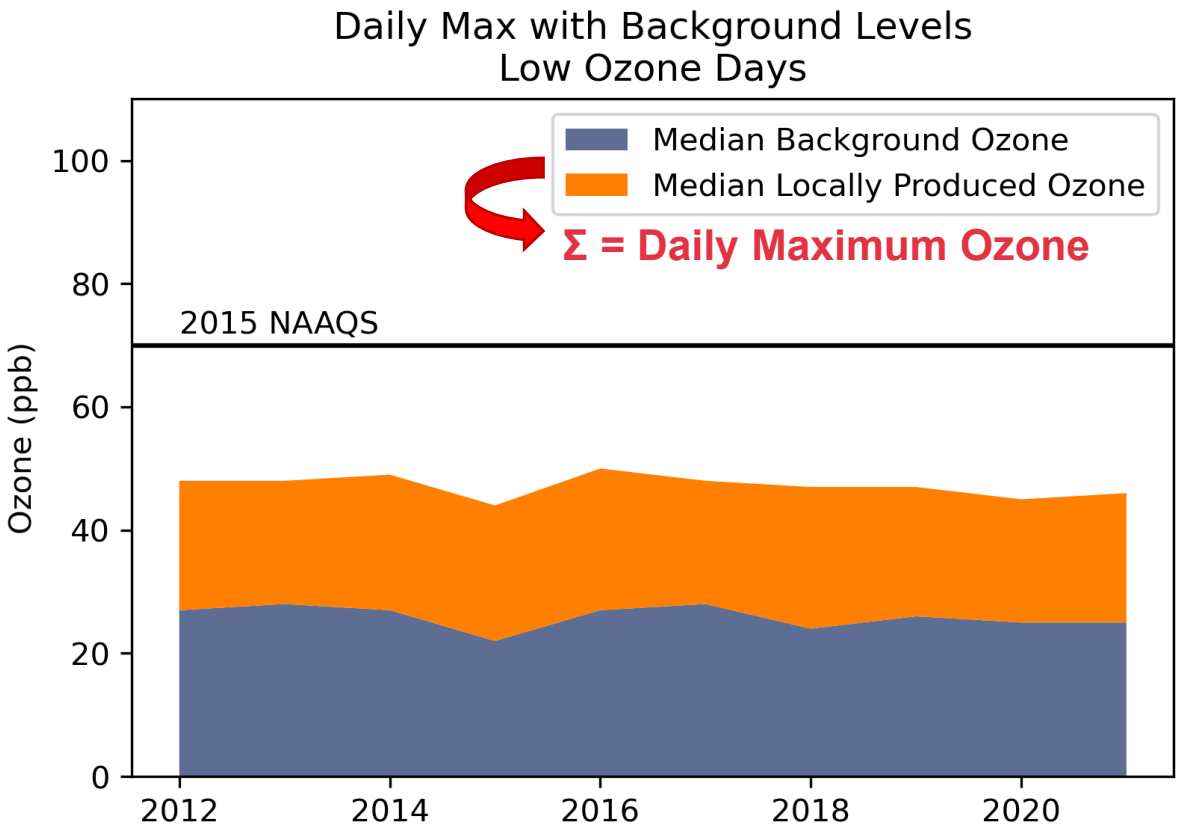
Eight-Hour Ozone 4th Highs



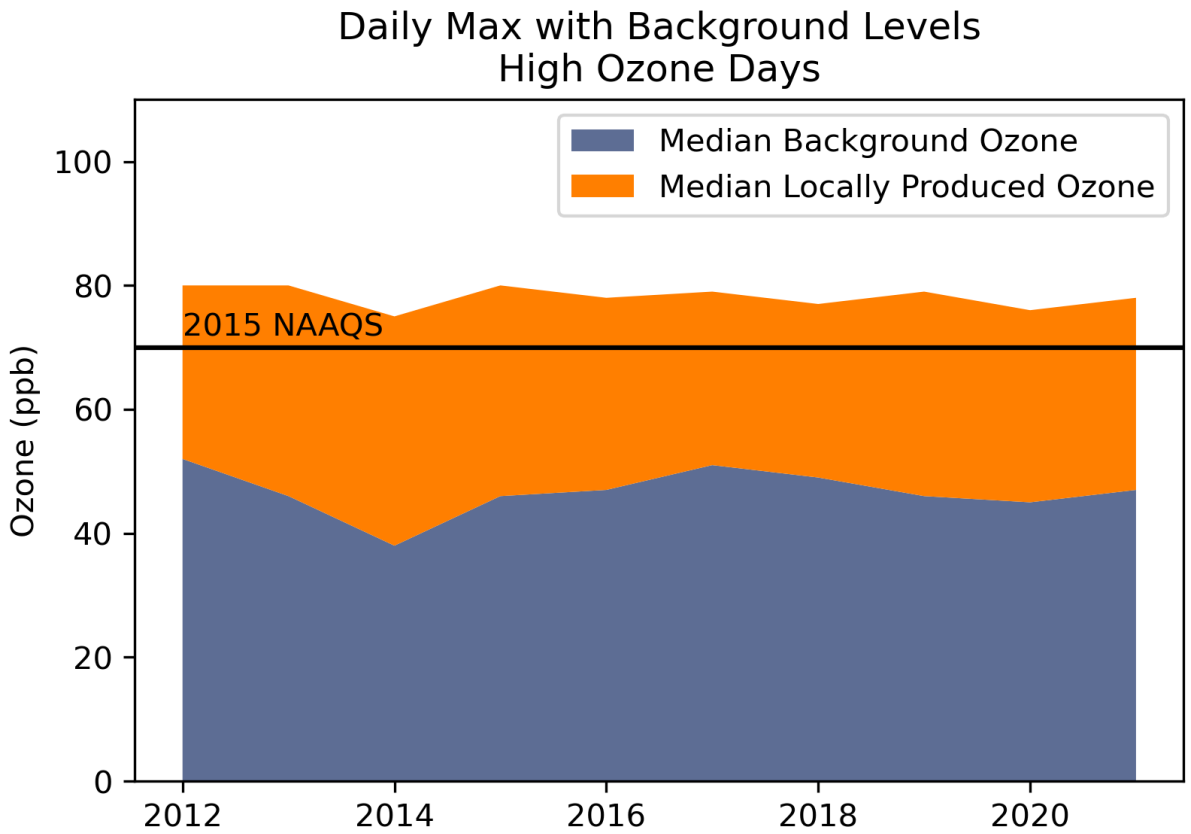


Ozone Season Background Ozone Comparison

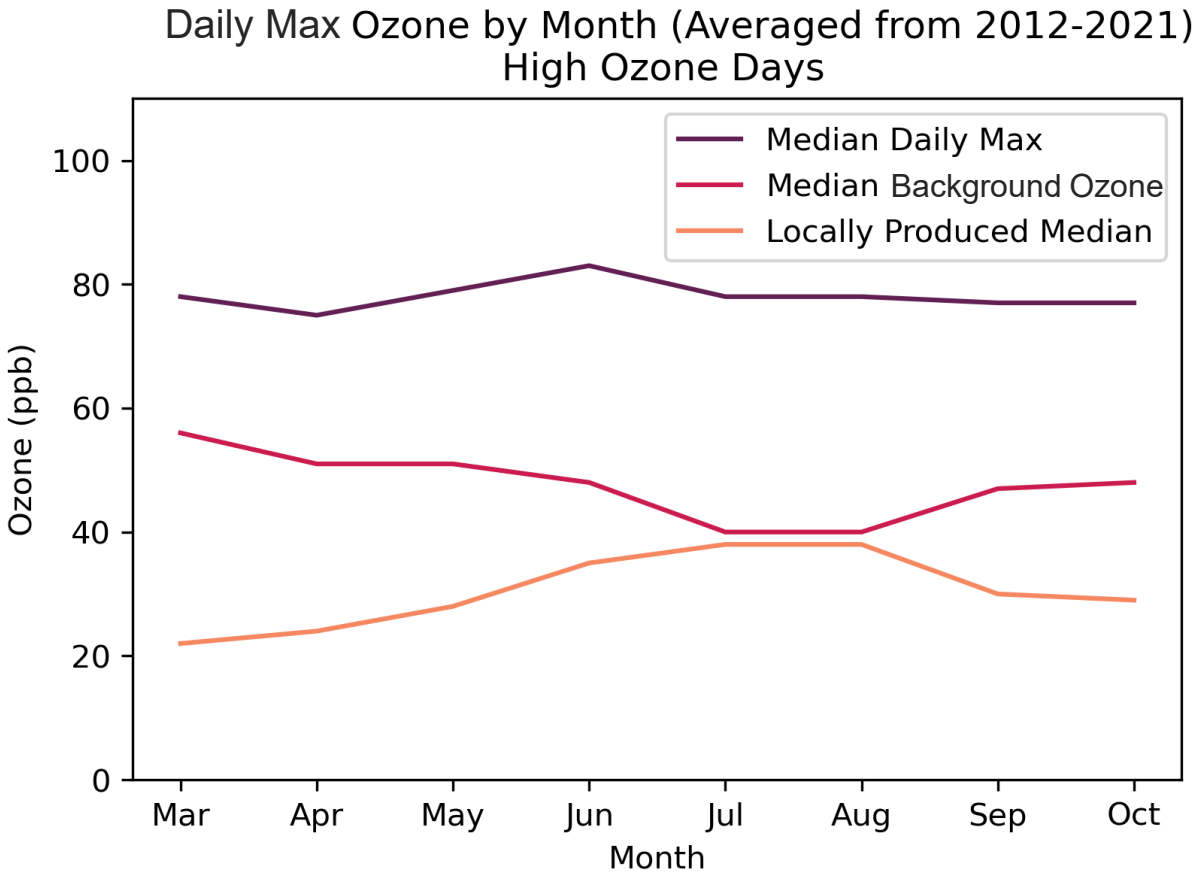
Low Ozone < 70 ppb

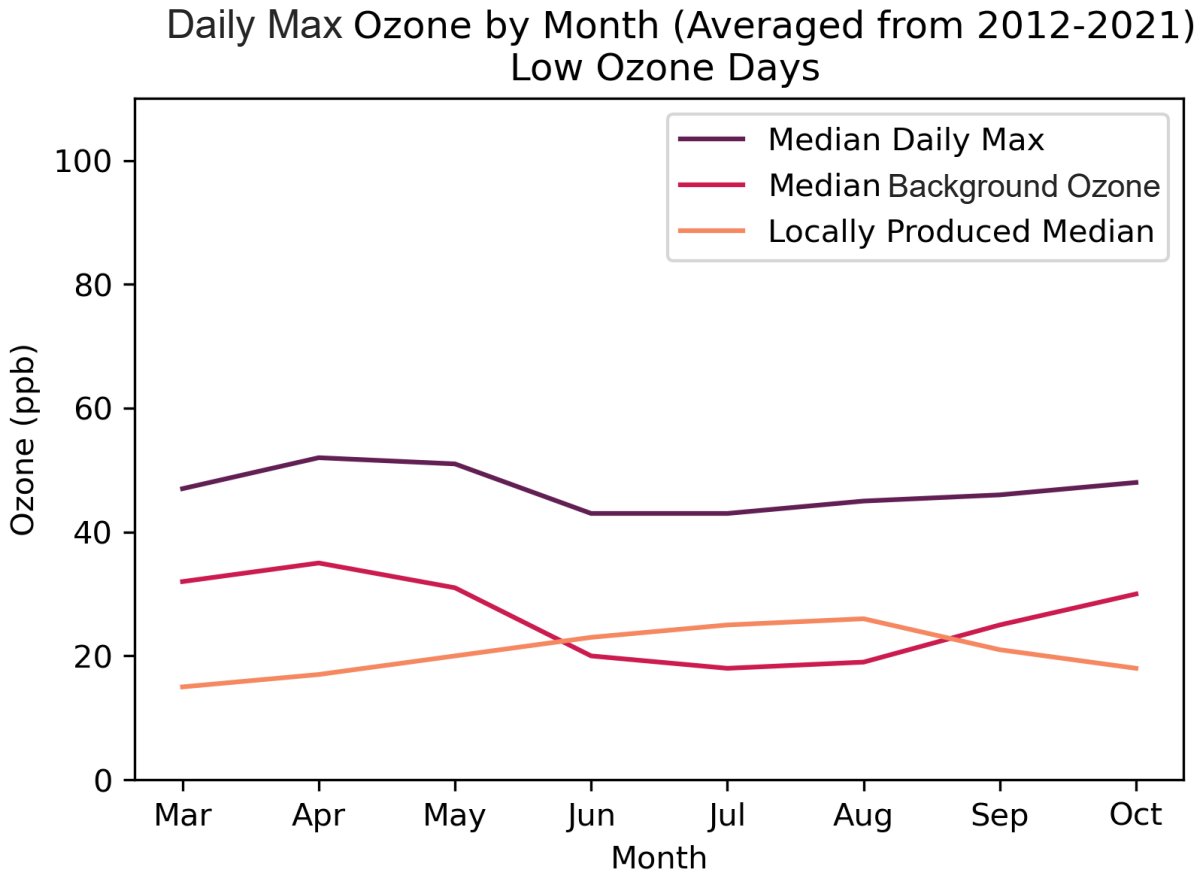


High Ozone ≥ 70 ppb



Daily Maximum Eight-Hour Ozone & Background Ozone Trends





Summary

- Design value trends from 2012-2021 have decreased.
- The largest percentage of the decrease in design value trends is concentrated between 2012-2014, as 2014 recorded the lowest number of exceedances compared to any other year.
- From 2014-2021 design values trends for the HGB area have not significantly increased or decreased.

Questions?

Emily Stashak

Office of Air – Air Quality Division – Air Modeling and Data Analysis

emily.stashak@tceq.texas.gov

512-239-0771

All data used to generate graphics for this presentation has been validated and was retrieved from the EPA Air Quality System in June 2022.
Available for public download at https://aqs.epa.gov/aqsweb/airdata/download_files.html#eighthour

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