Technical Information Meeting

Houston-Galveston-Brazoria
Eight-Hour Ozone Design Values

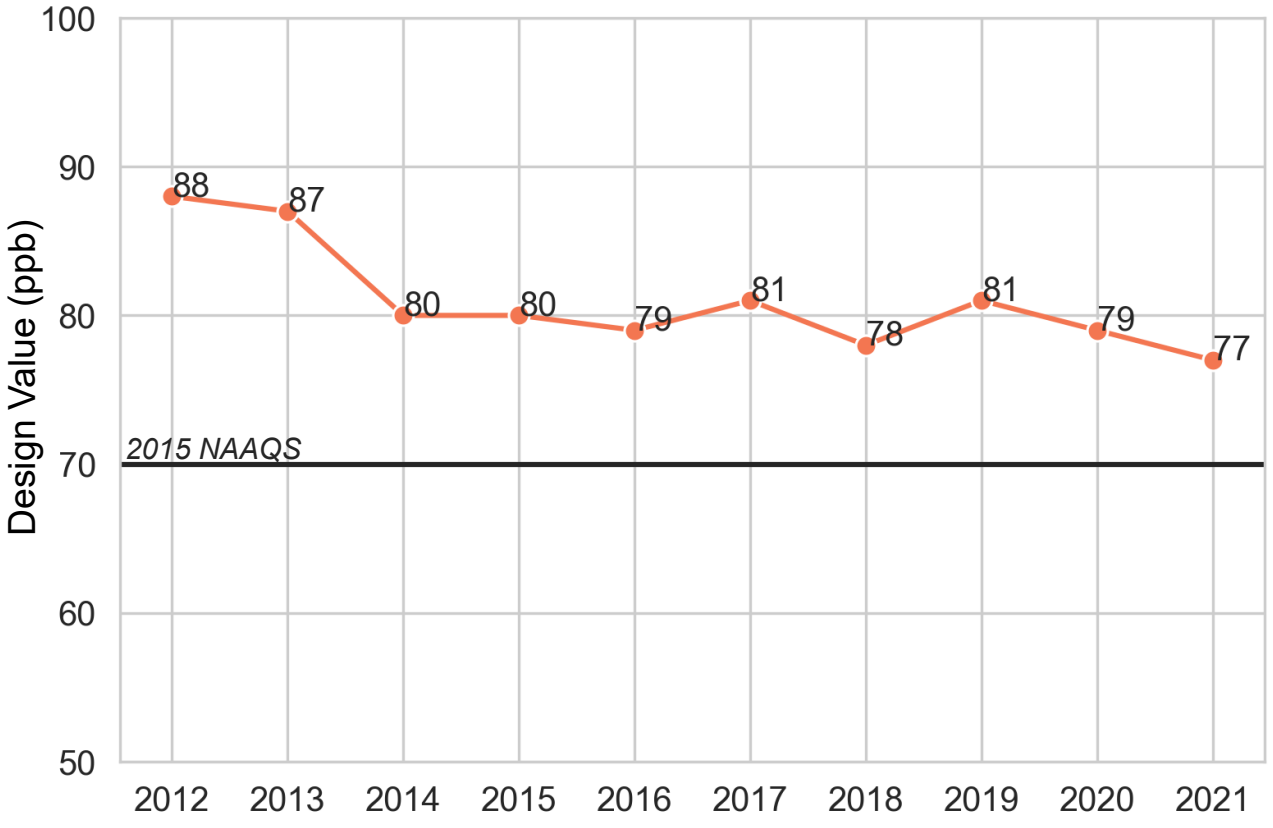
Emily Stashak

Outline

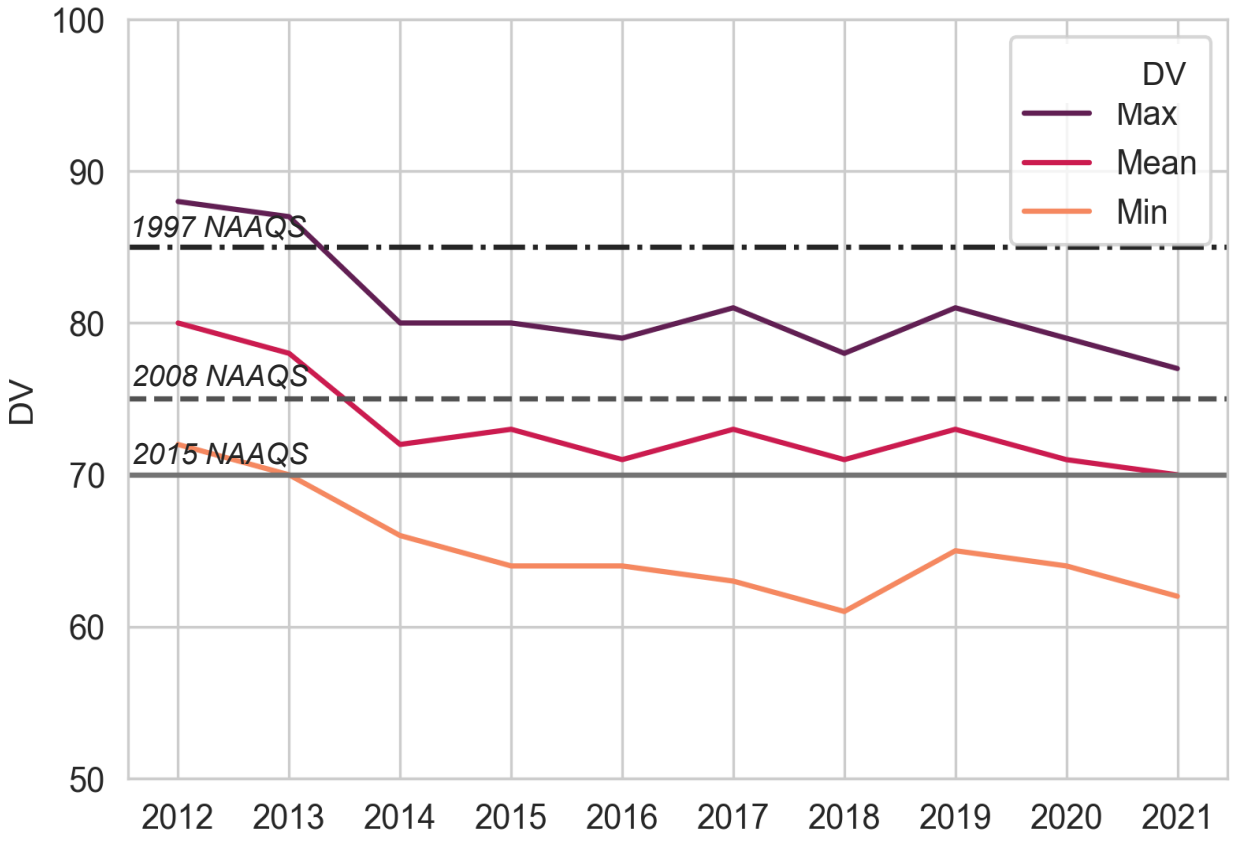
- Eight-Hour Ozone trends over the most recent decade with complete years of verified data (2012-2021).
- Displaying design value trends within the Houston-Galveston-Brazoria (HGB) area at large and at the individual monitor level by both month and year.
  - Exceedance Days
  - 4th Highest Eight-Hour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

Eight-Hour Design Value Trends

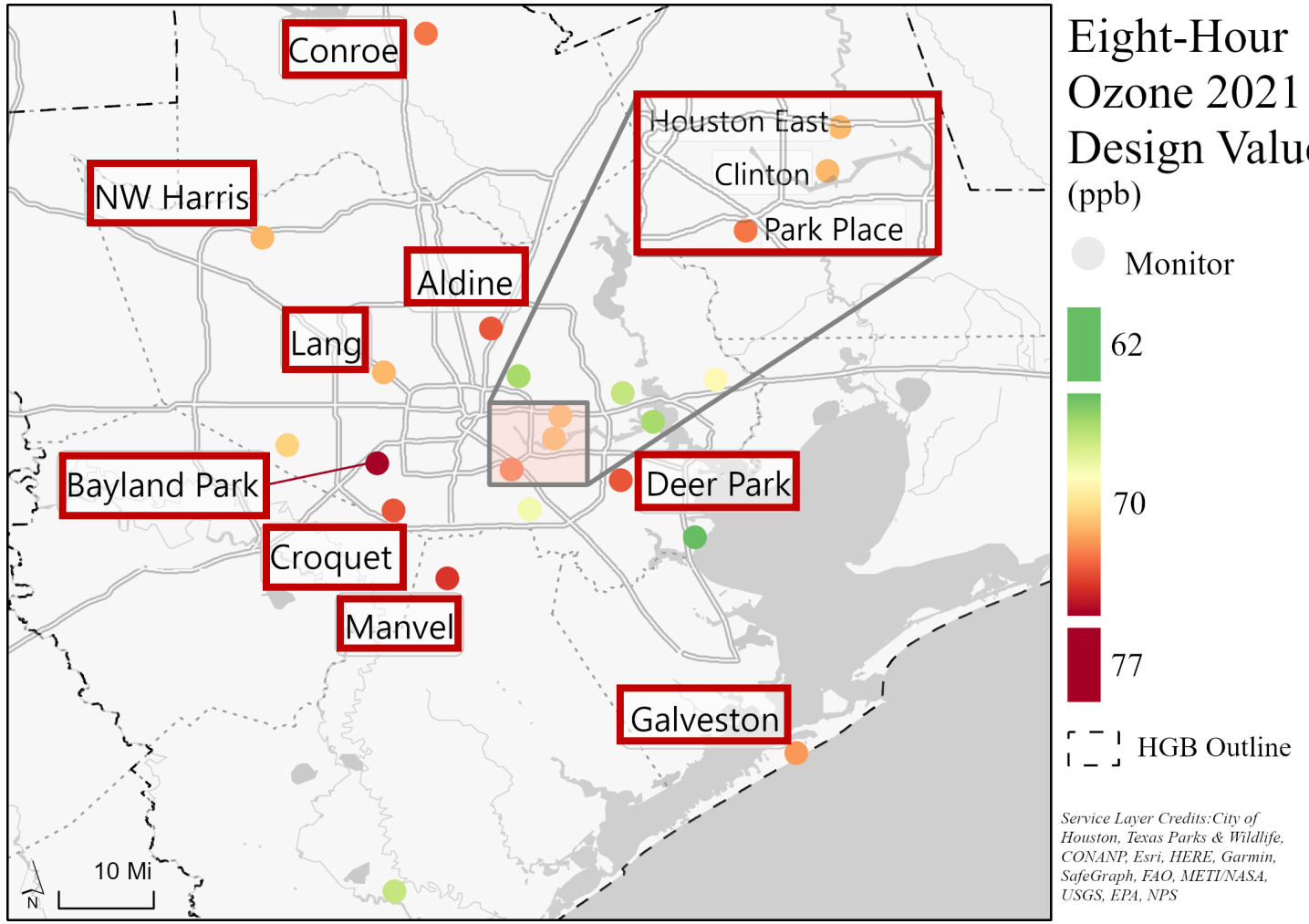
HGB Area Design Values



HGB Monitor Design Value Trends



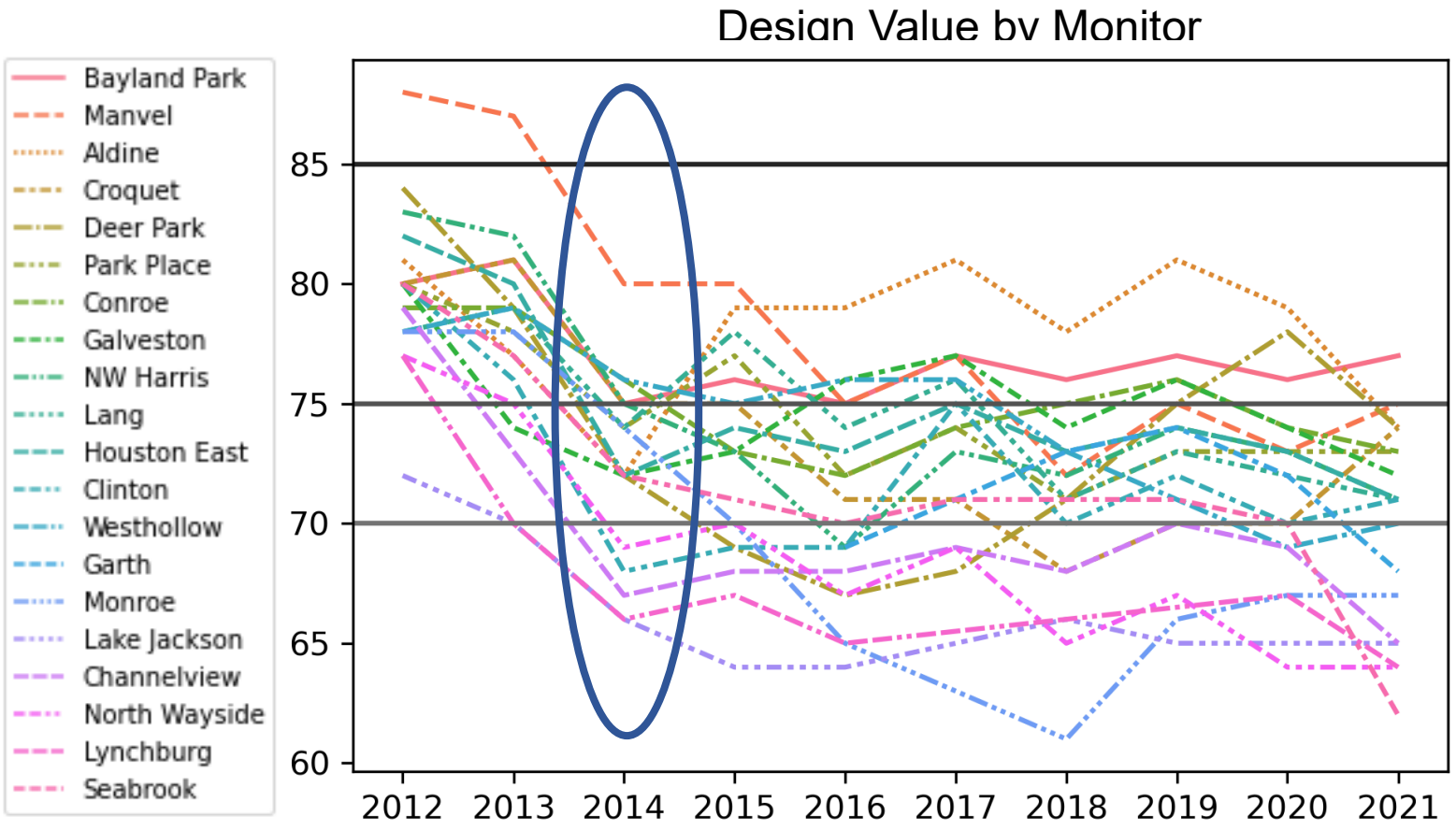
2021 Eight-Hour Design Value Trends by Monitor



Labels generated for monitors with DVs exceeding 70 ppb

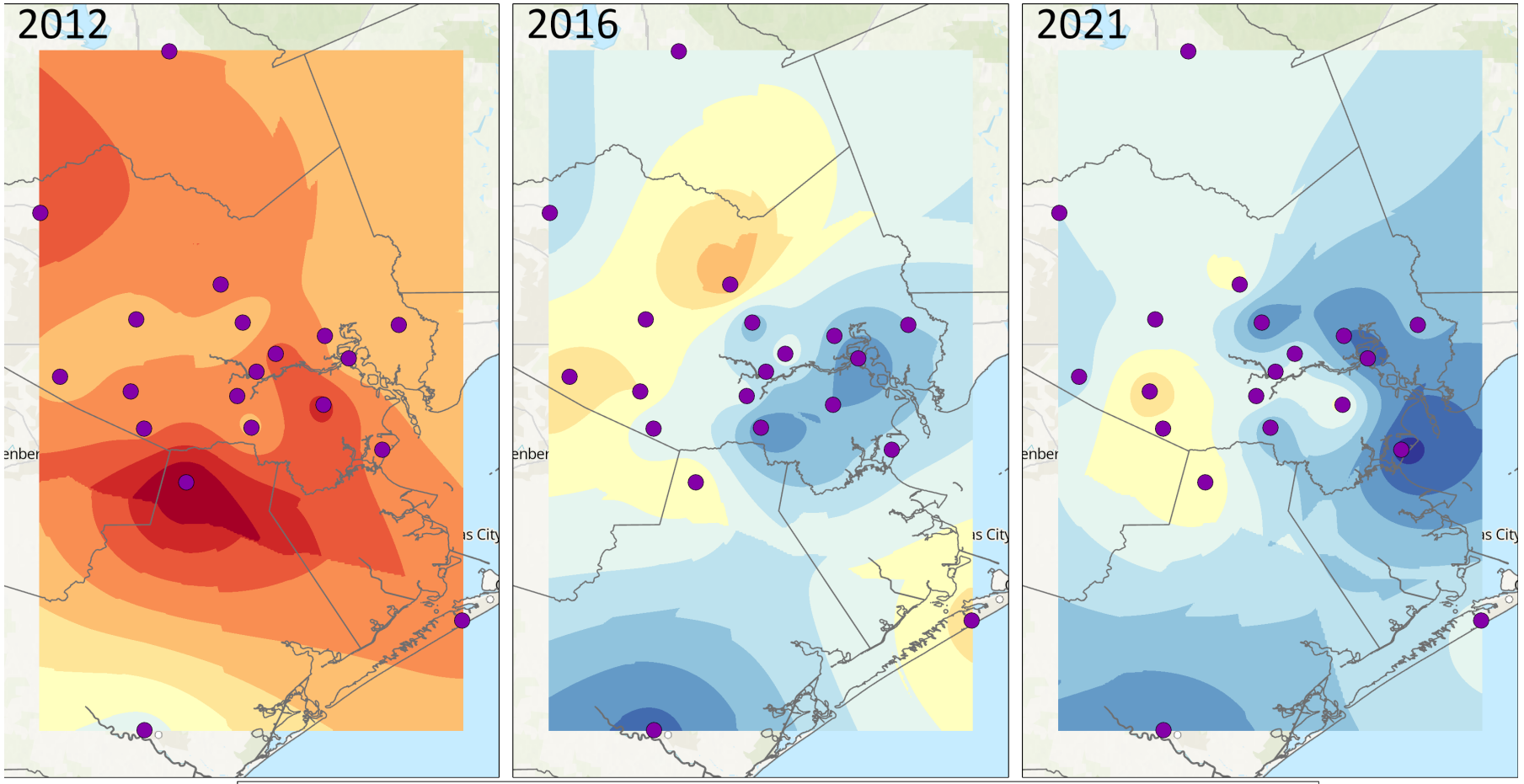
NAAQS Exceedances	Number of Monitors	Percentage of Monitors
Exceeds 1997 – 85 ppb	0	0%
Exceeds *2008 – 75 ppb*	1	5%
Exceeds *2015 – 70 ppb*	11	58%
Meets *2015 – 70 ppb*	8	37%

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



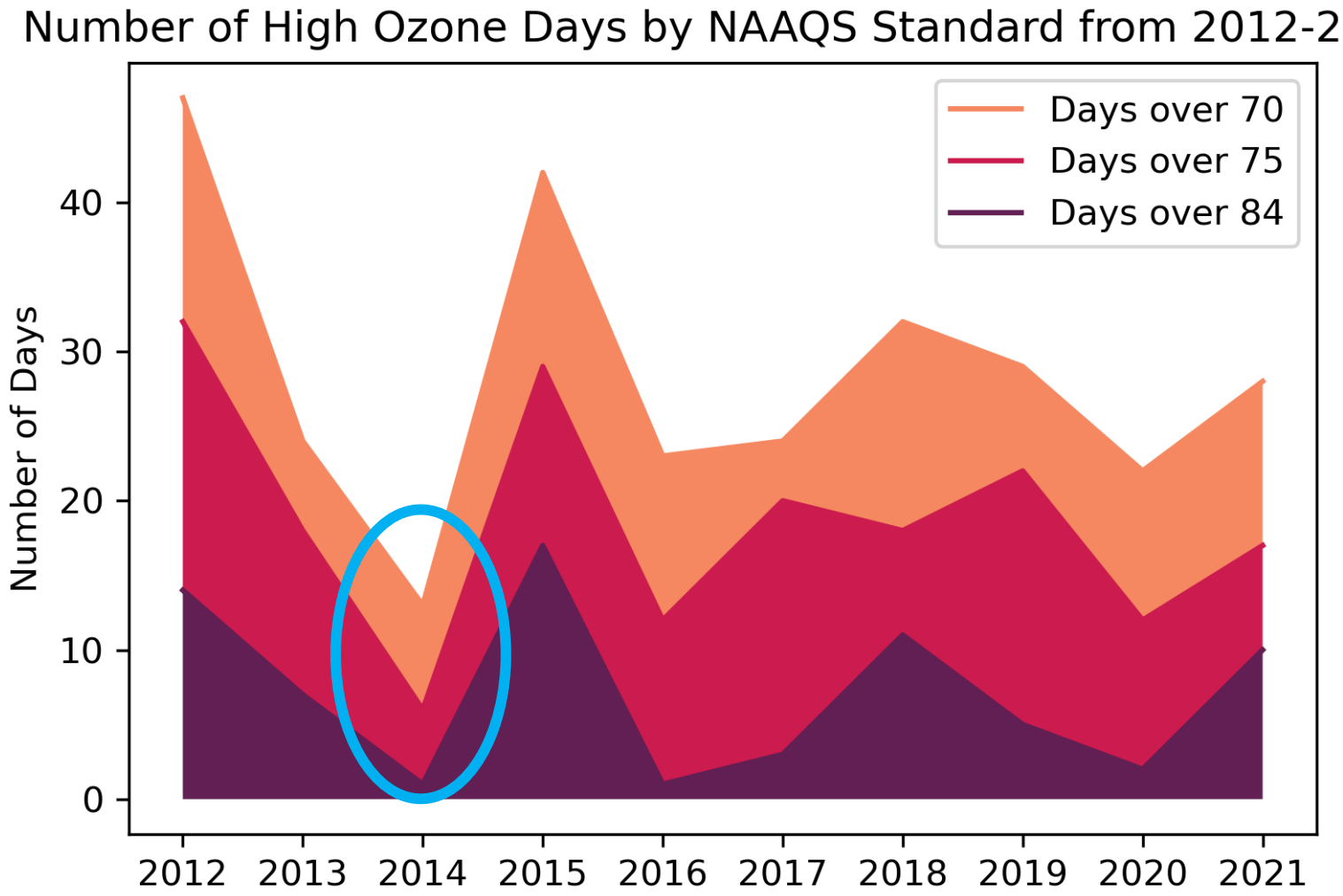
Eight-Hour Ozone Design Value (ppb)

- ≤ 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

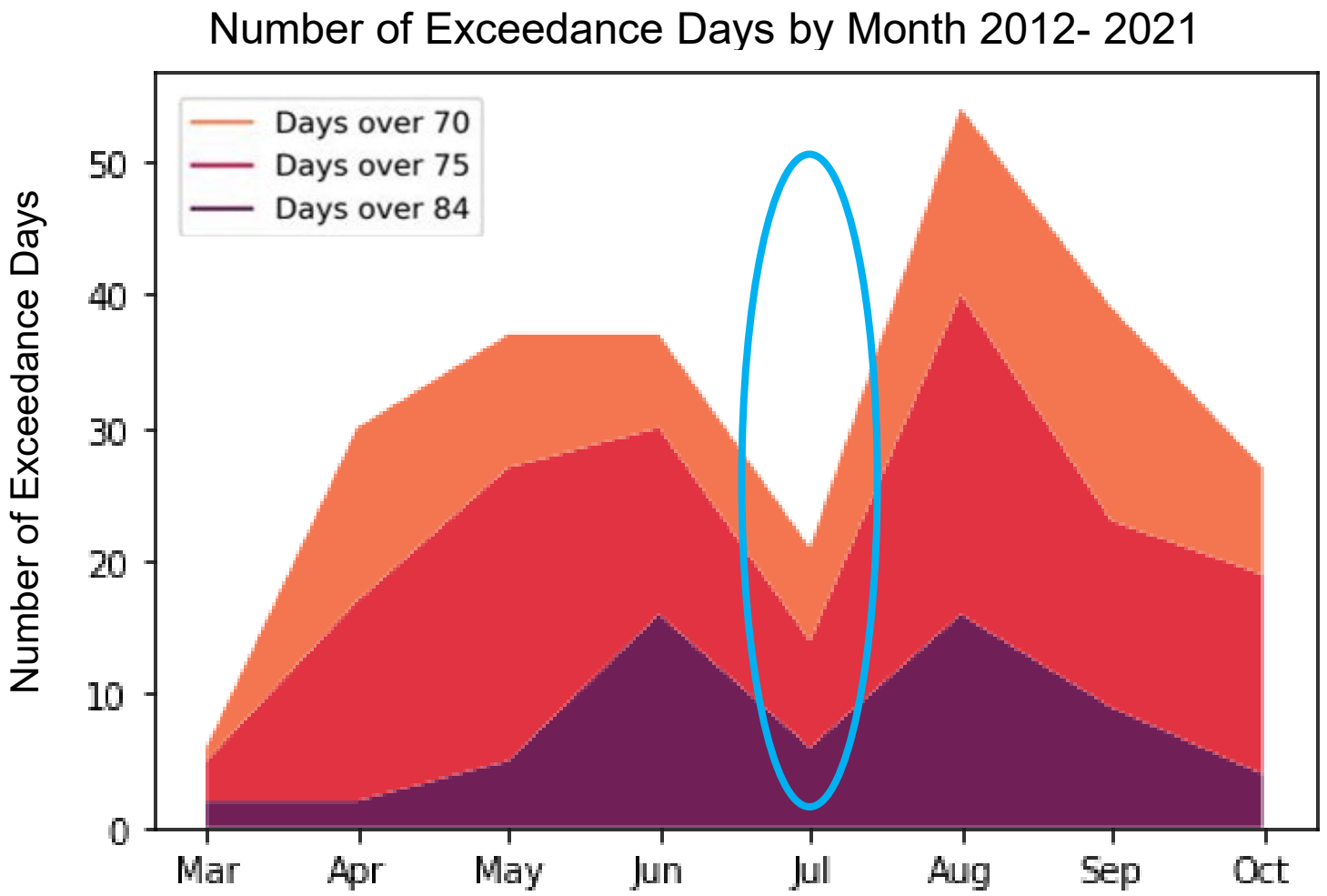
Ordinary kriging method applied to interpolate ozone DVs in areas without monitors utilizing three years of data per map generated.

Ozone Season Eight-Hour Ozone Exceedance Day Trends



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

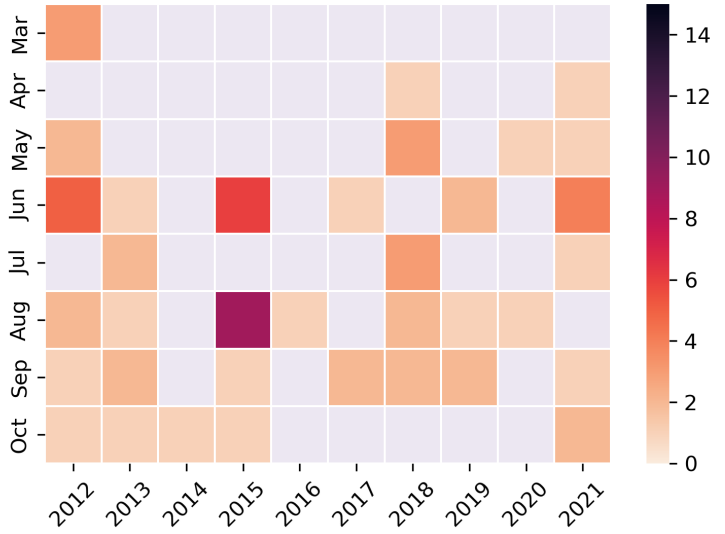
Ozone Season Eight-Hour Ozone Exceedance Day Trends



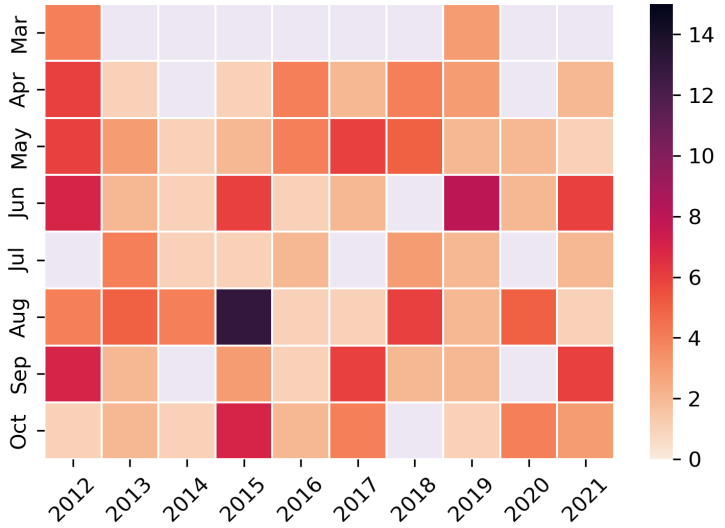
- The month of July typically has fewer exceedance days than other summer months. This is generally attributed to the impacts of a high-pressure system, the Bermuda High. The impacts of this system on local meteorology vary annually.

Ozone Season Eight-Hour Ozone Exceedance Heatmap Calendars

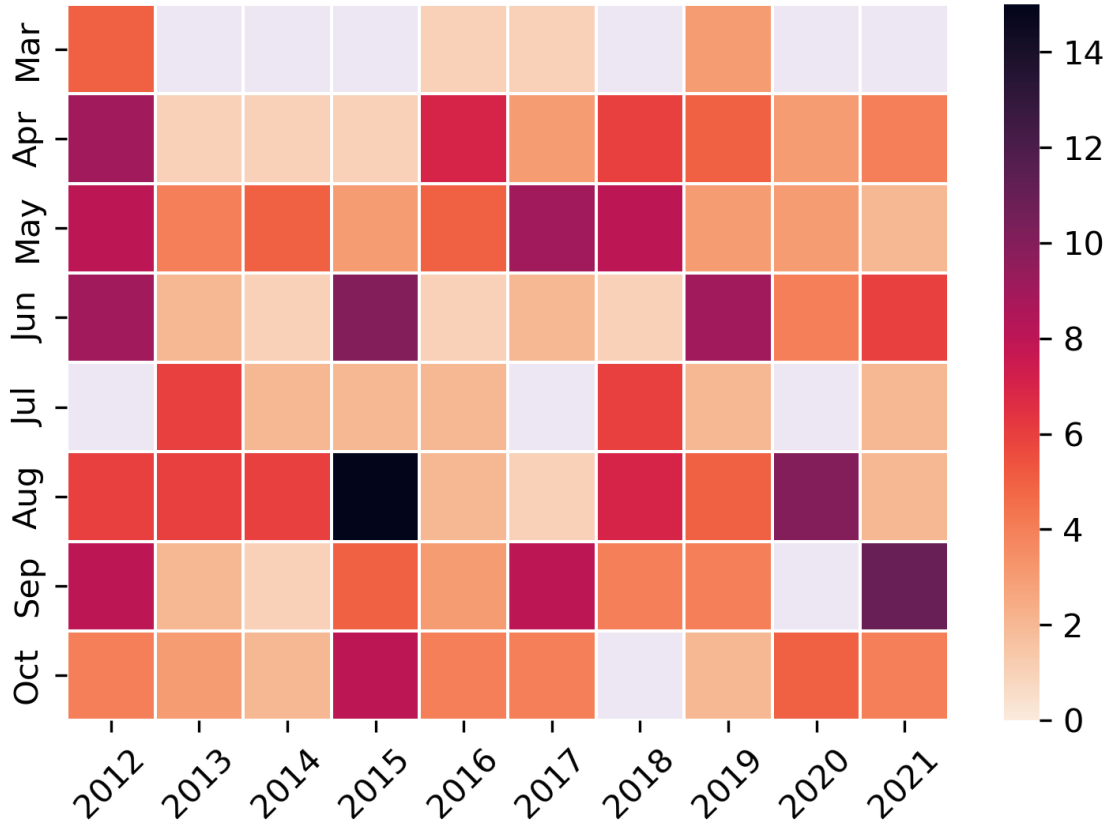
1997
NAAQS
85 ppb



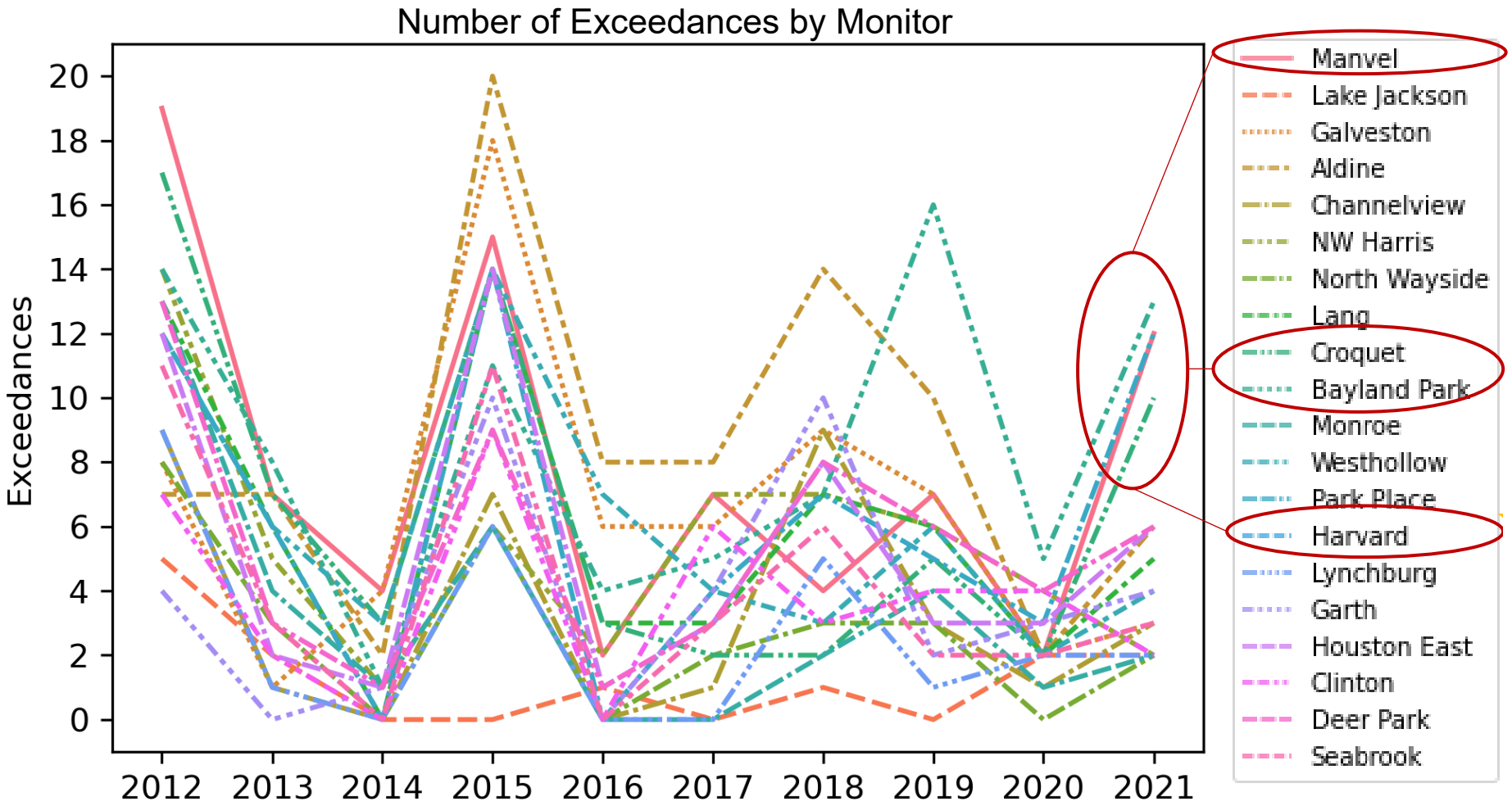
2008
NAAQS
75 ppb

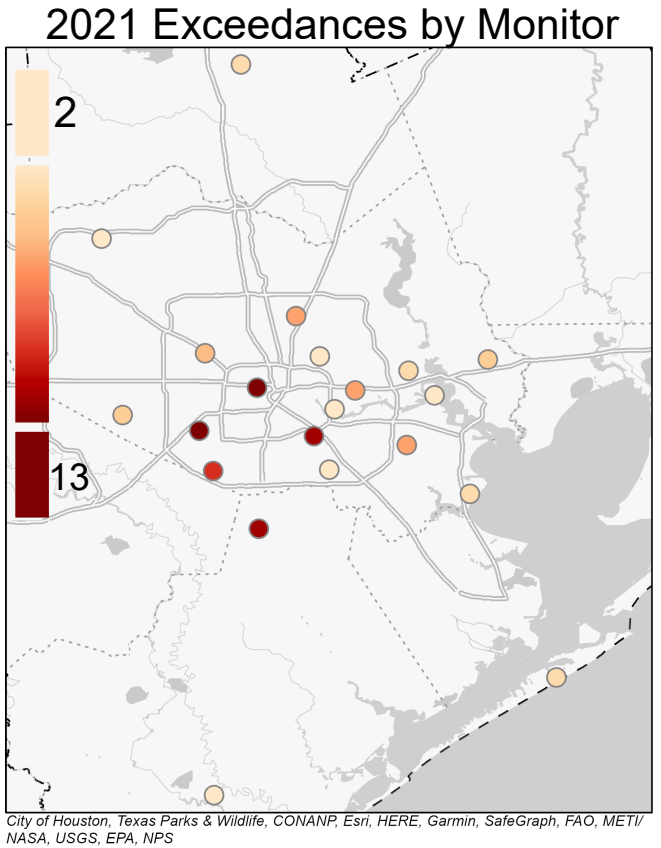


2015 NAAQS 70 ppb

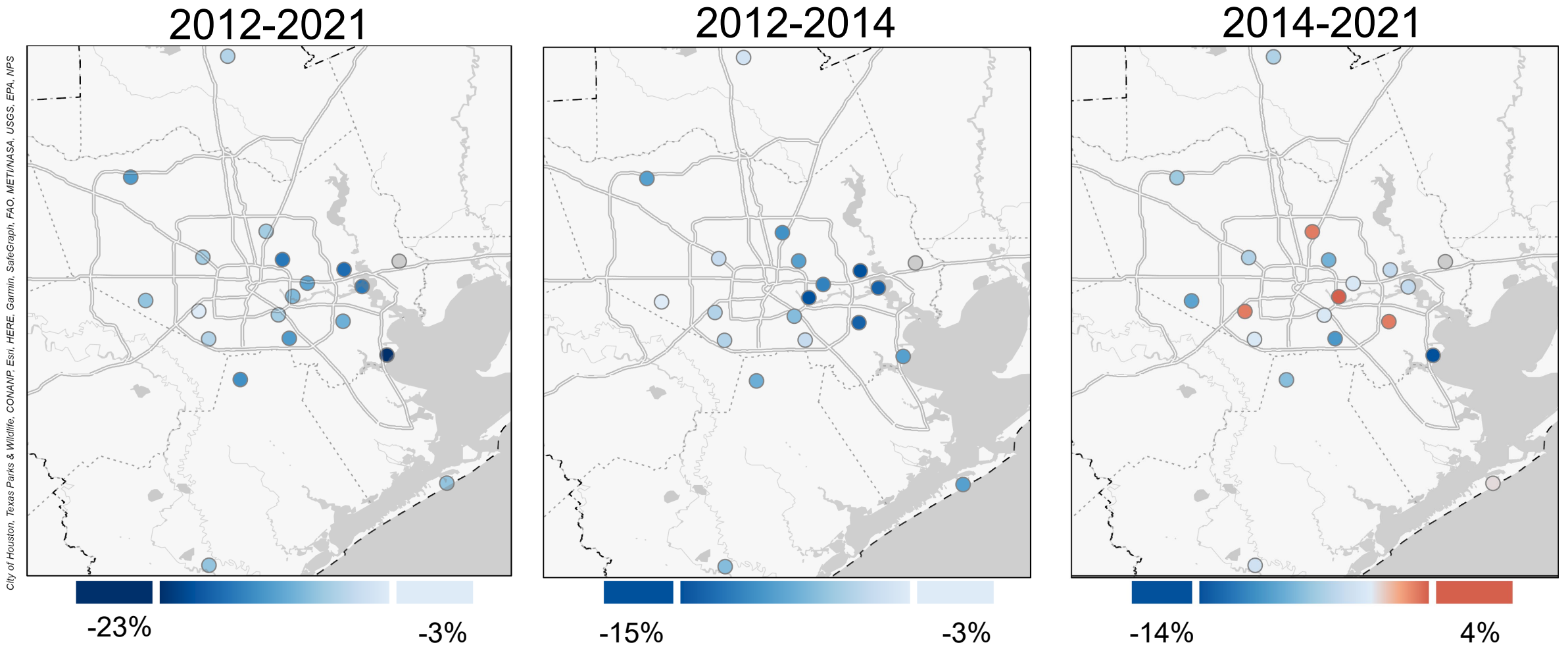


Eight-Hour Ozone Exceedance Days (70 ppb) by Monitor

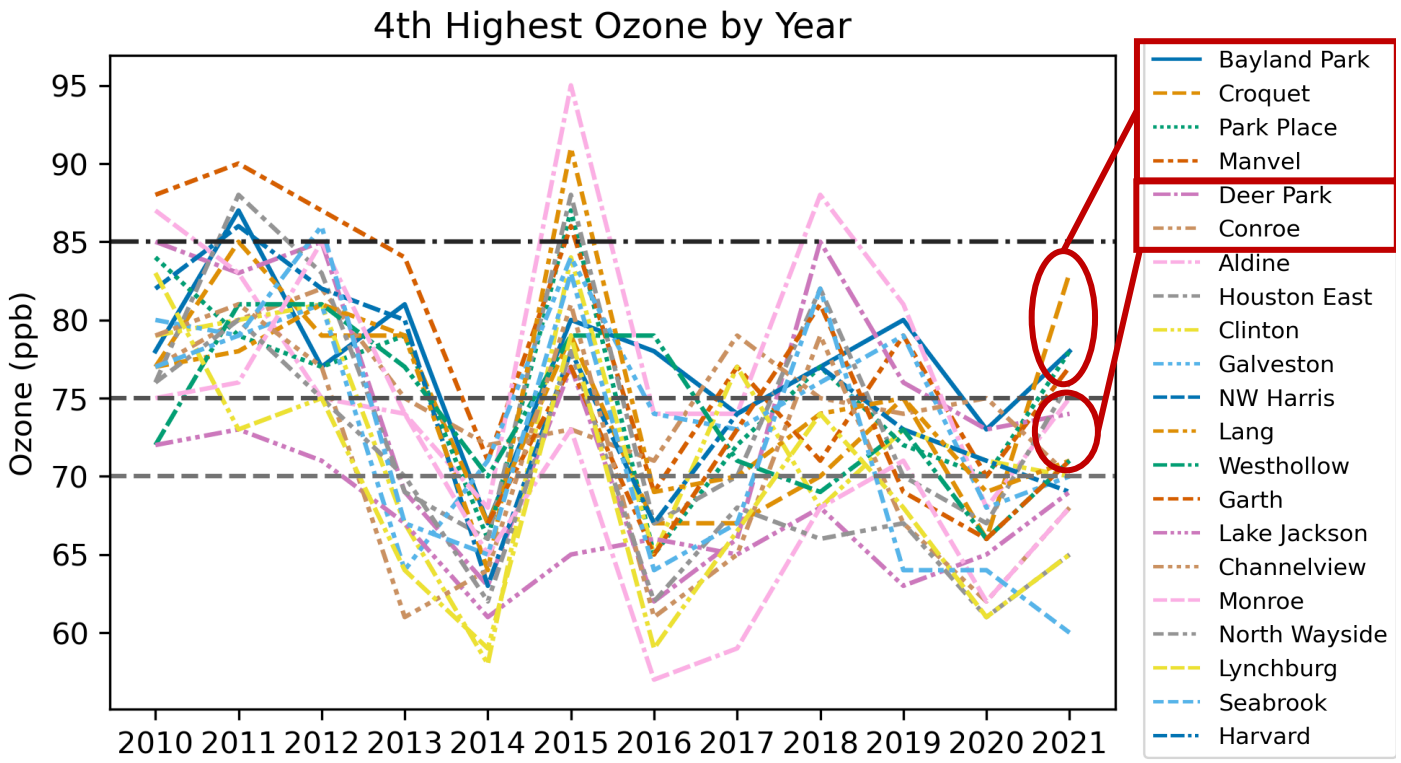


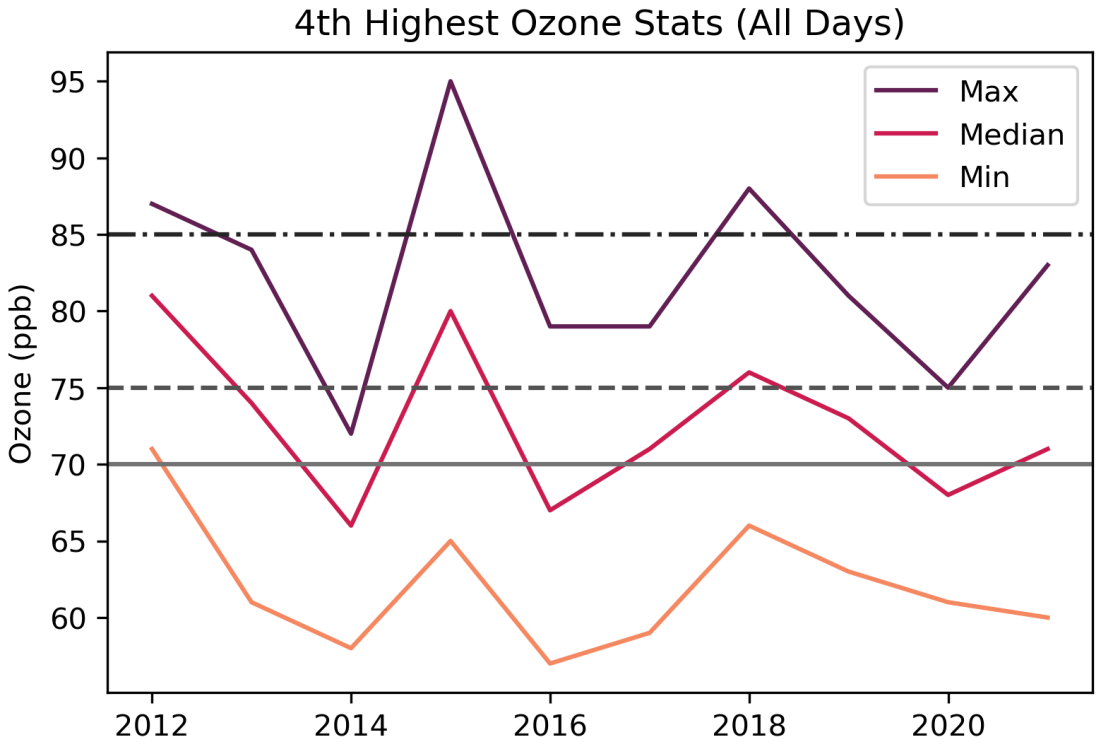


Percent Change of Exceedance Days by Monitor



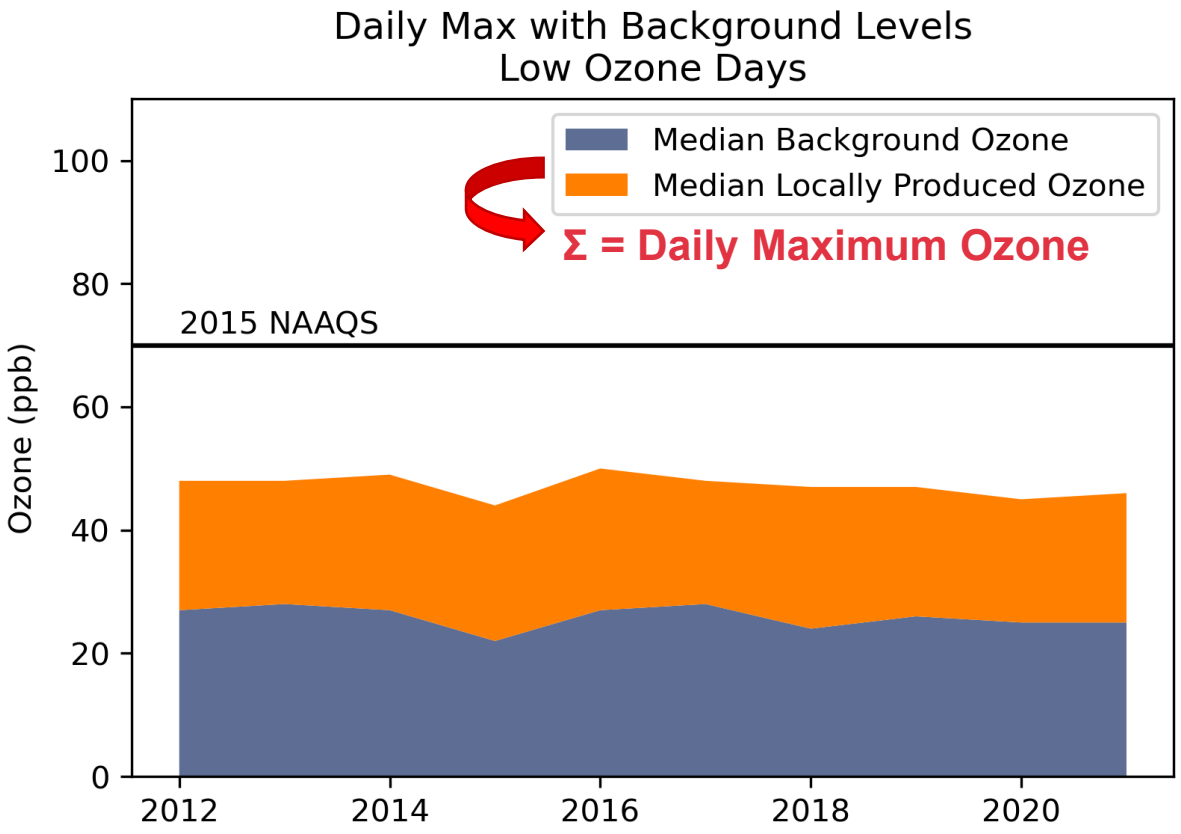
Eight-Hour Ozone 4th Highs



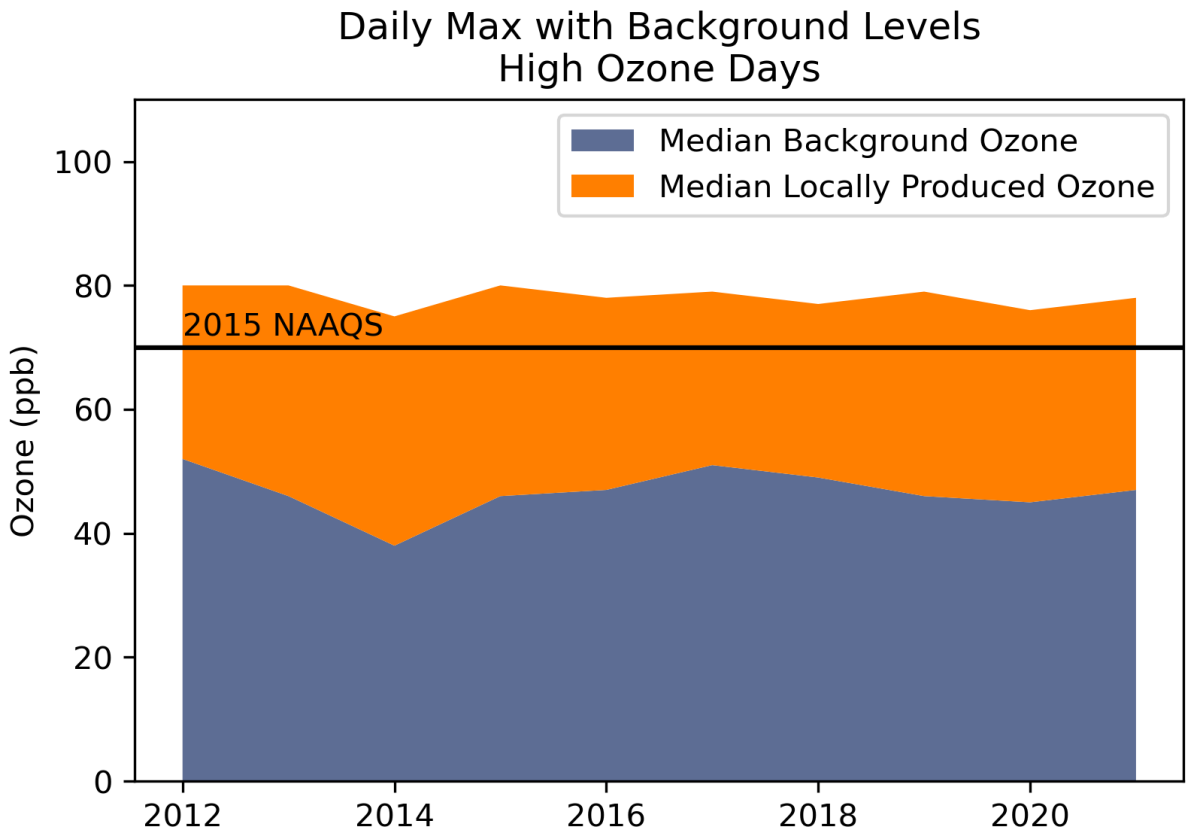


Ozone Season Background Ozone Comparison

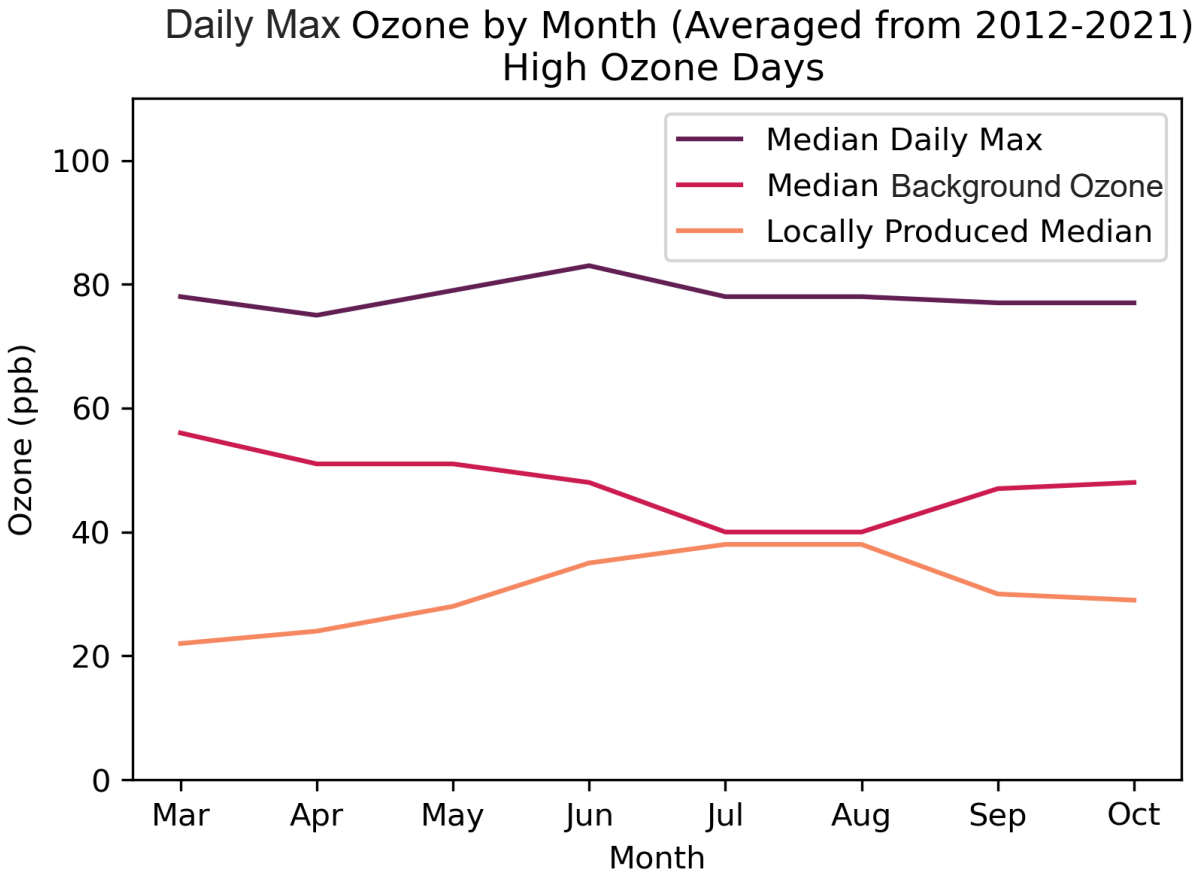
Low Ozone < 70 ppb

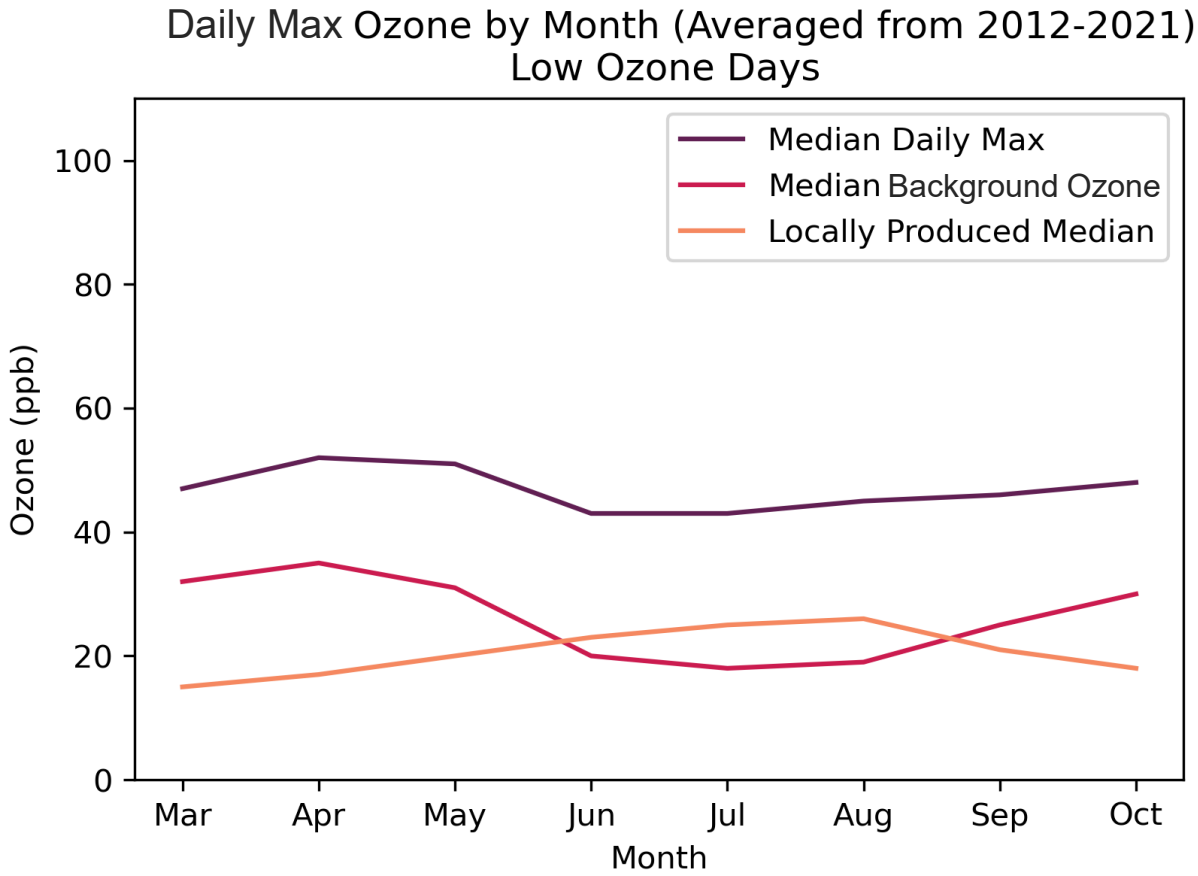


High Ozone ≥ 70 ppb



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?

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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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