



pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bureau of Air Quality

Ambient Air Quality in PA During COVID-19 Pandemic

**Small Business Compliance Advisory
Committee Meeting**

October 28, 2020

Via Webinar

Tom Wolf, Governor

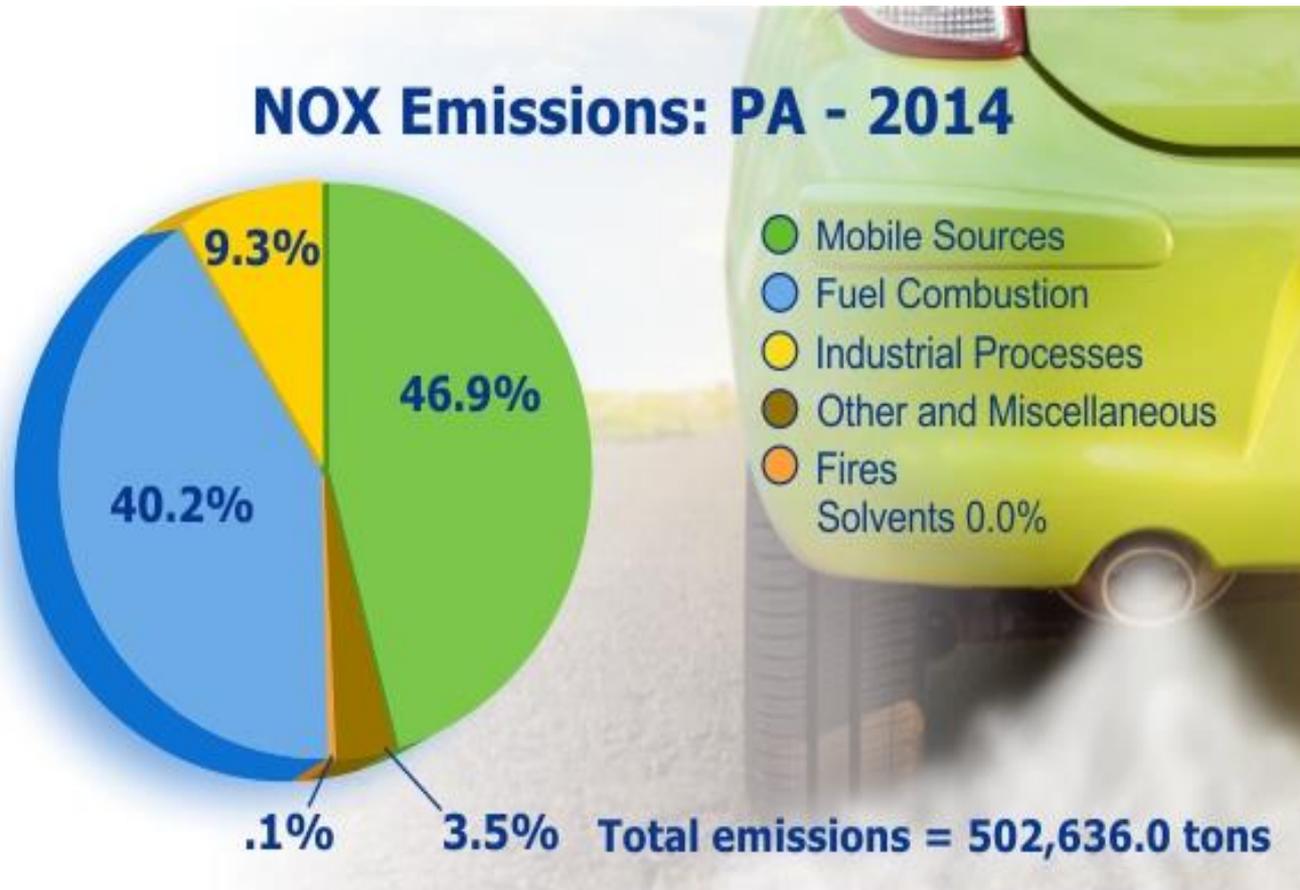
Patrick McDonnell, Secretary

Agenda

- Focus on Three Pollutants:
 - NO_2 (NO_x), Ozone, and Black Carbon
- Emission Trends – 2019 vs. 2020
 - Vehicles: Traffic Counts
- Satellite Data – 2019 vs. 2020
 - TROPOMI NO_2 Satellite Data
- Air Monitoring Trends – 2019 vs. 2020

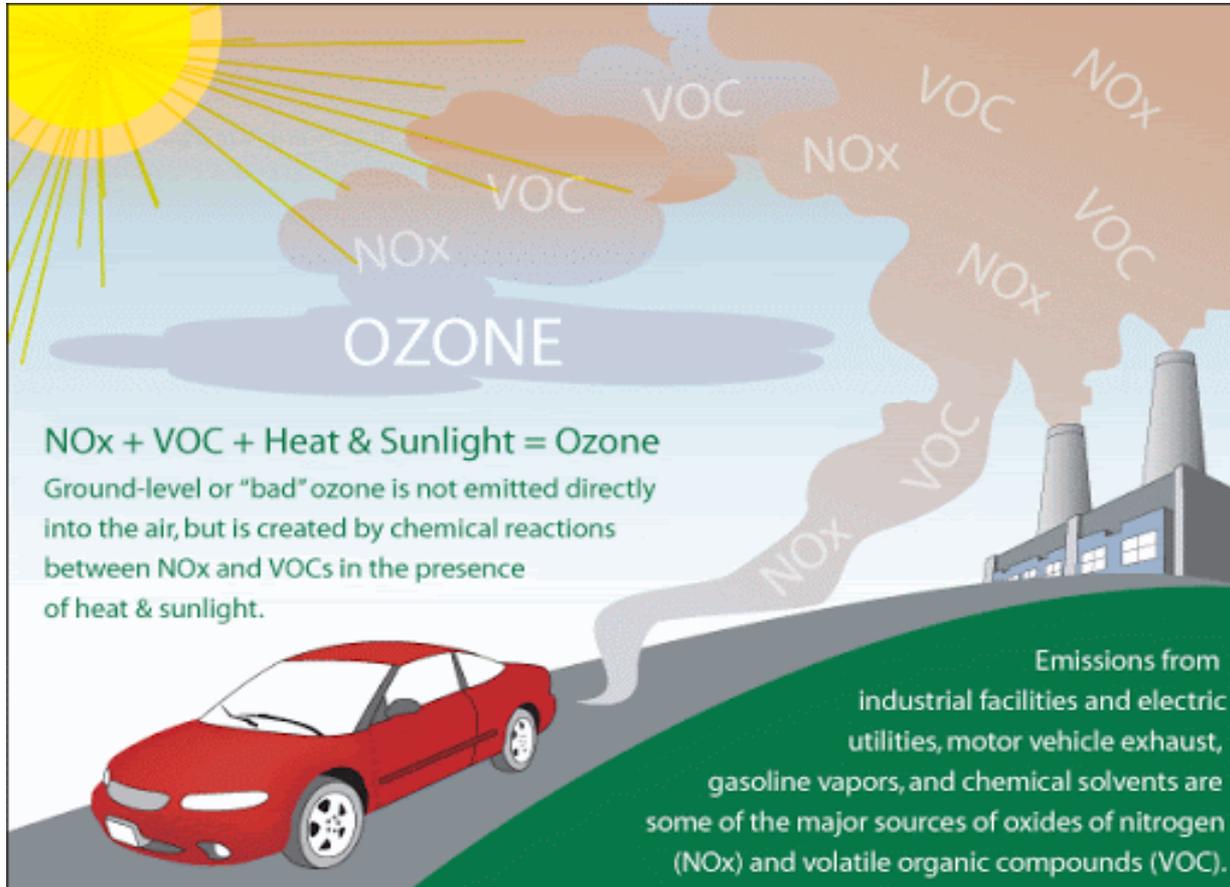
The Three Air Pollutants: NO₂, Ozone, and Black Carbon

The Air Pollutants – NO2



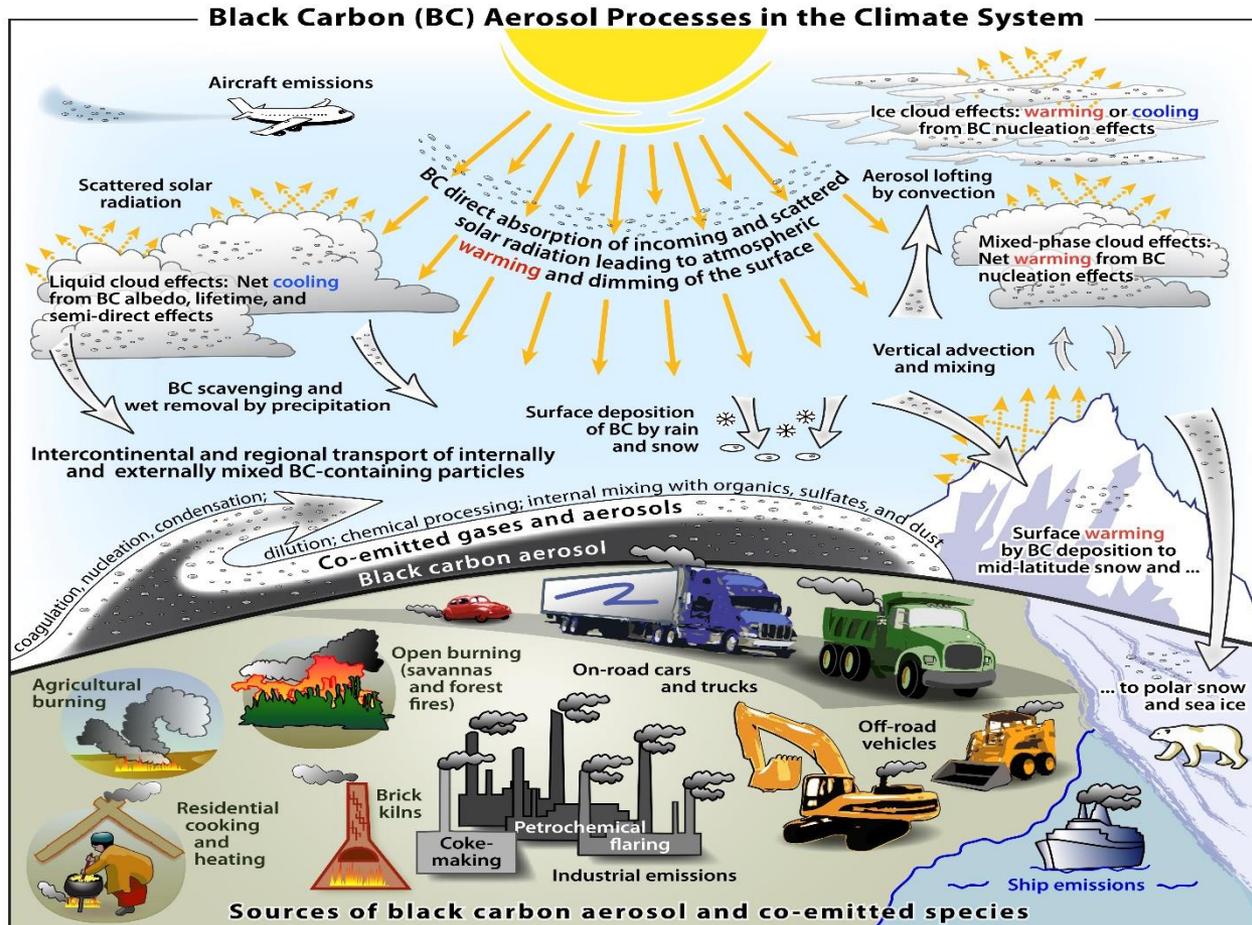
Source: PADEP's Driving PA Forward Campaign

The Air Pollutants – Ozone



Source: The Ozone Hole website

The Air Pollutants – Black Carbon



Source: Phys.org website

2019-20 PADEP Analysis Timeline

Stay At Home Period (First 42 Days)

COVID Day:

1

21

42

2019:	Monday, March 18, 2019	Sunday, April 7, 2019	Sunday, April 28, 2019
2020:	Monday, March 16, 2020	Sunday, April 5, 2020	Sunday, April 26, 2020



2019:	Friday, May 10, 2019	Saturday, May 25, 2019	Sunday, June 9, 2019
2020:	Friday, May 8, 2020	Saturday, May 23, 2020	Sunday, June 7, 2020

COVID Day:

54

69

84

Loosening Period (31 Days)

Vehicles: Traffic Counts 2019 vs. 2020

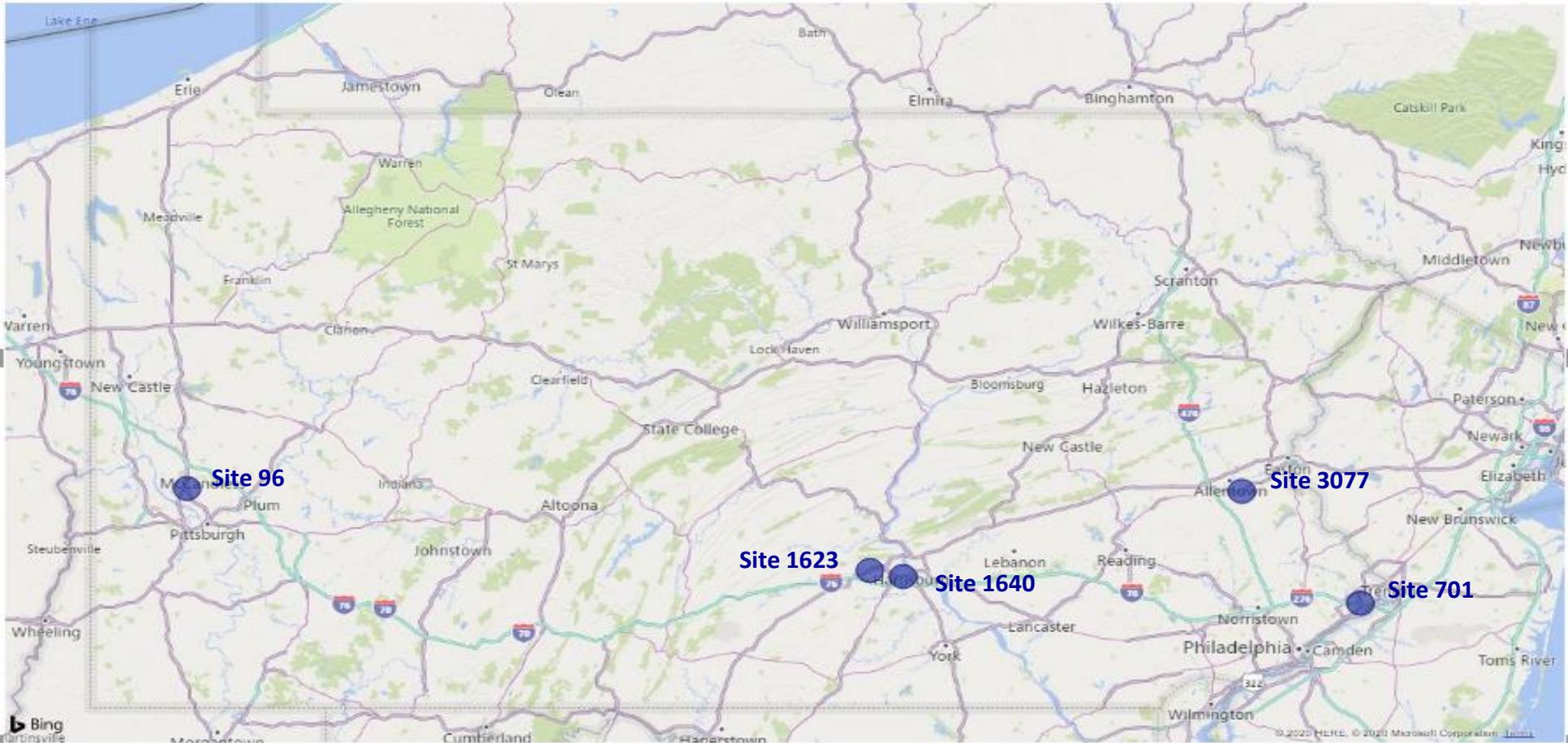
Stay At Home Period

Monday, March 16, 2020

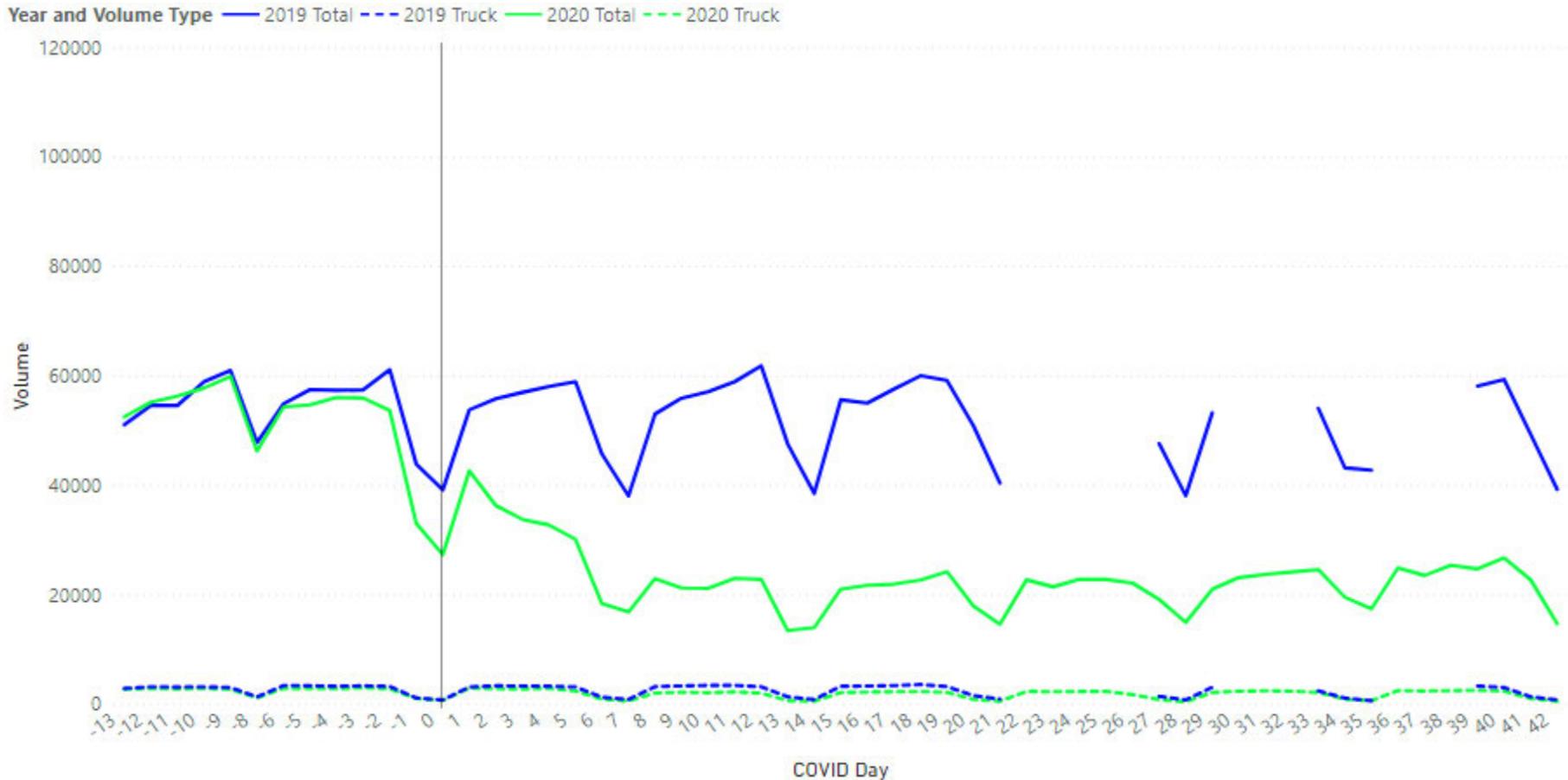
to

Sunday, April 26, 2020

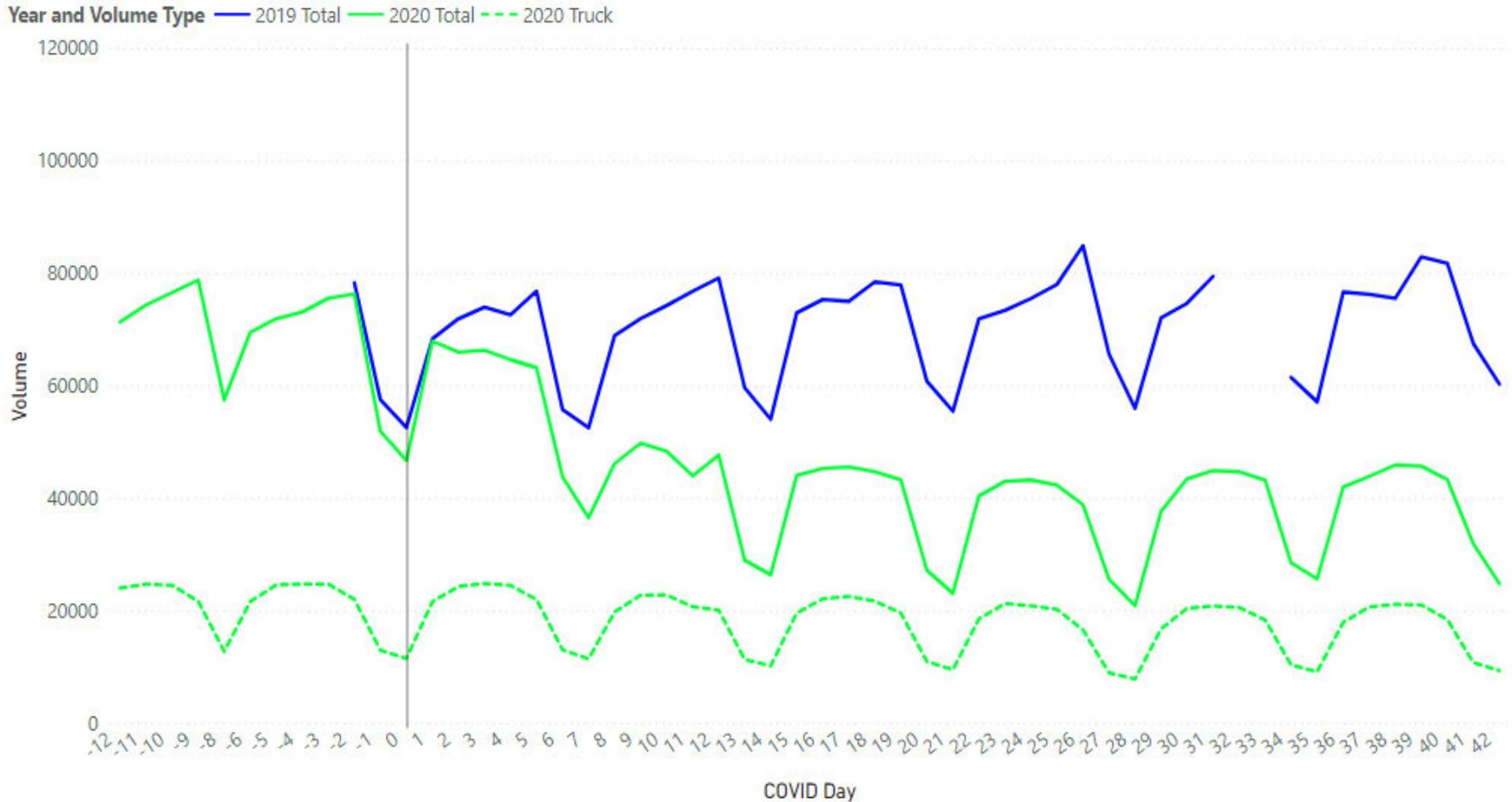
PennDOT Traffic Monitor Locations



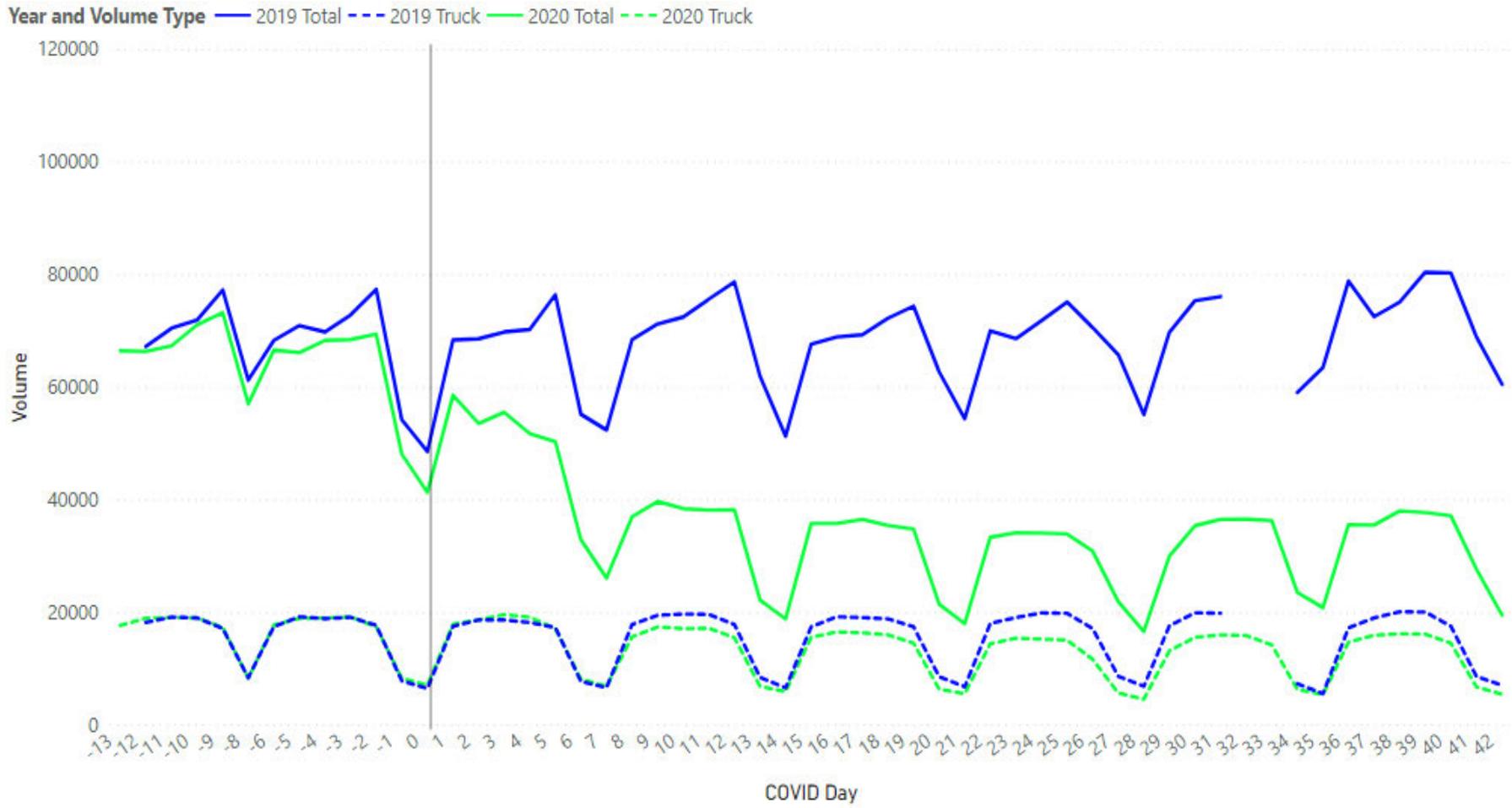
Daily Traffic Counts – Site 96 (I-279, Pittsburgh)



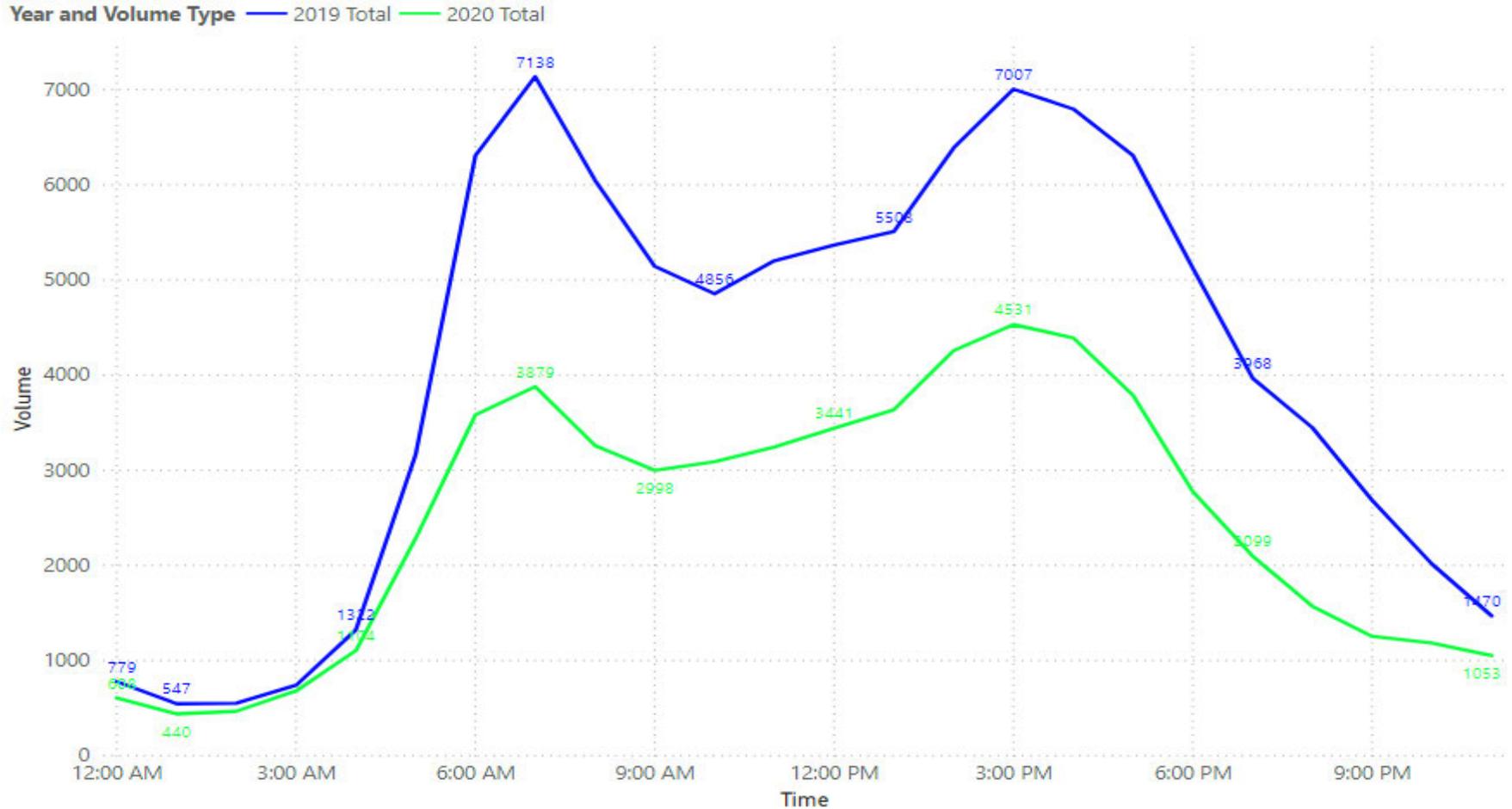
Daily Traffic Counts – Site 1623 (I-81, Carlisle)



Daily Traffic Counts – Site 3077 (I-78, Allentown)

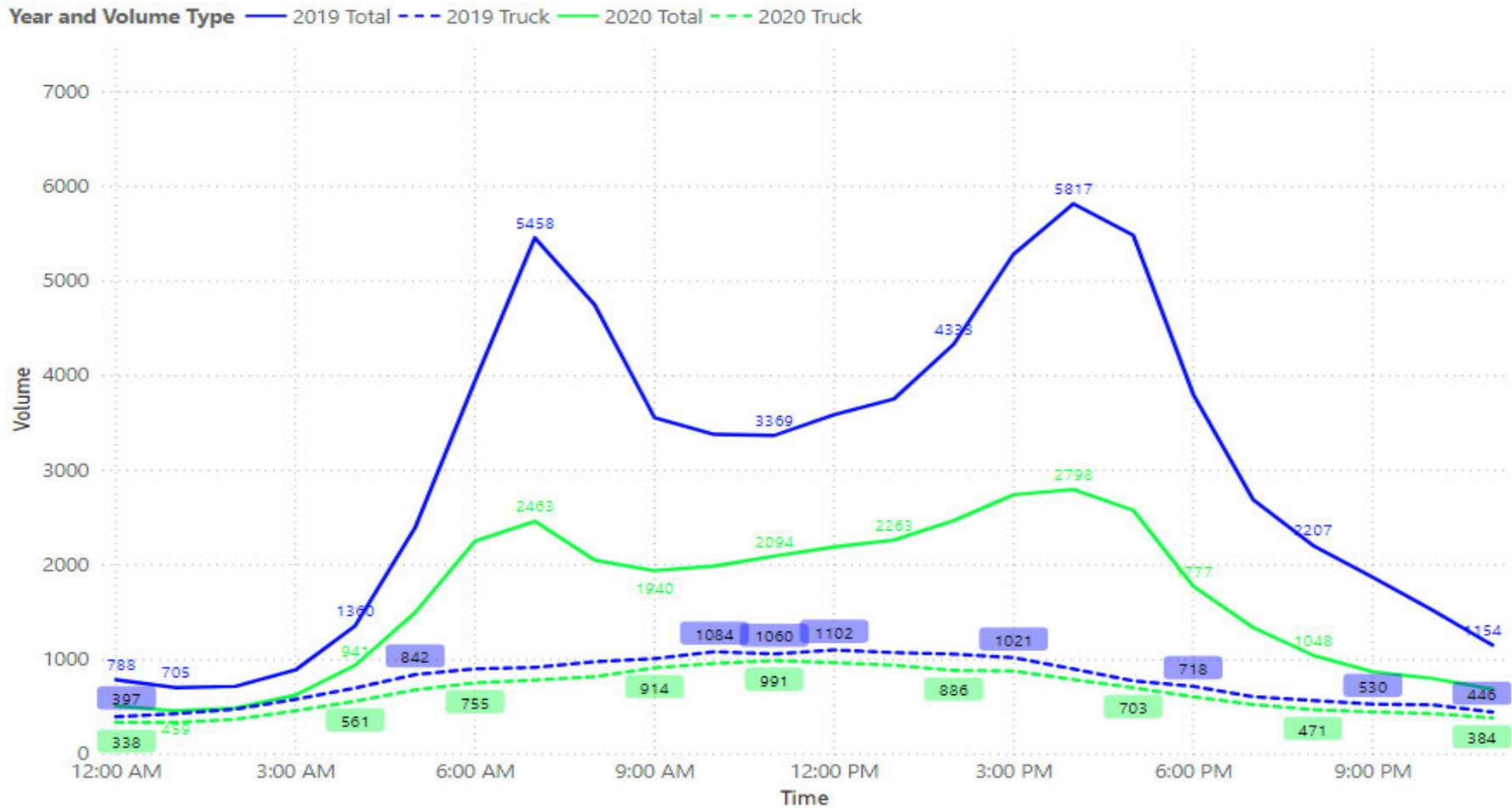


Hour Traffic Counts – Site 1640 (Rt. 581, Hbg)



Weekday Traffic Counts

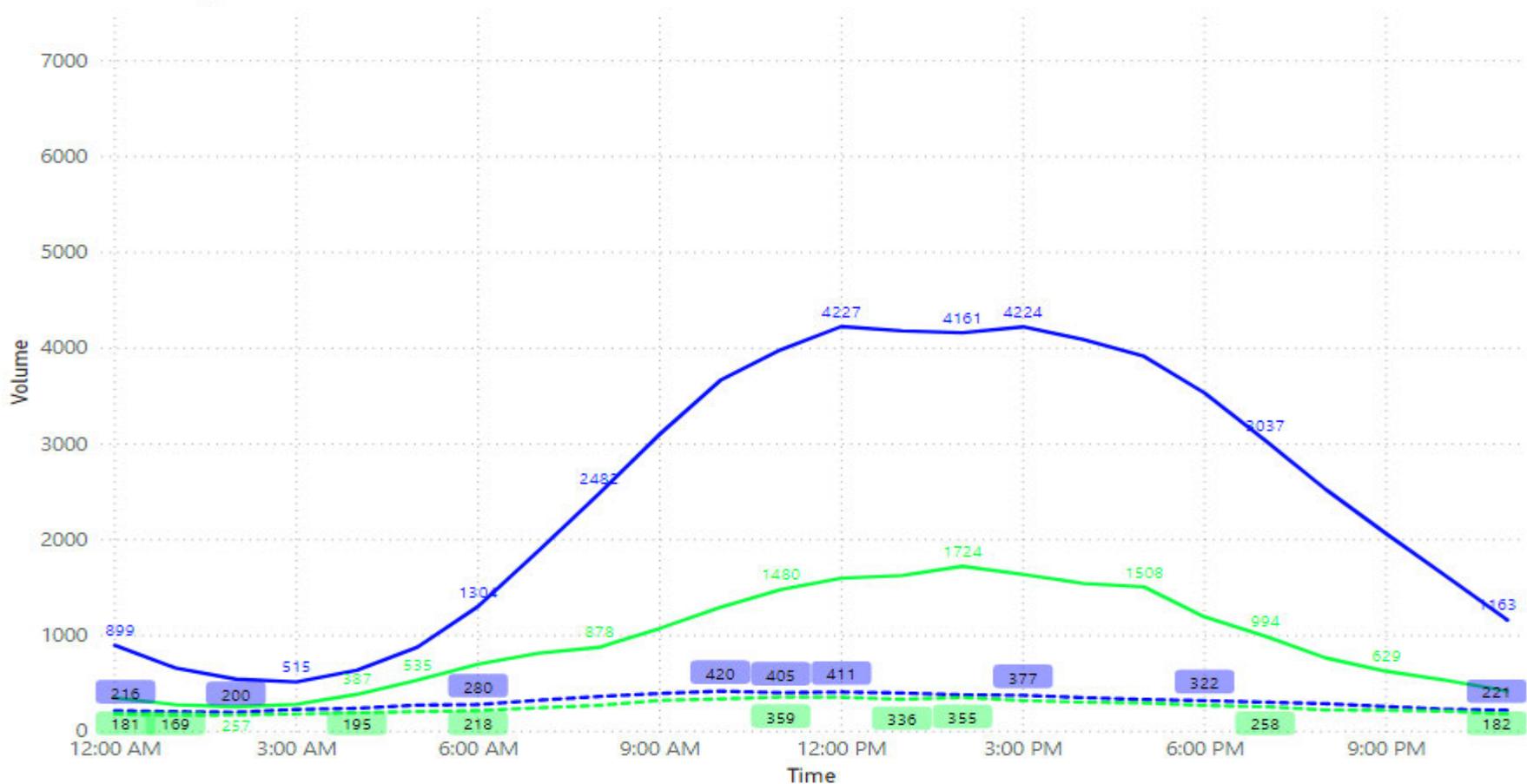
Hour Traffic Counts – Site 3077 (I-78, Allentown)



Weekday Traffic Counts

Hour Traffic Counts – Site 3077 (I-78, Allentown)

Year and Volume Type — 2019 Total — 2019 Truck — 2020 Total — 2020 Truck

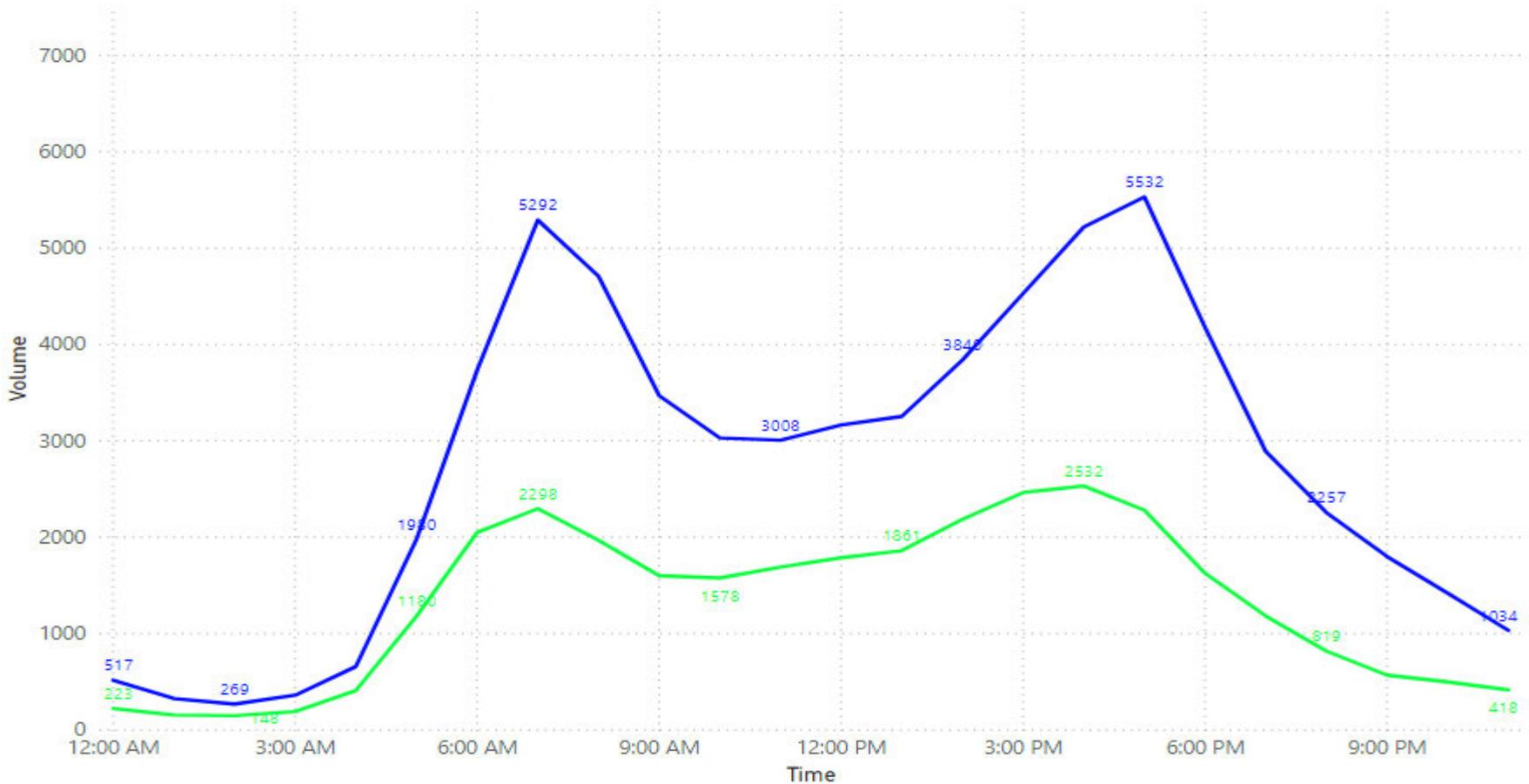


Weekend Traffic Counts



Hour Traffic Counts – Site 701 (I-276, Philly)

Year and Volume Type — 2019 Total — 2020 Total



Weekday Traffic Counts



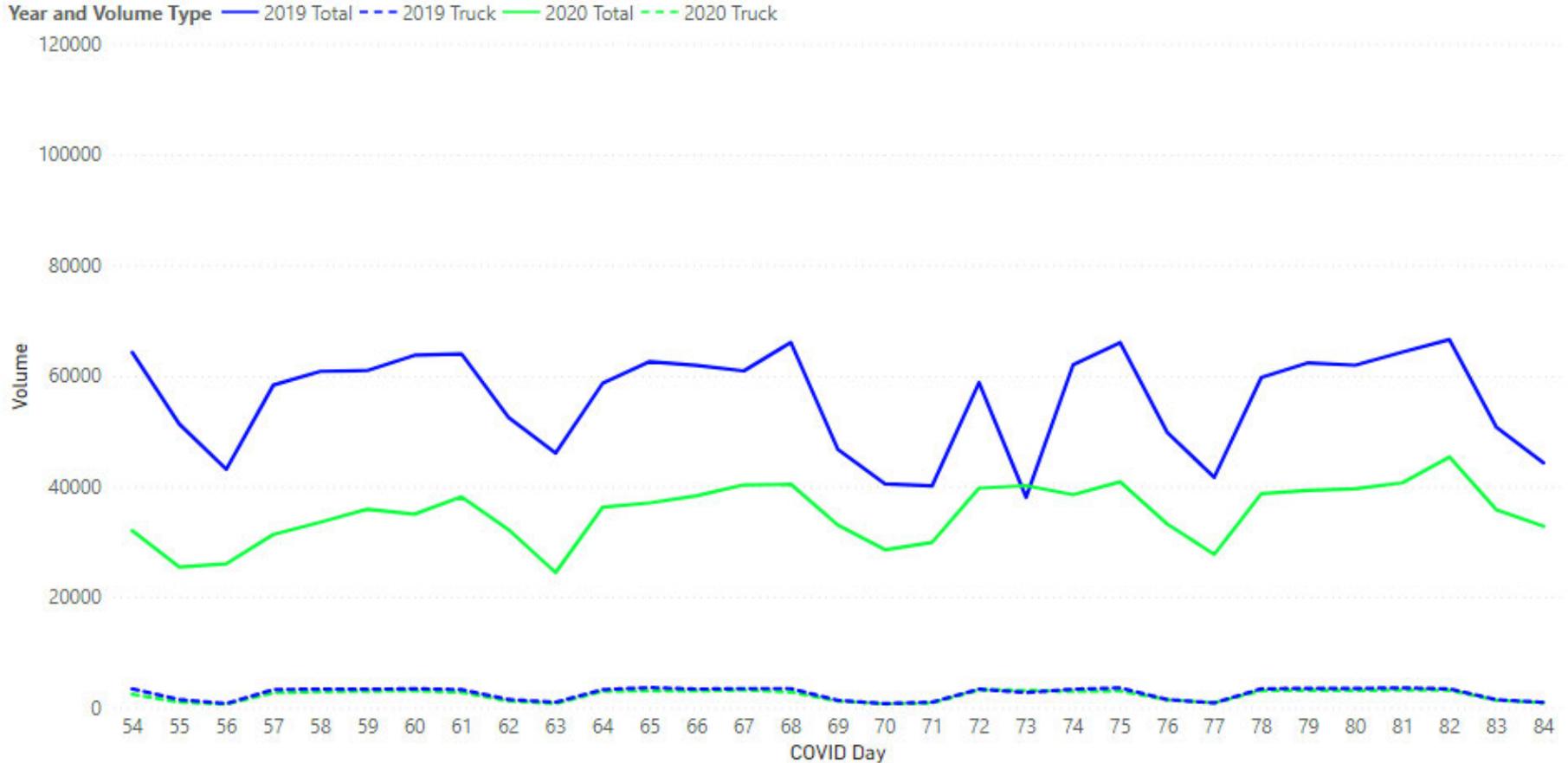
Loosening Period

Friday, May 8, 2020

to

Sunday, June 7, 2020

Daily Traffic Counts – Site 96 (I-279, Pittsburgh)



Yellow Phase – Since May 15 (24 Days)

Daily Traffic Counts – Site 1623 (I-81, Carlisle)



Yellow Phase – Since May 22 (17 Days)



Daily Traffic Counts – Site 3077 (I-78, Allentown)

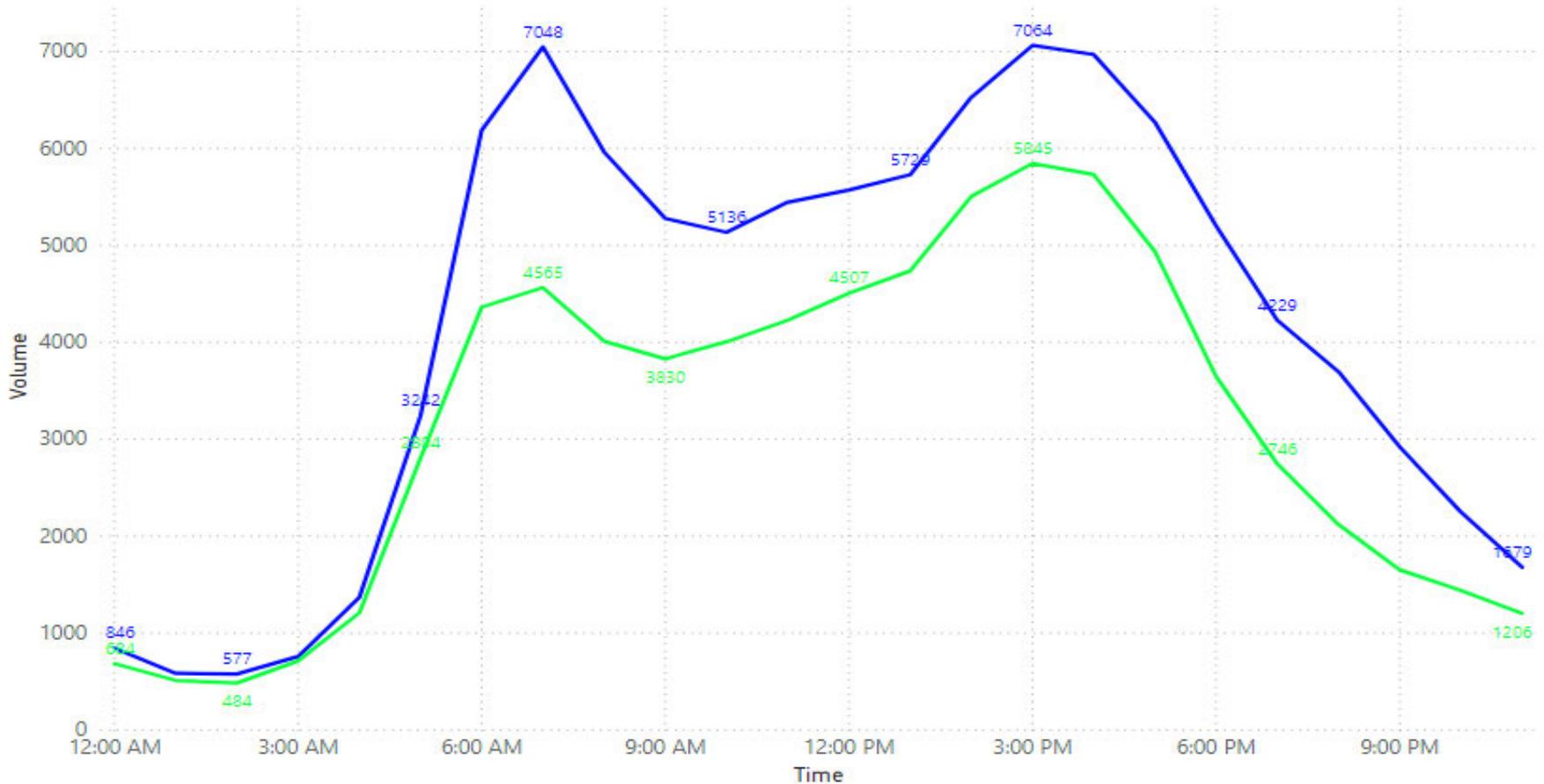


Yellow Phase – Since June 5 (3 Days)



Hour Traffic Counts – Site 1640 (Rt. 581, Hbg)

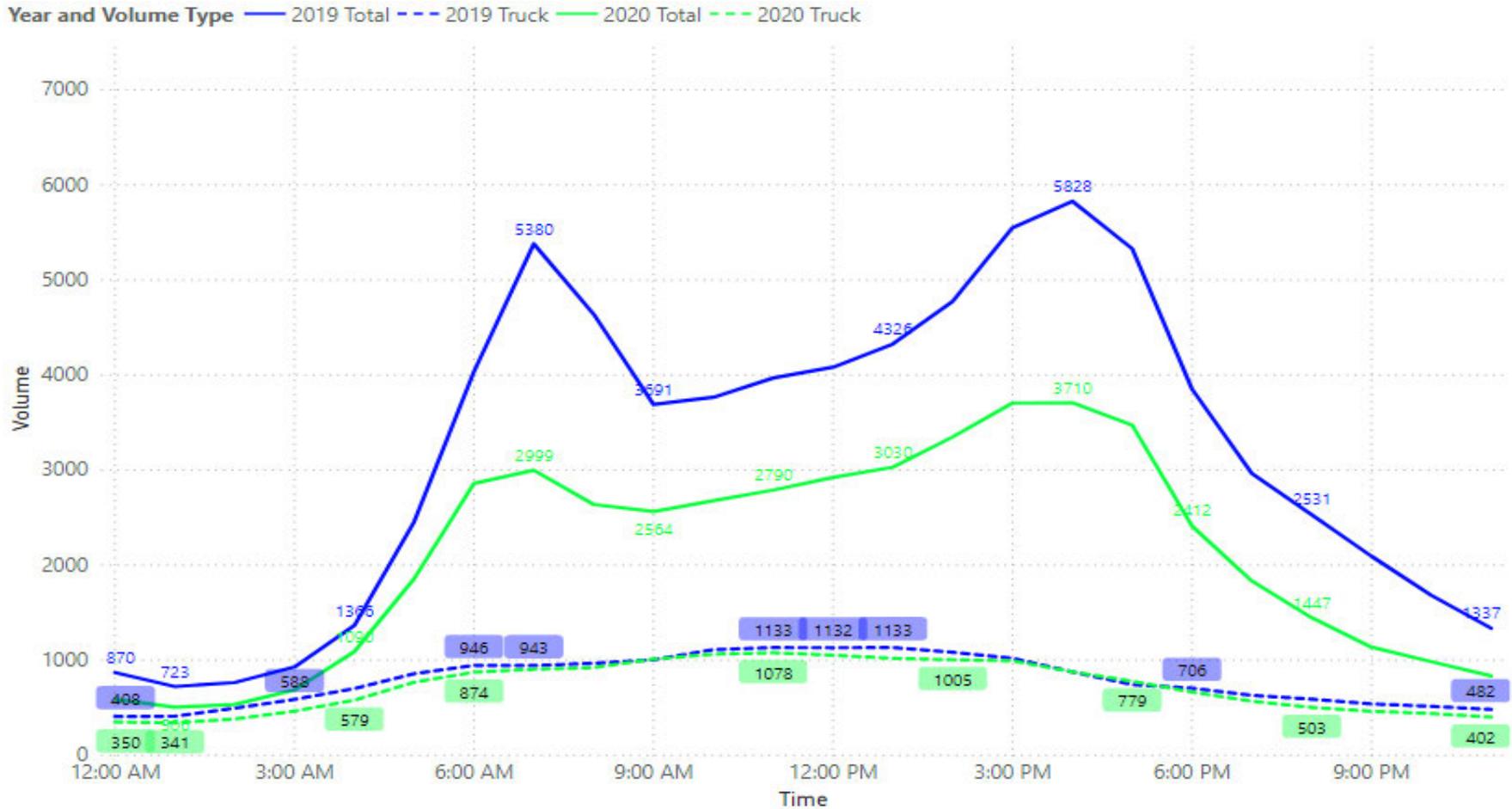
Year and Volume Type — 2019 Total — 2020 Total



Weekday Traffic Counts

Yellow Phase – Since May 22 (17 Days)

Hour Traffic Counts – Site 3077 (I-78, Allentown)

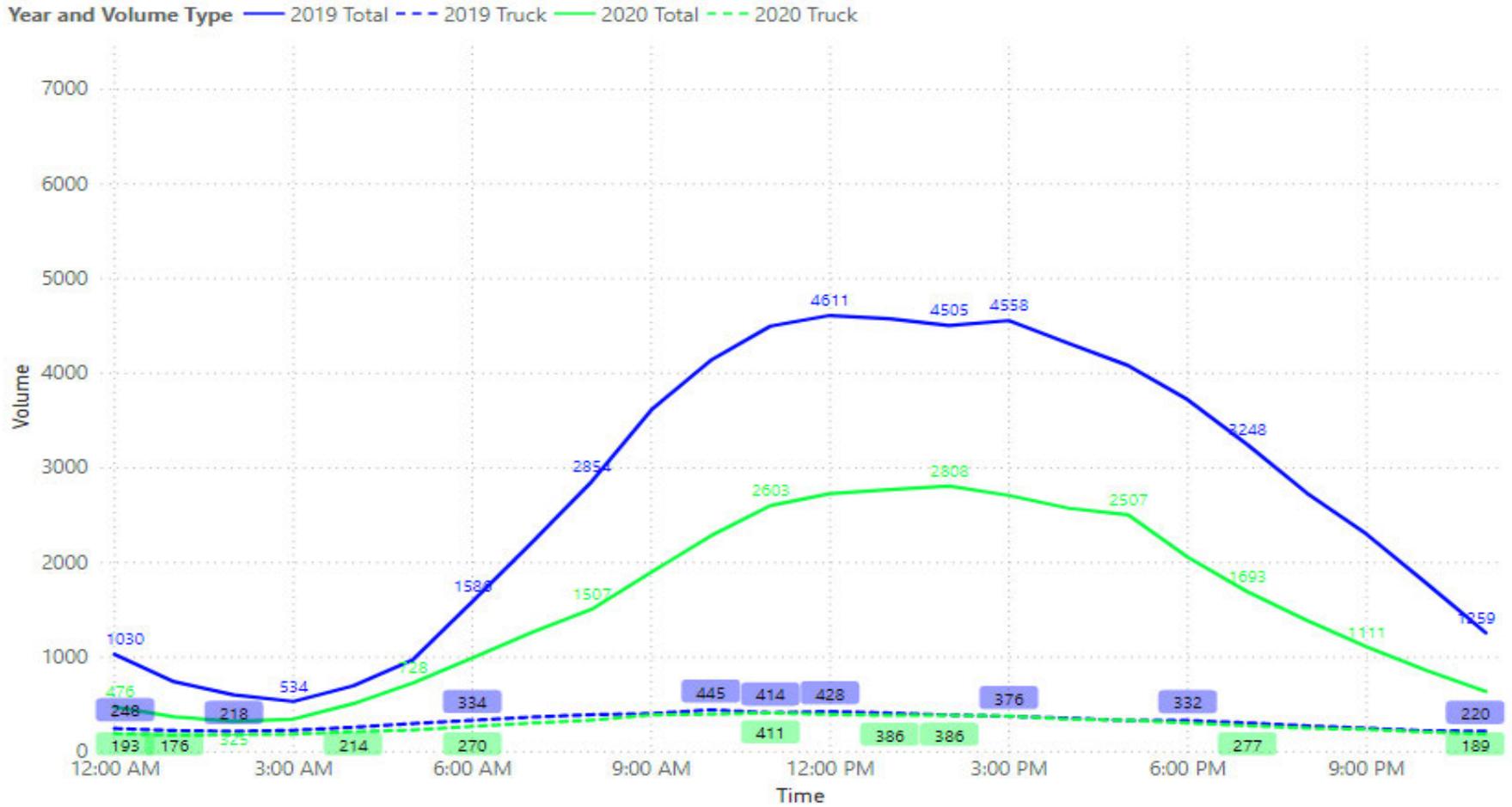


Weekday Traffic Counts

Yellow Phase – Since June 5 (3 Days)



Hour Traffic Counts – Site 3077 (I-78, Allentown)



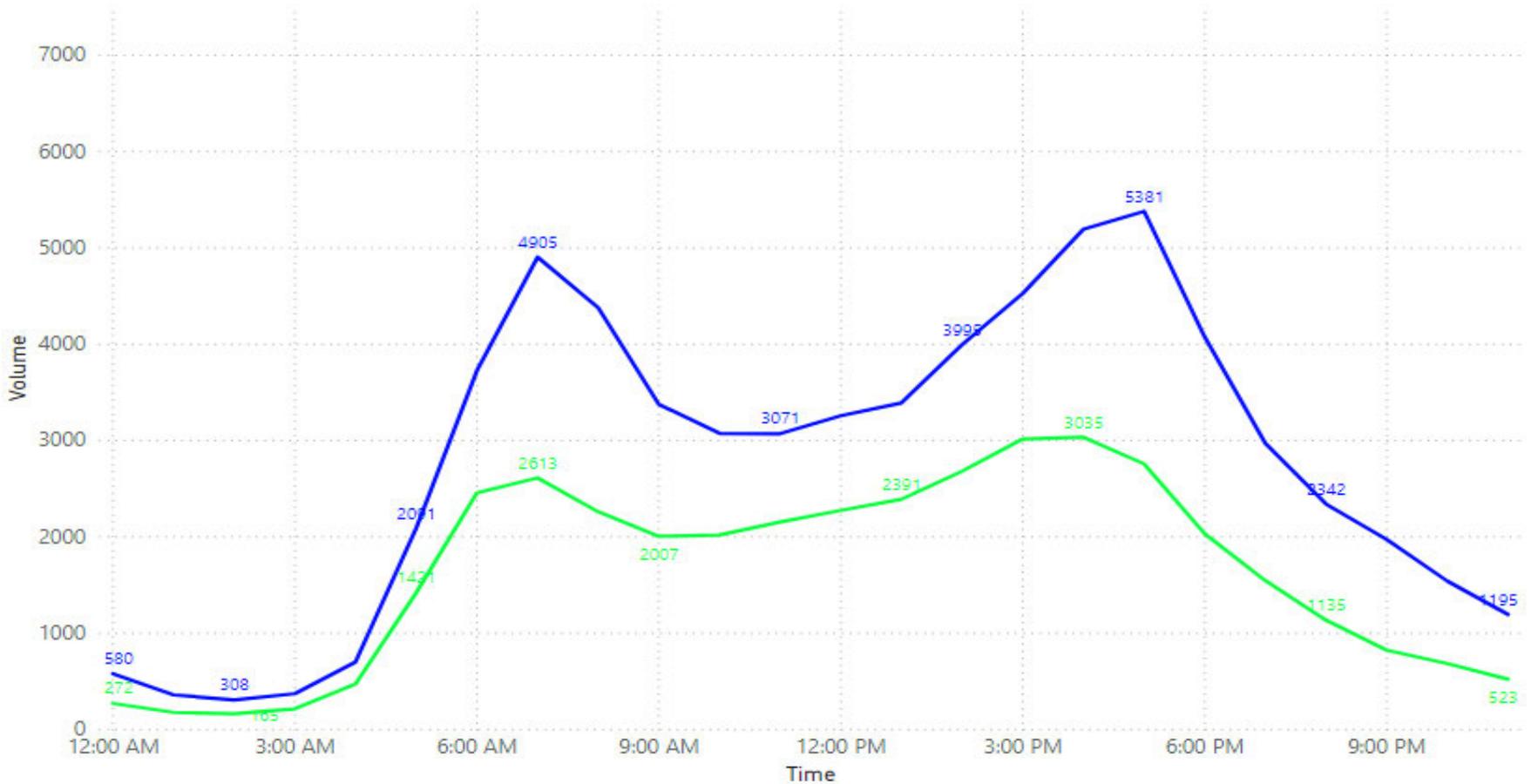
Weekend Traffic Counts

Yellow Phase – Since June 5 (3 Days)



Hour Traffic Counts – Site 701 (I-276, Philly)

Year and Volume Type — 2019 Total — 2020 Total



Weekday Traffic Counts

Yellow Phase – Since June 5 (3 Days)



TROPOMI NO₂ Satellite Data: 2019 vs. 2020

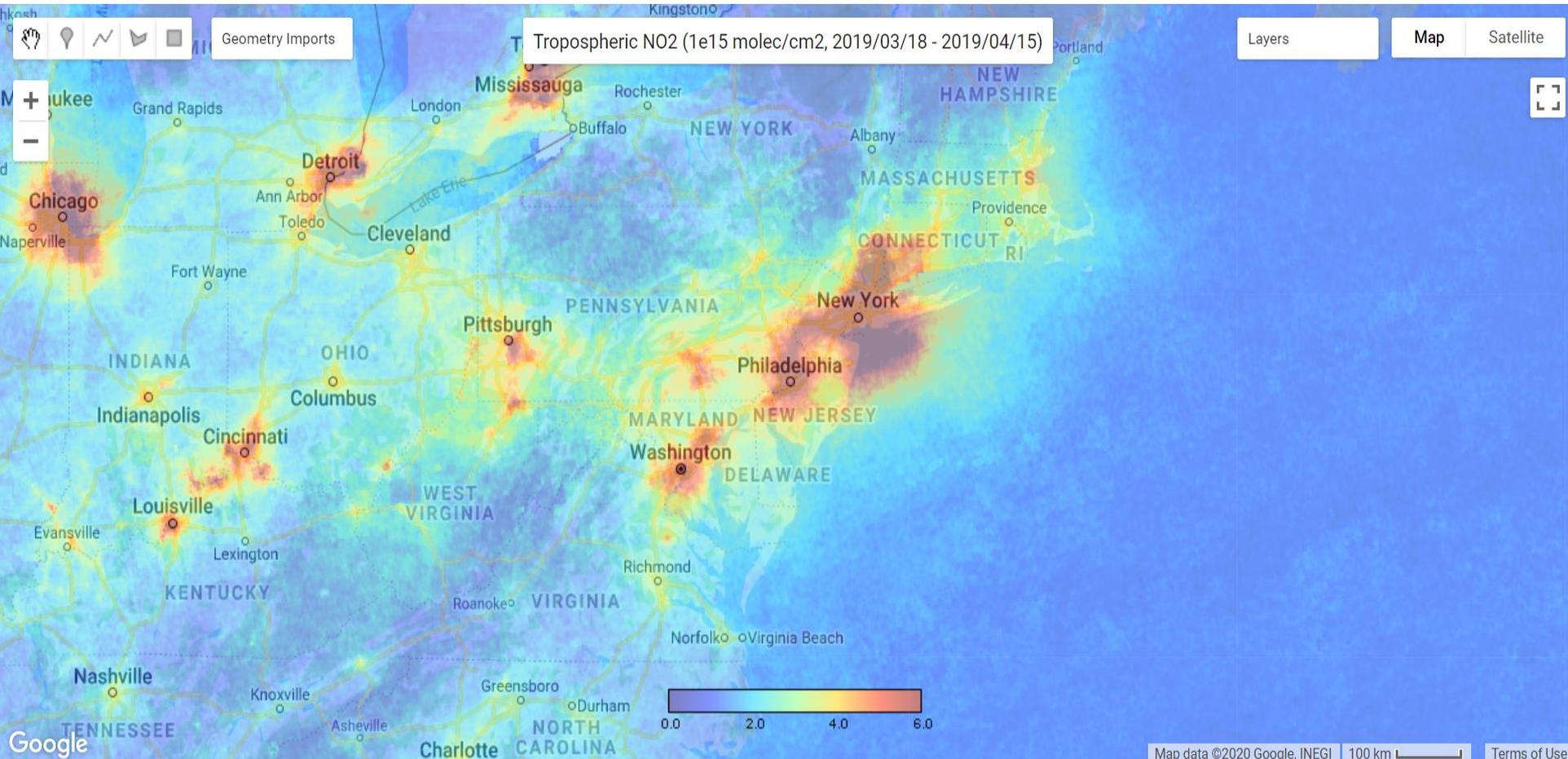
Stay At Home Period

Monday, March 16, 2020

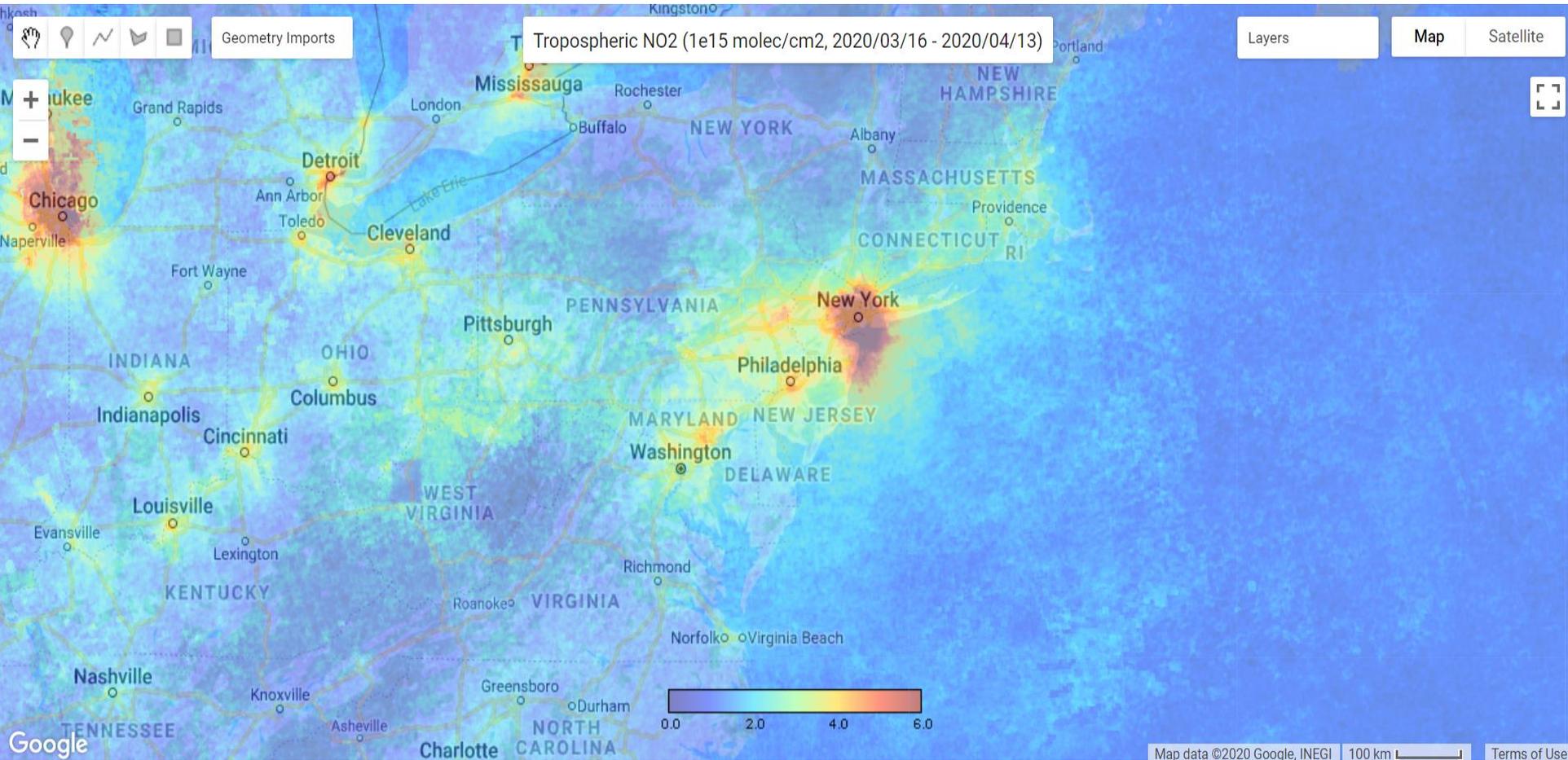
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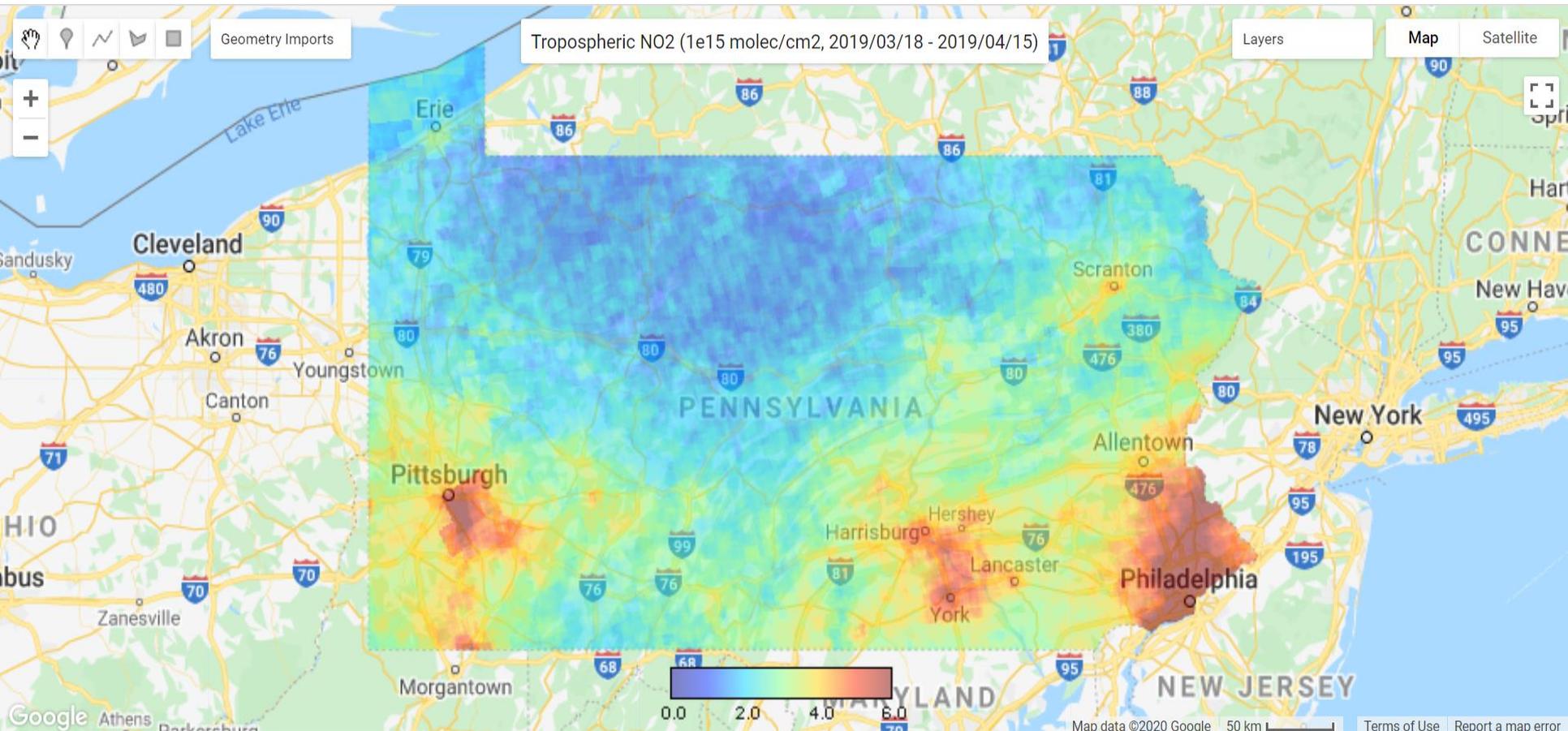
Regional NO₂ – Mid March-Mid April 2019



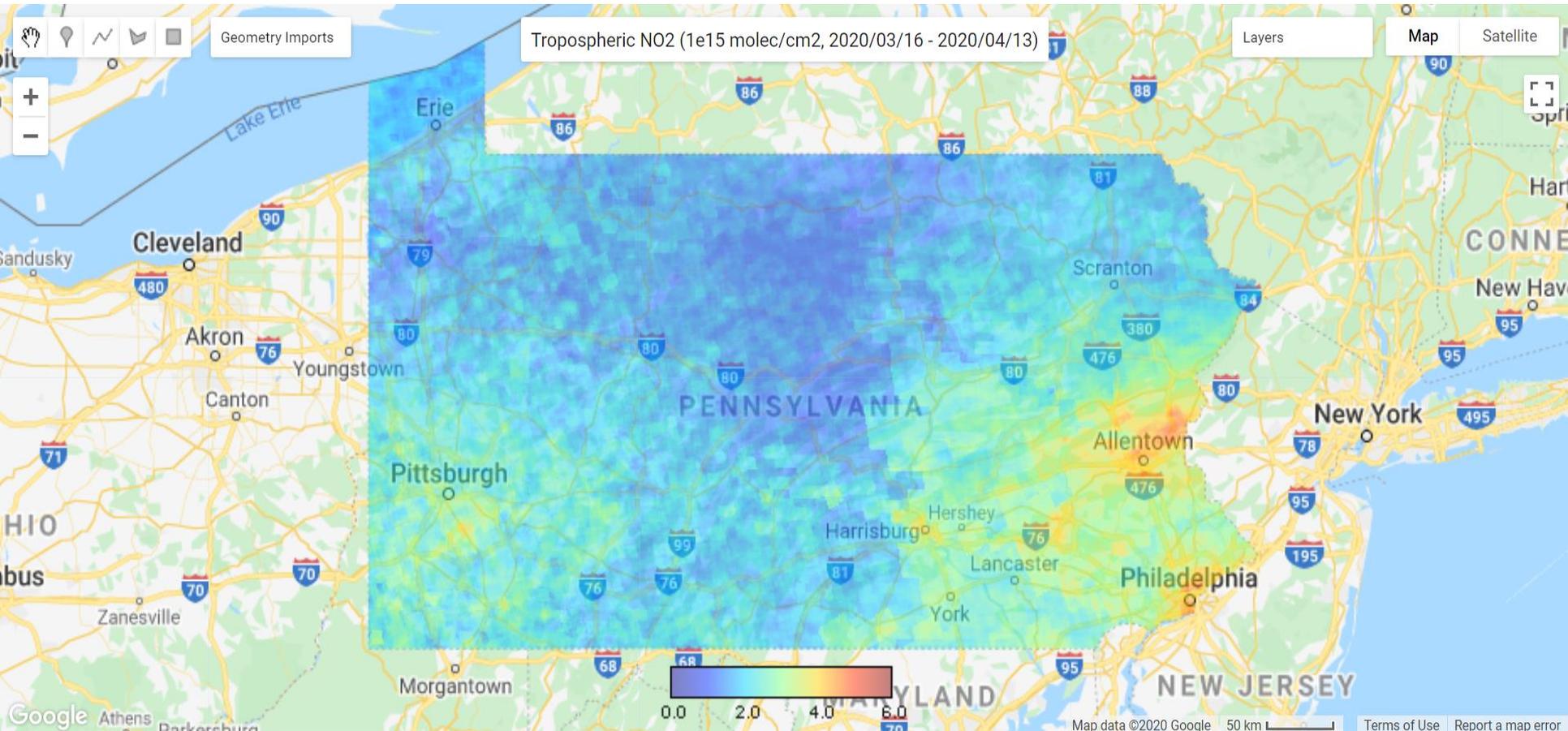
Regional NO₂ – Mid March-Mid April 2020



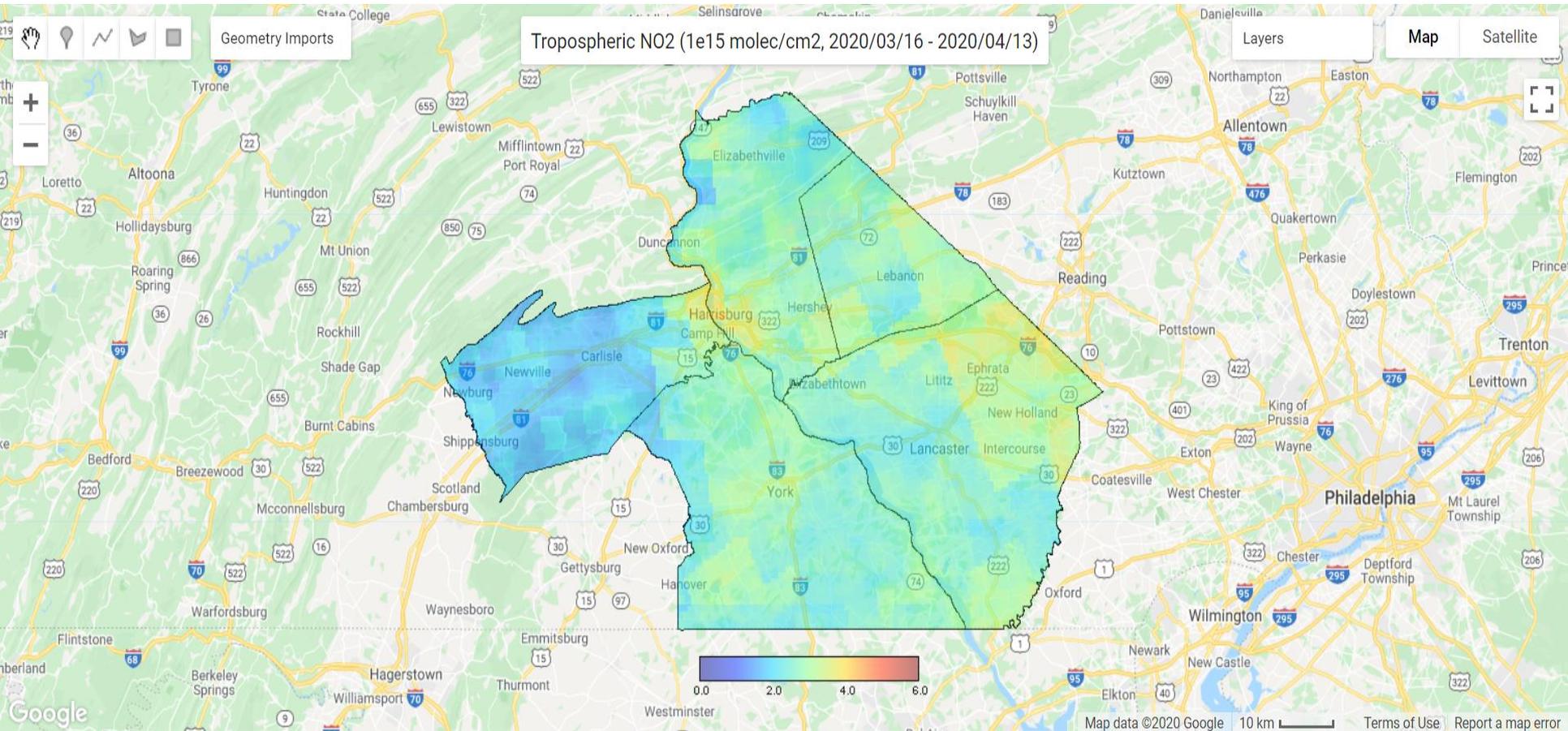
PA NO₂ – Mid March-Mid April 2019



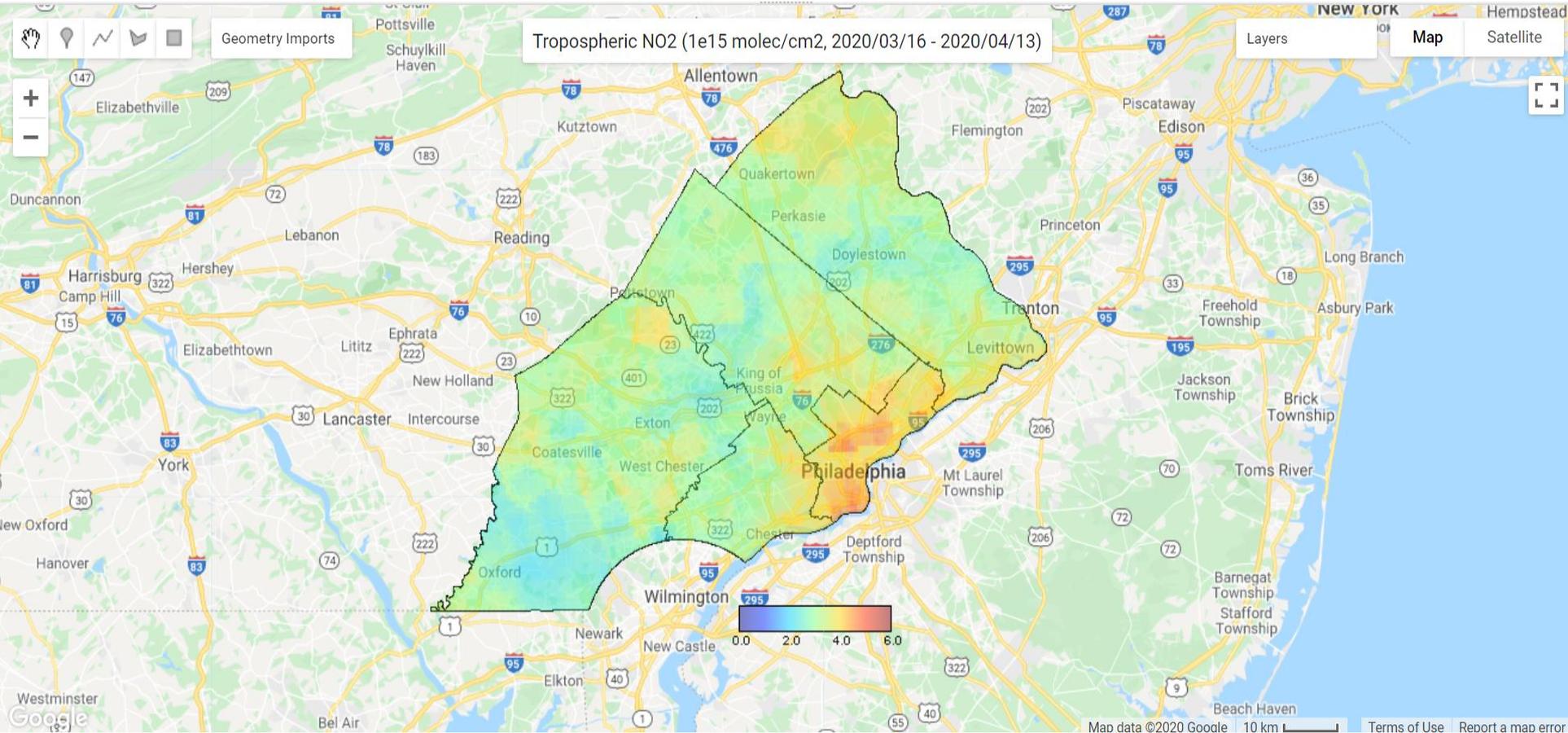
PA NO₂ – Mid March-Mid April 2020



Susq Valley NO₂ – Mid March-Mid April 2020



Philly NO₂ – Mid March-Mid April 2020



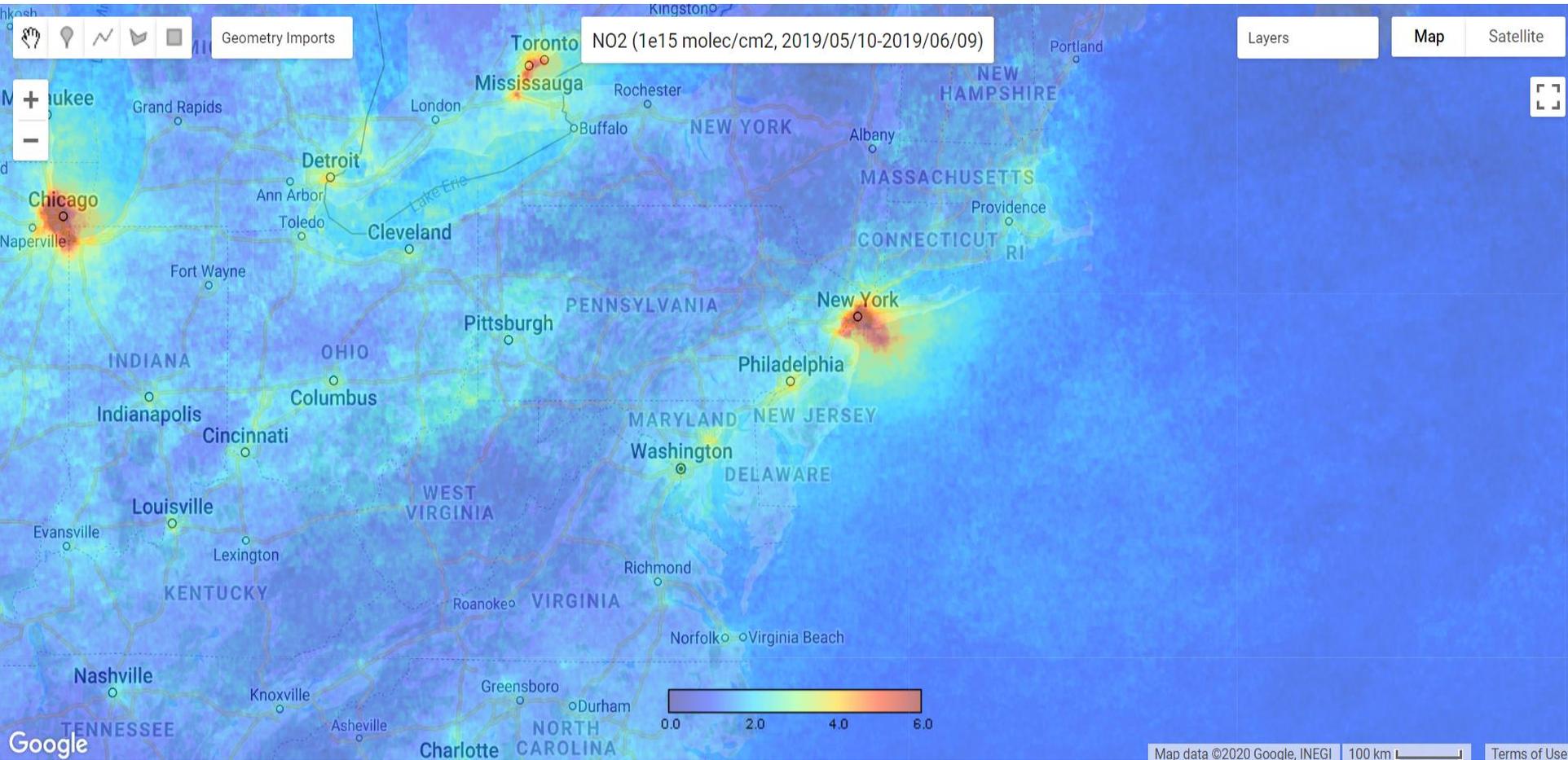
Loosening Period

Friday, May 8, 2020

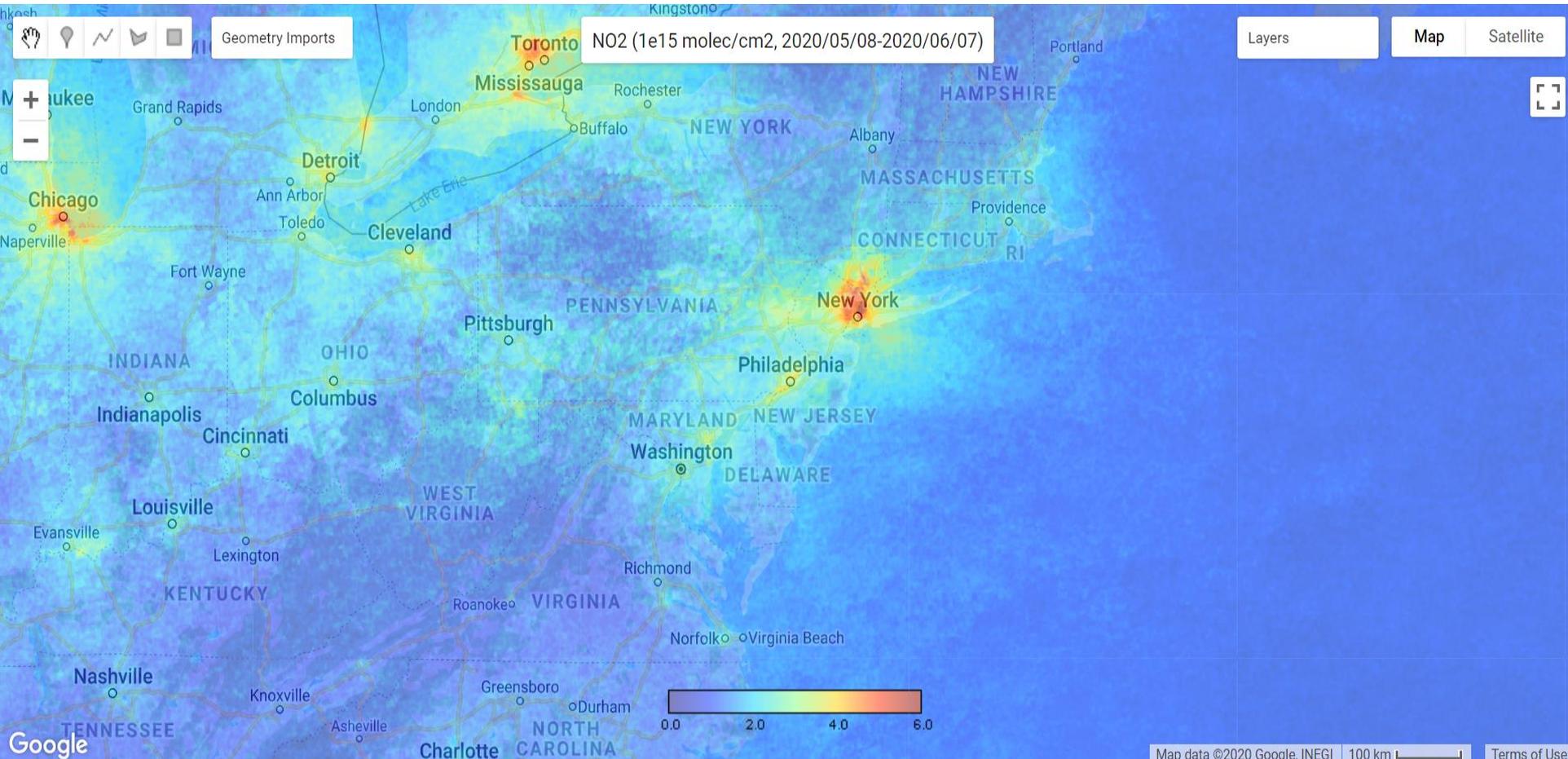
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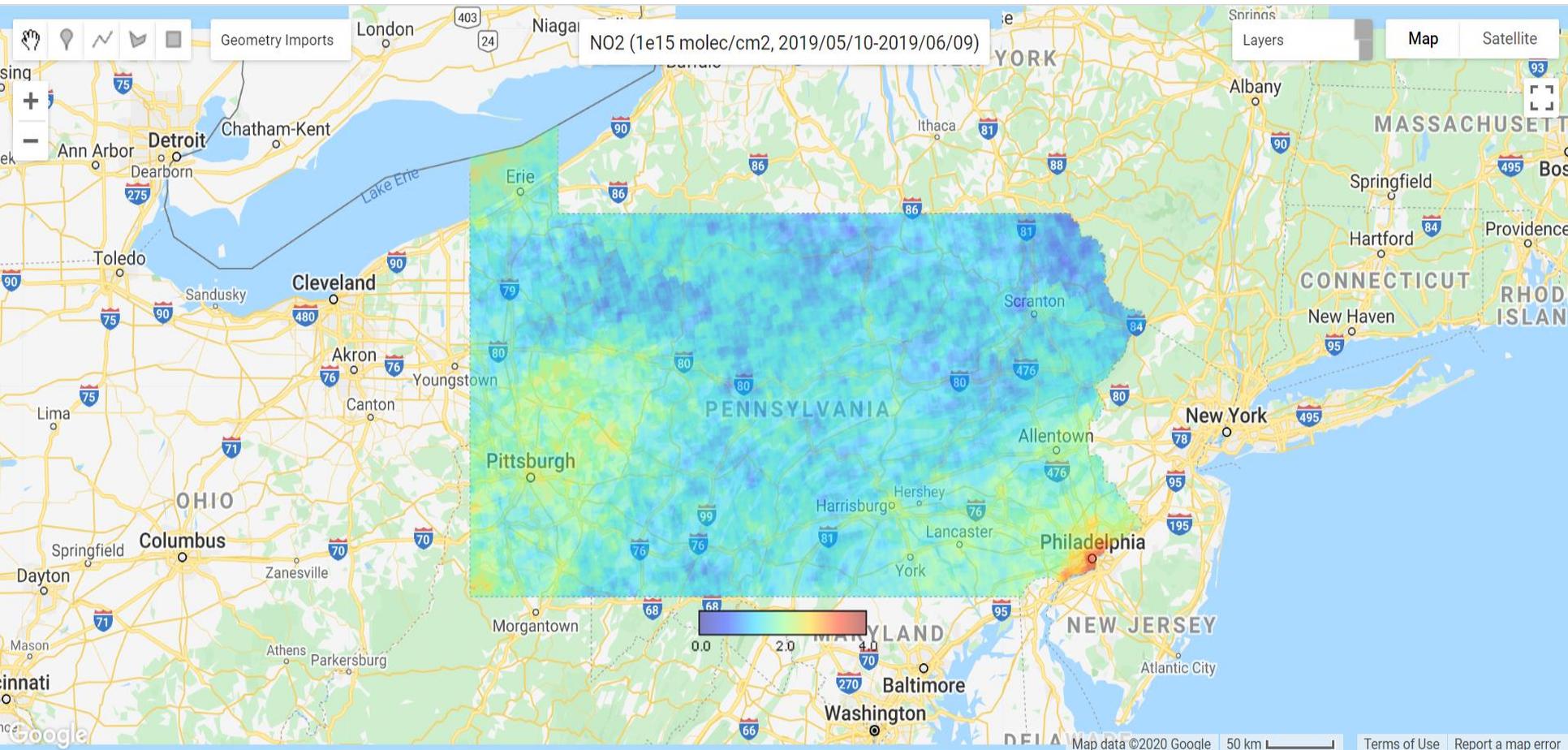
Regional NO₂ – Early May-Early June 2019



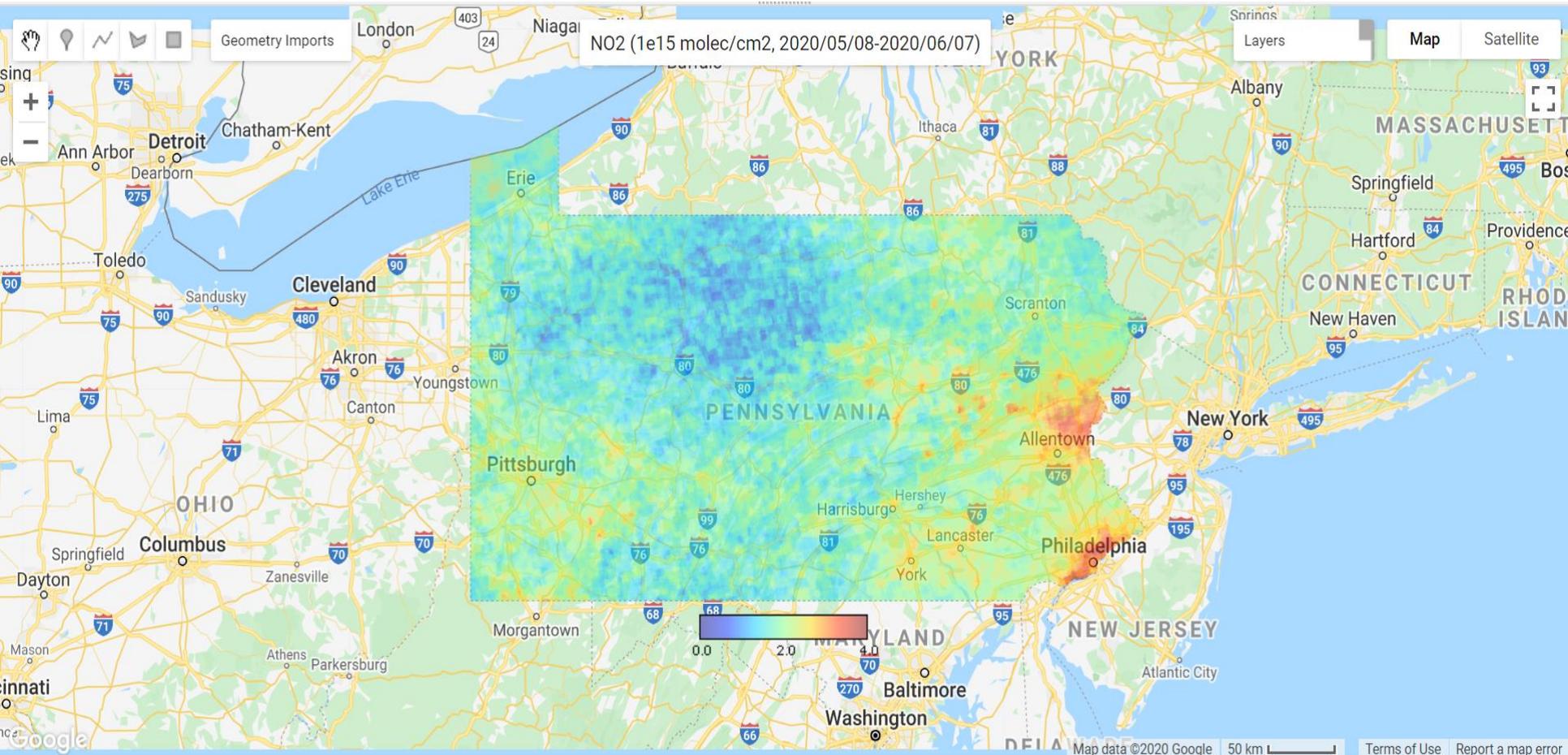
Regional NO₂ – Early May-Early June 2020



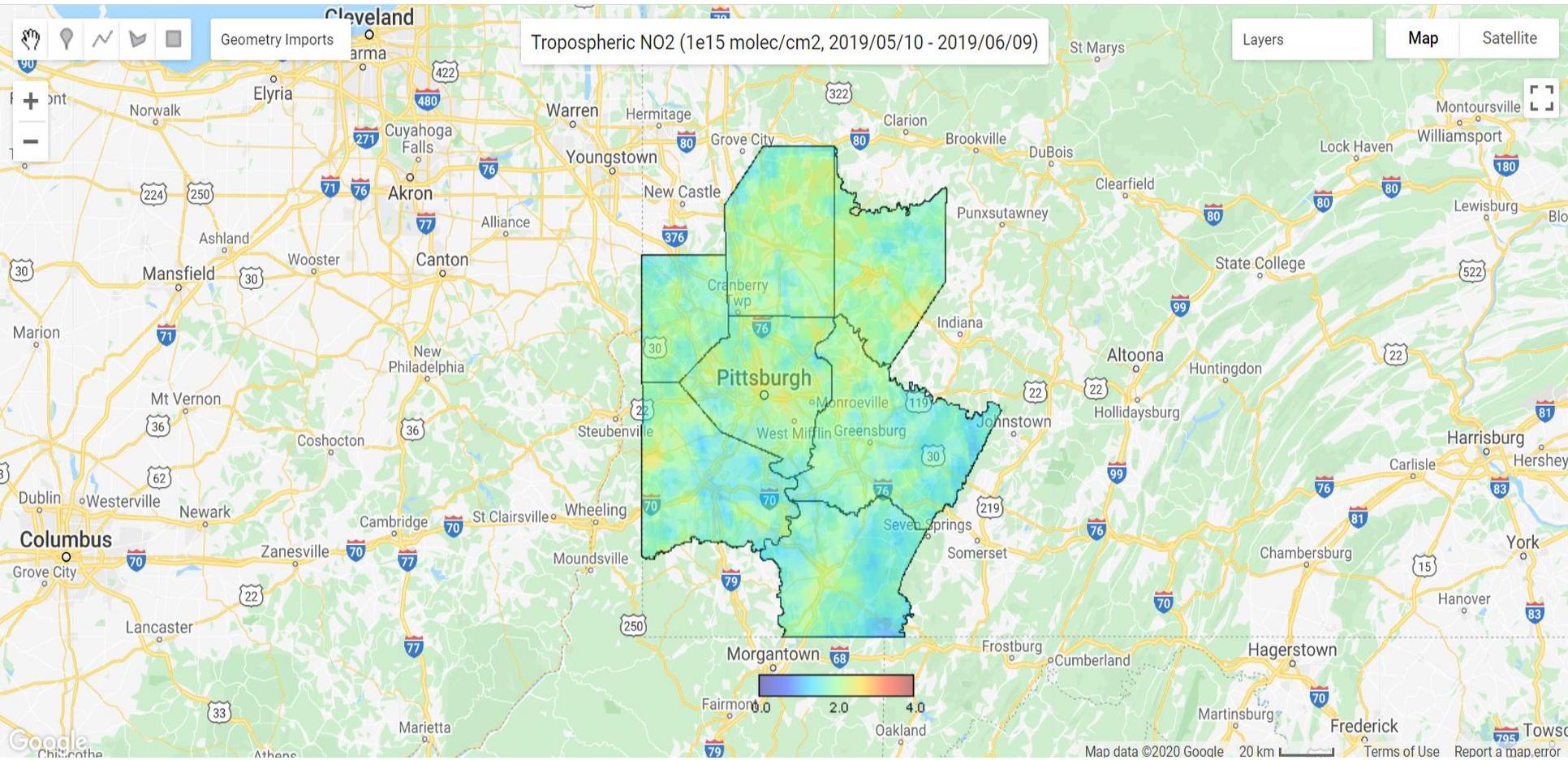
PA NO₂ – Early May-Early June 2019



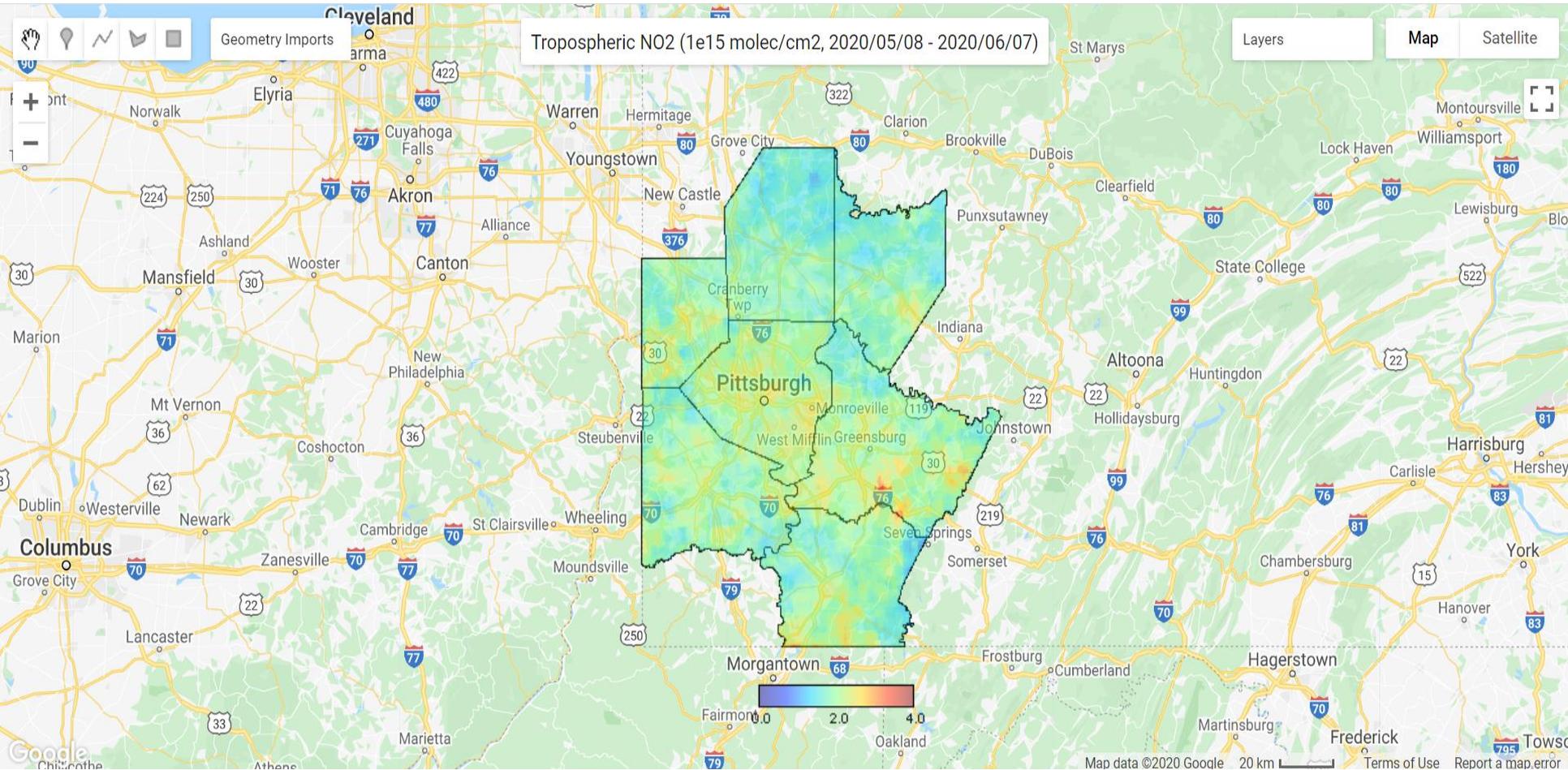
PA NO₂ – Early May-Early June 2020



Pitt NO₂ – Early May-Early June 2019

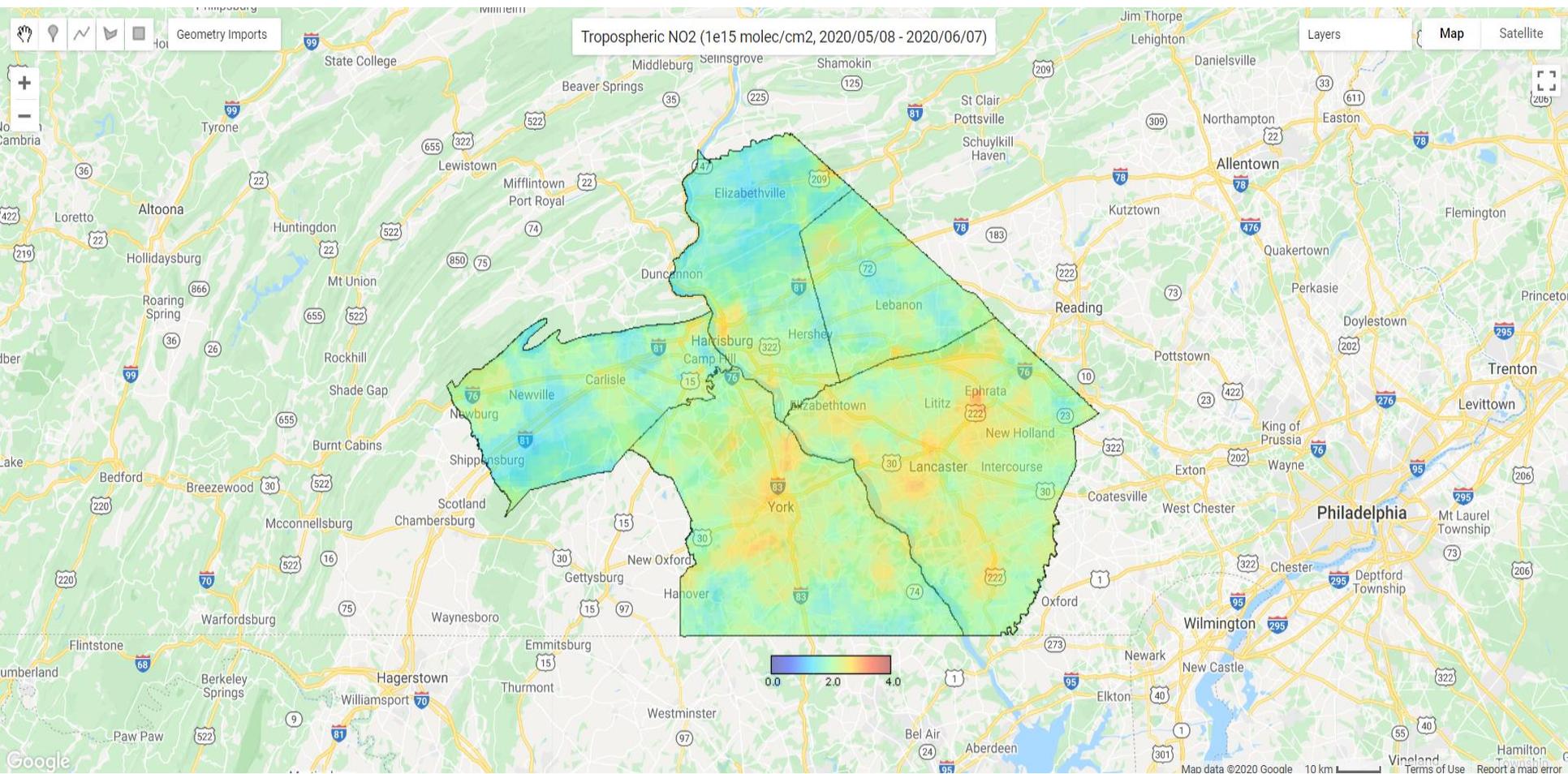


Pitt NO₂ – Early May-Early June 2020



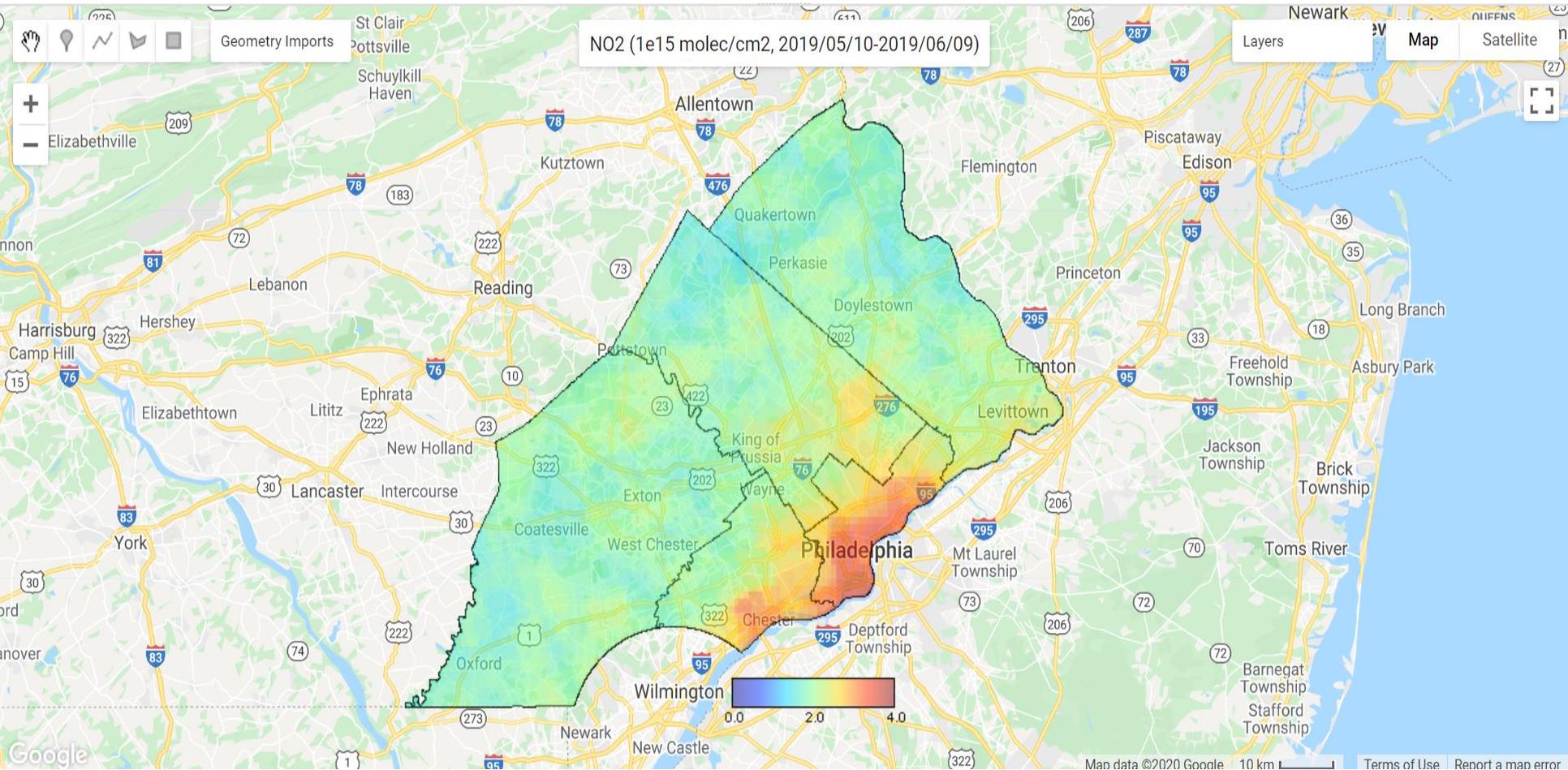
Yellow Phase – Most of Region Since
May 15 (24 Days)

Susq Valley NO₂ – Early May-Early June 2020

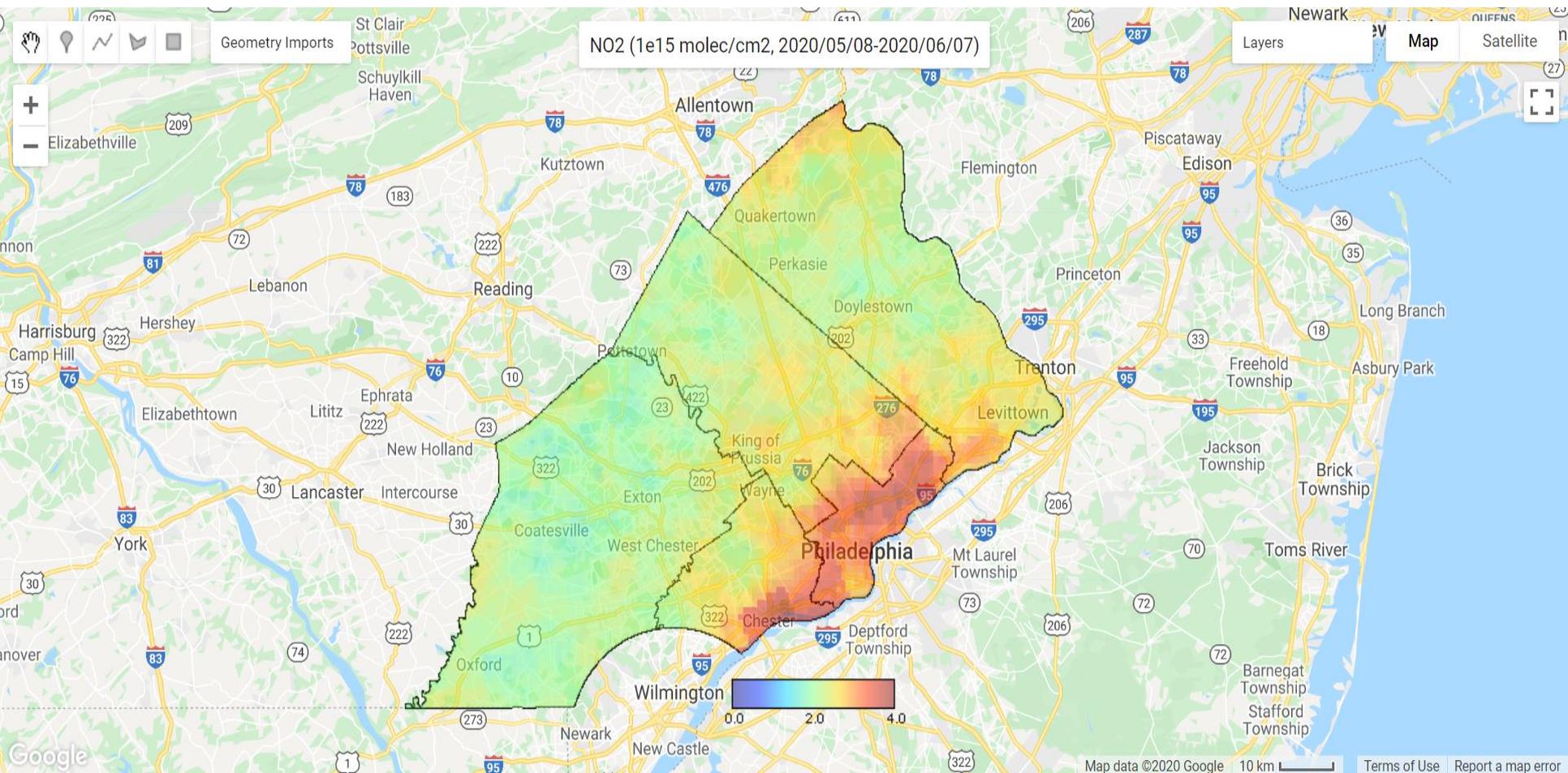


Yellow Phase – Most of Region Since
May 22 (17 Days)

Philly NO₂ – Early May-Early June 2019



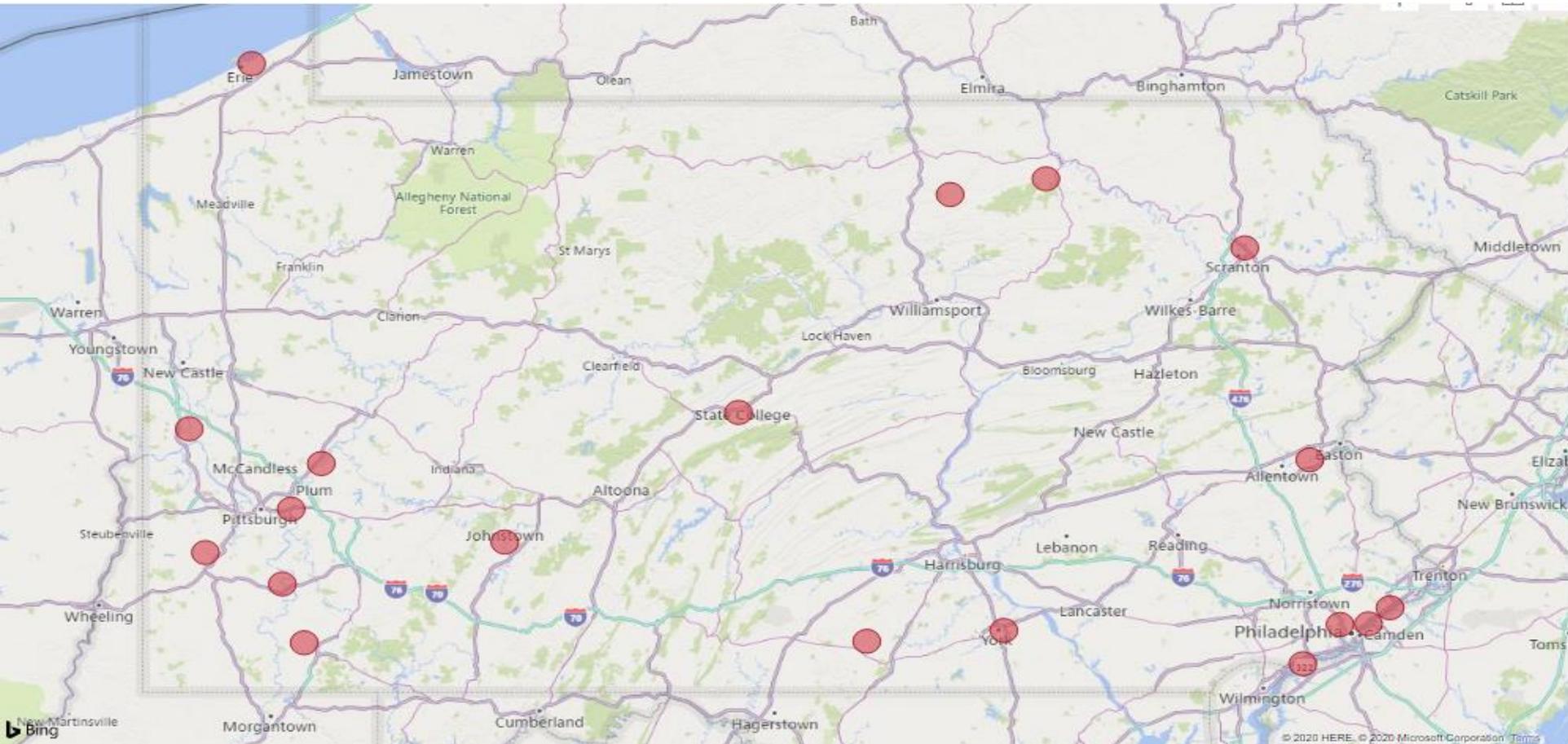
Philly NO₂ – Early May-Early June 2020



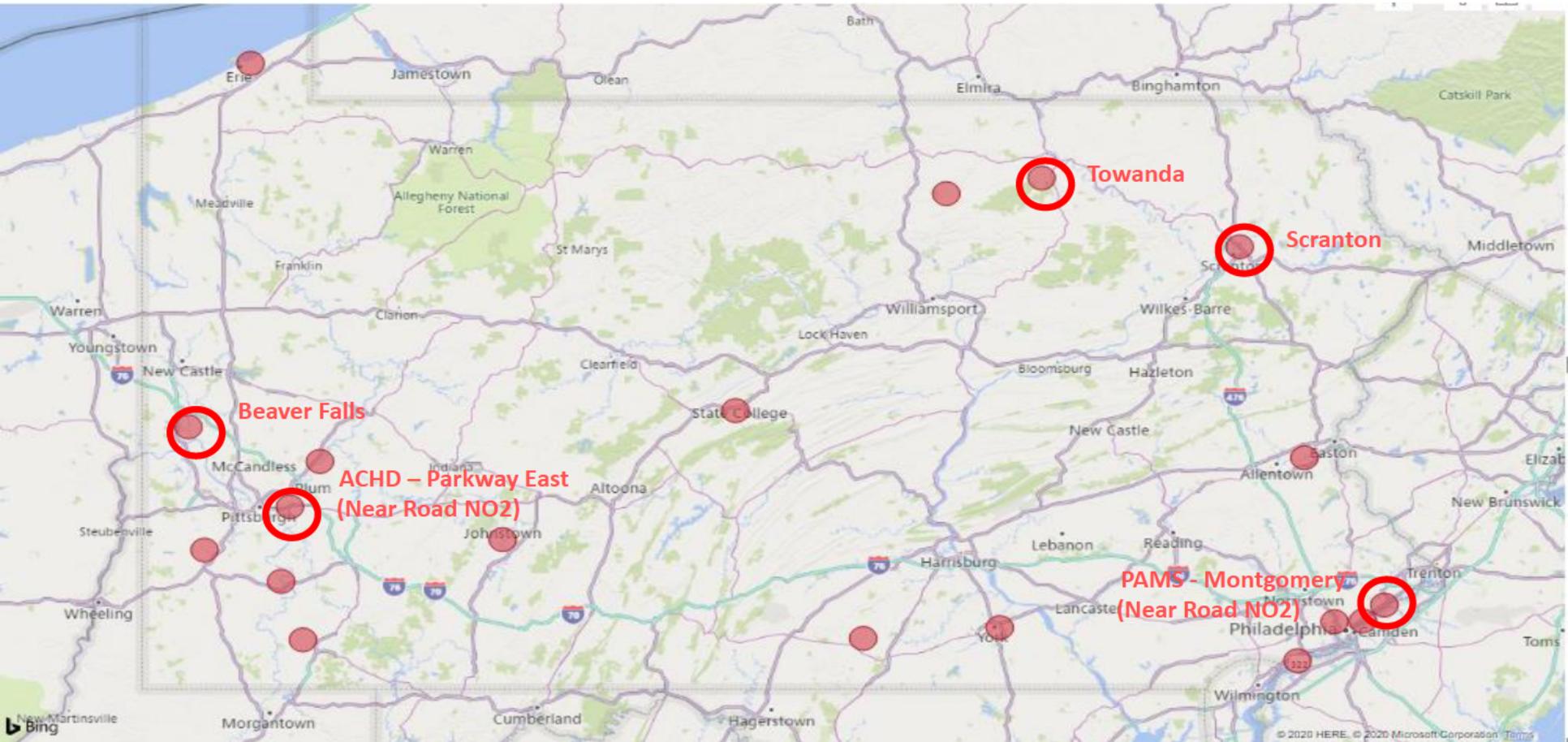
Yellow Phase – Most of Region Since
June 5 (3 Days)

PA Air Monitoring Data: 2019 vs. 2020

PA NO₂ Monitor Locations



PA NO₂ Monitor Locations (Focus Area)



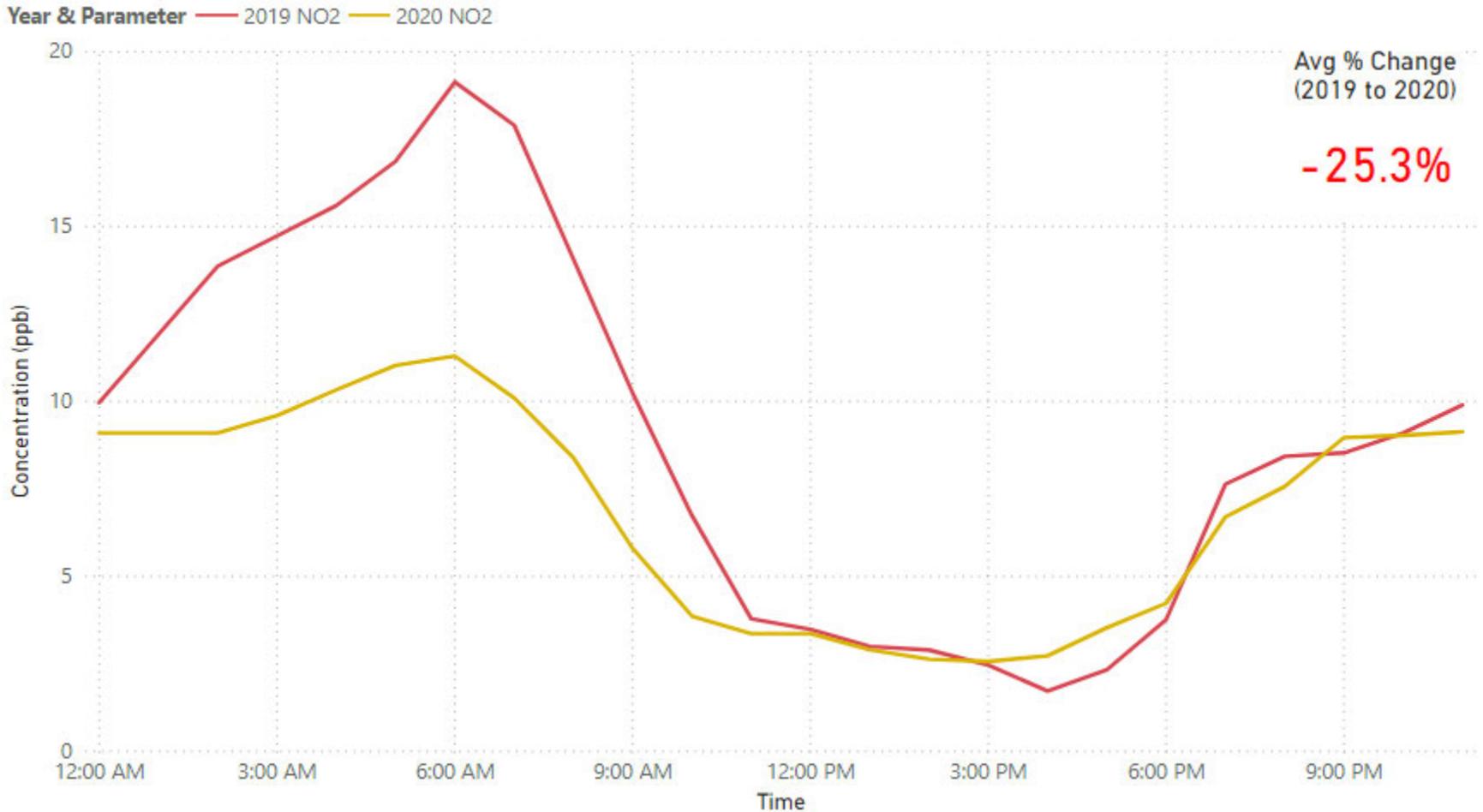
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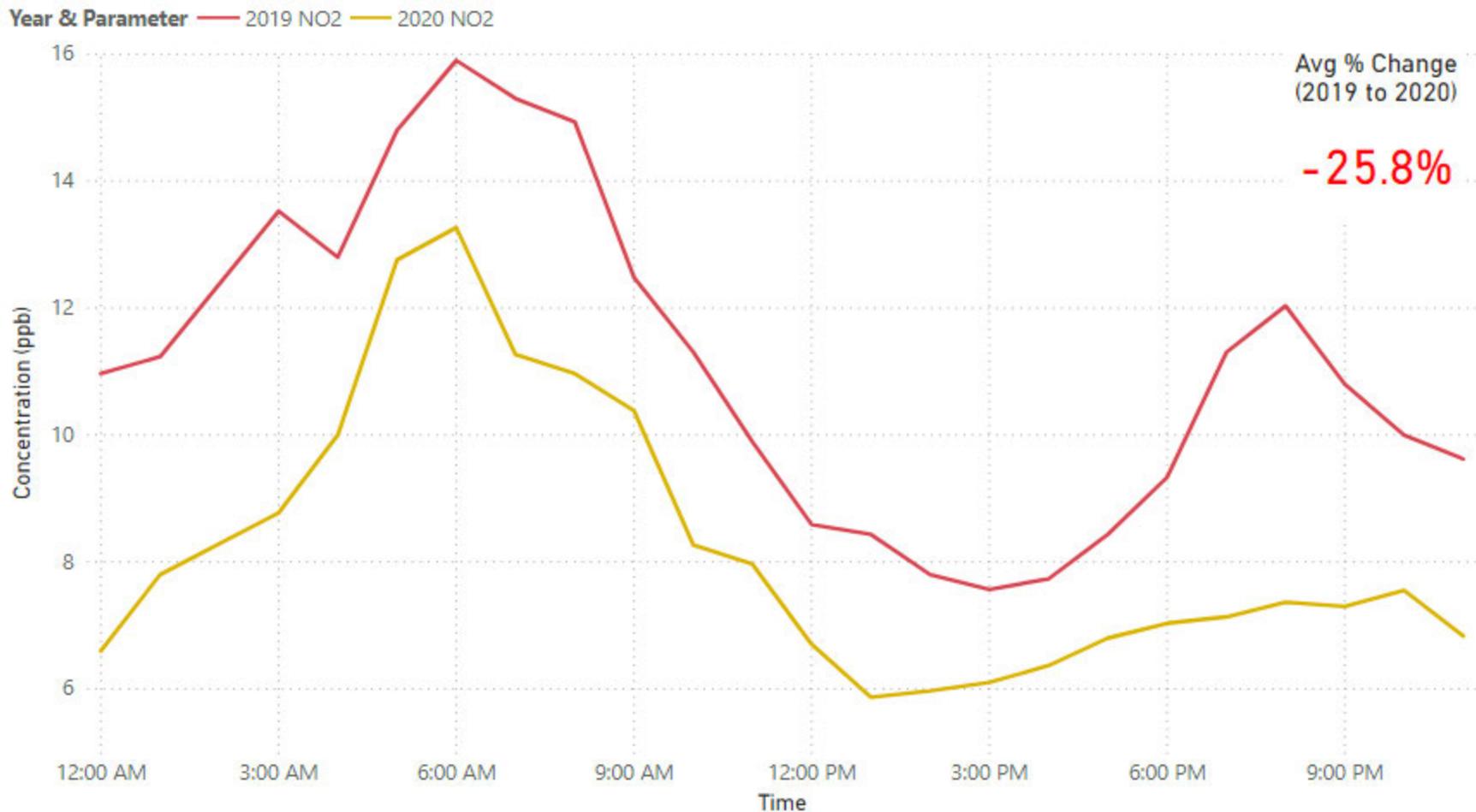
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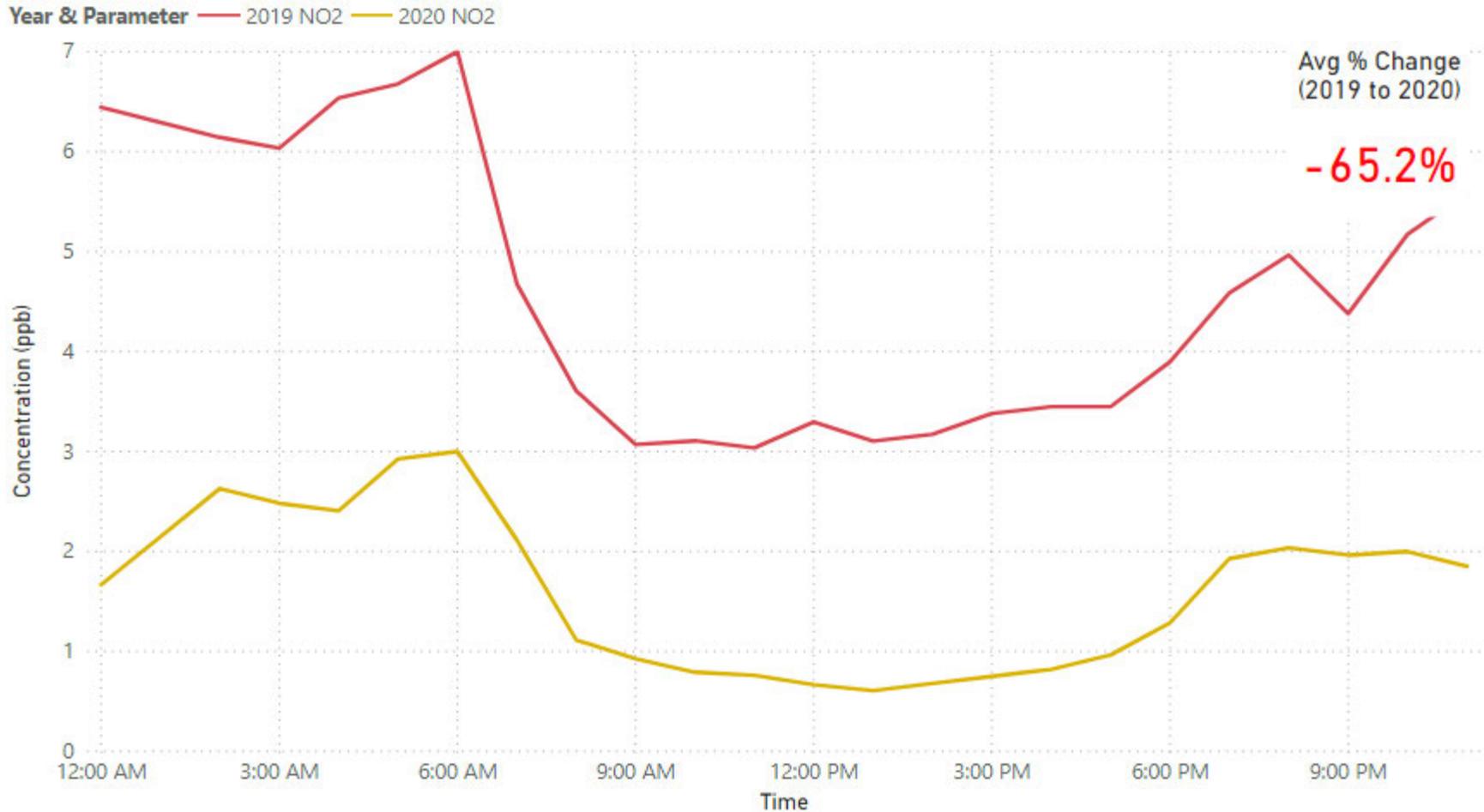
Weekday NO₂ Concentrations – Beaver Falls



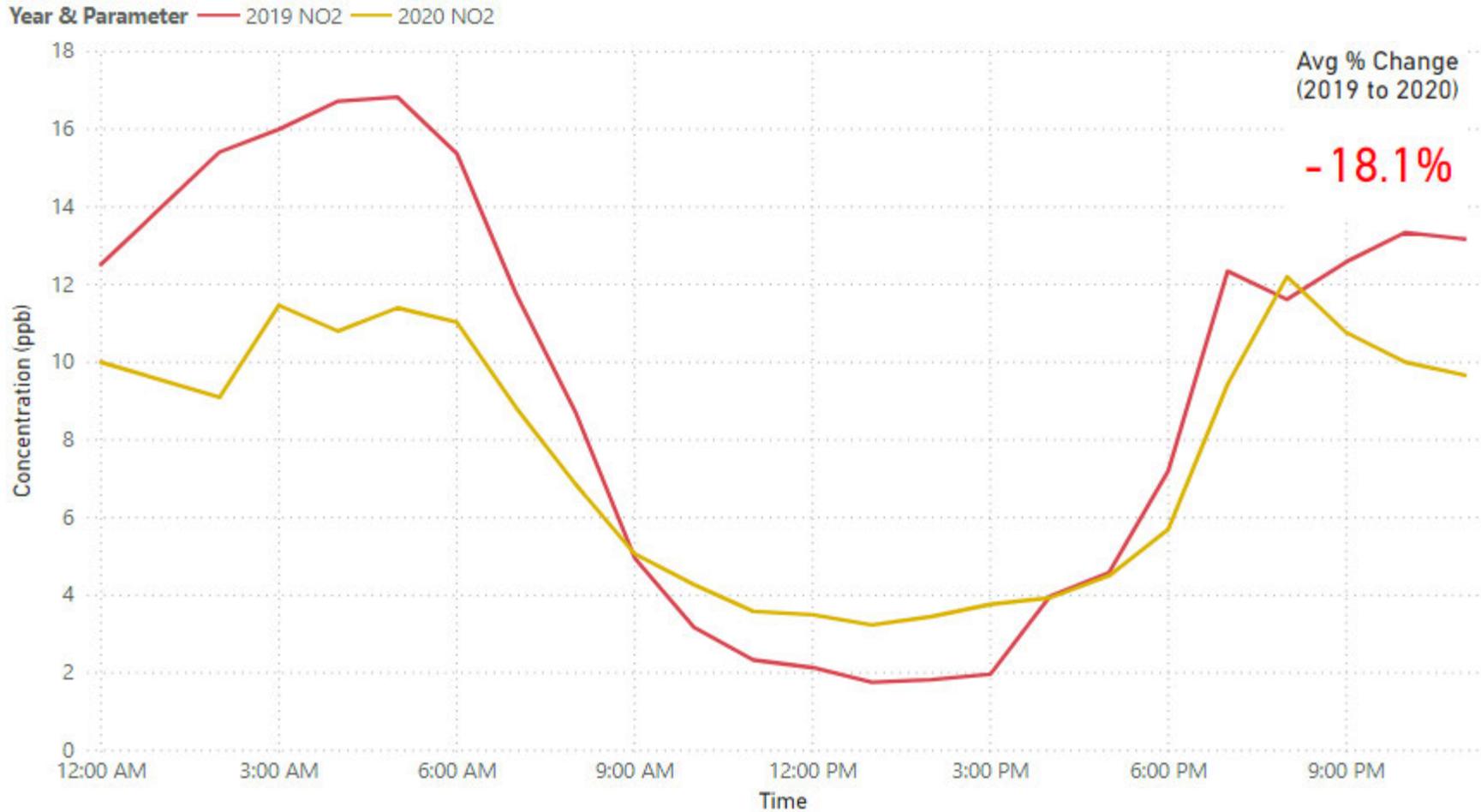
Weekday NO₂ Concentrations – Parkway East



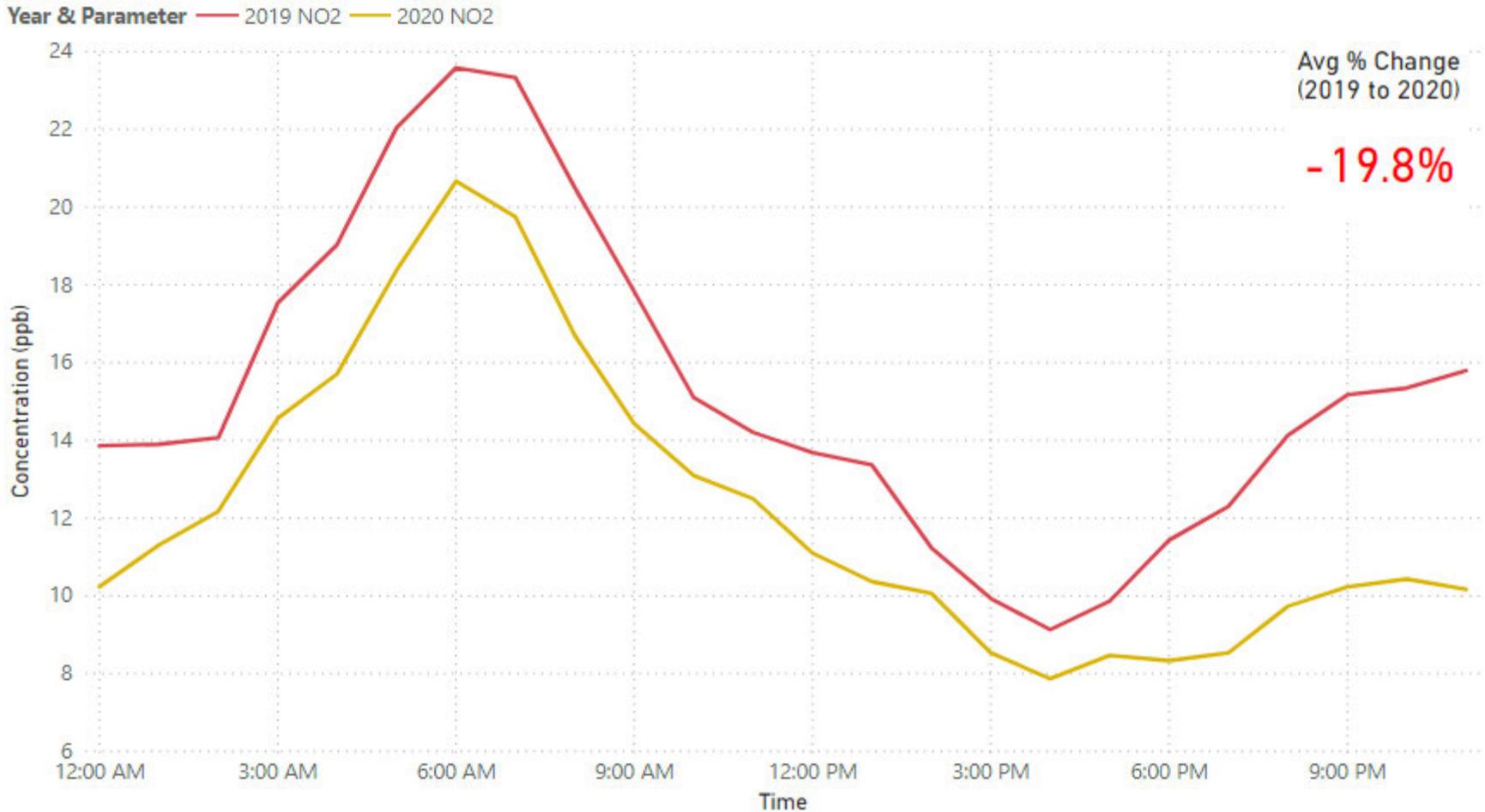
Weekday NO₂ Concentrations – Towanda



Weekday NO₂ Concentrations – Scranton



Weekday NO₂ Concentrations – Montgomery



Weekend NO₂ Concentrations – Montgomery



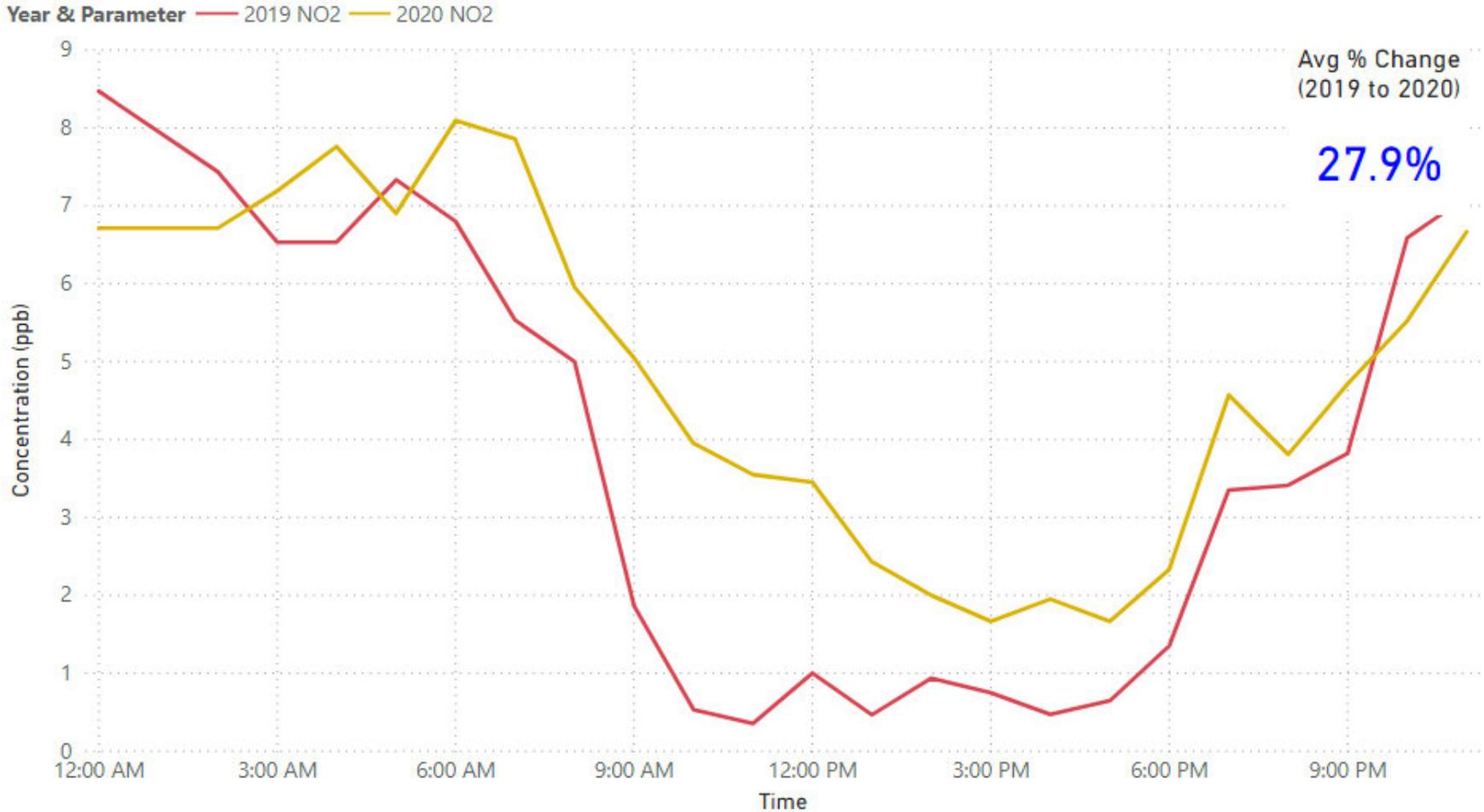
Loosening Period

Friday, May 8, 2020

to

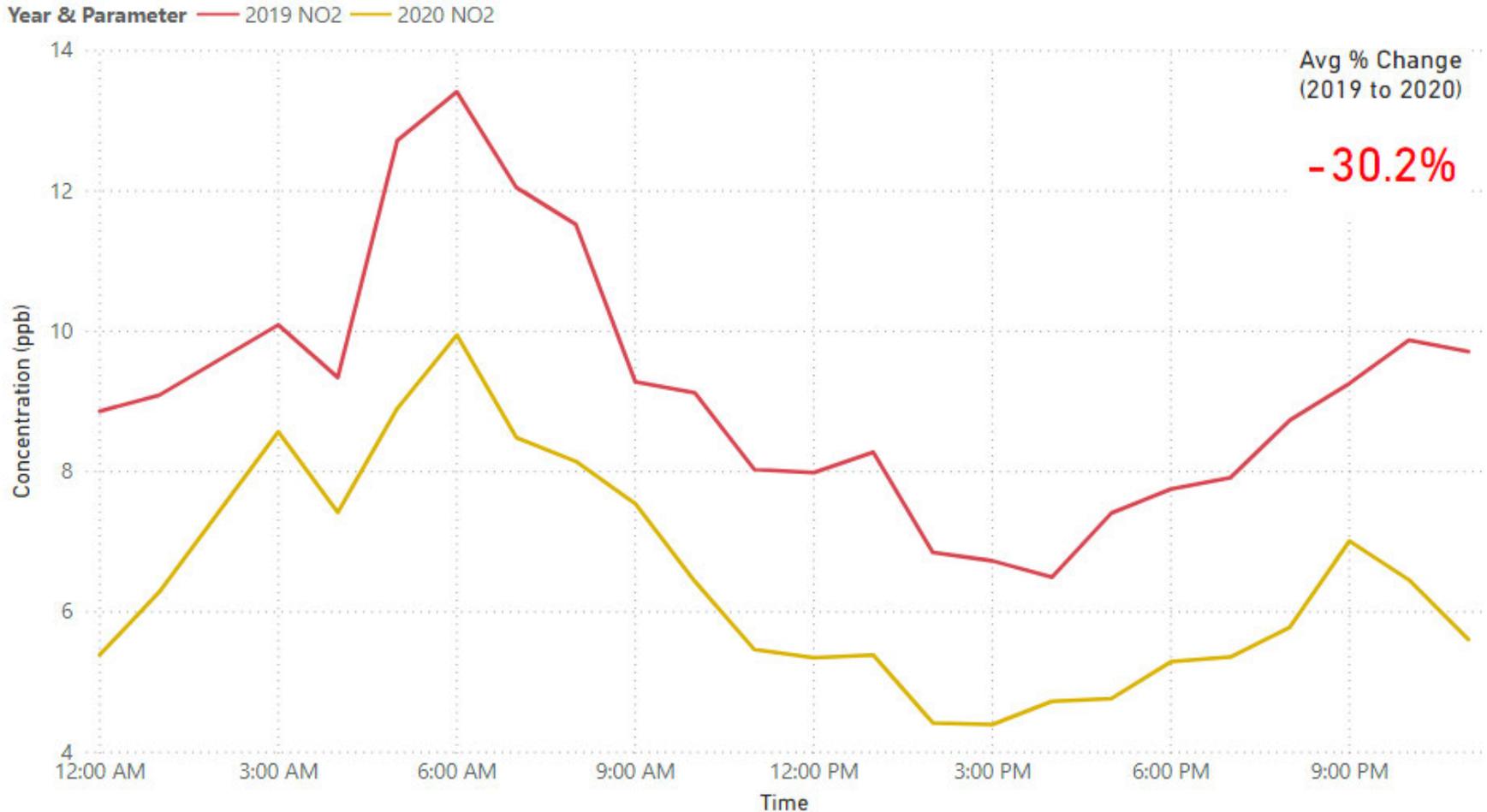
Sunday, June 7, 2020

Weekday NO₂ Concentrations – Beaver Falls



Yellow Phase – Since May 22 (17 Days)

Weekday NO₂ Concentrations – Parkway East



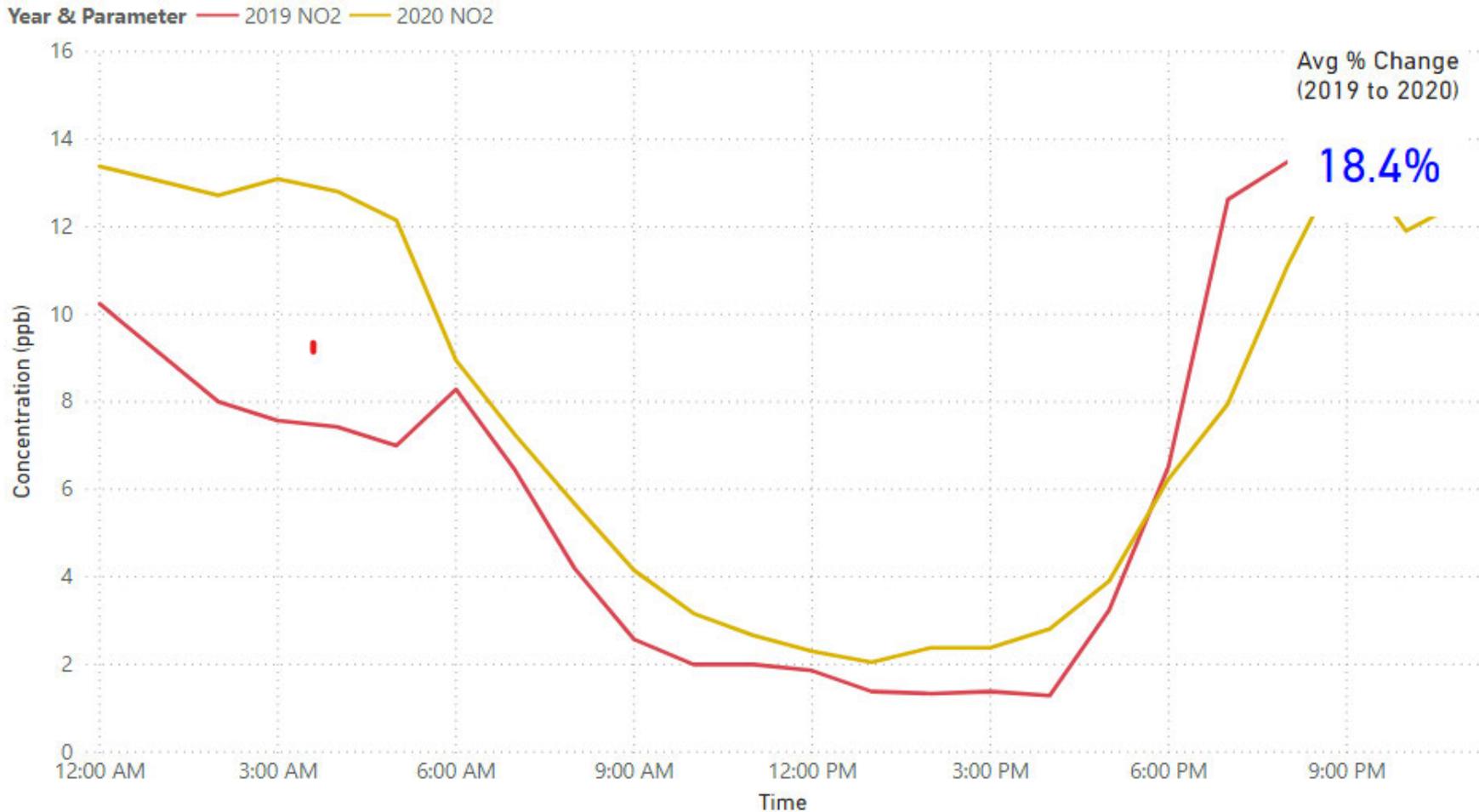
Yellow Phase – Since May 15 (24 Days)

Weekday NO₂ Concentrations – Towanda



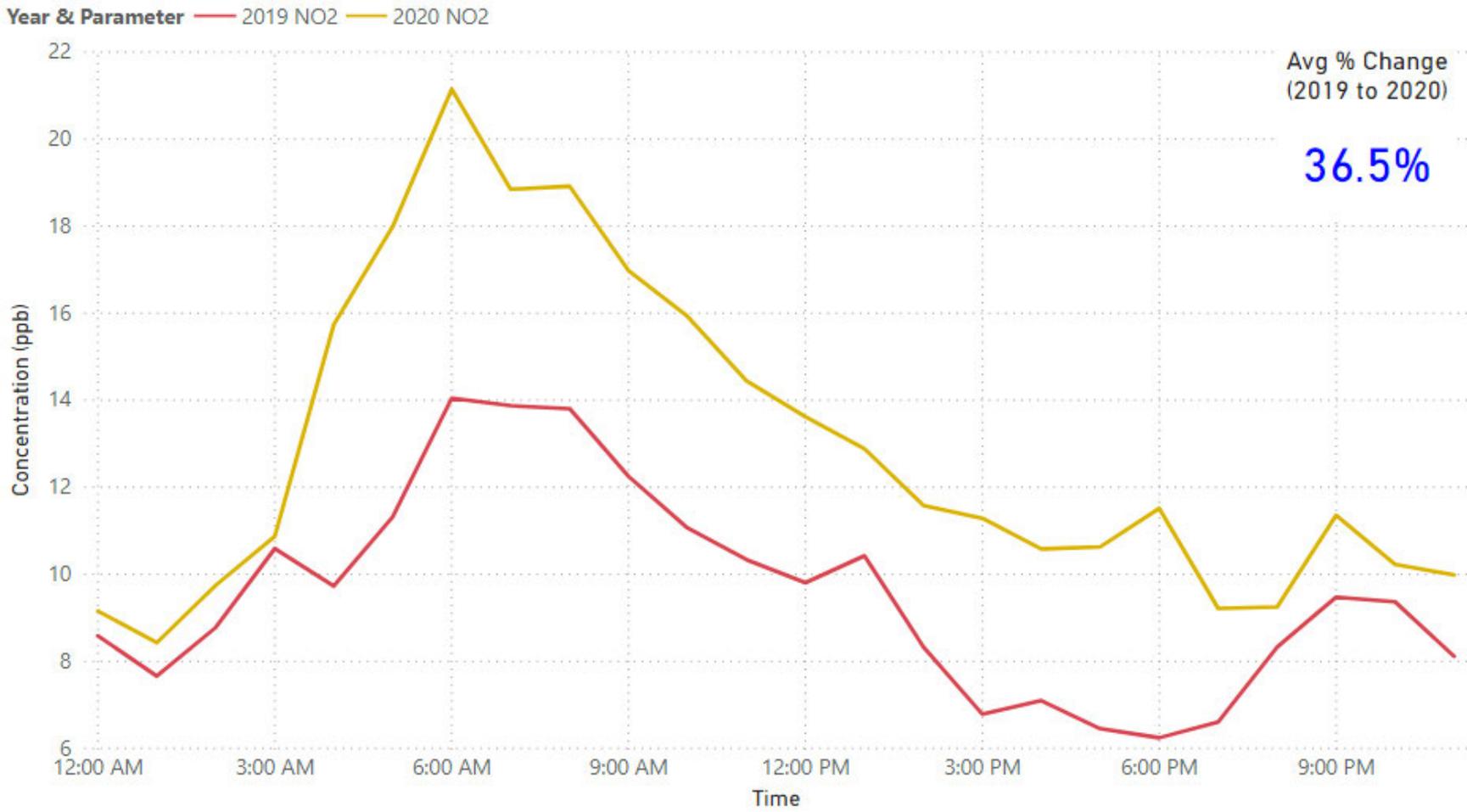
Yellow Phase – Since May 8 (31 Days)

Weekday NO₂ Concentrations – Scranton



Yellow Phase – Since June 5 (3 Days)

▶ Weekday NO₂ Concentrations – Montgomery

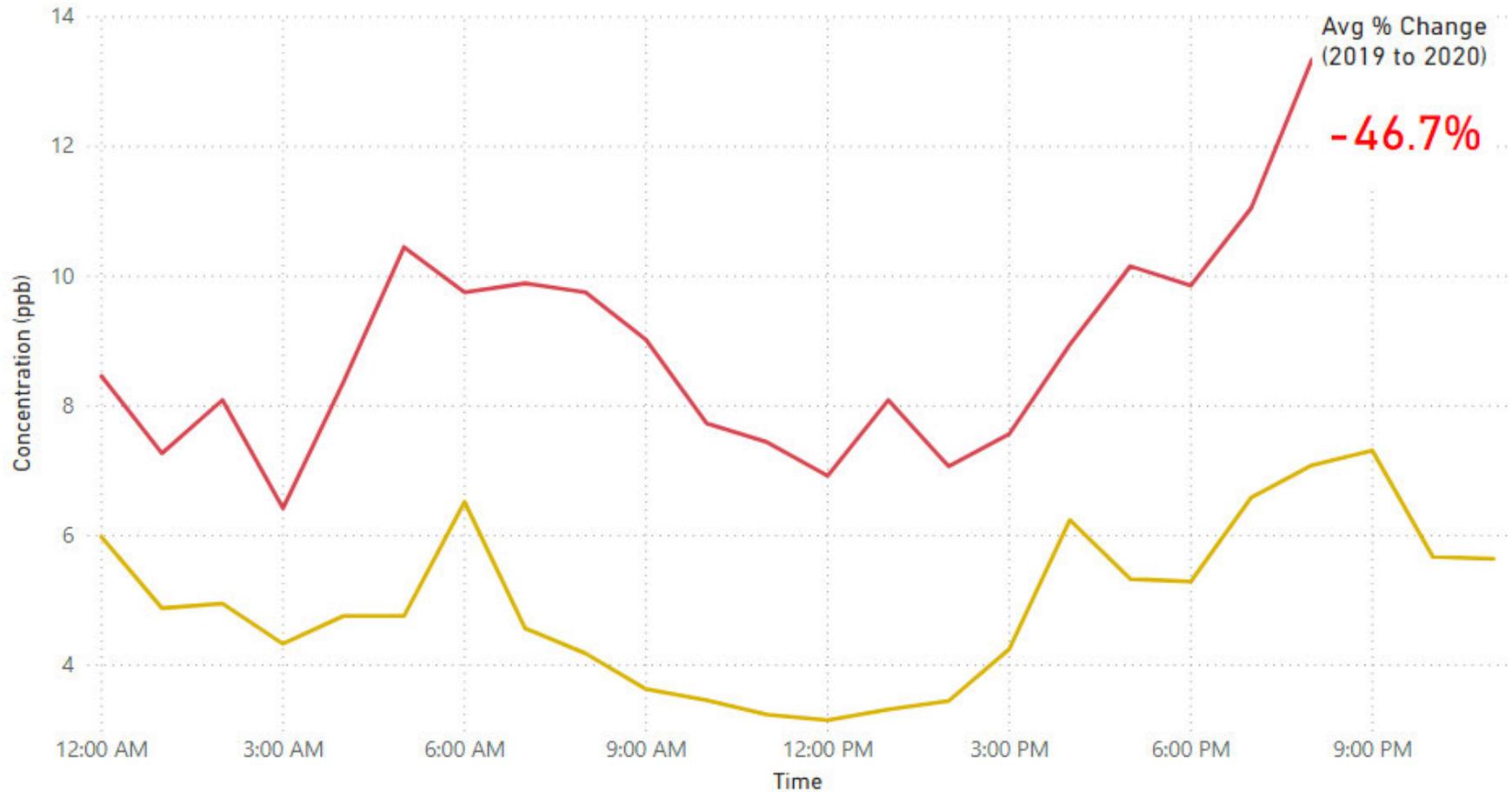


Yellow Phase – Since June 5 (3 Days)



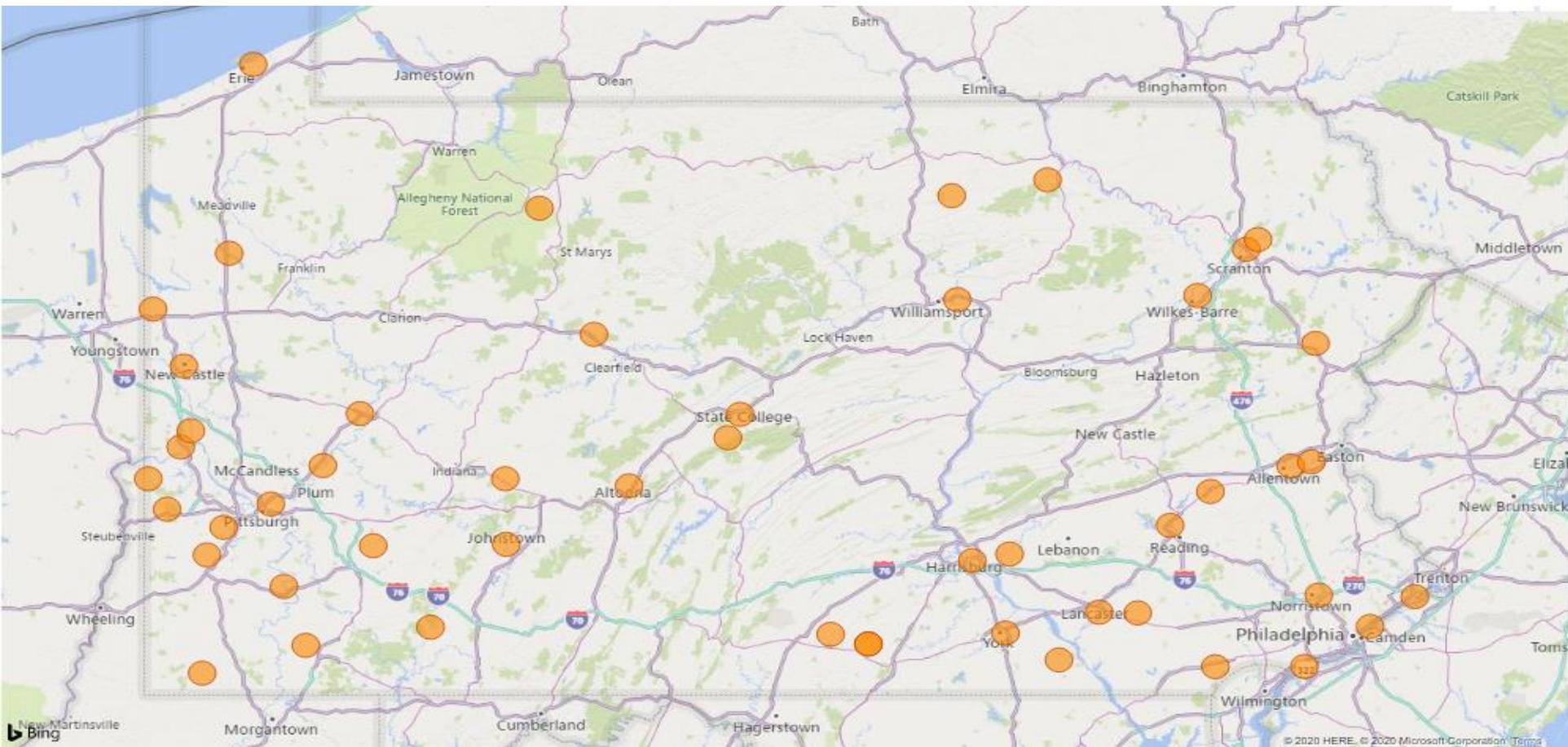
Weekend NO₂ Concentrations – Montgomery

Year & Parameter — 2019 NO₂ — 2020 NO₂

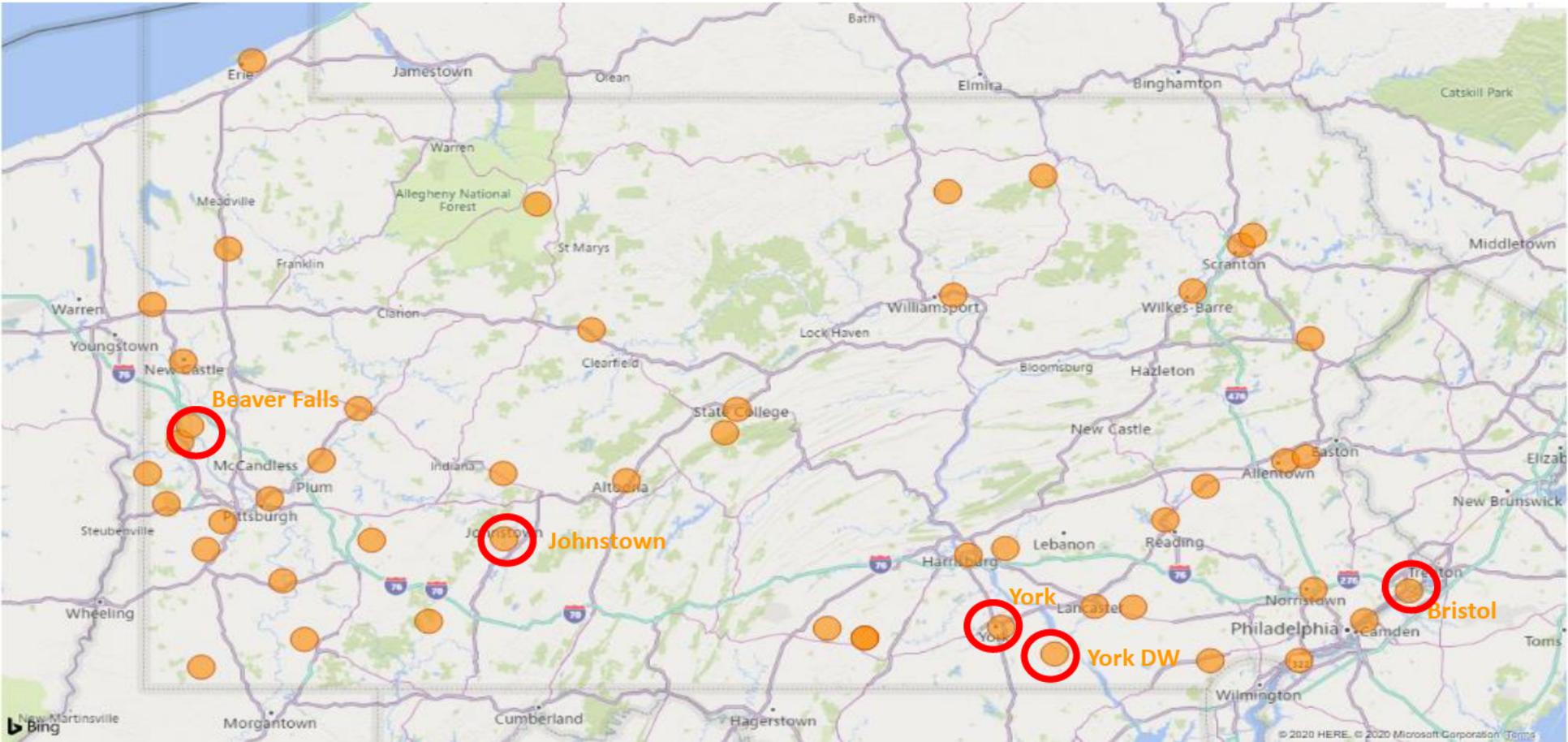


Yellow Phase – Since June 5 (3 Days)

PA Ozone Monitor Locations



PA Ozone Monitor Locations (Focus Area)



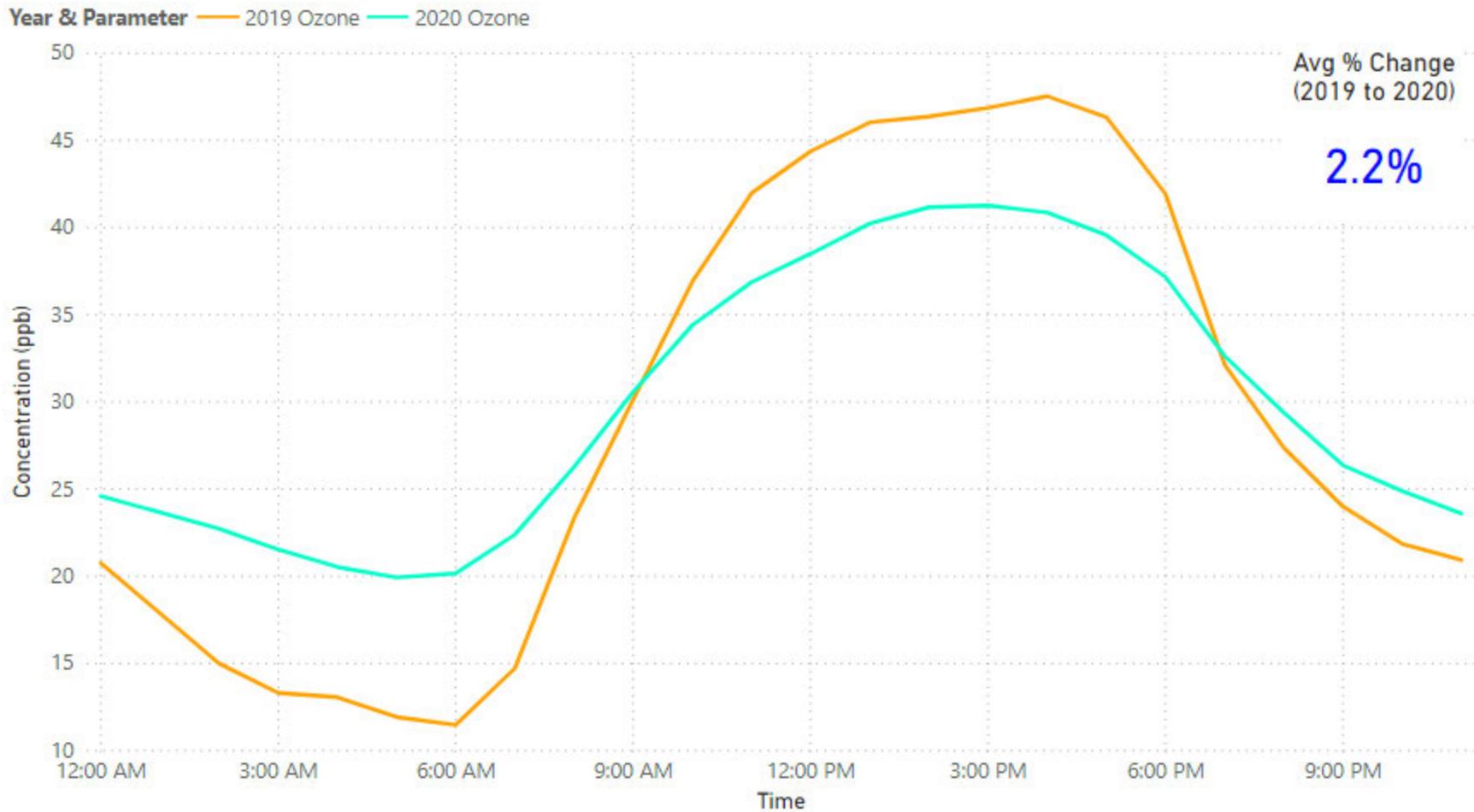
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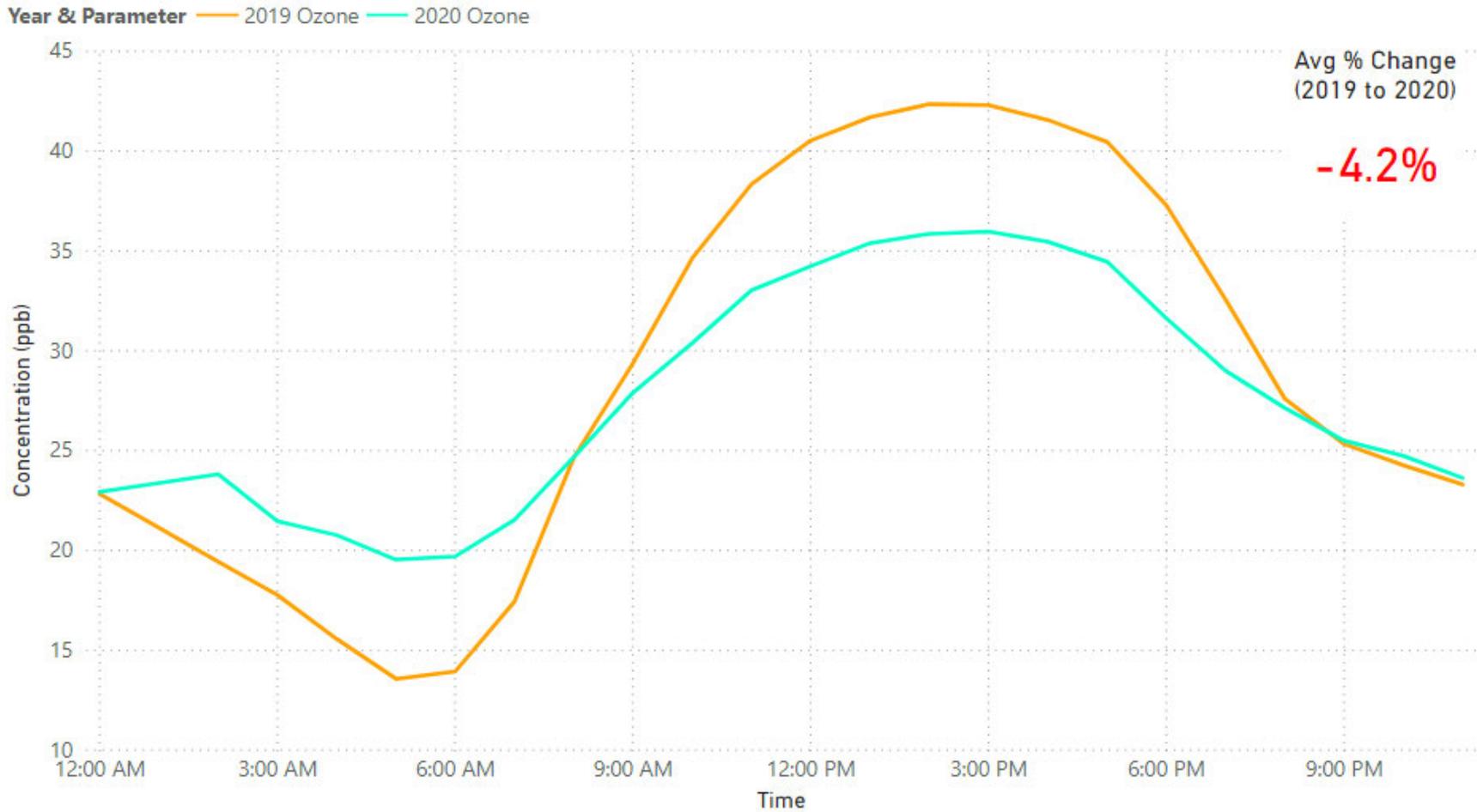
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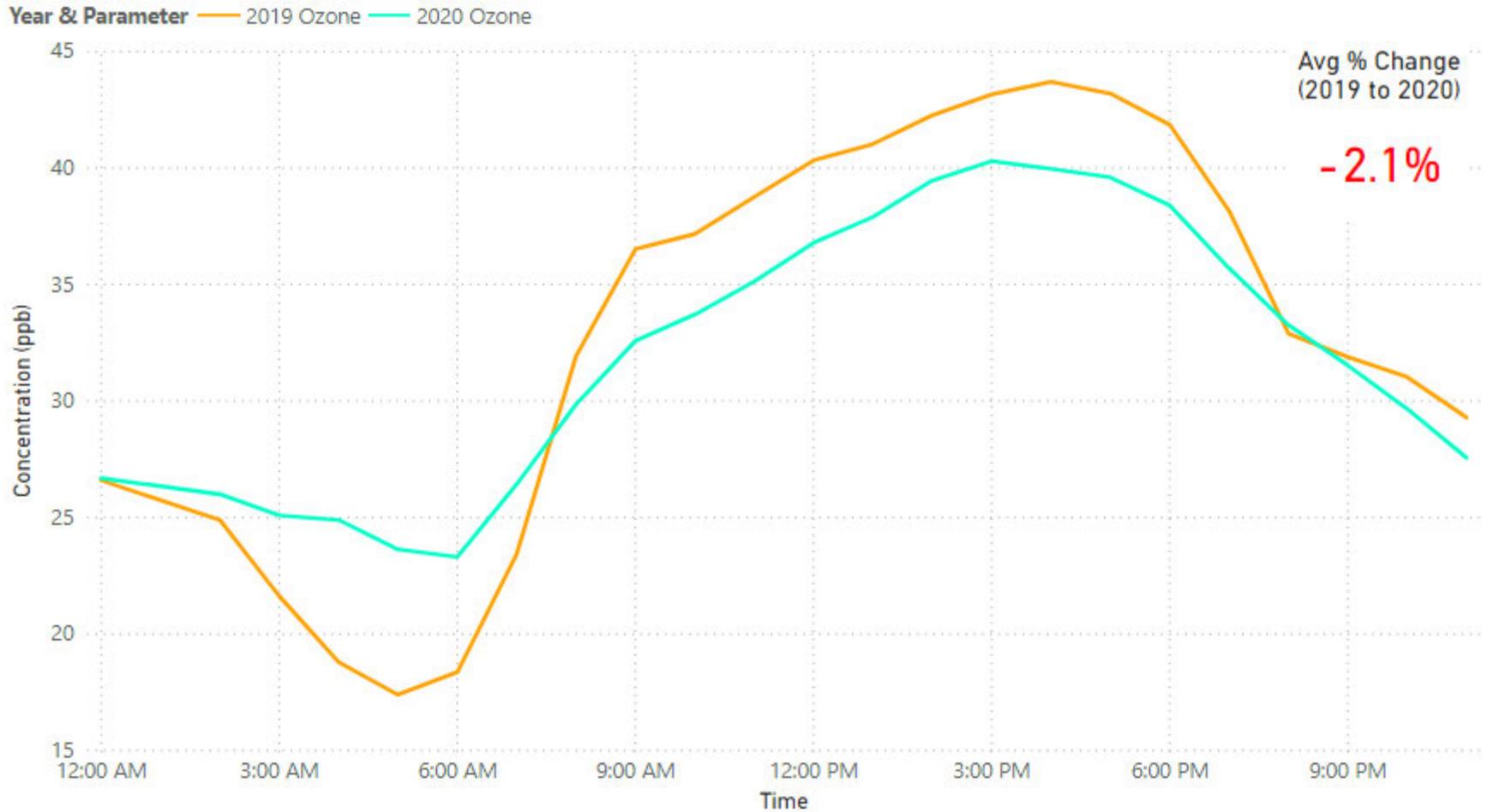
Weekday Ozone Concentrations – Beaver Falls



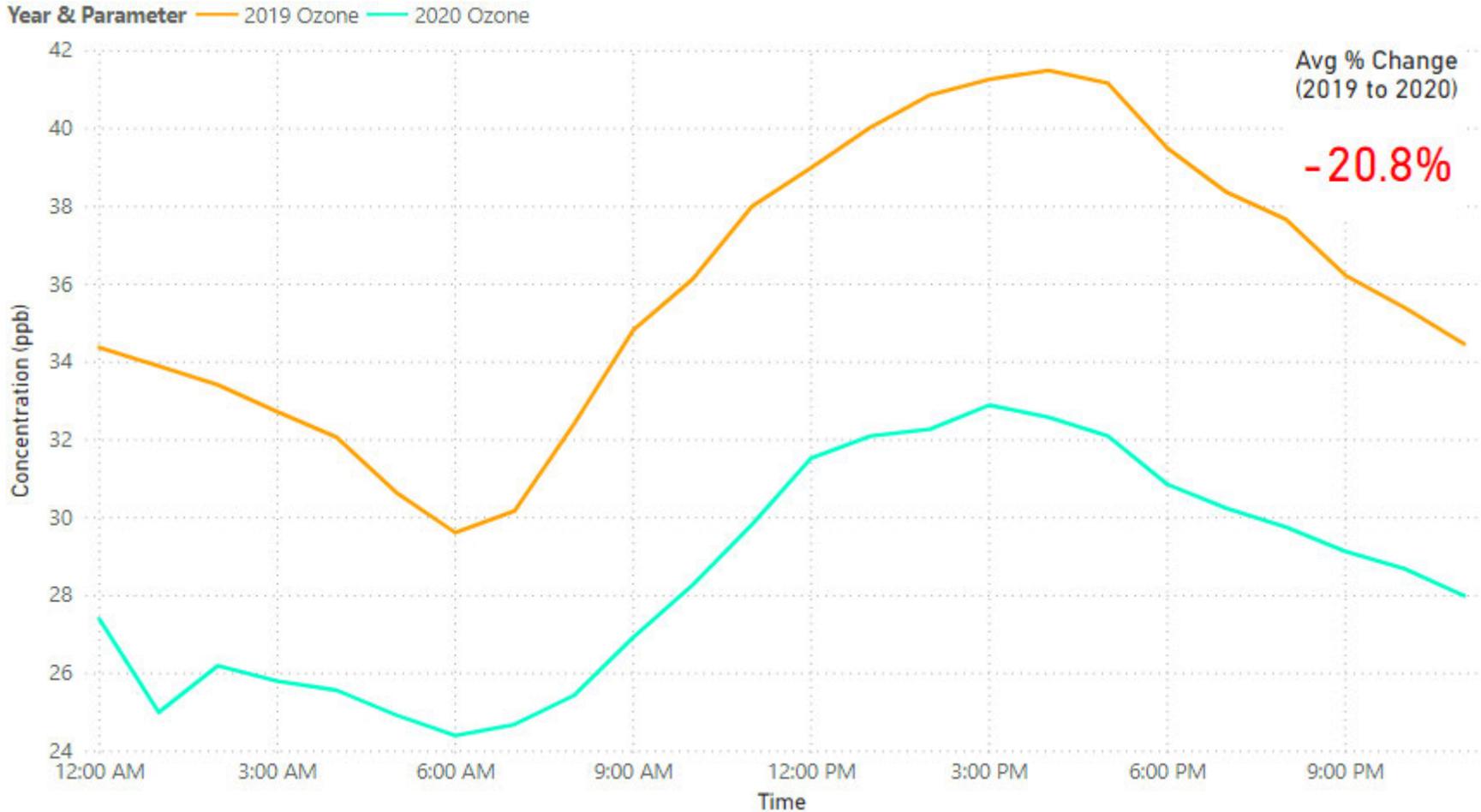
▶ Weekday Ozone Concentrations – Johnstown



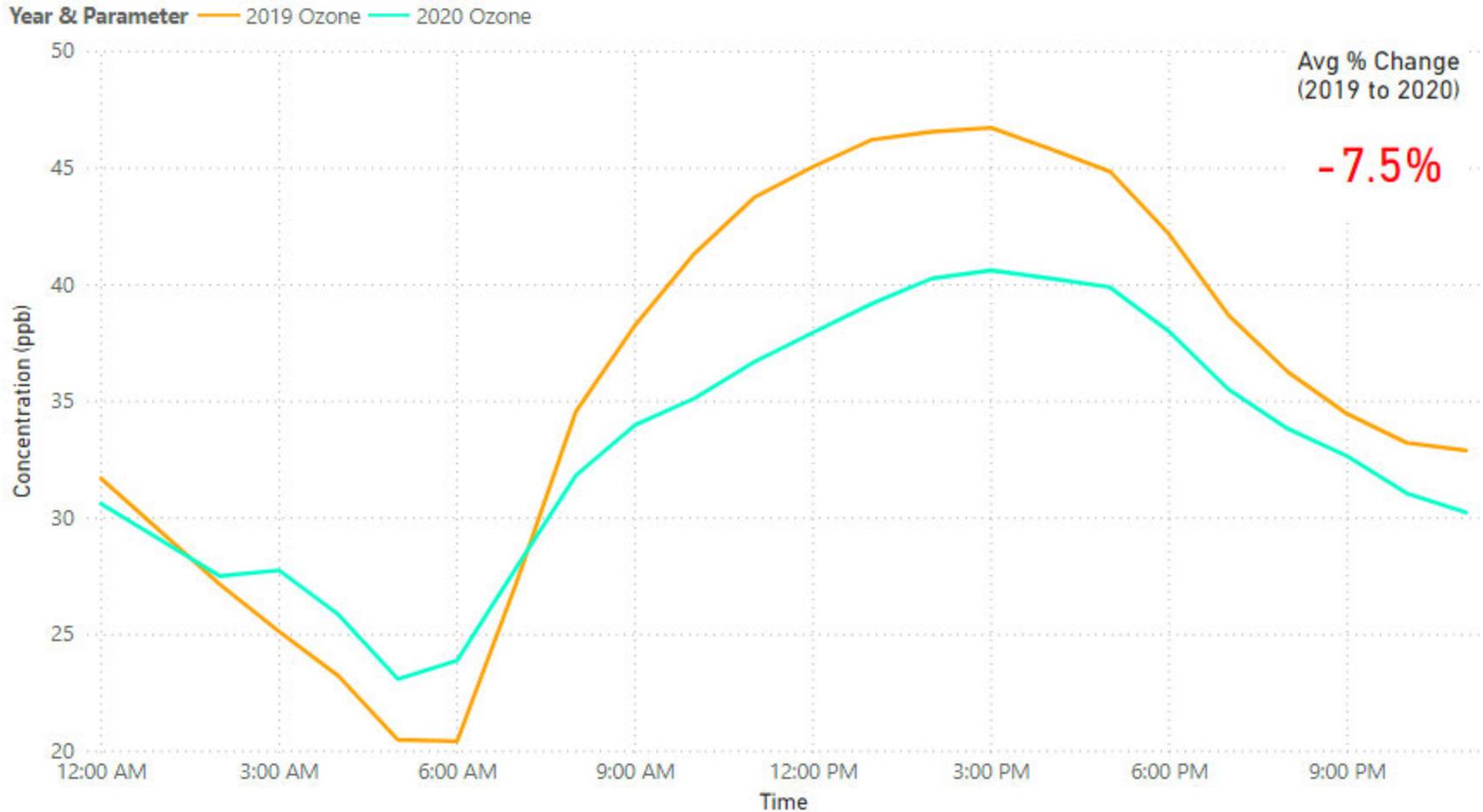
Weekday Ozone Concentrations – York



Weekday Ozone Concentrations – York DW



Weekday Ozone Concentrations – Bristol



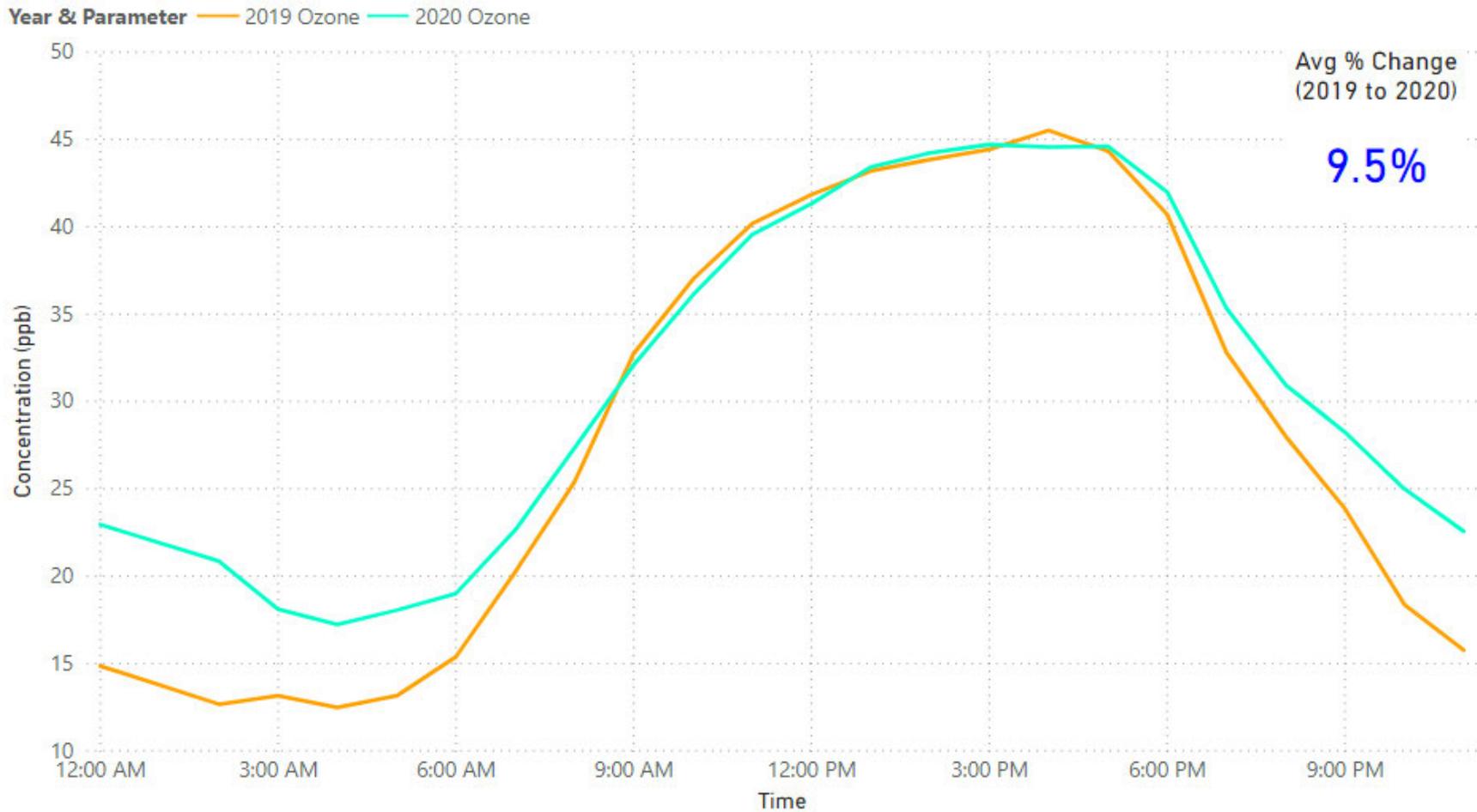
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to

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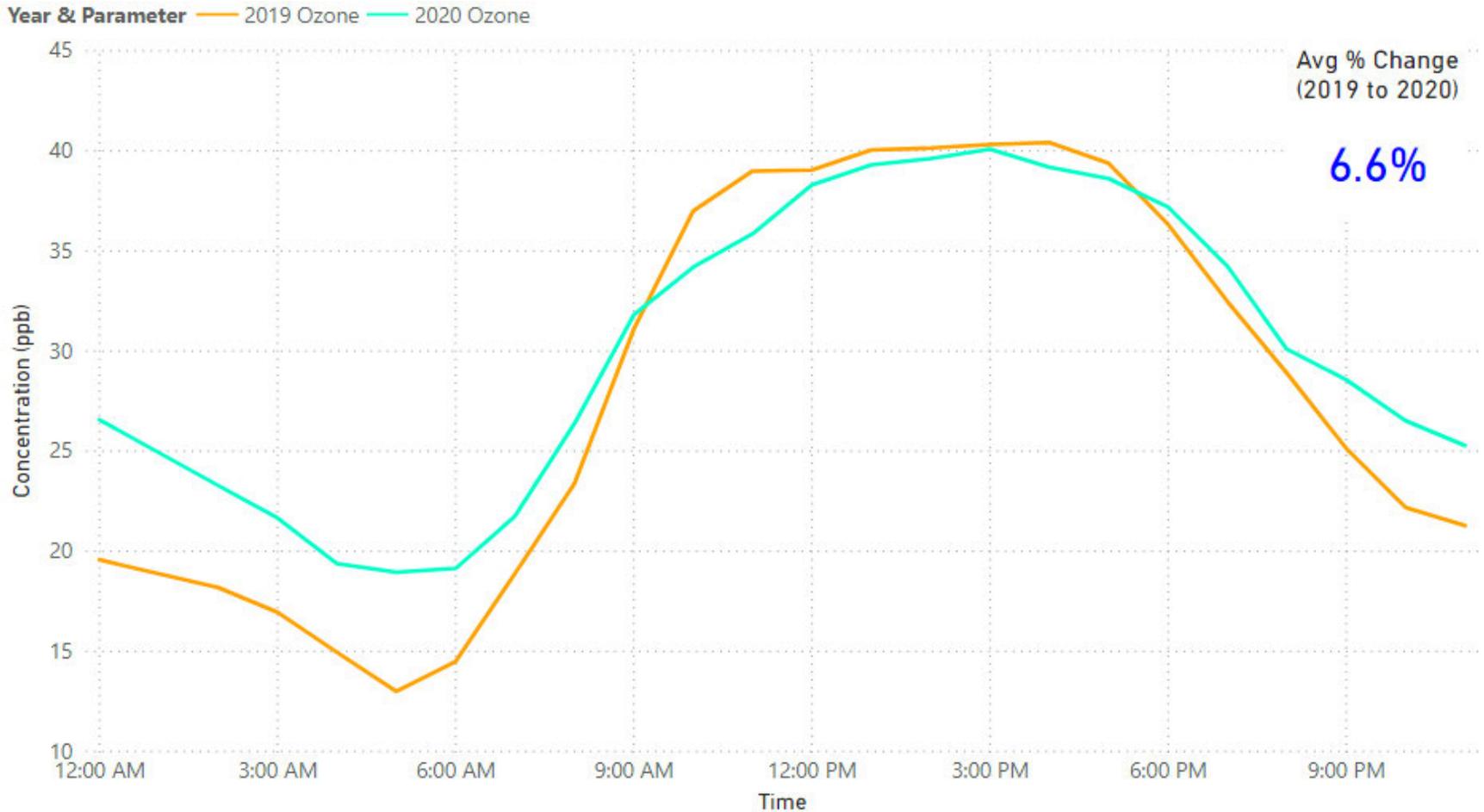
▶ Weekday Ozone Concentrations – Beaver Falls



Yellow Phase – Since May 22 (17 Days)



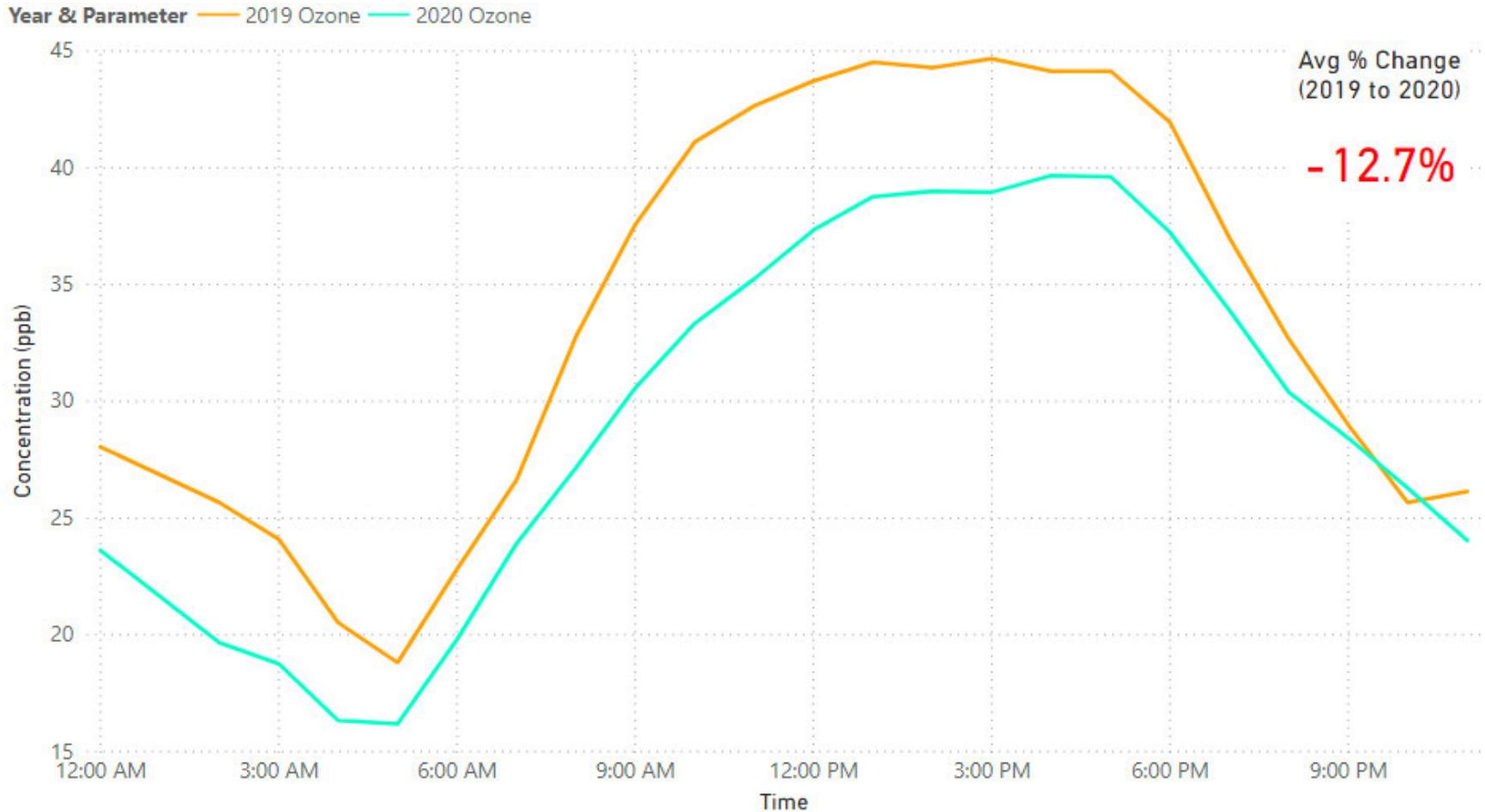
▶ Weekday Ozone Concentrations – Johnstown



Yellow Phase – Since May 15 (24 Days)

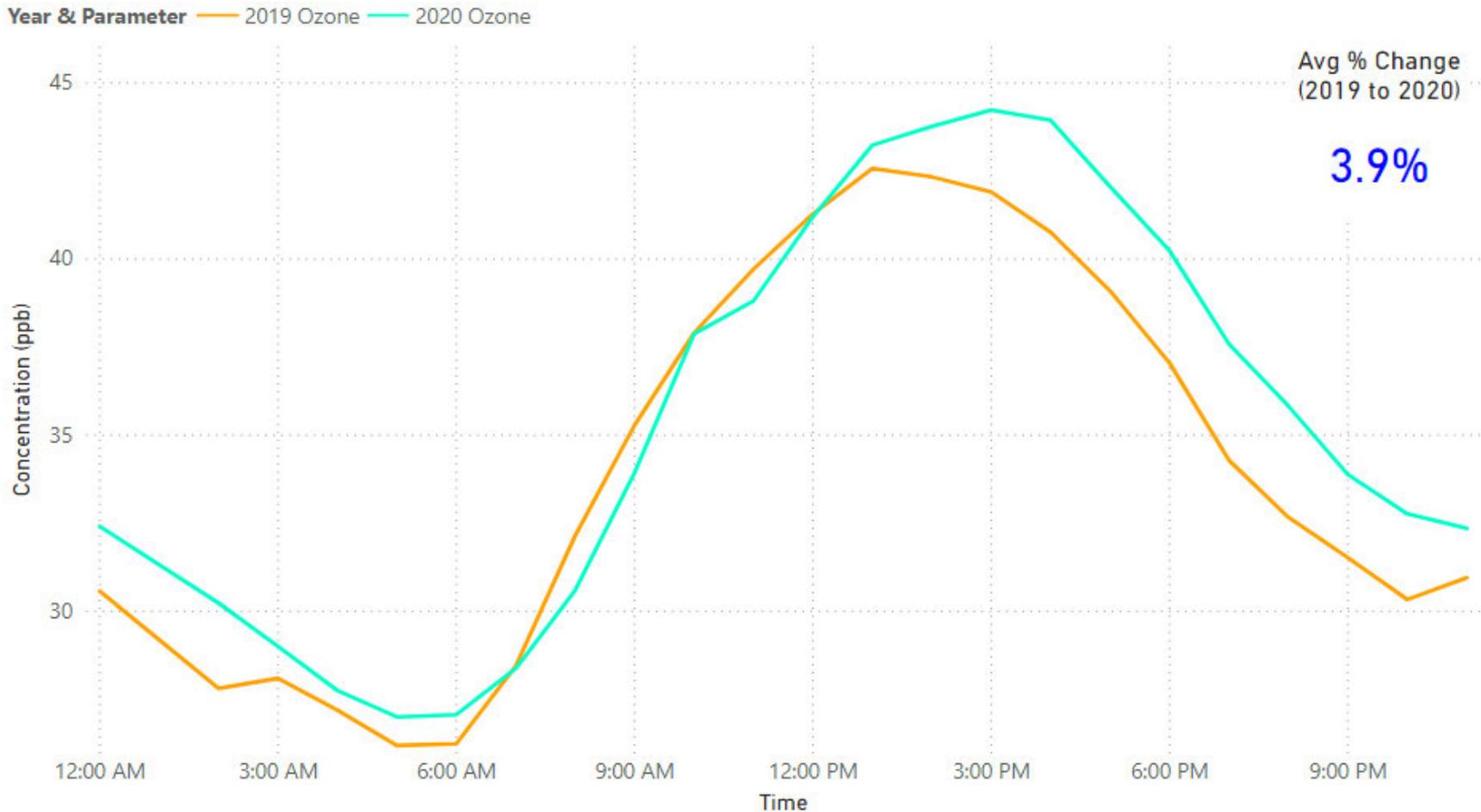


Weekday Ozone Concentrations – York



Yellow Phase – Since May 22 (17 Days)

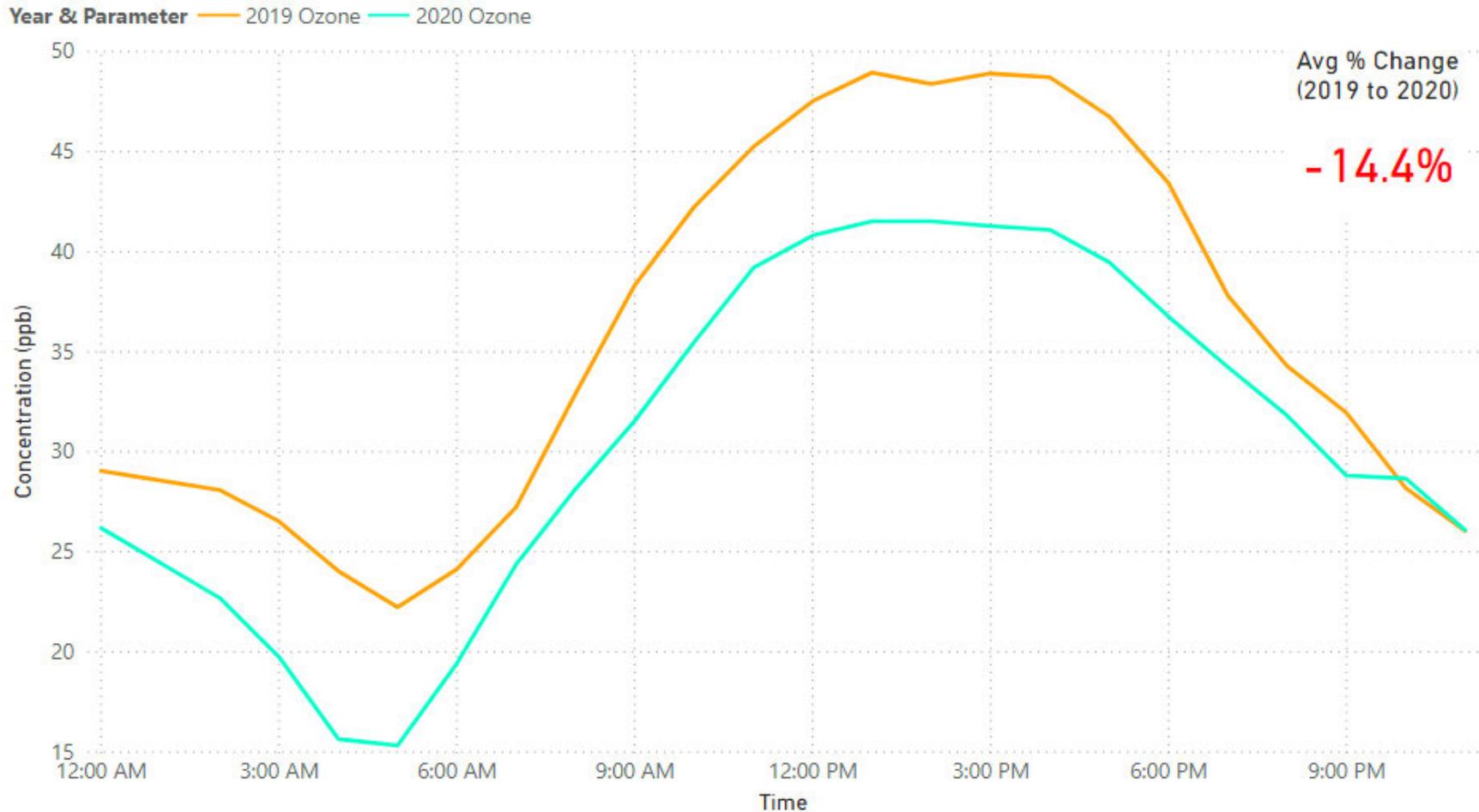
Weekday Ozone Concentrations – York DW



Yellow Phase – Since May 22 (17 Days)

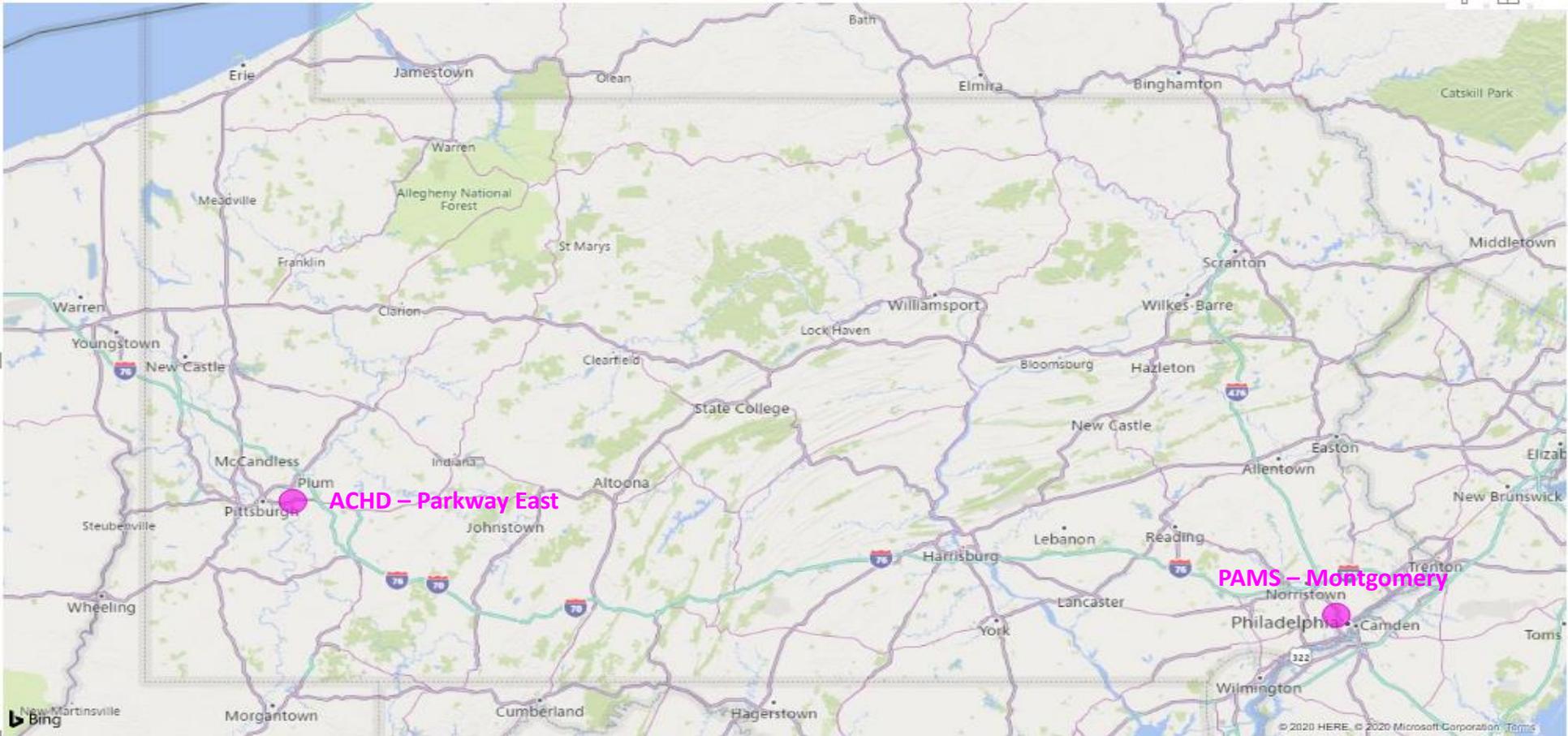


Weekday Ozone Concentrations – Bristol



Yellow Phase – Since June 5 (3 Days)

Black Carbon Monitor Locations



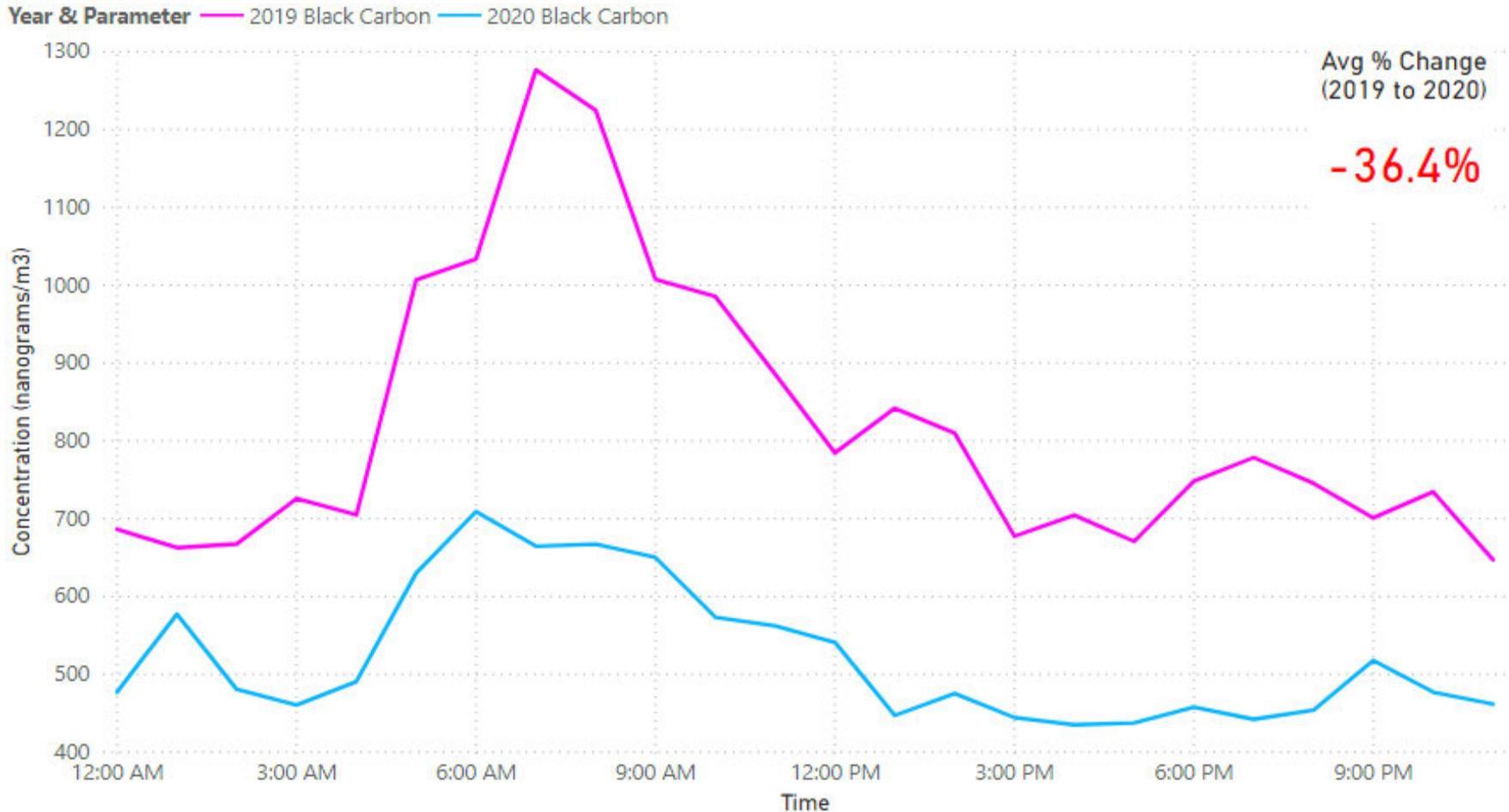
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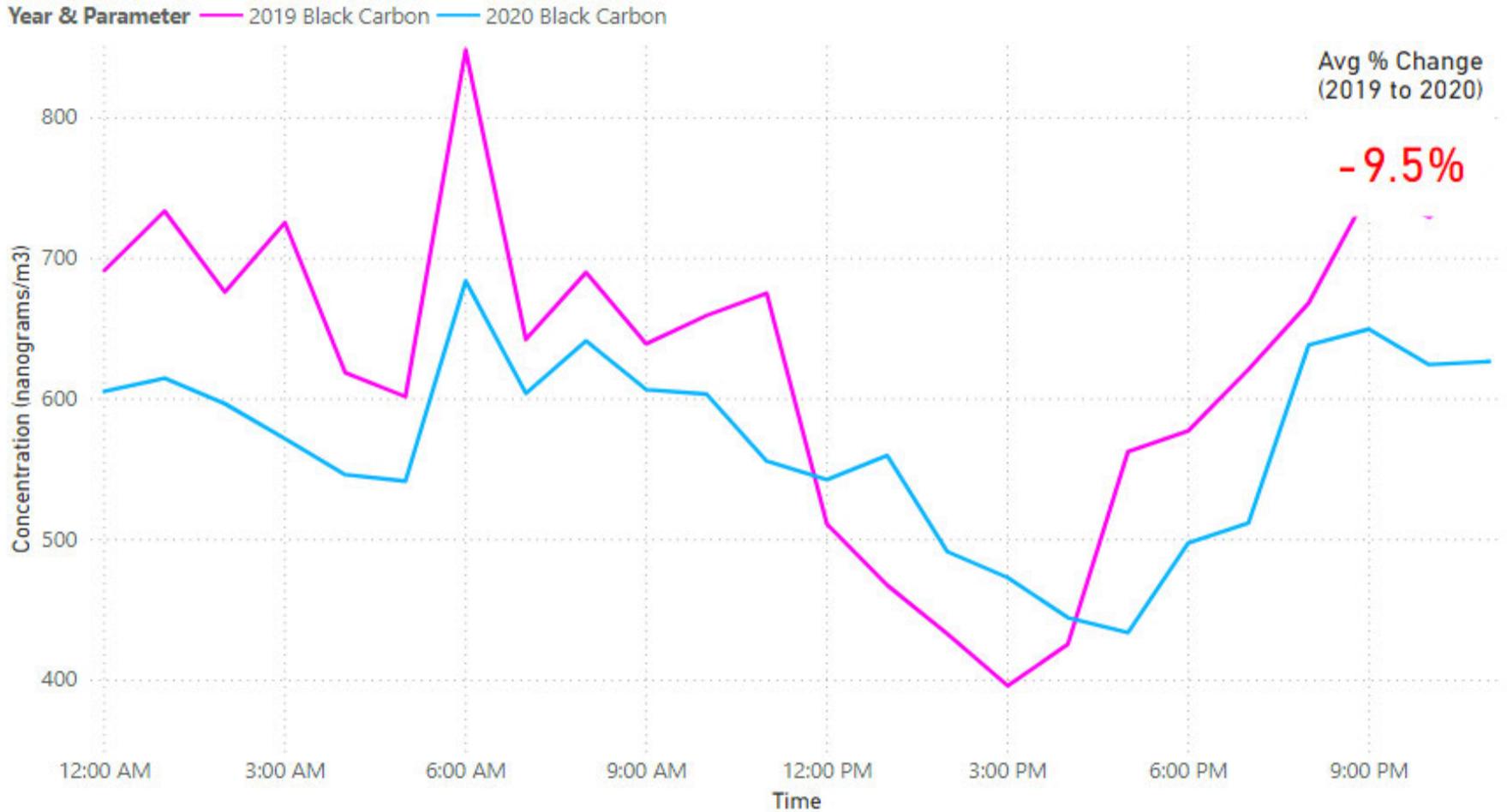
to

Sunday, April 26, 2020

Weekday BC Concentrations – Parkway East

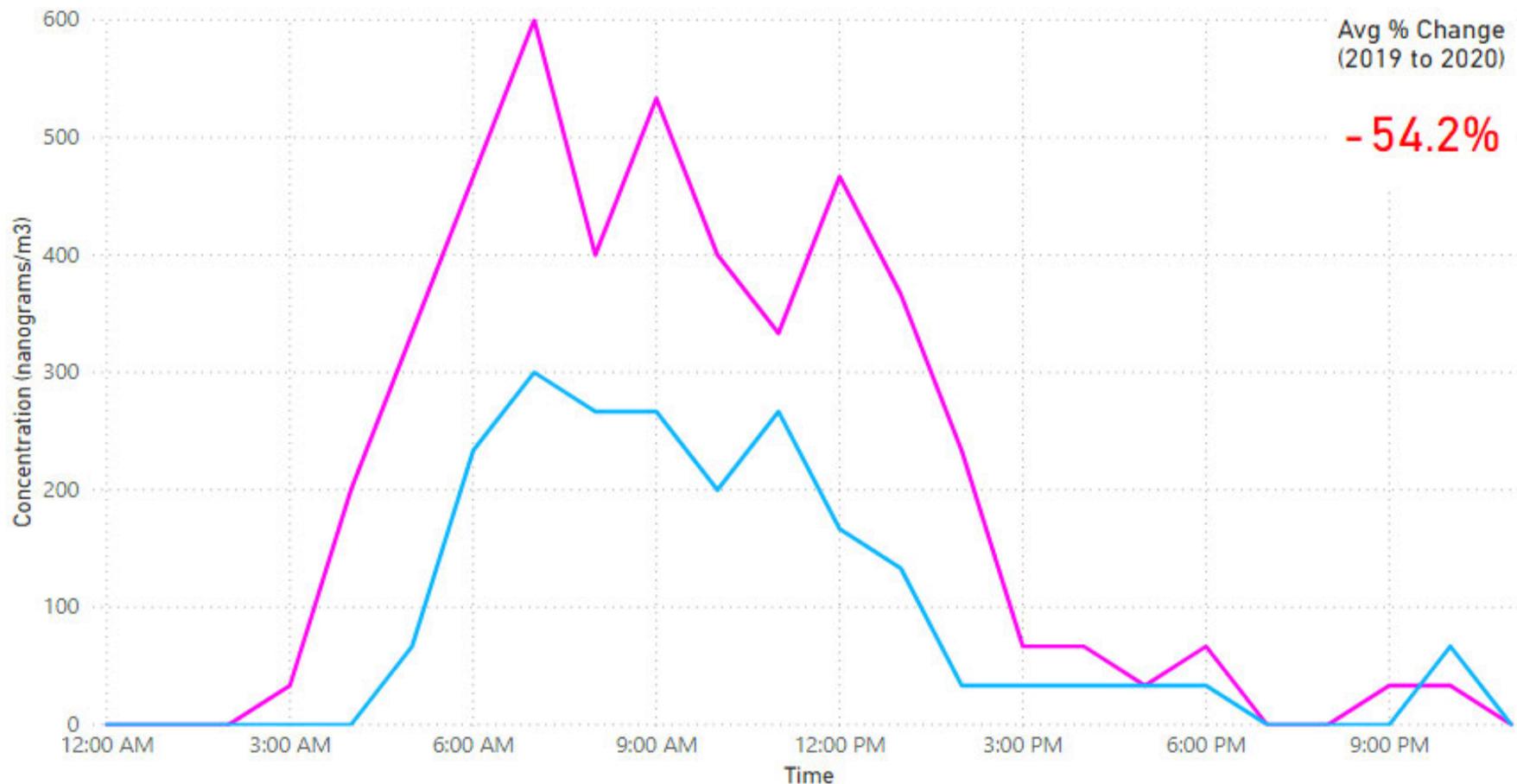


Weekend BC Concentrations – Parkway East



Weekday BC Concentrations – Montgomery

Year & Parameter — 2019 Black Carbon — 2020 Black Carbon



Avg % Change
(2019 to 2020)

-54.2%



pennsylvania
DEPARTMENT OF ENVIRONMENTAL
PROTECTION

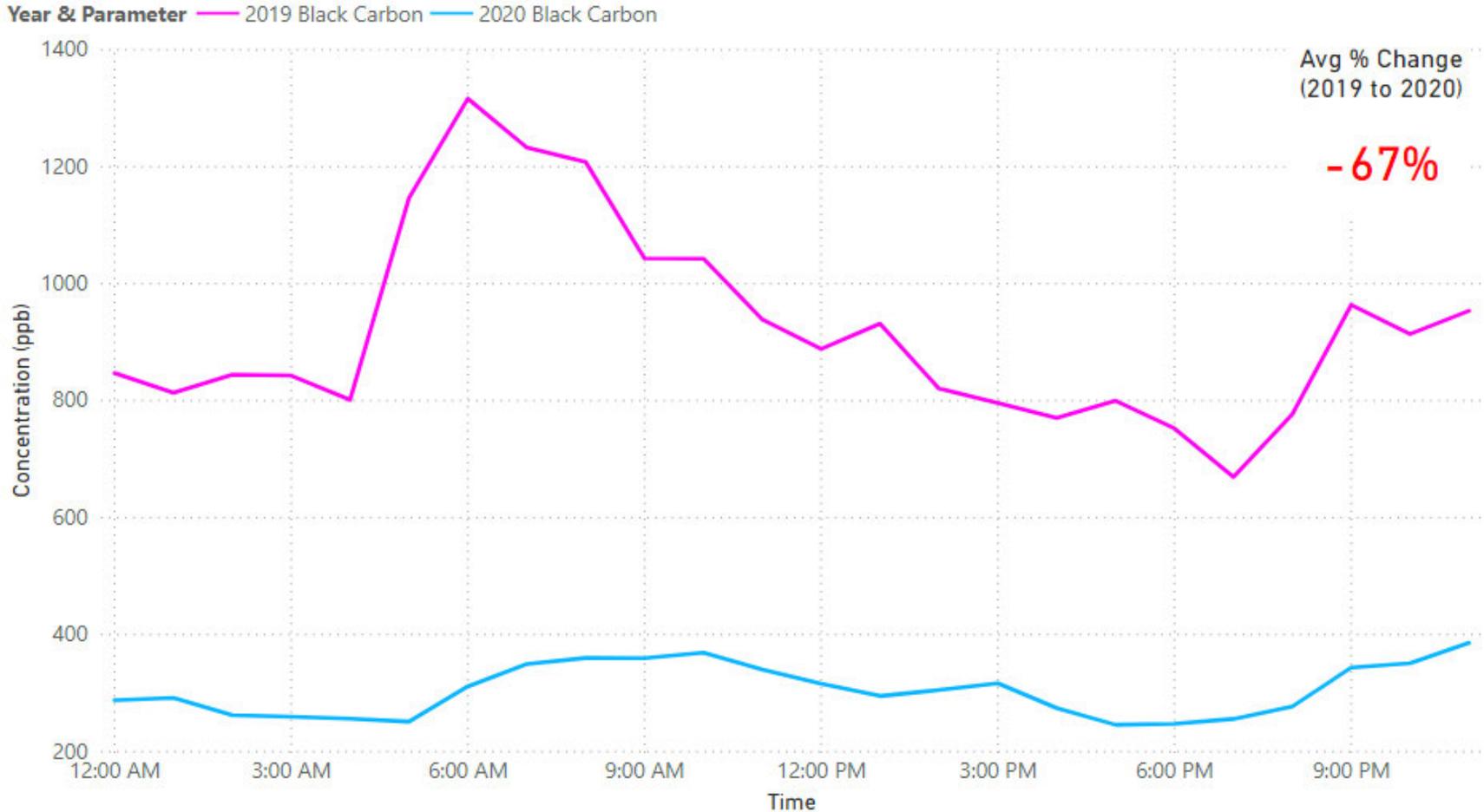
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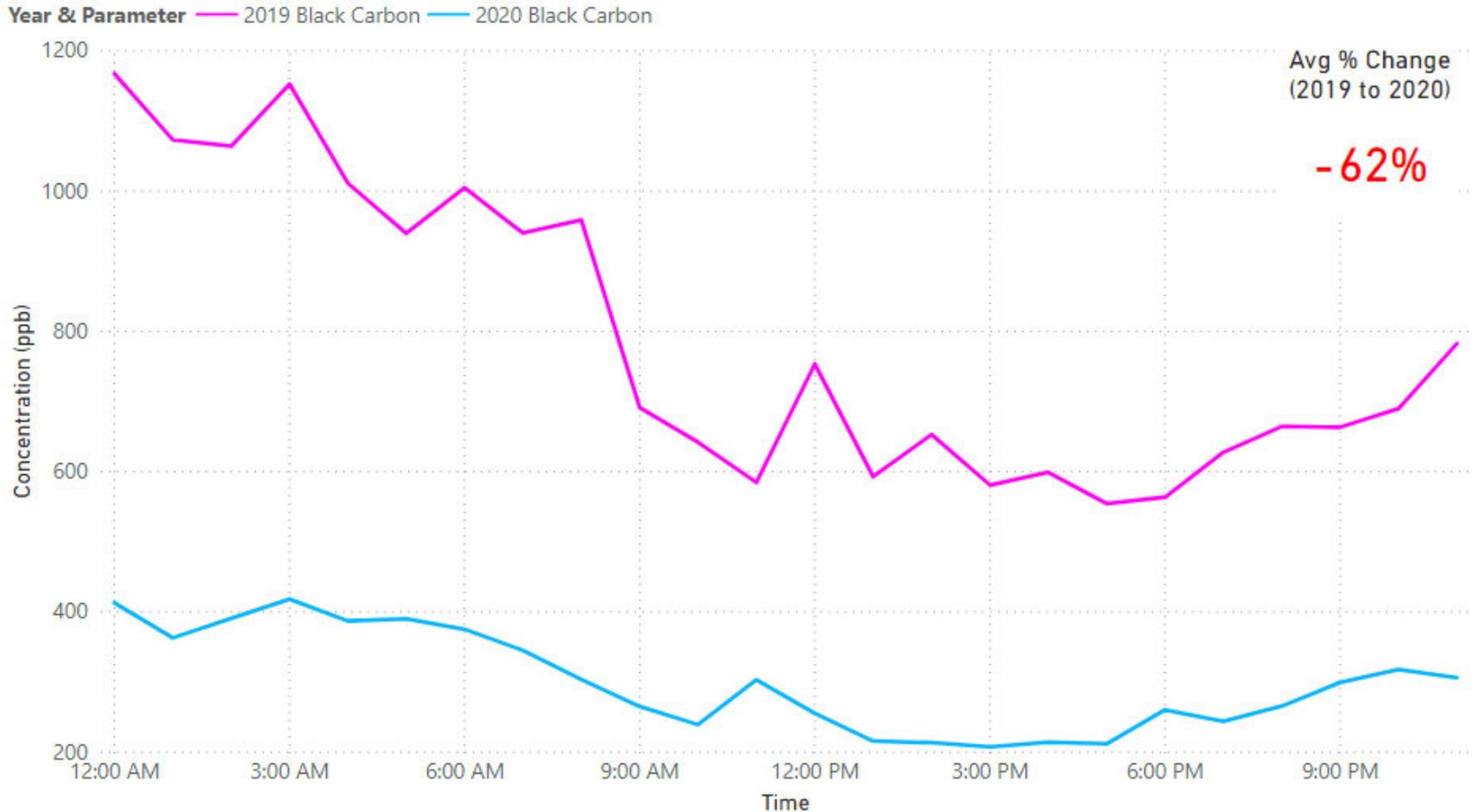
Sunday, June 7, 2020

Weekday BC Concentrations – Parkway East



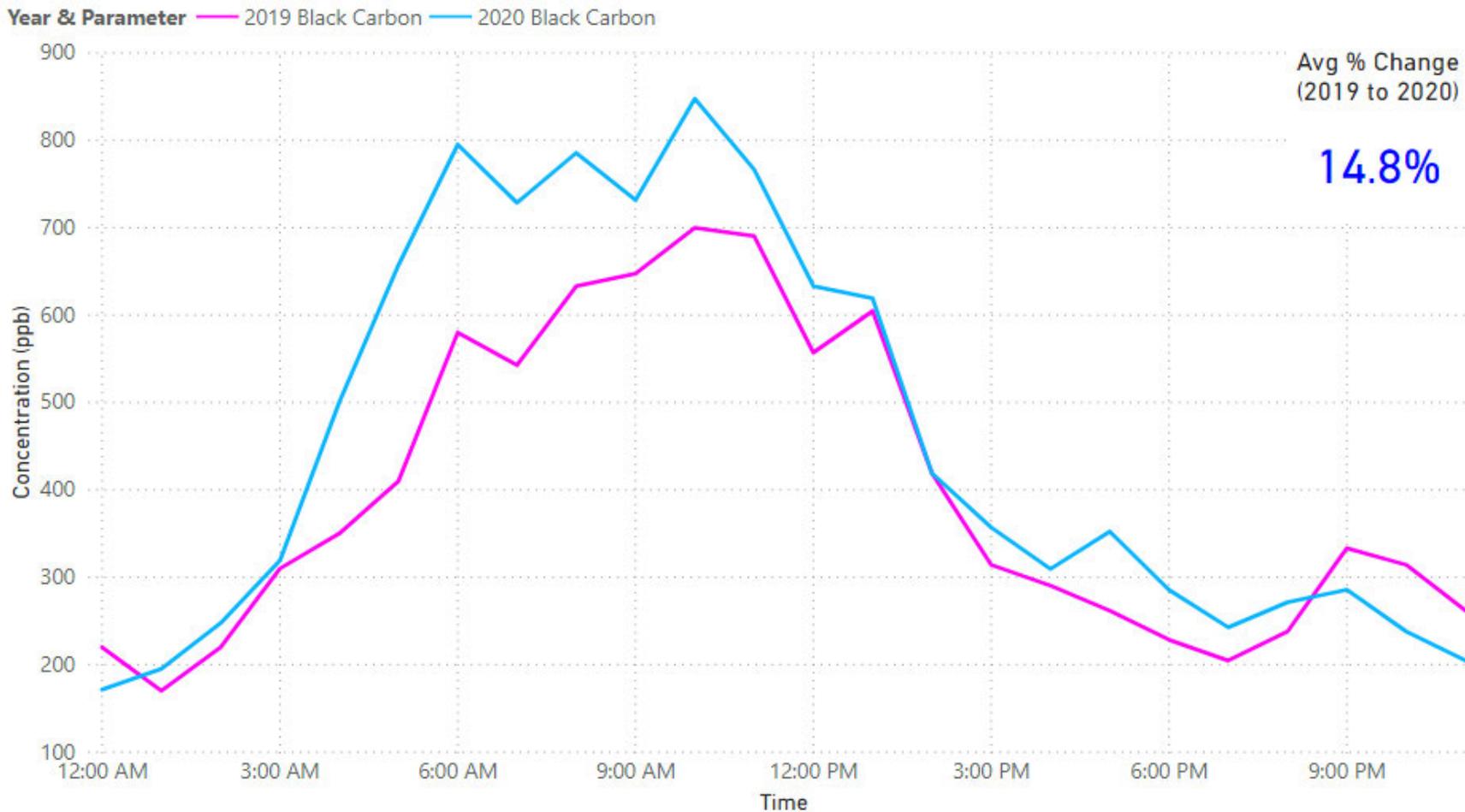
Yellow Phase – Since May 15 (24 Days)

Weekend BC Concentrations – Parkway East



Yellow Phase – Since May 15 (24 Days)

Weekday BC Concentrations – Montgomery



Yellow Phase – Since June 5 (3 Days)

Summary

- Since the start of the Stay at Home period, there has been a reduction in total vehicles traveled across Pennsylvania. However, truck traffic remained relatively unchanged.
- As a result, PA saw a decline in its air monitoring data (NO₂, ozone and black carbon). The greatest decline has been during weekdays.
- Over the latest 31 days (May 8 – June 7), as traffic levels have begun to increase, NO₂ levels have approached seasonal averages. Ozone is higher than 2019 in western PA and lower across eastern PA in urban areas (rural areas are higher). Compared to 2019, black carbon in 2020 has decreased in Pittsburgh and increased in Philadelphia.



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