



pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bureau of Air Quality

Ambient Air Quality in PA During COVID-19 Pandemic

Small Business Compliance Advisory Committee Meeting

July 22, 2020

Via Webinar

Tom Wolf, Governor

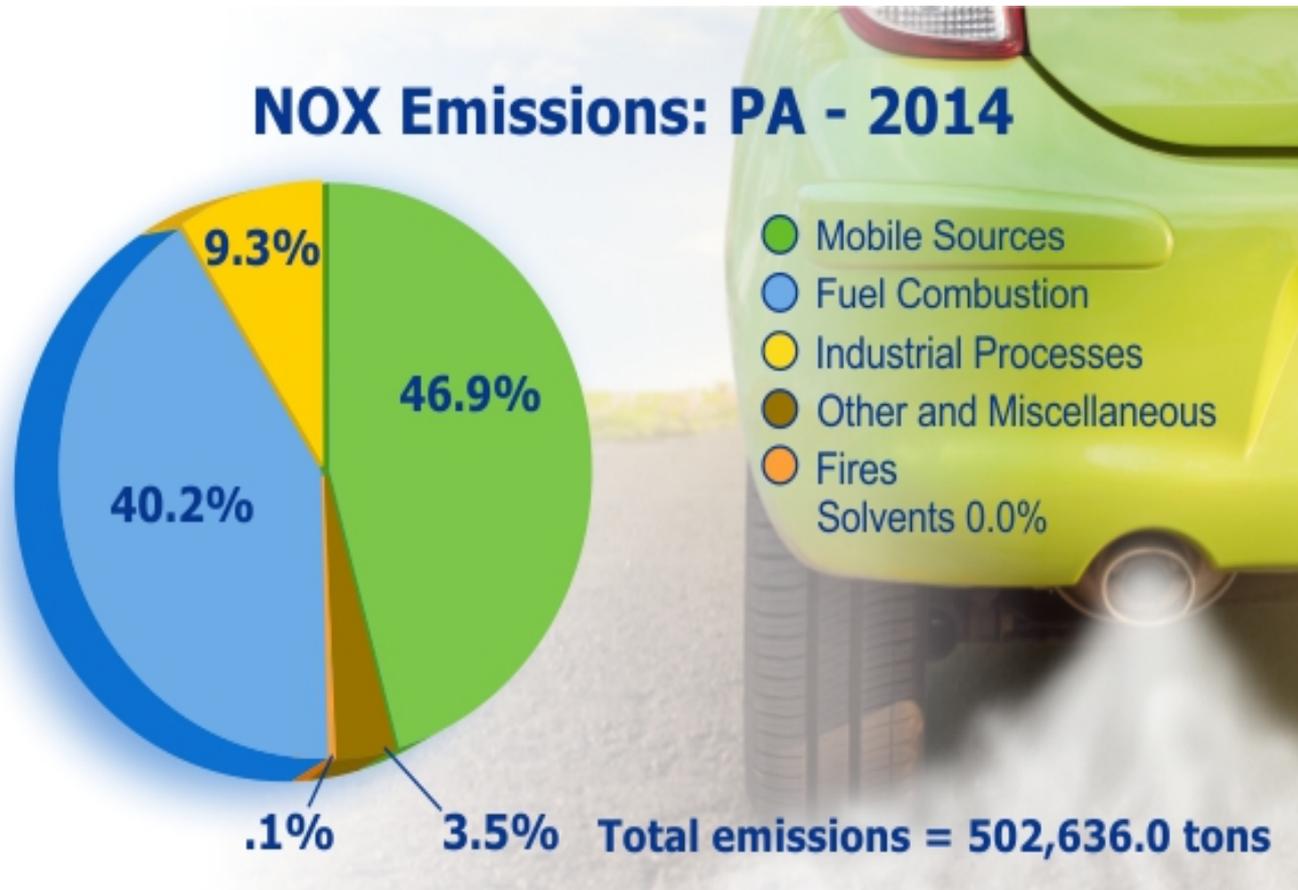
Patrick McDonnell, Secretary

Agenda

- Focus on Three Pollutants:
 - NO₂ (NO_x), Ozone, and Black Carbon
- Emission Trends – 2019 vs. 2020
 - Vehicles: Traffic Counts
- Satellite Data – 2019 vs. 2020
 - TROPOMI NO₂ Satellite Data
- Air Monitoring Trends – 2019 vs. 2020

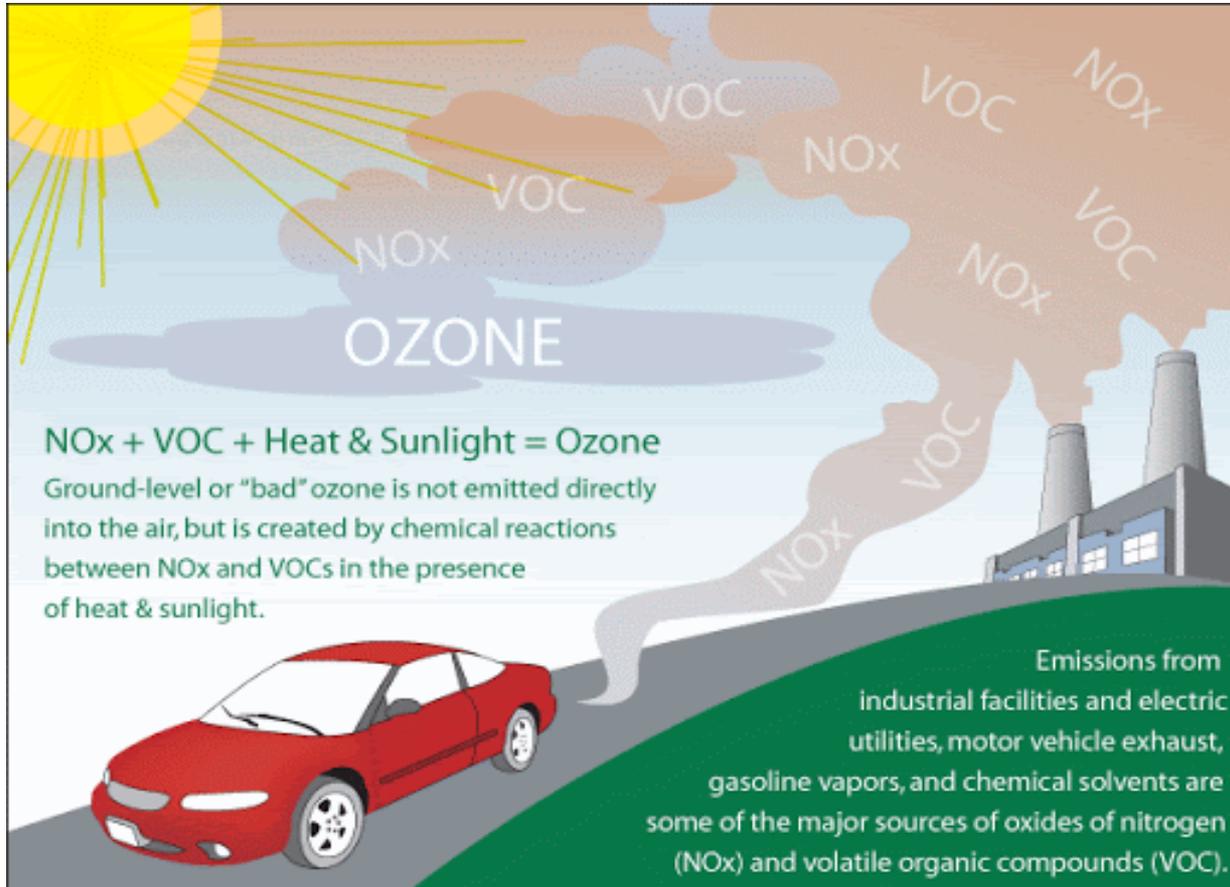
The Three Air Pollutants: NO₂, Ozone, and Black Carbon

The Air Pollutants – NO2



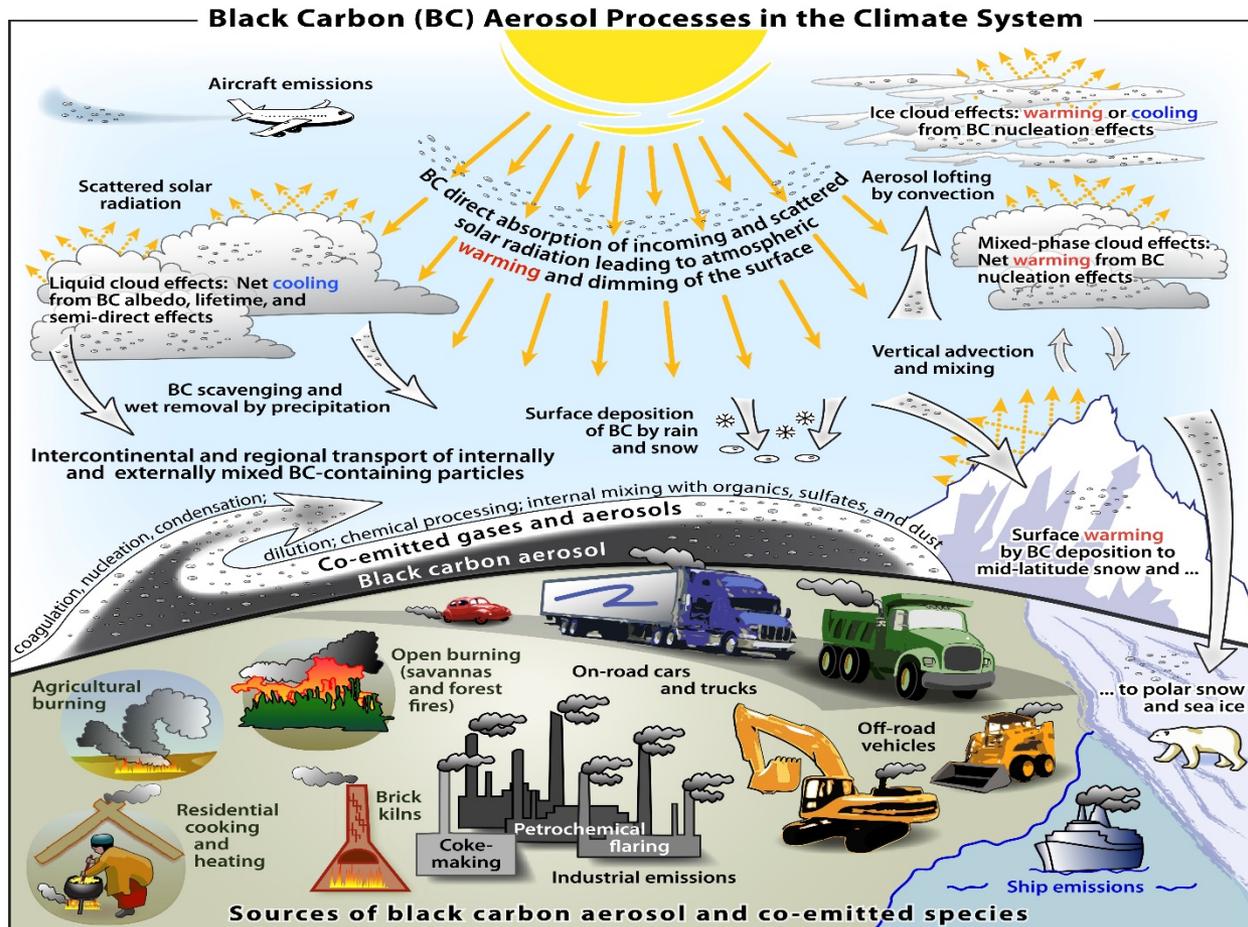
Source: PADEP's Driving PA Forward Campaign

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

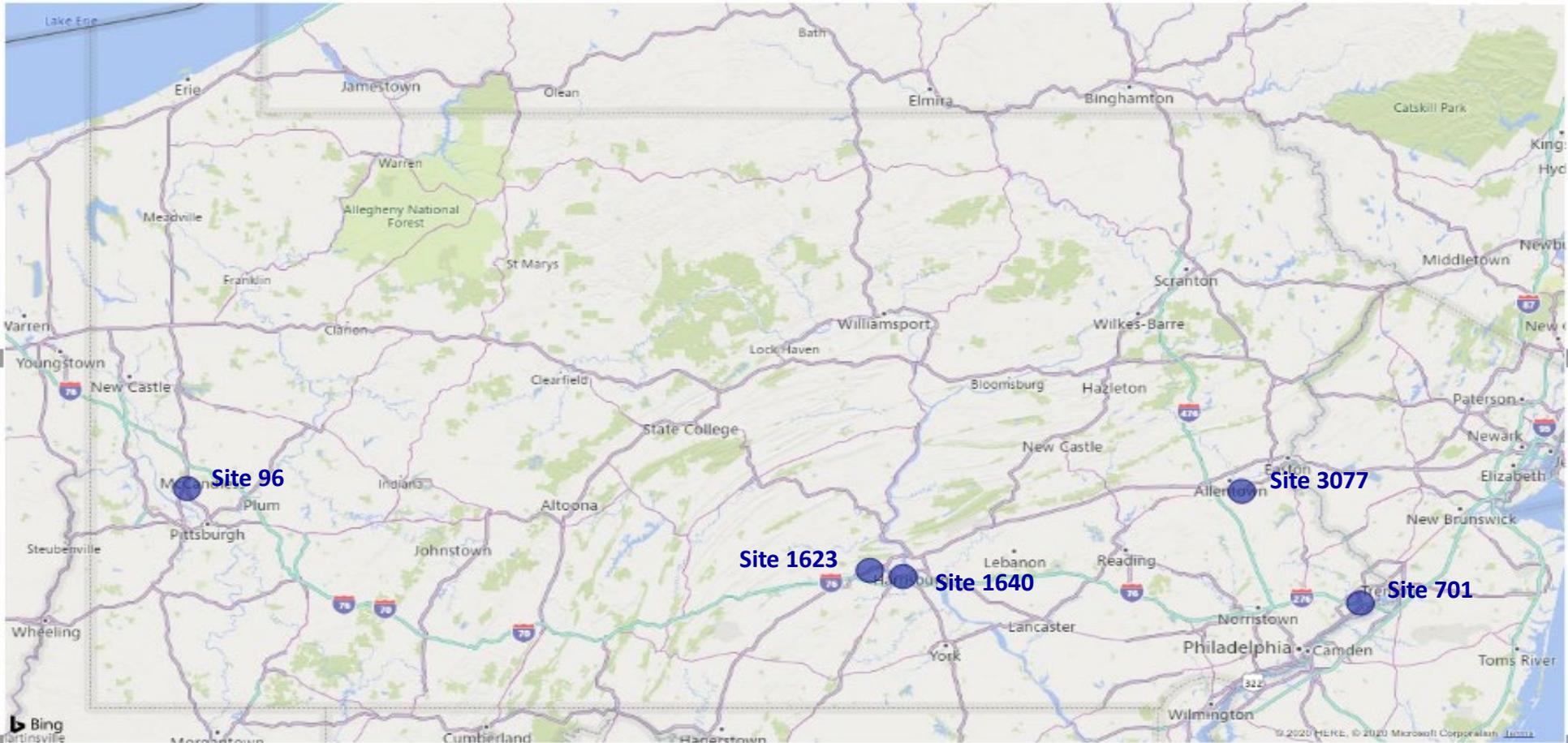
Stay At Home Period

Monday, March 16, 2020

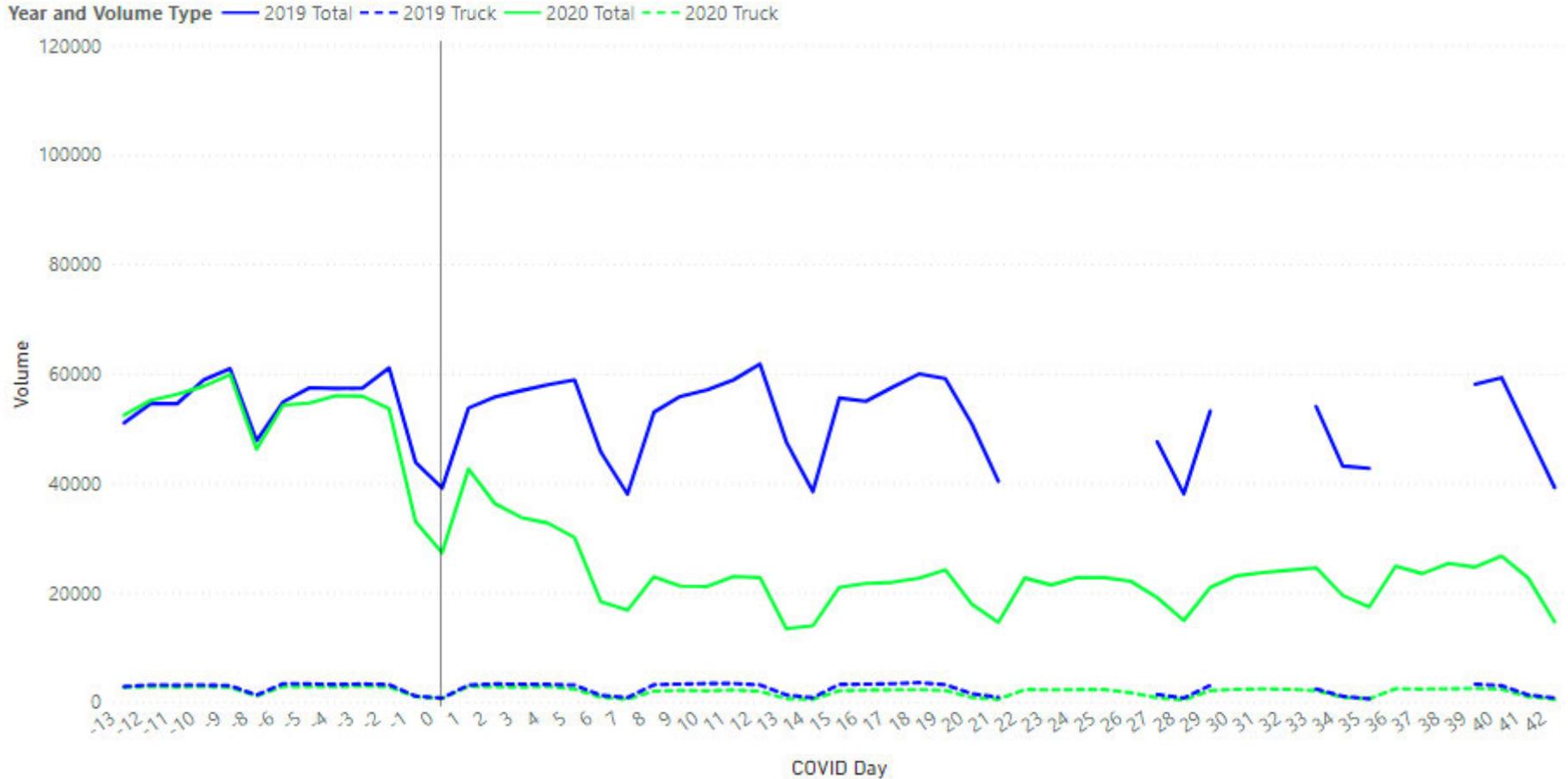
to

Sunday, April 26, 2020

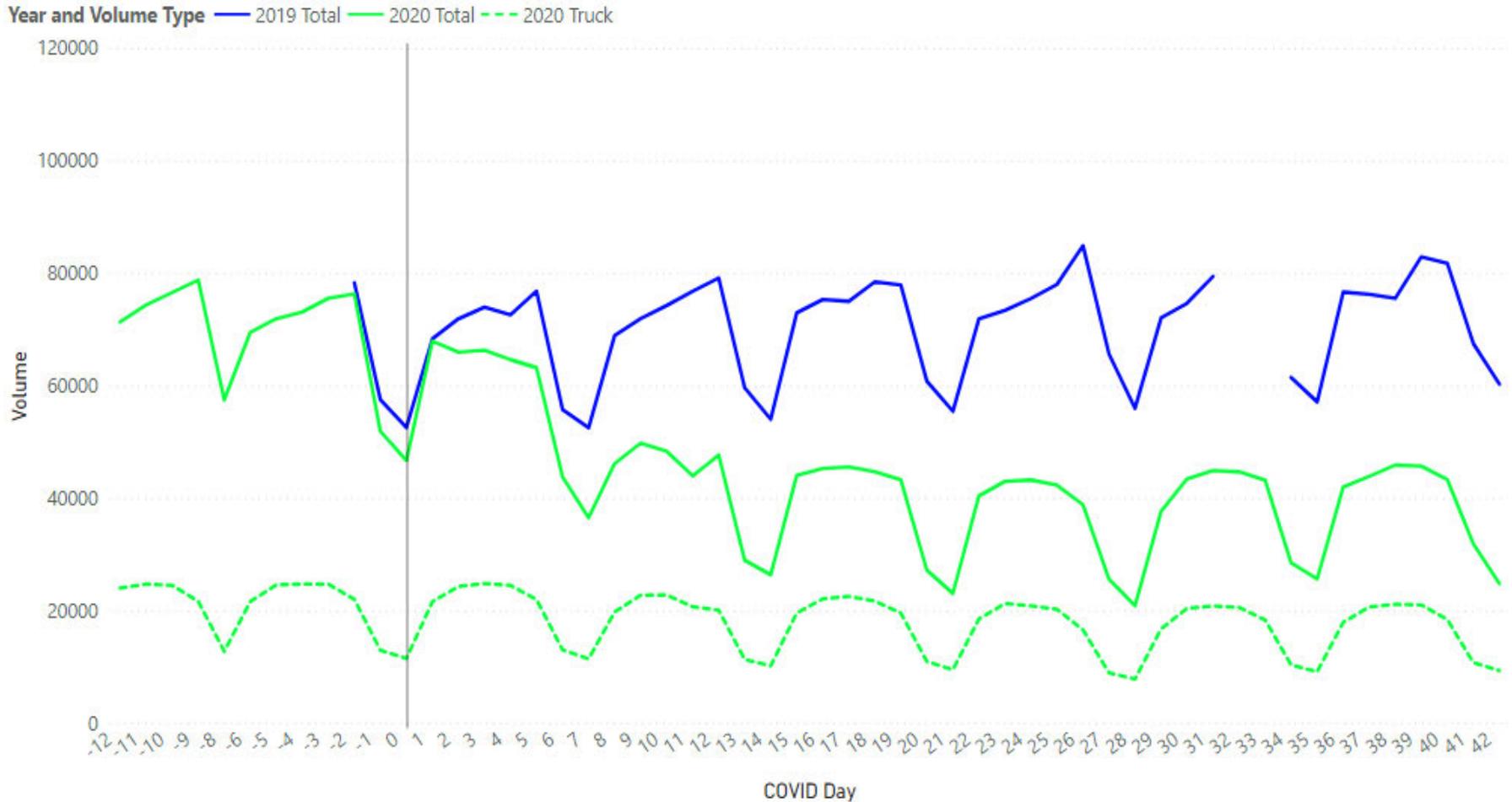
PennDOT Traffic Monitor Locations



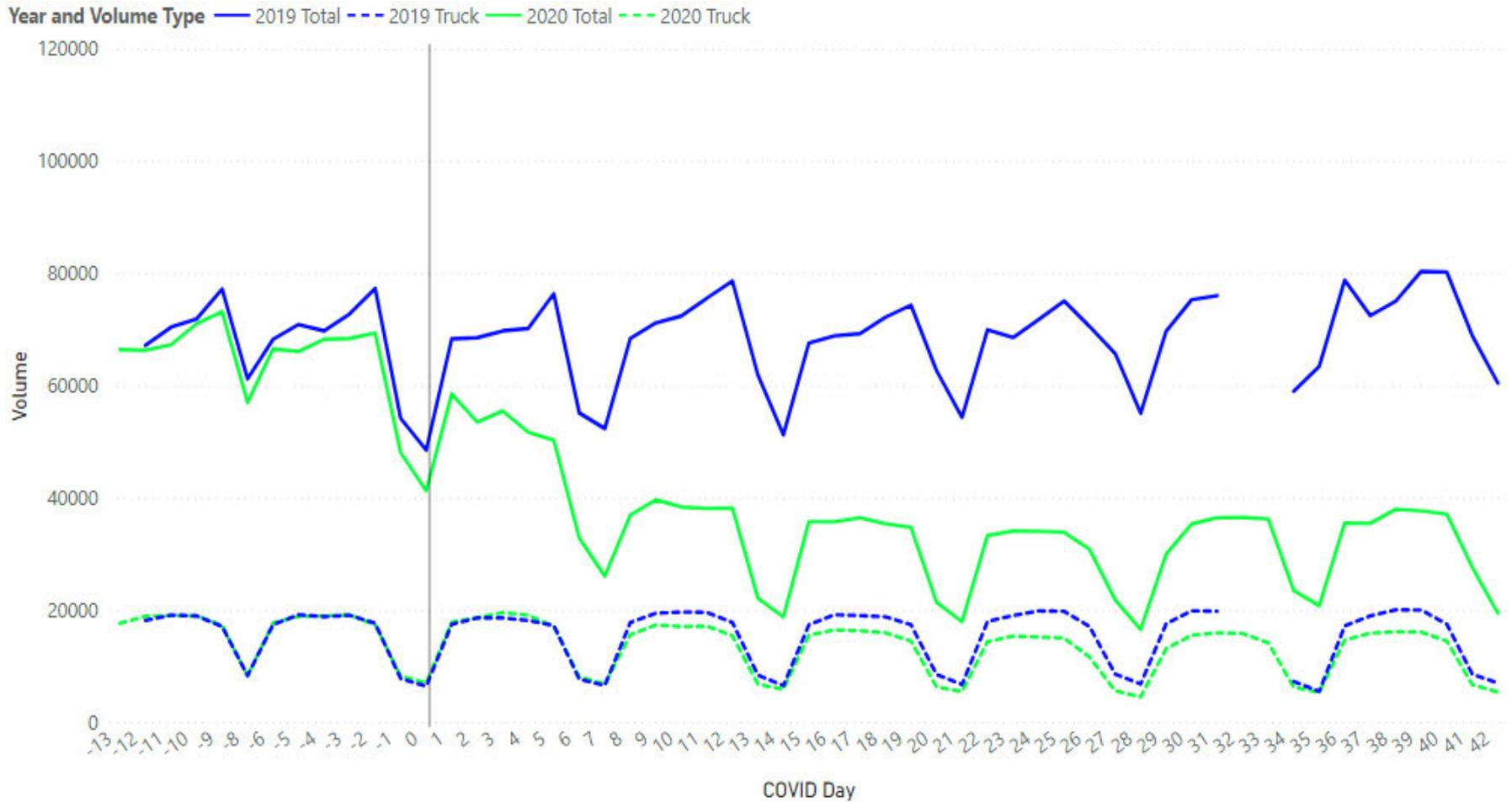
Daily Traffic Counts – Site 96 (I-279, Pittsburgh)



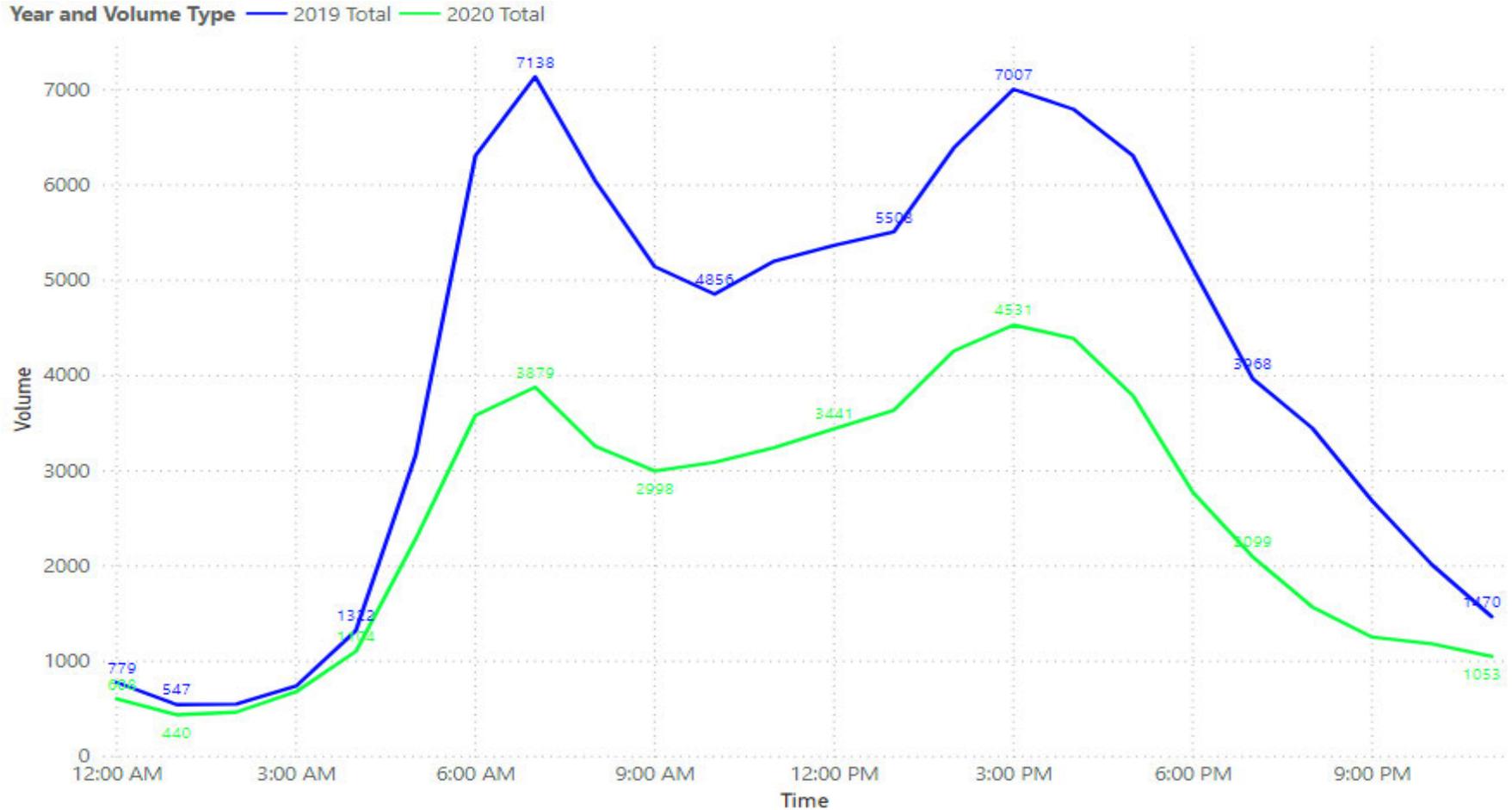
Daily Traffic Counts – Site 1623 (I-81, Carlisle)



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



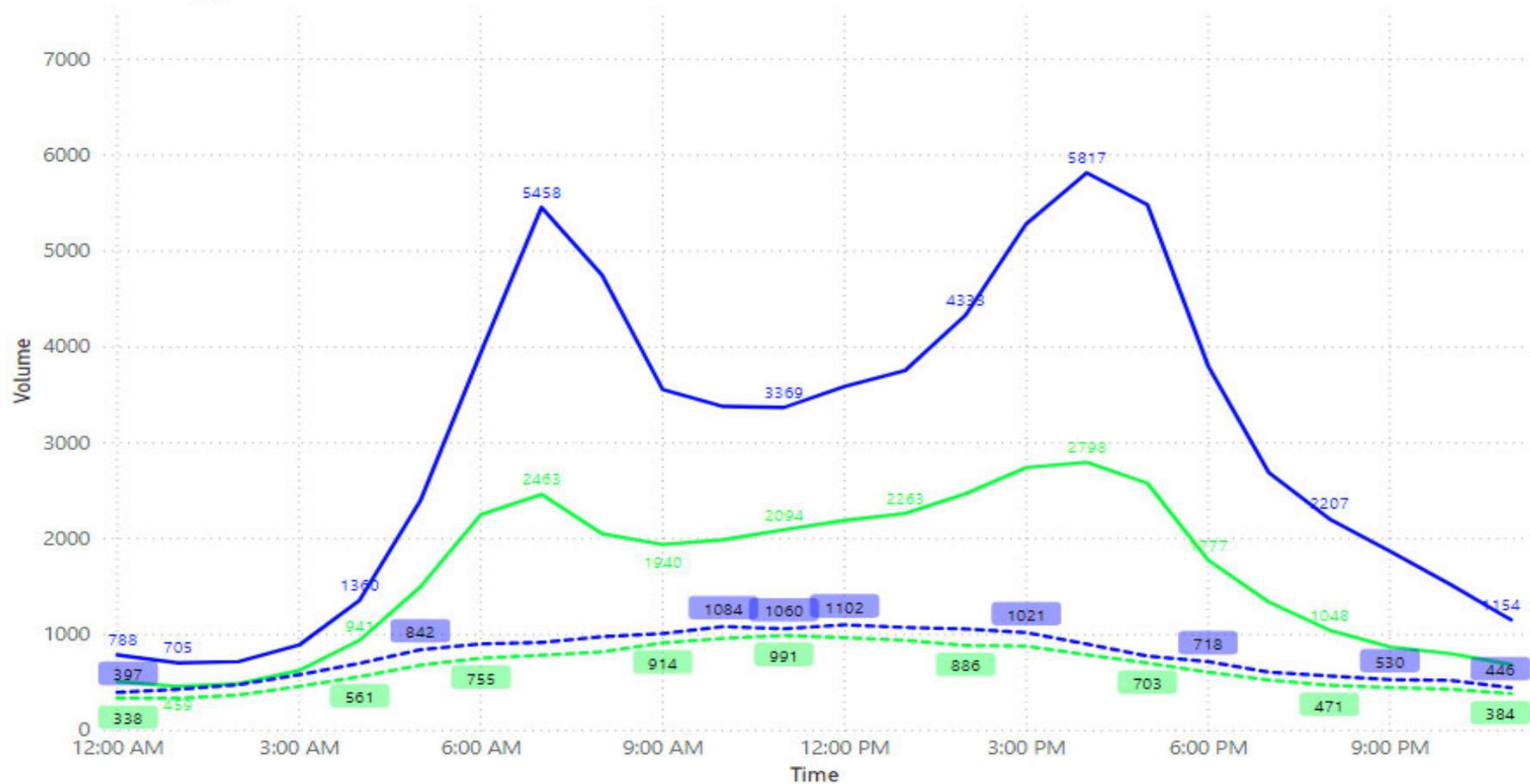
Hour Traffic Counts – Site 1640 (Rt. 581, Hbg)



Weekday Traffic Counts

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

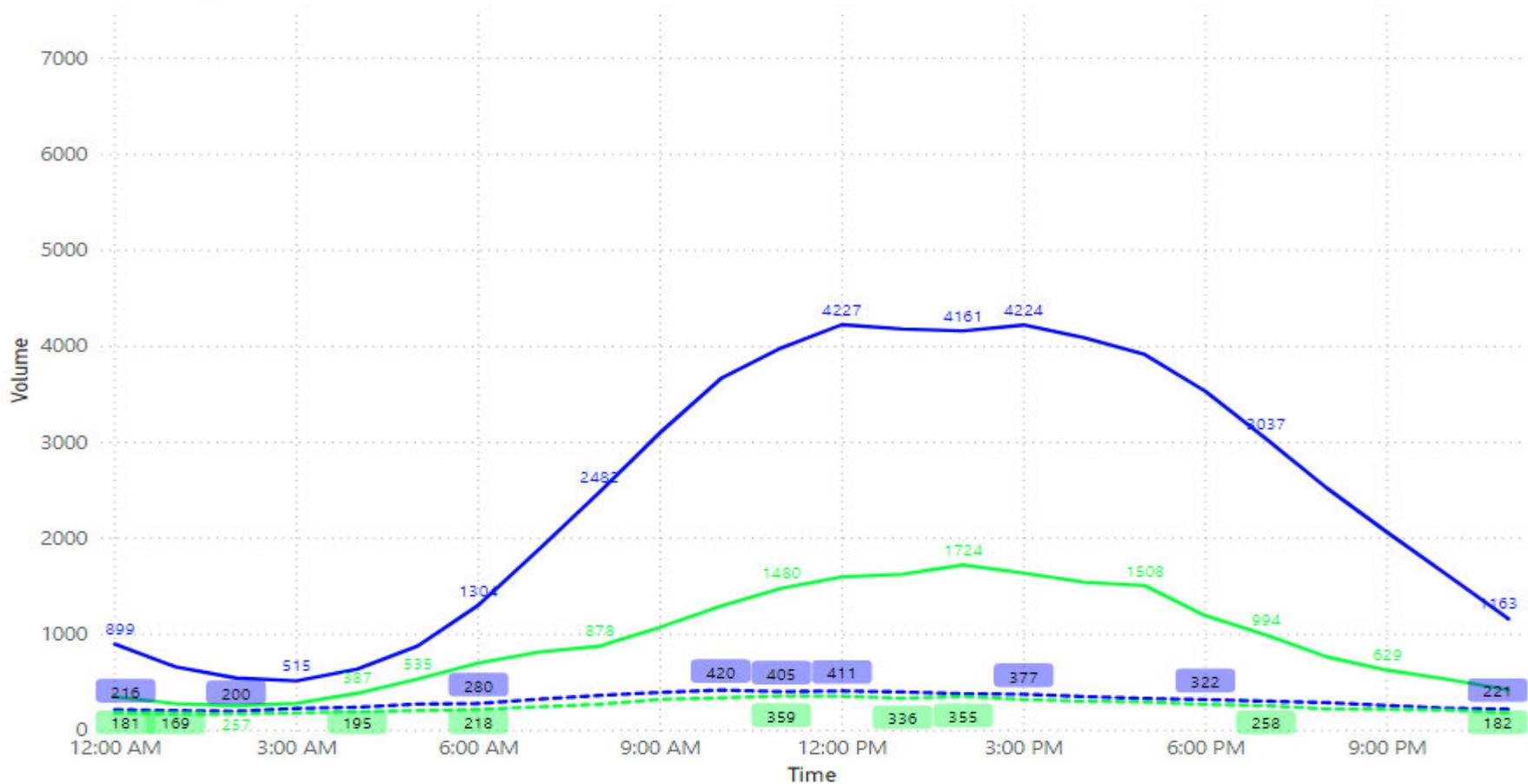
Year and Volume Type — 2019 Total — 2019 Truck — 2020 Total — 2020 Truck



Weekday Traffic Counts

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

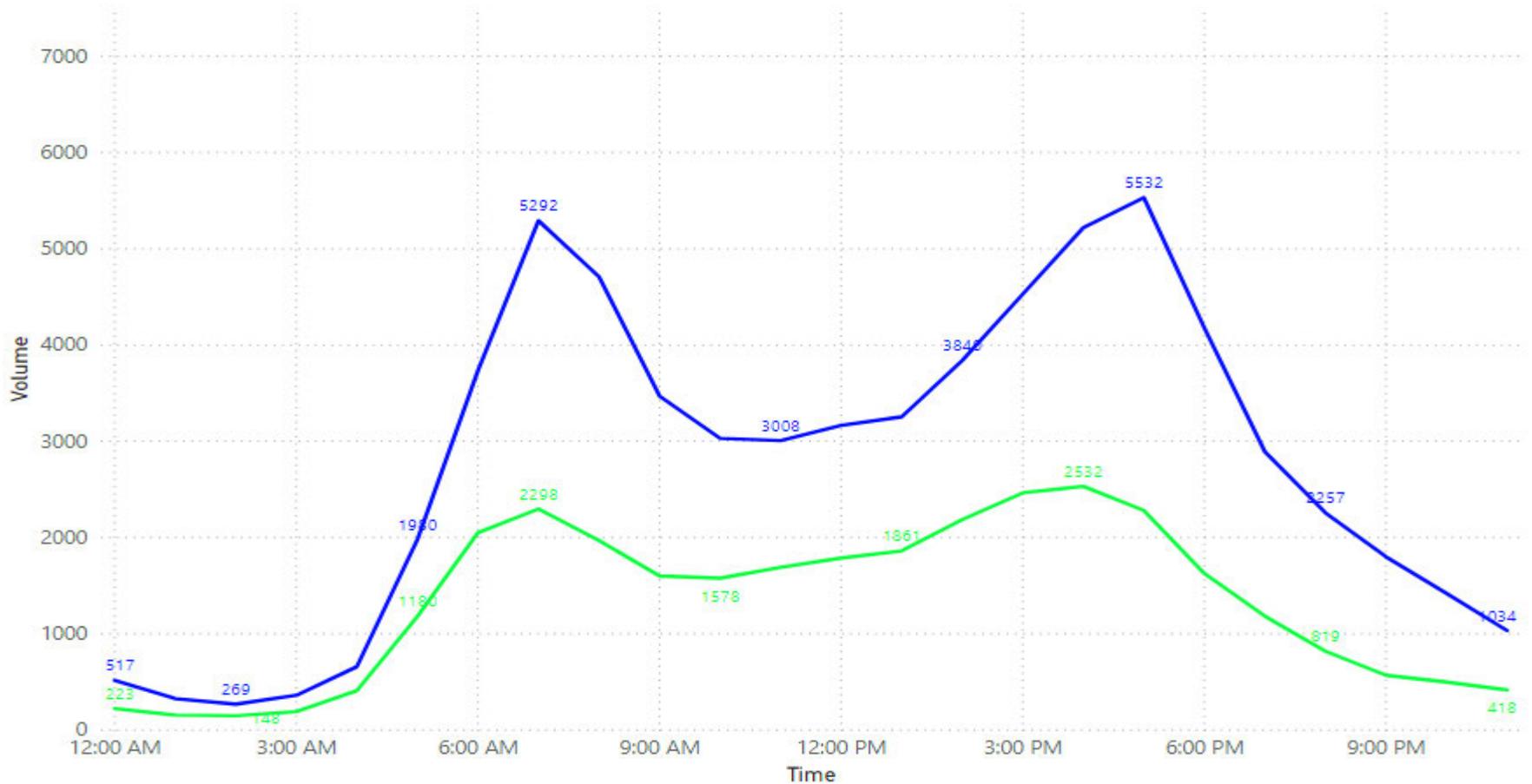
Year and Volume Type — 2019 Total — 2019 Truck — 2020 Total — 2020 Truck



Weekend Traffic Counts

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

Year and Volume Type — 2019 Total — 2020 Total



Weekday Traffic Counts

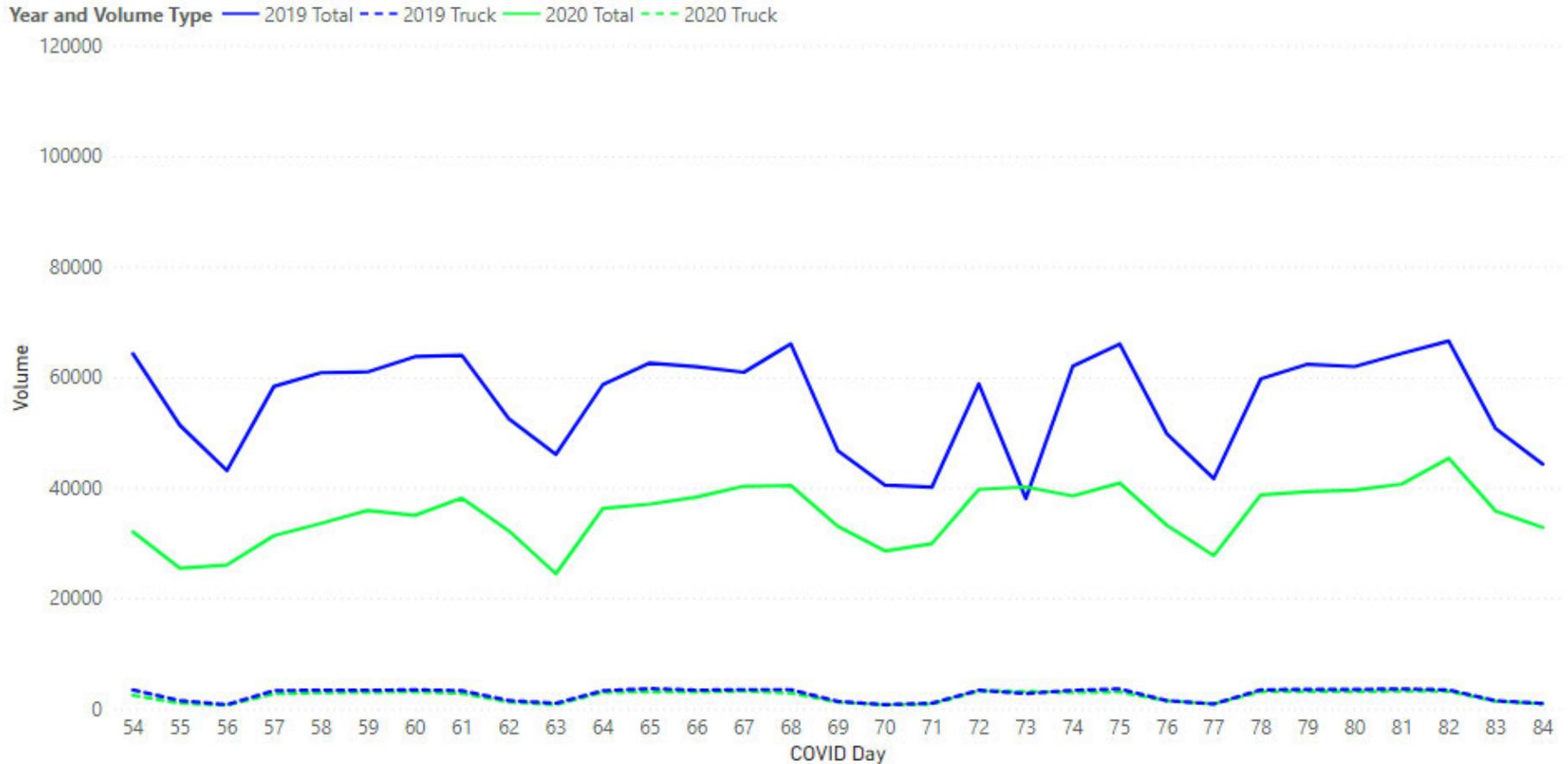
Loosening Period

Friday, May 8, 2020

to

Sunday, June 7, 2020

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

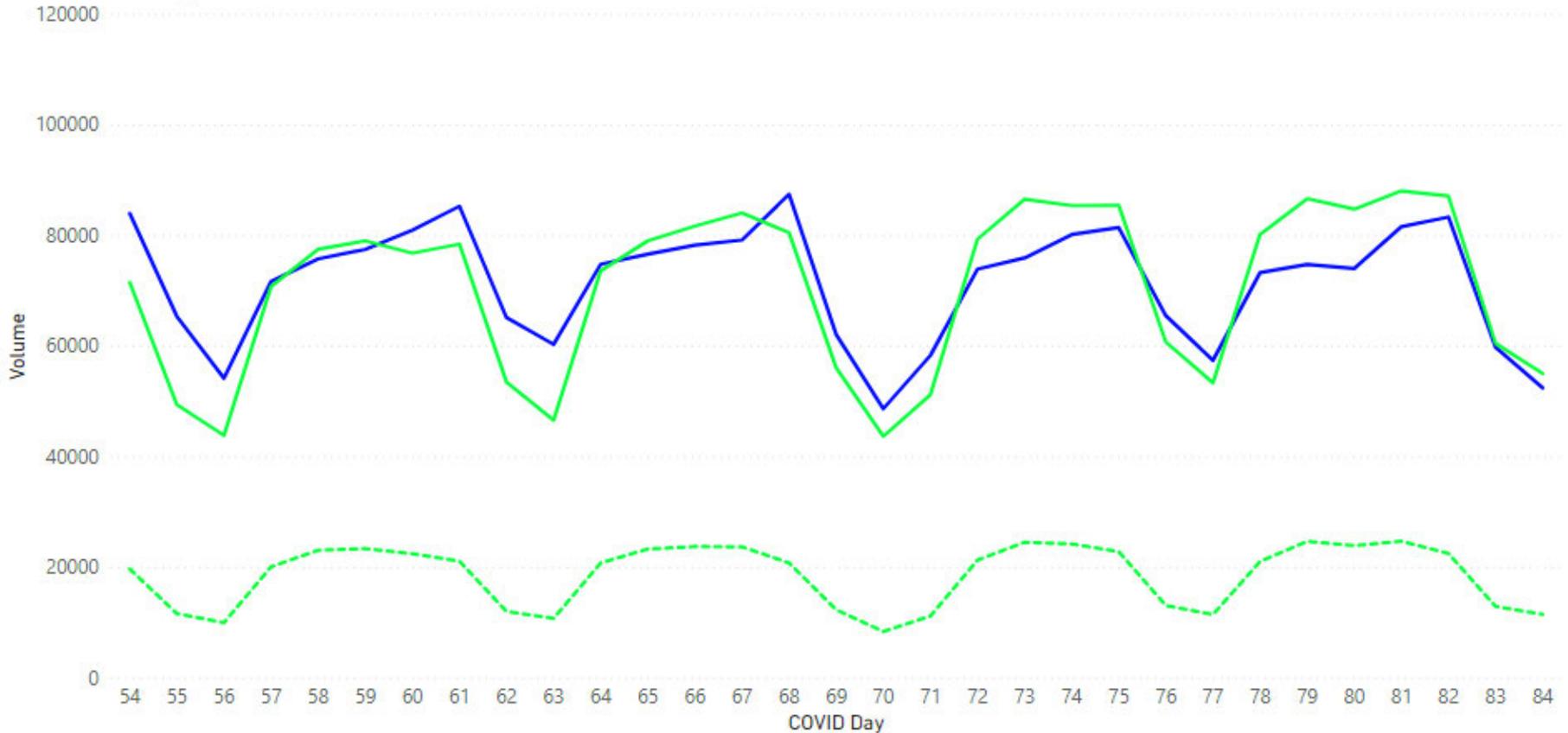


Yellow Phase – Since May 15 (24 Days)



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

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



Yellow Phase – Since May 22 (17 Days)

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

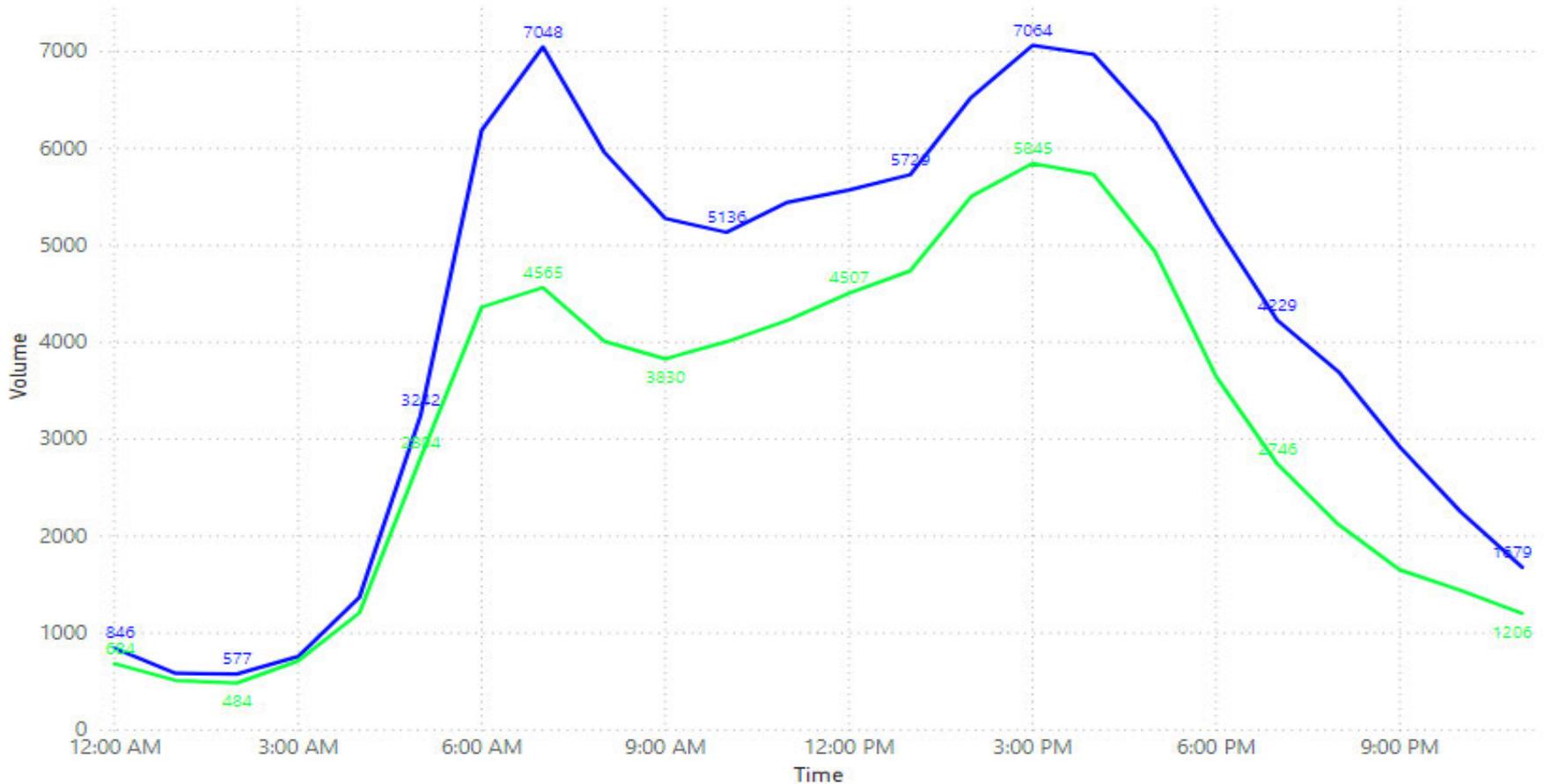


Yellow Phase – Since June 5 (3 Days)



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

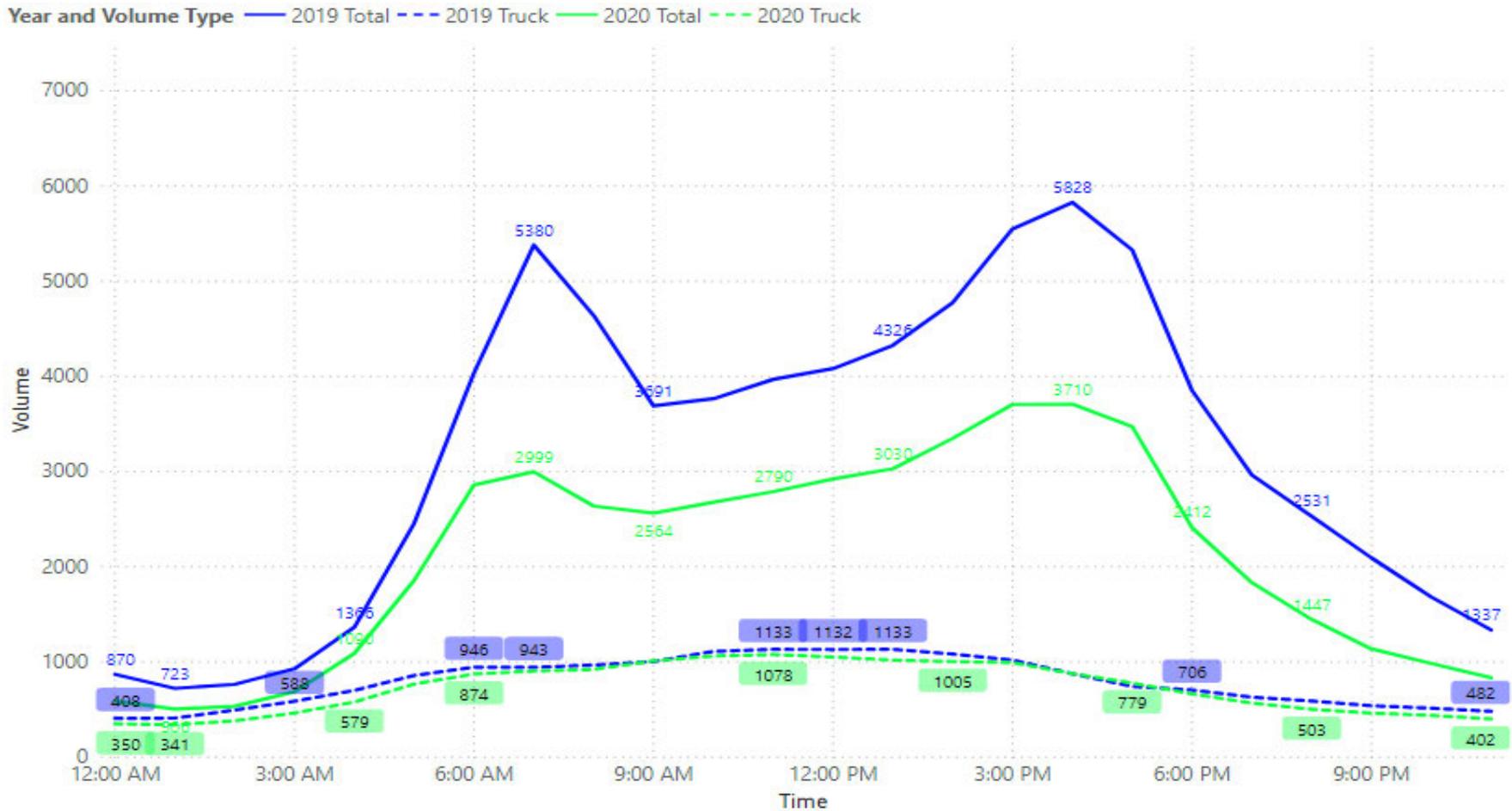
Year and Volume Type — 2019 Total — 2020 Total



Weekday Traffic Counts

Yellow Phase – Since May 22 (17 Days)

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

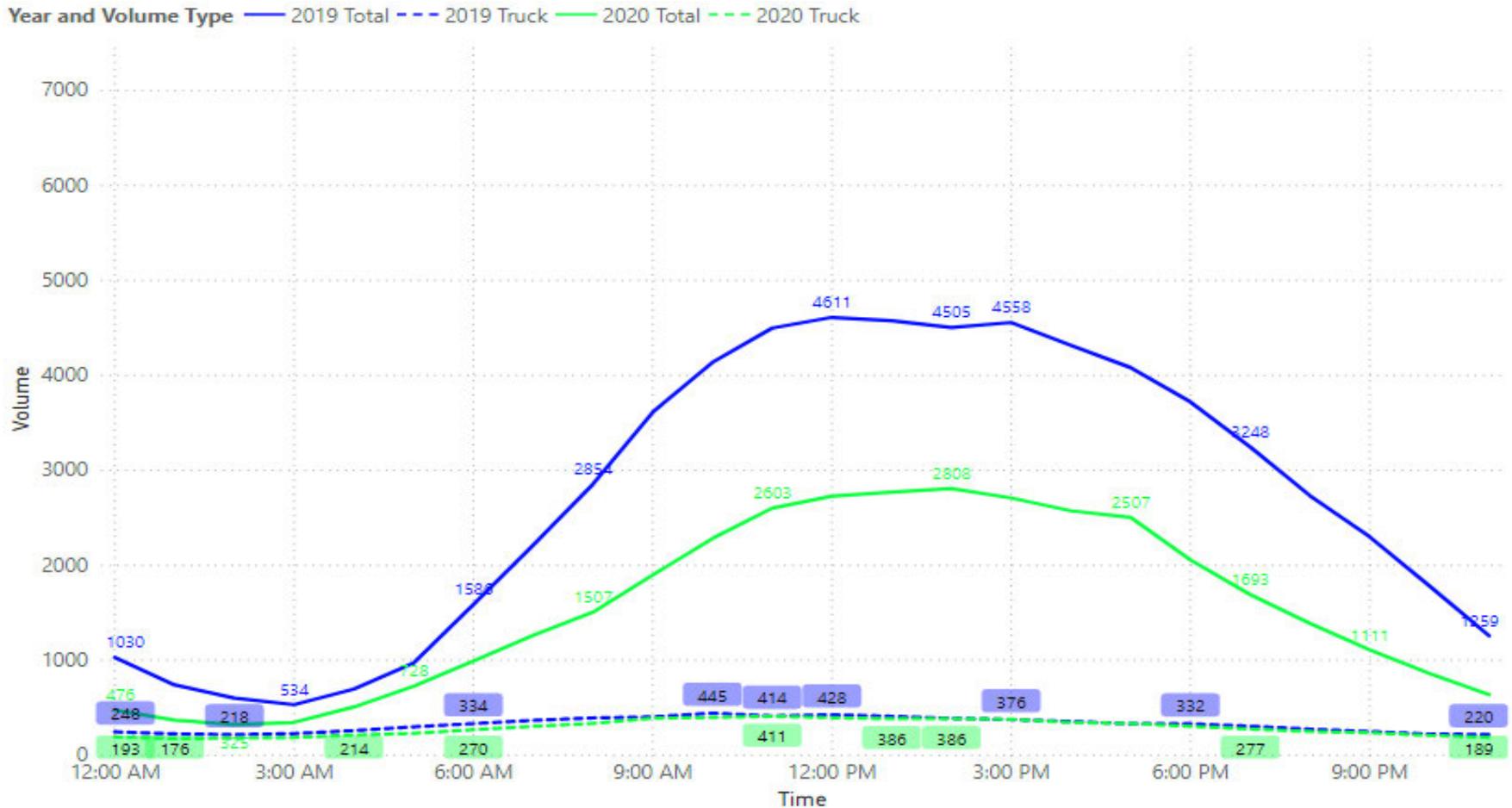


Weekday Traffic Counts

Yellow Phase – Since June 5 (3 Days)



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



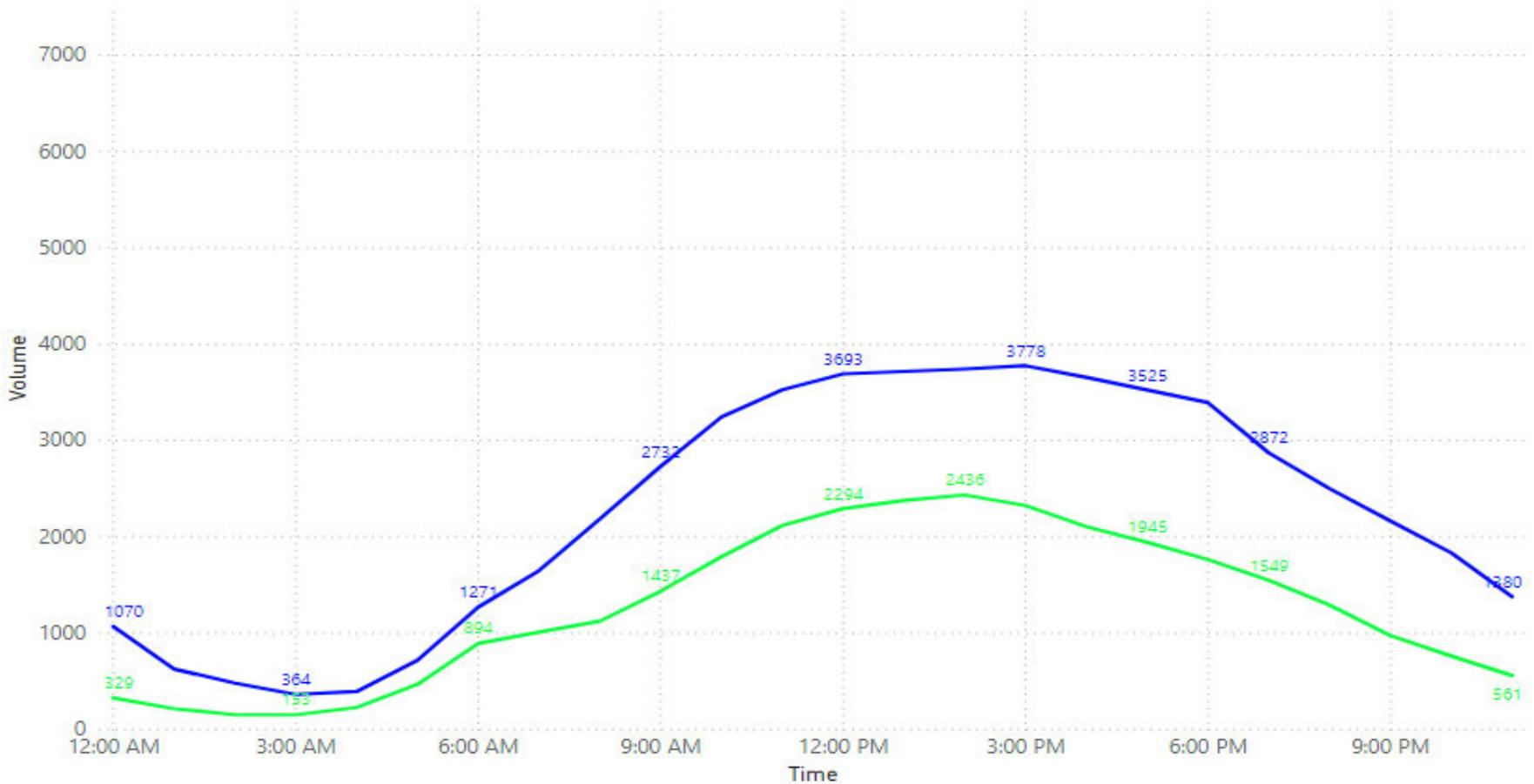
Weekend Traffic Counts

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

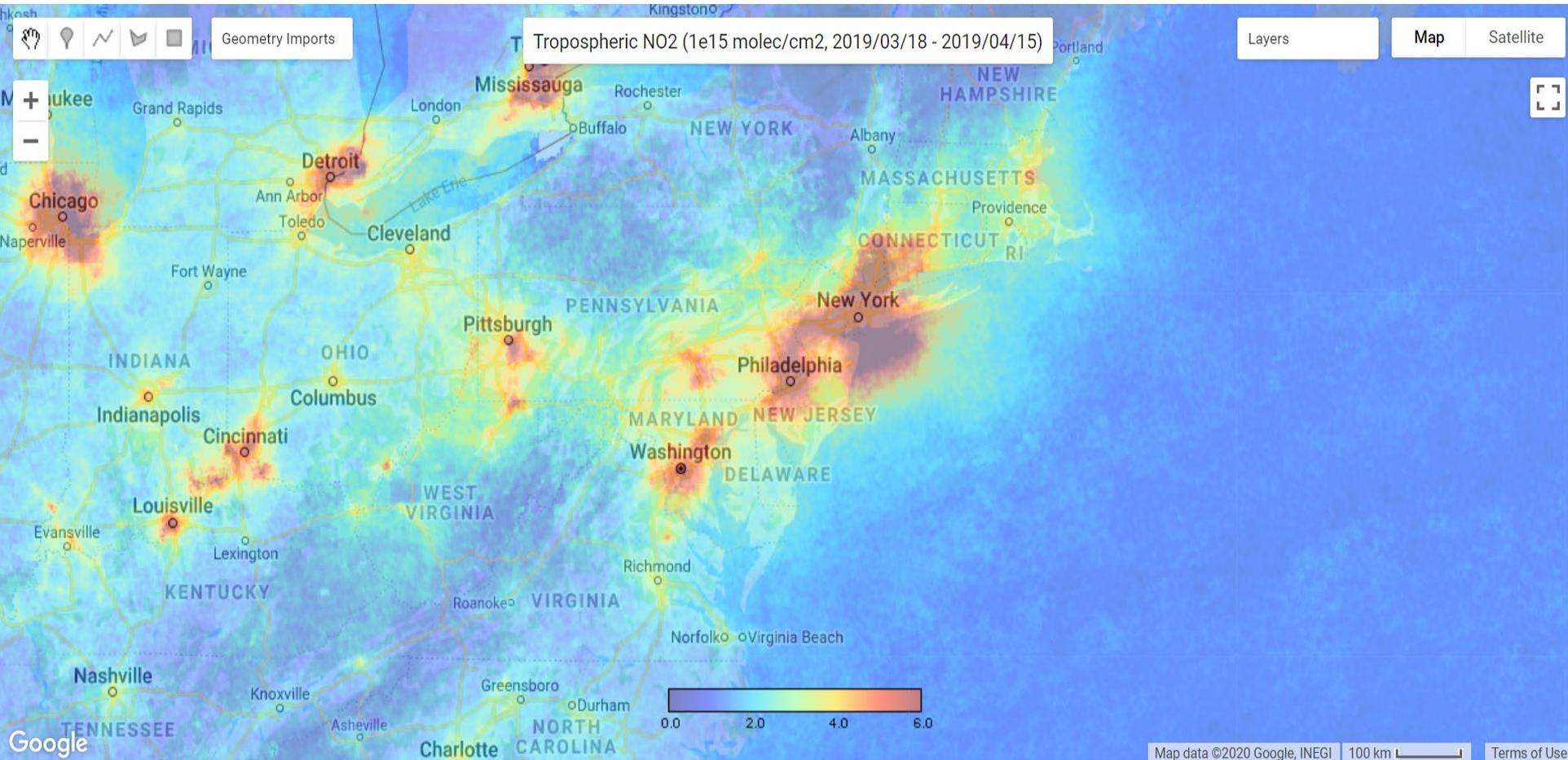
Stay At Home Period

Monday, March 16, 2020

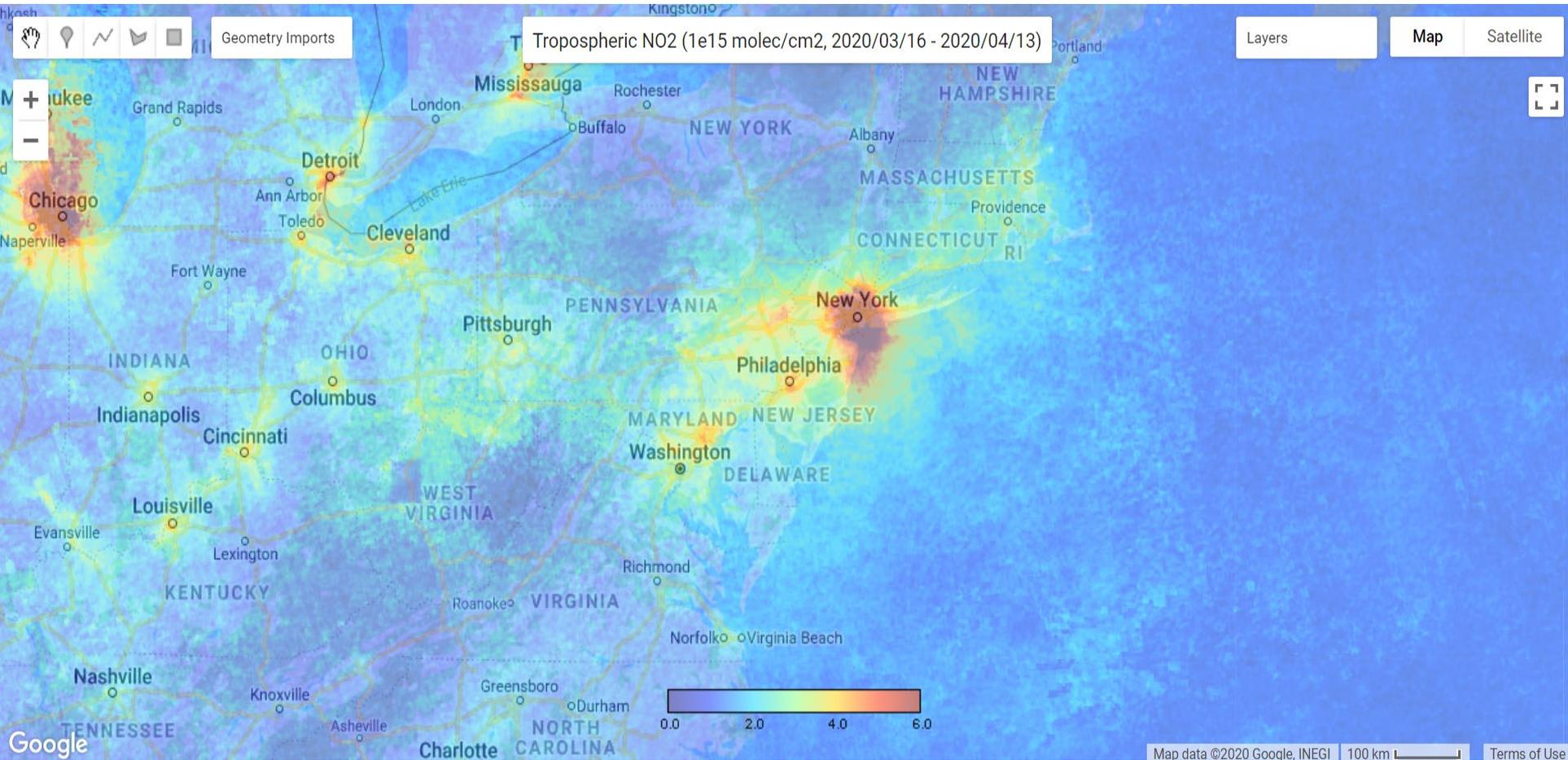
to

Sunday, April 26, 2020

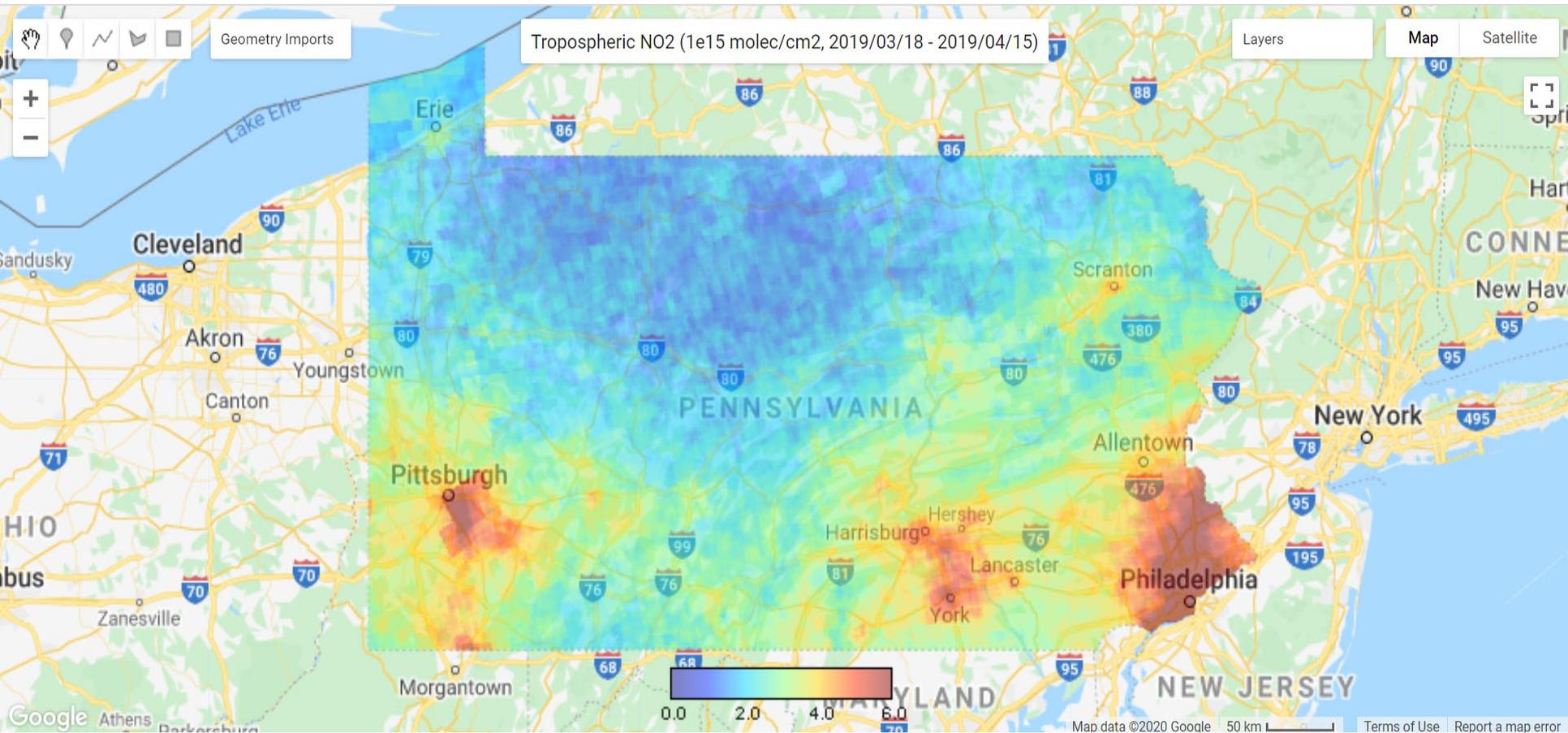
Regional NO₂ – Mid March-Mid April 2019



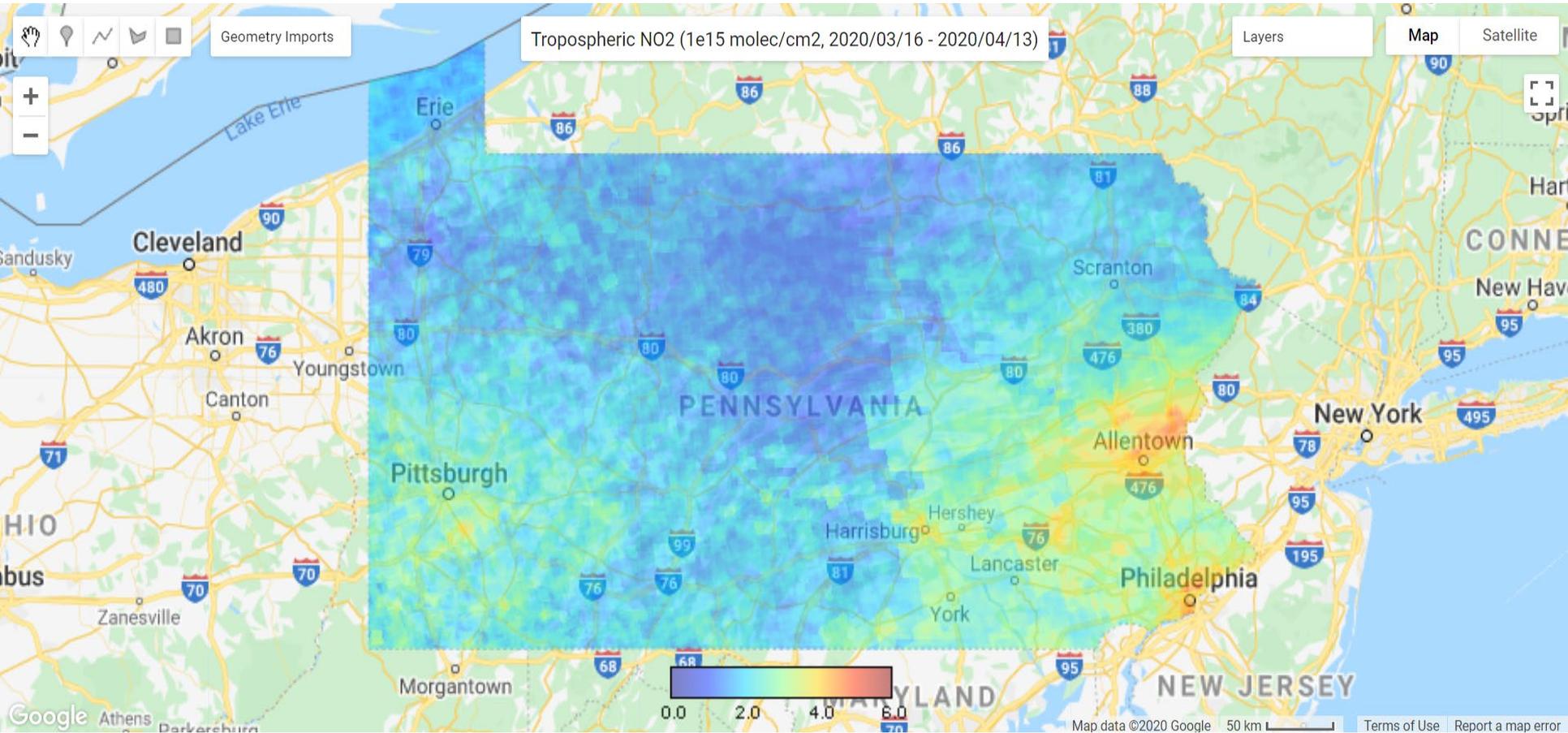
Regional NO₂ – Mid March-Mid April 2020



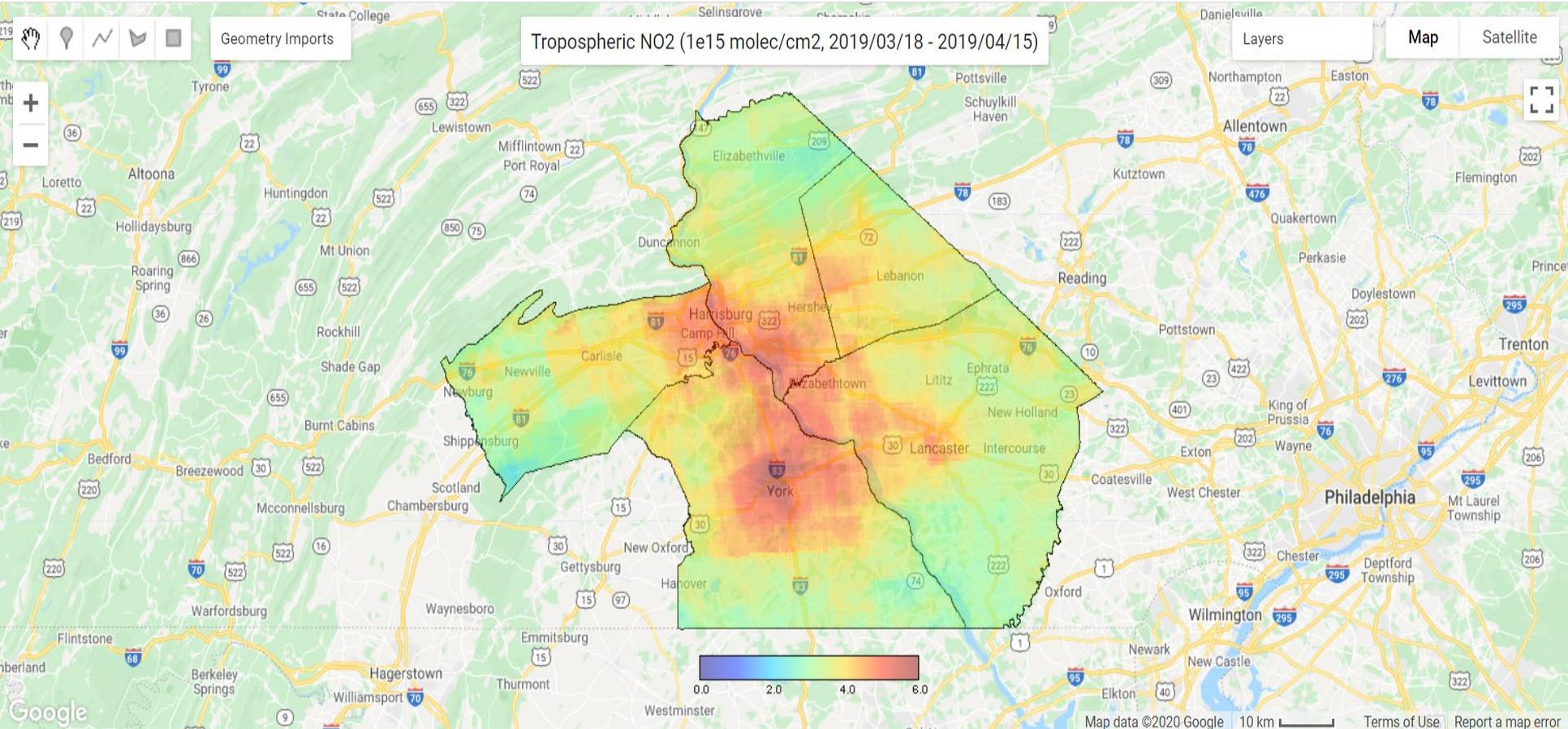
PA NO₂ – Mid March-Mid April 2019



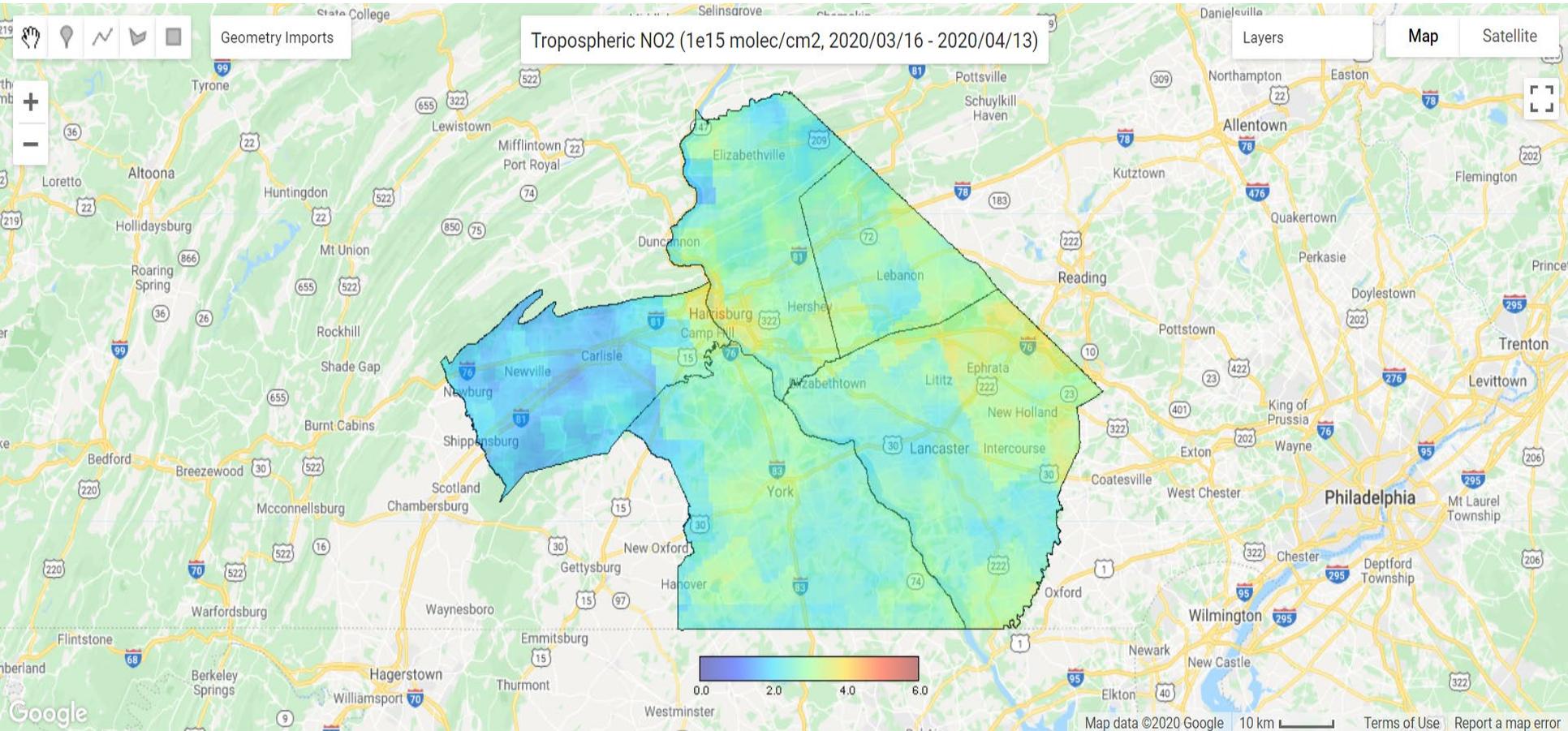
PA NO₂ – Mid March-Mid April 2020



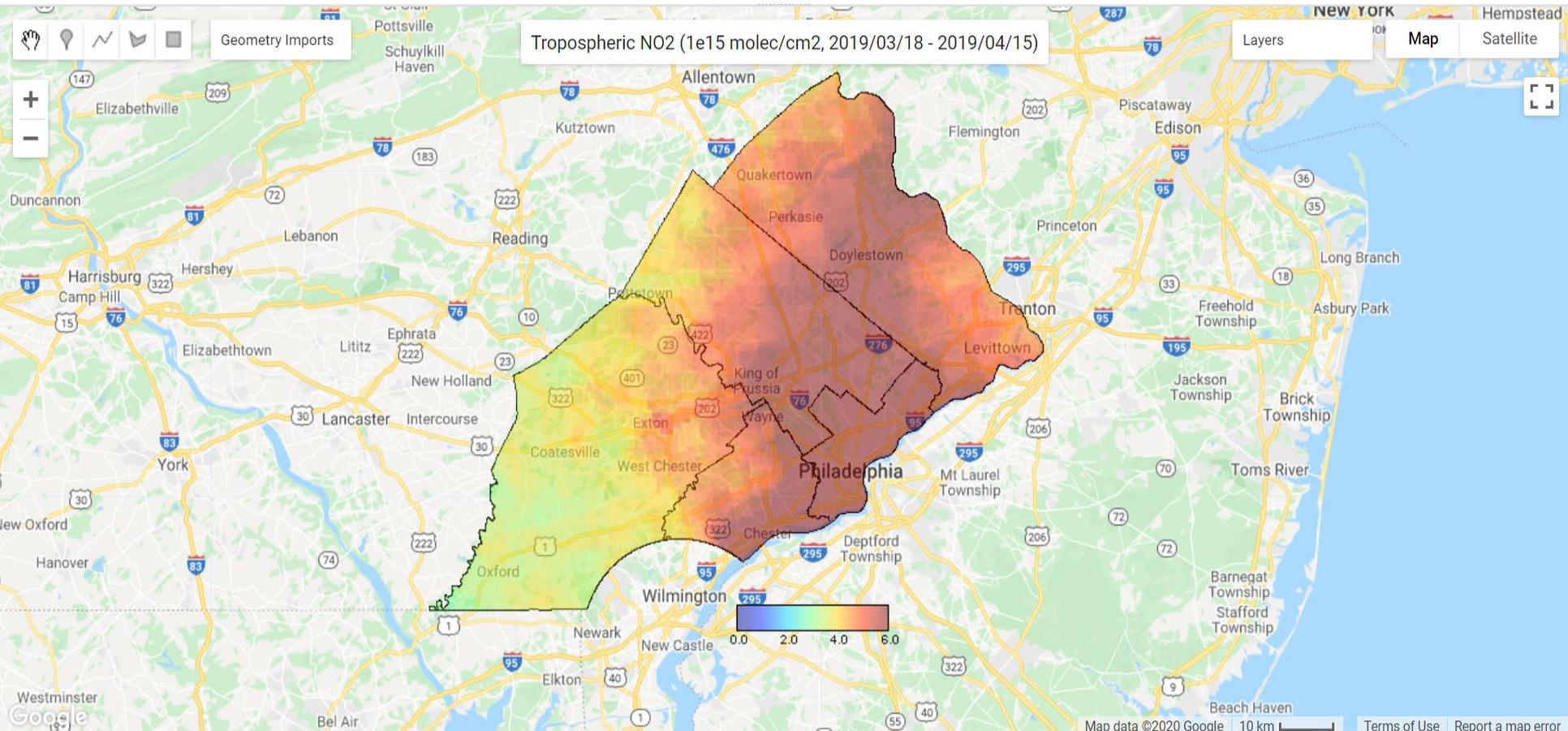
Susq Valley NO₂ – Mid March-Mid April 2019



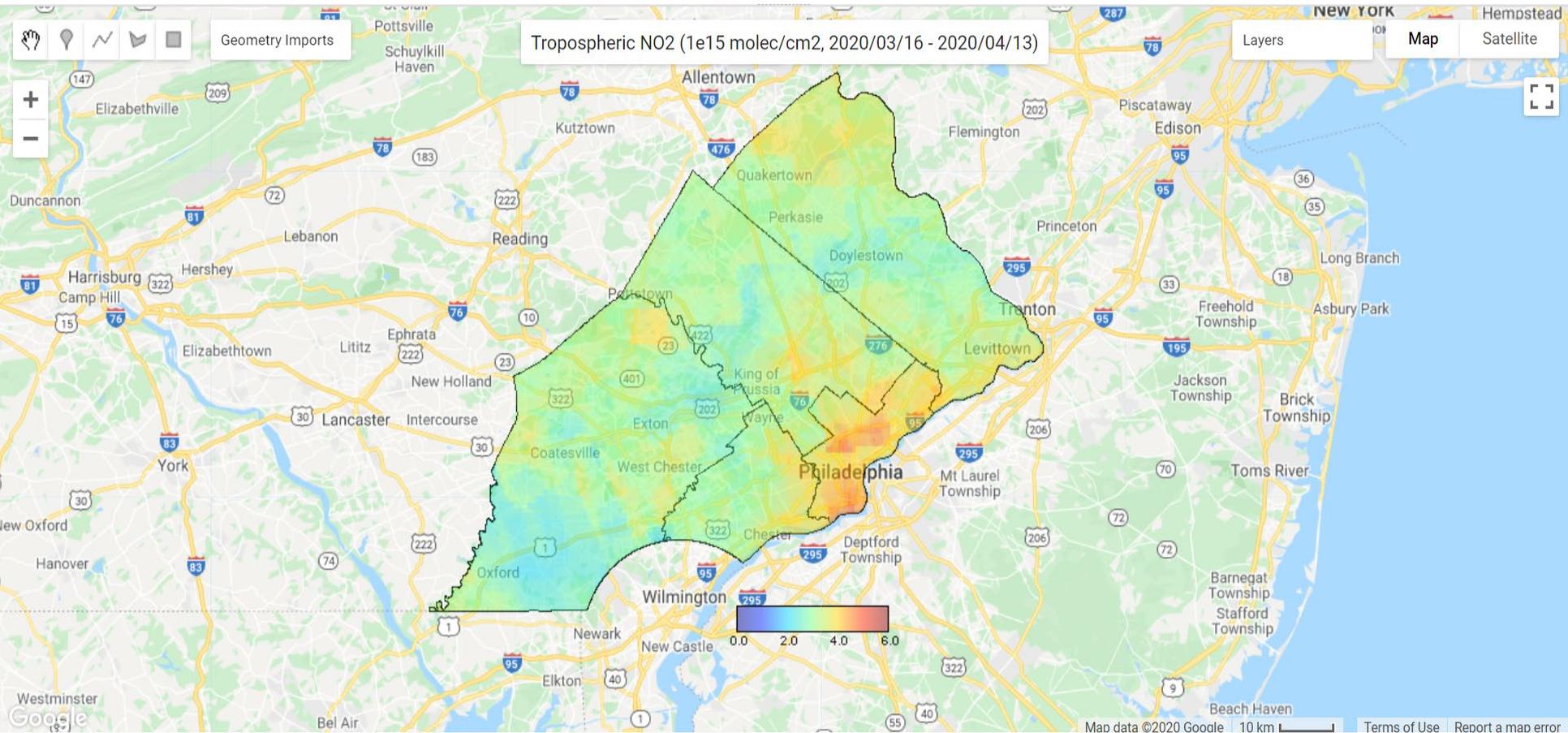
Susq Valley NO₂ – Mid March-Mid April 2020



Philly NO₂ – Mid March-Mid April 2019



Philly NO₂ – Mid March-Mid April 2020



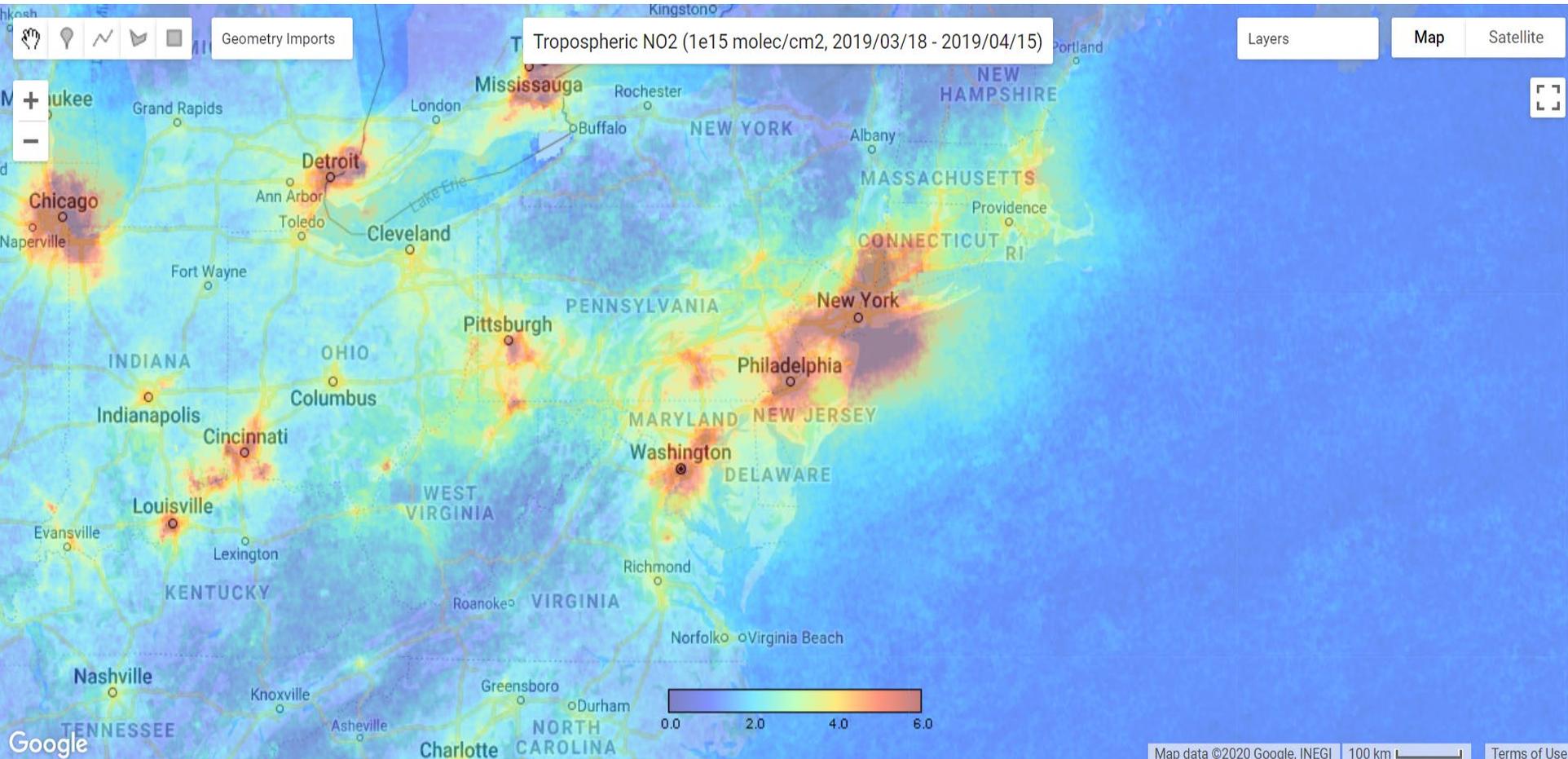
Loosening Period

Friday, May 8, 2020

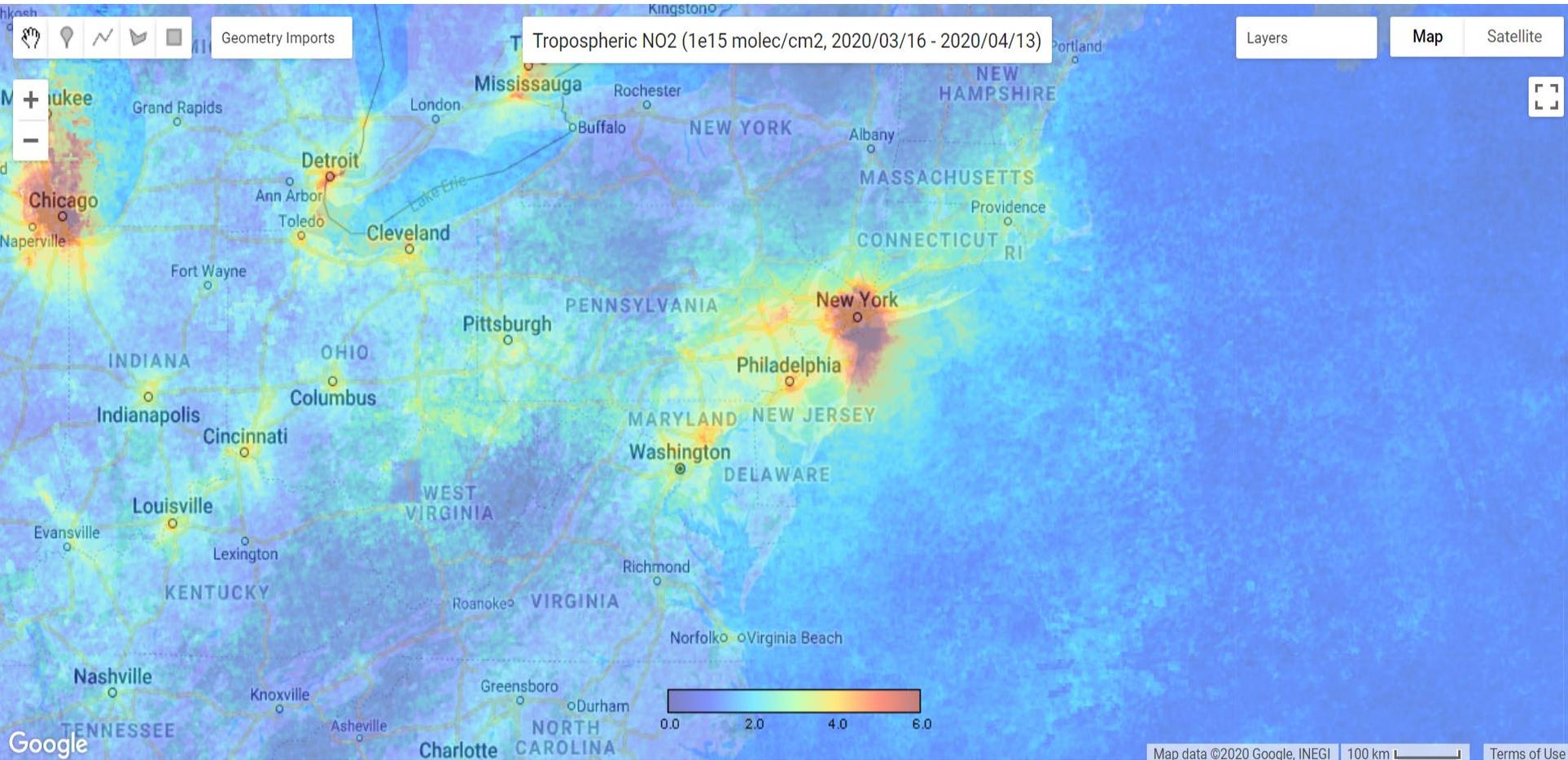
to

Sunday, June 7, 2020

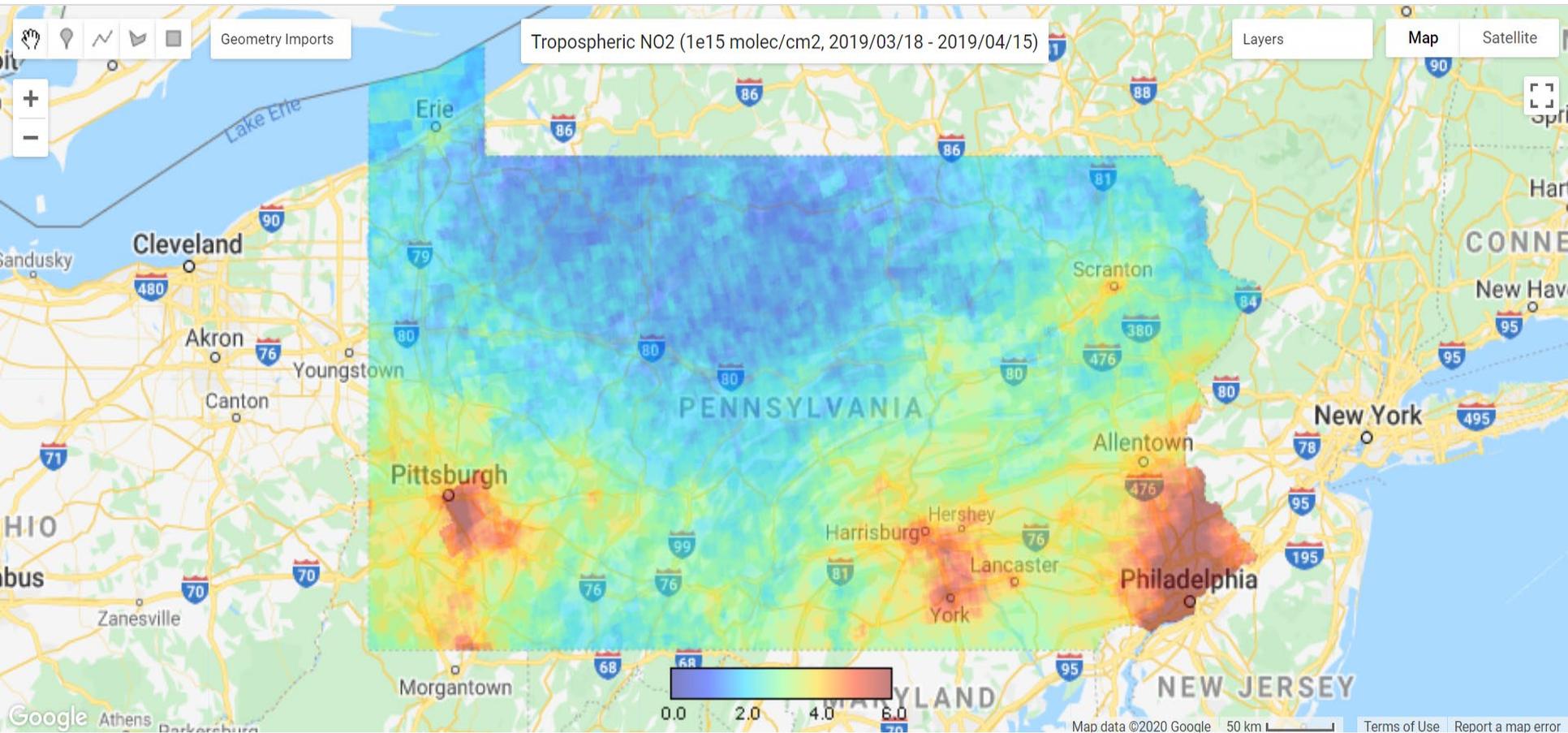
Regional NO₂ – Early May-Early June 2019



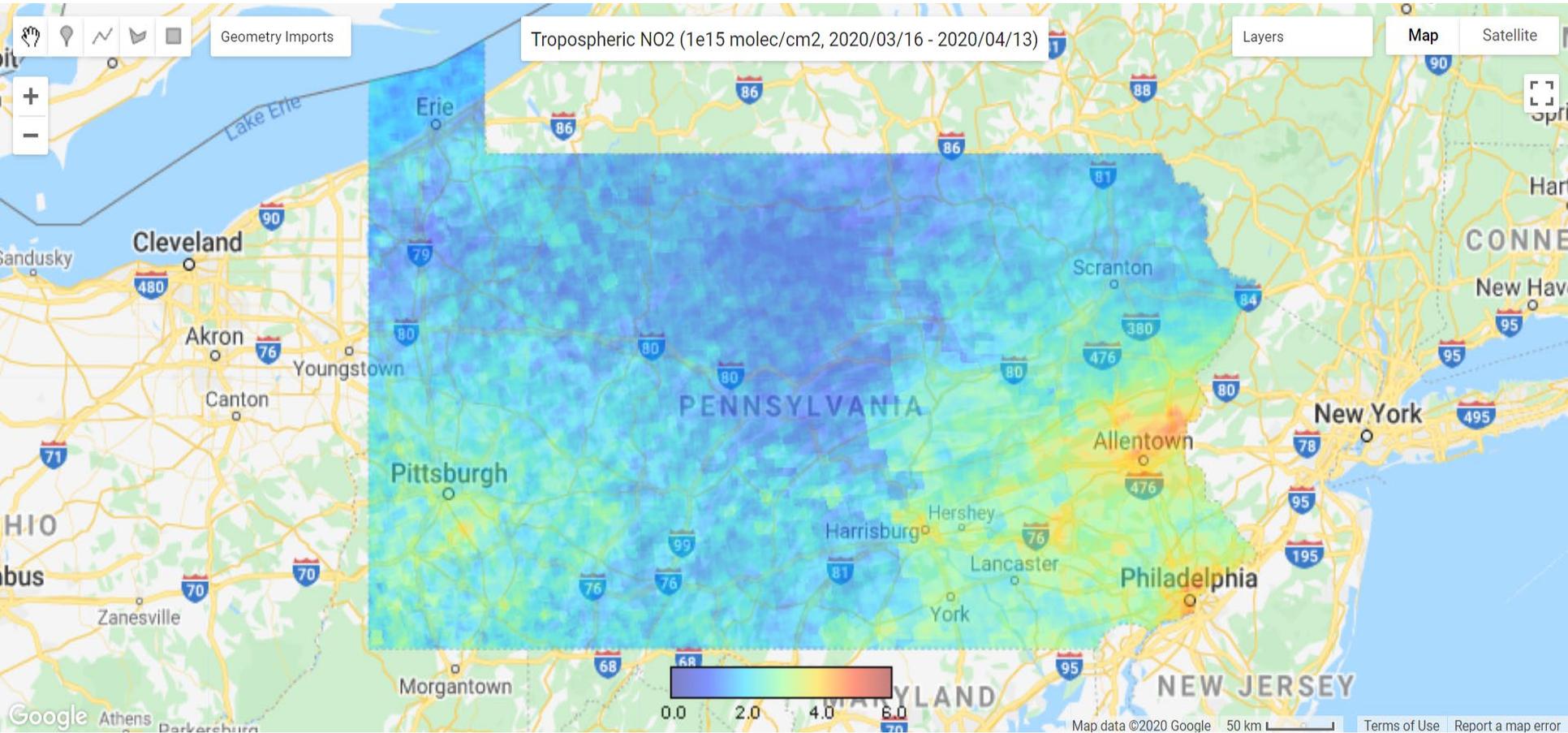
Regional NO₂ – Early May-Early June 2020



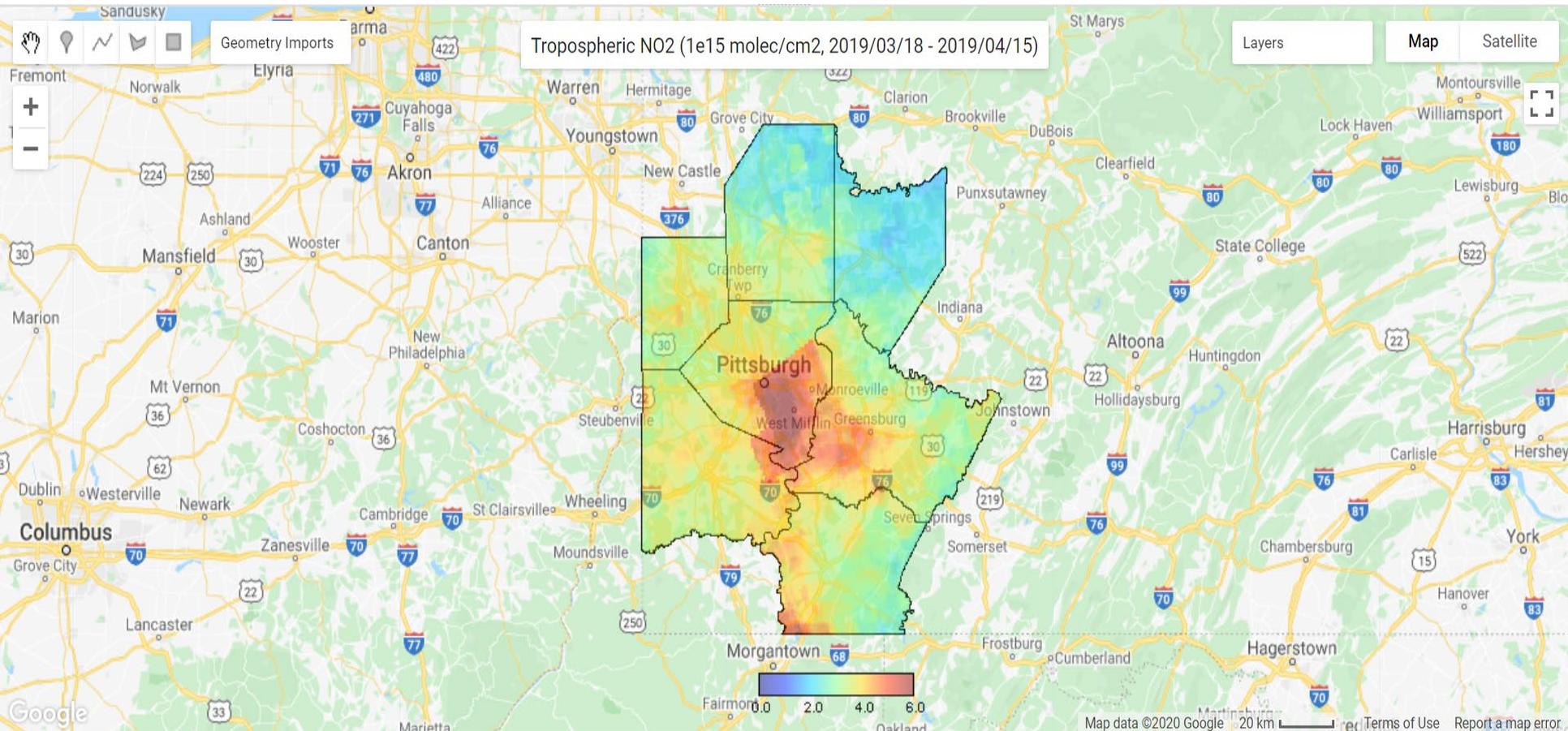
PA NO₂ – Early May-Early June 2019



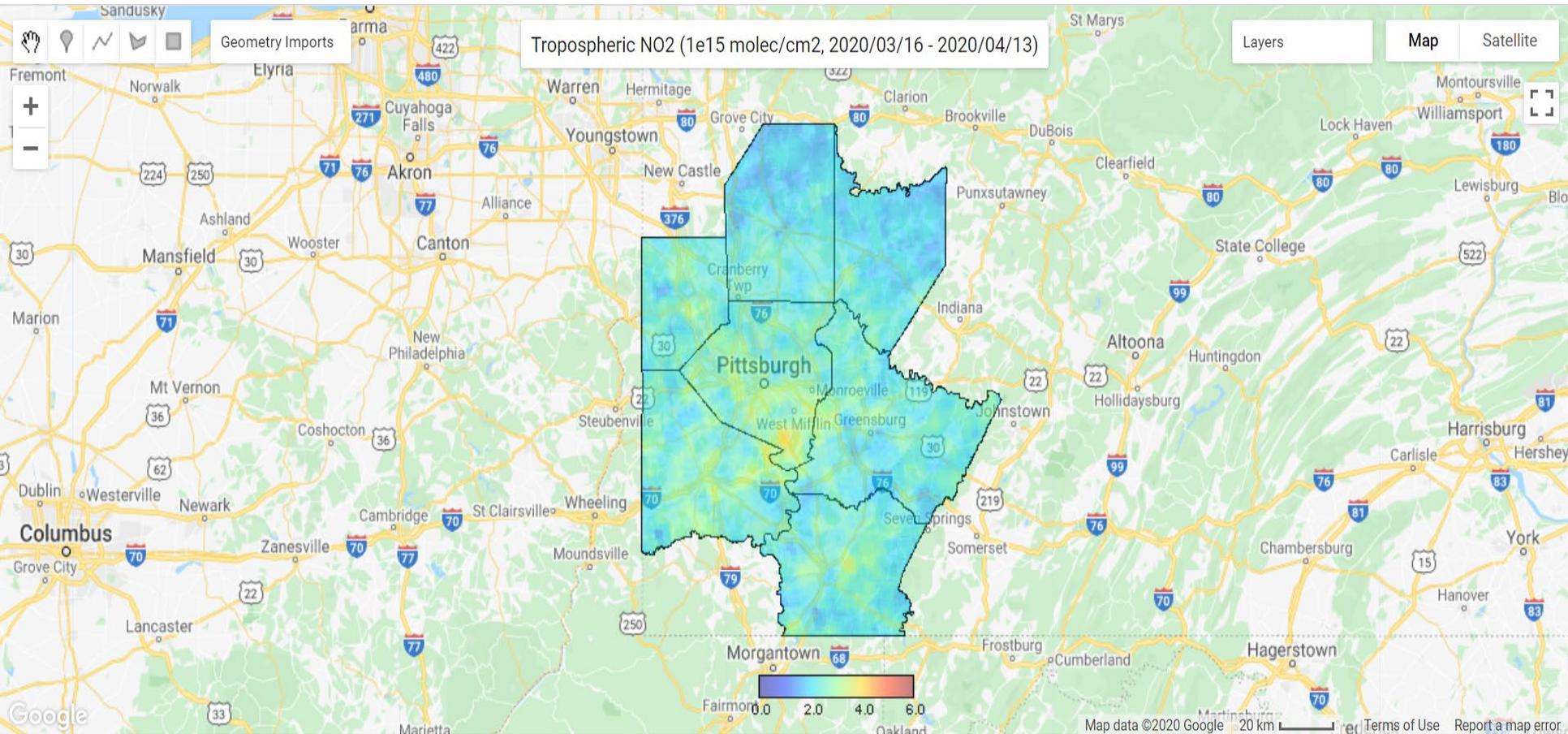
PA NO₂ – Early May-Early June 2020



Pitt NO₂ – Early May-Early June 2019

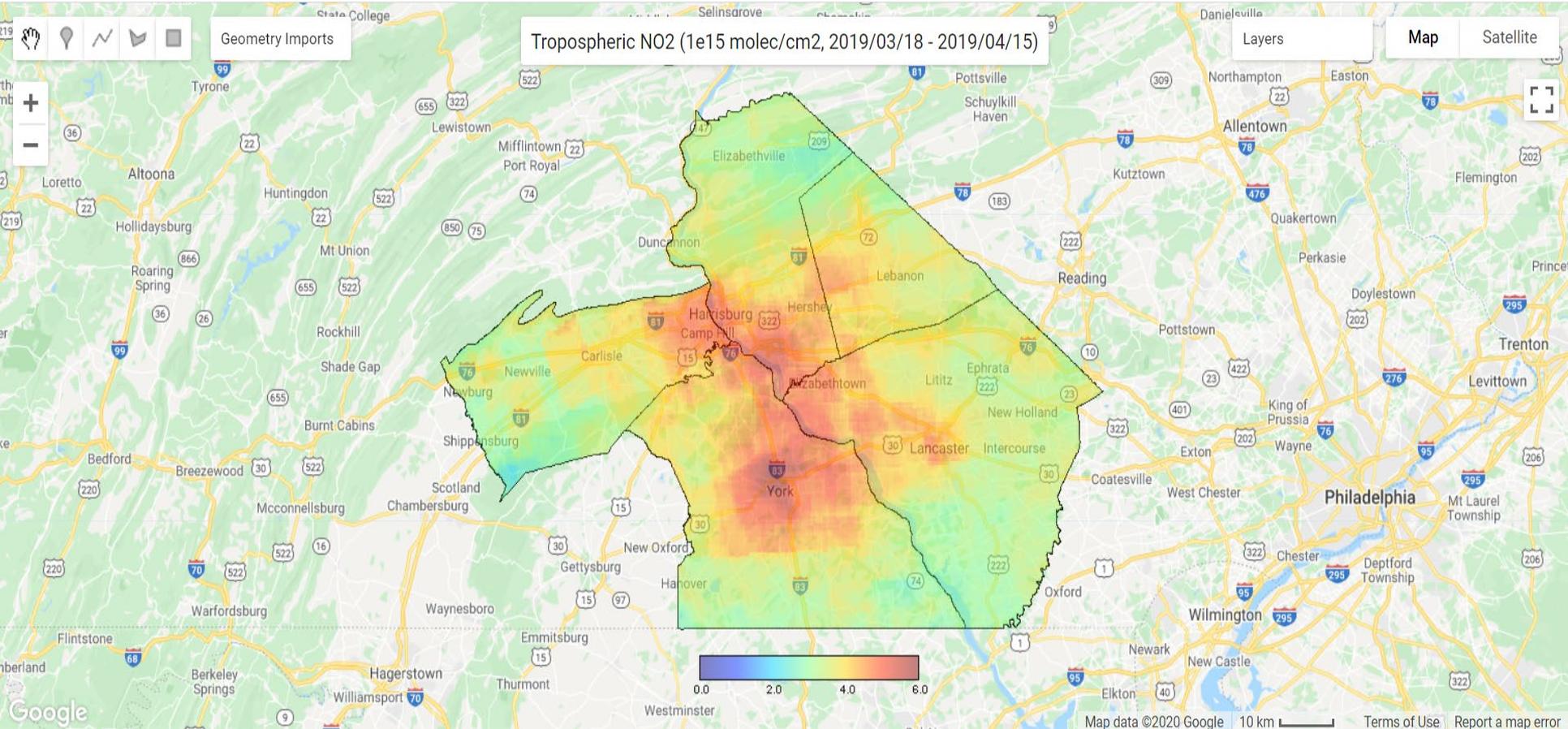


Pitt NO₂ – Early May-Early June 2020

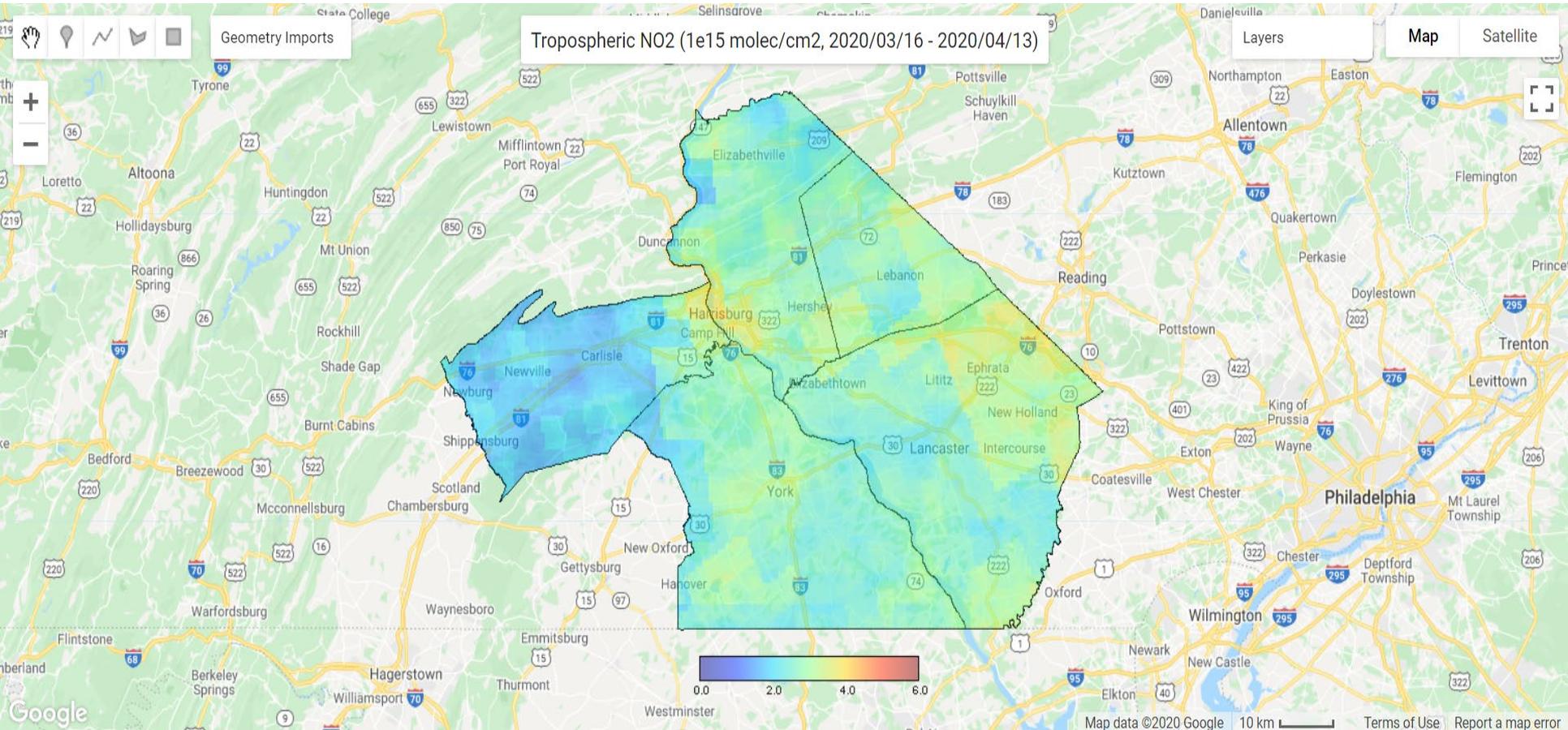


Yellow Phase – Most of Region Since
May 15 (24 Days)

Susq Valley NO₂ – Early May-Early June 2019

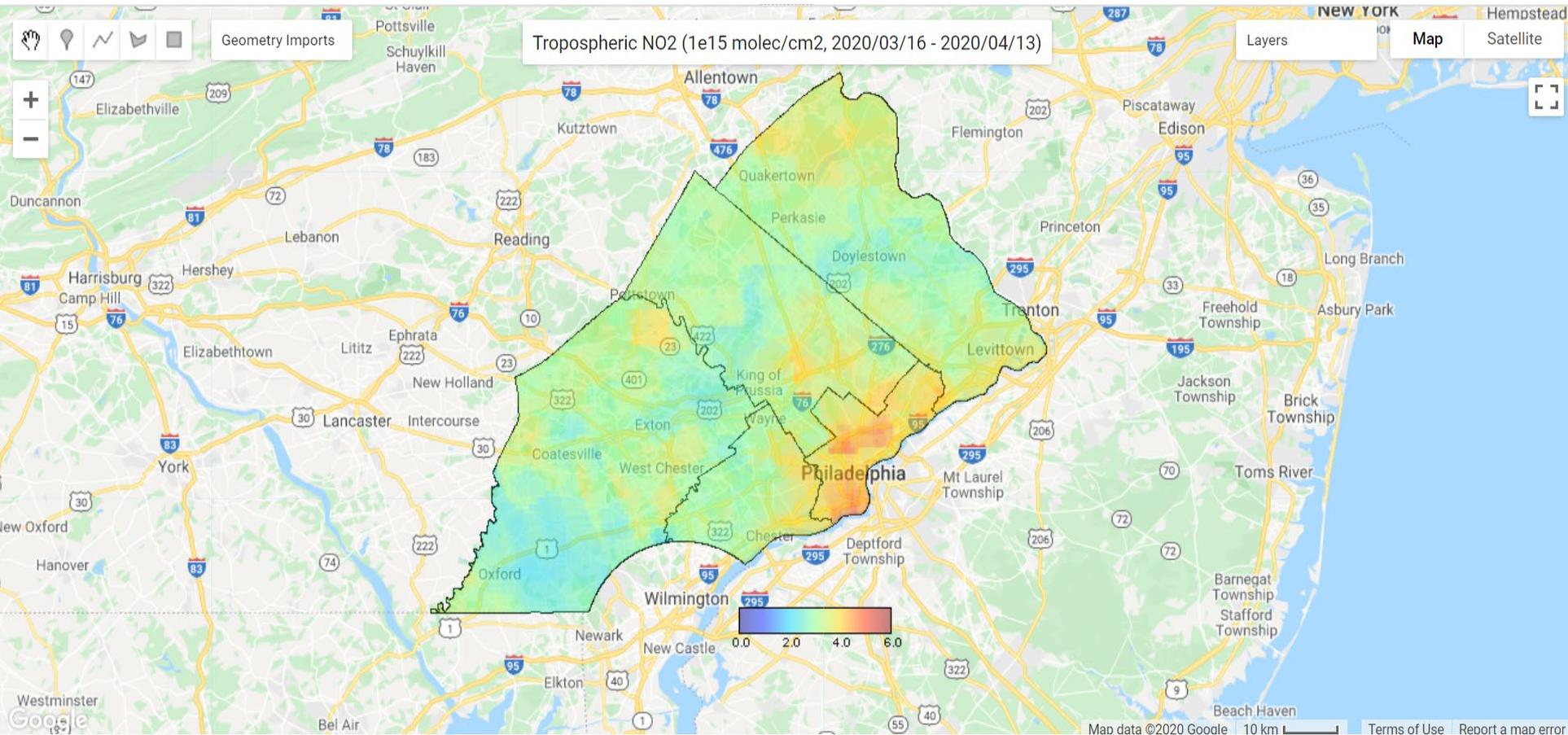


Susq Valley NO₂ – Early May-Early June 2020



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

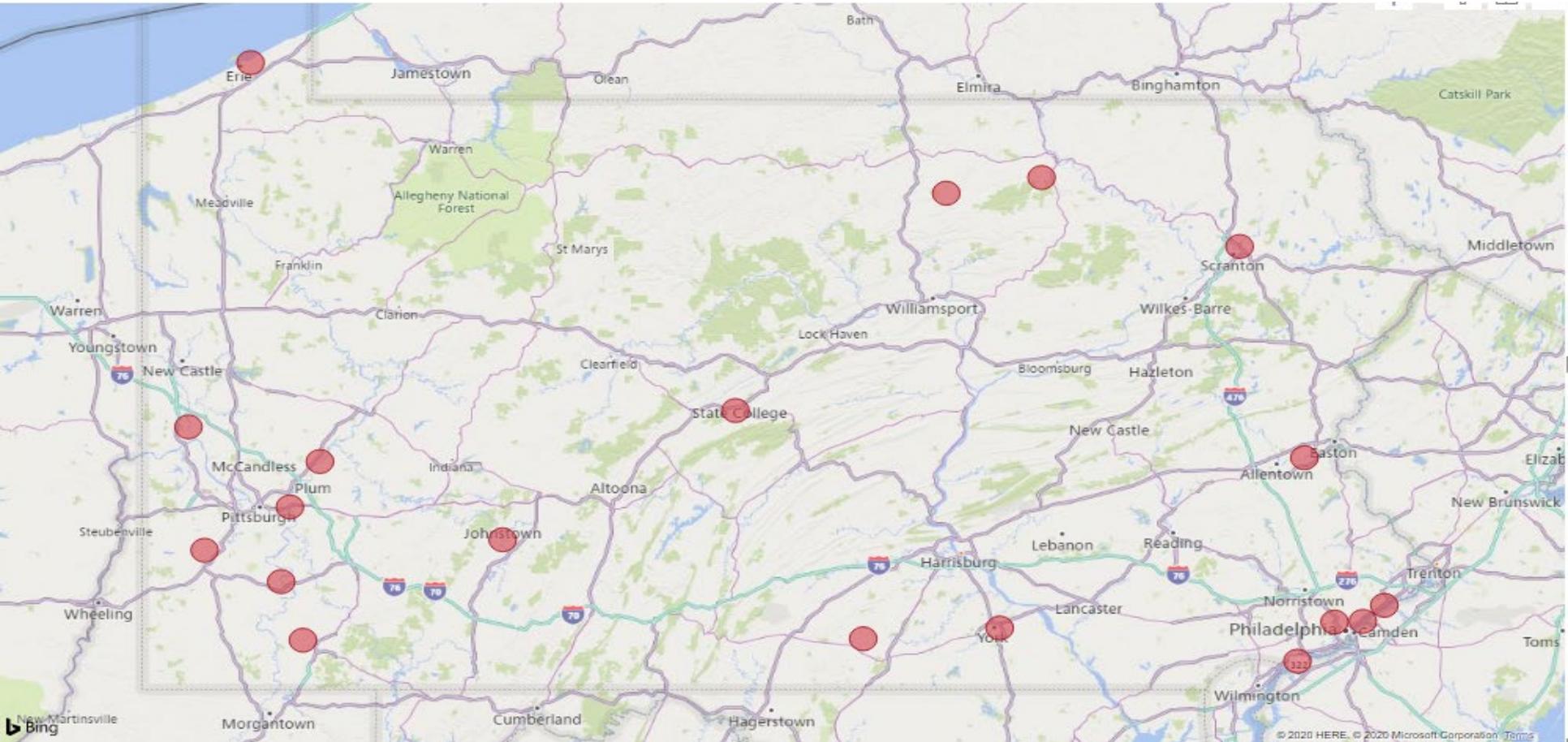
Philly NO₂ – Early May-Early June 2020



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

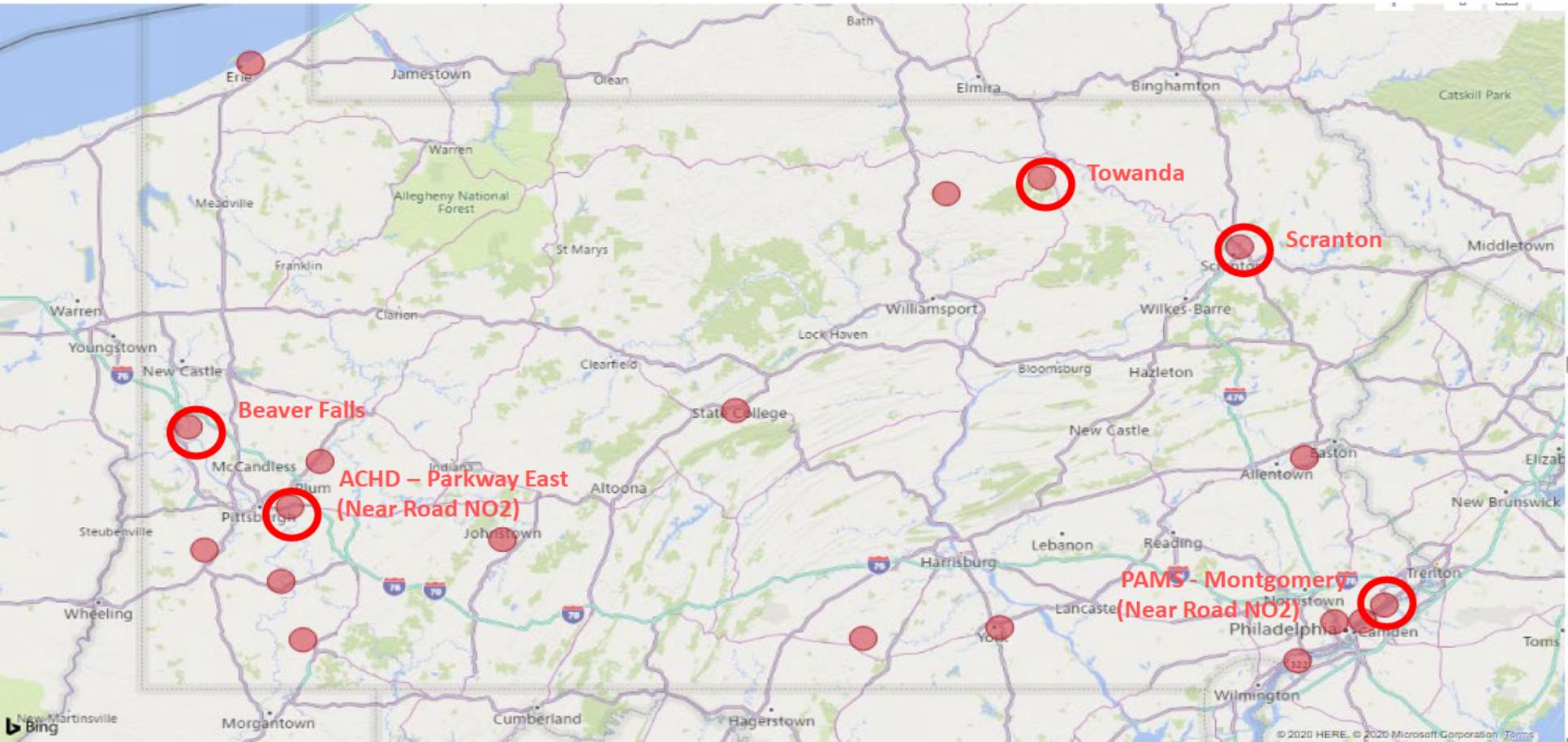
PA Air Monitoring Data: 2019 vs. 2020

PA NO₂ Monitor Locations



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PROTECTION

PA NO₂ Monitor Locations (Focus Area)



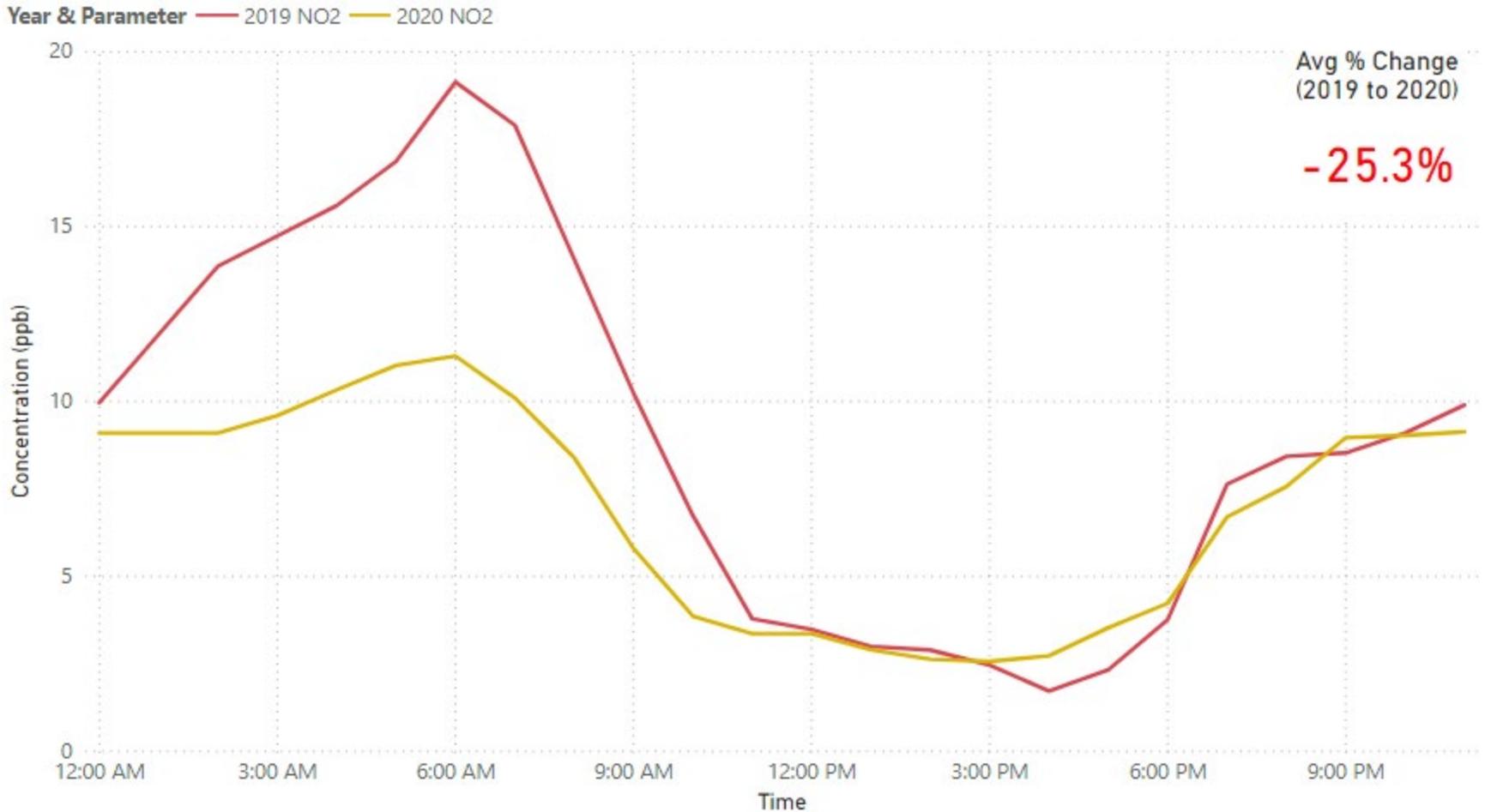
Stay At Home Period

Monday, March 16, 2020

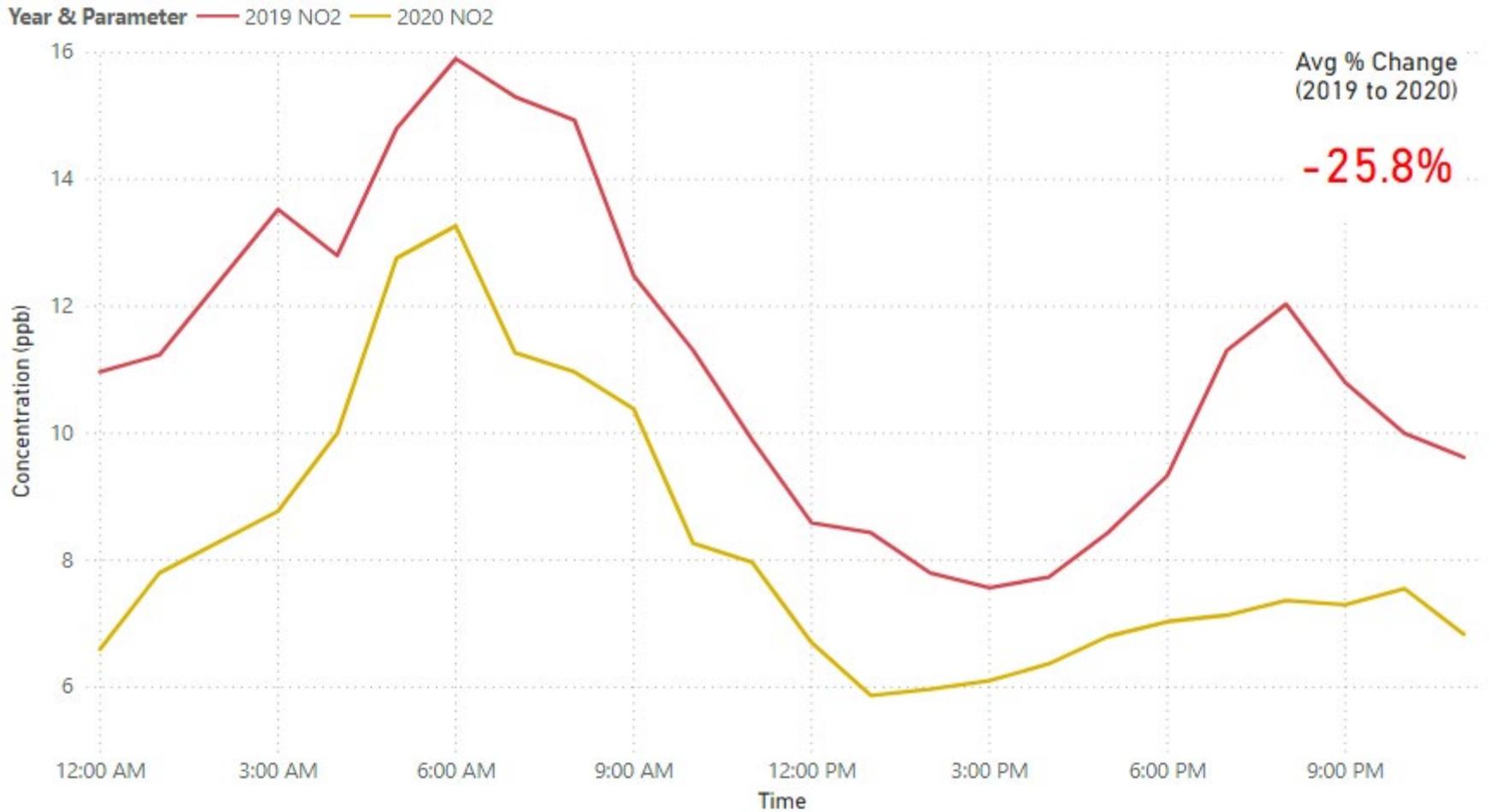
to

Sunday, April 26, 2020

Weekday NO₂ Concentrations – Beaver Falls



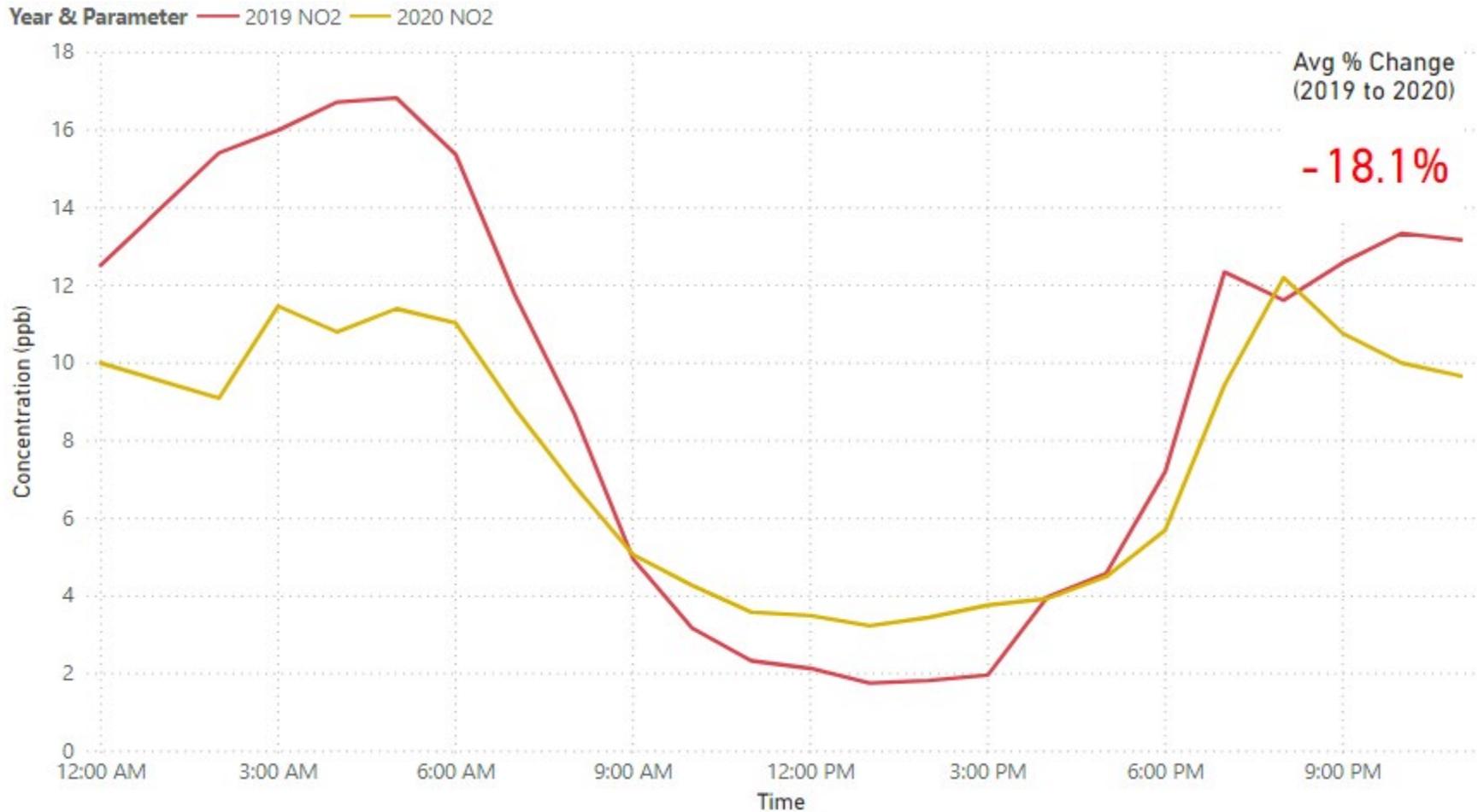
Weekday NO₂ Concentrations – Parkway East



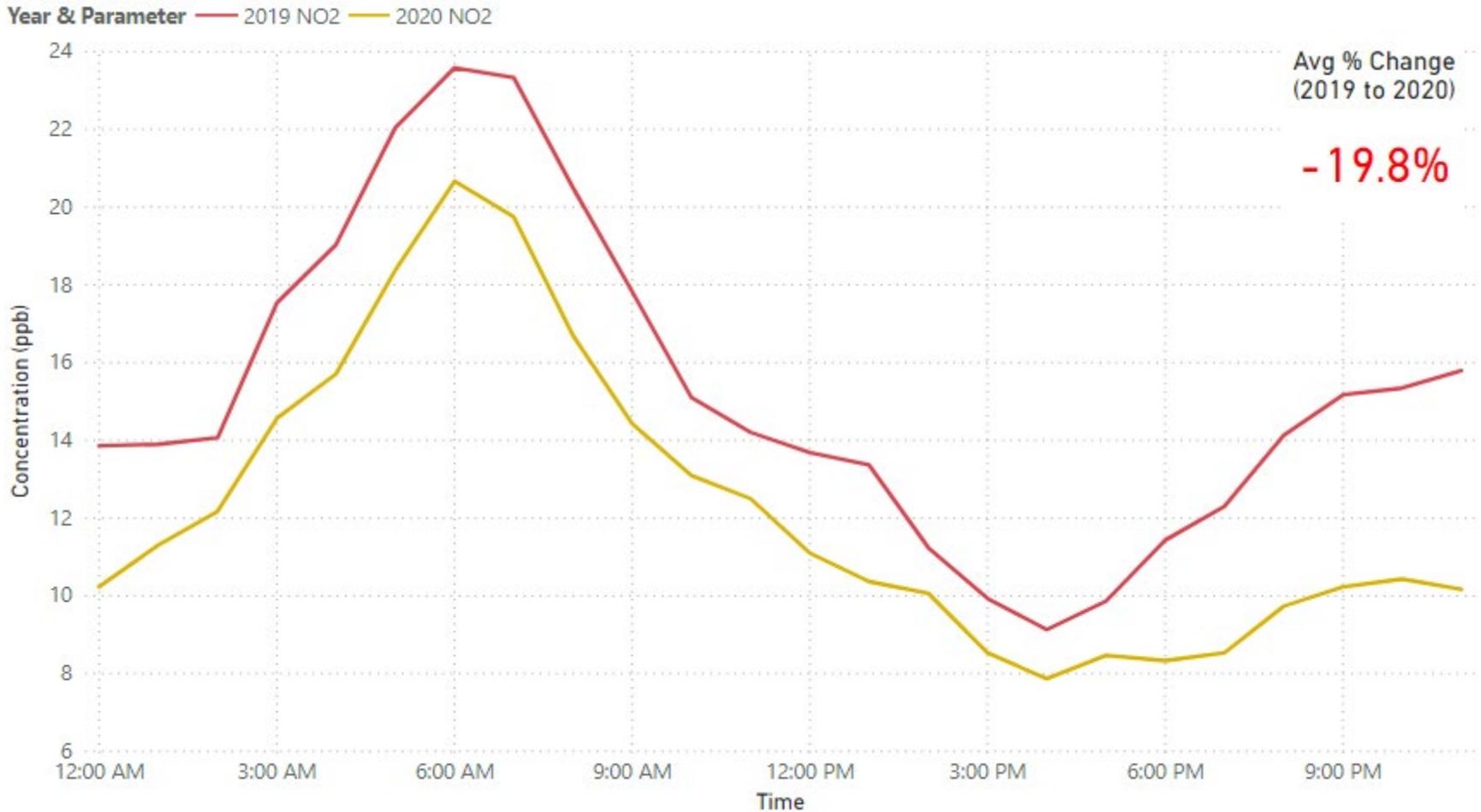
Weekday NO₂ Concentrations – Towanda



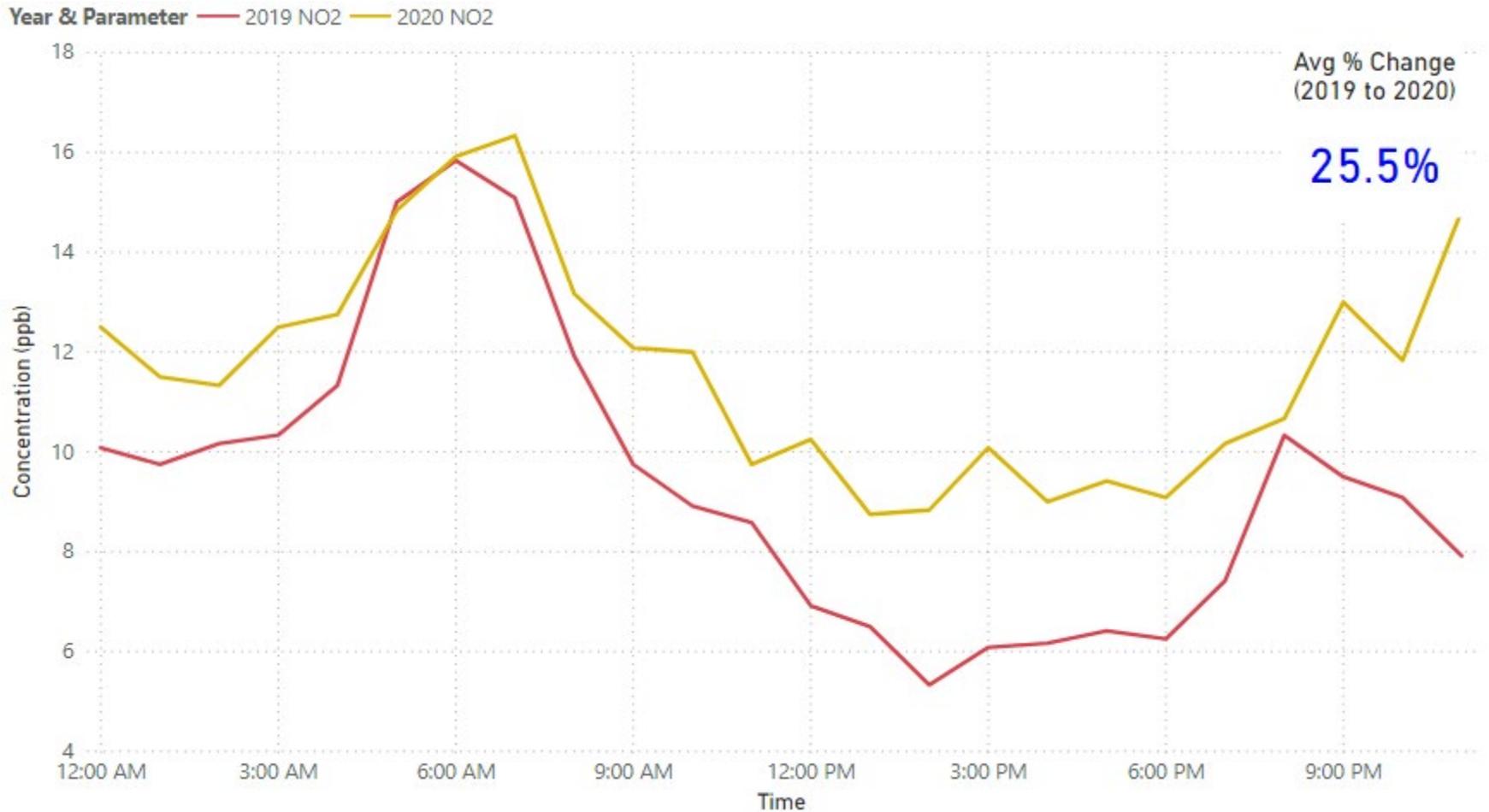
Weekday NO₂ Concentrations – Scranton



Weekday NO₂ Concentrations – Montgomery



Weekend NO₂ Concentrations – Montgomery



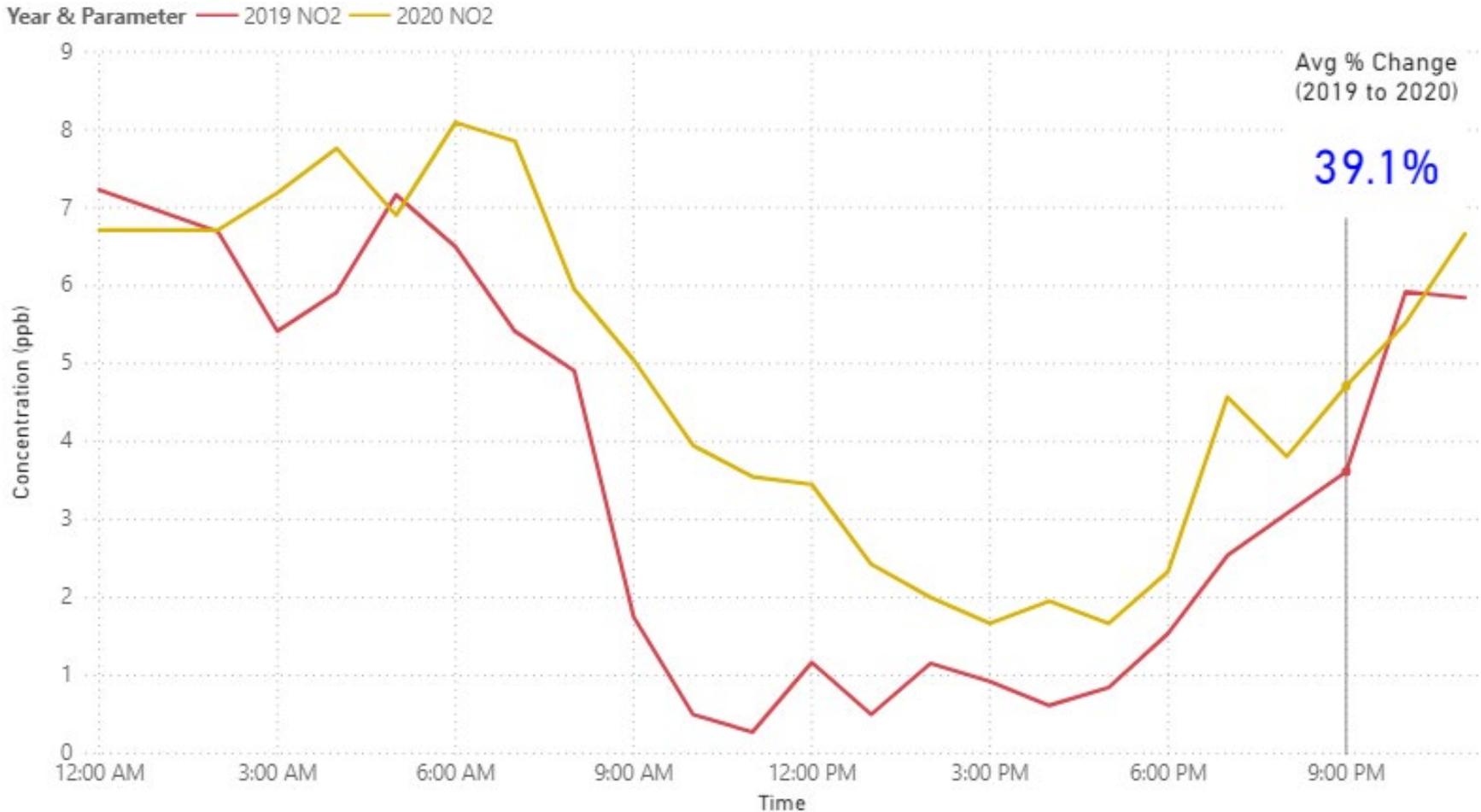
Loosening Period

Friday, May 8, 2020

to

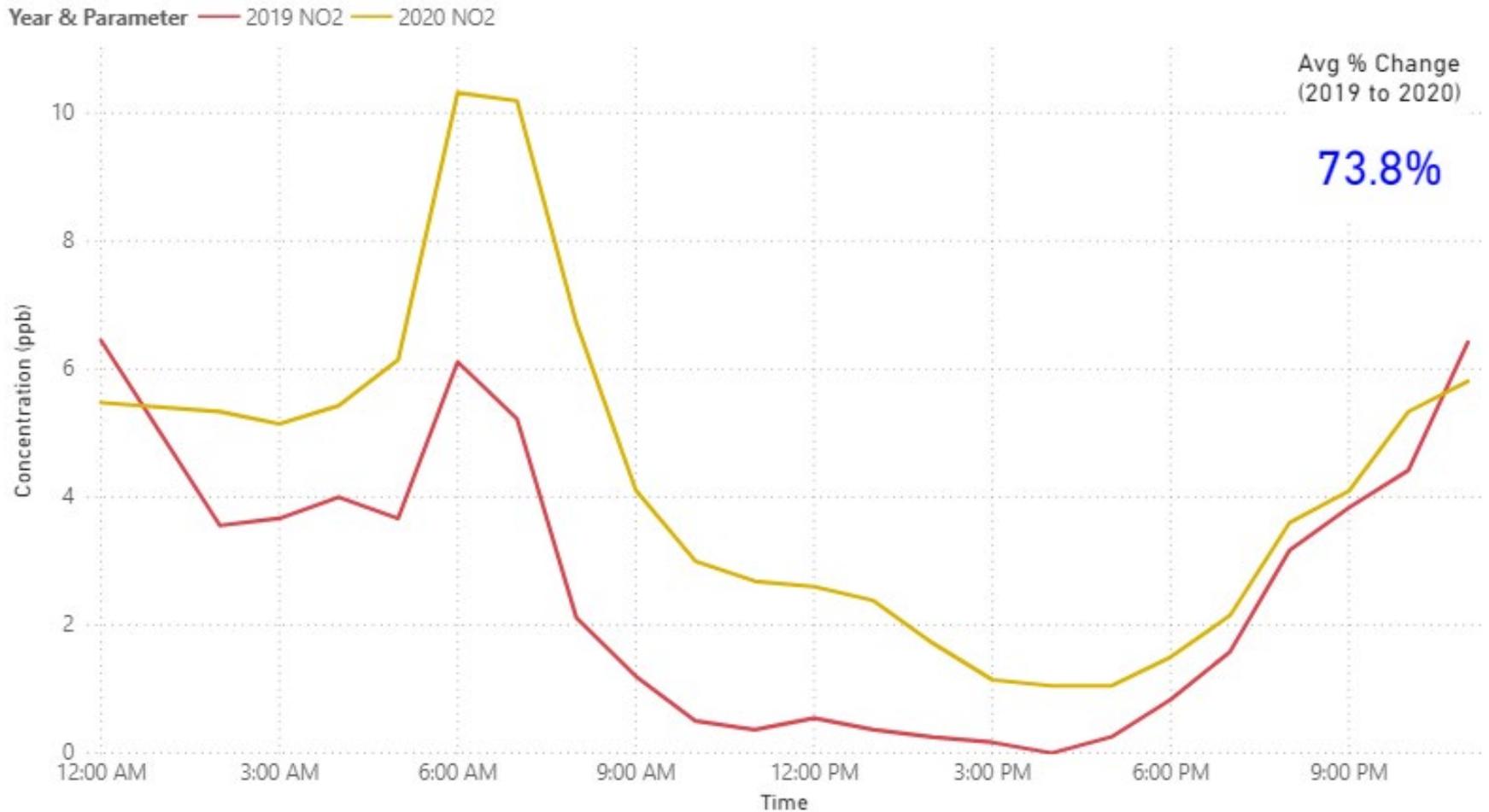
Sunday, June 7, 2020

Weekday NO₂ Concentrations – Beaver Falls



Yellow Phase – Since May 22 (17 Days)

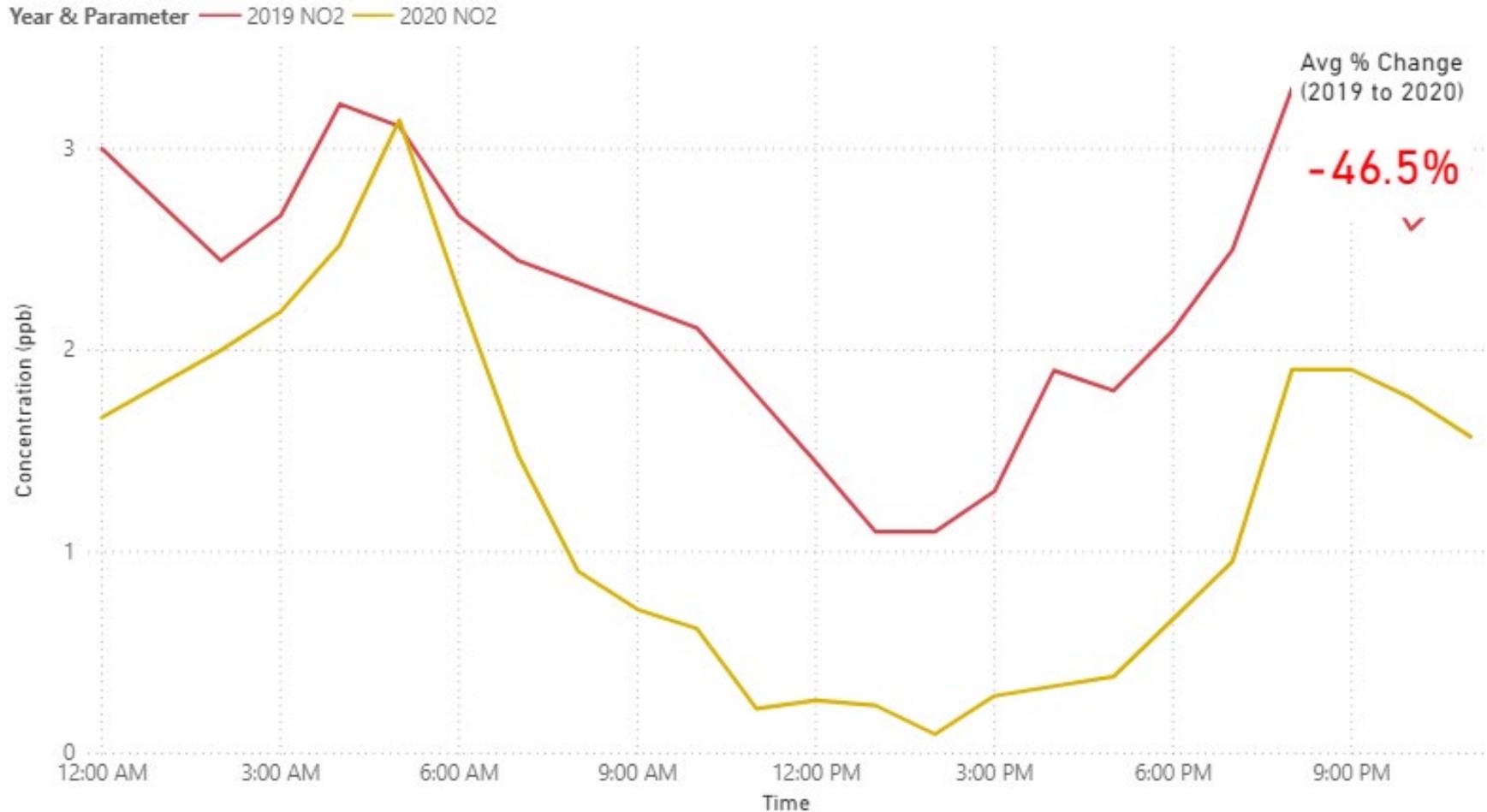
Weekday NO₂ Concentrations – Parkway East



Yellow Phase – Since May 15 (24 Days)

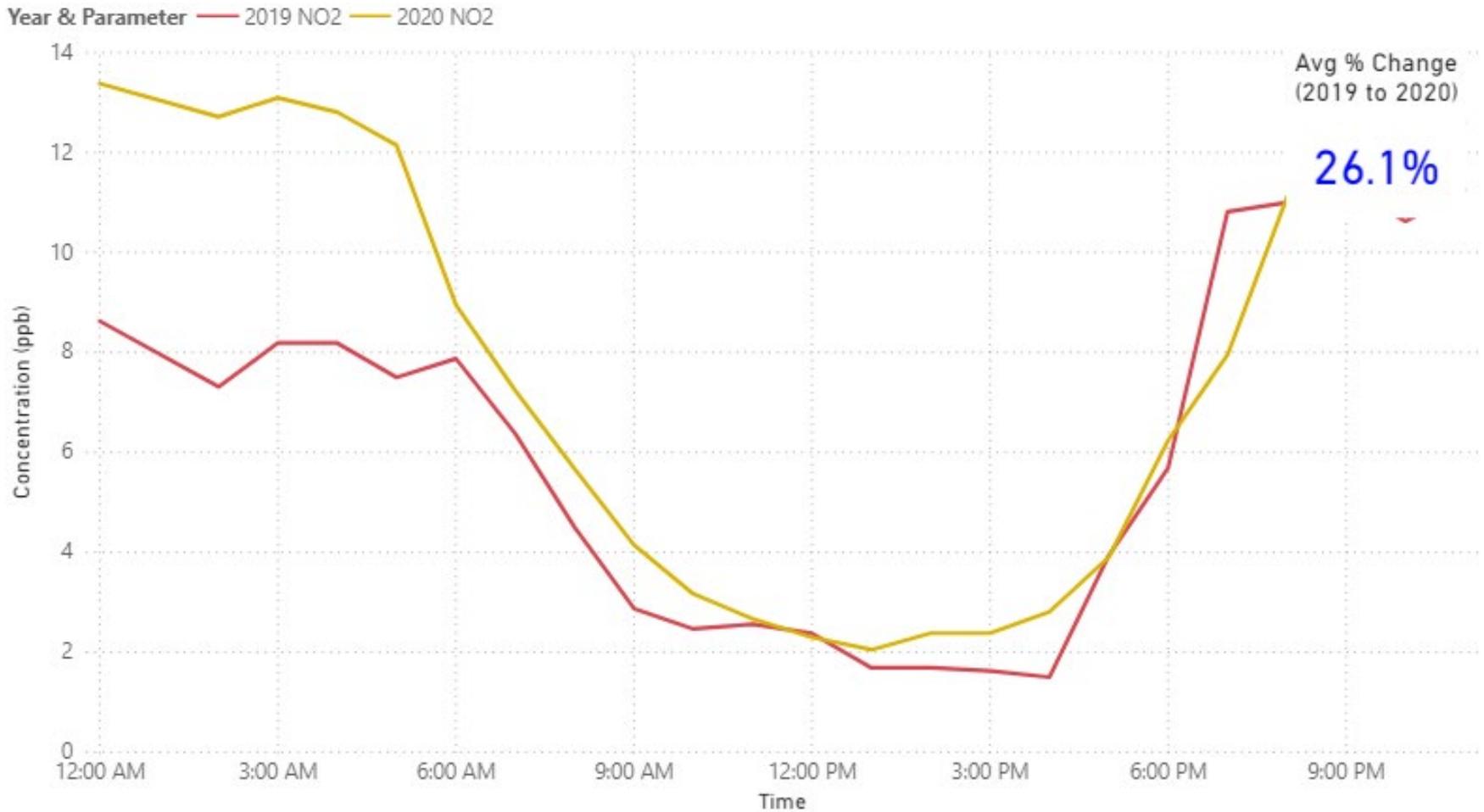


Weekday NO₂ Concentrations – Towanda



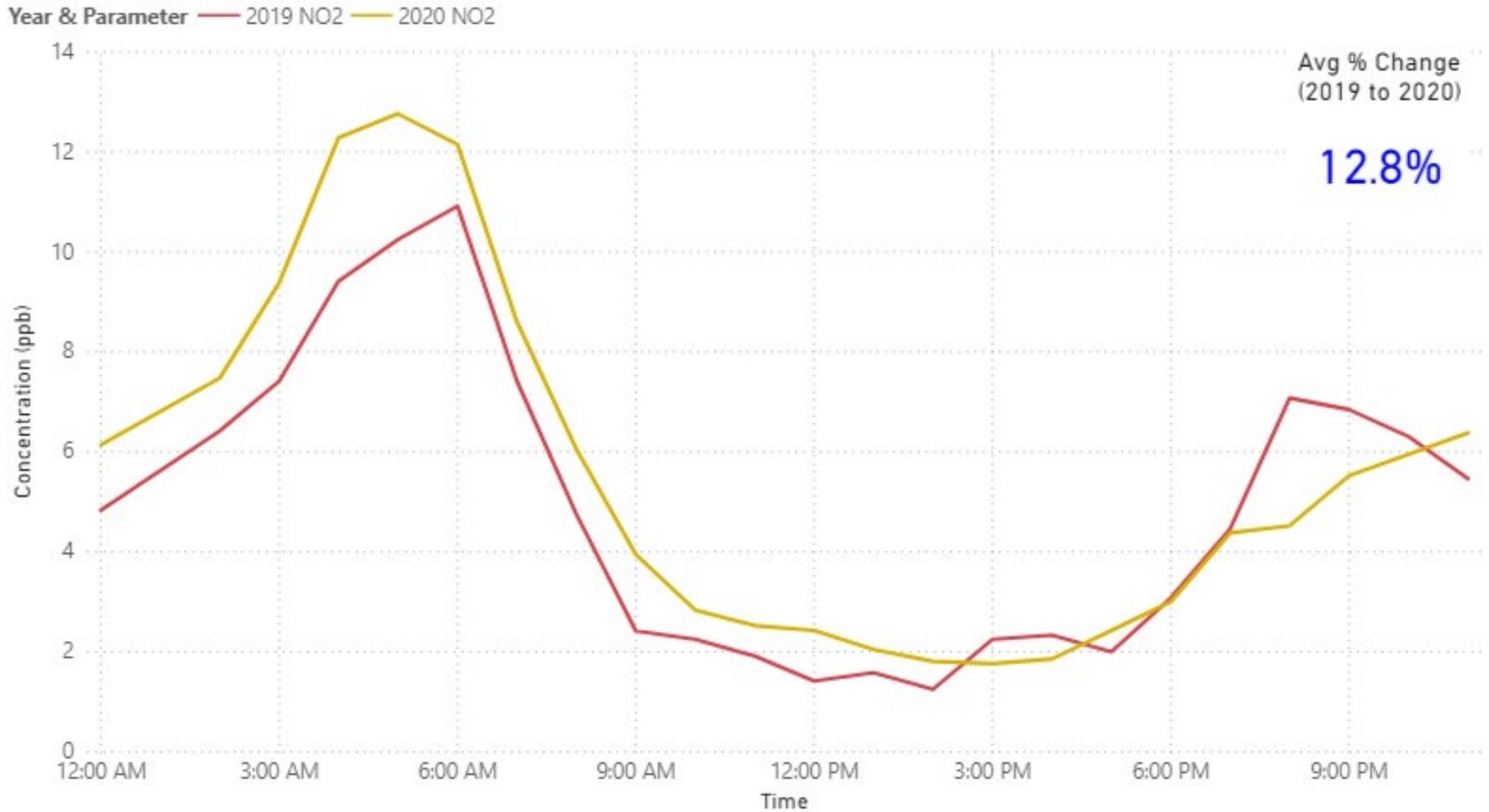
Yellow Phase – Since May 8 (31 Days)

Weekday NO₂ Concentrations – Scranton



Yellow Phase – Since June 5 (3 Days)

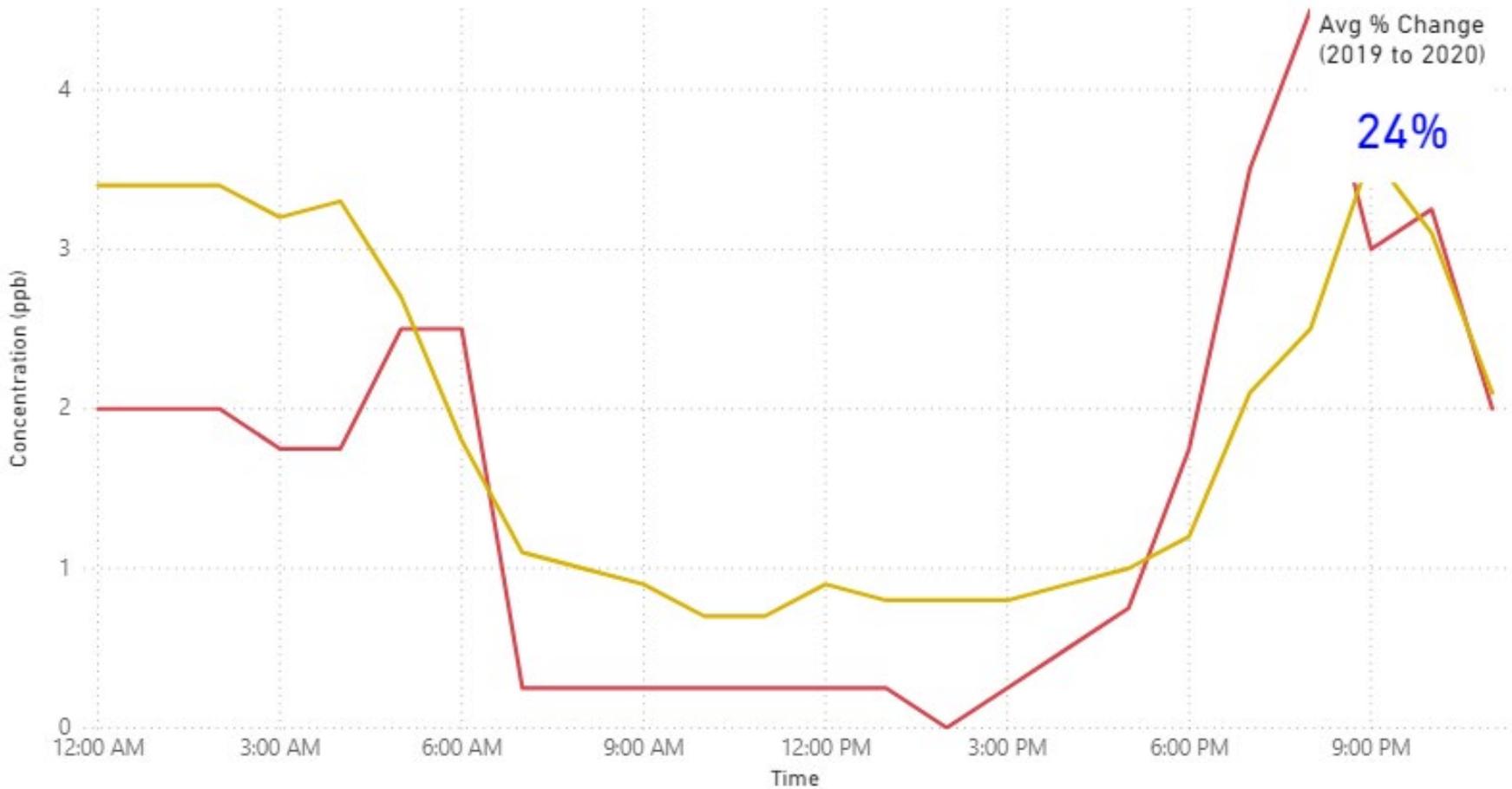
▶ Weekday NO₂ Concentrations – Montgomery



Yellow Phase – Since June 5 (3 Days)

Weekend NO₂ Concentrations – Montgomery

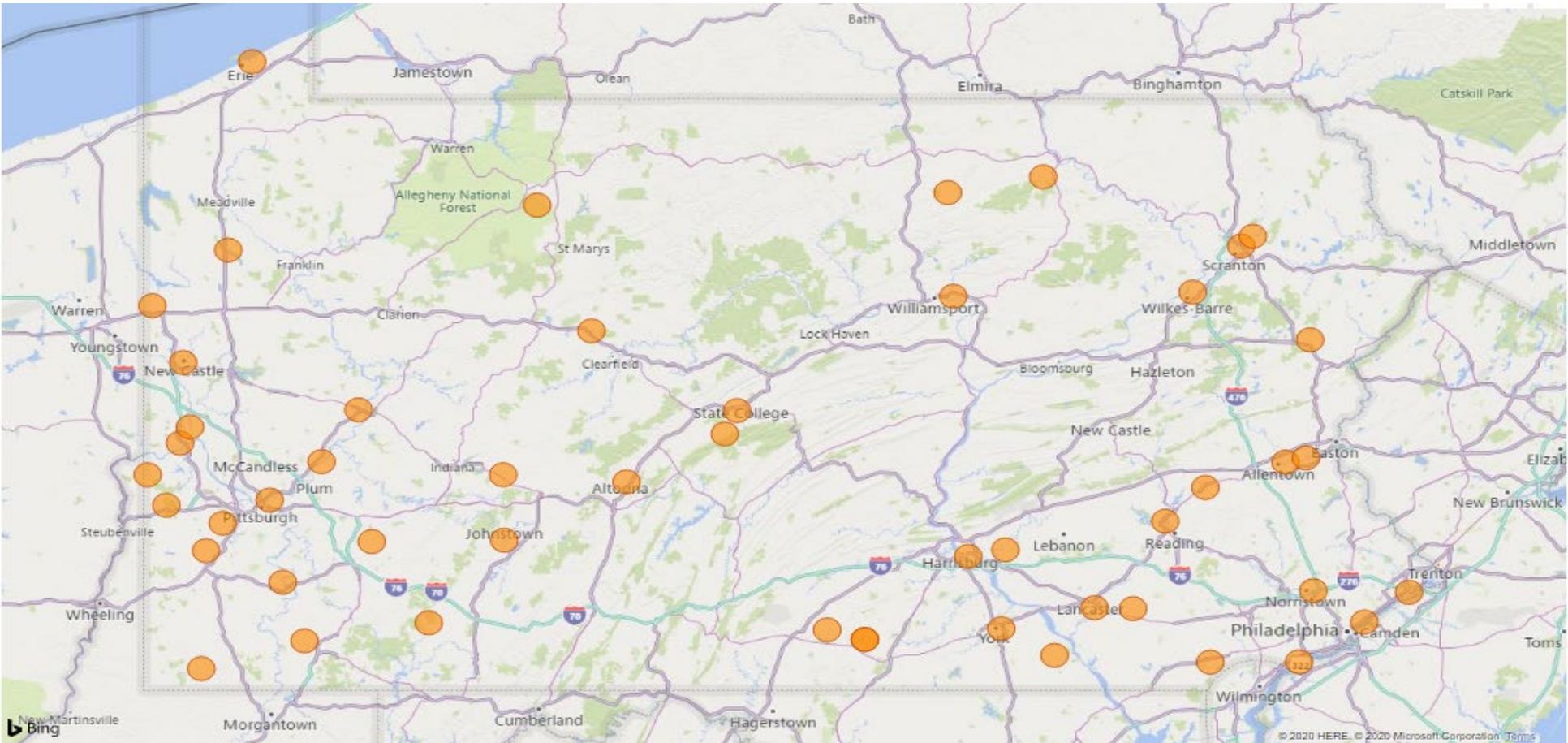
Year & Parameter — 2019 NO₂ — 2020 NO₂



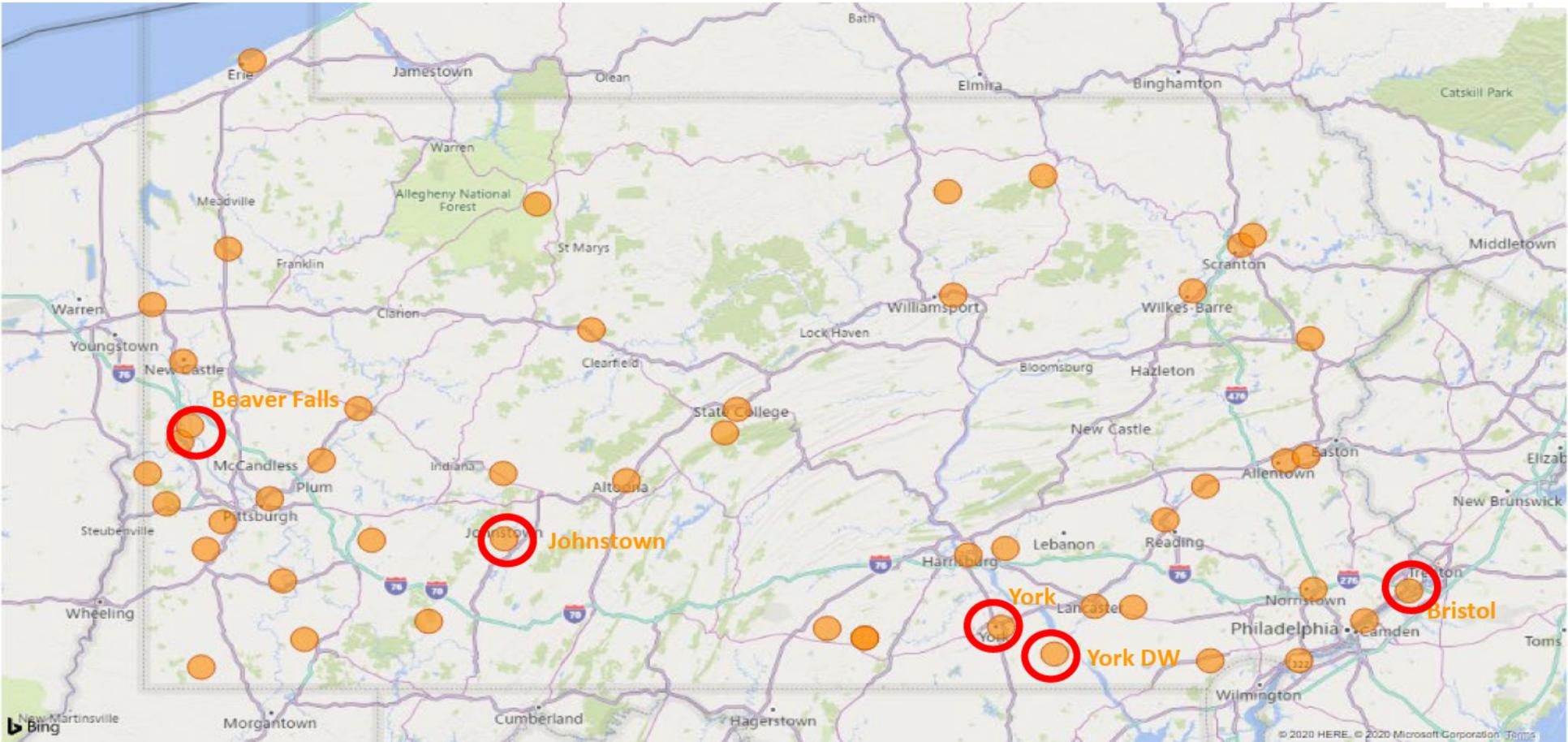
Yellow Phase – Since June 5 (3 Days)



PA Ozone Monitor Locations



PA Ozone Monitor Locations (Focus Area)



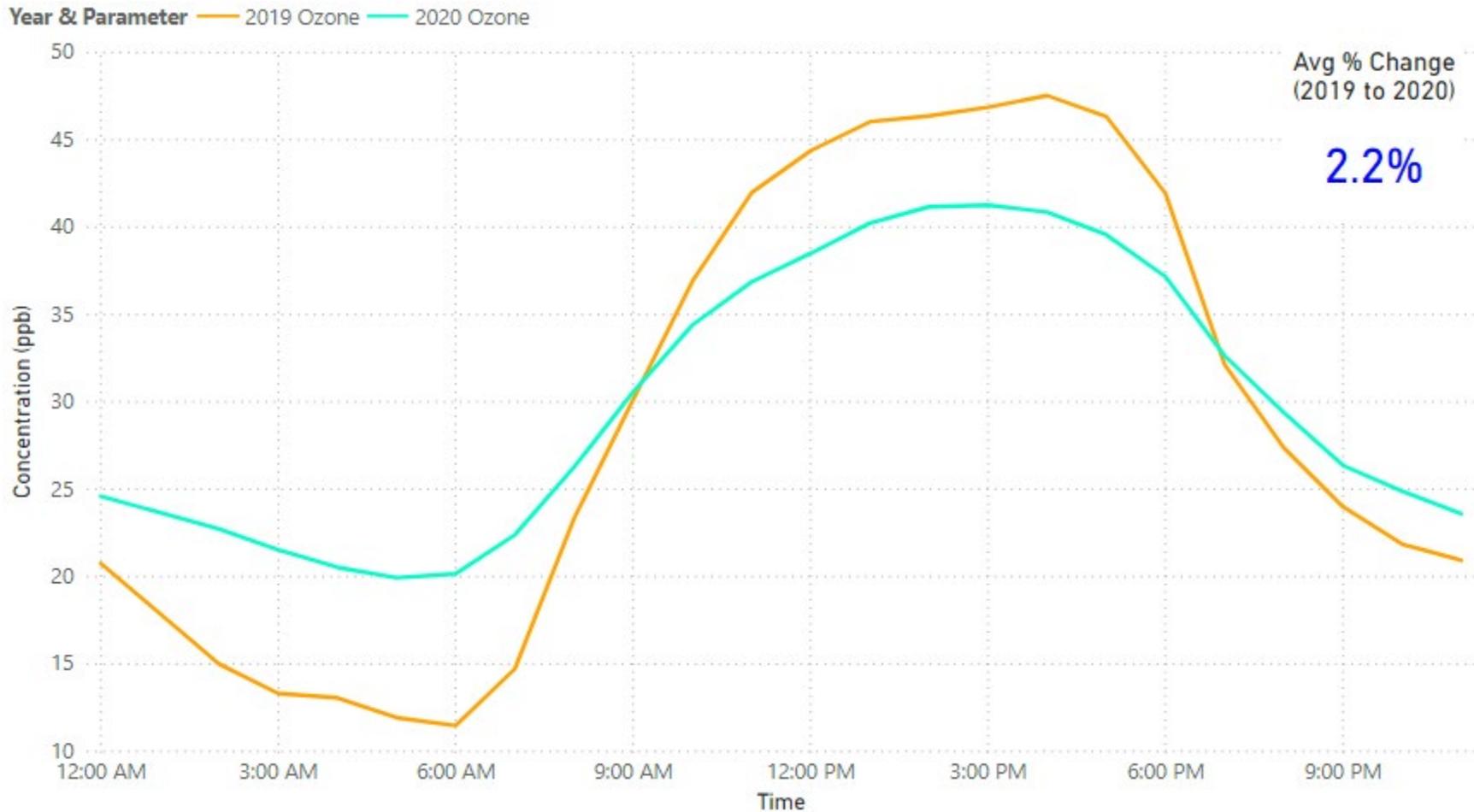
Stay At Home Period

Monday, March 16, 2020

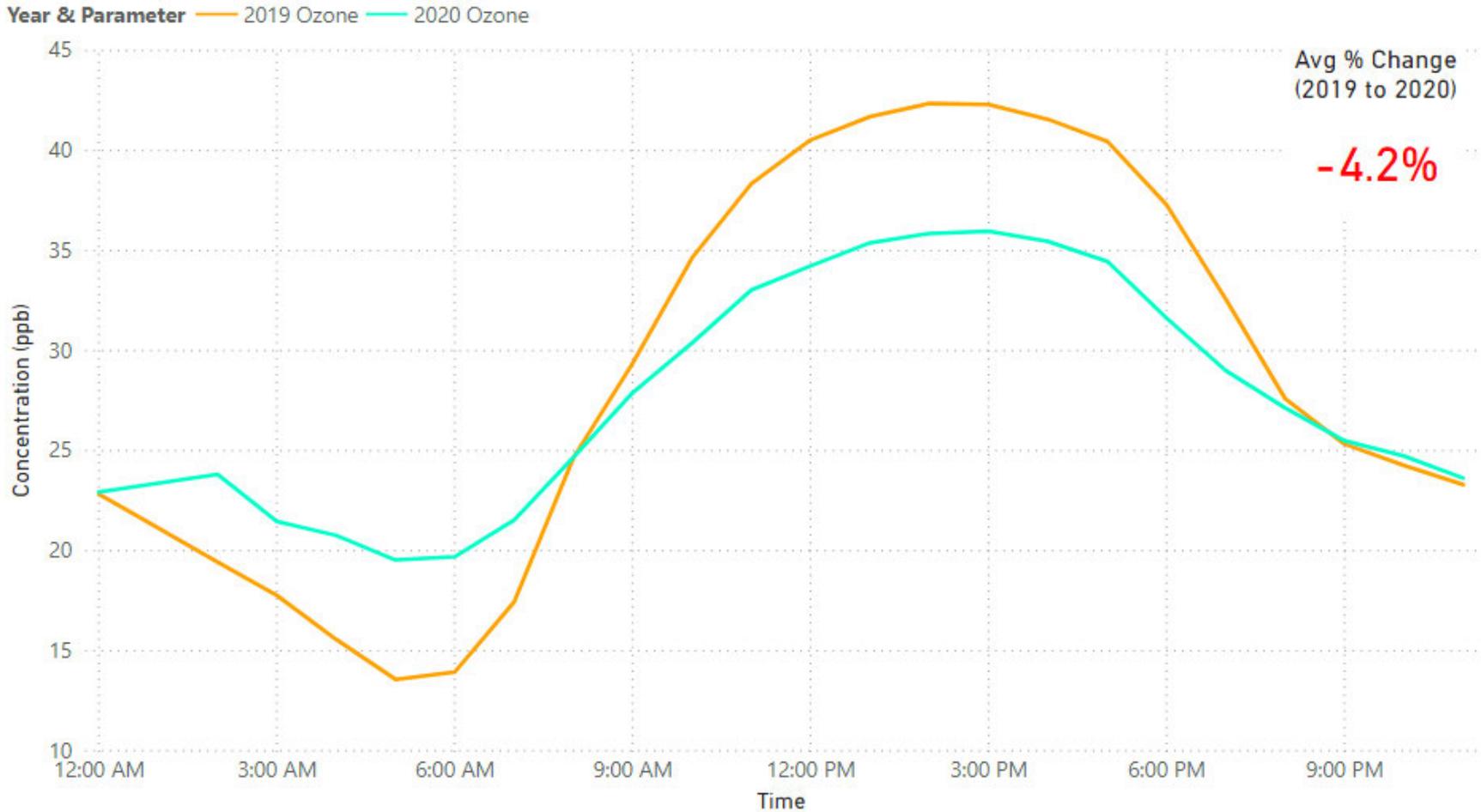
to

Sunday, April 26, 2020

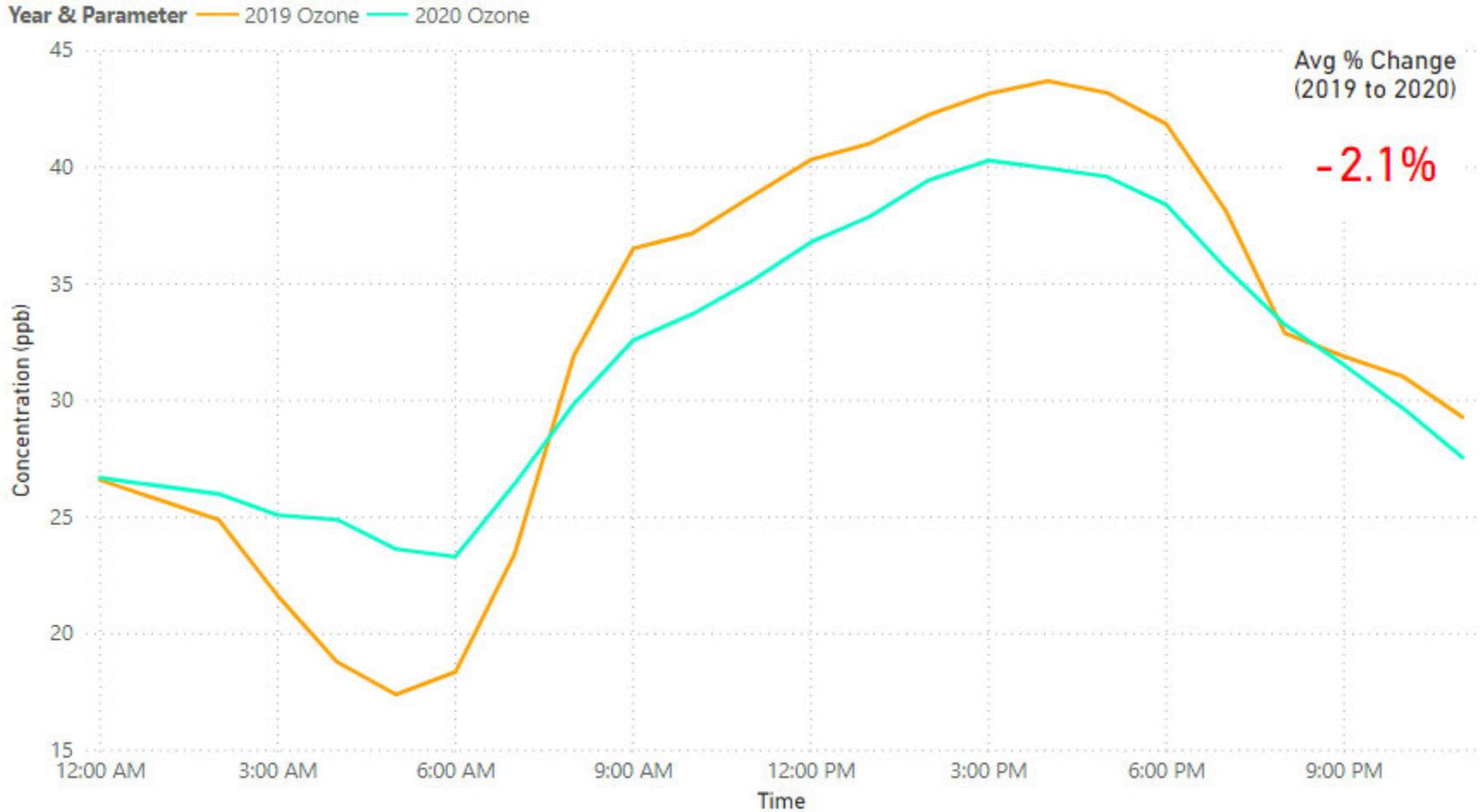
▶ Weekday Ozone Concentrations – Beaver Falls



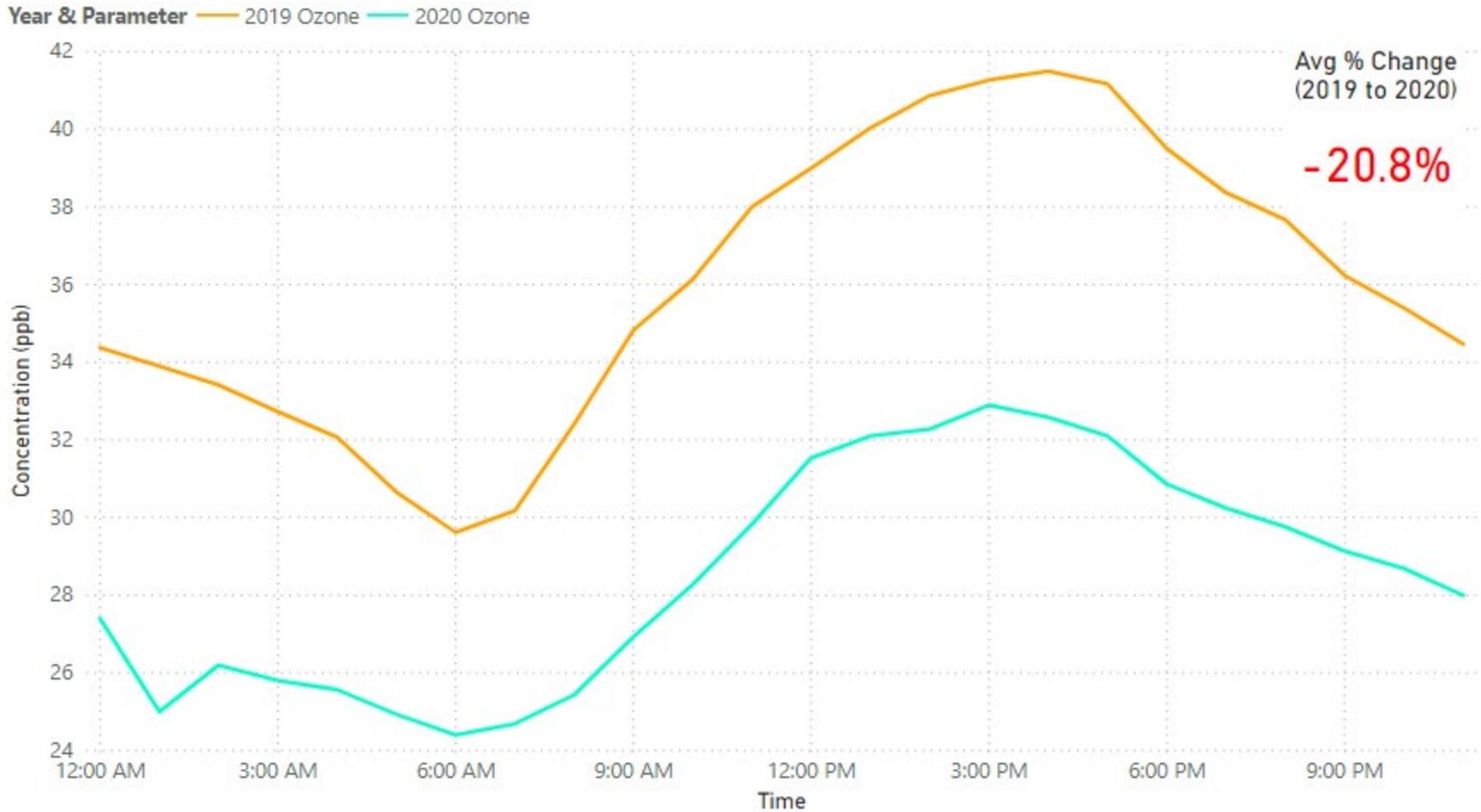
Weekday Ozone Concentrations – Johnstown



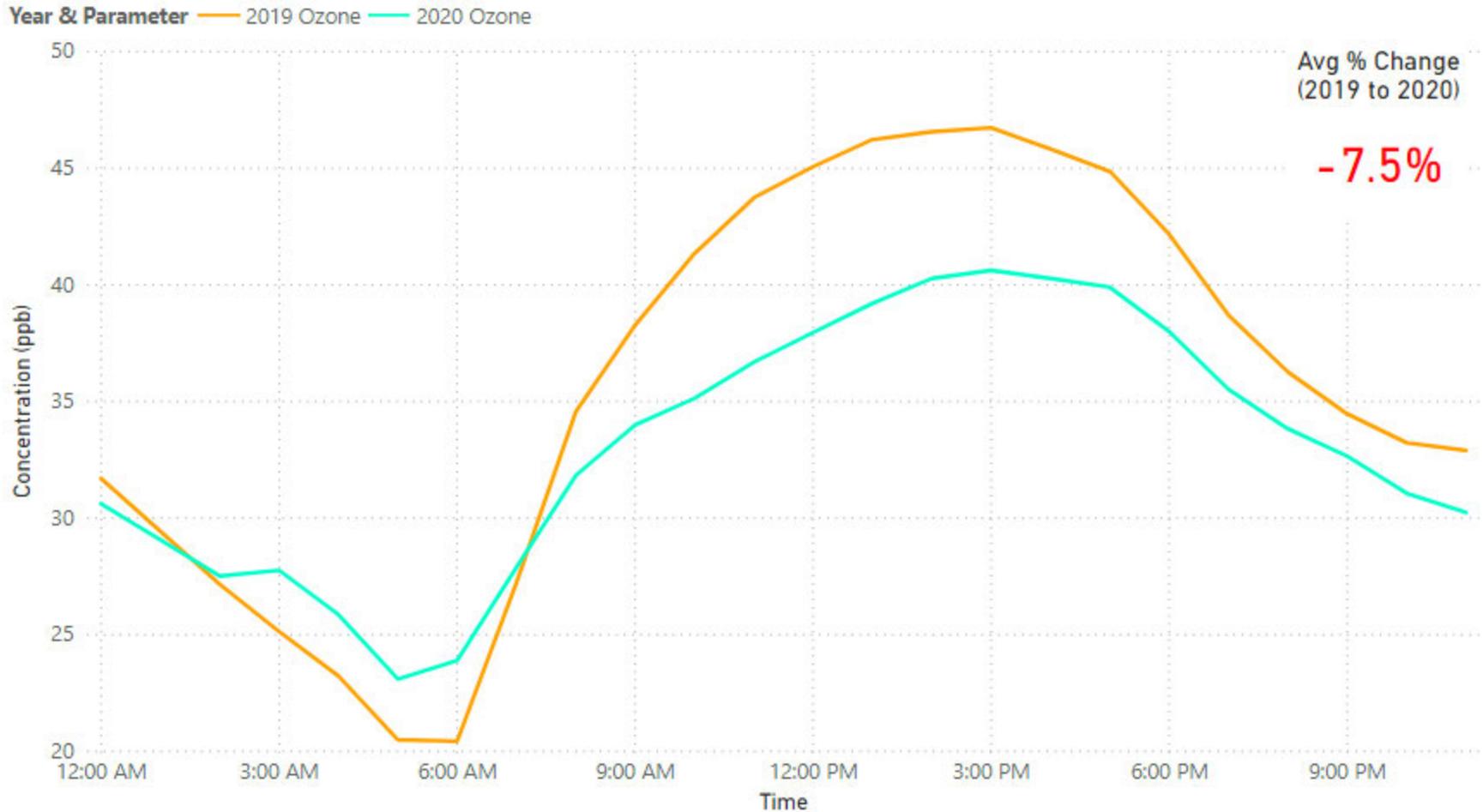
Weekday Ozone Concentrations – York



Weekday Ozone Concentrations – York DW



Weekday Ozone Concentrations – Bristol



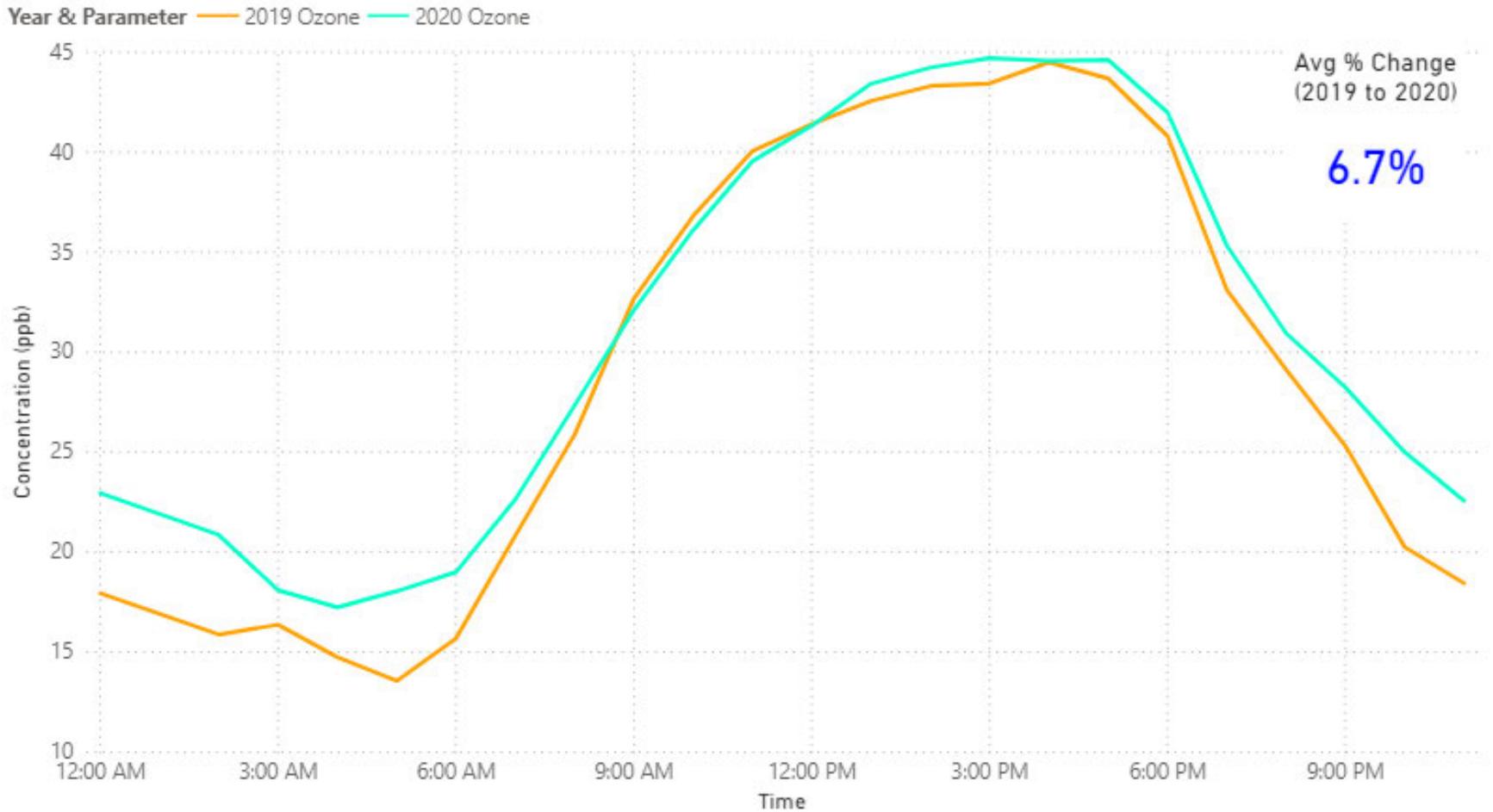
Loosening Period

Friday, May 8, 2020

to

Sunday, June 7, 2020

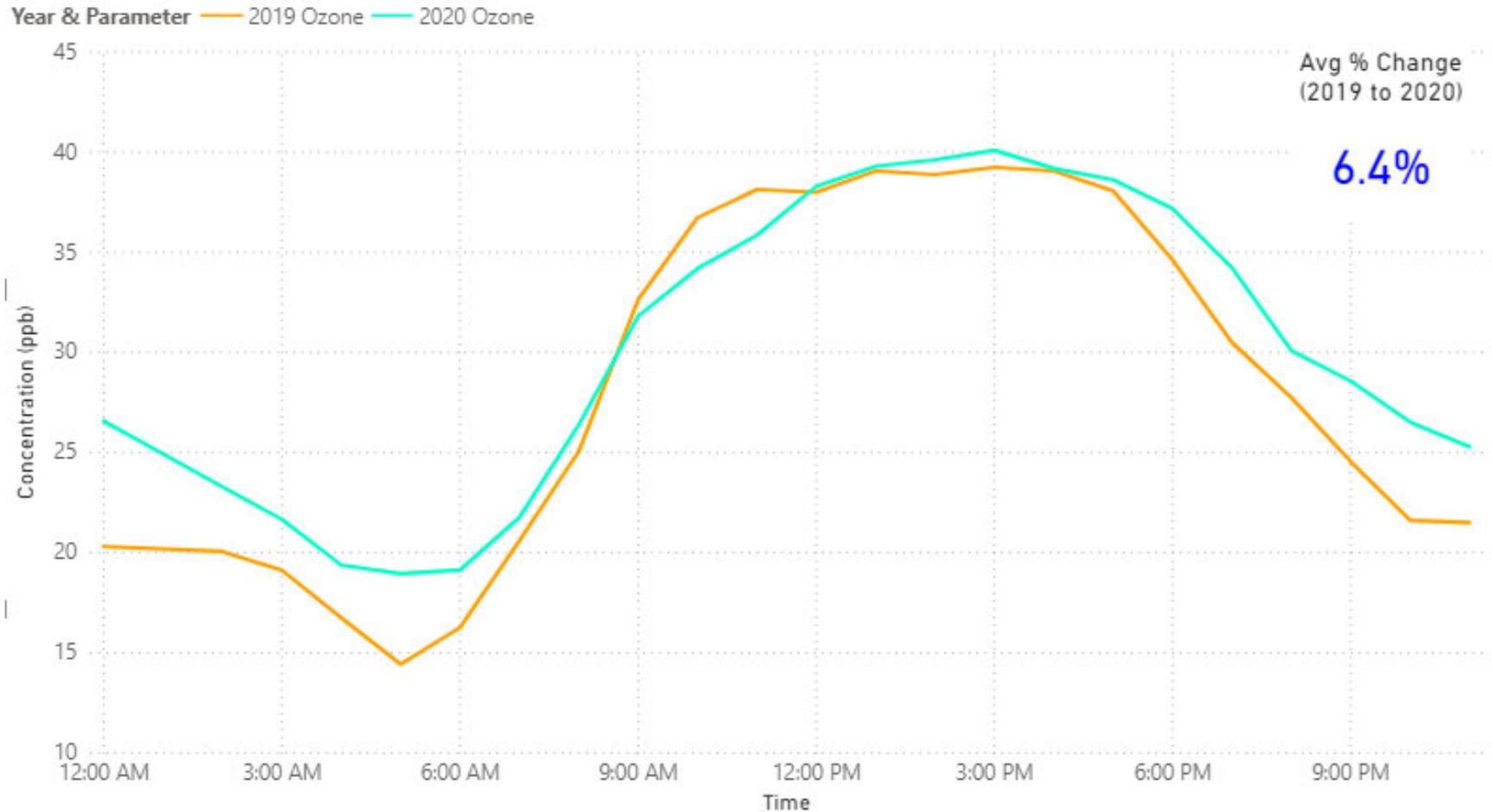
Weekday Ozone Concentrations – Beaver Falls



Yellow Phase – Since May 22 (17 Days)

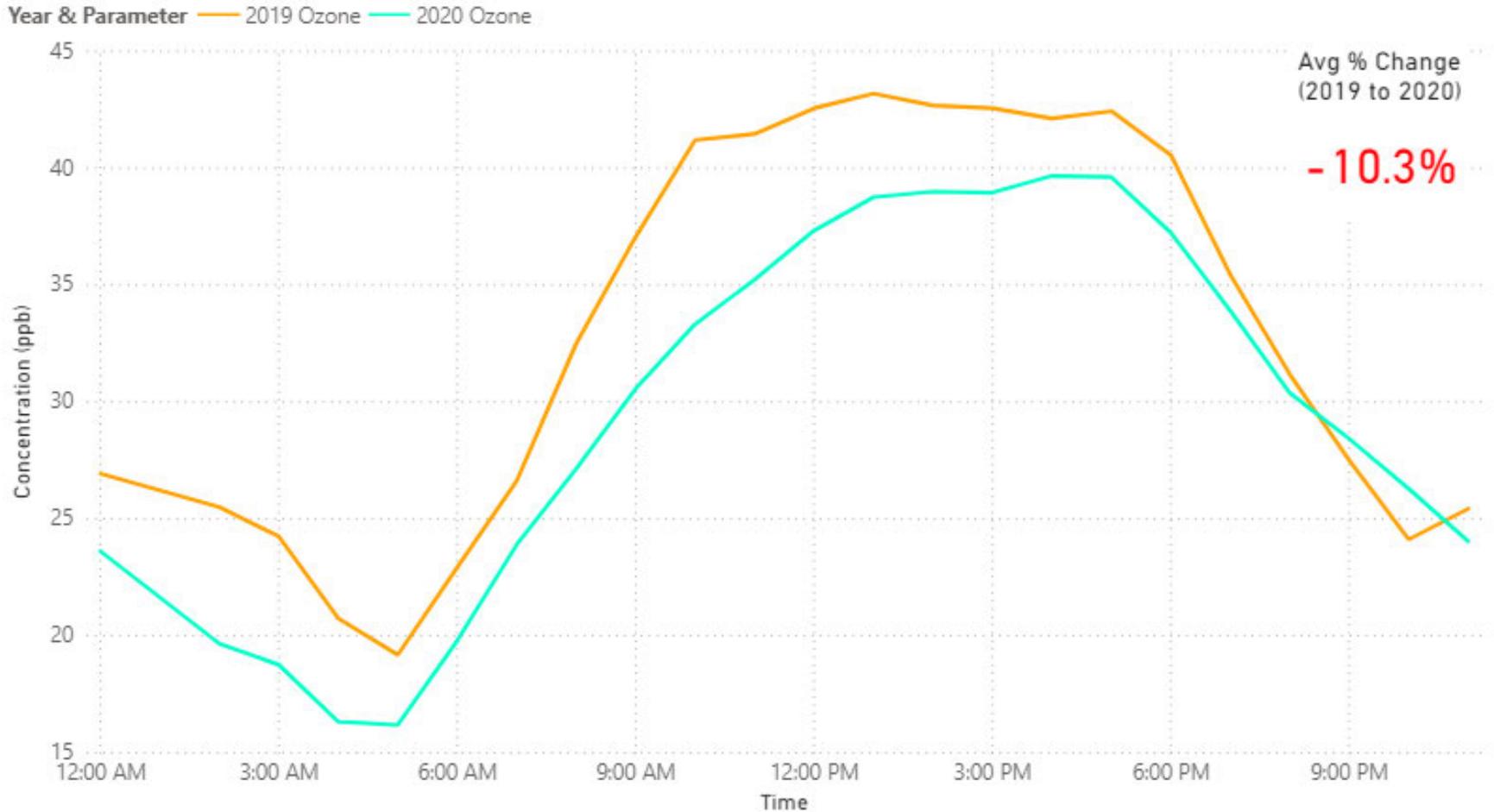


Weekday Ozone Concentrations – Johnstown



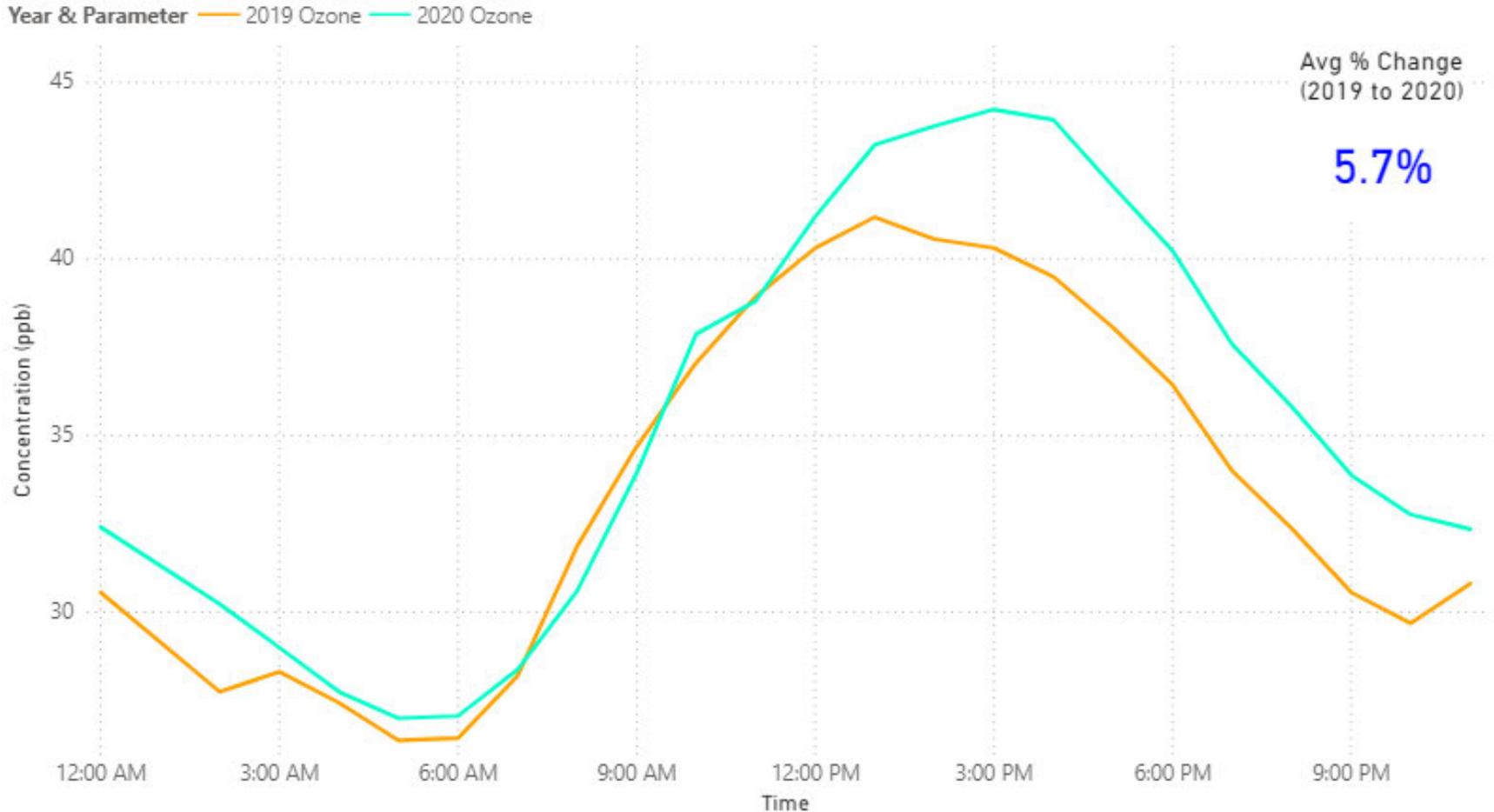
Yellow Phase – Since May 15 (24 Days)

Weekday Ozone Concentrations – York



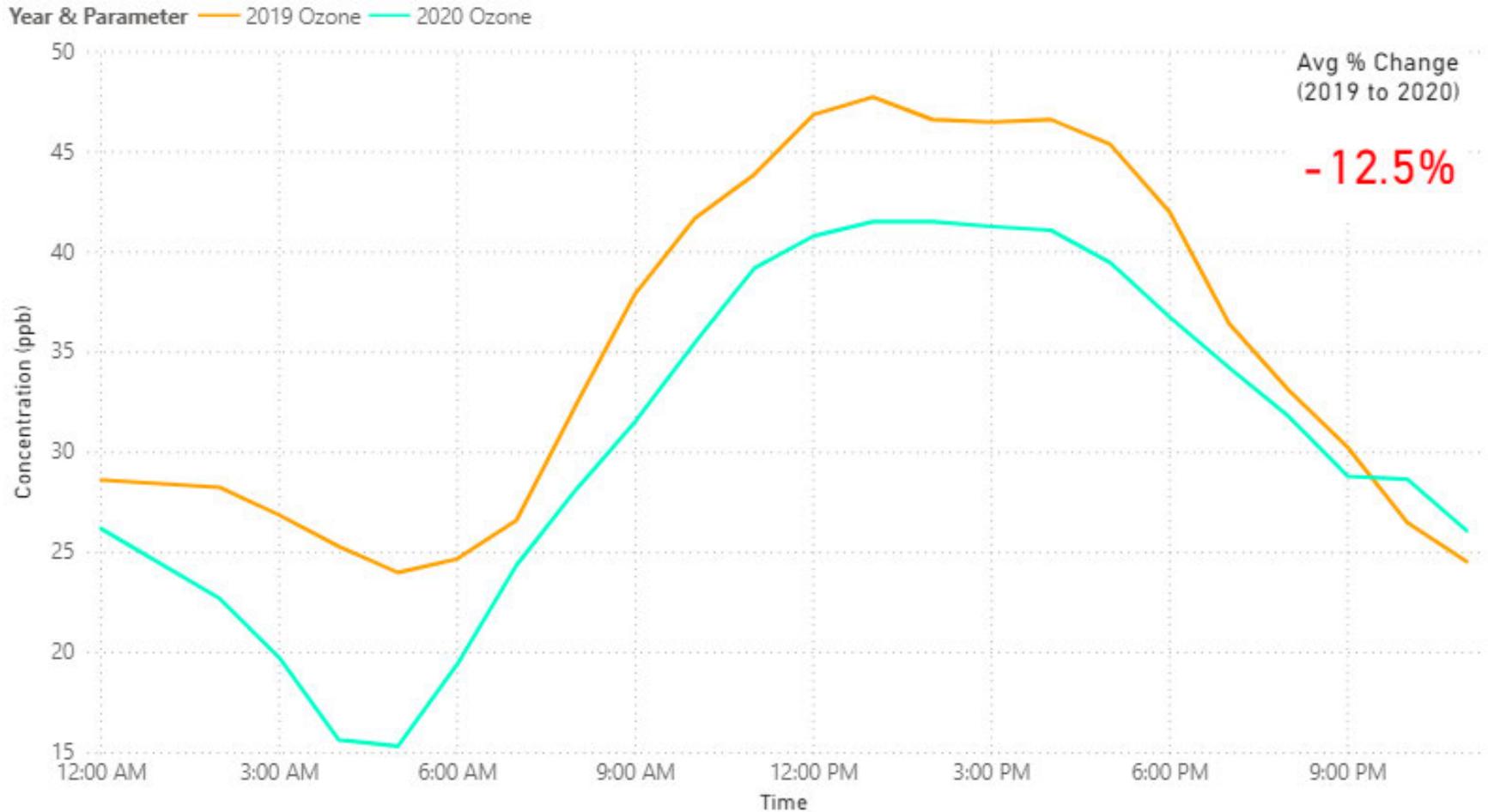
Yellow Phase – Since May 22 (17 Days)

Weekday Ozone Concentrations – York DW



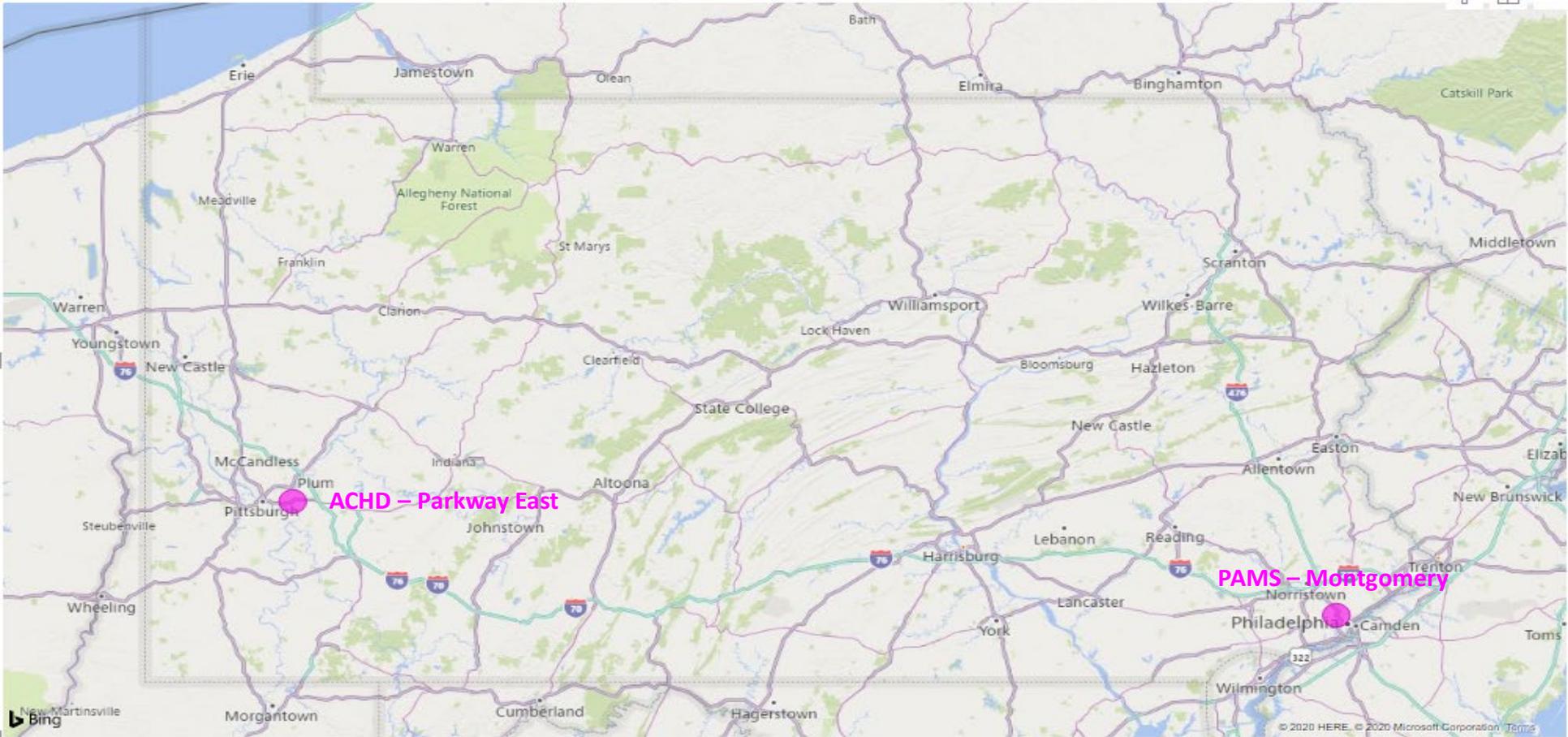
Yellow Phase – Since May 22 (17 Days)

Weekday Ozone Concentrations – Bristol



Yellow Phase – Since June 5 (3 Days)

Black Carbon Monitor Locations



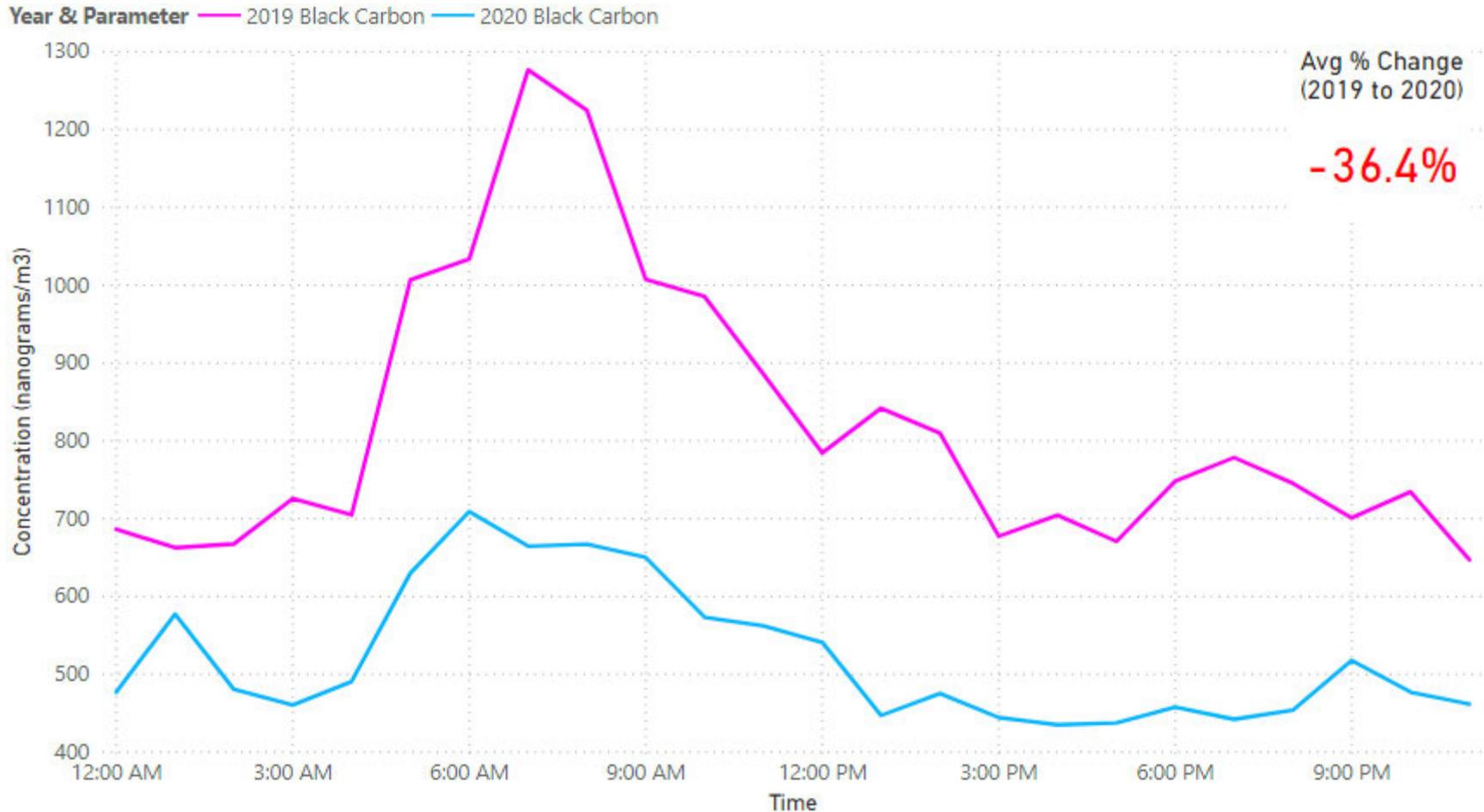
Stay At Home Period

Monday, March 16, 2020

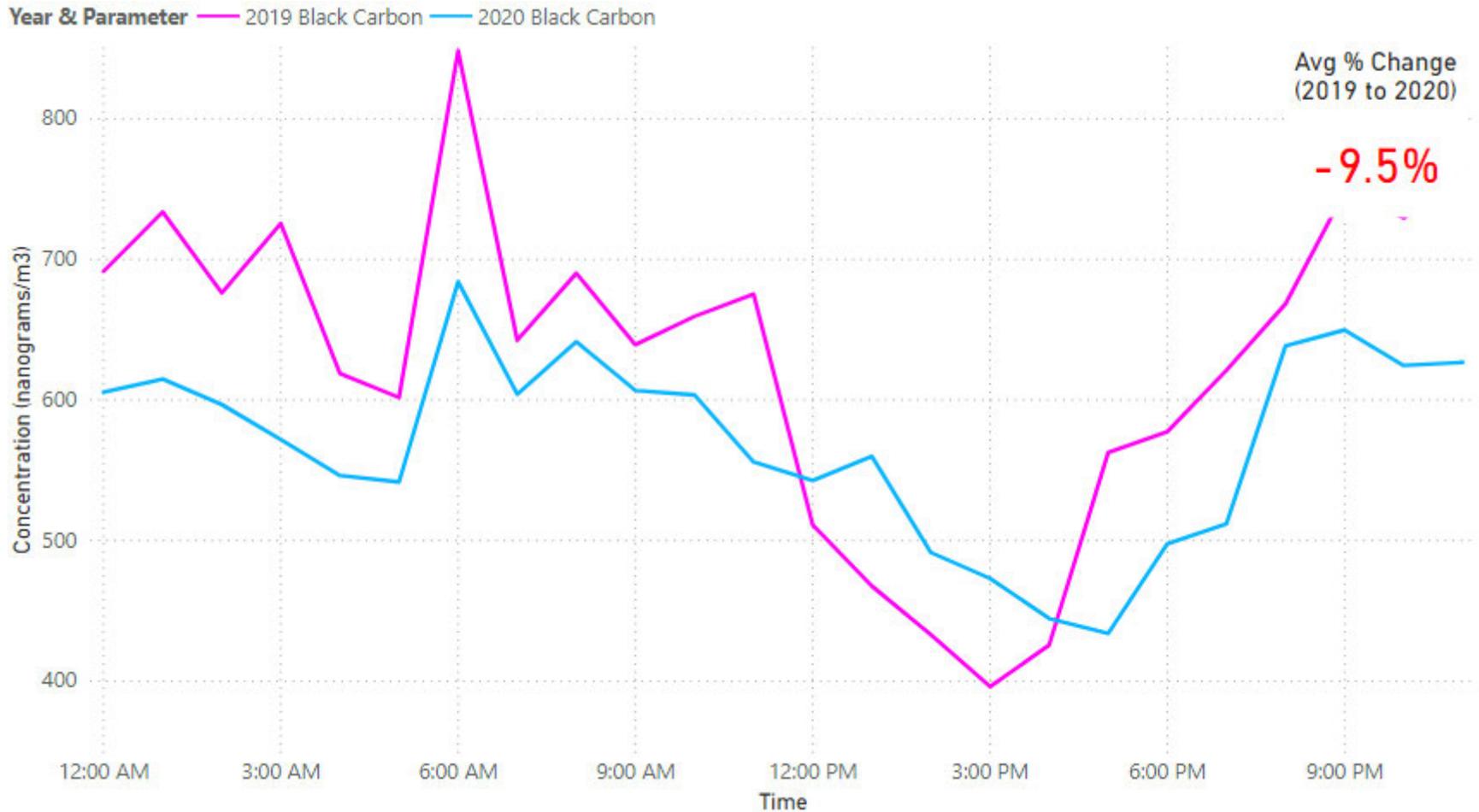
to

Sunday, April 26, 2020

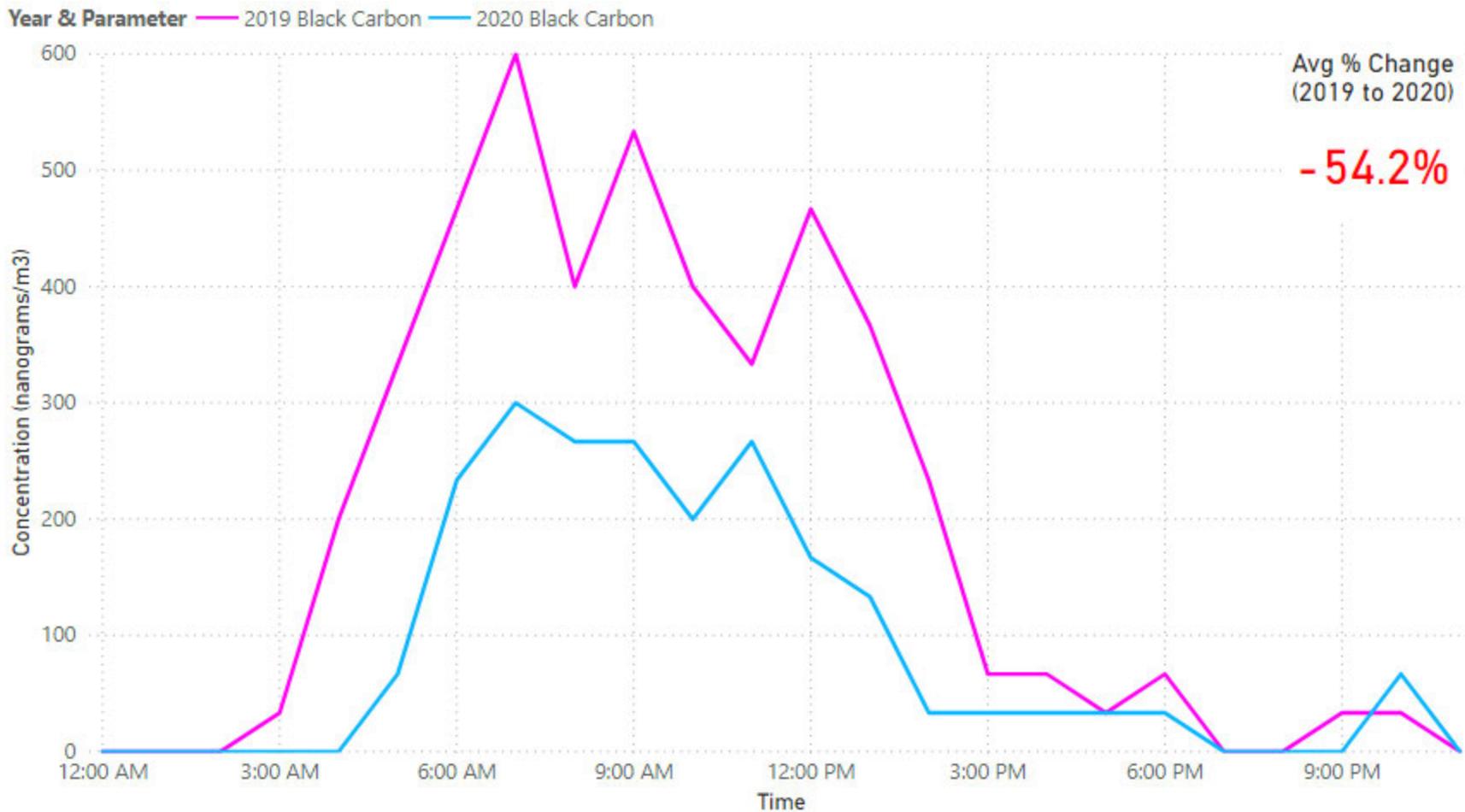
Weekday BC Concentrations – Parkway East



Weekend BC Concentrations – Parkway East



Weekday BC Concentrations – Montgomery



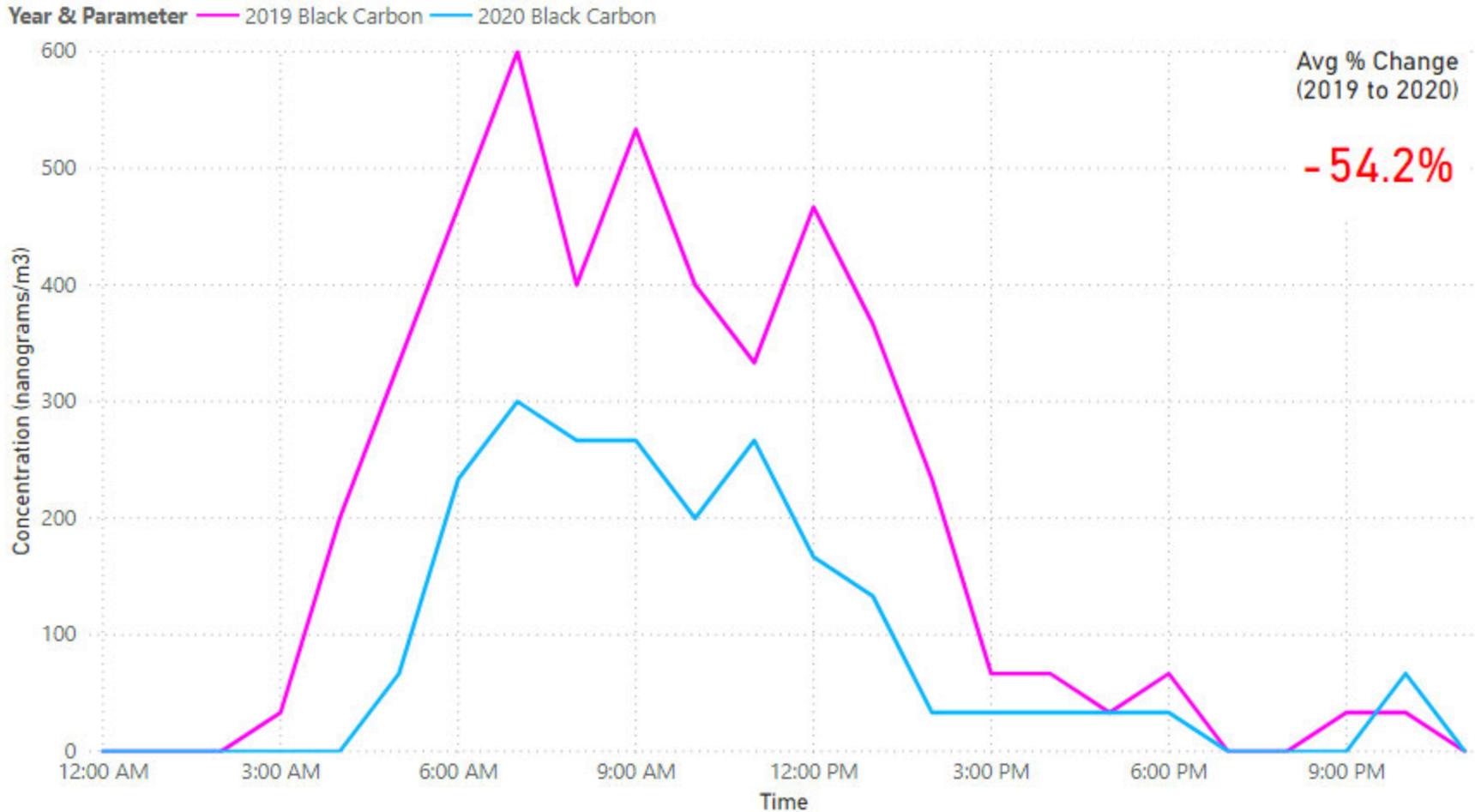
Loosening Period

Friday, May 8, 2020

to

Sunday, June 7, 2020

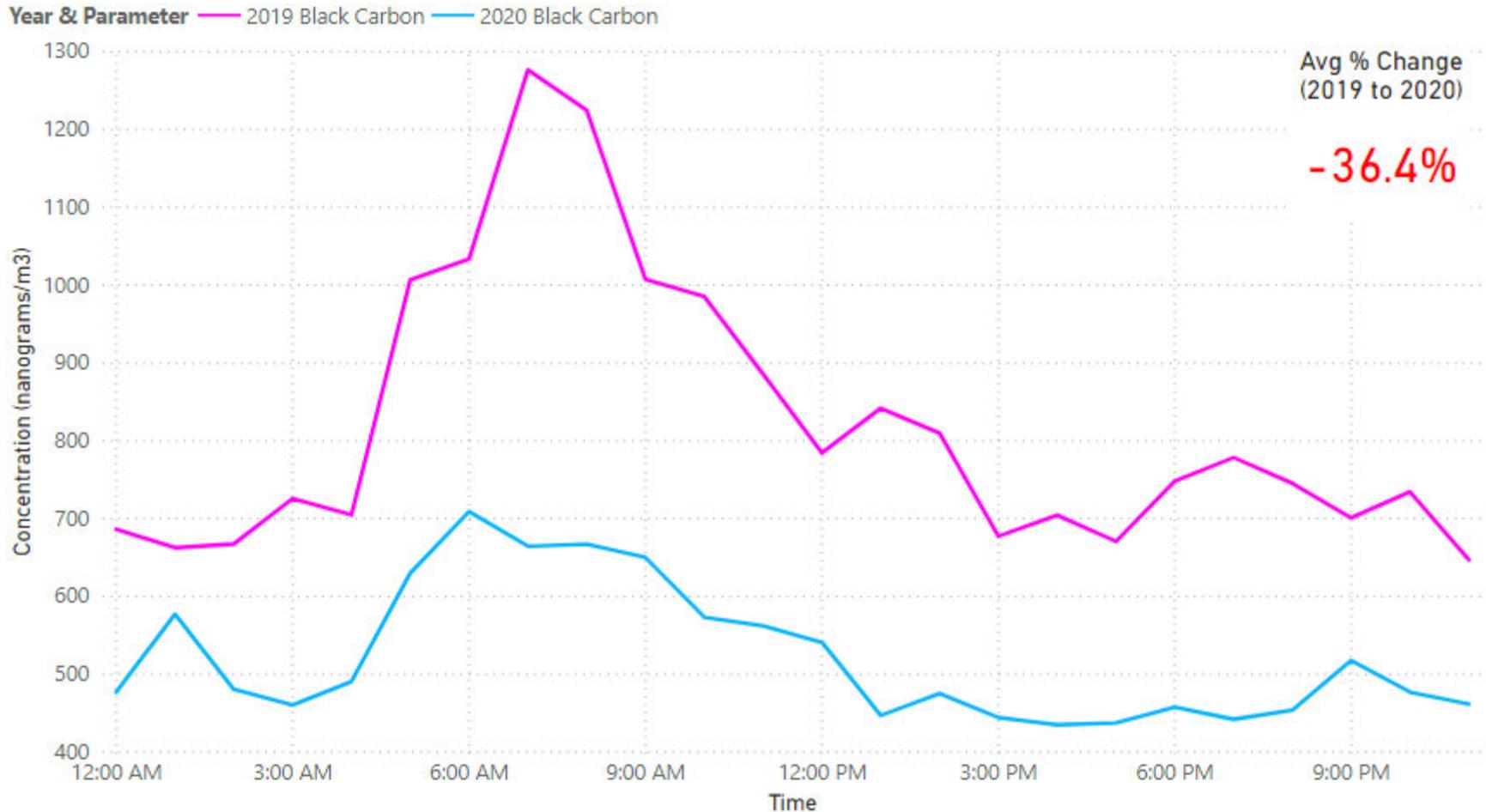
Weekday BC Concentrations – Parkway East



Yellow Phase – Since May 15 (24 Days)



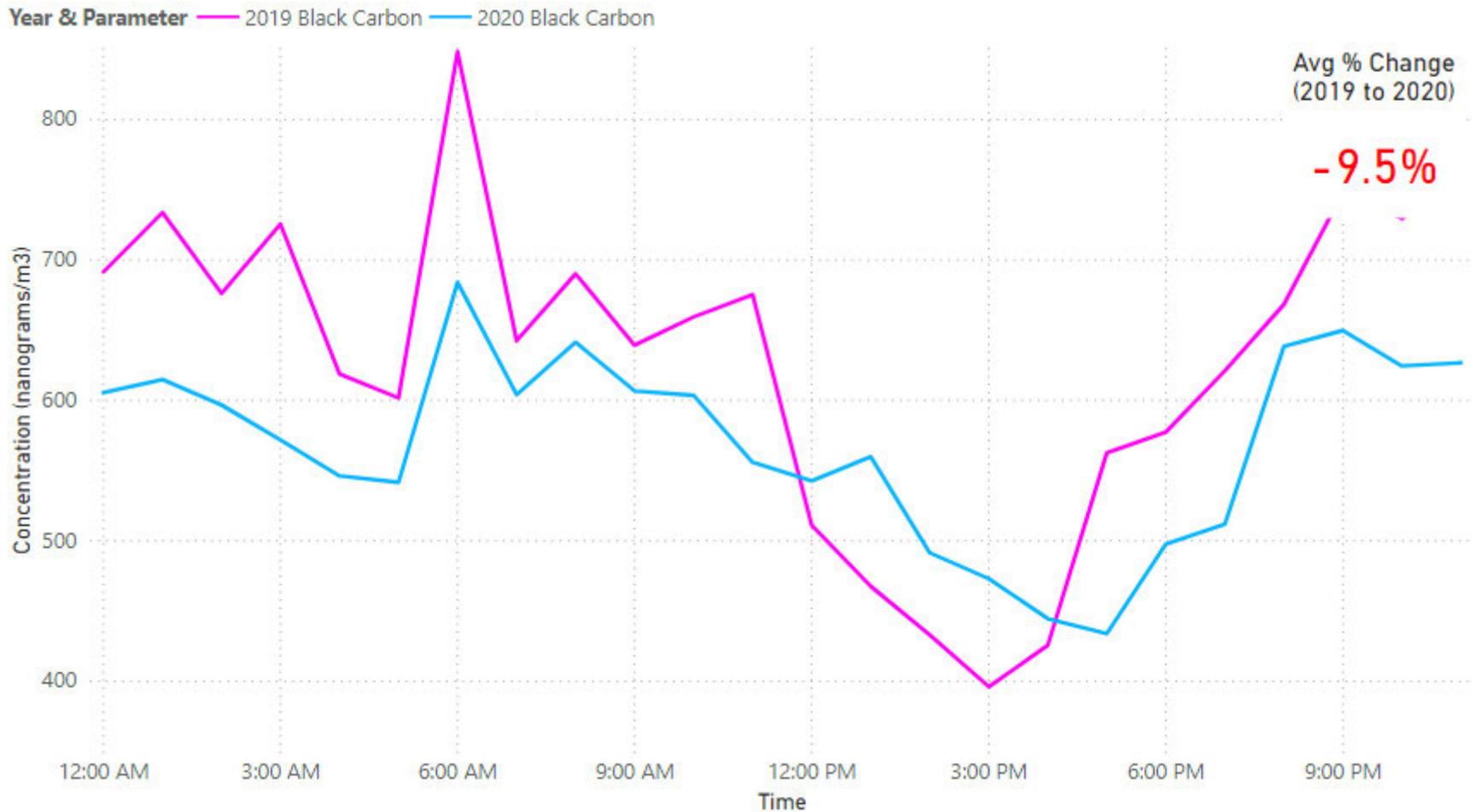
Weekend BC Concentrations – Parkway East



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 the Commonwealth. 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 30 days (May 8 – June 7), 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). Black carbon is relatively unchanged.



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Air Quality Monitoring Division
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