

# Air Quality Monitoring (Wembley)

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# Who are we?



## The Organization

- Multi-stakeholder
- Nonprofit
- Regional air quality monitoring
- Technical expertise
- Public data
- Governed by consensus

## Why we exist

- To monitor the air in our region
- Information on air quality issues
- Outreach initiatives

# Our Vision...

- People living, working and playing in the PAZA region have the best possible air quality data





Peace Airshed Zone Association

## Our Mission



Operate a  
Sustainable  
network



Collect, record,  
preserve data

- Data must be**
- **Relevant**
  - **Credible**
  - **Scientifically defensible**
  - **Transparent**
  - **Accessible**

...to allow all stakeholders to make informed decisions

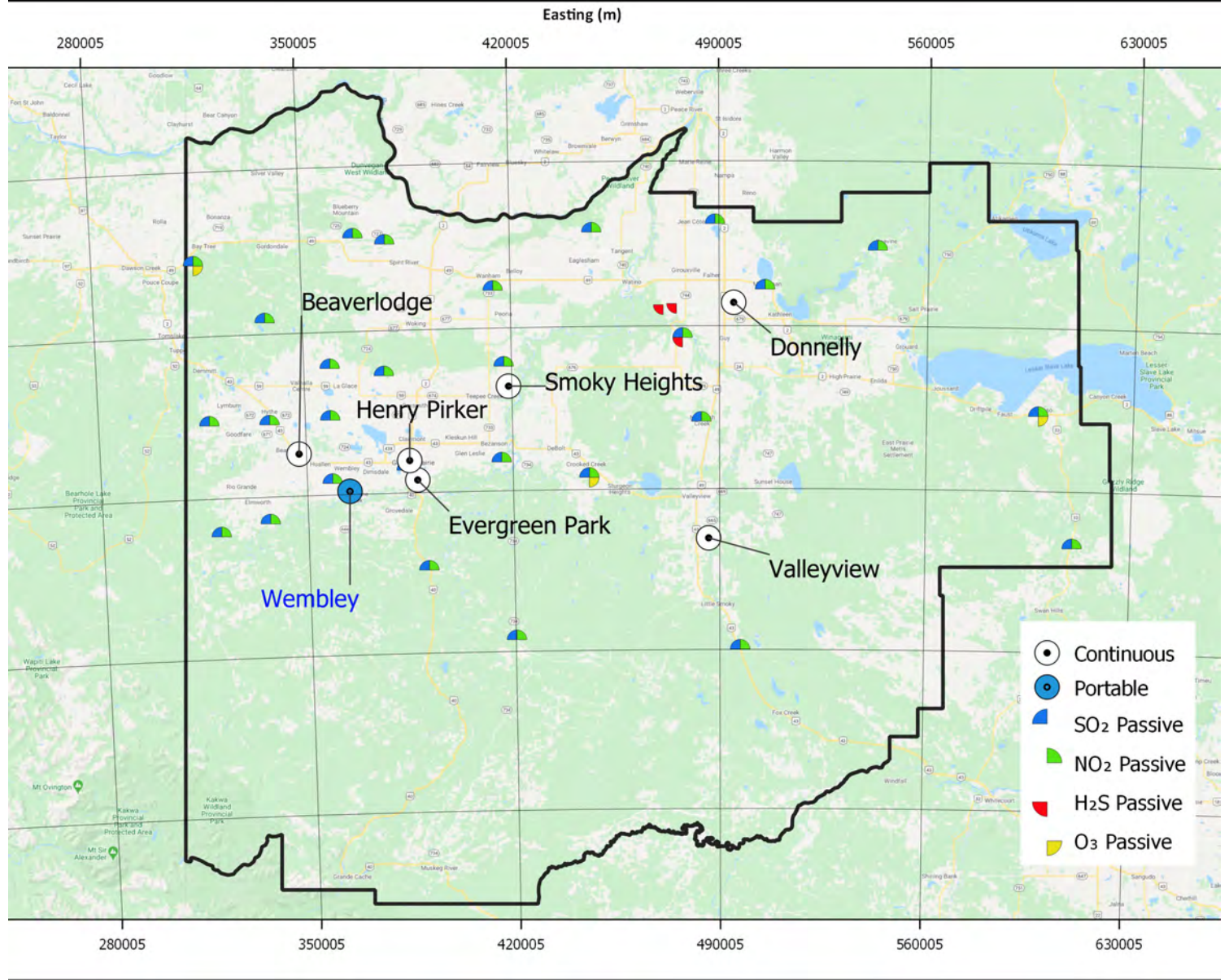
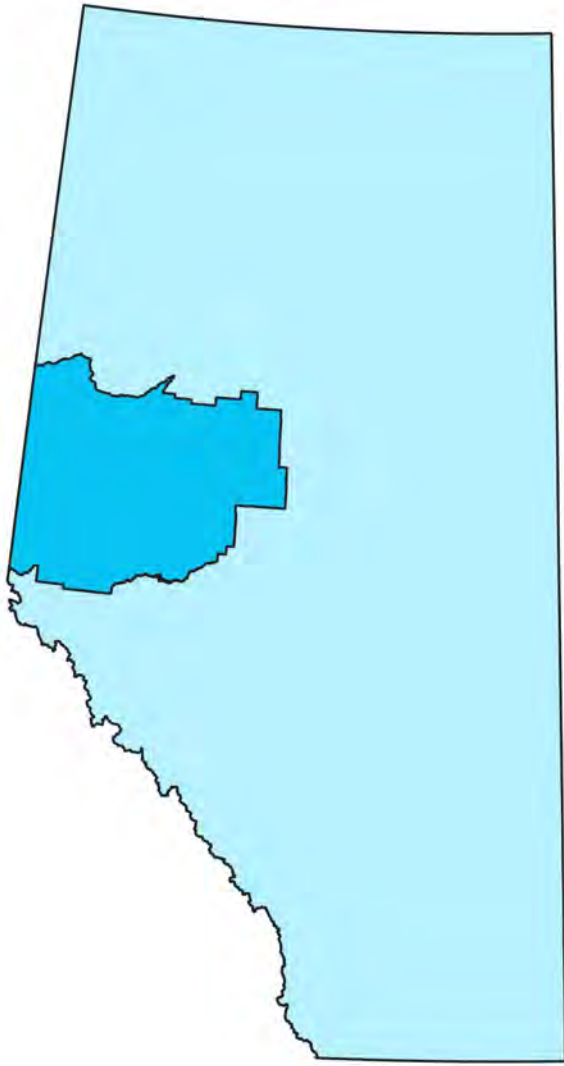
# PAZA - Air Monitoring Network 2020

## Continuous Monitoring

- Six (6) permanent ambient air monitoring stations: Beaverlodge; Henry Pirker; Donnelly; Evergreen Park; Valleyview; Smoky Heights
- One (1) portable: Wembley

## Passive Monitoring

- 32 Monitoring Sites:
  - 31 NO<sub>2</sub>
  - 31 SO<sub>2</sub>
  - 3 O<sub>3</sub>
  - 3 H<sub>2</sub>S



# Air Quality Data Availability and Access

- [www.paza.ca](http://www.paza.ca)
  - real time data (30s), updated hourly
  - hourly AQHI
  - monthly and annual report summaries on our webpage and submitted to Alberta Environment on behalf of industry members
  - Project monitoring reports
- [www.airdata.alberta.ca](http://www.airdata.alberta.ca)
  - current and historical hourly data for our stations and those across the Province

Longer term air quality management:

- CAAQS (Canadian Ambient Air Quality Standards) long term (3+ years) impacts indicator <https://www.alberta.ca/canadian-ambient-air-quality-standards.aspx>

Shorter term air quality management:

- AAAQOs (Alberta Ambient Air Quality Objectives) shorter term (i.e., hourly, 24hr, annual) indicator <https://www.alberta.ca/ambient-air-quality-objectives.aspx>
- AQHI (Air Quality Health Index) a tool that relates the air quality outside to your health <https://www.alberta.ca/about-the-air-quality-health-index.aspx>



# Wembley Air Quality Monitoring Station

## Why

- In February 2018, PAZA received a petition signed by several residents of the Wembley area requesting baseline monitoring in the vicinity of two sour gas facilities.

## Source Considerations

- Air quality dispersion modelling assessment: SEMCAMS ULC Proposed Pipestone Central Facility
- Residential receptor locations were taken into consideration with respect to the emission sources.



Township Rd 704

Township Rd 704

Township Rd 704

Range Rd 82

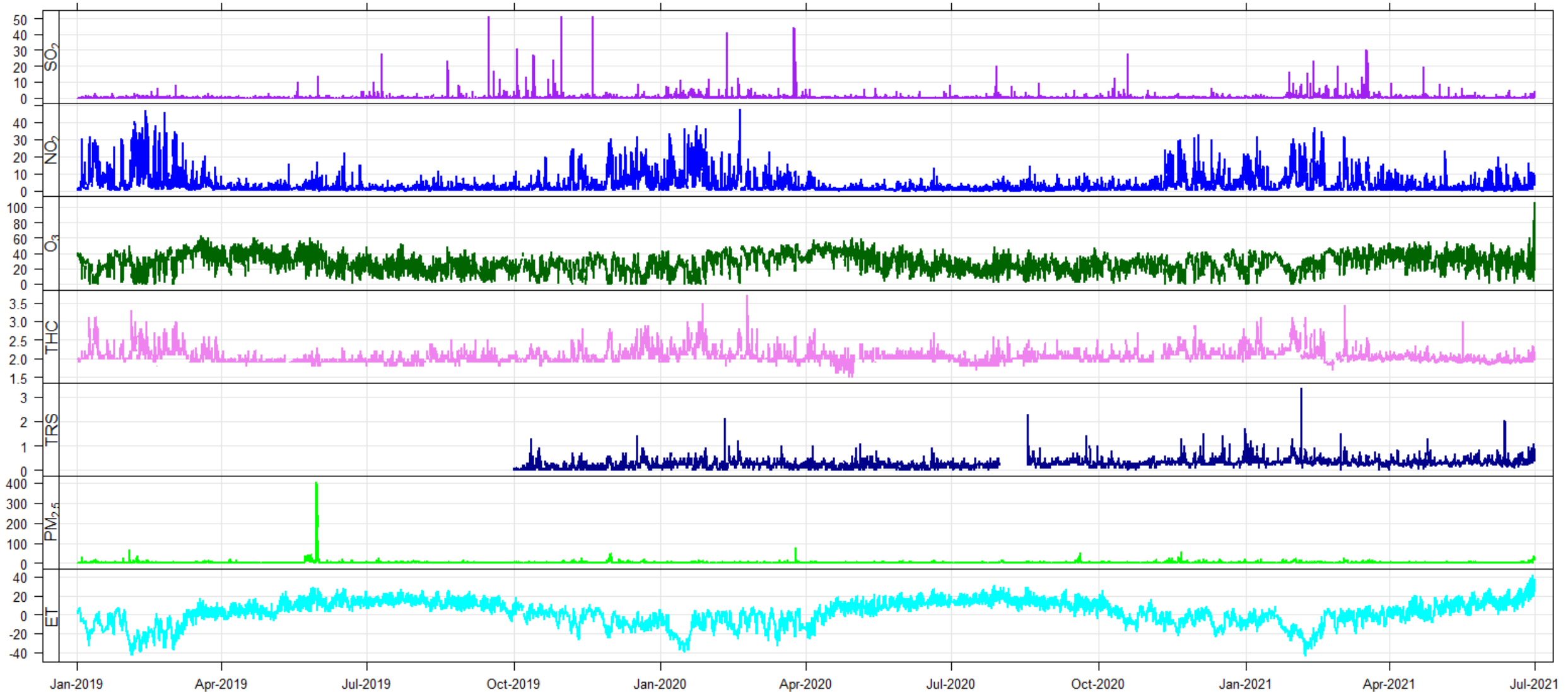
Range Rd 82

Pipestone Golf Club

Pipestone Golf Club

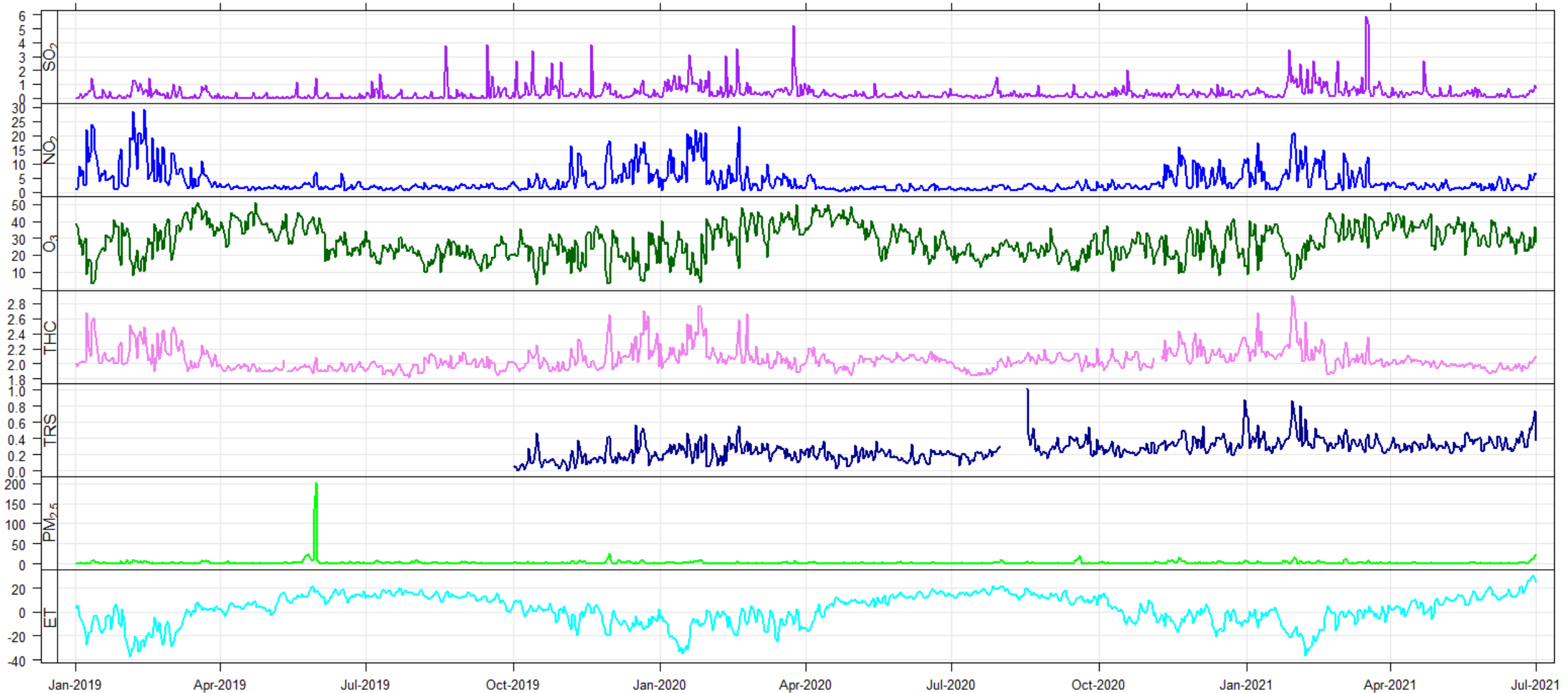
# Wembley – Hourly Averages

PAZA Wembley 2019 to 2021 (Jan to Jun)



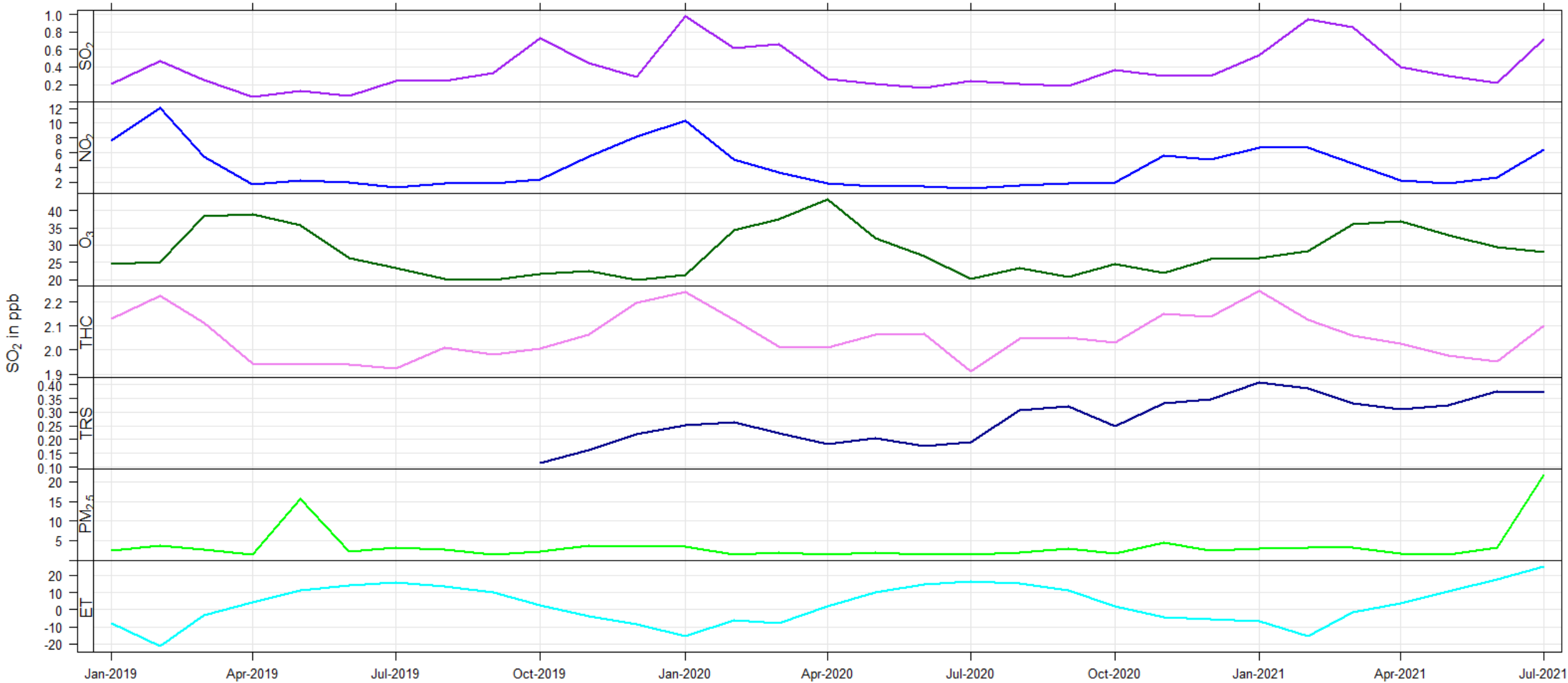
# Wembley – Daily Averages

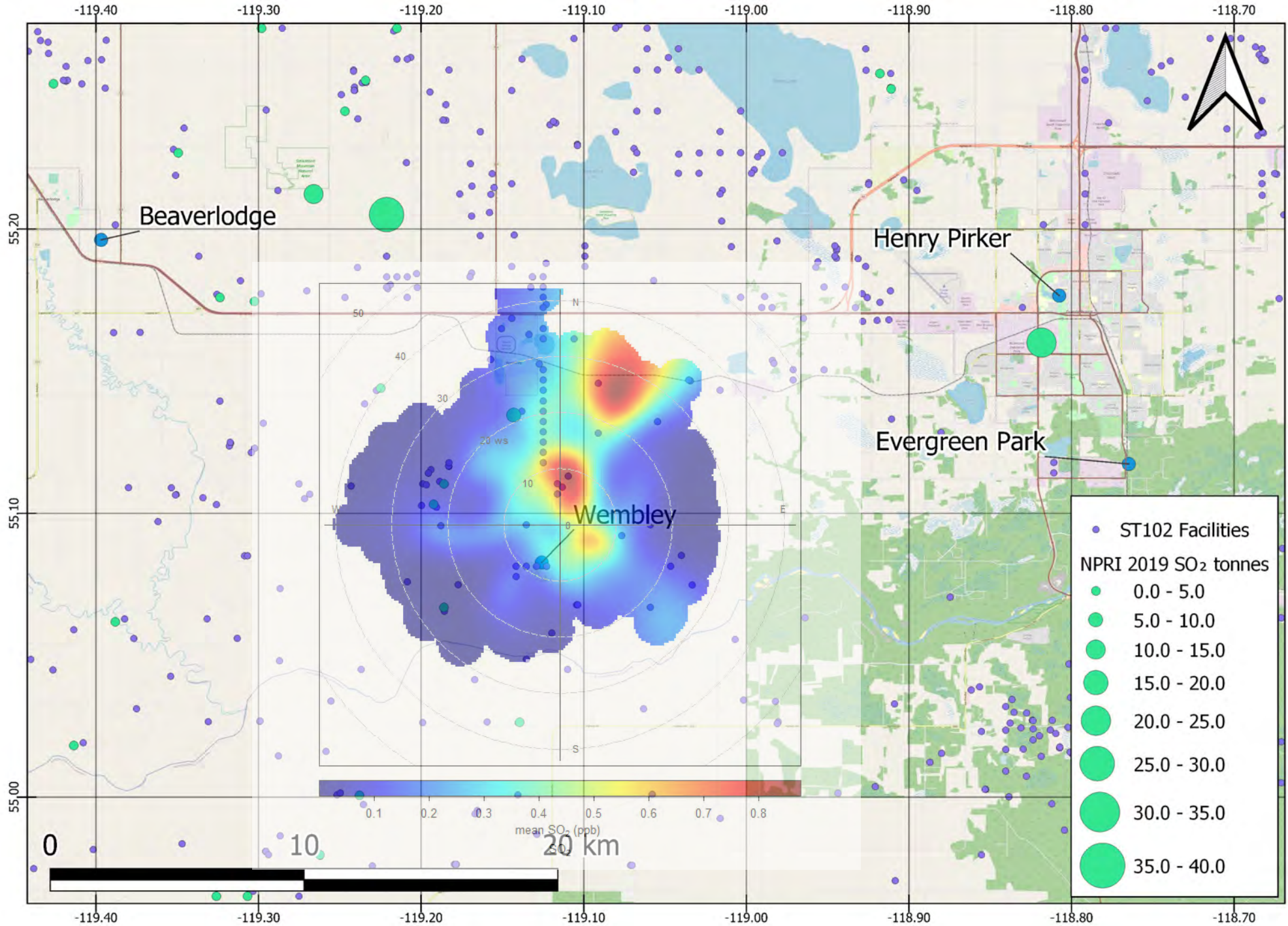
PAZA Wembley 2019 to 2021 (Jan to Jun)

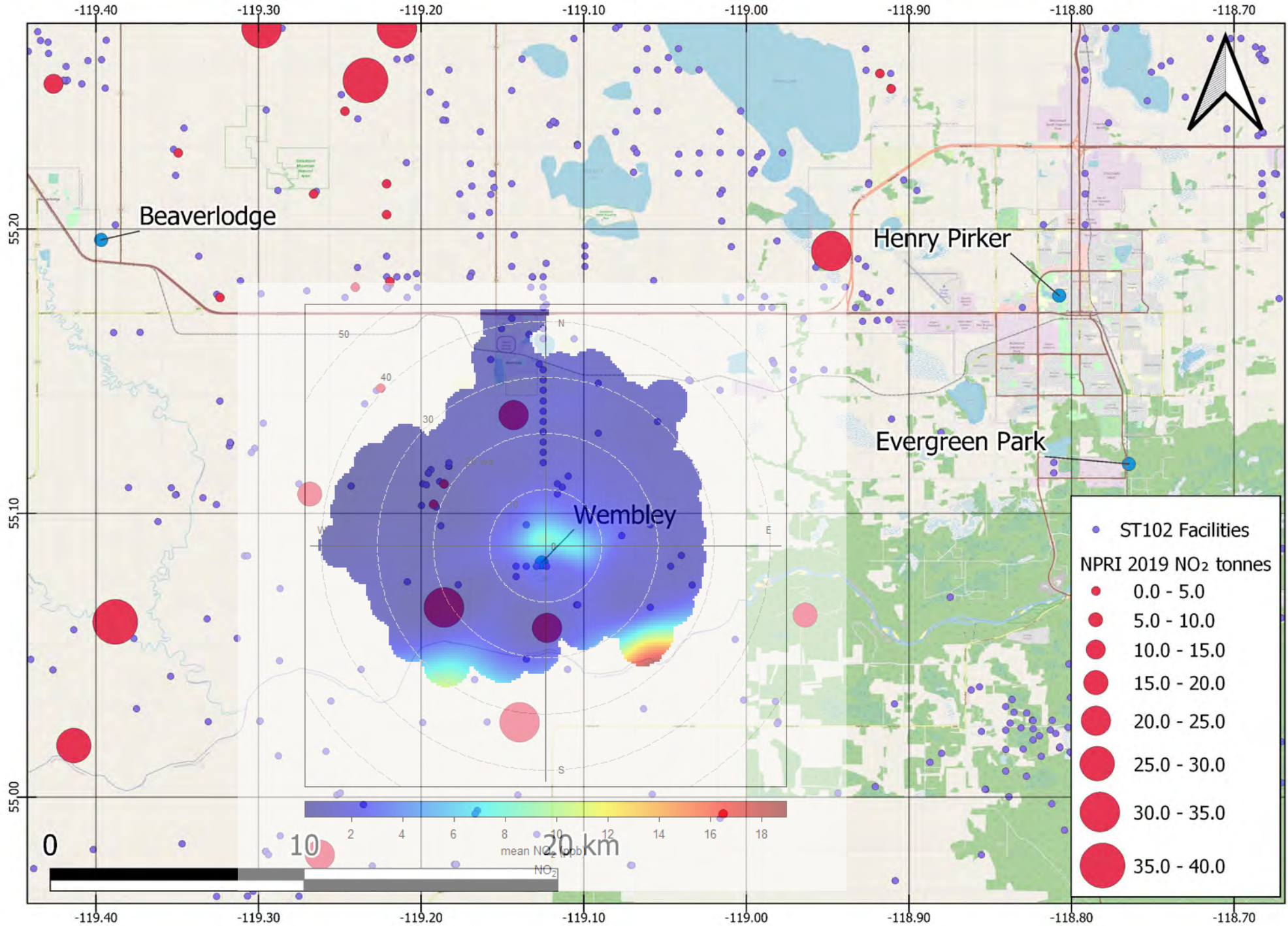


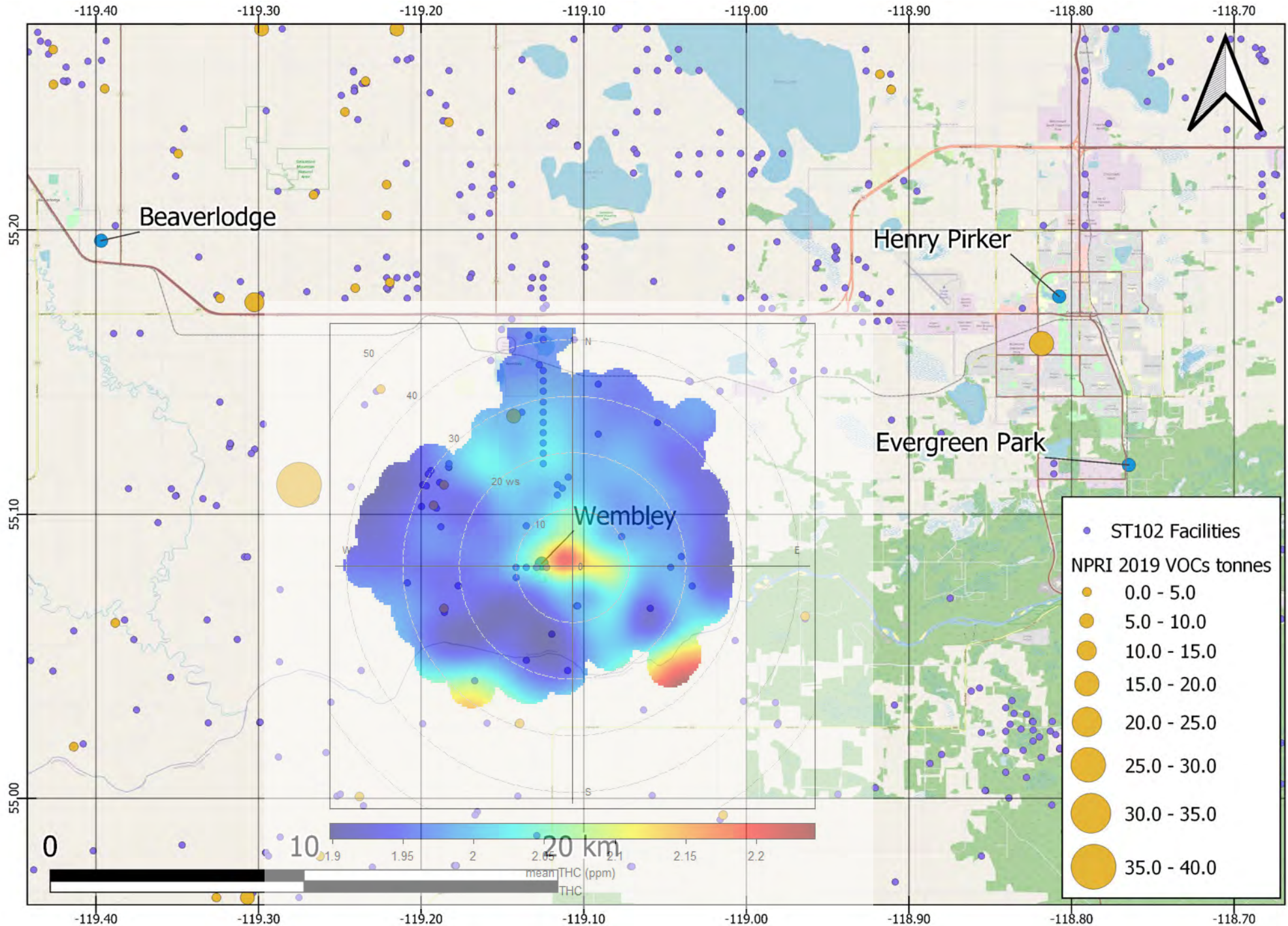
# Wembley – Monthly Averages

PAZA Wembley 2019 to 2021 (Jan to Jun)



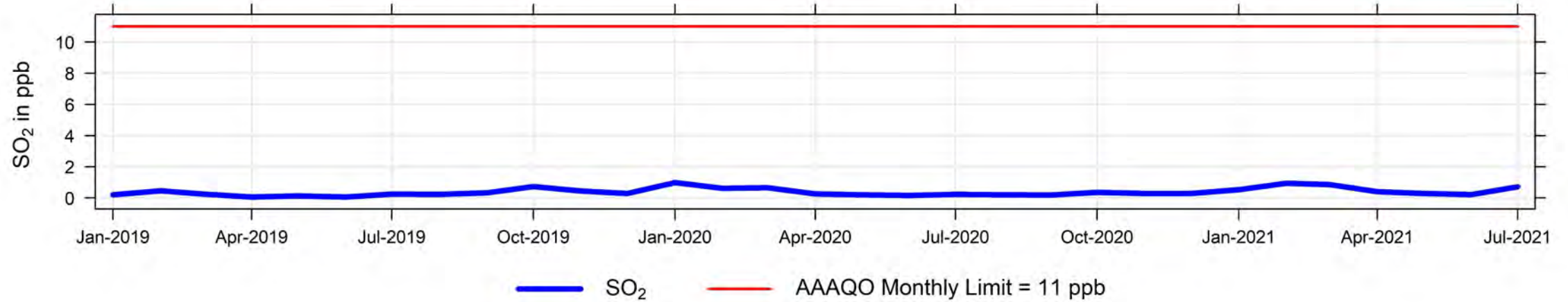




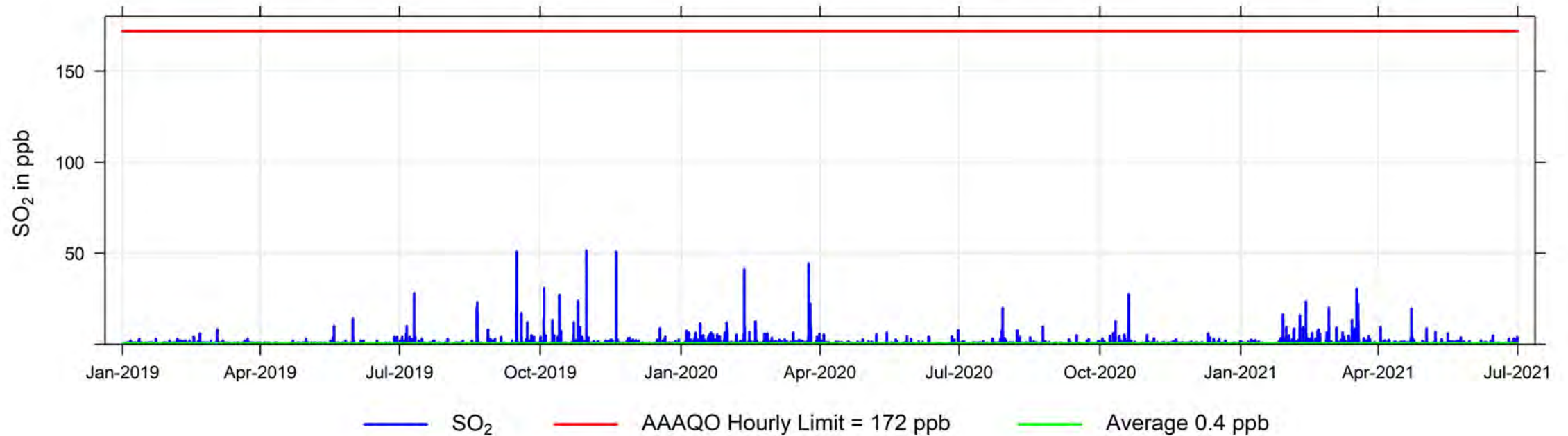




2019 to 2021 (Jan to June) Monthly Concentration Readings of SO<sub>2</sub> (in ppb) at Wembley



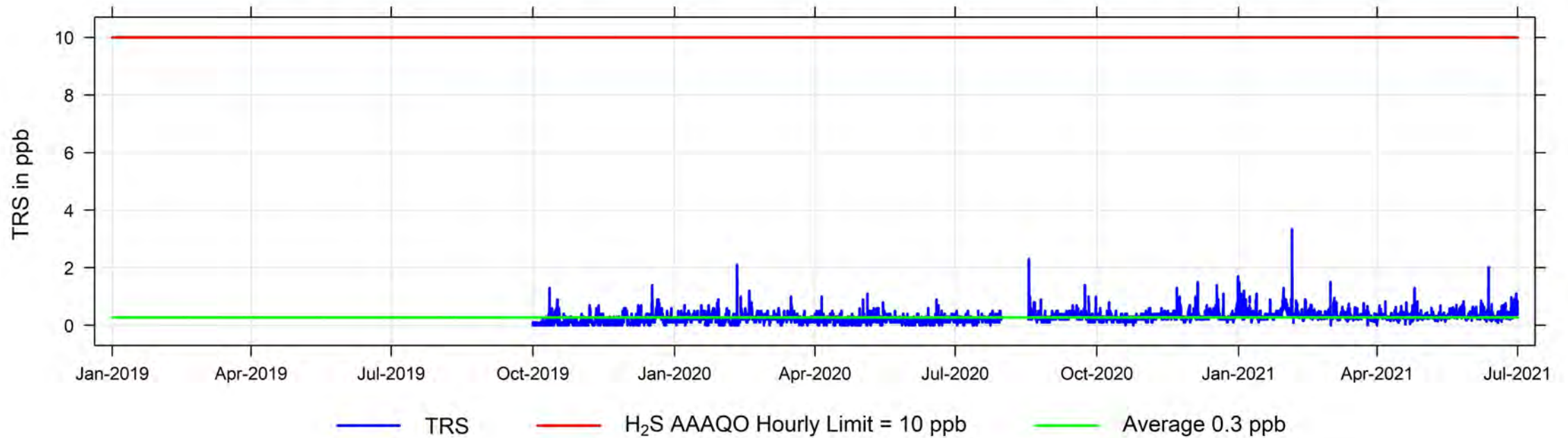
2019 to 2021 (Jan to June) Hourly Concentration Readings of SO<sub>2</sub> (in ppb) at Wembley



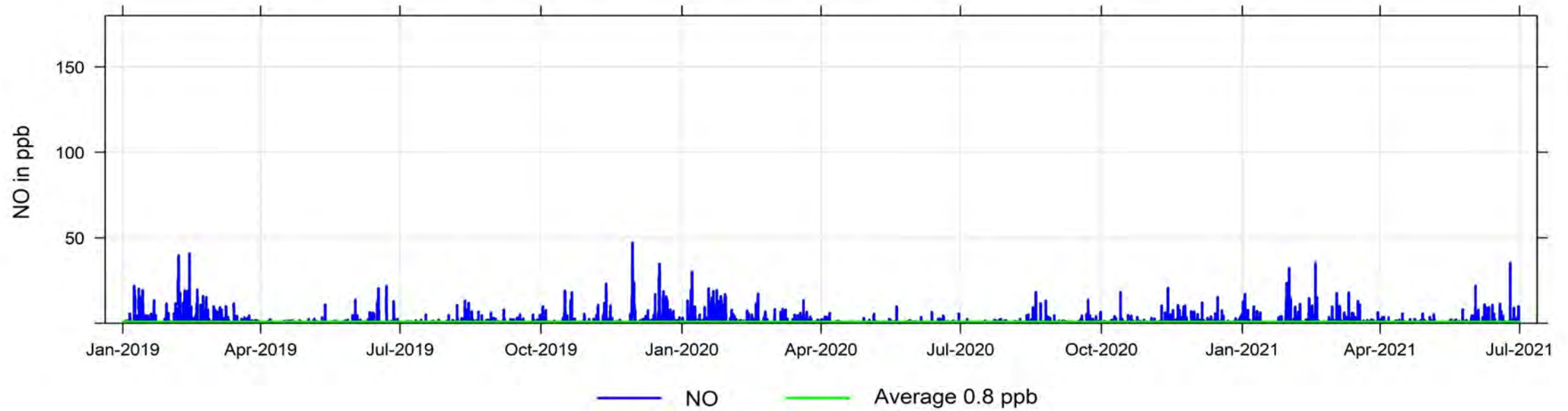
2019 to 2021 (Jan to June) Monthly Concentration Readings of TRS (in ppb) at Wembley



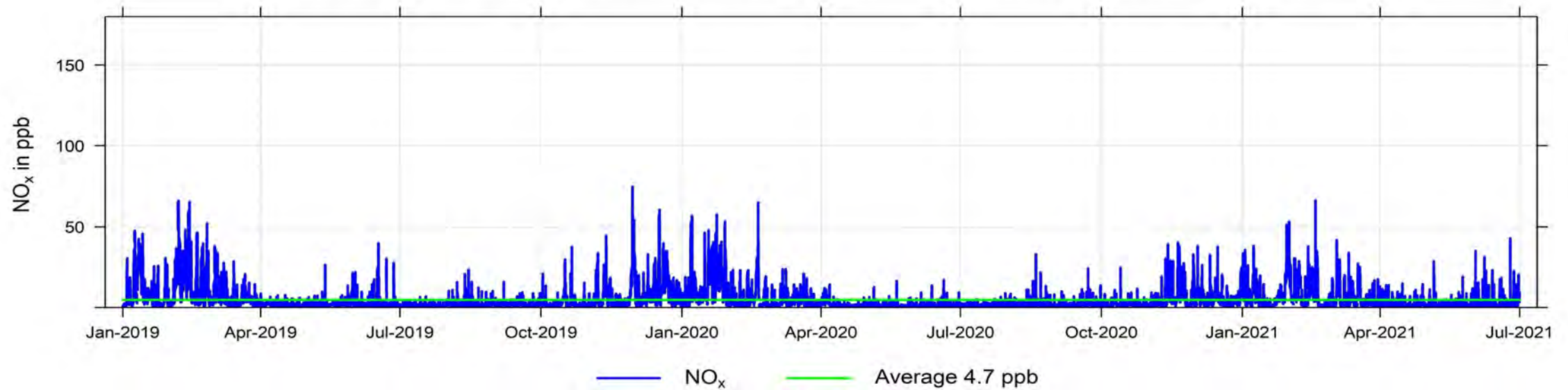
2019 to 2021 (Jan to June) Hourly Concentration Readings of TRS (in ppb) at Wembley



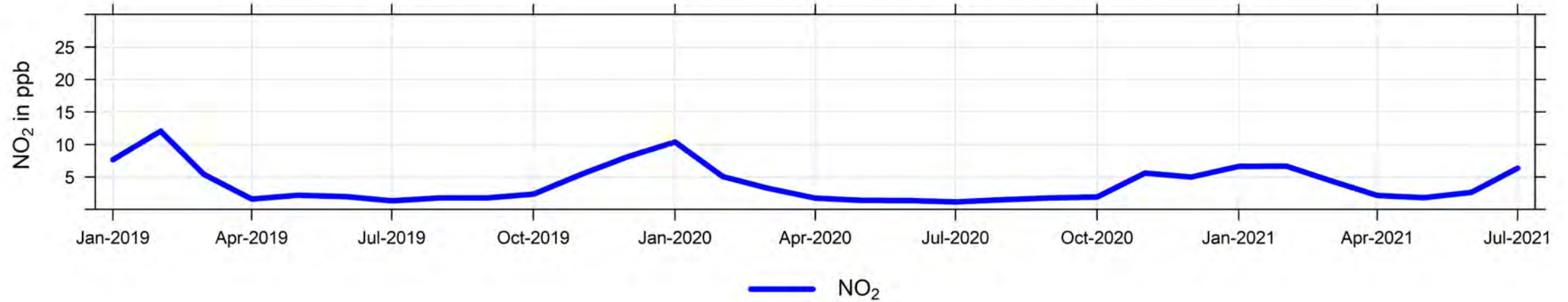
2019 to 2021 (Jan to June) Hourly Concentration Readings of NO (in ppb) at Wembley



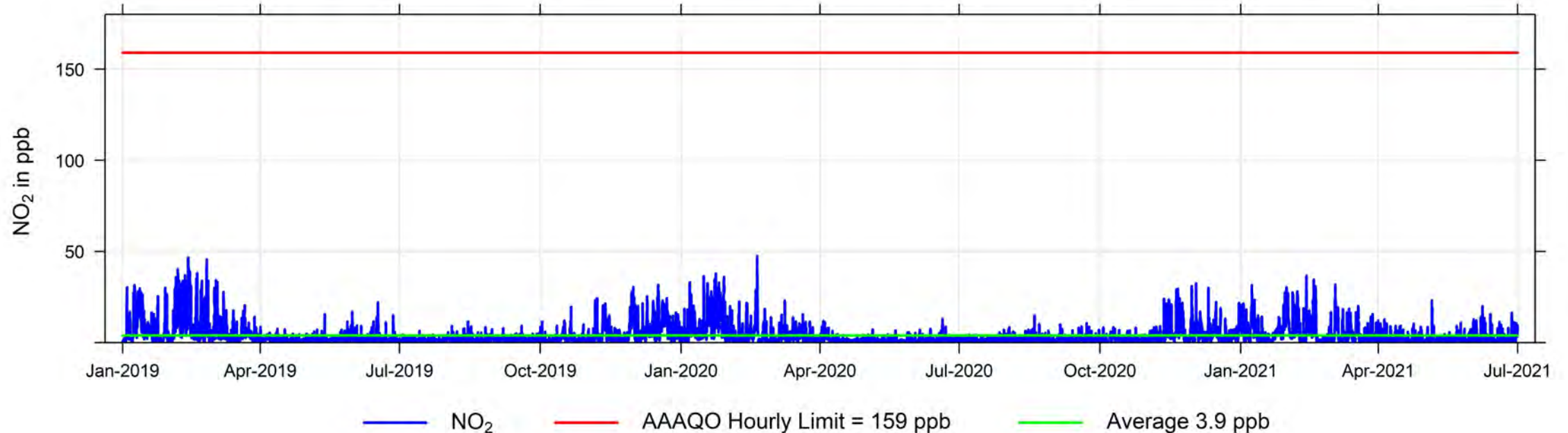
2019 to 2021 (Jan to June) Hourly Concentration Readings of NO<sub>x</sub> (in ppb) at Wembley



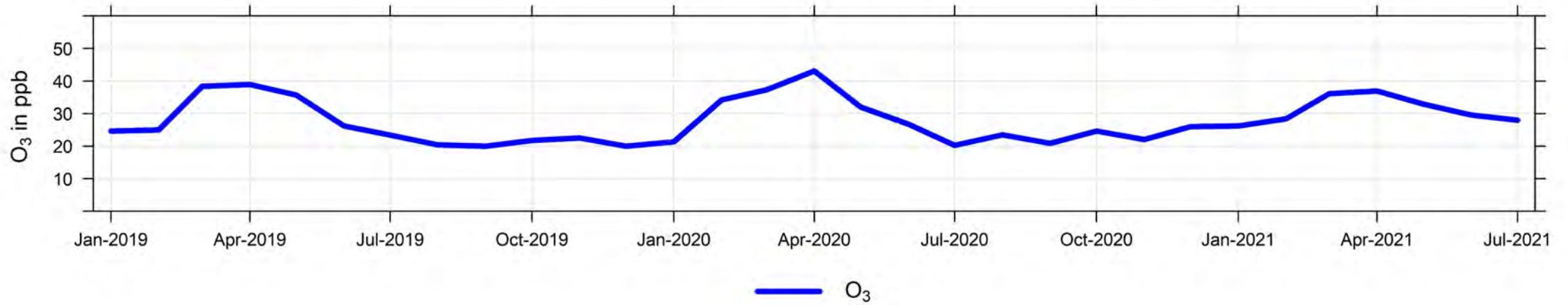
2019 to 2021 (Jan to June) Monthly Concentration Readings of NO<sub>2</sub> (in ppb) at Wembley



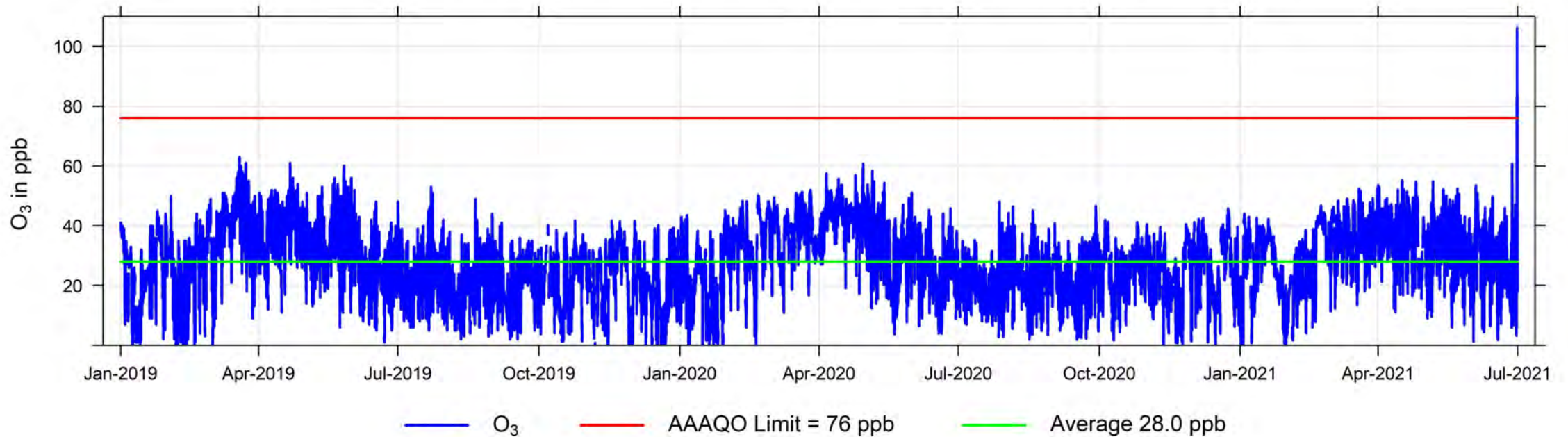
2019 to 2021 (Jan to June) Hourly Concentration Readings of NO<sub>2</sub> (in ppb) at Wembley



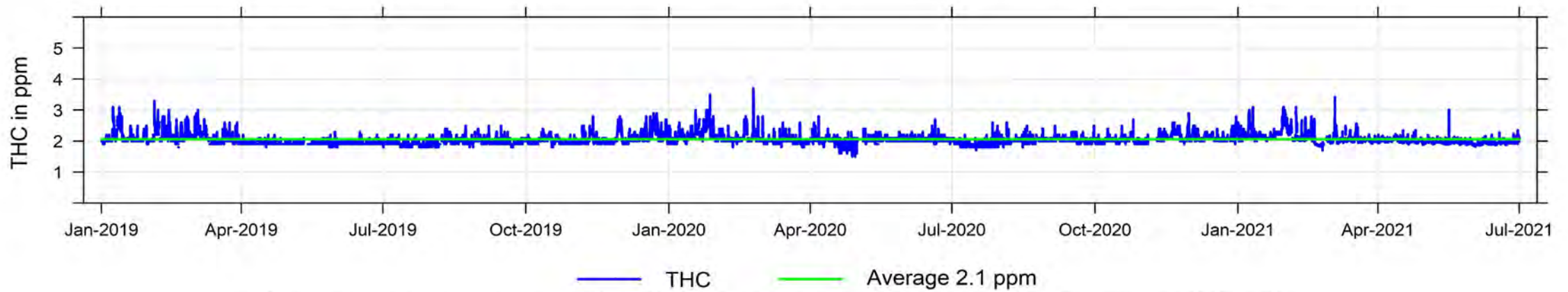
2019 to 2021 (Jan to June) Monthly Concentration Readings of O<sub>3</sub> (in ppb) at Wembley



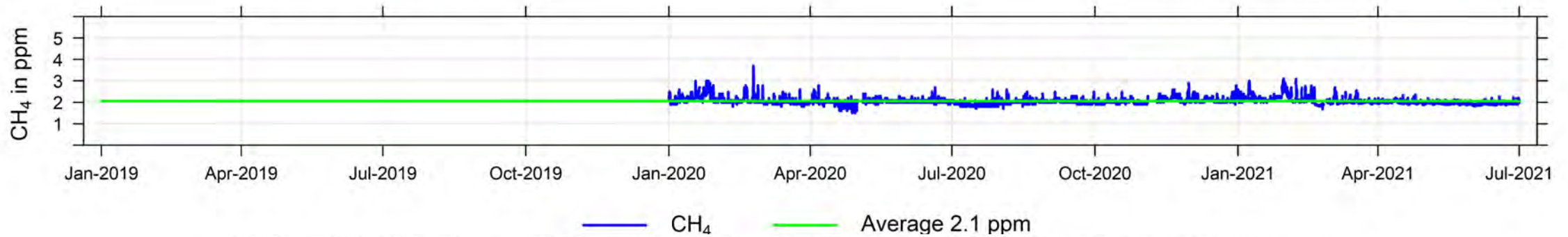
2019 to 2021 (Jan to June) Hourly Concentration Readings of O<sub>3</sub> (in ppb) at Wembley



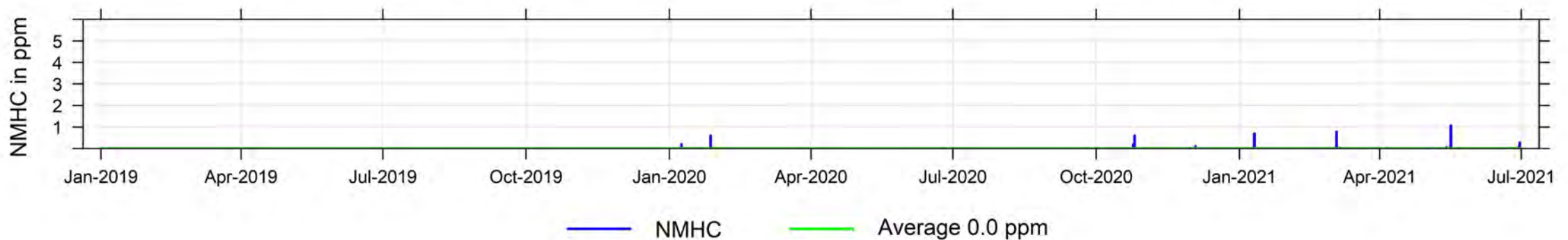
2019 to 2021 (Jan to June) Hourly Concentration Readings of THC (in ppm) at Wembley



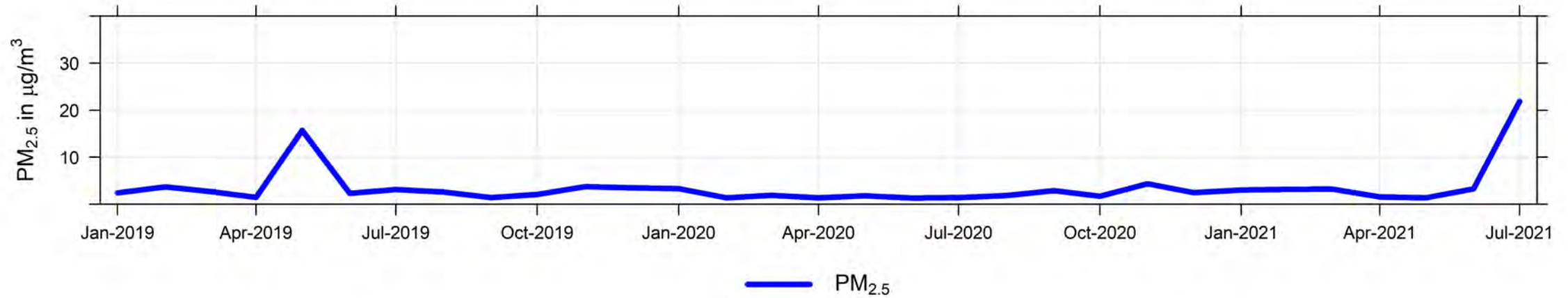
2019 to 2021 (Jan to June) Hourly Concentration Readings of CH<sub>4</sub> (in ppm) at Wembley



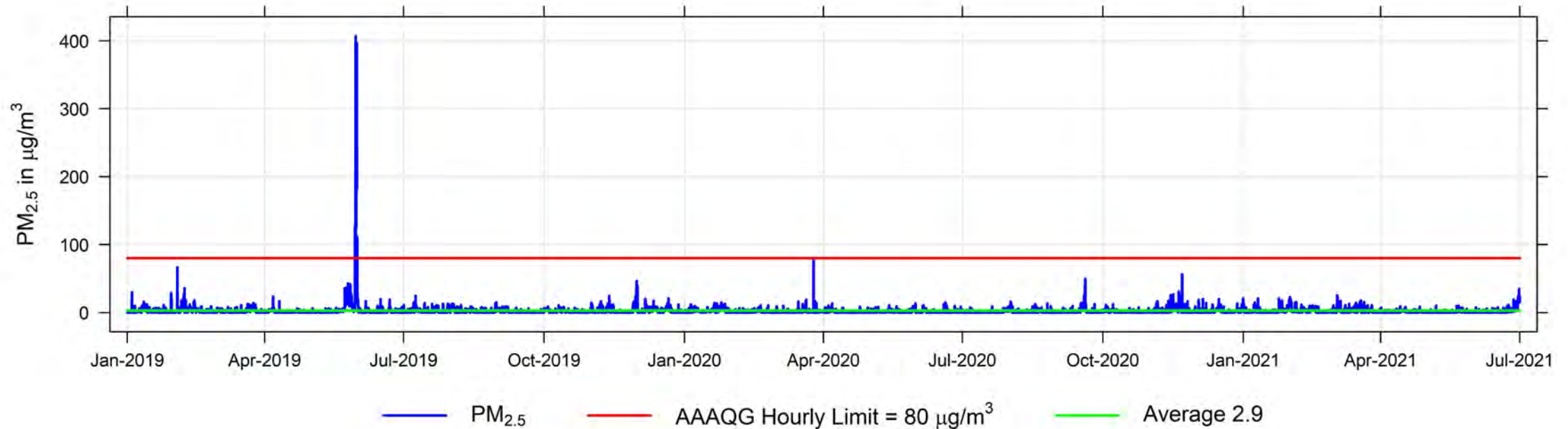
2019 to 2021 (Jan to June) Hourly Concentration Readings of NMHC (in ppm) at Wembley



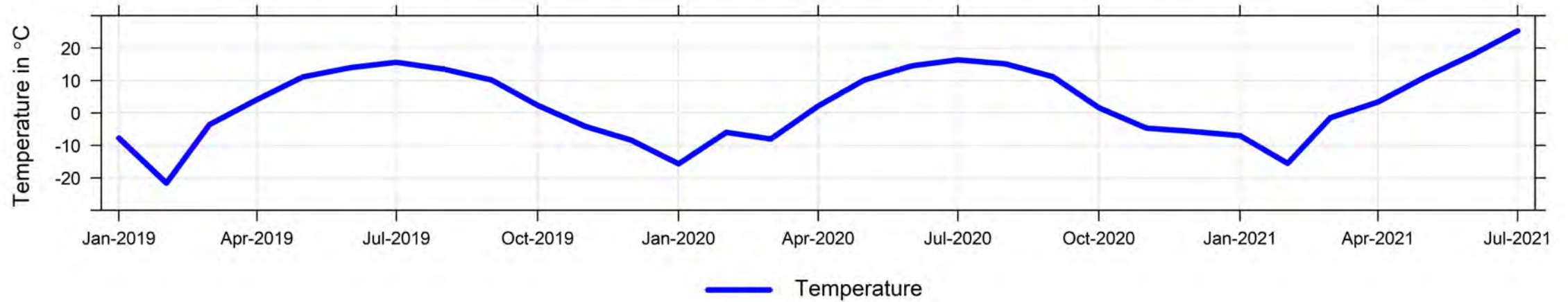
2019 to 2021 (Jan to June) Monthly Concentration Readings of PM<sub>2.5</sub> in  $\mu\text{g}/\text{m}^3$  at Wembley



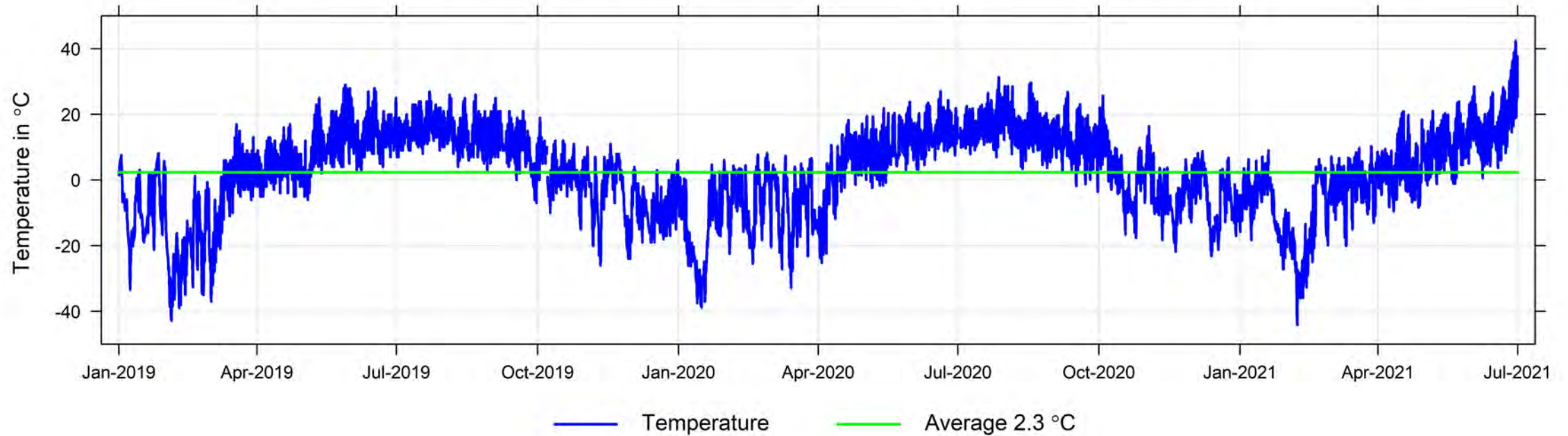
2019 to 2021 (Jan to June) Hourly Concentration Readings of PM<sub>2.5</sub> in  $\mu\text{g}/\text{m}^3$  at Wembley



2019 to 2021 (Jan to June) Monthly Temperature Readings in °C at Wembley

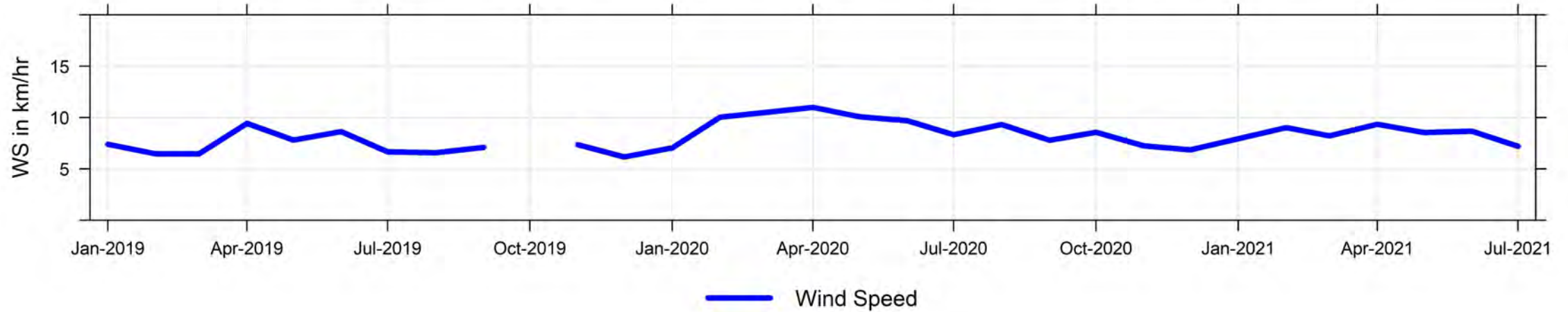


2019 to 2021 (Jan to June) Hourly Temperature Readings (in °C) at Wembley

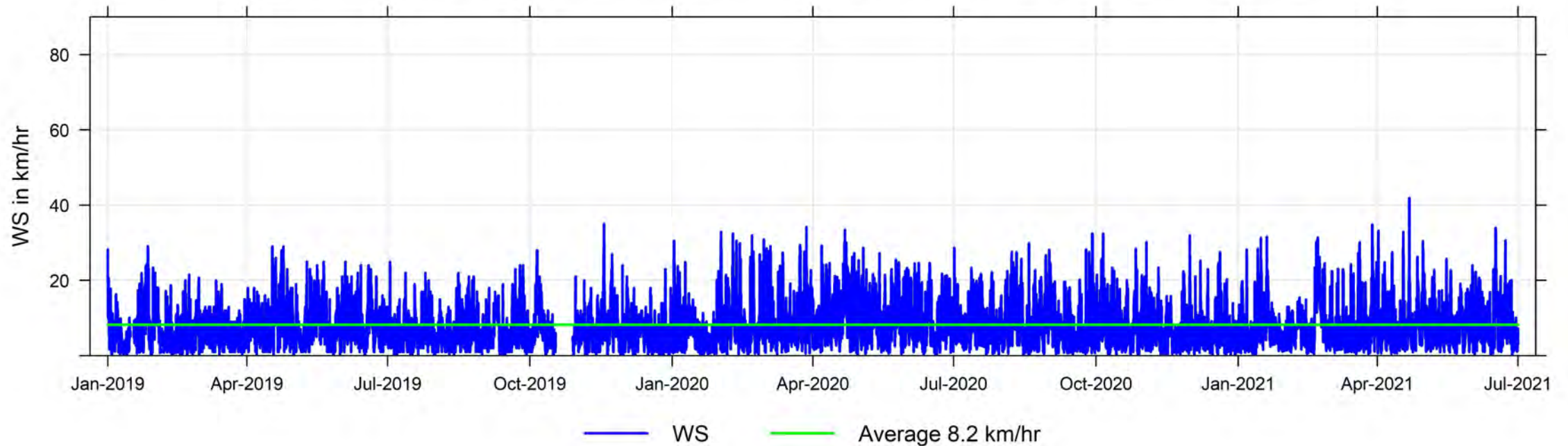




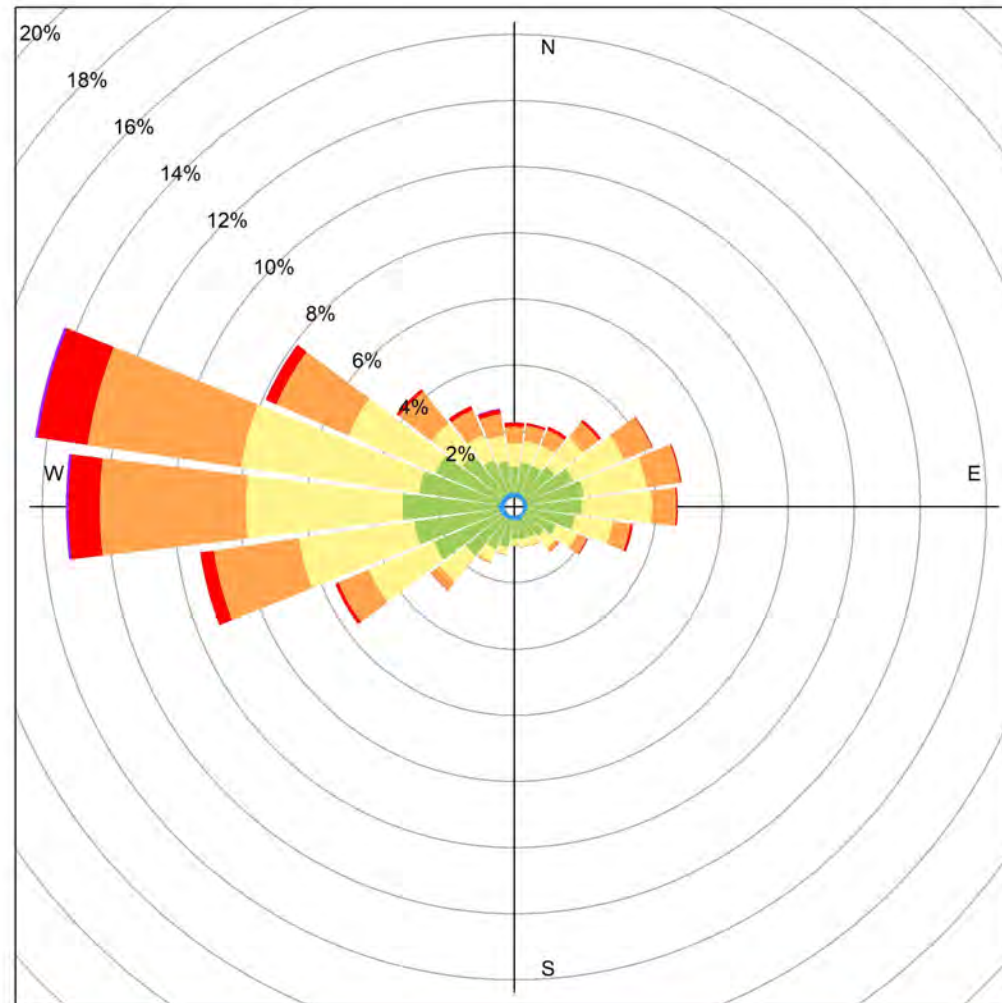
**2019 to 2021 (Jan to June) Monthly Readings of Wind Speed (in km/hr) at Wembley**



**2019 to 2021 (Jan to June) Hourly Readings of Wind Speed (in km/hr) at Wembley**

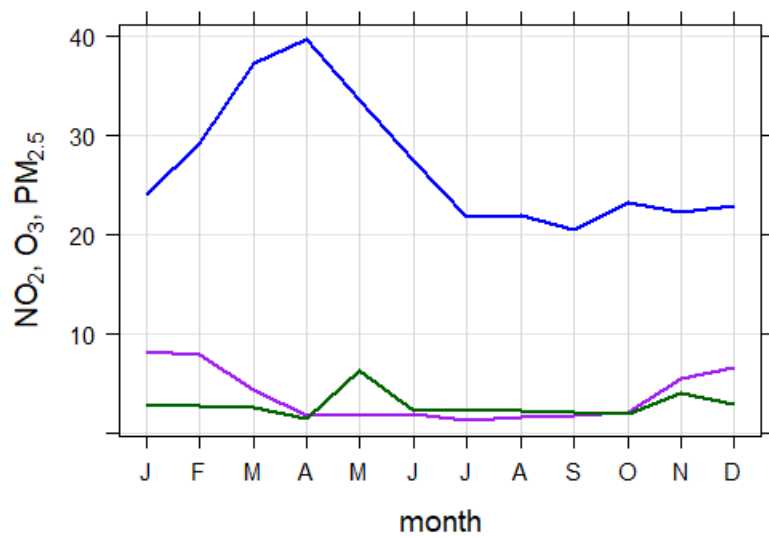
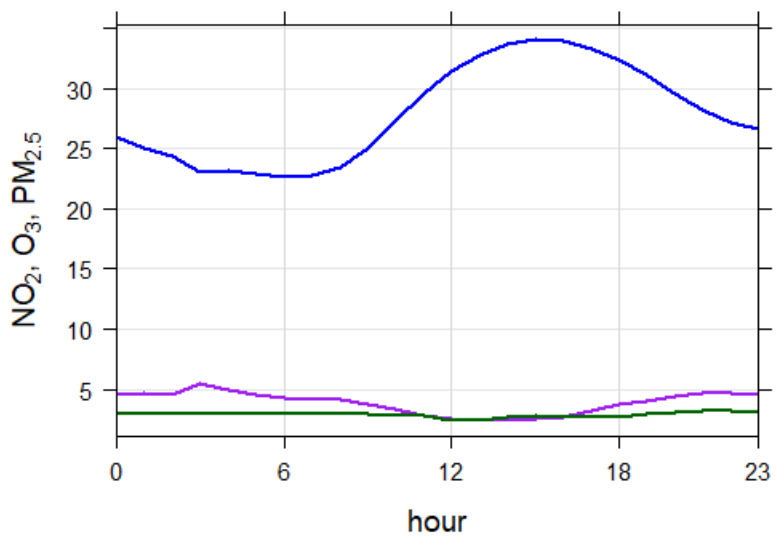
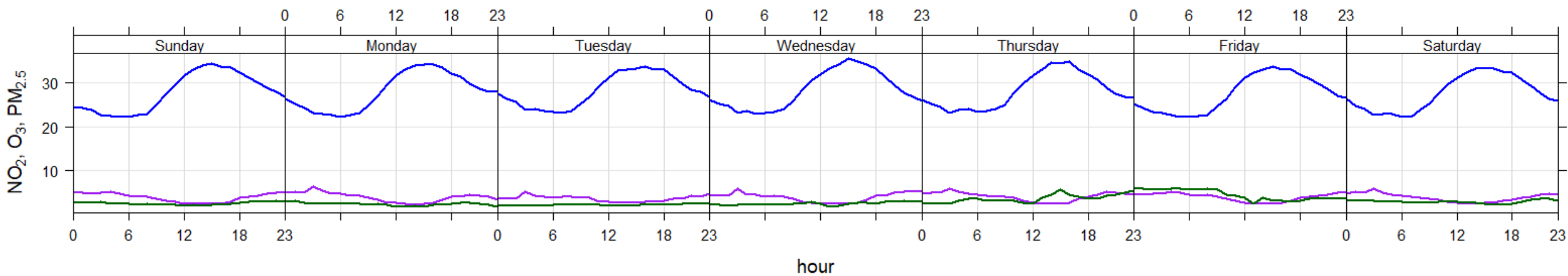


# Wind Direction

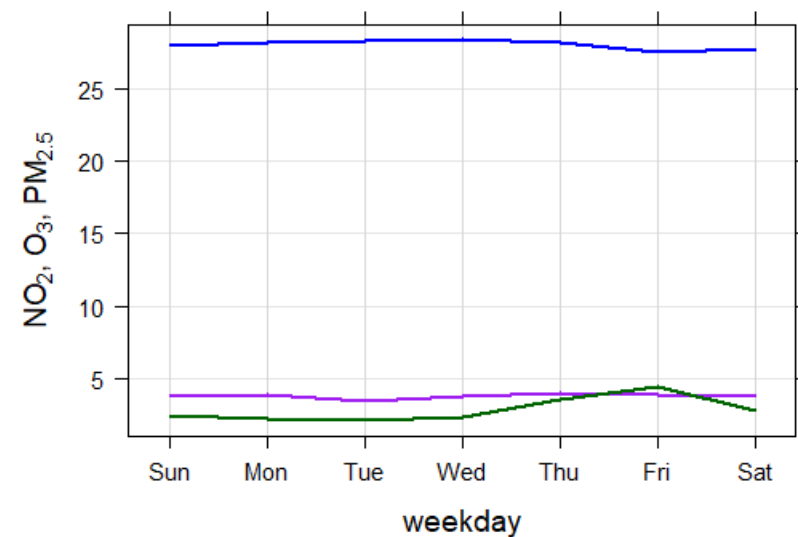


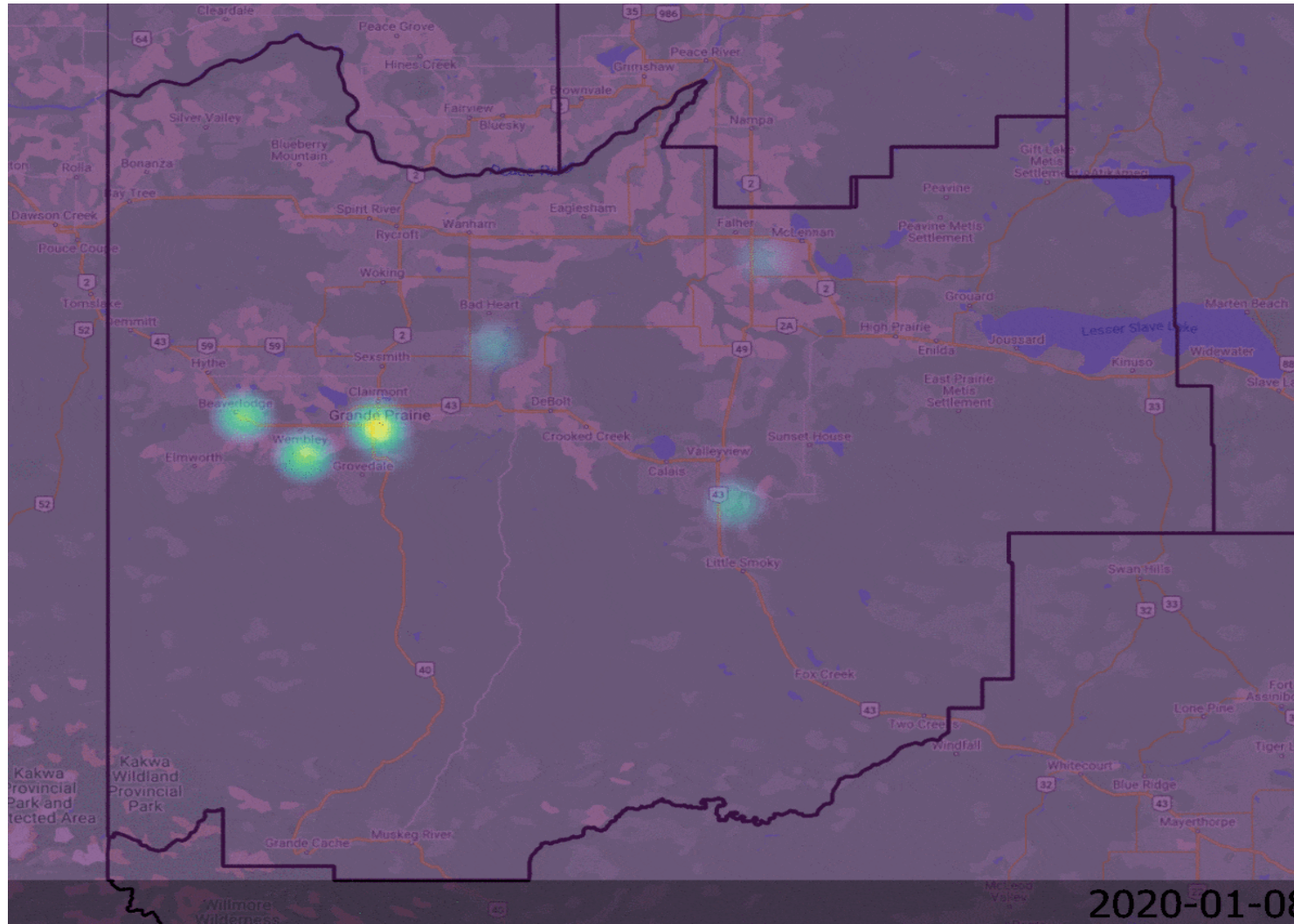
Wembley 2019 to 2021 (Jan to June) Wind Rose, wind speed in km/hr

### PAZA Wembley 2019 to 2021 (Jan to Jun)

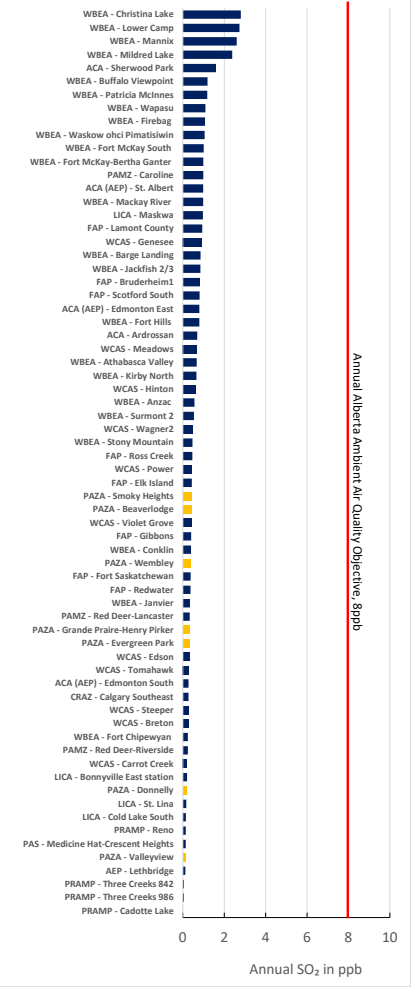


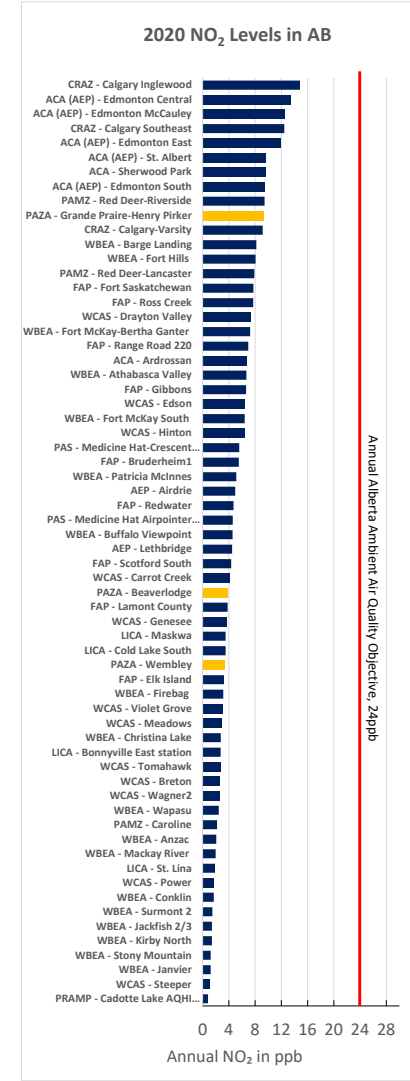
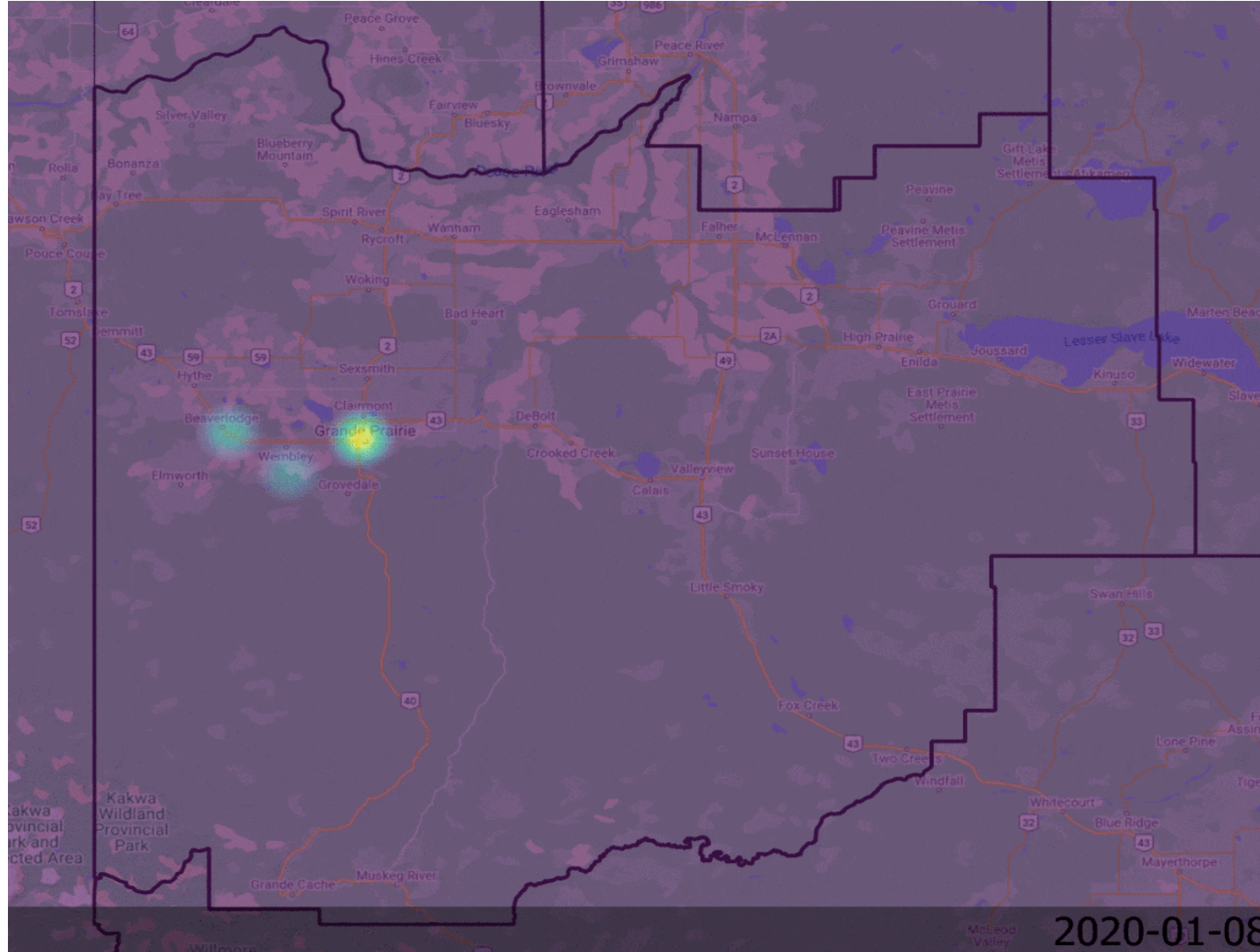
mean and 95% confidence interval in mean

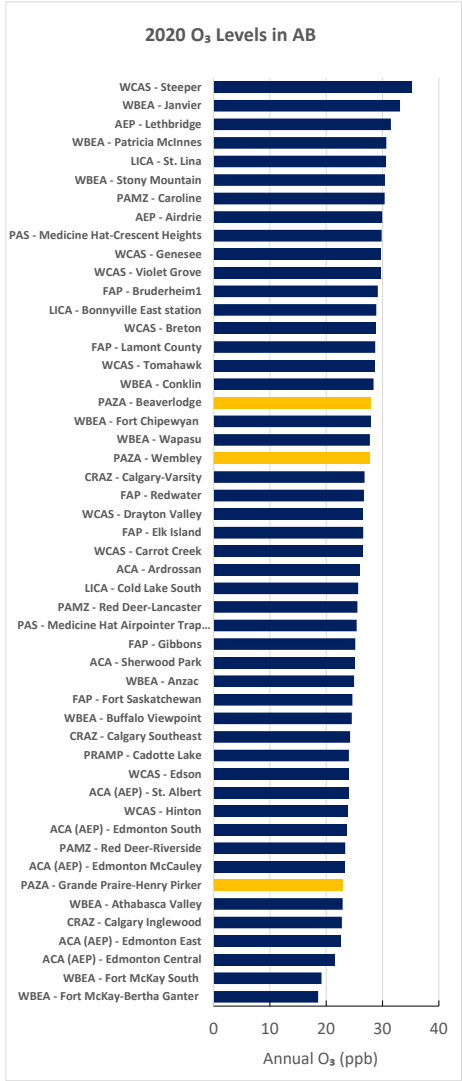
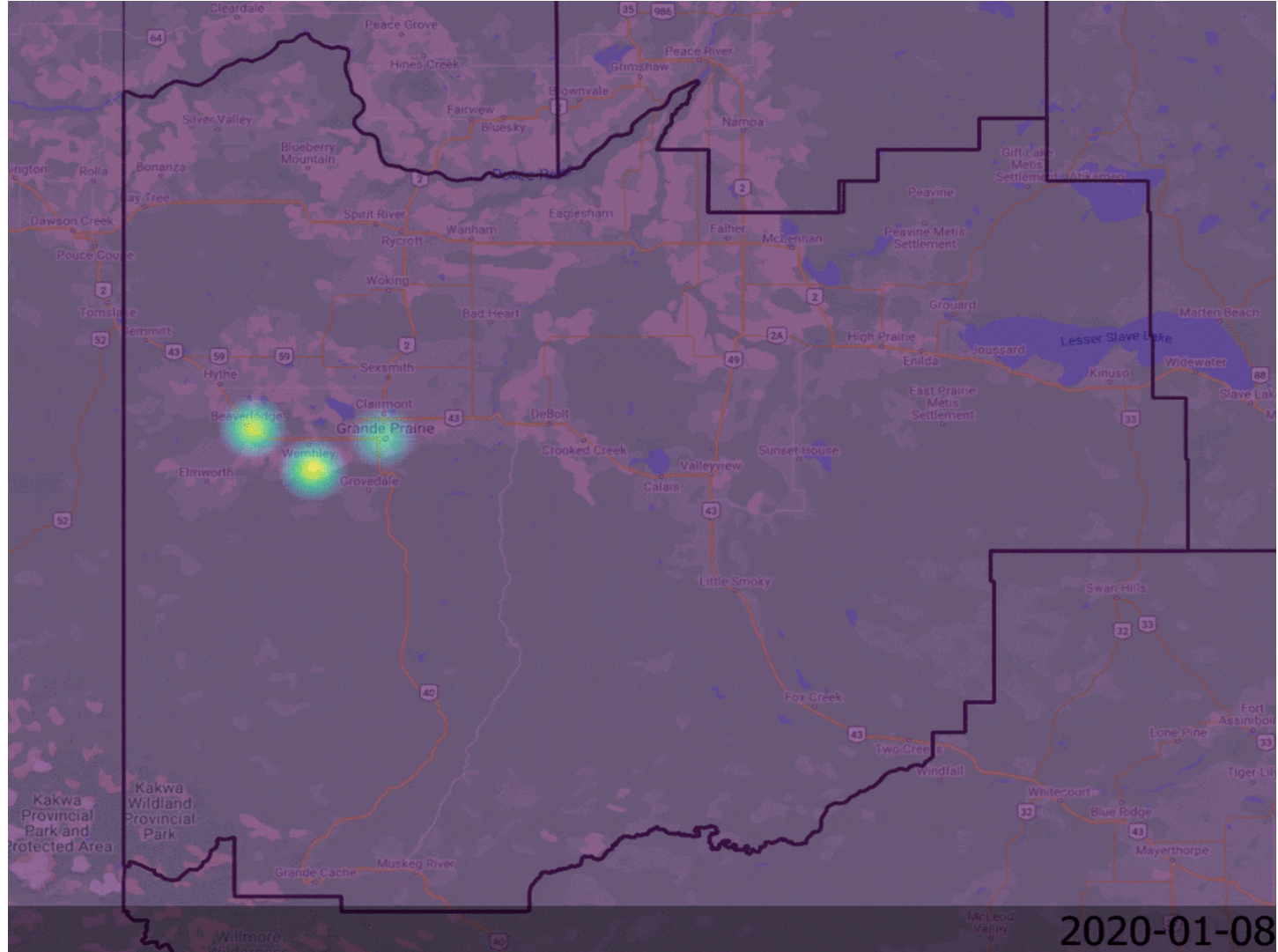


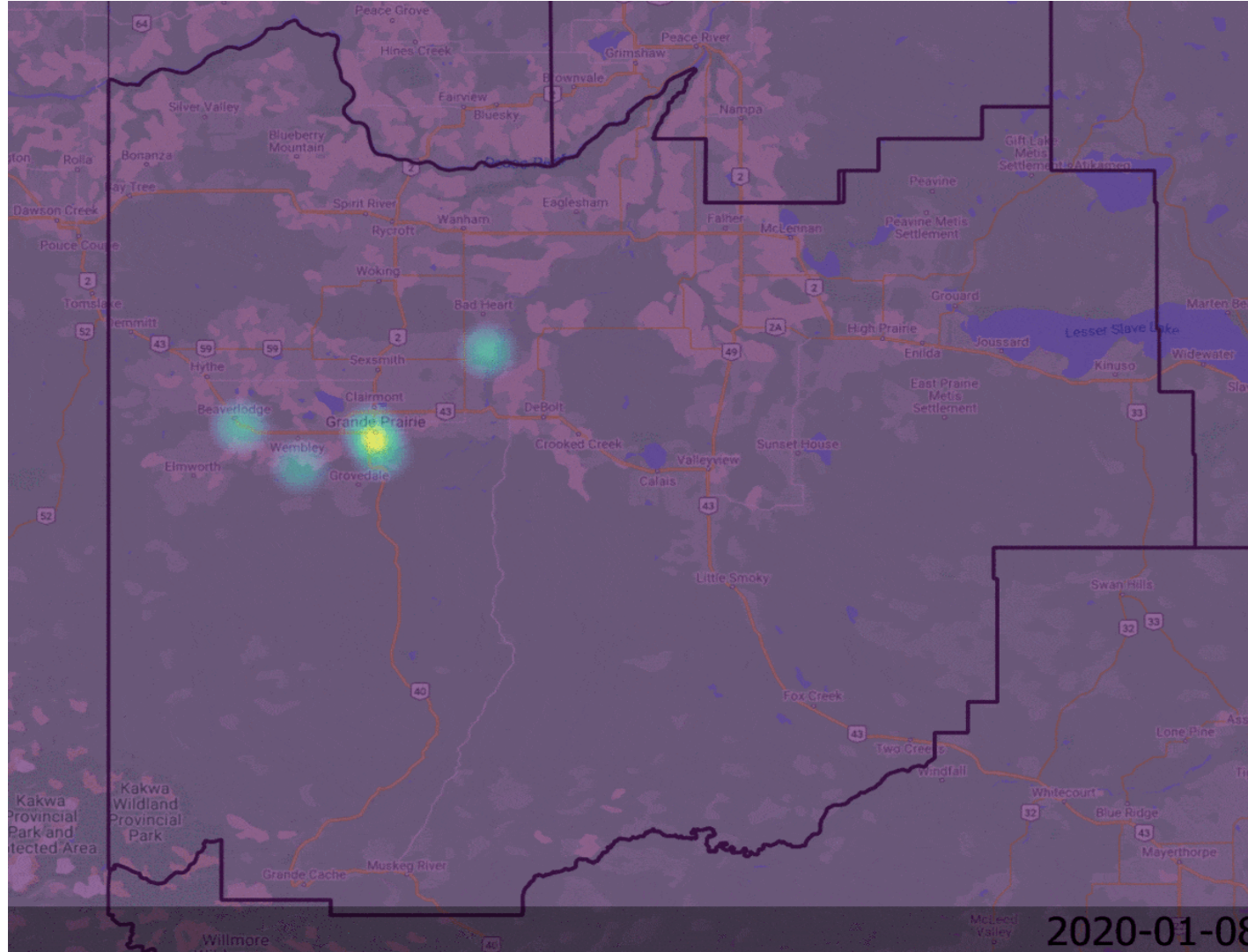


### 2020 SO<sub>2</sub> Levels in AB

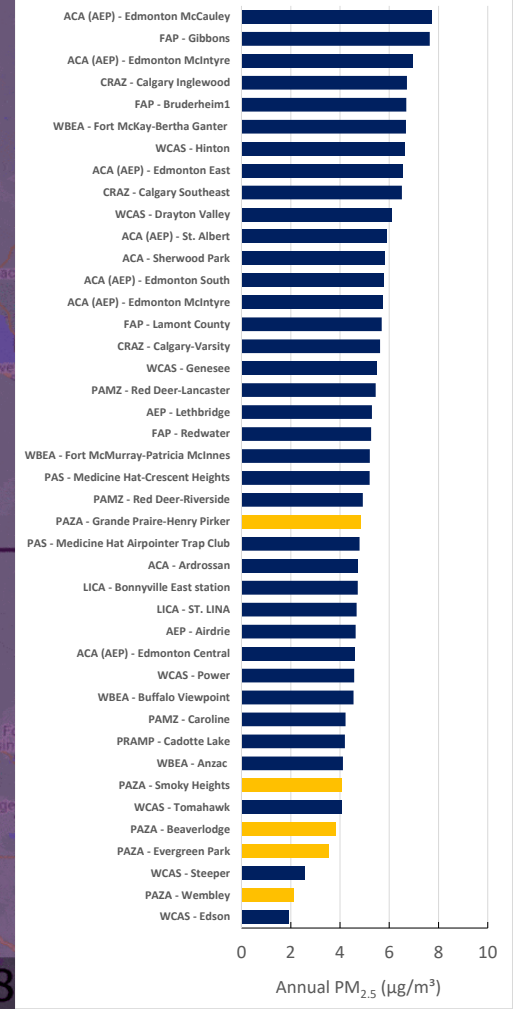




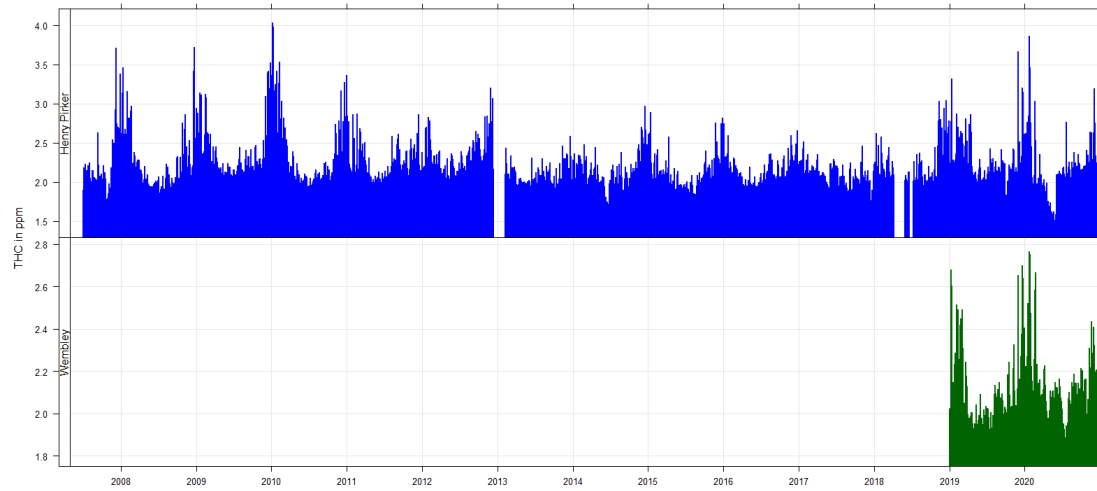




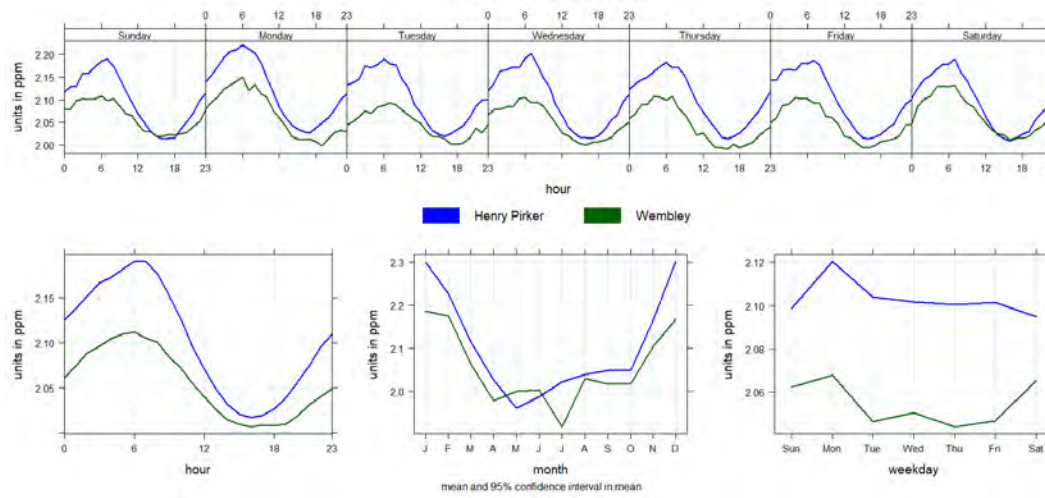
2020 PM<sub>2.5</sub> Levels in AB



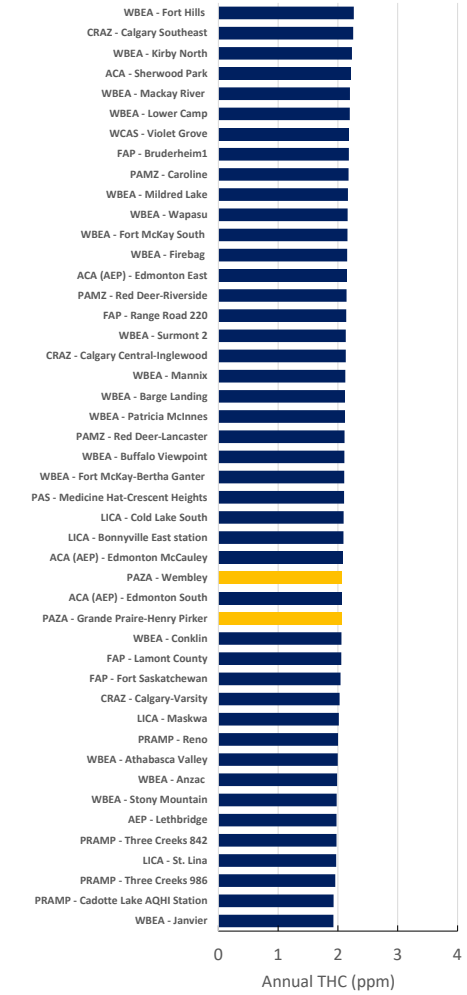
PAZA Monitoring daily average THC (in ppm) for years 2007 to 2020



PAZA THC Profile from 2007 to 2020



2020 THC Levels in AB

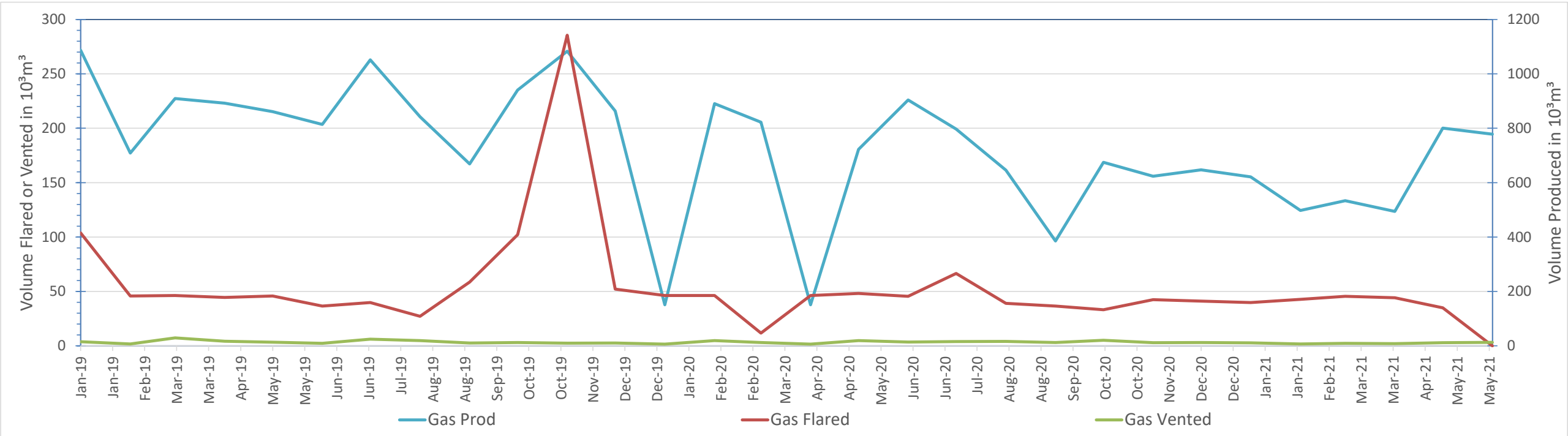


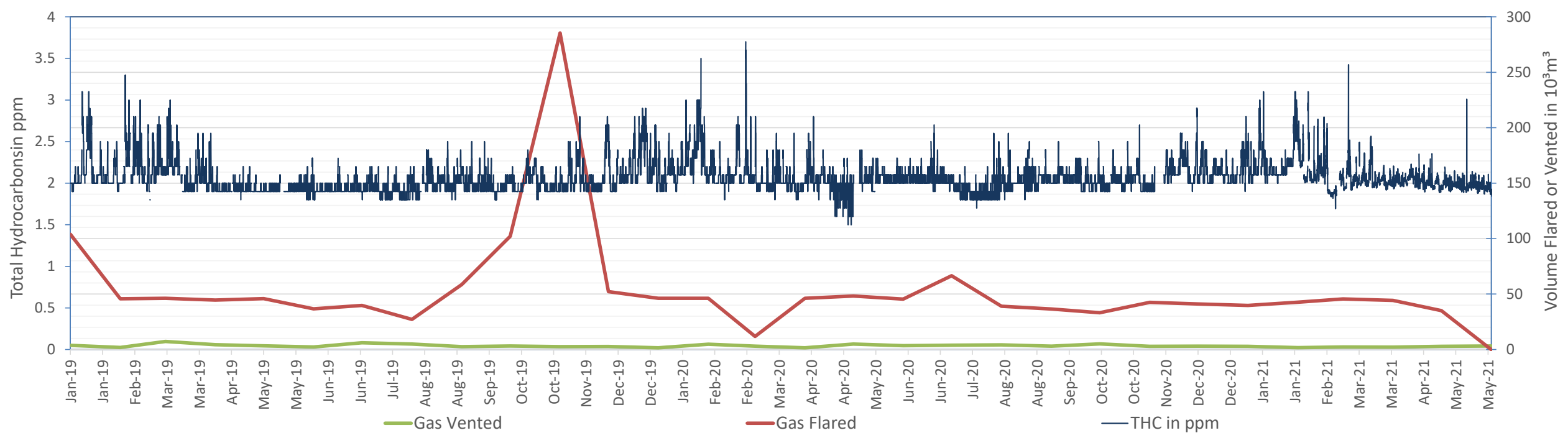
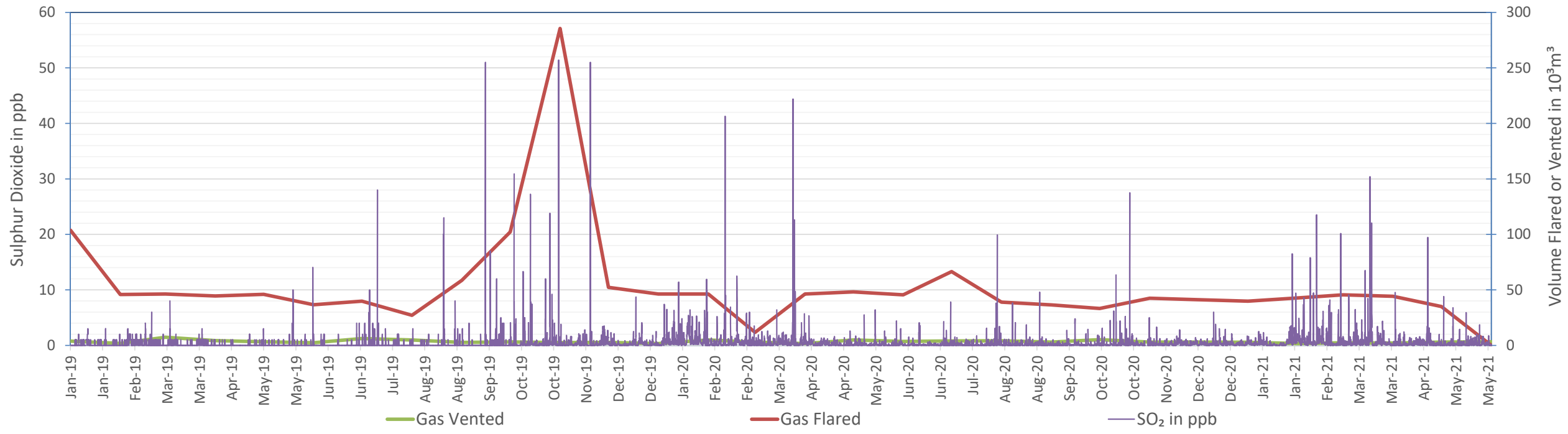


# Using ST60 from AER, Gas Produced, Gas Flared and Gas Vented to compare around Wembley

- Data was extracted from 324 sections using range 7 to 9; townships 69 to 71, all west of the 6<sup>th</sup> meridian resulted in the following figures

# Wembley Area – Gas (Flaring, Venting, Production)

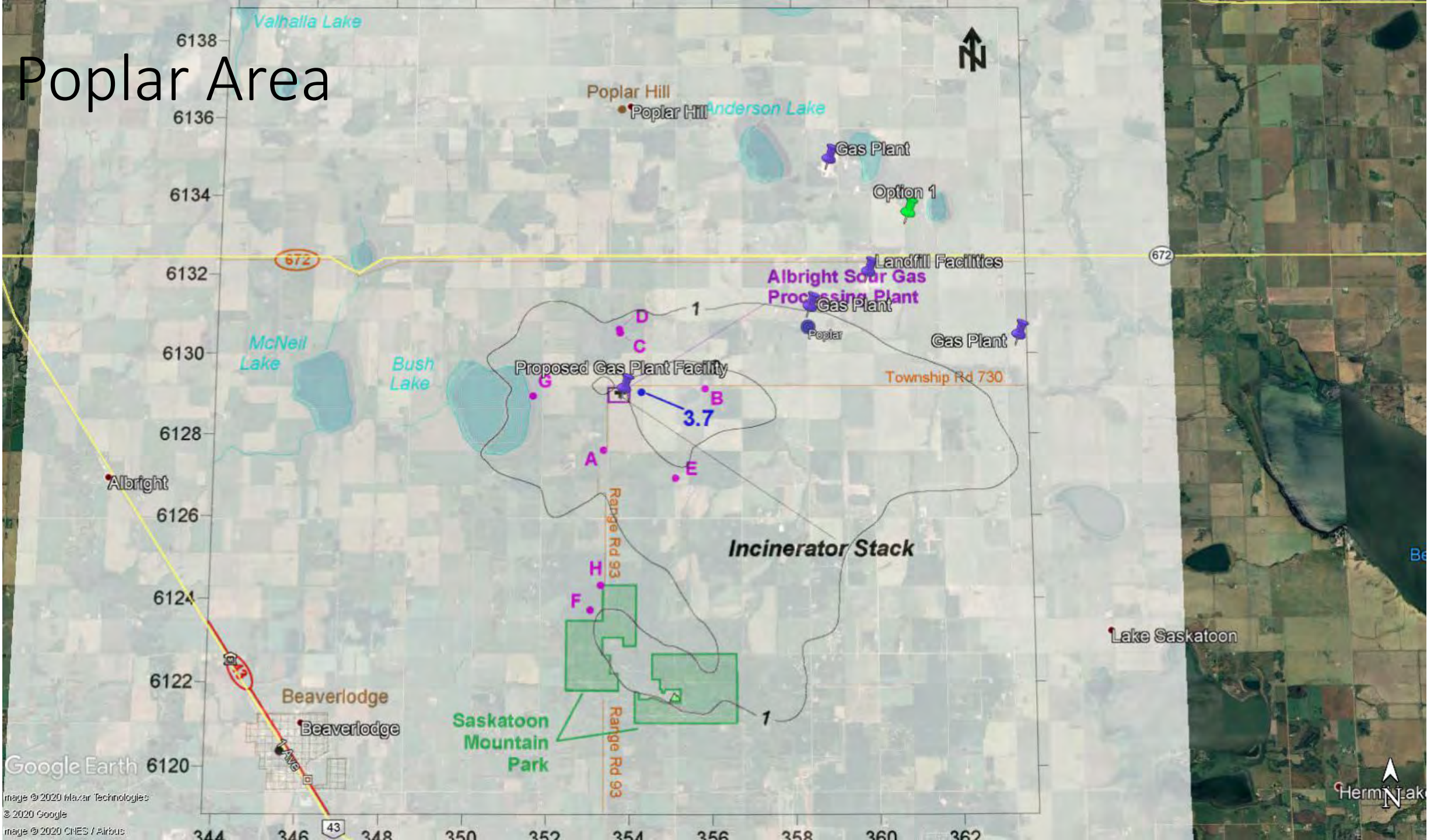






Next?

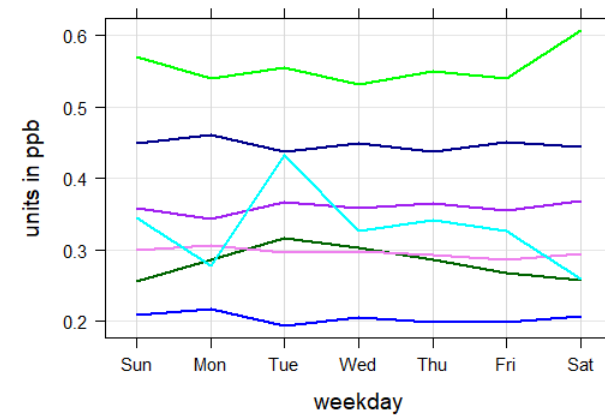
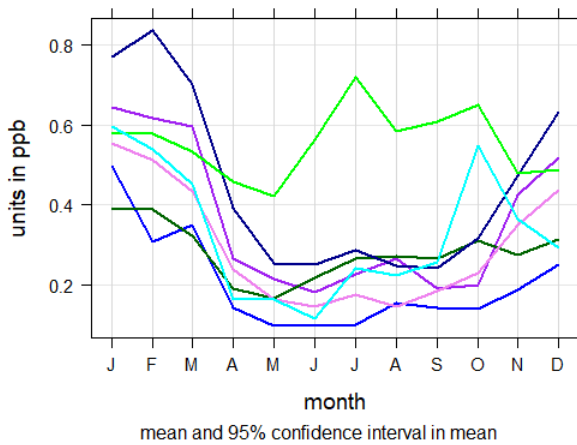
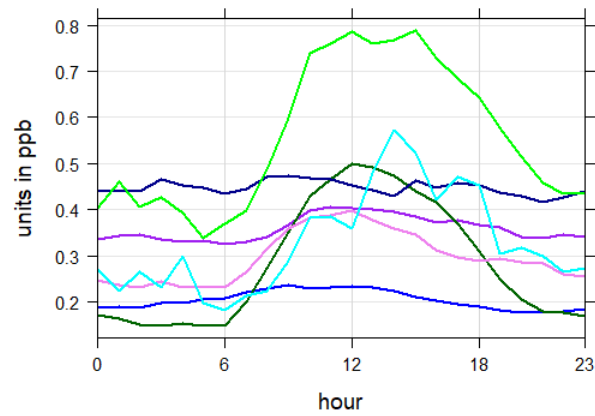
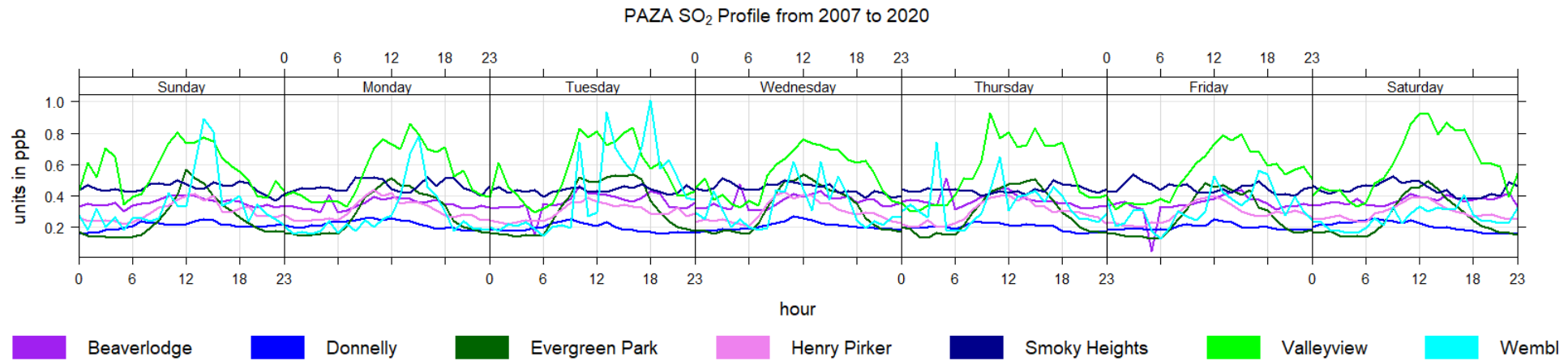
# Poplar Area



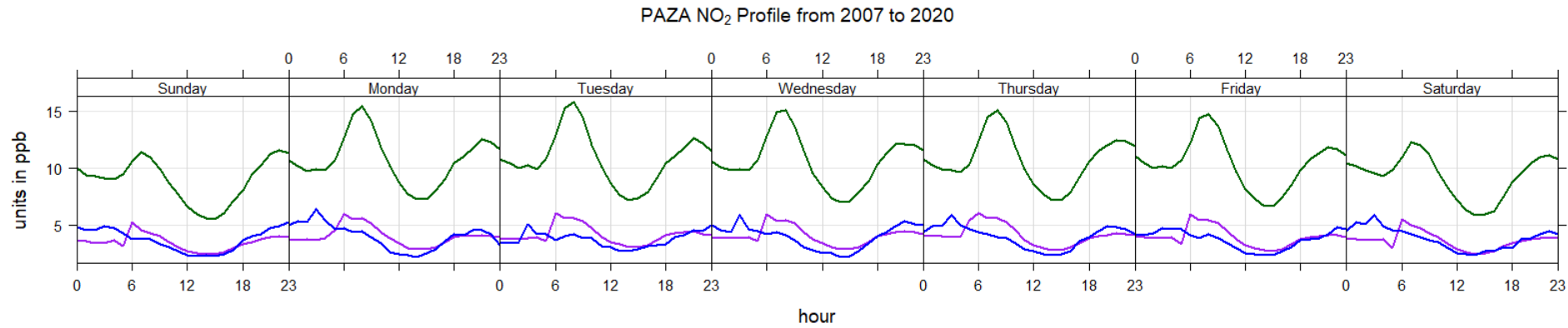


Questions

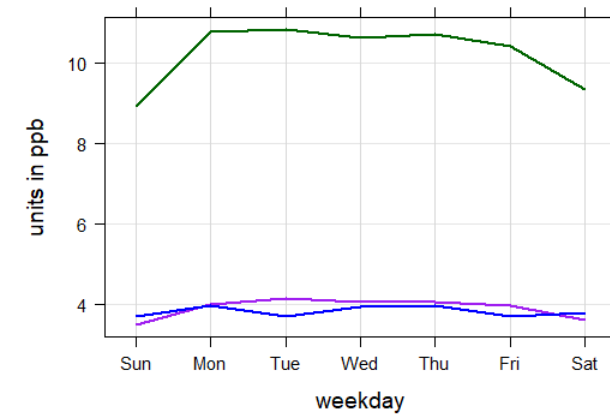
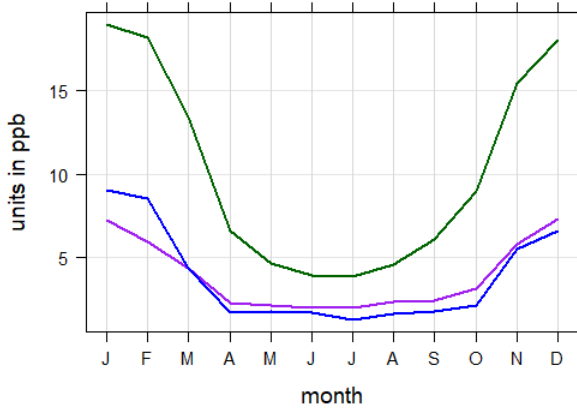
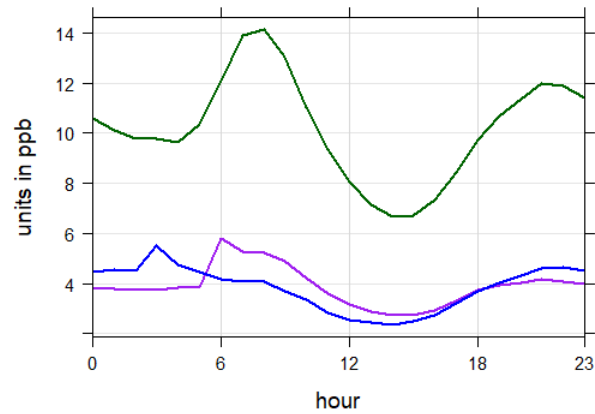
# Sulphur Dioxide (SO<sub>2</sub>) Historical Trends



# Nitrogen Dioxide (NO<sub>2</sub>) Historical Trends

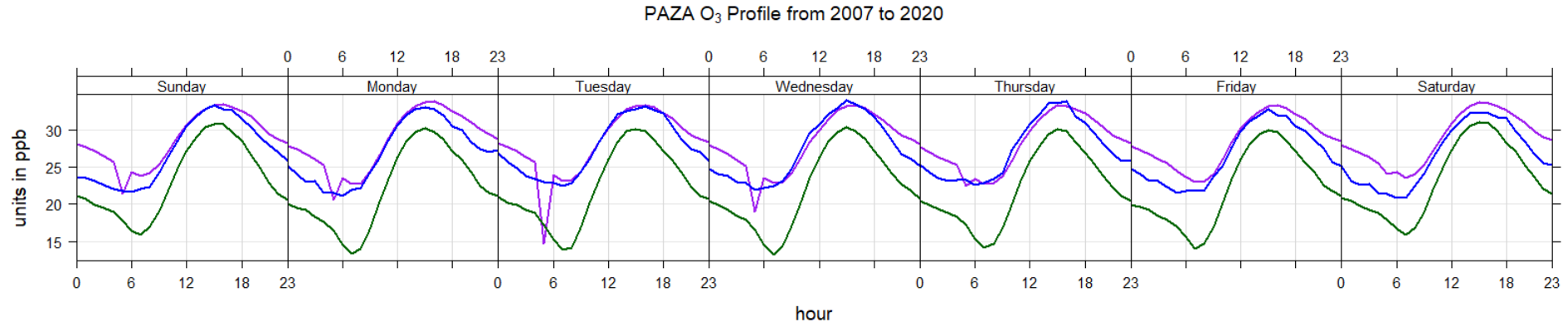


Beaverlodge Henry Pirker Wembley

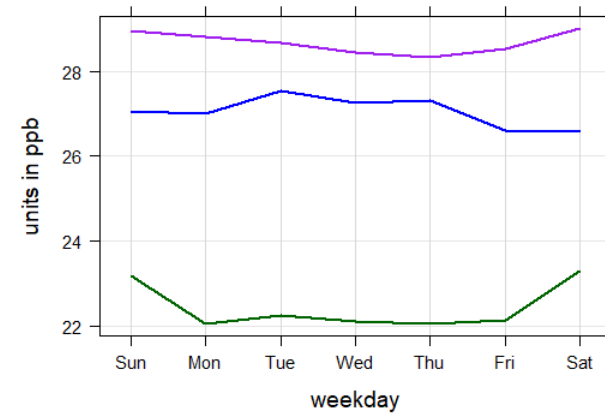
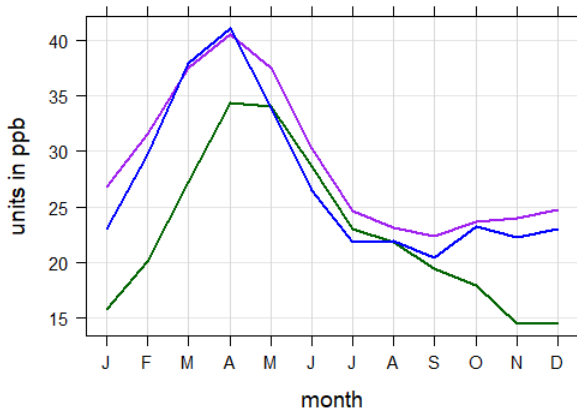
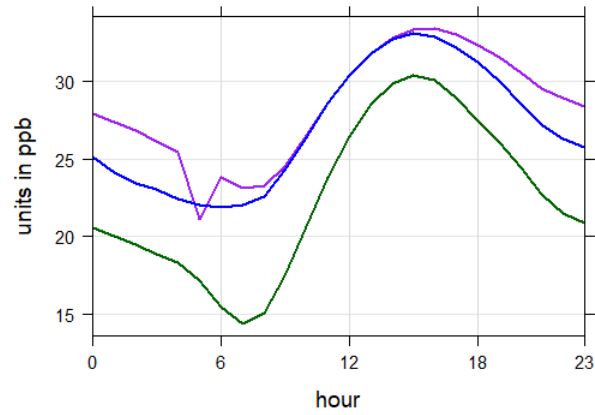




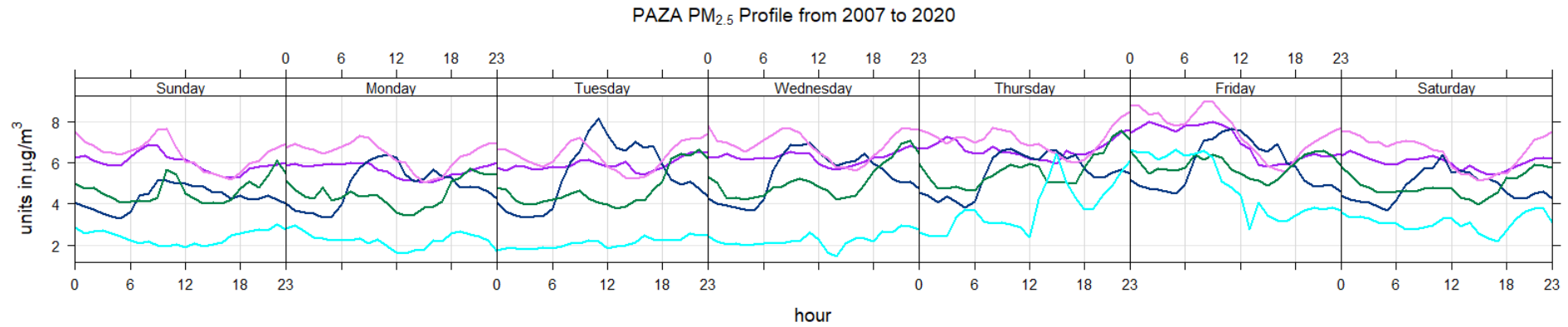
# Ozone (O<sub>3</sub>) Historical Trends



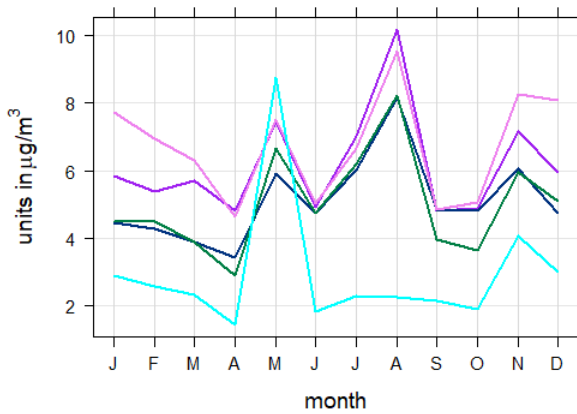
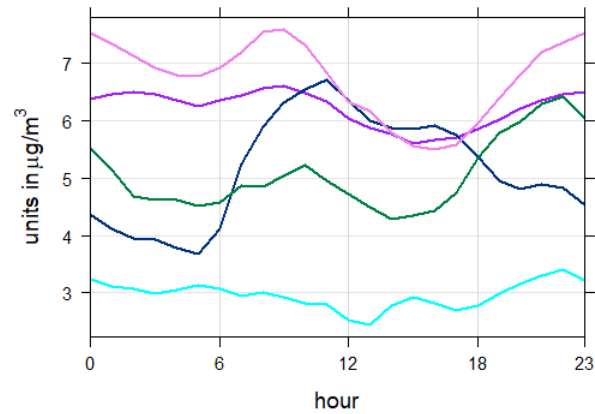
Beaverlodge Henry Pirker Wembley



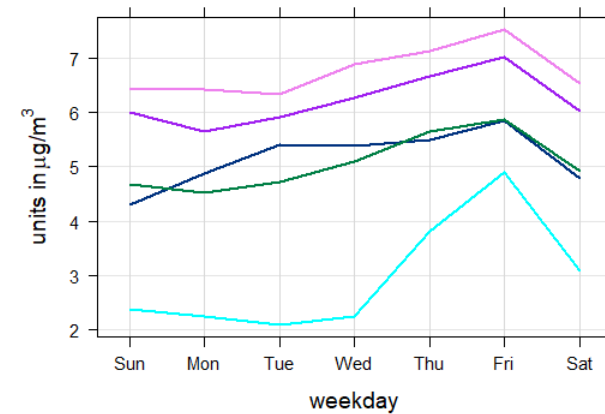
# Particulate Matter (PM<sub>2.5</sub>) Historical Trends



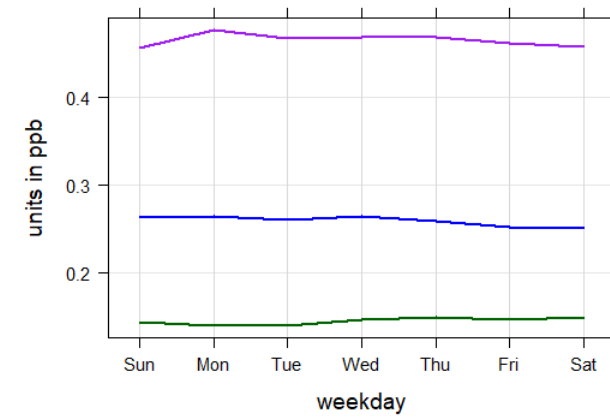
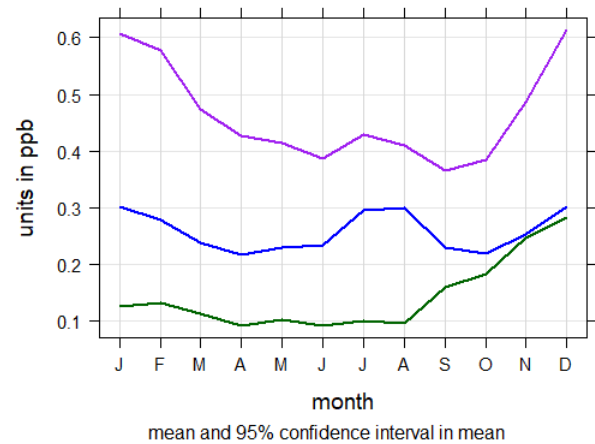
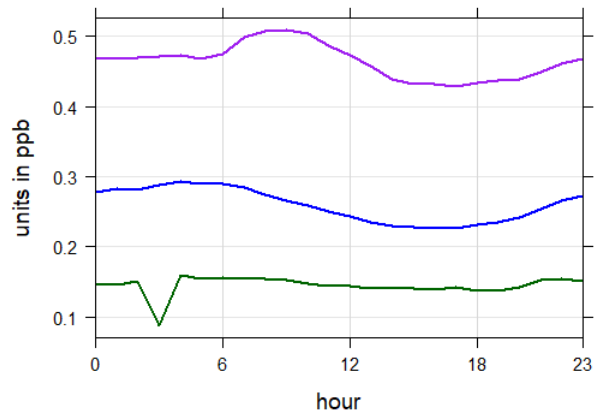
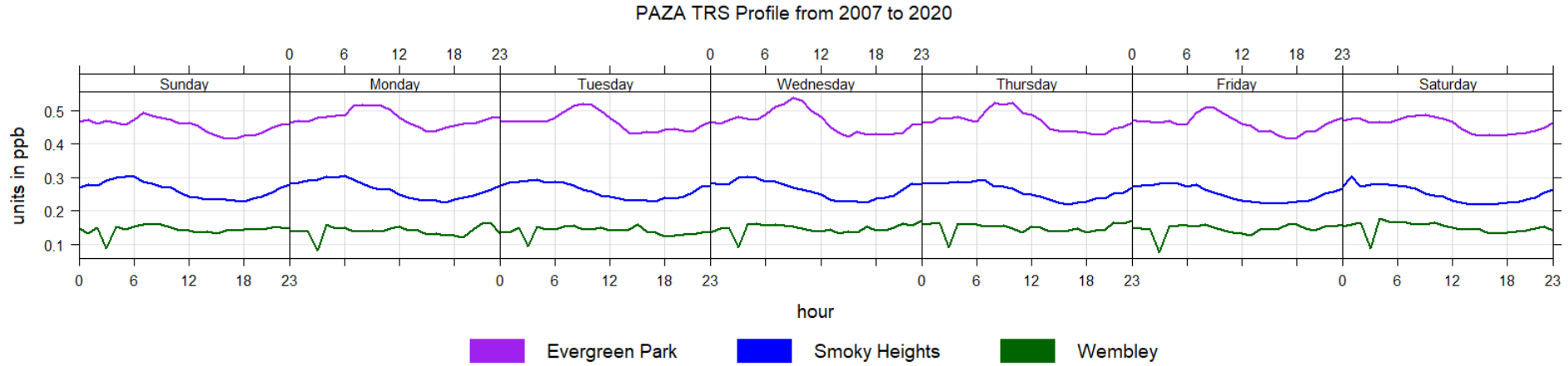
Beaverlodge Evergreen Park Henry Pirker Smoky Heights Wembley



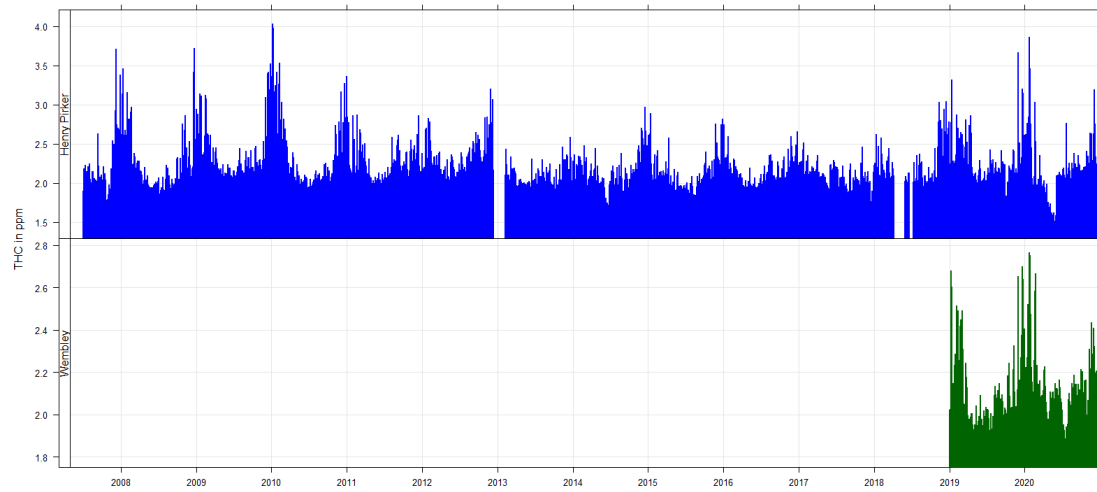
mean and 95% confidence interval in mean



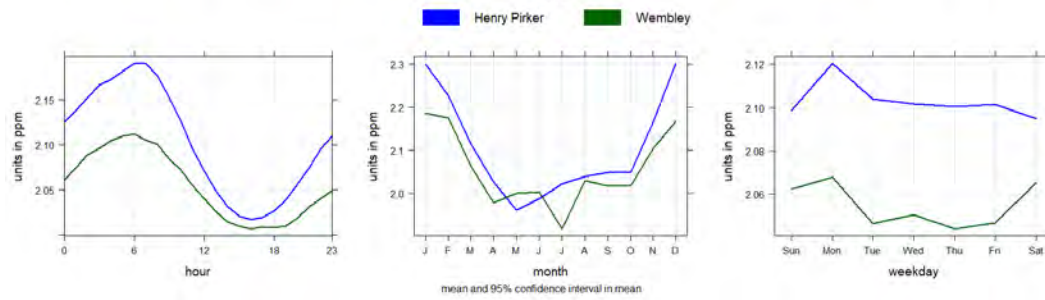
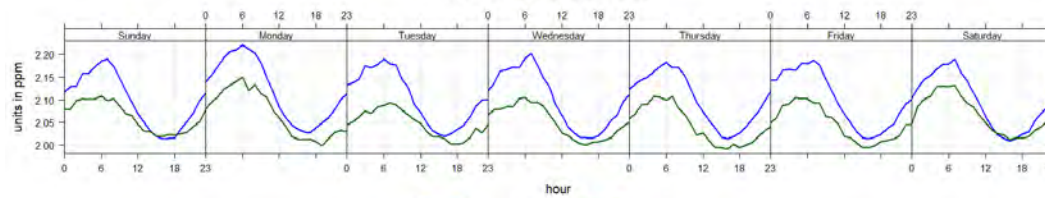
# Total Reduced Sulphur (TRS) Historical Trends



PAZA Monitoring daily average THC (in ppm) for years 2007 to 2020



PAZA THC Profile from 2007 to 2020



2020 THC Levels in AB

