Study of Neighborhood Air near Petroleum Sources (SNAPS) Inglewood Oil Field Communities

Data Analysis Update
Community Meeting
January 22, 2025

Agenda

- ✓ SNAPS Overview
- ✓ Monitoring Overview
- ✓ Preliminary Monitoring Results
- ✓ Risk Assessment Overview
- ✓ Short-Term Health Risk Results
- ✓ Timeline and Next Steps

SNAPS Overview

Study of Neighborhood Air near Petroleum Sources

- Characterize air quality in neighborhoods close to oil and gas extraction facilities

- Assess air quality and potential health impacts from all surrounding sources

Scope

Program Goals

Characterize air quality in communities near oil and gas operations

Identify emission sources, as feasible

Analyze data for **possible health risks**

Major Pollutants

Toxic Air Contaminants (TACs)

Criteria Pollutants
Particulate Matter ($PM_{2.5}$)
Carbon Monoxide (CO), Ozone (O_3)

Volatile Organic Compounds (VOCs)

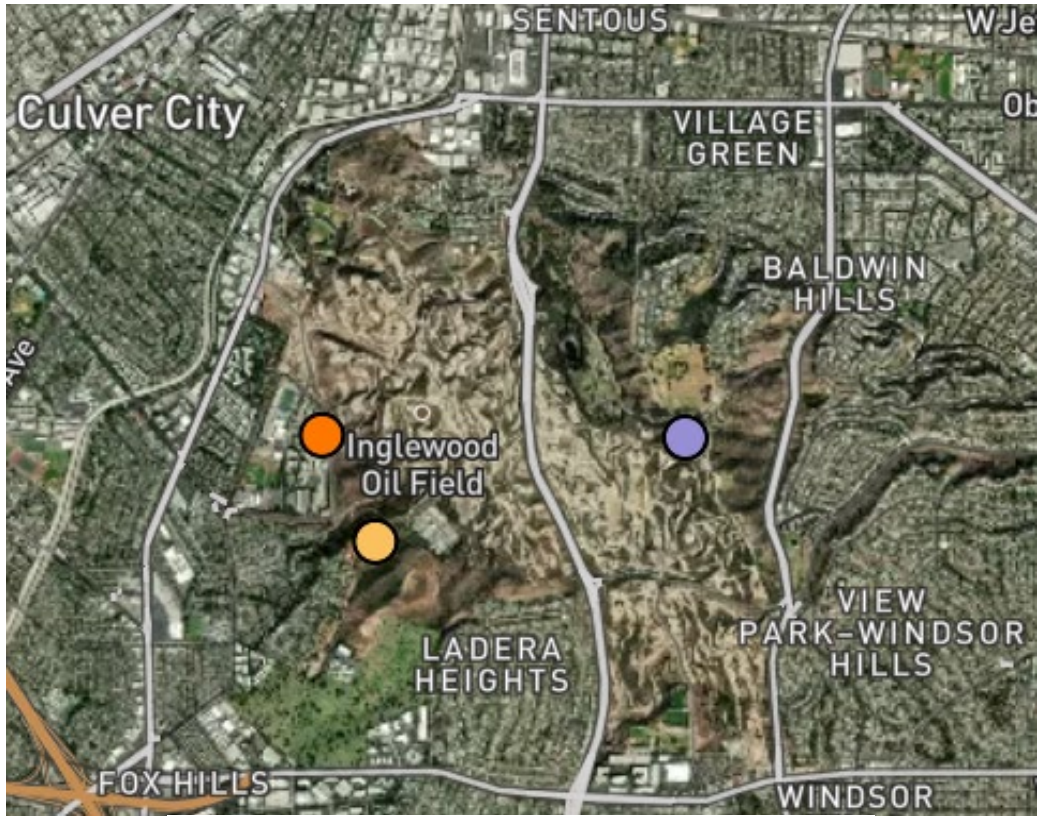
Methane (CH_4)

Hydrogen Sulfide (H_2S)

Metals

Monitoring Overview

Stationary Monitoring

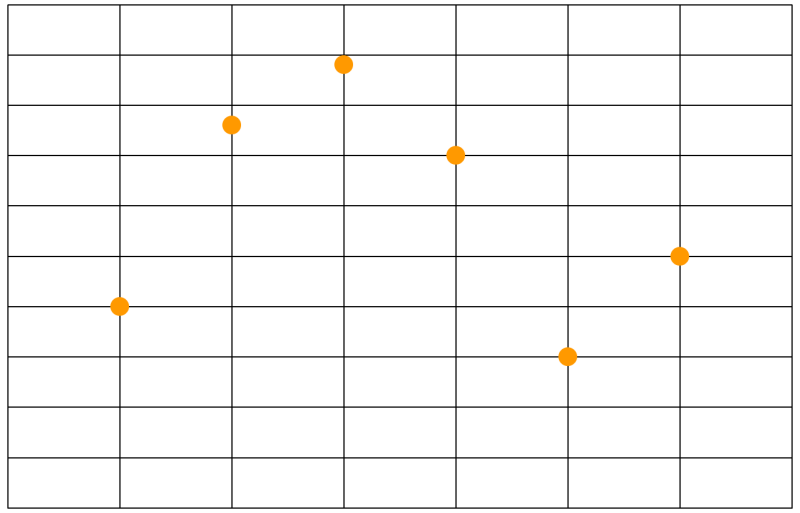


- **Eastern edge of Oil Field (Site 1)**
  - Sentinel Peak Resources (SPR) Site, near Kenneth Hahn State Recreation Area, since June 2023
- **West of Oil Field (Site 2)**
  - Marycrest Manor (MCM) June-August 2023
  - West LA College (WLAC) since January 2024
- **Duration:** 12 months after start at West LA College – monitoring to conclude Q1 2025

Stationary Monitoring: Types of Data

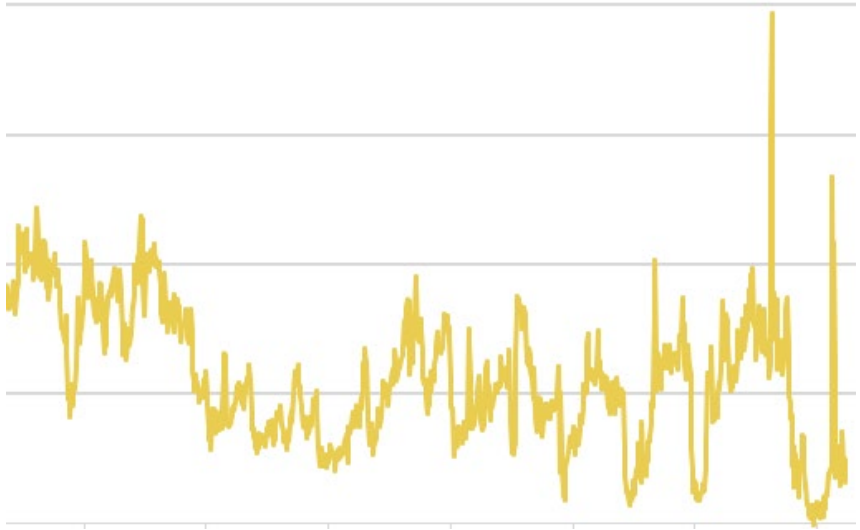
Discrete Data

- 24-hour samples taken every 6 or 12 days
- Requires lab analysis after sample collection
- Compounds include VOCs, metals, aldehydes, and polycyclic aromatic compounds (PAHs)
- Used for comparison against health guidance values



Real-Time Data

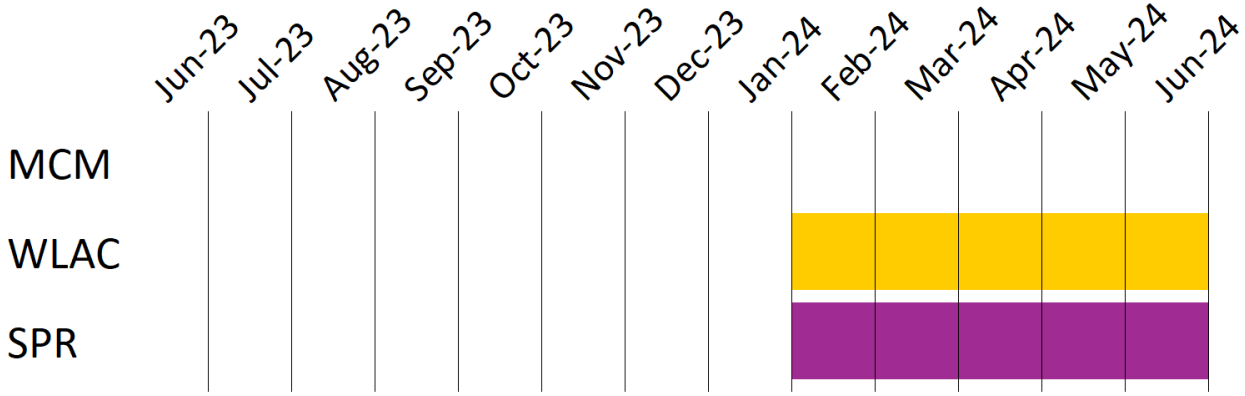
- Samples taken continuously
- Fast response instrumentation
- Compounds include criteria pollutants (CH_4, H_2S, O_3, CO, $PM_{2.5}$, BC), metals, and VOCs
- Used for comparison against National and California Ambient Air Quality Standards



Stationary Monitoring: Types of Data Used in This Update

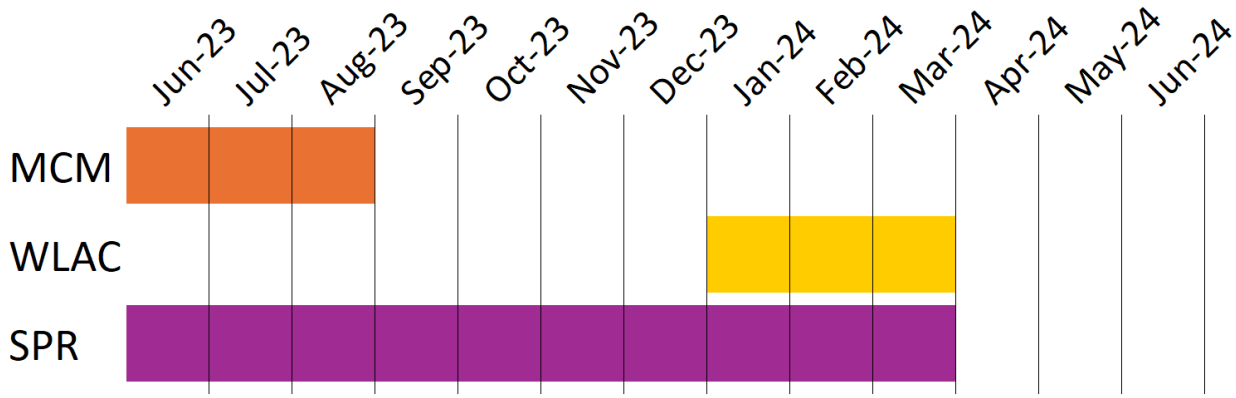
Discrete Data

- Not included on the SNAPS Data Display website in near-real time
  - Lag of several months in data availability due to processing timeframes
- Monitoring time periods **included in this analysis**

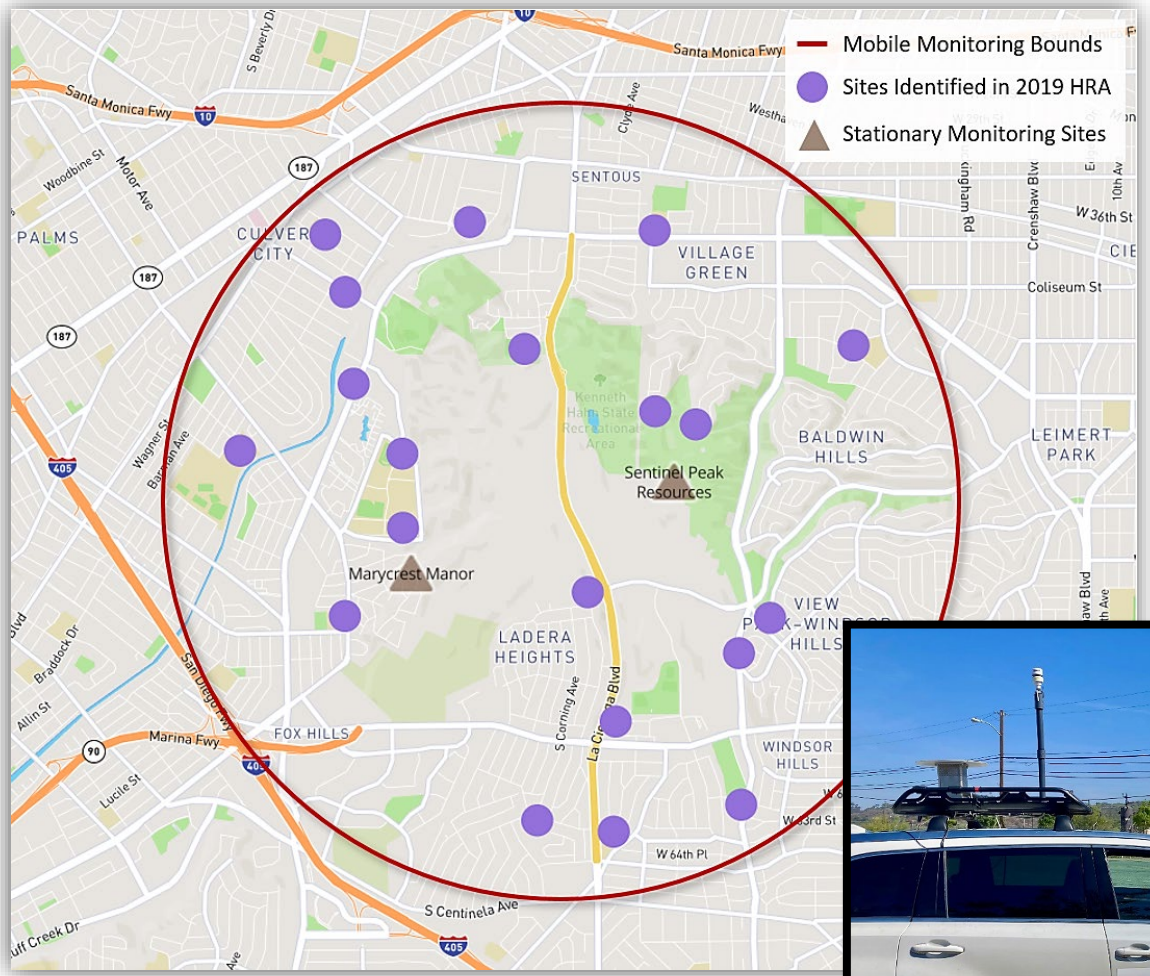


Real-Time Data

- Included on the SNAPS Data Display website in near-real time
  - Minimal lag in data availability
- Monitoring time periods **included in this analysis**



Mobile Monitoring



- Measurements are “snapshots” in time
  - 6 hours/day, 3 days/week, 2 weeks/quarter
  - Variability in time and location
    - Different days of the week
    - Different times of day
    - Multiple passes on streets
    - Community suggestions
  - Included upwind and downwind measurement periods
    - Air pollutants
      - Methane, ethane, black carbon, O_3, and H_2S continuously
      - BTX measurements (15 - 30 min samples, periodically)

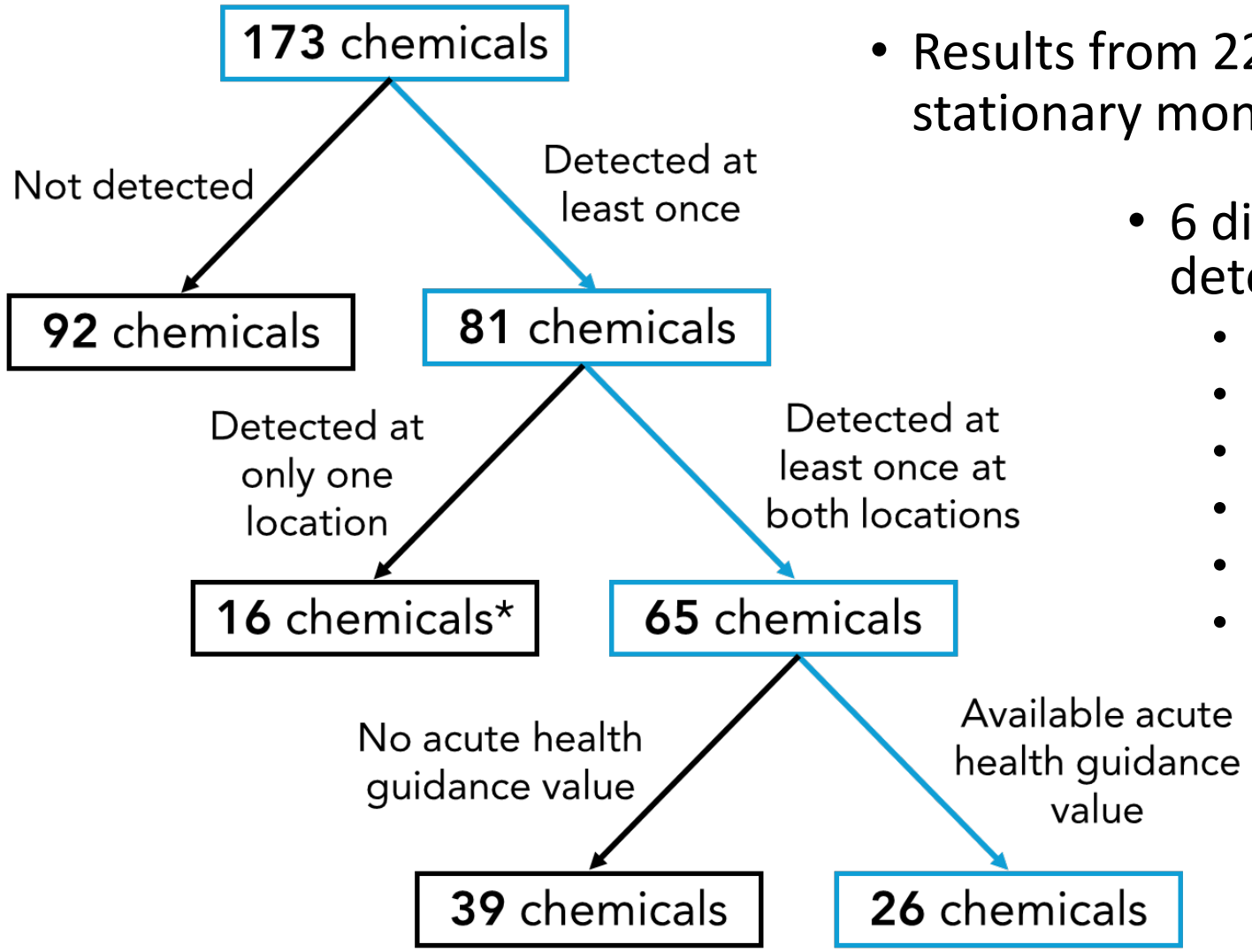
Not in Current Update: Community Sensors

- As recommended by the community, CARB provided a limited number of low-cost sensors for deployment in neighborhoods near the IOF
  - Total VOC sensors
  - Sensors that monitor for BC, PM, CO, NO/NO_2
  - Meteorological sensors

- Data from these sensors will be analyzed in future updates, as feasible

Preliminary Monitoring Results

Discrete Data: Detections



- Results from 22 sampling events at WLAC and SPR stationary monitoring sites (February 2024-June 2024)
  - 6 different chemistry methods used to determine concentrations
    - VOCs
    - Semi-volatile organic compounds (SVOCs)
    - Metals
    - Aldehydes and ketones
    - Sulfur compounds
    - PAHs
  - Will discuss analysis of short-term health risk later in this presentation

Real-Time Data: Metals

Max concentrations of four metals occurred night of July 4, 2023

Barium=Green

Strontium=Red

Potassium=Explosion

Bismuth=Popping Sound

"5 Facts About Fireworks." Department of Energy. 1 July 2019.

Max concentrations of five different metals occurred on February 8, 2024

Antimony

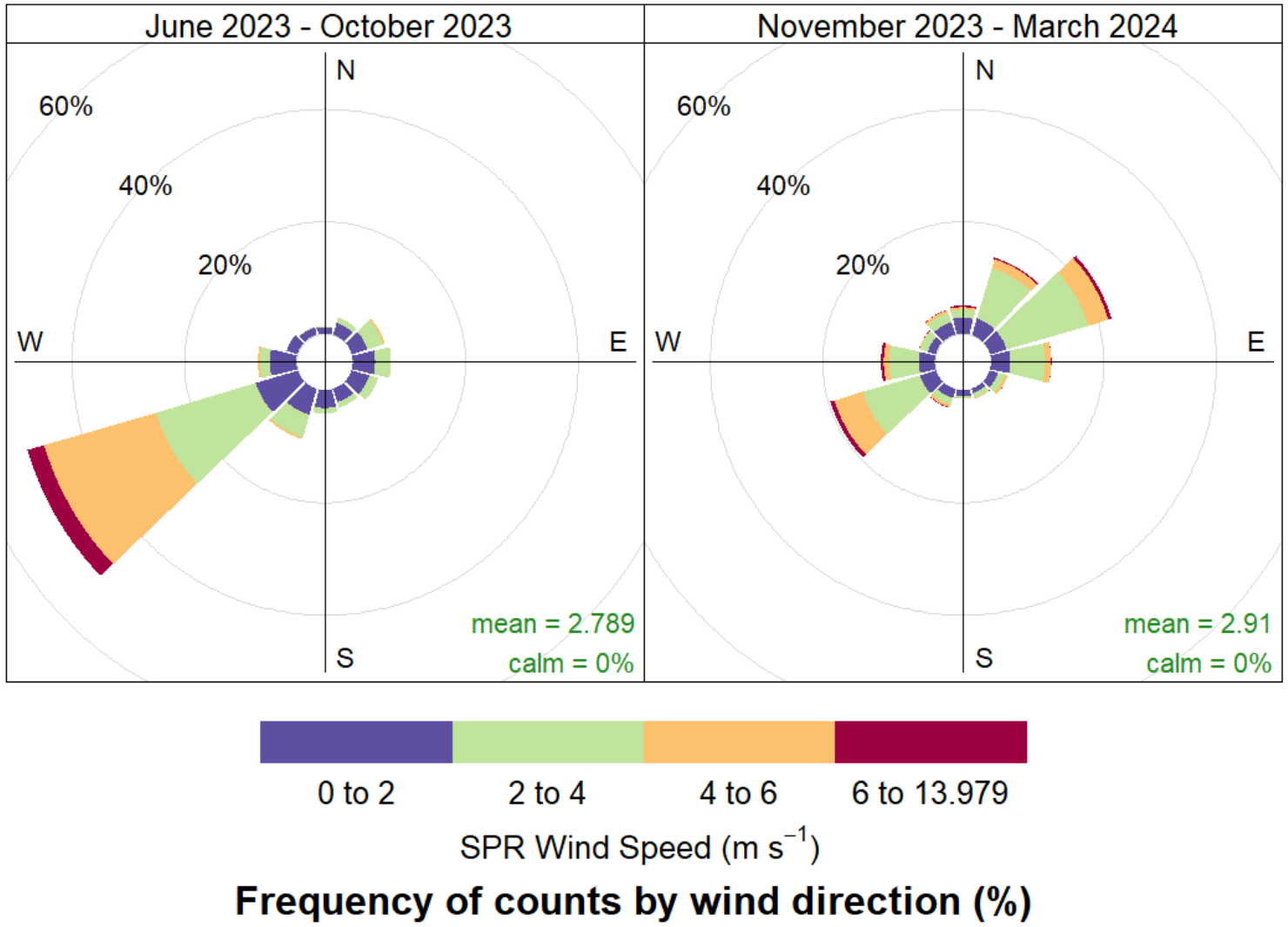
Cadmium

Indium

Silver

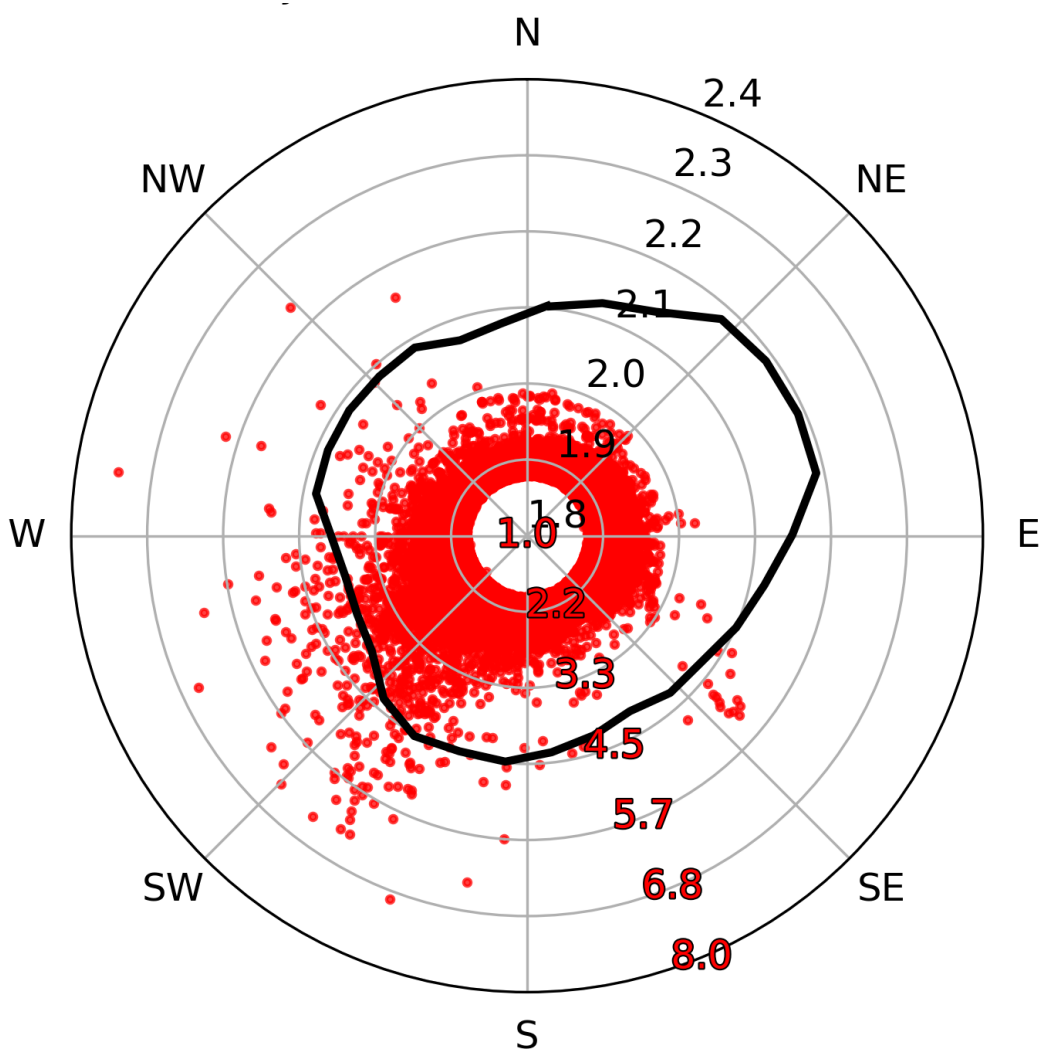
Tin

Real-Time Data: Wind Direction



- 10 months of available monitoring data at SPR (June 2023-March 2024)
- Summer and Early Fall
  - More winds blowing from west-southwest (WSW) towards east-northeast (ENE)
- Late Fall and Winter
  - More winds blowing from ENE towards WSW

Real-Time: Hourly Pollutant Concentrations

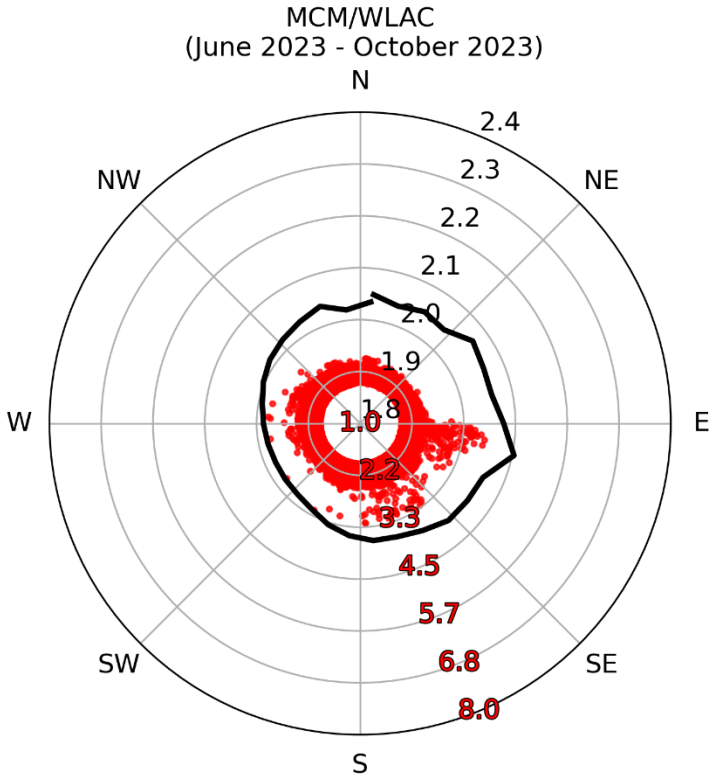


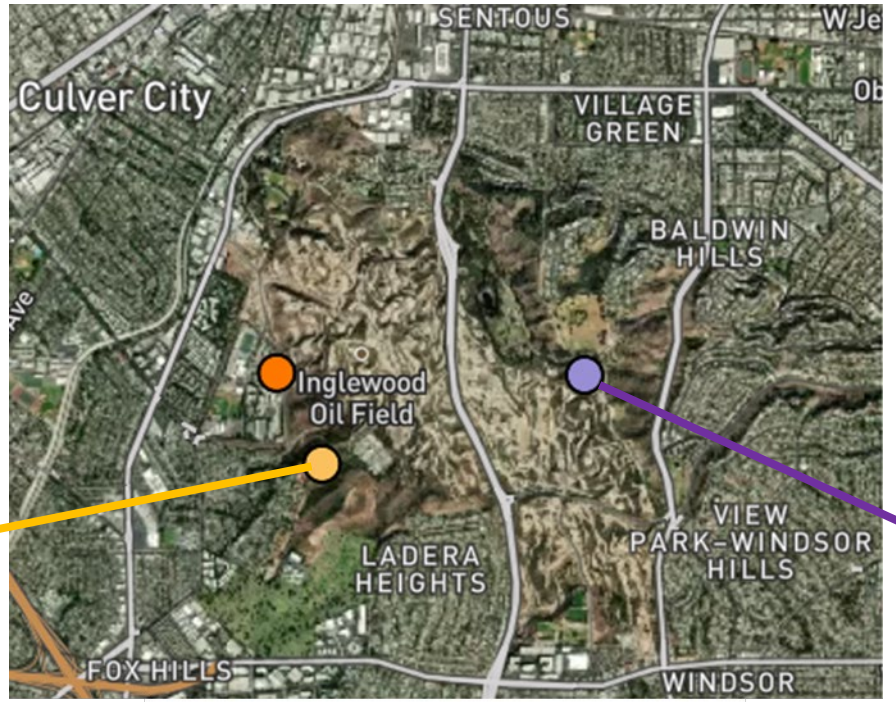
- Outermost circle: wind direction
- Red dots: individual hourly pollutant concentrations in parts per million (ppm). Scale shown in red between S and SE
- Thick black line: average pollutant concentration from each direction, in parts per million (ppm). Scale shown in black between N and NE

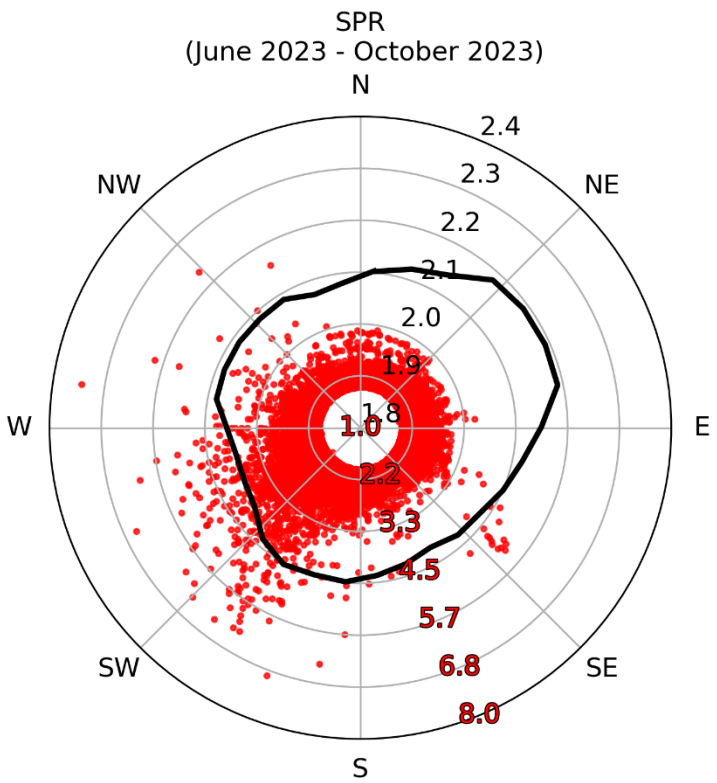
The direction mentioned is the direction that the wind is blowing from (example: data point in the South is blowing from South to North)

The closer to the outer edge of the circle, the higher the pollutant concentration

Methane, June 2023-October 2023



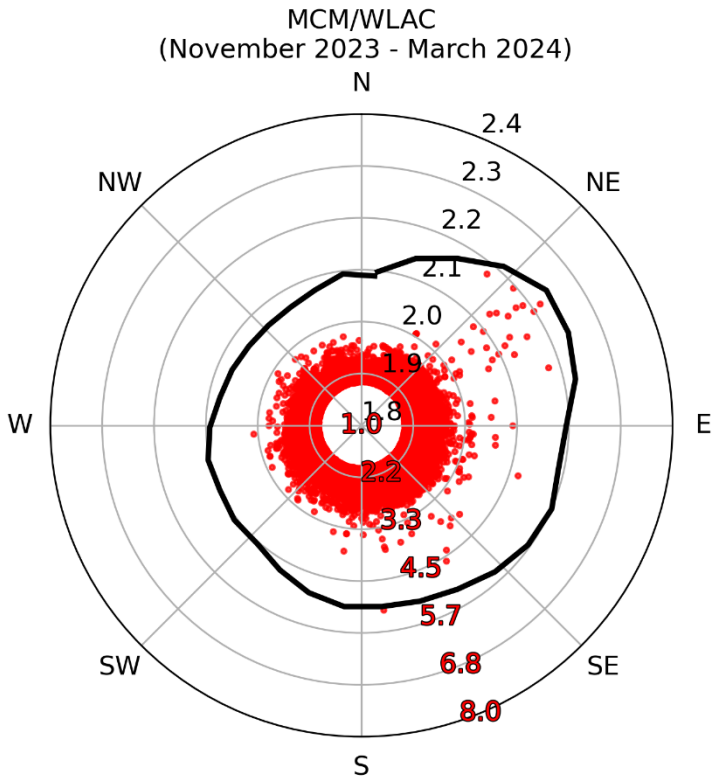


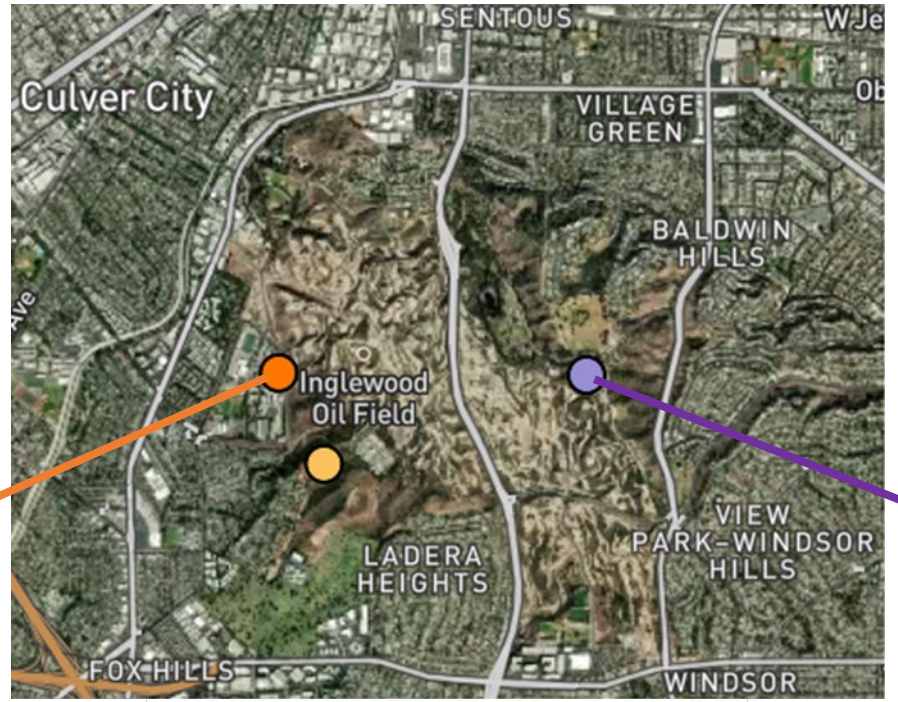


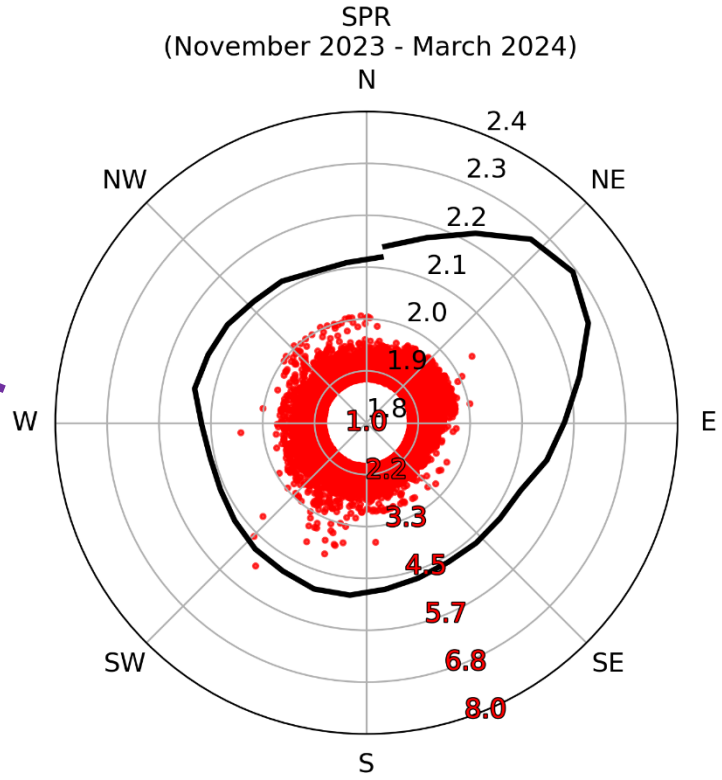
- Highest Hourly: ENE (downwind of IOF)
- Highest Average: ENE (downwind of IOF)

- Highest Hourly: WSW (downwind of IOF)
- Highest Average: ENE (inland)

Methane, November 2023-March 2024



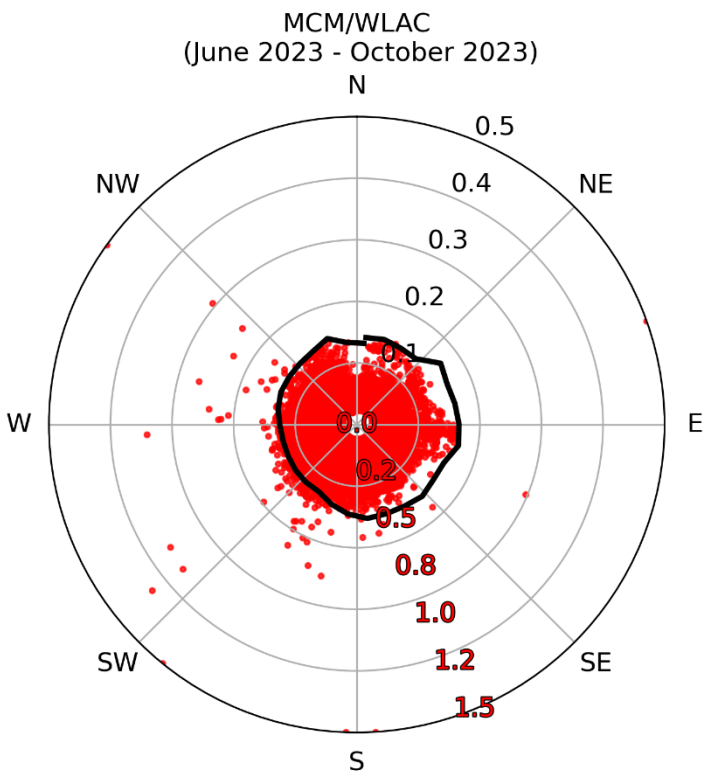


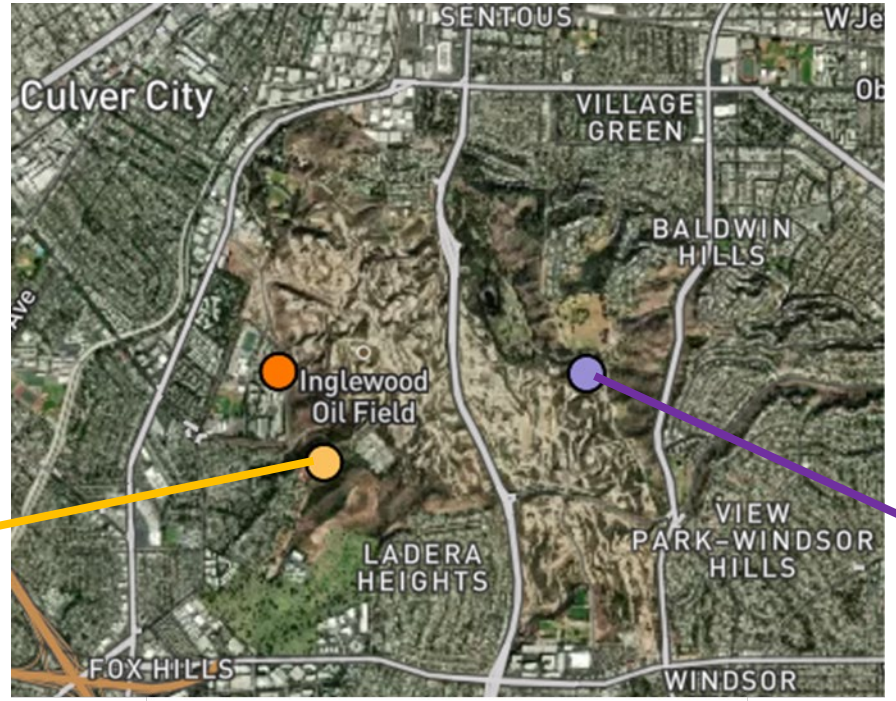


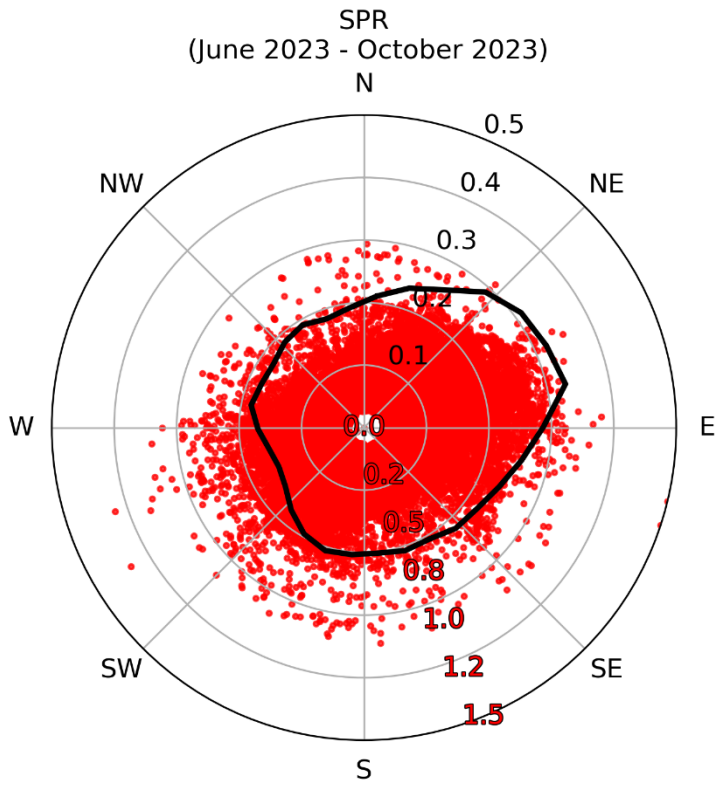
- Highest Hourly: ENE (downwind of IOF)
- Highest Average: ENE (downwind of IOF)

- Highest Hourly: WSW (downwind of IOF)
- Highest Average: ENE (inland)

Carbon Monoxide, June 2023-October 2023



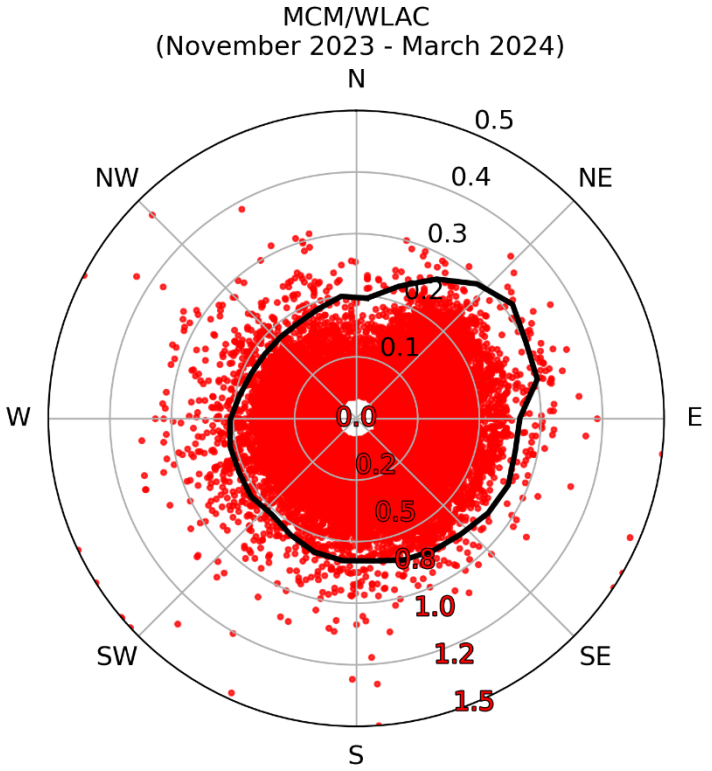


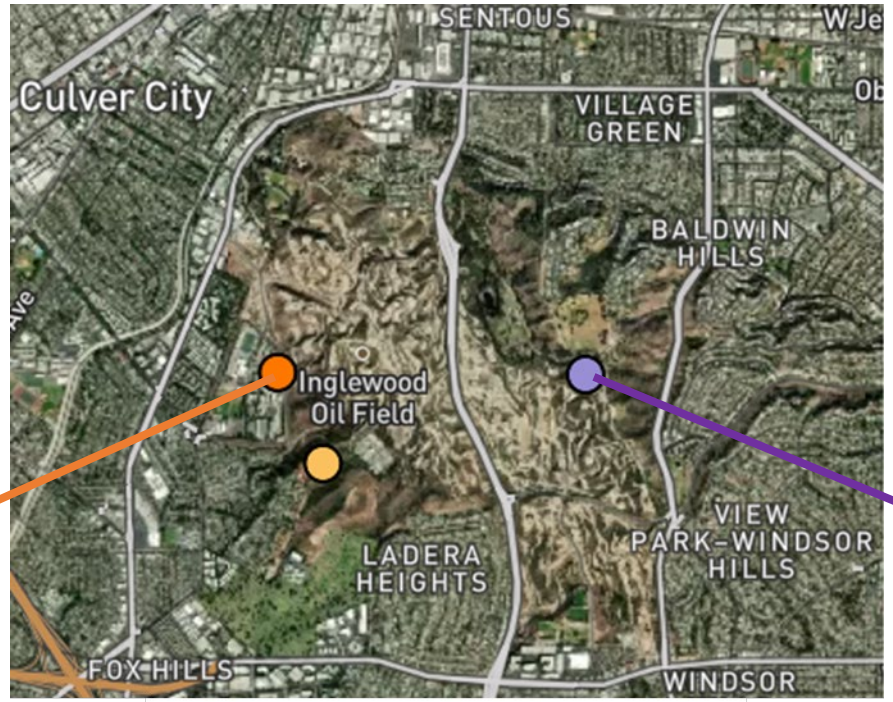


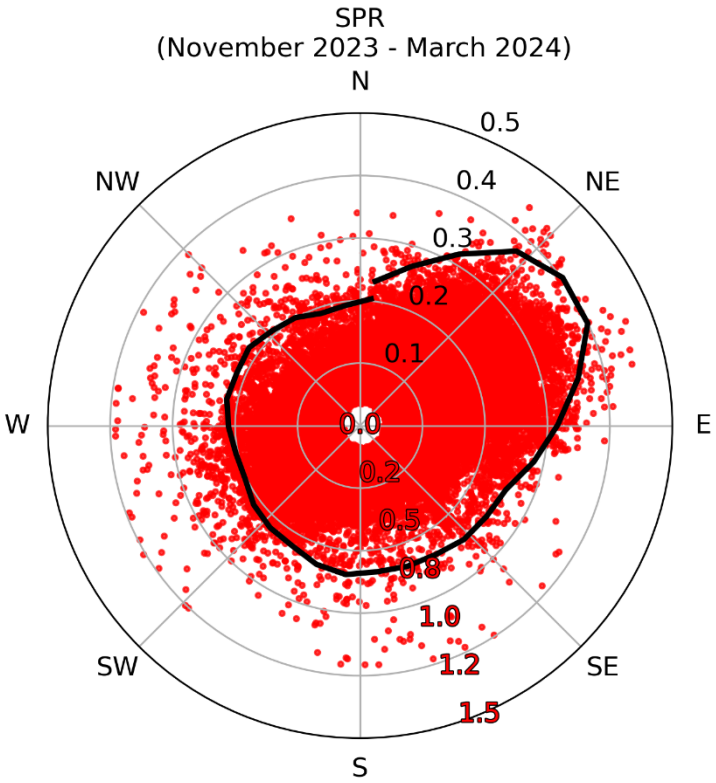
- Highest Hourly: uniform
- Highest Average: uniform

- Highest Hourly: ENE (inland)
- Highest Average: ENE (inland)

Carbon Monoxide, November 2023-March 2024



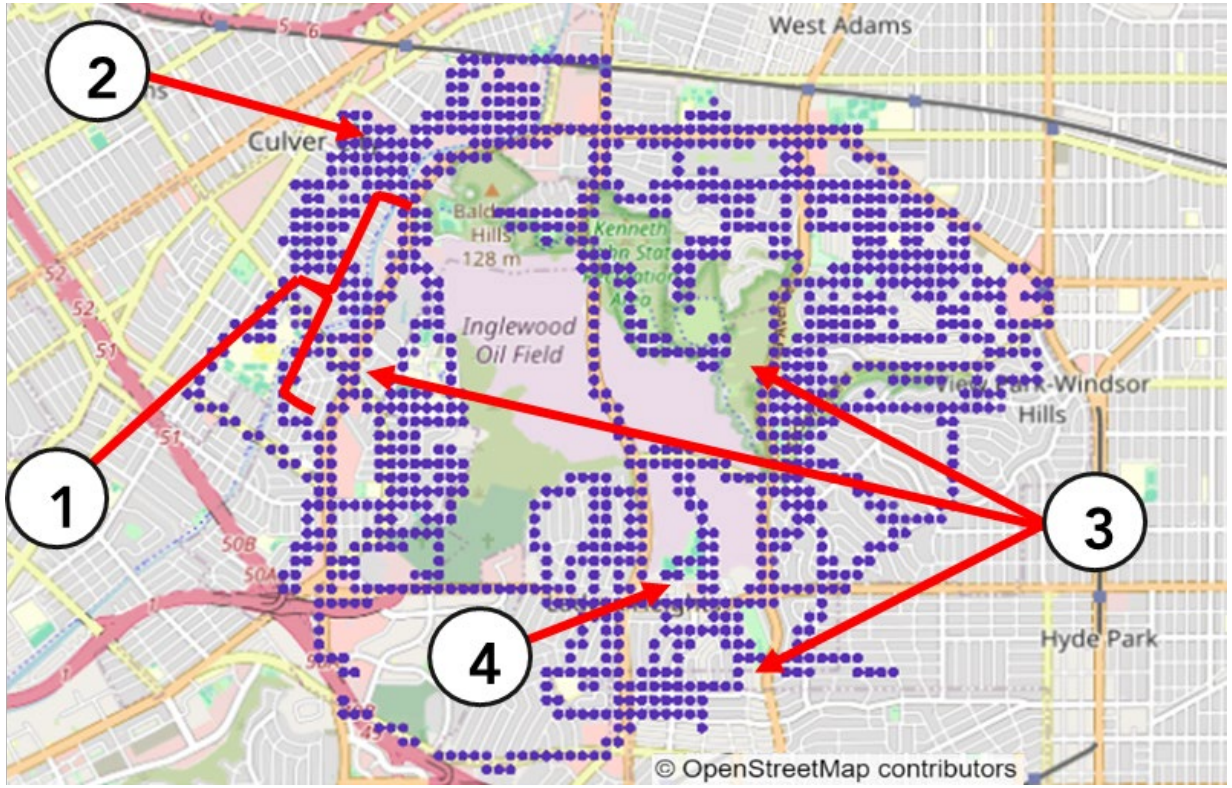




- Highest Hourly: ENE (downwind of IOF)
- Highest Average: ENE (downwind of IOF)

- Highest Hourly: WSW (downwind of IOF)
- Highest Average: ENE (inland)

Mobile Monitoring Results



12 distinct monitoring days total (June 2023, September 2023, January 2024, and May 2024)

1. Ballona Creek emissions
2. Repaired natural gas leak
3. Traffic-related pollutants
4. Community concerns investigation

10-minute break

Health Risk Overview

Types of Risk Assessment

Determining Human Health Risk

Exposure

- Pollutant concentration measured IOF (real-time or discrete)

Toxicity

- Health guidance value for pollutant

Risk

- Hazard quotient

Risk Assessment Methods

$$HQ = \frac{air\ concentration\ \left(\frac{\mu g}{m^3}\right)}{HGV\ \left(\frac{\mu g}{m^3}\right)}$$

HQ: hazard quotient

Air concentration: acute analyses use maximum air concentrations

HGV: health guidance value

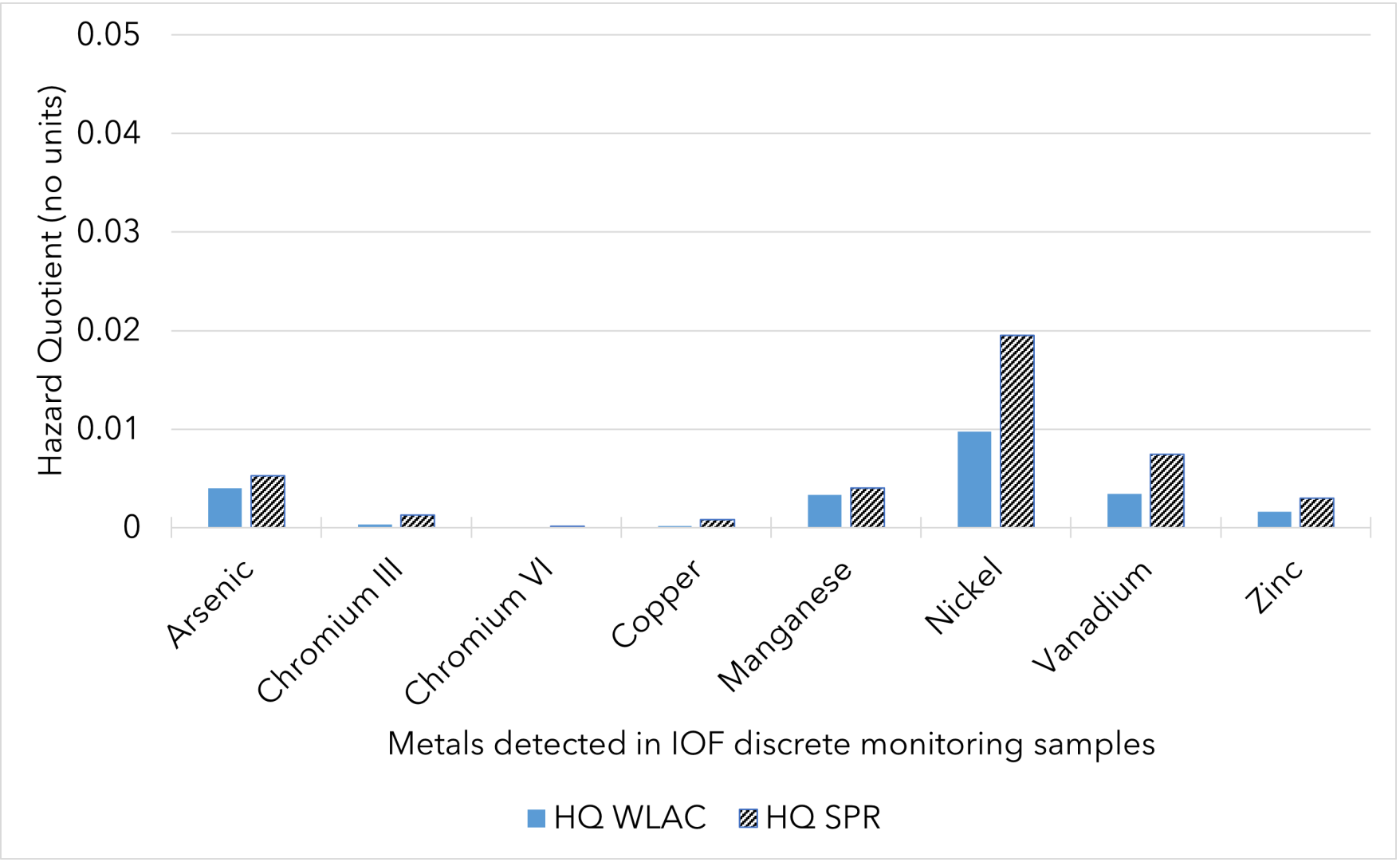
HQ less than or equal to 1 = health effects not expected

Short-Term Health Risk Results

Overview of Health Risk Findings

- Discrete monitoring
  - No acute health risks detected
- Real-time metals monitoring
  - No acute health risks detected
- Criteria air pollutants
  - Below standards
  - Ozone had no days above the standards; levels got close (~98%) to standards at SPR

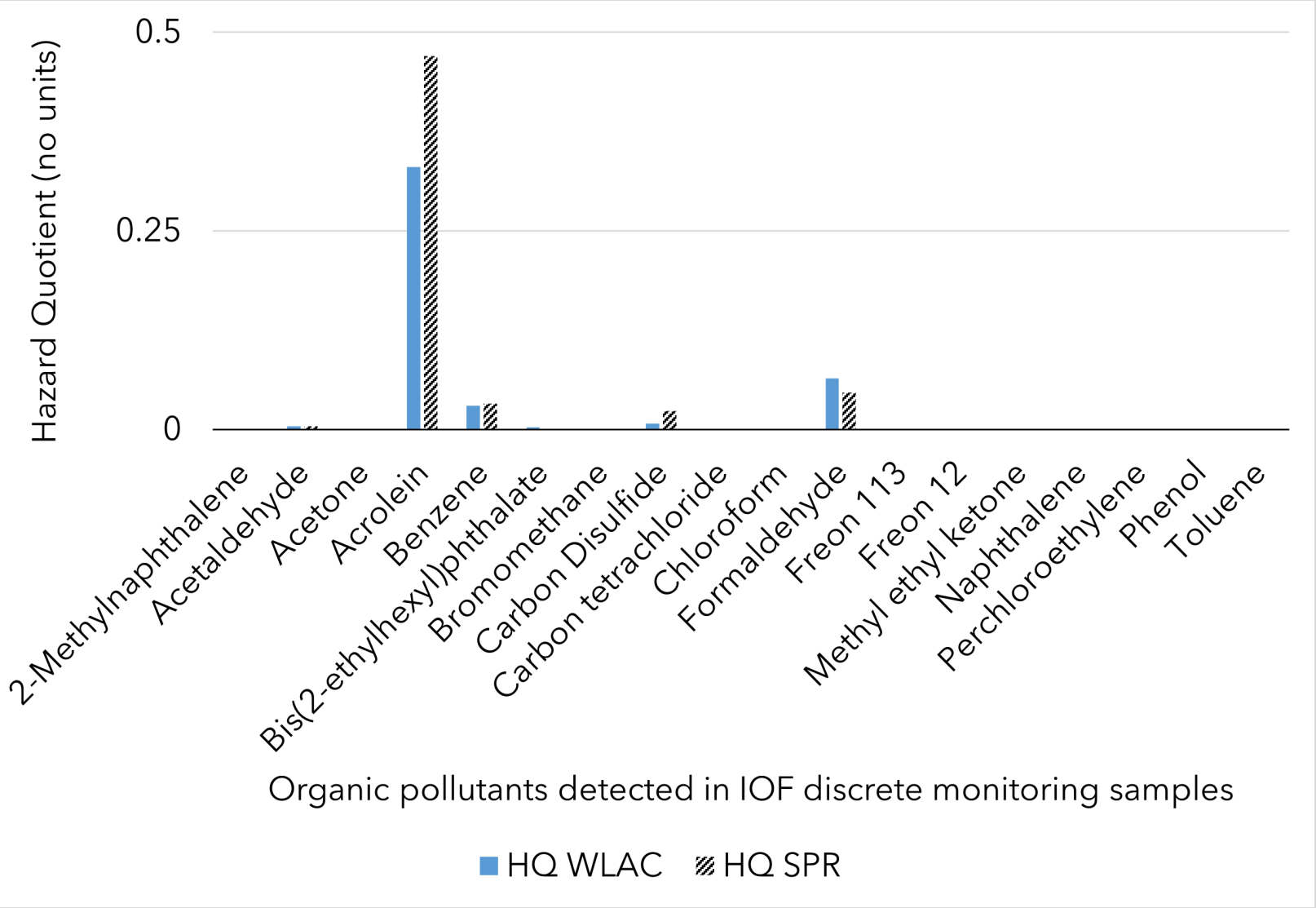
Discrete Monitoring: Risks from Metals



Hazard quotients (HQs) are calculated from the highest recorded measurement

HQs less than 1 indicate no increased risk from short-term exposure

Discrete Monitoring: Risks from Organics



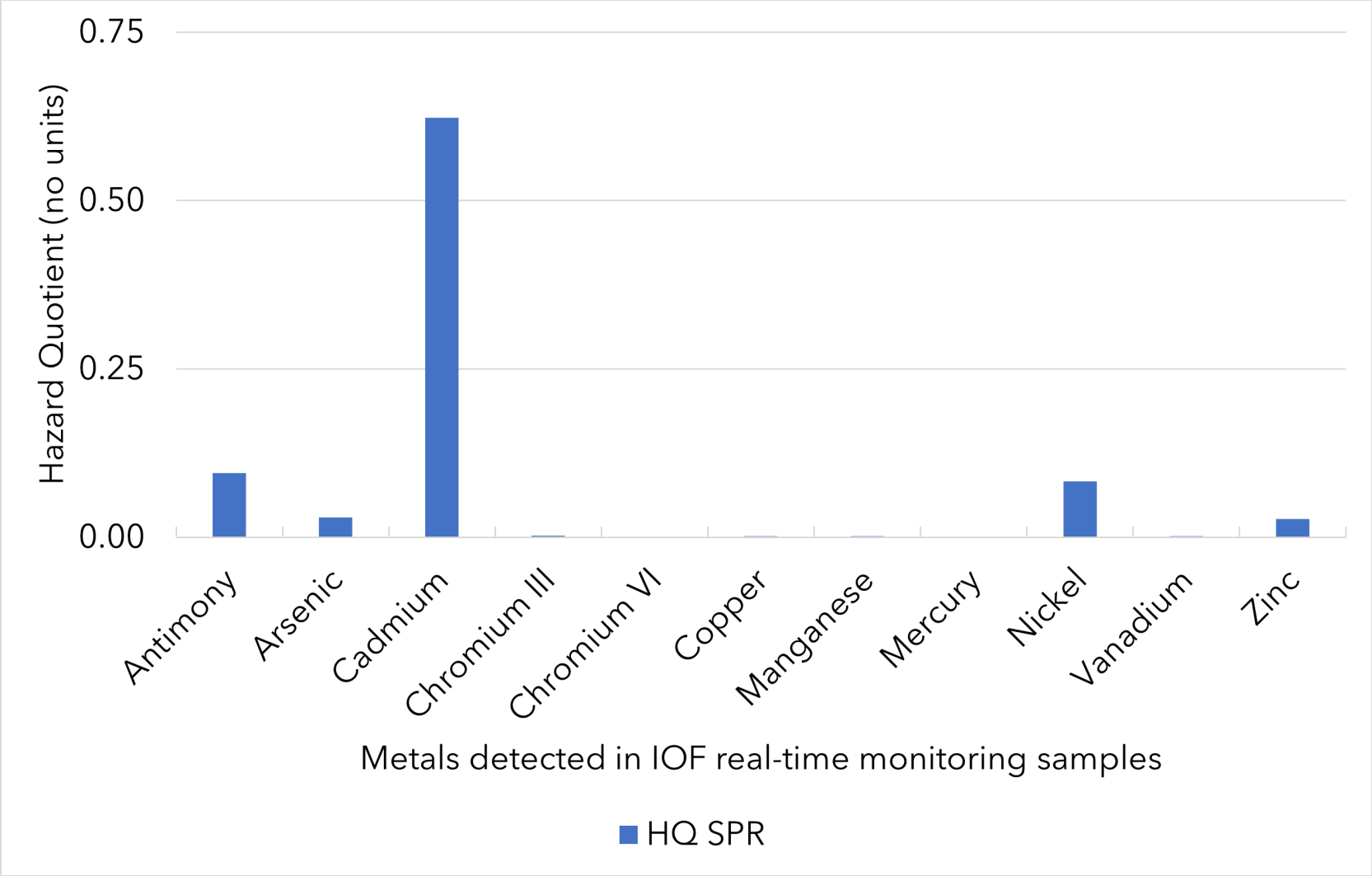
HQs are calculated from the highest recorded measurement

HQs less than 1 indicate no increased risk from short-term exposure

Organics:

- Volatile organic compounds
- Semi-volatile organic compounds
- Polyaromatic hydrocarbons
- Aldehydes

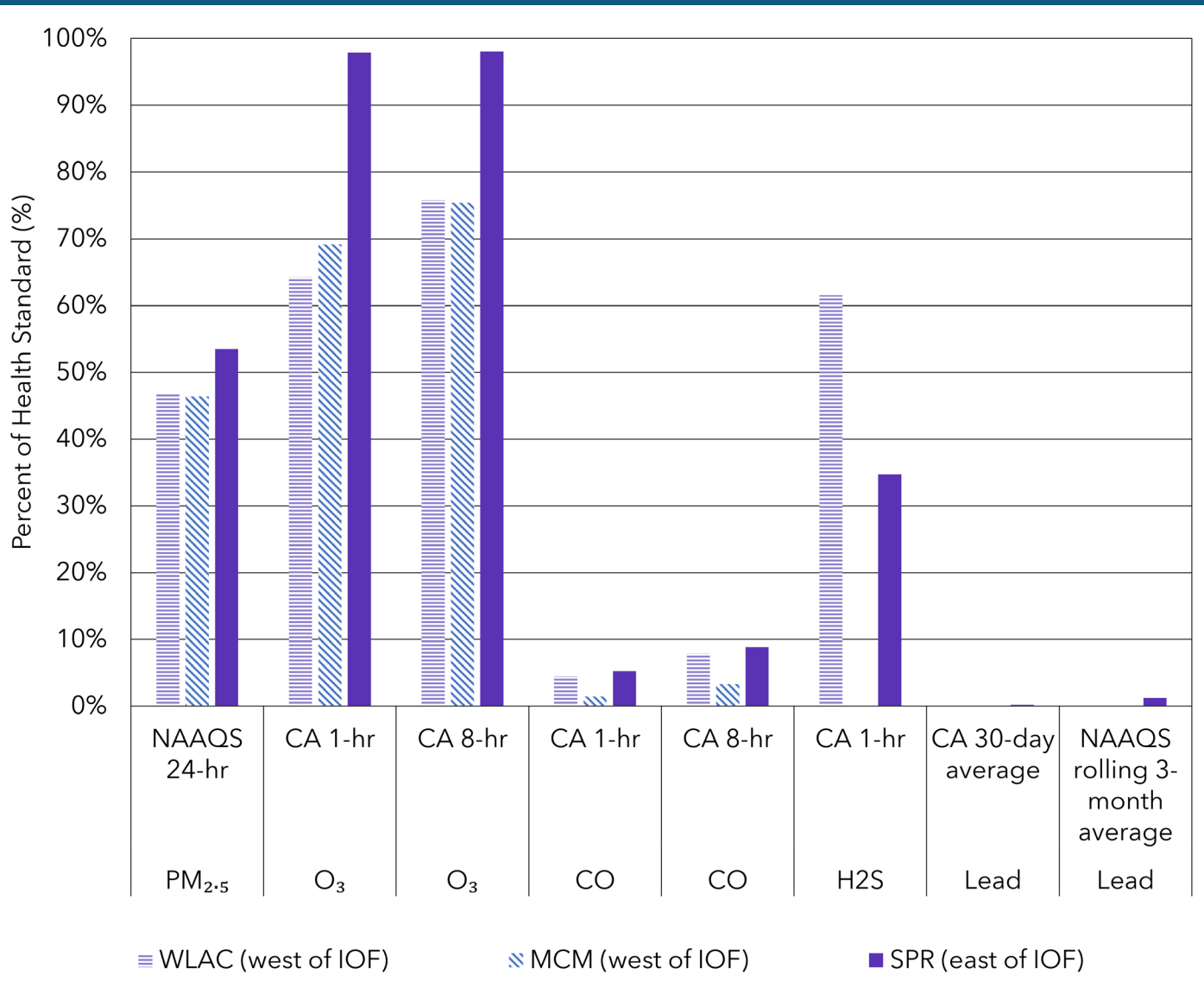
Real-Time Monitoring: Risks from Metals



HQs less than 1 indicate no increased risk from short-term exposure

HQs are calculated from the highest recorded measurement

Criteria Pollutants and Health Standards



Criteria pollutants were below State and Federal Standards

Timeline and Next Steps

Timeline and Next Steps

2019-2022	• Two sets of community meetings • Select and secure monitoring sites • Finalize air monitoring plan with community recommendations
June 2023	• Kickoff meeting • Began stationary monitoring at MCM and SPR sites
Fall 2023	• MCM equipment moved to WLAC • SPR equipment stayed at SPR
2024	• Posted first data analysis update • Deployed community sensors • Collected stationary and mobile monitoring data
Jan-Feb 2025	• Post second mid-monitoring data update • Hold community meeting • Conclude SNAPS monitoring near IOF
On-going	• Continue discussions with IOF communities • Conduct data analysis and source apportionment analysis • Conduct health risk assessment
TBD	• Release draft cumulative analysis for public comment • Community meeting to discuss draft cumulative analysis

Future Data Analysis (CARB)

- Further air quality data analysis will include:
  - Hourly, daily, monthly, seasonal trends in air pollutant concentrations
  - Statistics (e.g., average, maximum concentrations)
  - Case studies, as appropriate
  - Comparisons to regional data
  - Source apportionment - are pollutants likely originating from oil and gas-related sources? Mobile sources? Other sources?

Future Data Analysis (OEHHA)

- Health Risk Assessment will:
  - Continue assessing acute non-cancer risk
  - Continue comparison of air pollutant concentrations to air quality standards
  - Compare long-term exposure to health-based guidance values
    - Chronic noncancer health guidance values
    - Cancer risk assessment
  - Calculate cumulative risk from multiple chemicals

Resources and Contact Information

- Project webpage: https://ww2.arb.ca.gov/our-work/programs/study-neighborhood-air-near-petroleum-sources
- Visit project webpage to Subscribe and receive email updates
- Comments or questions:
  SNAPS@arb.ca.gov | (279) 208-7687

Scan QR code for SNAPS webpage

Questions?

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