Roaming Air Monitoring Vehicle
Kitimat, B.C., Deployment Report

May to August 2026



BCER
BRITISH COLUMBIA **ENERGY REGULATOR**

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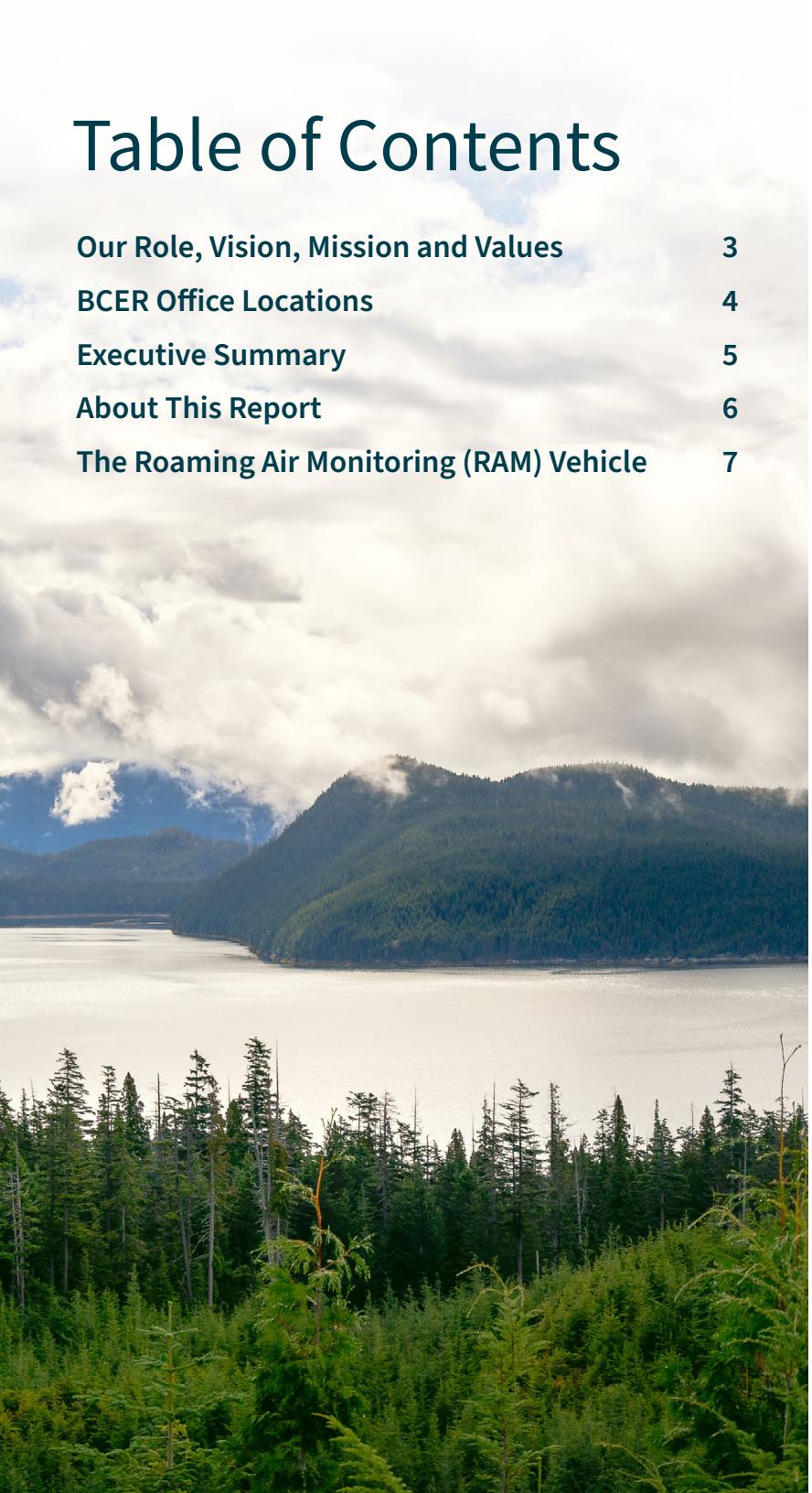
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Our Role

The British Columbia Energy Regulator (BCER) oversees the full life cycle of energy resource activities in B.C., from site planning to final restoration. Our role includes the regulation of natural gas, oil, hydrogen, ammonia, methanol and renewable energy sources such as geothermal, solar and wind power.

Our authority is established by way of the Energy Resource Activities Act (ERAA) and additional legislation related to heritage conservation, roads, land and water use, forestry and other natural resources. We work to ensure industry compliance with provincial legislation to protect public safety and the environment, support reconciliation with Indigenous peoples, conserve energy resources and foster a sound economy and social well-being.

With over 25 years' dedicated service, we're committed to ensuring safe and responsible energy resource management for British Columbia.

Vision



Mission

We regulate the life cycle of energy resource activities in B.C., from site planning to restoration, ensuring activities are undertaken in a manner that:

- Protects public safety and the environment
- Supports reconciliation with Indigenous peoples and the transition to low-carbon energy
- Conserves energy resources
- Fosters a sound economy and social well-being

Values

Respect is our commitment to listen, accept and value diverse perspectives.

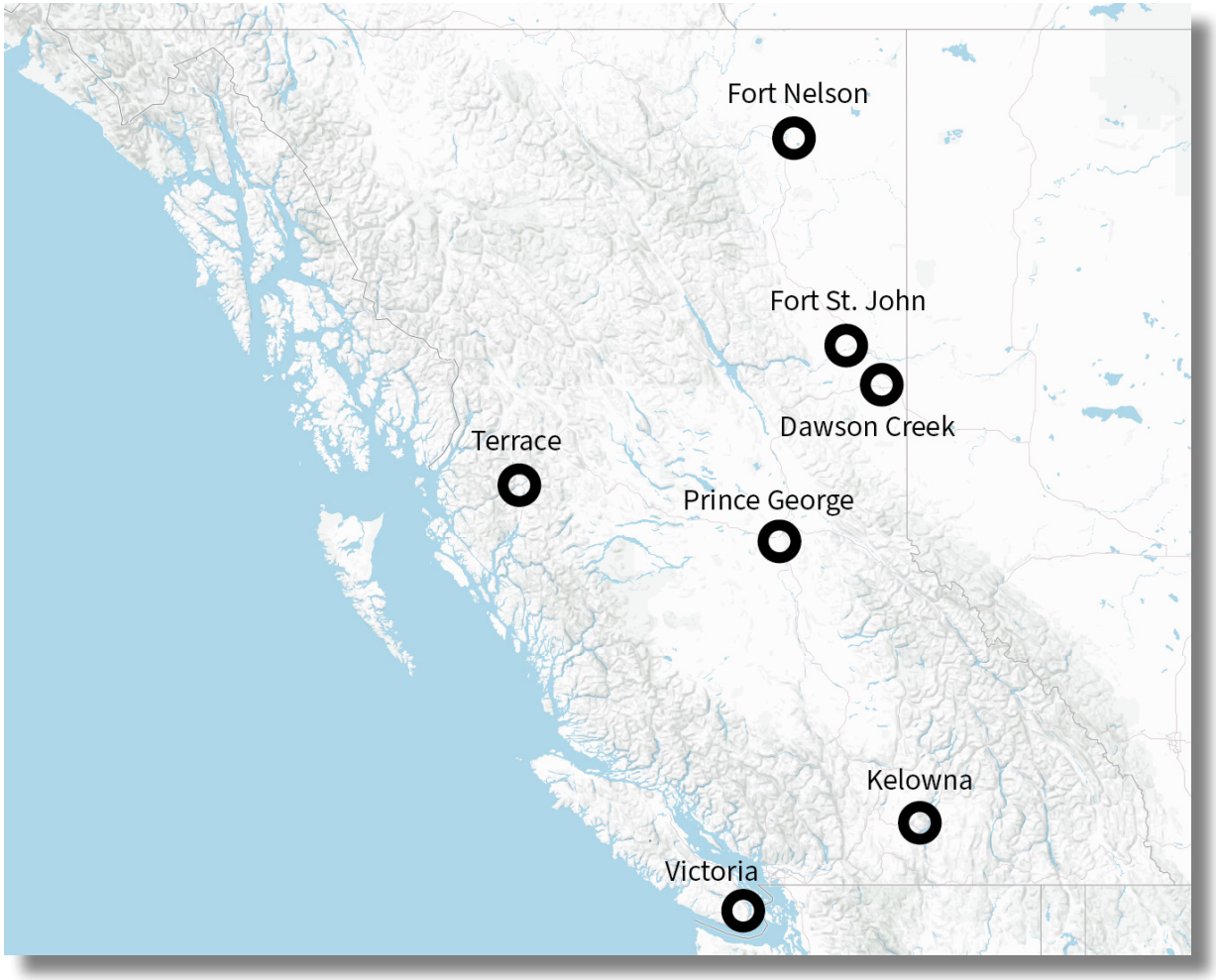
Integrity is our commitment to the principles of fairness, trust and accountability.

Transparency is our commitment to be open and provide clear information on decisions, operations and actions.

Innovation is our commitment to learn, adapt, act and grow.

Responsiveness is our commitment to listening and timely and meaningful action.

BC Energy Regulator Office Locations Throughout B.C.



Our employees work out of seven locations to ensure our presence near energy resource activities: Fort Nelson, Fort St. John, Dawson Creek, Terrace, Prince George, Kelowna and Victoria.

We acknowledge and respect the many First Nations, each with unique cultures, languages, legal traditions and relationships to the land and water, on whose territories the BCER's work spans.

Executive Summary

As part of the BC Energy Regulator's (BCER's) ongoing oversight of LNG Canada's facility in Kitimat, our Roaming Air Monitor (RAM) collected air quality measurements at locations throughout the Kitimat Valley from May 27 to Aug. 27, 2026. No sustained or widespread air quality concerns were indicated in the measurements gathered during the deployment period.

Measured concentrations of key pollutants were below the numerical values associated with applicable B.C. air quality objectives or reference criteria during the deployment. This indicates good overall air quality during the deployment with respect to the pollutants measured by the RAM.

The RAM measures ambient air. This means the results reflect the combined influence of all emission sources and background conditions in the area, rather than emissions from any single source or facility.

The RAM measured a broad range of pollutants and indicators relevant to industrial and combustion emissions and general air quality, including nitrogen dioxide (NO_2), sulphur dioxide (SO_2), ozone (O_3), carbon monoxide (CO), particulate matter (PM), hydrogen sulphide (H_2S), methane (CH_4), total non-methane hydrocarbons (NMHC) and focused individual hydrocarbons such as benzene, toluene, ethylbenzene, and xylene (BTEX).

Many B.C. air quality objectives are based on annual or multi-year statistical calculations; the approximately three-month deployment is not sufficient to determine formal achievement of those objectives. Ongoing monitoring in the region takes place through a network of fixed air monitoring stations.

For pollutants also measured by Kitimat's fixed ambient air quality monitoring network, the RAM results were consistent with the broader monitoring record. Community air quality monitoring in Kitimat also showed concentrations of key pollutants within the applicable B.C. Ambient Air Quality Objectives during this period.

Short-term elevated measurements of fine particulate matter were observed during the RAM deployment, consistent with and likely influenced by wildfire smoke.

For BTEX compounds, which do not have individual B.C. Ambient Air Quality Objectives, all valid one-hour average concentrations measured during the deployment were below the corresponding Alberta Ambient Air Quality Objectives.

About This Report

Overview

This report presents air quality measurements recorded by the BCER's RAM Vehicle between May 27 and Aug. 27, 2026. The dataset comprises 26,605 five-minute observations of gaseous pollutants, particulate mass, meteorological parameters, GPS position and vehicle speed, spanning approximately 92 continuous days with no missing intervals.

This dataset captures a long-duration deployment in which the station spent most of its time stationary at a small number of fixed locations, punctuated by brief relocation trips between sites. Pollutant records were classified as "moving" when the five-minute file's GPS-derived vehicle speed exceeded 2 km/h, and "stationary" otherwise. Only 433 of 26,605 records (1.6 per cent) were classified as moving, totalling 36.1 hours of transit time across 140 relocation trips; the remaining 98.4 per cent of the record represents in-place monitoring.

Stationary fixes in the one-minute track were grouped into discrete monitoring locations with a 100-metre radius, so that any fixes within 100 metres of one another are treated as a single location. This resolved 17 locations with at least one hour of cumulative dwell time.

All time-series graphs in this report (Section 4) are provided at both the native five-minute resolution and as one-hour averages, with stationary and moving records plotted in different colours (blue for stationary, orange for moving) so that transit periods can be visually distinguished from in-place measurements.

All 13 analyzer channels (O_3, NO, NO_2, NOx, CO, SO_2, H_2S, CH_4, NMHC, benzene, toluene, ethylbenzene, xylene) and BTEX total were excluded from July 14, 2026 07:00 to 10:00 due to an instrument calibration during that window. See Section 5: Key Observations.

The Roaming Air Monitoring (RAM) Vehicle

The RAM is a specially designed van housing equipment for monitoring air pollutants that could be associated with resource development. It is capable of recording air quality levels while being driven or parked. It serves as a quick response unit for emergencies. However, it can also be used for other ambient monitoring deployments when it is not in emergency service.

What Can RAM Measure?

RAM measures the following pollutants and atmospheric conditions:

Air Pollutants

- Nitrogen dioxide (NO_2)
- Sulphur dioxide (SO_2)
- Ozone (O_3)
- Carbon monoxide (CO)
- Particulate matter (PM)
- Hydrogen sulphide (H_2S)
- Methane (CH_4)
- Non-methane hydrocarbons (NMHC)
- Benzene, toluene, ethylbenzene and xylene (BTEX).

Atmospheric Conditions

- Temperature
- Wind speed and direction
- Humidity



Section 1: Station and Equipment

RAM Deployment

Information on the RAM deployment is summarized in the following table.

Parameter	Detail
Station ID	RAM (mobile station).
Monitoring Period	May 27, 2026 00:00 to Aug. 27, 2026 09:00.
Duration	92 days, 9 hours (26,605 five-minute records, no gaps).
GPS Track Resolution	One-minute fixes (132,496 records) used for location identification and mapping; five-minute fixes used to tag pollutant records.
Vehicle-state Classification	Stationary vs. moving, based on GPS speed > 2 km/h (five-minute data).
Moving/Transit Records	433 records (1.6 per cent) — 36.1 hours across 140 discrete trips.
Latitude Range	53.939°N to 54.518°N.
Longitude Range	128.727°W to 128.518°W.
Parameters Measured	O_3, NO, NO_2, NOx, CO, SO_2, H_2S, CH_4, NMHC, benzene, toluene, ethylbenzene, xylene (BTEX), neph450 particulate mass, wind speed/direction, vehicle speed/heading, GPS, air/internal temperature, barometric pressure, relative humidity.
BTEX Data Availability	17,002 of 26,605 records (approximately 64 per cent); BTEX analyzer data ends Aug. 26, 2026 (later gap between late July and late August at reduced coverage — see Section 3, Summary Statistics).

Section 2: Stationary Monitoring Locations

2.1: Identified Locations (≥ One Hour Dwell Time)

One location (S1) dominates the record, accounting for 2,037.2 hours (84.9 days, 91.9 per cent of the entire monitoring period) and is best interpreted as the station's home/base position. The remaining 16 locations were visited for shorter, spot-check-style deployments ranging from about one hour to 22 hours of cumulative time, in some cases across multiple separate visits over the three-month period.

Site	Latitude	Longitude	GPS fixes (1 min)	Hours	Visits	First Seen	Last Seen
S1	54.05644	-128.66958	122,234	2,037.2	44	2026-05-27 00:00	2026-08-27 09:00
S2	54.05211	-128.64947	1,317	21.9	13	2026-06-20 17:14	2026-08-12 17:19
S3	53.99193	-128.69626	1,238	20.6	10	2026-06-09 07:51	2026-08-13 11:18
S4	54.06920	-128.63511	919	15.3	7	2026-05-27 07:58	2026-08-11 15:04
S5	54.05573	-128.64819	817	13.6	7	2026-05-28 09:57	2026-08-13 13:16
S6	54.05905	-128.68867	741	12.3	7	2026-05-28 14:51	2026-07-09 09:13
S7	54.05261	-128.60856	569	9.5	9	2026-05-27 09:55	2026-08-12 18:16
S8	53.97443	-128.63987	464	7.7	5	2026-05-27 13:53	2026-08-12 11:24
S9	54.03125	-128.68792	387	6.5	5	2026-06-22 17:41	2026-08-12 13:10
S10	54.04893	-128.68840	386	6.4	4	2026-06-11 15:32	2026-08-13 20:06
S11	54.04808	-128.68942	261	4.3	1	2026-07-28 13:38	2026-07-28 17:59
S12	54.05446	-128.65385	162	2.7	33	2026-05-28 09:51	2026-08-13 18:50

Stationary Monitoring Locations, continued

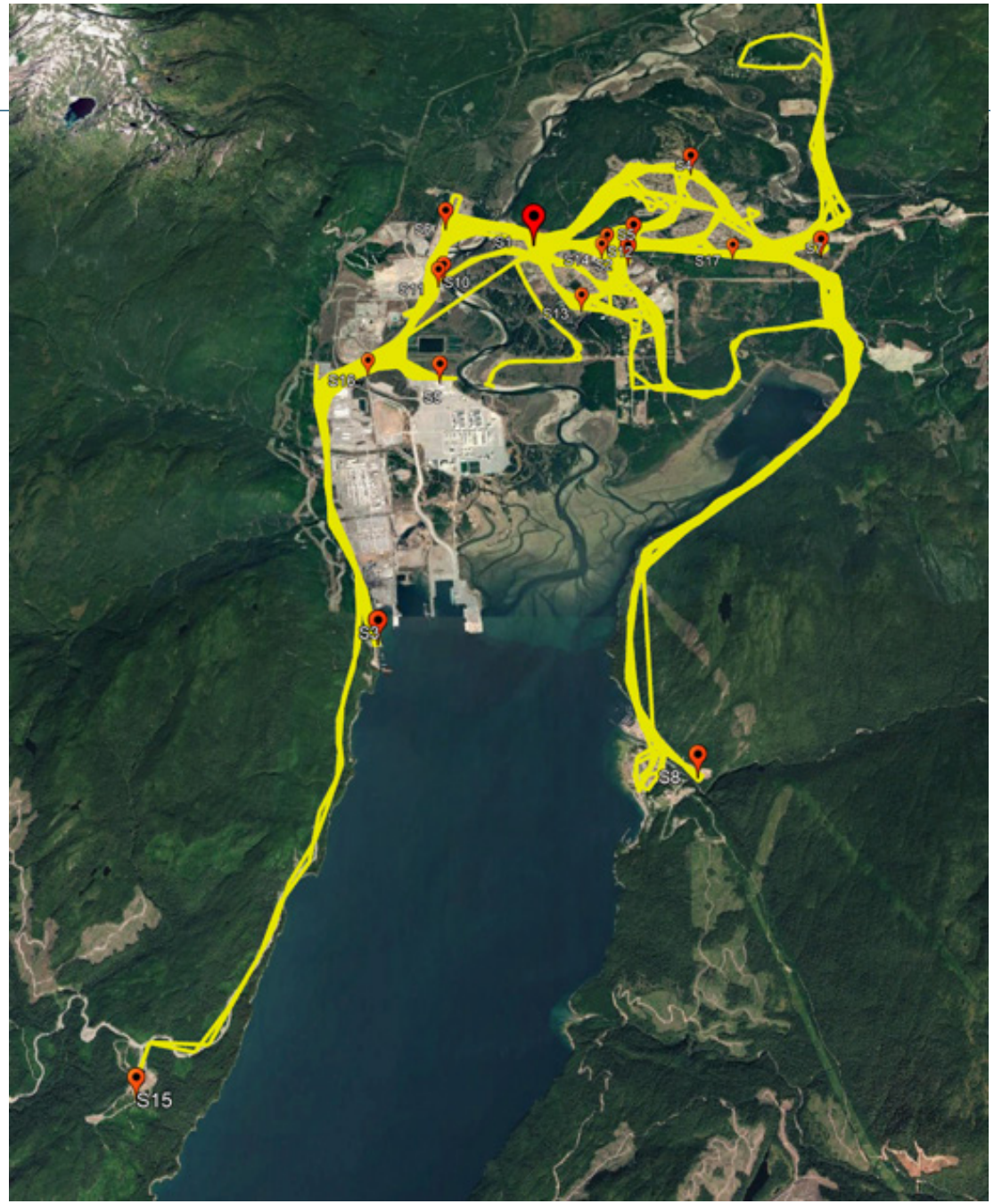
Identified Locations (≥ One Hour Dwell Time), continued

Site	Latitude	Longitude	GPS fixes (1 min)	Hours	Visits	First Seen	Last Seen
S13	54.04359	-128.65935	148	2.5	2	2026-06-09 09:45	2026-07-30 16:11
S14	54.03217	-128.70249	79	1.3	1	2026-07-28 11:50	2026-07-28 13:08
S15	54.05214	-128.62730	77	1.3	1	2026-07-09 14:36	2026-07-09 15:52
S16	54.05304	-128.65503	76	1.3	9	2026-06-21 12:32	2026-08-11 17:34
S17	53.93909	-128.72710	74	1.2	1	2026-06-21 09:44	2026-06-21 10:59

Note: "GPS fixes" counts one-minute track points at that location. "Visits" counts separate trips to that location, merging any gaps under 15 minutes (brief GPS/speed noise) into a single visit. An additional 34 locations were visited for under one hour each (4.85 hours combined) and are treated as brief transit pauses rather than sampling locations.

2.2: Location Map

The map on the right shows the GPS track and monitoring locations, identifying the RAM's route and site pins (S1–S17) over the surrounding area. A Google Earth file is available in the BCER Data Centre, providing the ambient air data for public use.



Section 3: Summary Statistics

3.1: Gaseous, Particulate and Meteorological Data (full record, five-minute basis)

The five-minute averaged data is summarized in the following table.

Parameter	Count	Mean	Std Dev	Min	Median	Max
SO_2 (ppb)	24,973	1.1	2.2	0.0	0.6	52.9
H_2S (ppb)	24,973	0.1	0.2	0.0	0.1	5.9
CH_4 (ppm)	23,447	1.977	0.056	1.850	1.971	2.848
NMHC (ppm)	23,581	0.021	0.069	0.000	0.000	4.645
O_3 (ppb)	24,898	19.0	9.4	0.3	19.4	56.2
NO (ppb)	21,418	1.0	2.2	0.0	0.2	123.9
NO_2 (ppb)	21,420	1.7	1.6	0.0	1.3	18.8
NOx (ppb)	21,421	2.5	3.2	0.0	1.8	142.6
CO (ppm)	21,203	0.121	0.070	0.016	0.107	4.067
Neph450 Mass ($\mu g/m^3$)	25,183	3.7	4.5	0.1	2.5	107.9

Summary Statistics, continued

3.2: Hourly Average Summary

The same parameters are summarized from one-hour block averages of the five-minute data (2,218 hourly periods spanning the monitoring record). Aggregating to hourly averages reduces short-duration peaks and noise relative to the five-minute statistics on the previous page.

Parameter	Count (hrs)	Mean	Std Dev	Min	Median	Max
SO_2 (ppb)	2,150	1.1	1.9	0.1	0.6	27.5
H_2S (ppb)	2,150	0.1	0.1	0.0	0.1	2.2
CH_4 (ppm)	2,049	1.977	0.055	1.851	1.973	2.521
NMHC (ppm)	2,065	0.021	0.043	0.000	0.002	0.517
O_3 (ppb)	2,144	18.8	9.4	0.7	19.2	46.4
NO (ppb)	1,866	1.0	1.5	0.0	0.4	12.2
NO_2 (ppb)	1,866	1.7	1.4	0.0	1.4	15.0
NOx (ppb)	1,866	2.6	2.4	0.0	2.0	22.5
CO (ppm)	1,843	0.122	0.050	0.022	0.110	0.753
Neph450 Mass (µg/m³)	2,155	3.7	4.1	0.2	2.6	46.0

Summary Statistics, continued

3.3: BTEX Compounds

BTEX values are only available for the portion of the record covered by the BTEX analyzer (17,002 of 26,605 records, approximately 64 per cent).

Compound	Count	Mean	Std Dev	Min	Median	Max
Benzene (ppb)	16,971	0.0	0.1	0.0	0.0	8.0
Toluene (ppb)	16,971	0.5	0.4	0.0	0.4	8.9
Ethylbenzene (ppb)	17,066	0.4	0.6	0.0	0.3	9.0
Xylene (ppb)	17,066	0.7	0.7	0.0	0.6	14.9
BTEX total (ppb)	16,967	1.7	1.3	0.0	1.3	21.2

Summary Statistics, continued

3.4: By-Location Highlights

Mean and maximum concentrations at the 11 locations with at least four hours of cumulative dwell time (sufficient records for a meaningful comparison). SO_2 and H_2S are measured in ppb, CH_4 and NMHC are measured in ppm, BTEX total totals are measured in ppb and Neph450 mass is in $\mu g/m^3$. A dash indicates the BTEX analyzer was not recording during that location's visit(s).

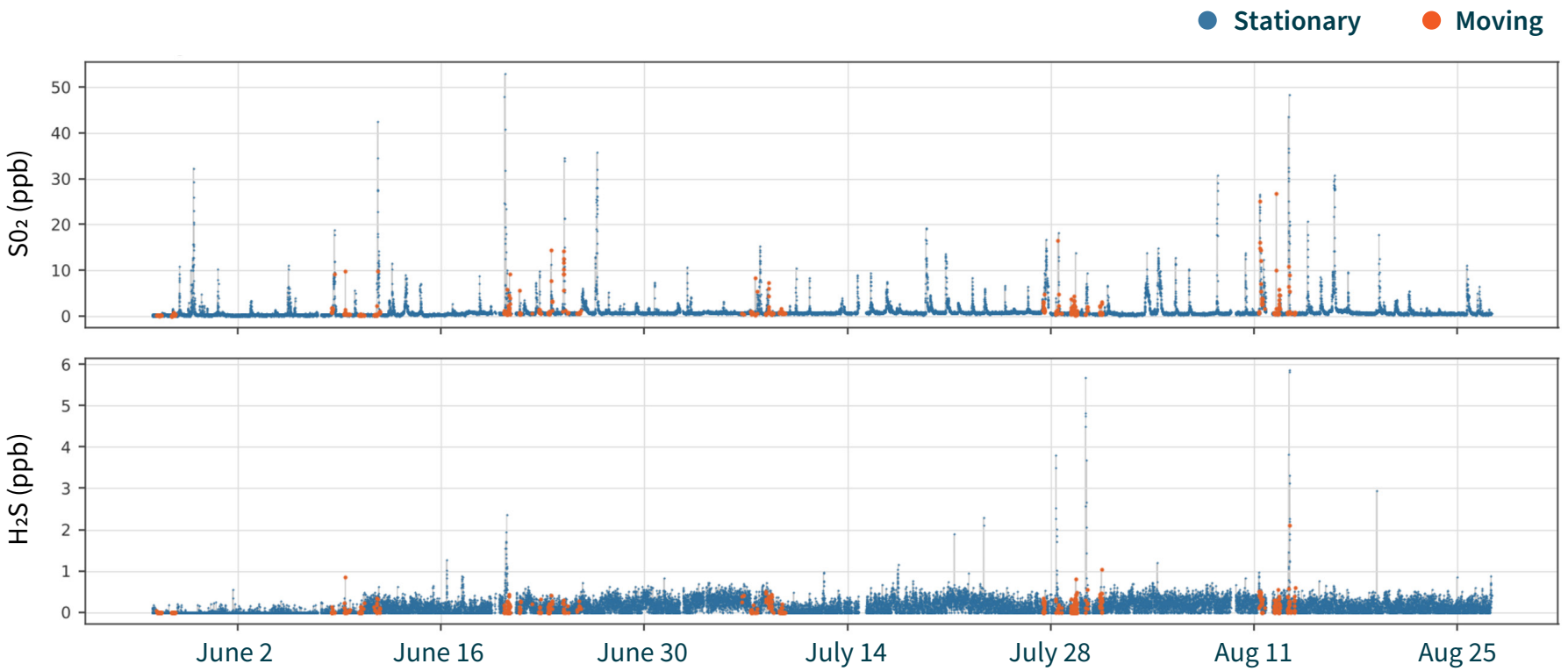
Site	SO_2 mean	SO_2 max	H_2S mean	H_2S max	CH_4 mean	CH_4 max	NMHC mean	NMHC max	BTEX mean	BTEX max	Neph mean	Neph max
S1	1.0	42.5	0.1	3.0	1.978	2.848	0.020	4.645	1.7	21.2	3.8	107.9
S2	2.8	16.7	0.1	0.6	1.940	2.073	0.003	0.165	1.2	3.6	2.2	8.0
S3	5.3	52.9	0.7	5.9	2.007	2.643	0.006	0.157	1.3	6.7	4.0	61.5
S4	1.5	9.1	0.1	0.5	1.943	2.023	0.030	0.164	1.5	11.4	2.4	19.8
S5	1.7	26.6	0.1	0.5	1.960	2.028	0.045	0.174	1.4	9.0	2.5	11.2
S6	2.8	34.6	0.2	0.7	1.984	2.159	0.036	0.502	1.0	4.7	2.1	7.8
S7	0.3	0.8	0.0	0.6	1.933	1.988	0.055	0.162	1.3	3.0	1.2	4.9
S8	0.8	5.9	0.1	0.4	1.973	1.999	0.040	0.137	2.0	7.1	2.1	6.5
S9	2.7	16.3	0.1	0.6	2.024	2.202	0.013	0.200	1.7	9.3	3.4	8.3
S10	3.2	22.7	0.1	0.6	1.976	2.069	0.034	0.140	1.6	6.2	5.9	65.7
S11	0.7	1.6	0.1	0.4	1.941	2.090	0.006	0.036	—	—	1.8	2.4

Site S3, formed by merging the two adjacent locations near 53.99°N / 128.696°W into a single site, shows the highest mean and maximum SO_2 and H_2S of any location, both well above the levels seen at the S1 base station and all other secondary sites, consistent with proximity to a shared local source (see Section 5, Key Observations).

Section 4: Time-Series Graphs

The following figures are provided at the native five-minute resolution and as one-hour averages. Blue points are stationary (in-place) measurements; orange points are records taken while the vehicle was moving between locations.

4.1: Primary Gaseous Pollutants — Five-Minute Data

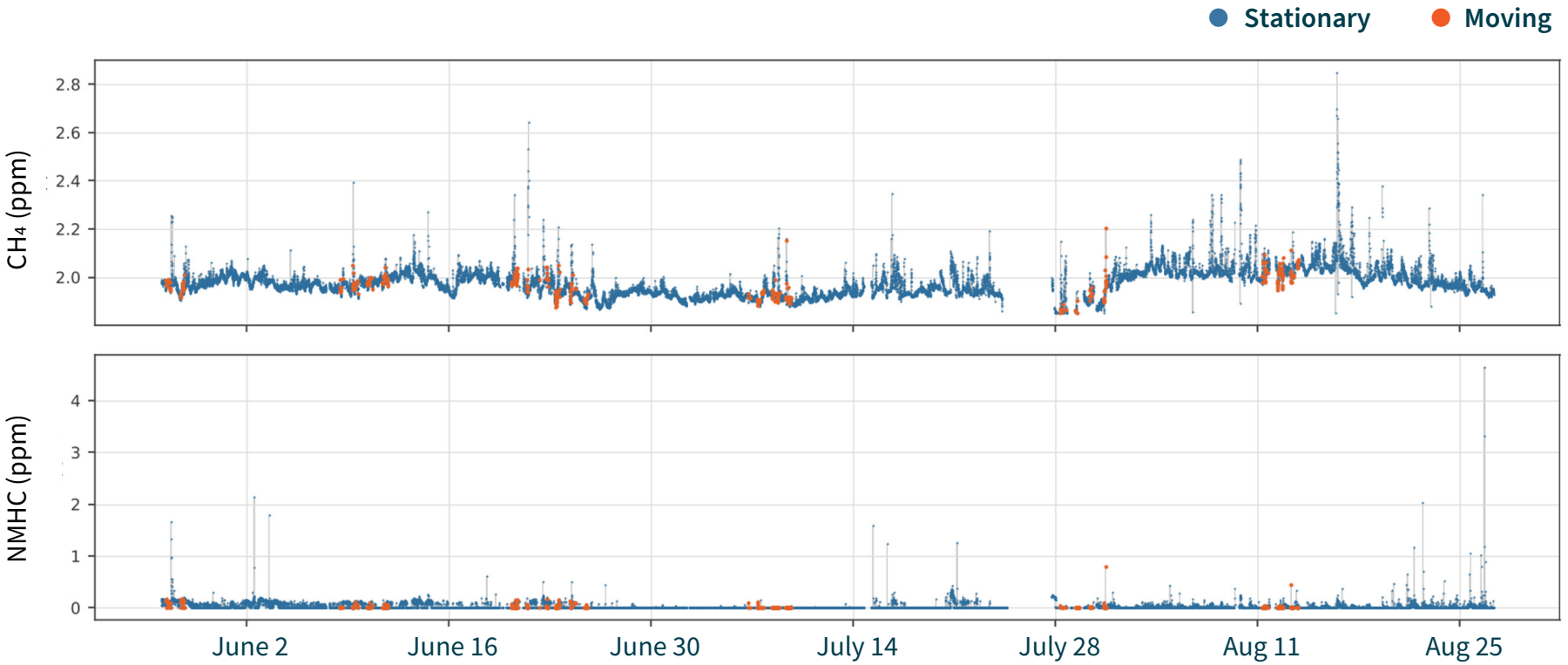


SO_2 and H_2S, Five-Minute Data

CH_4 and NMHC data provided on next page.

Time-Series Graphs, continued

4.1: Primary Gaseous Pollutants — Five-Minute Data



CH_4 and NMHC, Five-Minute Data

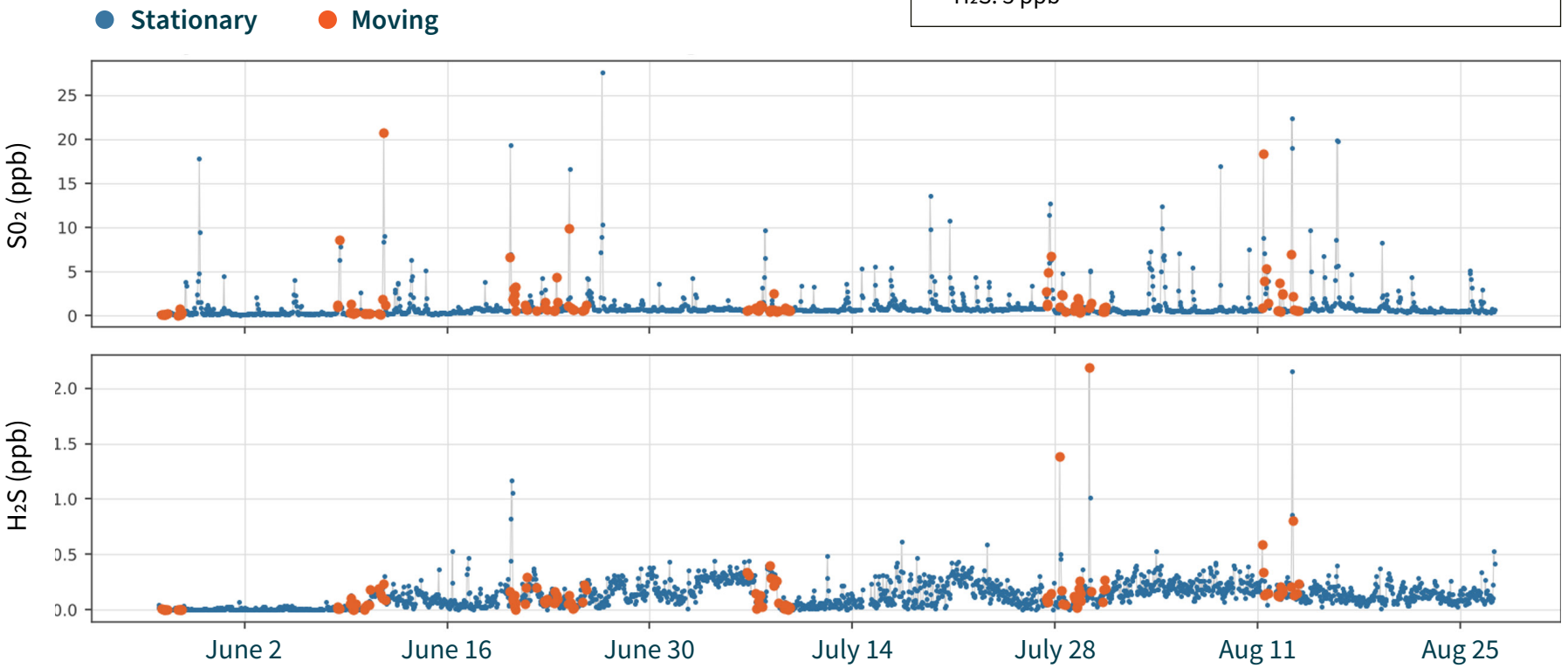
SO_2 and H_2S data provided on previous page.

Time-Series Graphs, continued

4.1: Primary Gaseous Pollutants — One-Hour Averages

One-Hour Ambient Air Quality Objective Metrics

British Columbia	Alberta
SO_2: 65 ppb	Benzene: 9 ppb
NO_2: 60 ppb	Toluene: 499 ppb
O_3: 82 ppb	Ethylbenzene: 460 ppb
CO: 13 ppm	Xylene: 529 ppb
H_2S: 5 ppb	

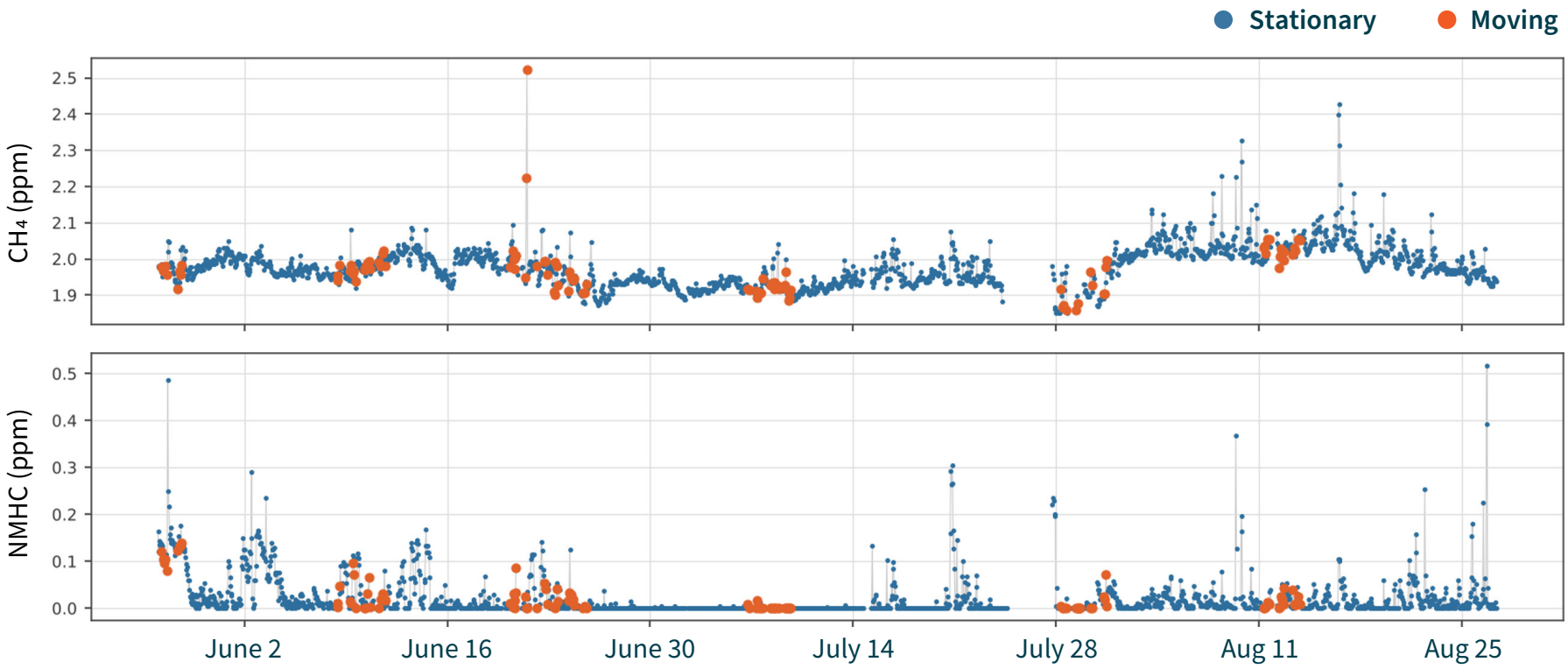


SO_2 and H_2S, One-Hour Averages

CH_4 and NMHC data provided on next page.

Time-Series Graphs, continued

4.1: Primary Gaseous Pollutants — One-Hour Averages

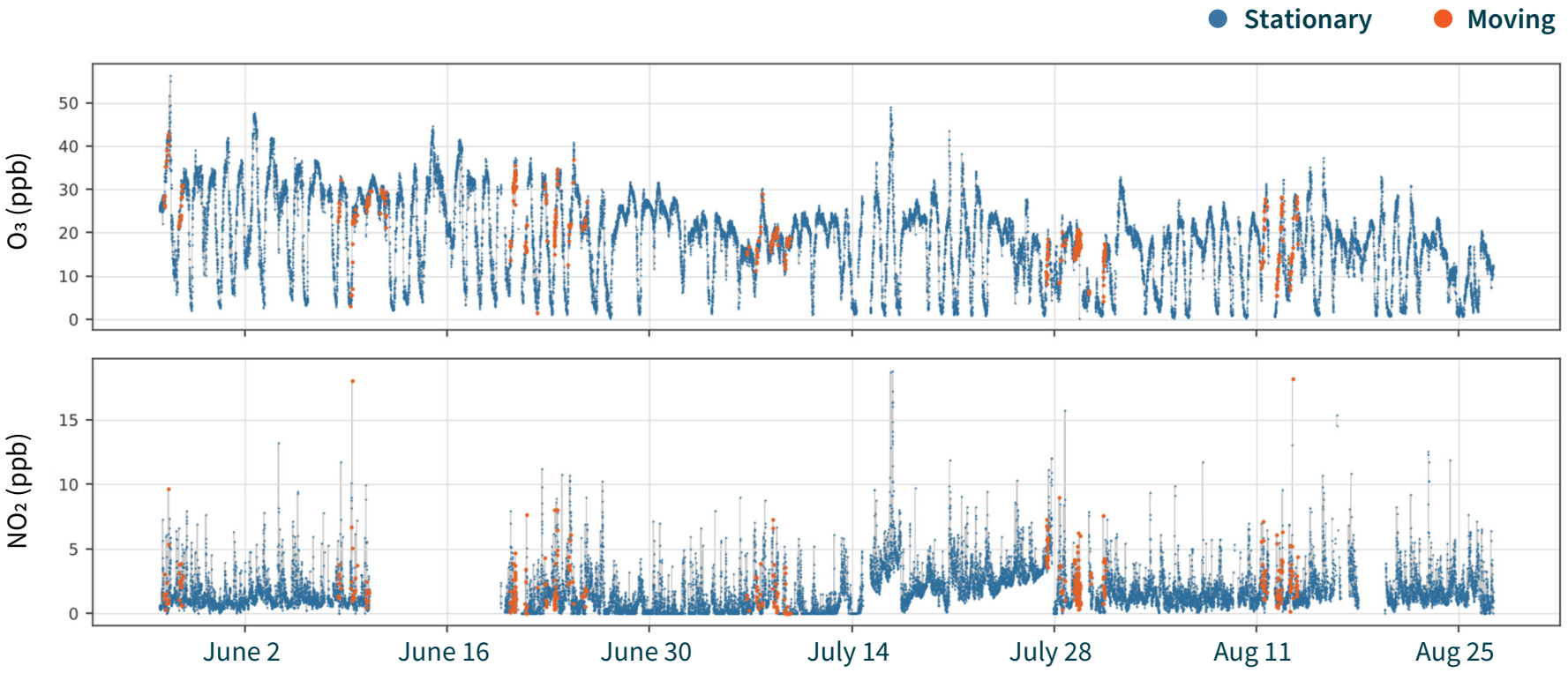


CH_4 and NMHC, One-Hour Averages

SO_2 and H_2S data provided on previous page.

Time-Series Graphs, continued

4.2: Criteria Pollutants — Five-Minute Data

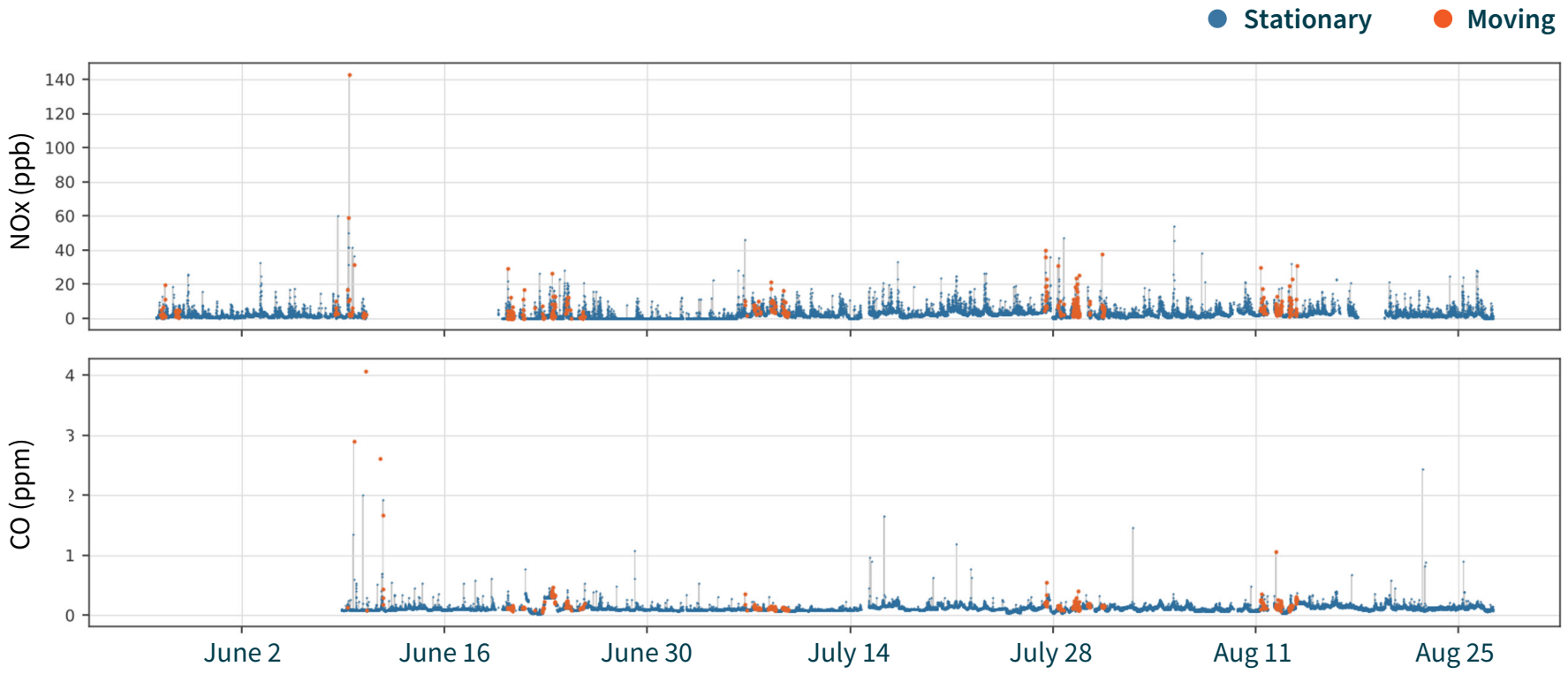


O_3 and NO_2, Five-Minute Data

NOx and CO data provided on next page.

Time-Series Graphs, continued

4.2: Criteria Pollutants — Five-Minute Data

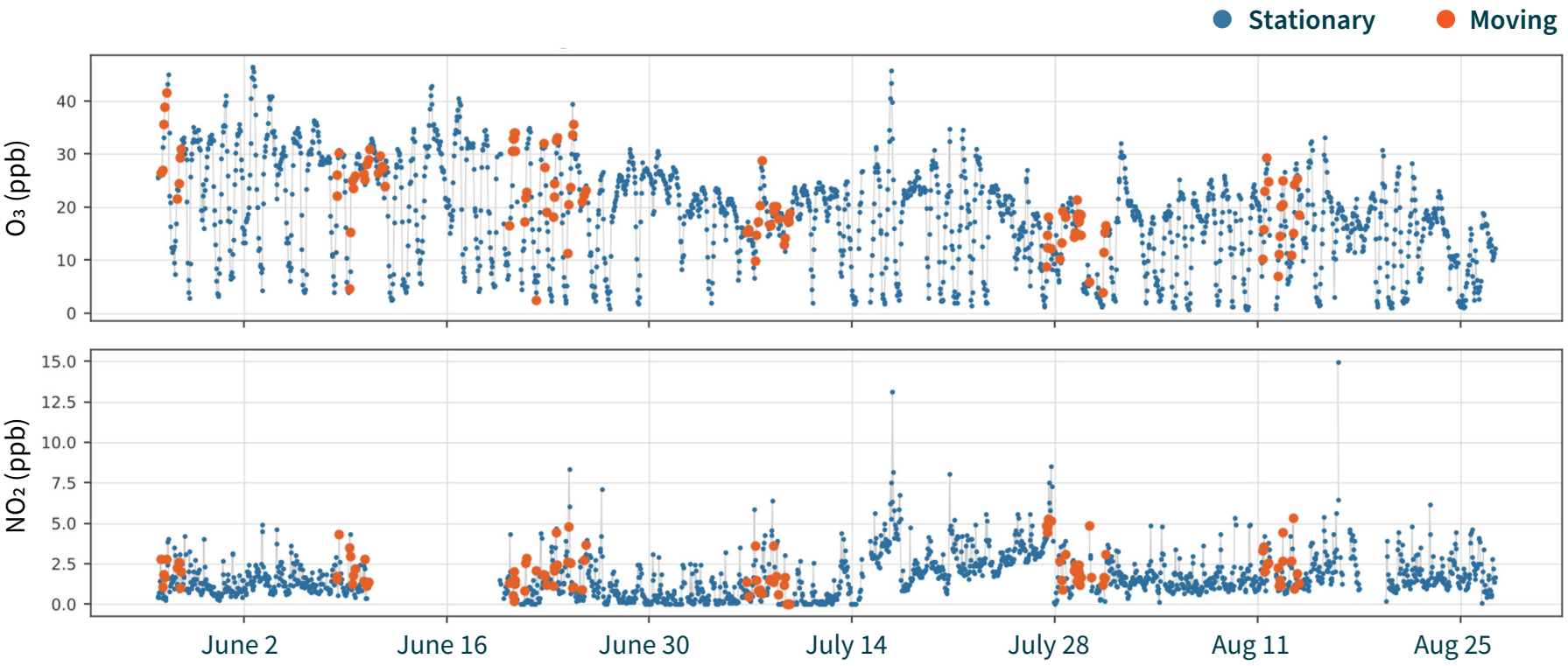


NOx and CO, Five-Minute Data

O_3 and NO_2 data provided on previous page.

Time-Series Graphs, continued

4.2: Criteria Pollutants — One-Hour Averages

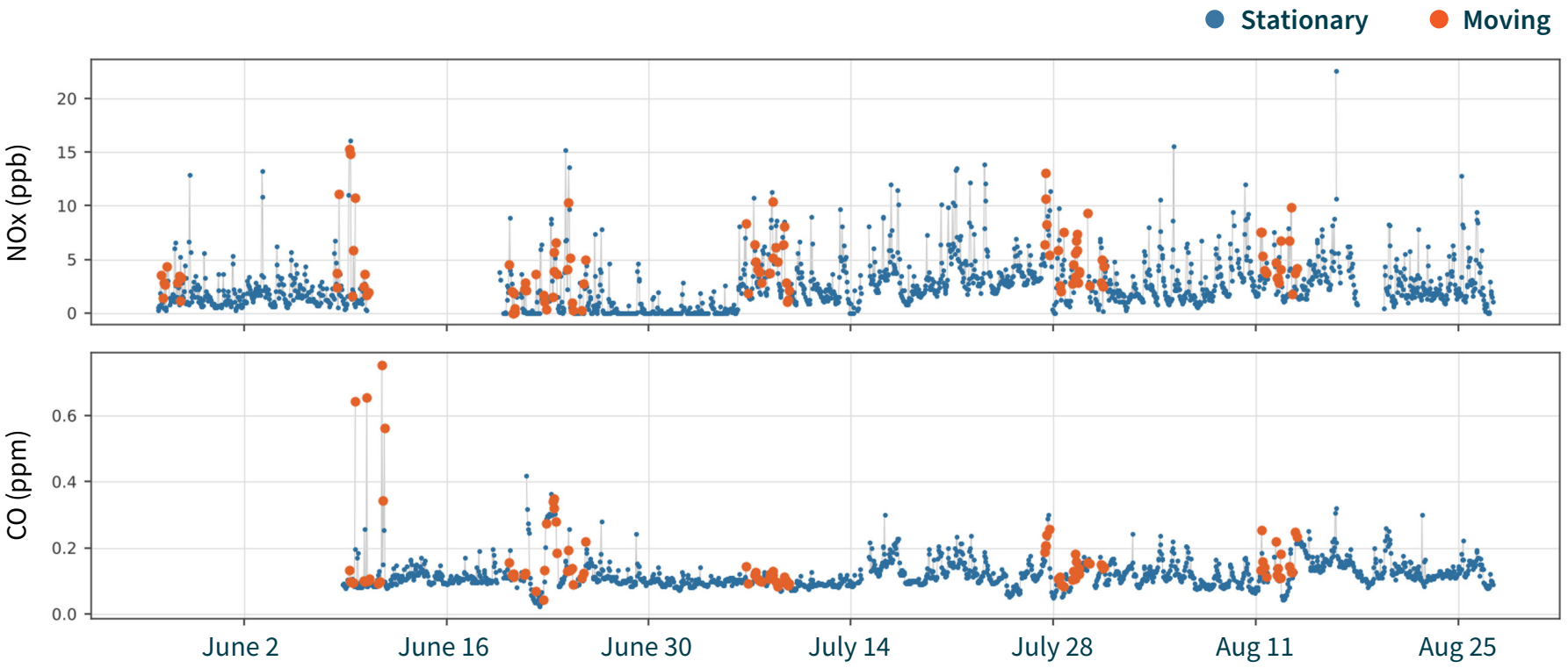


O_3 and NO_2, One-Hour Averages

NOx and CO data provided on next page.

Time-Series Graphs, continued

4.2: Criteria Pollutants — One-Hour Averages

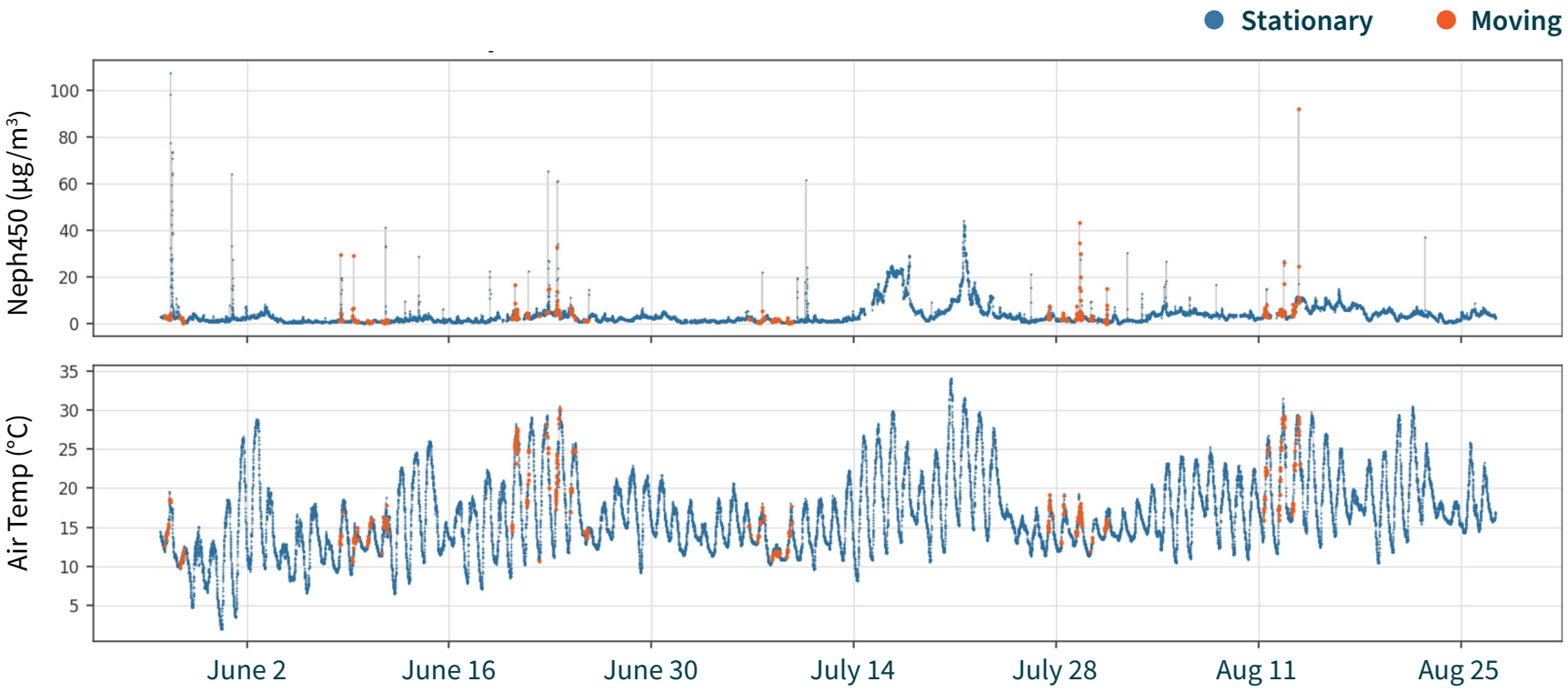


NOx and CO, One-Hour Averages

O_3 and NO_2 data provided on previous page.

Time-Series Graphs, continued

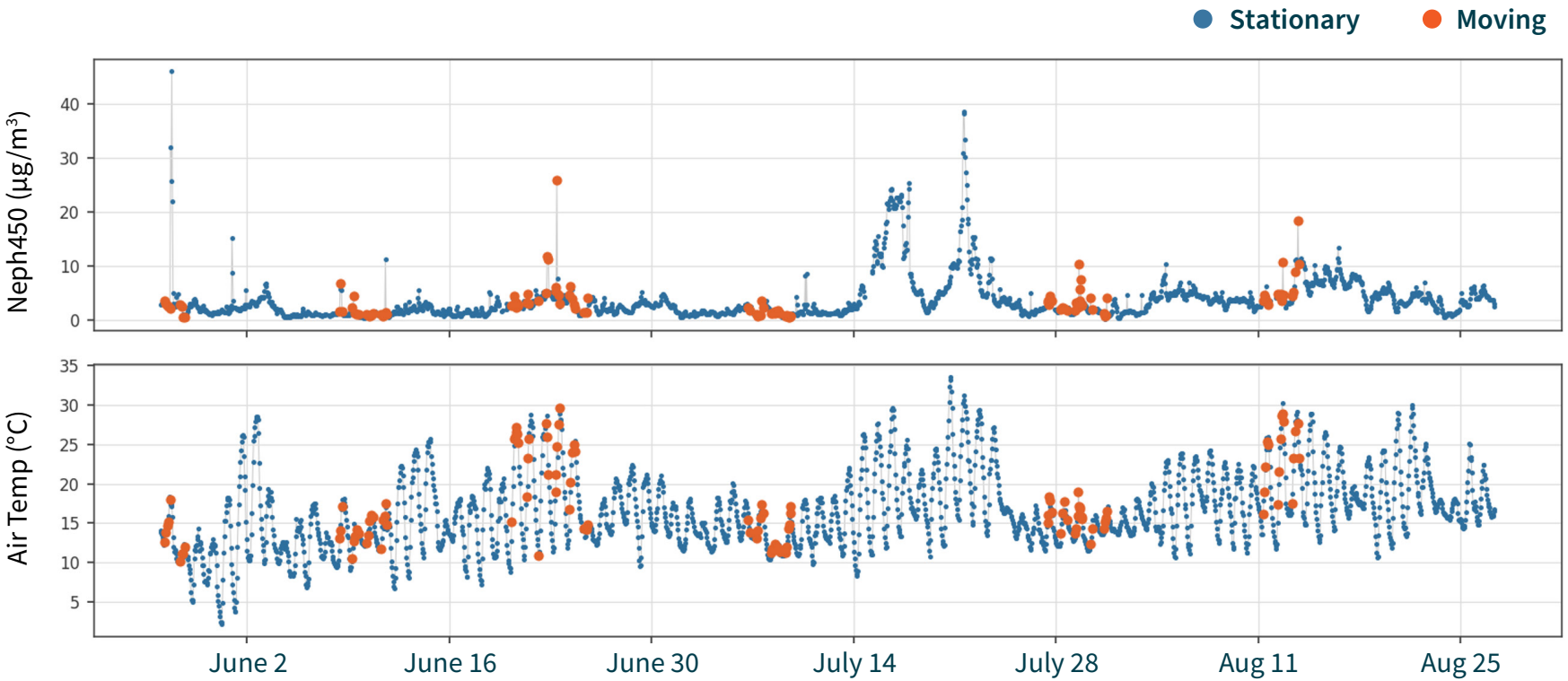
4.3: Particulate Matter and Air Temperature — Five-Minute Data



Neph450 Particulate Mass and Air Temperature, Five-Minute Data

Time-Series Graphs, continued

4.3: Particulate Matter and Air Temperature — One-Hour Averages

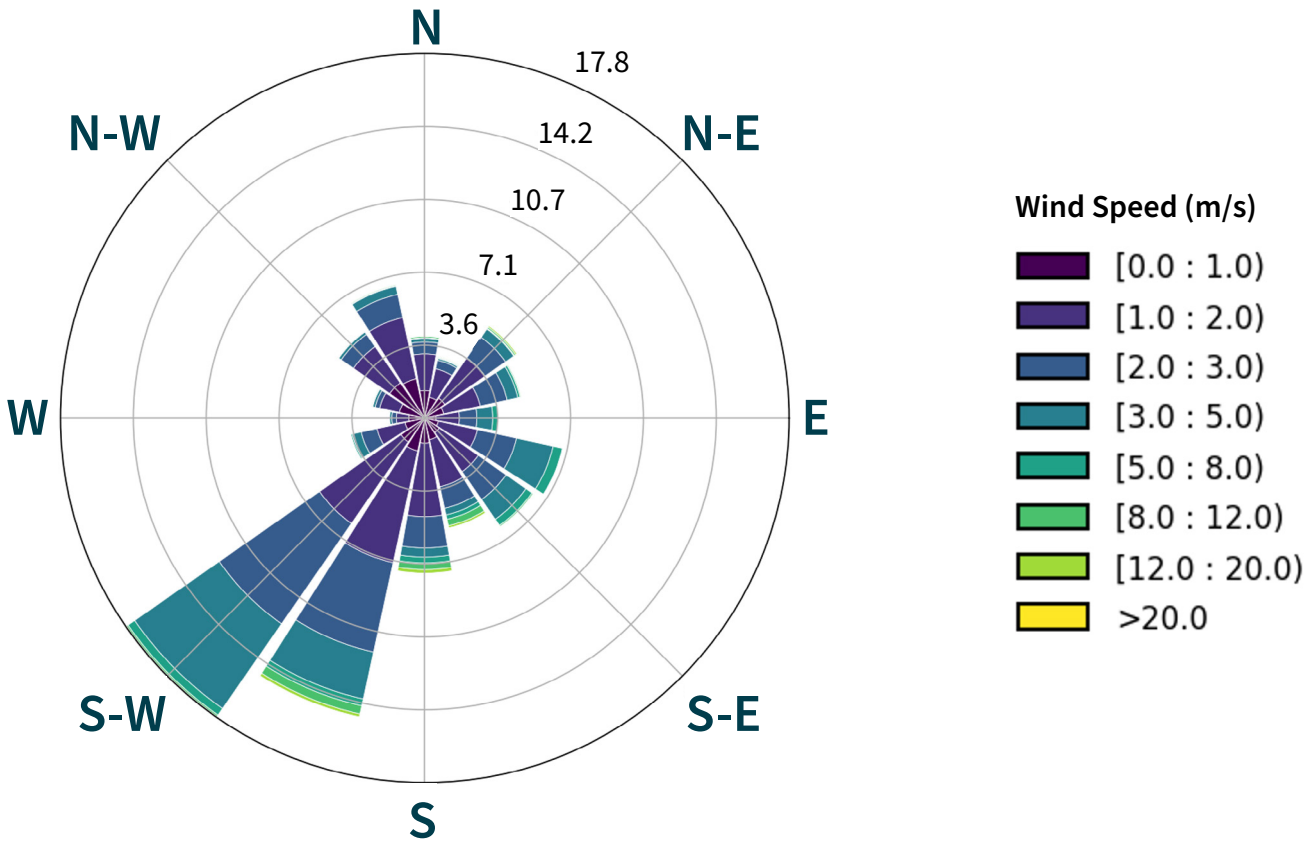


Neph450 Particulate Mass and Air Temperature, One-Hour Averages

Time-Series Graphs, continued

4.4: Wind Rose. May 27 to Aug. 27, 2026: Stationary Records Only, n = 23,350.

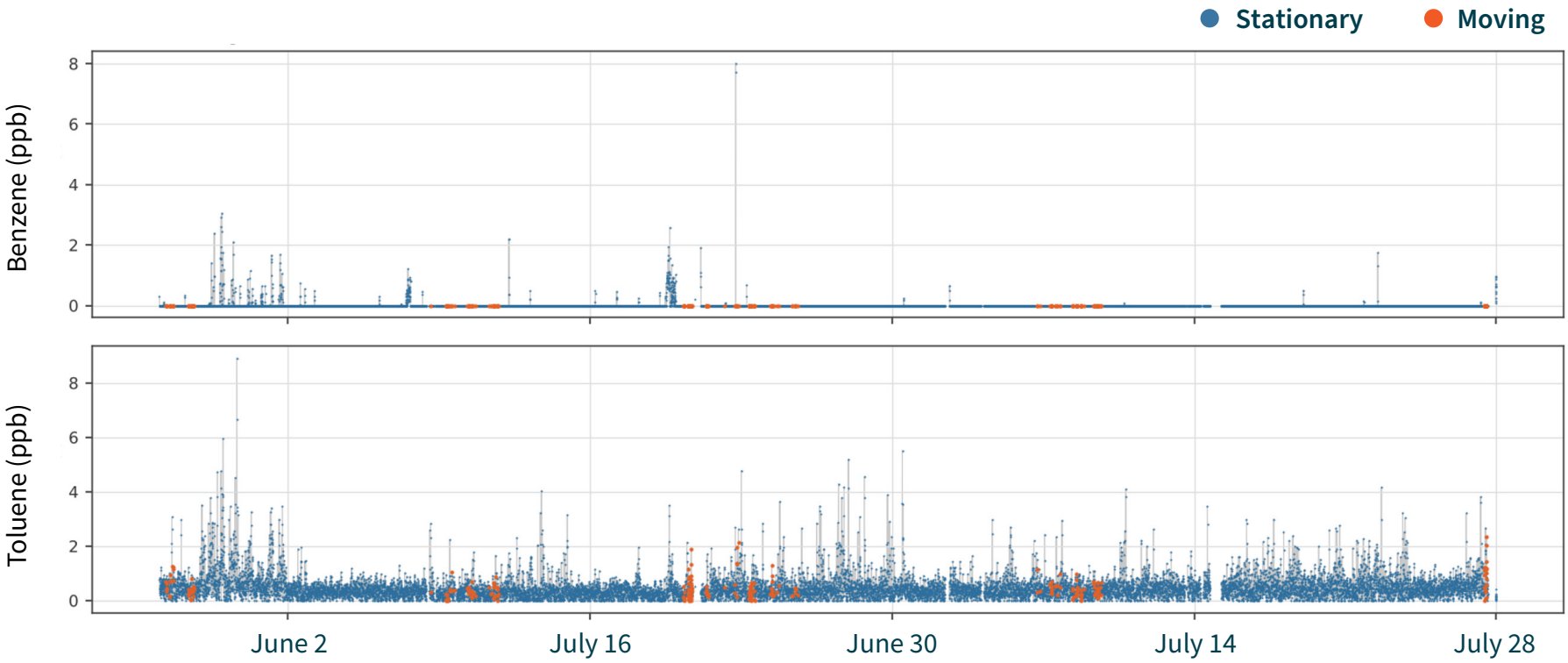
Wind speed and direction (true, motion-corrected) across the full monitoring period, stationary records only (moving/transit records excluded).



Wind rose for the full May 27 to Aug. 27, 2026 monitoring period, stationary records only (n = 23,350 valid wind observations). Petal direction shows the direction the wind was blowing from; colour bands show wind speed. Winds were predominantly from the south-southwest to southwest, with the strongest and most frequent winds from that sector.

Time-Series Graphs, continued

4.5: BTEX Compounds — Five-Minute Data



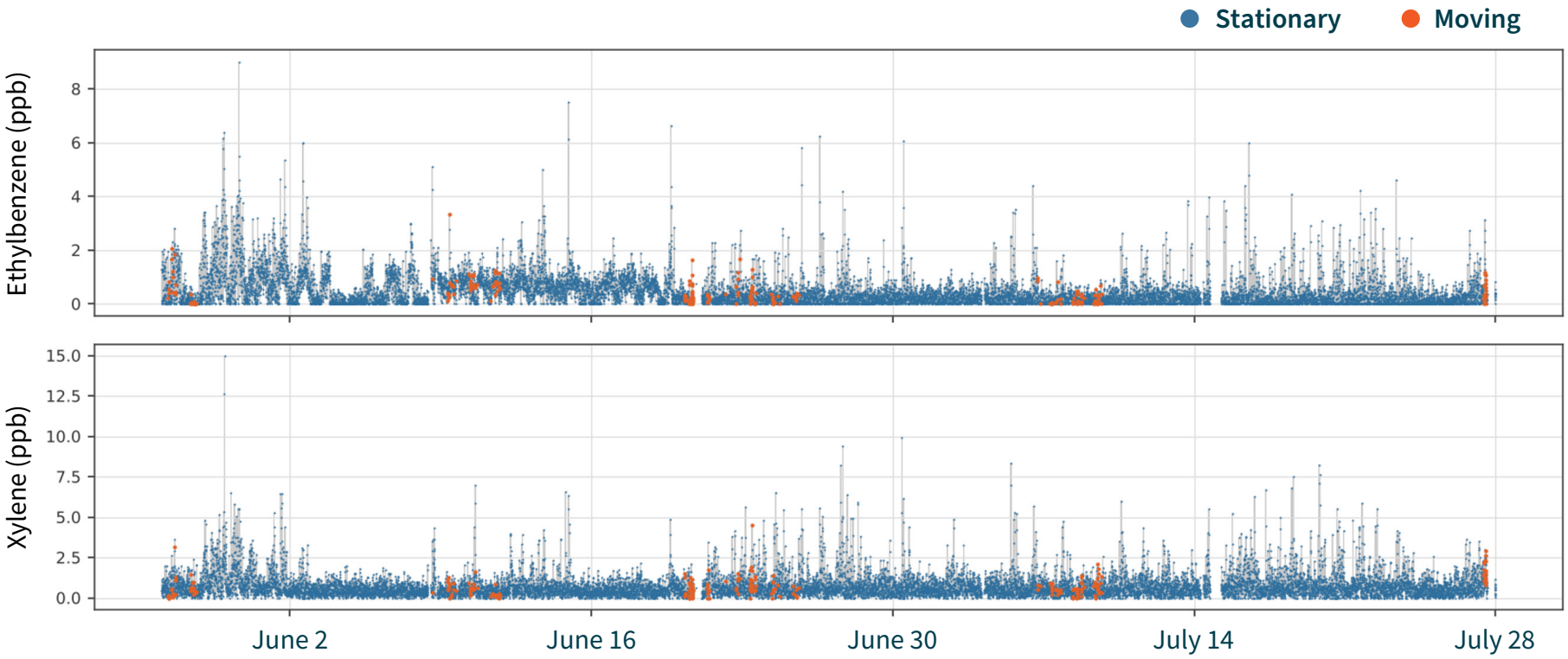
BTEX Compounds, Five-Minute Data

Ethylbenzene and xylene data provided on next page.

Benzene and toluene, five-minute data. Coverage ends in late August, before the end of the full monitoring record (Section 1: Station and Equipment).

Time-Series Graphs, continued

4.5: BTEX Compounds — Five-Minute Data



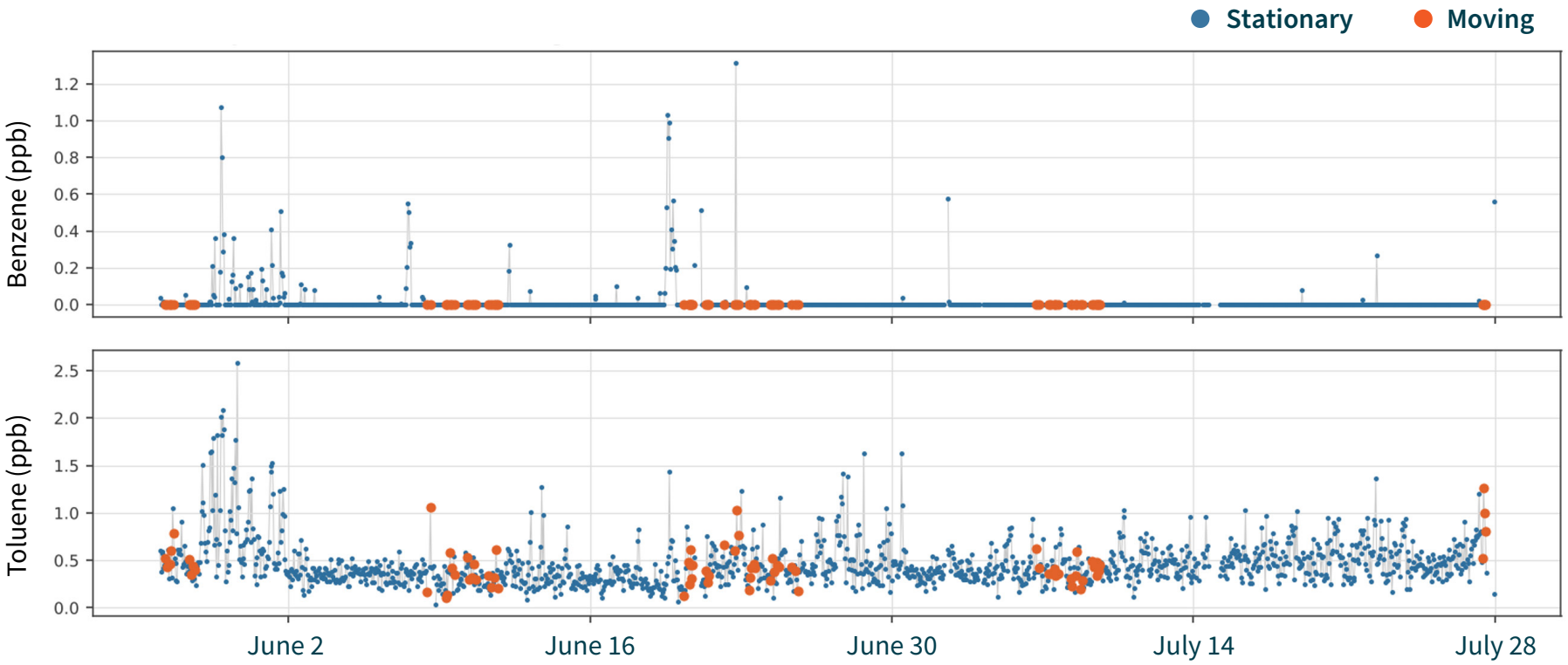
BTEX Compounds, Five-Minute Data

Benzene and toluene data provided on previous page.

Ethylbenzene and xylene, five-minute data. Coverage ends in late August, before the end of the full monitoring record (Section 1: Station and Equipment).

Time-Series Graphs, continued

4.5: BTEX Compounds — One-Hour Averages

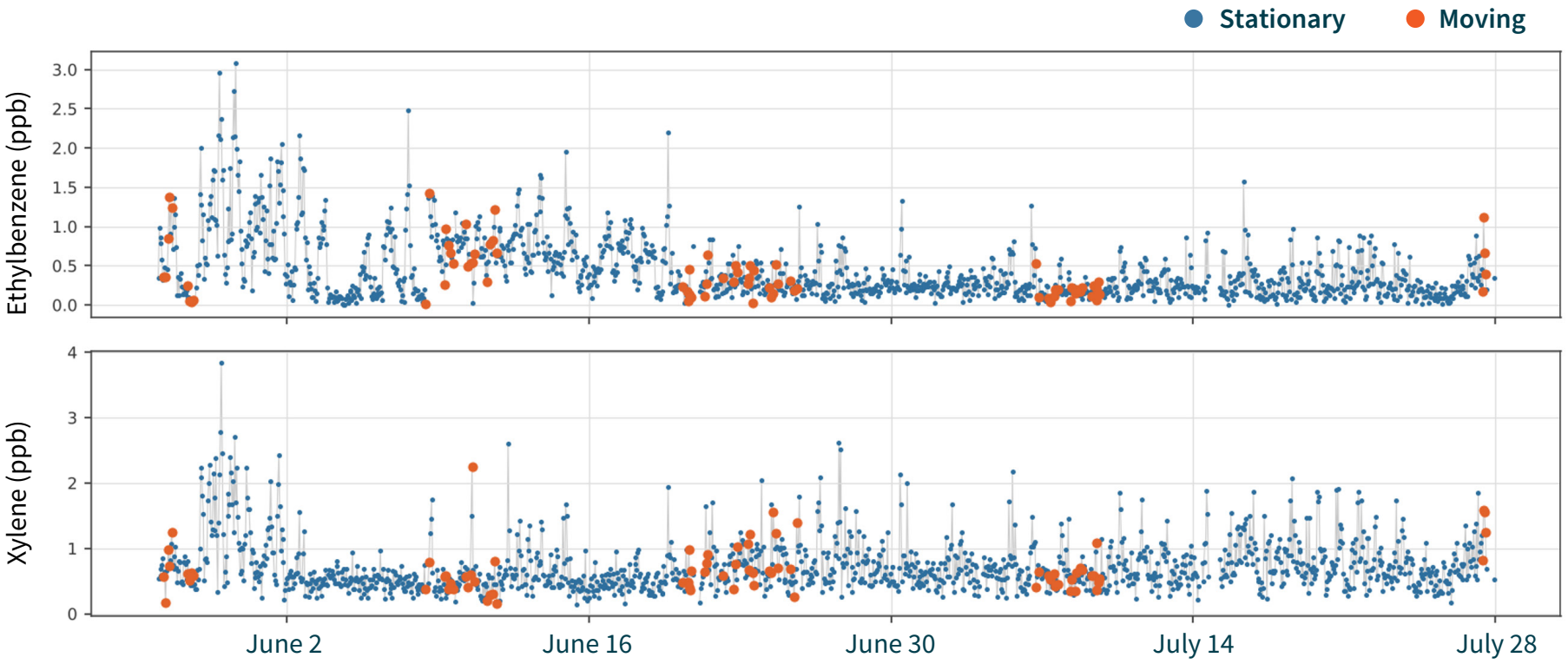


BTEX Compounds, One-Hour Averages

Ethylbenzene and xylene data provided on next page.

Time-Series Graphs, continued

4.5: BTEX Compounds — One-Hour Averages



BTEX Compounds, One-Hour Averages

Benzene and toluene data provided on previous page.

Section 5: Key Observations

5.1: Instrument Calibration - Jul. 14, 2026

All 13 analyzer channels (O_3, NO, NO_2, NOx, CO, SO_2, H_2S, CH_4, NMHC, benzene, toluene, ethylbenzene, xylene) were placed into calibration between 07:00 and 10:00 on July 14, 2026. Readings recorded during this window — including the single-point SO_2 (100.05 ppb), CH_4 (4.834 ppm) and NO_2 (76.66 ppb) values originally logged at 09:15 at the S1 base station in an earlier version of this report — are calibration artifacts rather than ambient measurements and have been excluded from all statistics, tables and figures presented here (see Section 5.4, below).

5.2: Elevated SO_2 and H_2S at Site S3 (53.99°N, 128.696°W)

Site S3 combines two GPS fixes about 170 metres apart near the southern end of the study area, visited on several separate occasions between June and mid-August. This location shows mean SO_2 (5.3 ppb) and mean H_2S (0.65 ppb) well above every other location, with a maximum of 52.9 ppb SO_2 and 5.9 ppb H_2S.

5.3: Vehicle Movement / Transit Periods

The station relocated 140 times over the three-month record, together accounting for 36.1 hours (1.6 per cent of the record). Individual transit episodes ranged from five minutes to 75 minutes (median 10 minutes). Transit periods are visible as clustered orange points in the Time-Series graphs in Section 4 (subsections 4.1, 4.2, 4.3 and 4.5).

5.4: Data Coverage Notes

- BTEX compound data (benzene, toluene, ethylbenzene, xylene) covers only the first approximately 64 per cent of the record; no BTEX values are present from late August onward due to instrument failure.
- NOx analyzer was replaced on June 20 after instrument failure.
- All analyzer channels (O_3, NO, NO_2, NOx, CO, SO_2, H_2S, CH_4, NMHC) and BTEX compounds (benzene, toluene, ethylbenzene, xylene, BTEX total) were excluded from July 14, 2026 07:00 to 10:00 due to an instrument calibration during that window.
- CH_4 readings below 1.85 ppm (below the expected ambient background) were excluded, along with the corresponding NMHC readings, affecting 557 five-minute records between July 24 and Aug. 26, 2026.
- NMHC values were adjusted by -0.18 ppm (baseline correction) from July 28, 2026 onward through the end of the monitoring period, with any resulting negative values floored to zero.

This report was published in November 2026.

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