

Appendix B – On-road Community Mapping of VOCs

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Mobile on-road deployments of the MMSL for community and on-site ambient VOC mapping

This appendix contains mapping from single day measurements of VOCs at ground level from the Mobile Mass spectrometry lab. Each section focuses on an individual wastewater treatment facility and by individual analyte shown in chronological order. Analytes that are displayed in this appendix were chosen to reflect reduced sulfur compounds distributions, by mapping methanethiol and dimethyl sulfide. A representative analyte that is part of the oxygenated VOC class is mapped, either acetaldehyde and/or acetone, also a biogenic hydrocarbon representative is mapped as monoterpenes (calibrated as α -pinene). Furthermore, a member of the BTEX family is mapped either toluene or ethylbenzene has been chosen, this represents the class of compounds commonly found in vehicle exhaust. Lastly methane has been mapped to illustrate possible co-location of methane concentrations with wastewater VOCs. This appendix includes all sample days from 2023-2024 with some additional maps from 2022. This information is supplemental to the thesis and allows for further assessment of how wind speed and direction can influence distributions of VOCs in the community and are part of the data that has informed the geospatial averages and interpolation mapping found in the main thesis.

French Creek Pollution Control Centre – Community Mapping of VOCs

Date	Sampling location	Time of sampling
August 02, 2022	Community drive	11:45-14:15
October 12, 2022	Community Drive	19:00-21:00
December 13, 2022	Community Drive	16:20-18:50
December 14, 2022	Community Drive	13:40-15:50
March 23, 2023	Community drive	11:45-13:30
May 4, 2023	Community drive	11:00-14:40
May 24, 2023	Community drive	14:40-15:10
May 25, 2023	Community drive	09:00-12:00
May 29, 2023	Community drive	12:45-15:45
June 12, 2023	Community drive	13:00-13:30
September 29, 2023	Community drive	13:45-14:50
November 6, 2023	Community drive	13:15-14:45
February 20, 2024	Community drive	09:15-11:45
June 13, 2024	Community drive	14:19-15:30
Total community drive hours (hh:mm)		26:40

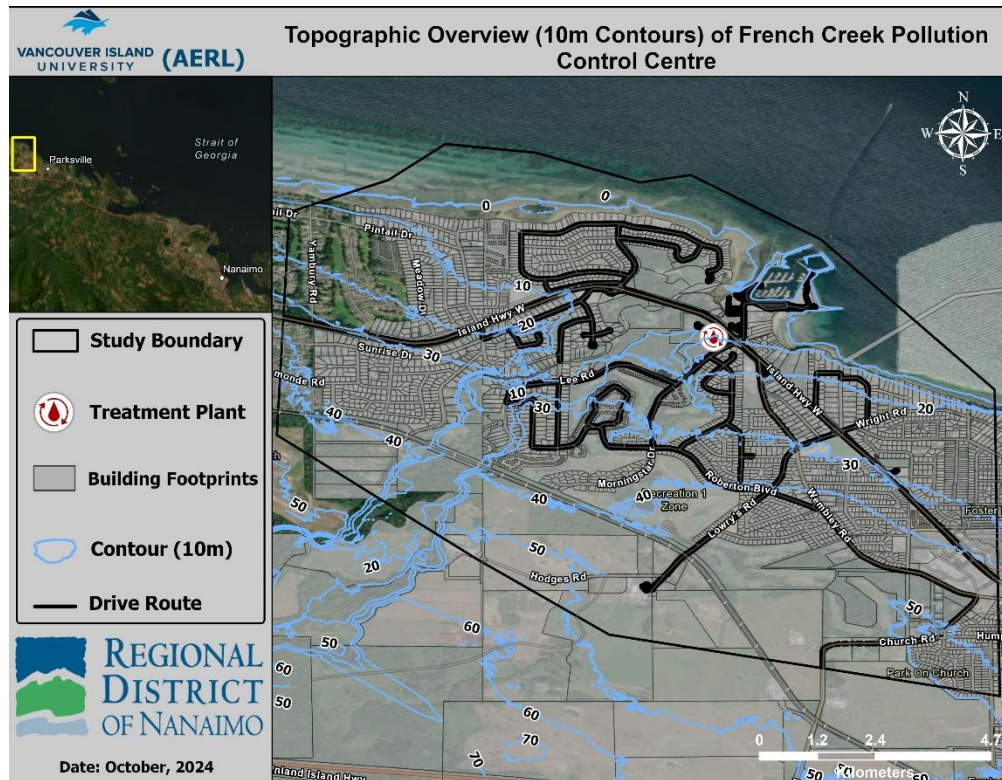


Figure 1: Topographical map of FCPCC community, showing contours at 5 m intervals, Marina is green diamond, WWTP is red diamond and typical drive route is in blue. Map courtesy of Ben Odia.

Written summary from two sample days in 2024

February 20, 2024 Community Maps showing VOC concentrations

During the on-road survey elevated levels of methanethiol and dimethyl sulfide were detected downwind of the WWTP >1km offsite at (0.2-0.8 ppb_v).

Minor amounts of acetaldehyde and monoterpenes were detected offsite, although they were found throughout the drive route and did not cluster only downwind of the WWTP suggesting multiple sources of these VOCs are found throughout the community.

Only onsite, methane was detected at elevated levels and no major detection of methane was seen offsite.

June 13, 2024 on-road community maps

Similar wind direction to the February sampling was observed during the June sampling, and elevated levels of methanethiol and dimethyl sulfide were observed downwind of the

WWTP >1km offsite, suggesting that these odourous compounds can infiltrate the nearby community and minor concentrations of 0.2-0.8 ppb_v.

Elevated concentrations of acetaldehyde and monoterpenes were detected off-site in the community, with high levels around the marina (11-25.2 ppb_v acetaldehyde) and minor elevated levels near the adjacent road to the WWTP and downwind of the WWTP (1.5-4.1 ppb_v acetaldehyde), (1.2-3.2 ppb_v monoterpenes).

No elevated levels of methane were detected off-site of the WWTP during this on-road survey.

Methanethiol community road maps

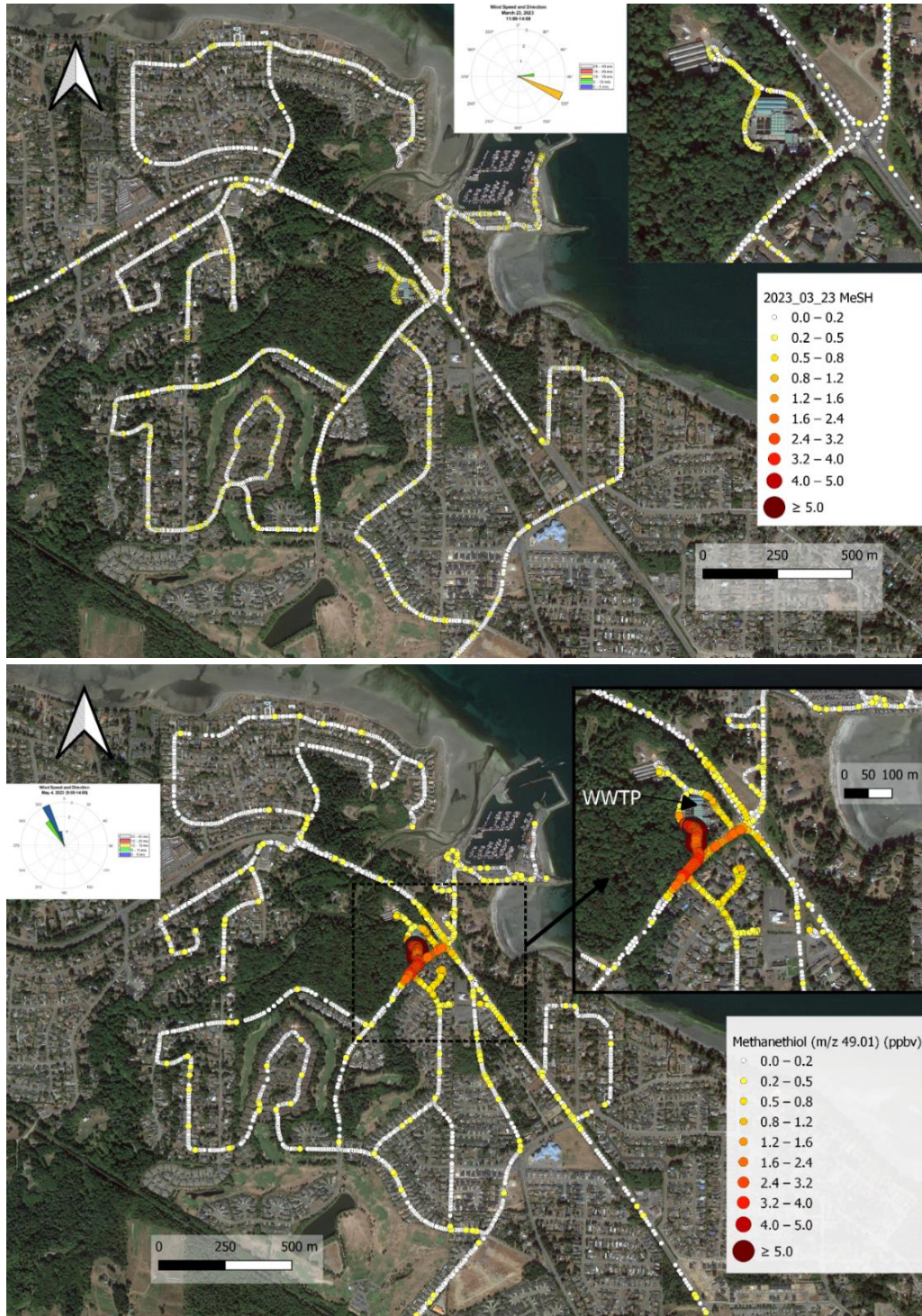


Figure 2 Community Road maps for Methanethiol, (top March 23, bottom May 4)

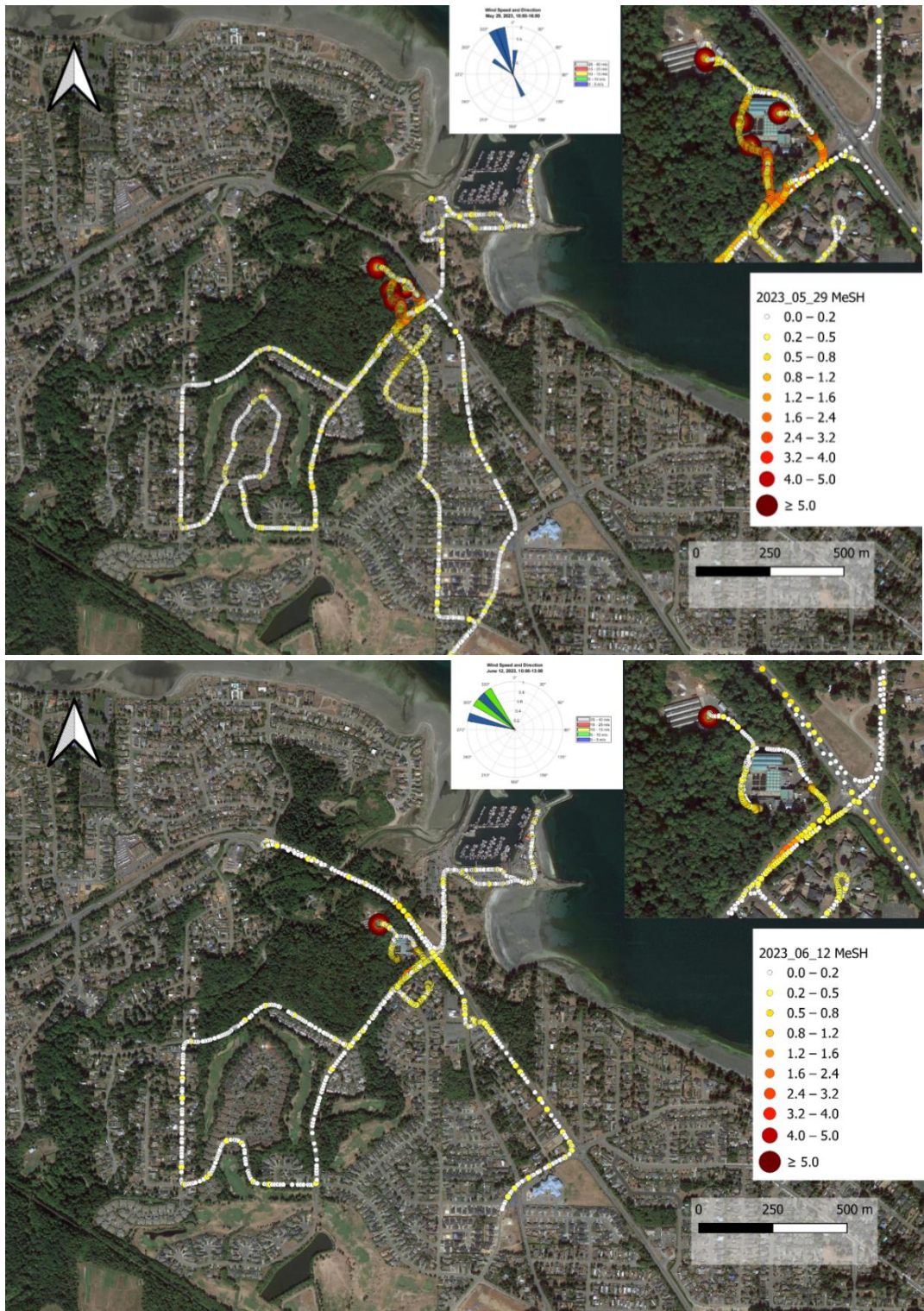


Figure 3 Community Road maps for Methanethiol, (top May 29, bottom June 12)



Figure 4 Community Road maps for Methanethiol, (top Sept 29, bottom Nov 6)



Figure 5: Community road maps for methanethiol, (top-Feb 20,2024, bottom-June 13, 2024)

Dimethyl sulfide community road maps



Figure 6 Community Road maps for Dimethyl Sulfide, (top-Mar 23, bottom-May 4)

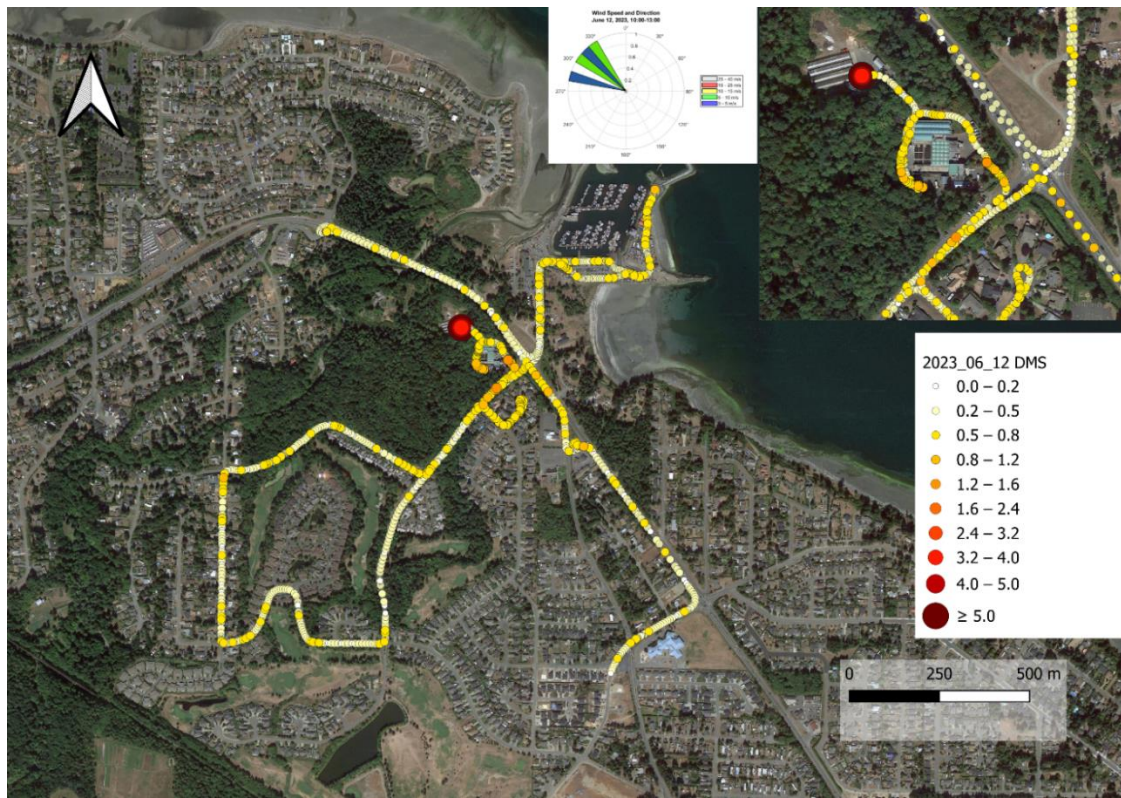
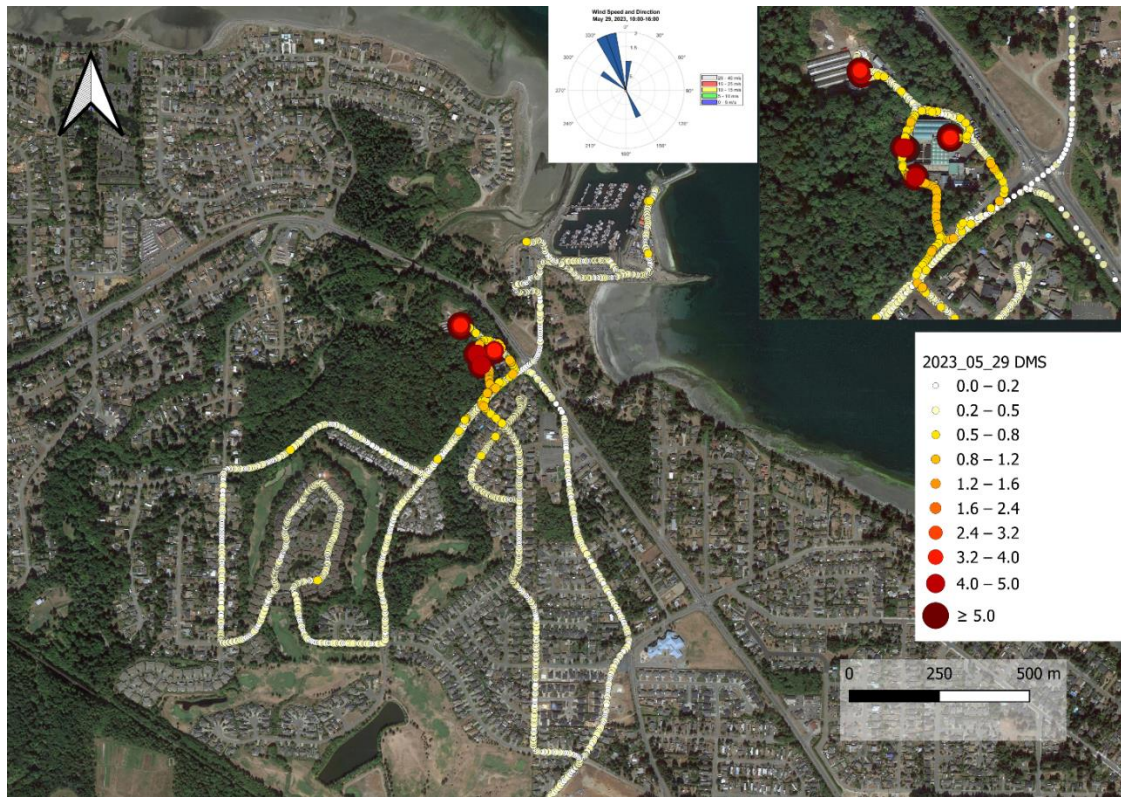


Figure 7 Community Road maps for Dimethyl Sulfide, (top-May 29, bottom-June 12)

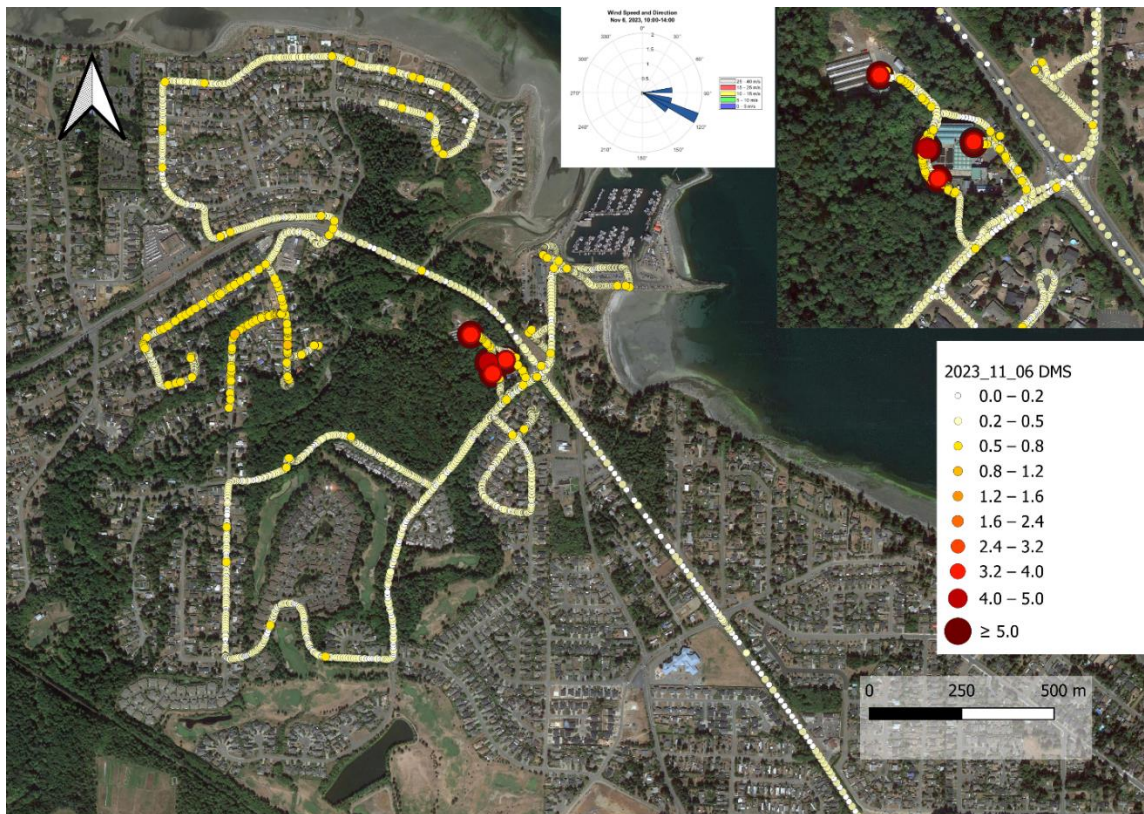


Figure 8 Community Road maps for Dimethyl Sulfide, (top-Sept 29, bottom-Nov 6)



Figure 9 Community Maps showing Dimethyl sulfide concentrations, (top-Feb 20,2024, bottom-June 13, 2024)

Monoterpenes community road maps



Figure 10 Community Road maps for Monoterpenes, (top-Mar 23, bottom-May 4)

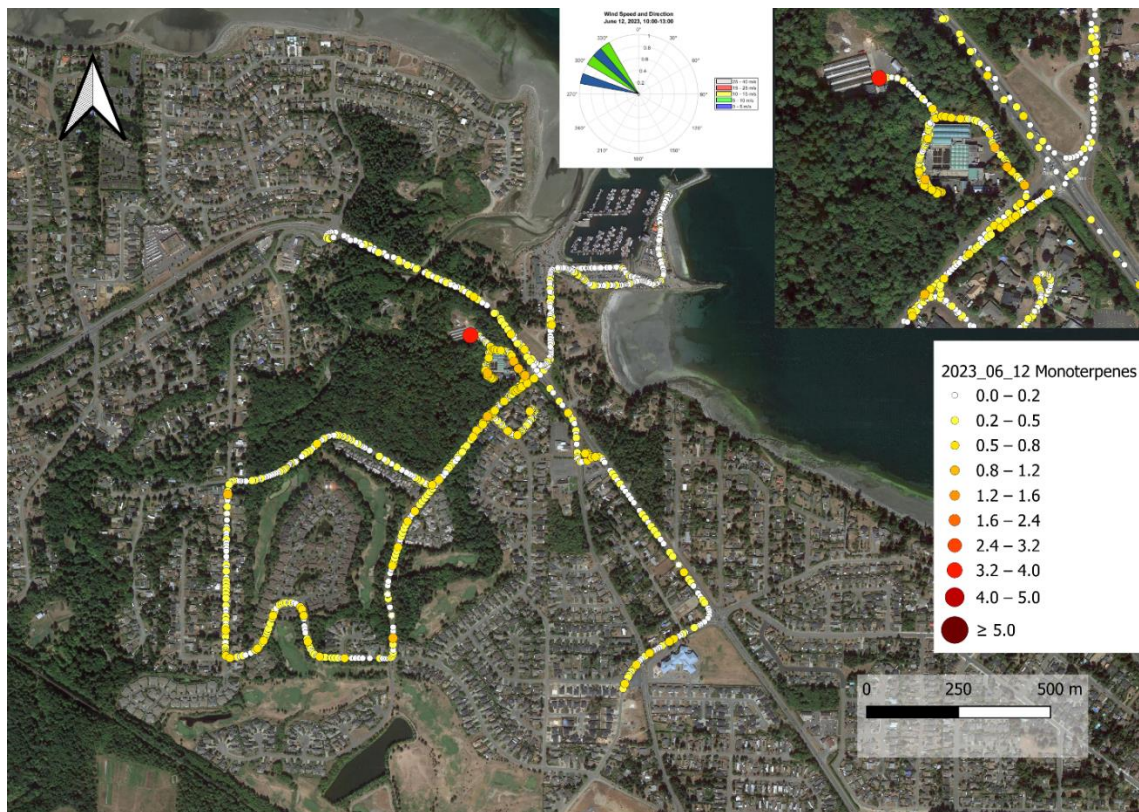


Figure 11 Community Road maps for Monoterpenes, (top-May 29, bottom-June 12)

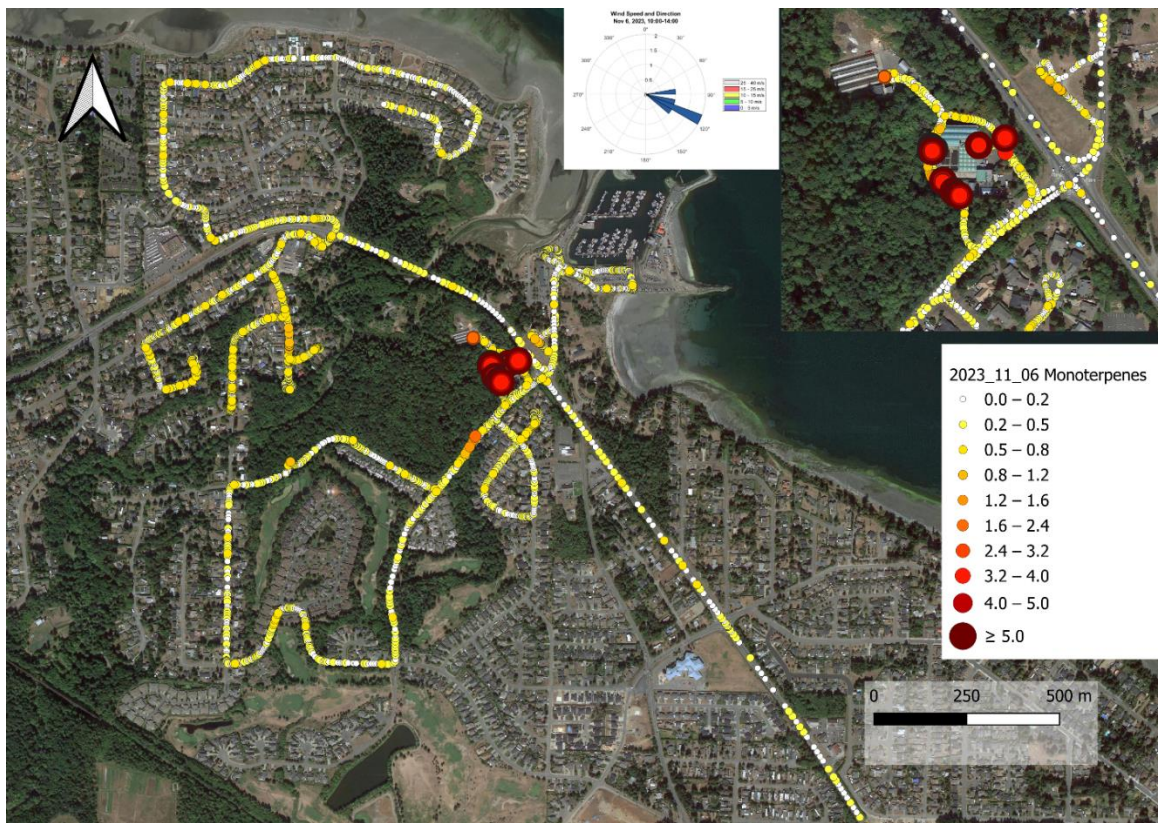
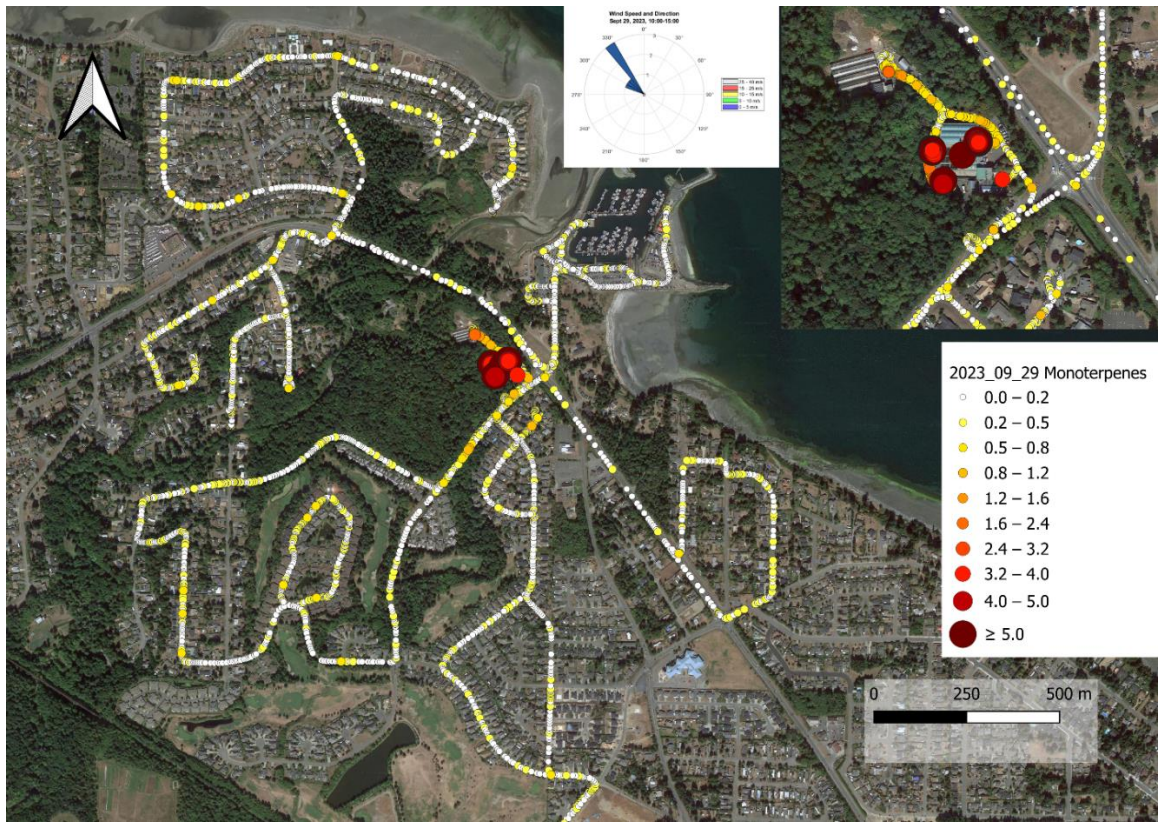


Figure 12 Community Road maps for Monoterpenes, (top-Sept 29, bottom-Nov 6)

Monoterpenes(PPBv)

2024_02_20

- 0.0 – 0.2
- 0.2 – 0.5
- 0.5 – 0.8
- 0.8 – 1.2
- 1.2 – 1.6
- 1.6 – 2.4
- 2.4 – 3.2
- 3.2 – 4.0
- 4.0 – 5.0
- ≥ 5.0



Monoterpenes(PPBv)

2024_06_13

- 0.0 – 0.2
- 0.2 – 0.5
- 0.5 – 0.8
- 0.8 – 1.2
- 1.2 – 1.6
- 1.6 – 2.4
- 2.4 – 3.2
- 3.2 – 4.0
- 4.0 – 5.0
- ≥ 5.0



Figure 13 Community road maps for Monoterpenes concentration (top- Feb 20,2024, bottom- June 13,2024)

Acetaldehyde community road maps

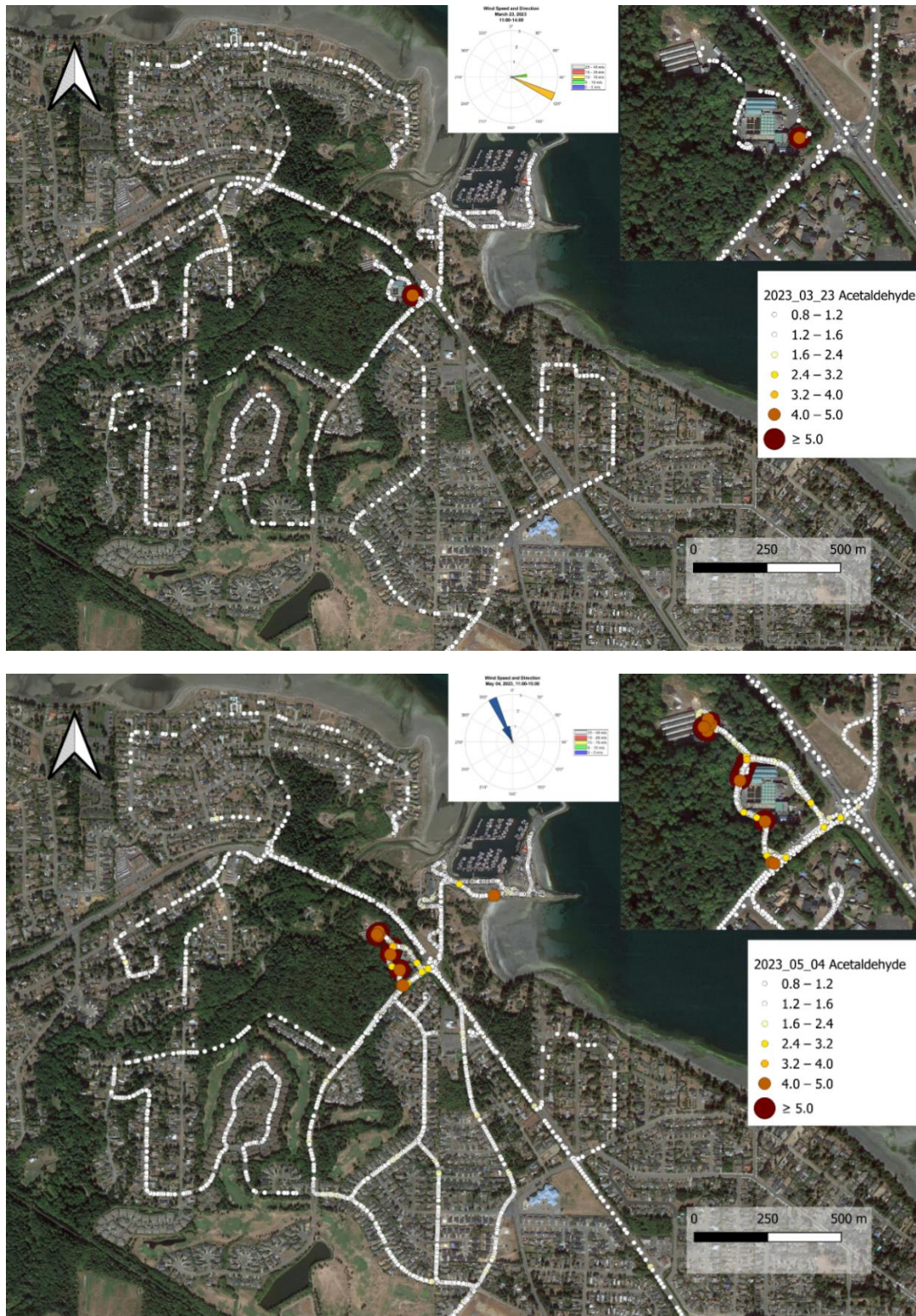


Figure 14 Community Road maps for Acetaldehyde, (top-Mar 23, bottom-May 4)

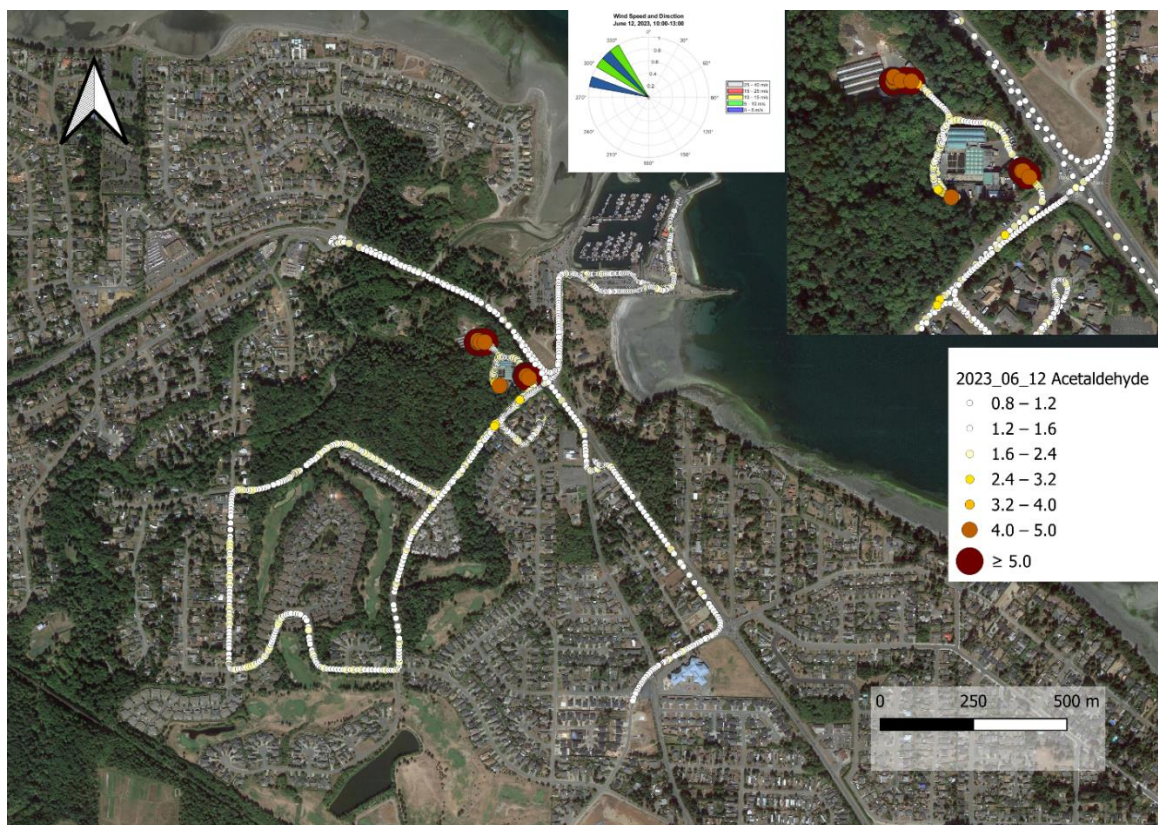
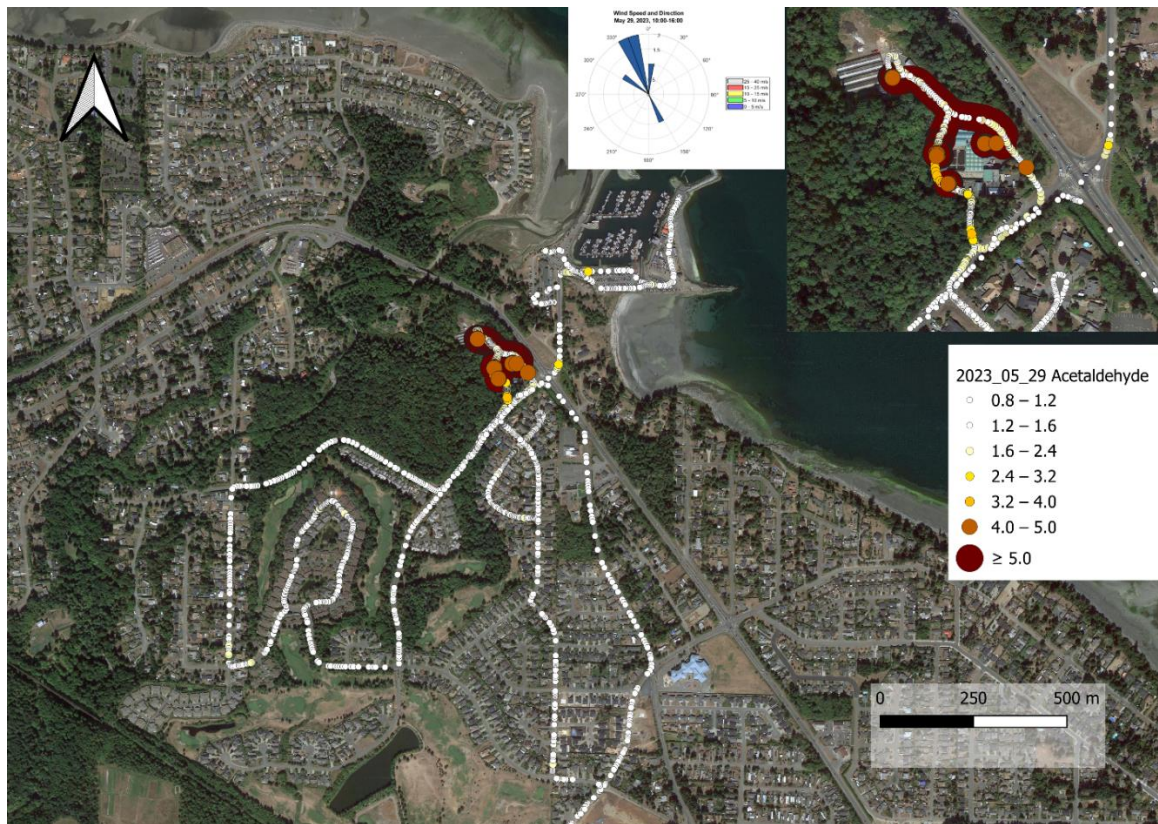


Figure 15 Community Road maps for Acetaldehyde, (top-May 29, bottom-June 12)

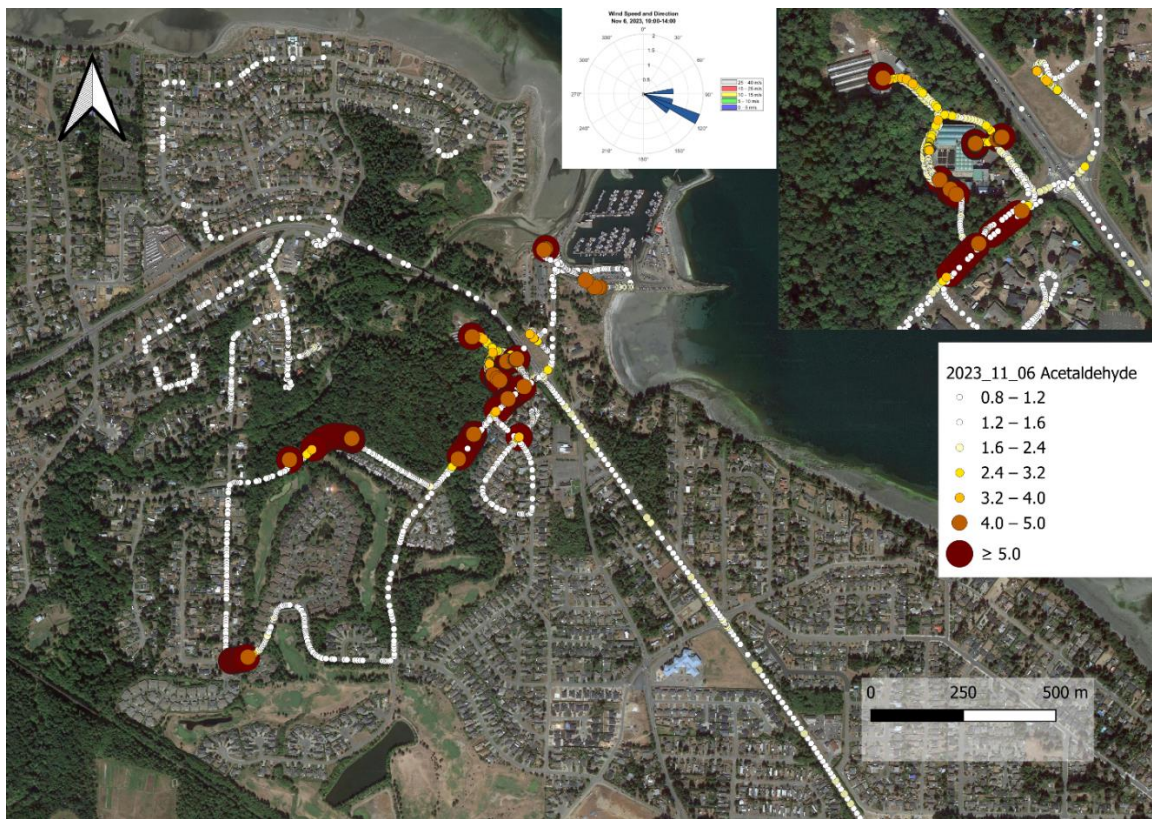
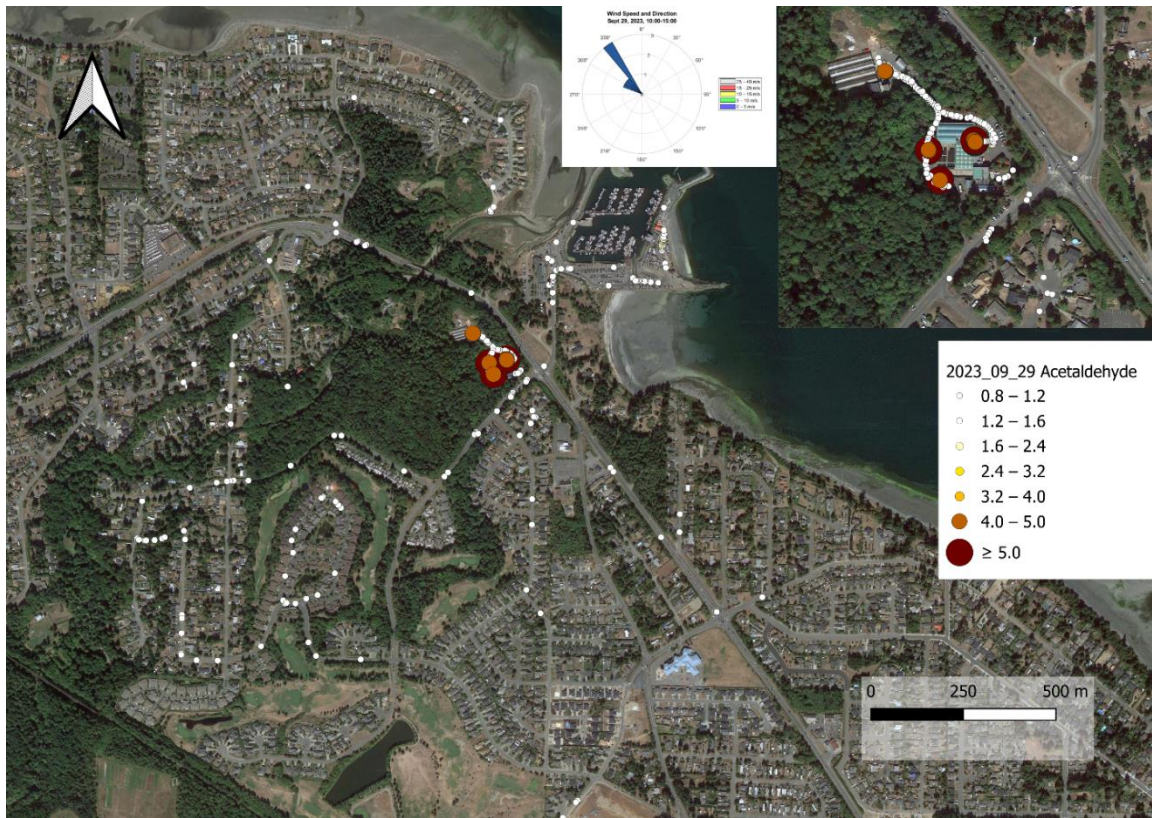
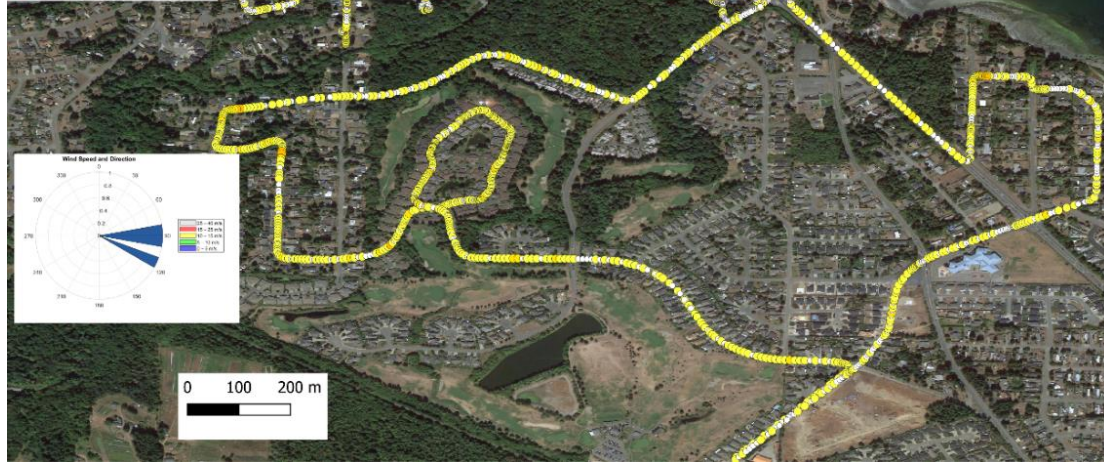


Figure 16 Community Road maps for Acetaldehyde, (top-Sept 29, bottom-Nov 6)

Acetaldehyde(PPBv)

2024_02_20

- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2.8
- 2.8 - 4.1
- 4.1 - 5.6
- 5.6 - 7.2
- 7.2 - 11
- 11 - 25.2
- ≥ 25.2



Acetaldehyde(PPBv)

2024_06_13

- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2.8
- 2.8 - 4.1
- 4.1 - 5.6
- 5.6 - 7.2
- 7.2 - 11
- 11 - 25.2
- ≥ 25.2

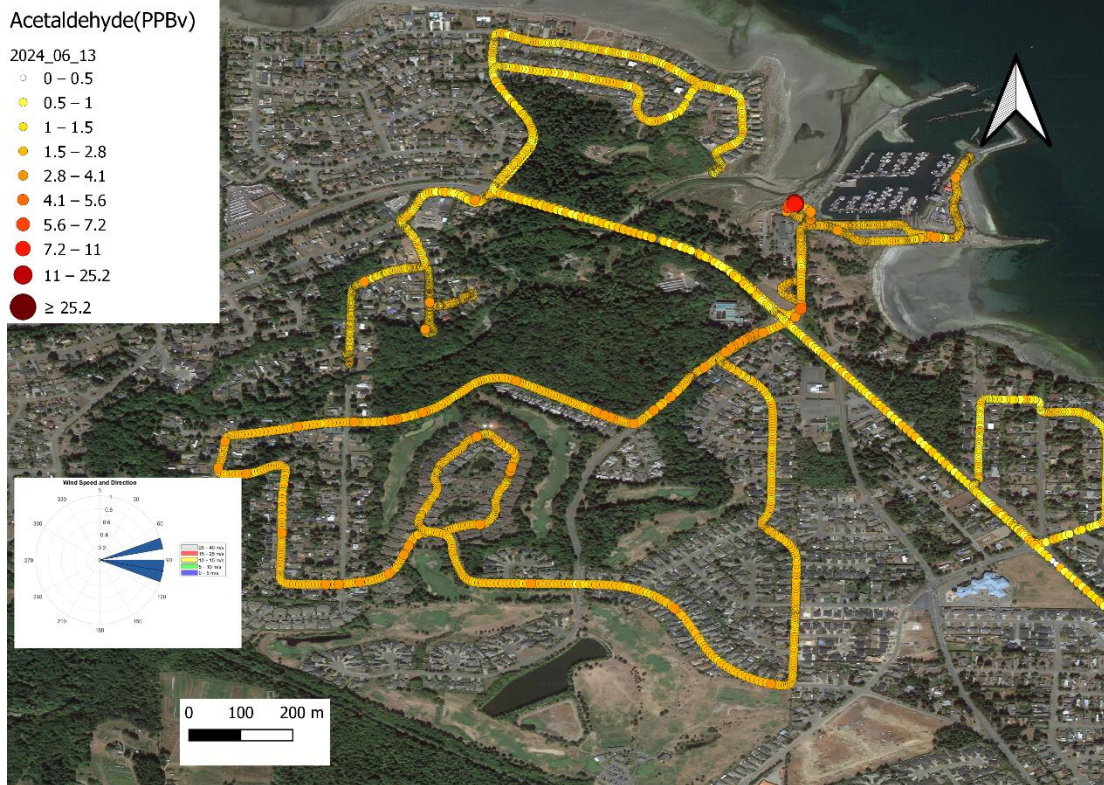


Figure 17 Community road maps for Acetaldehyde concentration. (top-Feb 20, 2024, bottom-June 13, 2024)

Methane community road maps

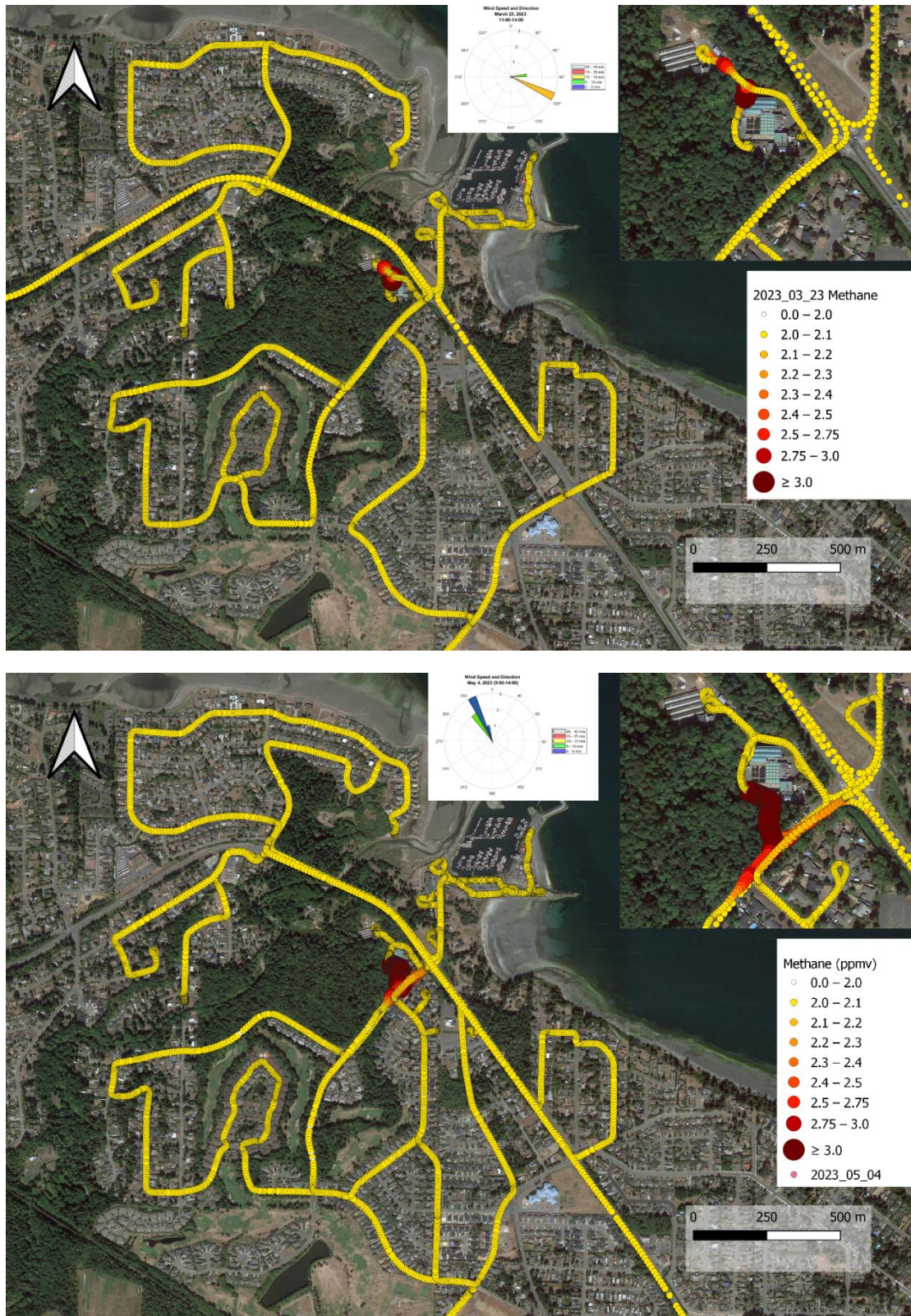


Figure 18 Community Road maps for Methane, (top-Mar 23, bottom-May 4)

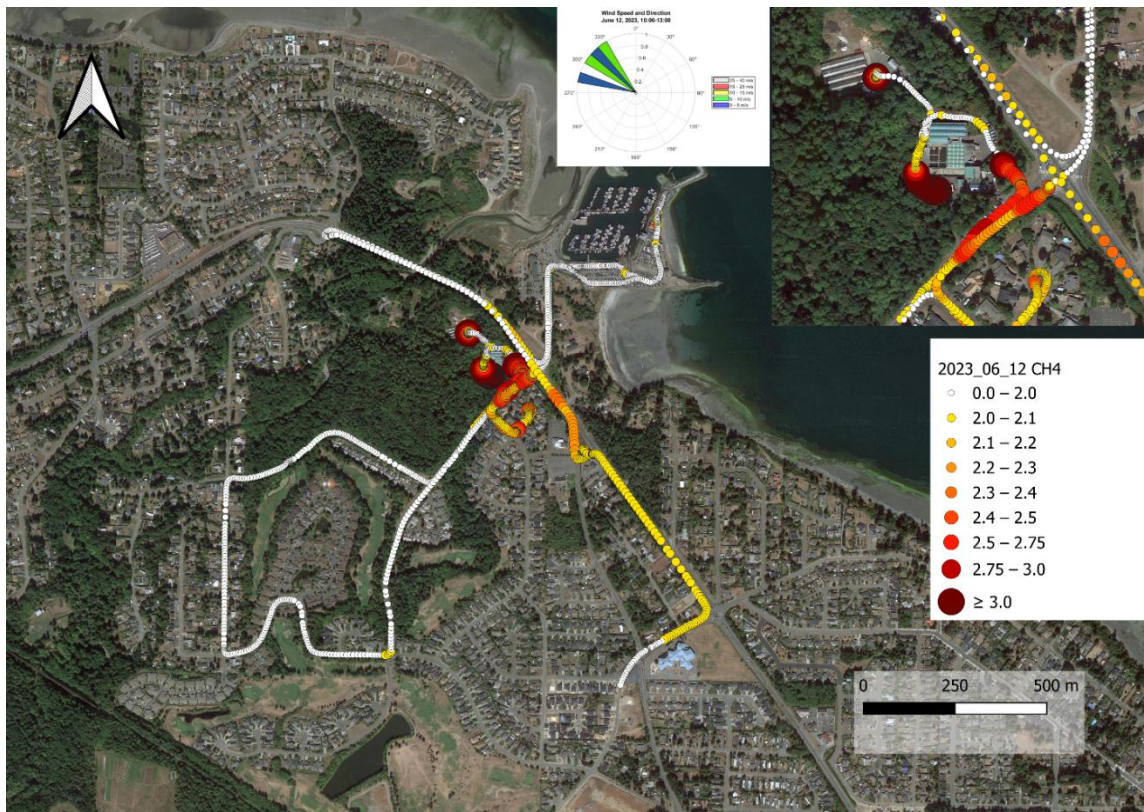
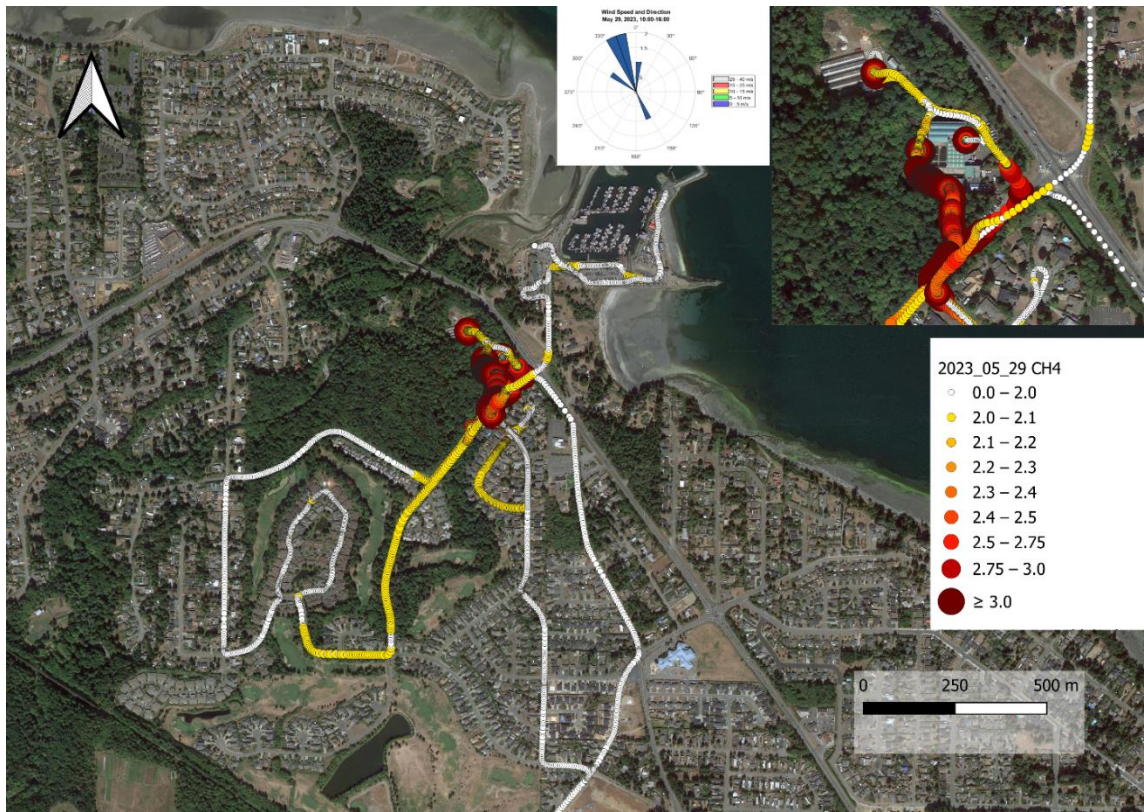


Figure 19 Community Road maps for Methane (top-May 29, bottom-June 12)

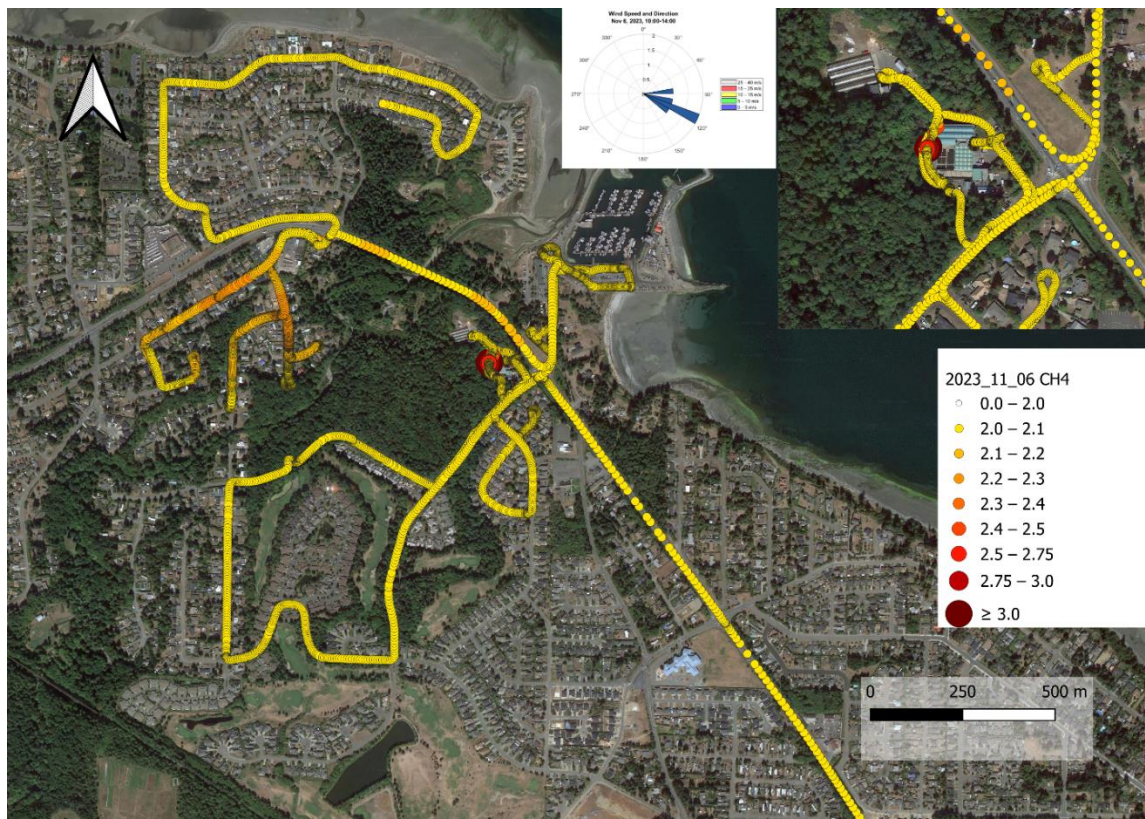
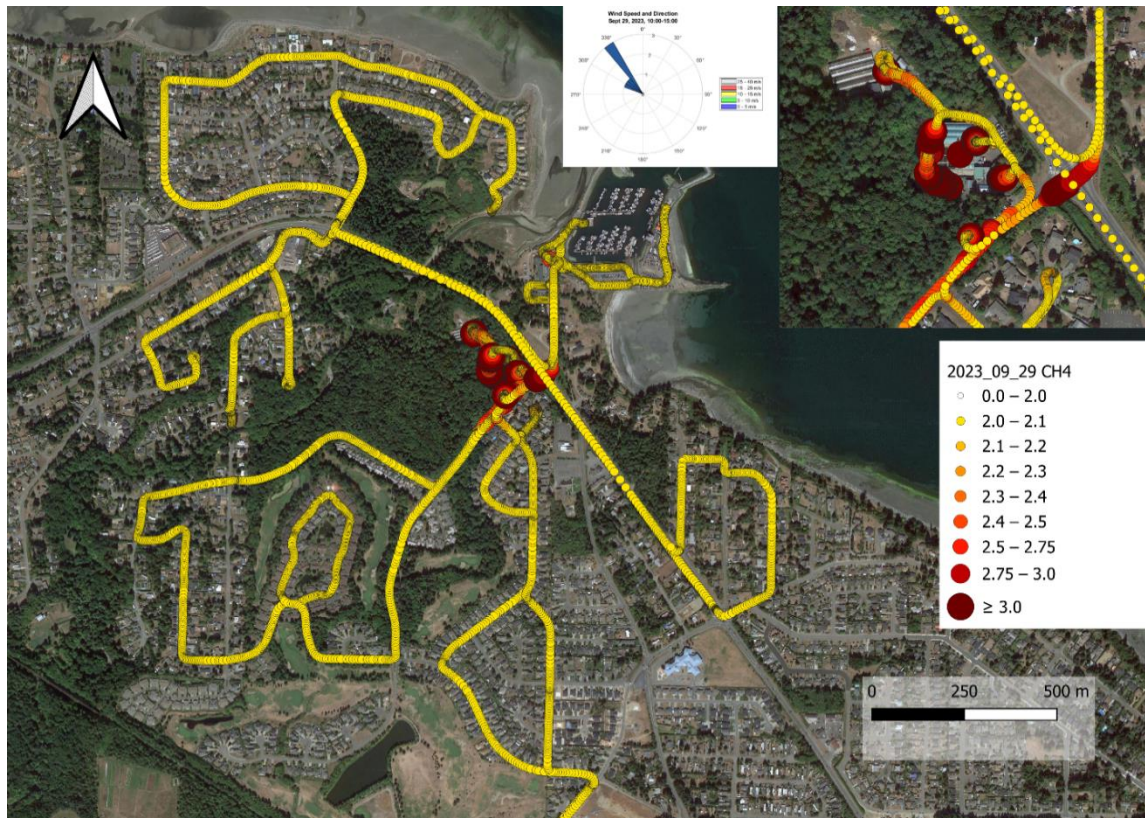
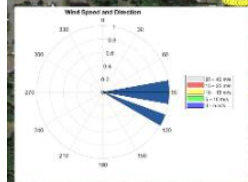


Figure 20 Community Road maps for Methane (top-Sept 29, bottom-Nov 6)

Methane(PPMv)

2024_02_20

- 0.0 - 2.0
- 2.0 - 2.4
- 2.4 - 2.8
- 2.8 - 3.2
- 3.2 - 3.8
- 3.8 - 4.4
- 4.4 - 5.0
- 5.0 - 5.6
- 5.6 - 6.2
- ≥ 6.2

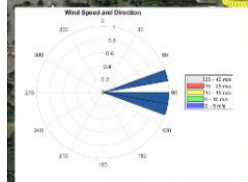


0 100 200 m

Methane(PPMv)

2024_06_13

- 0.0 - 2.0
- 2.0 - 2.4
- 2.4 - 2.8
- 2.8 - 3.2
- 3.2 - 3.8
- 3.8 - 4.4
- 4.4 - 5.0
- 5.0 - 5.6
- 5.6 - 6.2
- ≥ 6.2



0 100 200 m

Figure 21 Community road maps for Methane concentration. (top-Feb 20,2024, bottom-June 13,2024)

Acetone community road maps



Figure 22 Community Road maps for Acetone (top-Mar 23, bottom-May 4)

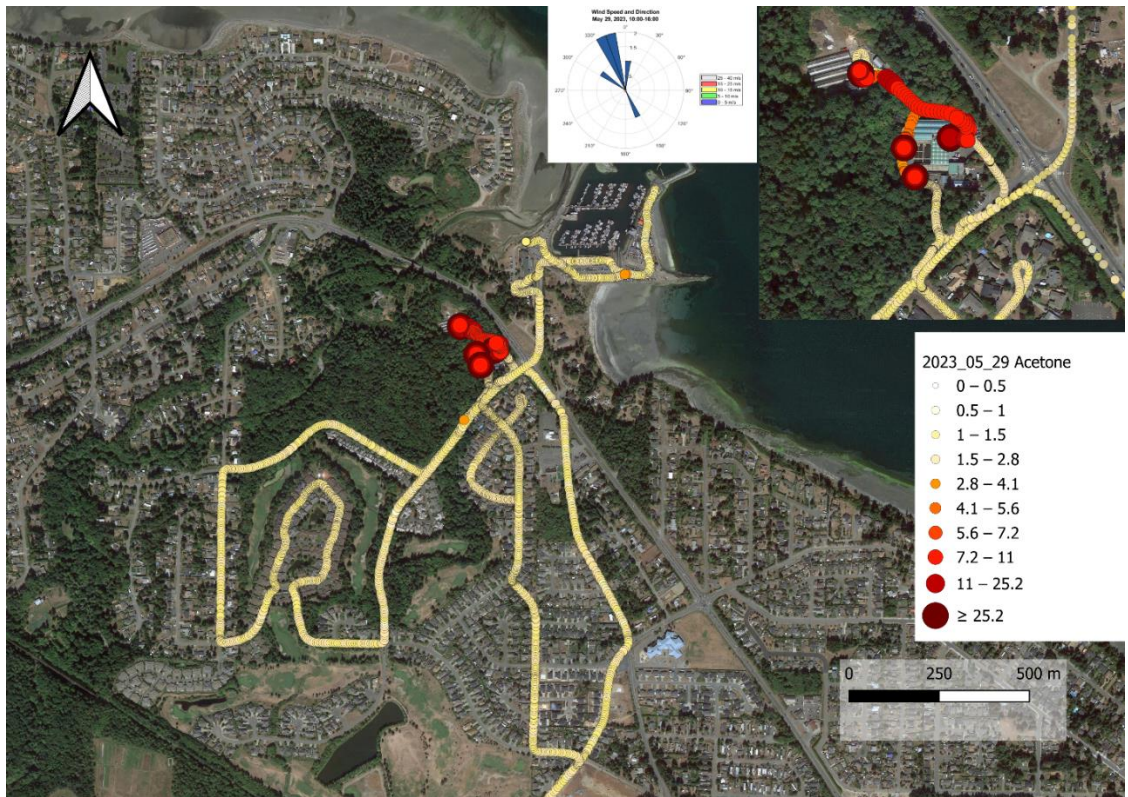


Figure 23 Community Road maps for Acetone (top-May 29, bottom-June 12)

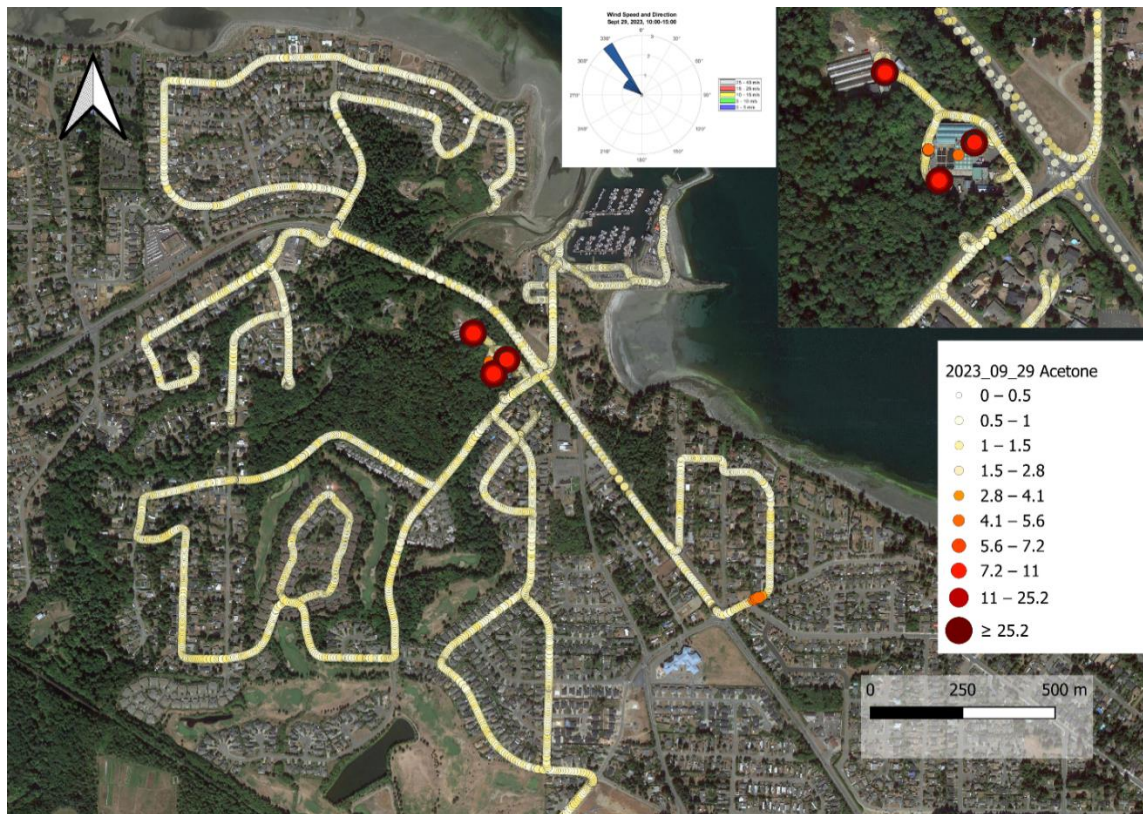
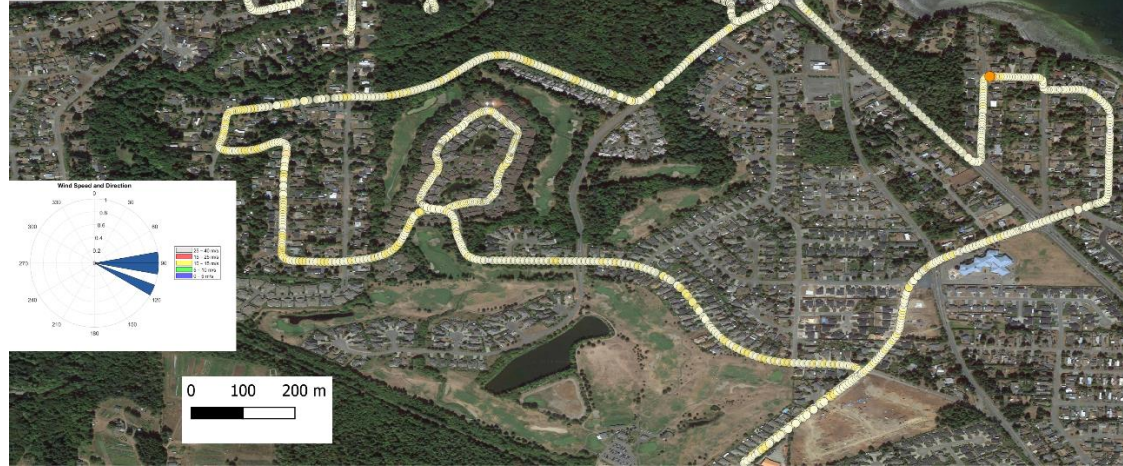


Figure 24 Community Road maps for Acetone (top-Sept 29, bottom-Nov 6)

Acetone (PPBv)

2024_02_20

- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2.8
- 2.8 - 4.1
- 4.1 - 5.6
- 5.6 - 7.2
- 7.2 - 11
- 11 - 25.2
- ≥ 25.2



Acetone (PPBv)

2024_06_13

- 0 - 0.5
- 0.5 - 1
- 1 - 1.5
- 1.5 - 2.8
- 2.8 - 4.1
- 4.1 - 5.6
- 5.6 - 7.2
- 7.2 - 11
- 11 - 25.2
- ≥ 25.2

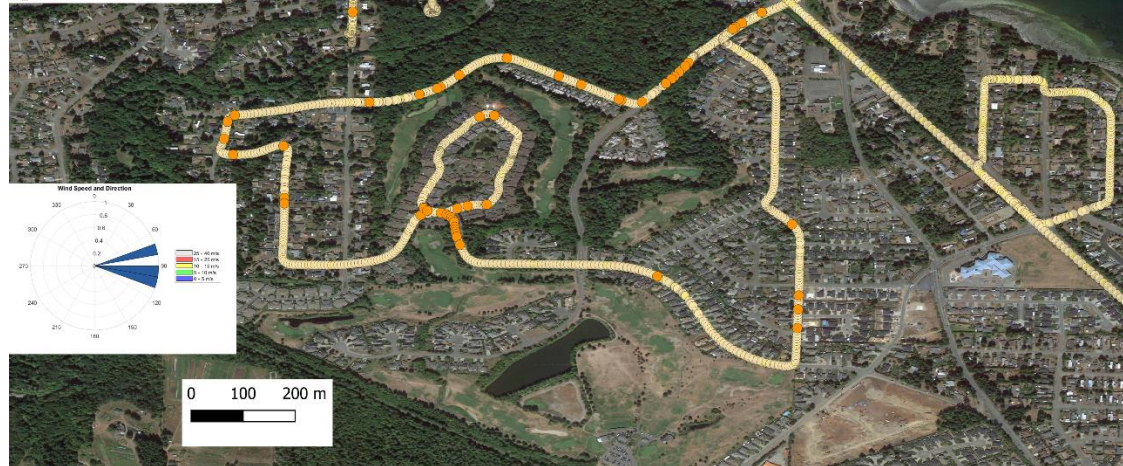


Figure 25 Community maps for Acetone concentration. (top-Feb 20, 2024, bottom-June 13, 2024)

Toluene community road maps

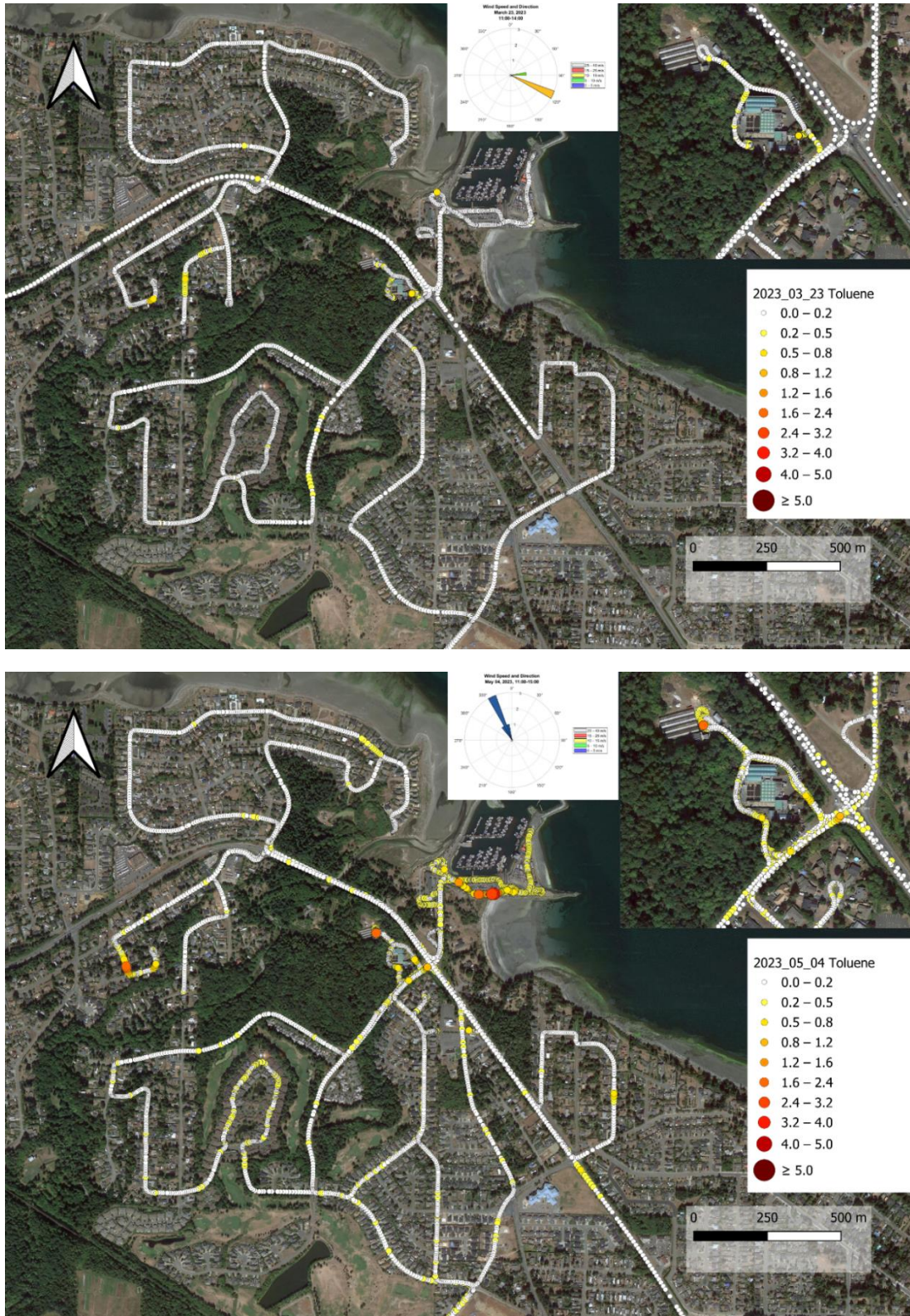


Figure 26 Community Road maps for Toluene (top-Mar 23, bottom-May 4)

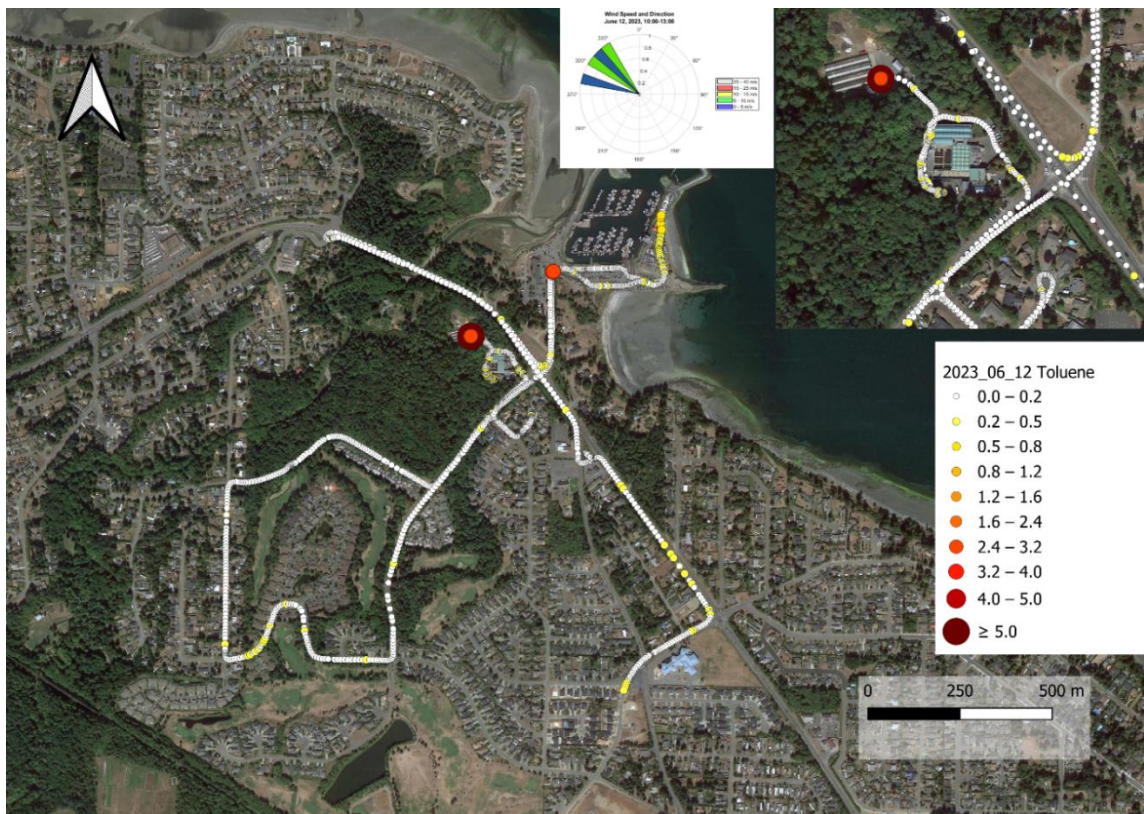


Figure 27 Community Road maps for Toluene (top-May 29, bottom-June 12)

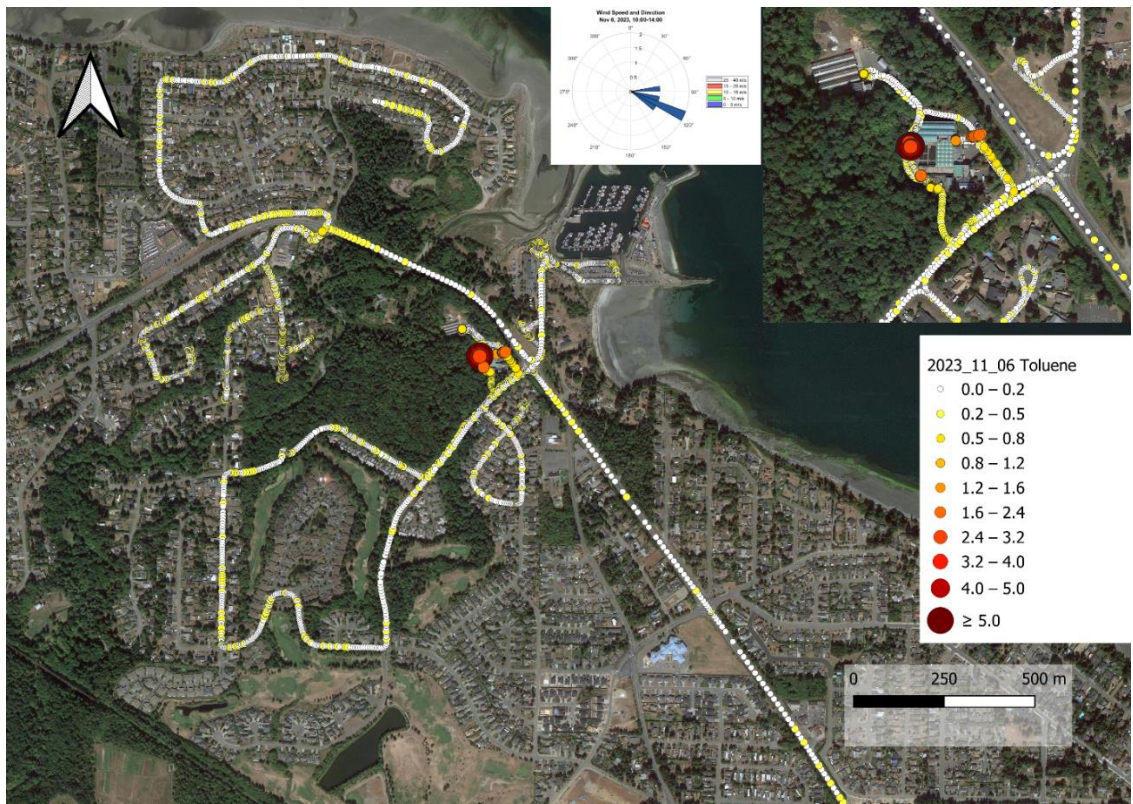
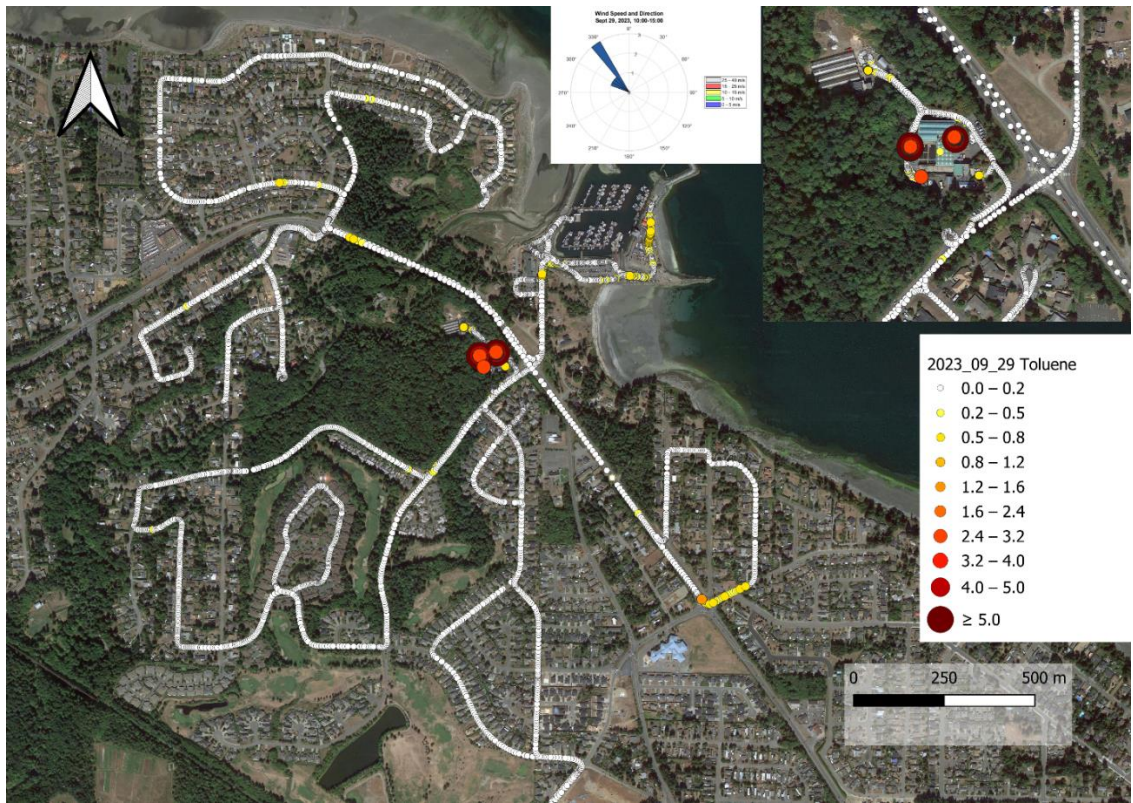
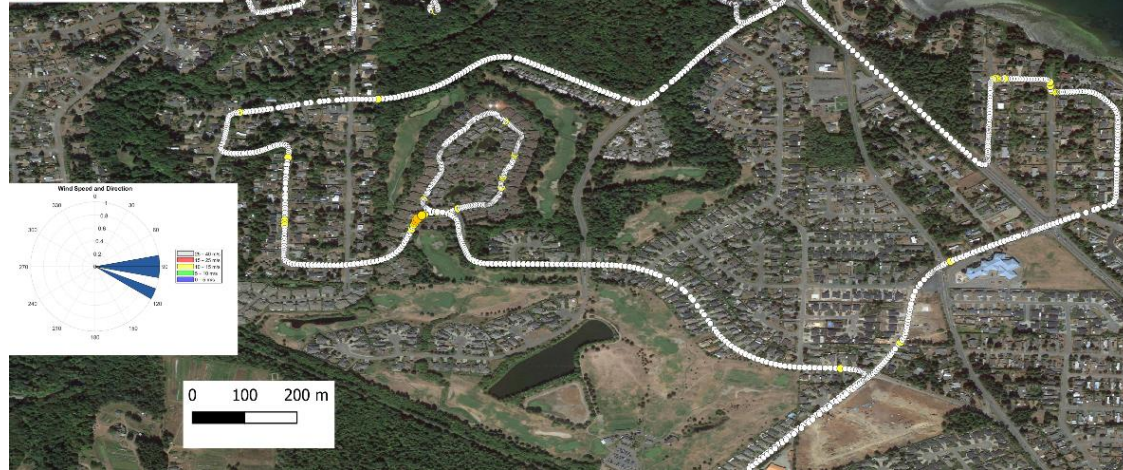


Figure 28 Community Road maps for Toluene (top-Sept 29, bottom-Nov 6)

Toluene (PPbv)

2024_02_20

- 0.0 - 0.2
- 0.2 - 0.5
- 0.5 - 0.8
- 0.8 - 1.2
- 1.2 - 1.6
- 1.6 - 2.4
- 2.4 - 3.2
- 3.2 - 4.0
- 4.0 - 5.0
- ≥ 5.0



Toluene (PPbv)

2024_06_13

- 0.0 - 0.2
- 0.2 - 0.5
- 0.5 - 0.8
- 0.8 - 1.2
- 1.2 - 1.6
- 1.6 - 2.4
- 2.4 - 3.2
- 3.2 - 4.0
- 4.0 - 5.0
- ≥ 5.0

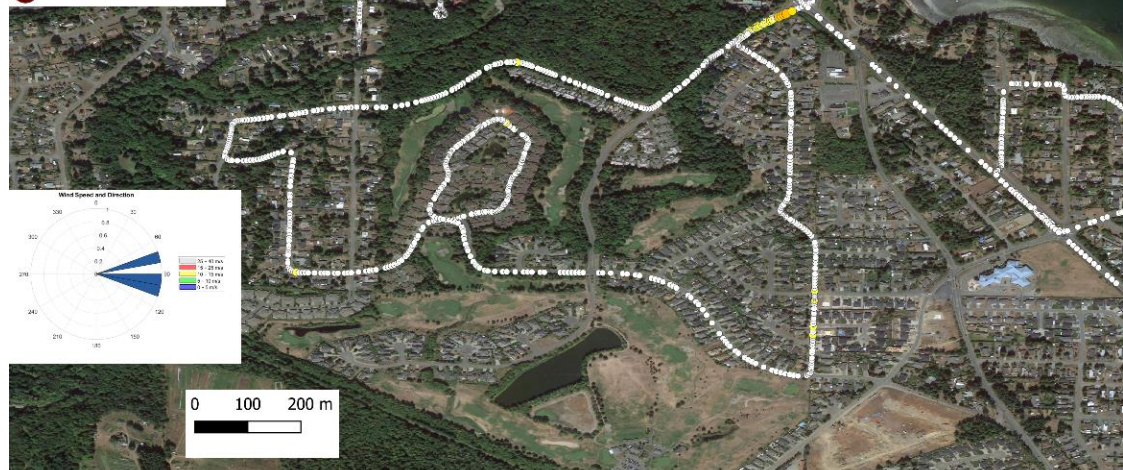


Figure 29 Community maps for Toluene concentration. (top-Feb 20, 2024, bottom-June 13, 2024)

Greater Nanaimo Pollution Control Centre Community Mapping

Data and results from on-site and community mapping

Data from January 25, April 4, June 23, September 22, and November 7, 2023, February 26, 2024 and June 11, 2024, of mobile surveys of VOC concentrations on-site at the WWTP and in the neighbouring community are shown below. In the following section geospatial maps of the concentrations of methane, methanethiol, DMS, acetaldehyde, toluene, and monoterpenes detected along the drive route are shown.

Sample date	Sampling Location	Time period of sampling
July 29, 2022	Community drive	10:30-12:50
August 23, 2022	community drive + (Pump Station)	12:00 – 13:40 / 14:30-15:30
November 16, 2022	Community drive	12:30 – 16:00
January 25, 2023	Community drive	10:50-12:00 / 14:00-15:40
April 04, 2023	Community drive	13:45-17:00
June 23, 2023	Community drive	13:45-16:30
Sept 22, 2023	Community drive	11:35-13:35
November 7, 2023	Community drive	9:20-10:20 / 11:40-13:40
February 26, 2024	Community drive	13:30-15:00
June 11, 2024	Community drive	12:45-15:05
Total community drive hours (hh:mm)		20:50



Figure 30 Contour map of WWTP2 community area. Map courtesy of Ben Odia.

Written summary for April 2023, June 2023, Feb 2024 and June 2024 on-site and community mapping

April 04, 2023, on-site and community mapping

Figure 32, 38, 44, 50, 56, 61 depict the concentration of methanethiol, DMS, acetaldehyde, monoterpenes, methane and toluene, respectively, measured in the ambient air on-site and in the vicinity of the GNPCC(WWTP2) on April 4, 2023. On-site, concentrations were elevated around the primary treatment area, particularly for methane, methanethiol, DMS, acetaldehyde, and monoterpenes. Of note, methanethiol was detected above odour threshold in this location. On the south side of the WWTP near the secondary treatment system and screening rooms slightly elevated levels of VOCs were detected, in particular methane, methanethiol, and acetaldehyde. Additionally, methane concentrations were high around the south west side of the WWTP near the digestors and the screening room. Off-site, no elevated levels malodourous VOCs were detected in the surrounding community. A small concentration excursion of toluene was detected leaving the plant onto the main road, where this signal could be due to car exhaust. Higher concentrations of acetaldehyde are mainly collocated with higher methane concentrations, with the exception of the east side of the facility where high acetaldehyde concentrations were observed in the absence of methane.

June 23, 2023 on-site and community mapping

The mapping of methane, methanethiol, DMS, acetaldehyde, toluene, and monoterpenes, measured in the ambient air on-site and in the vicinity of the GNPCC (WWTP2) had taken place on June 23, 2023. One of the clarifiers was down for maintenance this day, and the maintenance equipment and generators were in operation on the east side of the plant. Also, the secondary treatment system was having the southern channel drained for cleaning and maintenance. These maintenance activities would have impacted the concentration and distribution of VOCs observed during this sampling trip compared to standard operations. The area around the secondary treatment system that was drained for maintenance had elevated levels of VOCs, particularly methanethiol and DMS, compared to what was observed in April. Additionally, these two compounds were detected in the surrounding community on McGuffie Road, Keel Cove Lane, and Shores Drive above their odour detection thresholds. Elevated levels of methane were detected on-site and on the roads south and west of the plant. It appeared that we were in the downwind plume from the plant when we were parked near the digester and methane storage ball. Near the Wellington Pump Station low concentrations of methane, methanethiol, and DMS were observed, with both reduced sulfur compounds present above odour detection thresholds. Acetaldehyde was detected in the northwest and southeast areas of the site, with toluene also present in elevated concentrations in the southeast corner of the site and on Hammond Bay Road.

February 26 , 2024, on-site and community mapping

Community maps showing methanethiol and dimethyl sulfide concentrations are shown below, with elevated levels of both analytes seen on-site, and a minor detection of methanethiol on the adjacent roadway.

Maps showing concentrations of acetaldehyde and monoterpenes show minor elevated concentrations for both analytes on-site and detection offsite (0.2-1 ppb_v) ~200m down wind of the GNPCC.

A map showing concentrations of methane is shown below, with elevated levels of methane found on-site near the centrifuge room (>6.2 ppm_v), the digestors (>6.2 ppm_v) and near the screening room and primary settling ponds (2.8-3.8 ppm_v). No elevated levels of methane were detected off-site.

June 11, 2024 on-site and community mapping

Maps showing concentrations of methanethiol and dimethyl sulfide are below. Elevated levels of both analytes were detected on-site (1.2-1.6 ppb_v) and minor detection was

indicated off-site, on the adjacent roadway and in the community ~ 500m away from the plant at low levels of 0.2-0.5 ppb_v.

During June 11th elevated levels of acetaldehyde (4.1 - 11 ppb_v) and monoterpenes (1.6 – >5 ppb_v) were detected onsite, elevated concentrations were detected offsite but may have been from sources other than the WWTP as the high concentration of monoterpenes on-road was near a work site where tree's were being removed.

Elevated levels of methane were detected onsite at GNPCC near the screening room (3.8- >6.2 ppm_v) and near the digestors (3.8-4.4 ppm_v) and near the secondary treatment bioreactors (3.8-4.4 ppm_v). No elevated levels of methane were detected offsite.

Methanethiol Community maps

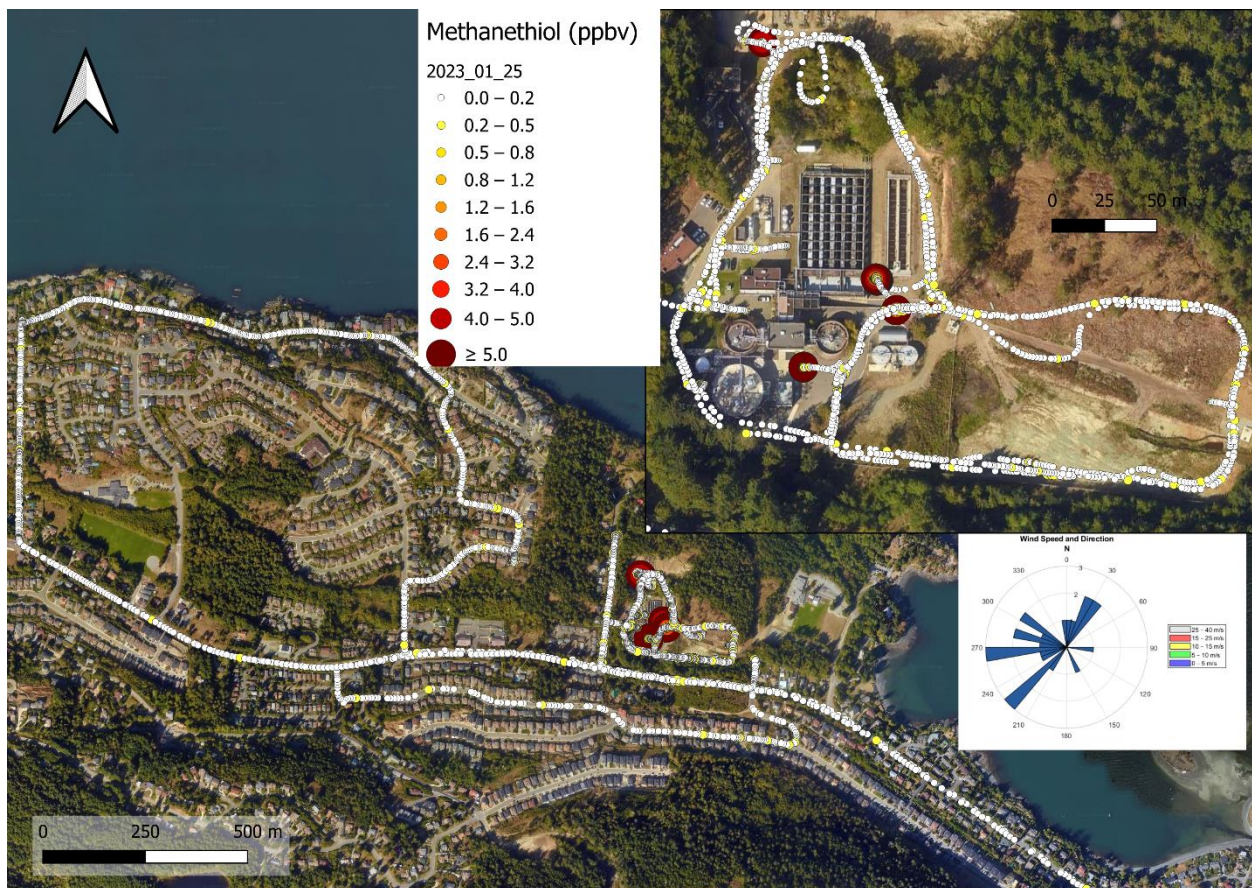


Figure 31 Jan 25, 2023, methanethiol (ppbv) community drive at WWTP2.



Figure 32 Methanethiol concentrations in the vicinity of the GNPCC on April 4, 2023.



Figure 33 Methanethiol concentrations in the vicinity of the GNPCC on June 23, 2023.



Figure 34 Sept 22, Methanethiol (ppbv) Community drive.

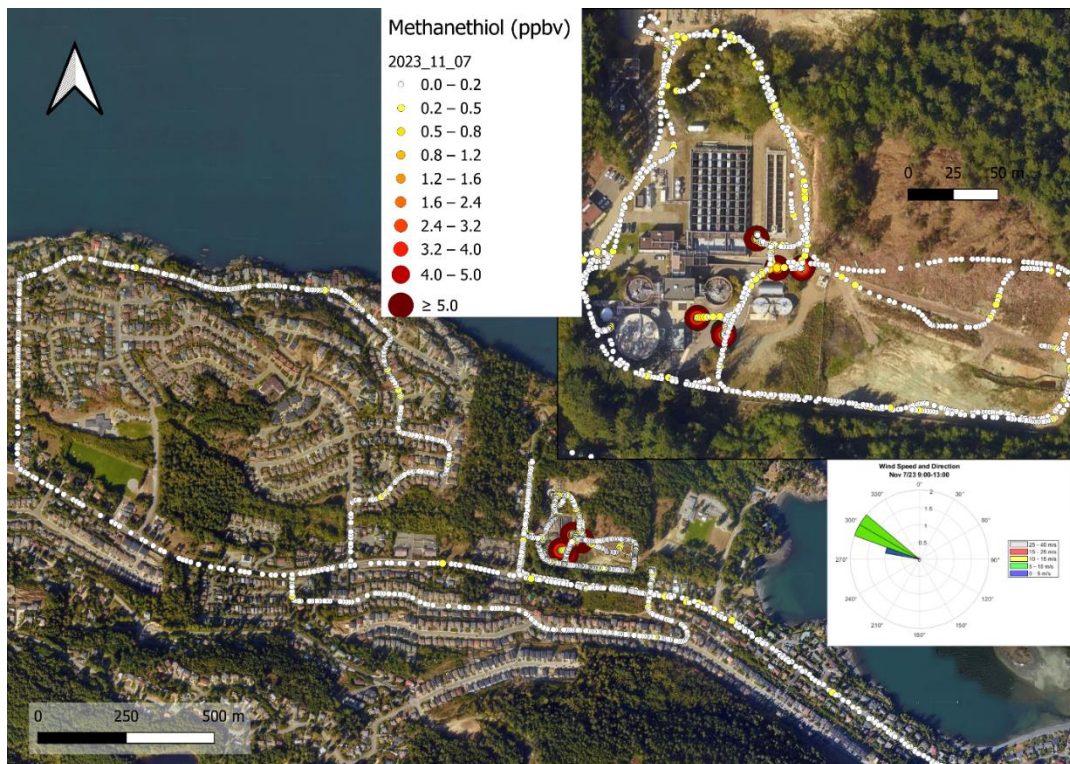


Figure 35 Nov7, Methanethiol (ppbv) Community drive

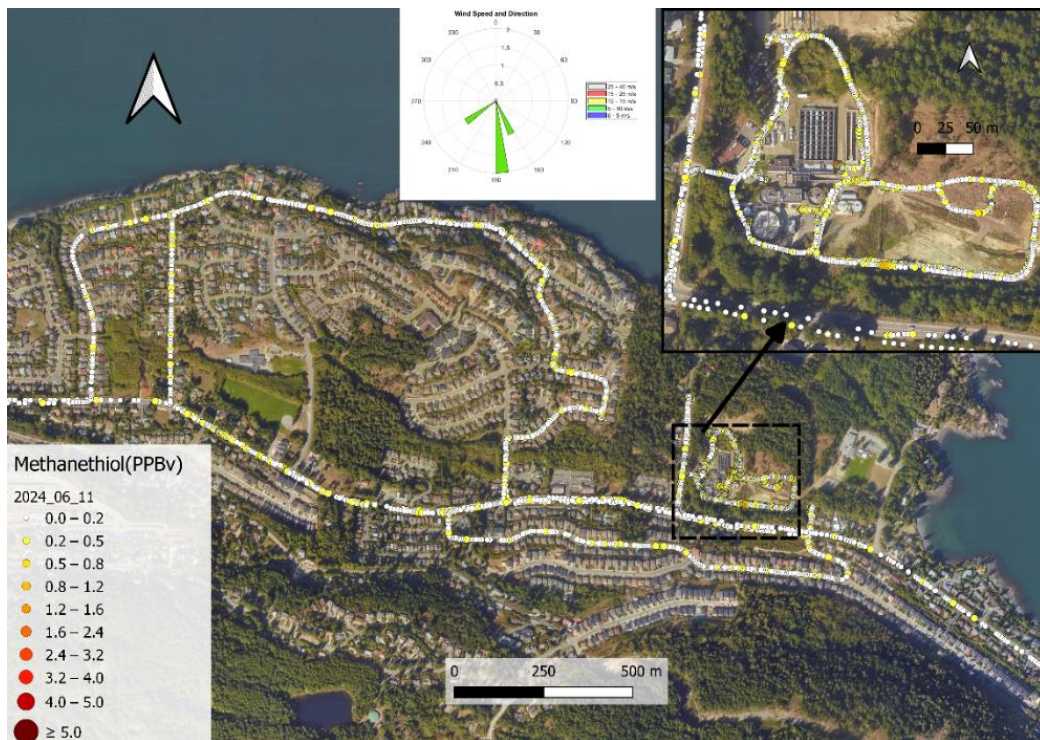


Figure 36 Community road maps for Methanethiol concentration. (top- Feb 26, 2024, bottom- June 11, 2024)

Dimethyl sulfide community maps

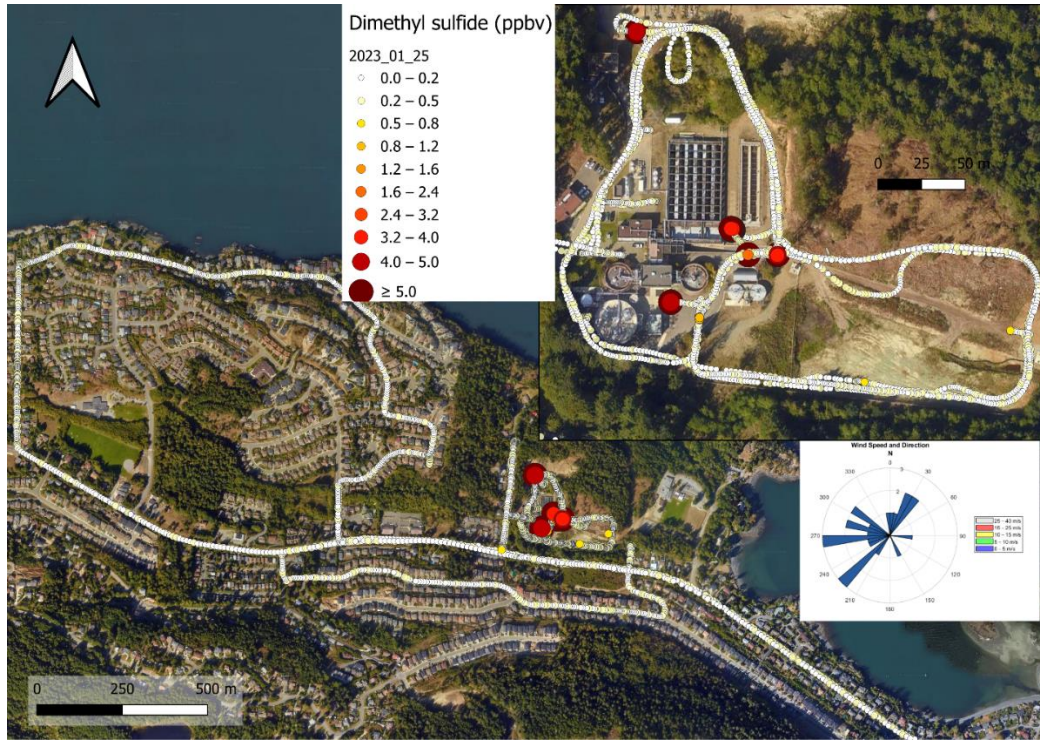


Figure 37 Jan 25, Dimethyl sulfide (ppbv) Community drive.



Figure 38: DMS concentrations in the vicinity of the GNPCC on April 4, 2023.

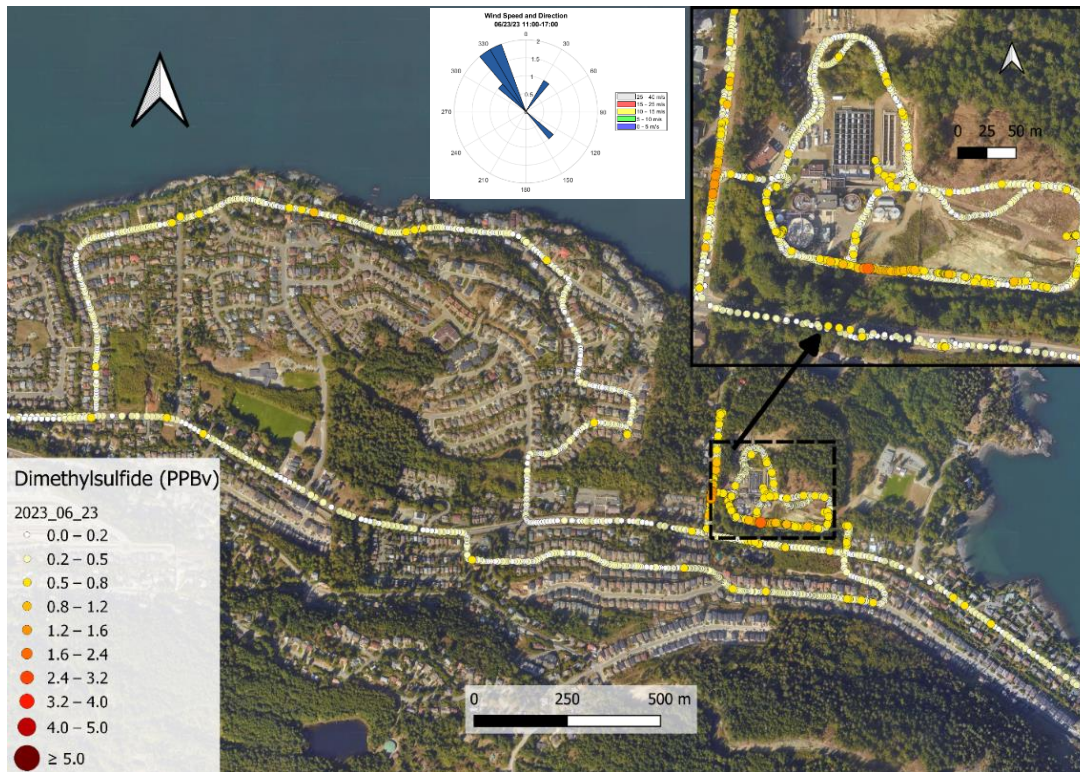


Figure 39: Dimethyl sulfide concentrations in the vicinity of the GNPCC on June 23, 2023.



Figure 40 Sept 22, Dimethyl sulfide (ppbv) Community drive.

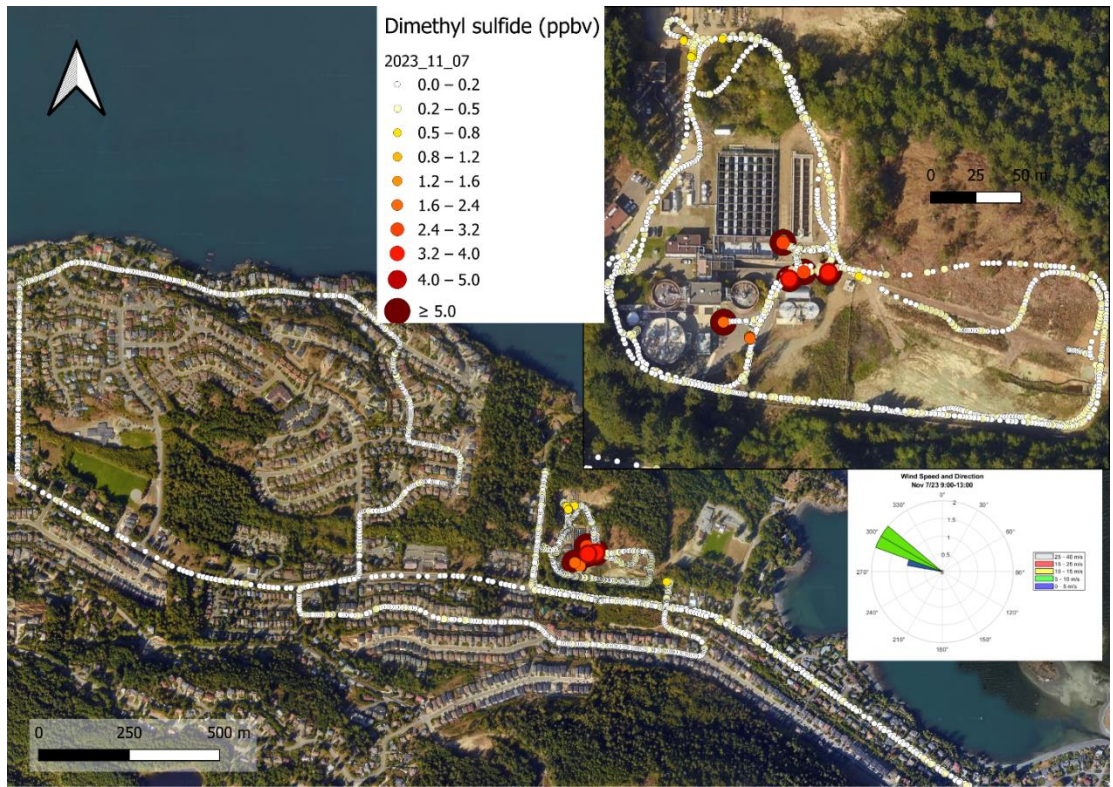


Figure 41 Nov 7, Dimethyl sulfide (ppbv) Community drive.



Figure 42 Community Maps showing Dimethyl sulfide concentrations from Feb 26, 2024

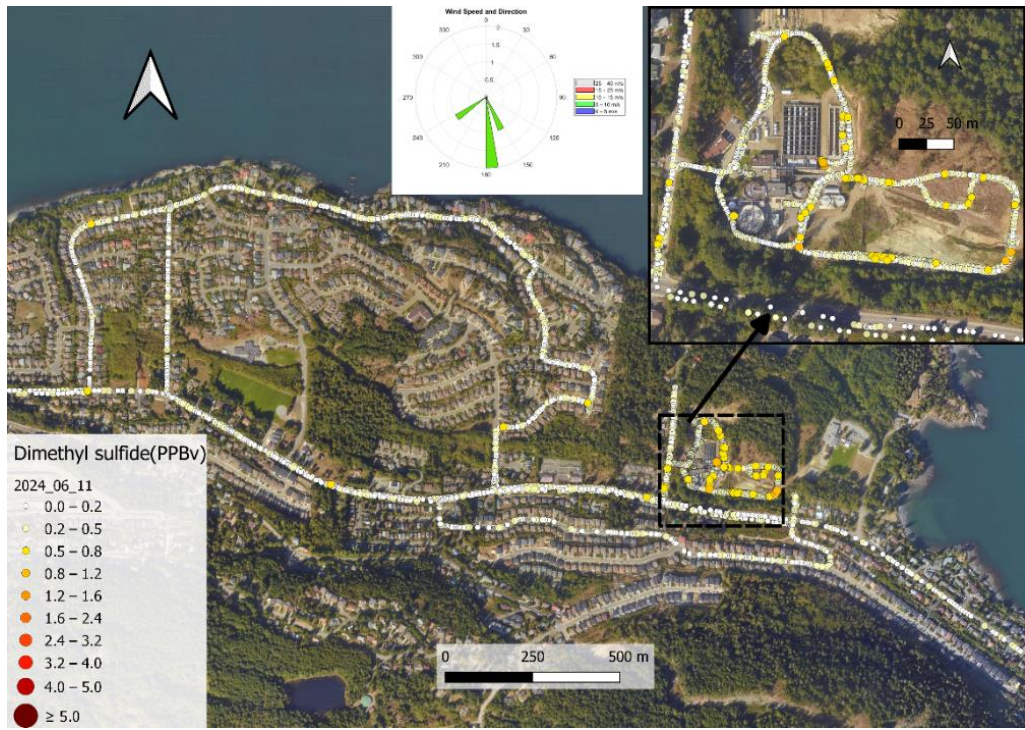


Figure 43 Community Maps showing Dimethyl sulfide concentrations from June 11, 2024

Acetaldehyde Community maps



Figure 44 Community maps for Acetaldehyde. (top-Jan 25, 2023, bottom-April 4, 2023)



Figure 45: Acetaldehyde concentrations in the vicinity of the GNPCC on June 23, 2023.



Figure 46 Sept 22, Acetaldehyde (ppbv) Community drive.

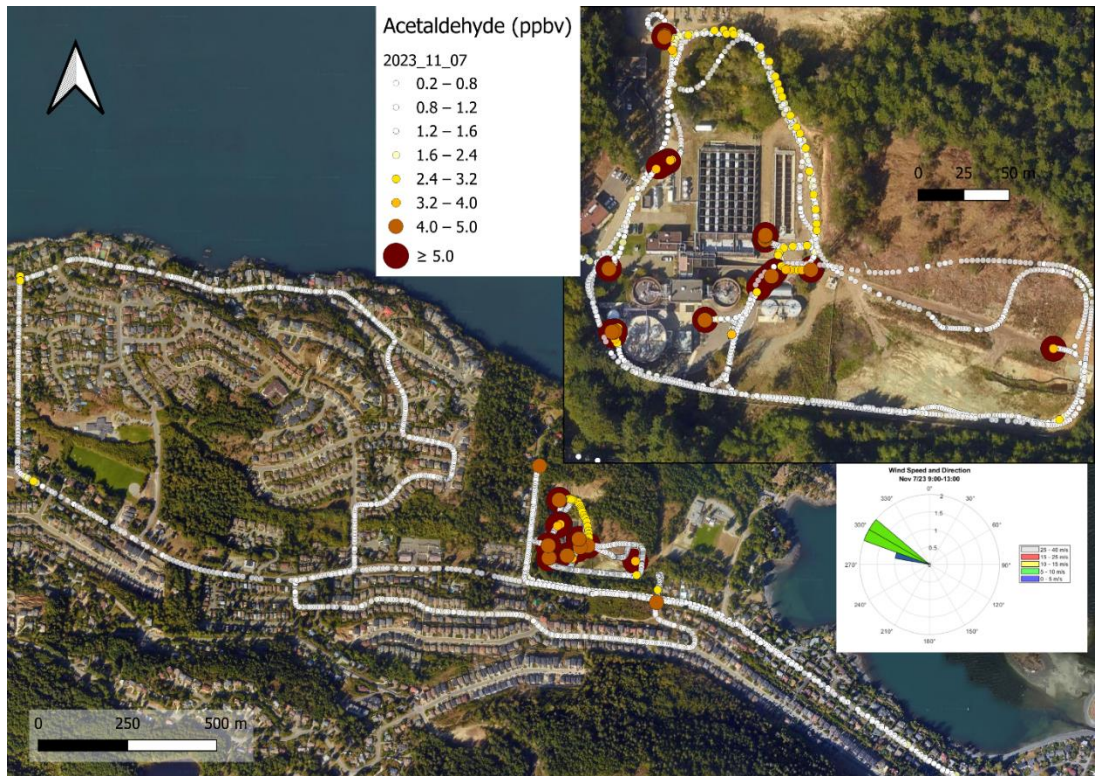


Figure 47 Nov 7, Acetaldehyde (ppbv) Community drive.



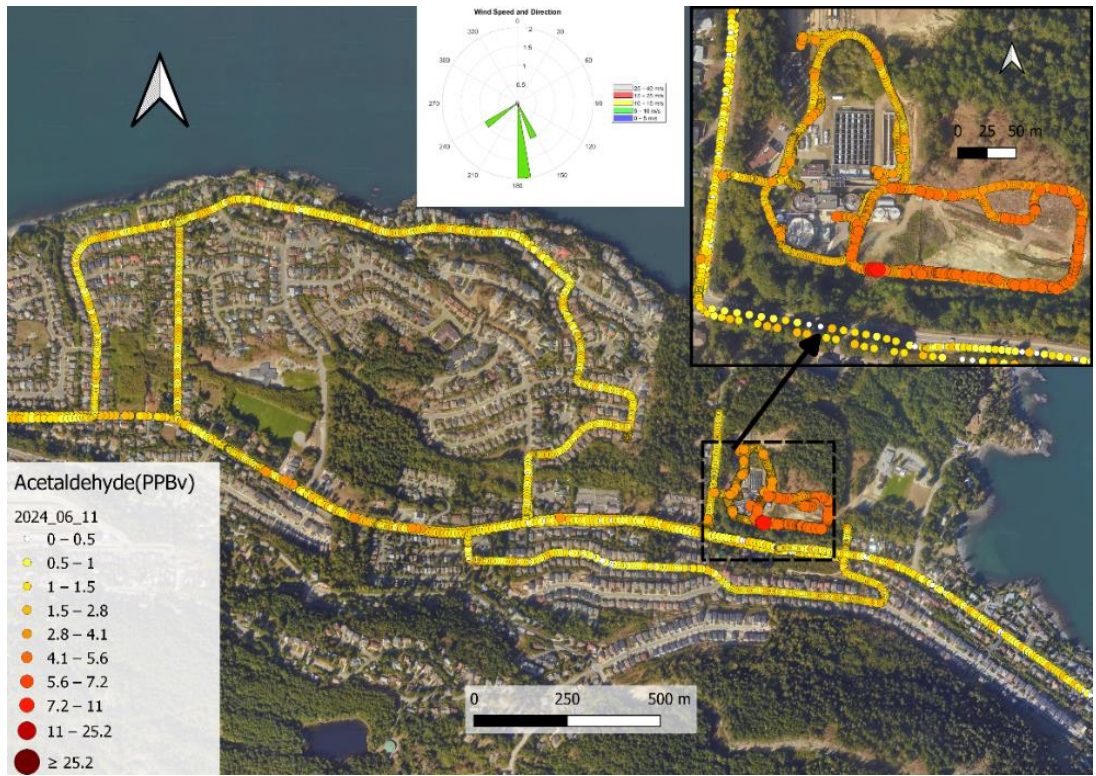


Figure 48 Community road maps for Acetaldehyde concentration. (top- Feb 26, 2024, bottom-June 11, 2024)

Monoterpenes Community maps

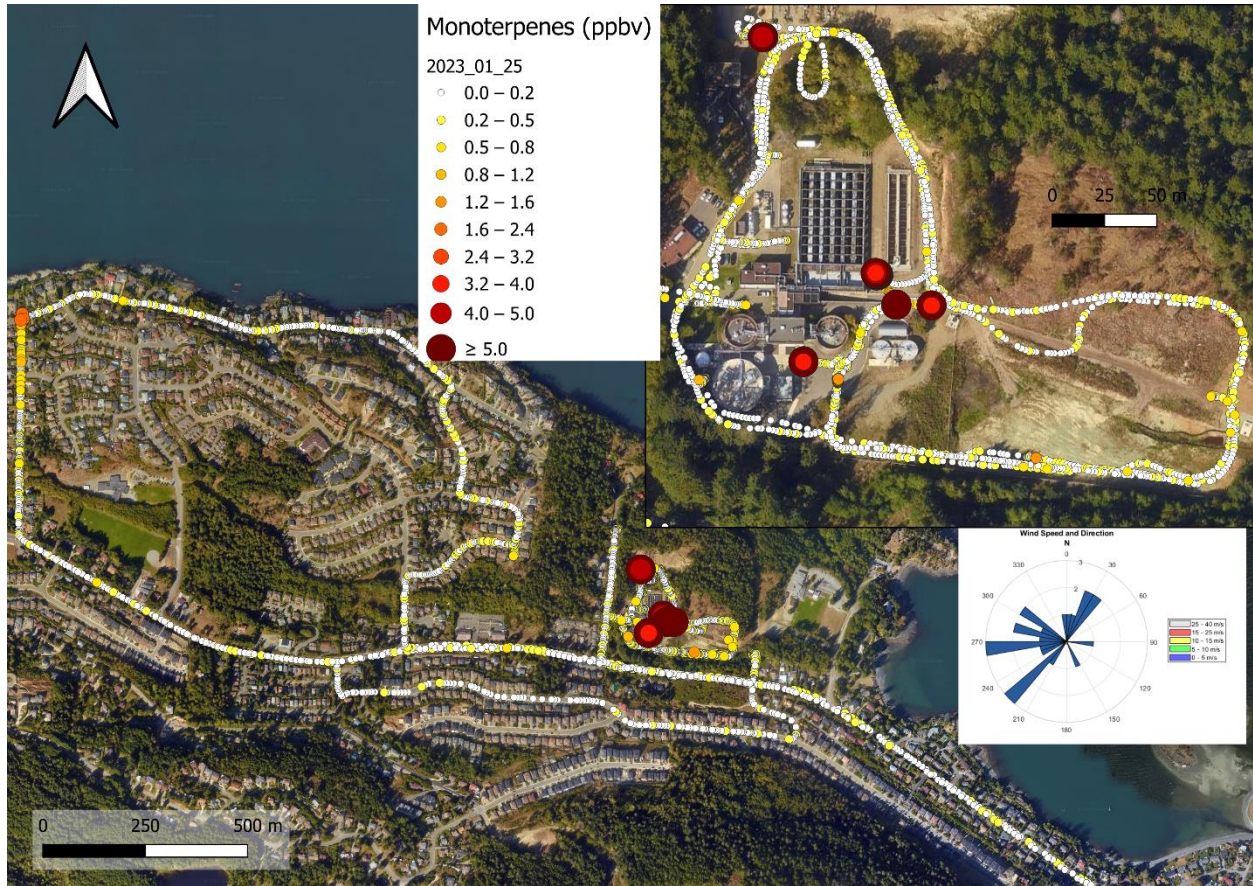


Figure 49 Jan 25, Monoterpenes (ppbv) Community drive.

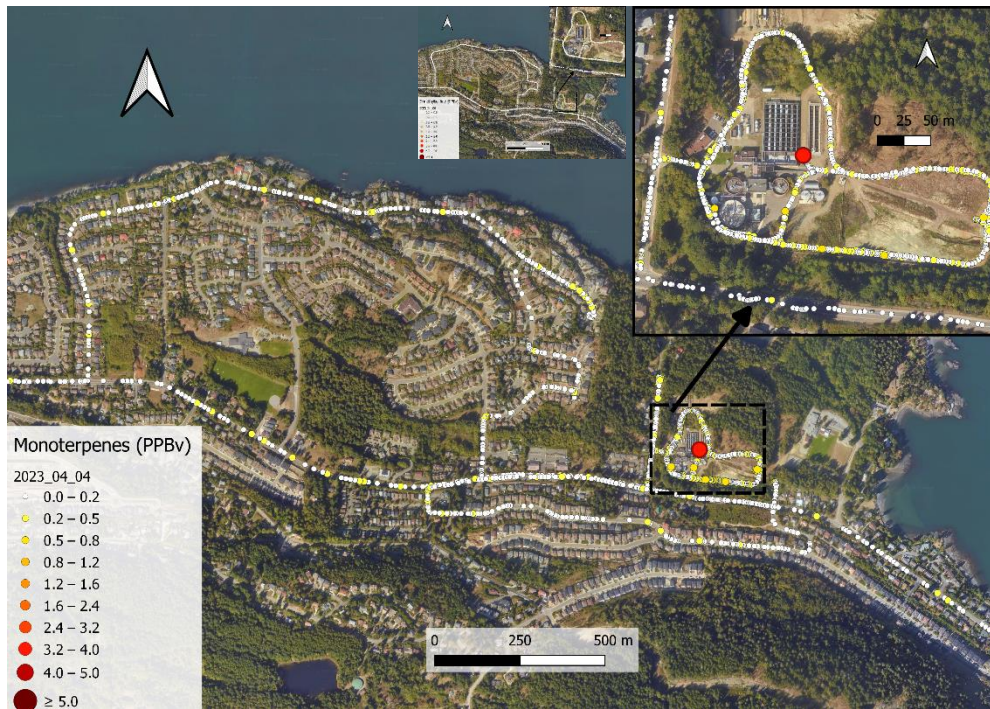


Figure 50: Monoterpene concentrations (quantified as α -pinene) in the vicinity of the GNPCC on April 4, 2023.



Figure 51: Monoterpene concentrations (quantified as α -pinene) in the vicinity of the GNPCC on June 23, 2023.



Figure 52 Sept 22, Monoterpenes (ppbv) Community drive.

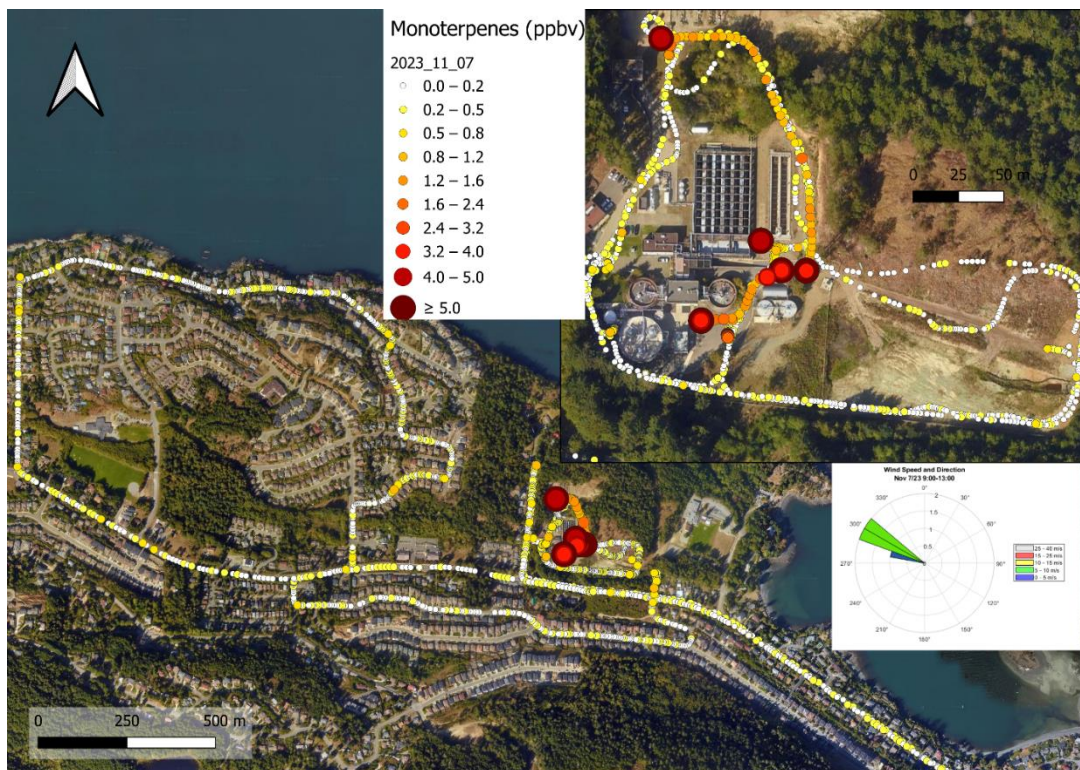


Figure 53 Nov 7, Monoterpenes (ppbv) Community drive.



Figure 54 Community Maps showing Monoterpenes concentrations from Feb 26, 2024

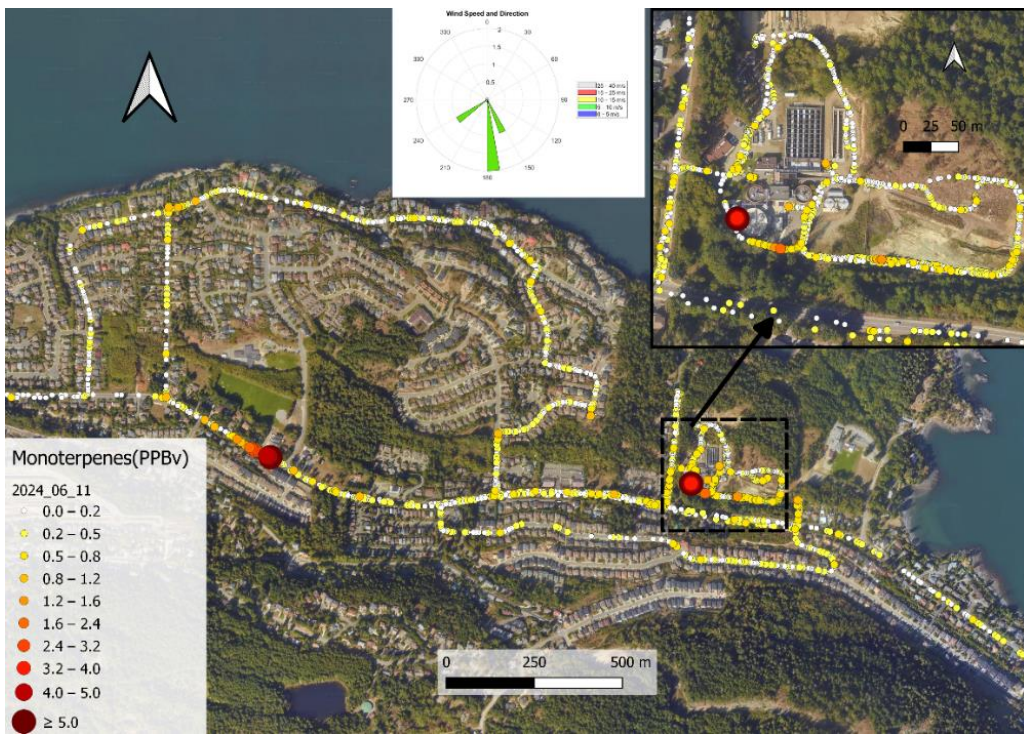


Figure 55 Community Maps showing Monoterpenes concentrations from June 11, 2024

Methane Community maps



Figure 56: Methane concentrations in the vicinity of the GNPC on Jan 25, 2023(top), April 4, 2023 (bottom).



Figure 57: Methane concentrations in the vicinity of the GNPCC on June 23, 2023.

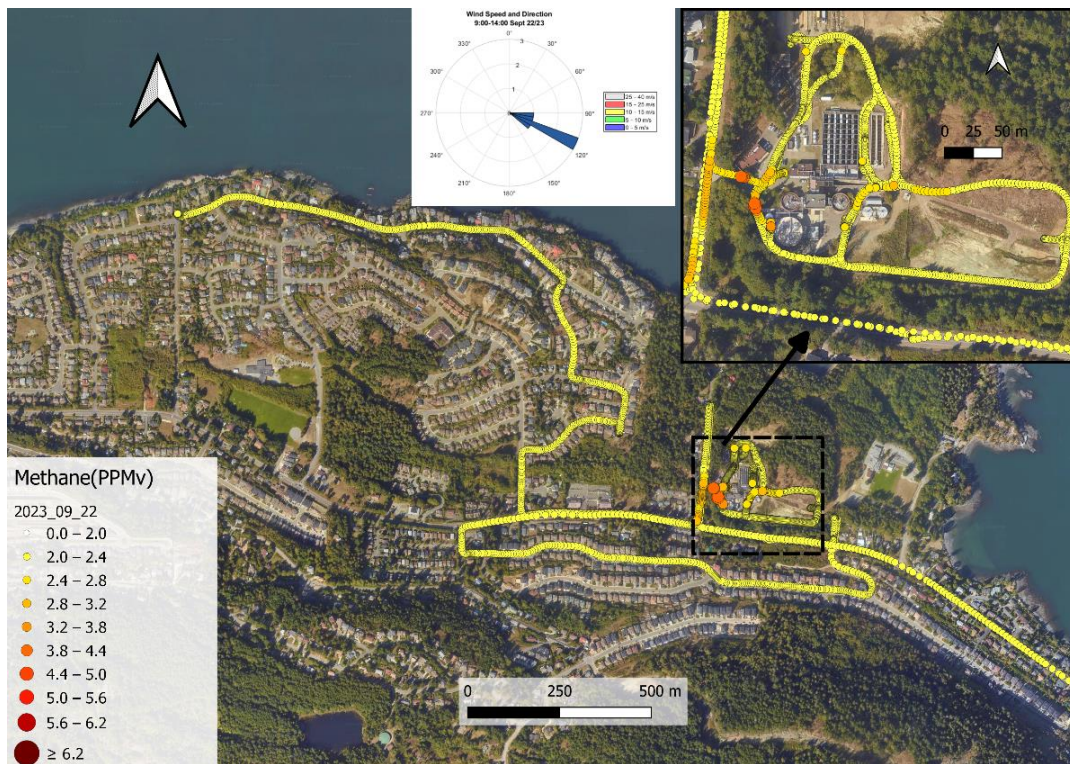


Figure 58 Community map for Methane concentration on Sept 22, 2023.

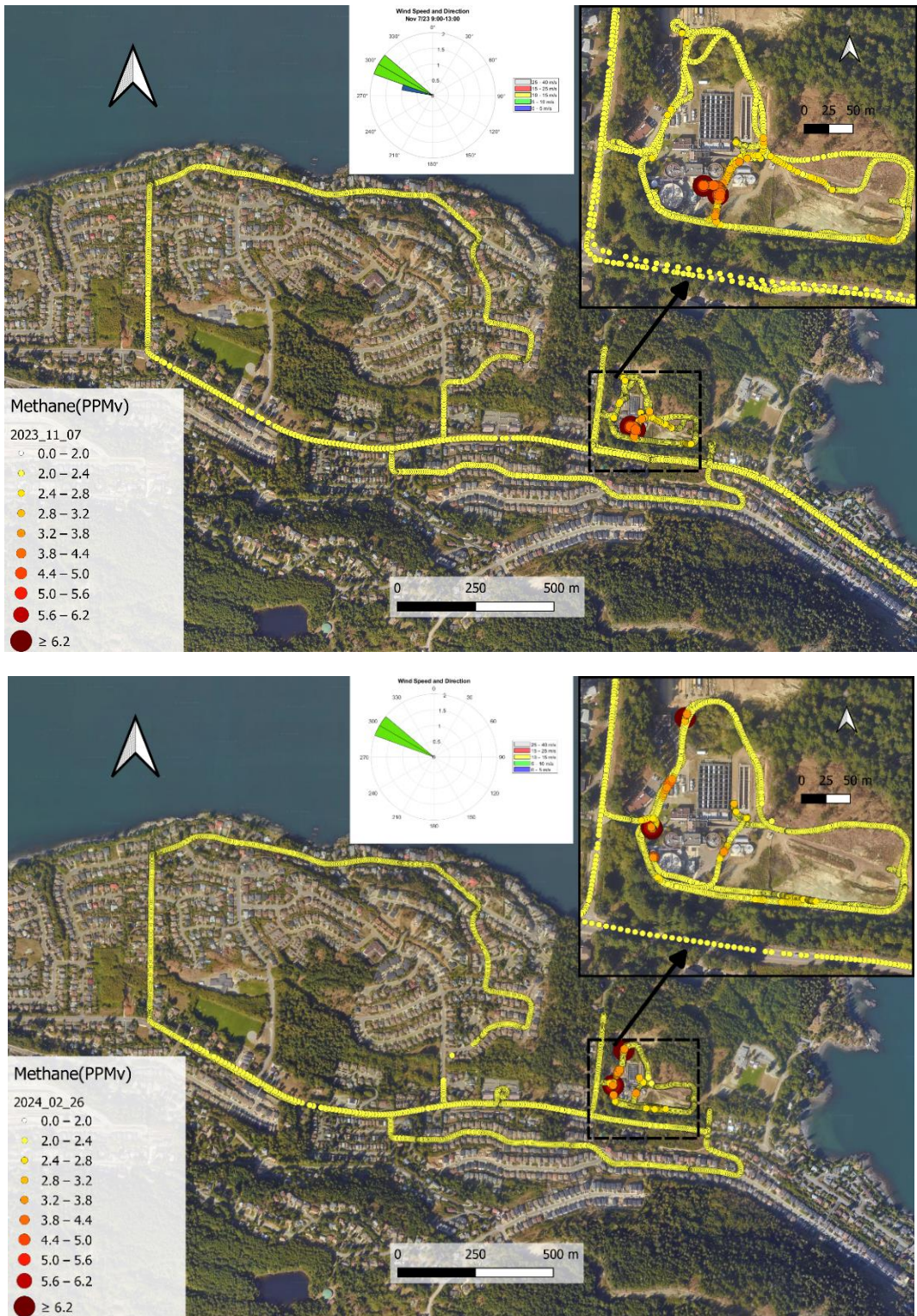


Figure 59 Community Map showing Methane concentrations from November 07, 2023 (top) and Feb 26, 2024 (bottom)

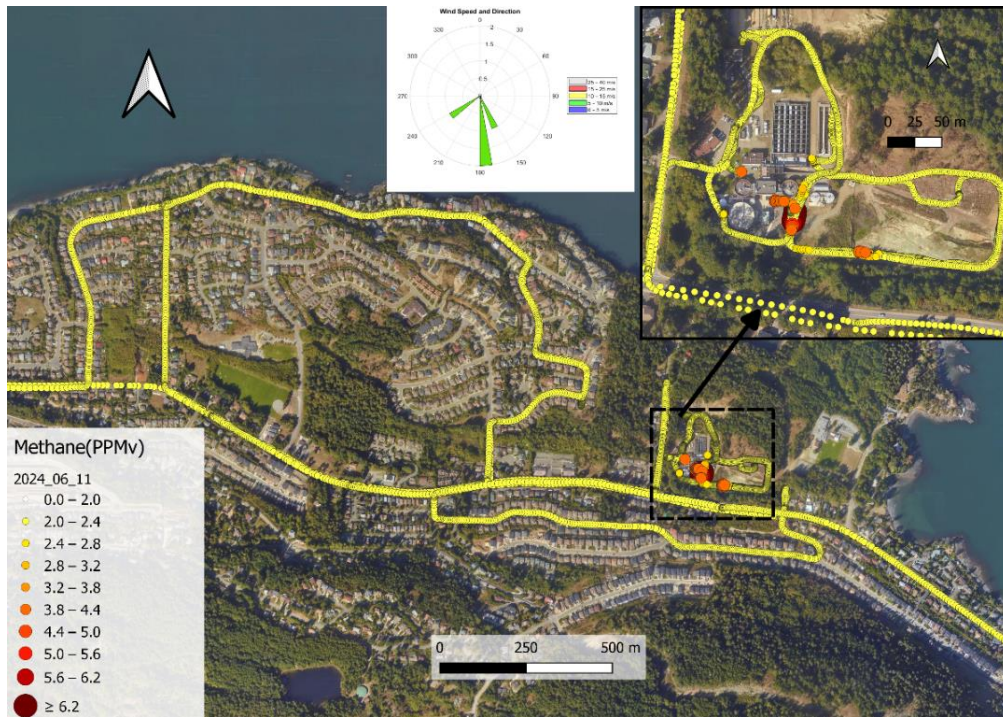


Figure 60 Community Map showing Methane concentrations from June 11, 2024

Toluene Community maps



Figure 61: Toluene concentrations in the vicinity of the GNPC on Jan 25, 2023 (top) and April 4, 2023 (bottom).



Figure 62: Toluene concentrations in the vicinity of the GNPCC on June 23, 2023.

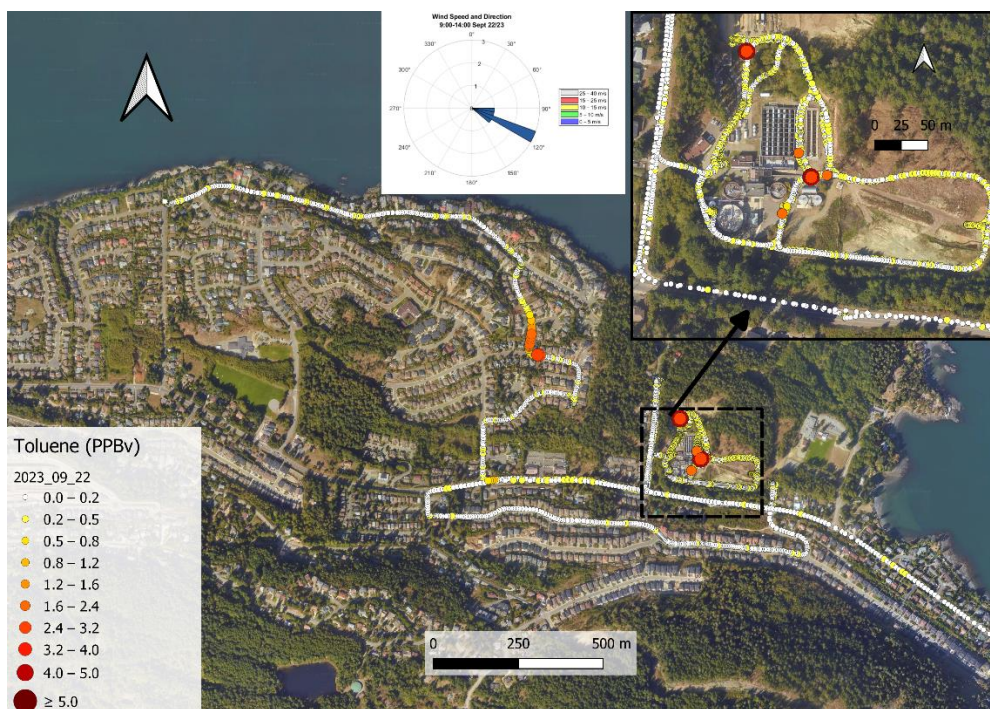


Figure 63 Toluene concentrations in the vicinity of the GNPCC on Sept 22, 2023.



Figure 64 Toluene concentrations in the vicinity of the GNPCC on Nov 7, 2023 (top) and Feb 26, 2024 (bottom).



Figure 65 Toluene concentrations in the vicinity of the GNPCC on June 11, 2024.

Capital Regional District, Mcloughlin Point Wastewater Treatment Plant Community Mapping

Community mapping of VOC concentrations measured with the MMSL during the sampling campaign. Maps are shown in chronological order and grouped by analyte which is shown on the map.

Date	Comments	Time Sampling
April 20, 2022	Community drive	10:30-12:30
July 26, 2022	Community drive	9:00-15:30
November 23, 2022	Community drive	15:10-16:25
November 24, 2022	Community drive	14:05-17:40
November 25, 2022	Community drive	10:20-12:15
February 08, 2023	Community drive	9:20-13:35
April 11, 2023	Community drive	13:00-16:20
April 13, 2023	(Manhole survey)	08:30-15:30
May 30, 2023	Community drive	9:00-13:30 / 17:00-19:00
May 31, 2023	Community drive + (Manhole survey)	8:50-12:30 / 13:05-13:35
July 26, 2023	Community drive	11:00-13:00
July 27, 2023	Community drive	13:21-13:55 / 15:30-17:15
July 28, 2023	Community drive + (Seaweed survey)	9:00-12:15 / 12:35-12:50
August 22, 2023	Community drive	15:30-17:00
October 19, 2023	Community drive	16:00-18:00
October 20, 2023	Community drive	8:25-10:25
November 10, 2023	Community drive	16:55-18:15
February 21, 2024	Community drive	12:30-15:30

February 22, 2024	Community drive	11:20-15:20
June 18, 2024	Community drive	12:20-16:00
TOTAL Community drive hours (hh:mm)		61:00

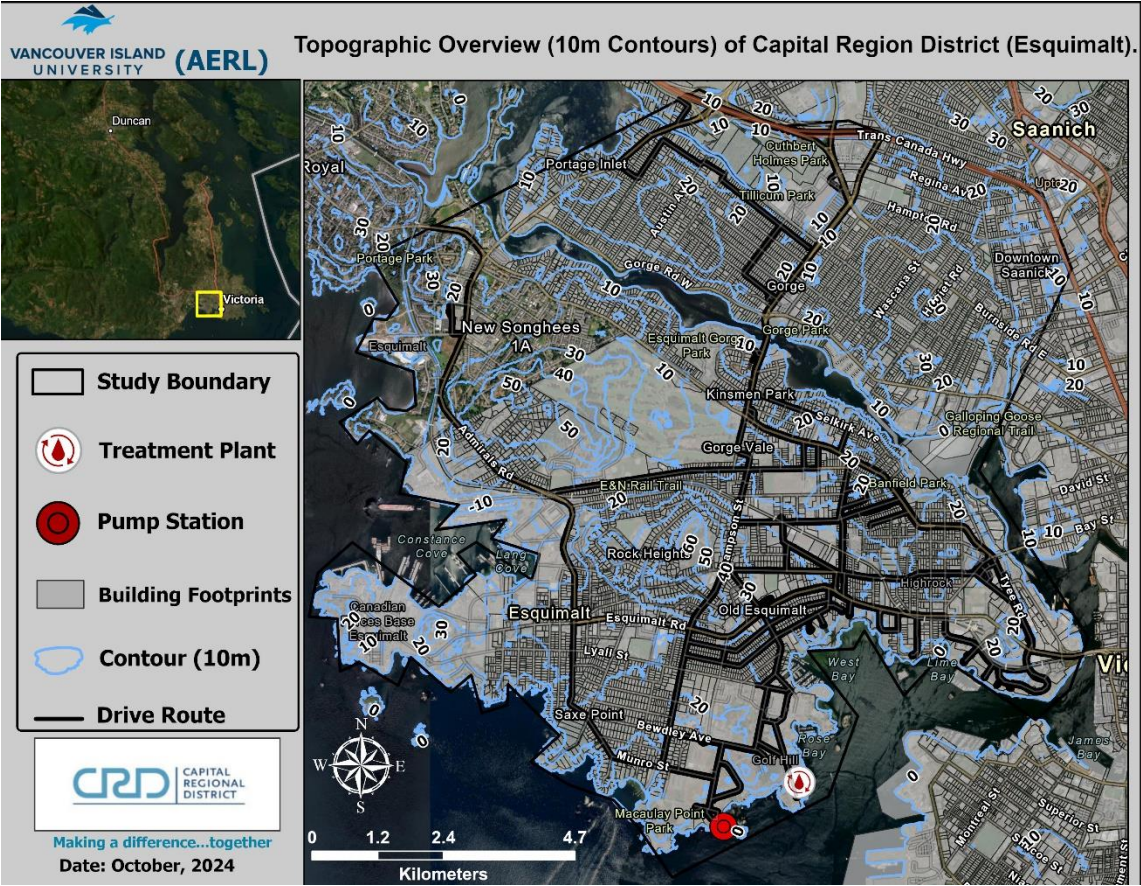


Figure 66 Contour map for WWTP3 area, Map courtesy of Ben Odia.

Methanethiol community maps

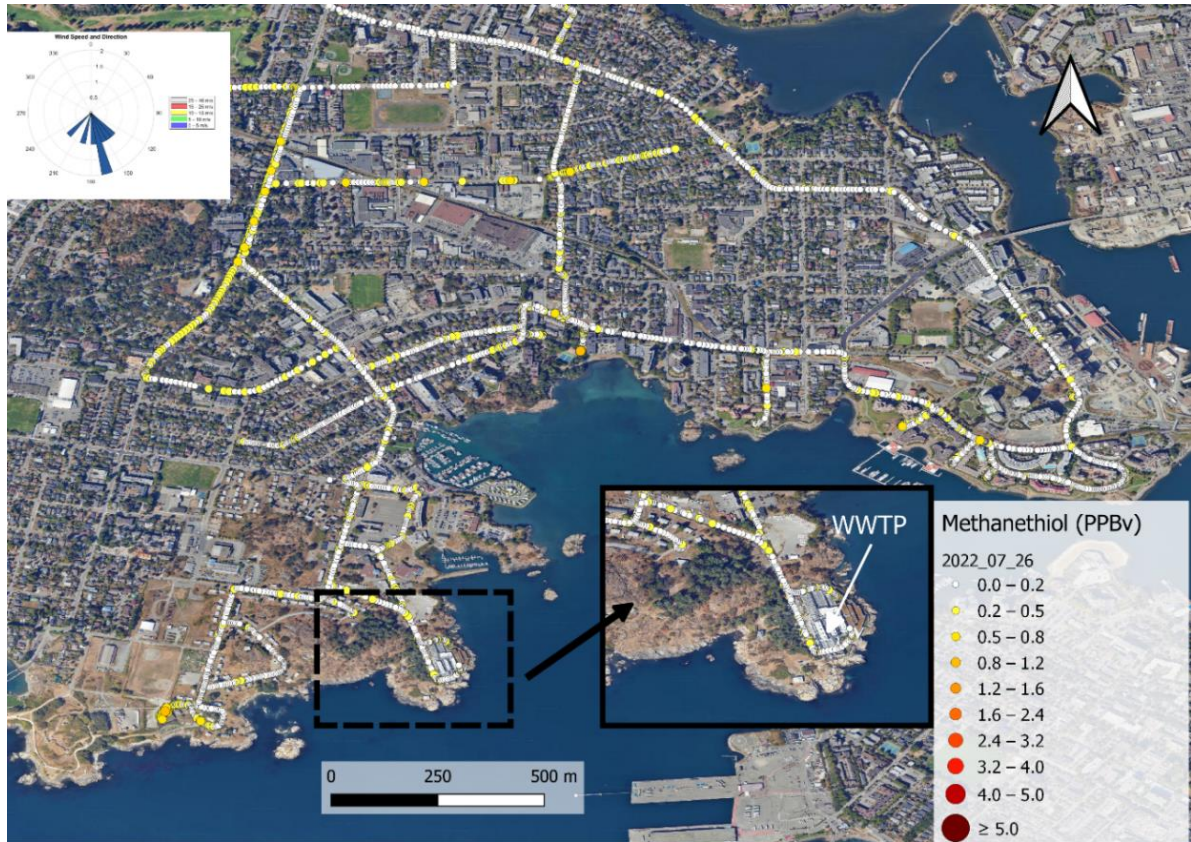


Figure 67 Community road maps for Methanethiol concentration, July 26, 2022)

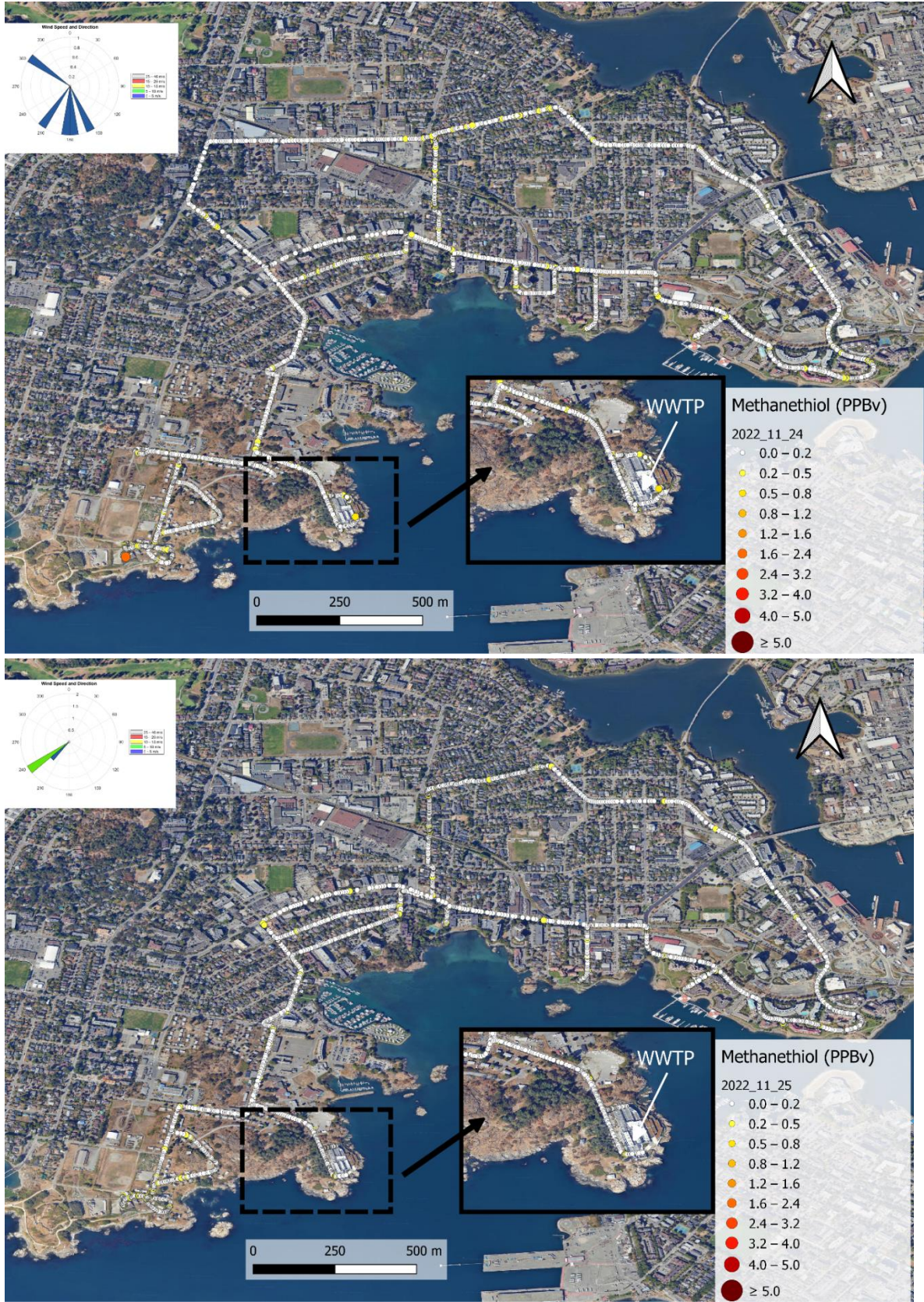


Figure 68 Community road maps for Methanethiol concentration, (top- Nov 24, 2022, bottom-Nov 25, 2022)

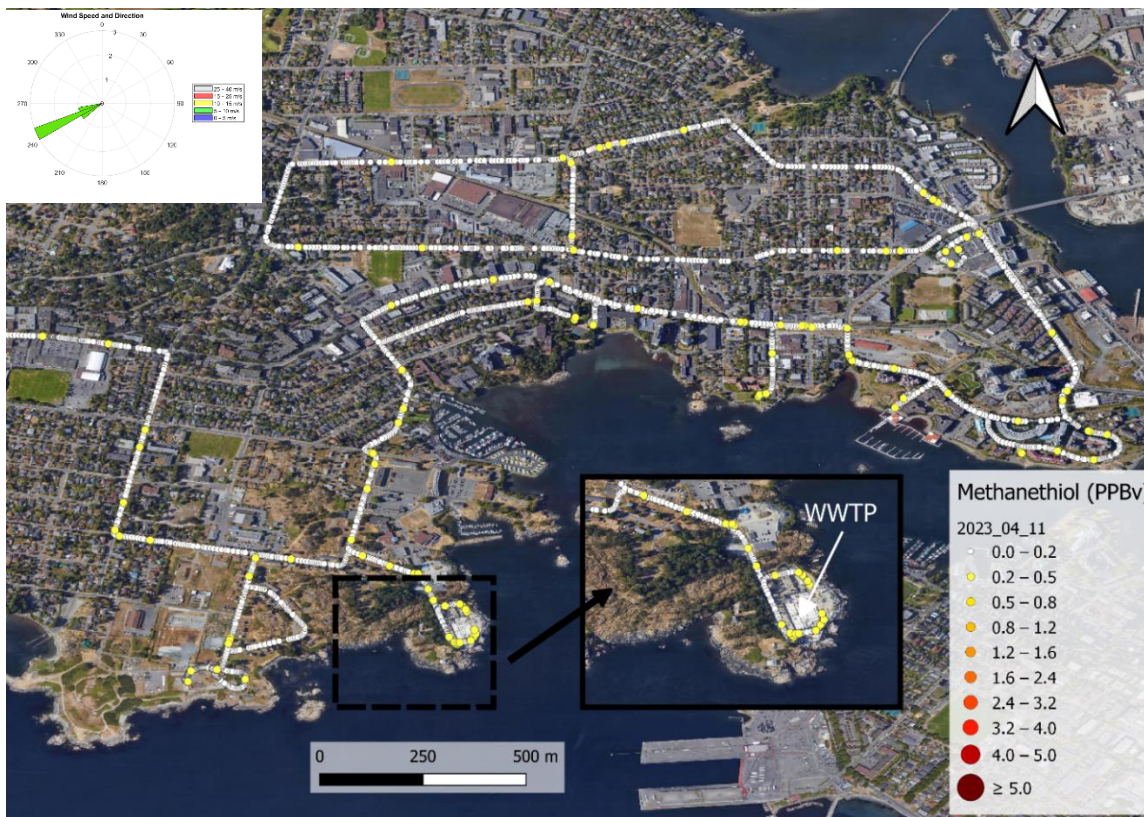
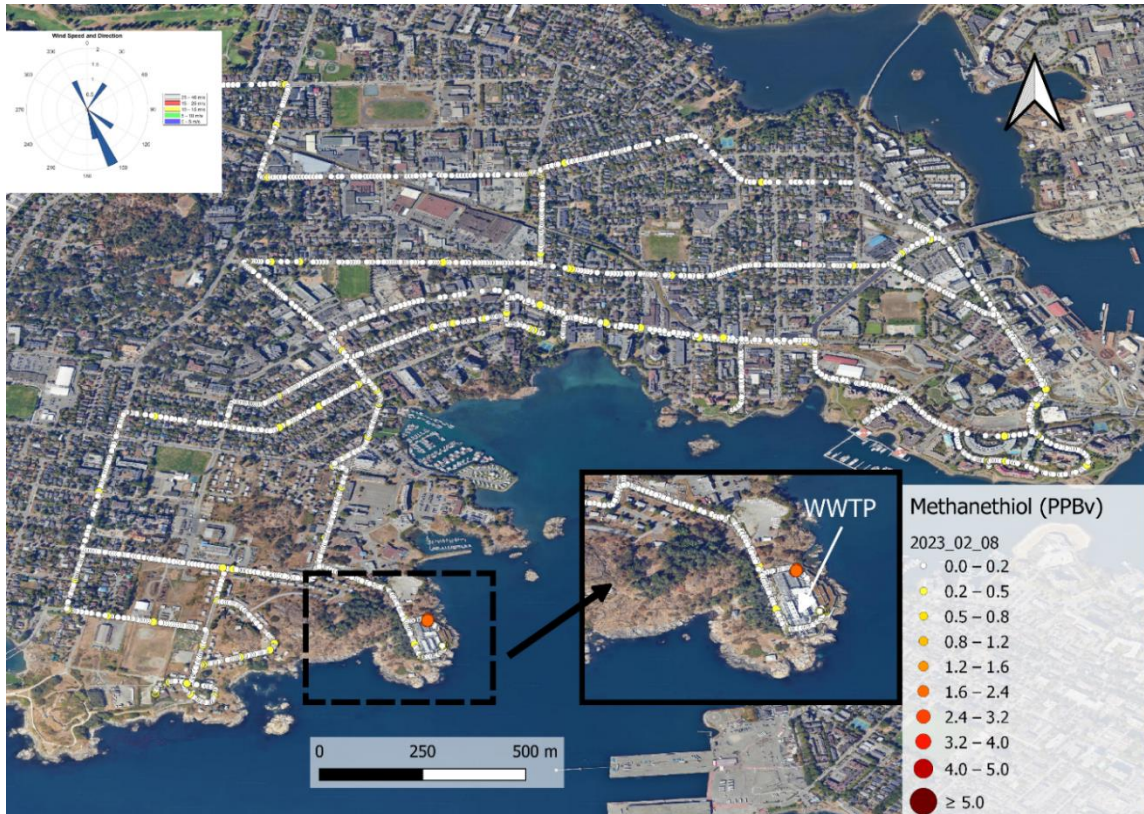


Figure 69 Community road maps for Methanethiol concentration, (top- Feb 8, 2023, bottom- April 11, 2023)



Figure 70 Community road maps for Methanethiol concentration, (top- May 30, 2023, bottom-May 31,2023)

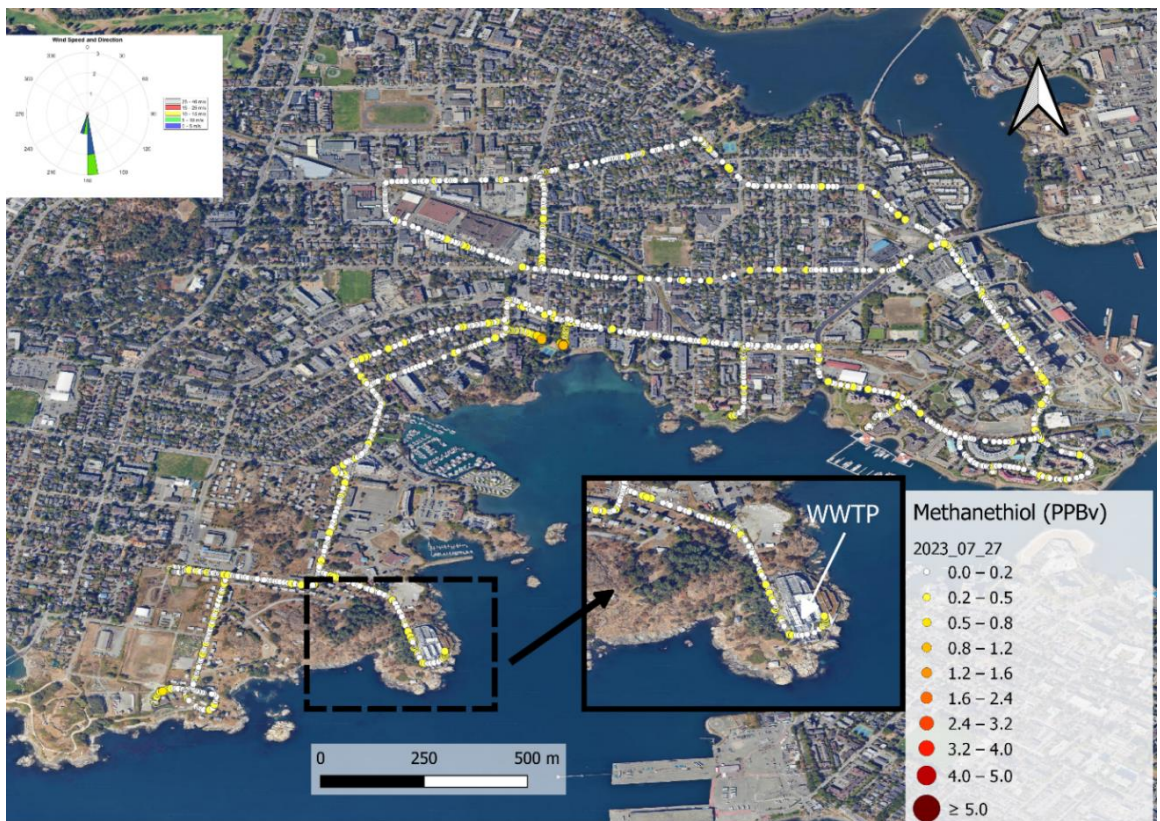


Figure 71 Community road maps for Methanethiol concentration, (top-July 26, 2023, bottom-July 27, 2023)

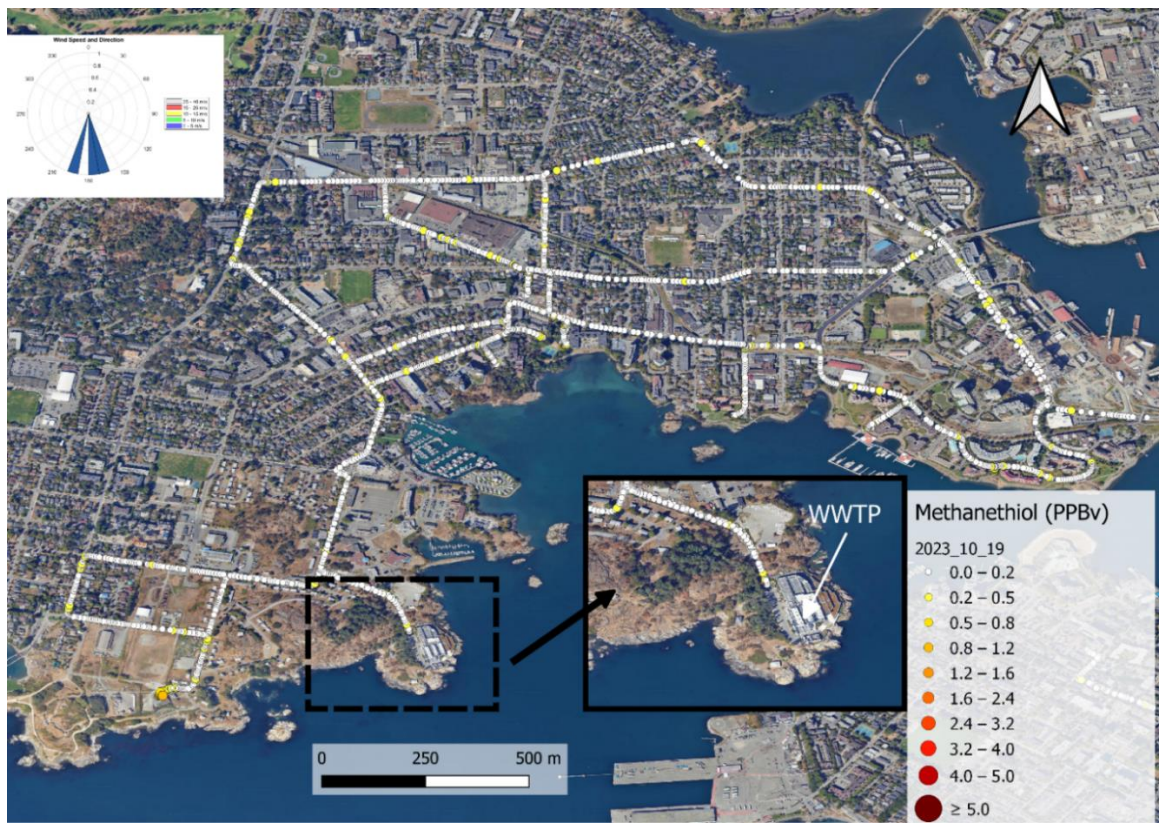
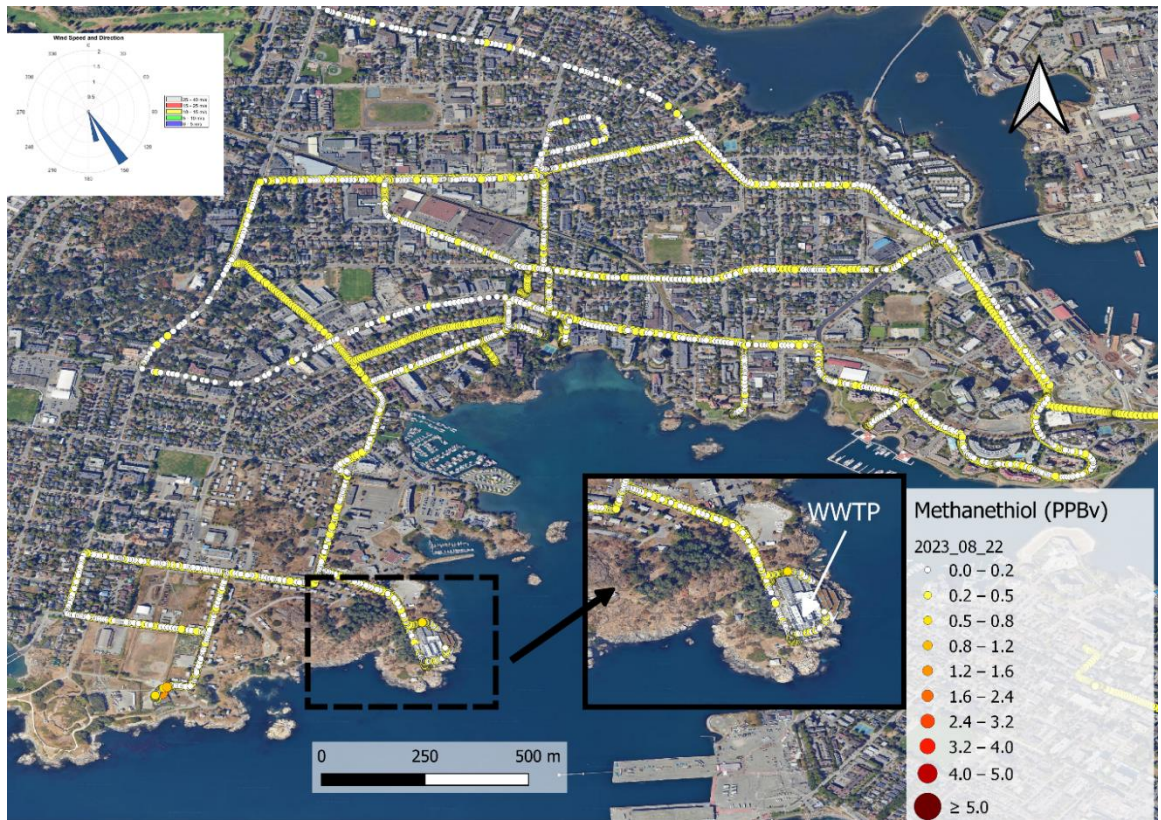


Figure 72 Community road maps for Methanethiol concentration, (top- Aug 22,2023, bottom-Oct 19, 2023)

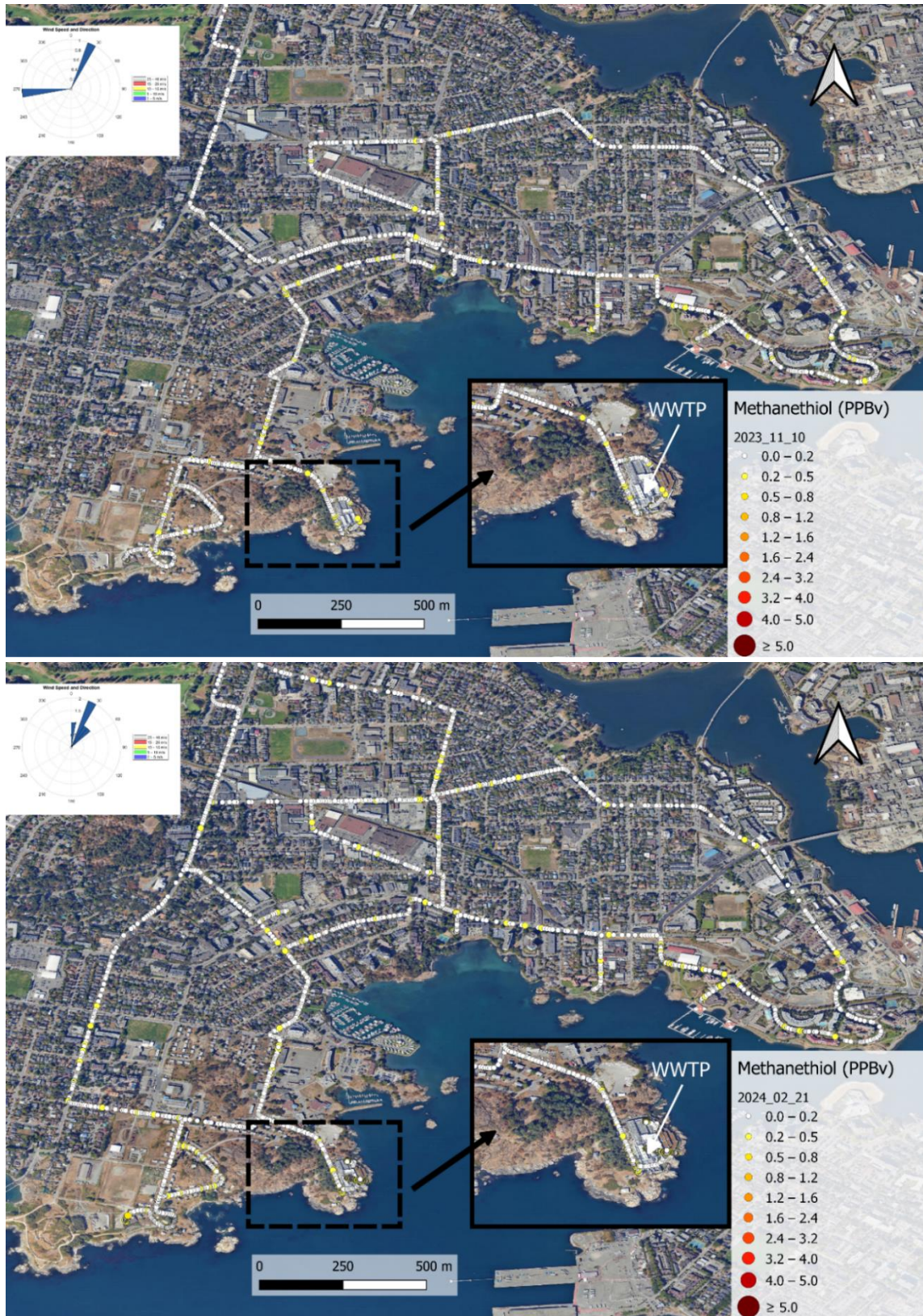


Figure 73 Community road maps for Methanethiol concentration, (top- Nov 10, 2023, bottom-Feb 21, 2024)

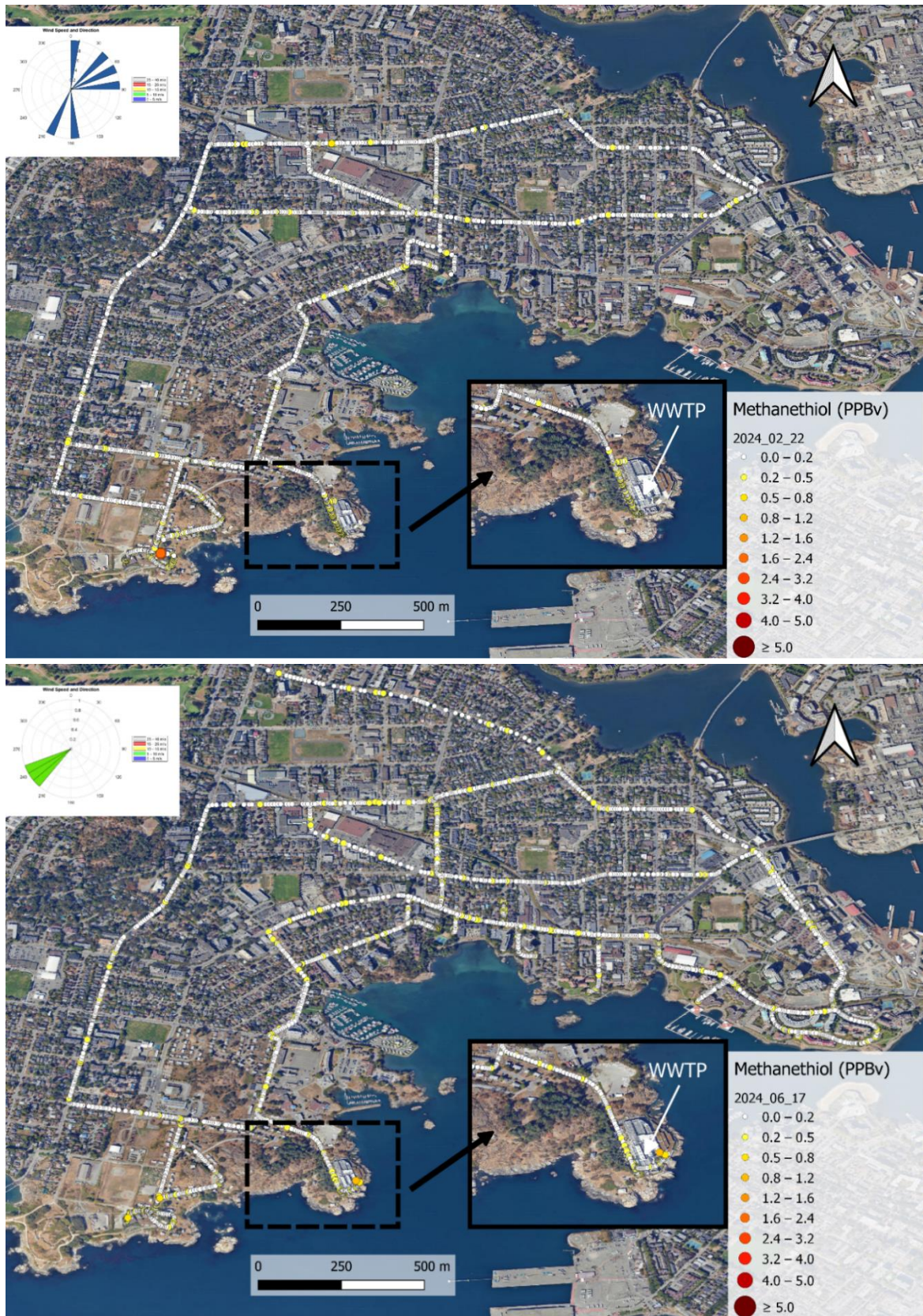


Figure 74 Community road maps for Methanethiol concentration, (top- Feb 22, 2024, bottom-June 17, 2024)

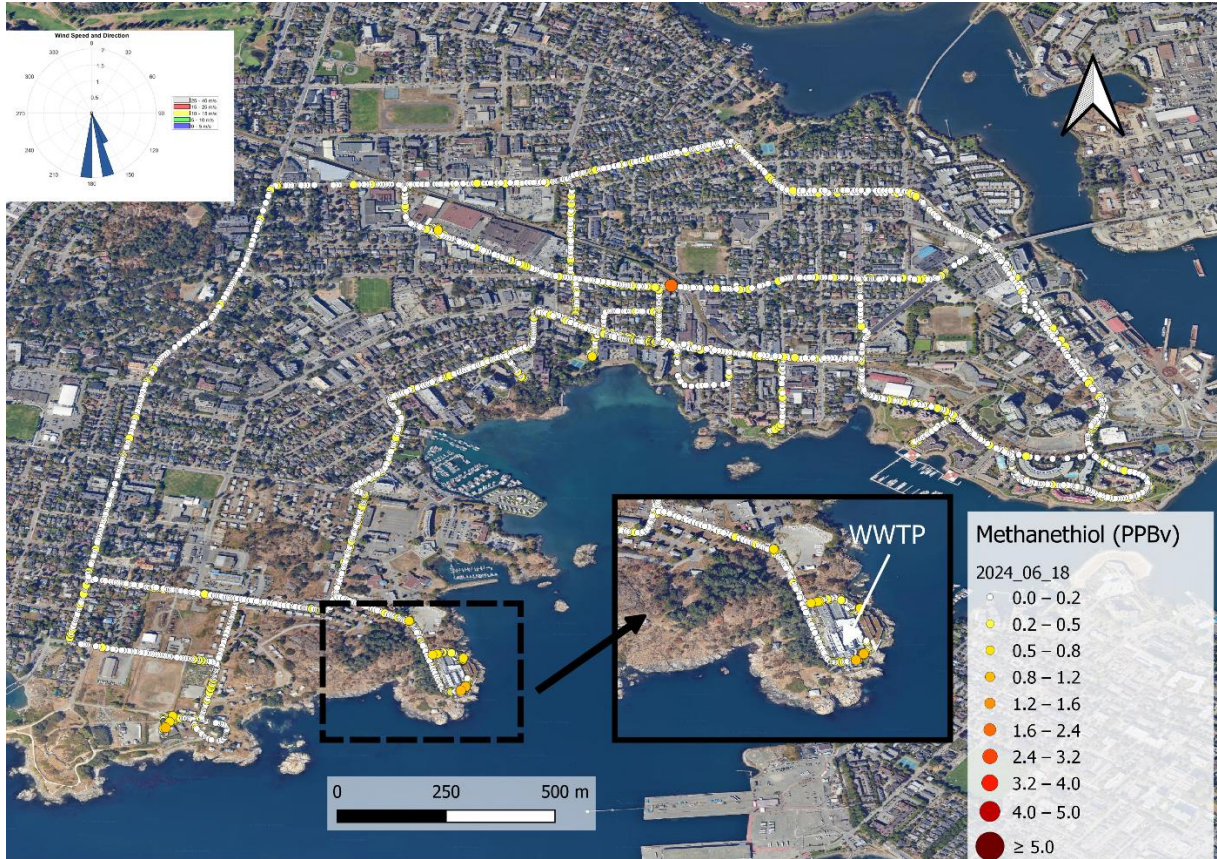


Figure 75 Community road maps for Methanethiol concentration, June 18, 2024

Dimethyl sulfide community maps

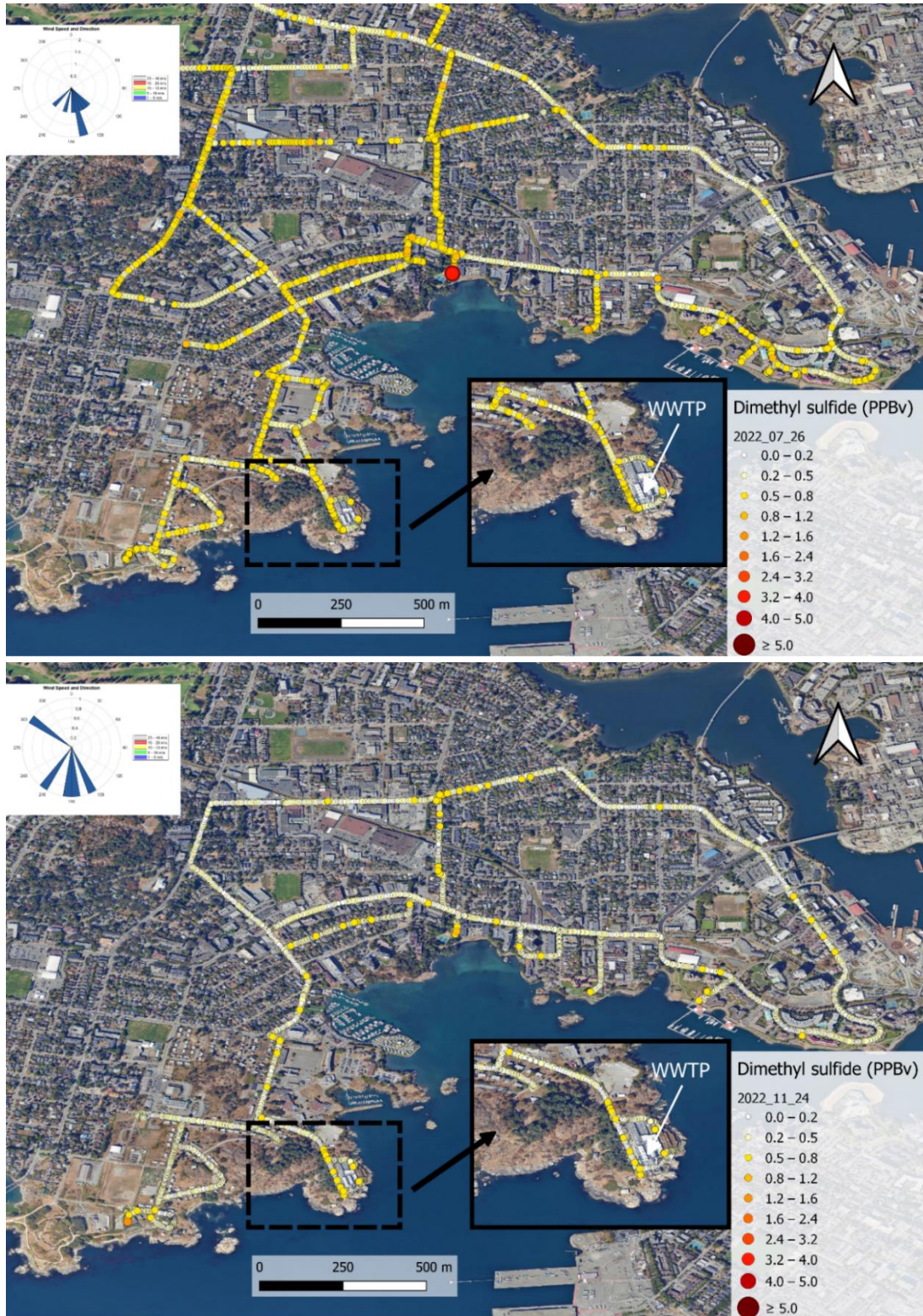


Figure 76 Community road maps for dimethyl sulfide concentration, (top- July 26, 2022, bottom-Nov 24, 2022)

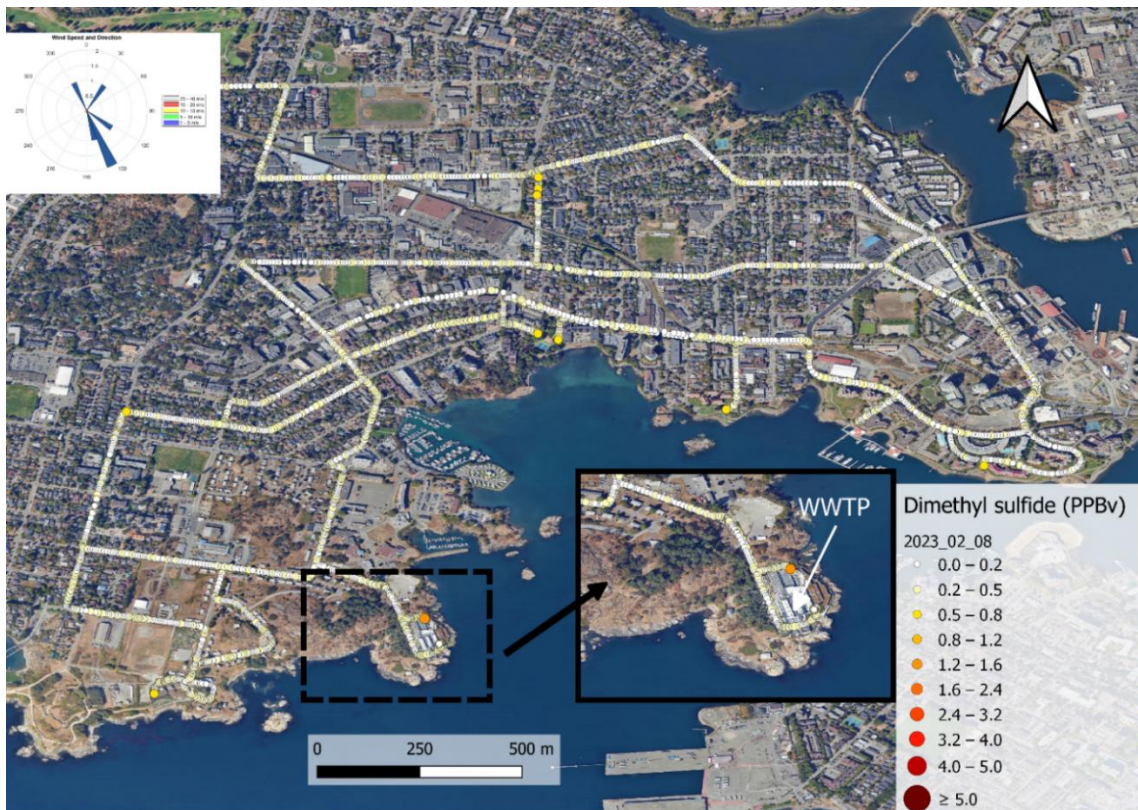
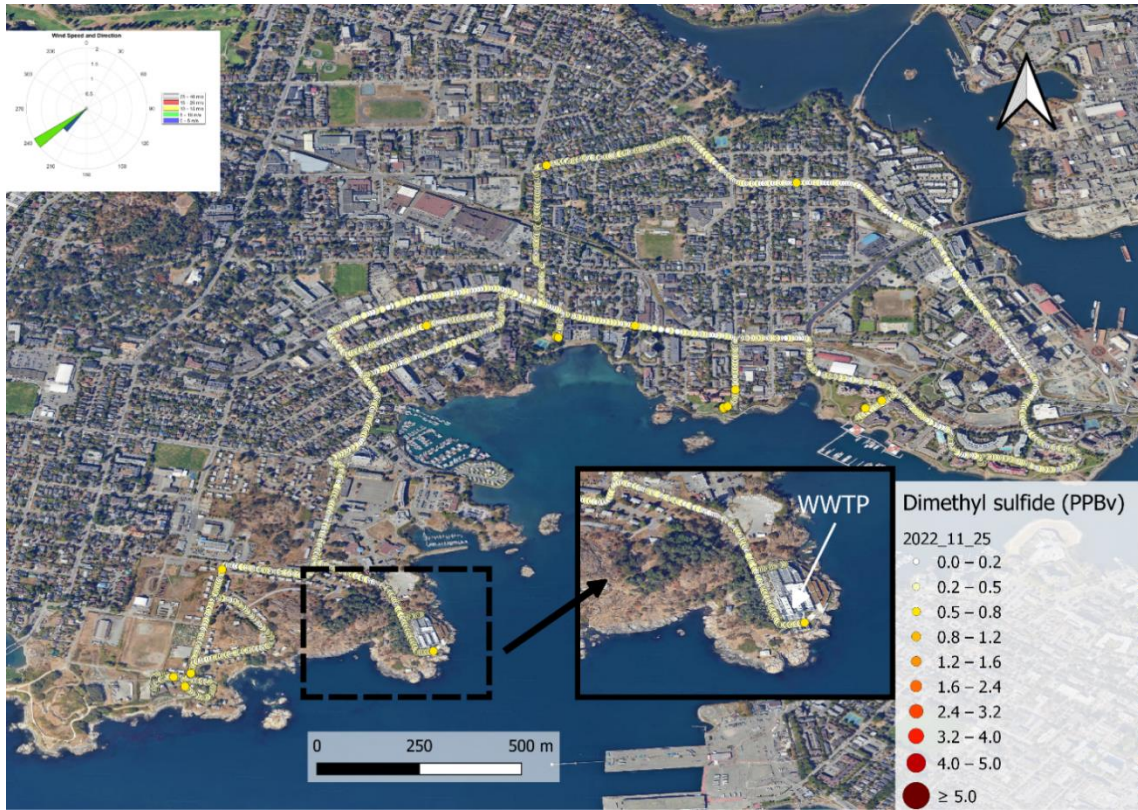


Figure 77 Community road maps for dimethyl sulfide concentration, (top-Nov 25, 2022, bottom- Feb 8, 2023)

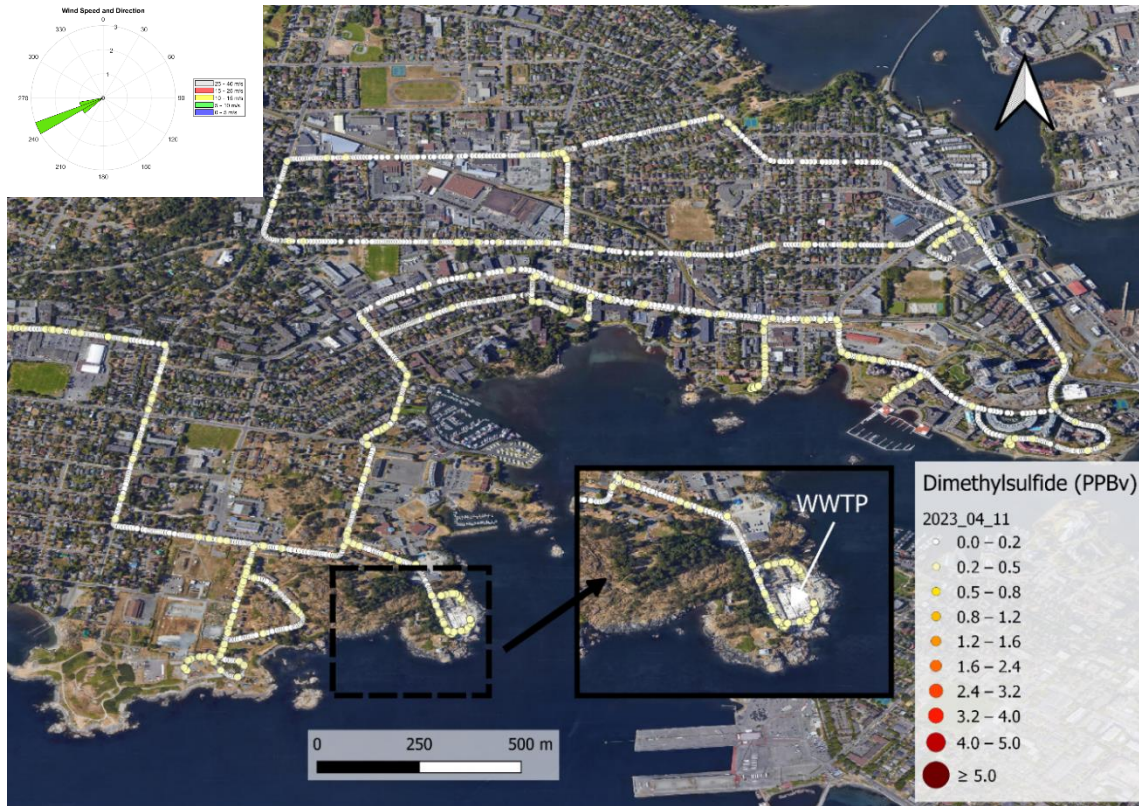


Figure 78 Community road maps for dimethyl sulfide concentration, (top-April 11, 2023, bottom-May 30, 2023)

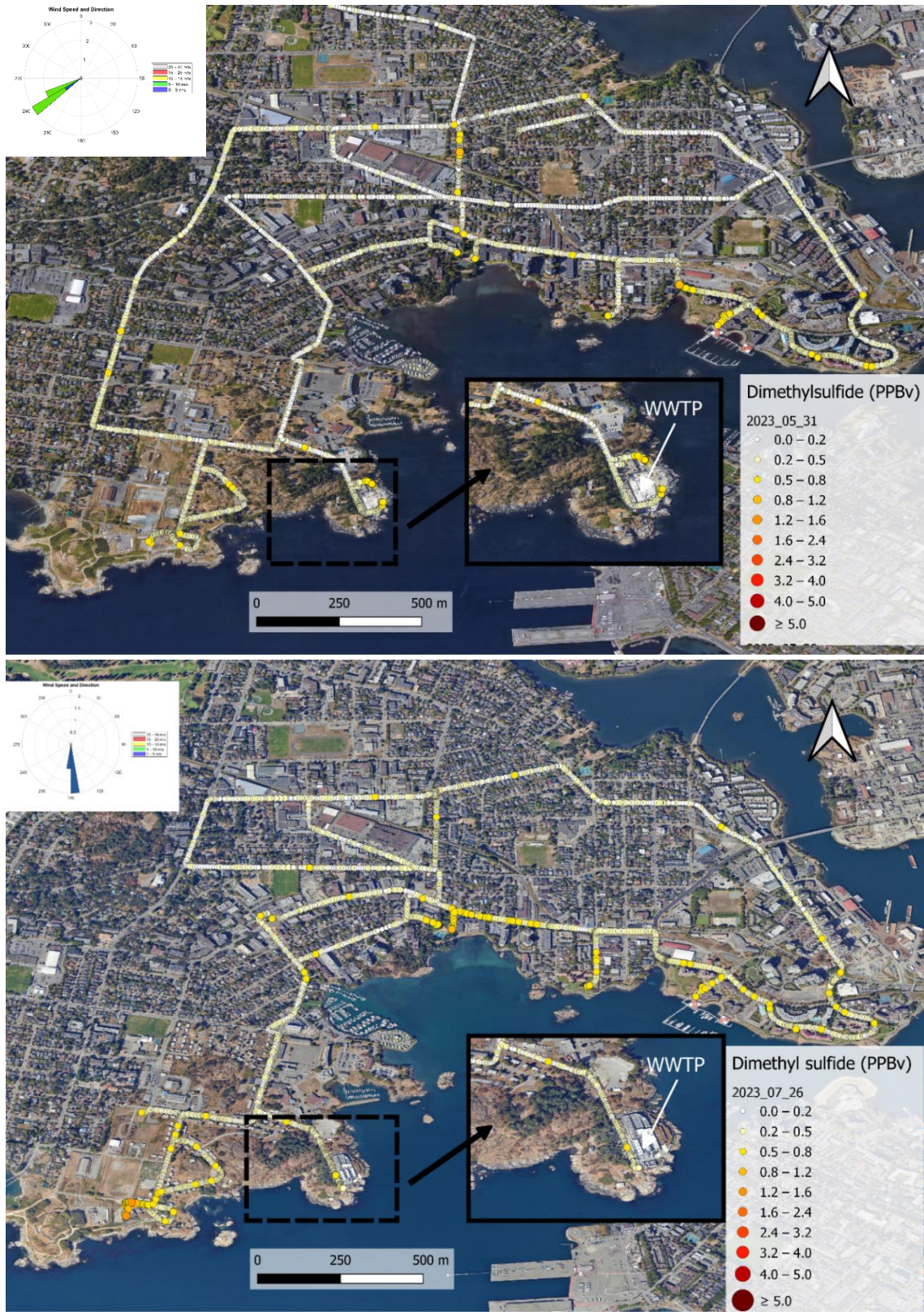


Figure 79 Community road maps for dimethyl sulfide concentration, (top-May 31, 2023, bottom-July 26, 2023)

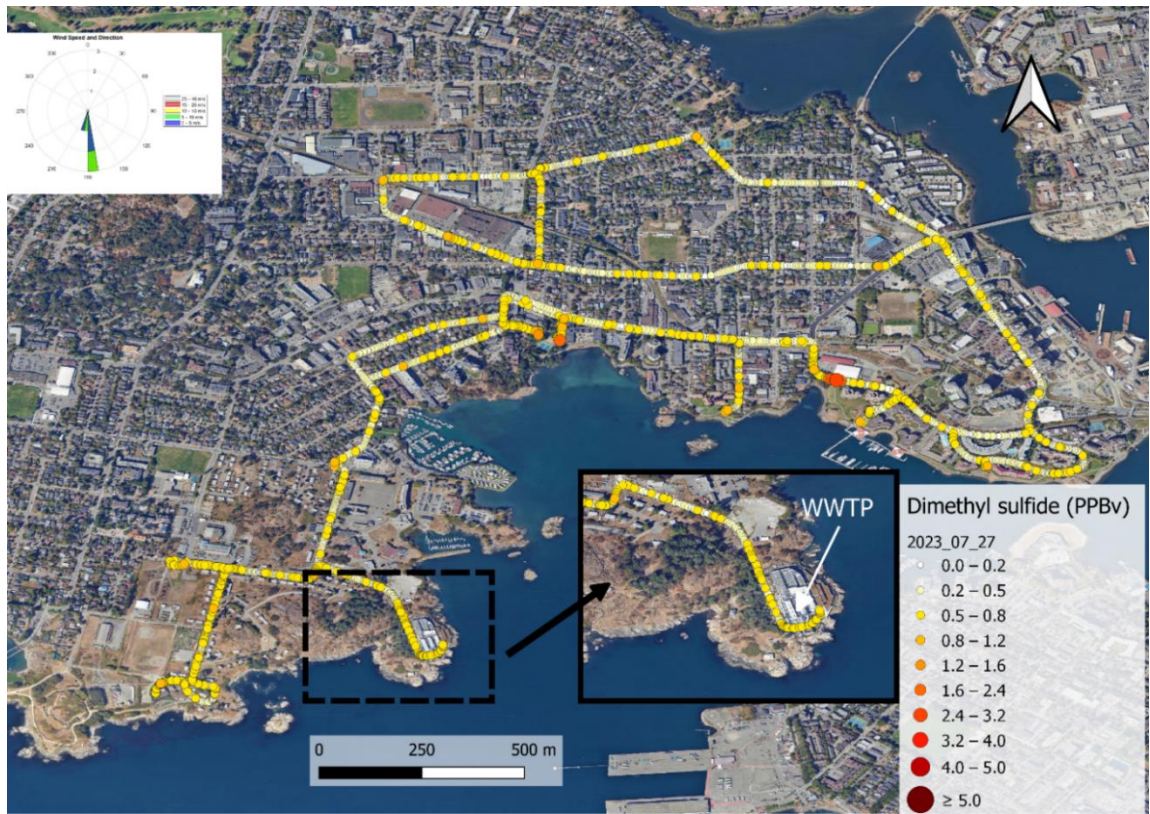


Figure 80 Community road maps for dimethyl sulfide concentration, (top-July 27, 2023, bottom-Aug 22, 2023)

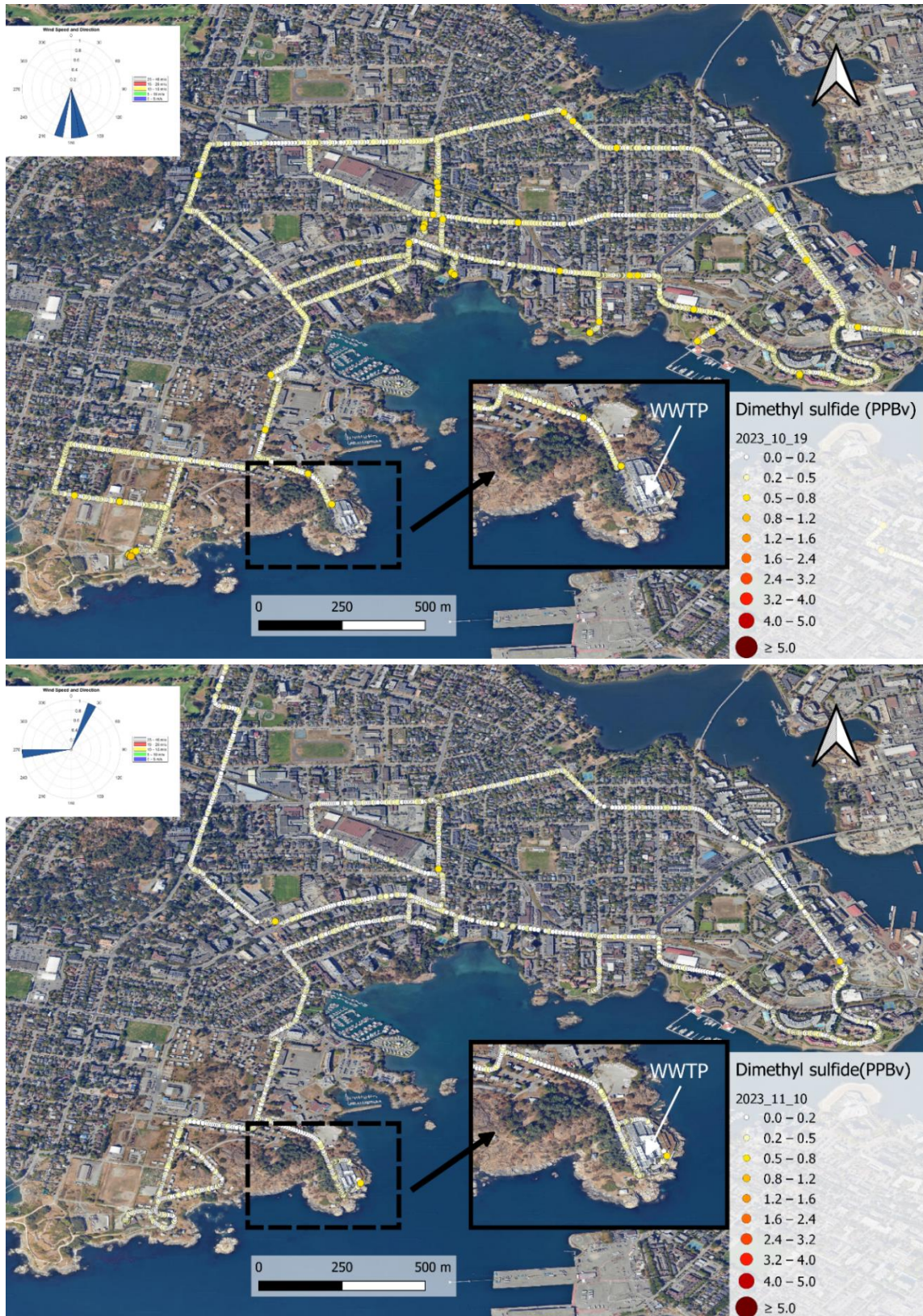


Figure 81 Community road maps for dimethyl sulfide concentration, (top-Oct 19, 2023, bottom-Nov 10, 2023)

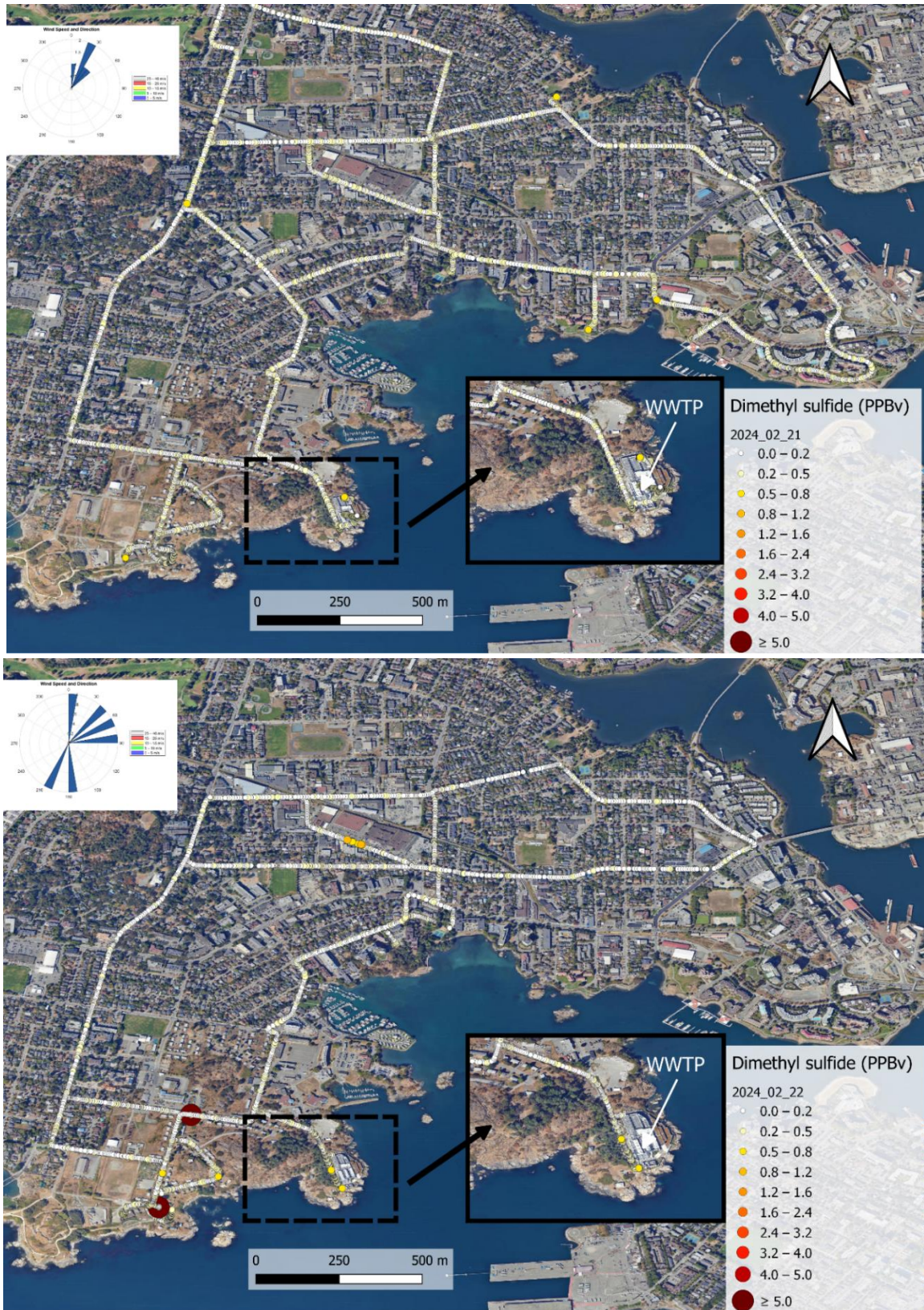


Figure 82 Community road maps for dimethyl sulfide concentration, (top-Feb 21, 2024, bottom-Feb 22, 2024)

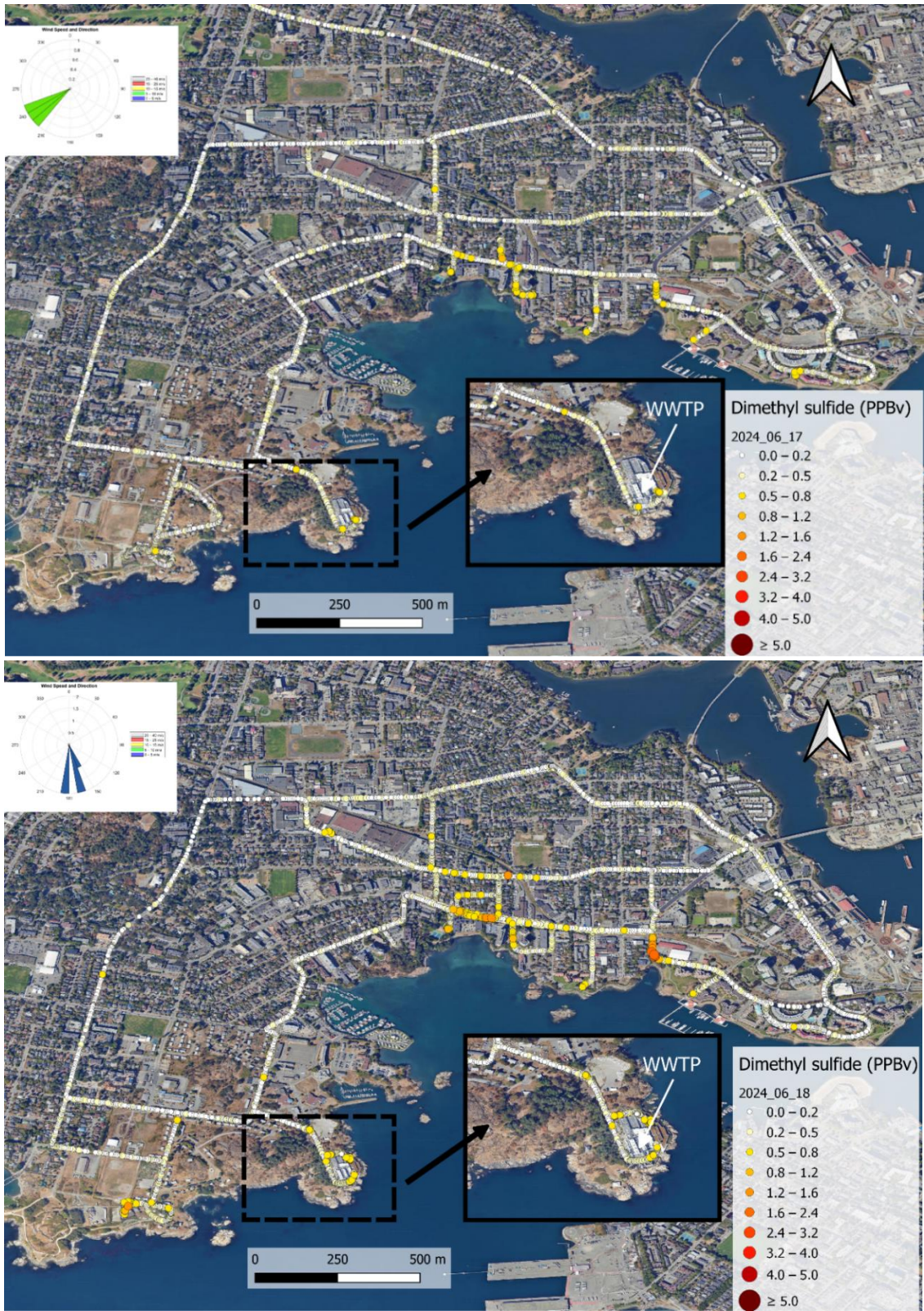


Figure 83 Community road maps for dimethyl sulfide concentration, (top-June 17, 2024, bottom-June 18, 2024)

Acetaldehyde Community maps

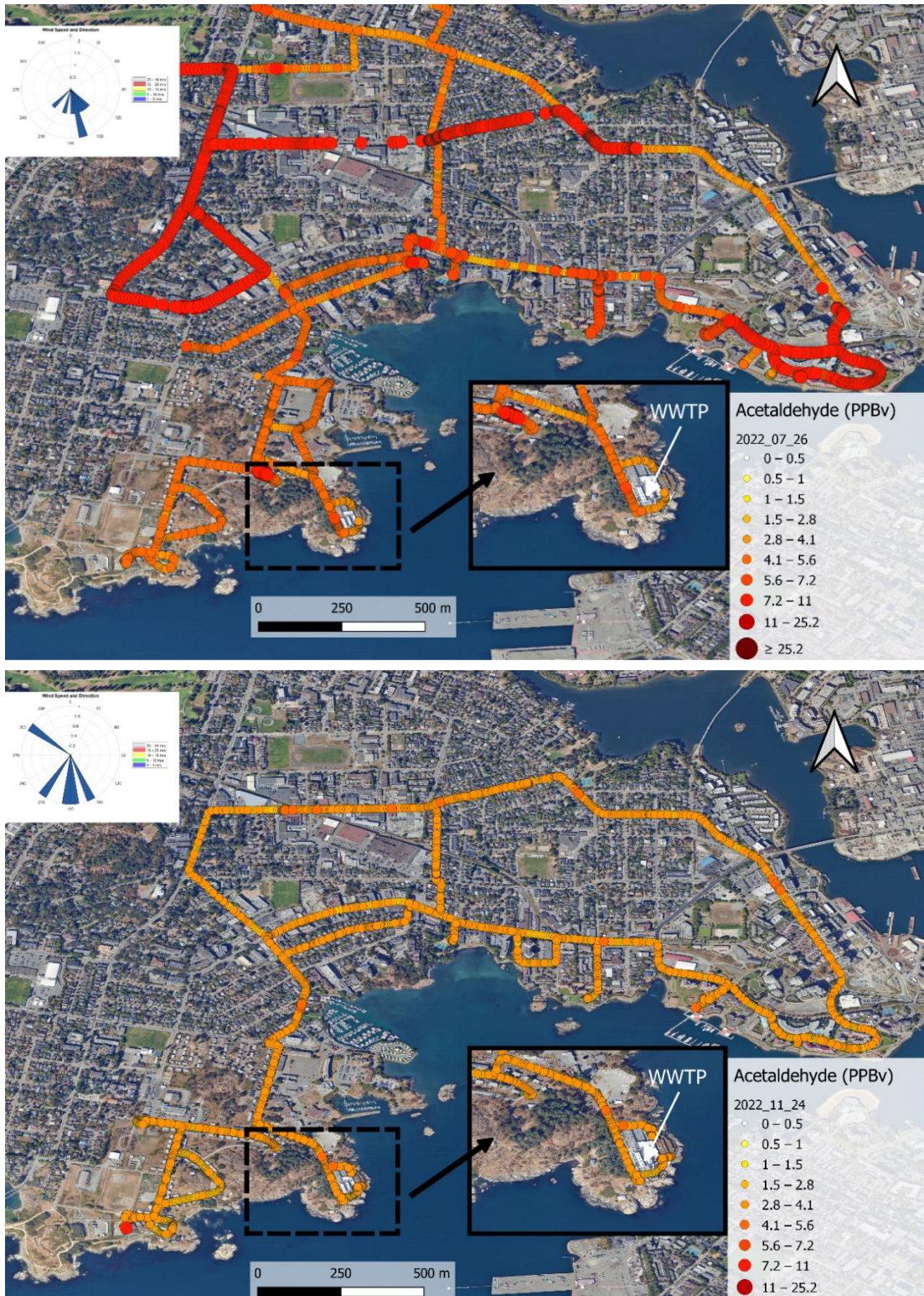


Figure 84 Community road maps for Acetaldehyde concentration, (top- July 26, 2022, bottom-Nov 24, 2022)

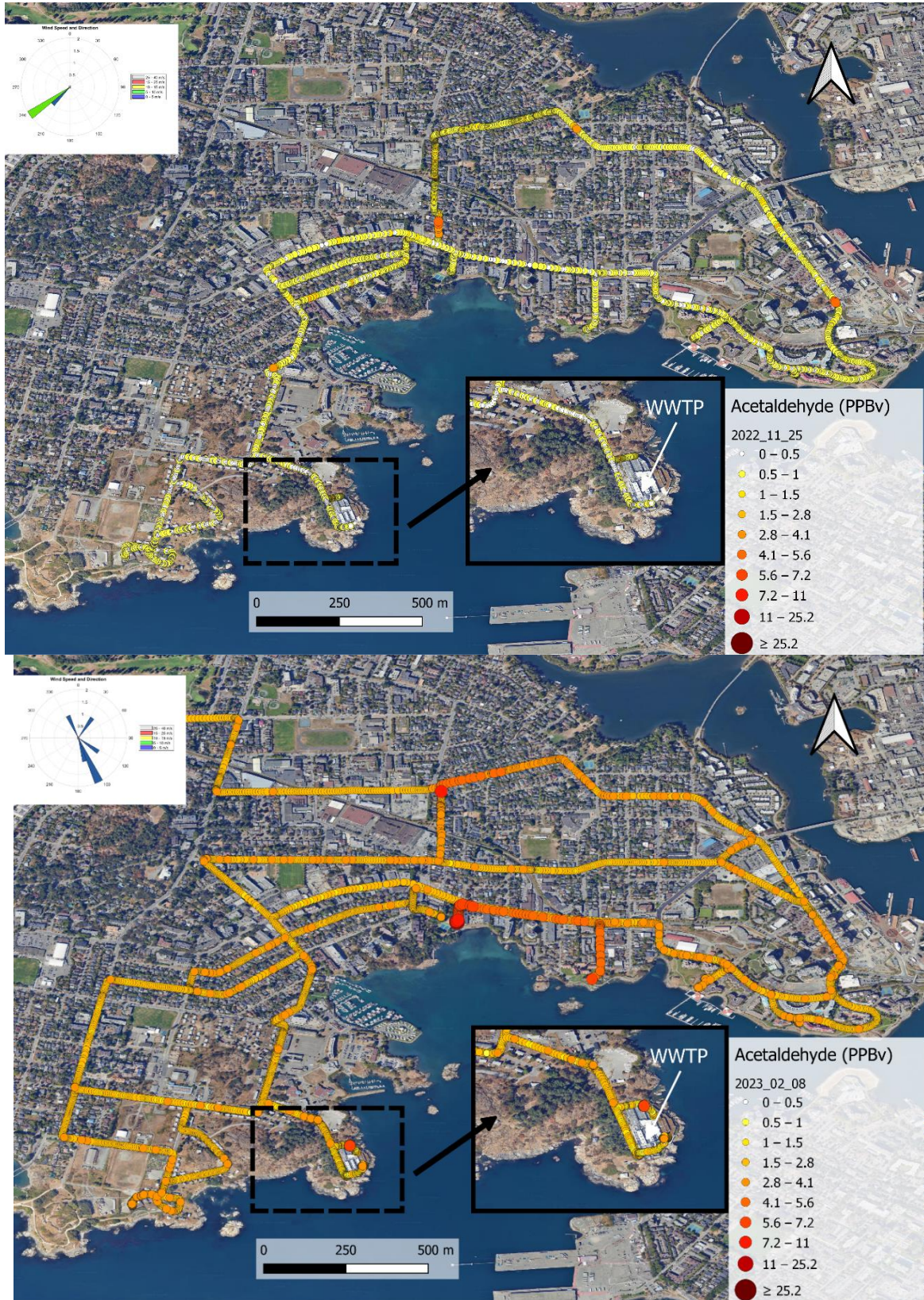


Figure 85 Community road maps for Acetaldehyde concentration, (top-Nov 25, 2022, bottom-Feb 8, 2023)

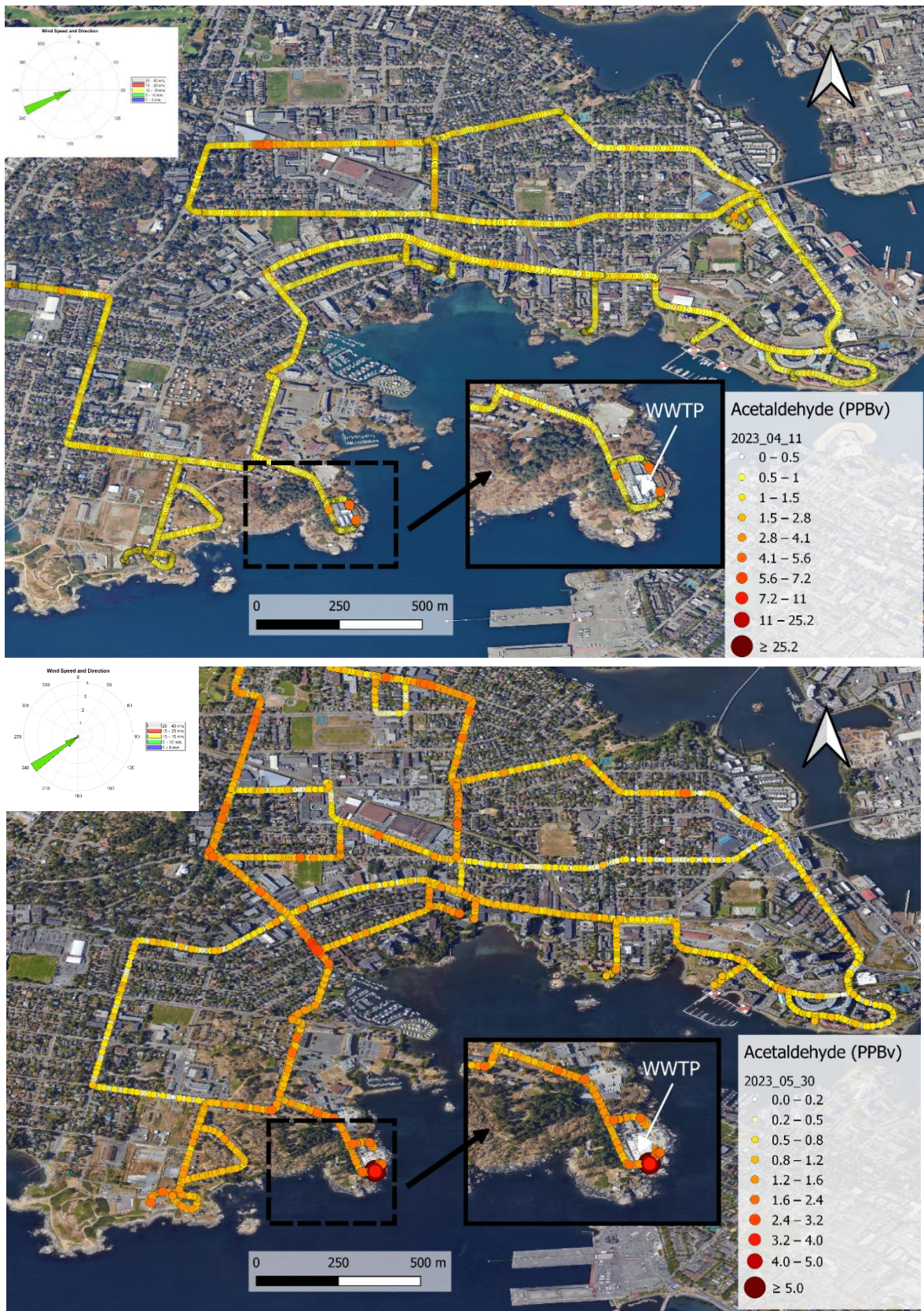


Figure 86 Community road maps for Acetaldehyde concentration, (top-April 11, 2023, bottom-May 30, 2023)



Figure 87 Community road maps for Acetaldehyde concentration, (top-May 31, 2023, bottom-July 26, 2023)

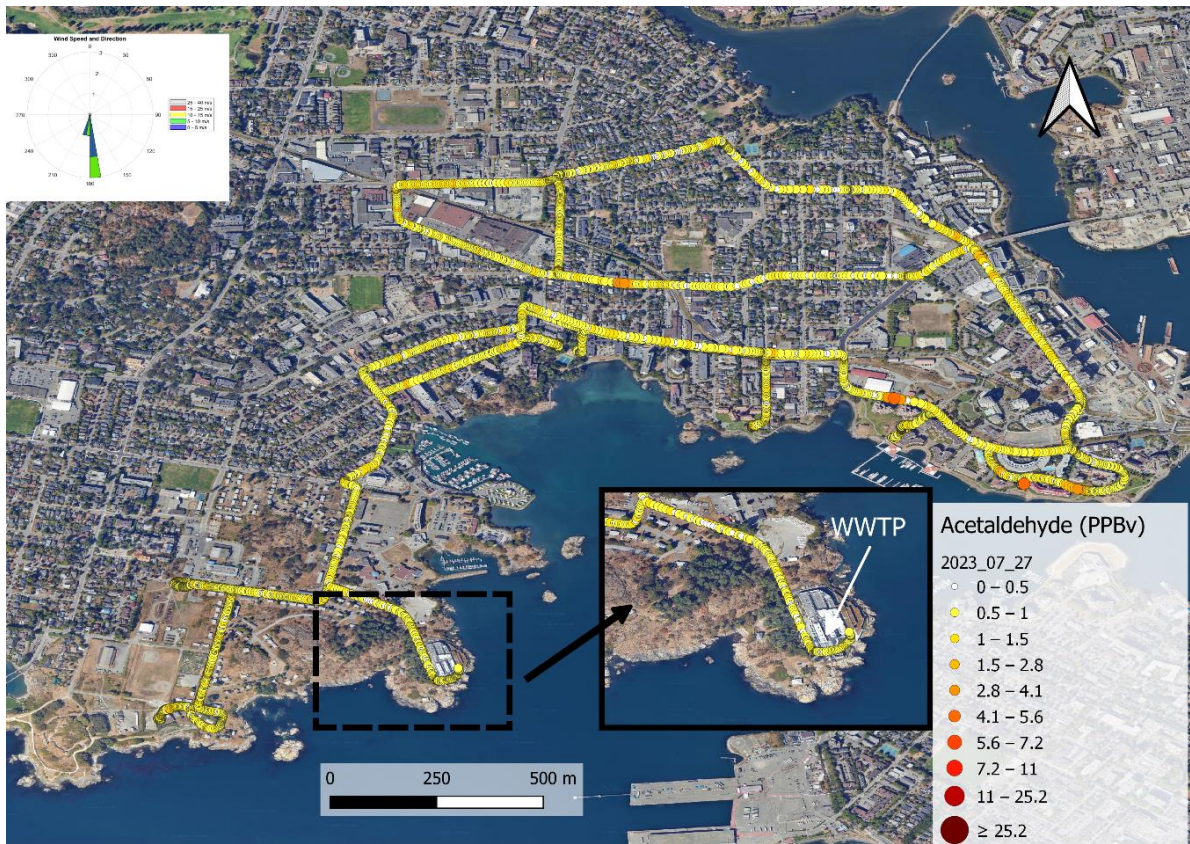


Figure 88 Community road maps for Acetaldehyde concentration, (top-July 27, 2023, bottom-Aug 22, 2023)

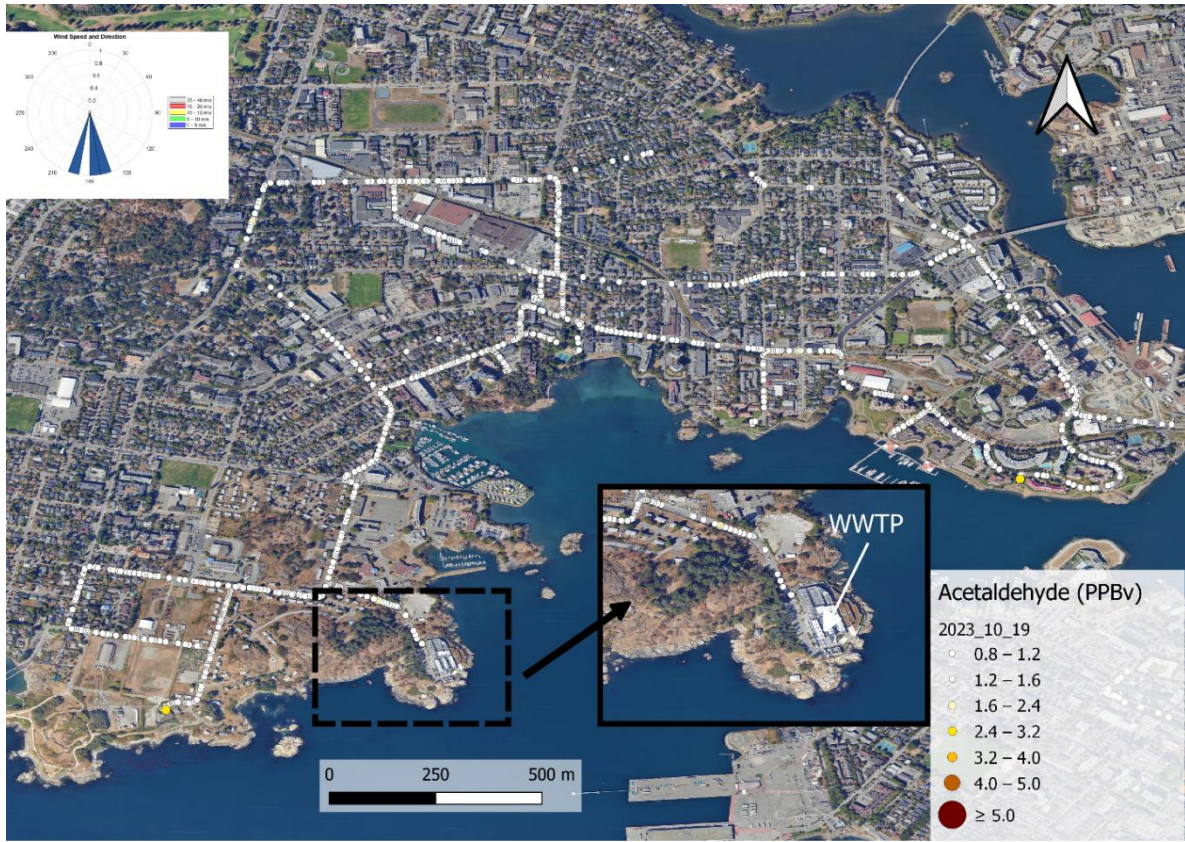


Figure 89 Community road maps for Acetaldehyde concentration, (top-Oct 19, 2023, bottom-Nov 10, 2023)

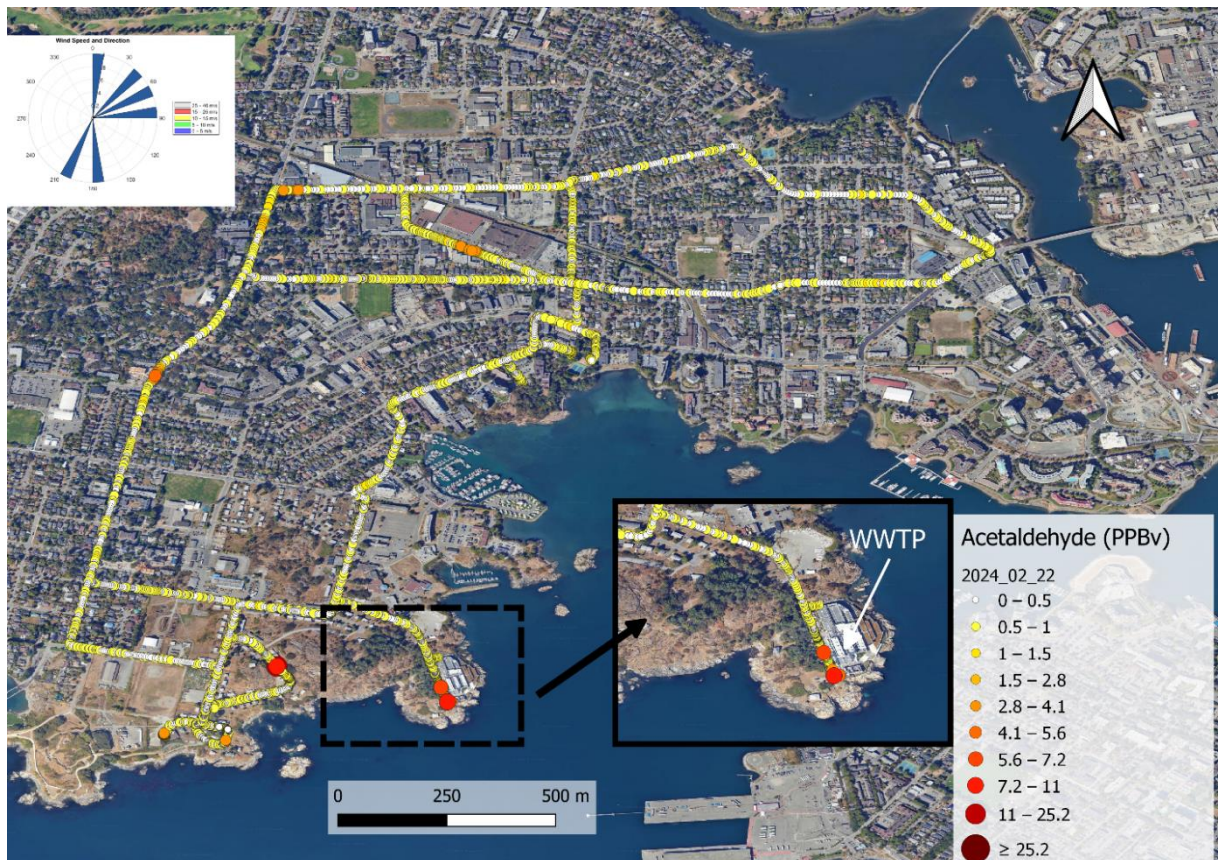
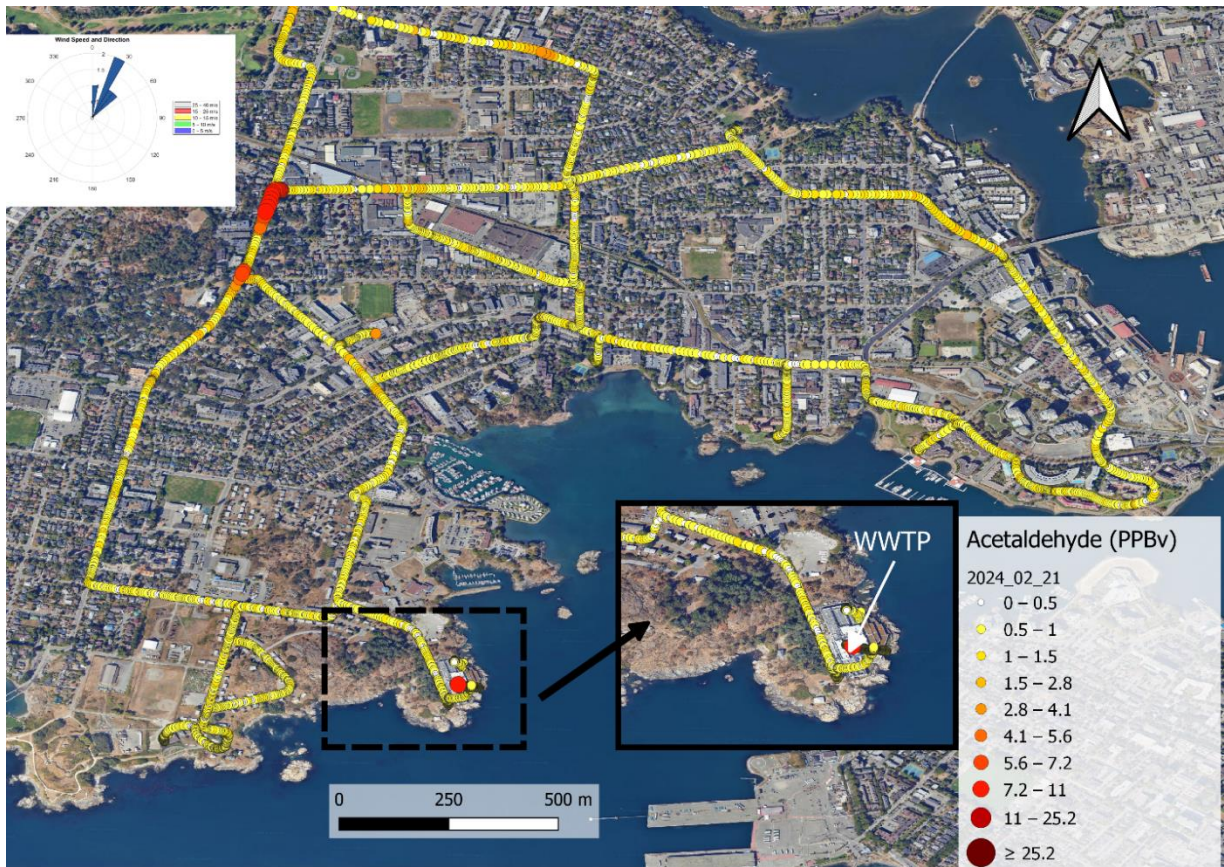


Figure 90 Community road maps for Acetaldehyde concentration, (top-Feb 21, 2024, bottom-Feb 22, 2024)

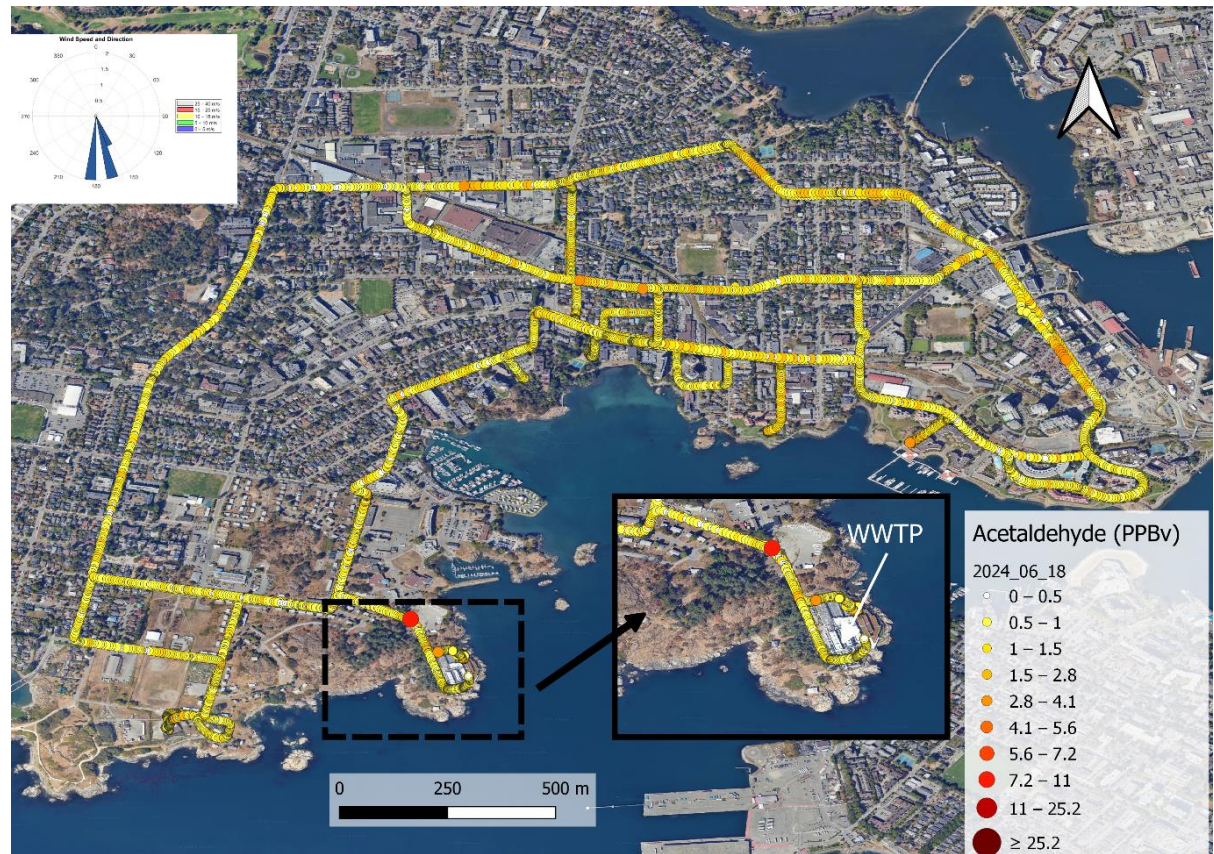
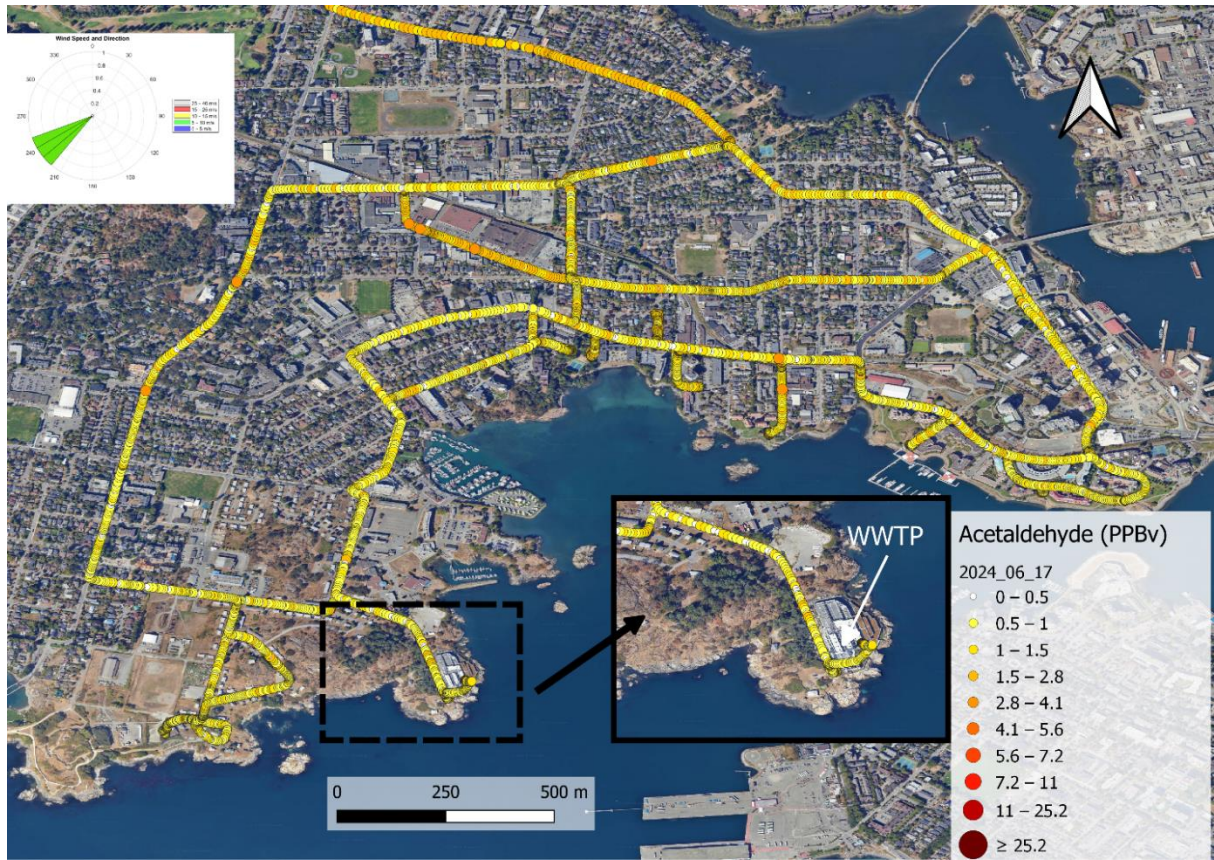


Figure 91 Community road maps for Acetaldehyde concentration, (top- June 17, 2024, bottom June 18, 2024)

Monoterpenes community maps

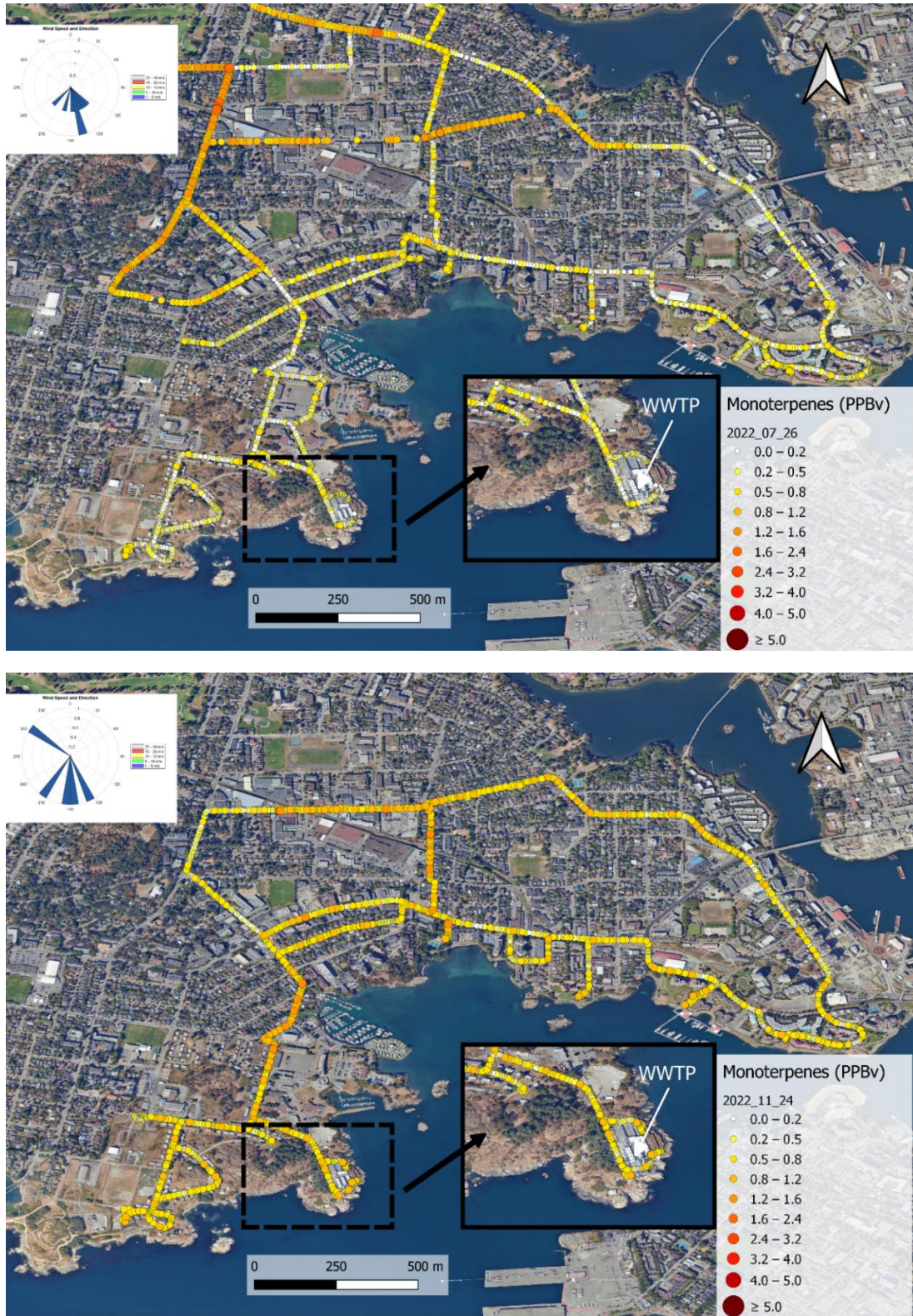


Figure 92 Community road maps for Monoterpenes concentration, (top-July 26, 2022, bottom-Nov 24, 2022)

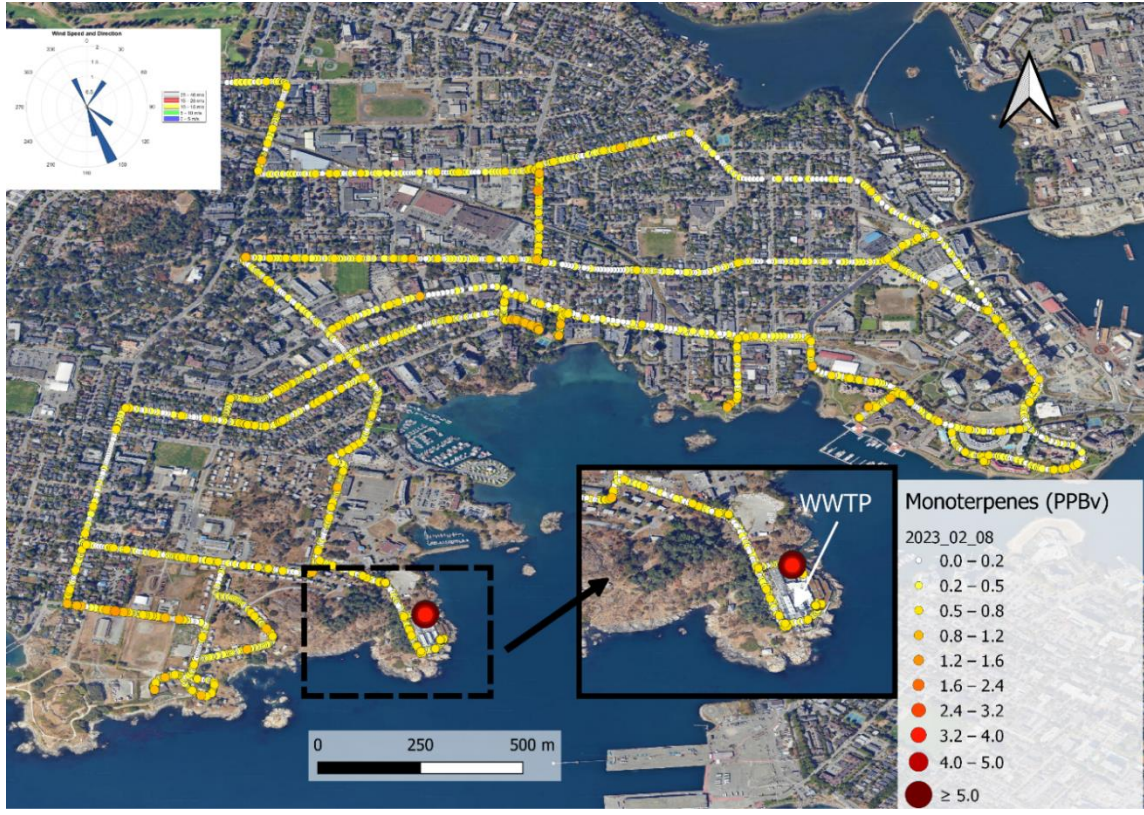
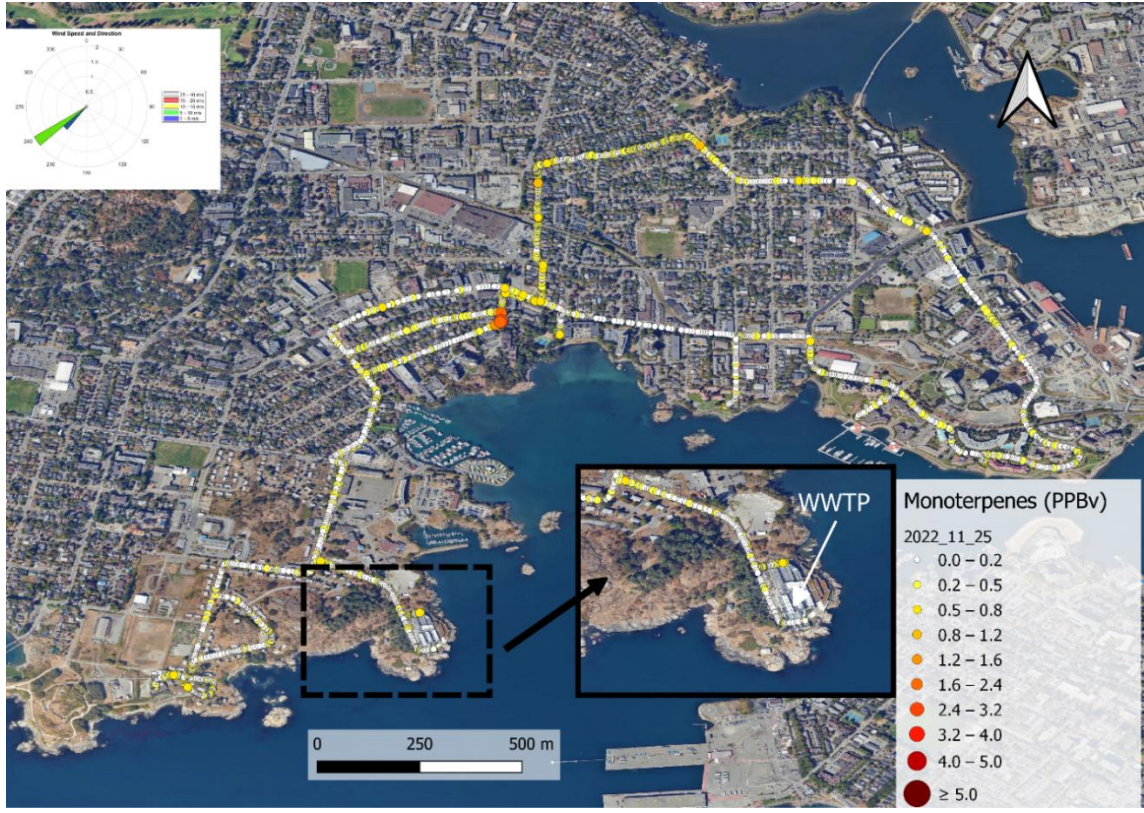


Figure 93 Community road maps for Monoterpenes concentration, (top-Nov 25, 2022, bottom-Feb 8, 2023)



Figure 96 Community road maps for Monoterpenes concentration, (top-July 27, 2023, bottom-Aug 22, 2023)



Figure 97 Community road maps for Monoterpenes concentration, (top-Oct 19, 2023, bottom-Nov 10, 2023)

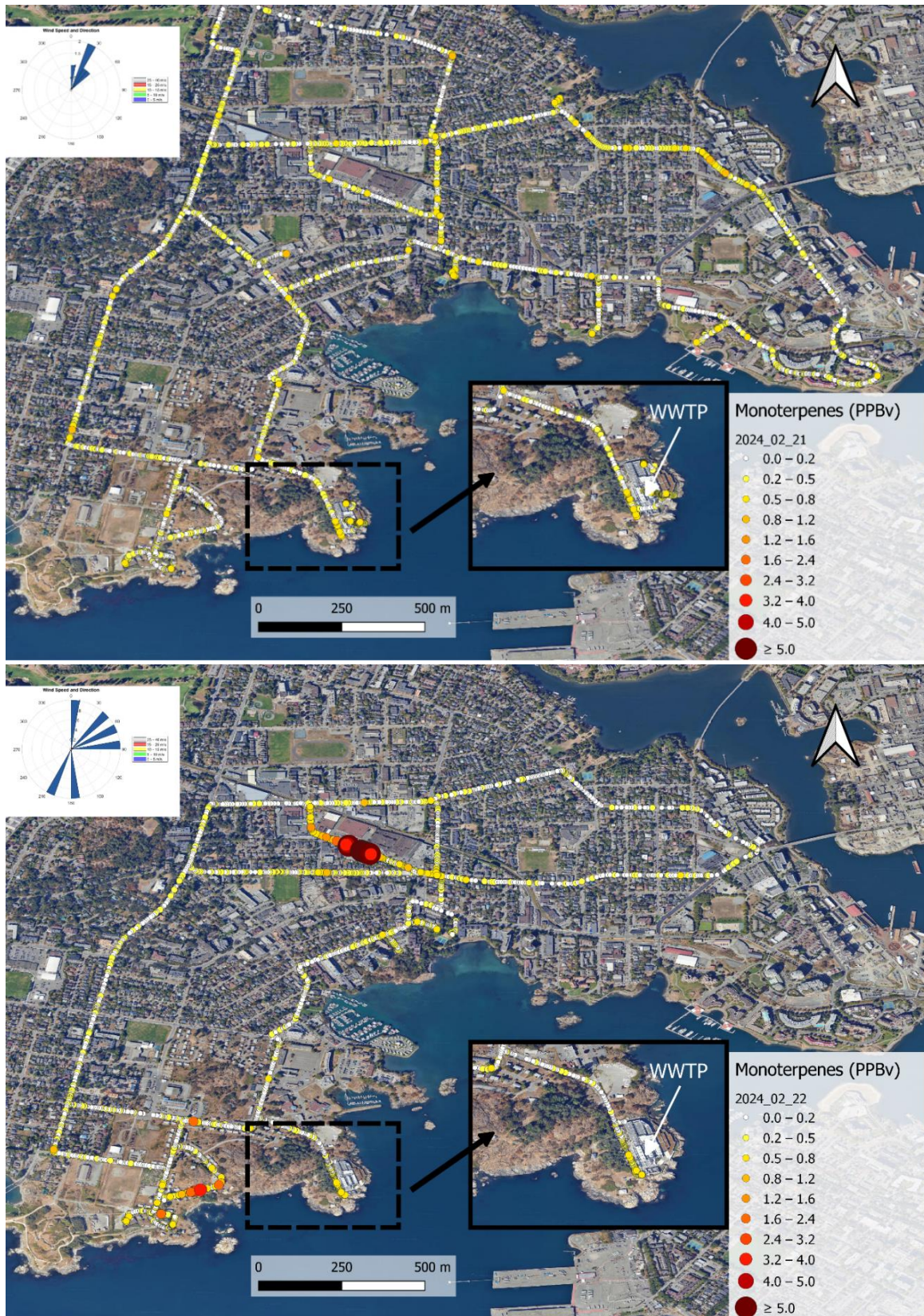


Figure 98 Community road maps for Monoterpenes concentration, (top-Feb 21, 2024, bottom-Feb 22, 2024)

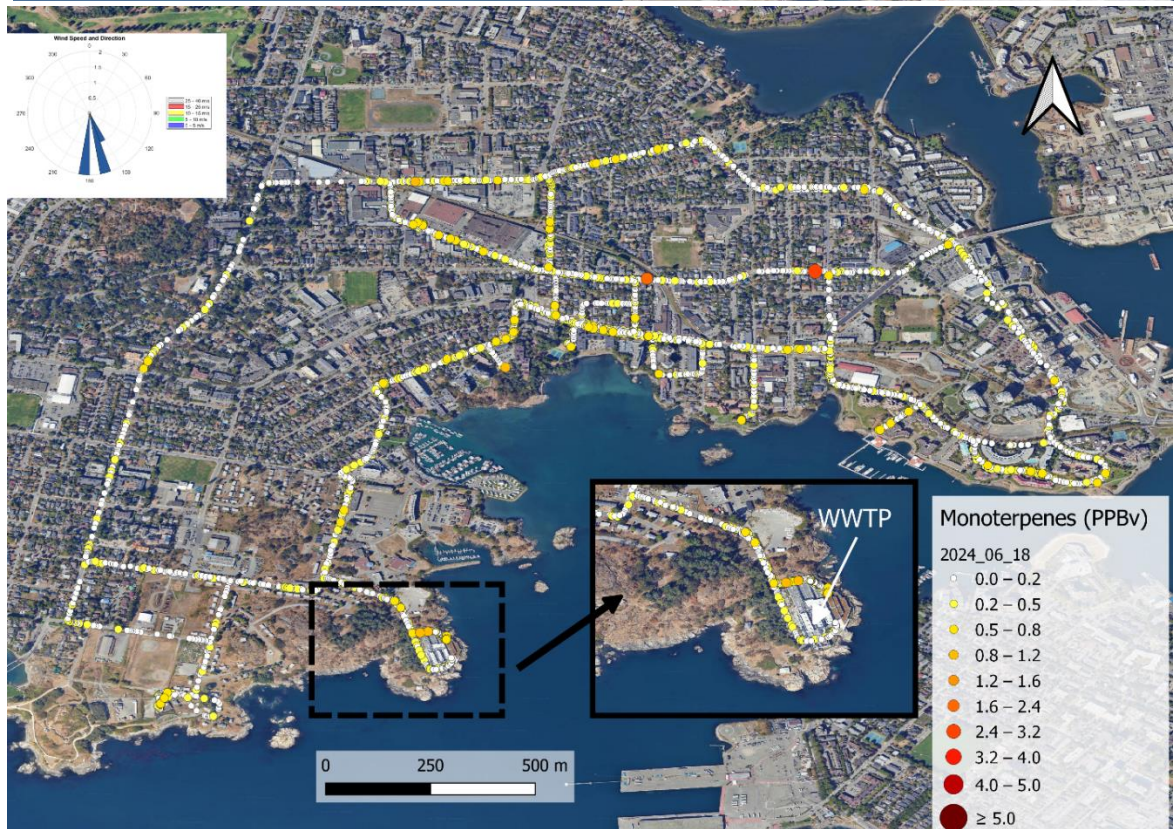
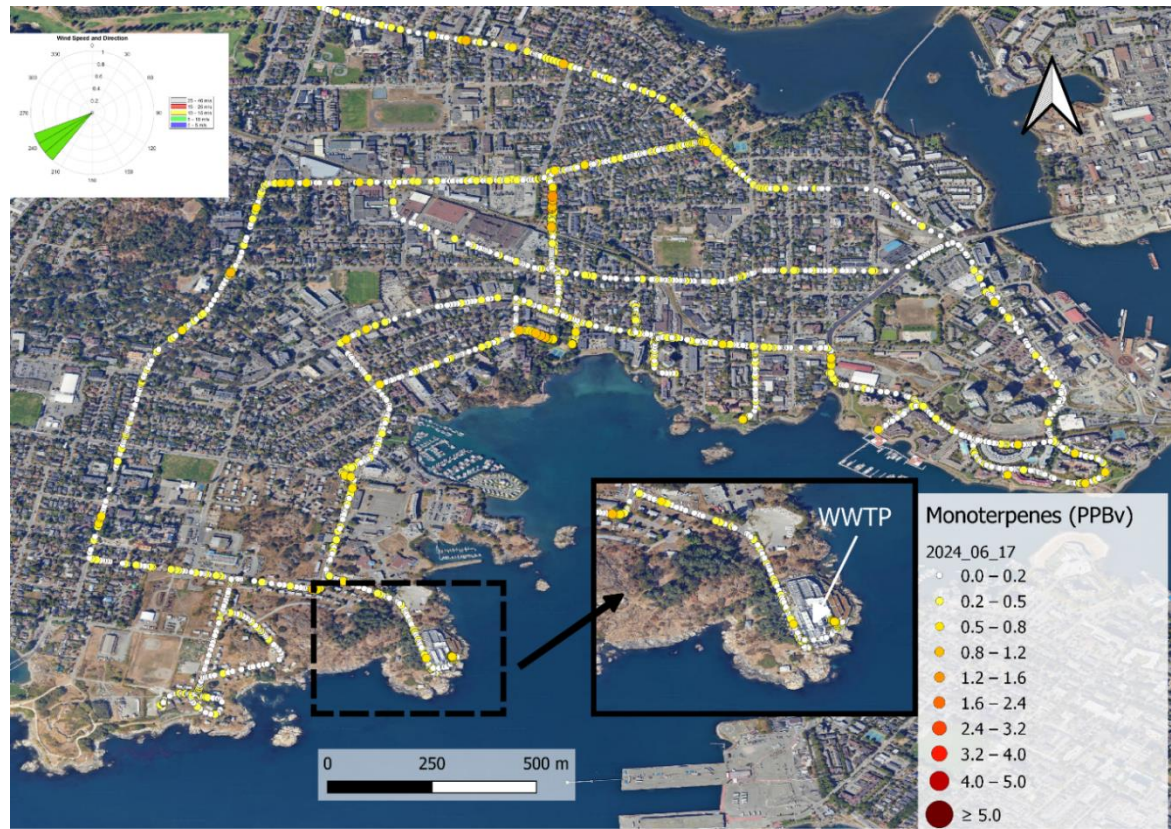


Figure 99 Community road maps for Monoterpenes concentration, (top-June 17, 2024, bottom-June 18, 2024)

Ethyl benzene community maps

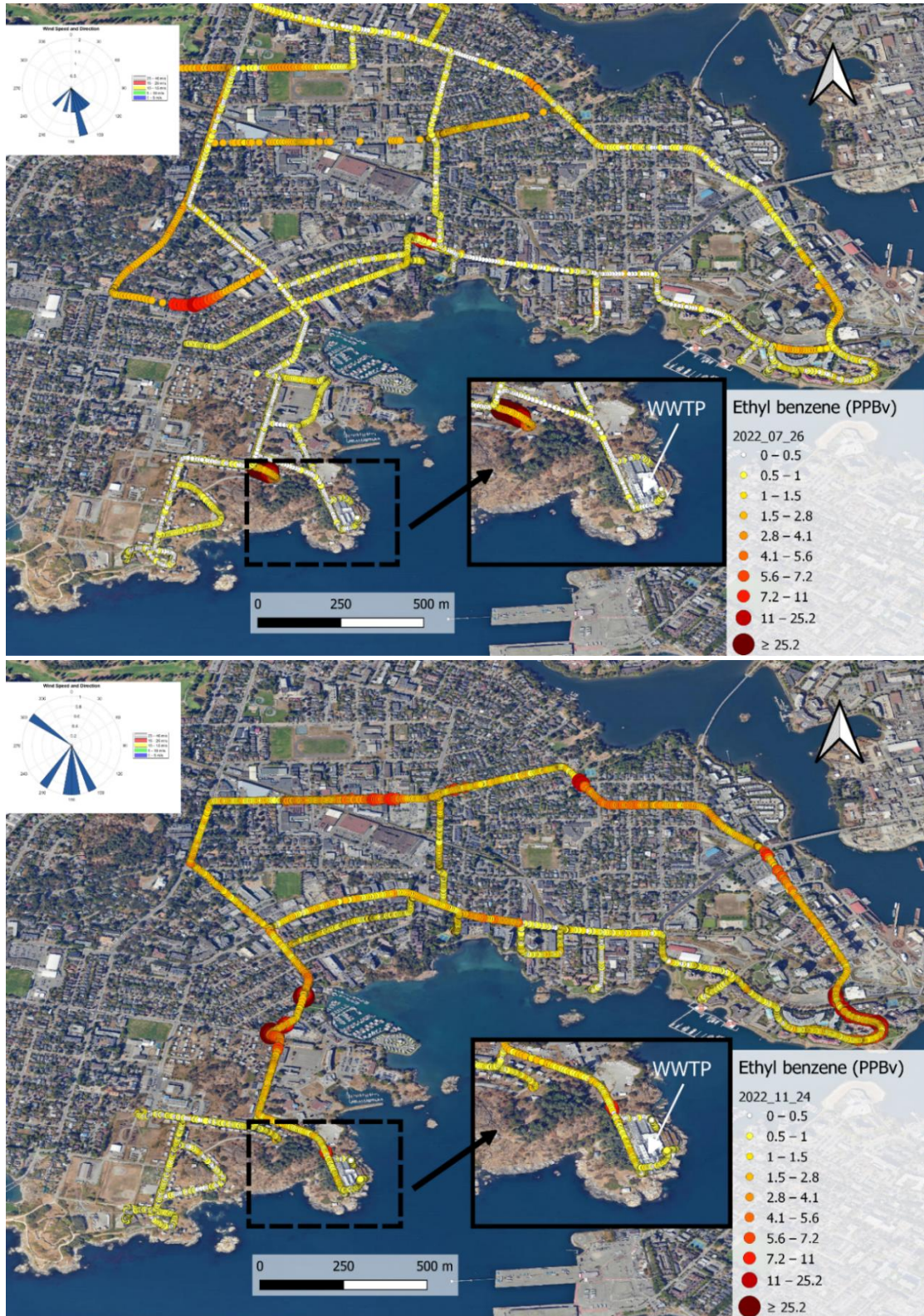


Figure 100 Community road maps for Ethyl benzene concentration, (top-July 26, 2022, bottom-Nov 24, 2022)



Figure 101 Community road maps for Ethyl benzene concentration, (top-Nov 25, 2022, bottom-Feb 8, 2023)

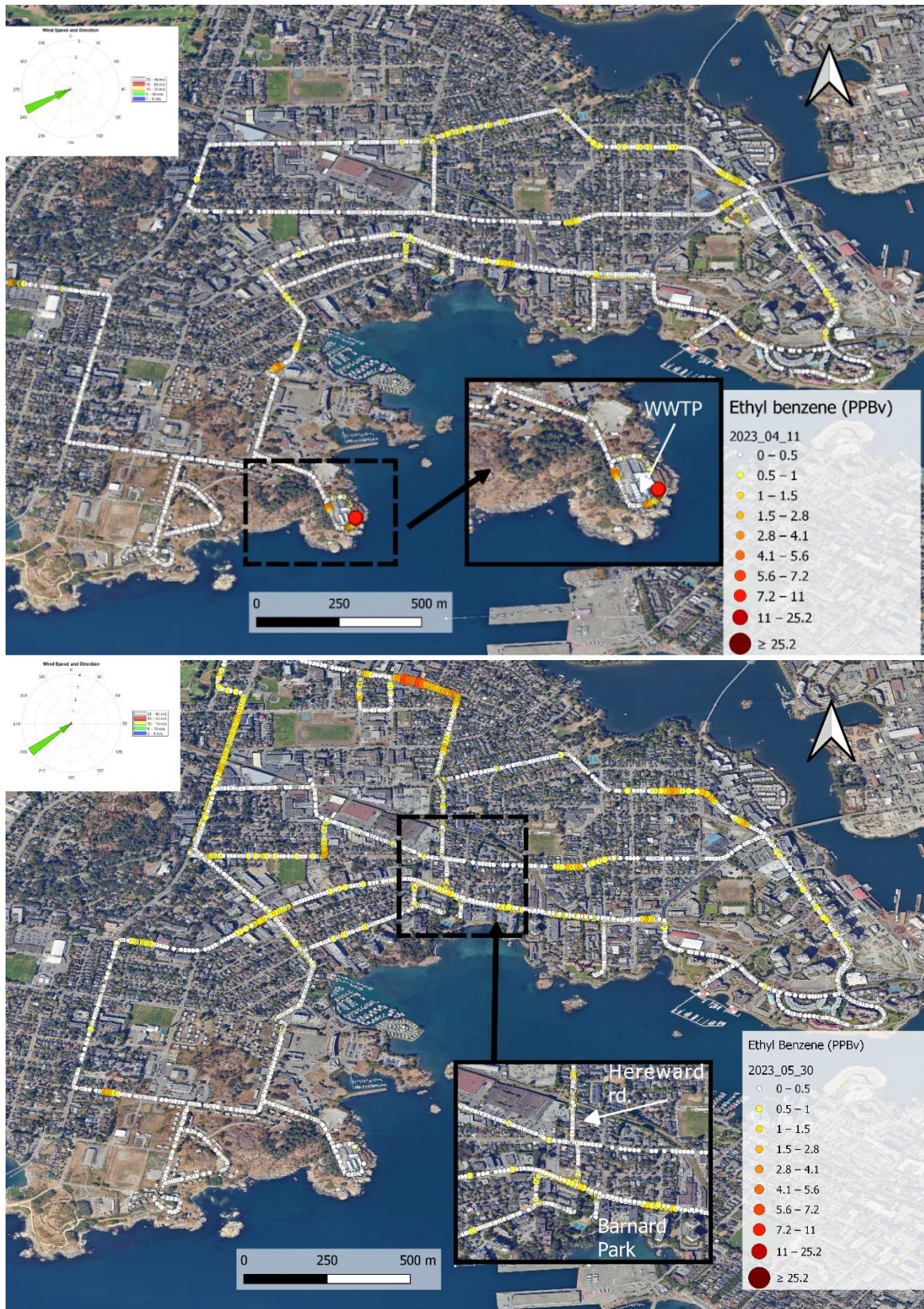


Figure 102 Community maps for Ethyl benzene. (top-April 11, 2023, bottom-May 30, 2023)

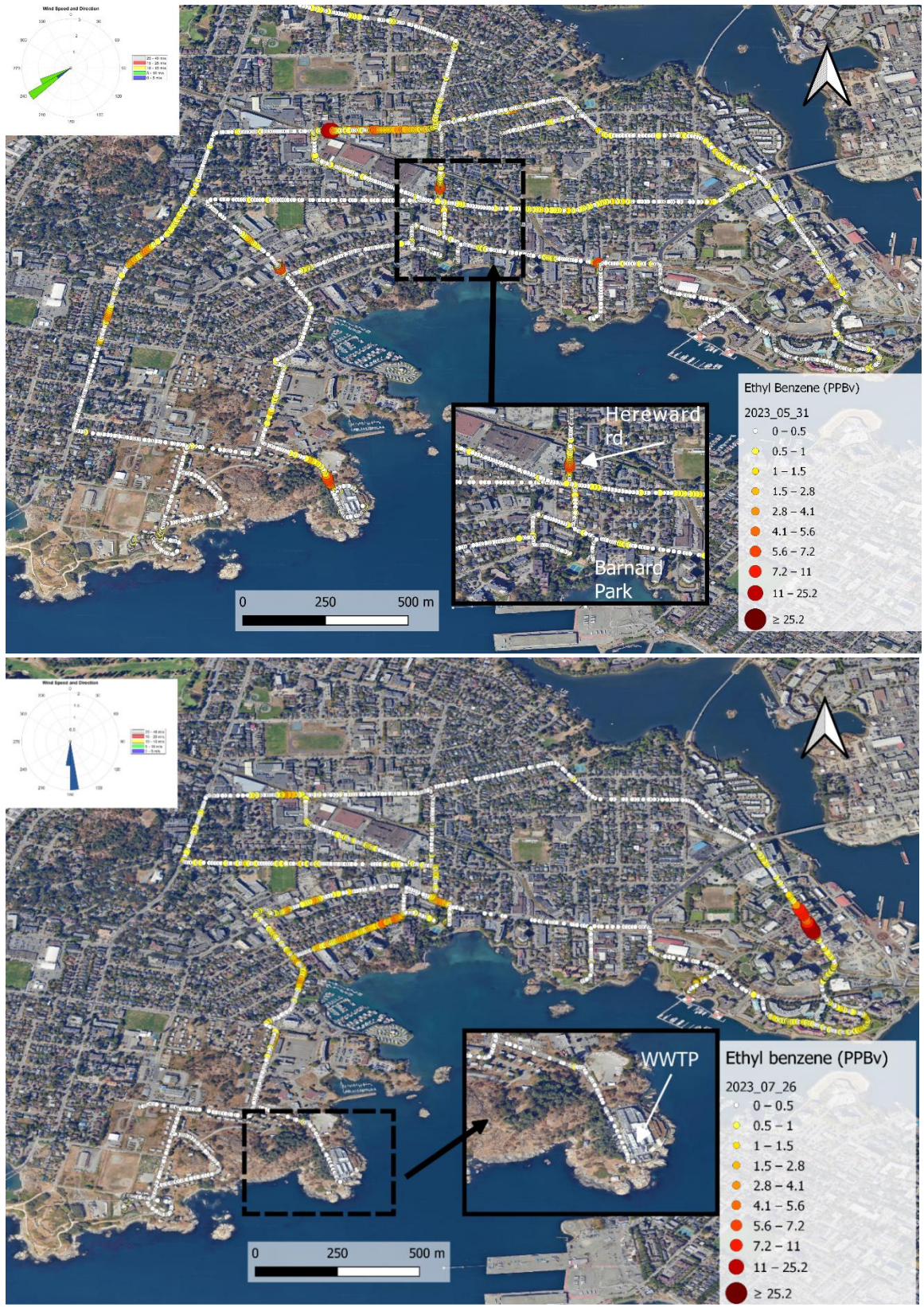


Figure 103 Community road maps for Ethyl benzene concentration, (top-May 31, 2023, bottom-July 26, 2023)

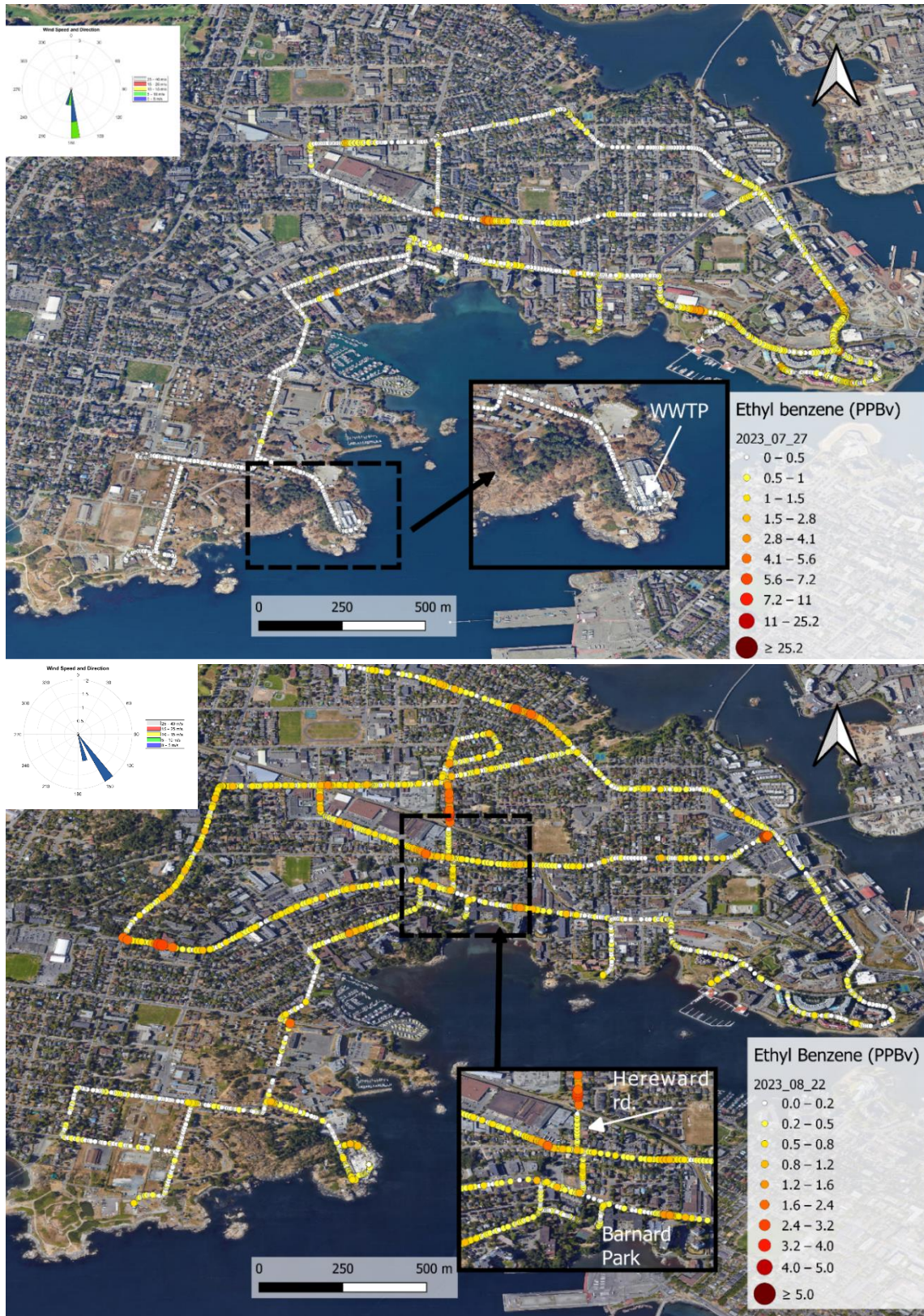


Figure 104 Community road maps for Ethyl benzene concentration, (top-July 27, 2023, bottom-Aug 22, 2023)



Figure 105 Community road maps for Ethyl benzene concentration, (top-Oct 19, 2023, bottom-Nov 10, 2023)

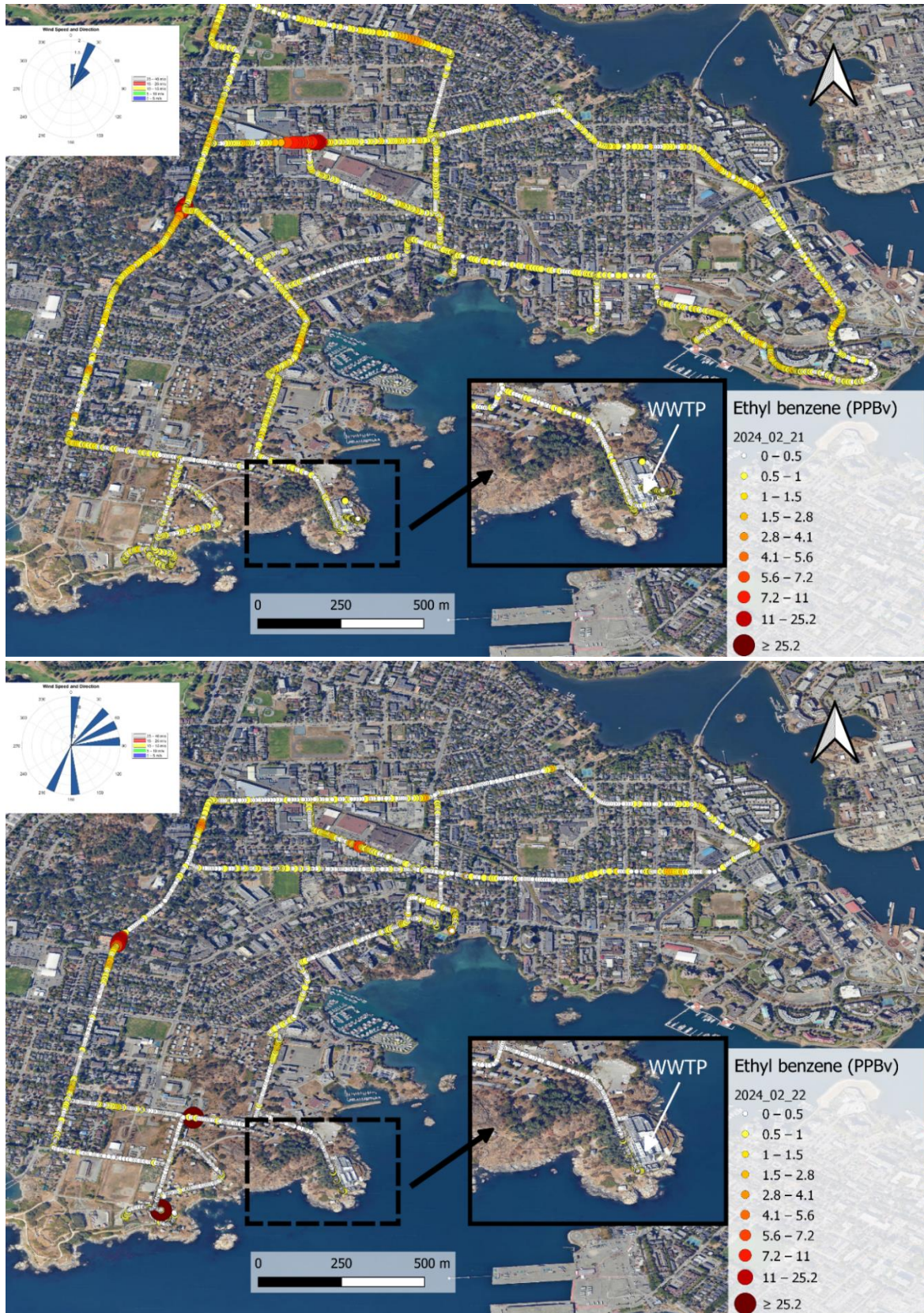


Figure 106 Community road maps for Ethyl benzene concentration, (top-Feb 21, 2024, bottom-Feb 22, 2024)

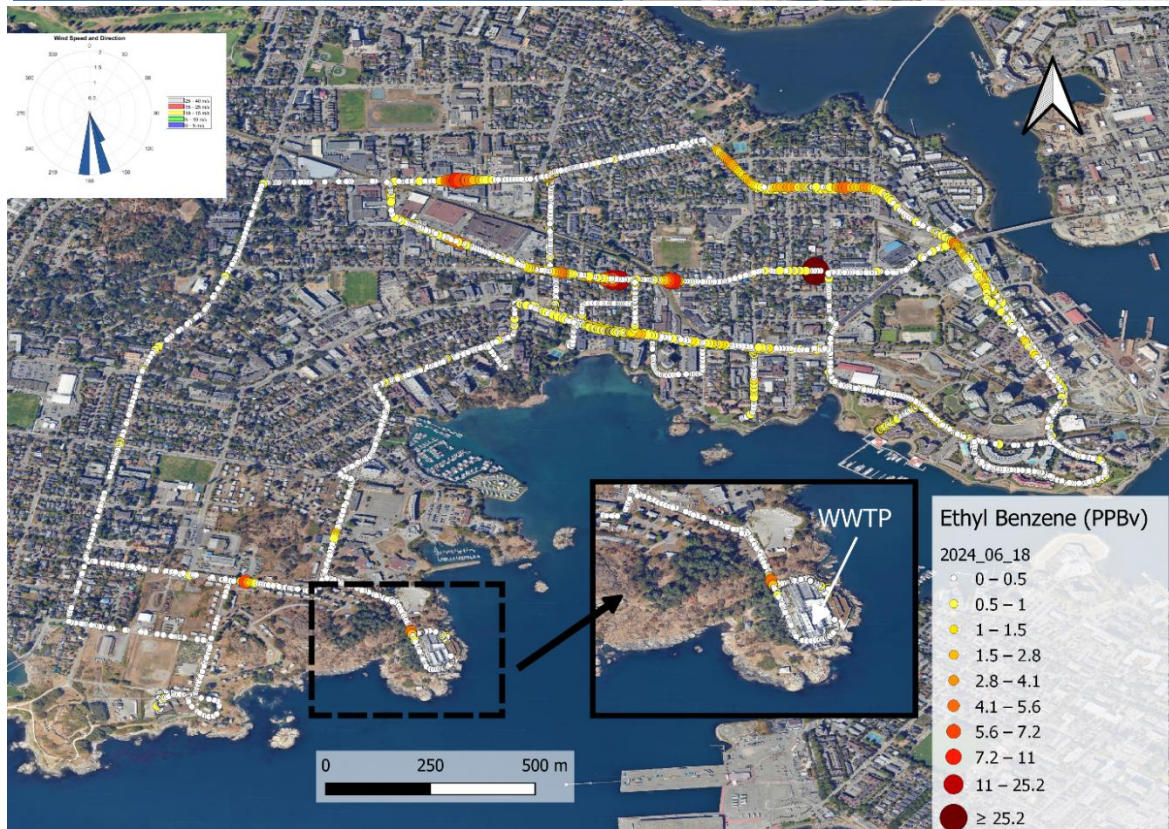
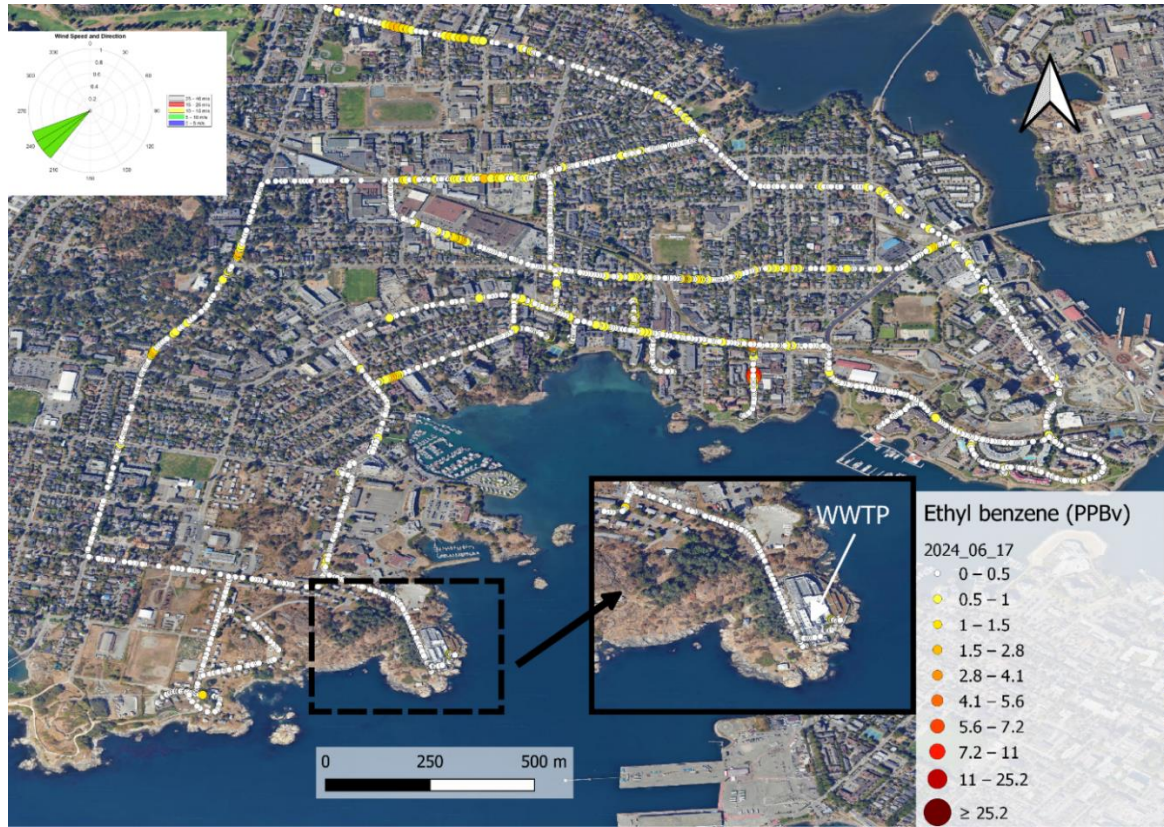


Figure 107 Community road maps for Ethyl benzene concentration, (top-June 17, 2024, bottom-June 18, 2024)

Methane Community maps

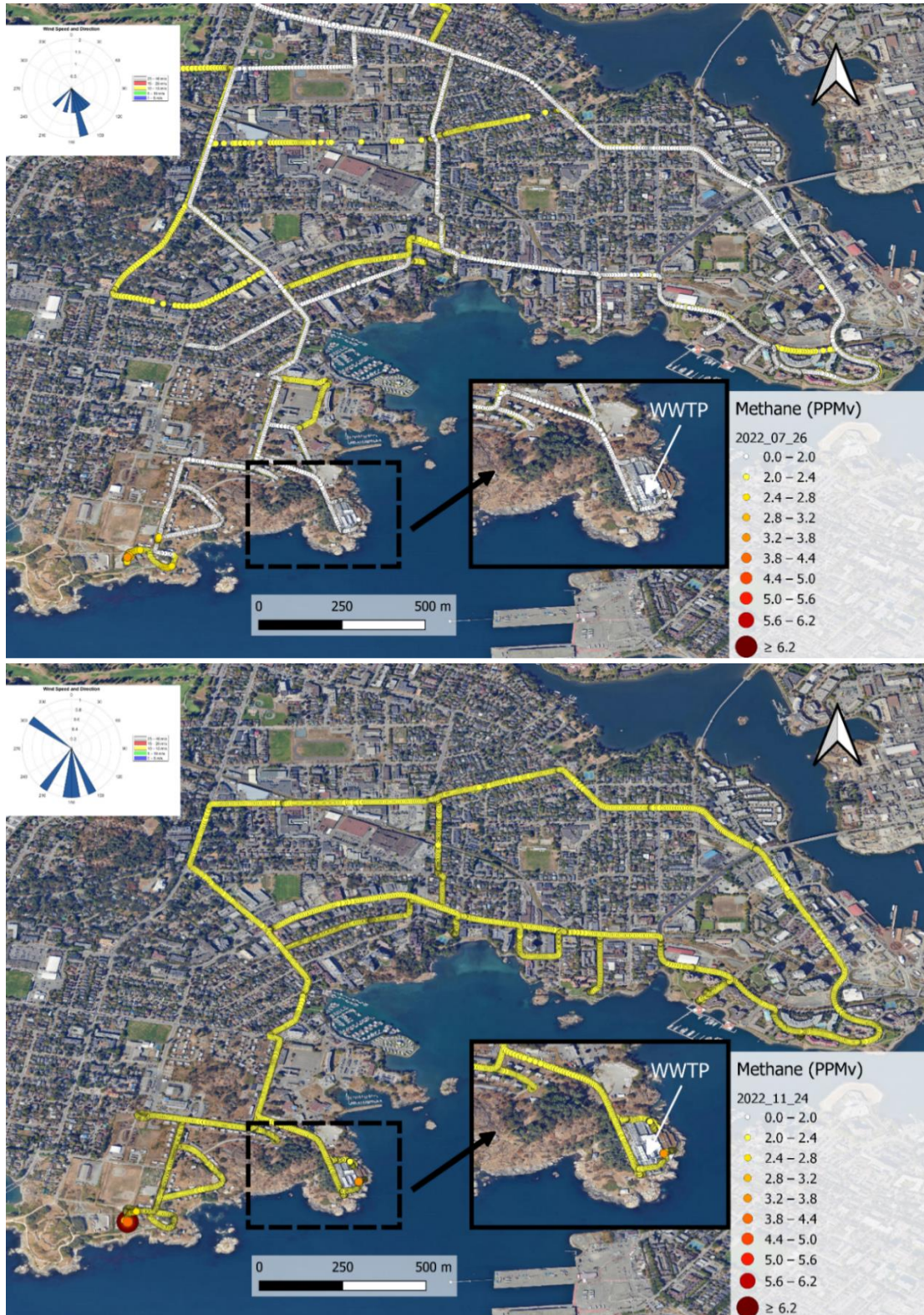


Figure 108 Community road maps Methane concentration, (top-July 26, 2022, bottom-Nov 24, 2022)

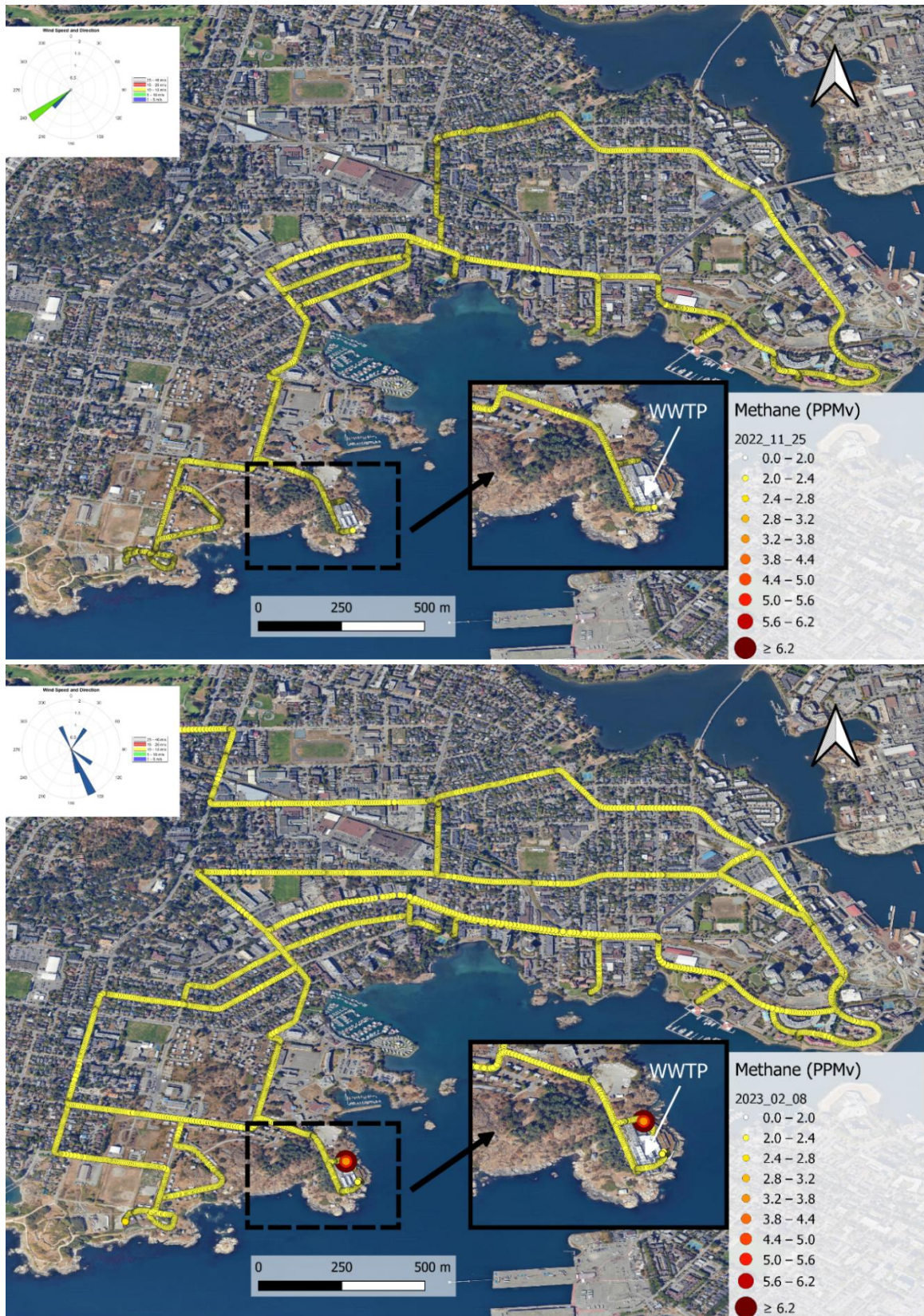


Figure 109 Community road maps Methane concentration, (top-Nov 25, 2022, bottom-Feb 8, 2023)



Figure 110 Community road maps Methane concentration, (top-April 11, 2023, bottom-May 30, 2023)

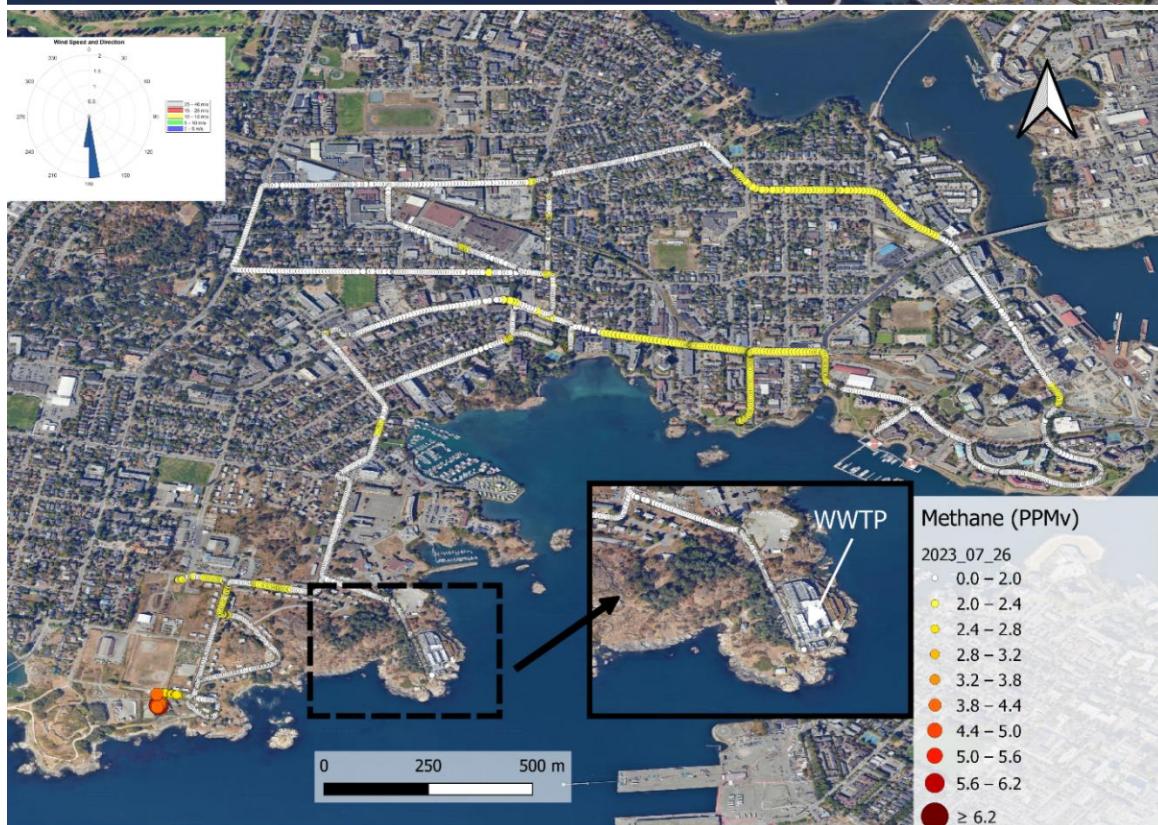


Figure 111 Community road maps Methane concentration, (top-May 31, 2023, bottom-July 26, 2023)



Figure 112 Community road maps Methane concentration, (top-July 27, 2023, bottom-Aug 22, 2023)



Figure 113 Community road maps Methane concentration, (top-Oct 19, 2023, bottom-Nov 10, 2023)

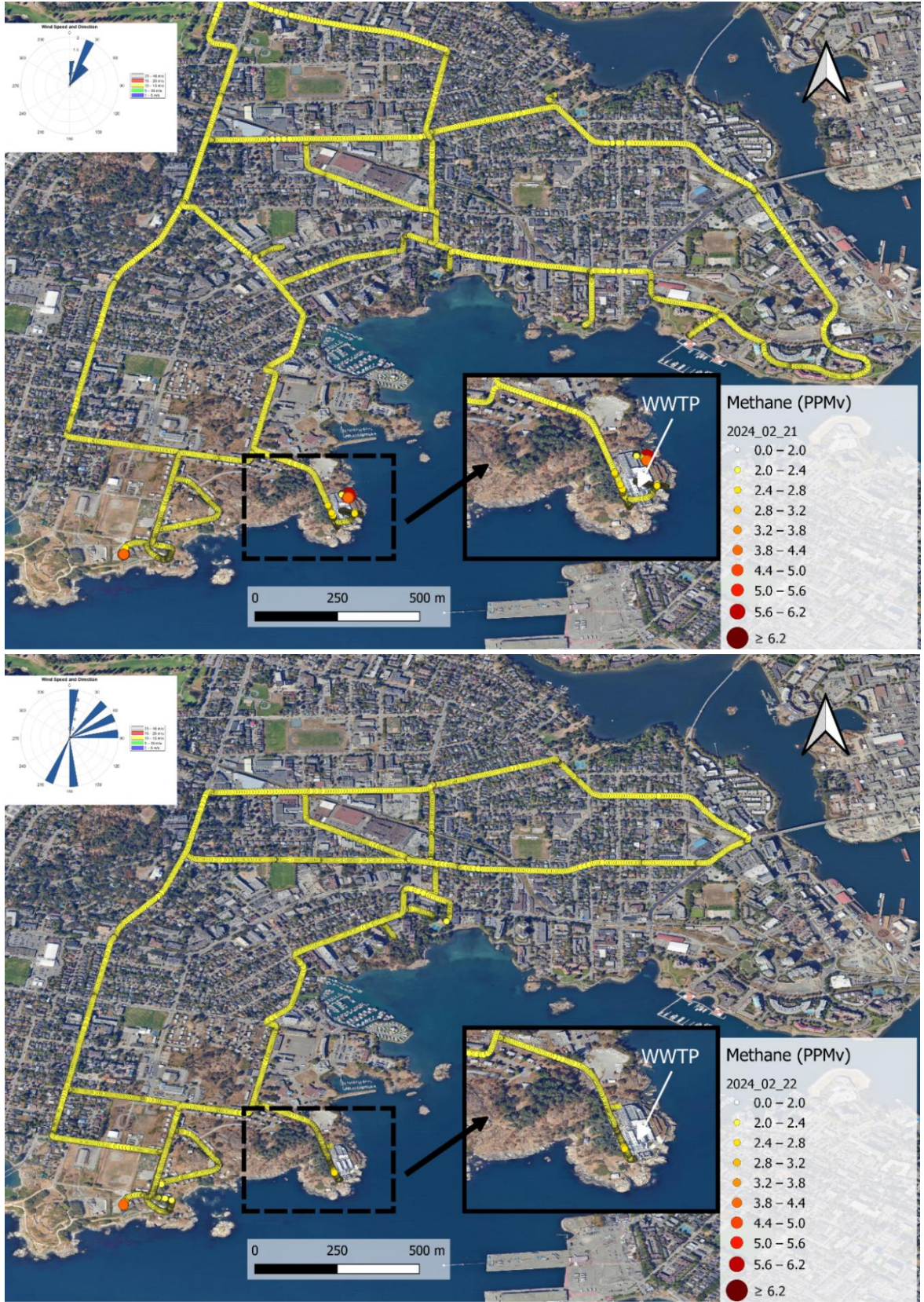


Figure 114 Community road maps Methane concentration, (top-Feb 21, 2024, bottom-Feb 22, 2024)

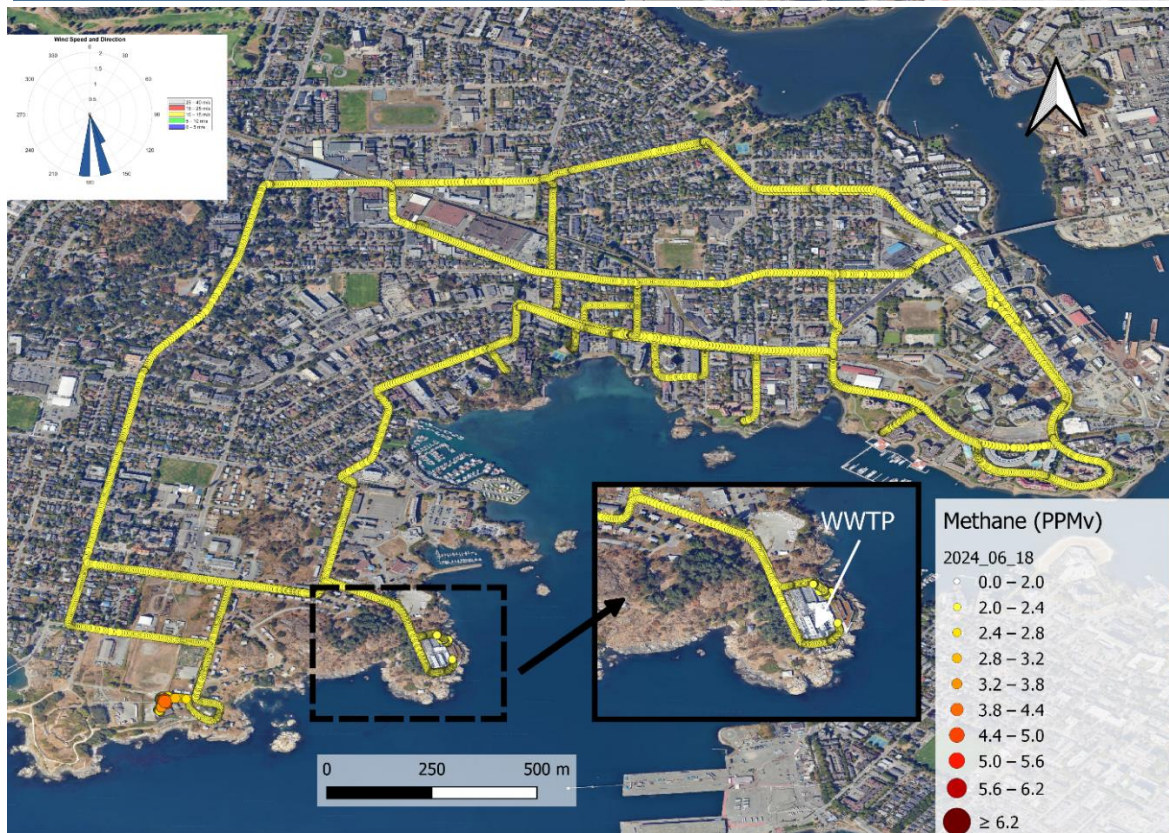
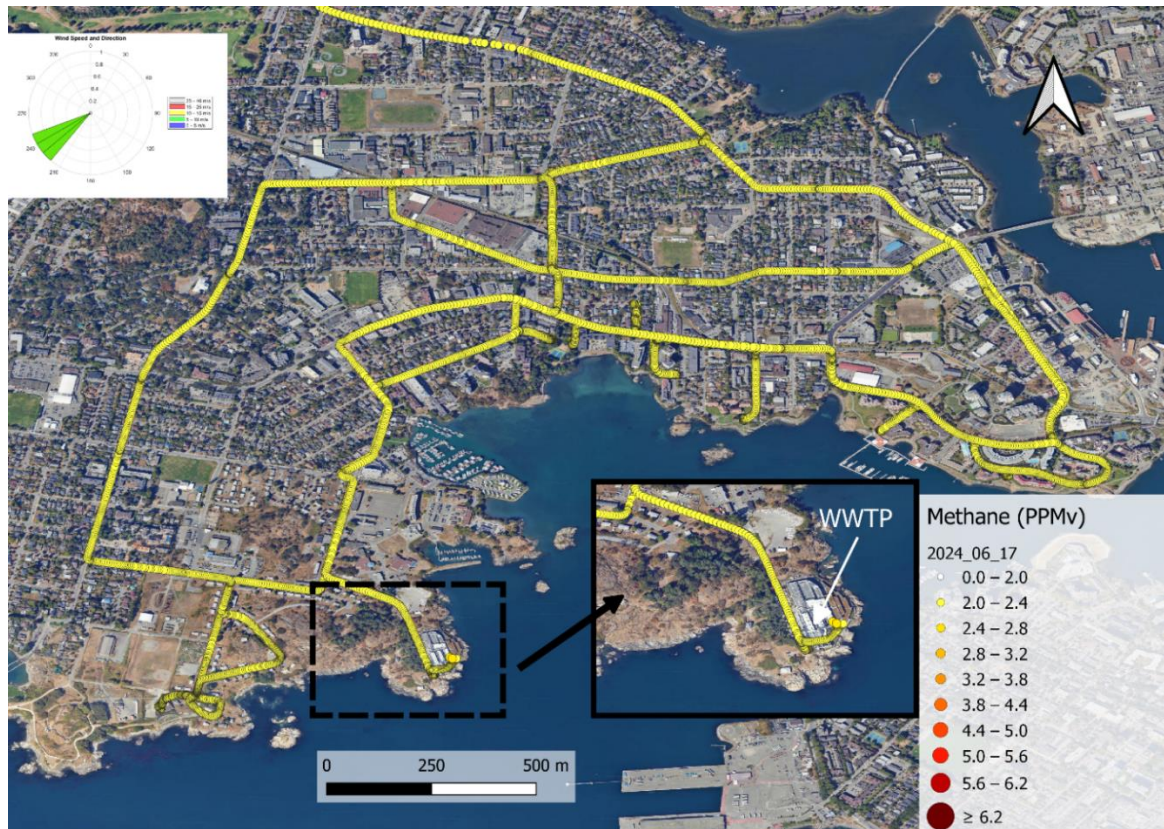


Figure 115 Community road maps Methane concentration, (top-June 17, 2024, bottom-June 18, 2024)