2025 Environmental Assessment Report

Air Quality in Montréal

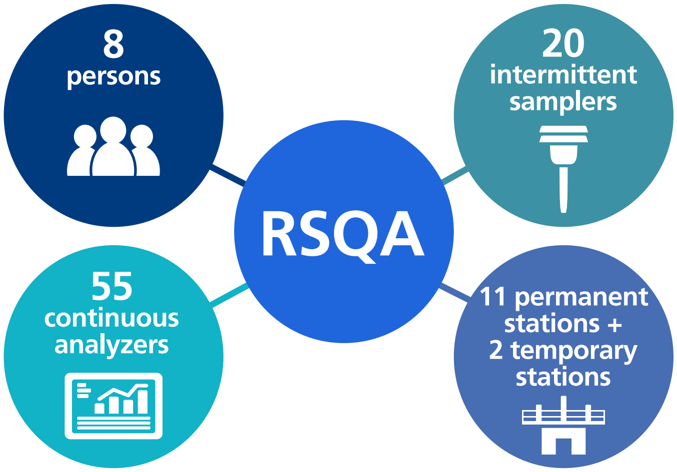
Service de l'environnement

Air quality monitoring

Our network, our mission

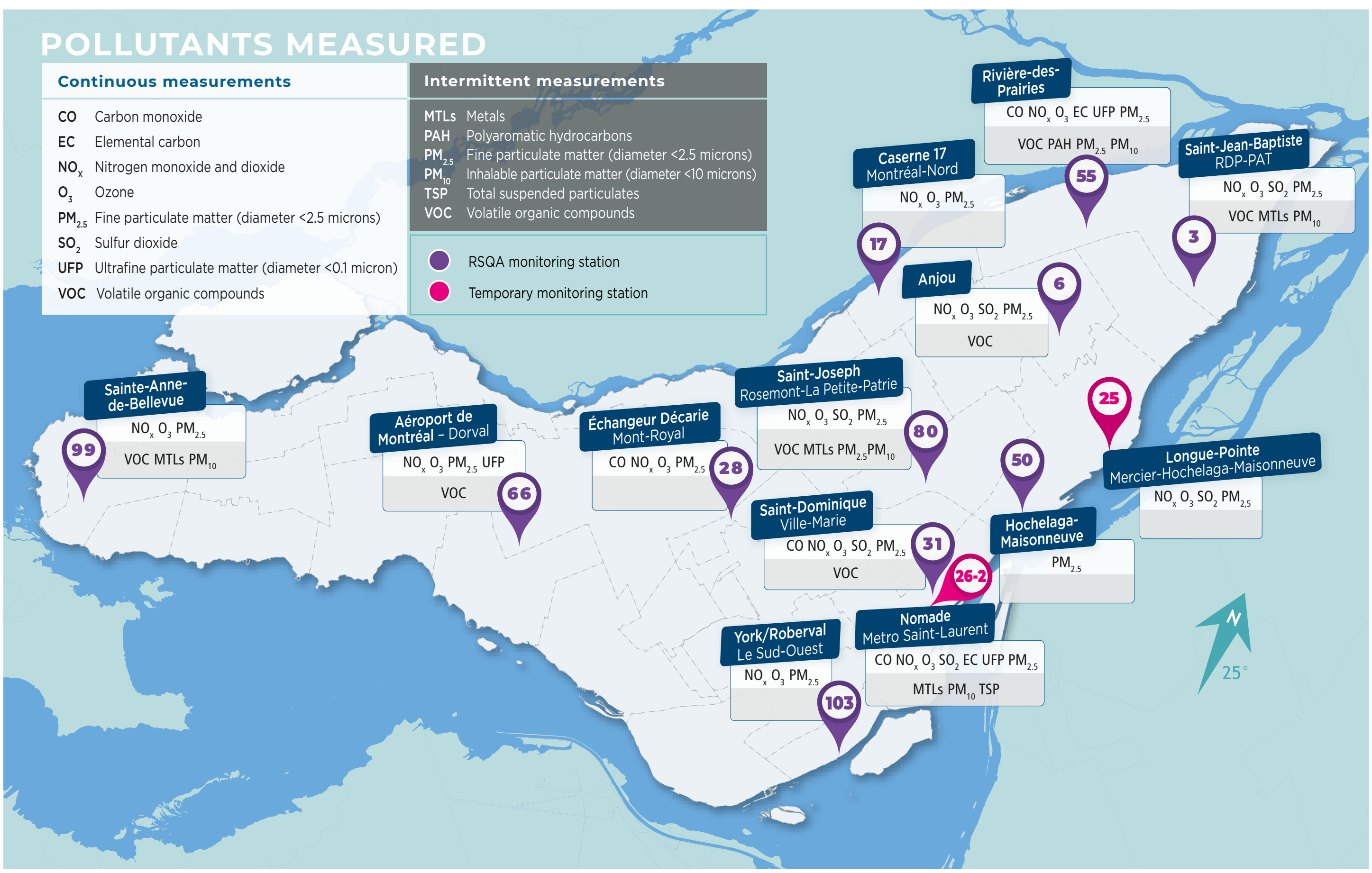
In keeping with its mission to provide reliable, verifiable, and easily accessible air quality data, the Réseau de surveillance de la qualité de l'air (RSQA) measured pollutant concentrations in ambient air to assess the current situation across the Montréal agglomeration territory.

In 2025, the RSQA relied on 11 permanent monitoring stations and 2 temporary stations dedicated to special projects, one of which is a nomadic station that is relocated every 12 to 24 months. As the network continues to evolve, 2025 marks the end of operations for 3 air quality monitoring stations: stations 28, 50, and 66. Station 28 will be replaced by station 33 – Autoroute 13, which is scheduled to open in the spring of 2026. Station 50, for its part, will close permanently, in accordance with the recommendations of Environment and Climate Change Canada (ECCC) and in agreement with Ville de Montréal. This decision falls within the framework of the National Air Pollution Surveillance Program (NAPS) and is based on a thorough analysis demonstrating that the station no longer met the program's needs, while the data it collected did not differ significantly from those of neighbouring stations (station 80). Finally, station 66 will have to be relocated at the request of Aéroports de Montréal (ADM), which wishes to reclaim the land currently occupied by the facility.



A technical team of eight specialists performs preventive and corrective maintenance on measuring instruments, ensures the accuracy and reliability of the analyzers, and applies a rigorous validation process to the numerous results collected. Once validated, all data are made available on Montréal's open data website, so that professionals, researchers, and the general public can access and use them.

Map of permanent and temporary stations



Portrait of air quality

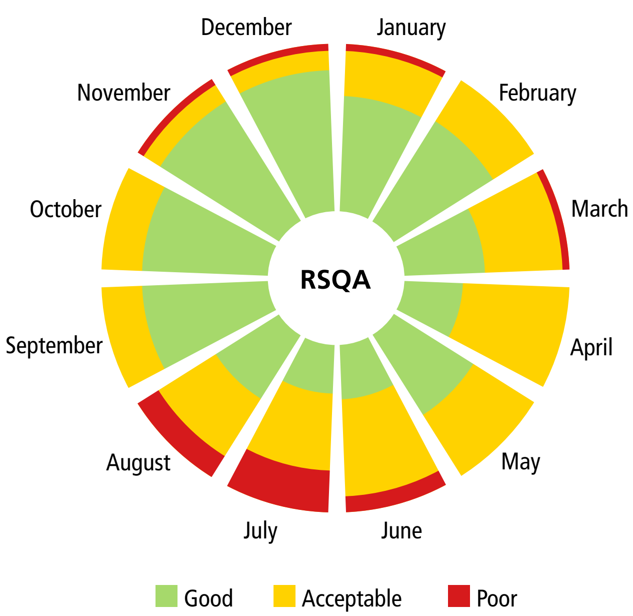
Air quality index

Ville de Montréal uses a numerical value called the "air quality index" (AQI) to present scientific air quality data in an accessible way. A value of 50 on this index corresponds to the acceptable upper limit for each of the pollutants measured, and these pollutants vary by monitoring station. The hourly index reported is the highest of the sub-indexes calculated for each of the pollutants measured continuously at RSQA stations: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), fine particulate matter ($PM_{2.5}$), and sulphur dioxide (SO_2).

For 2025, the AQI results for all permanent RSQA stations are as follows:

- Good: 62.4%
- Acceptable: 33.1%
- Poor: 4.5%

The data are presented in the form of a wheel divided by month of the year.

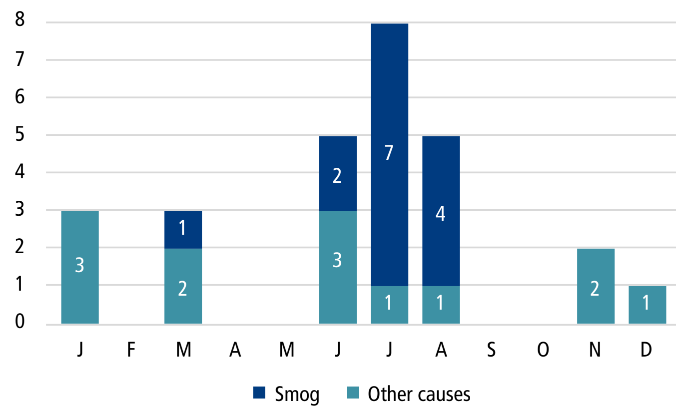


Fall and winter were dominated by a "good" AQI, characteristic of air that is often more stable with less photochemical activity, while the summer months had more days when the AQI was "moderate," with higher ozone concentrations, and "poor" air quality linked to smog episodes where concentrations of fine particles from wildfires were high.

Poor air quality days

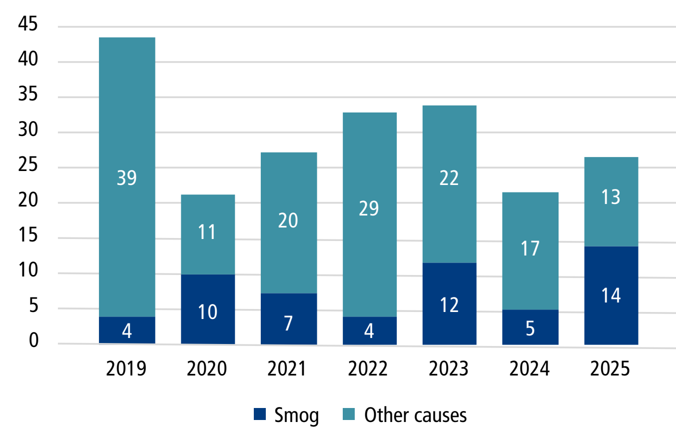
A total of 27 days of poor air quality, including 14 days of smog, were recorded in 2025 in the Montréal area, representing an increase of 5 days compared to 2024. The poor air quality of these days is due to the presence of fine particles. There were no days with poor air quality in February, April, May, September or October, whereas June, July, and August were the months most affected by poor air quality and smog.

Poor air quality days per month in Montréal in 2025



A day is considered to have poor air quality whenever fine particle concentrations exceed 35 µg/m³ for at least 3 hours at a given monitoring station. For a poor air quality day to be characterized as a smog day, these excessive concentrations must be measured over more than 75% of the Montréal agglomeration territory. During a smog day, concentrations of fine particulate matter generally remain high for 24 hours and sometimes longer.

Poor air quality days per year in Montréal since 2019



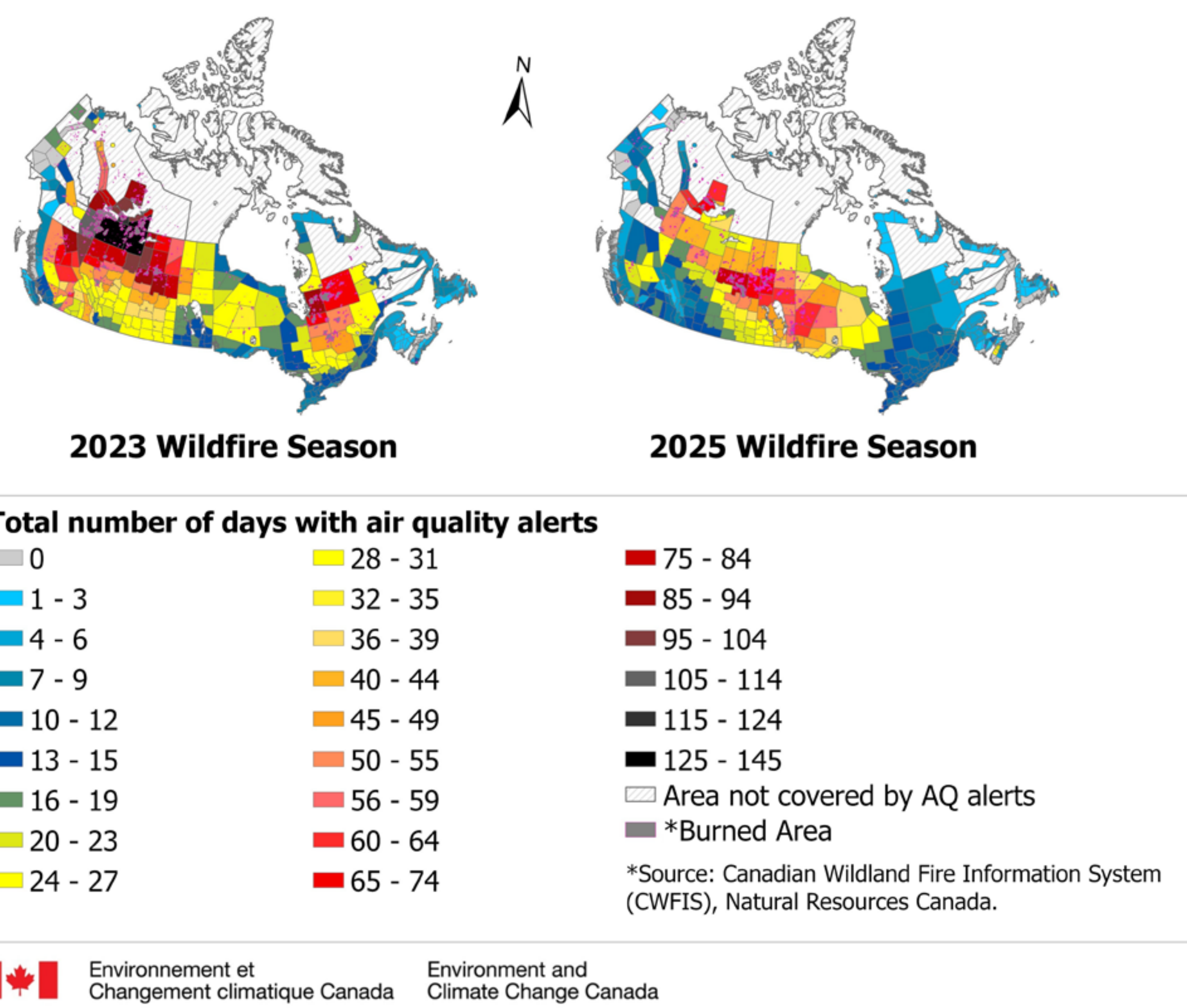
In 2025, there were 14 days of smog, most of which occurred during the summer. Smoke from wildfires, which wreaked havoc across Western Canada that summer, was the main cause of these smog days (13 days), while an exceptional event was responsible for the smog day on March 14. Favourable weather conditions, a temperature inversion with little or no wind, and high local emissions (notably from road traffic) contributed to the accumulation of pollutants at ground level on that day in March.

In addition to smog episodes, the impact of which extends across the region, the number of days with poor air quality observed in 2025—resulting primarily from local sources (other causes)—decreased to 13 days, compared to 17 in 2024 and more than 20 in the years 2021 through 2023. This result is close to the low recorded in 2020, at the height of the COVID-19 pandemic, when only 11 days of poor local air quality were recorded.

Summer smog in 2023 compared to 2025: More episodes, lower intensity

The summer smog episodes observed in 2023 and 2025 were caused by wildfires, but their geographic locations differed significantly. In 2023, the main wildfire hotspots were located in Alberta, British Columbia, and the Northwest Territories, as well as in northern Québec. One of the sources of emissions was therefore relatively close to the RSQA stations. However, in 2025, the major fires were concentrated mainly in Manitoba and Saskatchewan, regions somewhat farther from Québec's urban areas, and were less intense (see the map below).

ECCC's 2023 and 2025 Wildfire seasons Map[1]

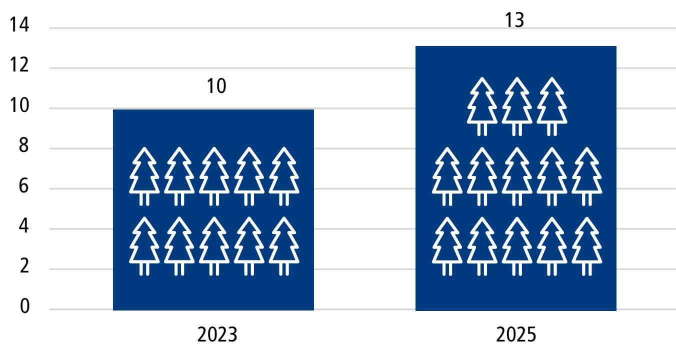


1. Personal email communication with Mehrez Samali of the Meteorological Service of Canada on February 27, 2026, with contributions from Sean Kearnan-Carbonneau and Melissa MacDonald of ECCC.

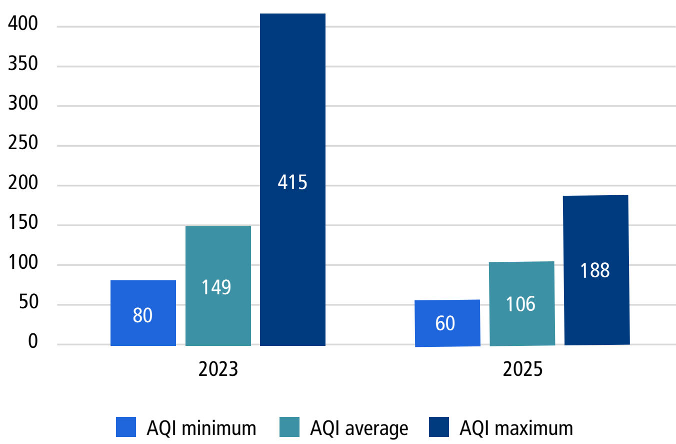
According to Environment and Climate Change Canada,[2] 2025 ranks as the second-worst year on record for wildfires, just behind 2023.

Summer smog 2023 vs 2025 - Wildfire context

Number of smog days (summer)



AQI values (minimum - average - maximum)



The intensity of smog as measured by the AQI generally varies depending on the distance from the fire sites, the structure of the smoke plume, and atmospheric circulation (prevailing winds, vertical dispersion, and precipitation). Between 2023 and 2025, the number of summer smog days rose from 10 to 13 (+30%). Despite this increase, the concentrations of the measured air pollutants have decreased (table below).

Difference in AQI values

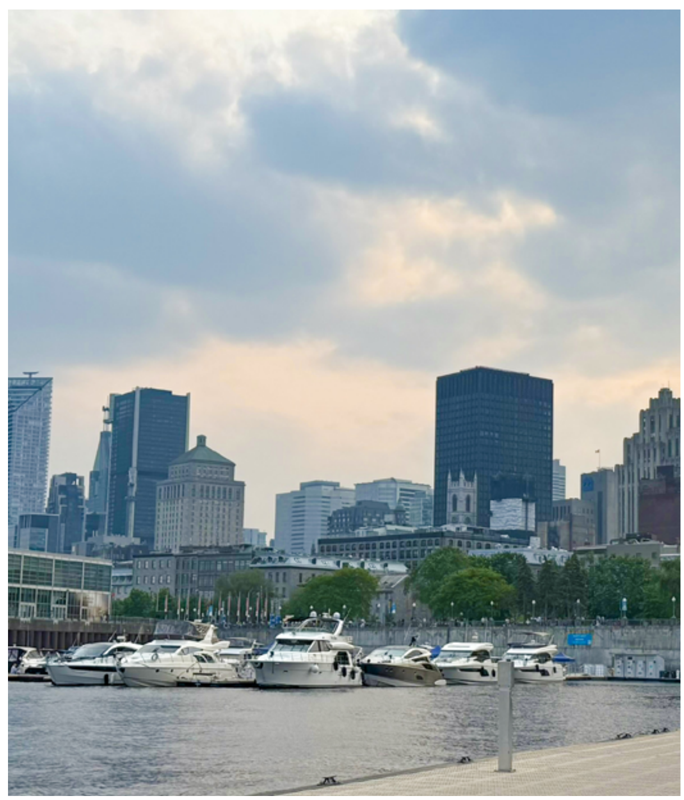
Minimum	↓ 25%
Average	↓ 29%
Maximum	↓ 55%

The episodes were more frequent in 2025 but significantly less severe. This reduction is consistent with the greater distance between Québec's populated areas and the 2025 wildfires in the Prairies. The plume must travel a greater distance, which promotes:

- Dilution of fine particles;
- Greater dispersion;
- Reduction of extreme peaks in AQI.

Conversely, in 2023, the proximity of wildfires in northern Québec led to more intense smog episodes, accounting for the extremely high maximum AQI value of 415. Smoke from wildfires has become a major factor in seasonal peaks and averages of $PM_{2.5}$, and the years 2023 and 2025 confirm urban vulnerability to regional and transboundary episodes.

Unfortunately, the wildfire season is set to become longer and more intense in the coming decades as a result of global warming.[3] Summer smog episodes will therefore become increasingly common and frequent. It is therefore important to maintain air quality monitoring and to implement risk communication plans and mitigation measures (cooled shelters with air filtration, targeted info-smog information, support for sensitive environments).[4]



2. https://www.canada.ca/fr/environnement-changement-climatique/services/dix-evenements-meteorologiques-plus-marquants/2025.html, website visited February 3, 2026.
3. https://creb-uqac.ca/wp-content/uploads/2023/11/3.-Conference-Y.-Boulanger-Sommet-feux_2023_compressed-1.pdf, website visited February 3, 2026.
3. https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2025GH001565, website visited February 10, 2026.

A next-generation BTEX analyzer!

In 2025, the RSQA replaced its old BTEX (benzene, toluene, ethylbenzene and xylenes) analyzer, which had been in service from 2010 to 2024, with a next-generation model: the airmoVOC BTEX from Chromatotec.

This instrument, equipped with a gas chromatograph coupled with a flame ionization detector (GC-FID), enables the measurement of concentrations of these volatile organic compounds (VOCs) in the atmosphere with increased sensitivity.

The analyzer is deployed at station 3 – Saint-Jean-Baptiste, located in the eastern part of the Island of Montréal, to improve the characterization of local BTEX sources and air quality monitoring in this area. This substitution yields more accurate and stable data, which are essential for detecting subtle variations in these compounds. The RSQA is thus continuing its technological modernization efforts to maintain high standards in atmospheric monitoring.

Ultrafine particles in Montréal: A scientific look at the invisible

Measurements of ultrafine particles (UFP) continued in 2025 at RSQA stations. These particles are distinguished by their extremely small size—with a diameter of less than 0.1 micrometers (µm)—and their abundance. In fact, they are the most abundant in terms of the number of particles per unit of volume in the ambient air. That is why their unit of measurement is expressed as the number of particles per cubic centimetre (# particles/cm^3), whereas larger particles are measured by mass, specifically in micrograms per cubic metre (µg/m^3). They come mainly from road traffic (exhaust emissions and tire and brake wear), air traffic, cooking, other combustion sources, and nucleation events (the formation of secondary ultrafine particles).

Although not regulated, UFPs are a major health concern in urban environments. A study conducted in Toronto and Montréal involving more than 1.5 million adults revealed that chronic exposure to ultrafine particles significantly increases nonaccidental, respiratory, and cardiovascular mortality. UFPs are distinguished by their ability to penetrate deep into the lungs, enter the systemic circulation, and trigger inflammatory and oxidative processes. They also exhibit disproportionately high toxicity, unmatched by other particle fractions, because their large surface area allows for the massive adsorption of toxic compounds (polycyclic aromatic hydrocarbons, metals, organic compounds). The RSQA is collecting data and gaining experience in the metrology of the measurement of UFPs with the aim of contributing to the potential elaboration of future regulations.

The UFP analyzer at station 55 – Rivière-des-Prairies is used to characterize concentrations observed in residential areas, particularly those associated with wood heating. For its part, the analyzer at station 66 – Aéroport de Montréal measures concentrations in an environment characterized by air traffic.

Between 2024 and 2025, there was an increase in UFP levels at our two monitoring stations (see following table).

Annual average of ultrafine particles (# particles/cm^3): 2024 vs 2025

	Station 55	Station 66
2024	6,730	23,873
2025	7,354	24,698
Difference (%)	+9,3%	+3,5%

The results from station 66, which are affected by airport activities, are significantly higher (with a ratio of approximately 3.5) than those recorded by station 55 in a residential area. These findings are consistent with those of a study conducted near Ottawa International Airport, which clearly demonstrated that aviation activities are a significant source of ultrafine particles in the immediate environment. In fact, each takeoff causes a 10–13% increase in UFP concentrations, especially when winds are light (<20 km/h). It is important to note that fine particles ($PM_{2.5}$) and elemental carbon (EC) show no significant correlation with aviation activity, confirming that the airport's environmental footprint is highly specific to ultrafine particles. That is why the following section presents a focused analysis of the UFPs generated by the Montréal Airport.

UFPs: the airport's invisible footprint

Several activities taking place on airport grounds contribute to concentrations of ultrafine particles: takeoffs, landings, taxiing, idling on the ground, and de-icing of aircraft. Station 66 is located right in the heart of the airport, where all these activities are taking place, with the de-icing facility just 215 m away. The de-icing fluid used is a mixture of ethylene glycol and water, in varying concentrations depending on weather conditions. Trucks are used to spray hot glycol, which releases ultrafine particles into the air.

5. https://pubs.rsc.org/en/content/articlelanding/2021/ea/d1ea00058f, website visited February 27, 2026.
6. https://pubmed.ncbi.nlm.nih.gov/38924496/, website visited February 27, 2026.
7. https://www.nature.com/articles/s12276-020-0403-3, website visited February 27, 2026.
8. https://pubs.acs.org/doi/10.1021/acsestair.4c00288, website visited February 27, 2026.

The chart below shows a month-by-month comparison of 2024 and 2025 for:

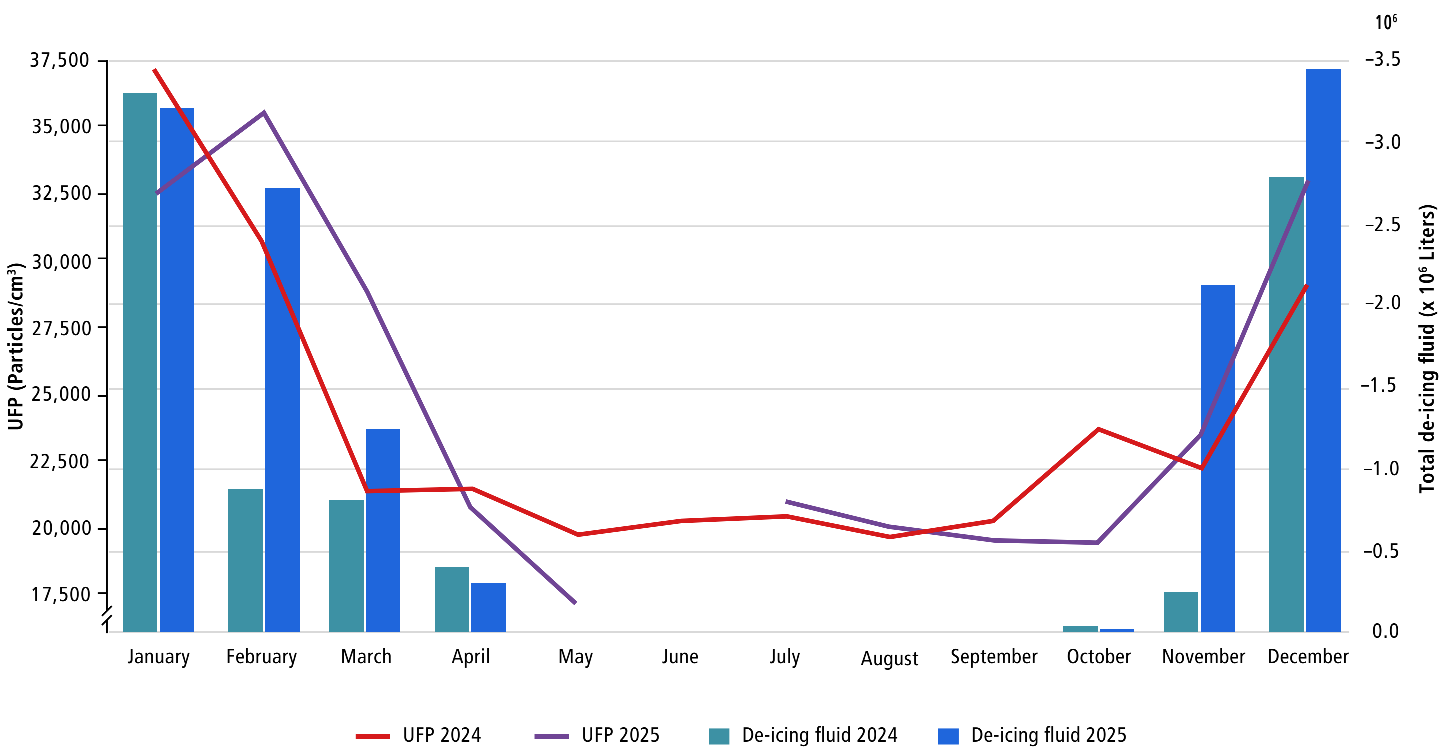
1- UFP concentrations: purple and red lines with the Y-axis on the left (June 2025 – no concentrations) in particles/cm^3 and the axis capped at 15,000 particles/cm^3;

2- the total amount of de-icer[9] used: green and blue histograms with the Y-axis on the right, showing the amount in litres. Please note that de-icing does not occur from May through September.

Over the past two years, monthly UFP concentrations have been higher during the winter months than during the summer months and have followed a similar trend. Colder temperatures promote the accumulation and formation of ultrafine particles through condensation and nucleation.[10] In addition, temperature inversions, low wind speeds, and a shallow mixing layer constitute winter conditions that hinder the dispersion of UFPs.[10] Ultrafine particles are much more volatile in summer than in winter.[11] This high volatility means that particles evaporate more readily as the temperature rises, thereby reducing UFP concentrations in the ambient air.[11]

An analysis of the data reveals significant differences between 2024 and 2025 for several key indicators: concentrations, temperatures, air traffic, and de-icing fluid usage. Two months stand out in particular: February and November 2025. During these periods, the quantities of de-icing fluid increased by 210.1% and 817.7%, respectively, due to colder weather conditions, despite a decrease in air movements. Thus, some of the increases observed in UFPs (February, November, and December) are consistent with the expected effect of colder temperatures.

2024–2025 comparison at Station 66 – Aéroport de Montréal
Monthly variations in concentrations of UFP and total de-icing fluid used



9. Email correspondence with Denis Lefebvre of Aeromag on March 6, 2026.

10. https://www.admtl.com/en-CA/community/soundscape-management/indicators, website visited March 5, 2026.

11. https://acp.copernicus.org/articles/22/2293/2022/, website visited March 5, 2026.

The following table shows the monthly differences between 2024 and 2025 for UFP concentrations, average temperatures measured at the Montréal Airport weather station operated by ECCC – Meteorological Service of Canada,[12] air movements compiled by ADM,[13] and the amount of de-icing fluid used by Aeromag,[14] the company responsible for the de-icing process at the Montréal Airport.

Temperatures in 2025 were generally cooler than in 2024, which could lead to higher UFP concentrations. The total number of movements per month for the entire airport does not appear to be a determining factor in the fluctuation of monthly UFP concentrations. In 2025, there was generally less activity than in 2024 for every month except March, April, and December. This suggests that the overall volume of movements alone does not account for the observed variations. The most significant factors are likely to be:

- the direction and layout of the runways;
- the specific phases (takeoff, taxiing, and landing);
- the distance between the actual trajectories and station 66.

A more detailed analysis of the data (track by track, altitude, ground speed, wind direction at the time of the operations) would allow for a more precise correlation, but it would require a significant amount of data processing.

However, 2025 marked the end of monitoring activities at station 66, which had been in operation since 1997 and had made a significant contribution to air quality monitoring in the area. ADM informed Ville de Montréal that it was no longer possible to house the station at its current location on a permanent basis due to major construction work planned for the area.

As a result, station 66 was officially closed, and the instruments were taken offline. The relocation is scheduled for spring 2026 to a site that has yet to be determined. The priority remains to ensure the continuity and integrity of the atmospheric data collected, which are essential to maintaining robust environmental monitoring for Montréal's residents.

Monthly differences: 2024 compared to 2025

	UFP %	Temperature °C	Aircraft movements %	De-icer used %
January	-12%	-3.1	-0.4%	-2.2%
February	16%	-5.2	-7.0%	210.1%
March	35%	-1.6	0.3%	53.3%
April	-3%	-1.1	2.6%	-24.2%
May	-13%	-2.0	-0.4%	N/A
June	Not available	-0.1	-1.2%	N/A
July	3%	-0.1	-0.3%	N/A
August	2%	0.1	-2.0%	N/A
September	-3%	-0.9	-1.0%	N/A
October	-17%	0.3	-0.7%	-47.4%
November	5%	-3.6	-0.1%	817.7%
December	13%	-3.2	1.1%	24.3%
Annual	**3.5%**	**-1.7**	**-0.8%**	**55.4%**

N/A: Not applicable

12. https://climate.weather.gc.ca/historical_data/search_historic_data_e.html, website visited March 5, 2026.
13. https://www.admtl.com/en-CA/community/soundscape-management/indicators, website visited March 5, 2026.
14. Email correspondence with Denis Lefebvre of Aeromag on March 6, 2026.

Canadian comparison: Levoglucosan 2009–2024

In Montréal, wood heating remains a major source of fine particles, contributing to winter smog episodes and significant health impacts. Since 2015, By-law 15–069 strictly regulates the use of solid-fuel appliances: a ban on using any appliance when a smog advisory is issued for the region, and, since October 1, 2018, a ban at all times on uncertified appliances (≤2.5 g/h of fine particulate matter according to EPA or CSA/B415.1-10), with an exception in the event of a power outage lasting more than 3 hours. These measures, combined with public awareness campaigns and replacement initiatives, have helped reduce the impact of wood heating on air quality.[15] Citizens are encouraged to practise responsible burning and to follow the smog advisories issued by ECCC's Info-Smog program via the WeatherCAN app.

But what about the other provinces?

To answer this question, the levoglucosan concentrations at all monitoring sites in ECCC's NAPS Program[17] were analyzed. In total, 18 stations measured levoglucosan for one year or more between 2009 and 2024. Several stations had few or no results between 2020 and 2023 due to COVID-19 and the very gradual resumption of operations by ECCC. For provinces with more than one station providing data, namely Québec, Ontario, and British Columbia, the station with the highest winter average was selected for comparison with the RQSA's station 55 – Rivière-des-Prairies. The period from November 1 to April 15 was chosen to represent winter because it aligns with the Info-Smog program's schedule.

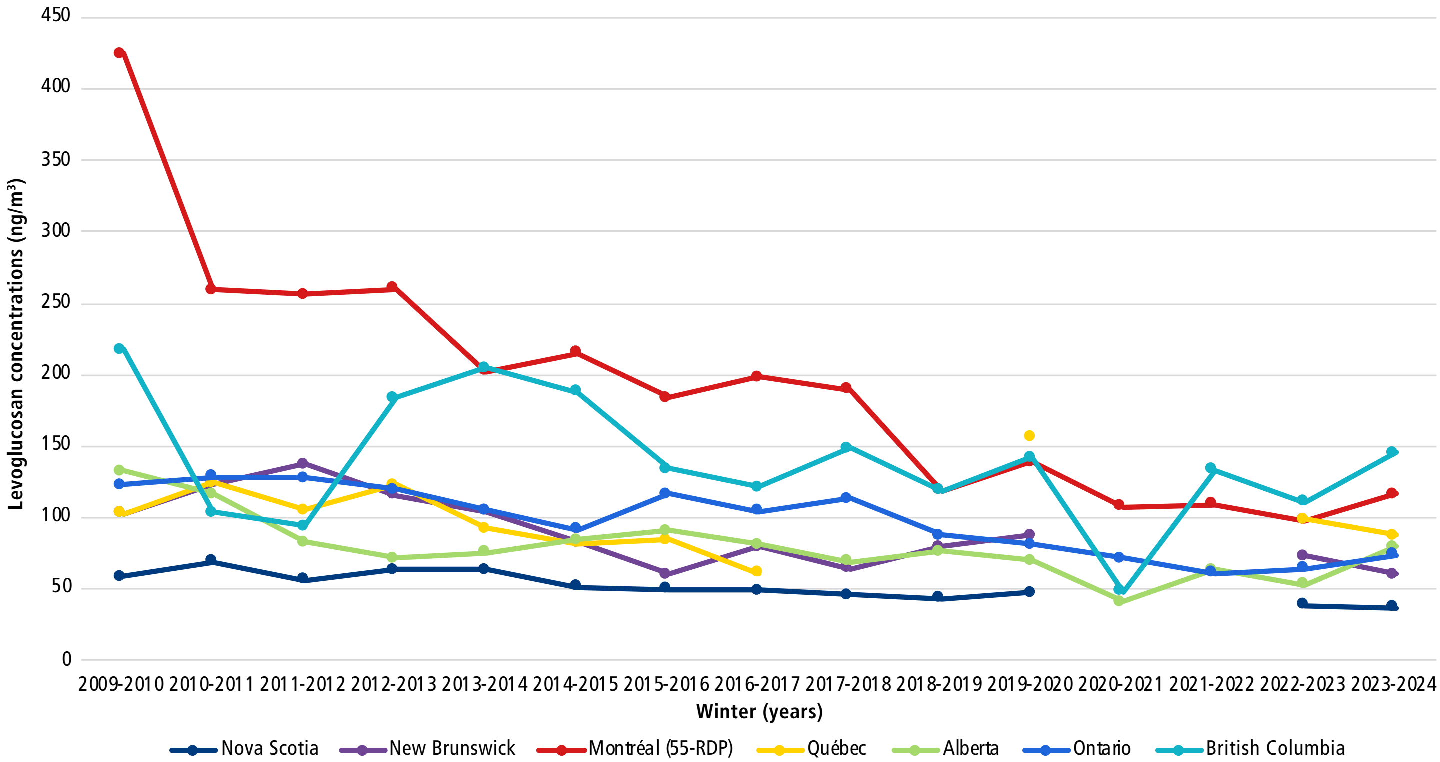
Did you know that smog advisories are sent by Environment and Climate Change Canada's (ECCC's) Info-Smog program? Download the WeatherCAN application to be notified of any smog occurrences in Montréal.

In last year's RSQA annual report,[16] an entire section was dedicated to the 2009–2023 trends in levoglucosan concentrations in Montréal. This compound is considered the ideal marker for wood-burning heating, as it results from the pyrolysis (chemical decomposition caused by heat) of cellulose, the main component of wood, and its only possible source is smoke. The use of wood-burning stoves and fireplaces is therefore directly linked to the levels of this compound, and its decline in Montréal's ambient air is attributable to regulations implemented over the years.

15. https://montreal.ca/en/articles/heating-wood-law-to-improve-air-quality-14544, website visited February 10, 2026.
16. https://donnees.montreal.ca/en/dataset/rsqa-bilans-annuels-qualite-air?, website visited February 10, 2026.
17. https://data-donnees.az.ec.gc.ca/data/air/monitor/national-air-pollution-surveillance-naps-program/?lang=en, website visited February 10, 2026, and personal communication with Rita So of ECCC on October 22, 2025.

The graph below shows that the situation in Montréal stood out from other Canadian monitoring stations, with a winter concentration of 424.4 ng/m³ observed in 2009–2010, 2 to 7 times higher than elsewhere, and explains why the City has been taking action for over 15 years to combat pollution associated with wood heating in urban areas.

Comparison of trends in winter levoglucosan concentrations at RSQA station 55 – Rivière-des-Prairies versus those at Canadian stations by province



Concentrations at station 55 – Rivière-des-Prairies (RDP) station in Montréal were highest during the winter seasons from 2009 to 2017. This transition coincides with the full implementation of By-law 15–069 (ban on use during smog advisories starting in 2015 and requirement for certified devices emitting ≤2.5 g/h of fine particulate matter starting in 2018), a regulatory framework that has contributed to the sustained decline observed in Montréal.

Over the past 3 winters, it has been British Columbia that now has the highest winter levels of levoglucosan, ranging from 111.2 ng/m³ (2022–2023) and 144.9 ng/m³ (2023–2024). This province showed a 30% increase between 2023 and 2024, while the increase was 52% in Alberta and 19% at the RQSA's station 55 – RDP (116.8 ng/m³ in 2023–2024). Winter concentrations in 2019–2020 were the highest in the province of Québec (the Limoilou station had very little data). In the other provinces, levoglucosan concentrations were much lower during this period, with Nova Scotia having the lowest concentrations, ranging from 36.7 to 69.1 ng/m³.

Winter conditions, particularly temperature inversions and light winds, contribute to the local accumulation of $PM_{2.5}$ generated by residential wood burning. These weather conditions limit the dispersion of pollutants and can thus lead to a measurable increase in concentrations of fine particulate matter as well as specific combustion markers, such as levoglucosan.

In Québec, wood-heating habits differ significantly from those observed in other provinces. This practice remains widespread during the cold season, particularly as supplemental heating, which contributes significantly to seasonal variations in ambient air quality.

A quarter century under the microscope: trends in gaseous pollutants

25 years

What does a comparison of gaseous pollutant concentrations measured on the Island of Montréal from 2000 to 2025 reveal?

Pollutant	2000-2025
SO_2	↓ 84%
CO	↓ 62%
O_3	↑ 54%
NO_2	↓ 60%
NO	↓ 88%

Overall, air quality has improved, particularly with regard to the following gaseous pollutants: sulphur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide and nitrogen monoxide (NO_2 and NO), with the majority of emissions coming from industrial or transportation activities. Paradoxically, a decrease in nitrogen oxides (NOx) can lead to an increase in ozone (O_3) during the summer months (due to reduced titration). This is what was observed for ozone concentrations, a pollutant formed in the atmosphere through the action of sunlight from precursors such as NOx and volatil organic compounds (VOCs). Since the formation of O_3 is closely linked to the effect of sunlight on precursor pollutants in the ambient air, warmer summers are therefore conducive to high ozone concentrations. These are increasing despite local emission reductions. It would therefore be advisable to focus on reducing VOCs, which are often less strictly regulated than NOx. This is precisely what the federal government is currently implementing through a series of regulations targeting, in particular, gas stations,[18] oil storage,[19] and consumer products.[20]

Although no exceedances of the hourly ozone standard under By-law 2001-10 were recorded in 2025, the same cannot be said for the 8-hour and 24-hour standards, which are frequently exceeded. For most stations that measure O_3, these exceedances are observed mainly between March and September.

According to the new query tool[21] from the NAPS, the trend in major Québec cities (Laval, Longueuil, Gatineau, etc.) and Ontario (Toronto, Ottawa, Kingston, etc.) between 2000 and 2024, the latest year for which results are available, is also on the rise, though less pronounced than in Montréal. In fact, the average increase is 37% in Québec and 31% in Ontario. The cities selected for the comparative analysis are classified as "large urban areas" according to the Canadian classification.[22] The analysis of Montréal's stations is based on data from 2025, while the analyses of the other cities are based on data from 2024. Given that O_3 concentrations increased by 3.5% in Montréal between 2024 and 2025, a comparable increase in the percentages for other cities can be expected when the 2025 data are updated. These data will be available via the federal government's query tool mentioned earlier, sometime in 2026.

The rise in ozone concentrations is a cause for concern, as ozone is a powerful oxidizing agent that reacts with other air pollutants. In addition, these chemical reactions also contribute to the formation of secondary fine particulate matter, which is responsible for all days of poor air quality. Just as with the reduction of $PM_{2.5}$ emissions, all measures likely to reduce the emission of ozone precursors into the atmosphere must be encouraged, both at the local and regional levels, since many of these precursors originate outside the Montréal area and are considered transboundary pollutants.

It should be noted that fine particulate matter was not included in this analysis, as monitoring of these particles was still in its infancy in 2000, with only 4 monitoring stations, 2 of which did not collect at least 75% of the valid annual data.

The complete RSQA dataset, covering the years 1986 to 2025, is available on Ville de Montréal's open data website.

18. https://gazette.gc.ca/rp-pr/p1/2024/2024-07-13/html/notice-avis-eng.html, website visited March 11, 2026.
19. https://gazette.gc.ca/rp-pr/p2/2025/2025-03-26/html/sor-dors88-eng.html, website visited March 11, 2026.
20. https://pollution-waste.canada.ca/environmental-protection-registry/regulations/view?Id=1167, website visited March 11, 2026.
21. https://environmental-maps.canada.ca/naps-snpa/, website visited March 11, 2026.
22. https://data-donnees.az.ec.gc.ca/data/air/monitor/national-air-pollution-surveillance-naps-program/ProgramInformation-InformationProgramme?lang=en, website visited March 11, 2026.

Special project: Endocrine disruptors

The RSQA would like to thank its researcher partners: Géraldine Delbes,[23] Antoine Gillet,[23] and Stéphane Bayen[24] for drafting this section of the report on the endocrine disruptor project.

This study provides a better understanding of urban exposure to complex mixtures of organic chemicals via the air—a matrix about which little is currently known—and their effects in terms of endocrine disruption.

Introduction

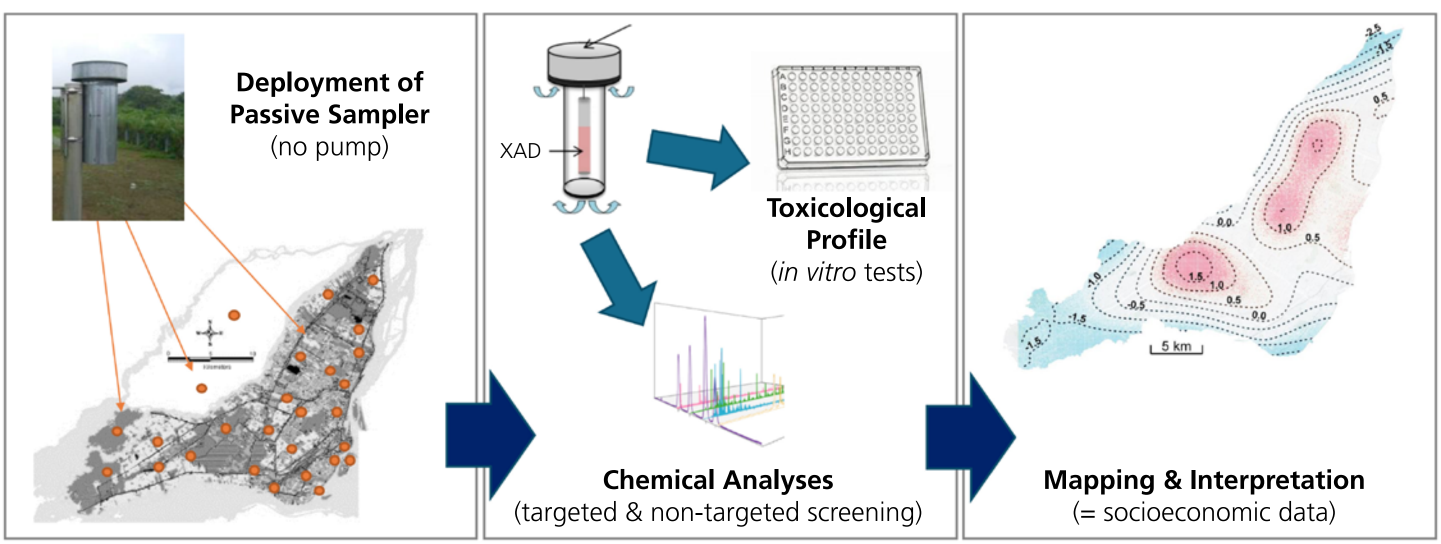
Endocrine disruptors (EDs) are a growing concern in environmental and public health. These contaminants, which often originate from industrial and urban activities, can disrupt the endocrine system in humans and wildlife, potentially causing harmful effects. The project, funded by the Fonds de Recherches du Québec – Nature et Technologies (FRQNT), aims to characterize the distribution and seasonal variability of chemical contaminants in the outdoor air of the Island of Montréal and to assess their potential for endocrine disruption using *in vitro* bioassays. The strategy implemented, as illustrated in the figure below, combines passive air sampling, chemical extraction, and nontargeted characterization, along with *in vitro* endocrine disruption testing and mapping.

Through its collaboration with the RSQA, the INRS research team gained access to air quality monitoring stations to install specialized samplers there during various periods (summer 2024 and the winter of 2025). The goal was to map endocrine disruptors in ambient air.

Definition of endocrine disruptors

Endocrine disruptors (EDs) are *exogenous substances* (or mixtures of substances) that interfere with the normal functioning of the endocrine system. They can mimic or block natural hormones, or interfere with their synthesis, transport, metabolism, and binding to receptors, leading to hormonal imbalances and physiological disturbances.[25] EDs encompass a wide range of natural and synthetic compounds, including pesticides, industrial products, flame retardants, plasticizers, and combustion byproducts. Their effects on the endocrine system are linked to reproductive, metabolic, developmental, and thyroid disorders. There are many sources and routes of exposure to EDs, but exposure through inhalation and its effects remain virtually unknown.

Methodological approach of the project



23. Armand-Frappier Santé Biotechnologie Research Centre, Institut national de la recherche scientifique, 531 des Prairies Blvd., Laval, Québec H7V 1B7.
24. Department of Food Science and Agricultural Chemistry, McGill University, 21111 Lakeshore Road, Sainte-Anne-de-Bellevue, Québec H9X 3V9.
25. https://www.who.int/publications/i/item/state-of-the-science-of-endocrine-disrupting-chemicals, website visited February 26, 2026.

Results at a glance

Two scientific articles based on a 2021 sampling campaign have been published, demonstrating the presence of several thousand organic compounds at each site, with geographical variations linked in particular to land use (parks versus residential areas)[26] and localized endocrine-disrupting activities.[27] Chemical analyses identified 25 compounds, some of which were detected in the air for the first time, including nitrophenols, pesticides/repellents, plasticizers, organophosphorus compounds, and organohalogen compounds. Data from the 2024 and 2025 sampling campaigns are currently being analyzed but reveal seasonal variations in chemical and functional characteristics.

Outlook

This study shows that Montréal's urban air contains a complex mixture of chemical contaminants, some of which have endocrine-disrupting potential. The combination of passive sampling, non-targeted chemical analysis, and *in vitro* bioassays is an effective approach for identifying and assessing environmental chemical mixtures. The spatial distribution of contaminants highlights the importance of local sources in urban exposure. These findings suggest the need for ongoing monitoring, more refined risk assessments, and further research into the potential effects of chronic low-dose exposure. The RSQA remains available and is ready to use its monitoring stations for any collaboration or participation in future research projects.

26. https://pubmed.ncbi.nlm.nih.gov/41033295/, website visited February 26, 2026.
27. https://pubmed.ncbi.nlm.nih.gov/41242228/, website visited February 26, 2026.

Outreach

The air map: A go-to tool for Montrealers!

The success of the RSQA's new website and its interactive map is now beyond doubt. Launched during the week of February 16, 2025, the platform quickly found its audience. In the 2025 calendar year, more than **62,000 visitors** viewed the map. This is a milestone that confirms the tool's public value.

Episodes of smog have truly served as catalysts for increased use. We saw our highest viewership levels during the smog episodes from June to August, with a record 7,651 visits during the week of August 3–9. Similarly, the weeks of July 27–August 2 (5,907 visits) and June 17 (5,894 visits) were among the most visited. These data show that when smog strikes, the map becomes a go-to resource for residents to plan their activities and reduce their exposure.

The origin of the visits highlights the tool's municipal relevance: the majority of visitors are from Canada (81.3%), with a strong concentration in Montréal, which ranks first among cities using the tool (65.9%). This local success reinforces the map's position as a go-to tool for real-time information.

When air science meets the public

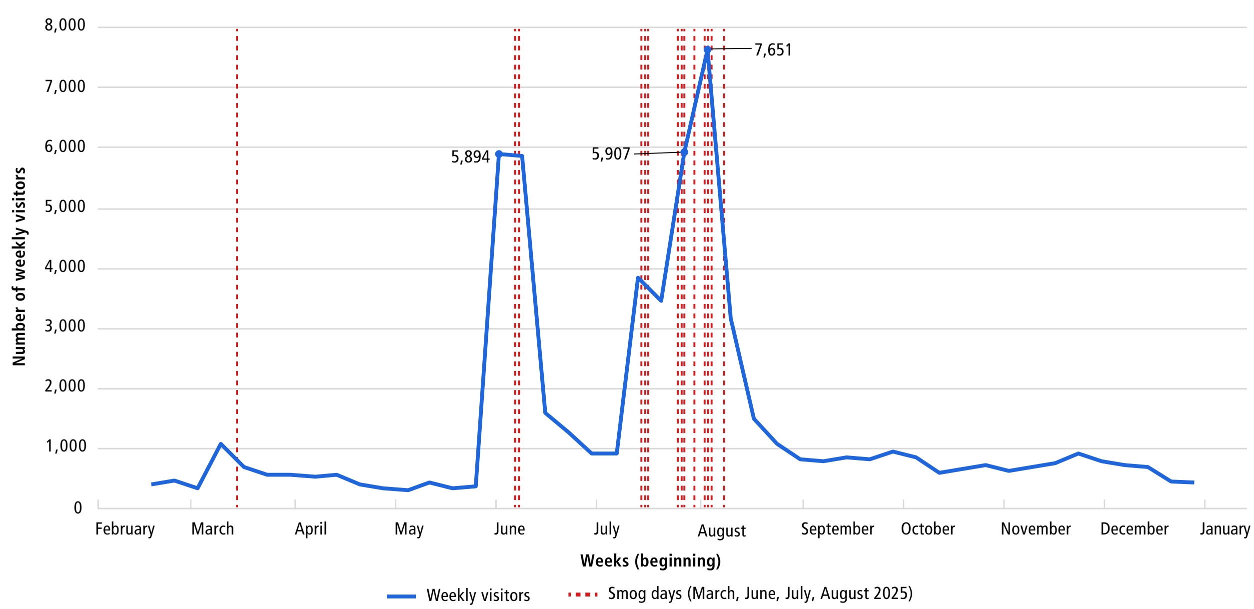
The year 2025 was marked by a series of scientific events in which the RSQA brilliantly introduced the public to the fascinating world of air quality.

It all began at the Eurêka! Festival, which took place from May 30 to June 1. Over the course of three days, hundreds of families flocked to our booth to explore our instruments, analyze real-time data, and try out interactive activities. The children especially enjoyed *Mr. Atchoum!*, our model showing how particles travel through the respiratory tract. It was sure to bring out the laughs—and lots of questions!

A few weeks later, it was time for Clean Air Day, another event focused on raising awareness among young people. It was the perfect opportunity to discuss air quality issues in a relaxed setting, outdoors, where people could easily engage in conversation. Once again, the entertaining activities captivated both children and adults alike, making complex scientific concepts accessible and fun to learn about.

The year ended on a high note with the Researchers' Night 2025 on November 14. Nearly 700 people experienced our immersive activities, including the impressive virtual tour of a monitoring station. Curiosity, wonder, and lively discussions marked this exceptional evening, during which the audience gained an in-depth understanding of the RSQA's missions.

Weekly visits in 2025 to the air quality map (including smog episodes)



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