

Navigating Air Quality Risks: A Guide for Orienteering Participants & Organizers

This is an infographic to provide tools and links for your information. You can click on the pictures and links to learn more about the resources.

Participants Must Know:

- **An orienteering event will be cancelled if the AQI PM2.5 is greater than 300 (or AQHI is greater than 10).**
- Any event could be cancelled, re-scheduled, or modified, in the event of poor air quality.
- For training events and youth programs the program director /coach can cancel the program at their discretion based on Health Canada recommendations.
- For Orienteering events (C, B ,Canada cup) **the decision will be made at the event site, at the start time of the event.**
- **Consider travel risks: be aware that events may be canceled based on local air quality data, even if conditions are different at your home location.**
- If, during an event, the AQI PM2.5 goes above 300, no further starts will be allowed. As well, any competitor observed, who is still on the course (e.g. passing through an arena), will be told to stop their race.
- An event may be cancelled the **day before** if the event set up is not safe due to poor air quality. In this case, notification must be posted on all relevant websites as soon as possible.

DOWNLOAD: AOA AIR QUALITY POLICY FOR ORIENTEERING EVENTS

Key Mitigation Strategies for Poor Air Quality and Orienteering Events

Stay Informed	-Monitor AQHI or AQI levels before and during events. Be aware of potential event modifications or cancellations
Event Preparedness	- Check event communications for updates - Consider travel risks due to local data variations - Have a backup plan for potential cancellations
Health Considerations	- Know your personal health status - Remember you're in the "AT RISK" category as an outdoor participant - Reduce intensity and limit time outdoors - Stay hydrated and listen to your body
Organizational Readiness	- Follow AOA Air Quality Policy guidelines - Have clear communication protocols - Prepare information notes about air quality risks - Have contingency plans for different scenarios - Consider volunteers' and organizers' health risks
Remember	- Event cancellation decisions will typically be made at the event's start time but may occur the day before if air quality prevents safe course setup. - As an outdoor activity participant, you are in the "AT RISK" category - Always prioritize your health and consider the volunteer organizers' safety when deciding to participate



Why Air Quality Matters in Outdoor Sports

- Poor air quality, caused by contaminants such as smoke from forest fires and emissions from other sources, can adversely affect a person's health. This is particularly important for athletes and outdoor enthusiasts because:
- Increased respiratory rate during exercise leads to greater exposure to air pollutants. Air quality can change rapidly, potentially exposing athletes to varying levels of pollutants during an event.
- Orienteering participants are considered part of the at-risk population because of the outdoor high intensity exercises.
- Special concern for orienteering activities related to Wildfires as it can coincide with main orienteering summer events .
- To learn more about the health impact of poor air quality visit the Heath Canada website or click on the links and images below.

THE HEALTH IMPACTS OF AIR POLLUTION IN CANADA

WHAT IS AIR POLLUTION?

Outdoor **air pollution** is a mixture of gases, particles, and many other chemicals that can have an impact on human health. Key outdoor **air pollutants** include:

- Fine particulate matter (**PM_{2.5}**)
- Nitrogen dioxide (**NO₂**)
- Ground-level ozone (**O₃**)

WHO IS AT RISK?

All Canadians can experience health issues on days when the air is heavily polluted, but some groups are more at risk:

- Children
- Seniors
- People with asthma, chronic obstructive pulmonary disease (COPD), cardiovascular diseases, diabetes
- Active people of all ages who exercise or work hard outdoors
- People living near sources of industrial pollution or busy roadways

Air pollution leads to disease, increased hospitalizations, and even premature death. Addressing air pollution remains a priority for the Government of Canada.

In Canada, **air pollution** comes from:

- Vehicles
- Industrial facilities
- Forest fires
- Wood burning
- Construction
- Agriculture
- Oil and gas industry
- Electricity generation

Health Canada estimates that every year, **air pollution** in Canada causes:

- **14,600** premature deaths
- **2.7 million** days of asthma symptoms
- **35 million** days of acute respiratory symptoms
- Economic costs of **\$114 billion**

AIR POLLUTION MORTALITY IN CANADA

Census division mortality rates due to outdoor levels of PM_{2.5}, O₃ and NO₂ (2014–2016)

Mortality per 100,000

- 1–15
- 16–30
- 31–45
- 46–60
- 61–90

WHAT ACTION IS THE GOVERNMENT OF CANADA TAKING ON OUTDOOR AIR POLLUTION?

- Federal regulations have reduced outdoor emissions of **air pollutants** from key sources in Canada.
- Canada participates in various international initiatives to reduce human health and environmental impacts from cross border flow of **air pollution**.
- Canada has established the **Canadian Ambient Air Quality Standards**. These help to continuously improve air quality across the country.

HOW CAN I PROTECT MYSELF AND MY FAMILY FROM OUTDOOR AIR POLLUTION?

Know the best times to be active outdoors:

- Check the **Air Quality Health Index** in your community (airhealth.ca)
- If you have a heart or lung condition, talk to your health care professional about more ways to protect your health when **air pollution** levels are higher

Ways to reduce exposure:

- Avoid or reduce strenuous outdoor activities when air pollution levels are high
- Choose low-traffic routes for walking, running, or cycling, especially during rush hour
- Exercise in parks and green spaces, away from major roads

DID YOU KNOW?

You can learn more about **air pollution** and air quality in Canada by visiting the **STATE OF THE AIR** website <http://airquality-qualite.delair.ccmo.ca/en/>

For more information, please visit www.canada.ca/en/health-canada/services/air-quality.html or contact us at: HC.air.SC@canada.ca / 1-833-233-1014 (toll free)

Health Canada Santé Canada

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How to Monitor Air Quality?

What to consider: Pros and cons using **AQHI** vs **AQI PM2.5** Index:

The AQHI provides a comprehensive health-focused air quality assessment but is limited by infrequent updates and availability primarily in urban centers only. Its complexity and slower reporting make it less practical for remote locations compared to more immediate AQI PM2.5 measurements, which offers less complex but more frequent and localized air quality data.

For Orienteering events we will use AQI PM.25 monitoring sites and locally measured data to make sure it is accurate and timely.

AQHI - Air Quality Health Index

The AQHI was created to help individuals understand and make decisions about the safety of the air around them. Sport participants can use the AQHI to help monitor their local air quality and make informed decisions about the safety of outdoor sport participation. The AQHI presents the relative health risk associated with the combined health effects of air pollutants, including NO₂, PM_{2.5} and O₃. The AQHI is presented on a scale of 1 to 10+, which are further grouped into four health risk categories ranging from low risk (1 to 3), moderate risk (4-6), high risk (7-10) and very high risk (10+; Figure 2).

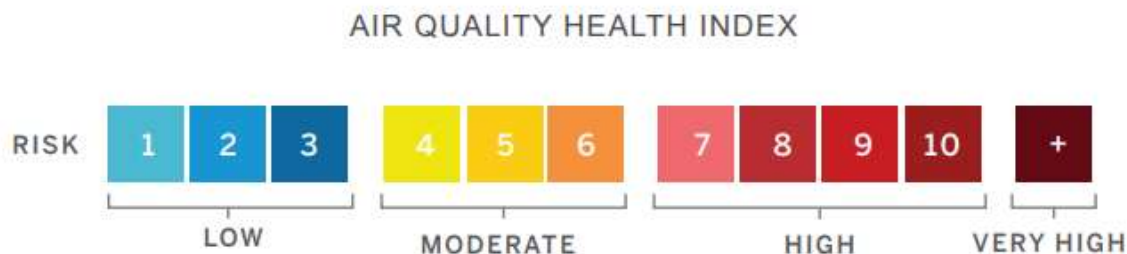


Figure 2. The AQHI scale and associated health risk categories.
Image retrieved from AirHealth.ca.

Health Risk	Air Quality Health Index	Health Messages	
		At Risk Population	General Population
Low Risk	1 - 3	Enjoy your usual outdoor activities.	Ideal air quality for outdoor activities.
Moderate Risk	4 - 6	Consider reducing or rescheduling strenuous activities outdoors if you are experiencing symptoms.	No need to modify your usual outdoor activities unless you experience symptoms such as coughing and throat irritation.
High Risk	7 - 10	Reduce or reschedule strenuous activities outdoors. Children and the elderly should also take it easy.	Consider reducing or rescheduling strenuous activities outdoors if you experience symptoms such as coughing and throat irritation.
Very High Risk	10+	Avoid strenuous activities outdoors. Children and the elderly should also avoid outdoor physical exertion.	Reduce or reschedule strenuous activities outdoors, especially if you experience symptoms such as coughing and throat irritation.

What is PM2.5?

Particulate matter, or PM, refers to particles found in the air, including dust, soot, dirt, smoke, and liquid droplets.

PM2.5 particles measure 2.5 microns or less in diameter. PM2.5 particles are so small they can only be seen with an electron microscope.

Of all air pollution measures, PM2.5 pollution poses the greatest health threat (1). Due to its small size, PM2.5 can remain suspended in the air for long periods of time and can be absorbed deep into the bloodstream upon inhalation.

What are the sources of PM2.5 pollution?

Particulate matter can be either emitted directly from manmade or natural sources, with manmade sources generally resulting in greater amount of PM2.5 (2).

- motor combustion
- power plant combustion
- industrial processes
- stoves, fireplaces, and home wood burning
- smoke from fireworks
- smoking
- dust
- soot
- dirt
- windblown salt
- plant spores
- pollen
- smoke from wildfires

Levels of Concern	Values of Index	Description of Air Quality
Good	0 to 50	Air quality is satisfactory, and air pollution poses little or no risk.
Moderate	51 to 100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Unhealthy	151 to 200	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201 to 300	Health alert: The risk of health effects is increased for everyone.
Hazardous	301 and higher	Health warning of emergency conditions: everyone is more likely to be affected.

How to monitor AQHI

- [Urban AQHI in Canada: https://weather.gc.ca/airquality/pages/index_e.html](https://weather.gc.ca/airquality/pages/index_e.html)
- Download the WeatherCAN app to your phone (provides the AQHI for urban areas)

How to monitor AQI PM2.5

- Use your own sensor measuring tool: e.g. [Purple Air Portable Air Quality Monitor](#)
- There are many different sites that provide real-time data on available sensors in the area, see couple examples below. These are localized air quality data by displaying PM2.5 concentrations from a network of low-cost sensors, allowing for rapid monitoring of air quality conditions.
- [Purple Air Real Time Map](#)
- [AQI Map Alberta](#)
- [AQAIR measurements](#)







Monitoring Wildfire Smoke

- [FIRESMOKE.CA](https://firesmoke.ca) is a wildfire and air quality forecast website that provides real-time information about wildfire smoke dispersion, air quality indices, and potential health risks across Canada. It can also be downloaded for your phone.

What if no data are available?

- If there are no other sources of air quality data, visibility could be used, but research has shown it to be somewhat problematic. This scale could be used as a warning scale if conditions are deteriorating or improving. See below table Nevada Division of Environmental Protection: [Visibility Range as a Tool for Estimating Air Quality.](#)

VISIBILITY RANGE AS A TOOL FOR ESTIMATING AIR QUALITY

Visibility (AQI)	Local Landmark	Level of Health Concern	Visibility Example
Visibility >10 miles Good = 0-50	Slide Mountain	Air quality is considered satisfactory, and air pollution poses little or no risk.	
Visibility 6 to 10 miles Moderate = 51-100	Snow Valley Peak	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.	
Visibility 3 to 5 miles Unhealthy for Sensitive Groups = 101-150	Prison Hill	Members of sensitive groups may experience health effects. The general public is not likely to be affected.	
Visibility 1.5 to 2.75 miles Unhealthy 151-200	Mouth of Ash Canyon	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.	
Visibility 1 to 1.25 miles Very Unhealthy 201-300	C Hill	Health alert: everyone may experience more serious health effects.	
Visibility <1 mile Hazardous 301-500	No visible landmarks	Health warnings of emergency conditions. The entire population is more likely to be affected.	



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Explore your Air Quality

