Air Quality Monitoring Guide

During wildfire season, you have several tools available to help you make smart decisions about outdoor activities and to protect your health. This guide explains what these tools show you and how to use them effectively.

What is the Air Quality Health Index?

The Air Quality Health Index or "AQHI" is a tool to help protect your health. Think of it as a thermometer for air pollution instead of temperature that helps you decide when it's safe to be active outside, especially if you have a health condition such as lung or heart disease. Using a scale from 1 to 10 and the words low, moderate, high, and very high, it measures current levels of outdoor air pollution and related health risk. A rating of 1 to 3 means low risk (it's generally safe for everyone to be active outside), while a rating of 7 to 10 means very high risk (everyone should reduce outdoor activities, and sensitive people should avoid going outside altogether).

What is PurpleAir Monitoring?

PurpleAir is an air quality monitoring system providing real-time, air quality data to the public through an interactive map. Think of PurpleAir as a network of community weather stations that measure air pollution. These sensors could be privately owned and operated. They measure particulate matter (PM) concentrations, offering valuable insights into local air pollution levels and complementing data from traditional regulatory monitoring stations.

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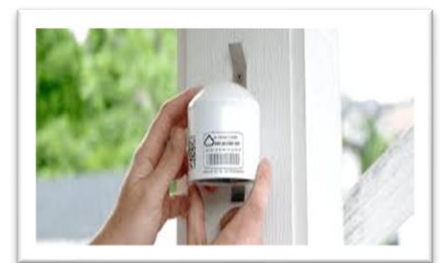
## What are Particulate Matter (PM) Concentrations?

Particulate matter concentrations tell us how many particles are in the air. Exposure to small particles in wildfire smoke can have an impact on human health. It is important to know particulate matter concentrations so that you can take action to reduce exposure.

How Do I Read the PurpleAir Map?

The PurpleAir Quality interactive map may be found at: PurpleAir Monitoring Nova Scotia Map
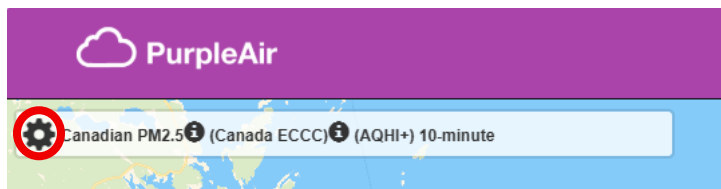
Before using this map effectively, you need to adjust two important settings to ensure you're seeing Canadian measurements and standards. To change the settings, click the gear icon in the upper left-hand corner to use the drop-down menu.
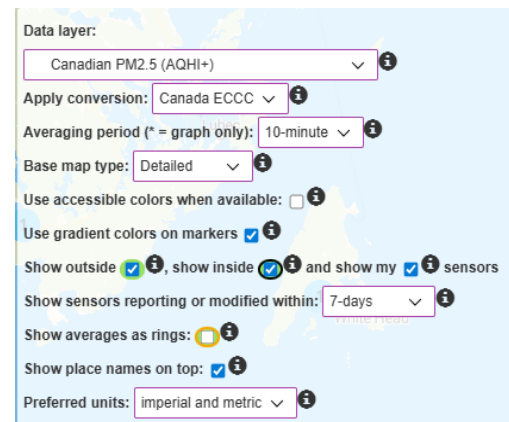
(1) The "Data layer" drop-down should be changed to "Canadian PM2.5 AQHI+".
(2) The "Apply conversion" drop-down should be changed to "Canada ECCC".

The map displays information for each sensor location. The number in the centre of the circle and the colour of the circle directly show the AQHI scale. A low number and blue colours represent a low AQHI risk. Higher numbers and orange through to red colours represent increasing risk.

You can find messaging about the AQHI levels and associated risks at this link: Understanding Air Quality Health Index messages - Canada.ca.

What Does it Mean When I Notice a Difference Between the AQHI and PurpleAir Monitors?

You might notice different numbers when comparing official government air quality reports with PurpleAir readings. This happens for understandable reasons and knowing why helps you use both tools more effectively.

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The PurpleAir map publishes the 'AQHI+' – this measure is only used for wildfire smoke. It is calculated using measurement of fine particles only and provides a 10-minute average.

The 'AQHI' on weather.gc.ca is calculated using three pollutants (fine particulate matter ($PM_{2.5}$), ground level ozone (O_3) and nitrogen dioxide (NO_2)). AQHI provides a more comprehensive assessment of air quality. It is reported every hour, which means there is a time lag between what is presented on weather.gc.ca as the AQHI and what is presented on the PurpleAir map (near real time).

Both tools serve valuable purposes. The official AQHI gives you the complete air quality picture and authoritative health guidance, while PurpleAir sensors provide immediate, localized information that's particularly useful in areas where official monitoring stations aren't available.

Is There a Way to Tell Where Wildfire Smoke Might Go?

Environment and Climate Change Canada produces air quality forecast maps twice a day. The maps show the anticipated spread of wildfire smoke, shown as hourly levels of fine particulate matter ($PM_{2.5}$) for the next 72 hours. The information uses weather forecasting and information about the wildfire to show what the impacts are anticipated to be at ground level. This ground-level prediction is important because wildfire smoke often travels high in the atmosphere without affecting the air you breathe. You might see smoky skies overhead while experiencing relatively clean air at ground level, or conversely, you might face unhealthy air quality even when the sky appears relatively clear. These maps are found here: Air Quality Model Forecast Maps. Use these forecast maps to check if wildfire smoke might appear in your area and then check the AQHI messaging to see what, if any, action you should take.

If you are unsure, please check social media posts from your local Regional Emergency Management Office (REMO) or check for any Special Air Quality Statements at Weather Information - Environment Canada.

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