

Environmental Trends in British Columbia: 2007

Air Quality



Clean air is important for health and quality of life, but as transportation and other activities that burn fossil fuels increase, air quality can become compromised.

Airborne particulate matter and ground-level ozone are of major concern because even low levels of exposure may contribute to bronchitis and aggravate asthma, cardiovascular disease and other lung-related problems.

Airborne pollution or smog is primarily made up of airborne particulate matter, ground-level ozone, nitrogen dioxide and sulphur dioxide. Other pollutants may include carbon monoxide and heavy metals.



Photo: Ministry of Transportation & Highways



Photo: Ministry of Transportation & Highways

In 2000, the Canadian Council of Ministers of the Environment endorsed Canada-wide Standards (CWS) that include target levels for fine particulates and ground level ozone. B.C. monitors these pollutants to determine which communities are achieving the CWS levels.

Trends in the levels of air pollutants are shown in the following indicators.

Environmental Trends in British Columbia: 2007

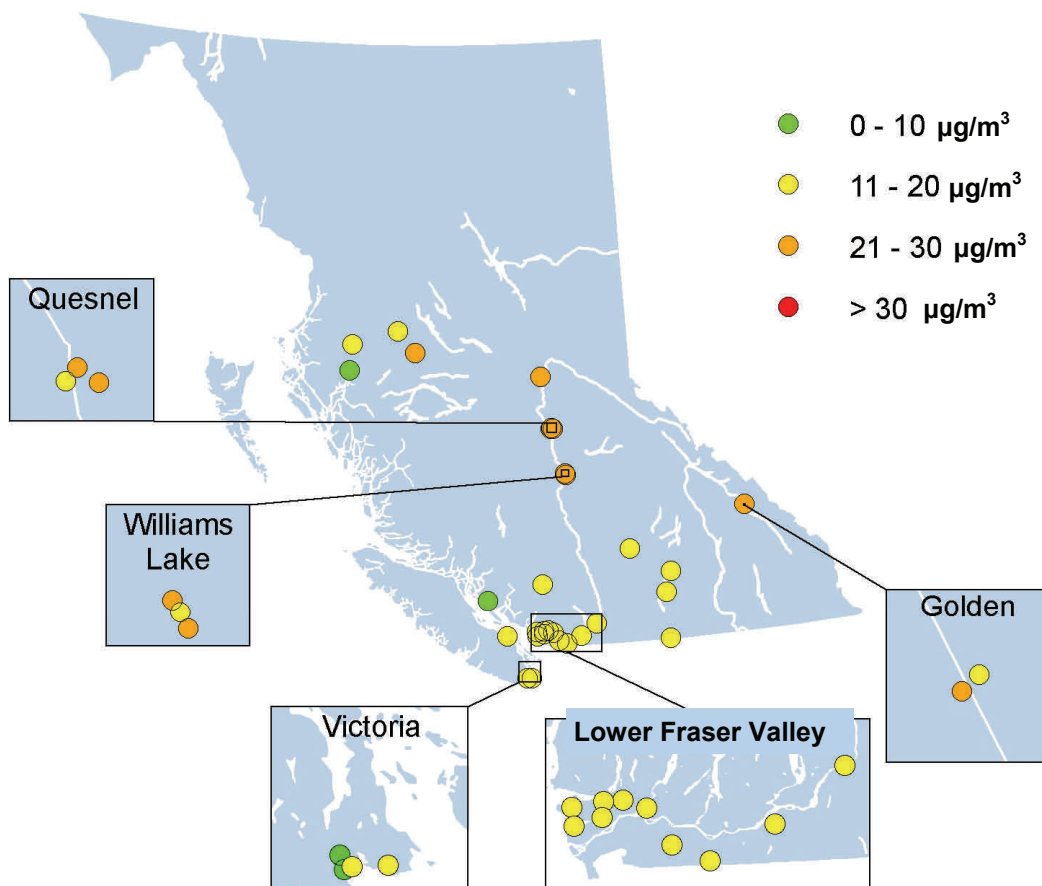
Fine particulate levels (PM_{2.5}) in BC communities

Airborne particulate matter is composed of tiny solid or liquid particles. Sources of these fine particles include soot and smoke emitted by motor vehicles, marine vessels, power plants, factories, construction, and wood burning, as well as naturally occurring dust and other activities.

The greatest threats to health come from particulate matter under 2.5 µm (micrometres) in diameter (PM_{2.5}). These particles are just one-twentieth of the width of a human hair and can penetrate deeply into the lungs.

- In 2006, all continuously monitored communities in B.C. had PM_{2.5} levels below the Canada-wide Standard (CWS) of 30 µg/m³. Only the levels in Prince George approached the standard of 30 µg/m³.
- The higher levels of PM_{2.5} in communities in the interior regions compared with the coastal communities are due to factors such as the larger number of wood burning sources and a greater frequency of air inversions that trap smoke.

Ambient PM_{2.5} concentrations in communities across BC



Source: B.C. Ministry of Environment

Environmental Trends in British Columbia: 2007

Ground-level ozone in BC communities

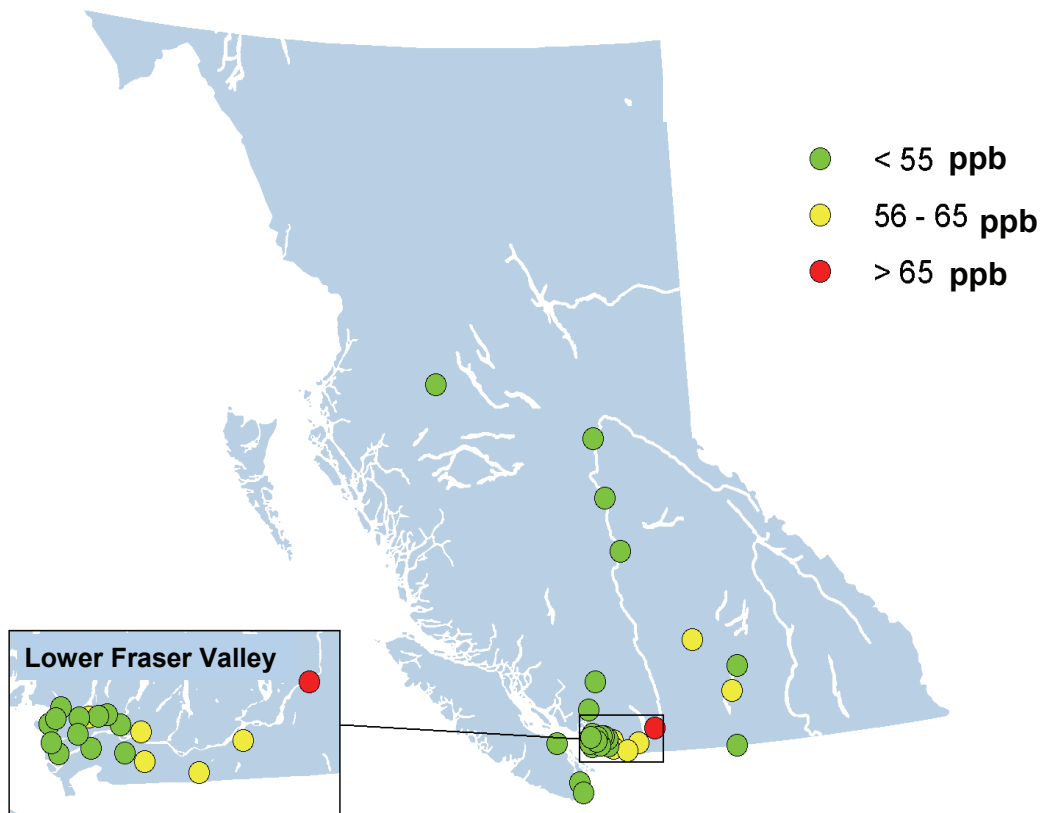
Ground-level ozone is formed by chemical reactions between nitrogen oxides and volatile organic compounds in the presence of sunlight.

The component compounds for these reactions come from local emissions, such as burning fossil fuels, or are transported in the air from other regions.

Ozone concentrations vary by location and time of day. Hourly concentrations in urban areas are typically highest in the long days of summer when temperatures are highest and the sun is most intense.

- From 2004-2006, most communities in B.C. had ground-level ozone below the CWS of 65 ppb. However, the CWS was exceeded at Hope, and readings at Chilliwack, Langley Central and Maple Ridge were at or near the CWS threshold.
- The highest annual mean concentrations of ground level ozone occurred in the southern interior region, where summers are very warm and sunny. The lowest concentrations were measured in downtown Vancouver.

Ambient ground level ozone concentrations in communities across BC



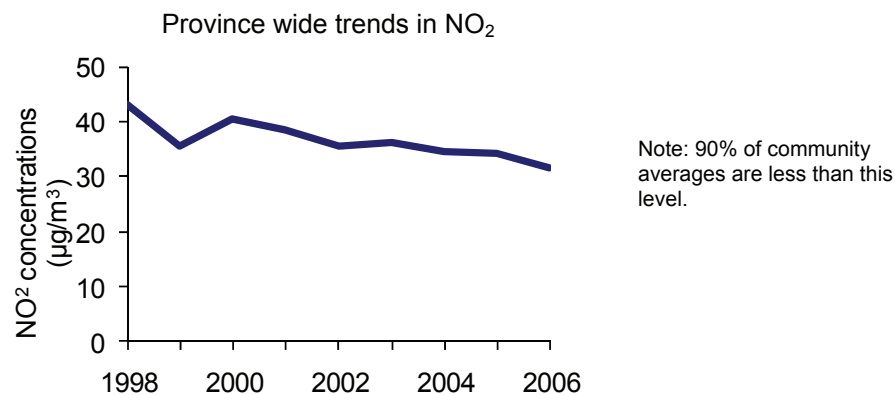
Source: B.C. Ministry of Environment

Environmental Trends in British Columbia: 2007

Nitrogen dioxide (NO₂) is a corrosive gas that contributes to ozone, secondary particulate formation and acid rain and is the reddish-brown haze associated with smog events.

Most NO₂ emissions come from transportation sources, non-road engines, the pulp and paper industry and the oil and gas industry.

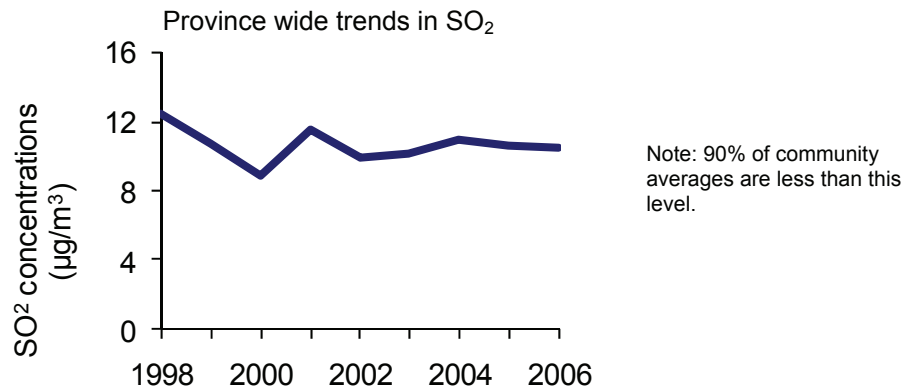
- The Canadian annual objective for NO₂ is less than 60µg/m³ which none of the BC communities have exceeded.
- Province wide trends suggest that NO₂ is declining, which is consistent with emission standards for motor vehicles that have been adopted over the last decade.



Source: B.C. Ministry of Environment

Sulphur dioxide (SO₂) is a colourless gas that irritates lungs and damages vegetation if it occurs in high concentrations. It comes from burning fossil fuels that contain sulphur and from processing ores that contain sulphur.

- All BC communities except Trail met the B.C. annual objective for SO₂ of 25 µg/m³.



Source: B.C. Ministry of Environment

Environmental Trends in British Columbia: 2007

Taking Action - What is being done?

Federal Initiatives

- Environment Canada is investing in new monitoring instruments and establishing new monitoring sites.
- The National Pollutant Release Inventory [http://www.ec.gc.ca/pdb/npri/npri_home_e.cfm] tracks emissions of particulate matter and other air pollutants.
- The federal government has established higher engine and fuel standards for diesel engines.



Provincial Initiatives

- Provincial legislation limits open burning, regulates vehicle and fuel quality, sets emission limits for some industrial sources and has required the phase-out of beehive burners by the end of 2007.
- Over three years, \$13.5 million have been allocated to clean air initiatives led by the Ministry of Environment in partnership with industry, communities and other levels of government.



Other Initiatives

- **The Clean Air Toolkit** helps local governments develop emission reduction programs in their community.
- **Air Quality Health Index (AQHI)** shows air quality conditions on a scale of one to ten in terms of the risks to health.
- **Provincial Woodstove Exchange Program:** The province is investing \$1,000,000 over three years to help homeowners replace older woodstoves with new, cleaner burning models.
- **Air Quality Plans:** Local air quality plans are voluntary and take into account different types of pollutants and sources in each region. As of July 2007, 11 communities and regional districts in B.C. had air quality management plans.
 - **AirCare® and AirCare OnRoad** (for heavy duty vehicles) are vehicle inspection and maintenance programs aimed at reducing air polluting emissions. Together, it is estimated they have reduced emissions by 5 per cent. AirCare is now managed by TransLink.



Environmental Trends in British Columbia: 2007

What can you do?

Reducing the amount of fuel burned reduces the emission of air pollutants:

- Insulate homes to reduce the use of home heating fuels.
- Replace older wood stoves with EPA/CSA-certified wood burning appliances. Keep smoke emissions low by burning only dry, well-seasoned wood in moderately hot fires.
- Purchase fuel efficient cars, use public transportation, bicycle or walk to reduce the amount of fuel burned.
- Avoid unnecessary vehicle idling and keep vehicles tuned correctly to avoid excessive tailpipe emissions.
- Use manual or electric lawn mowers, leaf blowers, and weed trimmers, instead of gas-powered models.



Backyard burning not only creates particulate matter but it is also a source of environmental contaminants (such as dioxins and furans) that can pose a health risk.

- Never burn toxic materials (e.g., tires, plastics, construction and demolition waste, treated and painted wood, or rubber).
- Instead of backyard burning, recycle or compost waste and yard debris.

For detailed information on these and other indicators, including an in-depth report [pdf], see the *Environmental Trends in British Columbia: 2007* website:

<http://www.env.gov.bc.ca/soe/et07/>