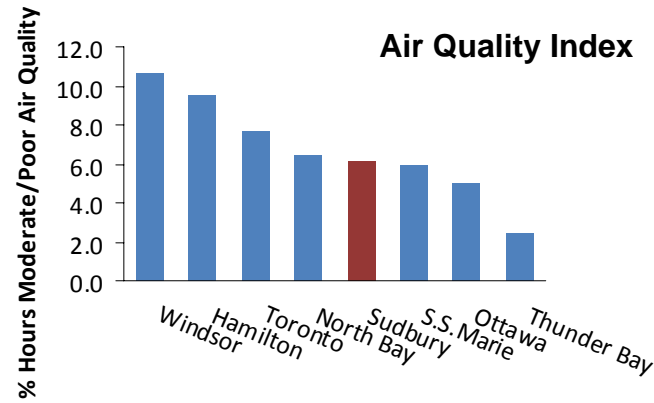
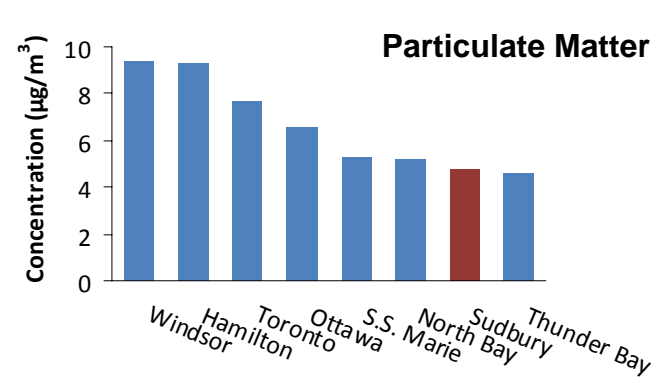
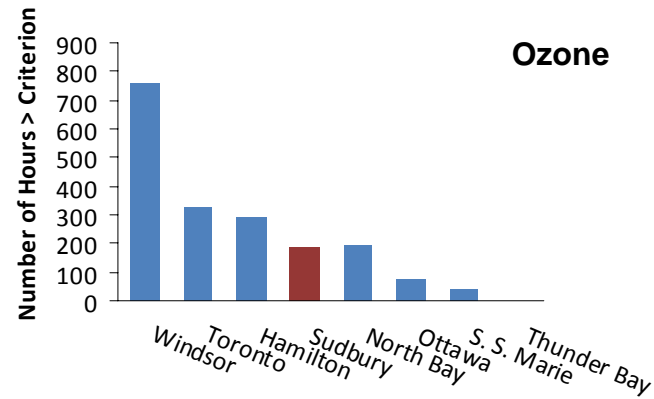
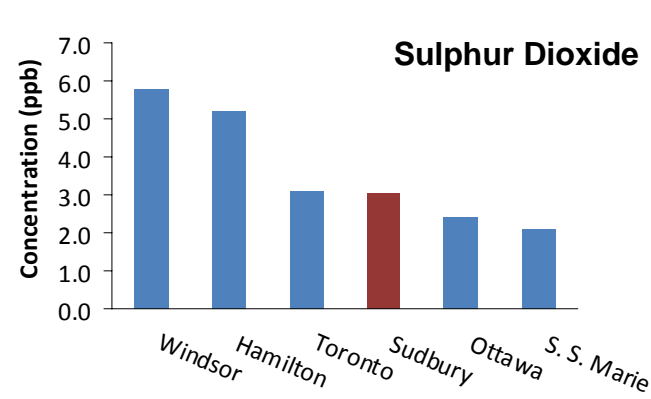


How Does Sudbury Compare to Other Cities?

Greater Sudbury's air quality from 1998 to 2007 was compared to other Ontario cities. Greater Sudbury ranks in the middle of the range for sulphur dioxide, ozone and the Air Quality Index and has the second lowest concentrations of fine particulate matter. In general, Sudbury's air quality is better than Hamilton, Toronto and Windsor and comparable to cities in northern Ontario.



Air Quality Index

Greater Sudbury's air was rated as very good to good 94.1% of the time from 1998 to 2007. It was rated as moderate 5.6% of the time and as poor 0.2% of the time. It was never rated as very poor. Ground-level ozone and fine particulate matter (PM_{2.5}) are the primary pollutants responsible for moderate and poor ratings. SO₂ also occasionally contributes. Poor air quality days typically occur on hot, sunny days in the summer, which are the ideal conditions for creating smog.

Clean Air Sudbury's mission is to compile, summarize and disseminate local air quality information; to promote education and awareness of community air quality issues; and to provide opportunities for the public to get involved in air quality improvements.

This pamphlet was prepared by:



For a copy of the complete report, visit our website at www.cleanairsudbury.ca

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June 2009

Air Quality Trends in Sudbury (1998-2007)

What is in Sudbury's Air?

Sulphur Dioxide (SO₂)

Sulphur dioxide (SO₂) is a colourless gas. Exposure to high levels of sulphur dioxide can cause respiratory health effects. Under certain weather conditions, sulphur dioxide can damage trees and crops and can contribute to acid rain. In Greater Sudbury, approximately 99% of sulphur dioxide emissions come from local smelters. The remaining 1% comes from transportation and fuel combustion.

Ground-Level Ozone (O₃)

Ozone (O₃) is a colourless gas that occurs naturally in the upper atmosphere, where it shields the earth from the sun's harmful UV radiation. Ground-level ozone is found at the earth's surface and is one of the prime components of "smog". It is formed in the lower atmosphere when nitrogen oxides react with volatile organic compounds in the presence of sunlight. Ozone can irritate the eyes and respiratory tract and can also damage trees and crops. More than half of the ozone during widespread smog episodes comes from the United States.

Particulate Matter (PM)

Particulate matter (PM) is a mixture of solid and liquid particles suspended in air, ranging in size from less than 0.1 micron to over 100 microns (a human hair is 50 microns thick).

PM is classified by size fractions:

TSP (total suspended particulates) = particles <44 microns

PM₁₀ = particles ≤ 10 microns PM_{2.5} = particles ≤ 2.5 microns

Residential, transportation and industrial sources contribute almost equally to urban PM_{2.5} in Ontario. More than half of the PM_{2.5} during widespread smog episodes comes from the United States.

Keeping Up to Date!

This is our second air quality trends report. Our first report highlighted trends from 1953 to 2002.

Metals

Metals exist naturally in rocks, soil, air, water, plants and animals. The metal-containing rocks in Greater Sudbury are the source of our rich mining deposits. Small particles containing metals are released during the mining and smelting processes through stacks and as wind-blown dust from fugitive sources. The metals can be measured by chemically analyzing particulate matter samples collected from air monitoring stations.

Air Quality Index

The Air Quality Index (AQI) was developed by the Ontario Ministry of Environment in 1988 as a way of providing information on a range of common air pollutants. The index translates concentrations of various pollutants into a sliding scale of air quality (from very poor to very good).



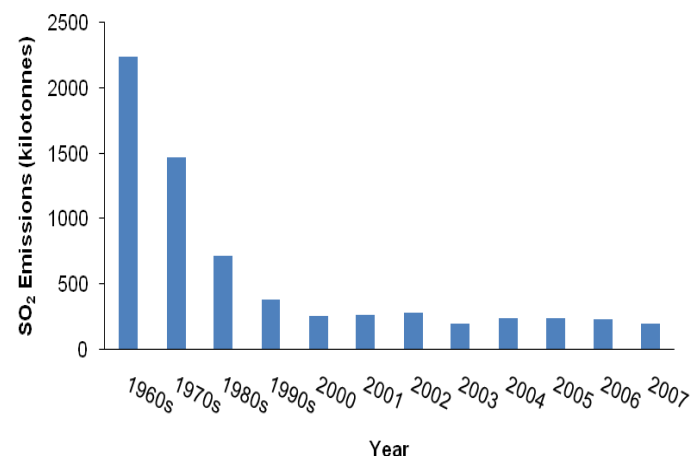
AQI values are available to the public at:

www.airqualityontario.com

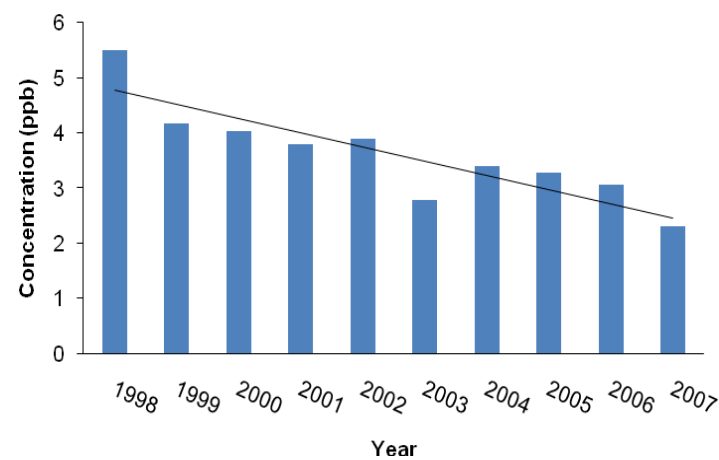
Sulphur Dioxide

Sudbury's smelters have reduced their emissions of sulphur dioxide by 93% percent between 1960 and 2007. Annual average concentrations continued to decrease from 1998 to 2007 and remained much lower than the annual criterion, which hasn't been exceeded since 1976. The provincial 1-hour criterion was occasionally exceeded (0.03% of the time) as a result of local weather conditions which can cause the sulphur dioxide emitted from the stacks to drop down to the ground (called the "looping plume" phenomenon).

SO₂ Emissions from Smelters (1960-2007)



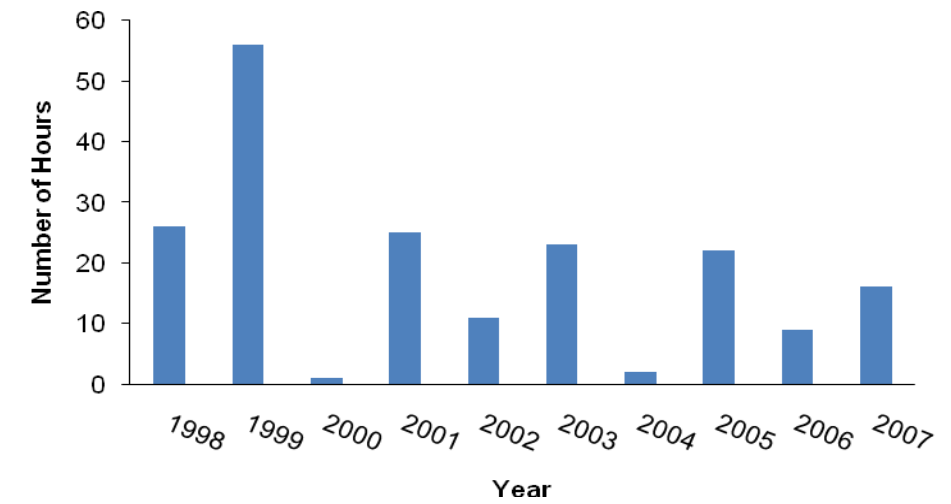
Annual Average SO₂ Concentrations (1998-2007)



Ground-Level Ozone

Annual concentrations of ground-level ozone in Sudbury were variable from 1998 to 2007, with no noticeable trend. The 1-hour criterion for ozone was met most of the time, but was occasionally exceeded. The number of hours exceeding the criterion varied from year to year. Ozone episodes are strongly linked to specific weather conditions in the summer months that transport ozone into our area from the United States.

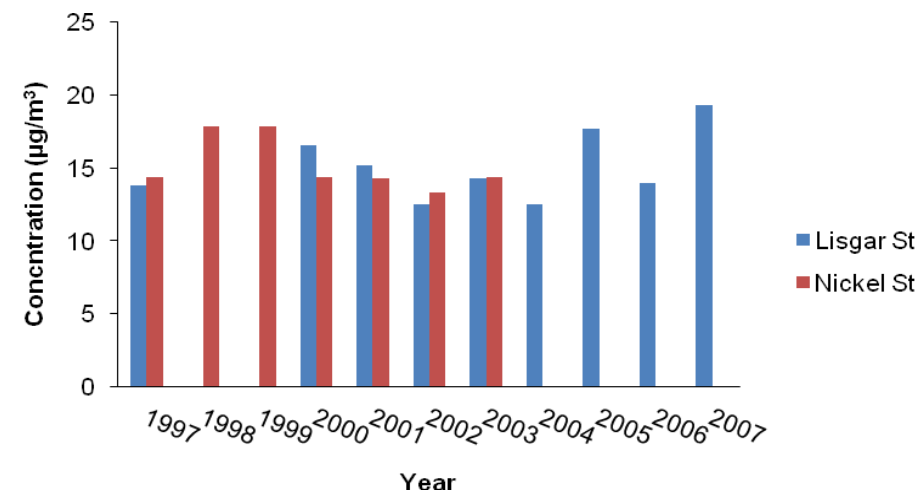
Number of Hours Greater than the 1-hour Ozone Criterion (1998 to 2007)



Particulate Matter

Annual average concentrations of TSP and PM₁₀ at Nickel Street and Lisgar Street were variable from 1998 to 2007 with no noticeable trend. The provincial criteria for TSP and PM₁₀ were met most of the time, with the exception of a few exceedances of the 24-hour criteria. From 2005 to 2007, PM_{2.5} concentrations met the Canada Wide Standard and were the second lowest of the 20 Ontario cities evaluated.

Annual Average PM₁₀ Concentrations (1997 to 2007)



Metals

Metals were measured at six stations in Greater Sudbury. Annual concentrations of nickel, lead and copper have decreased since 1997 at the Lisgar and Nickel Street stations. While provincial 24-hour criteria for metals were met most of the time, there were a few exceedances for nickel at stations near Vale Inco and for cobalt at stations near Xstrata Nickel.

Annual Average Nickel and Lead Concentrations (1997-2007)

