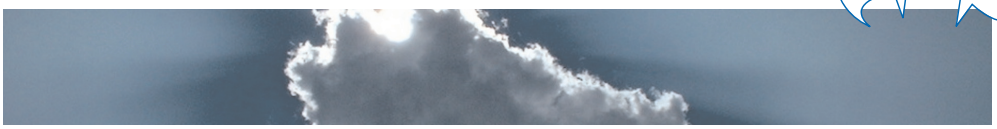
YORK REGION'S

AIR Resources



6.0 YORK REGION'S air resouces

The text in this chapter relates to the indicators of health for York Region's air resources. These are found in table format in section 6.7. The text of this section should be read in conjunction with the table.

6.1 measures of OUTDOOR air quality

Every day we are exposed to a host of pollutants in the outdoor air around us. Air pollutants come from many different sources including non-point sources such as transportation (personal vehicles, trains, planes), and natural sources and point sources such as industry (coal fired generating plants, steel mills, etc), public buildings and homes. Air movement does not stop at political boundaries and as much as half of Ontario's air pollution can be caused from sources within the U.S. (MOE, 2005). With so many varied sources, air pollution in Ontario can take many forms. In terms of potential impacts on human health, five that are of great concern are sulphur dioxide, nitrogen dioxide, carbon monoxide, ground level ozone and fine particulate matter.

Air monitoring in York Region began at the Stouffville station in 1980, at which time only one parameter was monitored; ozone. In 1984, the station began to measure nitrogen dioxide and in 1987, it began to measure continuous PM_{10} (particulate matter that is less than 10 microns in size). In 2000, Stouffville became the York Region Air Quality Index (AQI) site although ozone and nitrogen dioxide were the only two AQI pollutants measured. The province established the Newmarket monitoring station in 2001, and it replaced the Stouffville station as York Region's AQI site in 2002. Currently, the Stouffville station only monitors ozone. The Newmarket station monitored sulphur dioxide from 2001-2003 and carbon monoxide from 2001-2005, and currently monitors ozone, $PM_{2.5}$ and nitrogen dioxide.[1] The data for the Toronto North monitoring station in North York is also included in this report as it may be a better representation of the air quality in the southern portions of York Region.

Monitoring data show that concentrations of sulphur dioxide, nitrogen dioxide and carbon did not exceed the provincial Ambient Air Quality Criteria (AAQC) in 2003 in York Region. However, levels of ground-level ozone and fine particulate matter are of concern.

In 2003, at the Newmarket air monitoring station, ozone concentrations exceeded the one-hour criterion for 50 hours. In 2001 and 2002, the criterion was exceeded for 89 and 115 hours respectively. This is an increase over the year 2000, when the ozone criterion was exceeded for only 15 hours at the Stouffville air monitoring station. The Toronto North station recorded 55, 96 and 42 days above the criterion in 2001, 2002 and 2003 respectively. Trend analysis of data shows that the seasonal means for ozone (averages for the summer and winter) across the province have been steadily increasing since 1980.[2]

Fine particulate matter ($PM_{2.5}$) can penetrate deep into the respiratory system. $PM_{2.5}$ exceeded the MOE reference level at the Newmarket monitoring station 4 times in 2003, 8 times in 2002 and 6 times in 2001. The MOE reference level was exceeded 7, 10 and 7 days in 2003, 2002 and 2001 respectively at the Toronto North station.

Key Findings:

- *Concentrations of sulphur dioxide, nitrogen dioxide and carbon monoxide are not a concern in York Region and meet the provincial AAQC.*
- *The MOE one-hour criterion for ground-level ozone was exceeded for 50 hours at the Newmarket air monitoring station in 2003. This is an increase over the number of exceedances experienced in 2000 at the Stouffville air monitoring station.*

ANTI-IDLING INITIATIVES

Three of York Region's area municipalities - Vaughan, Whitchurch-Stouffville and Markham - have enacted Anti-Idling By-Laws. These by-laws restrict the idling of vehicles for specified periods of time, no more than 3 minutes in the case of Markham. The by-laws differ as to the type of enforcement and the use of fines.

These initiatives will help to improve local air quality, especially around school zones and other high traffic areas.

In June 2005, four area municipalities and the Region took part in the GTA Idle Free Campaign, which educates people about the adverse environmental and health effects of idling and the benefits of not idling.

6.1 measures of OUTDOOR air quality
continued

- *Average annual concentrations of ground-level ozone are increasing across Ontario and North America.*
- *The Newmarket site was established and began monitoring air quality in 2001, but did not become an AQI station until 2002.*

HEALTH EFFECTS of EXPOSURE to GROUND-LEVEL OZONE

Ozone irritates the respiratory tract and eyes. Exposure of sensitive people to the pollutant can result in chest tightness, coughing and wheezing. Children who are active outdoors in the summer, when ozone levels are highest, are particularly at risk. Other groups at risk include individuals with pre-existing respiratory disorders, such as asthma and chronic obstructive heart disease. Ground-level ozone is linked to increased hospital admissions and premature deaths.

Air Quality in Ontario 2003 Report, MOE

6.2 AIR QUALITY index

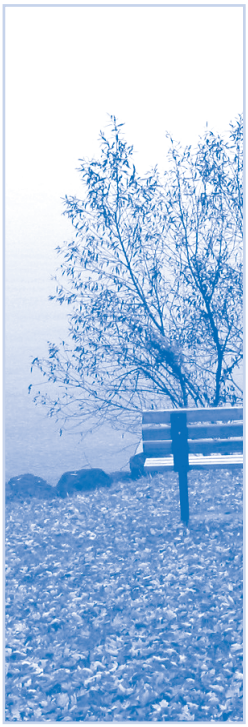
The Air Quality Index (or AQI) is a composite index that was developed by the MOE in 1988 to simplify air pollution messaging and provide "real time" information to the public. The AQI is an indicator of air quality, and is based on measurements of some or all of the six most common pollutants – sulphur dioxide, ground-level ozone, nitrogen dioxide, total reduced sulphur compounds, carbon monoxide and fine particulate matter (added in 2002).
To generate the AQI, provincial staff measure the concentrations of these pollutants every hour at the province's network of 38 continuous air monitoring stations. At the end of each hour, the concentration of each pollutant measured at a particular site is converted into a number ranging from 0 upwards using a common scale or index. The calculated number for each pollutant is called a sub-index. During any given hour, the pollutant with the highest value becomes the AQI reading. (That is, if the value for ozone is the highest at 54, then the AQI becomes 54). The AQI is divided into categories from good to very poor (see Figure 6.1). The lower the AQI, the cleaner the air. The MOE reports the AQI results to the public 7 times per day from May 1 to September 30, and 5 times a day from October 1 to April 30.

Figure 6.1 Air Quality Index Pollutants and Their Impacts

Index	Contents	Ozone (O_3)	Fine Particulate Matter ($P.M_{2.5}$)
0-15	Very good	No health effects are expected in healthy people	Sensitive populations may want to exercise caution
16-31	Good	No health effects are expected in healthy people	Sensitive populations may want to exercise caution
32-49	Moderate	Respiratory irritation in sensitive people during vigorous exercise; people with heart/lung disorders at some risk; damage to very sensitive plants	People with respiratory disease at some risk
50-99	Poor	Sensitive people may experience irritation when breathing and possible lung damage when physically active; people with heart/lung disorders at greater risk; damage to some plants	People with respiratory disease should limit prolonged exertion; general population at some risk
100 and over	Very poor	Serious respiratory effects, even during light physical activity; people with heart/lung disorders at high risk; more vegetation damage	Serious respiratory effects even during light physical activity; people with heart disease, the elderly and children at high risk; increased risk for general population

Source: Green Facts: Ontario's Air Quality Index, Ministry of the Environment, May 2005.

6.2 AIR QUALITY index
continued



In 2002, the AQI was poor for at least 1 hour on 26 days at the Newmarket monitoring station. In 2003, the value was 10 days. At the Toronto North station the AQI was poor on 2 days in 2000, 13 days in 2001, 23 days in 2002 and 11 days in 2004. Overall in 2003, the AQI was good to very good 90% of the time, moderate for 9.2% of the time, and poor for less than 1% of the hours in which monitoring was done.[3] Ground-level ozone and $PM_{2.5}$ are the pollutants that were most often responsible for poor AQI readings in 2003.

Trend analysis for the AQI is not possible because of the lack of comparable monitoring data from York Region before 2002, and because of the addition of $PM_{2.5}$ to the Index in 2002.

Key Findings:

- *In 2003, there were 10 days in which the AQI was poor (i.e., AQI > 49) at the Newmarket air monitoring station. This represents about 1% of the year.*
- *The pollutants most frequently responsible for poor AQI readings in 2003 were ground-level ozone and $PM_{2.5}$.*
- *Trend analysis is not possible at this time.*

A HEALTH-RISK BASED AQI

Environment Canada is leading the development of a new health risk based AQI. This health risk-based approach is intended to simplify the AQI and give Canadians more meaningful information. It is modelled after the UV index. Environment Canada hopes to roll the index out in 2006. This will be an important indicator for future SOE documents.

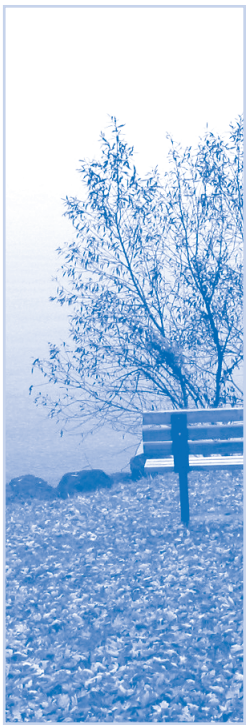
Nitrogen Dioxide (NO_2)	Sulphur Dioxide (SO_2)	Carbon Monoxide (CO)	Fine Particulate Matter ($P.M_{2.5}$)
No health effects are expected in healthy people	No health effects are expected in healthy people	No health effects are expected in healthy people	No health effects are expected in healthy people
Slight odour	Damages some vegetation in combination with ozone	No health effects are expected in healthy people	Slight odour
Odour	Damages some vegetation	Blood chemistry changes, but no noticeable impairment	Odour
Air smells and looks brown; some increase in bronchial reactivity in asthmatics	Odour; increasing vegetation damage	Increased symptoms in smokers with heart disease	Strong odour
Increasing sensitivity for asthmatics and people with bronchitis	Increasing sensitivity for asthmatics and people with bronchitis	Increasing symptoms in non-smokers with heart disease; blurred vision; some clumsiness	Severe odour; some people may experience nausea and headaches

6.3 SMOG advisories

The MOE developed its Smog Advisory Program in 1993 jointly with Environment Canada and the program has been subsequently revised and expanded. Unlike the Air Quality Index, which measures air pollutants in real time, the Smog Advisory Program predicts when elevated smog conditions are expected ahead of time. The MOE's Smog Advisory Program has two-levels of alerts. A "Smog Watch" is issued when there is a 50% chance that widespread, elevated and persistent smog levels will be experienced within the following three days. A "Smog Advisory" is called when there is a strong likelihood that there will be widespread, elevated and persistent smog levels with the next 24 hours.[4]

In 2003, there were 5 Smog Advisories issued for York-Durham that spanned 12 days. The number for the City of Toronto was the same.[5] In 2004, there were 6 advisories issued for York-Durham spanning 14 days. Again, the numbers for the City of Toronto were the same. Smog episodes are highly dependent on the weather and are more likely to occur in hot, sunny summers than in cool, wet ones. Summer smog episodes in Ontario are often part of regional weather conditions that prevail over much of northeastern North America. Slow moving high pressure cells lead to the long-range transport of smog pollutants from the neighbouring U.S. states during warm south to southwesterly air flow conditions.[6] The MOE expects that the inclusion of the $PM_{2.5}$ sub-index to the AQI will increase the average number of Smog Advisories issued by about 10 percent.

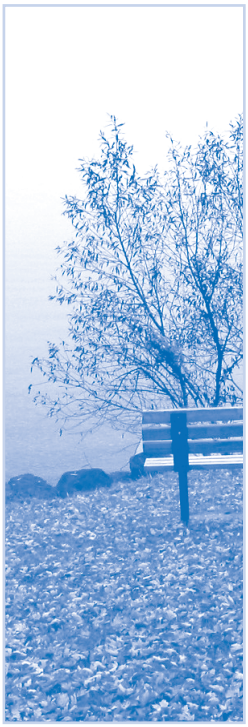
Municipalities can play a key role in the local response to Smog Advisories through the development of Smog Alert Response Plans. By taking prompt action to inform municipal staff and the community at large of the smog situation, municipal staff can help curb smog-producing emissions from such sources as gasoline-powered lawnmowers or leaf blowers. More importantly, municipal early warning efforts can ensure that those community members who are most at risk from poor air quality will be informed in advance so they can take the necessary precautions to protect their health. York Region is developing a Smog Alert Response Plan through its Corporate Clean Air Task Force and as part of the overall Regional Air Quality Policy. Many of the area municipalities are developing Smog Alert Response Plans, and the Towns of Richmond Hill and Markham have Smog Alert Response Plans in place that have been endorsed by their respective councils.



Key Findings:

- *In 2004, there were 6 Smog Advisories spanning 14 days in York-Durham.*
- *Smog episodes are closely related to weather patterns, and are more likely to occur in hot, sunny summers than in cool, wet ones.*
- *The Region and some area municipalities are in the process of developing Smog Alert Response Plans.*
- *Richmond Hill and Markham have Smog Alert Response Plans that have been endorsed by their respective Councils.*

6.4 OUTDOOR AIR POLLUTION and human health



Many epidemiological studies have demonstrated that there are associations between a range of adverse health outcomes and changes in the concentration of common air pollutants.[7] Air pollution can irritate the eyes, nose and throat, and can cause wheezing, coughing and breathing difficulties. Studies have consistently linked common air pollutants with lung cancer, heart attack, stroke and respiratory illnesses such as asthma and bronchitis. Air pollution may also aggravate pre-existing heart and lung conditions and in some cases result in emergency room visits, hospitalization, or premature death. Common air pollutants of concern include ground-level ozone and fine particulate matter (see section 6.1).

Over the years, many researchers have developed estimates of the amount of disease and mortality that is related to air pollution. Generally, this is done by estimating the reduction in deaths or hospitalizations if past exposure to air pollution had been lower. At this time, there is no internationally standardized method to examine the potential impact of air pollution on mortality. Thus, estimates have varied widely largely due to the application of different statistical techniques and different assumptions for calculating them. Selected examples of health burden estimates are described below and are expressed as a percent of total deaths, where possible, in order to provide perspective on the possible relative impact of air pollution.

In a recent World Health Organization (WHO) global risk analysis, outdoor air pollution was estimated to contribute up to 1% of total deaths in North America.[8] In comparison, Health Canada used complex statistical models to estimate that air pollution may contribute up to 8% of total deaths in Windsor, Quebec City, Montreal, Ottawa, Toronto, Hamilton, Calgary and Vancouver.[9] The Ontario Medical Association (OMA) recently released a computer model estimating the number of pollution-caused deaths and illnesses based on hypothetical constant air pollution levels. The OMA forecasts for 2005 suggest that air pollution may contribute to up to 5,800 deaths across Ontario and 290 deaths in York Region.[10] Because the OMA results do not specify how many deaths would take place in Ontario or York Region in the absence of air pollution, these results cannot be expressed as percentages of total deaths. Based on 1999 air pollution and mortality data for Toronto, two recent estimates by Toronto Public Health using different methods suggest that air pollution levels in Toronto may contribute to up to 10% of the city's total deaths.[11, 12] The Ontario Ministry of the Environment recently estimated that transboundary air pollution accounts for more of Ontario deaths attributable to air pollution (56%), than air pollution generated within Ontario (44%).[13] The considerable uncertainty surrounding the true population exposure and the subsequent size of the environmental risk, limits our ability to calculate reliable local estimates of the potential impact of air pollution on mortality.

Such widely varying estimates highlight the importance of continuing to develop better ways to estimate the number of air-pollution related deaths and illness. Even in the absence of such predictive tools, however, we do know that an enormous number of people are exposed to air pollution throughout an entire lifetime and that this has health consequences. The health risk due to air pollution is an important public health problem and it is vital that actions be taken to improve the quality of the air we breathe.

6.5 UV RADIATION and human health

Ultraviolet (UV) radiation is one form of energy emitted by the sun. The sun radiates energy in a range of frequencies that span the electromagnetic spectrum from low frequency radio waves to high frequency gamma rays. Some of this energy is beneficial (e.g., visible light) and some is harmful to life (e.g., X rays). In small doses, exposure to UV radiation is beneficial to health. It initiates the production of vitamin D, which is essential for building and maintaining bones, and is necessary for the survival of plants and animals. However, in large doses, UV radiation can damage DNA and lead to serious human health problems, including skin and eye damage, as well as skin cancer.[14]

TYPES OF UV RADIATION

UV-A
Not absorbed by the ozone layer

UV-B
Mostly absorbed by the ozone layer, but some does reach the Earth's surface

UV-C
Completely absorbed by the ozone layer and oxygen

We are naturally protected from the sun's higher energy radiation by the earth's ozone layer, which is located about 15 to 30 km above the surface of the earth in the stratosphere. The ozone layer screens out the higher energy wavelengths including most (but not all) UV radiation. In the late 1970s, scientists first began noticing that the ozone layer above the Antarctic was beginning to thin, allowing harmful UV-B radiation to pass through. The culprit was found to be ozone-depleting gases such as chlorine, bromine and fluorine. These compounds, called chlorofluorocarbons (or CFCs) were extensively used in refrigeration and air conditioning systems and in a range of consumer products. CFCs are chemically stable and when released to the atmosphere, pass through to the stratosphere without decomposing. However, once in the stratosphere, CFCs react with ozone and destroy it. Because of the release of CFCs, the ozone layer over Canada has thinned by about 4% since the early 1980s.[15]

The thinning of the ozone layer increases the amount of harmful UV-B radiation that reaches the earth. Exposure to UV rays has been linked to different types of cancers, including malignant melanoma, a serious and often deadly form of cancer. In 2003, an estimated 840 Canadians died of melanoma. The incidence and death rate of melanoma in men has almost doubled since 1980. During the past decade, while the incidence of most cancers declined, melanoma was one of a very small number of cancers that continued to increase in incidence.[16] In addition to effects on people, UV-B radiation can hinder the growth of plants and negatively impact small organisms such as zooplankton and young fish.[17]

Addressing the Issue

Realizing the need for action, Canada and 182 other nations around the world signed the 1987 Montreal Protocol to protect the ozone layer.[18] This landmark international agreement established legally binding controls on the production and consumption of ozone depleting gases, and committed signatories to phase out the production and use of CFCs. Most ozone-depleting substances are now banned or strictly controlled. As a result of this international action, the concentration of CFCs in the stratosphere has levelled off and the rate of ozone loss has slowed.[19]

YORK REGION'S SUNSENSE PROGRAM

York Region's Skin Cancer Prevention (Sunsense) Program aims to increase the community's awareness of the early signs of skin cancer, the understanding of the risks of exposure to sun, and the use of proper sun protection measures. Sunsense workshops provide information about skin cancer and other harmful effects of UV radiation and identify ways people can protect themselves including:

- the use of sunscreen
- protective clothing
- sunglasses
- the importance of shade
- special sun protection considerations for infants and children
- monitoring skin and early detection of skin cancer.

For more information, contact ***Health Connection*** at 1-800-361-5653.

6.6 CLIMATE CHANGE and human health

The earth's natural climate has always been, and still is, constantly changing. The historical record tells us that the earth has seen significant swings in temperature over time periods ranging from decades to millennia. For example, 12,000 years ago, during the last ice age, the Region of York was covered in a sheet of ice 1 km thick. The climate change we are experiencing today, however, differs markedly from previous climate change in both rate and magnitude of change.[20]

The temperature on Earth is regulated by the atmosphere, which like a greenhouse, traps the heat of the sun and prevents it from dissipating into space. Without this "greenhouse effect", the average temperature on earth would be -18 degrees C and life as we know it would not exist. The major greenhouse gases in the atmosphere that trap the sun's heat are water vapour, carbon dioxide, methane, nitrous oxide and ozone.

Over the last 200 years, the concentration of greenhouse gases in the atmosphere has increased markedly. Since the industrial revolution, for example, concentrations of carbon dioxide in the atmosphere have increased by 30%, and methane by 145%.[21] The result of this has been to amplify the natural greenhouse effect of the atmosphere. Average global temperature has increased by around 0.4ºC since the 1970s, and now exceeds theupper limit of natural (historical) variability. Most scientists now agree that the bulk of the recent increase in temperature is due to human influences.[22]

The main culprit in global warming is the burning of fossil fuels (wood, coal, oil and gas) to generate electricity, heat our homes and fuel our cars. The clearing of land is another important contributor, as it leads to the loss of forests and wetlands that absorb and store greenhouse gases. Other human activities that contribute greenhouse gases to the atmosphere include the burning of forests, irrigation for agriculture, the cultivation of soil and the extraction of oil.[23]

The Intergovernmental Panel on Climate Change (IPCC) has estimated that the average global temperature will rise by several degrees Celsius in the 21st century. Considerations such as population growth, economic growth, energy efficiency and a host of other factors were used to calculate a wide range of possible scenarios, and consequently a wide range of possible future climates.[24] (See Figure 6-2). The implementation of the Kyoto Accord is predicted to reduce, but not stop, the rise in average global temperature.

Climate change is more than just a global warming trend. Increasing temperatures also lead to changes in many aspects of weather, including wind patterns, the amount and type of precipitation, as well as the severity and frequency of extreme weather events. Climate and weather influences much in our lives - where we live, the recreational activities we participate in, what we wear, eat, and drive. Any change can result in far-reaching health, environmental, social and economic consequences.[25]

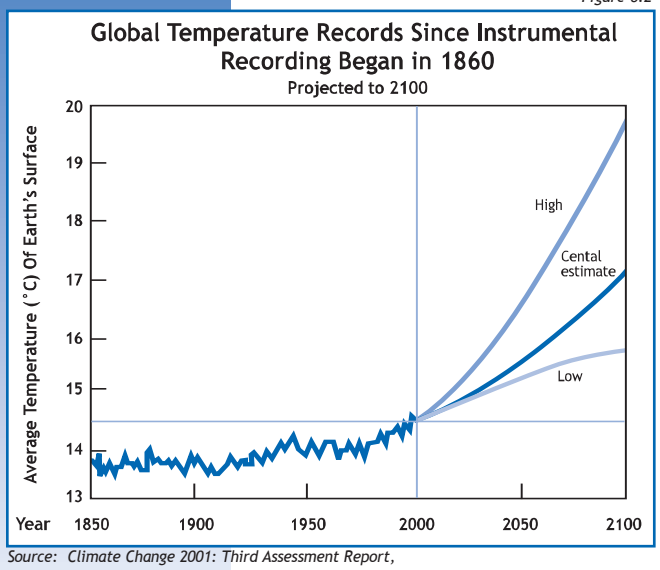
What's the INTERGOVERNMENTAL PANEL on CLIMATE CHANGE?

The IPCC was formed jointly in 1988 by the United Nations Environment Program and the World Meteorological Organization. The IPCC brings together the world's top scientists in all relevant fields, synthesizes peer-reviewed scientific literature on global warming studies, and produces authoritative assessments of the current state of knowledge of climate change.

Source: Global Warming: Climate, U.S. Environmental Protection Agency (EPA), April 2001.

6.6 CLIMATE CHANGE and human health
continued

Figure 6.2

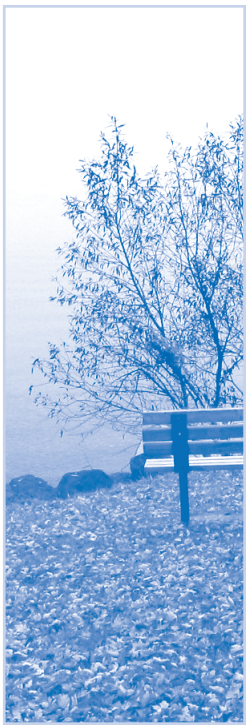


Source: Climate Change 2001: Third Assessment Report, Intergovernmental Panel on Climate Change (IPCC), 2001.

Health Effects of Climate Change

To a large extent, public health depends on clean air, safe drinking water, sufficient food, secure shelter, and social stability. A changing climate will affect all of these. According to the World Health Organization, there are a number of potential health effects of climate change.

- Increasing frequency of heatwaves and poor air quality episodes can adversely affect human health and cause potentially fatal illnesses, including heat stress, as well as increased death rates from heart and respiratory diseases.
- Increased flooding or increased precipitation caused by global warming may compromise the supply of freshwater, increasing the risks of water-borne disease.
- Rising temperatures and variable precipitation are likely to decrease the production of staple foods in many of the poorest regions, increasing risks of malnutrition and social unrest.
- Rising sea levels increase the risk of coastal flooding, and may necessitate population displacement. More than half of the world's population now lives within 60 km of the sea.
- Changes in climate are likely to lengthen the transmission seasons of diseases borne by insects (e.g., West Nile Virus), and to alter their geographic range, potentially bringing them to regions which lack either population immunity or a strong public health infrastructure.
- Weather extremes, such as heavy wind and rains can have severe impacts on health. Approximately 600,000 deaths occurred worldwide as a result of weather-related natural disasters in the 1990s.
- Measurement of health effects from climate change can only be estimated. Nevertheless, a World Health Organization study concluded that the climate change that has occurred since the mid-1970s may have caused over 150,000 deaths in the year 2000. It also concluded that these impacts are likely to increase in the future.[26]



Meeting the Challenge of Climate Change

Like many other environmental issues, climate change cannot be addressed by governments alone. Meeting the climate change challenge will require efforts from all sectors of society - businesses, institutions, governments, organizations and individuals - to reduce the emissions of greenhouse gases.

Section 2.3 of this report provides an overview of key federal actions to reduce the emissions of greenhouse gases. To learn more about what individuals can do about climate change, please refer to Chapter 9 “Taking Responsibility – What You Can Do”.

K Y O T O P R O T O C O L

In December 1997, Canada and more than 160 other countries met in Kyoto, Japan, and agreed to targets to reduce greenhouse gas (GHG) emissions. The agreement that set out those targets, and the options available to countries to achieve them, is known as the Kyoto Protocol. Canada's target is to reduce its GHG emissions to 6 percent below 1990 levels by the period between 2008 and 2012. This is comparable to the targets taken on by our major trading partners. The Kyoto Protocol entered into force on February 16, 2005.

Source: Canada and the Kyoto Protocol, Government of Canada, July 2001. www.climatechange.gc.ca

6.7 indicators of health AIR

CATEGORY	INDICATOR	STATUS in 2000 REPORT	STATUS in 2005 REPORT	TRENDS/COMMENTS
MEASURES of OUTDOOR AIR QUALITY	Annual number of times that ozone (O_3) concentrations exceed MOE 1-hour criteria at Newmarket, Stouffville and Toronto North air monitoring stations	Stouffville: 15 (2000)* Toronto North: 8 (2000)*	Newmarket: 50 (2003), 115 (2002), 89 (2001) Stouffville: 57 (2003), 90 (2002), 64 (2001) Toronto North: 42 (2003), 96 (2002), 55 (2001)	Increase. Average annual concentrations of ozone increasing across Ontario and North America
	Annual number of times that fine particulate matter ($PM_{2.5}$) exceeds MOE reference level at Newmarket and Toronto North air monitoring stations	Toronto North: 1 (2000)*	Newmarket: 4 (2003), 8 (2002),6 (2001) Toronto North: 7 (2003), 10 (2002), 7 (2001)	-
	Annual number of times that sulphur dioxide (SO_2) concentrations exceed MOE 24-hour criteria at Newmarket and Toronto North air monitoring stations	-	Newmarket : 0 (2003) Toronto North: not tested (2003)	Met provincial air quality criteria
	Annual number of times that nitrogen dioxide(NO_2) concentrations exceed MOE 24-hour criteria at Newmarket and Toronto North air monitoring stations	-	Newmarket : 0 (2003) Toronto North: 0 (2003)	Met provincial air quality criteria
	Annual number of times that carbon monoxide (CO) concentrations exceed MOE 8-hour criteria at Newmarket and Toronto North air monitoring stations	-	Newmarket: 0 (2003) Toronto North: not tested (2003)	Met provincial air quality criteria
	Number of odour complaints received by MOE on air quality in York Region	-	992 odour complaints reported (Sept. 2002- Aug. 2005)	-

6.7 indicators of health AIR

CATEGORY	INDICATOR	STATUS in 2000 REPORT	STATUS in 2005 REPORT	TRENDS/COMMENTS
AIR QUALITY INDEX	Number of days that air quality is "poor" (i.e., AQI > 49) for at least 1 hour measured at the York Region monitoring station	Stouffville station*: 16 days (2001) 3 days (2000)	Newmarket station: 10 days (2003) 26 days (2002)	Newmarket monitoring station opened in 2001 and replaced Stouffville as AQI station in 2002
	Number of days that air quality is "poor" (i.e., AQI > 49) for at least 1 hour measured at the Toronto North monitoring station	-	11 days (2003) 23 days (2002) 13 days (2001) 2 days (2000)	-
	Pollutants most often responsible for poor air quality (i.e., when AQI is > 49) at Newmarket and Toronto North air monitoring stations	-	Newmarket: Ozone was responsible for poor air quality for 49 hours and $PM_{2.5}$ for 21 hours (2003) Toronto North: Ozone for 41 hoursand $PM_{2.5}$ for 36 hours (2003)	-
SMOG ADVISORIES	Annual number of smog advisories that are issued for York-Durham, and the length of advisories in days	3 advisories spanning 3 days (2000)*	6 advisories spanning 14 days (2004)	$PM_{2.5}$ added to AQI in 2002. MOE predicts this will lead to a 10% increase in smog advisories. Smog advisories highly dependant on weather patterns

*Information not included in 2000 SOE Report; added here to facilitate comparison with 2005 SOE Report.