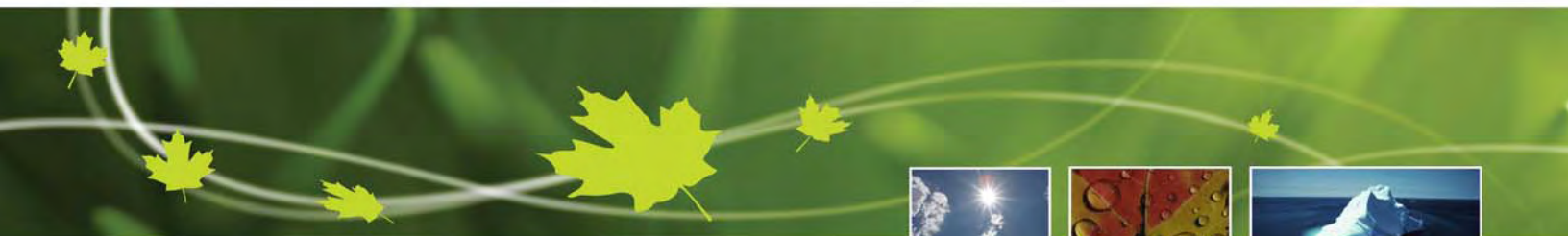




Environment
Canada

Environnement
Canada



Issue 1

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Environmental Trends

(Canadian Environmental Sustainability Indicators Newsletter)

Visit our website at www.ec.gc.ca/indicateurs-indicators

Research Corner

When is a Trend a Trend?

Simply put, a trend is a change in one direction over a long period of time. With something like house prices in Canada, spotting a trend such as a steady increase or decrease can be relatively simple. Identifying trends in the environment is much more challenging.

Our climate, for example, consists of countless interconnected elements related to our air, water and ecosystems. It is complex and affected by natural and human processes that may cause small changes over decades. The challenge is to tell the difference between a trend - that indicates in which direction things are going over the long term - and a fluctuation that is just a "hiccup" or temporary change.

All analyses of trends start with quality data. For example, determining air quality trends involves assessing data from hundreds of air quality monitoring stations located in areas

where most of our population lives. These stations measure ground-level ozone (smog) and fine particulate matter concentrations, two of the primary air pollutants that affect our health.

Canada's air quality monitoring stations are part of the National Air Pollution Surveillance (NAPS) program which involves federal, provincial, territorial and municipal governments.



Naps air quality monitoring stations

Canada 

The NAPS program has been around since 1970 and is designed to provide uniform, accurate and long-term air quality measurements across the country.

At each individual monitoring station there is a quality control process to ensure the equipment is working properly and that measurements taken at each station reflect what is really present in the air. Statistical methods are then used to determine the air quality averages at the monitoring stations and to determine if a trend is emerging.

“To establish air quality trend information,” Tom Dann, Manager of Air Toxics Measurement at Environment Canada explains, “We start with hourly observations of air quality and then compute seasonal averages per site across Canada to better reflect long-term population exposure to outdoor air pollution. These site values are then used to calculate the trends.”

Environment Canada (EC) has developed the [Canadian Environmental Sustainability Indicators initiative](#) to report on environmental trends. Its purpose is to give Canadians better information on the key environmental issues that concern them: air quality, greenhouse gas emissions and freshwater quality.

On the Canadian Environmental Sustainability Indicators (CESI) website, a linear trend (trend line) is shown on a graph when statistical tools show that the data identifies a real trend. In ‘statistical jargon’ it is said that

Did You Know:

Monitoring stations in southern Ontario had the highest ground-level ozone concentrations in 2006, but Alberta also had many stations reporting high levels.

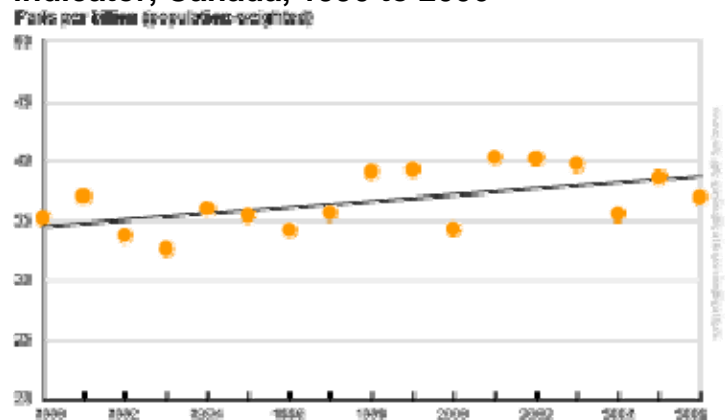
‘there is 90% confidence or 90% likelihood that the trend is between the upper and lower values’.

These values are the “confidence limits”. The actual trend reported is the average in this range.

By collecting and analyzing data related to our air, water and greenhouse gas emissions, CESI helps to give us the best possible “fix” on the status and possible evolution of our environment. The CESI program at Environment Canada continues to work with statistical experts to ensure that trend information is credible and consistent with the latest science. This will give Canadians a clear picture of how our world is changing.

In the case of national ground-level ozone exposure, data shows a trend and a national average increase of 11.3% between 1990 and 2006.

National ground-level ozone exposure indicator, Canada, 1990 to 2006



([Click here for more details about the chart National ground-level ozone exposure indicator, Canada, 1990 to 2006](#))

In some cases, however, when the data varies a great deal and there are few data points, the range can be quite large and encompass positive, zero and negative

trends. In these cases, there is low confidence in knowing just where the trend is going and therefore no linear trend line is reported.

In case of fine particulate matter, between 2000 and 2006 there were many fluctuations in our exposure to fine particulate matter but no significant trend is evident, either increasing or decreasing. Although fine particulate matter levels are higher now than they were in 2000, no trend can be established given that there has been so much variation over the last few years. Despite the lack of a trend, the data remain relevant because they show that stations are recording higher levels of fine particulates in our air.

Innovation Corner

Regional and Site Level Data

Environment Canada's fourth annual CESI report was released online in March 2009 in an easier to use, more interactive format.

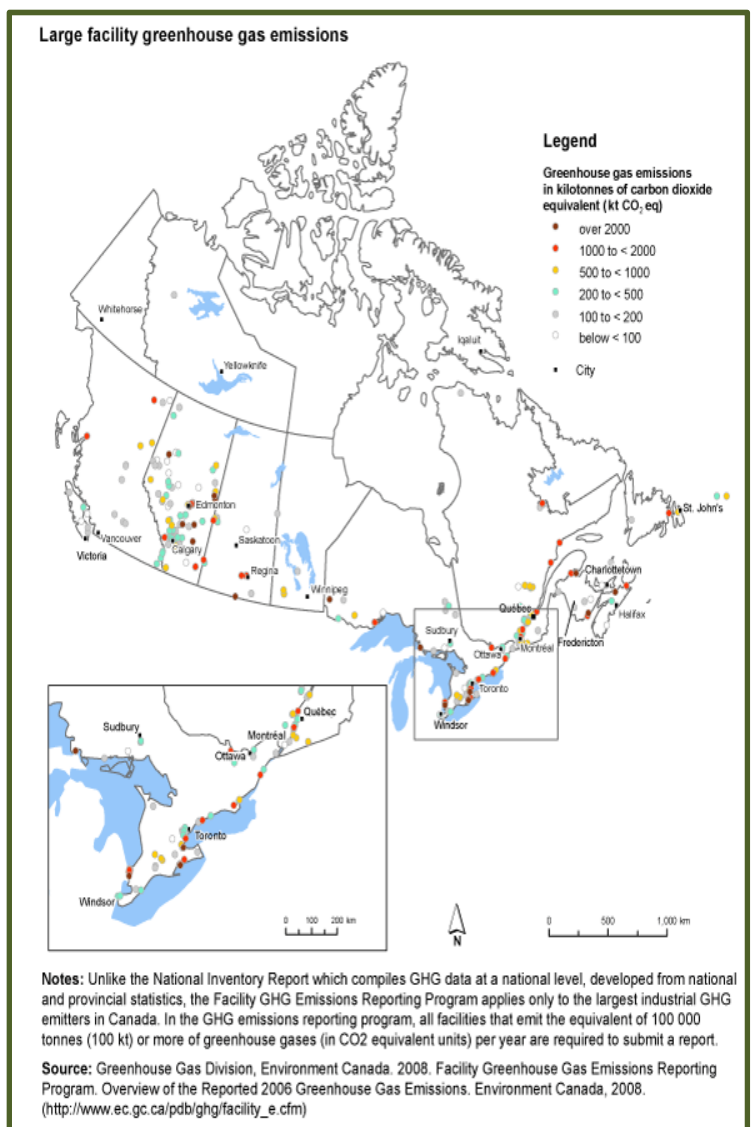
CESI brings together environmental information from federal, provincial and territorial governments to provide decision-makers and the public with clear, concise, credible information on key issues of high importance to Canadians - [Air Quality](#), [Water Quality](#) and [Greenhouse Gas Emissions](#).

CESI can help those involved in making or influencing policies or programs to more fully understand and deliver scientifically credible information in a manner that can be readily understood by decision makers, so we encourage you to take a look at the report.

Using CESI, you can access data that is national, provincial/territorial and regional and

that is also scalable by site level, facilities and basins.

For example, you can find 15 years of trend data on national ground-level ozone (a key component of smog); three years of data on the water quality ratings for protection of aquatic life; 16 years of phosphorus levels monitoring data from each ocean drainage basin; greenhouse gas emissions per person in Canada from 1990 to 2006 and a comparison of Canada's performance with that of other selected countries.



Using CESI's Interactive Mapping Application is as easy as 1-2-3!

- Step 1:** Choose the map and indicator of interest by using the "Select A Map" list selector.
- Step 2:** Zoom the map to a particular area within Canada, choose the province of interest or enter the first 3 characters of the postal code.
- Step 3:** Click on "Get Map" and wait for your map to load.

Findings are presented in a variety of formats including charts, data tables and an interactive mapping application that allows you to view environmental indicator data for Canada in different geographic areas.

The new features allow you to zoom into a region of Canada to view environmental indicator data at a particular monitoring station or emission facility.

Did You Know:

GHGs From Large Facilities

In 2007, slightly more than one third of Canada's GHG emissions came from 350 large industrial facilities. Of these facilities, three industrial sectors accounted for the **majority of GHG emissions**:

- Utilities, primarily those generating electricity (44%);
- Manufacturing (31%); and
- Mining, Quarrying and Oil and Gas Extraction (20%).

The remaining 5% of emissions were from Transportation and Warehousing, Administrative and Support Services and Waste Management and Remediation Services. Overall emissions from these facilities declined 0.4% (1 Mt) from 2004 to 2007.

This is the first issue of a new bi monthly newsletter for the Canadian Environmental Sustainability Indicators initiative. The "Research Corner" and "Innovation Corner" are regular features, so watch for them in future issues! Please feel free to send us any topic areas you would like to see covered in this newsletter.

CESI was launched in 2004, in response to the recommendation made by the National Round Table on the Environment and the Economy in 2003, that the federal government establish a core set of environment and sustainable development indicators to track key factors of importance to Canadians [1]. Environment Canada, Statistics Canada and Health Canada work together to develop and communicate these indicators and to present related information on society and the economy to policy makers and the Canadian public, in collaboration with provincial and territorial partners.

For more information about CESI indicators, go to <http://www.ec.gc.ca/indicateurs-indicators> or
Contact: indicateurs-indicators@ec.gc.ca.