

EnviroStats



Spring 2010

Vol. 4, no. 1

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Latest indicators

Population 2008 to 2009 Percentage change	1.2%	Particulate matter (PM _{2.5}) 2000 to 2006	No significant trend
Gross domestic product, monthly December 2009 Percentage change	0.6%	Ground-level ozone 1990 to 2006 Median percent change per year	0.7%
Greenhouse gas emissions 2006 to 2007 Percentage change	4.0%	Natural resource wealth 2007 to 2008 Percentage change	45.3%



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.	not available for any reference period
..	not available for a specific reference period
...	not applicable
0	true zero or a value rounded to zero
0 ^s	value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
P	preliminary
r	revised
X	suppressed to meet the confidentiality requirements of the <i>Statistics Act</i>
E	use with caution
F	too unreliable to be published

A new research project on Canadian settlements: initial geographic results

Nancy Hofmann, Akmal Elgarawany, Hugo Larocque, Giuseppe Filoso and Tim Dennis, Environment Accounts and Statistics Division

This paper introduces a new concept and dataset developed by Statistics Canada to delineate or map boundaries for Canada's settlements. For the purposes of this research, settlements are defined as tracts of land where humans have altered the physical environment by constructing residential, commercial, industrial, institutional and other installations or buildings. Settlements include cities, towns, villages and other concentrations of human population.

Settlements are fundamental to Canadian society, as most Canadians either live or work in a settlement. While settlements are important hubs for residential, commercial and industrial activity, the size, structure and form of settlements over time can have a variety of social, economic and environmental implications. The expansion of settlements, for instance, requires infrastructure such as roads, sewers and water supply lines and can lead to encroachment onto high quality agricultural land. Potential environmental impacts include loss of wildlife habitat, increased air pollution and greenhouse gas emissions, and the contamination of rivers, lakes and aquifers. The form of expansion is also significant. Low density expansion consumes more agricultural and forested land and results in higher infrastructure costs per capita than high density expansion.

The settlements research project provides detailed, harmonized and comparable datasets that will allow for a more complete national analysis of settlements including their physical form and growth patterns. One key use of the data by Statistics Canada is the development of a series of indicators that will help track land cover and land use change.

The need for a new dataset

There is strong policy and research interest for this project, since the existing datasets on the structure of settlements have significant limitations. For instance, not all existing datasets were produced at regular intervals and most, owing to their underlying methodologies, yielded settlement boundary results that were often not comparable over time and space. A review of settlement boundary datasets showed that many of the datasets

What you should know about this study

The methodology used for delineating settlements in Canada was made possible through the analysis of data extracted from satellite imagery and the use of census data.

Through geo-statistical analysis of this information, a series of rules and thresholds were developed to delineate settlements by 'dissemination block.' The dissemination block is the smallest census geographic unit available and, in general terms, is an area equivalent to a city block bounded by intersecting streets. Census data on population, dwelling and employment were used. Settlement boundaries were produced for 2001 and 2006, the most recent census years, and provide an accurate portrayal of the physical form of Canada's settlements.

A fundamental component of this research project was the creation of a database referred to as the Settlements Earth Observation Inventory (SEOI). The SEOI provides information based on an overlay and visual interpretation of dissemination blocks in comparison to mostly high-resolution satellite imagery. For example, in addition to census data for each block, the percentage of settled area is now available for many individual dissemination blocks. The SEOI was created for the following reasons: to understand the characteristics of settled blocks and the spatial structure of settlements, to assist in the development of thresholds and subsequent rules, and to conduct data quality and accuracy activities.

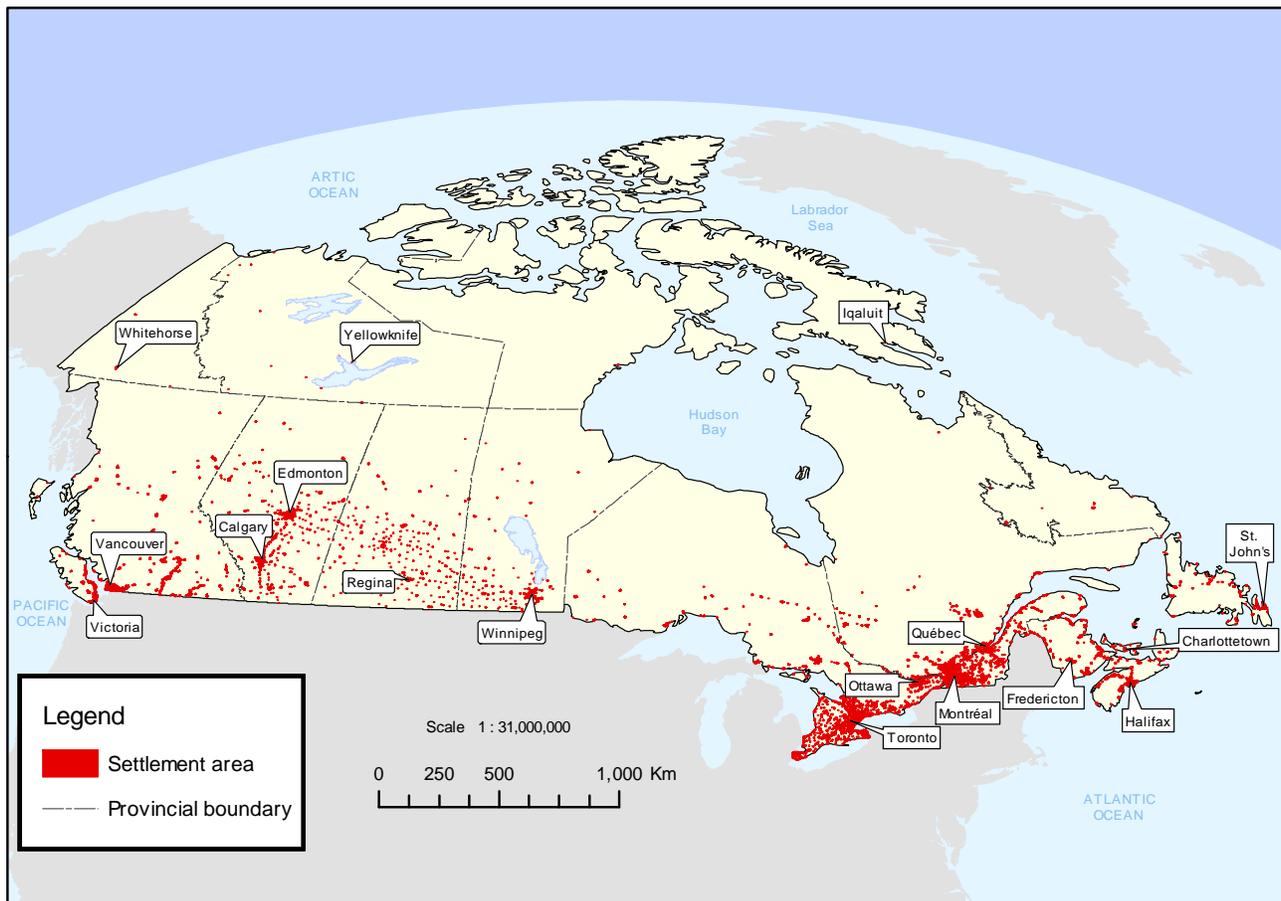
For more detailed information including the methodological research and SEOI, data processing and data accuracy activities, please refer to: [Introducing a New Concept and Methodology for Delineating Settlement Boundaries: A Research Project on Canadian Settlements](#).

were created using boundaries that did not necessarily reflect the true physical form of settlements; sometimes this resulted in the inclusion of large amounts of other land uses, such as agriculture, within the boundaries of settlements. This research project on Canadian settlements was designed to provide timely data and digital boundaries that more closely reflected the physical form of settlements.

This research project was funded by the Policy Research Initiative's Policy Research Data Group, which identifies data gaps and collaborates in the development of new data products for research in priority horizontal policy areas.¹

1. For more information please see: Government of Canada, Policy Research Initiative, 2009, *Policy Research Data Group*, www.policyresearch.gc.ca/page.asp?pagenm=inf_prdg_index (accessed February 19, 2010).

Map 1
Initial research results: settlements in Canada, 2006



Source(s):
Statistics Canada, Environment Accounts and Statistics Division.

Initial research results

Some of the early results of this project are related to analyzing general settlement patterns including the tendency of settlements to be more concentrated in specific parts of Canada. There are also typical geographic or location preferences such as proximity to fertile agricultural land and access to transportation.

Concentrations of settlements

Approximately 20,000 square kilometres of Canada’s land was classified as settled in 2006.²

2. This figure includes adjustments made to the total area of dissemination blocks classified as settled, by using the SEOI. For more information about the SEOI please see: Statistics Canada, 2010, “Introducing a New Concept and Methodology for Delineating Settlement boundaries: A Research Project on Canadian Settlements,” *Environment Accounts and Statistics*

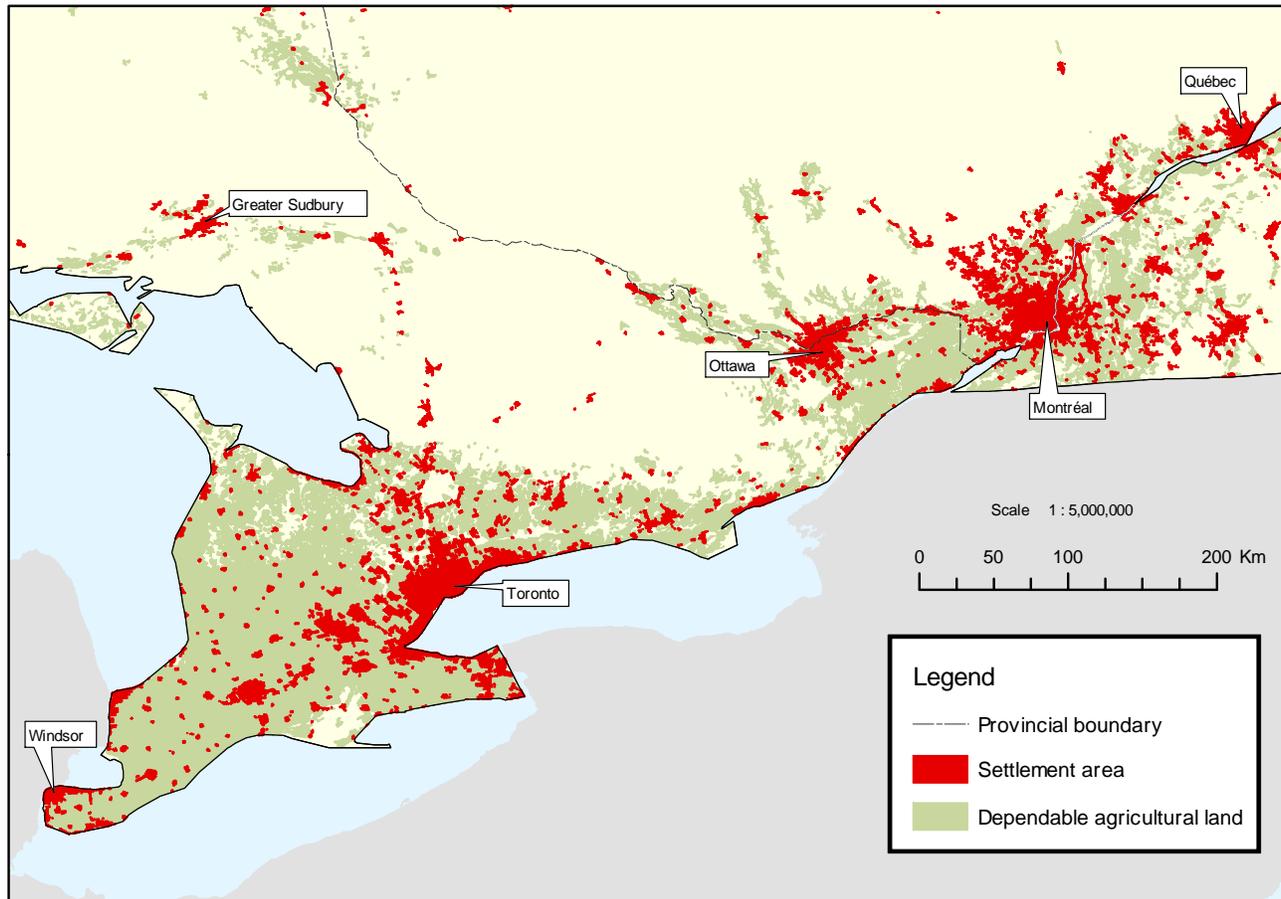
Map 1 shows the settlements found in Canada through this research project. Settlements are found throughout the country, but tend to be concentrated in certain regions—particularly in southern British Columbia, central Alberta and southern Ontario and Quebec.

Physical geography and historical preferences

Fertile agricultural land was a major draw for settlers

The more accurate location of settlements provided by this research makes it evident that physical geography and historical settlement preferences played an important role in the creation and location

Analytical and Technical Paper Series, Catalogue no. [16-001-M2010011](#).

Map 2**Initial research results: settlements and dependable agricultural land in southern Ontario and Quebec, 2006****Source(s):**

Statistics Canada, Environment Accounts and Statistics Division. Agriculture and Agri-Food Canada, Canada Land Inventory.

of settlements in Canada. Historically, when settlers came to Canada they settled near fertile agricultural land. Many successful and growing settlements started as small agricultural trading centres. Map 2 shows the Class 1 to 3 agricultural land in southern Ontario and Quebec.³ This 'dependable agricultural land' is considered to be free of any severe constraints to crop production. Ontario and Quebec are home to 20% of Canada's total dependable agricultural land. Over 56% of Canada's Class 1 agricultural land, the most fertile, is found in

Ontario alone.⁴

Although it was the fertile agricultural land that helped attract settlers, the expansion of settlements is often carefully controlled to preserve this agricultural land. In Ontario, for example, the provincial government has extended a moratorium on expansion in areas of the extended Greater Toronto Area.

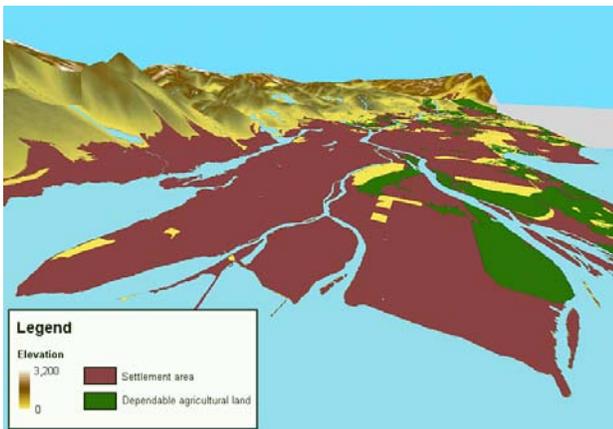
Similarly, British Columbia has developed an Agricultural Land Reserve to restrict encroachment

3. As defined by the Canada Land Inventory (CLI). For more information on the CLI please visit: Canada Land Inventory, 2000, *Canada Land Inventory*, <http://geogratia.cgd.gc.ca/CLI/frames.html> (accessed February 19, 2010).

4. N. Hofmann, G. Filoso and M. Schofield, 2005, "The loss of dependable agricultural land in Canada," *Rural and Small Town Analysis Bulletin*, Statistics Canada Catalogue no. [21-006-X2005001](#), Vol. 6, no. 1.

on agricultural land. At the same time, the Greater Vancouver Regional District has approved a “Liveable Region Strategic Plan” to control expansion. However, unlike other parts of the country, the greater Vancouver area has natural restrictions to growth due to its physical environment; the expansion of the settled areas is inhibited by the Rocky Mountains (Map 3). The settlements results clearly show this boundary.

Map 3
Initial research results: Vancouver area, 2006



Source(s):
Statistics Canada, Environment Accounts and Statistics Division.
Natural Resources Canada, Earth Sciences Sector, Canadian Digital Elevation Data.
Agriculture and Agri-Food Canada, Canada Land Inventory.

Railways shaped settlements in the Prairies

In the Prairie region, settlements follow the railway lines (Map 4). To entice immigrants to settle the west, the Canadian government gave away plots of land to settlers. The Canadian Pacific Railway was the nation’s only transcontinental line. Many cities and towns in Canada owe their very inception to railways.⁵

The importance of transportation

Transportation was also an important factor in the development of other settlements. Typically settlements are located near rivers and water bodies. There are many advantages for such a location, including transportation, but also access to drinking water and resources from the sea. In the Maritime provinces, many settlements are located near coastal areas (Map 1). For instance, in 2006, almost 70% of

settlements were located within 10 kilometres of the coast in the Atlantic provinces.

Future directions

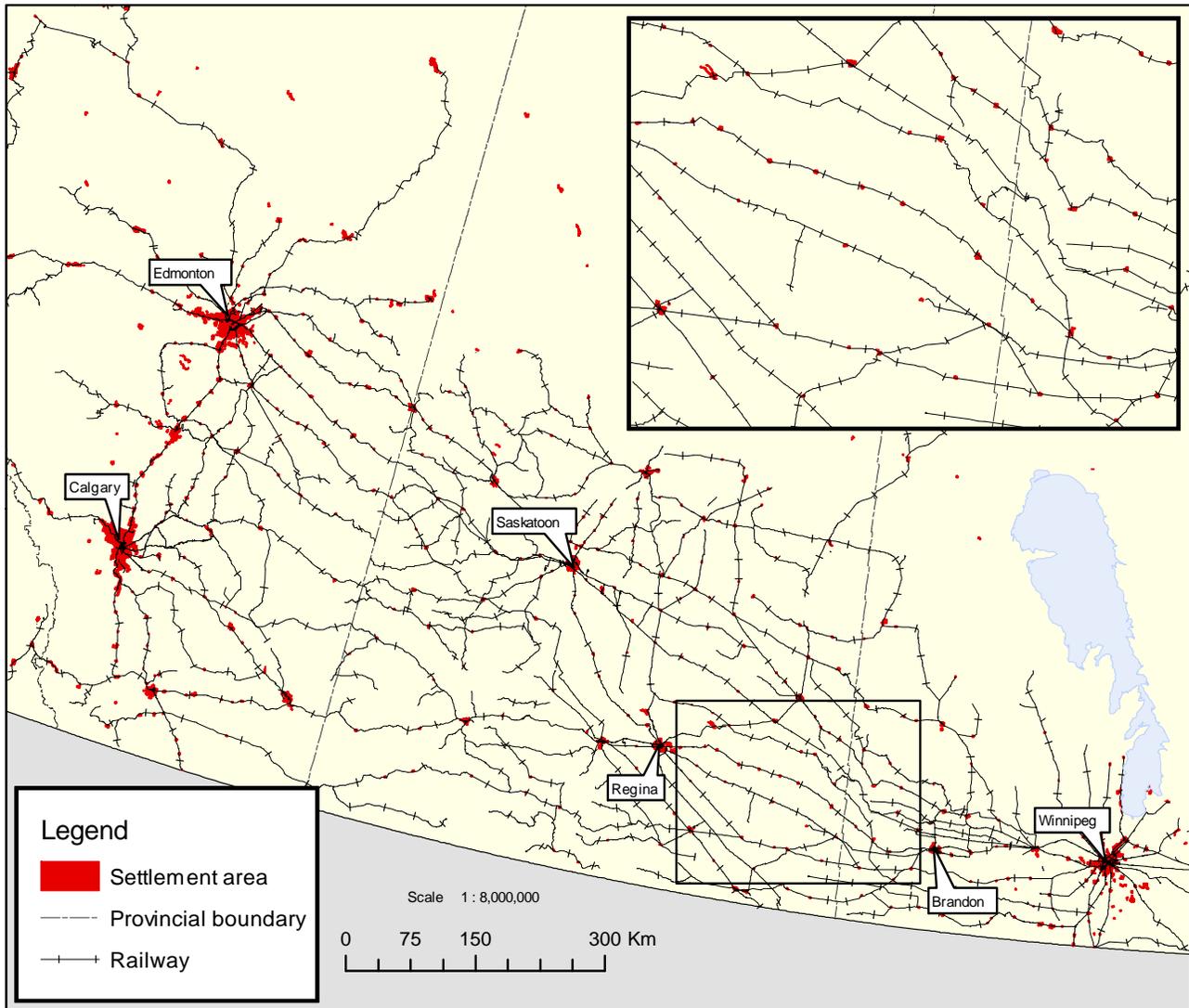
Using the new dataset introduced in this paper, a series of indicators are planned to help illuminate settlement-related issues in Canada. Several key themes have been proposed for further study. Although some national and provincial data will be available, it is proposed that the indicators be based on two broad categories: settlements by class size and Canada’s very largest settlements. Initial indicators would cover the following themes: land converted to settlements (2001 to 2006); density of settled areas; compactness or distribution of settlements.

The Settlements Project team consisted of the following:

Nancy Hofmann, project manager
Akmal Elgarawany, technical leader (Research and Methodology)
Hugo Larocque
Giuseppe Filoso
Tim Dennis

5. Library and Archives Canada, 2003, *Urban Growth*, www.collectionscanada.gc.ca/trains/h30-3030-e.html (accessed November 24, 2009).

Map 4
Initial research results: Prairie provinces, 2006



Source(s):
Statistics Canada, Environment Accounts and Statistics Division.
Statistics Canada, Geography Division.

Ecoregion profile: Lake Erie Lowland

Giuseppe Filoso and Hugo Larocque, Environment Accounts and Statistics Division

The Lake Erie Lowland ecoregion (Map 1) is one of Canada's 194 ecoregions. It covers a total area of approximately 24,000 square kilometres and extends from the city of Toronto in the East to the city of Windsor in the west and contains the most southerly point of mainland Canada, Point Pelee.



Due to its southern location the ecoregion has one of the most temperate climates in Canada, with warm, humid summers and mild winters. The climate, in conjunction with an abundance of level fertile soils, makes this ecoregion a major agricultural area.

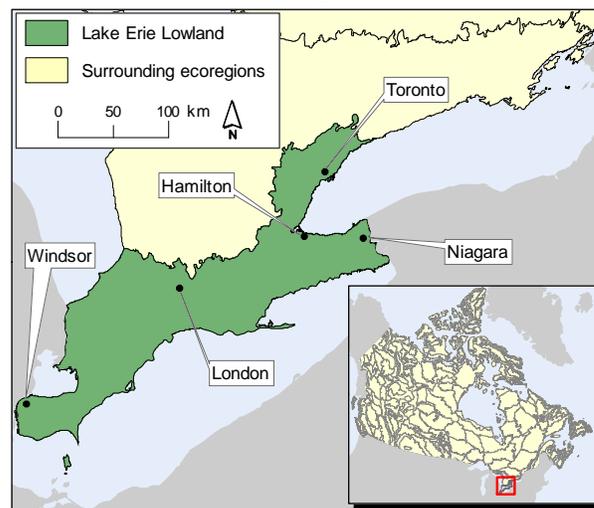
In 2006, the Lake Erie Lowland was the most populated ecoregion in Canada with a population of approximately 7.3 million or about 23% of the Canadian population. Between 1971 and 2006 the Lake Erie Lowland experienced considerable population growth (61.6%). The population density of 305 persons per square kilometre in 2006 made it the second most densely populated ecoregion in Canada (Table 1) after the Lower Mainland ecoregion.¹

Within the ecoregion, the dominant land cover is cropland. Limited areas of mixed and deciduous forests on the Niagara Escarpment and developed land are the other significant land cover types (Chart 1 and Map 2).

Between 1971 and 2006, farmland declined 9.7% to a total of 16,194 square kilometres, while the number of farms also declined by 43.7% to a total of 19,735. Declines were significant for the number of farms reporting tobacco (-82.3%), poultry (-77.2%), pigs (-88.0%) and cattle (-73.2%); although in some cases actual production increased, as is the case for poultry (20.0%) and pigs (67.5%) (Table 1).

Other agricultural sectors have seen an increase in the number of farms and area under cultivation. Farms reporting greenhouses increased 2.1% and those reporting nurseries increased 26.6%. More importantly the area being cultivated in greenhouses increased by 371.8% and in nurseries by 342.5% (Table 1). This is most likely due to the mild climate of the ecoregion, the amount of dependable land and the proximity to markets.

Map 1
Lake Erie Lowland ecoregion



Source(s):

Agriculture and Agri-Food Canada, 2008, *A National Ecological Framework for Canada*, <http://sis.agr.gc.ca/cansis/nsdb/ecostrat/intro.html> (accessed February 19, 2010).

1. D. Trant, H. Larocque and G. Filoso, 2009, "Ecoregion profile: Lower Mainland of British Columbia," *EnviroStats*, Statistics Canada Catalogue no. [16-002-X200900411031](https://doi.org/10.26367/16-002-X200900411031), Vol. 3, no. 4.

Table 1
Lake Erie Lowland ecoregion

	Lake Erie Lowland ecoregion	Canada	Percentage share of Canada total
Total area (km²)	23,805	9,976,182	0.24
Land cover circa 2000¹			
Annual cropland and perennial cropland (km ²)	17,535	..	...
Forest (km ²)	3,050	..	...
Developed land (km ²)	2,664	..	...
Water (km ²)	220	..	...
Exposed land (km ²)	0	..	...
Grasses-herbaceous (km ²)	12	..	...
Other classes (km ²)	62	..	...
Shrubland (km ²)	40	..	...
Wetland (km ²)	222	..	...
Agricultural land			
Area of dependable agricultural land ² (km ²)	20,550	454,630	4.5
Proportion of area in dependable land (percent)	85.8	4.6	...
Population			
Population in 1971 (number)	4,515,935	21,568,310	20.9
Population in 1981 (number)	5,042,665	24,343,181	20.7
Population in 1991 (number)	5,909,138	27,296,859	21.6
Population in 1996 (number)	6,328,124	28,846,761	21.9
Population in 2001 (number)	6,796,306	30,007,094	22.6
Population in 2006 (number)	7,299,037	31,612,895	23.1
Population density in 2006 (people/km ²)	304.7	3.0	...
Population change 1971 to 2006 (percent)	61.6	46.6	...
Agriculture			
Area of farmland in 1971 (hectares)	1,793,991	68,662,444	2.6
Area of farmland in 2006 (hectares)	1,619,410	67,586,739	2.4
Change (percent)	-9.7	-1.6	...
Farms in 1971 (number)	35,056	366,128	9.6
Farms in 2006 (number)	19,735	229,373	8.6
Change (percent)	-43.7	-18.2	...
Area of cropland in 1971 (hectares)	1,228,702	27,828,479	4.4
Area of cropland in 2006 (hectares)	1,368,712	35,912,247	3.8
Change (percent)	11.4	29.0	...
Tobacco in 1971 (hectares)	32,367	41,218	78.5
Tobacco in 2006 (hectares)	12,366	12,469	99.2
Change (percent)	-61.8	-69.7	...
Farms reporting tobacco in 1971 (number)	3,592	4,810	74.7
Farms reporting tobacco in 2006 (number)	637	656	97.0
Change (percent)	-82.3	-86.4	...
Greenhouses in 1971 (hectares)	2,135,165	3,700,048	57.7
Greenhouses in 2006 (hectares)	10,074,224	19,001,600	53.0
Change (percent)	371.8	413.6	...
Farms reporting greenhouses in 1971 (number)	1,028	2,727	37.7
Farms reporting greenhouses in 2006 (number)	1,049	5,537	18.9
Change (percent)	2.1	103.0	...

Table 1 (continued)
Lake Erie Lowland ecoregion

	Lake Erie Lowland ecoregion	Canada	Percentage share of Canada total
Nursery products in 1971 (hectares)	1,885	3,408	55.3
Nursery products in 2006 (hectares)	8,342	39,347	21.2
Change (percent)	342.5	1,054.5	...
Farms reporting nursery products in 1971 (number)	442	1,454	30.4
Farms reporting nursery products in 2006 (number)	603	4,218	14.3
Change (percent)	26.6	190.1	...
Pigs in 1971 (number)	859,966	8,068,186	10.7
Pigs in 2006 (number)	1,440,788	12,726,573	11.3
Change (percent)	67.5	57.7	...
Farms reporting pigs in 1971 (number)	9,164	122,259	7.5
Farms reporting pigs in 2006 (number)	1,104	11,680	9.4
Change (percent)	-88.0	-90.4	...
Cattle in 1971 (number)	677,608	13,276,308	5.1
Cattle in 2006 (number)	342,759	15,773,527	2.2
Change (percent)	-49.4	18.8	...
Farms reporting cattle in 1971 (number)	16,070	248,151	6.5
Farms reporting cattle in 2006 (number)	4,310	110,290	3.9
Change (percent)	-73.2	-55.6	...
Poultry in 1971 (number)	16,458,462	98,049,591	16.8
Poultry in 2006 (number)	19,757,241	125,314,793	15.8
Change (percent)	20.0	27.8	...
Farms reporting poultry in 1971 (number)	8,994	125,551	7.2
Farms reporting poultry in 2006 (number)	2,049	24,432	8.4
Change (percent)	-77.2	-80.5	...

1. Land cover classes are aggregated. Forest area contains all types of forest. Developed land includes built-up areas, lawns, road surfaces, industrial sites and farmsteads. Other refers to unclassified land types due to shadow and clouds in the satellite imagery. Land cover is based on LANDSAT satellite data from 1996 to 2003.

2. Dependable agricultural land is defined as land designated as Class 1, Class 2 and Class 3 by the Canada Land Inventory.

Source(s):

Statistics Canada, CANSIM tables [153-0057](#) and [153-0058](#) (accessed October 8, 2009).

Statistics Canada, Census of Population and Census of Agriculture.

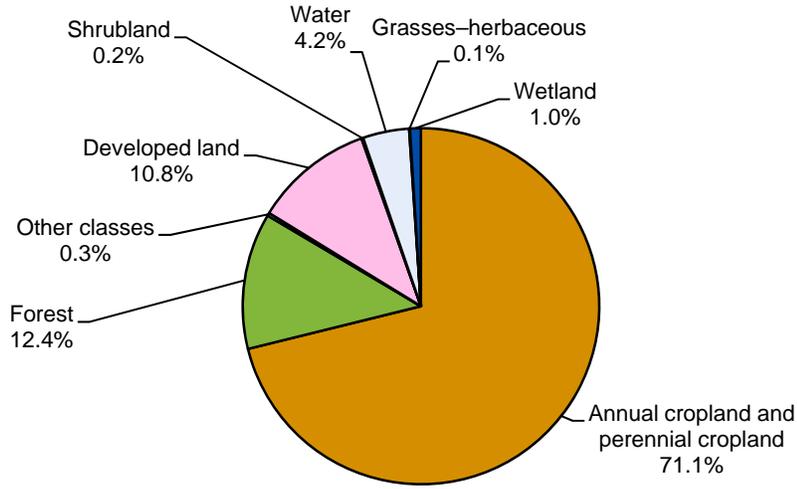
Statistics Canada, Environment Accounts and Statistics Division, Spatial Environmental Information System.

Natural Resources Canada, n.d., *Canada Land Inventory—Land Capability for Agriculture* (1968 to 1990), Earth Sciences Sector, www.geogratis.ca/geogratis/en/collection/cli.html (accessed October 8, 2009).

Natural Resources Canada, 2009, *Land Cover, Circa 2000-Vector (LCC2000-v)*, Earth Sciences Sector, www.geobase.ca (accessed October 8, 2009).

Agriculture and Agri-Food Canada, 2008, *A National Ecological Framework for Canada*, <http://sis.agr.gc.ca/cansis/nsdb/ecostrat/intro.html> (accessed February 19, 2010).

Chart 1
Lake Erie Lowland ecoregion, by type of land cover, circa 2000



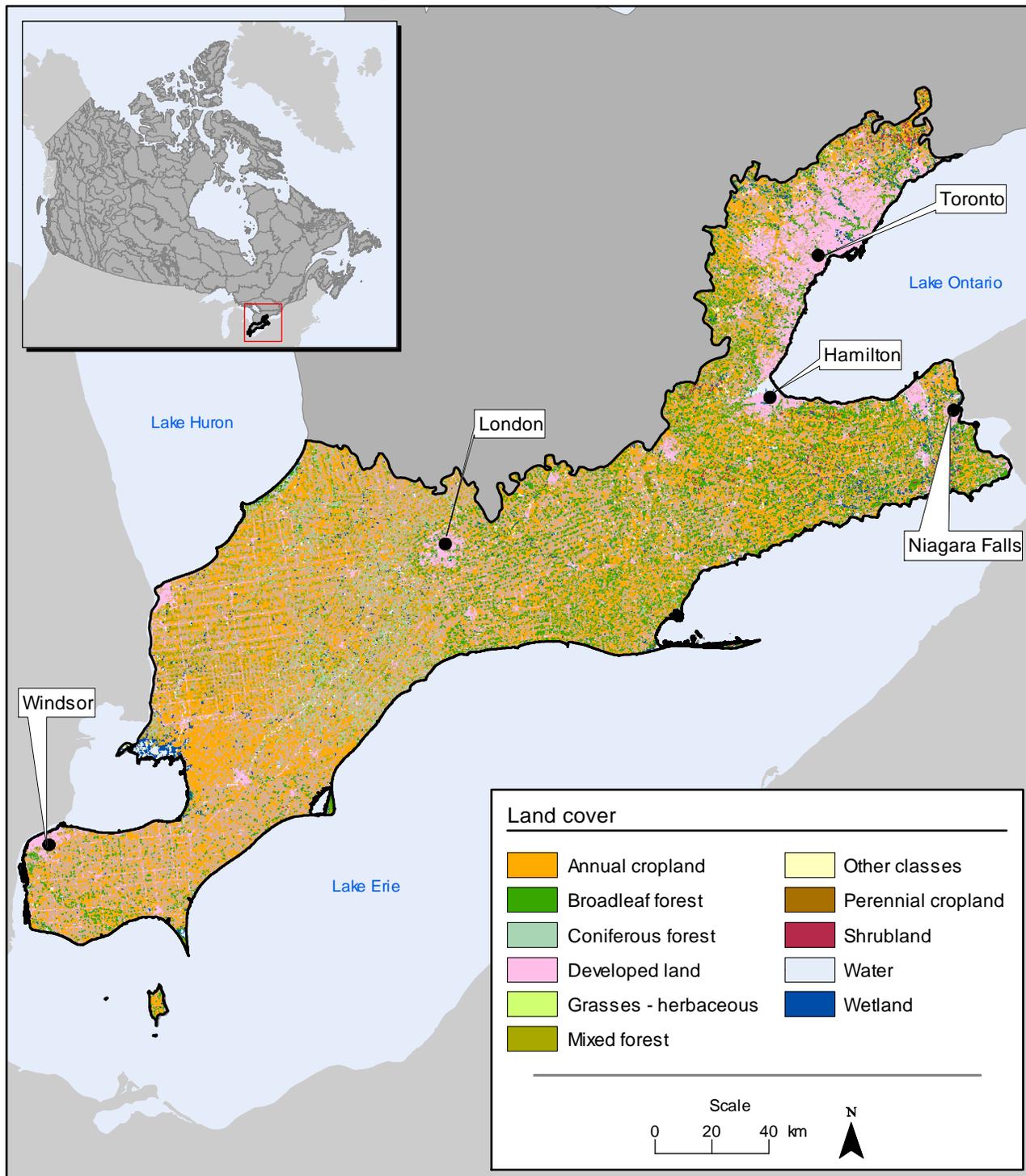
Note(s):

Developed land includes built-up areas, lawns, road surfaces, industrial sites and farmsteads. Other refers to unclassified land types due to shadow and clouds in the satellite imagery. Land cover is based on LANDSAT satellite data from 1996 to 2003.

Source(s):

Natural Resources Canada, 2009, *Land Cover, Circa 2000-Vector (LCC2000-v)*, Earth Sciences Sector, www.geobase.ca (accessed October 8, 2009).

Map 2
Land cover, Lake Erie Lowland ecoregion, circa 2000



Source(s):

Natural Resources Canada, 2009, *Land Cover, Circa 2000-Vector (LCC2000-v)*, Earth Sciences Sector, www.geobase.ca (accessed October 8, 2009).

Agriculture and Agri-Food Canada, 2008, *A National Ecological Framework for Canada*, <http://sis.agr.gc.ca/cansis/nsdb/ecostrat/intro.html> (accessed February 19, 2010).

Quick fact: Lawn mowers in Canada

Data from the 2007 Households and the Environment Survey reveal that 86% of households in Canada with a lawn used a lawn mower, with a small number of households (2%) having reported using more than one type of lawn mower. Seven out of ten households used a gas-powered lawn mower, 15% used an electric mower, while just 1 in 25 (4%) used a manual one. Households in Prince Edward Island were most likely to have used a lawn mower with a gasoline motor (87%), followed closely by those in New Brunswick (85%). Six percent of households in British Columbia used a manual lawn mower to cut their grass. The 14% of households with a lawn that did not use a lawn mower may have had their lawns maintained by a lawn care company, may not have mowed their lawns or were not responsible for the maintenance of their lawns.

Table 1
Lawn mower use, Canada and provinces, 2007

	Used a lawn mower	Used more than one type of lawn mower	Type of lawn mower used		
			Gas-powered percent	Electric	Manual
Canada	86	2	70	15	4
Newfoundland and Labrador	91	F	77	15	F
Prince Edward Island	90	F	87	F	F
Nova Scotia	92	F	83	8 ^E	F
New Brunswick	90	F	85	F	F
Quebec	86	2 ^E	70	16	2
Ontario	85	2	67	15	5
Manitoba	91	F	79	10 ^E	F
Saskatchewan	94	F	84	10	F
Alberta	87	2 ^E	68	17	4 ^E
British Columbia	81	3 ^E	62	16	6

Note(s):

As a percentage of those households that were not in apartments and that had a lawn.

Source(s):

Statistics Canada, Environment Accounts and Statistics Division, Households and the Environment Survey, 2007.

Environment and sustainable development indicators

Table 1
Population indicators

	2003	2004	2005	2006	2007	2008
Population (number) ¹	31,639,670	31,940,676	32,245,209	32,576,074	32,931,956	33,327,337
Percentage change	0.9	1.0	1.0	1.0	1.1	1.2
Aged 65 and over (percent of total)	12.8	13.0	13.1	13.3	13.5	13.7
Population in census metropolitan areas and census agglomerations (percent of total) ²	..	..	..	81.1	..	..
Density (per square kilometre)	3.5	3.5	3.6	3.6	3.7	3.7

1. Population data is based on the Estimates of Population program, except for data on population in census metropolitan areas and census agglomerations, which is based on the Census of Population.

2. Area consisting of one or more neighbouring municipalities situated around a major urban core. A census metropolitan area must have a total population of at least 100,000 of which 50,000 or more live in the urban core. A census agglomeration must have an urban core population of at least 10,000.

Source(s):

Statistics Canada, CANSIM table [051-0001](#) (accessed February 17, 2010).

Statistics Canada, 2007, *Population and Dwelling Count Highlight Tables, 2006 Census*, <http://www12.statcan.ca/english/census06/data/popdwell/Tables.cfm> (accessed February 17, 2010).

Table 2
Economy indicators

	2003	2004	2005	2006	2007	2008
Gross Domestic Product (million chained 2002 dollars)	1,174,592	1,211,239	1,247,807	1,283,419	1,315,907	1,321,360
Percentage change	1.9	3.1	3.0	2.9	2.5	0.4
Per capita (chained 2002 dollars)	37,124	37,922	38,697	39,398	39,958	39,648
Consumer Price Index (2002 = 100)	102.8	104.7	107.0	109.1	111.5	114.1
Unemployment rate (percent)	7.6	7.2	6.8	6.3	6.0	6.1

Source(s):

Statistics Canada, CANSIM tables [380-0017](#), [051-0001](#), [326-0021](#) and [282-0002](#) (accessed February 17, 2010).

Table 3
Social indicators

	2003	2004	2005	2006	2007	2008
Average household spending ¹ (current dollars)						
Total	60,088	62,464	65,575	67,736	69,946	71,364
Water and sewage	202	204	211	221	253	251
Electricity	1,026	1,040	1,070	1,111	1,147	1,162
Food	6,618	6,772	6,978	7,046	7,305	7,435
Gasoline and other motor fuels	1,665	1,854	2,024	2,079	2,223	2,233
Personal expenditure on consumer goods and services (million chained 2002 dollars)	675,443	697,566	723,146	752,727	787,063	810,723
Residential waste						
Production per capita (kilograms)	..	386 ^r	..	399	..	..
Disposal (tonnes)	..	8,961,583 ^r	..	9,238,376	..	..
Disposal per capita (kilograms)	..	281 ^r	..	284	..	..
Diversión (tonnes)	..	3,363,803 ^r	..	3,744,843	..	..
Diversión per capita (kilograms)	..	105 ^r	..	115	..	..
Diversión rate (percent of waste production)	..	27 ^r	..	29	..	..
Distance driven by light vehicles ² (million kilometres)	286,803	285,164	289,717	296,871	300,203	294,361
Asthma (percent of population age 12 and over)	8.4	..	8.3	..	8.1	8.4

1. Data on average household spending is based on the Survey of Household Spending (SHS). For information on the difference between the SHS and personal expenditure data please see: Statistics Canada, 2008, *Guide to the Income and Expenditure Accounts*, Catalogue no. [13-017-X](#).

2. Distance driven for vehicles weighing less than 4.5 tonnes, excluding the territories.

Source(s):

Statistics Canada, CANSIM tables [203-0001](#), [203-0003](#), [203-0002](#), [203-0007](#), [380-0017](#), [153-0041](#), [153-0042](#), [051-0001](#), [405-0063](#) and [105-0501](#) (accessed February 17, 2010).

Table 4
Energy indicators

	2003	2004	2005	2006	2007	2008
Primary energy availability (terajoules)	11,478,526	11,527,500	11,307,113	11,176,879 ^f	11,969,050	11,545,145
Primary and secondary energy (terajoules)						
Export	9,444,883	9,810,695	9,641,137	9,833,549 ^f	10,308,635	10,186,895
Residential consumption	1,338,166	1,313,015	1,296,644	1,243,425 ^f	1,336,452	1,360,303
Established reserve, closing stock ¹						
Crude bitumen (million cubic metres)	1,720	1,660	1,620	3,340	3,500	4,300
Crude oil (million cubic metres)	590.0	603.8	752.3	712.6	721.8	..
Natural gas (billion cubic metres)	1,469.5	1,497.5	1,553.7	1,577.7	1,534.3	..
Recoverable reserves, closing stock ¹						
Coal (million tonnes)	4,406.4 ^f	4,666.3 ^f	4,560.4 ^f	4,468.8	4,395.1	4,331.5
Uranium (tonnes)	429,000	444,000	431,000	423,400	482,000	..
Total electricity generation (megawatt hours)	564,218,465	571,291,905	597,810,875	585,097,531	603,572,420	601,719,256
Hydro (percent of total)	59.0	58.7	60.1	60.0	60.6	62.0
Nuclear (percent of total)	12.5	14.9	14.5	15.8	14.6	14.7
Generation from fossil fuel and other fuel combustion (percent of total)	28.5	26.4	25.4	24.2	24.8	23.3

1. The size of the reserve at year-end.

Source(s):

Statistics Canada, CANSIM tables [128-0009](#), [153-0012](#), [153-0013](#), [153-0014](#), [153-0017](#), [153-0018](#), [153-0019](#), [127-0001](#) and [127-0002](#) (accessed February 17, 2010).

Table 5
Environment and natural resources indicators

	2003	2004	2005	2006	2007	2008
Total greenhouse gas (GHG) emissions, Canada (megatonnes of carbon dioxide equivalent)	741	741	731	718	747	..
GHG emissions per capita (tonnes)						
GHG emissions by final demand	23.4	23.2	22.7	22.0	22.7	..
Total household ¹ (megatonnes of carbon dioxide equivalent)	433 ^f	425	418 ^p	..	..	..
Total household per capita (tonnes)	13.7 ^f	13.3	13.0 ^p			
Direct household ² (megatonnes of carbon dioxide equivalent)	111 ^f	110	108 ^p	..	..	..
Indirect household ³ (megatonnes of carbon dioxide equivalent)	323 ^f	315	309 ^p	..	..	..
Exports (megatonnes of carbon dioxide equivalent)	273	278	276 ^p	..	..	..
Annual temperature departures, ⁴ Canada (degrees Celsius)	1.1	0.1	1.7	2.4	0.9	0.7
Value of selected natural resources (million current dollars)						
Land	1,095,419	1,227,819	1,367,002	1,520,392	1,691,239	1,797,753
Timber	297,474	311,771	283,572	265,640	246,626	237,063
Subsoil resource stocks	465,083	566,179	805,761	931,643	939,060	1,486,234
Average farm pesticide expenditures (current dollars)	7,232	7,602	7,792	8,268	9,147	10,802 ^p
Air quality ⁵						
Ozone (population-weighted, parts per billion)	40	36	39	37	..	..
PM _{2.5} (population-weighted, micrograms per cubic metre)	9	9	9	8	..	..

1. Total household greenhouse gas emissions are the sum of direct plus indirect household greenhouse gas emissions.
2. Direct household greenhouse gas emissions include all greenhouse gas emissions due to energy use in the home and for private motor vehicles.
3. Indirect household greenhouse gas emissions are those business-sector emissions due to the production of the goods and services purchased by households. An estimate of the greenhouse gas emissions from foreign companies due to the production of the imported goods purchased by Canadian households is included.
4. Annual departures from the 1951-1980 temperature normals.
5. Ground-level ozone and fine particulate matter (PM_{2.5}) are two key components of smog that have been linked to health impacts ranging from minor respiratory problems to hospitalizations and premature death. Exposure studies indicate that adverse health effects can occur even with low concentrations of these pollutants in the air. Annual data are revised, based on the latest release of the *Canadian Environmental Sustainability Indicators* report.

Source(s):

 Statistics Canada, CANSIM tables [153-0046](#), [051-0001](#), [378-0005](#), and [002-0044](#) (accessed February 17, 2010).

 Environment Canada, 2009, *Canada's 2007 Greenhouse Gas Inventory – A Summary of Trends*,

www.ec.gc.ca/pdb/ghg/inventory_report/2007/som-sum_eng.cfm (accessed February 17, 2010).

 Environment Canada, 2009, *Temperature and Precipitation in Historical Perspective*, www.msc-smc.ec.gc.ca/ccrm/bulletin/annual08/national_e.cfm (accessed February 17, 2010).

 Environment Canada, 2009, *Canadian Environmental Sustainability Indicators 2008 – Air Quality*, <http://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=B4B7C8F6-1> (accessed February 17, 2010).

 Environment Canada, 2009, *Canadian Environmental Sustainability Indicators 2008 – Air Quality*, <http://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=B4B7C8F6-1> (accessed February 17, 2010).

Statistics Canada, Environment Accounts and Statistics Division, Material and Energy Flow Accounts.

Updates

New releases

Environment Accounts and Statistics Product Catalogue

Environment Accounts and Statistics Division is Statistics Canada's focal point for the collection, analysis and dissemination of environmental information. This reference guide briefly describes the division's programs, as well as all publications and electronic products offered on a quarterly, annual, biennial and occasional basis.

Released March 19, 2010 (Statistics Canada Catalogue no. [16-257-X](#)).

Introducing a New Concept and Methodology for Delineating Settlement Boundaries: A Research Project on Canadian Settlements

A new concept and methodology has been developed by Statistics Canada to delineate or map boundaries for Canada's settlements. Settlements, for the purposes of this research project, are defined as tracts of land where humans have altered the physical environment by constructing residential, commercial, industrial, institutional and other installations/buildings. Settlements include cities, towns, villages and other concentrations of human population that inhabit a given area of the environment. The purpose of the settlements research project is to provide detailed, harmonized and comparable datasets that will allow for a more complete national analysis of settlements including their physical form and growth patterns.

Released February 2, 2010 (Statistics Canada Catalogue no. [16-001-M2010011](#)).

CANSIM tables and updates

CANSIM is Statistics Canada's key socio-economic database.

Data for the years 1971, 1976 and 2006 can now be found in the following tables on CANSIM:

CANSIM table [153-0036](#), Selected population characteristics, Canada, major drainage areas and sub-drainage areas

CANSIM table [153-0038](#), Selected agricultural activities, all major drainage areas and sub-drainage areas with agriculture

Summary tables and updates

The following summary tables have been added to the Statistics Canada website:

[Population served by drinking water plants, by source water type and drainage region](#)

[Capital expenditures on pollution abatement and control \(end-of-pipe\) by medium and industry](#)

[Capital expenditures on pollution prevention by medium and industry](#)

[Area of stocked timber-productive forest land burned](#)

[Forest area harvested by province and territory](#)

[Forest land by province and territory](#)

[Landed catch and value](#)

Upcoming releases

Households and the Environment: Energy Use

The Households and the Environment Survey Energy Use Supplement (2007) collected detailed information on the energy consumption by households. It also gathered detailed information on energy conservation practices, heating and cooling systems, and other household characteristics. Conducted in partnership with Natural Resources Canada, it is similar to the Survey of Household Energy Use, which was last collected in 2003.

To be released shortly (Statistics Canada Catalogue no. 11-526-S).

Greenhouse gas emissions from private vehicles in Canada, 1990 to 2007 - Estimates for Canada, the provinces and census metropolitan areas

The paper examines the contribution of the household sector to greenhouse gas (GHG) emissions in Canada, through its use of private motor vehicles. Emissions estimates are presented at national, provincial and census metropolitan area (CMA) levels. The study uses data from the Canadian Vehicle Survey, conducted by Statistics Canada's Transportation Division and the Material and Energy Flow Accounts from Environment Accounts and Energy Statistics Division.

At the national level the study presents estimates of vehicle emissions, GHG intensity, as well as per capita emissions. Total and per capita emissions by income group are also presented at the national level. At the provincial and CMA levels, the study presents the first survey based estimates of total and per capita vehicle emissions. It also explores the regional differences and examines the contributing factors.

To be released shortly (Statistics Canada Catalogue no. 16-001-M).