



Catalogue no. 16-201-XIE

Human Activity and the Environment: Annual Statistics

2006



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Statistics Canada
Environment Accounts and Statistics Division
System of National Accounts

Human Activity and the Environment: Annual Statistics

2006

Published by authority of the Minister responsible for Statistics Canada

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November 2006

Catalogue no. 16-201-XPE

ISSN 1703-5775

Catalogue no. 16-201-XIE

ISSN 1703-5783

Frequency: Annual

Ottawa

La version française de cette publication est disponible sur demande (n° 16-201-XIF au catalogue).

Note of appreciation

Canada owes the success of its statistical system to a long standing partnership between Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued cooperation and goodwill.

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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 *Statistics Act*
- E use with caution
- F too unreliable to be published

Acknowledgements

Human Activity and the Environment: Annual Statistics 2006 has been prepared by the Environment Accounts and Statistics Division under the direction of **Robert Smith** (Director). **Patrick Adams** served as editor and project manager and **Laurie Jong, France Mondoloni** and **Hélène Trépanier** were the database managers and technical editors. Major contributions to the statistics and analysis presented in the report have been made by:

Patrick Adams

Michelle Tait

Jennie Wang

Thanks to the following people for their technical support in the areas of marketing, graphic design, map creation, translation, reviewing, editing, proofreading, dissemination and technical development:

Johanne Beauseigle

Suzanne Carrière

Line Ménard D'Aoust

Louise Demers and her team

Monique Deschambault

Giuseppe Filoso

Jesse Flowers

Elizabeth Irving

André La Chapelle

Ginette Anaëlle Lavoie

Martin Lemire

Dennis O'Farrell

Marc Pelchat and his team

Gerry Savage

Joe St. Lawrence

Doug Trant

Tom Vradenburg

Karen Watson

The support of the following federal departments and agencies through data provision and / or report review is also gratefully acknowledged:

Agriculture and Agri-Food Canada

Environment Canada (Enforcement Branch; Meteorological Service of Canada; Strategic Policy Branch, Knowledge Integration Strategies Division; Science and Technology Branch, Greenhouse Gas Division and Pollution Data; Environmental Stewardship Branch, Canadian Wildlife Service, Environmental Protection Operations and Transportation Division)

Fisheries and Oceans (Statistical Services, Economic and Policy Analysis Directorate)

Natural Resources Canada (Earth Sciences Sector, Geoaccess Division; Minerals and Metals Sector, Minerals and Mining Statistics Division; Energy Policy Sector, Oil Division)

Statistics Canada (Agriculture Division; Demography Division; Industry Accounts Division; Labour Statistics Division; Manufacturing Construction and Energy Division; Public Institutions Division; Science, Innovation and Electronic Information Division; Transportation Division)

Transport Canada (Surface and Marine Statistics and Forecasts; Environmental Affairs, Sustainable Development)

Canadian Council of Forest Ministers

Canadian Council of Ministers of the Environment

Canadian Council on Ecological Areas

Canadian Wildlife Federation

Canadian Political Science Association and Social Science Research Council of Canada

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Overview

Human Activity and the Environment publication

Canadians recognize the importance of a clean and healthy environment. We understand that the capacity of the environment to supply materials and absorb wastes is finite. But to be effective at reducing our collective impact on the environment we need systematic, accessible and relevant information. Without such information, we are unable to understand and respond to environmental change.

The annual *Human Activity and the Environment* (HAE) publications meet this need with a collection of environmental statistics brought together from many sources. The goal is to paint a statistical portrait of Canada's environment with special emphasis on human activity and its relationship to natural systems—air, water, soil, plants and animals.

Each annual issue of HAE begins with a feature article (section 1) covering a current environmental issue of concern to Canadians. The in-depth article provides data and analysis which complement the information presented in the *Annual statistics* compendium that follows.

The *Annual statistics* compendium of the HAE report serves as a general reference for environmental statistics in Canada, pointing readers to available data on environmental-human interactions. Divided into three sections, the compendium is organized using the state-pressure-response framework, in which information is classified as measuring the state of the physical environment at a point in time, the pressure placed on the environment by human activities, or the socio-economic response to environmental conditions. The current report includes 85 data tables, 14 charts and 7 maps, along with data highlights that briefly describe notable developments in relation to human activity and the environment to help the reader navigate through the data holdings.

Feature article

Section 1

The feature article "Transportation in Canada (section 1)" focuses on major trends in transportation and the resulting environmental impacts. The article concludes with a look at what is being done by government, business and citizens to help mitigate the effects of transportation on the environment.

Annual statistics; an environmental data compendium

Section 2

"Canada's physical environment (section 2)" presents information and statistics on Canada's physiography and climate. Physiography, or physical geography, is the study of the physical features of the earth's surface. This section covers two of the key elements that make up Canada's physiography: land cover and hydrology.

Climate can be defined as the average weather that occurs in a specific area over a period of time. Humans rely heavily on the regularity of climate patterns for almost all of their activities. Climate is measured using various weather elements as indicators. These are presented in this section of the compendium.

Section 3

"Pressures on Canada's Environment (section 3)" begins by presenting information on the driving forces that shape the relationship between human activities and the environment—namely population, economic conditions

and transportation. The section then examines one of the main sources of impacts on the environment—natural resource consumption—by presenting data and highlights on agriculture, fisheries, forestry, minerals and energy. The section concludes by looking at the impacts human activities have on ecosystems, focusing on air, land, water and wildlife statistics.

Section 4

"Socio-economic response to environmental conditions (section 4)" explores the way governments, businesses and households try to respond and adapt as environmental conditions change. This chapter describes activities and practices aimed at minimizing or reducing the harmful effects of human activity on the environment.

Related products

Selected publications from Statistics Canada

11-509-X	Human Activity and the Environment
16-251-X	Canadian Environmental Sustainability Indicators
16-253-X	Canadian Environmental Sustainability Indicators: Socio-economic Information

Section 1

Transportation in Canada



Transportation provides people and businesses with services that are fundamental to our standard of living and well-being. The transportation system connects communities by moving people and goods and, in an increasingly globalized world, it is vital to trade and competitiveness.

In Canada, we demand much from transportation, with our geographically dispersed yet highly urbanized population and heavy dependence on trade.

Our transportation system has more kilometres of roads per person than almost any other nation. It also includes: 10 major international airports

and 300 smaller ones; 72,093 km of operating railroad tracks; and more than 300 commercial ports and harbours, which provide access to three oceans and the Great Lakes St. Lawrence Seaway System.^{1,2}

Our rising population and continued growth in trade are pushing up transport-related energy usage as never before. We rank near the top in per capita use of fossil fuels, and we pay a price: from greenhouse gas emissions and air pollution to contamination of water and soil.

Large portions of land are devoted to transportation and wildlife habitat is fragmented by its infrastructure. Transportation's effects on the environment are felt locally and globally.

Governments and businesses are running programs and developing new techniques and technologies to help reduce transportation's impact on the environment. Individuals also play a role.

1. Transport Canada, 2004, *Transportation in Canada, 2004 Annual Report*, catalogue no. T1-10/2004E, www.tc.gc.ca/pol/en/report/anre2004/add/aba71.htm (accessed March 2, 2006).
2. Transport Canada, 2003, *Canada's Transportation System*, www.tc.gc.ca/pol/en/brochure/default.htm (accessed September 12, 2006).

1.1 Transportation trends



1.1.1 Transportation: an economic driver

The 'transportation industries'—those that use aircraft, trucks, trains, ships or other equipment to provide transportation services to clients for a fee—accounted for 3.7% of Canada's economic output as measured by Gross Domestic Product (GDP) in 2000. While this makes up a significant share of economic activity, recent research shows that transportation services contribute far more to the economy if we look beyond the 'for-hire' transportation industry.³ This is because many non-transportation industries, from forestry and logging to wholesale trade, produce their own transportation services by operating fleets of trucks, buses or ships. When the value of these 'in-house' transportation services is added to the mix, the contribution of transportation to GDP jumps to 6.3%. This places transportation's contribution ahead of retail trade, construction and the mining, oil and gas industries. The number one occupation among men, according to the 2001 census, was truck driver.

When we talk about 'transportation,' the use of private vehicles to get around in our daily lives is also a significant component of the overall picture.

1.1.2 Moving people: how Canadians get around

Canadians must cover a lot of ground—both to cover the distance between far-flung urban centres and to

move around within them. As a result, they are very dependent on passenger transportation (text table 1.1).

As in most developed countries, Canadians are very reliant on the automobile. From the postwar era onwards, vehicle ownership rates were spurred on by relatively low prices for vehicles and gasoline, increased spending on expressways and road systems, and socioeconomic factors like higher household incomes, smaller-sized households, and more women entering the workforce.⁴ In 1951 there were nearly 5 people for every vehicle registered in Canada. By the mid-1980's this number had fallen to less than two persons per vehicle (chart 1.1).

As the number of vehicles continued to climb, consumer tastes shifted away from the family sedan towards light trucks—vans, sport utility vehicles (SUVs) and pickups. From 2000 to 2005, the number of light trucks on Canadian roads grew by more than one-quarter, while the number of cars and station wagons fell by 1%. In 2005, vans, SUVs and pickups made up 42% of the 18 million light vehicles⁵ on the road in Canada. These vehicles tend to use more fuel than cars and station wagons (text table 1.2).

4. Environment Canada, 1996, *The State of Canada's Environment-1996*, <http://www.ec.gc.ca/soer-ree/English/SOER/1996report/Doc/1-7-5-4-4-1.cfm> (accessed September 12, 2006).

5. Vehicles weighing less than 4.5 tonnes.

3. *The Economic Importance of Transportation in Canada: Measuring Own-account Transportation Toward the Development of a Transportation Satellite Account*, catalogue no. 13-597-X.

Growing rates of urbanization

While our widespread dependence on the automobile can be attributed to many factors, suburban expansion may be one of the most important. In 2001, 80% of the Canadian population lived in an urban area compared to just under 76% two decades earlier. For the majority of these urban areas, population growth has been fastest in the suburban fringe.

At the same time, employment growth in the suburbs has been on the rise. According to the Census, between 1996 and 2001, for each new job created within a 5 km radius of a city core, nearly five were created in the suburbs.

As more people and jobs have become 'suburbanized,' commuting patterns have become more complex and diffuse. The suburb-to-city-core commuting route, the one that is most easily supported by traditional public transit systems, has increasingly given way to suburb-to-suburb commutes. Even reverse daily commuting—from city core to suburb—is becoming more common.

Canadians living or working in more distant suburbs are much more likely to drive to work than to use the bus or some other means (text table 1.3).

According to the General Social Survey of time use, the proportion of workers in Canada who used the bus or subway to get to and from work remained steady at about 12% between 1992 and 2005. In large urban areas, where service is more accessible to commuters, this proportion was higher—20% of workers in Canada's six largest metropolitan areas used the bus or subway for part or all of their commute in 1992 and 2005.⁶

Whether they use public transit or travel by automobile, workers are spending more time commuting to and from work. Average commute time varies from region to region, but for Canada as a whole, commuters spent an average of 63 minutes getting to work

6. *The time it takes to get to work and back, General Social Survey on Time Use: Cycle 19, catalogue no. 89-622-X.*

7. *Ibid.*

and back again in 2005, compared to 59 minutes in 1998 and 54 minutes in 1992.⁷

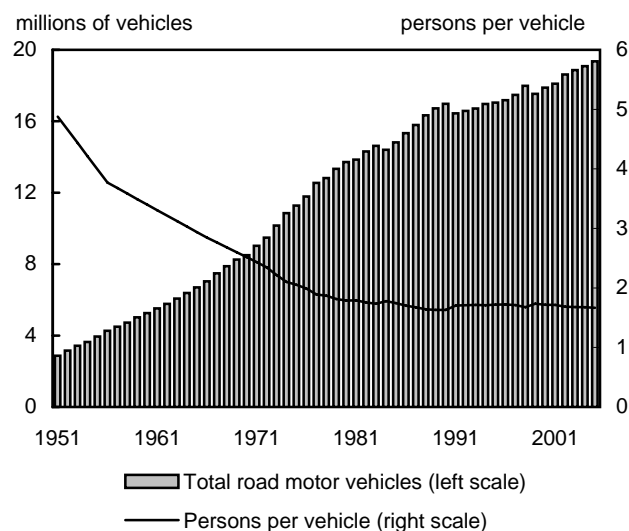
Text table 1.1
Passenger transportation, 2003

Mode	Passenger movement	
	Passenger-kilometres ¹	Passenger trips
	millions	
Cars and light trucks	463,156	12,017
Urban transit	.	1,628
Air	90,326	42
Intercity bus	.	15
Rail	1,426	4

1. Passenger-kilometres are derived by multiplying the number of passengers by distance travelled.

Source(s): Transportation Division, Canadian Vehicle Survey, 2004 (revised), catalogue no. 53-223-X; Aviation Service Bulletin, catalogue no. 51-004-X, Vol. 37, no. 6; Rail in Canada, 2004, catalogue no. 52-216-X.

Chart 1.1
Road motor vehicles



Note(s): In 1999, Statistics Canada changed the data collection methodology for road motor vehicles. Some of the difference in the vehicle trend after 1999 may be attributable to this methodological change.

Source(s): Canadian Political Science Association and Social Science Research Council of Canada, 1965, Historical Statistics of Canada, M.C. Urquhart, catalogue no. HA746 U7, Toronto; 1983, Historical Statistics of Canada, Second Edition, F.H. Leacy (edition), catalogue no. 11-516-X and CANSIM tables 051-0001, 405-0001 and 405-0004.

Text table 1.2
Vehicle activity by vehicle body type, 2005

	Vehicles	Vehicle- kilometres	Passenger- kilometres	Litres of gasoline	Distribution			Distance driven	Persons per vehicle	Fuel efficiency	
					Vehicles	Vehicle- kilometres	Passenger- kilometres				Litres of gasoline
	millions	billions			percent			thousand of kilometres	number	litres per 100 kilometres	
Total light vehicles ¹	18.0	287.7	493.7	29.2^E	100.0	100.0	100.0	100.0	16.0	1.7	10.6
Light trucks or vans											
Van	2.9	53.6	111.7	6.0 ^E	16.1	18.6	22.6	20.7	18.5	2.1	11.5
Sport utility vehicle	1.4	23.3	45.0	F	7.9	8.1	9.1	...	16.5	1.9	...
Pickup	3.3	49.5	76.8	5.9 ^E	18.3	17.2	15.6	20.4	15.0	1.6	14.0
Cars and station wagons											
Car	10.0	154.3	249.7	13.6 ^E	55.7	53.6	50.6	46.6	15.4	1.6	9.1
Station wagon	0.3	5.1	7.9	F	1.7	1.8	1.6	...	16.7	1.6	...

1. Includes other vehicle types in addition to light trucks and light automobiles.

Note(s): These data exclude the territories. Figures may not add up to totals due to rounding.

Source(s): CANSIM tables 405-0062, 405-0063, 405-0064, 405-0114 and 405-0115.

1.1.3 Freight transport

As with the movement of people, demand for freight transportation has grown steadily in recent decades and continues to rise—especially the demand for truck transport.

In Canada, more goods are shipped by water (443 million tonnes in 2003) and rail (338 million tonnes) than by any other means; the lion's share of coal, lumber and other heavy bulk goods is carried by these behemoths of transport. For-hire trucking followed closely in third place, carrying 305 million tonnes (chart 1.2). Air cargo ranked a distant fourth, carrying 663 thousand tonnes⁸ of mainly high-value goods in 2003.

Although trucking's share takes third place in weight terms, its importance in the overall scheme of freight transportation has grown substantially. From 1990 to 2003, the amount of freight carried by the for-hire trucking industry grew nearly three times faster (75%) than all other modes combined (up a collective 27% over the same period).

What's more, these numbers do not include goods shipped by 'private trucking'—trucking fleets owned or leased by companies outside of the trucking industry who look after their own shipping—or by small and local for-hire carriers. In economic output terms—as measured by GDP—private trucking and delivery services accounted for more than half (58%) of trucking's overall contribution to GDP in 2000.⁹

8. *Aviation Service Bulletin*, catalogue no. 51-004-X, Vol. 37, no. 6.

9. *The Economic Importance of Transportation in Canada: Measuring Own-account Transportation toward the Development of a Transportation Satellite Account*, catalogue no. 13-597-X.

Text table 1.3
Census metropolitan area workers by commuting mode, 2001

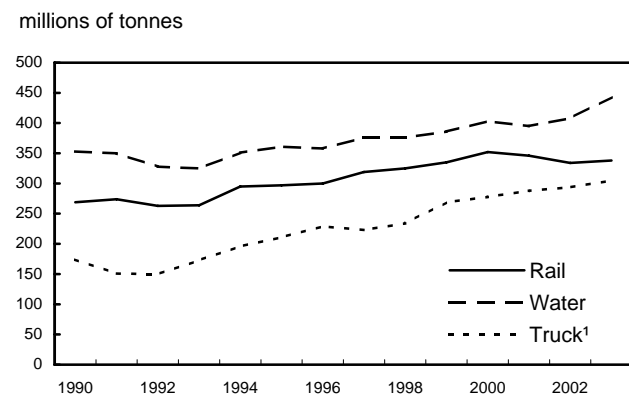
	Public transportation	Driver	Passenger	Walk	Bicycle	Other
	percent					
Residence to city centre						
0 to 5 kilometres	16.5	61.2	6.6	12.2	2.5	1.1
5 to 10 kilometres	20.7	65.3	6.8	5.0	1.4	0.7
10 to 15 kilometres	17.8	70.0	6.9	3.8	0.8	0.7
15 to 20 kilometres	15.8	71.8	7.5	3.6	0.7	0.6
20 to 25 kilometres	12.2	76.1	7.6	3.0	0.5	0.6
More than 25 kilometres	7.0	80.1	7.6	3.9	0.7	0.7
Residence to job ¹						
0 to 5 kilometres	14.9	57.0	8.3	15.8	2.7	1.3
5 to 10 kilometres	19.8	70.5	7.2	0.8	1.0	0.6
10 to 15 kilometres	17.0	75.6	6.1	0.5	0.4	0.4
15 to 20 kilometres	14.5	78.6	5.8	0.5	0.2	0.4
20 to 25 kilometres	13.3	80.2	5.5	0.5	0.1	0.4
More than 25 kilometres	11.1	79.2	5.9	2.6	0.4	0.8

1. Some individuals reside in a different census metropolitan area from which they work. Consequently, these results must be interpreted with caution.

Note(s): Includes all individuals aged 15 and older working at a usual place of work in census metropolitan areas.

Source(s): "Work and Commuting in Census Metropolitan Areas, 1996-2001, Trends and Conditions in Census Metropolitan Areas", catalogue no. 89-613-M.

Chart 1.2
Freight shipped for selected modes of transport



1. These figures pertain only to Canada-based for-hire trucking carriers.

Source(s): Shipping in Canada, catalogue no. 54-205-X; Rail in Canada, catalogue no. 52-216-X; Trucking in Canada, catalogue no. 53-222-X.

Trucking and trade

Spurred on by trade agreements—from the Auto Pact (1966) to NAFTA (1994)—Canada's trade with the US grew by 191% from 1990 to 2005.¹⁰ As bilateral trading partners go, Canada and the US rank first in the world.

For the for-hire trucking industry, this has meant an ever-increasing demand for freight movement over the border. On a tonne-kilometre basis (taking weight of shipments *and* distance traveled into

account) truck traffic moving across the Canada-US border grew five times faster than domestic traffic, between 1990 and 2003 (chart 1.3).

A booming 'scheduled' economy

The ability to deliver goods door-to-door—in sync with customers' production and distribution needs—has made trucking a highly valued service for the scheduled economy. The 'just-in-time' delivery of freight, where parts and products are scheduled to arrive as they are needed, helps firms stay leaner and more competitive by reducing the costs of carrying large inventories.¹¹ From 1992 to 2005, manufacturers were able to reduce inventories as a share of shipments by 15%,¹² thanks in part to more frequent deliveries by truck.

1.1.4 Fuelling the economy

Growing demand for both passenger and freight transportation continues to push up demand for gasoline and diesel fuel in Canada. From 1990 to 2004, the volume of fuel purchased at the pump grew by more than 20%. Over the same period, growing demand for trucking (particularly for the services of heavy trucks) helped push up fuel consumption by road transport and urban transit by more than 70%. While most retail pump sales are made to individuals,

11. *Too many trucks on the road?*, Analysis in Brief, no. 28, catalogue no. 11-621-M.

12. CANSIM table 304-0014.

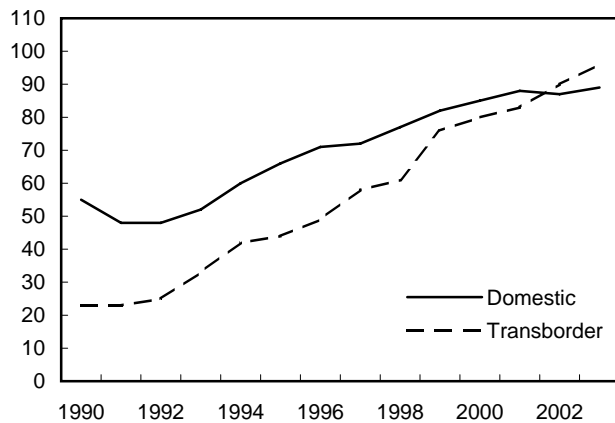
10. Statistics Canada, International Trade Division.

some commercial vehicles including taxis and fleet vehicles also purchase retail fuel (text table 1.4).

While overall fuel consumption by the transportation industry continues to rise, the 'intensity' with which transport industries are using energy has tended to fall over time. Put another way, when comparing energy use to economic output, these industries are using less and less energy for each thousand dollars of real gross domestic product in transportation services (chart 1.4).

Chart 1.3
Domestic and transborder shipments by truck¹

billions of tonne-kilometres



1. These figures pertain only to Canada-based for-hire trucking carriers.
Source(s): Trucking in Canada, catalogue no. 53-222-X.

Text table 1.4
Transportation's consumption of refined petroleum products¹

	Total	Railways	Airlines ²	Marine ²	Road transport and urban transit	Retail sales (pumps)
	thousands of cubic metres					
1990	45,991	2,313	4,078	2,640	4,419	32,541
1991	44,484	2,143	3,687	2,733	4,474	31,447
1992	45,596	2,241	3,921	2,711	4,657	32,067
1993	46,537	2,233	3,756	2,397	5,104	33,048
1994	49,086	2,310	4,015	2,574	5,979	34,208
1995	49,560	2,092	4,244	2,523	6,450	34,251
1996	51,005	2,046	4,941	2,480	6,690	34,849
1997	52,562	2,074	5,082	2,481	7,147	35,778
1998	54,158	1,999	5,227	2,919	7,197	36,817
1999	55,688	2,116	5,583	2,741	7,345	37,902
2000	55,880	2,169	5,634	2,801	7,175	38,101
2001	55,332	2,132	5,015	3,016	6,721	38,448
2002	55,486	1,934	5,299	2,718	6,871	38,665
2003	56,884	1,928	5,336	2,525	7,368	39,728
2004	59,351	1,959	5,823	2,803	7,573	41,193

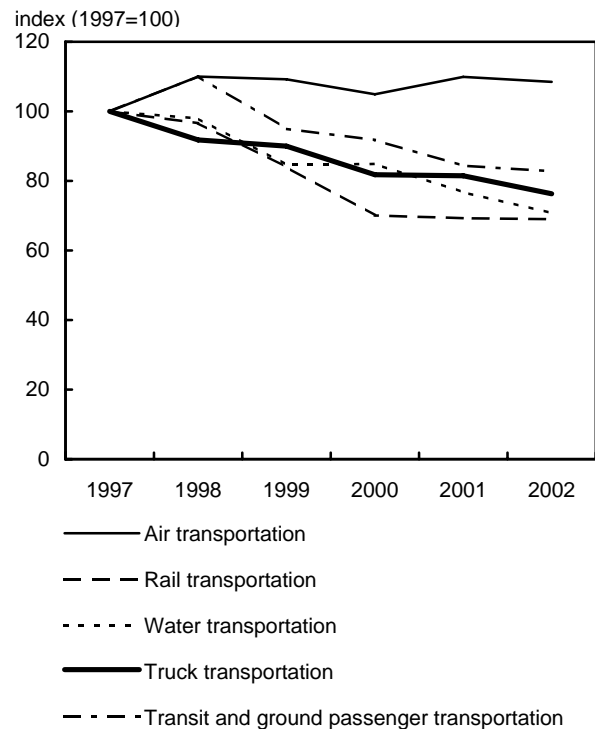
1. Refined petroleum products refers to motor gasoline, diesel fuel oil, light fuel oil, heavy fuel oil, aviation gasoline and aviation turbo fuel.

2. Includes fuels purchased in Canada by domestic and foreign companies.

Note(s): Figures may not add up to totals due to rounding.

Source(s): CANSIM tables 128-0003 and 128-0010.

Chart 1.4
Energy intensities¹ for selected transportation industries



1. Based on gigajoules of energy per thousand dollars of real gross domestic product in transportation services.

Source(s): CANSIM tables 153-0032 and 379-0017.

1.2 Transportation's environmental impacts



From urban sprawl and gridlock to air pollution from high-flying jets, the transportation choices we make every day affect the environment.

Significant environmental effects result from the use of fossil fuels. Transportation consumed 31% of all energy used in Canada in 2004, the second largest user after industry (mining, manufacturing, forestry, and construction).¹³

Paving over land for highways and parking lots, introducing invasive species (such as zebra mussels in the Great Lakes) and throwing out old tires and used motor oil are other ways transportation can affect the environment (text table 1.5).

1.2.1 The air we breathe

A significant portion of regional air pollution results from transportation activities. In Canada, the major air pollutants—known as 'criteria air contaminants' (CAC)—are monitored by the National Air Pollution Surveillance Network at over 150 stations in 55 cities across the country. (Text box **Criteria air contaminants**.)

Transportation is a major emitter of three of these contaminants: nearly three-quarters of the carbon monoxide (CO), more than one-half of the nitrogen

oxides (NO_x) and more than one-quarter of the volatile organic compounds (VOC) in 2004¹⁴ (text table 1.6).

The good news is that, over time, transportation's output of CAC has declined. The introduction of catalytic converters, cleaner burning fuels and higher fuel efficiency standards have all contributed to the decrease. For example, NO_x emissions from transportation were 19% lower in 2004 than in 1990. In the same period, CO and VOC emissions each dropped 37% (chart 1.5 and text table 1.6).

However, these emissions continue to be a concern because of their potential environmental and human health impacts. For example, NO_x and VOC are precursors to the formation of ground level ozone—a key component of smog. NO_x is also a major contributor to acid rain. Small amounts of CO can slow human response and perception, and prolonged exposure to low levels—or brief exposure to high concentrations—can cause unconsciousness and death.

While the bulk of CAC emissions come from road sources, not all types of vehicles contribute equally to the mix. Heavy-duty vehicles (including tractor trailers, for example) were responsible for 25% of transportation NO_x emissions in 2004. Light trucks—vans, SUVs and pickups—contributed 22% of transportation VOC and 31% of transportation CO emissions; light automobiles—cars and station wagons—were accountable for 23% of VOC and 30% of CO.

13. CANSIM table 128-0009.

14. Environment Canada, Pollution Data Section.

Criteria air contaminants

Criteria air contaminants: Criteria air contaminants (CAC) are a concern due to potential effects on human health and ecosystems. They include:

Total particulate matter (TPM): Particulate matter is a broad category of air pollutants that includes a range of small solids or liquids varying in size and chemical composition. Total particulate matter refers to all particles with a diameter less than 100 microns.

Particulate matter less than or equal to 10 microns (PM₁₀): A subset of TPM consisting of particles that are 10 microns or less in size. Sources include windblown soil, road dust and industrial activities. These particles can travel into the lungs and may be captured by lung tissue.

Particulate matter less than or equal to 2.5 microns (PM_{2.5}): A subset of PM₁₀ consisting of particles that are 2.5 microns or less in size. Particles are formed through the chemical transformation of gases released from sources such as motor vehicles, gas plants and forest fires. PM_{2.5} is thought to be more dangerous than PM₁₀ because it can travel deeper into the lungs.

Carbon monoxide (CO): A toxic, colourless, odourless gas generated primarily from the incomplete combustion of fossil fuels. CO displaces oxygen in red blood cells, reducing the amount of oxygen available for respiration.

Nitrogen oxides (NO_x): Air pollutants that consist primarily of nitric oxide (NO) and nitrogen dioxide (NO₂) produced by the reaction of nitrogen (N₂) and oxygen (O₂) in air at high temperatures in internal combustion engines and furnaces. Nitrogen oxides contribute to the formation of ozone, the production of particulate matter and acid deposition (including acid rain).

Sulphur oxides (SO_x): A group of gases—mainly sulphur dioxide (SO₂)—produced by the combustion of fossil fuels and by natural sources such as volcanoes. Sulphur dioxide, a colourless gas with a pungent odour, irritates the upper respiratory tract in humans and leads to acid rain.

Volatile organic compounds (VOCs): Any organic compound that has a high tendency to pass from the solid or liquid state to the vapour state under typical environmental conditions. Such compounds participate in a range of processes that lead to atmospheric pollution, including the formation of ground-level ozone, a component of smog.

Source(s): *Human Activity and the Environment 2000*, catalogue no. 11-509-X. Wood Buffalo Environmental Association, Glossary and Technical Information, 2006, www.wbea.org/am/gloss.aspx#17 (accessed April 17, 2006).

1.2.2 Living in a greenhouse

Naturally occurring greenhouse gases (GHG) help regulate the planet's climate by trapping solar energy, which warms the earth's surface. However, since industrialization, GHG emissions from human activities have amplified this natural process, and scientists predict that this trend will continue.¹⁵

Transportation is a major source of GHG emissions. In 2004, transportation accounted for 26% of total GHG emissions in Canada and 28% of emissions growth since 1990. Greenhouse gases emitted by transportation include carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O).¹⁶

From 1990 to 2004, GHG emissions from transportation rose 30%, or almost 45 megatonnes. Our growing dependence on road vehicles to move people and goods was the main contributor to the increase (text table 1.7). Eighty-six percent of the increase in transportation's emissions came from road vehicles, in particular light trucks and heavy-duty vehicles (chart 1.6).

SUVs, pickups and vans have grown in popularity. From 2000 to 2005, the fleet of light automobiles fell 1%, while the number of light trucks rose 26%, according to the Canadian Vehicle Survey.¹⁷ Generally, light trucks are heavier and have greater horsepower than cars. In 2005, the average fuel efficiency for cars in the Canadian vehicle fleet was 9.1 L/100 km; for pickups, 14.0 L/100 km; and for vans, 11.5 L/100 km.¹⁸

15. Environment Canada, Statistics Canada and Health Canada, 2005, *Canadian Environmental Sustainability Indicators, 2005*, catalogue no. 16-251-X.

16. Environment Canada, 2006, *National Inventory Report: Greenhouse Gases Sources and Sinks in Canada, 1990-2004*, Gatineau, 2006.

17. CANSIM table 405-0064.

18. CANSIM tables 405-0063 and 405-0015.

Text table 1.5
Selected environmental impacts by type of transport

	Air	Land	Water	Solid waste	Noise	Other
Cars and trucks	Air pollution and greenhouse gas emissions	Land taken for highways, roads, parking lots and other infrastructure; extraction of road building materials; habitat disturbance; corridor creation; release of contaminants (spills, road salt)	Surface and groundwater pollution; modification of water systems through road building	Waste oil, tires and other materials; road vehicles and parts taken out of service	Noise and vibration in cities and along main roads	Animal kills; congestion
Trains	Air pollution and greenhouse gas emissions	Land taken for terminals, track and rights of way; habitat disturbance; corridor creation	Modification of water systems in railway construction	Rolling stock and related equipment taken out of service	Noise and vibration around terminals and along railway lines	Animal kills
Planes	Air pollution and greenhouse gas emissions	Land taken for terminals and runways; habitat disturbance	Modification of water systems in airport construction	Aircraft and parts taken out of service	Noise and vibration around airports	Bird kills
Water transport	Air pollution and greenhouse gas emissions	Land taken for ports and other infrastructure; habitat disturbance	Release of substances into water (discharge of ballast water, oil spills); modification of water systems in port construction, canal cutting, and dredging	Vessels and parts taken out of service	Noise and vibration around terminals and port facilities	Animal kills; introduction of invasive species

Source(s): Human Activity and the Environment 2000, catalogue no. 11-509-X.

Text table 1.6
Criteria air contaminant emissions from transportation

	1990	2004	Change 1990 to 2004
	tonnes		percent
Total particulate matter	98,710	70,949	-28
Particulate matter less than or equal to 10 microns	97,444	69,872	-28
Particulate matter less than or equal to 2.5 microns	89,236	63,484	-29
Sulphur oxides	113,431	66,022	-42
Nitrogen oxides	1,577,967	1,274,212	-19
Volatile organic compounds	995,686	630,291	-37
Carbon monoxide	11,746,035	7,375,378	-37

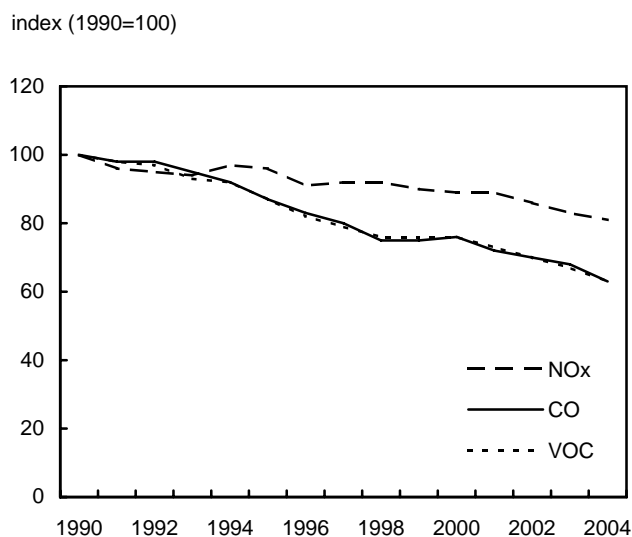
Source(s): Environment Canada, Pollution Data Section.

The share of freight moved by road relative to other types of transportation is also affecting GHG emissions. Just-in-time delivery—in lieu of carrying large inventories—means trucks are making more trips. The number of tractor trailers registered

was 32% larger in 2005 than in 2000; the number of straight trucks was up 12%.¹⁹

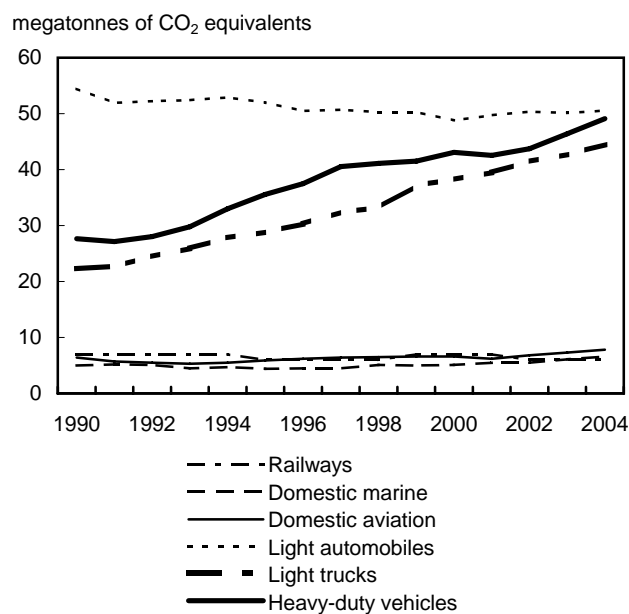
¹⁹ CANSIM table 405-0064.

Chart 1.5
Emissions of NO_x, CO and VOC from transportation



Source(s): Environment Canada, Pollution Data Section.

Chart 1.6
Greenhouse gas emissions from transportation



Source(s): Environment Canada, 2006, National Inventory Report, Greenhouse Gas Sources and Sinks in Canada, 1990-2004, Gatineau.

Text table 1.7
Greenhouse gas emissions from transportation

	Carbon dioxide (CO ₂)		Methane (CH ₄)		Nitrous oxide (N ₂ O)		CO ₂ -equivalents ¹		
	1990	2004	1990	2004	1990	2004	1990	2004	Percentage change 1990 to 2004
	kilotonnes						percent		
Transportation	142,000	185,000	30	30	20	30	150,000	190,000	29.9
Domestic aviation	6,220	7,590	0.5	0.4	0.6	0.7	6,400	7,800	22.0
Road transportation	103,000	140,000	16	12	12	16	107,000	145,000	35.9
Light automobiles	52,300	48,600	9	4	6	6	54,400	50,600	-7.2
Light trucks	20,900	41,800	4	5	4	8	22,300	44,500	99.6
Heavy-duty vehicles	27,300	48,500	2	3	1	2	27,700	49,100	77.5
Motorcycles	225	214	0.18	0.17	0.00	0.00	230	219	-4.8
Propane and natural gas vehicles	2,160	837	2	1	0.04	0.02	2,200	870	-60.7
Railways	6,320	5,350	0.3	0.3	3	2	7,000	6,000	-15.3
Domestic marine	4,730	6,260	0.4	0.5	1	1	5,000	6,600	31.3
Other	22,000	26,000	10	10	4	6	20,000	30,000	17.9

1. CO₂ equivalent emissions are the weighted sum of all greenhouse gas emissions. The following global warming potentials are used as the weights: CO₂ = 1; CH₄ = 21; N₂O = 310.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Environment Canada, 2006, National Inventory Report, Greenhouse Gas Sources and Sinks in Canada, 1990-2004, Gatineau.

Aircraft emissions

Aircraft generate many of the same emissions as do vehicles operating on land or ships at sea, including NO_x, CO₂, SO_x and H₂O. However, because emissions from aircraft in flight are released at high altitude into highly sensitive atmospheric regions, their impact can be quite different. While carbon dioxide emissions have a similar impact whether emitted from aircraft or sources on the ground, emissions of NO_x and the condensation trails left in an airplane's wake have different effects.

The altitude at which emissions of NO_x are released is vital in determining their impact. Most NO_x emissions from today's aircraft are released in the troposphere (the atmospheric layer extending from the earth's surface to about 10 km) and the lower-most part of the stratosphere (the layer between about 10 km and 50 km) where they react with VOC to produce ozone. At this level, ozone acts as a greenhouse gas. In contrast, the effect of NO_x emissions in the upper stratosphere by high-flying supersonic aircraft would have a different effect. Emissions here would result in reduced ozone. This effect is a concern because stratospheric ozone absorbs potentially harmful ultraviolet radiation.

The condensation trails, or contrails, commonly left in a plane's path can also affect climate. Contrails form when the temperature difference between the warm, moist engine exhaust gases and surrounding air is great enough to cause the vapour to reach saturation point and condense to form water droplets. These water droplets rapidly freeze, and the resulting contrails can spread to form cirrus cloud cover.

Contrails and aircraft-induced cirrus clouds affect climate in two ways: they reduce the amount of earth-emitted radiation escaping to space and they increase the amount of solar radiation reflected back into space. The former effect is greater than the latter; as a result, the earth's surface is warmed. One way to negate this impact is by reducing flight altitude. However, this raises concerns such as the restriction of airspace capacity and greater release of CO₂ due to less efficient aircraft operation.

Source(s): Grewe, V., M. Dameris, C. Fichter and D.S. Lee, 2002, "Impact of aircraft NO_x emissions, Part 2: Effects of lowering the flight altitude," *Meteorologische Zeitschrift*, 11, 3: 197-205. Intergovernmental Panel on Climate Change, 1999, *IPCC Special Report: Aviation and the global atmosphere*. Plummer, David, Environment Canada, Canadian Centre for Climate Modelling and Analysis, personal communication. Williams, V., R.B. Noland and R. Toumi, 2002, "Reducing the climate change impacts of aviation by restricting cruise altitudes," *Transportation Research, Part D*, 7: 451-464.

1.2.3 Land impacts

Transportation affects our land resources in many ways, including the loss of farmland, wetlands and animal habitat to urban sprawl, highway networks and airports. Soil contamination can result from road spills and from waste and litter that is improperly disposed of.

Transportation also consumes many raw materials—from fossil fuels to metals and minerals. In 2003, for example, 245 million tonnes of sand and gravel were mined across Canada, 70% of which was used for road construction, ice control and concrete and asphalt production.²⁰

Roads and sprawl

With so much distance to cover, Canada's road network comprises more than 1.4 million kilometres of highways and roads (text table 1.8), enough to circle the Earth 35 times. In cities, streets and parking lots

alone can take up as much as 35% to 50% of available land.²¹

Car culture has helped facilitate lower-density development in suburbs and surrounding countryside. With larger lot sizes, longer distances to amenities, meandering roads and fewer public transit options, the car is in some cases the only way to get around. As depicted in figure 1.1, the prevalence of short-stop streets and cul-de-sacs characteristic of suburban development contrasts sharply with the more easily navigable grid pattern typical of a downtown core.

Huge areas are cleared to develop new residential areas and create transportation corridors: once developed, this land is unlikely to be used for other purposes, such as agriculture. Since many cities started off as farming communities, development and the ensuing road-building often occur on our limited supply of good quality farmland. Forty-six percent of urban land occupies land formerly considered dependable for agriculture.²² By 2001, 40,400 square kilometres of Canada's farmland had been lost to

20. 2003, *Non-metallic Mineral Mining and Quarrying, catalogue no. 26-226-X*.

21. Berton, P., 1989, "Wheels: the car as a cultural driving force," *Canadian Geographic*, 109(6): 44-52, quoted in Environment Canada, *The State of Canada's Environment—1996*, www.ec.gc.ca/soer-ree/English/SOER/1996report/Doc/1-5-3-8-2-1.cfm (accessed March 23, 2006).

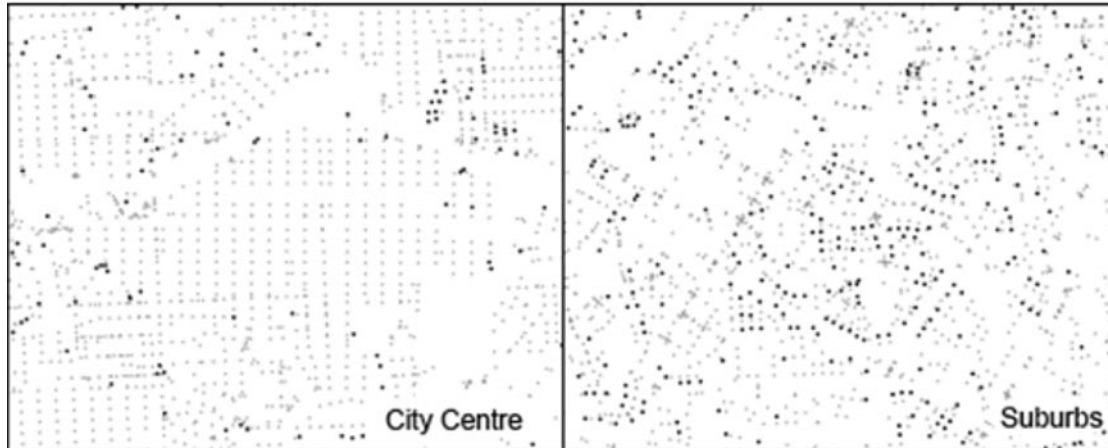
22. *The loss of dependable agricultural land in Canada, Rural and Small town Canada Analysis Bulletin*, Vol. 6, no. 1, catalogue no. 21-006-X.

other uses, up from 20,000 square kilometres in 1951. Of this total, 29% was used for transportation and

utilities, including roads, railways, airports and utility transmission lines (text table 1.9).

Figure 1.1

Connectivity, city centre versus suburban



Note(s): Dark dots indicate cul-de-sacs (dead ends). Grey dots represent intersections.

Source(s): Natural Resources Canada, Earth Sciences Sector, Canada Centre for Remote Sensing.

Text table 1.8

Road network, by province and territory, 2004

	Road length					Distribution			
	Freeway ¹	Primary highway	Secondary highway and major arterial	Local street and rural road ²	Total	Freeway ¹	Primary highway	Secondary highway and major arterial	Local street and rural road ²
	thousands of two-lane equivalent kilometres					percent			
Canada	16.9	85.8	114.6	1,191.6	1,408.8	1.2	6.1	8.1	84.6
Newfoundland and Labrador	0.2	1.4	5.4	20.1	27.1	0.7	5.2	19.9	74.2
Prince Edward Island	0.0	1.3	2.2	2.9	6.5	0.0	20.0	33.8	44.6
Nova Scotia	1.6	2.8	3.3	40.9	48.7	3.3	5.7	6.8	84.0
New Brunswick	1.3	1.5	6.2	67.5	76.6	1.7	2.0	8.1	88.1
Quebec	5.0	10.9	15.1	197.3	228.3	2.2	4.8	6.6	86.4
Ontario	5.7	10.2	34.2	180.4	230.6	2.5	4.4	14.8	78.2
Manitoba	0.2	8.2	10.8	85.3	104.5	0.2	7.8	10.3	81.6
Saskatchewan	0.1	20.5	12.6	216.8	250.3	0.0	8.2	5.0	86.6
Alberta	1.4	15.5	17.3	171.1	205.3	0.7	7.5	8.4	83.3
British Columbia	1.3	9.9	5.2	188.5	204.8	0.6	4.8	2.5	92.0
Yukon Territory	0.0	2.6	0.9	12.5	16.1	0.0	16.1	5.6	77.6
Northwest Territories	0.0	0.8	1.3	8.1	10.1	0.0	7.9	12.9	80.2
Nunavut	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	100.0

1. Freeways are defined as divided highways.

2. Includes roads with paved and unpaved surfaces.

Source(s): Transport Canada, 2004, Transportation in Canada, 2004 Annual Report, catalogue no. T1-10/2004E, www.tc.gc.ca/pol/en/report/anre2004/add/aba71.htm (accessed March 2, 2006).

Text table 1.9

Estimated area of non-agricultural uses of dependable agricultural land¹

	Urban and rural built-up ²	Transportation and utilities ³	Protected areas and campgrounds	Other ⁴	Total
square kilometres					
1951	11,400	7,400	1,000	200	20,000
1961	12,600	7,400	1,100	300	21,400
1971	14,300	8,200	1,300	500	24,300
1981	18,000	9,800	1,500	1,100	30,400
1991	21,100	10,600	2,100	1,700	35,500
2001	23,200	11,700	3,400	2,100	40,400

1. Includes class 1 to 3 in the Canada Land Inventory agricultural land classification.

2. Includes inventoried human settlements with populations above 1,000, settlements with a population under 1,000, and rural farmsteads and housing lots.

3. Includes roads, railways, airports and utility transmission lines.

4. Includes lumberyards, sewage treatment facilities, dumps, federal real property, cemeteries, pits, quarries, autowreckers and golf courses.

Note: Figures are rounded to the nearest 100.

Source: The loss of dependable agricultural land in Canada, Rural and Small town Canada Analysis Bulletin, Vol. 6, no 1, catalogue no. 21-006-X.

Wildlife and habitat

Besides consuming land, transportation infrastructure can have an impact on wildlife. Wide roads and busy highways can act as a barrier, limiting movement of small and large mammals. At the same time, road and rail corridors can facilitate the spread of plants and wildlife into new areas. Wildlife habitat can also be affected by train derailments and spills.

Animal kills are another way that transportation affects wildlife; however, available data are limited. The Insurance Corporation of British Columbia estimates that 2% of annual vehicle collisions in the province involve wildlife.²³ Collisions involving large animals, such as bear, deer and moose can be particularly dangerous. In Banff National Park in Alberta, a project on reducing road impacts on wildlife uses fencing, gates, underpasses and overpasses to limit animal

mortality on the highway while allowing animals to cross.²⁴

The construction of airports and subsequent air traffic can disrupt habitat and result in bird kills. To lessen this danger airports modify habitat, use sirens, cannons, lights and other equipment to discourage birds from approaching. Vancouver International Airport, which is located along a major Pacific bird flyway, reported that control officers killed 1,060 birds in 2005, and another 222 birds were killed in bird strikes with aircraft.²⁵

Contaminating soils

The risk of soil contamination from transportation and transportation infrastructure is also a concern. Corroding underground gas tanks can leak fuel into surrounding soil. Wood preservation chemicals can leach from railway ties. According to the National Pollutant Release Inventory, 2,704 tonnes of ethylene glycol, which is commonly used to de-ice airplanes, was released onto land in 2004.²⁶

Oil, gasoline, diesel, antifreeze, coolants and other substances regularly spill or leak onto roads. As they wear and break down, engines, tires and brakes produce pollutants. This mix of chemicals can run off onto surrounding roadsides. Studies show that concentrations of heavy metals are higher near heavily travelled roads.²⁷

Canadian producers shipped 13.8 million tonnes of salt in 2005,²⁸ much of it used to de-ice roads. It is estimated that close to 5 million tonnes of road salt

23. Insurance Corporation of British Columbia, 2006, *Wildlife Warning*, www.icbc.com/road_safety/roadsafety_tips_daily_wild.asp (accessed March 21, 2006).

24. Parks Canada, *Banff National Park of Canada, 2004, Park Management, Highway Mitigation Research in the Mountain Parks*, www.pc.gc.ca/pn-np/ab/banff/docs/routes/routes1_E.asp (accessed March 10, 2006).

25. Vancouver International Airport Authority, 2006, *Wildlife Management 2005 Summary Report*, www.yvr.ca/authority/facts/wildlife_management.asp?id=2005 (accessed March 21, 2006).

26. Environment Canada, Pollution Data Branch, 2006, *National Pollutant Release Inventory Database*, www.ec.gc.ca/pdb/npri/npri_dat_rep_e.cfm (accessed June 6, 2006).

27. Hoedrejaerv, H., A. Vaarman and I. Inno, 1997, "Heavy metals in roadside: chemical analysis of snow and soil and dependence of the properties of heavy metals on local conditions," *Proceedings of the Estonian Academy of Science: Chemistry*, 46(4), 153-167, quoted in William R. Black, 2003, *Transportation: A Geographical Analysis*, New York, The Guildford Press.

28. CANSIM table 152-0004.

are used in Canada each year.²⁹ Some environmental contamination risks of road salt are increased salinity of soils, damage to vegetation, contamination of ground and surface water, and fish mortality.

An indirect way that transportation can contaminate soil is through acid deposition, which occurs when emissions of sulphur and nitrogen oxides fall to the ground in dry form or as acid rain, fog or snow.

1.2.4 Water resources

Ships and boats releasing ballast water in ports and waterways can introduce alien species (for example, zebra mussels) and contaminate water resources. Transportation infrastructure—roads, railways, airports, ports and canals—can also modify water systems and impact their ecology.

Hydrological impacts

Dredging to allow the passage of larger ships removes bottom sediments, some of which may contain contaminants, and deposits them in a different location. Along with dredging, construction of ports, marinas and canals affects habitat, water flow and, ultimately, biodiversity. Eroded sediment from dirt and gravel roads can reach streams reducing fish spawning.

Impervious surfaces, such as roads and parking lots, affect water resources as well. Natural absorption of rainfall is impossible, so the groundwater under the surface cannot be replenished. Instead, the water runs off quickly along the surface or into storm sewer systems. As a result, streams may receive more water than they are able to accommodate, resulting in flooding. Runoff from roads and parking lots also contains pollutants, such as pulverized rubber, oils and lubricants, and salt in winter months. Some of these contaminants make their way into local water systems.³⁰

Release of hazardous substances

When we think of spills, we tend to think of catastrophic events such as the Exxon Valdez spill in 1989, which occurred off the coast of Alaska. However,

transportation-related spills happen every day on a much smaller scale.

Recreational boats, for example, are also a potential source of water pollution. Spilled fuel and oil, garbage dumped overboard and the use of chlorine bleach and phosphate soaps to clean boats can all affect water and aquatic life. A little can go a long way: a single litre of gasoline can make up to 1 million litres of water unfit for human consumption.³¹

Introduction of invasive species

The number one method by which alien invasive species enter Canadian waters is the release of ballast water. It is estimated that at least one-third of the 140 alien invasive species living in the Great Lakes were introduced through discharged ballast water.³² A full ballast tank is essential for a ship's stability when it is carrying little or no cargo. When cargo is loaded, the ballast water is discharged—along with any organisms living in it.

The zebra mussel—one of the most notorious and problematic invasive species in Canada—was introduced via discharged ballast water. The mussel has achieved densities as great as 300,000 per m² in the Great Lakes, where it thrives free of its natural predators.³³ This Caspian Sea native was accidentally introduced in 1988.

Release of ballast water is not the only means by which invasive species have been introduced to Canadian waters. Plant and animal life transported on the exterior of ships and boats and movement through canals and other waterways are also potential conduits for invasive species.

1.2.5 Congestion

Being held up in a traffic jam is frustrating: road construction, bad weather and traffic accidents can all cause congestion. However, where we choose to live, work and play are also contributing factors. As Canadians drive more, traffic congestion is a growing

29. Morin, David and Max S. Perchanok, 2003, "Road salt use in Canada," *Weather and Transportation in Canada*, ed: Jean Andrey and Christopher Knapper, Department of Geography, University of Waterloo, www.fes.uwaterloo.ca/Research/GeogPubs/pdf/transportation_andrey01.pdf (accessed March 2, 2006).

30. Black, William R. 2003, *Transportation: A Geographical Analysis*, New York, The Guilford Press.

31. Kruss, P., M. Demmer and K. McCaw, 1991, *Chemicals in the Environment*, Morin Heights, Quebec, Polyscience Publications.

32. Great Lakes Water Quality Board, 2001, *Alien Invasive Species and Biological Pollution of the Great Lakes Basin Ecosystem*, www.ijc.org/en/home/main_accueil.htm (accessed March 20, 2006).

33. Environment Canada, *The St. Lawrence Centre, 2000, The Unfolding Story of the Zebra Mussel in the St. Lawrence River*, catalogue no. EN40-591/2000E, Montreal, www.qc.ec.gc.ca/CSL/pub/pub004_e.html (accessed March 20, 2006).

problem in urban areas. It is also a major concern from an environmental standpoint.

Most people use their cars at peak times—during the morning and evening rush hours. In 2005, Canadians drove their cars and trucks 28% more on weekdays than on Saturdays or Sundays, according to the Canadian Vehicle Survey.³⁴

Idling and slow-moving vehicles caught in stop-and-go traffic use more fuel and, as a result, release more emissions than they would if their trips were made

in less time. A recent study by Transport Canada, which looked at the costs of urban traffic congestion for Canada's nine largest urban areas, estimated that approximately one-half billion litres of fuel is wasted annually because of congestion; this amounts to between 1.2 to 1.4 Mt of GHG emissions, according to the study. The majority of congestion occurs in Toronto, Montréal, and Vancouver, Canada's largest urban areas.³⁵

35. Transport Canada, Sustainable Development Branch, 2005, *Costs of Congestion in Canada's Transportation Sector*, www.tc.gc.ca/mediaroom/releases/nat/2006/06-h006e.htm (accessed July 18, 2006).

34. CANSIM table 405-0068.

Driving on thin ice

For most of us, an icy road is a driving hazard, but for many Northerners it is an essential part of mobility. Every year, winter roads are constructed over frozen rivers, lakes and rugged areas in northern Canada. For many northern communities these ice highways are the only means by which they can be reached by road.

The road system north of 60° is quite different in each of the three territories. In the Yukon almost all communities are accessible by the all-weather road system. In the Northwest Territories, about half of all communities are accessible by winter roads only and the other half by all-weather roads. No road linkages exist between communities in Nunavut.

Warming winter temperatures in the Canadian North are threatening the reliability of winter roads. Higher temperatures mean a shorter ice season and reduced ice thickness and strength, limiting the weight of vehicles that can travel on it. In addition, more time and money will have to be spent maintaining winter roads to ensure that conditions are safe.

All-weather roads, bridges and runways could also be affected by increasing temperatures. Thawing of the permafrost upon which many of these structures exist could threaten their stability and strength: this must be taken into account when these facilities are built. For example, building the runway at the Yellowknife airport involved digging down to the permafrost and laying insulation to prevent the permafrost from melting.

Source(s): Yukon Conservation Society, 2004, "Northern community impacts and adaptations," Impacts of Climate Change, High School Backgrounder 11, www.climatechangenorth.ca/section-BG/BG_HS_11_O_E.html, (accessed March 13, 2006). Transport Canada, 2005, Northern Transportation System Background Paper, www.tc.gc.ca/prairieandnorthern/CoordGrain/northerntransportation/menu.htm#contents (accessed November 18, 2005).

1.3 What is being done



Balancing the need to move people and goods with environmental considerations is a major challenge. Government and industry are responding with innovative programs, projects and new technologies. Individuals' choices and behaviours are also key to reducing the environmental impacts of transportation.

The responsibilities of each level of government are explained in the following text box (**Government responsibilities**).

1.3.1 Demand management

Transportation demand management is a set of strategies to make existing transportation systems more efficient, off-setting or delaying the need for infrastructure investments. Building cities and roads in ways that reduce congestion and bring homes, work and services closer together reduces the distance we need to travel on a daily basis. Flexible hours in the workplace can mute the effect of morning and evening rush hours as the transportation network is used more evenly throughout the day. Telework eliminates the need for commuting altogether. Ride-sharing and public transit take people out of single-occupant vehicles, as can disincentives such as parking fees, road tolls and gasoline taxes.

³⁶ Statistics Canada, International Trade Division.

³⁷ Government of Canada, 2005, *Government of Canada Announces Pacific Gateway Strategy*, www.tc.gc.ca/mediaroom/releases/nat/2005/05-gc013e.htm (accessed May 9, 2006).

Some specific projects are highlighted in the following text box (**Selected transportation projects**).

Transportation infrastructure

Whether it involves building new infrastructure, expanding on current infrastructure or simply making better use of what already exists, infrastructure improvements can help reduce congestion in cities and bottlenecks in inter-city corridors. Improvements in infrastructure design and use can result in reduced environmental impacts.

Relieving pressure at ports

Trade with Asia has grown in recent years and is expected to continue doing so. From 1990 to 2005 Canada's exports to China increased by 315% and imports from China ballooned by over 2,000%.³⁶ Canada's west coast—particularly the Port of Vancouver and Fraser Port—receives a large portion of Asian freight destined for North America.

As the amount of freight being handled increases, west coast infrastructure has come under strain, resulting in congestion. To relieve the pressure, key congestion areas in British Columbia's Lower Mainland have been targeted for infrastructure improvements. Replacing swing bridges and building overpasses to separate road and rail traffic along the route to the port in Delta will reduce travel times and increase reliability. This will make rail operations more efficient, improve the flow of local automobile traffic and reduce vehicle idling.³⁷

Government responsibilities

The municipal, provincial/territorial and federal governments have different responsibilities when it comes to transportation. All three levels are involved in initiatives to reduce transportation-related environmental impacts.

Municipal

Urban transportation systems and local planning decisions are the responsibility of municipal governments. At the municipal level, initiatives range from public transit improvements to the addition of high-occupancy vehicle lanes. Many of these projects are a combined effort of public and private sector parties.

Provincial/territorial

Provincial/territorial governments are responsible for intraprovincial transportation, including regulations for the provincial/territorial highway systems, marine, rail and air services as well as transportation policy. Passenger and freight on-road vehicles are the focus of the majority of provincial and territorial environmental initiatives because of their relatively large environmental impact.

Federal

The federal government is responsible for international and interprovincial transportation. The wide range of potential environmental effects of transportation is reflected in the number of acts and regulations that govern road, rail, marine and air transport; including, for example, the *Arctic Waters Pollution Prevention Act*, *Transportation of Dangerous Goods Act*, *Navigable Waters Protection Act* and the *Canada Shipping Act*. Transport Canada is the main federal body responsible for these acts. Regulations and standards for on-road and off-road emissions are the responsibility of Environment Canada under the *Canadian Environmental Protection Act*.

As well, expansion of the Port of Prince Rupert will provide a new destination for ships arriving in North America from Asia, helping to reduce congestion. Once complete, the port will be able to receive the largest of container vessels and will be the second largest handling facility on the Canadian west coast. Road and rail links will enable transport to destinations across Canada, the United States and Mexico.

Getting cars off the road

Many commuters prefer driving alone to carpooling or public transit. Transportation demand management projects attempt to make best use of existing transportation infrastructure and invest in alternatives to private vehicles, making public transit or carpooling a more appealing option.

Although it may not feel like it at rush hour, our highways are capable of handling more people if they are used more efficiently. Alberta, British Columbia, Ontario and Quebec allow buses, emergency vehicles and vehicles carrying at least two people to make use of high-occupancy vehicle (HOV) lanes. HOV lanes

provide faster travel when other lanes are congested and slow. HOV lanes encourage commuters to carpool or take transit, by making their trip to work much faster. By making better use of existing infrastructure, HOV lanes move more people through congested areas more efficiently.

Buses and trains are the major components of transit systems in Canada's largest cities. The first subway line in Toronto opened in 1952, while the Montreal metro opened in 1966. Light rail transit is used in Vancouver, Ottawa, Calgary, and Edmonton. Residents of the Toronto, Montreal and Vancouver regions can use commuter rail, which connects suburbs with the central city.³⁸

Urban transit and commuter passenger trips have grown in recent years (chart 1.7). Passenger trips increased by an average of 3.2% per year from 2001 to 2004.

38. Rodrigue, J-P et al., 2006, *The Geography of Transport Systems*, Hofstra University, Department of Economics & Geography, people.hofstra.edu/geotrans (accessed May 16, 2006).

Selected transportation projects

All levels of government support and foster transportation demand management strategies and efficient urban transportation planning. For example, the Federation of Canadian Municipalities' Green Municipal Fund supports transportation-related projects focusing on public transit, municipal fleets, integrated and alternative transportation systems, transportation demand management and transportation planning. Transport Canada's Urban Transportation Showcase Program supports transportation strategies and best practices to reduce greenhouse gas emissions.

The Whitehorse Driving Diet, Whitehorse, Yukon.

A strategy to reduce automobile use through active transportation infrastructure, public outreach and transportation demand management.

Future Vision for LA Transit, Lethbridge, Alberta.

This project involves expanding transit service, improving the existing service, increasing ridership and cutting fuel consumption using improved technology applications.

Central Okanagan Smart Transit Plan, Kelowna, British Columbia

The project examines options for handling the expected 55% population growth in the region over the next 20 years. It involves preparing transit approaches supporting smart growth, identifying transit priorities, integrating intelligent transportation systems (ITS) technologies and preparing a strategy to develop bus rapid transit and/or rail transit.

Vertigogogo, Ville de Val-Morin, Quebec.

This pilot project will test the suitability of a web-based 'ride-matching' service for residents and tourists in the Laurentides region. Rural taxi services, vanpooling and transportation for the physically disabled will be provided.

SmartBus, Mississauga, Ontario.

A field test is being conducted to examine the usefulness of an intelligent transportation system to improve customer service, boost ridership and cut operating costs.

Transit Station Precinct Parking Study, Burnaby British Columbia.

This study examines parking supply and demand and opportunities for commuters, visitors and residents in and around transit-friendly development located in the city's regional town centre and its two SkyTrain stations.

Saanich Transportation Demand Management Plan, District of Saanich British Columbia.

This project involves development and implementation of a demand management plan for all municipal facilities, including baseline research and benchmarking.

Saskatoon Transit Strategic Plan 2015, Saskatoon, Saskatchewan

This long-range planning exercise will determine how Saskatoon Transit should respond to the 20-year downward trend in transit ridership and how the community could maximize the environmental and economic benefits of transit use.

Hybrid Technology and Feasibility Study, Ottawa, Ontario.

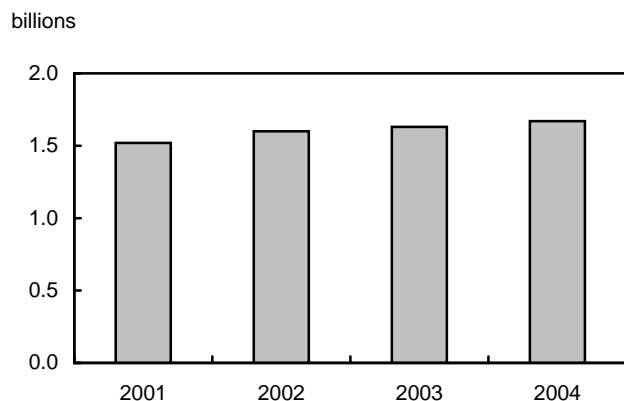
This feasibility study will identify the most cost-effective diesel-electric hybrid technology for Ottawa's transit services.

Trolley Bus Replacement Project, Greater Vancouver Regional District, British Columbia

This project has two distinct components: a core project supporting the purchase of electric trolley buses and a component investing in transportation demand management and renewable energy.

Source(s): Federation of Canadian Municipalities, 2006, Green Municipal Fund, www.sustainablecommunities.ca/GMF (accessed April 25, 2006); Transport Canada, 2006, Urban Transportation Showcase Program, www.tc.gc.ca/programs/environment/utsp/menu.htm (accessed July 18, 2006).

Chart 1.7
Urban transit and commuter passenger trips



Source(s): Transportation Division.

The new transit pass tax credit introduced in July 2006 is one initiative that may help get cars off the road.³⁹ Some transit authorities are also introducing improved amenities and vehicles as well as real time schedule information to improve services and increase ridership.

Accessible communities

Urban planning is another tool used to improve the efficiency of transportation systems. Planning that encourages high-density, mixed-use communities, rather than low-density, single-use communities, can help reduce our reliance on transportation, particularly private vehicle use.

Many cities and regions across the country are embracing smart growth principles, which emphasize more efficient land use and transportation patterns (text table 1.10).

Smart growth can be applied to urban, suburban and rural areas. Shorter distances between homes, work, shopping and other services make it easier for people to walk, bike or take the bus.

In urban areas, smart growth promotes pedestrian activity, public transit options, infill and redevelopment; in suburbs, smart growth features medium-density town centres; in rural areas, village centres and main streets.

39. Canada Revenue Agency, 2006, "Canada Revenue Agency tells monthly public transit pass holders: Keep your pass!," 2006 - News Releases, www.cra-arc.gc.ca/newsroom/releases/2006/june/nr060619-e.html (accessed July 18, 2006).

Ontario and British Columbia have articulated the need to minimize sprawl and direct growth to built-up areas.^{40,41} Vancouver, for example, has a long history of smart growth approaches, including mixing housing, retail and office space downtown, developing mixed-use residential/ commercial uses along transit lines, and allowing secondary suites throughout single-family neighbourhoods.⁴²

Smart growth is not restricted to large urban centres. In 1998, Okotoks, one of several fast-growing rural towns in the Calgary metropolitan area, developed the Sustainable Okotoks Municipal Development plan, which focuses on land use, mixed residential housing, transportation systems, open space and urban forest.⁴³

1.3.2 New technologies

Both industry and government are working to develop new technologies to reduce the environmental impacts of transportation. Many of these projects focus on fuel efficiency improvements and alternative fuels. Industry is also looking for ways to curb or prevent pollution in the production of transportation equipment.

Cleaner vehicles

Because road vehicles are responsible for more air pollution and GHG emissions than any other mode of transport, most of the work government and industry are doing to reduce the environmental impacts of transportation has focused on road transport.

The oil crisis of the 1970s prompted the federal government to introduce fuel efficiency standards in 1976. These voluntary company average fuel consumption (CAFC) standards were aligned with the U.S. corporate average fuel economy (CAFE) standards.

Canada's fleet of light automobiles and light trucks continues to meet CAFC standards (chart 1.8), but

40. Ontario Ministry of Public Infrastructure Renewal, 2005, *Proposed Growth Plan for the Greater Golden Horseshoe*, www.pir.gov.on.ca/userfiles/HTML/cma_4_44013_1.html (accessed April 19, 2006).

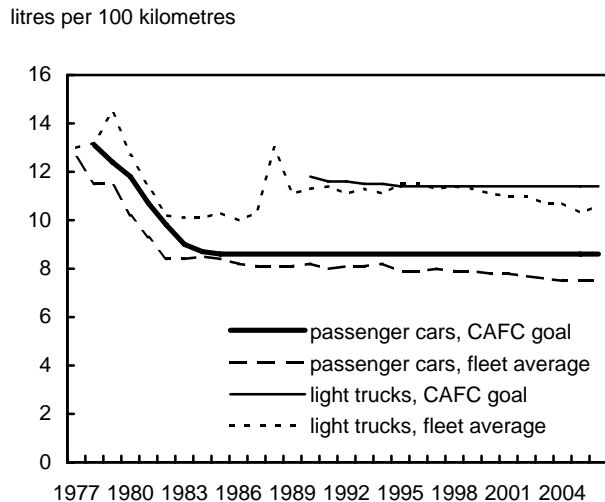
41. British Columbia Ministry of Water, Land and Air Protection, 2004, *Environmental Best Management Practices for Urban and Rural Land Development*, www.env.gov.bc.ca/wld/documents/bmp/urban_ebmp/urban_ebmp.html (accessed April 19, 2006).

42. City of Vancouver, 2005, *The Climate-Friendly City: A Community Climate Change Action Plan*, www.city.vancouver.bc.ca/sustainability/coolvancouver/pdf/corp_climatechangeAp.pdf (accessed April 19, 2006).

43. Canada Mortgage Housing Corporation, 2002, *Sustainable Community Design Demonstration in Okotoks, Alberta: Testing Consumer Receptivity*, www.cmhc-schl.gc.ca/en/inpr/rehi/index.cfm (accessed April 20, 2006).

since the 1980s the standards have not reduced the overall fuel consumption. Most SUVs, vans and pickups fall in the light truck category, whose CAFC standards are less stringent. In recent years, SUVs, vans and pickups have made up a larger share of the fleet.

Chart 1.8
Company average fuel consumption (CAFC) goals and fleet averages



Note(s): Light trucks includes vans, pickups and special-purpose vehicles. Weight limit was 2,722 kilograms prior to 1988 and 3,856 kilograms after 1988. Estimated values for passenger cars and light trucks fleet average for 2002 to 2006.

Source(s): Transport Canada, no date, Company Average Fuel Consumption, www.tc.gc.ca/programs/environment/fuelpgm/cafc/page2.htm (accessed April 4, 2006).

After purchase, proper vehicle maintenance and driving habits help reduce the environmental impacts of road transportation. Two mandatory inspection and maintenance programs are currently operating in Canada: Ontario's Drive Clean (1999) and British Columbia's AirCare (1992). These programs control emissions in two of the most heavily populated areas of Canada: Southern Ontario (from Windsor to Ottawa) and British Columbia's Lower Fraser Valley (from Lions Bay to Chilliwack). Vehicles five years and older in Ontario and four years and older in B.C. must be tested every second year—they must pass the test before registration can be renewed.

Several models of hybrid-electric vehicles have been on the market since 2000, with more to come in the next few years. Provincial incentives to encourage purchases of these vehicles include sales tax rebates in Ontario⁴⁴ and Quebec.⁴⁵

Fuel cells, alternative low-carbon fuels, advanced gasoline and diesel engines, advanced powertrains and lightweight materials are just a few of the technologies being looked at by Transport Canada's Advanced Technology Vehicles Program. The program aims to reduce air emissions from on-road vehicles through the introduction of environmentally-friendly vehicles.

These advanced technologies could be vital to reducing greenhouse gas emissions by 5.3 Mt by 2010—the emissions target set out in a 2005 memorandum of understanding between the federal government and the auto industry.⁴⁶

New regulations for heavy-duty trucks will require that all new trucks be much less polluting. These regulations, being phased-in from 2004 through 2010, aim to reduce 90% of particulate matter and 95% of NO_x emissions.⁴⁷

Several federal programs aim to improve freight transportation. The Freight Efficiency Program encourages rail, marine and air freight carriers to use technology to reduce GHG emissions. FleetSmart offers free, practical advice on energy-efficient vehicles and business practices.

Emission-reduction technologies can also be retrofitted on long-life vehicles, such as buses. For example, Environment Canada has collaborated with the Canadian Urban Transit Association to install diesel oxidation catalysts on board more than 330 urban buses in 15 Canadian cities.⁴⁸

Cleaner fuels

Fuels emit air pollutants when burned. To reduce the emissions of some of these smog-forming air pollutants, the federal government has established fuel quality regulations. For example, all diesel fuel sold in Canada must, as of October 2006, meet the new 15 ppm sulphur content standard. The new standard is 97% lower than the previous allowable

44. Ontario Ministry of Finance, "Budget Speech," 2006 Ontario Budget, www.ontariobudget.ca/english/index.html (accessed July 18, 2006).

45. Ministère des Finances Québec, 2006, "Targeting sustainable economic development," 2006-2007 Budget Speech, Press Release No. 4, www.budget.finances.gouv.qc.ca/budget/2006-2007/index_en.asp (accessed July 18, 2006).

46. Natural Resources Canada, 2005, Automobile Industry and Government Agree on Climate Change Action, www.nrcan.gc.ca/media/newsreleases/2005/200522_e.htm (accessed December 13, 2005).

47. Environment Canada, Transportation Division.

48. Environment Canada, 2006, Urban Bus Retrofit, www.ec.gc.ca/cleanair-airpur/default.asp?lang=En&n=2C562D80-1 (accessed July 25, 2006).

level of 500 ppm.⁴⁹ Interest in alternatives to traditional fuels has grown in recent years (text table 1.11). Many alternative fuels are cleaner than today's gasoline and diesel, and could improve air quality if used widely.

Some alternative fuels are already commercially available. A blended fuel containing 10% ethanol is available at many service stations throughout Canada. It can be used in all vehicles manufactured in 1980 or later. Testing of biodiesel—a diesel substitute made at least in part from organic products—is under way. Natural gas and propane vehicles are commercially available and conventional vehicles can be converted to use these fuels.

Vehicles powered by fuel cells—highly efficient energy-conversion devices that utilize hydrogen—are not yet commercially available, in part because of the lack of a hydrogen distribution network required for refuelling. The British Columbia Hydrogen Highway Project aims to build a hydrogen highway from Vancouver International Airport to Whistler in time for the 2010 Olympics and Paralympics. The demonstration project hopes to speed up the commercialization of hydrogen and fuel cells. Project participants include 11 technology providers, six federal and provincial bodies and 12 companies and public agencies who are sponsoring or taking part in projects.⁵⁰

Across the country, municipalities are testing alternative fuels for public transit fleets. For example, Saskatoon Transit Services and the Société de transport de Montréal have tested biodiesel for bus fleets. The goal of these studies was to assess how biodiesel works in buses in cold weather, and how it compares with diesel for emissions, fuel economy and engine wear.

The entire ferry and bus fleet in Halifax began using a biodiesel mixture of waste fish oil and diesel in October, 2004. The fuel, known as B-20, is 20% biofuel made with fish oil and 80% regular diesel fuel. Tests have shown that B-20 fuel cuts particulate matter emissions by 18% compared with regular diesel, CO₂ by 16% and unburned hydrocarbons by 11%.

Cleaner processes

Canadian companies are investing to protect the environment. Their spending is tracked by Statistics Canada's Survey of Environmental Protection Expenditures. These expenditures are made to reduce the environmental impacts of their manufacturing processes.

The transportation equipment manufacturing industry posted operating expenses of \$202 million for environmental protection in 2002, and spent an additional \$59 million on capital projects. The largest proportions were devoted to pollution abatement and control processes, waste management and sewerage services, and pollution prevention processes (text table 1.12).

Intelligent transportation systems

Intelligent transportation systems (ITS) apply computers, communications, control and sensor technology, and management strategies to transportation systems, resulting in safer, more efficient and less congested transportation systems.

In the Toronto region, the COMPASS freeway traffic management system uses traffic monitors on the highway system and complex computer algorithms to detect and manage traffic incidents. System operators assess traffic situations and manage the response. Drivers receive real-time information from overhead signs, a website, media advisories and still-camera or video images. Using this ITS-generated information, drivers can plan their trips better and avoid contributing to traffic congestion.

The system helps curb traffic congestion and improve transportation efficiency. In addition to saving lives, time, money and energy, ITS can also help the environment by reducing fuel consumption and pollutant emissions.

49. Environment Canada, 2006, "Sulphur in diesel fuel regulations (SOR/ 2002-254)," *Current Regulations*, www.ec.gc.ca/CEPARRegistry/regulations/detailReg.cfm?intReg=63 (accessed July 25, 2006).

50. Natural Resources Canada, 2004, *Hydrogen Highway Background*, www.nrcan.gc.ca/media/newsreleases/2004/200413a_e.htm (accessed September 12, 2006).

Text table 1.10
Characteristics of smart growth and sprawl

	Smart growth	Sprawl
Characteristics		
Density	Higher-density, clustered activities	Lower-density, dispersed activities
Growth pattern	Infill (brownfield) development	Urban periphery (greenfield) development
Land use mix	Mixed	Single use, segregated
Scale	Human scale; smaller buildings, blocks and roads	Large scale; larger buildings, blocks, and wide roads
Public services (shops, schools, parks)	Local, distributed, smaller; accommodates walking access	Regional, consolidated, larger; may require automobile access
Transport	Multi-modal transportation; land use patterns that support walking, cycling and public transit	Automobile-oriented transportation; land use patterns less conducive to walking, cycling and transit
Connectivity	Highly connected roads, sidewalks and paths, allowing more direct travel	Hierarchical road network with many unconnected roads and walkways and barriers to non-motorized travel
Street designs	Streets designed to accommodate a variety of activities; traffic calming	Streets designed to maximize motor vehicle traffic volume and speed
Public space	Emphasis on the public realm (streetscapes, pedestrian areas, public parks)	Emphasis on the private realm (yards, shopping malls, gated communities)

Source(s): Adapted from Litman, T.A., 2005, Evaluating Criticism of Smart Growth, www.vtpi.org/sgcritics.pdf (accessed April 3, 2006).

Text table 1.11
Alternative fuels and vehicles

	What it is	Environmental advantages
Fuels		
Biodiesel	A liquid fuel created from vegetable oils and waste oil products.	Renewable fuel; diverts waste from landfills; fewer GHG emissions than gasoline or diesel on a life cycle basis; non-toxic and biodegradable
Ethanol	An alcohol produced from fermenting grains and other products that is blended with gasoline	Renewable fuel; burns more cleanly and completely than gasoline or diesel on a life cycle basis; fewer GHG emissions than gasoline or diesel
Natural gas	A mixture of gases found in porous rock formations	Burns more cleanly than gasoline or diesel; fewer GHG emissions and toxic pollutants than gasoline or diesel
Propane	A pressurized gaseous fuel that is a by-product of natural gas production	Burns more cleanly than gasoline or diesel; fewer GHG emissions and toxic pollutants than gasoline or diesel
Vehicles		
Fuel cells and hydrogen	Fuel cells generate electricity by electrochemically combining hydrogen and oxygen	On a life cycle basis, they produce zero or very few emissions (depending on hydrogen source); no toxic pollutants; only tailpipe emissions are heat and water vapour if pure hydrogen used
Battery-electric	Powered by motors that draw electricity from on-board storage batteries	No pollutants or GHG emissions from the tailpipe or through fuel evaporation
Hybrid	Powered by batteries and a conventional internal combustion engine	Fewer GHG emissions than conventional gasoline vehicles

Source(s): Natural Resources Canada, 2005, Vehicle Fuel, www.oee.nrcan.gc.ca/transportation/personal/vehicle-fuels.cfm?attr=8#electric (accessed March 29, 2006)

Text table 1.12
Transportation equipment industry expenditures on environmental protection

	1996	1997	1998 ¹	2000 ²	2002
	millions of dollars				
Environmental monitoring					
Operating expenditures	5.2	6.5	5.8	6.5	7.4
Capital expenditures	0.8	0.8	0.7	0.2	0.5
Environmental assessments and audits					
Operating expenditures	2.1	2.7	2.3	4.6	4.5
Capital expenditures	0.2	0.2	0.2	0.5	0.3
Reclamation and decommissioning					
Operating expenditures	4.7	2.8	18	2.5	11.9
Capital expenditures	3.3	x	1	0.8	0.7
Wildlife and habitat protection					
Operating expenditures	0.1	3.8	0.1	0.1	0.1
Capital expenditures	0.7	x	0.2	0	0.5
Pollution abatement and control processes (end-of-pipe), waste management and sewerage services					
Operating expenditures	99.5	101.7	89.8	119.3	134.2
Capital expenditures	25.3	24.8	16.3	13.7	29.7
Pollution prevention processes					
Operating expenditures	3.7	12	10.8	15.8	14.8
Capital expenditures	31	93.2	30.4	187.9	27.3
Fees and licenses					
Operating expenditures	0.8	1.4	0.9	1.5	0.8
Other					
Operating expenditures	9.7	8.7	11.7	19.9	28.3
Total					
Operating expenditures	125.8	139.5	139.4	170.2	201.9
Capital expenditures	61.4	121.2	48.7	203.1	58.9

1. Before the 1998 reference year establishments were selected based on the 1980 Standard Industrial Classification System (SIC). However, beginning with reference year 1998, industry selection was based on the North American Industry Classification System (NAICS). For further information, see Statistics Canada, 2001, Environmental Protection Expenditures in the Business Sector 1998, catalogue no. 16F0006X, Ottawa.

2. As of reference year 1998, the Survey of Environmental Protection Expenditures is conducted every two years.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Environmental Protection Expenditures in the Business Sector, catalogue no. 16F0006X.

1.3.3 Consumer choices

Each of us plays a role in helping to reduce the impacts of transportation: taking public transit, cycling or walking, using fuel-efficient vehicles and buying locally-produced goods can all help curb the environmental effects of transportation.

The bulk of Canadian households' spending on transportation goes towards buying, leasing, renting and operating private vehicles. In 2004, households spent on average 2% of their total transportation budget on public transit options such as city or commuter buses, subways, streetcars and commuter trains (text table 1.13). Meanwhile, transit ridership has increased to close to 1.7 billion trips per year (chart 1.7).

Text table 1.13
Average household spending on transportation

	2004
	dollars
Private transportation	7,820
Purchase of automobiles, trucks and vans	2,767
Rented and leased automobiles, trucks and vans	652
Operation of owned and leased automobiles, trucks and vans	4,362
Purchase of automotive accessories	40
Public transportation	806
City or commuter bus, subway, street car and commuter train	189
Taxi	62
Airplane	429
Train	13
Highway bus	18
Other passenger transportation	42
Household moving, storage and delivery services	53
Total	8,626

Source(s): CANSIM table 203-0007.

Canadians now have more environmentally friendly options when choosing a new vehicle, thanks to new automotive technologies and recent product developments such as hybrids and other fuel-efficient cars.

Whether motivated by rising gasoline prices or environmental awareness, consumers are buying more and more of these cars.⁵¹

⁵¹. Amy Coy, *DesRosiers Automotive Consultants*, personal communication.

Section 2

Annual statistics: Canada's physical environment

2.1 Physiography

Physiography, or physical geography, is the study of the physical features of the earth's surface. This section covers two of the key elements that make up Canada's physiography: land cover and hydrology.

2.1.1 Land cover

Land cover represents the surface properties of the land. Land cover information is a basic requirement for the determination of land use and, ultimately, of land value. Canada's land area totals nearly 10 million km². The two most extensive land cover types in Canada are evergreen needleleaf forest (26%) and low vegetation/barren (25%), representing just over half of Canada's land cover.

Map 2.1 shows the distribution of 10 different land cover types across Canada. Land cover types and areas are presented by ecozone in table 2.1.

2.1.2 Ecozones

The desire for a national approach to ecosystem classification and mapping in Canada led to the development of a hierarchical ecological classification framework. The objective of the approach was to delineate, classify and describe ecologically distinct areas of the earth's surface at different levels of generalization. The ecological framework was developed by identifying distinct areas of non-living (abiotic) and living (biotic) factors that are ecologically related. From the broadest to the smallest, the hierarchical classification consists of seven levels of generalization: ecozones, ecoprovinces, ecoregions, ecodistricts, ecosections, ecosites and ecoelements. Map 2.2 illustrates the boundary delineations of the country's 15 terrestrial ecozones.

2.1.3 Hydrology

Hydrologists identify eleven major drainage areas and 164 sub-drainage areas in Canada. A sub-drainage area is composed of one or more river basins, also called watersheds. A watershed is an area where all surface waters, i.e. runoff from precipitation and snowmelt and streamflow, share the same outlet. Map 2.3 and table 2.2 outline Canada's major drainage areas and sub-drainage areas.

An estimated 12% of Canada, or 1.2 million km², is covered by lakes and rivers (Table 2.3). While many provinces have a substantial amount of water in comparison with their population, only 3% of the area covered by water in Canada is located in inhabited regions.¹ Canada's major river basins and their water resource characteristics are outlined in map 2.4 and table 2.3 respectively. Table 2.4 shows the distribution of streamflow, water area and population for each province and territory.

2.2 Climate

Climate can be defined as the average weather that occurs in a specific area over a period of time. Humans rely heavily on the regularity of climate patterns for almost all of their activities. Climate is measured using various weather elements as indicators. The two essential indicators, temperature and precipitation, are measured systematically at a site over time, accumulating an archive of observations from which climatic summaries can be derived for that location. Daily stations provide readings once or twice daily for temperature and precipitation while principal stations provide hourly readings of more detailed weather information for forecasting purposes.

Table 2.5 lists some of the more extreme weather events that affected areas of Canada in 2005.

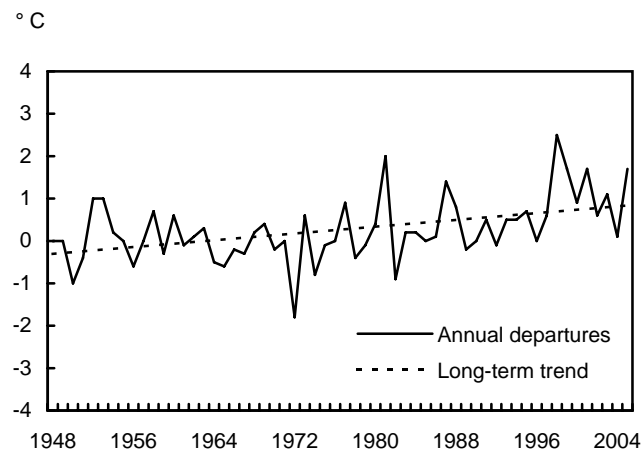
1. *Fresh Water Resources, Human Activity and the Environment, Annual Statistics 2003, catalogue no. 16-201-X.*

2.2.1 Temperature

Drastic changes in temperature signal the change from one season to the next in Canada. Although winters can be bitterly cold, summers can be hot and dry, or hot and humid, depending on the region. Table 2.6 summarizes the mean daily temperatures by month as recorded at selected weather stations across Canada and averaged over the period 1971 to 2000.

Chart 2.1 shows the trend in average air temperature in Canada over the last half-century. In recent years, Canada appears to be experiencing warmer average temperatures. Table 2.7 presents temperature trends and departures for the climate regions shown in map 2.5.

Chart 2.1
Annual national temperature departures and long-term trend



Note(s): Departures from 1951 to 1980 temperature average.

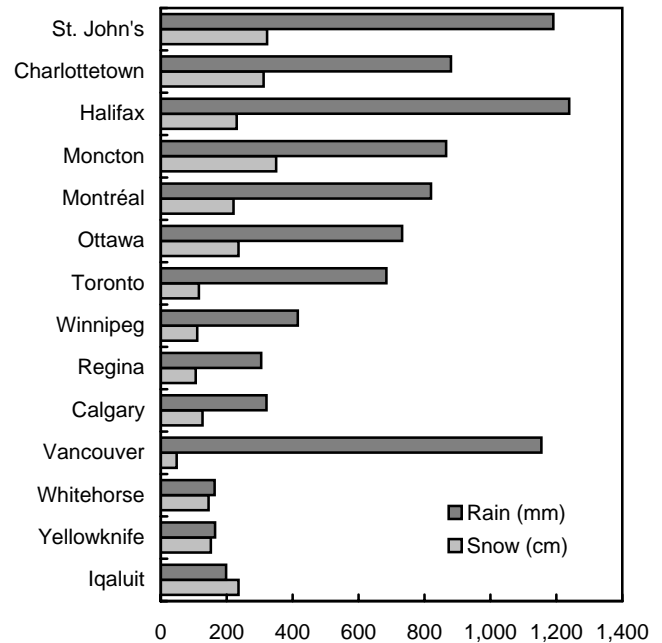
Source(s): Environment Canada, Meteorological Service of Canada, Climate Research Branch, 2006, Climate Trends and Variations Bulletin for Canada, Annual 2005, www.msc.ec.gc.ca/ccrm/bulletin/national_e.cfm (accessed January 12, 2006).

2. *Fresh Water Resources, Human Activity and the Environment, Annual Statistics 2003, catalogue no. 16-201-X.*

2.2.2 Precipitation

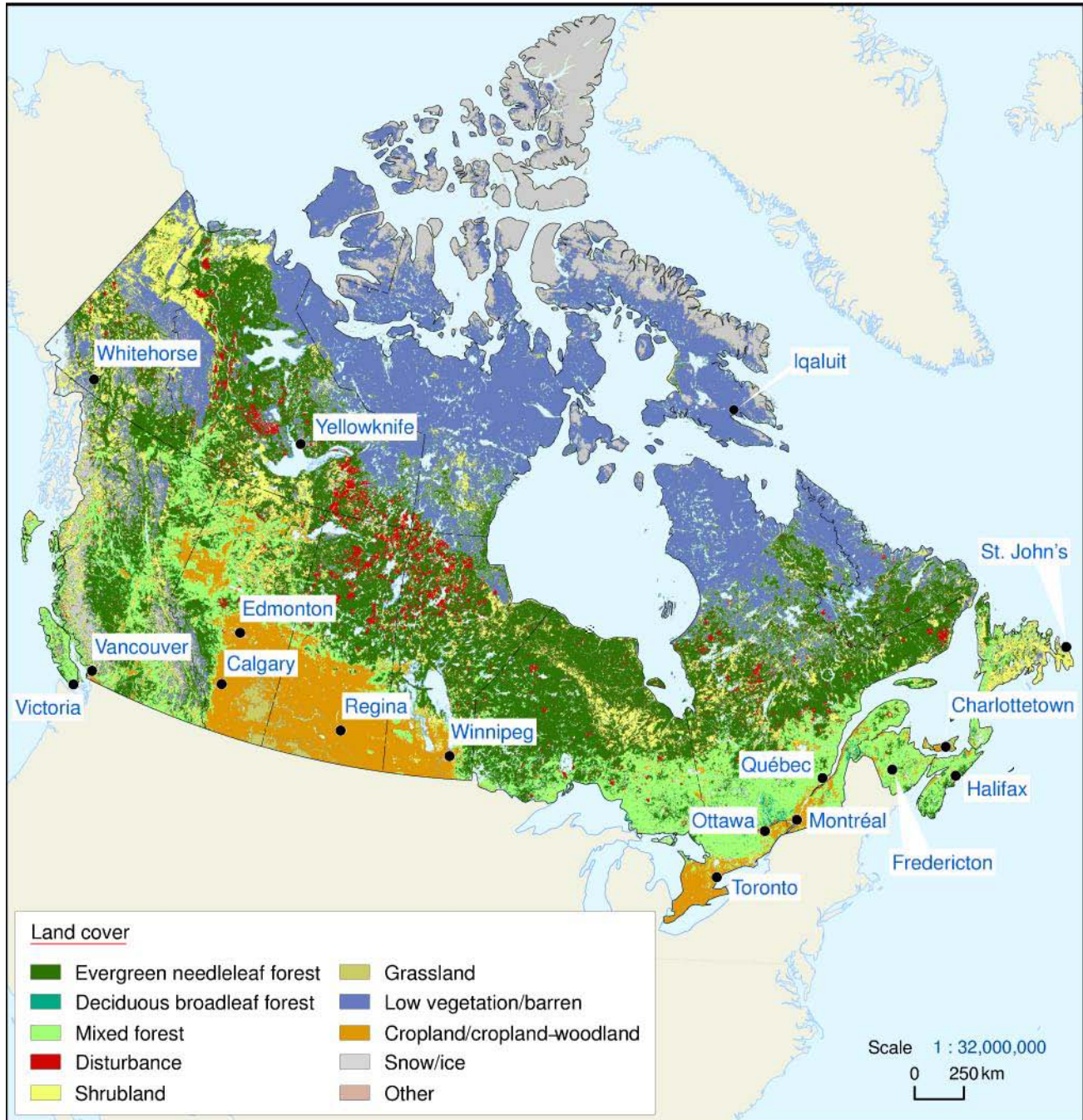
Some 5,500 km³ of precipitation falls on Canada every year, mainly in the form of rain and snow.² Air masses that carry this precipitation generally circulate from west to east (Map 2.6). Chart 2.2 shows the average annual precipitation as recorded at selected weather stations.

Chart 2.2
Average annual precipitation, 1971 to 2000



Source(s): Environment Canada, 2004, Canadian Climate Normals, 1971-2000, www.climate.weatheroffice.ec.gc.ca/climate_normals/index_e.html (accessed November 29, 2005).

Map 2.1
Land cover, 2000



Source(s): Latifovic, R., Z.-L. Zhu, J. Cihlar, C. Giri, and I. Olthof, 2004, "Land cover mapping of North and Central America –Global Land Cover 2000," in *Remote Sensing of Environment*, 89, pp 116–127. Statistics Canada, Environment Accounts and Statistics Division.

Map 2.2
Terrestrial ecozones, 2003



Source(s): Wiken, E.B. et al., 1996, A Perspective on Canada's Ecosystems: An Overview of the Terrestrial and Marine Ecozones, Canadian Council on Ecological Areas, Occasional Paper, No. 14, Ottawa.

Map 2.3
Major drainage areas and sub-drainage areas



Note(s): The sub-drainage area codes on this map are used in Table 2.2.

Source(s): Natural Resources Canada, 2003, National Scale Frameworks Hydrology –Drainage Areas, Canada, Version 5.0, www.geogratis.cgdi.gc.ca (accessed September 16, 2003).
Statistics Canada, Environment Accounts and Statistics Division, Spatial Environmental Information System.

Map 2.4
Major river basins



Note(s): The river basin codes in this map are used in Tables 2.3, 3.5 and 3.55.

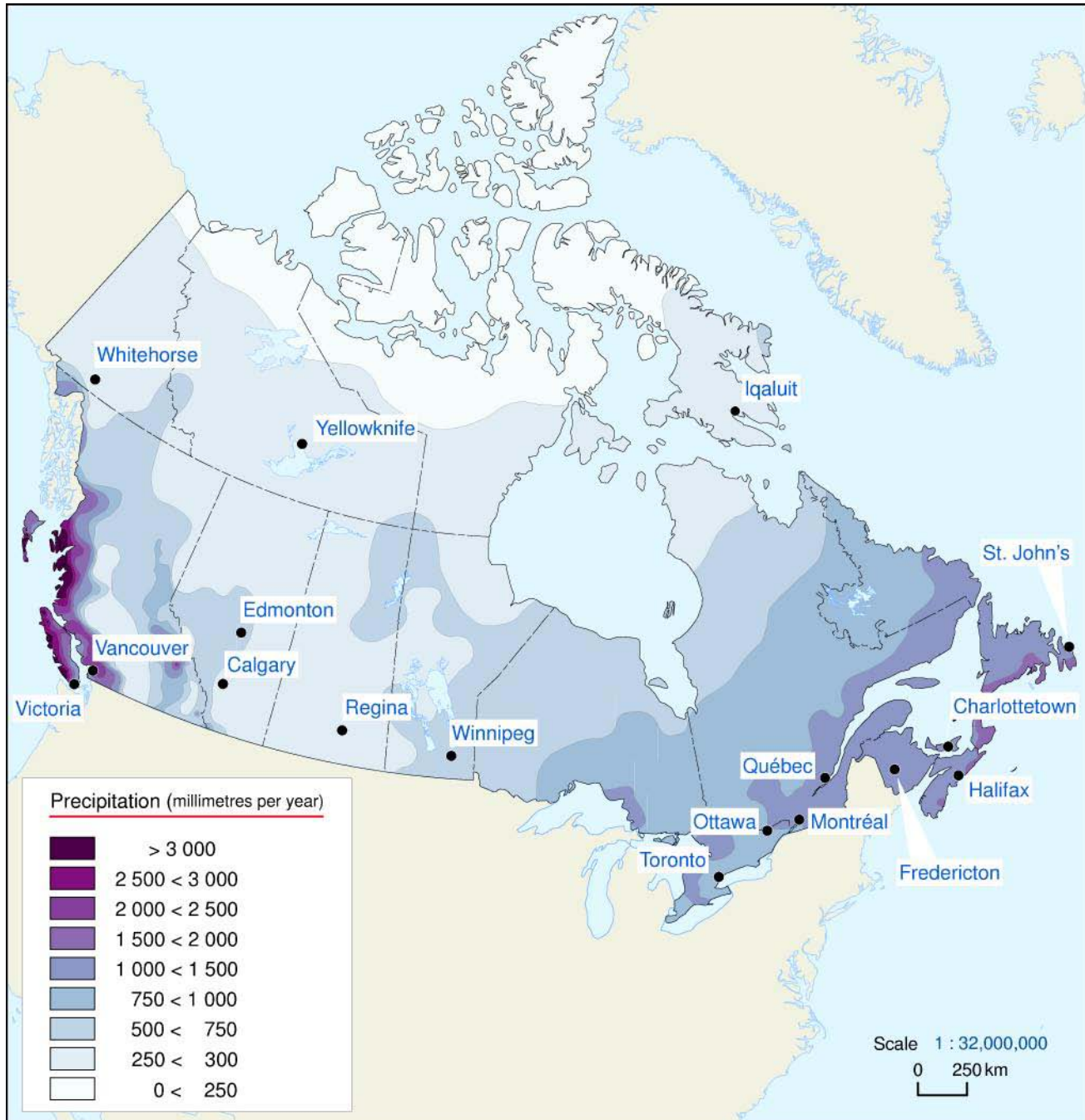
Source(s): Pearse, P.H., F. Bertrand and J.W. MacLaren, 1985, Currents of Change: Final Report of the Inquiry on Federal Water Policy, Environment Canada, Ottawa.
Statistics Canada, Environment Accounts and Statistics Division, Spatial Environmental Information System.

Map 2.5
Canadian climate regions



Source(s): Environment Canada, Atmospheric Environment Service, Climate Research Branch, 1998, Climate Trends and Variations Bulletin for Canada, Ottawa.

Map 2.6
Normal precipitation, 1971 to 2000



Note(s): The data for this map were estimated using a two-pass inverse distance-weighted interpolation of the 1971 to 2000 normal precipitation data from the Meteorological Service of Canada, using the Albers Equal Area Conic projection (Statistics Canada, Environment Accounts and Statistics Division).

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

Table 2.1
Land cover by ecozone, 2000¹

	Evergreen needleleaf forest	Deciduous broadleaf forest	Mixed forest	Disturbance ²	Shrubland	Grassland	Low vegetation and barren	Cropland and cropland- woodland	Snow and ice	Other ³	Total
square kilometres											
Canada	2,657,880	34,890	1,143,780	234,150	1,006,470	49,720	2,598,790	671,150	681,050	915,120	9,993,000
Arctic Cordillera	30	0	0	10	370	0	57,360	0	180,150	6,700	244,620
Northern Arctic	1,870	0	0	50	8,800	0	1,002,750	0	430,470	86,110	1,530,050
Southern Arctic	58,700	0	60	860	40,270	0	661,720	0	13,720	76,380	851,710
Taiga Plains	298,880	700	67,930	39,130	121,420	10	46,730	1,820	210	78,900	655,730
Taiga Shield	517,010	0	540	96,780	107,700	0	465,570	70	30	204,010	1,391,710
Boreal Shield	916,440	12,890	474,130	67,400	182,370	70	35,760	10,000	240	225,160	1,924,460
Atlantic Maritime	20,920	10,990	135,130	600	3,210	30	50	19,510	0	12,180	202,620
Mixed Wood Plains	180	1,520	25,210	40	3,340	70	30	72,390	0	65,960	168,740
Boreal Plains	186,170	4,780	223,460	10,340	88,380	470	1,980	158,490	0	67,050	741,120
Prairies	90	10	3,920	20	4,140	47,290	80	399,910	0	11,400	466,860
Taiga Cordillera	22,400	0	4,220	980	88,480	0	145,750	0	4,590	870	267,290
Boreal Cordillera	181,070	190	19,030	7,430	136,580	0	93,820	0	10,300	22,060	470,480
Pacific Maritime	18,100	3,260	67,750	2,610	47,670	20	15,150	1,300	25,350	31,870	213,080
Montane Cordillera	192,960	550	120,330	2,340	76,490	1,760	56,530	7,650	15,990	15,650	490,250
Hudson Plains	243,060	0	2,070	5,560	97,250	0	15,510	10	0	10,820	374,280

1. A modified Atlas of Canada Vector Map Level 0 (VMAPO) shoreline was used in the creation of this map. The 2000 United States National Oceanic and Atmospheric Administration (NOAA) Advanced Very High Resolution Radiometer (AVHRR) 1-km data raster product was converted to a vector dataset for processing purposes.

2. The disturbance area category refers to forest disturbance, which can be caused by changes in forest structure or composition resulting from natural events such as fire, flood or wind, from mortality caused by insect or disease outbreaks, or from human-caused events such as forest harvesting.

3. 'Other' consists of water, urban and built-up and statistical error.

Source(s): Agriculture and Agri-Food Canada and Environment Canada, 2003, Framework Data - National Resolution - Ecological Units, www.geoconnections.org/CGDI.cfm/fuseaction/dataFrameworkData.ecoUnits/gcs.cfm (accessed March 2, 2005); Natural Resources Canada, Canada Centre for Remote Sensing, 2006, Multi-Temporal Land Cover Maps of Canada using NOAA AVHRR 1-km data from 1985 to 2000, geogratis.cgdi.gc.ca/download/EO_Data/Land_Cover_Of_Canada_1985-2000 (accessed August 16, 2006); The Atlas of Canada, 2002, The Atlas of Canada Vector Map Level 0 (VMAPO), geogratis.cgdi.gc.ca/vmap/intro_e.html (accessed March 2, 2005); Statistics Canada, Environment Accounts and Statistics Division, Spatial Environmental Information System.

Table 2.2
Major drainage and sub-drainage area¹ names and areas

	Drainage area code	Area
	code	square kilometres
Maritime Provinces	01	
Saint John and Southern Bay of Fundy, New Brunswick	01A	41,987
Gulf of St. Lawrence and Northern Bay of Fundy, New Brunswick	01B	60,653
Prince Edward Island	01C	5,943
Bay of Fundy and Gulf of St. Lawrence, Nova Scotia	01D	21,499
Southeastern Atlantic Ocean, Nova Scotia	01E	23,222
Cape Breton Island	01F	10,685
Maritime Provinces total	...	163,990
St. Lawrence	02	
Northwestern Lake Superior	02A	51,541
Northeastern Lake Superior	02B	61,283
Northern Lake Huron	02C	45,421
Wanapitei and French, Ontario	02D	19,669
Eastern Georgian Bay	02E	28,778
Eastern Lake Huron	02F	33,728
Northern Lake Erie	02G	35,302
Lake Ontario and Niagara Peninsula	02H	39,336
Upper Ottawa	02J	50,670
Central Ottawa	02K	40,753
Lower Ottawa	02L	54,719
Upper St. Lawrence	02M	6,139
Saint-Maurice	02N	42,251
Central St. Lawrence	02O	35,600
Lower St. Lawrence	02P	37,780
Northern Gaspé Peninsula	02Q	13,383
Saguenay	02R	88,072
Betsiamites, coast	02S	27,473
Manicouagan and aux Outardes	02T	65,221
Moisie and St. Lawrence Estuary	02U	39,589
Gulf of St. Lawrence, Romaine	02V	36,416
Gulf of St. Lawrence, Natashquan	02W	53,841
Petit Mécatina and Strait of Belle Isle	02X	50,320
Northern Newfoundland	02Y	66,153
Southern Newfoundland	02Z	44,441
St. Lawrence total	...	1,067,879
Northern Quebec and Labrador	03	
Nottaway, coast	03A	67,938
Broadback and Rupert	03B	77,195
Eastmain	03C	45,930
La Grande, coast	03D	112,203
Grande rivière de la Baleine, coast	03E	62,753
Eastern Hudson Bay	03F	46,383
Northeastern Hudson Bay	03G	100,054
Western Ungava Bay	03H	78,208
Aux Feuilles, coast	03J	63,722
Koksoak	03K	45,542
Caniapiscau	03L	90,094
Eastern Ungava Bay	03M	106,790
Northern Labrador	03N	92,911
Churchill Newfoundland and Labrador	03O	95,003
Central Labrador	03P	35,678
Southern Labrador	03Q	37,889
Northern Quebec and Labrador total	...	1,158,292
Southwestern Hudson Bay	04	
Hayes, Manitoba	04A	109,482
Southwestern Hudson Bay	04B	28,384
Severn	04C	99,533
Winisk, coast	04D	79,224
Ekwan, coast	04E	50,484
Attawapiskat, coast	04F	57,243
Upper Albany	04G	64,914
Lower Albany, coast	04H	42,345
Kenogami	04J	52,370
Moose, Ontario	04K	17,949
Missinaibi and Mattagami	04L	60,593
Abitibi	04M	29,291
Harricanaw, coast	04N	43,509

See footnotes at the end of the table.

Table 2.2 – continued

Major drainage and sub-drainage area¹ names and areas

	Drainage area code	Area
	code	square kilometres
Southwestern Hudson Bay total	...	735,320
Nelson River	05	
Upper South Saskatchewan	05A	46,410
Bow	05B	25,628
Red Deer	05C	50,315
Upper North Saskatchewan	05D	27,983
Central North Saskatchewan	05E	42,275
Battle	05F	30,241
Lower North Saskatchewan	05G	49,652
Lower South Saskatchewan	05H	55,268
Qu'Appelle	05J	74,589
Saskatchewan	05K	81,194
Lake Winnipegosis and Lake Manitoba	05L	82,719
Assiniboine	05M	51,259
Souris	05N	39,591
Red	05O	25,266
Winnipeg	05P	55,104
English	05Q	52,550
Eastern Lake Winnipeg	05R	63,642
Western Lake Winnipeg	05S	41,819
Grass and Burntwood	05T	42,390
Nelson	05U	49,119
Nelson River total	...	987,015
Western and Northern Hudson Bay	06	
Beaver, Alberta and Saskatchewan	06A	49,940
Upper Churchill, Manitoba	06B	44,288
Central Churchill, upper, Manitoba	06C	45,892
Reindeer	06D	67,357
Central Churchill, lower, Manitoba	06E	51,295
Lower Churchill, Manitoba	06F	54,799
Seal, coast	06G	75,970
Western Hudson Bay, Southern	06H	73,301
Thelon	06J	85,479
Dubawnt	06K	68,952
Kazan	06L	70,690
Chesterfield Inlet	06M	67,783
Western Hudson Bay, central	06N	63,743
Western Hudson Bay, northern	06O	54,523
Hudson Bay, Southampton Island	06P	48,764
Foxe Basin, Southampton Island	06Q	13,285
Foxe Basin, Melville Peninsula	06R	59,727
Foxe Basin, Baffin Island	06S	211,083
Hudson Strait, Baffin and Southampton Islands	06T	46,342
Western and Northern Hudson Bay total	...	1,253,213
Great Slave Lake	07	
Upper Athabasca	07A	34,856
Central Athabasca, upper	07B	40,496
Central Athabasca, lower	07C	57,030
Lower Athabasca	07D	29,942
Williston Lake	07E	72,362
Upper Peace	07F	67,824
Smoky	07G	51,508
Central Peace, upper	07H	35,412
Central Peace, lower	07J	59,401
Lower Peace	07K	36,510
Fond-du-Lac	07L	70,913
Lake Athabasca, shores	07M	39,560
Slave	07N	19,009
Hay	07O	51,405
Southern Great Slave Lake	07P	38,067
Great Slave Lake, east arm, south shore	07Q	103,895
Lockhart	07R	27,124
Northeastern Great Slave Lake	07S	74,222
Marian	07T	24,262
Western Great Slave Lake	07U	41,056
Great Slave Lake total	...	974,853

See footnotes at the end of the table.

Table 2.2 – continued

Major drainage and sub-drainage area¹ names and areas

	Drainage area code	Area
	code	square kilometres
Pacific	08	
Alsek	08A	31,192
Northern coastal waters, British Columbia	08B	22,767
Stikine, coast	08C	49,997
Nass, coast	08D	29,036
Skeena, coast	08E	55,751
Central coastal waters, British Columbia	08F	54,658
Southern coastal waters, British Columbia	08G	41,986
Vancouver Island	08H	34,882
Nechako	08J	47,332
Upper Fraser	08K	67,088
Thompson	08L	55,777
Lower Fraser	08M	61,880
Columbia	08N	102,925
Queen Charlotte Islands	08O	10,049
Skagit	08P	1,027
Pacific total	...	666,349
Yukon River	09	
Headwaters Yukon	09A	94,018
Pelly	09B	50,485
Upper Yukon	09C	44,206
Stewart	09D	51,360
Central Yukon	09E	29,820
Porcupine	09F	61,566
Tanana	09H	1,470
Copper	09M	4,112
Yukon River total	...	337,036
Arctic	10	
Upper Liard	10A	61,858
Central Liard	10B	72,031
Fort Nelson	10C	54,771
Central Liard and Petitot	10D	30,563
Lower Liard	10E	55,571
Upper Mackenzie, Mills Lake	10F	51,042
Upper Mackenzie, Camsell Bend	10G	57,858
Central Mackenzie, Blackwater Lake	10H	67,210
Great Bear	10J	158,140
Central Mackenzie, The Ramparts	10K	46,736
Lower Mackenzie	10L	77,259
Peel and Southwestern Beaufort Sea	10M	107,693
Southern Beaufort Sea	10N	99,387
Amundsen Gulf	10O	91,087
Coppermine	10P	50,741
Coronation Gulf and Queen Maud Gulf	10Q	174,679
Back	10R	135,956
Gulf of Boothia	10S	114,752
Southern Arctic Islands	10T	373,180
Baffin Island, Arctic drainage	10U	299,813
Northern Arctic Islands	10V	424,812
Arctic total	...	2,605,138
Mississippi River	11	
Missouri	11A	27,097
Mississippi River total	...	27,097
Canada total	...	9,976,182

1. A sub-drainage area, also called a watershed or drainage basin, is an area where all contributing surface waters share the same drainage outlet. Drainage areas channel runoff from precipitation and snow melt into stream flow. The resulting hierarchy of streams and rivers and their associated sub-drainage areas form the National Hydrological Network of Canada. There are 11 major drainage areas and 164 sub-drainage areas in Canada. Canada's entire land and fresh water area has been allocated to individual drainage areas.

Source(s): Natural Resources Canada, 2005, National Scale Frameworks Hydrology - Drainage Areas, Canada, Version 5.0, www.geogratis.cgdi.gc.ca (accessed May 29, 2006).

Table 2.3
Water resource characteristics by major river basin¹

	Major river basin	Total area ²	Water area ³		
			Total	As a share of total	Per capita 2001
			code	square kilometres	percent	square meters
Canada	...	9,978,904	1,174,452	11.8	39,139
Pacific Coastal	1	334,452	15,041	4.5	10,944
Fraser - Lower Mainland	2	233,105	9,015	3.9	4,462
Okanagan - Similkameen	3	15,603	650	4.2	2,279
Columbia	4	87,321	2,482	2.8	15,457
Yukon	5	332,906	9,329	2.8	343,653
Peace - Athabasca	6	485,146	16,725	3.4	48,306
Lower Mackenzie	7	1,330,481	176,937	13.3	3,623,373
Arctic Coast - Islands	8	1,764,279	177,906	10.1	10,617,432
Missouri	9	27,097	1,129	4.2	120,359
North Saskatchewan	10	150,151	7,245	4.8	5,539
South Saskatchewan	11	177,623	6,243	3.5	3,522
Assiniboine - Red	12	190,705	9,098	4.8	6,665
Winnipeg	13	107,654	20,599	19.1	247,350
Lower Saskatchewan - Nelson	14	360,883	67,612	18.7	309,699
Churchill	15	313,572	51,858	16.5	593,728
Keewatin - Southern Baffin Island	16	939,568	161,438	17.2	13,416,290
Northern Ontario	17	691,811	55,952	8.1	391,174
Northern Quebec	18	940,194	148,986	15.8	1,426,559
Great Lakes - St. Lawrence	19	582,945	134,928	23.1	7,624
North Shore - Gaspé	20	369,094	37,363	10.1	74,117
Saint John - St. Croix	21	41,904	1,800	4.3	4,481
Maritime Coastal	22	122,056	6,728	5.5	4,469
Newfoundland and Labrador	23	380,355	55,388	14.6	107,731

	Major river basin	Total area ²	Mean annual Streamflow ⁴			
			Rate	Total	Per unit area	As a share of total
			code	square kilometres	cubic metres per second	cubic kilometres	thousands of cubic metres per square kilometre	percent
Canada	...	9,978,904	105,135	3,315.5	332	100.0
Pacific Coastal	1	334,452	16,390	516.9	1,545	15.6
Fraser - Lower Mainland	2	233,105	3,972	125.3	537	3.8
Okanagan - Similkameen	3	15,603	74	2.3	150	0.1
Columbia	4	87,321	2,009	63.4	726	1.9
Yukon	5	332,906	2,506	79.0	237	2.4
Peace - Athabasca	6	485,146	2,903	91.5	189	2.8
Lower Mackenzie	7	1,330,481	7,337	231.4	174	7.0
Arctic Coast - Islands	8	1,764,279	8,744	275.8	156	8.3
Missouri	9	27,097	12	0.4	14	0.0
North Saskatchewan	10	150,151	234	7.4	49	0.2
South Saskatchewan	11	177,623	239	7.5	42	0.2
Assiniboine - Red	12	190,705	50	1.6	8	0.0
Winnipeg	13	107,654	758	23.9	222	0.7
Lower Saskatchewan - Nelson	14	360,883	1,911	60.3	167	1.8
Churchill	15	313,572	701	22.1	70	0.7
Keewatin - Southern Baffin Island	16	939,568	5,383	169.8	181	5.1
Northern Ontario	17	691,811	5,995	189.1	273	5.7
Northern Quebec	18	940,194	16,830	530.8	565	16.0
Great Lakes - St. Lawrence	19	582,945	7,197	227.0	389	6.8
North Shore - Gaspé	20	369,094	8,159	257.3	697	7.8
Saint John - St. Croix	21	41,904	779	24.6	586	0.7
Maritime Coastal	22	122,056	3,628	114.4	937	3.5
Newfoundland and Labrador	23	380,355	9,324	294.0	773	8.9

See footnotes at the end of the table.

Table 2.3 – continued

Water resource characteristics by major river basin¹

	Major river basin	Total area ² square kilometres	Precipitation annual mean ⁵		Dams	
			Rate millimetres	Volume cubic kilometres	Number units	Generating capacity ⁶ megawatts
Canada	...	9,978,904	545	5,451	1,462	67,411
Pacific Coastal	1	334,452	1,354	451	50	1,648
Fraser - Lower Mainland	2	233,105	670	156	24	848
Okanagan - Similkameen	3	15,603	466	7	3	594
Columbia	4	87,321	776	68	56	5,153
Yukon	5	332,906	346	115	10	76
Peace - Athabasca	6	485,146	497	241	17	3,427
Lower Mackenzie	7	1,330,481	365	486	18	83
Arctic Coast - Islands	8	1,764,279	189	333	0	0
Missouri	9	27,097	390	11	2	13
North Saskatchewan	10	150,151	443	67	6	504
South Saskatchewan	11	177,623	419	74	21	310
Assiniboine - Red	12	190,705	450	86	3	168
Winnipeg	13	107,654	683	74	98	905
Lower Saskatchewan - Nelson	14	360,883	508	183	60	4,941
Churchill	15	313,572	480	151	12	119
Keewatin - Southern Baffin Island	16	939,568	330	310	0	0
Northern Ontario	17	691,811	674	466	60	1,116
Northern Quebec	18	940,194	698	656	66	15,238
Great Lakes - St. Lawrence	19	582,945	957	556	623	12,515
North Shore - Gaspé	20	369,094	994	367	129	10,785
Saint John - St. Croix	21	41,904	1,147	48	54	1,864
Maritime Coastal	22	122,056	1,251	153	60	411
Newfoundland and Labrador	23	380,355	1,030	392	90	6,693

1. These major river basins and associated flow measures are adapted from Laycock (1987) (see full reference below). Some of these river basin aggregates have more than one outflow.

2. Area includes the Canadian portion of the Great Lakes.

3. Water area figures are calculated from the Canada-wide 1-km water fraction derived from National Topographic Database maps.

4. Basins at the US-Canada border exclude inflow from U.S. portion of basin region.

5. Precipitation has been estimated from an Inverse Distance Weighted (IDW) interpolation of the 1971 to 2000 normals.

6. The generating capacity refers to the maximum power capability from hydro plants. The survey coverage for those plants is limited to those utilities and companies which have at least one plant with a total generating capacity of over 500 kilowatts.

Source(s): Environment Canada, 2003, Canadian Climate Normals, 1971 to 2000, Meteorological Service of Canada, climate.weatheroffice.ec.gc.ca/climate_normals/index_e.html (accessed February 23, 2005). Pearce, P.H., F. Bertrand and J.W. MacLaren, 1985, Currents of Change: Final Report of the Inquiry on Federal Water Policy, Environment Canada, Ottawa. Fernandes, R., G. Pavlic, W. Chen and R. Fraser, 2001, Canada-wide 1-km² water fraction, National Topographic Database, Natural Resources Canada, www.nrcan.gc.ca/ess/_portal_esst.cache/gc_ccrs_e (accessed February 23, 2005). Laycock, A.H., 1987, "The Amount of Canadian Water and its Distribution", in Canadian Aquatic Resources, no. 215 of Canadian Bulletin of Fisheries and Aquatic Sciences, M.C. Healey and R.R. Wallace (eds.), 13-42, Fisheries and Oceans Canada, Ottawa. Natural Resources Canada, GeoAccess Division, 2003, 1:1 Million Digital Drainage Area Framework, version 4.8b. Statistics Canada, 2001 Census of Population. "Electric Power Generating Stations", catalogue no. 57-206-X.

Table 2.4
Distribution of streamflow, water area and 2005 population, by province and territory

	Streamflow	Water area	Population
	percent		
Canada	100.0	100.0	100.0
Newfoundland and Labrador	8.6	5.0	1.6
Prince Edward Island	0.1	0.1	0.4
Nova Scotia	1.2	0.5	2.9
New Brunswick	1.3	0.2	2.3
Quebec	21.6	18.6	23.5
Ontario	8.9	8.8	38.9
Manitoba	2.6	10.0	3.6
Saskatchewan	1.5	7.0	3.1
Alberta	1.9	2.6	10.1
British Columbia	24.0	3.0	13.2
Yukon Territory	4.2	1.0	0.1
Northwest Territories and Nunavut	24.0	43.3	0.2

Source(s): Laycock, A.H., 1987, "The Amount of Canadian Water and its Distribution," in Canadian Aquatic Resources, no. 215 of Canadian Bulletin of Fisheries and Aquatic Sciences, M.C. Healey and R.R. Wallace (eds.), 13-42, Fisheries and Oceans Canada, Ottawa. Fernandes, R., G. Pavlic, W. Chen and R. Fraser, 2001, Canada-wide 1-km water fraction, National Topographic Database, Natural Resources Canada, www.nrcan.gc.ca/ess/_portal_esst.cache/gc_ccrs_e (accessed April 29 2002). Statistics Canada, CANSIM table 051-0001.

Table 2.5
Top ten Canadian weather stories of 2005

	Location	Time period	Rank ¹
Alberta's Flood of Floods	Alberta	June	1
Manitoba's Worst Widespread Flooding Ever	Manitoba	June to July	2
Ontario's Most Expensive Weather Disaster	Ontario	August	3
From a Bummer to a Hummer of a Summer	Ontario and Quebec	summer	4
Year of the Hurricane ... But not in Canada	Various	August to October	5
April Showers Bring May Floods to the Maritimes	Maritimes	April	6
Winter Snow Goes Missing in British Columbia	British Columbia	winter	7
Atlantic Canada's Week of Snow	Atlantic Canada	January	8
November's Nasty Weather Brew	Ontario	November	9
BC's Tropical Punch	British Columbia	January	10

1. Canada's Top Weather Stories for 2005 are rated from one to ten based on the degree to which Canada and Canadians were impacted, the extent of the area affected, economic effects and longevity as a top news story.

Source(s): Environment Canada, Meteorological Service of Canada, 2006, Environment Canada's Top Weather Stories for 2005, www.msc.ec.gc.ca/media/top10/2005_e.html (accessed January 16, 2006).

Table 2.6
Average daily temperatures by month for selected weather stations, 1971 to 2000¹

	January	February	March	April	May	June	July	August	September	October	November	December	Annual
average daily temperature in Celsius degrees													
Goose Bay, Newfoundland and Labrador	-18.1	-16.3	-9.6	-1.7	5.1	11.0	15.4	14.5	9.2	2.4	-4.5	-13.9	-0.5
Gander, Newfoundland and Labrador	-7.4	-7.9	-4.0	1.3	6.7	11.6	16.0	15.7	11.4	5.8	1.0	-4.3	3.8
St. John's, Newfoundland and Labrador	-4.8	-5.4	-2.5	1.6	6.2	10.9	15.4	15.5	11.8	6.9	2.6	-2.2	4.7
Charlottetown, Prince Edward Island	-8.0	-7.8	-3.1	2.7	9.1	14.6	18.5	18.1	13.6	7.8	2.3	-4.1	5.3
Sydney, Nova Scotia	-5.7	-6.5	-2.7	2.1	7.8	13.3	17.7	17.7	13.4	8.0	3.3	-2.1	5.5
Halifax, Nova Scotia	-6.0	-5.6	-1.4	4.0	9.8	15.0	18.6	18.4	14.1	8.3	3.1	-2.8	6.3
Yarmouth, Nova Scotia	-3.0	-3.0	0.3	4.9	9.7	13.7	16.5	16.9	13.8	9.1	4.8	-0.2	7.0
Moncton, New Brunswick	-8.9	-8.0	-2.9	3.2	9.9	15.1	18.6	17.9	13.0	7.1	1.4	-5.5	5.1
Saint John, New Brunswick	-8.1	-7.3	-2.5	3.6	9.4	14.0	17.1	16.9	12.8	7.3	2.0	-4.7	5.0
Chapais 2, Quebec	-18.8	-16.6	-9.5	-0.5	7.9	14.0	16.3	14.9	9.3	2.9	-5.4	-14.8	0.0
Kuujuuaq, Quebec	-24.3	-23.6	-18.3	-9.1	0.3	7.2	11.5	10.6	5.6	-0.7	-8.4	-19.3	-5.7
Kuujuarapik, Quebec	-23.4	-23.2	-17.3	-7.6	1.3	7.0	10.6	11.4	7.4	2.1	-5.0	-16.2	-4.4
Québec, Quebec	-12.8	-11.1	-4.6	3.3	11.2	16.5	19.2	17.9	12.5	6.2	-0.7	-9.1	4.0
Sept-Îles, Quebec	-15.3	-13.4	-7.1	0.0	5.9	11.7	15.3	14.2	9.3	3.4	-3.1	-11.3	0.8
Montréal, Quebec	-10.4	-9.0	-2.5	5.5	12.9	17.7	20.5	19.2	13.9	7.5	1.0	-6.8	5.8
Ottawa, Ontario	-10.8	-8.7	-2.5	5.7	13.4	18.3	20.9	19.5	14.3	7.8	1.0	-7.1	6.0
Kapuskasing, Ontario	-18.7	-15.5	-8.6	0.5	9.0	14.4	17.2	15.7	10.1	3.8	-4.8	-14.3	0.7
Thunder Bay, Ontario	-14.8	-12.0	-5.5	2.9	9.5	14.0	17.6	16.6	11.0	5.0	-3.0	-11.6	2.5
Toronto, Ontario	-6.3	-5.4	-0.4	6.3	12.9	17.8	20.8	19.9	15.3	8.9	3.2	-2.9	7.5
Windsor, Ontario	-4.5	-3.2	2.0	8.2	14.9	20.1	22.7	21.6	17.4	11.0	4.6	-1.5	9.4
The Pas, Manitoba	-20.6	-16.1	-8.9	1.0	9.0	14.8	17.7	16.5	10.0	3.1	-7.8	-17.4	0.1
Winnipeg, Manitoba	-17.8	-13.6	-6.1	4.0	12.0	17.0	19.5	18.5	12.3	5.3	-5.3	-14.4	2.6
Churchill, Manitoba	-26.7	-24.6	-19.5	-9.7	-0.7	6.6	12.0	11.7	5.6	-1.7	-12.6	-22.8	-6.9
Regina, Saskatchewan	-16.2	-11.9	-5.0	4.5	11.7	16.4	18.8	18.0	11.7	4.8	-5.5	-13.2	2.8
Saskatoon, Saskatchewan	-17.0	-13.0	-5.8	4.4	11.5	16.0	18.2	17.3	11.2	4.5	-6.2	-14.3	2.2
Calgary, Alberta	-8.9	-6.1	-1.9	4.6	9.8	13.8	16.2	15.6	10.8	5.4	-3.1	-7.4	4.1
Edmonton, Alberta	-13.5	-10.5	-4.5	4.3	10.4	14.1	15.9	15.1	10.1	4.3	-5.7	-11.3	2.4
Victoria, British Columbia	3.8	4.9	6.4	8.8	11.8	14.4	16.4	16.4	14.0	9.8	6.1	4.0	9.7
Penticton, British Columbia	-1.7	0.7	4.7	9.0	13.6	17.4	20.4	20.1	14.9	8.7	3.1	-1.1	9.2
Vancouver, British Columbia	3.3	4.8	6.6	9.2	12.5	15.2	17.5	17.6	14.6	10.1	6.0	3.5	10.1
Prince Rupert, British Columbia	1.3	2.5	3.9	6.0	8.7	11.1	13.1	13.5	11.3	7.9	4.1	2.2	7.1
Prince George, British Columbia	-9.6	-5.4	-0.3	5.2	9.9	13.3	15.5	14.8	10.1	4.6	-2.9	-7.8	4.0
Mayo, Yukon Territory	-25.7	-19.0	-9.6	0.9	8.4	14.0	16.0	13.1	6.4	-2.9	-15.9	-22.3	-3.1
Whitehorse, Yukon Territory	-17.7	-13.7	-6.6	0.9	6.9	11.8	14.1	12.5	7.1	0.6	-9.4	-14.9	-0.7
Inuvik, Northwest Territories	-27.6	-26.9	-23.2	-12.8	0.2	11.3	14.2	11.0	3.7	-8.2	-21.0	-25.7	-8.8
Yellowknife, Northwest Territories	-26.8	-23.4	-17.3	-5.3	5.6	13.5	16.8	14.2	7.1	-1.7	-13.8	-23.7	-4.6
Resolute, Nunavut	-32.4	-33.1	-30.7	-22.8	-10.9	-0.1	4.3	1.5	-4.7	-14.9	-23.6	-29.2	-16.4
Alert, Nunavut	-32.3	-33.4	-32.4	-24.3	-11.8	-0.8	3.3	0.8	-9.2	-19.3	-26.4	-30.0	-18.0
Clyde, Nunavut	-28.1	-29.6	-27.2	-19.0	-8.5	0.7	4.4	3.9	0.0	-7.6	-17.5	-24.8	-12.8
Iqaluit, Nunavut	-26.6	-28.0	-23.7	-14.8	-4.4	3.6	7.7	6.8	2.2	-4.9	-12.8	-22.7	-9.8
Baker Lake, Nunavut	-32.3	-31.5	-27.2	-17.4	-5.8	4.9	11.4	9.5	2.6	-7.5	-20.1	-28.4	-11.8

1. Averaged over the period 1971 to 2000.

Source(s): Environment Canada, National Climate Data and Information Archive, 2004, Canadian Climate Normals or Averages, 1971-2000, www.climate.weatheroffice.ec.gc.ca/climate_normals/index_e.html (accessed November 29, 2005).

Table 2.7
Annual regional temperature departures, trends and extremes, 1948 to 2005

	Trend ²		Extreme years				Annual 2005 ^P	
	Coldest		Warmest		Rank ⁴	Departure ³		
	Year on record	Departure ³	Year on record	Departure ³				
	degree Celsius	year	degree Celsius	year	degree Celsius	number	degree Celsius	
Canada ¹	1.2	1970	-0.2	1998	2.5	5	1.7	
Atlantic Canada	0.1	1972	-1.4	1999	2.0	7	0.9	
Great Lakes/St. Lawrence Lowlands	0.5	1967	-0.4	1998	2.3	9	1.1	
Northeastern Forest	0.6	1985	-0.5	1998	2.1	6	1.4	
Northwestern Forest	1.7	1969	-0.4	1987	3.0	6	2.0	
Prairies	1.3	1979	-0.6	1987	3.1	11	1.2	
South British Columbia Mountains	1.5	1956	-0.5	1998	2.0	8	1.1	
Pacific Coast	1.3	1951	-0.4	1958	1.6	5	1.2	
North British Columbia Mountains/Yukon	2.2	1948	-0.7	2005	2.8	1	2.8	
Mackenzie District	2.0	2004	-0.7	1998	3.9	7	2.1	
Arctic Tundra	1.3	2004	-0.5	1998	3.3	6	1.7	
Arctic Mountains and Fiords	0.9	1964	-0.7	1981	2.2	2	2.0	

1. The climate regions of Canada are illustrated in Map.

2. A linear (least square) trend over the period of record.

3. Difference from the normal temperature.

4. This column ranks 2005 temperature departures over a 58 year period between 1948 and 2005. For example, the Atlantic Canada Climate Region had a departure that was 0.8°C warmer than the long term temperature average, which ranked the 2005 season as the 7th warmest over the 58 year period.

Source(s): Environment Canada, Meteorological Service of Canada, Climate Research Branch, 2006, Climate Trends and Variations Bulletin for Canada, Annual 2005, www.msc.ec.gc.ca/ccrm/bulletin/regional_e.cfm (accessed January 16, 2006).

Section 3

Annual statistics: Pressures on Canada's environment

3.1 Driving forces

Driving forces are the conditions and activities that shape the relationship between human activities and the environment. Topics covered in this section include population, economic conditions and transportation.

3.2 Population

Population growth, distribution and density are major factors in determining the impacts that human activities have on the environment. Canada's population has expanded considerably since 1901, when there were 5.4 million Canadians (table 3.1). By 2001, the population had grown almost six-fold, reaching over 31 million people. However, growth rates have not been consistent over time. Two historical periods were characterized by high annual population growth rates. The first was from 1901 to 1911, when massive immigration resulted in annual growth rates of up to 3%. The second period of high growth followed the end of the Second World War and is generally referred to as the 'baby boom'. In contrast to these two periods of population growth, two periods of slow economic activity (1891 to 1901 and 1931 to 1941) coincided with a slump in population growth rates. Since 1957, when the annual growth rate was 3.3%, growth rates have been decreasing, fluctuating between 1% and 1.8% from 1970 to 2001.

The growth of Canada's population is the result of two factors: natural increase and net migration. Since 1993, net migration has become a more important component of population growth than natural increase, accounting for more than two-thirds of the annual increase by 2005 (table 3.2).

Tables 3.3 and 3.4 present population by ecozone, illustrating the unevenness of Canada's population

distribution. Although the average population density for Canada was only three persons per km² in 2001, over 30 persons per km² inhabited the Great Lakes - St. Lawrence river basin (table 3.5).

In 2001, 80% of the Canadian population lived in urban areas compared to 76% two decades earlier. Table groups 3.6, 3.7, 3.8 and 3.9 breakdown urban and rural population by sub-drainage area.¹

3.3 Economy

The economy is a strong driving force for changes in the environment. Gross domestic product (GDP) measures the total value of goods and services produced in Canada. Goods-producing industries—such as manufacturing, construction and resource industries—accounted for 31% of GDP in 2005 and 26% of employment. Service-producing industries—from wholesale and retail trade to health care—made up the remaining 69% of GDP and 74% of employment (tables 3.10 and 3.11).

Table 3.12 outlines the changes in the composition of exports and imports from 1971 to 2005. Over the period, agricultural and fishing products' share of total exports decreased from 13.0% to 6.7% and forestry products' share fell from 16.1% to 8.1%. With Canada becoming an important energy producer, energy exports took up the slack. Exports of energy products moved from 7.1% to 19.2% of total exports from 1971 to 2005. At the same time, the share of energy imports grew from 5.8% to 8.7%.

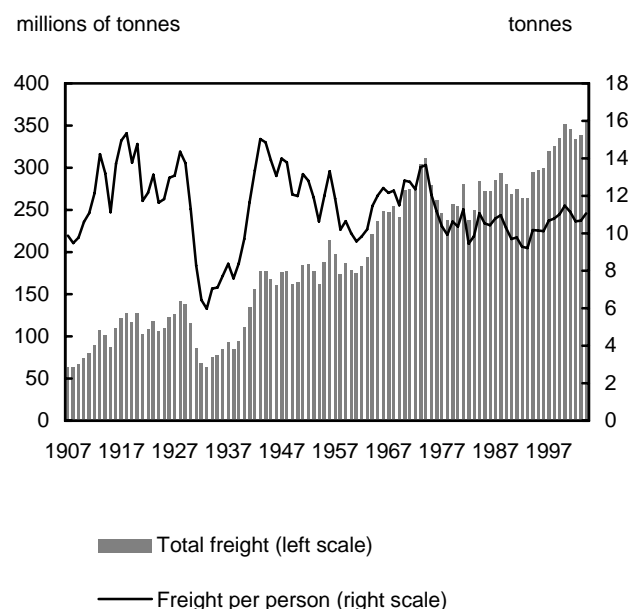
1. A sub-drainage area, also called a watershed or drainage basin, is an area where all contributing surface waters share the same drainage outlet. Drainage areas channel runoff from precipitation and snow melt into stream flow. The resulting hierarchy of streams and rivers and their associated sub-drainage areas form the National Hydrological Network of Canada. There are 11 major drainage areas and 164 sub-drainage areas in Canada. Canada's entire land and fresh water area has been allocated to individual drainage areas. See map 2.3 and table 2.2 for classification codes and area figures for these sub-drainage areas.

3.4 Transportation

Transportation fulfils an essential role in maintaining Canada's economic and social well-being. Bringing goods to market and getting people from place to place, transportation refers to the transport of goods and commercial passengers, as well as private transport.

The tables 3.13, 3.14, 3.15 and 3.16 and chart 3.8 outline the tonnage of goods transported by water, rail, truck and air transport. In 2003, 443.0 million tonnes of goods were moved by water compared to 338.0 million tonnes by rail, 305.2 million tonnes by truck, and 662.6 thousand tonnes by air. Water transport also led other modes on a tonne-kilometre basis—which takes into account weight of shipment and distance transported—at 1.9 trillion tonne-kilometres in 2003.

Chart 3.1
Railroad freight shipped



Source(s): Canadian Political Science Association and Social Science Research Council of Canada, 1965, *Historical Statistics of Canada*, M.C. Urquhart (edition), catalogue no. HA746 U7, Toronto; 1983, *Historical Statistics of Canada*, Second Edition, F.H. Leacy, catalogue no. 11-516-X; *Rail in Canada*, catalogue no. 52-216-X and CANSIM table 051-0001.

While the majority of freight is indeed moved by water and rail, the importance of trucking to freight transport has grown substantially. For the for-hire trucking industry, tonnes of freight carried grew by 75%

from 1990 to 2003, while tonne-kilometres grew by 140% (table 3.15).

The amount of freight shipped by rail grew steadily between 1907 and 2001, with the exception of the depression years (chart 3.1). While rail freight per person has fluctuated greatly, its overall trend has been flat over the whole of this period.

In 2004, 45.6 million passengers were transported by Canadian air transport carriers (Table 3.16). Following a three-year lull, passenger kilometers (derived by multiplying the number of passengers by the distance travelled) for air transport grew to more than 103 billion in 2004. Trains carried 4.0 million passengers in 2004, down 5% from a high reached in 2002 (table 3.14). In 2003, 38.9 million passengers were transported by ferry, 10% below a high of 43.2 million reached in 1994 (Table 3.13).

The number of road motor vehicle registrations increased by 10% between 1999 and 2005, reaching over 19 million vehicles. Since 1999, the number of vehicles weighing less than 4,500 kg has increased by nearly 1.6 million to 18.1 million, accounting for 94% of all registered road motor vehicles (table 3.17). As the number of vehicles on the road increased over the course of the twentieth century, the number of persons per vehicle declined. There were 8.6 persons for each vehicle registered in 1931; by the mid-1980's this number had fallen to about 1.7 persons per vehicle (chart 3.2).

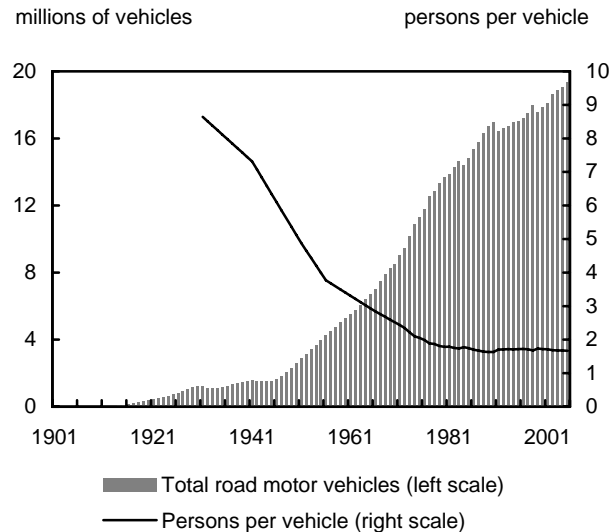
Across the country, driving to work is by far the most popular commuting method (table 3.18). However, some regional differences exist: for example, public transportation is most popular in Montreal, Ottawa-Hull and Toronto; more than 10% of people get to work by walking in Halifax, Kingston and Victoria; and 4.8% of workers bicycle to work in Victoria, more than any other census metropolitan area (CMA) (table 3.19).

The majority (69%) of petroleum products used for transportation in 2004 were sold through retail pump sales. The road transport and urban transit industries used another 13% of petroleum products, compared to 10% for airlines, 5% for marine and 3% for railways (table 3.20). While most retail pump sales are made to individuals, some commercial vehicles including taxis and fleet vehicles also purchase retail fuel.

More than 59 thousand vehicles were in use by passenger bus and urban transit industries in 2004, 59% of which were used to transport

students to school and employees to work. Urban transit vehicles made up a further 26%. Urban transit vehicles used 53% of the diesel fuel and 97% of electricity consumed by passenger bus and urban transit industries in 2004. School and employee buses consumed 27% of diesel fuel (table 3.21).

Chart 3.2
Road motor vehicles



Note(s): In 1999, Statistics Canada changed the data collection methodology for road motor vehicles. Some of the difference in the vehicle trend after 1999 may be attributable to this methodological change.

Source(s): Canadian Political Science Association and Social Science Research Council of Canada, 1965, *Historical Statistics of Canada*, M.C. Urquhart, catalogue no. HA746 U7, Toronto; 1983, *Historical Statistics of Canada, Second Edition*, F.H. Leacy (ed.), catalogue no. 11-516-X; CANSIM, tables 405-0001, 405-0004 and 051-0001.

3.5 Natural resources

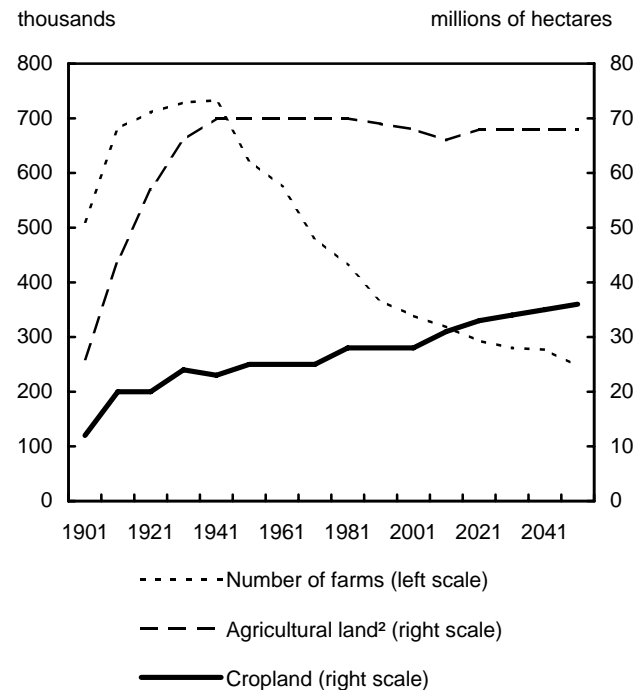
This section examines one of the main sources of impacts on the environment – natural resource consumption. The statistics presented here on agriculture, fisheries, forestry, minerals and energy, provide an indication of the role that Canada's environment plays as a source of natural resources.

3.5.1 Agriculture

From 1951 to 2001, the number of farms in Canada decreased by 60%, from 623 087 to 246 923 (table 3.22). Figure 3.3 illustrates that while the total area of agricultural land remained stable at 68 million hectares, the area of cropland increased to 36 million hectares. The average farm size increased from 113 hectares in 1951 to 273 hectares in 2001.

Charts 3.4 and 3.5 present the production of selected field crops and small grains, while chart 3.6 presents livestock inventories.

Chart 3.3
Number of farms, agricultural land and cropland¹

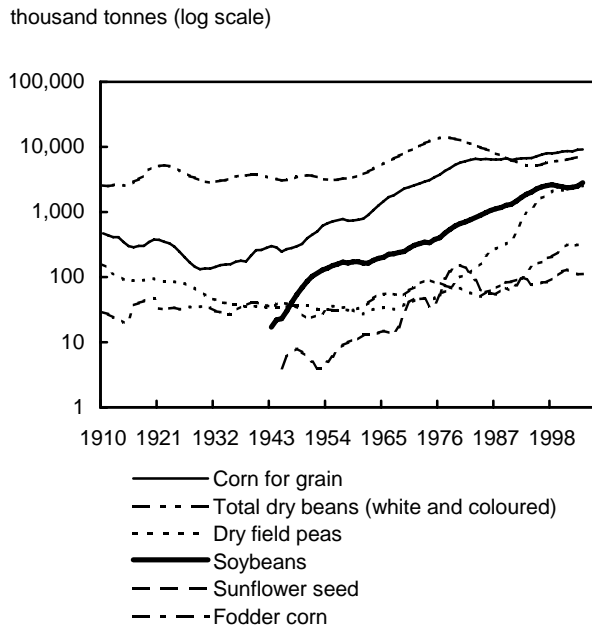


1. The definition of a census farm changed over the years, affecting the comparability of data among censuses.

2. Data for 1901 and 1911 includes all improved land.

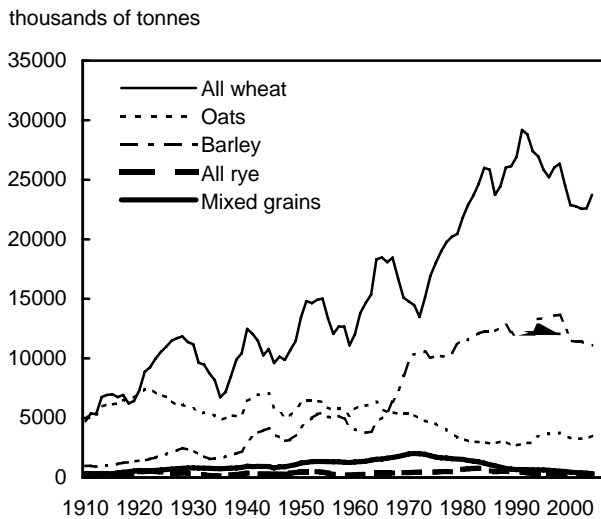
Source(s): Historical Statistics of Canada, Second Edition, F.H. Leacy (editor), catalogue no. 11-516-E; Historical Overview of Canadian Agriculture, catalogue no. 93-358-X; 2004 Census of Agriculture (accessed February 16, 2005).

Chart 3.4
Selected field crop production (five-year averages)



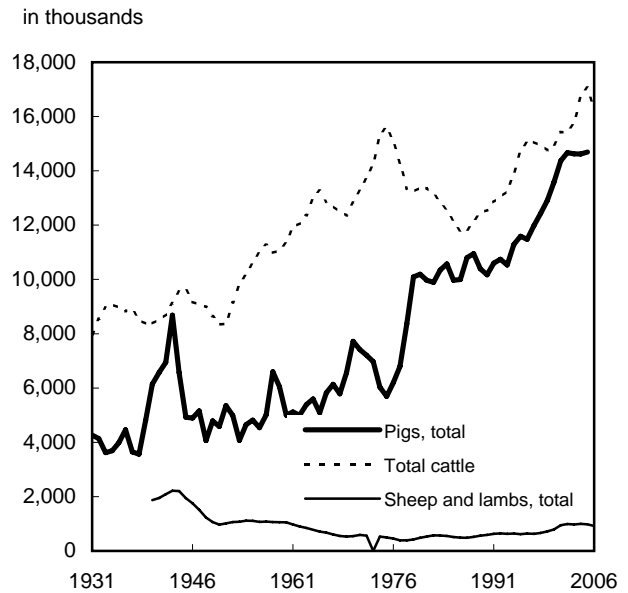
1. Data from 1908 to 2005 are used to create the five-year averages.
Source(s): CANSIM table 001-0010.

Chart 3.5
Production of major small grains (five-year averages)



1. Data from 1908 to 2005 are used to create the five-year averages.
Source(s): CANSIM table 001-0010.

Chart 3.6
Selected livestock populations



Source(s): CANSIM tables 003-0032, 003-0031 and 003-0004.

3.5.2 Fisheries

Despite declines in fish stocks during the last part of the twentieth century, Canadian fisheries continue to play an important role in communities in Atlantic Canada and British Columbia. Fishing industries contributed 0.18% or \$1.9 billion to total GDP in 2005 (table 3.23). And, they employed nearly fifty thousand people, 0.31% of total employment in Canada (table 3.24).

Exports and imports of fish and fish products are presented in table 3.25. Canada continues to be a net exporter of these products, with exports of \$4.7 billion and imports of \$1.8 billion in 2005.

After a steady decline throughout the early 1990s, the total catch of fish and shellfish has remained relatively stable, with slightly over 1.2 million tonnes, worth \$2.2 billion, caught in 2004 (table 3.26). Aquaculture production decreased for a second straight year to 146 thousand tonnes in 2004. Production had been on the rise since 1992, growing by an average of 20% per year (table 3.27).

3.5.3 Forestry

Logs and bolts—the raw material from which lumber, plywood and other wood products are

produced—account for the bulk of wood harvested from forests each year, with pulpwood making up most of the remainder (table 3.28). British Columbia and Quebec continue to dominate the forest industry. The two provinces harvested over 60% of the total volume of wood cut in 2002 (table 3.29).

Gross domestic product (GDP) for the forest products industries fell slightly to \$26.6 billion dollars in 2005, its share in total GDP has hovered at around 2.5% over the last several years (table 3.30).

Dampened by the lingering impact of the softwood lumber dispute with the United States and further impacted by the recent rapid appreciation of the Canadian dollar, employment in the forest products industries declined for a fourth consecutive year in 2005, falling to 192 thousand (table 3.31).

Forest products exports made continuous gains from 1986 to 2000, but have since trended downward, reaching a level of \$37 billion in 2005. As a share of total exports, forest products declined from 14.7% in 1986 to 8.6% in 2005 (table 3.32).

3.5.4 Minerals

The mineral industries include the extraction and production of metallic minerals such as copper, gold, iron, nickel, silver and zinc; mineral fuels including coal, crude petroleum and natural gas; and other minerals including potash, sand, and gravel. In 2005, mining and oil and gas extraction industries contributed 3.7% to GDP while petroleum and coal products and selected primary mineral manufacturing contributed another 1.0% (Tables 3.33 and 3.35).

In 2005, total employment in the mining and oil and gas extraction industries reached 163,479 (table 3.34). Since 1991, Alberta's share of total employment in the mining and oil and gas extraction industries has risen from 45% to 58%.

In 2004, crude petroleum production in Canada reached nearly \$41 billion. In the same year, over \$44 billion worth of natural gas was extracted, with the majority coming from the western provinces. Metal production totalled just over \$12.5 billion (table 3.36).

Tables 3.37 and 3.38 detail reserves and production of selected minerals.

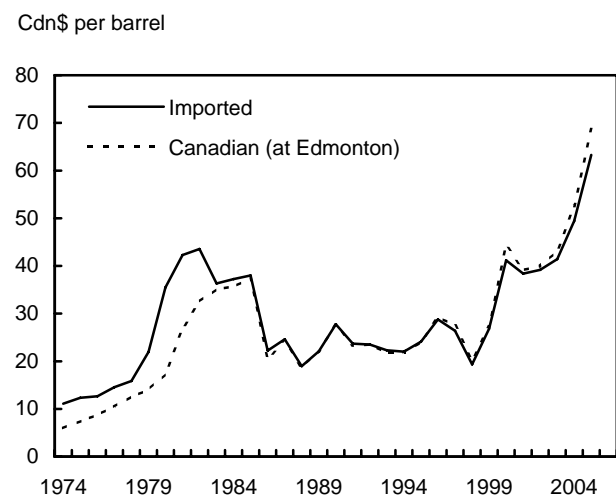
3.5.5 Energy

Energy resources such as coal, crude oil, natural gas, hydro power and uranium have transformed society, fuelling economic growth and industrial activity. They have provided the means to heat and light our homes, travel and transport goods with ease.

Canadians are consuming more energy than ever before. Growing an average of 1% per year during the previous two decades, energy consumption in Canada reached 363 gigajoules per person by 2004. By contrast, energy consumption per dollar of inflation-adjusted (real) gross domestic product (GDP) has fallen since the 1974 oil crisis (table 3.39).

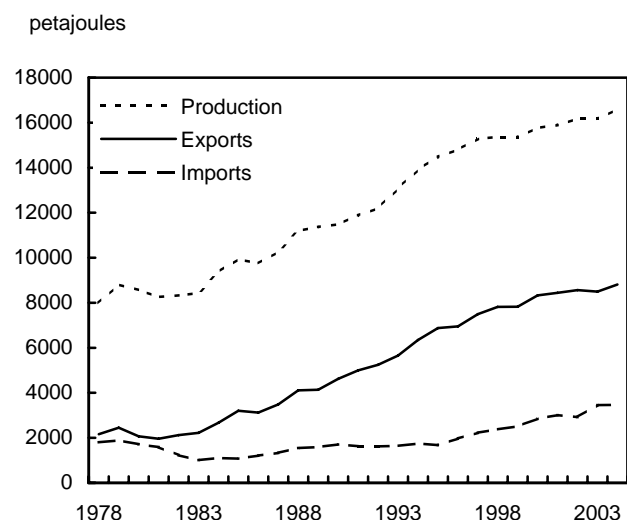
Since 1978, primary energy production has more than doubled to 16.6 million TJ, driven by increases in the production of natural gas and crude oil (table 3.40). Energy products have become an increasingly large component of Canadian exports. By 2004, energy exports rose to 8,814 PJ, up from 2,068 PJ in 1980 (chart 3.8). Meanwhile, record-high crude oil prices provide further incentive for energy producers to ramp up production (chart 3.7).

Chart 3.7
Crude oil prices



Source(s): Natural Resources Canada, Oil Division.

Chart 3.8
Primary energy production, exports and imports



Source(s): Statistics Canada, CANSIM, tables 128-0002 and 128-0009.

Table 3.41 outlines Canadian energy resource reserves of coal, crude oil, crude bitumen, natural gas and uranium. Established crude oil reserves declined by 40% from 1976 to 2004. As a result of the decline, the reserve life of crude oil fell from about 14 years in 1976 to 8 years in 2004. In contrast, established reserves of crude bitumen increased more than elevenfold from 1976 to 2004.

In 2004, 577 million MWh of electricity was generated at hydro-electric, thermal-electric, nuclear, and wind and tidal generating stations. Quebec and British Columbia were the largest hydro-electric power generators, followed by Newfoundland and Labrador and Ontario. Alberta and Ontario were the leading generators of thermal-electric energy, while Ontario generated 89% of Canada's nuclear power. Most wind energy was generated in Pincher Creek, Alberta and in the Gaspé region of Quebec (table 3.42).

Hydro-electric facilities generated 336,660 GWh of electricity, accounting for 58% of total electric power generation in Canada (table 3.43). Coal, the predominant source of fuel for thermal-electric power production in Canada (table 3.44), accounted for 69% of electricity generated at thermal-electric power stations in 2004 (table 3.45). Across Canada, the efficiency of thermal electric power plants ranged from 19% to 35%, depending on the type of fuel consumed (table 3.46).

3.6 Ecosystems

Human activity has had a profound impact on the structure and function of many ecosystems. Natural areas are altered by human activities which contributes to loss of habitats and extinction of animal and plant species. This section focuses on the impacts human activities have on air, land, water and wildlife.

3.6.1 Air

The atmosphere, an envelope of gases surrounding the earth, is made up of nitrogen (78%), oxygen (21%) argon (0.9%) and other gases. The atmosphere provides the air we breathe, shields us from ultraviolet radiation, affects air circulation and weather patterns and keeps the earth warm.

Human activities can affect both the air and the atmosphere. Traffic emissions affect urban air quality; industrial emissions of sulphur oxides and nitrogen oxides can lead to acid rain; chlorofluorocarbons, hydrochlorofluorocarbons and other substances deplete the ozone layer; and carbon dioxide, methane and nitrous oxide contribute to climate change.

Air pollutants have a negative impact on the air we breathe and also have an effect on soil and water systems through acid deposition and other means. Effects can be local or global, as pollution travels with prevailing winds. Criteria air contaminants are those for which ambient air quality standards have been established by government. In 2004, criteria air contaminants including sulphur oxides, carbon monoxide, nitrogen oxides, volatile organic compounds and particulate matter made up nearly 94% of pollutants released by industrial facilities to air (table 3.47).

Table 3.48 breaks down criteria air contaminant emissions for 2000, by source. In 2000, industrial sources were responsible for the highest emissions of sulphur oxides and volatile organic compounds and were the second highest emitters of particulate matter, after open sources. The majority of nitrogen oxides and carbon monoxide emissions came from transportation.

Greenhouse gases (GHGs) help regulate the planet's climate by trapping solar energy as it is radiated back from the Earth. Emissions of GHGs from human activities over the past 200 years have amplified this natural process and could impact global climate conditions. While criteria air contaminants persist in

the environment for a relatively short time (from less than a day to a few weeks), the effects of greenhouse gases may not be realised for much longer periods of time.

Table 3.49 compares emissions of common GHGs: carbon dioxide, methane and nitrous oxide by source for 1990 and 2004. Greenhouse gas emissions reached 758 megatonnes in 2004, 27% higher than in 1990. The increase was driven by growth in emissions from electricity and heat generation, the fossil fuel industries, transportation and mining. GHG emissions declined for the chemical, pulp & paper and construction industries.

3.6.2 Land

Canada is the second largest country in the world, with over 9.9 million square kilometres of land.² This land supports many uses, from agriculture and forestry to urban development, parks and recreation.

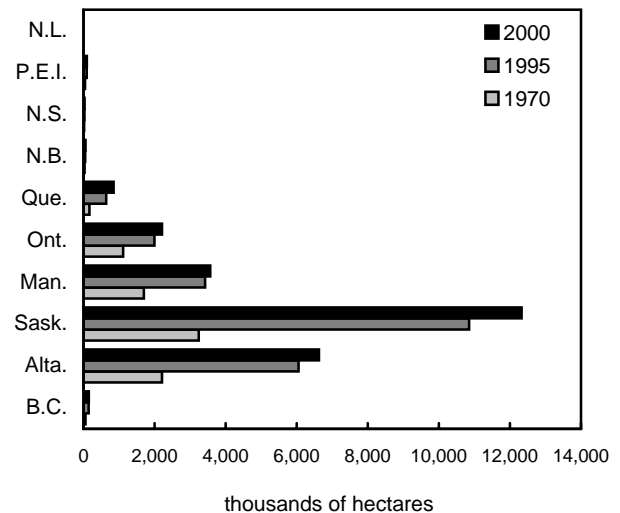
Table 3.50 presents the area of forest harvested by province and territory from 1975 to 2004, while table 3.51 shows the area of timber-productive forest land burned from 1980 to 2004.

Fertilizers and manure supply the nitrogen, phosphorus and potassium and other nutrients that are essential for plant growth. The application of manure also adds needed organic matter to soil. Care must be taken to ensure that fertilizers and manure are applied correctly, in a way that minimizes the risk of runoff. In 2000, Canadian farmers applied fertilizer to just over 24 million hectares of land to improve crop yield, a decrease of 4% compared to 1995. While the area of farmland fertilized was lower in most provinces, declines in the prairie provinces accounted for 80% of the drop (table 3.52). Livestock produced an estimated 178 million tonnes of manure in 2001 (table 3.53).

Pesticides, including herbicides, insecticides and fungicides are used to control weeds, insects and crop diseases. The risk to the environment is determined by the mobility, persistence and toxicity of the pesticide to organisms other than its target, as well as the amount used. The area of farmland treated with pesticides is illustrated in charts 3.9 and 3.10.

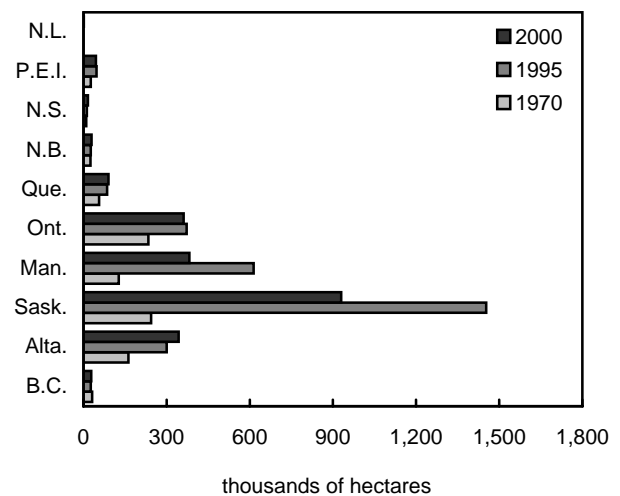
2. Natural Resources Canada, 2004, "Land and Freshwater Areas," *The Atlas of Canada*, atlas.gc.ca/site/english/learningresources/facts/surfareas.html (accessed March 23, 2005).

Chart 3.9
Area of farmland treated with herbicides by province



Source(s): Census of Agriculture, catalogue no. 95F0301X.

Chart 3.10
Area of farmland treated with insecticides by province



Note(s): For 1970, fungicides were also included.

Source(s): Census of Agriculture; 2002, Census of Agriculture (accessed March 8, 2006).

The National Pollutant Release Inventory Database measures the volume of pollutants released on-site by over 8 thousand industrial facilities. In 2004, hydrogen sulphide made up more than 81% of the tonnage of substances released to land (table 3.54).

3.6.3 Water

With 20% of the world's fresh water resources and 7% of the world's total renewable water flow, water remains a precious part of Canada's natural wealth.³ Used for power generation, transportation, recreation, irrigation, manufacturing, agriculture and drinking water, Canadian water use per capita is the second highest in the world.⁴ We also use our

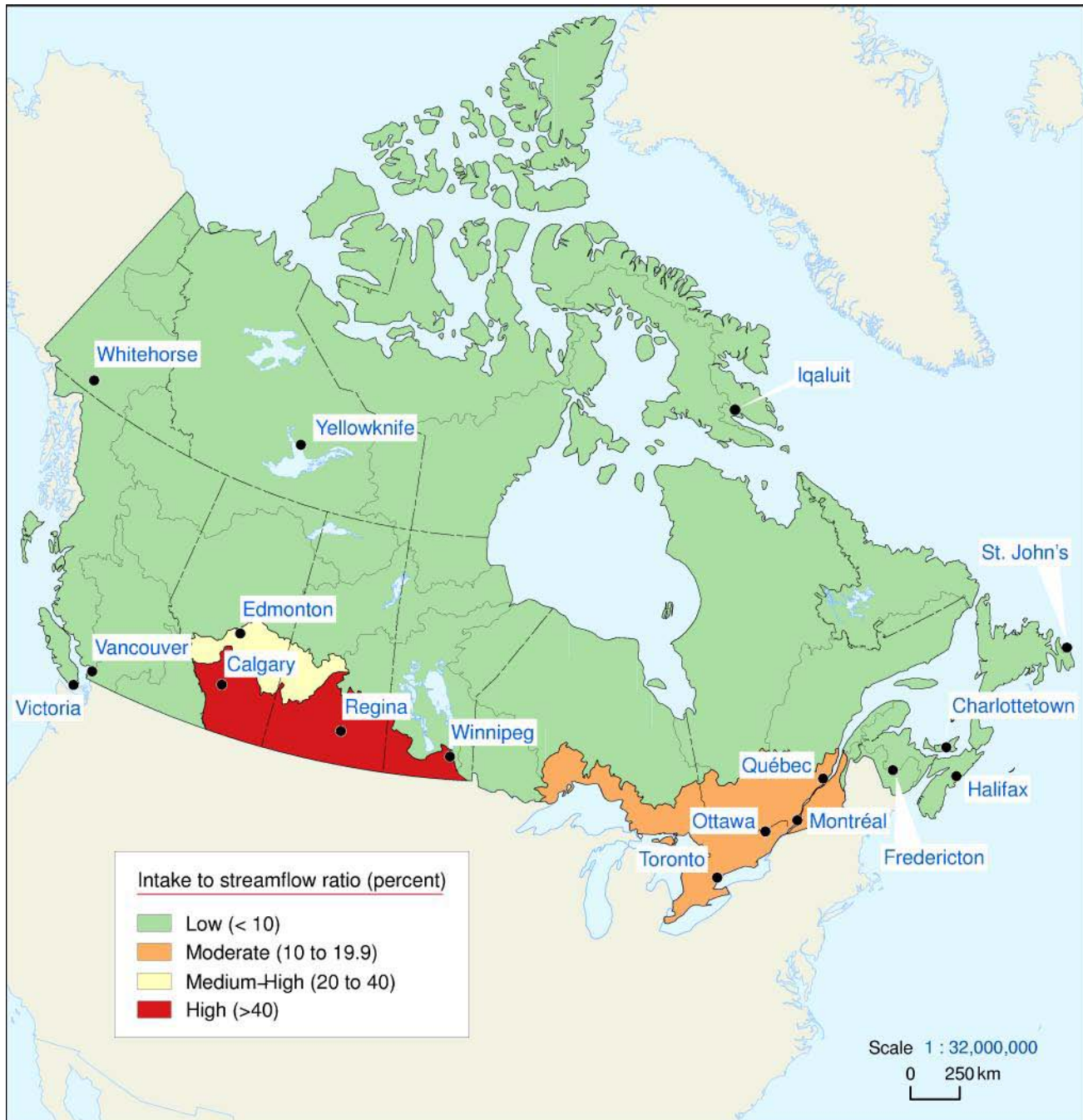
rivers, lakes and marine areas to dispose of municipal wastewater and wastes from industry. Some activities for which water is used can make it unfit for use by humans or wildlife.

Map 3.1 illustrates the proportion of surface fresh water that is used by Canadians within each of Canada's major drainage areas. Although responsible for only 14% of total water intake, the South Saskatchewan, Missouri and Assiniboine-Red and the North Saskatchewan river basins have the highest ratios of water intake to streamflow (table 3.55).

3. *Fresh Water Resources, Human Activity and the Environment, catalogue no. 16-201-X.*

4. *Fresh Water Resources, Human Activity and the Environment, catalogue no. 16-201-X.*

Map 3.1
Water use and availability by major river basin



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

The Great Lakes - St. Lawrence river basin also stands out with water intake of 30.6 billion m³, used mainly for industrial (89%) and municipal (10%) purposes. In contrast, 71% of total surface fresh water intake in the South Saskatchewan, Missouri and Assiniboine-Red river basin, 2.9 billion m³, was for agricultural use (table 3.55).

In 2004, ammonia and nitrate made up 90% of the total tonnage of substances released by into water (table 3.56). Water contaminated with high levels of nitrate cannot be used as drinking water and ammonia is toxic to fish and other aquatic organisms.

3.6.4 Wildlife

Despite the importance of wildlife to Canadians, our activities have significantly reduced certain wildlife populations. Hunting by early European settlers was unregulated and in some cases, excessive. Habitats have been disrupted and fragmented as land has been drained and cleared to make way for agriculture, forestry, urbanization, transportation corridors and industrial development. Habitats have also been polluted, creating conditions under which a number of species can no longer live or reproduce.

As of 2005, 35 animal and plant species in Canada were either extinct or extirpated, while 184 were considered to be endangered and another 129 were classified as threatened (table 3.58). Table 3.57 lists extinct and extirpated species in Canada, including date of extinction/extirpation and probable cause(s).

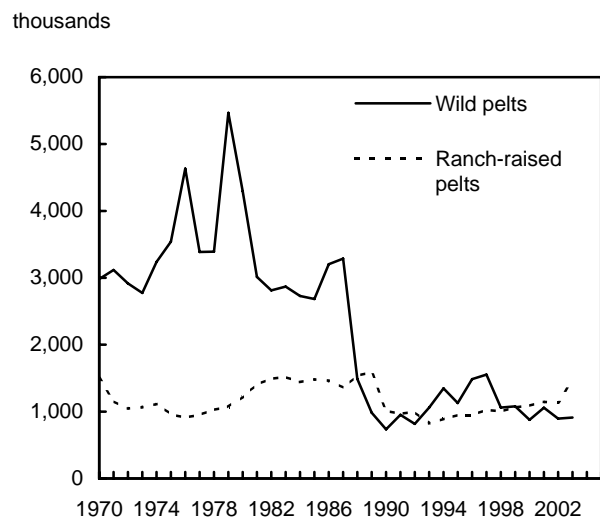
Human activity has affected the structure and function of many ecosystems through the introduction of invasive species. Invasive species include animals, microbes and plants that enter new areas when humans carry them across natural barriers, such as bodies of water that normally limit their dispersal. Invasive species can displace native species or alter native habitats in a significant fashion as they become established in an ecosystem.

Invasive species in Canada considered to be of highest threat to our ecosystems are presented in table 3.59. Information on the origin of these species, their invasive range in Canada and major impacts on ecosystems as well as background on when and how they were introduced is also included.

While many prefer to simply view wildlife in a natural setting, hunting remains a popular recreational activity.

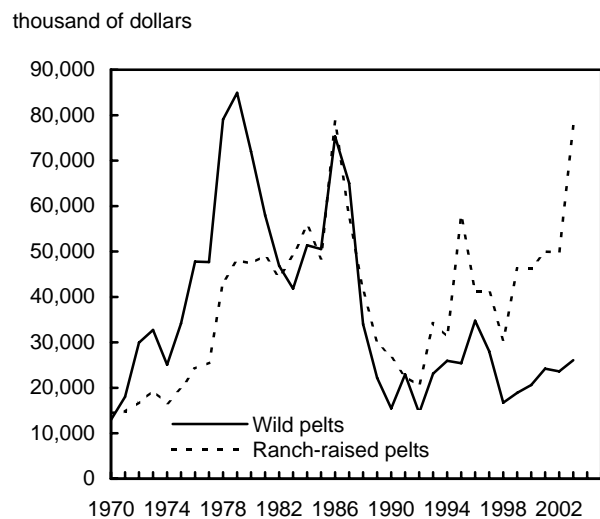
Some continue to hunt and trap for their livelihood. At the same time, farming of furbearing animals continue to contribute to the Canadian economy. Table 3.60 shows harvest estimates for selected waterfowl species including Canada geese, American black ducks and mallards. Tables 3.61 and 3.62 and charts 3.11 and 3.12 show the number and value of wild and farmed pelts harvested.

Chart 3.11
Number of pelts harvested



Source(s): CANSIM table 003-0013.

Chart 3.12
Value of pelts harvested



Source(s): CANSIM table 003-0013.

Table 3.1
Total population by province and territory, selected census years

	1901	1911	1921	1931	1941	1951	1961
	thousands						
Canada	5,371.3	7,206.6	8,787.8	10,376.7	11,506.7	14,009.4	18,238.3
Newfoundland and Labrador	..	..	..	..	..	361.4	457.9
Prince Edward Island	103.3	93.7	88.6	88.0	95.0	98.4	104.6
Nova Scotia	459.6	492.3	523.8	512.8	578.0	642.6	737.0
New Brunswick	331.1	351.9	387.9	408.2	457.4	515.7	597.9
Quebec	1,648.9	2,005.8	2,360.5	2,874.7	3,331.9	4,055.7	5,259.2
Ontario	2,182.9	2,527.3	2,933.7	3,431.7	3,787.7	4,597.6	6,236.1
Manitoba	255.2	461.4	610.1	700.1	729.7	776.5	921.7
Saskatchewan	91.3	492.4	757.5	921.8	896.0	831.7	925.2
Alberta	73.0	374.3	588.5	731.6	796.2	939.5	1,332.0
British Columbia	178.7	392.5	524.6	694.3	817.8	1,165.2	1,629.1
Yukon Territory	27.2	8.5	4.1	4.2	5.0	9.1	14.6
Northwest Territories	20.1 ¹	6.5 ¹	8.1 ¹	9.3 ¹	12.0 ¹	16.0 ¹	23.0 ¹
Nvt.	..	..	..	..	..	..	..
	1971	1981	1991	2001	Percentage change		
					1901 to 1951	1951 to 2001	
	thousands				percent		
Canada	21,962.0	24,820.4	28,031.4	31,021.3	161	121	
N.L.	530.9	574.8	579.5	522.0	..	44	
P.E.I.	112.6	123.7	130.3	136.7	-5	39	
N.S.	797.3	854.6	915.1	932.4	40	45	
N.B.	642.5	706.3	745.5	749.9	56	45	
Que.	6,137.3	6,547.7	7,064.6	7,397.0	146	82	
Ont.	7,849.0	8,811.3	10,428.1	11,897.6	111	159	
Man.	998.9	1,036.4	1,109.6	1,151.3	204	48	
Sask.	932.0	975.9	1,002.7	1,000.1	811	20	
Alta.	1,665.7	2,294.2	2,592.6	3,056.7	1,187	225	
B.C.	2,240.5	2,823.9	3,373.5	4,078.4	552	250	
Y.T.	19.0	23.9	28.9	30.1	-67	231	
N.W.T.	36.4 ¹	47.6 ¹	38.7	40.8	..	..
Nvt.	..	..	22.2	28.1	..	..

1. Includes Nunavut.

Note(s): Figures may not add up to totals due to rounding.

Source(s): CANSIM tables 075-0009 and 051-0001.

Table 3.2
Components of population growth

	Population			Natural increase			Migration		
	Total	Growth	Growth rate	Births	Deaths	Natural increase	Immigration	Emigration ¹	Net migration
	thousands		percent	thousands					
1972	22,218	256	1.2	351.3	159.5	191.7	117.0	26.6	90.5
1973	22,492	273	1.2	345.8	162.6	183.2	138.5	27.7	110.8
1974	22,808	316	1.4	342.4	166.3	176.2	217.5	46.8	170.7
1975	23,143	335	1.4	356.0	168.8	187.2	209.3	40.5	168.8
1976	23,450	307	1.3	364.3	166.4	197.9	170.0	30.3	139.7
1977	23,726	276	1.2	357.9	165.7	192.1	130.9	25.1	105.9
1978	23,963	237	1.0	359.8	169.0	190.8	101.0	31.4	69.5
1979	24,202	238	1.0	362.4	165.8	196.6	84.5	30.9	53.7
1980	24,516	314	1.3	367.3	171.5	195.8	143.8	20.5	123.3
1981	24,820	304	1.2	372.1	170.5	201.6	127.2	17.8	109.4
1982	25,117	297	1.2	372.5	172.4	200.1	135.3	29.1	106.2
1983	25,367	250	1.0	373.6	176.5	197.1	101.4	31.1	70.3
1984	25,608	241	0.9	374.5	174.2	200.4	88.6	31.8	56.8
1985	25,843	235	0.9	376.3	179.1	197.2	83.9	28.1	55.8
1986	26,101	258	1.0	375.4	183.4	192.0	88.7	24.8	63.9
1987	26,449	348	1.3	373.0	182.6	190.4	130.9	31.0	99.9
1988	26,795	347	1.3	370.0	189.9	180.1	152.2	26.7	125.5
1989	27,282	486	1.8	384.0	188.4	195.6	177.6	26.3	151.3
1990	27,698	416	1.5	403.3	192.6	210.7	203.4	25.8	177.5
1991	28,031	334	1.2	402.9	192.4	210.5	221.4	28.5	192.9
1992	28,367	335	1.2	403.1	197.0	206.1	244.3	49.5	194.8
1993	28,682	315	1.1	392.2	201.8	190.4	266.9	48.5	218.4
1994	28,999	317	1.1	386.2	206.5	179.7	235.4	52.8	182.5
1995	29,302	303	1.0	382.0	209.4	172.6	220.7	53.4	167.3
1996	29,611	309	1.0	372.5	209.8	162.7	217.5	49.1	168.4
1997	29,907	296	1.0	357.3	217.2	140.1	224.9	59.4	165.4
1998	30,157	250	0.8	345.1	217.7	127.4	194.5	58.7	135.8
1999	30,404	247	0.8	338.3	217.6	120.7	173.2	56.1	117.1
2000	30,689	285	0.9	336.9	217.2	119.7	205.7	56.0	149.7
2001	31,021	332	1.1	327.1	219.1	108.0	252.5	55.4	197.1
2002	31,373	351	1.1	328.2	220.5	107.7	256.3	46.4	209.9
2003	31,669	297	0.9	330.5	224.7	105.8	199.2	44.6	154.6
2004	31,974	305	1.0	335.7	231.3	104.4	239.1	45.3	193.8
2005	32,271	296	0.9	337.9	234.6	103.2	244.6	45.6	198.9

1. Emigration refers to the total number of emigrants less returning emigrants. From 1992 on, emigration also includes the net change in the number of persons living temporarily abroad.

Note(s): Population growth figures do not equal the sum of the natural increase and net migration. The balance of non-permanent residents and the number of returning Canadians, as well as a residual need to be added.

Source(s): CANSIM tables 051-0001 and 051-0004.

Table 3.3
Population by ecozone

	Area	Population			Density	
		1981	2001	Change 1981 to 2001	1981	2001
	square kilometres	persons			persons per 100 square kilometres	
Canada	8,806,839	24,343,181	30,007,094	5,663,913	276.41	340.72
Arctic Cordillera	234,708	821	1,304	483	0.35	0.56
Northern Arctic	1,371,340	11,872	20,451	8,579	0.87	1.49
Southern Arctic	702,542	8,137	14,470	6,333	1.16	2.06
Taiga Plains	569,363	18,358	20,726	2,368	3.22	3.64
Taiga Shield	1,122,504	30,859	38,116	7,257	2.75	3.40
Boreal Shield	1,640,949	2,731,344	2,821,808	90,464	166.45	103.31
Atlantic Maritime	192,017	2,428,735	2,537,685	108,950	1,264.86	1,321.60
Mixed Wood Plains	107,017	12,187,952	15,631,830	3,443,878	11,388.75	14,606.81
Boreal Plains	668,664	673,775	771,205	97,430	100.76	115.34
Prairies	443,159	3,499,494	4,222,569	723,075	789.67	952.83
Taiga Cordillera	264,213	563	370	-193	0.21	0.14
Boreal Cordillera	459,864	26,507	30,690	4,183	5.76	6.67
Pacific Maritime	196,200	2,014,790	3,027,206	1,012,416	1,026.91	1,542.92
Montane Cordillera	474,753	701,014	859,134	158,120	147.66	180.96
Hudson Plains	359,546	8,960	9,530	570	2.49	2.65

Note(s): The area figures are for land area only and are calculated by taking the total ecozone area and subtracting the surface water area in the ecozone derived from the 1-km water fraction digital coverage. The total area of Canada excluding the Great Lakes is 9,886,215 km². Including the Canadian portion of the Great Lakes the total area of Canada is 9,976,182 km². The population figures presented here are the census counts and are not adjusted for net undercoverage and non-permanent residents.

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Spatial Environmental Information System and Censuses of Population, 1981 and 2001. Agriculture and Agri-Food Canada, and Environment Canada, 2003, Framework Data - National Resolution - Ecological Units, www.geoconnexions.org/CGDI.cfm/fuseaction/dataFrameworkData.ecoUnits/gcs.cfm (accessed March 2, 2005). Fernandes, R., G. Pavlic, W. Chen and R. Fraser, 2001, Canada-wide 1-km water fraction, National Topographic Database, Natural Resources Canada, www.nrcan.gc.ca/ess/_portal_esst.cache/gc_ccrs_e (accessed March 2, 2005).

Table 3.4
Population by provincial and territorial ecozone

	Area		Population					Density				
	1981 to 1999	1999 to 2001	1981	1991	2001	Change 1981 to 2001	Change 1991 to 2001	1981	1991	2001	Change 1981 to 2001	Change 1991 to 2001
	square kilometres		persons					persons per square kilometre			percent	
Canada	8,806,839	8,806,839	24,343,181	27,296,859	30,007,094	5,663,913	2,710,235	2.764	3.099	3.407	18.9	9.0
Newfoundland and Labrador												
Arctic Cordillera	17,318	17,318	0	0	0	0	0	0.000	0.000	0.000	0.0	0.0
Boreal Shield	139,813	139,813	563,063	563,897	508,197	-54,866	-55,700	4.027	4.033	3.635	-10.8	-11.0
Taiga Shield	194,228	194,228	4,618	4,577	4,733	115	156	0.024	0.024	0.024	2.4	3.3
Total	351,359	351,359	567,681	568,474	512,930	-54,751	-55,544	1.616	1.618	1.460	-10.7	-10.8
Prince Edward Island												
Atlantic Maritime	5,402	5,402	122,506	129,765	135,294	12,788	5,529	22.679	24.023	25.047	9.5	4.1
Total	5,402	5,402	122,506	129,765	135,294	12,788	5,529	22.679	24.023	25.047	9.5	4.1
Nova Scotia												
Atlantic Maritime	50,633	50,633	847,442	899,942	908,007	60,565	8,065	16.737	17.774	17.933	6.7	0.9
Total	50,633	50,633	847,442	899,942	908,007	60,565	8,065	16.737	17.774	17.933	6.7	0.9
New Brunswick												
Atlantic Maritime	70,602	70,602	696,403	723,900	729,498	33,095	5,598	9.864	10.253	10.333	4.5	0.8
Total	70,602	70,602	696,403	723,900	729,498	33,095	5,598	9.864	10.253	10.333	4.5	0.8
Quebec												
Arctic Cordillera	12,360	12,360	0	0	0	0	0	0.000	0.000	0.000	0.0	0.0
Atlantic Maritime	65,380	65,380	762,384	758,879	764,886	2,502	6,007	11.661	11.607	11.699	0.3	0.8
Boreal Shield	573,556	573,556	1,159,520	1,227,015	1,292,746	133,226	65,731	2.022	2.139	2.254	10.3	5.1
Hudson Plains	34,724	34,724	1,342	1,788	2,312	970	524	0.039	0.051	0.067	42.0	22.7
Mixed Wood Plains	27,220	27,220	4,501,391	4,894,723	5,160,906	659,515	266,183	165.373	179.823	189.602	12.8	5.2
Northern Arctic	33,599	33,599	932	1,461	1,842	910	381	0.028	0.043	0.055	49.4	20.7
Southern Arctic	123,968	123,968	2,156	3,257	4,017	1,861	760	0.017	0.026	0.032	46.3	18.9
Taiga Shield	437,194	437,194	10,678	8,840	10,770	92	1,930	0.024	0.020	0.025	0.9	17.9
Total	1,308,002	1,308,002	6,438,403	6,895,963	7,237,479	799,076	341,516	4.922	5.272	5.533	11.0	4.7
Ontario												
Boreal Shield	559,603	559,603	933,099	952,438	933,908	809	-18,530	1.667	1.702	1.669	0.1	-2.0
Hudson Plains	254,963	254,963	5,447	5,789	5,214	-233	-575	0.021	0.023	0.020	-4.5	-11.0
Mixed Wood Plains	79,798	79,798	7,686,561	9,126,658	10,470,924	2,784,363	1,344,266	96.326	114.372	131.218	26.6	12.8
Total	894,364	894,364	8,625,107	10,084,885	11,410,046	2,784,939	1,325,161	9.644	11.276	12.758	24.4	11.6
Manitoba												
Boreal Plains	83,667	83,667	104,579	110,298	116,672	12,093	6,374	1.250	1.318	1.394	10.4	5.5
Boreal Shield	216,334	216,334	65,707	68,052	72,277	6,570	4,225	0.304	0.315	0.334	9.1	5.8
Hudson Plains	66,685	66,685	2,171	2,361	2,004	-167	-357	0.033	0.035	0.030	-8.3	-17.8
Prairies	64,234	64,234	852,832	910,069	927,172	74,340	17,103	13.277	14.168	14.434	8.0	1.8
Southern Arctic	1,142	1,142	0	0	0	0	0	0.000	0.000	0.000	0.0	0.0
Taiga Shield	109,048	109,048	952	1,162	1,458	506	296	0.009	0.011	0.013	34.7	20.3
Total	541,110	541,110	1,026,241	1,091,942	1,119,583	93,342	27,641	1.897	2.018	2.069	8.3	2.5
Saskatchewan												
Boreal Plains	163,274	163,274	161,945	158,821	160,484	-1,461	1,663	0.992	0.973	0.983	-0.9	1.0
Boreal Shield	147,484	147,484	9,955	12,086	14,680	4,725	2,594	0.067	0.082	0.100	32.2	17.7
Prairies	229,248	229,248	792,946	816,283	801,806	8,860	-14,477	3.459	3.561	3.498	1.1	-1.8
Taiga Shield	37,460	37,460	3,467	1,738	1,963	225	0.093	0.046	0.052	-76.6	-11.5	
Total	577,467	577,467	968,313	988,928	978,933	10,620	-9,995	1.677	1.713	1.695	1.1	-1.0
Alberta												
Boreal Plains	367,431	367,431	354,030	387,592	438,155	84,125	50,563	0.964	1.055	1.192	19.2	11.5
Boreal Shield	4,159	4,159	0	4	0	0	-4	0.000	0.001	0.000	0.0	0.0
Montane Cordillera	46,336	46,336	27,961	31,481	39,813	11,852	8,332	0.603	0.679	0.859	29.8	20.9
Prairies	149,676	149,676	1,853,716	2,123,916	2,493,591	639,875	369,675	12.385	14.190	16.660	25.7	14.8
Taiga Plains	60,663	60,663	2,017	2,560	2,938	921	378	0.033	0.042	0.048	31.3	12.9
Taiga Shield	7,932	7,932	0	0	310	310	310	0.000	0.000	0.039	100.0	100.0
Total	636,199	636,199	2,237,724	2,545,553	2,974,807	737,083	429,254	3.517	4.001	4.676	24.8	14.4
British Columbia												
Boreal Cordillera	188,728	188,728	3,598	3,351	2,396	-1,202	-955	0.019	0.018	0.013	-50.2	-39.9
Boreal Plains	39,073	39,073	48,582	49,126	53,174	4,592	4,048	1.243	1.257	1.361	8.6	7.6
Montane Cordillera	428,417	428,417	673,053	720,713	819,321	146,268	98,608	1.571	1.682	1.912	17.9	12.0
Pacific Maritime	192,107	192,107	2,014,790	2,503,960	3,027,206	1,012,416	523,246	10.488	13.034	15.758	33.4	17.3
Taiga Plains	66,853	66,853	4,444	4,911	5,641	1,197	730	0.066	0.073	0.084	21.2	12.9
Total	915,178	915,178	2,744,467	3,282,061	3,907,738	1,163,271	625,677	2.999	3.586	4.270	29.8	16.0
Yukon Territory												
Boreal Cordillera	266,546	266,546	22,909	27,488	28,294	5,385	806	0.086	0.103	0.106	19.0	2.8
Pacific Maritime	4,093	4,093	0	0	0	0	0	0.000	0.000	0.000	0.0	0.0
Southern Arctic	4,496	4,496	1	0	0	-1	0	0.000	0.000	0.000	0.0	0.0
Taiga Cordillera	180,170	180,170	243	309	370	127	61	0.001	0.002	0.002	34.3	16.5

See footnotes at the end of the table.

Table 3.4 – continued

Population by provincial and territorial ecozone

	Area		Population					Density				
	1981 to 1999	1999 to 2001	1981	1991	2001	Change 1981 to 2001	Change 1991 to 2001	1981	1991	2001	Change 1981 to 2001	Change 1991 to 2001
	square kilometres		persons		persons			persons per square kilometre		persons per square kilometre	percent	
Taiga Plains	18,110	18,110	0	0	10	10	10	0.000	0.000	0.001	100.0	100.0
Total	473,415	473,415	23,153	27,797	28,674	5,521	877	0.049	0.059	0.061	19.3	3.1
Northwest Territories 1												
Arctic Cordillera	205,053	...	821	1,047	...	...	...	0.004	0.005	...	...	...
Boreal Cordillera	4,589	4,589	0	0	0	0	0	0.000	0.000	0.000	0.0	0.0
Boreal Plains	15,218	15,218	4,639	3,008	2,720	-1,919	-288	0.305	0.198	0.179	-70.6	-10.6
Hudson Plains	3,174	...	0	0	...	...	...	0.000	0.000	...	...	...
Northern Arctic	1,337,719	198,761	10,940	14,867	512	-10,428	-14,355	0.008	0.075	0.003	-217.5	-2,803.7
Southern Arctic	572,936	158,124	5,980	7,057	3,109	-2,871	-3,948	0.010	0.045	0.020	46.9	-127.0
Taiga Cordillera	84,043	84,043	320	0	0	-320	0	0.004	0.000	0.000	0.0	0.0
Taiga Plains	423,737	423,737	11,897	13,958	12,137	240	-1,821	0.028	0.033	0.029	2.0	-15.0
Taiga Shield	336,641	257,638	11,144	17,712	18,882	7,738	1,170	0.033	0.069	0.073	54.8	6.2
Total	2,983,143	1,142,110	45,741	57,649	37,360	-8,381	-20,289	0.015	0.050	0.033	53.1	-54.3
Nunavut 1												
Arctic Cordillera	...	205,053	...	...	1,304	...	...	...	...	0.006	...	...
Hudson Plains	...	3,174	...	...	0	...	...	...	...	0.000	...	...
Northern Arctic	...	1,138,957	...	...	18,097	...	...	...	...	0.016	...	...
Southern Arctic	...	414,811	...	...	7,344	...	...	...	...	0.018	...	...
Taiga Shield	...	79,003	...	...	0	...	...	...	...	0.000	...	...
Total	...	1,841,032	...	...	26,745	...	...	...	...	0.015	...	...

1. As Nunavut was created on April 1, 1999, population data is not available for 1981 and 1991. Population for 1981 and 1991 for Nunavut is included in the Northwest Territories data.

Note(s): The area figures are for land area only and are calculated by taking the total ecozone area and subtracting the surface water area in the ecozone derived from the 1-km water fraction digital coverage. The total area of Canada excluding the Great Lakes is 9,886,215 km². Including the Great Lakes the total area of Canada is 9,976,182 km². The population figures presented here are the census counts and are not adjusted for net undercoverage and non-permanent residents.

Source(s): Statistics Canada, Environment Accounts and Statistics Division, Spatial Environmental Information System and Censuses of Population, 1981, 1991 and 2001. Agriculture and Agri-Food Canada, and Environment Canada, 2003, Framework Data - National Resolution - Ecological Units, www.geoconnections.org/CGDI.cfm/fuseaction/dataFrameworkData.ecoUnits/gcs.cfm (accessed March 2, 2005). Fernandes, R., G. Pavlic, W. Chen and R. Fraser, 2001, Canada-wide 1-km water fraction, National Topographic Database, Natural Resources Canada, www.nrcan.gc.ca/ess/_portal_esst.cache/gc_ccrs_e (accessed March 2, 2005).

Table 3.5
Population characteristics by major river basin¹

Drainage area code	Total population		Population as a share of total	Population change	Population density in 2001		Mean annual streamflow per capita	
	1971	2001	2001	1971 to 2001	By total area ²	By water area ³		
code	persons		percent		persons per square kilometre		thousands of cubic metres per person	
Canada	...	21,568,311	30,007,094	100.00	39.1	3.0	25.5	110
Pacific Coastal	1	916,210	1,374,422	4.58	50.0	4.1	91.4	376
Fraser - Lower Mainland	2	967,851	2,020,656	6.73	108.8	8.7	224.1	62
Okanagan - Similkameen	3	120,553	285,145	0.95	136.5	18.3	438.7	8
Columbia	4	131,462	160,605	0.54	22.2	1.8	64.7	394
Yukon	5	17,204	27,148	0.09	57.8	0.1	2.9	2,911
Peace - Athabasca	6	206,564	346,234	1.15	67.6	0.7	20.7	264
Lower Mackenzie	7	34,182	48,832	0.16	42.9	0.0	0.3	4,738
Arctic Coast - Islands	8	7,690	16,756	0.06	117.9	0.0	0.1	16,457
Missouri	9	14,349	9,378	0.03	-34.6	0.3	8.3	40
North Saskatchewan	10	844,730	1,307,959	4.36	54.8	8.7	180.5	6
South Saskatchewan	11	948,446	1,772,288	5.91	86.9	10.0	283.9	4
Assiniboine - Red	12	1,250,804	1,365,079	4.55	9.1	7.2	150.0	1
Winnipeg	13	84,685	83,277	0.28	-1.7	0.8	4.0	287
Lower Saskatchewan - Nelson	14	237,276	218,315	0.73	-8.0	0.6	3.2	276
Churchill	15	61,711	87,343	0.29	41.5	0.3	1.7	253
Keewatin - Southern Baffin Island	16	6,271	12,033	0.04	91.9	0.0	0.1	14,107
Northern Ontario	17	149,112	143,036	0.48	-4.1	0.2	2.6	1,322
Northern Quebec	18	87,805	104,437	0.35	18.9	0.1	0.7	5,082
Great Lakes - St. Lawrence	19	12,759,943	17,698,641	58.98	38.7	30.4	131.2	13
North Shore - Gaspé	20	503,796	504,113	1.68	0.1	1.4	13.5	510
Saint John - St. Croix	21	365,294	401,681	1.34	10.0	9.6	223.2	61
Maritime Coastal	22	1,329,135	1,505,585	5.02	13.3	12.3	223.8	76
Newfoundland - Labrador	23	523,238	514,131	1.71	-1.7	1.4	9.3	572

1. These major river basins and associated flow measures are adapted from Laycock (1987) (see full reference below). Some of these river basin aggregates have more than one outflow.
2. Area includes the Canadian portion of the Great Lakes.
3. Water area figures are calculated from the Canada-wide 1-km water fraction derived from National Topographic Database maps.

Source(s): Environment Canada, 2003, Canadian Climate Normals, 1971 to 2000, Meteorological Service of Canada, climate.weatheroffice.ec.gc.ca/climate_normals/index_e.html (accessed February 23, 2005). Pearse, P.H., F. Bertrand and J.W. MacLaren, 1985, Currents of Change: Final Report of the Inquiry on Federal Water Policy, Environment Canada, Ottawa. Fernandes, R., G. Pavlic, W. Chen and R. Fraser, 2001, Canada-wide 1-km water fraction, National Topographic Database, Natural Resources Canada, www.nrccan.gc.ca/ess/_portal_esst.cache/gc_ccrs_e (accessed February 23, 2005). Laycock, A.H., 1987, "The Amount of Canadian Water and its Distribution," in Canadian Aquatic Resources, no. 215 of Canadian Bulletin of Fisheries and Aquatic Sciences, M.C. Healey and R.R. Wallace (eds.), 13-42, Fisheries and Oceans Canada, Ottawa. Natural Resources Canada, GeoAccess Division, 2003, 1:1 Million Digital Drainage Area Framework, version 4.8b. Statistics Canada, Censuses of Population 1971 and 2001.

Table 3.6-1
Total population by major drainage and sub-drainage area — Maritime Provinces

Drainage area code	1981	1986	1991	1996	2001	
Canada	...	24,343,181	25,309,300	27,296,859	28,846,761	30,007,094
Maritime Provinces	[01]	1,806,205	1,848,245	1,883,845	1,911,685	1,893,695
Saint John and Southern Bay of Fundy, N.B.	[01A]	385,680	393,945	398,480	408,885	403,755
Gulf of St. Lawrence and Northern Bay of Fundy, N.B.	[01B]	450,040	454,330	455,665	458,955	446,645
Prince Edward Island	[01C]	122,510	126,645	129,765	134,560	135,295
Bay of Fundy and Gulf of St. Lawrence, N.S.	[01D]	291,055	305,415	315,810	321,270	317,940
Southeastern Atlantic Ocean, N.S.	[01E]	386,840	401,795	422,445	429,745	441,655
Cape Breton Island	[01F]	170,085	166,115	161,685	158,275	148,410

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.6-2
Total population by major drainage and sub-drainage area — St. Lawrence

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	24,343,181	25,309,300	27,296,859	28,846,761	30,007,094
St. Lawrence	[02]	15,137,905	15,727,225	17,073,065	17,963,690	18,704,560
Northwestern Lake Superior	[02A]	133,445	134,360	136,790	137,515	132,490
Northeastern Lake Superior	[02B]	55,595	50,145	51,075	49,510	46,625
Northern Lake Huron	[02C]	263,665	260,525	266,290	267,435	253,190
Wanapitei and French, Ont.	[02D]	91,670	87,530	91,315	91,675	89,015
Eastern Georgian Bay	[02E]	410,135	440,775	540,300	610,395	679,535
Eastern Lake Huron	[02F]	263,420	275,645	302,160	309,535	310,990
Northern Lake Erie	[02G]	1,649,120	1,690,085	1,838,285	1,933,060	2,028,510
Lake Ontario and Niagara Peninsula	[02H]	4,549,385	4,879,010	5,463,720	5,882,975	6,356,940
Upper Ottawa	[02J]	112,510	114,270	120,075	120,200	112,595
Central Ottawa	[02K]	343,685	356,280	383,730	412,425	429,430
Lower Ottawa	[02L]	857,915	932,310	1,044,135	1,129,250	1,190,950
Upper St. Lawrence	[02M]	233,990	246,585	260,335	273,790	270,745
Saint-Maurice	[02N]	131,615	135,045	126,960	128,740	126,420
Central St. Lawrence	[02O]	3,895,360	3,971,215	4,253,605	4,407,750	4,516,340
Lower St. Lawrence	[02P]	1,052,255	1,068,255	1,118,665	1,149,035	1,154,435
Northern Gaspé Peninsula	[02Q]	140,060	139,320	132,855	132,995	131,525
Saguenay	[02R]	287,275	286,690	287,215	287,765	279,825
Betsiamites, coast	[02S]	16,200	15,505	15,155	15,160	15,385
Manicouagan and aux Outardes	[02T]	23,655	20,155	20,240	20,495	18,170
Moisie and St. Lawrence Estuary	[02U]	61,195	53,820	53,055	52,840	49,250
Gulf of St. Lawrence, Romaine	[02V]	2,065	2,030	2,145	2,195	1,560
Gulf of St. Lawrence, Natashquan	[02W]	20,755	21,380	19,970	19,685	19,880
Petit Mécatina and Strait of Belle Isle	[02X]	6,565	6,650	6,905	6,670	5,705
Northern Newfoundland	[02Y]	217,670	214,330	208,475	198,690	178,700
Southern Newfoundland						

Table 3.6-4
Total population by major drainage and sub-drainage area — Southwestern Hudson Bay

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	24,343,181	25,309,300	27,296,859	28,846,761	30,007,094
Southwestern Hudson Bay	[04]	207,340	199,745	207,410	210,250	200,275
Hayes, Man.	[04A]	5,145	7,650	7,365	9,440	10,445
Southwestern Hudson Bay	[04B]	0	0	0	0	0
Severn	[04C]	4,290	575	3,590	4,625	5,760
Winisk, coast	[04D]	1,575	1,055	1,945	2,295	2,615
Ekwan, coast	[04E]	0	0	0	0	0
Attawapiskat, coast	[04F]	1,400	490	1,945	2,040	1,965
Upper Albany	[04G]	2,775	1,050	1,550	1,545	2,260
Lower Albany, coast	[04H]	1,200	0	1,195	1,605	445
Kenogami	[04J]	11,040	10,485	9,060	8,805	8,105
Moose, Ont.	[04K]	2,975	1,935	2,855	4,070	2,885
Missinaibi and Mattagami	[04L]	71,360	69,265	68,265	67,170	62,010
Abitibi	[04M]	51,130	50,430	50,005	48,785	46,375
Harricanaw, coast	[04N]	54,450	56,815	59,615	59,880	57,415

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.
Source(s): CANSIM table 153-0036.

Table 3.6-5
Total population by major drainage and sub-drainage area — Nelson River

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	24,343,181	25,309,300	27,296,859	28,846,761	30,007,094
Nelson River	[05]	3,975,415	4,163,310	4,347,520	4,497,255	4,746,290
Upper South Saskatchewan	[05A]	193,860	201,045	209,695	221,130	231,665
Bow	[05B]	670,160	716,255	805,825	883,470	1,029,515
Red Deer	[05C]	167,620	178,675	188,285	202,625	220,550
Upper North Saskatchewan	[05D]	295,410	284,880	303,690	312,845	342,365
Central North Saskatchewan	[05E]	576,450	638,380	683,145	697,835	747,370
Battle	[05F]	107,650	105,455	106,290	111,590	118,105
Lower North Saskatchewan	[05G]	102,505	105,895	102,620	101,530	100,240
Lower South Saskatchewan	[05H]	248,015	274,140	277,460	284,360	289,255
Qu'Appelle	[05J]	323,500	333,890	330,410	326,810	318,850
Saskatchewan	[05K]	71,065	68,755	65,215	65,160	63,130
Lake Winnipegosis and Lake Manitoba	[05L]	98,160	94,195	90,590	89,915	91,860
Assiniboine	[05M]	374,905	365,480	353,115	349,745	337,010
Souris	[05N]	81,070	80,400	74,510	73,520	69,765
Red	[05O]	526,560	575,680	611,715	625,545	638,805
Winnipeg	[05P]	53,830	54,150	56,165	57,430	54,745
English	[05Q]	28,900	29,365	28,305	29,380	28,455
Eastern Lake Winnipeg	[05R]	5,405	5,275	5,350	5,750	5,175
Western Lake Winnipeg	[05S]	24,660	22,815	25,455	27,980	30,730
Grass and Burntwood	[05T]	18,235	19,810	19,830	19,450	17,975
Nelson	[05U]	7,460	8,770	9,860	11,185	10,710

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.
Source(s): CANSIM table 153-0036.

Table 3.6-6
Total population by major drainage and sub-drainage area — Western and Northern Hudson Bay

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	24,343,181	25,309,300	27,296,859	28,846,761	30,007,094
Western and Northern Hudson Bay	[06]	76,300	82,725	85,540	95,660	98,540
Beaver, Alta. and Sask.	[06A]	46,355	50,875	52,490	57,095	58,215
Upper Churchill, Manitoba	[06B]	6,795	6,495	7,075	7,830	8,185
Central Churchill, upper, Manitoba	[06C]	6,570	7,340	8,015	9,610	10,430
Reindeer	[06D]	1,450	2,340	2,490	3,135	3,160
Central Churchill, lower, Manitoba	[06E]	6,485	6,165	4,785	5,760	5,560
Lower Churchill, Manitoba	[06F]	1,440	1,220	1,175	1,085	960
Seal, coast	[06G]	240	215	235	340	315
Western Hudson Bay, Southern	[06H]	0	0	0	0	0
Thelon	[06J]	0	0	0	0	0
Dubawnt	[06K]	0	0	0	0	0
Kazan	[06L]	0	0	0	0	0
Chesterfield Inlet	[06M]	955	1,005	1,190	1,390	1,505
Western Hudson Bay, central	[06N]	2,570	3,070	3,585	4,260	4,730
Western Hudson Bay, northern	[06O]	0	0	0	0	0
Hudson Bay, Southampton Island	[06P]	810	895	1,100	1,300	1,390
Foxe Basin, Southampton Island	[06Q]	0	0	0	0	0
Foxe Basin, Melville Peninsula	[06R]	1,445	1,725	1,955	2,280	2,505
Foxe Basin, Baffin Island	[06S]	75	110	45	0	0
Hudson Strait, Baffin and Southampton Islands	[06T]	1,085	1,245	1,405	1,565	1,585

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.6-7
Total population by major drainage and sub-drainage area — Great Slave Lake

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	24,343,181	25,309,300	27,296,859	28,846,761	30,007,094
Great Slave Lake	[07]	319,365	334,860	342,895	365,465	378,200
Upper Athabasca	[07A]	34,185	35,690	37,475	40,960	40,835
Central Athabasca, upper	[07B]	50,445	52,770	53,530	58,085	57,035
Central Athabasca, lower	[07C]	32,630	30,520	27,015	26,960	38,450
Lower Athabasca	[07D]	9,085	15,940	18,120	17,750	15,430
Williston Lake	[07E]	7,440	6,965	7,460	7,705	6,225
Upper Peace	[07F]	71,255	73,515	74,705	78,060	74,465
Smoky	[07G]	61,190	62,590	65,580	71,490	78,705
Central Peace, upper	[07H]	15,180	14,505	12,555	13,495	14,795
Central Peace, lower	[07J]	10,285	13,950	14,855	15,485	19,290
Lower Peace	[07K]	825	1,090	1,230	1,660	1,620
Fond-du-Lac	[07L]	855	1,665	1,700	2,035	1,945
Lake Athabasca, shores	[07M]	4,230	1,240	1,250	1,290	1,295
Slave	[07N]	2,330	2,485	2,510	2,470	2,205
Hay	[07O]	5,300	5,435	6,305	7,380	5,845
Southern Great Slave Lake	[07P]	2,345	2,185	720	640	805
Great Slave Lake, east arm, south shore	[07Q]	255	270	290	305	245
Lockhart	[07R]	0	0	0	0	0
Northeastern Great Slave Lake	[07S]	10,855	13,225	17,170	19,265	18,195
Marian	[07T]	265	345	390	420	455
Western Great Slave Lake	[07U]	410	470	0	0	355

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.6-8
Total population by major drainage and sub-drainage area — Pacific

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	24,343,181	25,309,300	27,296,859	28,846,761	30,007,094
Pacific	[08]	2,680,660	2,818,275	3,215,895	3,655,150	3,840,750
Alsek	[08A]	365	520	650	765	560
Northern coastal waters, B.C.	[08B]	0	0	0	0	0
Stikine, coast	[08C]	615	685	875	885	915
Nass, coast	[08D]	3,625	2,670	2,955	2,985	2,590
Skeena, coast	[08E]	59,260	57,095	60,690	64,625	60,850
Central coastal waters, B.C.	[08F]	18,245	16,330	17,225	17,390	16,285
Southern coastal waters, B.C.	[08G]	473,825	491,685	531,145	587,815	625,205
Vancouver Island	[08H]	496,695	517,380	590,845	655,925	665,695
Nechako	[08J]	59,570	59,480	59,875	67,415	63,715
Upper Fraser	[08K]	68,555	69,435	70,240	75,025	74,650
Thompson	[08L]	143,160	137,485	149,305	172,315	171,985
Lower Fraser	[08M]	1,008,555	1,118,750	1,347,655	1,570,510	1,708,120
Columbia	[08N]	341,575	341,290	378,995	433,780	445,045
Queen Charlotte Islands	[08O]	5,620	5,480	5,320	5,590	4,940
Skagit	[08P]	995	0	85	110	210

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.6-9
Total population by major drainage and sub-drainage area — Yukon River

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	24,343,181	25,309,300	27,296,859	28,846,761	30,007,094
Yukon River	[09]	21,945	22,200	26,285	28,730	27,230
Headwaters Yukon	[09A]	17,305	18,475	21,945	23,725	23,530
Pelly	[09B]	2,150	990	1,770	1,870	1,025
Upper Yukon	[09C]	390	230	290	295	245
Stewart	[09D]	935	895	540	555	575
Central Yukon	[09E]	915	1,375	1,490	2,005	1,555
Porcupine	[09F]	240	235	255	280	305
Tanana	[09H]	0	0	0	0	0
Copper	[09M]	0	0	0	0	0

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.6-10
Total population by major drainage and sub-drainage area — Arctic

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	24,343,181	25,309,300	27,296,859	28,846,761	30,007,094
Arctic	[10]	26,950	29,925	31,365	34,515	34,300
Upper Liard	[10A]	2,935	2,945	2,765	2,320	1,775
Central Liard	[10B]	0	0	135	105	145
Fort Nelson	[10C]	4,590	4,810	4,660	5,495	5,635
Central Liard and Petitot	[10D]	0	0	0	0	0
Lower Liard	[10E]	840	1,035	575	585	1,315
Upper Mackenzie, Mills Lake	[10F]	735	710	765	865	875
Upper Mackenzie, Camsell Bend	[10G]	980	990	1,185	1,280	480
Central Mackenzie, Blackwater Lake	[10H]	440	510	545	615	640
Great Bear	[10J]	820	720	805	875	815
Central Mackenzie, The Ramparts	[10K]	425	630	645	790	665
Lower Mackenzie	[10L]	3,730	4,055	3,955	4,190	3,635
Peel and Southwestern Beaufort Sea	[10M]	1,355	1,525	1,565	1,645	1,465
Southern Beaufort Sea	[10N]	825	980	1,025	945	1,035
Amundsen Gulf	[10O]	620	230	260	1,475	1,490
Coppermine	[10P]	375	895	0	0	0
Coronation Gulf and Queen Maud Gulf	[10Q]	90	80	1,130	65	0
Back	[10R]	0	0	0	0	0
Gulf of Boothia	[10S]	690	790	985	1,145	1,325
Southern Arctic Islands	[10T]	1,835	2,125	2,490	2,785	2,780
Baffin Island, Arctic drainage	[10U]	5,330	6,465	7,545	8,760	9,755
Northern Arctic Islands	[10V]	310	430	305	525	450

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.6-11
Total population by major drainage and sub-drainage area — Mississippi River

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	24,343,181	25,309,300	27,296,859	28,846,761	30,007,094
Mississippi River	[11]	12,875	12,150	10,445	9,905	10,095
Missouri	[11A]	12,875	12,150	10,445	9,905	10,095

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.7-1
Rural population by major drainage area and sub-drainage area — Maritime Provinces

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	5,907,255	5,957,245	6,389,985	6,385,550	6,098,985
Maritime Provinces	[01]	898,565	937,110	973,335	960,110	922,275
Saint John and Southern Bay of Fundy, N.B.	[01A]	180,790	192,455	202,815	202,375	195,460
Gulf of St. Lawrence and Northern Bay of Fundy, N.B.	[01B]	258,640	264,090	274,135	271,210	251,185
Prince Edward Island	[01C]	77,995	78,360	77,950	75,090	74,625
Bay of Fundy and Gulf of St. Lawrence, N.S.	[01D]	182,450	192,720	198,955	201,820	192,275
Southeastern Atlantic Ocean, N.S.	[01E]	131,475	140,465	150,455	143,995	148,125
Cape Breton Island	[01F]	67,215	69,010	69,025	65,605	60,595

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.7-2
Rural population by major drainage area and sub-drainage area — St. Lawrence

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	5,907,255	5,957,245	6,389,985	6,385,550	6,098,985
St. Lawrence	[02]	3,015,225	3,073,415	3,385,835	3,330,260	3,158,575
Northwestern Lake Superior	[02A]	20,595	22,280	26,380	28,405	29,275
Northeastern Lake Superior	[02B]	13,645	13,225	13,655	12,785	14,260
Northern Lake Huron	[02C]	50,210	47,425	49,305	48,815	47,605
Wanapitei and French, Ont.	[02D]	30,055	30,040	32,330	34,165	33,850
Eastern Georgian Bay	[02E]	178,345	185,490	222,235	231,795	226,225
Eastern Lake Huron	[02F]	143,475	140,380	155,690	155,270	155,480
Northern Lake Erie	[02G]	381,435	374,110	389,845	383,230	379,255
Lake Ontario and Niagara Peninsula	[02H]	404,135	457,350	534,810	483,685	441,685
Upper Ottawa	[02J]	49,670	50,695	55,040	57,170	53,405
Central Ottawa	[02K]	90,425	99,505	111,710	115,280	115,715
Lower Ottawa	[02L]	257,330	265,345	292,090	321,440	326,695
Upper St. Lawrence	[02M]	81,080	86,850	94,495	101,625	93,745
Saint-Maurice	[02N]	21,775	24,210	25,200	21,410	21,805
Central St. Lawrence	[02O]	533,630	526,815	587,745	589,460	524,470
Lower St. Lawrence	[02P]	325,545	322,650	343,055	320,775	307,840
Northern Gaspé Peninsula	[02Q]	69,065	69,585	64,600	64,095	61,025
Saguenay	[02R]	89,640	87,320	90,655	86,330	79,905
Betsiamites, coast	[02S]	10,635	10,285	10,055	9,815	8,235
Manicouagan and aux Outardes	[02T]	4,345	4,150	4,080	4,715	3,595
Moisie and St. Lawrence Estuary	[02U]	11,995	8,920	7,935	8,490	6,680
Gulf of St. Lawrence, Romaine	[02V]	2,065	2,025	2,150	2,195	1,555
Gulf of St. Lawrence, Natashquan	[02W]	16,055	16,690	15,235	15,010	15,300
Petit Mécatina and Strait of Belle Isle	[02X]	6,565	6,650	6,905	6,665	5,705
Northern Newfoundland	[02Y]	108,390	108,135	114,125	104,920	95,180
Southern Newfoundland	[02Z]	115,105	113,300	136,495	122,720	110,085

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.7-3
Rural population by major drainage area and sub-drainage area — Northern Quebec and Labrador

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	5,907,255	5,957,245	6,389,985	6,385,550	6,098,985
Northern Quebec and Labrador	[03]	30,650	30,605	34,470	35,410	32,695
Nottaway, coast	[03A]	6,775	6,185	5,875	6,785	6,390
Broadback and Rupert	[03B]	2,955	3,530	3,385	4,370	3,060
Eastmain	[03C]	330	355	440	530	610
La Grande, coast	[03D]	5,415	3,545	4,215	4,725	1,505
Grande rivière de la Baleine, coast	[03E]	1,065	1,050	1,115	1,375	1,335
Eastern Hudson Bay	[03F]	0	55	280	315	350
Northeastern Hudson Bay	[03G]	1,665	1,980	2,510	2,765	3,055
Western Ungava Bay	[03H]	1,325	1,705	2,080	2,335	2,645
Aux Feuilles, coast	[03J]	175	250	285	350	390
Koksoak	[03K]	810	1,065	1,410	1,730	1,935
Caniapiscou	[03L]	1,170	790	1,145	1,215	1,250
Eastern Ungava Bay	[03M]	145	385	525	645	710
Northern Labrador	[03N]	2,170	2,440	2,655	2,560	2,890
Churchill, N.L.	[03O]	945	960	1,835	855	710
Central Labrador	[03P]	3,040	3,455	3,770	1,980	3,145
Southern Labrador	[03Q]	2,670	2,875	2,965	2,875	2,720

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.7-4
Rural population by major drainage area and sub-drainage area — Southwestern Hudson Bay

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	5,907,255	5,957,245	6,389,985	6,385,550	6,098,985
Southwestern Hudson Bay	[04]	87,815	82,000	92,345	82,850	81,675
Hayes, Man.	[04A]	5,145	7,645	7,370	9,435	10,445
Southwestern Hudson Bay	[04B]	0	0	0	0	0
Severn	[04C]	4,290	580	3,590	4,625	5,760
Winisk, coast	[04D]	1,575	1,060	1,950	2,290	2,610
Ekwan, coast	[04E]	0	0	0	0	0
Attawapiskat, coast	[04F]	1,400	490	1,945	775	665
Upper Albany	[04G]	2,775	1,055	1,555	1,545	2,260
Lower Albany, coast	[04H]	1,200	0	1,195	1,605	440
Kenogami	[04J]	3,805	3,430	2,750	2,640	2,825
Moose, Ont.	[04K]	1,745	835	1,845	0	940
Missinaibi and Mattagami	[04L]	19,415	19,375	21,410	17,235	14,790
Abitibi	[04M]	25,250	25,135	24,060	22,340	22,370
Harricanaw, coast	[04N]	21,205	22,400	24,670	20,340	18,560

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.7-5
Rural population by major drainage area and sub-drainage area — Nelson River

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	5,907,255	5,957,245	6,389,985	6,385,550	6,098,985
Nelson River	[05]	1,066,545	1,028,650	1,038,670	1,068,960	1,064,300
Upper South Saskatchewan	[05A]	56,120	54,465	56,900	60,405	60,430
Bow	[05B]	38,615	36,730	43,630	51,555	57,975
Red Deer	[05C]	82,535	81,180	85,310	93,040	96,865
Upper North Saskatchewan	[05D]	39,805	36,250	38,425	42,590	40,245
Central North Saskatchewan	[05E]	127,495	116,445	123,485	127,505	128,485
Battle	[05F]	60,390	55,855	53,895	56,445	60,725
Lower North Saskatchewan	[05G]	54,130	53,950	48,980	46,585	45,870
Lower South Saskatchewan	[05H]	64,165	61,270	57,070	57,995	58,420
Qu'Appelle	[05J]	101,875	94,765	91,380	87,680	79,525
Saskatchewan	[05K]	38,965	38,085	37,235	38,065	36,920
Lake Winnipegosis and Lake Manitoba	[05L]	73,085	68,940	67,495	66,920	66,810
Assiniboine	[05M]	91,610	90,355	84,595	82,725	78,475
Souris	[05N]	52,370	49,835	45,620	43,945	40,125
Red	[05O]	109,955	115,480	122,315	123,640	122,255
Winnipeg	[05P]	25,835	25,490	28,645	29,840	28,525
English	[05Q]	13,960	14,825	16,095	17,760	17,165
Eastern Lake Winnipeg	[05R]	5,405	5,275	5,355	5,750	5,175
Western Lake Winnipeg	[05S]	20,655	18,590	20,210	22,675	26,030
Grass and Burntwood	[05T]	2,105	3,345	3,330	3,810	3,580
Nelson	[05U]	7,455	7,535	8,715	10,035	10,710

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.7-6
Rural population by major drainage area and sub-drainage area — Western and Northern Hudson Bay

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	5,907,255	5,957,245	6,389,985	6,385,550	6,098,985
Western and Northern Hudson Bay	[06]	54,845	55,245	59,950	66,445	69,700
Beaver, Alta. and Sask.	[06A]	28,615	30,385	30,320	35,475	36,145
Upper Churchill, Manitoba	[06B]	5,160	3,840	7,075	7,825	8,180
Central Churchill, upper, Manitoba	[06C]	6,565	4,650	5,435	6,645	7,150
Reindeer	[06D]	1,450	2,345	2,495	3,135	3,160
Central Churchill, lower, Manitoba	[06E]	4,390	4,515	3,950	4,265	4,250
Lower Churchill, Manitoba	[06F]	1,445	1,215	1,175	0	965
Seal, coast	[06G]	240	220	230	340	320
Western Hudson Bay, Southern	[06H]	0	0	0	0	0
Thelon	[06J]	0	0	0	0	0
Dubawnt	[06K]	0	0	0	0	0
Kazan	[06L]	0	0	0	0	0
Chesterfield Inlet	[06M]	955	1,005	1,185	1,385	1,510
Western Hudson Bay, central	[06N]	2,565	3,065	3,585	2,195	2,545
Western Hudson Bay, northern	[06O]	0	0	0	0	0
Hudson Bay, Southampton Island	[06P]	810	895	1,100	1,305	1,395
Foxe Basin, Southampton Island	[06Q]	0	0	0	0	0
Foxe Basin, Melville Peninsula	[06R]	1,445	1,725	1,950	2,275	2,505
Foxe Basin, Baffin Island	[06S]	75	115	50	0	0
Hudson Strait, Baffin and Southampton Islands	[06T]	1,085	1,245	1,405	1,565	1,585

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.7-7
Rural population by major drainage area and sub-drainage area — Great Slave Lake

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	5,907,255	5,957,245	6,389,985	6,385,550	6,098,985
Great Slave Lake	[07]	137,275	143,870	147,285	158,980	157,315
Upper Athabasca	[07A]	8,660	7,850	8,460	9,975	9,990
Central Athabasca, upper	[07B]	32,070	32,905	34,420	35,585	34,930
Central Athabasca, lower	[07C]	8,600	8,290	7,370	8,435	10,895
Lower Athabasca	[07D]	105	675	510	585	600
Williston Lake	[07E]	1,640	1,590	1,900	2,075	1,265
Upper Peace	[07F]	34,455	38,010	33,465	36,400	34,710
Smoky	[07G]	25,325	24,275	23,705	25,675	26,160
Central Peace, upper	[07H]	9,665	8,955	8,375	9,290	10,290
Central Peace, lower	[07J]	8,090	10,950	12,000	12,395	14,445
Lower Peace	[07K]	820	1,090	1,230	1,660	1,625
Fond-du-Lac	[07L]	860	1,660	1,705	2,035	1,950
Lake Athabasca, shores	[07M]	1,730	1,075	1,255	1,295	1,295
Slave	[07N]	0	55	2,510	2,470	2,205
Hay	[07O]	2,445	2,475	3,635	4,490	2,950
Southern Great Slave Lake	[07P]	480	630	715	635	805
Great Slave Lake, east arm, south shore	[07Q]	250	275	290	310	245
Lockhart	[07R]	0	0	0	0	0
Northeastern Great Slave Lake	[07S]	1,370	2,290	5,310	5,235	2,145
Marian	[07T]	265	350	390	420	455
Western Great Slave Lake	[07U]	410	470	0	0	355

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.7-8
Rural population by major drainage area and sub-drainage area — Pacific

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	5,907,255	5,957,245	6,389,985	6,385,550	6,098,985
Pacific	[08]	578,585	568,340	617,720	640,660	571,255
Alsek	[08A]	365	515	650	760	560
Northern coastal waters, B.C.	[08B]	0	0	0	0	0
Stikine, coast	[08C]	610	690	880	885	910
Nass, coast	[08D]	3,630	2,665	2,955	2,125	2,590
Skeena, coast	[08E]	24,005	20,105	20,625	22,185	21,085
Central coastal waters, B.C.	[08F]	5,780	5,575	6,430	6,835	6,045
Southern coastal waters, B.C.	[08G]	28,790	26,255	29,055	29,720	25,345
Vancouver Island	[08H]	128,235	130,400	146,695	158,150	136,690
Nechako	[08J]	21,655	22,250	22,235	25,505	23,340
Upper Fraser	[08K]	27,785	28,195	27,200	29,410	27,380
Thompson	[08L]	64,665	60,580	60,965	68,250	64,710
Lower Fraser	[08M]	131,960	129,835	149,010	135,095	120,360
Columbia	[08N]	134,480	135,790	145,590	157,265	137,095
Queen Charlotte Islands	[08O]	5,620	5,480	5,315	4,330	4,940
Skagit	[08P]	990	0	85	110	210

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.7-9
Rural population by major drainage area and sub-drainage area — Yukon River

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	5,907,255	5,957,245	6,389,985	6,385,550	6,098,985
Yukon River	[09]	7,125	7,000	9,950	10,285	10,385
Headwaters Yukon	[09A]	2,490	3,285	5,610	6,535	6,685
Pelly	[09B]	2,150	990	1,770	620	1,020
Upper Yukon	[09C]	395	225	290	295	245
Stewart	[09D]	935	890	535	555	575
Central Yukon	[09E]	915	1,375	1,485	2,005	1,550
Porcupine	[09F]	245	230	255	275	305
Tanana	[09H]	0	0	0	0	0
Copper	[09M]	0	0	0	0	0

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.7-10
Rural population by major drainage area and sub-drainage area — Arctic

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	5,907,255	5,957,245	6,389,985	6,385,550	6,098,985
Arctic	[10]	17,750	19,870	20,935	21,690	20,720
Upper Liard	[10A]	2,935	2,945	2,765	2,325	1,775
Central Liard	[10B]	0	0	135	100	140
Fort Nelson	[10C]	865	1,085	855	1,090	1,450
Central Liard and Petitot	[10D]	0	0	0	0	0
Lower Liard	[10E]	845	1,035	575	590	1,315
Upper Mackenzie, Mills Lake	[10F]	730	705	760	865	870
Upper Mackenzie, Camsell Bend	[10G]	985	990	1,185	1,280	485
Central Mackenzie, Blackwater Lake	[10H]	435	505	545	620	640
Great Bear	[10J]	820	720	800	875	810
Central Mackenzie, The Ramparts	[10K]	420	625	640	790	670
Lower Mackenzie	[10L]	585	675	775	935	755
Peel and Southwestern Beaufort Sea	[10M]	1,350	1,525	1,570	1,645	1,460
Southern Beaufort Sea	[10N]	825	980	1,025	940	1,030
Amundsen Gulf	[10O]	625	225	255	1,475	1,495
Coppermine	[10P]	370	895	0	0	0
Coronation Gulf and Queen Maud Gulf	[10Q]	90	80	1,135	65	0
Back	[10R]	0	0	0	0	0
Gulf of Boothia	[10S]	685	785	985	1,145	1,320
Southern Arctic Islands	[10T]	1,830	2,120	2,495	2,785	2,780
Baffin Island, Arctic drainage	[10U]	3,005	3,530	4,090	3,605	3,245
Northern Arctic Islands	[10V]	310	430	300	525	455

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.7-11
Rural population by major drainage area and sub-drainage area — Mississippi River

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	5,907,255	5,957,245	6,389,985	6,385,550	6,098,985
Mississippi River	[11]	12,875	11,145	9,495	9,900	10,095
Missouri	[11A]	12,875	11,145	9,495	9,900	10,095

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.8-1
Urban population by major drainage and sub-drainage area — Maritime Provinces

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	18,435,930	19,352,085	20,906,875	22,461,210	23,908,105
Maritime Provinces	[01]	907,640	911,135	910,510	951,570	971,420
Saint John and Southern Bay of Fundy, N.B.	[01A]	204,885	201,495	195,670	206,505	208,290
Gulf of St. Lawrence and Northern Bay of Fundy, N.B.	[01B]	191,395	190,225	181,520	187,745	195,455
Prince Edward Island	[01C]	44,515	48,285	51,810	59,460	60,675
Bay of Fundy and Gulf of St. Lawrence, N.S.	[01D]	108,605	112,695	116,860	119,445	125,660
Southeastern Atlantic Ocean, N.S.	[01E]	255,365	261,335	271,990	285,745	293,530
Cape Breton Island	[01F]	102,865	97,100	92,660	92,665	87,815

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.8-2
Urban population by major drainage and sub-drainage area — St. Lawrence

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	18,435,930	19,352,085	20,906,875	22,461,210	23,908,105
St. Lawrence	[02]	12,122,685	12,653,810	13,687,235	14,633,430	15,545,985
Northwestern Lake Superior	[02A]	112,850	112,085	110,405	109,115	103,215
Northeastern Lake Superior	[02B]	41,950	36,930	37,415	36,730	32,360
Northern Lake Huron	[02C]	213,460	213,105	216,990	218,620	205,595
Wanapitei and French, Ont.	[02D]	61,605	57,495	58,985	57,515	55,165
Eastern Georgian Bay	[02E]	231,785	255,285	318,065	378,590	453,315
Eastern Lake Huron	[02F]	119,950	135,270	146,475	154,260	155,515
Northern Lake Erie	[02G]	1,267,685	1,315,975	1,448,440	1,549,830	1,649,245
Lake Ontario and Niagara Peninsula	[02H]	4,145,250	4,421,665	4,928,900	5,399,295	5,915,255
Upper Ottawa	[02I]	62,835	63,580	65,035	63,030	59,185
Central Ottawa	[02K]	253,260	256,785	272,020	297,140	313,705
Lower Ottawa	[02L]	600,580	666,965	752,050	807,815	864,255
Upper St. Lawrence	[02M]	152,915	159,730	165,835	172,165	177,005
Saint-Maurice	[02N]	109,840	110,835	101,760	107,335	104,615
Central St. Lawrence	[02O]	3,361,735	3,444,400	3,665,865	3,818,295	3,991,865
Lower St. Lawrence	[02P]	726,720	745,615	775,610	828,250	846,605
Northern Gaspé Peninsula	[02Q]	70,990	69,740	68,250	68,900	70,495
Saguenay	[02R]	197,635	199,365	196,560	201,430	199,920
Betsiamites, coast	[02S]	5,565	5,225	5,110	5,335	7,150
Manicouagan and aux Outardes	[02T]	19,315	16,010	16,155	15,785	14,575
Moisie and St. Lawrence Estuary	[02U]	49,205	44,900	45,115	44,350	42,580
Gulf of St. Lawrence, Romaine	[02V]	0	0	0	0	0
Gulf of St. Lawrence, Natashquan	[02W]	4,710	4,690	4,735	4,685	4,575
Petit Mécatina and Strait of Belle Isle	[02X]	0	0	0	0	0
Northern Newfoundland	[02Y]	109,275	106,190	94,345	93,775	83,520
Southern Newfoundland	[02Z]	203,585	211,975	193,130	201,195	196,270

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.8-3
Urban population by major drainage and sub-drainage area — Northern Quebec and Labrador

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	18,435,930	19,352,085	20,906,875	22,461,210	23,908,105
Northern Quebec and Labrador	[03]	47,570	40,060	38,120	39,050	40,465
Nottaway, coast	[03A]	25,535	23,220	21,135	20,190	18,790
Broadback and Rupert	[03B]	0	0	0	0	1,810
Eastmain	[03C]	0	0	0	0	0
La Grande, coast	[03D]	0	0	0	0	3,470
Grande rivière de la Baleine, coast	[03E]	0	0	0	0	0
Eastern Hudson Bay	[03F]	0	0	0	0	0
Northeastern Hudson Bay	[03G]	0	0	0	0	0
Western Ungava Bay	[03H]	0	0	0	0	0
Aux Feuilles, coast	[03J]	0	0	0	0	0
Koksoak	[03K]	0	0	0	0	0
Caniapiscau	[03L]	1,990	280	0	0	0
Eastern Ungava Bay	[03M]	0	0	0	0	0
Northern Labrador	[03N]	0	0	0	0	0
Churchill, N.L.	[03O]	18,770	15,230	15,315	15,315	13,455
Central Labrador	[03P]	1,270	1,340	1,665	3,530	2,950
Southern Labrador	[03Q]	0	0	0	0	0

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.8-4
Urban population by major drainage and sub-drainage area — Southwestern Hudson Bay

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	18,435,930	19,352,085	20,906,875	22,461,210	23,908,105
Southwestern Hudson Bay	[04]	119,525	117,745	115,065	127,405	118,600
Hayes, Man.	[04A]	0	0	0	0	0
Southwestern Hudson Bay	[04B]	0	0	0	0	0
Severn	[04C]	0	0	0	0	0
Winisk, coast	[04D]	0	0	0	0	0
Ekwan, coast	[04E]	0	0	0	0	0
Attawapiskat, coast	[04F]	0	0	0	1,255	1,295
Upper Albany	[04G]	0	0	0	0	0
Lower Albany, coast	[04H]	0	0	0	0	0
Kenogami	[04J]	7,235	7,050	6,305	6,155	5,285
Moose, Ont.	[04K]	1,235	1,105	1,005	4,070	1,955
Missinaibi and Mattagami	[04L]	51,935	49,895	46,855	49,935	47,210
Abitibi	[04M]	25,880	25,290	25,945	26,445	24,005
Harricana, coast	[04N]	33,240	34,405	34,945	39,545	38,865

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.8-5
Urban population by major drainage and sub-drainage area — Nelson River

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	18,435,930	19,352,085	20,906,875	22,461,210	23,908,105
Nelson River	[05]	2,908,870	3,134,665	3,308,855	3,428,295	3,681,990
Upper South Saskatchewan	[05A]	137,745	146,590	152,785	160,715	171,235
Bow	[05B]	631,545	679,530	762,195	831,910	971,535
Red Deer	[05C]	85,085	97,490	102,980	109,585	123,680
Upper North Saskatchewan	[05D]	255,605	248,635	265,260	270,245	302,130
Central North Saskatchewan	[05E]	448,950	521,935	559,655	570,340	618,885
Battle	[05F]	47,260	49,595	52,395	55,150	57,380
Lower North Saskatchewan	[05G]	48,370	51,950	53,645	54,945	54,360
Lower South Saskatchewan	[05H]	183,845	212,870	220,385	226,365	230,840
Qu'Appelle	[05J]	221,635	239,125	239,025	239,140	239,330
Saskatchewan	[05K]	32,100	30,675	27,985	27,090	26,210
Lake Winnipegosis and Lake Manitoba	[05L]	25,065	25,255	23,105	22,995	25,055
Assiniboine	[05M]	283,295	275,125	268,510	267,025	258,540
Souris	[05N]	28,700	30,570	28,885	29,575	29,635
Red	[05O]	416,605	460,195	489,410	501,905	516,555
Winnipeg	[05P]	27,990	28,655	27,525	27,580	26,225
English	[05Q]	14,945	14,550	12,215	11,630	11,295
Eastern Lake Winnipeg	[05R]	0	0	0	0	0
Western Lake Winnipeg	[05S]	4,015	4,220	5,250	5,295	4,695
Grass and Burntwood	[05T]	16,130	16,475	16,500	15,645	14,395
Nelson	[05U]	0	1,230	1,140	1,155	0

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.8-6
Urban population by major drainage and sub-drainage area — Western and Northern Hudson Bay

Drainage area code	1981	1986	1991	1996	2001
Canada ...	18,435,930	19,352,085	20,906,875	22,461,210	23,908,105
Western and Northern Hudson Bay [06]	21,460	27,480	25,595	29,215	28,840
Beaver, Alta. and Sask. [06A]	17,745	20,490	22,180	21,625	22,065
Upper Churchill, Manitoba [06B]	1,630	2,655	0	0	0
Central Churchill, upper, Manitoba [06C]	0	2,690	2,575	2,965	3,290
Reindeer [06D]	0	0	0	0	0
Central Churchill, lower, Manitoba [06E]	2,090	1,640	835	1,500	1,305
Lower Churchill, Manitoba [06F]	0	0	0	1,075	0
Seal, coast [06G]	0	0	0	0	0
Western Hudson Bay, Southern [06H]	0	0	0	0	0
Thelon [06J]	0	0	0	0	0
Dubawnt [06K]	0	0	0	0	0
Kazan [06L]	0	0	0	0	0
Chesterfield Inlet [06M]	0	0	0	0	0
Western Hudson Bay, central [06N]	0	0	0	2,055	2,180
Western Hudson Bay, northern [06O]	0	0	0	0	0
Hudson Bay, Southampton Island [06P]	0	0	0	0	0
Foxe Basin, Southampton Island [06Q]	0	0	0	0	0
Foxe Basin, Melville Peninsula [06R]	0	0	0	0	0
Foxe Basin, Baffin Island [06S]	0	0	0	0	0
Hudson Strait, Baffin and Southampton Islands [06T]	0	0	0	0	0

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.8-7
Urban population by major drainage and sub-drainage area — Great Slave Lake

Drainage area code	1981	1986	1991	1996	2001
Canada ...	18,435,930	19,352,085	20,906,875	22,461,210	23,908,105
Great Slave Lake [07]	182,090	190,990	195,615	206,480	220,885
Upper Athabasca [07A]	25,525	27,835	29,020	30,985	30,845
Central Athabasca, upper [07B]	18,380	19,865	19,110	22,490	22,105
Central Athabasca, lower [07C]	24,020	22,230	19,655	18,530	27,550
Lower Athabasca [07D]	8,985	15,275	17,605	17,165	14,825
Williston Lake [07E]	5,795	5,375	5,560	5,625	4,955
Upper Peace [07F]	36,805	35,510	41,245	41,650	39,755
Smoky [07G]	35,865	38,310	41,865	45,820	52,545
Central Peace, upper [07H]	5,510	5,555	4,175	4,210	4,505
Central Peace, lower [07J]	2,195	3,005	2,845	3,090	4,855
Lower Peace [07K]	0	0	0	0	0
Fond-du-Lac [07L]	0	0	0	0	0
Lake Athabasca, shores [07M]	2,505	155	0	0	0
Slave [07N]	2,290	2,435	0	0	0
Hay [07O]	2,860	2,960	2,665	2,885	2,895
Southern Great Slave Lake [07P]	1,865	1,555	0	0	0
Great Slave Lake, east arm, south shore [07Q]	0	0	0	0	0
Lockhart [07R]	0	0	0	0	0
Northeastern Great Slave Lake [07S]	9,480	10,925	11,860	14,025	16,055
Marian [07T]	0	0	0	0	0
Western Great Slave Lake [07U]	0	0	0	0	0

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.8-8
Urban population by major drainage and sub-drainage area — Pacific

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	18,435,930	19,352,085	20,906,875	22,461,210	23,908,105
Pacific	[08]	2,102,075	2,249,935	2,598,180	3,014,490	3,269,495
Alsek	[08A]	0	0	0	0	0
Northern coastal waters, B.C.	[08B]	0	0	0	0	0
Stikine, coast	[08C]	0	0	0	0	0
Nass, coast	[08D]	0	0	0	860	0
Skeena, coast	[08E]	35,265	36,980	40,065	42,440	39,770
Central coastal waters, B.C.	[08F]	12,460	10,745	10,795	10,555	10,235
Southern coastal waters, B.C.	[08G]	445,035	465,440	502,090	558,095	599,865
Vancouver Island	[08H]	368,450	386,975	444,150	497,775	528,995
Nechako	[08J]	37,915	37,220	37,645	41,910	40,365
Upper Fraser	[08K]	40,775	41,235	43,045	45,605	47,270
Thompson	[08L]	78,490	76,915	88,330	104,060	107,285
Lower Fraser	[08M]	876,605	988,910	1,198,655	1,435,410	1,587,765
Columbia	[08N]	207,095	205,505	233,400	276,515	307,950
Queen Charlotte Islands	[08O]	0	0	0	1,265	0
Skagit	[08P]	0	0	0	0	0

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.8-9
Urban population by major drainage and sub-drainage area — Yukon River

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	18,435,930	19,352,085	20,906,875	22,461,210	23,908,105
Yukon River	[09]	14,815	15,200	16,335	18,445	16,845
Headwaters Yukon	[09A]	14,810	15,195	16,335	17,190	16,850
Pelly	[09B]	0	0	0	1,250	0
Upper Yukon	[09C]	0	0	0	0	0
Stewart	[09D]	0	0	0	0	0
Central Yukon	[09E]	0	0	0	0	0
Porcupine	[09F]	0	0	0	0	0
Tanana	[09H]	0	0	0	0	0
Copper	[09M]	0	0	0	0	0

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.8-10
Urban population by major drainage and sub-drainage area — Arctic

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	18,435,930	19,352,085	20,906,875	22,461,210	23,908,105
Arctic	[10]	9,205	10,055	10,430	12,825	13,585
Upper Liard	[10A]	0	0	0	0	0
Central Liard	[10B]	0	0	0	0	0
Fort Nelson	[10C]	3,725	3,725	3,805	4,405	4,185
Central Liard and Petitot	[10D]	0	0	0	0	0
Lower Liard	[10E]	0	0	0	0	0
Upper Mackenzie, Mills Lake	[10F]	0	0	0	0	0
Upper Mackenzie, Camsell Bend	[10G]	0	0	0	0	0
Central Mackenzie, Blackwater Lake	[10H]	0	0	0	0	0
Great Bear	[10J]	0	0	0	0	0
Central Mackenzie, The Ramparts	[10K]	0	0	0	0	0
Lower Mackenzie	[10L]	3,145	3,385	3,180	3,265	2,885
Peel and Southwestern Beaufort Sea	[10M]	0	0	0	0	0
Southern Beaufort Sea	[10N]	0	0	0	0	0
Amundsen Gulf	[10O]	0	0	0	0	0
Coppermine	[10P]	0	0	0	0	0
Coronation Gulf and Queen Maud Gulf	[10Q]	0	0	0	0	0
Back	[10R]	0	0	0	0	0
Gulf of Boothia	[10S]	0	0	0	0	0
Southern Arctic Islands	[10T]	0	0	0	0	0
Baffin Island, Arctic drainage	[10U]	2,330	2,940	3,455	5,165	6,510
Northern Arctic Islands	[10V]	0	0	0	0	0

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.8-11
Urban population by major drainage and sub-drainage area — Mississippi River

	Drainage area code	1981	1986	1991	1996	2001
Canada	...	18,435,930	19,352,085	20,906,875	22,461,210	23,908,105
Mississippi River	[11]	0	1,010	940	0	0
Missouri	[11A]	0	1,010	940	0	0

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.9-1
Urban population as a share of total, by major drainage area and sub-drainage area — Maritime Provinces

	Drainage area code	1981	1986	1991	1996	2001
		percent				
Canada	...	75.7	76.5	76.6	77.9	79.7
Maritime Provinces	[01]	50.3	49.3	48.3	49.8	51.3
Saint John and Southern Bay of Fundy, N.B.	[01A]	53.1	51.1	49.1	50.5	51.6
Gulf of St. Lawrence and Northern Bay of Fundy, N.B.	[01B]	42.5	41.9	39.8	40.9	43.8
Prince Edward Island	[01C]	36.3	38.1	39.9	44.2	44.8
Bay of Fundy and Gulf of St. Lawrence, N.S.	[01D]	37.3	36.9	37.0	37.2	39.5
Southeastern Atlantic Ocean, N.S.	[01E]	66.0	65.0	64.4	66.5	66.5
Cape Breton Island	[01F]	60.5	58.5	57.3	58.5	59.2

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.9-2
Urban population as a share of total, by major drainage area and sub-drainage area — St. Lawrence

Drainage area code	1981	1986	1991	1996	2001
	percent				
Canada	75.7	76.5	76.6	77.9	79.7
St. Lawrence	80.1	80.5	80.2	81.5	83.1
Northwestern Lake Superior [02A]	84.6	83.4	80.7	79.3	77.9
Northeastern Lake Superior [02B]	75.5	73.6	73.3	74.2	69.4
Northern Lake Huron [02C]	81.0	81.8	81.5	81.7	81.2
Wanapitei and French, Ont. [02D]	67.2	65.7	64.6	62.7	62.0
Eastern Georgian Bay [02E]	56.5	57.9	58.9	62.0	66.7
Eastern Lake Huron [02F]	45.5	49.1	48.5	49.8	50.0
Northern Lake Erie [02G]	76.9	77.9	78.8	80.2	81.3
Lake Ontario and Niagara Peninsula [02H]	91.1	90.6	90.2	91.8	93.1
Upper Ottawa [02J]	55.9	55.6	54.2	52.4	52.6
Central Ottawa [02K]	73.7	72.1	70.9	72.0	73.1
Lower Ottawa [02L]	70.0	71.5	72.0	71.5	72.6
Upper St. Lawrence [02M]	65.4	64.8	63.7	62.9	65.4
Saint-Maurice [02N]	83.5	82.1	80.1	83.4	82.7
Central St. Lawrence [02O]	86.3	86.7	86.2	86.6	88.4
Lower St. Lawrence [02P]	69.1	69.8	69.3	72.1	73.3
Northern Gaspé Peninsula [02Q]	50.7	50.1	51.4	51.8	53.6
Saguenay [02R]	68.8	69.5	68.4	70.0	71.4
Betsiamites, coast [02S]	34.3	33.7	33.7	35.2	46.5
Manicouagan and aux Outardes [02T]	81.6	79.4	79.8	77.0	80.2
Moisie and St. Lawrence Estuary [02U]	80.4	83.4	85.0	83.9	86.4
Gulf of St. Lawrence, Romaine [02V]	0.0	0.0	0.0	0.0	0.0
Gulf of St. Lawrence, Natashquan [02W]	22.7	21.9	23.7	23.8	23.0
Petit Mécatina and Strait of Belle Isle [02X]	0.0	0.0	0.0	0.0	0.0
Northern Newfoundland [02Y]	50.2	49.5	45.3	47.2	46.7
Southern Newfoundland [02Z]	63.9	65.2	58.6	62.1	64.1

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.9-3
Urban population as a share of total, by major drainage area and sub-drainage area — Northern Quebec and Labrador

Drainage area code	1981	1986	1991	1996	2001
	percent				
Canada	75.7	76.5	76.6	77.9	79.7
Northern Quebec and Labrador	60.8	56.7	52.5	52.4	55.3
Nottaway, coast [03A]	79.0	79.0	78.3	74.8	74.6
Broadback and Rupert [03B]	0.0	0.0	0.0	0.0	37.2
Eastmain [03C]	0.0	0.0	0.0	0.0	0.0
La Grande, coast [03D]	0.0	0.0	0.0	0.0	69.8
Grande rivière de la Baleine, coast [03E]	0.0	0.0	0.0	0.0	0.0
Eastern Hudson Bay [03F]	0.0	0.0	0.0	0.0	0.0
Northeastern Hudson Bay [03G]	0.0	0.0	0.0	0.0	0.0
Western Ungava Bay [03H]	0.0	0.0	0.0	0.0	0.0
Aux Feuilles, coast [03J]	0.0	0.0	0.0	0.0	0.0
Koksoak [03K]	0.0	0.0	0.0	0.0	0.0
Caniapiscau [03L]	63.0	25.8	0.0	0.0	0.0
Eastern Ungava Bay [03M]	0.0	0.0	0.0	0.0	0.0
Northern Labrador [03N]	0.0	0.0	0.0	0.0	0.0
Churchill, N.L. [03O]	95.2	94.1	89.3	94.7	95.0
Central Labrador [03P]	29.5	27.9	30.7	64.0	48.4
Southern Labrador [03Q]	0.0	0.0	0.0	0.0	0.0

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.9-4
Urban population as a share of total, by major drainage area and sub-drainage area — Southwestern Hudson Bay

Drainage area code	1981	1986	1991	1996	2001
	percent				
Canada	75.7	76.5	76.6	77.9	79.7
Southwestern Hudson Bay	57.6	58.9	55.5	60.6	59.2
Hayes, Man.	0.0	0.0	0.0	0.0	0.0
Southwestern Hudson Bay	0.0	0.0	0.0	0.0	0.0
Severn	0.0	0.0	0.0	0.0	0.0
Winisk, coast	0.0	0.0	0.0	0.0	0.0
Ekwan, coast	0.0	0.0	0.0	0.0	0.0
Attawapiskat, coast	0.0	0.0	0.0	61.8	65.9
Upper Albany	0.0	0.0	0.0	0.0	0.0
Lower Albany, coast	0.0	0.0	0.0	0.0	0.0
Kenogami	65.5	67.3	69.6	70.0	65.2
Moose, Ont.	41.4	56.8	35.2	100.0	67.6
Missinaibi and Mattagami	72.8	72.0	68.6	74.3	76.1
Abitibi	50.6	50.2	51.9	54.2	51.8
Harricanaw, coast	61.1	60.6	58.6	66.0	67.7

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.9-5
Urban population as a share of total, by major drainage area and sub-drainage area — Nelson River

Drainage area code	1981	1986	1991	1996	2001
	percent				
Canada	75.7	76.5	76.6	77.9	79.7
Nelson River	73.2	75.3	76.1	76.2	77.6
Upper South Saskatchewan	71.1	72.9	72.9	72.7	73.9
Bow	94.2	94.9	94.6	94.2	94.4
Red Deer	50.8	54.6	54.7	54.1	56.1
Upper North Saskatchewan	86.5	87.3	87.3	86.4	88.2
Central North Saskatchewan	77.9	81.8	81.9	81.7	82.8
Battle	43.9	47.0	49.3	49.4	48.6
Lower North Saskatchewan	47.2	49.1	52.3	54.1	54.2
Lower South Saskatchewan	74.1	77.7	79.4	79.6	79.8
Qu'Appelle	68.5	71.6	72.3	73.2	75.1
Saskatchewan	45.2	44.6	42.9	41.6	41.5
Lake Winnipegosis and Lake Manitoba	25.5	26.8	25.5	25.6	27.3
Assiniboine	75.6	75.3	76.0	76.3	76.7
Souris	35.4	38.0	38.8	40.2	42.5
Red	79.1	79.9	80.0	80.2	80.9
Winnipeg	52.0	52.9	49.0	48.0	47.9
English	51.7	49.5	43.1	39.6	39.7
Eastern Lake Winnipeg	0.0	0.0	0.0	0.0	0.0
Western Lake Winnipeg	16.3	18.5	20.6	18.9	15.3
Grass and Burntwood	88.4	83.1	83.2	80.4	80.1
Nelson	0.0	14.0	11.6	10.3	0.0

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.9-6
Urban population as a share of total, by major drainage area and sub-drainage area — Western and Northern Hudson Bay

	Drainage area code	1981	1986	1991	1996	2001
		percent				
Canada	...	75.7	76.5	76.6	77.9	79.7
Western and Northern Hudson Bay	[06]	28.1	33.2	29.9	30.5	29.3
Beaver, Alta. and Sask.	[06A]	38.3	40.3	42.3	37.9	37.9
Upper Churchill, Manitoba	[06B]	24.0	40.8	0.0	0.0	0.0
Central Churchill, upper, Manitoba	[06C]	0.0	36.7	32.2	30.9	31.5
Reindeer	[06D]	0.0	0.0	0.0	0.0	0.0
Central Churchill, lower, Manitoba	[06E]	32.2	26.7	17.4	26.0	23.5
Lower Churchill, Manitoba	[06F]	0.0	0.0	0.0	98.5	0.0
Seal, coast	[06G]	0.0	0.0	0.0	0.0	0.0
Western Hudson Bay, Southern	[06H]	0.0	0.0	0.0	0.0	0.0
Thelon	[06J]	0.0	0.0	0.0	0.0	0.0
Dubawnt	[06K]	0.0	0.0	0.0	0.0	0.0
Kazan	[06L]	0.0	0.0	0.0	0.0	0.0
Chesterfield Inlet	[06M]	0.0	0.0	0.0	0.0	0.0
Western Hudson Bay, central	[06N]	0.0	0.0	0.0	0.0	46.1
Western Hudson Bay, northern	[06O]	0.0	0.0	0.0	0.0	0.0
Hudson Bay, Southampton Island	[06P]	0.0	0.0	0.0	0.0	0.0
Foxe Basin, Southampton Island	[06Q]	0.0	0.0	0.0	0.0	0.0
Foxe Basin, Melville Peninsula	[06R]	0.0	0.0	0.0	0.0	0.0
Foxe Basin, Baffin Island	[06S]	0.0	0.0	0.0	0.0	0.0
Hudson Strait, Baffin and Southampton Islands	[06T]	0.0	0.0	0.0	0.0	0.0

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.9-7
Urban population as a share of total, by major drainage area and sub-drainage area — Great Slave Lake

	Drainage area code	1981	1986	1991	1996	2001
		percent				
Canada	...	75.7	76.5	76.6	77.9	79.7
Great Slave Lake	[07]	57.0	57.0	57.0	56.5	58.4
Upper Athabasca	[07A]	74.7	78.0	77.4	0.0	75.5
Central Athabasca, upper	[07B]	36.4	37.6	35.7	0.0	38.8
Central Athabasca, lower	[07C]	73.6	72.8	72.7	0.0	71.7
Lower Athabasca	[07D]	98.9	95.8	97.2	0.0	96.1
Williston Lake	[07E]	77.9	77.1	74.5	0.0	79.7
Upper Peace	[07F]	51.6	48.3	55.2	0.0	53.4
Smoky	[07G]	58.6	61.2	63.8	0.0	66.8
Central Peace, upper	[07H]	36.3	38.3	33.3	0.0	30.5
Central Peace, lower	[07J]	21.3	21.5	19.2	0.0	25.2
Lower Peace	[07K]	0.0	0.0	0.0	0.0	0.0
Fond-du-Lac	[07L]	0.0	0.0	0.0	0.0	0.0
Lake Athabasca, shores	[07M]	59.2	12.8	0.0	0.0	0.0
Slave	[07N]	98.8	97.9	0.0	0.0	0.0
Hay	[07O]	54.0	54.5	42.3	0.0	49.5
Southern Great Slave Lake	[07P]	79.5	71.3	0.0	0.0	0.0
Great Slave Lake, east arm, south shore	[07Q]	0.0	0.0	0.0	0.0	0.0
Lockhart	[07R]	0.0	0.0	0.0	0.0	0.0
Northeastern Great Slave Lake	[07S]	87.4	82.6	69.1	0.0	88.2
Marian	[07T]	0.0	0.0	0.0	0.0	0.0
Western Great Slave Lake	[07U]	0.0	0.0	0.0	0.0	0.0

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.9-8
Urban population as a share of total, by major drainage area and sub-drainage area — Pacific

	Drainage area code	1981	1986	1991	1996	2001
		percent				
Canada	...	75.7	76.5	76.6	77.9	79.7
Pacific	[08]	78.4	79.8	80.8	82.5	85.1
Alsek	[08A]	0.0	0.0	0.0	0.0	0.0
Northern coastal waters, B.C.	[08B]	0.0	0.0	0.0	0.0	0.0
Stikine, coast	[08C]	0.0	0.0	0.0	0.0	0.0
Nass, coast	[08D]	0.0	0.0	0.0	0.0	0.0
Skeena, coast	[08E]	59.5	64.8	66.0	0.0	65.3
Central coastal waters, B.C.	[08F]	68.3	65.8	62.7	0.0	62.9
Southern coastal waters, B.C.	[08G]	93.9	94.7	94.5	0.0	95.9
Vancouver Island	[08H]	74.2	74.8	75.2	0.0	79.5
Nechako	[08J]	63.6	62.6	62.9	0.0	63.4
Upper Fraser	[08K]	59.5	59.4	61.3	0.0	63.3
Thompson	[08L]	54.8	55.9	59.2	0.0	62.4
Lower Fraser	[08M]	86.9	88.4	88.9	0.0	93.0
Columbia	[08N]	60.6	60.2	61.6	0.0	69.2
Queen Charlotte Islands	[08O]	0.0	0.0	0.0	0.0	0.0
Skagit	[08P]	0.0	0.0	0.0	0.0	0.0

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.9-9
Urban population as a share of total, by major drainage area and sub-drainage area — Yukon River

Drainage area code	1981	1986	1991	1996	2001
	percent				
Canada	75.7	76.5	76.6	77.9	79.7
Yukon River	67.5	68.5	62.2	64.2	61.9
Headwaters Yukon	85.6	82.3	74.4	0.0	71.6
Pelly	0.0	0.0	0.0	0.0	0.0
Upper Yukon	0.0	0.0	0.0	0.0	0.0
Stewart	0.0	0.0	0.0	0.0	0.0
Central Yukon	0.0	0.0	0.0	0.0	0.0
Porcupine	0.0	0.0	0.0	0.0	0.0
Tanana	0.0	0.0	0.0	0.0	0.0
Copper	0.0	0.0	0.0	0.0	0.0

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.9-10
Urban population as a share of total, by major drainage area and sub-drainage area — Arctic

Drainage area code	1981	1986	1991	1996	2001
	percent				
Canada	75.7	76.5	76.6	77.9	79.7
Arctic	34.1	33.6	33.3	37.2	39.6
Upper Liard	0.0	0.0	0.0	0.0	0.0
Central Liard	0.0	0.0	0.0	0.0	0.0
Fort Nelson	81.2	77.5	81.6	0.0	74.3
Central Liard and Petitot	0.0	0.0	0.0	0.0	0.0
Lower Liard	0.0	0.0	0.0	0.0	0.0
Upper Mackenzie, Mills Lake	0.0	0.0	0.0	0.0	0.0
Upper Mackenzie, Camsell Bend	0.0	0.0	0.0	0.0	0.0
Central Mackenzie, Blackwater Lake	0.0	0.0	0.0	0.0	0.0
Great Bear	0.0	0.0	0.0	0.0	0.0
Central Mackenzie, The Ramparts	0.0	0.0	0.0	0.0	0.0
Lower Mackenzie	84.4	83.5	80.4	0.0	79.3
Peel and Southwestern Beaufort Sea	0.0	0.0	0.0	0.0	0.0
Southern Beaufort Sea	0.0	0.0	0.0	0.0	0.0
Amundsen Gulf	0.0	0.0	0.0	0.0	0.0
Coppermine	0.0	0.0	0.0	0.0	0.0
Coronation Gulf and Queen Maud Gulf	0.0	0.0	0.0	0.0	0.0
Back	0.0	0.0	0.0	0.0	0.0
Gulf of Boothia	0.0	0.0	0.0	0.0	0.0
Southern Arctic Islands	0.0	0.0	0.0	0.0	0.0
Baffin Island, Arctic drainage	43.7	45.5	45.7	0.0	66.7
Northern Arctic Islands	0.0	0.0	0.0	0.0	0.0

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.9-11
Urban population as a share of total, by major drainage area and sub-drainage area — Mississippi River

	Drainage area code	1981	1986	1991	1996	2001
		percent				
Canada	...	75.7	76.5	76.6	77.9	79.7
Mississippi River	[11]	0.0	8.3	9.0	0.0	0.0
Missouri	[11A]	0.0	8.3	9.0	0.0	0.0

Note(s): The population figures presented here are not adjusted for net undercoverage and non-permanent residents.

Source(s): CANSIM table 153-0036.

Table 3.10
Gross domestic product by industry

	1997	1998	1999	2000	2001	2002	2003	2004	2005
	percent of total								
Agriculture, forestry, fishing and hunting	2.5	2.6	2.6	2.4	2.2	2.0	2.1	2.2	2.2
Mining and oil and gas extraction	4.2	4.1	3.8	3.7	3.7	3.7	3.8	3.8	3.7
Utilities	3.3	3.1	2.9	2.8	2.7	2.7	2.7	2.6	2.7
Construction	5.3	5.2	5.2	5.2	5.5	5.5	5.6	5.8	5.9
Manufacturing	17.4	17.6	18.0	19.0	17.8	17.5	17.0	16.8	16.5
Wholesale trade and retail trade	10.5	10.9	10.9	11.0	11.4	11.6	11.8	12.0	12.3
Transportation and warehousing	4.9	4.8	4.9	4.8	4.9	4.7	4.7	4.8	4.8
Information and cultural industries	3.4	3.5	3.8	3.8	4.1	4.2	4.2	4.1	4.1
Arts, entertainment and recreation	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Finance and insurance, real estate and renting and leasing and management of companies and enterprises	19.7	19.6	19.4	19.1	19.6	19.6	19.6	19.8	19.9
Administrative and support, waste management and remediation services	1.9	1.9	2.0	2.0	2.1	2.2	2.2	2.2	2.3
Professional, scientific and technical services	3.7	4.0	4.2	4.4	4.4	4.4	4.5	4.5	4.5
Educational services	5.2	5.0	4.9	4.6	4.6	4.5	4.5	4.5	4.4
Health care and social assistance	6.3	6.1	6.0	5.8	5.8	5.8	5.8	5.7	5.6
Accommodation and food services	2.4	2.4	2.4	2.4	2.4	2.3	2.2	2.2	2.2
Other services (except public administration)	2.4	2.3	2.3	2.3	2.5	2.5	2.5	2.5	2.4
Public administration	6.1	5.9	5.8	5.6	5.7	5.7	5.7	5.7	5.6
All industries	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source(s): CANSIM table 379-0017.

Table 3.11
Employment by industry

	1992	1993	1994	1995	1996	1997	1998
	percent						
Agriculture, forestry and logging with support							
activities, fishing, hunting and trapping	4.3	4.3	4.3	4.1	4.0	3.9	3.8
Mining and oil and gas extraction	1.4	1.3	1.3	1.3	1.3	1.3	1.3
Utilities	1.1	1.1	1.0	0.9	0.9	0.8	0.8
Construction	5.6	5.4	5.5	5.5	5.3	5.3	5.2
Manufacturing	14.3	13.9	14.0	14.3	14.3	14.7	14.9
Trade	16.0	15.8	15.8	15.6	15.6	15.4	15.1
Transportation and warehousing	4.8	4.8	4.9	5.0	5.0	5.1	5.1
Finance, insurance, real estate and leasing, business, building and other support services	9.1	9.2	9.2	9.4	9.6	9.5	9.4
Professional, scientific and technical services	4.6	4.8	4.9	5.1	5.3	5.7	6.1
Educational services	7.0	7.1	7.1	7.0	6.8	6.7	6.6
Health care and social assistance	10.4	10.5	10.4	10.4	10.4	10.1	10.2
Information, culture and recreation	3.9	3.9	4.1	4.3	4.3	4.4	4.4
Accommodation and food services	6.0	6.0	6.1	6.1	6.3	6.4	6.5
Other services	4.7	4.9	5.0	4.9	4.9	5.0	5.0
Public administration	6.8	6.7	6.4	6.2	6.0	5.8	5.6
Total, all industries	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	1999	2000	2001	2002	2003	2004	2005
	percent						
Agriculture, forestry and logging with support							
activities, fishing, hunting and trapping	3.6	3.3	2.8	2.8	2.8	2.7	2.7
Mining and oil and gas extraction	1.1	1.1	1.2	1.1	1.1	1.2	1.3
Utilities	0.8	0.8	0.8	0.9	0.8	0.8	0.8
Construction	5.3	5.5	5.5	5.7	5.8	6.0	6.3
Manufacturing	15.2	15.2	14.9	14.9	14.5	14.4	13.7
Trade	15.4	15.5	15.8	15.7	15.7	15.7	15.9
Transportation and warehousing	5.1	5.2	5.2	5.0	5.0	5.0	4.9
Finance, insurance, real estate and leasing, business, building and other support services	9.5	9.4	9.5	9.6	9.7	10.0	10.2
Professional, scientific and technical services	6.3	6.3	6.6	6.4	6.4	6.4	6.5
Educational services	6.7	6.6	6.6	6.6	6.6	6.5	6.8
Health care and social assistance	10.0	10.3	10.3	10.6	10.7	10.9	10.7
Information, culture and recreation	4.4	4.5	4.7	4.7	4.6	4.6	4.5
Accommodation and food services	6.3	6.4	6.3	6.4	6.4	6.3	6.2
Other services	5.0	4.7	4.5	4.5	4.6	4.4	4.3
Public administration	5.4	5.2	5.3	5.2	5.2	5.2	5.2
Total, all industries	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source(s): CANSIM table 282-0008.

Table 3.12
Exports and imports¹

	1971	1976	1981	1986	1991	1996	2001	2004	2005
	percent								
Exports									
Agricultural and fishing products	13.0	11.9	12.1	8.7	8.9	8.3	7.4	7.2	6.7
Energy products	7.1	12.7	13.4	8.8	9.6	9.3	13.3	15.8	19.2
Forestry products	16.1	16.6	14.4	14.2	12.6	12.3	9.6	9.2	8.1
Industrial goods and materials	25.4	21.8	23.9	20.6	21.2	18.7	16.1	18.1	18.7
Machinery and equipment	10.7	11.3	14.3	16.2	19.8	22.1	24.4	21.3	20.9
Automotive products	22.7	20.9	15.6	25.3	22.0	22.6	22.0	21.1	19.5
Other consumer goods ²	1.5	1.3	1.6	2.0	2.4	3.4	3.9	4.0	3.8
Special transactions trade	0.2	0.4	0.8	0.4	1.1	1.1	1.9	1.9	1.8
Unallocated balance of payments adjustments	3.3	3.1	3.9	3.8	2.5	2.2	1.5	1.5	1.4
Exports, total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	percent								
Imports									
Agricultural and fishing products	8.4	8.6	7.4	6.3	6.4	5.9	5.8	5.9	5.7
Energy products	5.8	10.8	12.2	4.4	4.7	4.0	5.1	6.8	8.7
Forestry products	1.0	1.2	0.9	0.9	0.9	0.8	0.8	0.9	0.8
Industrial goods and materials	20.8	17.2	20.2	18.7	17.6	19.6	19.5	20.2	20.2
Machinery and equipment	26.1	24.7	28.4	27.2	30.5	32.1	32.0	28.6	28.6
Automotive products	25.5	24.7	19.7	28.6	22.0	21.5	20.7	21.3	20.2
Other consumer goods ²	10.2	10.9	9.6	10.4	11.8	10.9	12.3	13.1	12.7
Special transactions trade	1.1	1.3	1.2	1.5	2.6	3.0	2.0	1.4	1.2
Unallocated balance of payments adjustments	1.1	0.6	0.6	2.1	3.6	2.2	1.8	1.9	1.9
Imports, total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

1. Merchandise imports and exports by sector, balance of payments basis—transactions are defined in terms of ownership change.

2. Includes apparel and footwear, televisions, radios, printed matter, watches, sporting goods and toys, house furnishings, photographic goods, and other miscellaneous end products.

Source(s): CANSIM table 228-0043.

Table 3.13
Water transport

	Freight loaded		Freight unloaded		Total freight handled	Containerized freight handled		Movement of freight	Passengers transported by ferry
	Domestic	International	Domestic	International		Domestic	International		
	millions of tonnes						millions of tonne-kilometres ¹	millions of passengers	
1988	70.0	171.1	70.0	78.9	389.9	1.6	12.6	1,535,267	..
1989	62.0	159.1	62.0	80.3	363.4	1.4	12.1	1,440,267	38.7
1990	60.4	159.0	60.4	73.3	353.0	1.3	12.3	1,614,653	40.8
1991	57.9	168.0	57.9	66.1	349.9	0.8	12.2	1,708,444	40.4
1992	52.3	153.8	52.3	69.3	327.7	1.0	12.6	1,578,406	40.0
1993	50.4	152.6	50.4	71.6	324.9	0.9	13.3	1,561,381	41.2
1994	52.2	170.0	52.2	76.9	351.3	0.8	14.7	1,697,540	43.2
1995	50.4	176.5	50.4	83.2	360.5	0.8	15.6	1,775,600	42.0
1996	48.8	174.3	48.8	85.6	357.5	0.8	17.1	1,780,975	39.8
1997	46.7	187.9	46.7	94.7	376.1	1.0	18.8	1,967,331	38.2
1998	48.3	179.0	48.3	100.4	376.0	0.9	19.7	1,876,721	37.3
1999	52.2	179.6	52.2	101.6	385.6	0.9	22.5	1,881,478	39.2
2000	54.5	187.8	54.5	105.9	402.8	0.9	24.0	1,969,188	38.5
2001	53.9	174.7	53.9	112.1	394.7	0.9	23.5	1,872,734	39.0
2002	62.8	174.3	62.6	108.5	408.1	1.0	25.6	1,765,574	39.4
2003	68.1	191.4	68.3	115.2	443.0	1.0	28.2	1,919,479	38.9

1. The movement of one tonne over a distance of one kilometre.

Source(s): Shipping in Canada, catalogue no. 54-205-X. Transport Canada, Surface and Marine Statistics and Forecasts.

Table 3.14
Rail transport¹

	Freight movement		Passenger movement		Locomotives	Passenger cars	Freight cars	Fuel consumed ⁴	Track operated
	Tonnes	Tonne-kilometres ²	Passengers	Passenger-kilometres ³					
	millions				number		millions of litres	kilometres	
1997	319.1	306,198	4.1	1,515	3,143	426	107,976	2,258	74,949
1998	325.2	298,797	4.0	1,458	3,142	430	105,676	2,129	73,360
1999	334.7	299,807	3.9	1,510	3,115	435	102,917	1,979	70,346
2000	352.2	321,894	4.2	1,533	2,956	464	102,200	1,989	72,201
2001	345.8	321,233	4.2	1,553	2,889	449	100,110	1,997	69,410
2002	334.0	318,243	4.3	1,597	2,894	497	96,673	2,019	72,744
2003	338.0	317,933	4.0	1,426	2,900	532	95,624	2,051	71,655
2004	353.8	336,482	4.0	1,414	2,956	560	99,344	2,103	72,093

1. Private railways, that transport goods solely for parent companies and do not operate on a for-hire basis, are excluded.
2. The movement of one tonne over a distance of one kilometre.
3. The movement of a passenger over a distance of one kilometre. Passenger-kilometres are derived by multiplying the number of passengers by the distance travelled.
4. Diesel and heavy fuel oil in 1997. Diesel only from 1998 to 2004.

Source(s): Rail in Canada, catalogue no. 52-216-X.

Table 3.15
Truck transport

	Freight carried		Shipments		
	Tonnes	Tonne-kilometres ¹	Number of shipments	Weight per shipment	Distance per shipment
	millions			kilograms	kilometres
1989	189.6	77,383	34.9	5,431	621
1990	174.2	77,069	30.0	5,816	647
1991	150.6	70,048	29.1	5,178	648
1992	149.5	72,276	27.6	5,410	656
1993	173.4	83,968	27.9	6,208	659
1994	195.6	101,873	30.5	6,418	641
1995	210.9	109,434	32.3	6,523	685
1996	229.0	120,459	35.2	6,509	709
1997	223.3	130,141	32.0	6,962	792
1998	233.9	137,552	33.8	6,914	776
1999	269.3	158,104	36.4	7,396	771
2000	278.4	164,720	35.6	7,830	798
2001	288.0	170,569	36.9	7,800	795
2002	293.6	177,012	38.5	7,629	778
2003	305.2	184,744	40.3	7,580	794

1. The movement of one tonne over a distance of one kilometre.

Note(s): These figures pertain only to Canada-based for-hire trucking carriers.

Source(s): Trucking in Canada, catalogue no. 53-222-X.

Table 3.16
Air transport

	Freight carried		Passengers	
	Weight	Tonne-kilometres ¹	Passengers	Passenger-kilometres ²
	tonnes	millions		
1988	591,250	1,516	34.8	62,141
1989	603,828	1,552	35.7	65,628
1990	628,180	1,727	36.3	66,608
1991	603,267	1,565	31.3	57,953
1992	596,812	1,493	31.9	62,117
1993	624,561	1,636	31.1	60,985
1994	653,444	1,791	32.5	65,636
1995	692,579	2,034	36.0	73,506
1996	721,260	2,168	39.6	82,270
1997	789,146	2,353	43.6	92,104
1998	822,185	2,280	45.2	96,643
1999	832,987	2,364	46.4	99,623
2000	845,809	2,327	46.8	104,917
2001	789,625	2,149	45.4	102,473
2002	786,607	2,151	40.5	95,094
2003	662,612	1,855	41.5	90,326
2004	693,798	2,010	45.6	103,116

1. The movement of one tonne over a distance of one kilometre.

2. The movement of a passenger over a distance of one kilometre. Passenger-kilometres are derived by multiplying the number of passengers by distance travelled.

Notes: Figures include all Canadian carriers that earned more than 1 million dollars in revenue during each of the previous two years.

Source(s): Transportation Division; Service Bulletin, Aviation, catalogue no. 51-004-X, Vol. 37, no. 6.

Table 3.17
Motor vehicle registrations

	Road motor vehicles					Trailers	Off-road, construction, farm vehicles	
	Vehicles weighing less than 4,500 kilograms	Vehicles weighing 4,500 kilograms to 14,999 kilograms	Vehicles weighing 15,000 kilograms or more	Buses	Motorcycles and mopeds			Total, road motor vehicle registrations
	thousands							
1999	16,538	387	262	73	274	17,534	4,145	1,957
2000	16,832	391	270	77	311	17,882	3,989	1,756
2001	17,055	387	267	74	318	18,102	4,023	1,302
2002	17,544	367	277	79	350	18,617	4,161	1,419
2003	17,755	378	282	80	373	18,869	4,309	1,488
2004	17,920	390	285	77	409	19,081	4,493	1,526
2005	18,124	407	300	78	444	19,353	4,690	1,599

Note(s): In 1999, Statistics Canada implemented a revised methodology for motor vehicle registration data in Canada. These data are not comparable with motor vehicle registrations prior to 1999.

Source(s): CANSIM table 405-0004.

Table 3.18
Usual mode of transportation for travel to work

	1996	2001	Change 1996 to 2001	1996	2001	Percentage change 1996 to 2001
	workers			percent		
Car, truck, van, as driver	8,934,025	9,929,470	995,445	73.3	73.8	11.1
Car, truck, van, as passenger	899,340	923,975	24,635	7.4	6.9	2.7
Public transportation	1,233,870	1,406,585	172,715	10.1	10.5	14.0
Walk	850,855	881,085	30,230	7.0	6.6	3.6
Bicycle	137,435	162,910	25,475	1.1	1.2	18.5
Other	127,885	146,835	18,950	1.0	1.1	14.8
Total	12,183,410	13,450,855	1,267,445	100.0	100.0	10.4

Source(s): Where Canadians work and how they get there?, 2001 Census: analysis series,
www12.statcan.ca/english/census01/Products/Analytic/companion/pow/pdf/96F0030XIE2001010.pdf (accessed March 17, 2006).

Table 3.19
Usual mode of transportation for travel to work, by census metropolitan areas (CMA), 2001

	All modes	Car, truck, van		Public transportation	Walk	Bicycle	Other
		As driver	As passenger				
	workers	percent					
St. John's	75,735	77.3	12.3	2.8	5.9	0.1	1.6
Halifax	170,210	68.1	9.6	9.9	10.3	0.9	1.2
Saint John	53,050	76.5	10.5	4.3	6.9	0.4	1.4
Chicoutimi-Jonquière ¹	62,765	85.1	4.9	2.4	5.9	0.8	0.9
Québec	325,005	76.0	5.2	9.8	7.0	1.3	0.7
Sherbrooke	70,365	80.0	5.7	5.6	7.2	0.8	0.7
Trois-Rivières	57,610	84.3	4.6	3.0	6.0	1.5	0.6
Montréal	1,580,270	65.6	4.8	21.7	5.9	1.3	0.7
Ottawa-Hull ²	525,070	64.6	7.4	18.5	6.8	1.9	0.8
Kingston	65,375	74.2	8.2	3.5	10.4	2.2	1.5
Oshawa	142,430	80.2	7.7	7.1	3.6	0.5	0.9
Toronto	2,248,055	65.2	6.3	22.4	4.6	0.8	0.7
Hamilton	304,900	78.2	7.1	8.0	5.1	0.9	0.7
St. Catharines-Niagara	167,980	83.8	7.4	2.0	5.0	0.9	0.9
Kitchener	206,805	81.3	8.1	3.9	4.9	1.1	0.7
London	200,125	77.9	7.8	6.0	5.9	1.5	0.9
Windsor	137,590	83.8	6.5	3.1	4.7	1.1	0.8
Greater Sudbury ³	67,380	78.2	8.8	4.9	6.5	0.4	1.2
Thunder Bay	54,325	82.5	7.0	3.0	5.4	1.0	1.1
Winnipeg	327,740	70.0	8.4	13.2	6.1	1.4	0.9
Regina	94,295	80.3	7.9	4.4	5.2	1.4	0.8
Saskatoon	106,025	79.7	6.6	4.1	5.8	2.5	1.3
Calgary	499,050	71.8	6.8	13.2	5.9	1.5	0.8
Edmonton	469,225	77.7	6.6	8.6	4.7	1.2	1.2
Abbotsford	61,880	84.4	8.7	1.6	3.6	0.9	0.8
Vancouver	905,995	72.2	7.0	11.5 ⁴	6.5	1.9	0.9
Victoria	140,515	67.5	6.0	9.7	10.4	4.8	1.6
All CMAs	9,119,770	70.8	6.6	14.8	5.7	1.3	0.8

1. Now known as Saguenay.

2. Now known as Ottawa-Gatineau.

3. Now known as Greater Sudbury / Grand Sudbury.

4. A transit strike was ongoing in Vancouver at the time of the 2001 Census, which affected the number of commuters reporting that they usually used public transit to get to work.

Source(s): Where Canadians work and how they get there?, 2001 Census: analysis series, www12.statcan.ca/english/census01/Products/Analytic/companion/pow/pdf/96F0030XIE2001010.pdf (accessed March 17, 2006).

Table 3.20
Consumption of refined petroleum products¹ by transportation industry

	Railways	Total airlines ²	Total marine ²	Road transport and urban transit	Retail pump sales	Pipelines ³	Total
thousands of cubic metres							
1990	2,313	4,078	2,640	4,419	32,541	16	46,007
1991	2,142	3,686	2,733	4,474	31,447	15	44,499
1992	2,240	3,921	2,711	4,656	32,067	12	45,608
1993	2,232	3,756	2,397	5,104	33,048	8	46,545
1994	2,310	4,015	2,574	5,978	34,208	30	49,116
1995	2,092	4,244	2,523	6,450	34,251	36	49,596
1996	2,046	4,941	2,480	6,690	34,849	57	51,062
1997	2,074	5,082	2,481	7,147	35,778	13	52,574
1998	1,999	5,227	2,919	7,197	36,817	24	54,182
1999	2,116	5,583	2,741	7,345	37,902	24	55,711
2000	2,169	5,634	2,801	7,175	38,100	21	55,901
2001	2,132	5,015	3,016	6,721	38,448	12	55,344
2002	1,934	5,299	2,718	6,871	38,665	9	55,496
2003	1,928	5,336	2,524	7,368	39,728	20	56,905
2004	1,959	5,822	2,803	7,573	41,192	25	59,376

1. Refined petroleum products refers to motor gasoline, diesel fuel oil, light fuel oil, heavy fuel oil, aviation gasoline and aviation turbo fuel.

2. Includes fuels purchased in Canada by domestic and foreign companies.

3. The volume used to operate and run the pumps at the pumping stations.

Note(s): Figures may not add up to totals due to rounding.

Source(s): CANSIM tables 128-0003 and 128-0010.

Table 3.21
Fuel consumption and number of vehicles by passenger bus and urban transit industries, 2004

	Fuel consumed			Electricity	Number of vehicles
	Diesel	Gasoline	Other gas		
	thousands of litres			thousands of kilowatts	number
Total	765,365	17,833	22,620	814,066	59,493
Urban transit systems	408,737	1,067	17,199	791,023	15,560
Interurban and rural bus transportation	70,875	30	0	0	3,386
School and employee bus transportation	204,258	14,007	1,372	29	35,238
Charter bus	48,172	158	173	0	2,195
Other transit - shuttle	14,427	2,334	3,875	0	2,070
Sight-seeing	1,486	236	0	0	175
Other ¹	17,411	0	0	23,014	869

1. Comprised mostly of municipal transit operations that are part of municipal budgets rather than separate operating entities.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Transportation Division.

Table 3.22
Number of farms by province

	Total	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec
	number					
1871	367,862	...	...	46,316	31,202	118,086
1881	464,025	...	13,629	55,873	36,837	137,863
1891 ¹	542,181	...	14,549	60,122	38,577	174,996
1901 ¹	511,073	...	13,748	54,478	37,006	140,110
1911 ¹	682,329	...	14,113	52,491	37,755	149,701
1921	711,090	...	13,701	47,432	36,655	137,619
1931	728,623	...	12,865	39,444	34,025	135,957
1941	732,832	...	12,230	32,977	31,889	154,669
1951	623,087	3,626	10,137	23,515	26,431	134,336
1961	480,877	1,752	7,335	12,518	11,786	95,777
1971	366,110	1,042	4,543	6,008	5,485	61,257
1981	318,361	679	3,154	5,045	4,063	48,144
1991	280,043	725	2,361	3,980	3,252	38,076
1996	276,548	742	2,217	4,453	3,405	35,991
2001	246,923	643	1,845	3,923	3,034	32,139
	Total	Ontario	Manitoba	Saskat- chewan	Alberta	British Columbia
	number					
1871	367,862	172,258	...	...	...	...
1881	464,025	206,989	9,077	1,014 ²	...	2,743
1891 ¹	542,181	216,195	22,008	9,244 ³	...	6,490
1901 ¹	511,073	204,054	32,252	13,445	9,479	6,501
1911 ¹	682,329	212,108	43,631 ⁴	95,013 ⁴	60,559 ⁴	16,958
1921	711,090	198,053	53,252 ⁴	119,451 ⁴	82,954 ⁴	21,973
1931	728,623	192,174	54,199	136,472	97,408	26,079
1941	732,832	178,204	58,024	138,713	99,732	26,394
1951	623,087	149,920	52,383	112,018	84,315	26,406
1961	480,877	121,333	43,306	93,924	73,212	19,934
1971	366,110	94,722	34,981	76,970	62,702	18,400
1981	318,361	82,448	29,442	67,318	58,056	20,012
1991	280,043	68,633	25,706	60,840	57,245	19,225
1996	276,548	67,520	24,383	56,995	59,007	21,835
2001	246,923	59,728	21,071	50,598	53,652	20,290

1. Excludes plots under one acre, to attain comparability with data for later years.
2. Data comprise the portion of the Northwest Territories located west of Manitoba.
3. Data comprise the districts of Assiniboia, Saskatchewan and Alberta.
4. Data exclude farms located on Indian reserves.

Source(s): 1983, Historical Statistics of Canada, Second Edition, F.H. Leacy (ed.), catalogue no. 11-516-X, 1997; Historical Overview of Canadian Agriculture, catalogue no. 93-358-X, 2002, Census of Agriculture, www.statcan.ca/english/freepub/95F0301-X/tables/html/Table3Can.htm (accessed February 16, 2005).

Table 3.23
Gross domestic product of fishing industries

	Total gross domestic product	Fishing, hunting and trapping	Seafood product preparation and packaging	Total	Share of total gross domestic product
	millions of chained 1997 dollars				percent
1997	816,756	847	721	1,568	0.19
1998	848,414	821	715	1,536	0.18
1999	896,069	807	843	1,650	0.18
2000	943,738	832	876	1,708	0.18
2001	957,258	916	874	1,790	0.19
2002	982,843	944	958	1,902	0.19
2003	1,002,936	967	1,020	1,987	0.20
2004	1,034,024	982	990	1,972	0.19
2005	1,062,951	940	921	1,861	0.18

Source(s): CANSIM table 379-0017.

Table 3.24
Employment in the fishing industries

	Total employment	Fishing industries			Total	Share of total employment
		Fishing	Animal aquaculture	Seafood product preparation and packaging		
	thousands of persons				percent	
1987	12,333	33.4	2.3	31.6	67.3	0.55
1988	12,710	37.5	1.6	35.3	74.4	0.59
1989	12,996	36.9	2.0	33.8	72.7	0.56
1990	13,086	37.1	2.5	30.7	70.3	0.54
1991	12,857	40.9	3.0	29.5	73.4	0.57
1992	12,731	35.1	3.1	29.4	67.6	0.53
1993	12,793	36.2	2.9	25.5	64.6	0.50
1994	13,059	35.2	2.5	25.2	62.9	0.48
1995	13,295	28.5	2.2	22.6	53.3	0.40
1996	13,421	30.1	3.2	20.2	53.5	0.40
1997	13,706	29.7	3.9	22.5	56.1	0.41
1998	14,046	29.5	2.5	22.4	54.4	0.39
1999	14,407	29.1	3.4	24.8	57.3	0.40
2000	14,764	28.5	4.7	22.9	56.1	0.38
2001	14,946	25.7	4.1	23.7	53.5	0.36
2002	15,310	25.6	3.2	27.6	56.4	0.37
2003	15,672	26.2	3.1	24.3	53.6	0.34
2004	15,947	26.5	3.5	25.9	55.9	0.35
2005	16,170	24.3	3.9	21.3	49.5	0.31

Source(s): Labour Force Survey and Statistics Canada, CANSIM table 282-0088.

Table 3.25
Exports and imports of fish and fish products

	Exports			Imports		
	Total exports	Fish fresh, frozen, preserved and canned	Share of total exports	Total imports	Fish and marine animals	Share of total imports
	millions of dollars		percent	millions of dollars		percent
1971	17,782	276	1.55	15,314	60	0.39
1972	20,222	340	1.68	18,272	81	0.44
1973	25,649	484	1.89	22,726	110	0.48
1974	32,738	418	1.28	30,903	119	0.38
1975	33,616	451	1.34	33,962	134	0.39
1976	38,166	590	1.54	36,608	182	0.50
1977	44,495	795	1.79	41,523	219	0.53
1978	53,361	1,111	2.08	49,048	248	0.51
1979	65,582	1,271	1.94	61,157	310	0.51
1980	76,680	1,265	1.65	67,903	354	0.52
1981	84,432	1,494	1.77	77,140	360	0.47
1982	84,393	1,591	1.89	66,738	352	0.53
1983	90,556	1,563	1.73	73,098	418	0.57
1984	111,330	1,595	1.43	91,493	488	0.53
1985	119,061	1,849	1.55	102,669	494	0.48
1986	125,172	2,580	2.06	115,195	613	0.53
1987	131,484	2,957	2.25	119,324	691	0.58
1988	143,534	2,818	1.96	132,715	679	0.51
1989	146,963	2,530	1.72	139,216	738	0.53
1990	152,056	2,817	1.85	141,000	679	0.48
1991	147,669	2,636	1.79	140,658	736	0.52
1992	163,464	2,736	1.67	154,430	777	0.50
1993	190,213	2,868	1.51	177,123	996	0.56
1994	228,167	3,258	1.43	207,872	1,126	0.54
1995	265,334	3,496	1.32	229,936	1,286	0.56
1996	280,079	3,444	1.23	237,689	1,470	0.62
1997	303,378	3,498	1.15	277,726	1,434	0.52
1998	327,162	3,664	1.12	303,399	1,636	0.54
1999	369,035	4,261	1.15	327,026	1,870	0.57
2000	429,372	4,561	1.06	362,337	1,929	0.53
2001	420,730	4,722	1.12	350,071	1,945	0.56
2002	414,038	5,240	1.27	356,727	1,935	0.54
2003	398,954	4,987	1.25	342,692	1,812	0.53
2004	429,121	4,870	1.13	363,638	1,804	0.50
2005	453,060	4,700	1.04	388,210	1,822	0.47

Source(s): CANSIM table 228-0003.

Table 3.26
Landed catch and value

	Groundfish ¹		Pelagic fish ²		Shellfish ³		Total ⁴	
	Catch	Value	Catch	Value	Catch	Value	Catch	Value
	tonne (live weight)	thousands of dollars	tonne (live weight)	thousands of dollars	tonne (live weight)	thousands of dollars	tonne (live weight)	thousands of dollars
1990	791,246	475,491	560,238	425,690	246,796	518,244	1,624,792	1,432,044
1991	792,383	500,184	431,514	293,514	247,199	580,985	1,506,966	1,392,490
1992	630,574	415,422	389,644	315,887	265,243	647,967	1,317,602	1,397,032
1993	431,407	297,814	418,817	364,067	284,396	730,487	1,154,408	1,419,576
1994	332,896	252,858	351,139	402,321	313,434	1,013,681	1,031,024	1,699,994
1995	220,710	232,210	302,013	242,458	305,165	1,270,278	858,039	1,781,263
1996	274,086	231,609	310,941	269,575	299,562	1,037,063	918,663	1,579,576
1997	276,317	255,308	323,497	222,455	337,297	1,081,094	977,940	1,599,953
1998	287,498	288,029	319,085	166,369	355,523	1,134,154	994,575	1,611,592
1999	298,264	324,995	286,236	124,061	382,486	1,435,695	1,003,063	1,910,165
2000	229,637	309,511	305,813	186,734	429,937	1,617,924	1,003,500	2,137,792
2001 ^p	274,925	302,344	307,672	171,916	433,100	1,618,301	1,053,338	2,118,552
2002 ^p	256,097	283,371	316,870	187,617	456,498	1,669,279	1,072,034	2,176,965
2003 ^p	256,319	293,600	349,337	187,806	462,689	1,715,711	1,129,287	2,231,445
2004 ^p	306,289	280,713	337,652	185,447	484,964	1,709,121	1,151,264	2,212,373

1. Species that are usually caught near the ocean bottom, including cod, haddock, pollock, redfish, halibut, flounder, and many others.

2. The pelagic species live in midwater or close to the surface. They include herring, capelin, swordfish, tuna, and many others.

3. Aquatic shelled molluscs (oysters, etc.) and crustaceans (crabs, shrimp, etc.).

4. Data do not add up because total also includes marine plants, lumpfish roe and miscellaneous other marine products.

Source(s): Department of Fisheries and Oceans, Statistical Services, 2005, www.dfo-mpo.gc.ca/communic/statistics/commercial/landings/seafisheries/index_e.htm (accessed December 8, 2005).

Table 3.27
Aquaculture production

	Trout ¹		Oysters		Salmon		Mussels		Total ^{2, 3}	
	Weight	Value	Weight	Value	Weight	Value	Weight	Value	Weight	Value
	tonnes	thousands of dollars	tonnes	thousands of dollars	tonnes	thousands of dollars	tonnes	thousands of dollars	tonnes	thousands of dollars
1986	2,176	14,626	5,164	5,752	1,073	11,271	2,062	3,427	10,488	35,106
1987	3,031	18,611	5,794	6,874	3,125	31,043	1,740	2,839	13,936	61,669
1988	3,444	20,809	5,913	6,987	9,719	71,202	2,045	3,368	21,466	105,355
1989	3,888	22,655	6,489	9,015	16,276	102,018	3,391	4,148	30,273	139,137
1990	4,677	26,714	6,774	8,462	21,167	155,059	3,598	3,964	36,462	195,955
1991	3,324	15,575	5,900	5,952	34,109	195,538	3,956	4,875	49,594	233,559
1992	3,927	20,234	5,843	6,049	30,325	202,735	4,877	5,696	46,931	244,014
1993	4,121	21,737	6,036	6,573	36,670	234,036	5,141	5,727	53,927	277,604
1994	4,434	24,169	7,534	9,081	36,083	249,152	6,867	7,575	57,147	301,992
1995	5,316	26,216	7,719	9,702	42,515	286,852	8,626	9,891	66,269	341,957
1996	7,712	38,993	7,989	10,710	45,624	287,154	9,898	12,022	73,187	362,527
1997	6,876	33,629	5,631	8,695	56,775	324,030	11,570	13,834	82,487	392,123
1998	8,376	42,123	8,137	11,321	58,618	349,043	15,018	18,965	92,105	436,867
1999	12,576	60,830	8,785	13,278	72,890	450,084	17,397	23,185	114,204	567,841
2000	12,037	57,289	9,624	16,515	82,195	483,755	21,262	27,078	128,030	608,881
2001	11,218	51,193	11,319	16,772	105,606	470,471	21,515	30,283	154,069	605,491
2002	8,867	42,811	11,520	15,176	126,321	502,036	20,572	31,281	171,799	628,318
2003	6,403	32,038	13,621	19,208	107,228	441,471	20,590	30,929	158,207	590,984
2004	4,871	22,086	12,645	16,207	96,774	387,038	22,857	32,761	145,840	526,562

1. Includes steelhead.

2. Data do not add up to total because total also includes char, other finfish, clams and scallops.

3. Starting in 1996, total includes restocking to outfitters in Quebec.

Source(s): Department of Fisheries and Oceans, Statistical Services, 2004, www.dfo-mpo.gc.ca/communic/statistics/aqua/index_e.htm (accessed November 8, 2004) and Statistics Canada, 2005, Aquaculture Statistics, 2004, catalogue no. 23-222-X.

Table 3.28
Volume of roundwood harvested by forest product category, selected years

	Industrial roundwood				Fuelwood and firewood	Total roundwood harvested
	Logs and bolts ¹	Pulpwood	Other	Total		
thousands of cubic metres						
1940	32,625	20,981	2,109	55,715	19,732	75,447
1945	30,596	26,412	2,039	59,047	17,188	76,235
1950	40,095	32,311	1,701	74,107	11,508	85,615
1955	44,262	38,721	1,691	84,674	8,208	92,882
1960	51,118	33,924	1,524	86,566	6,750	93,316
1965	62,618	34,164	1,838	98,620	5,125	103,745
1970	75,645	40,553	1,294	117,492	4,133	121,625
1975	73,542 ^r	37,270 ^r	915	111,727 ^r	3,783	115,510 ^r
1980	109,952	38,909	1,923	150,784	4,840 ^r	155,624 ^r
1985	119,317 ^r	40,620 ^r	2,077 ^r	162,014 ^r	6,708	168,722 ^r
1990	118,941 ^r	35,876 ²	1,581 ^r	156,398 ^r	6,169 ²	162,567 ^r
1995	150,150 ^r	30,926 ³	2,081 ^r	183,156 ^r	5,340 ^r	188,497 ^r
2000	166,652 ^r	28,699 ^r	3,566 ^r	198,917 ^r	2,927 ^r	201,843 ^r
2001	154,417 ^r	23,079 ^r	5,449 ^r	182,945 ^r	2,908 ^r	185,854 ^r
2002	164,387 ²	26,042 ²	3,298 ²	193,727 ²	2,866 ²	196,593 ²
2003	..	..	3,315 ²	..	..	..

1. Logs are defined as the stem of a tree after it has been felled; the raw material from which lumber, plywood, and other wood products are processed. Bolts are defined as raw material used in the manufacture of shingles and shakes; short logs to be sawn for lumber or peeled for veneer.

2. Estimated by provincial or territorial forestry agency.

3. Estimated by the Canadian Forest Service or by Statistics Canada.

Source(s): Canadian Council of Forest Ministers, Compendium of Canadian Forestry Statistics, 2006, nfdp.ccfm.org/compendium/index_e.php (accessed April 19, 2006).

Table 3.29
Volume of roundwood harvested by province and territory

	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario
thousands of cubic metres							
1980	155,624 ^r	2,795 ^r	381	4,686	8,387	31,686	21,322
1981	144,736 ^r	2,568	371 ^r	4,112	7,795	34,234	22,808
1982	127,202 ^r	2,379	357 ^r	3,105	6,320	29,133	19,778
1983	155,983 ^r	2,429	381 ^r	2,596	7,442	36,288	23,736
1984	167,824 ^r	2,889	400 ^r	3,894	8,378	36,519	28,130
1985	168,722 ^r	2,509	411 ^r	3,515	7,896	35,400	28,225
1986	177,190 ^r	2,408	424 ^r	4,004	8,720	38,127	30,186
1987	191,685	2,524	480	4,789	7,869	39,503	29,692
1988	190,616 ^r	2,513	476 ^r	5,039	9,199	39,381	29,338
1989	188,254 ^r	2,535	416 ^r	4,772	9,281	36,192	29,642
1990	162,567 ^r	2,876 ²	448 ^r	4,639 ²	8,824 ²	30,148 ²	25,420 ²
1991	160,880 ^r	2,680	452 ^r	4,348	8,643	28,943 ²	23,829 ³
1992	170,131 ^r	2,821 ²	510 ²	4,248 ²	9,205	31,001 ^r	24,286 ³
1993	175,999 ^r	3,131 ²	534 ²	4,585 ²	8,959	34,091 ²	25,432 ³
1994	183,261 ²	2,445	519 ²	5,106 ²	9,269	38,231 ²	25,952 ³
1995	188,497 ^r	2,983	638	5,483 ²	10,055	41,438 ²	26,260 ³
1996	183,375 ^r	2,742 ²	557 ³	6,012 ²	10,902 ³	38,267 ²	25,871 ³
1997	188,750 ^r	2,558 ²	514 ^r	6,989 ²	11,253 ³	42,543 ²	26,595 ³
1998	176,957 ^r	2,398 ²	520	5,903 ^r	11,534 ²	43,427 ²	24,126 ²
1999	198,258 ^r	2,720 ²	693	6,164	11,294	45,646 ²	24,814 ²
2000	201,843 ^r	2,868 ²	716 ²	6,470 ^r	11,872	43,485 ²	28,118 ²
2001	185,854 ^r	2,556 ²	626 ²	6,182 ^r	10,186	40,579 ²	24,099 ²
2002	196,593 ²	2,559 ²	635 ²	6,066	10,457 ²	41,525 ²	26,327 ²
2003	..	2,289 ²	650 ²	6,085	10,454 ²	..	24,347 ²
	Canada	Manitoba	Saskat- chewan	Alberta	British Columbia	Yukon Territory	Northwest ¹ Territories
thousands of cubic metres							
1980	155,624 ^r	2,335	3,330	5,933	74,654	115	..
1981	144,736 ^r	1,803	3,555	6,586	60,780	124	..
1982	127,202 ^r	1,498	2,526	5,714	56,231	161	..
1983	155,983 ^r	1,520	2,612	7,344	71,443	192	..
1984	167,824 ^r	1,698	2,726	8,457	74,556	177	..
1985	168,722 ^r	1,717	3,016	8,979	76,868	186	..
1986	177,190 ^r	1,703	3,529	10,387	77,503	199	..
1987	191,685	1,887	3,666	10,496	90,591	188	..
1988	190,616 ^r	1,883	3,818	11,990	86,807	172	..
1989	188,254 ^r	1,848	3,685	12,293	87,414	176	..
1990	162,567 ^r	1,563 ²	2,758 ²	11,911	73,861	82	38
1991	160,880 ^r	1,278	2,957 ²	12,926 ²	74,706	79	40
1992	170,131 ^r	1,598	3,081 ²	14,594 ²	78,579	162	46
1993	175,999 ^r	1,539	4,433 ^r	14,897	78,004	193	203
1994	183,261 ²	1,786	4,468	19,790	75,093	421	181
1995	188,497 ^r	1,987	4,258	20,287	74,622 ³	357 ^r	127 ²
1996	183,375 ^r	2,148	4,126	20,037	72,252 ³	254 ^r	207 ²
1997	188,750 ^r	2,183	4,205	22,217	69,298 ³	253 ^r	143
1998	176,957 ^r	2,328	3,348	17,172	65,938 ²	110 ^r	154
1999	198,258 ^r	2,171	3,882	23,729	76,930	145 ^r	71
2000	201,843 ^r	2,188	4,197	23,418	78,457 ^r	33	20 ²
2001	185,854 ^r	2,079	4,119	23,474	71,896	39	19 ²
2002	196,593 ²	2,106	4,309	24,673	77,864	42	30
2003	..	2,106 ²	4,898	24,225 ^p	65,358	32	26

1. Includes Nunavut.

2. Estimated by provincial or territorial forestry agency.

3. Estimated by the Canadian Forest Service or by Statistics Canada.

Source(s): Canadian Council of Forest Ministers, Compendium of Canadian Forestry Statistics, 2006, nfdp.ccfm.org/compendium/index_e.php (accessed April 19, 2006).

Table 3.30
Gross domestic product of forest products industries

	Forest products industries				Total
	Forestry and logging	Sawmills and wood preservation	Other wood product manufacturing	Pulp, paper and paperboard mills	
millions of chained 1997 dollars					
1997	5,564	6,240	1,554	8,294	21,652
1998	5,644	6,609	1,585	7,910	21,748
1999	5,845	6,753	1,836	8,989	23,423
2000	6,209	7,419	2,193	9,538	25,359
2001	6,257	6,829	2,215	8,644	23,945
2002	6,497	7,572	2,437	9,065	25,571
2003	6,509	7,526	2,467	9,036	25,538
2004	7,146	8,027	2,608	9,212	26,993
2005	7,135	7,928	2,708	8,824	26,595
Forest products industries as a share of total gross domestic product					
	Forestry and logging	Sawmills and wood preservation	Other wood product manufacturing	Pulp, paper and paperboard mills	Total
percent					
1997	0.68	0.76	0.19	1.02	2.65
1998	0.67	0.78	0.19	0.93	2.56
1999	0.65	0.75	0.20	1.00	2.61
2000	0.66	0.79	0.23	1.01	2.69
2001	0.65	0.71	0.23	0.90	2.50
2002	0.66	0.77	0.25	0.92	2.60
2003	0.65	0.75	0.25	0.90	2.55
2004	0.69	0.78	0.25	0.89	2.61
2005	0.67	0.75	0.25	0.83	2.50

Source(s): CANSIM table 379-0017.

Table 3.31
Employment in forest products industries¹ by province and territory

	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario
persons							
1991	218,480	1,456	.	3,766	14,831	65,168	42,018
1992	202,215	1,471	.	3,634	13,226	58,029	40,130
1993	204,053	1,448	.	3,625	13,423	57,788	39,462
1994	213,819	1,908	.	4,650	12,805	59,942	40,031
1995	214,688	2,116	.	3,957	13,722	62,321	39,881
1996	218,358	2,004	.	4,024	13,691	63,044	39,608
1997	225,356	2,305	.	4,451	14,237	66,734	43,000
1998	221,511	1,863	.	4,511	14,725	66,508	43,348
1999	228,248	1,639	.	4,447	14,636	67,666	44,379
2000	238,707	1,730	.	4,867	16,553	72,222	45,495
2001	222,244	1,729	.	4,099	15,727	67,715	44,971
2002	202,276	1,667	.	3,586	15,238	62,761	42,638
2003	200,663	x	.	3,385	x	63,264	39,512
2004	200,090	x	.	3,265	x	64,434	37,781
2005	191,794	x	.	2,838	x	63,128	35,401
	Manitoba	Saskat- chewan	Alberta	British Columbia	Yukon Territory	Northwest Territories including Nunavut	
persons							
1991	1,704	860	9,003	74,402	.	.	.
1992	1,491	976	8,586	69,401	.	.	.
1993	1,656	1,167	10,478	69,590	.	.	.
1994	2,235	1,359	10,144	74,324	.	.	.
1995	2,304	1,502	10,918	71,274	.	.	.
1996	2,247	1,338	12,391	73,087	.	.	.
1997	2,409	1,620	12,759	70,836	.	.	.
1998	2,744	2,017	13,518	65,662	.	.	.
1999	2,958	1,787	14,395	69,431	.	.	.
2000	3,385	1,559	13,452	72,531	.	.	.
2001	3,861	1,556	13,454	62,584	.	.	.
2002	x	1,407	12,766	52,062	.	.	.
2003	x	1,180	11,790	53,625	.	.	.
2004	x	1,229	12,597	54,196	.	.	.
2005	x	1,195	13,224	51,164	.	.	.

1. Includes the following industries: forestry and logging; pulp, paper and paperboard mills; sawmills and wood preservation; and other wood product manufacturing.

Note(s): Data do not add up to Canada total because of unavailable data for some provinces or territories.

Source(s): CANSIM table 281-0024.

Table 3.32
Export of forest products

	Other crude wood products	Lumber	Other wood fabricated materials	Wood pulp and similar pulp	Newsprint paper	Other paper and paperboard	Total	Total as a share of Canadian exports
	millions of dollars							percent
1986	320.3	5,032.8	1,031.1	4,072.5	5,661.2	1,560.7	17,678.6	14.7
1987	467.4	5,937.6	1,095.1	5,473.9	6,028.7	1,944.1	20,946.8	16.7
1988	473.4	5,461.7	1,086.6	6,496.2	7,299.7	1,400.7	22,218.3	16.0
1989	438.3	5,590.6	1,060.4	6,940.8	6,507.1	1,753.2	22,290.4	16.1
1990	328.2	5,463.0	1,085.3	6,122.5	6,462.5	2,217.4	21,678.9	14.6
1991	283.0	5,225.5	965.8	4,937.5	6,499.1	2,215.0	20,125.9	13.8
1992	371.5	6,606.9	1,367.8	5,068.6	6,317.3	2,525.8	22,257.9	13.7
1993	389.3	9,514.8	1,787.3	4,640.9	6,656.8	2,812.5	25,801.6	13.8
1994	317.3	11,460.3	2,324.4	6,755.4	6,968.5	3,443.5	31,269.4	13.9
1995	339.2	10,966.3	2,735.0	10,938.3	9,480.1	4,785.1	39,244.0	15.0
1996	339.0	12,591.3	2,973.0	6,922.5	8,849.6	4,441.1	36,116.5	13.1
1997	324.7	13,080.7	3,486.9	6,917.4	7,958.3	4,711.1	36,479.1	12.2
1998	417.2	11,755.1	4,548.9	6,717.8	8,094.0	5,432.4	36,965.4	11.6
1999	528.9	13,413.9	5,965.1	7,468.0	8,254.7	5,780.9	41,411.5	11.7
2000	668.3	12,285.6	5,603.4	9,906.2	8,984.2	6,387.6	43,835.3	10.6
2001	667.8	11,703.3	5,384.5	7,356.0	9,294.5	6,356.1	40,762.2	10.1
2002	812.6	11,006.2	5,657.4	7,003.3	8,318.9	5,705.4	38,503.8	9.7
2003	701.9	9,070.6	6,363.2	6,806.4	7,360.4	4,958.4	35,260.9	9.3
2004	649.0	11,673.3	7,943.8	7,149.7	7,364.5	5,292.7	40,073.0	9.7
2005	758.8	10,567.0	7,262.1	6,265.8	7,471.9	5,093.2	37,418.8	8.6

Note(s): Figures may not add up to totals due to rounding.

Source(s): CANSIM table 228-0003.

Table 3.33
Gross domestic product of mining and oil and gas extraction industries

	Oil and gas extraction	Coal mining	Metal ore mining	Non-metallic mineral mining and quarrying	Support activities for mining and oil and gas extraction	Total	Share of total gross domestic product
	millions of chained 1997 dollars						percent
1997	21,203	1,209	5,027	2,464	4,032	33,935	4.2
1998	21,947	1,185	5,252	2,402	3,761	34,547	4.1
1999	22,058	1,166	5,057	2,839	3,345	34,465	3.8
2000	22,014	1,235	5,390	2,780	4,404	35,823	3.8
2001	21,629	1,377	5,076	2,979	4,814	35,875	3.7
2002	23,231	1,102	4,854	3,081	4,552	36,820	3.7
2003	23,633	838	4,646	3,829	5,197	38,143	3.8
2004	23,977	921	4,638	4,150	5,430	39,116	3.8
2005	23,786	913	4,569	4,139	6,067	39,474	3.7

Source(s): CANSIM table 379-0017.

Table 3.34
Employment in mining and oil and gas extraction industries by province and territory

	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario
persons							
1991	152,742	.	.	.	3,390	16,654	25,261
1992	135,330	.	.	.	3,395	15,067	23,039
1993	126,664	.	.	.	3,113	13,344	23,767
1994	135,304	.	.	.	2,966	13,052	21,413
1995	132,204	.	.	.	3,544	12,311	22,785
1996	128,240	.	.	.	3,606	11,872	22,723
1997	138,972	.	.	.	3,520	14,090	22,690
1998	138,040	.	.	.	3,373	14,066	20,066
1999	132,392	.	.	.	3,637	13,908	19,618
2000	136,269	.	.	.	3,840	14,064	18,872
2001	138,685	.	.	.	3,490	11,143	18,426
2002	139,841	.	.	.	3,004	11,649	17,312
2003	149,635	.	.	.	x	11,882	17,345
2004	155,307	.	.	.	x	11,839	18,976
2005	163,479	.	.	.	x	10,675	19,579

	Manitoba	Saskat- chewan	Alberta	British Columbia	Yukon Territory	Northwest Territories including Nunavut
persons						
1991	4,226	8,328	68,206	16,053	.	.
1992	4,230	8,312	58,766	12,664	.	.
1993	3,992	8,106	54,546	10,542	.	.
1994	3,766	8,527	63,907	12,297	.	.
1995	3,442	9,992	58,743	13,061	.	.
1996	2,927	10,124	57,110	11,862	.	.
1997	3,762	10,910	63,173	12,781	.	.
1998	3,657	10,539	65,936	13,010	.	.
1999	2,854	10,254	63,813	10,665	.	.
2000	3,190	11,153	66,960	10,618	.	.
2001	2,720	11,334	73,614	10,546	.	.
2002	2,324	9,982	77,782	10,311	.	.
2003	x	10,191	86,032	10,517	.	.
2004	x	11,068	89,385	11,516	.	.
2005	2,391	12,645	95,434	12,638	.	.

Note(s): Data do not add up to Canada total because of unavailable data for some provinces or territories.

Source(s): CANSIM table 281-0024.

Table 3.35
Gross domestic product of petroleum and coal products and selected primary metal manufacturing

	Petroleum and coal products manufacturing	Iron and steel mills and ferro-alloy manufacturing	Alumina and aluminum production and processing	Non-ferrous metal (except aluminum) production and processing	Total	Share of total gross domestic product
	millions of chained 1997 dollars					percent
1997	1,657	3,142	2,088	1,865	8,752	1.07
1998	1,805	3,416	2,452	2,063	9,736	1.15
1999	1,737	3,419	2,607	2,149	9,912	1.11
2000	1,741	3,605	3,200	2,276	10,822	1.15
2001	1,950	2,982	3,289	2,677	10,898	1.14
2002	1,981	3,529	3,450	2,393	11,353	1.16
2003	2,002	3,177	3,357	2,204	10,740	1.07
2004	2,044	3,148	3,226	2,514	10,932	1.06
2005	1,987	3,102	3,518	2,464	11,071	1.04

Source(s): CANSIM table 379-0017.

Table 3.36
Production of leading minerals by province and territory, 2004^P

	Total production					
	Metallic minerals		Fuels		Non-metallic minerals	
	millions of dollars					
Canada	12,529.64		86,652.92			10,039.93
Newfoundland and Labrador	773.86		5,651.96			37.65
Prince Edward Island	0.00		0.00			3.66
Nova Scotia	0.64		x			x
New Brunswick	502.34		x			x
Quebec	2,643.35		0.00			1,354.40
Ontario	4,775.42		133.69			2,446.90
Manitoba	1,127.50		195.64			105.12
Saskatchewan	719.40		x			x
Alberta	1.20		x			x
British Columbia	1,886.92		7,909.02			575.72
Yukon Territory	54.46		33.95			7.18
Northwest Territories	8.96		517.82			2,147.89
Nunavut	35.61		0.00			0.00
	Selected metallic minerals					
	Copper	Gold	Iron ore	Nickel	Silver	Zinc
	millions of dollars					
Canada	2,030.65	2,206.48	1,370.59	3,348.13	354.11	996.87
Newfoundland and Labrador	0.00	7.99	765.85	0.00	0.02	0.00
Prince Edward Island	0.00	0.00	0.00	0.00	0.00	0.00
Nova Scotia	0.00	0.64	0.00	0.00	0.00	0.00
New Brunswick	29.47	3.98	0.00	0.00	54.47	332.48
Quebec	246.52	414.34	x	516.99	70.49	348.25
Ontario	660.16	1,225.09	0.00	2,133.18	51.81	113.11
Manitoba	148.00	74.86	0.00	697.96	9.88	135.65
Saskatchewan	44.07	31.17	0.00	0.00	0.61	7.01
Alberta	0.00	1.20	0.00	0.00	0.00	0.00
British Columbia	902.44	348.56	x	0.00	166.46	60.38
Yukon Territory	0.00	54.23	0.00	0.00	0.22	0.00
Northwest Territories	0.00	8.93	0.00	0.00	0.03	0.00
Nunavut	0.00	35.49	0.00	0.00	0.12	0.00
	Fuels			Selected non-metallic minerals		
	Coal	Crude petroleum	Natural gas ¹	Potash	Sand and gravel	
	millions of dollars					
Canada	1,598.06	40,722.66	44,332.20	1,930.03	1,078.76	
Newfoundland and Labrador	0.00	5,651.96	0.00	0.00	6.90	
Prince Edward Island	0.00	0.00	0.00	0.00	x	
Nova Scotia	x	155.08	1,150.11	0.00	x	
New Brunswick	x	0.00	0.00	x	11.34	
Quebec	0.00	0.00	0.00	0.00	90.47	
Ontario	0.00	53.82	79.88	0.00	456.74	
Manitoba	0.00	195.64	0.00	0.00	33.28	
Saskatchewan	x	5,582.05	1,692.94	x	44.85	
Alberta	x	27,853.02	35,306.62	0.00	228.11	
British Columbia	1,127.03	835.18	5,946.82	0.00	172.24	
Yukon Territory	0.00	0.00	33.95	0.00	7.18	
Northwest Territories	0.00	395.93	121.90	0.00	3.15	
Nunavut	0.00	0.00	0.00	0.00	0.00	

1. Includes natural gas by-products.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Manufacturing, Construction and Energy Division; Canada's Mineral Production, Preliminary Estimates, 2004, catalogue no. 26-202-X.

Table 3.37
Reserves of selected major metals

	Copper	Nickel	Lead	Zinc	Gold	Silver
thousands of tonnes						
1977	16,914	7,749	8,954	26,953	0.5	31
1978	16,184	7,843	8,930	26,721	0.5	31
1979	16,721	7,947	8,992	26,581	0.6	32
1980	16,714	8,348	9,637	27,742	0.8	34
1981	15,511	7,781	9,380	26,833	0.9	32
1982	16,889	7,546	9,139	26,216	0.8	31
1983	16,214	7,393	9,081	26,313	1.2	31
1984	15,530	7,191	9,180	26,000	1.2	31
1985	14,201	7,041	8,503	24,553	1.4	29
1986	12,918	6,780	7,599	22,936	1.5	26
1987	12,927	6,562	7,129	21,471	1.7	25
1988	12,485	6,286	6,811	20,710	1.8	26
1989	12,082	6,092	6,717	20,479	1.6	24
1990	11,261	5,776	5,643	17,847	1.5	20
1991	11,040	5,691	4,957	16,038	1.4	18
1992	10,755	5,605	4,328	14,584	1.3	16
1993	9,740	5,409	4,149	14,206	1.3	16
1994	9,533	5,334	3,861	14,514	1.5	19
1995	9,250	5,832	3,660	14,712	1.5	19
1996	9,667	5,623	3,450	13,660	1.7	19
1997	9,032	5,122	2,344	10,588	1.5	17
1998	8,402	5,683	1,845	10,159	1.4	16
1999	7,763	4,983	1,586	10,210	1.3	15
2000	7,419	4,782	1,315	8,876	1.1	14
2001	6,666	4,335	970	7,808	1.1	13
2002	6,774	4,920	872	6,871	1.0	11
2003	6,037	4,303	749	6,251	1.0	9

Source(s): Natural Resources Canada, 2006, Canadian Minerals Yearbook, www.nrcan.gc.ca/mms/cmypref_e.htm (accessed April 12, 2006).

Table 3.38
Annual production¹ of metals and non-fuel minerals

	Copper	Nickel	Lead	Zinc	Iron ore	Gold	Potash	Salt	Gypsum
	thousands of tonnes								
1948	218	119	152	212	1,213	0.11	..	672	2,916
1949	239	117	145	262	3,334	0.13	..	679	2,735
1950	240	112	150	284	3,271	0.14	..	779	3,325
1951	245	125	144	309	4,246	0.14	..	875	3,450
1952	234	127	153	337	4,783	0.14	..	882	3,255
1953	230	130	176	364	5,906	0.13	..	866	3,483
1954	274	146	198	342	6,678	0.14	..	880	3,584
1955	296	159	184	393	14,772	0.14	..	1,129	4,234
1956	322	162	171	384	20,274	0.14	..	1,443	4,440
1957	326	170	165	375	20,205	0.14	..	1,607	4,151
1958	313	126	169	386	14,267	0.14	..	2,155	3,596
1959	358	169	169	359	22,215	0.14	..	2,985	5,335
1960	398	195	186	369	19,550	0.14	..	3,007	4,722
1961	398	211	209	377	18,469	0.14	..	2,945	4,478
1962	415	211	195	420	24,820	0.13	..	3,301	4,836
1963	416	200	184	424	27,300	0.12	..	3,377	5,409
1964	444	207	185	611	34,857	0.12	..	3,618	5,770
1965	462	242	268	747	36,181	0.11	1,335	4,159	5,718
1966	461	203	276	872	36,914	0.10	1,979	3,746	5,421
1967	547	224	285	994	37,788	0.09	2,389	4,532	4,549
1968	574	240	309	1,052	43,040	0.09	2,576	4,413	5,378
1969	520	194	289	1,096	36,337	0.08	3,161	4,199	5,782
1970	610	278	353	1,136	47,458	0.07	3,108	4,919	5,733
1971	654	267	368	1,134	42,957	0.07	3,558	5,061	6,081
1972	720	235	335	1,129	38,736	0.06	3,495	4,902	7,349
1973	824	249	342	1,227	47,498	0.06	4,454	5,047	7,610
1974	821	269	294	1,127	46,784	0.05	5,776	5,447	7,226
1975	720	240	315	1,004	44,742	0.05	4,726	5,123	5,746
1976	731	241	256	982	55,416	0.05	5,215	5,994	6,003
1977	759	232	281	1,071	53,621	0.05	5,764	6,039	7,231
1978	659	128	320	1,067	42,931	0.05	6,344	6,452	8,074
1979	636	126	311	1,100	59,617	0.05	7,074	6,881	8,099
1980	710	188	280	920	50,224	0.05	7,225	7,226	7,285
1981	691	160	268	911	49,551	0.05	6,549	7,239	7,025
1982	612	89	272	966	33,198	0.06	5,309	7,930	5,986
1983	653	125	272	988	32,959	0.07	6,294	8,602	7,507
1984	722	174	264	1,063	39,930	0.08	7,527	10,235	7,775
1985	739	170	268	1,049	39,502	0.09	6,661	10,085	7,761
1986	699	164	334	988	36,167	0.10	6,753	10,740	8,802
1987	794	189	373	1,158	37,804	0.12	7,668	10,129	9,095
1988	758	199	351	1,370	39,934	0.13	8,154	10,687	9,513
1989	704	196	269	1,273	39,445	0.16	7,014	11,158	8,195
1990	771	195	233	1,179	35,670	0.17	7,345	11,191	7,977
1991	780	188	248	1,083	35,917	0.18	7,087	11,871	6,729
1992	762	178	340	1,196	32,137	0.16	7,040	11,088	7,293
1993	711	178	183	991	33,774	0.15	6,880	10,993	7,564
1994	591	142	168	976	36,728	0.15	8,517	12,244	8,586
1995	701	172	204	1,095	37,024	0.15	8,855	10,957	8,055
1996	652	182	242	1,163	34,709	0.16	8,120	12,248	8,201
1997	648	181	171	1,027	39,293	0.17	9,235	13,497	8,628
1998	691	198	150	992	36,847	0.16	8,884	13,034	8,307
1999	582	177	155	963	33,990	0.16	8,475	12,686	9,347
2000	622	181	143	936	35,247	0.15	9,033	12,164	8,572
2001	614	184	150	1,012	27,119	0.16	8,237	13,725	7,820
2002	584	180	101	924	30,902	0.15	8,361	12,736	8,810
2003	541	155	93	757	33,322	0.14	9,229	13,718	8,380
2004	544	177	73	734	28,596	0.13	10,332	14,096	9,204
2005	573	182	73	621	30,125	0.12	10,015	13,799	8,339

1. Refers to the recoverable metal in concentrates shipped, with the exception of iron ore where the quantity of ore mined is the determining factor.

Source(s): CANSIM tables 152-0001 and 152-0004.

Table 3.39
Basic energy indicators

	Consumption of primary energy ¹	Population	Real GDP	Energy consumption per capita	Energy consumption per dollar of real GDP
	terajoules	thousands	millions of chained 1997 dollars	gigajoule per person	megajoule per dollars chained 1997
1978	7,641,345	23,963	546,825	319	14.0
1979	8,176,028	24,202	567,631	338	14.4
1980	8,214,887	24,516	579,907	335	14.2
1981	7,862,627	24,820	600,253	317	13.1
1982	7,381,457	25,117	583,089	294	12.7
1983	7,299,903	25,367	598,941	288	12.2
1984	7,737,547	25,608	633,756	302	12.2
1985	7,908,762	25,843	664,059	306	11.9
1986	7,834,444	26,101	680,144	300	11.5
1987	8,122,249	26,449	709,058	307	11.5
1988	8,660,052	26,795	744,333	323	11.6
1989	8,945,237	27,282	763,837	328	11.7
1990	9,229,938	27,698	765,311	333	12.1
1991	9,090,962	28,031	749,294	324	12.1
1992	9,176,260	28,367	755,848	323	12.1
1993	9,314,103	28,682	773,528	325	12.0
1994	9,564,313	28,999	810,695	330	11.8
1995	9,695,204	29,302	833,456	331	11.6
1996	10,097,156	29,611	846,952	341	11.9
1997	10,200,117	29,907	882,733	341	11.6
1998	10,194,873	30,157	918,910	338	11.1
1999	10,518,257	30,404	969,750	346	10.8
2000	10,830,985	30,689	1,020,488	353	10.6
2001	10,950,393	31,021	1,038,702	353	10.5
2002	11,163,501	31,373	1,069,282	356	10.4
2003	11,478,526	31,676	1,088,773	362	10.5
2004	11,617,600	31,989	1,124,688	363	10.3
2005	..	32,299	1,157,705	..	..
2006	..	32,623	..	..	..

1. Defined as the amount that was available for use in the Canadian economy. Includes the use of energy resources for non-energy purposes (for example, petrochemical feedstocks in fertilizer production). Excludes the use of wood and wastes as energy sources.

Source(s): CANSIM tables 128-0002, 051-0001, 380-0017 and 128-0009.

Table 3.40
Production and consumption¹ of primary energy resources

	Coal		Crude oil		Natural gas ²		Electricity ³		Total	
	Production	Consumption	Production	Consumption	Production	Consumption	Production	Consumption	Production	Consumption
	terajoules									
1978	743,553	52,037	3,194,640	..	2,863,732	1,485,517	948,475	1,032,732	7,993,487	7,750,400
1979	811,421	46,529	3,600,201	..	3,071,148	1,553,330	994,737	1,059,308	8,813,137	8,477,507
1980	891,070	47,179	3,444,041	..	2,865,119	1,522,770	1,031,587	1,107,030	8,567,904	8,231,817
1981	969,542	47,113	3,093,450	..	2,763,693	1,512,963	1,084,296	1,144,372	8,257,607	7,910,981
1982	1,028,279	47,164	3,052,121	..	2,855,524	1,546,028	1,049,328	1,134,048	8,336,746	7,985,252
1983	1,066,011	42,521	3,232,271	..	2,675,454	1,510,129	1,113,298	1,186,972	8,431,490	8,087,034
1984	1,396,400	47,321	3,430,899	..	2,985,278	1,641,336	1,199,014	1,277,535	9,373,678	9,011,591
1985	1,487,132	51,231	3,516,525	..	3,305,379	1,763,867	1,290,078	1,336,111	9,940,153	9,599,114
1986	1,382,118	49,786	3,531,205	..	3,152,722	1,713,402	1,352,942	1,396,554	9,753,277	9,418,987
1987	1,393,936	49,699	3,690,859	..	3,418,781	1,697,170	1,392,992	1,452,216	10,267,224	9,896,568
1988	1,614,195	51,529	3,877,941	..	3,942,089	1,883,077	1,377,741	1,524,745	11,195,852	10,811,966
1989	1,718,400	49,795	3,769,304	..	4,174,731	1,957,305	1,310,173	1,559,037	11,371,968	10,972,608
1990	1,673,101	47,284	3,765,187	..	4,183,782	1,910,700	1,305,883	1,558,741	11,495,369	10,927,953
1991	1,747,976	40,346	3,765,443	..	4,405,959	1,929,062	1,387,596	1,576,604	11,887,932	11,306,974
1992	1,553,530	41,048	3,931,692	..	4,864,490	2,014,671	1,401,753	1,592,940	12,196,167	11,751,465
1993	1,651,313	37,672	4,116,941	..	5,347,996	2,086,863	1,472,698	1,626,394	13,077,776	12,588,948
1994	1,735,269	41,347	4,299,874	..	5,831,341	2,155,411	1,542,272	1,648,263	13,913,267	13,408,756
1995	1,800,811	43,292	4,457,769	..	6,129,266	2,215,063	1,530,044	1,681,139	14,489,249	13,917,890
1996	1,832,286	44,223	4,590,726	..	6,343,371	2,366,249	1,583,107	1,708,204	14,800,295	14,349,490
1997	1,897,322	46,369	4,842,646	..	6,409,471	2,327,877	1,530,692	1,729,396	15,284,416	14,680,131
1998	1,651,482	45,996	5,021,730	..	6,664,073	2,163,769	1,426,237	1,719,379	15,368,738	14,763,522
1999	1,589,310	47,249	4,788,758	..	6,857,098	2,231,992	1,481,669	1,753,580	15,358,207	14,716,835
2000	1,509,905	52,778	4,999,607	..	7,062,109	2,346,735	1,524,557	1,812,245	15,768,364	15,096,178
2001	1,532,994	50,393	5,056,168	..	7,202,051	2,161,963	1,447,914	1,809,650	15,894,878	15,239,127
2002	1,429,897	48,582	5,359,627	..	7,249,883	2,323,356	1,505,333	1,866,560	16,170,951	15,544,740
2003	1,326,114	50,670	5,679,573	0	7,065,218	2,370,729	1,457,123	1,888,457	16,170,924	15,528,028
2004	1,415,738	55,671	5,869,418	0	7,135,666	2,344,842	1,522,251	1,899,869	16,593,779	15,943,073

1. Defined as the amount that was available for use in the Canadian economy. Includes the use of energy resources for non-energy purposes (for example, petrochemical feedstocks in fertilizer production). Excludes the use of wood and wastes as energy sources.

2. Includes natural gas liquids (ethane, butane, propane and pentanes plus).

3. Includes primary steam.

Source(s): CANSIM tables 128-0002 and 128-0009.

Table 3.41

Table 3.42
Installed capacity and generated electricity by province and territory, 2004

	Installed generating capacity ¹				Total
	Hydroelectric energy	Thermal-electric energy ²	Nuclear energy	Wind and tidal energy	
	megawatts				
Canada	70,858	36,656	12,805	448	120,766
Newfoundland and Labrador	6,777	718	.	.	7,494
Prince Edward Island	.	108	.	14	121
Nova Scotia	404	2,001	.	9	2,413
New Brunswick	928	2,825	680	.	4,433
Quebec	35,075	1,906	675	113	37,769
Ontario	8,444	13,022	11,450	15	32,930
Manitoba	5,029	503	.	.	5,532
Saskatchewan	853	2,922	.	22	3,797
Alberta	879	10,243	.	275	11,397
British Columbia	12,359	2,200	.	.	14,559
Yukon Territory	77	45	.	1	122
Northwest Territories and Nunavut	33	165	.	.	198
	Generation				
	Hydroelectric energy	Thermal-electric energy ²	Nuclear energy	Wind and tidal energy	Total electric energy
	megawatt hours				
Canada	336,659,556	154,595,654	85,239,845	971,873	577,466,928
Newfoundland and Labrador	39,589,147	1,965,601	.	.	41,554,748
Prince Edward Island	.	12,825	.	34,703	47,528
Nova Scotia	897,189	11,661,249	.	28,961	12,587,399
New Brunswick	3,013,367	13,460,117	4,298,814	.	20,772,298
Quebec	166,572,168	3,314,114	4,877,718	186,783	174,950,783
Ontario	39,498,038	40,283,483	76,063,313	25,110	155,869,944
Manitoba	27,219,340	483,822	.	.	27,703,162
Saskatchewan	2,746,393	16,616,673	.	73,634	19,436,700
Alberta	1,876,384	58,917,058	.	622,205	61,415,647
British Columbia	54,652,337	7,326,767	.	.	61,979,104
Yukon Territory	305,994	23,691	.	477	330,162
Northwest Territories and Nunavut	289,199	530,254	.	.	819,453

1. Nameplate rating in megawatts.

2. Includes steam, internal combustion and combustion turbines.

Source(s): Electric Power Generation, Transmission and Distribution, 2004, catalogue no. 57-202-X.

Table 3.43
Hydro-electric power generation by province and territory

	1994			2004		
	Hydro	Total electric power	Hydro as share of total	Hydro	Total electric power	Hydro as share of total
	gigawatt hours		percent	gigawatt hours		percent
Canada	326,434.1	539,441.7	60.5	336,659.6	577,466.9	58.3
Newfoundland and Labrador	37,606.7	38,482.6	97.7	39,589.1	41,554.7	95.3
Prince Edward Island	0.0	40.0	0.0	0.0	47.5	0.0
Nova Scotia	1,020.4	9,767.4	10.4	897.2	12,587.4	7.1
New Brunswick	2,772.2	15,891.2	17.4	3,013.4	20,772.3	14.5
Quebec	157,850.7	163,600.7	96.5	166,572.2	174,950.8	95.2
Ontario	39,080.7	152,429.2	25.6	39,498.0	155,869.9	25.3
Manitoba	28,146.2	28,443.4	99.0	27,219.3	27,703.2	98.3
Saskatchewan	3,392.5	15,478.1	21.9	2,746.4	19,436.7	14.1
Alberta	1,806.3	52,361.3	3.4	1,876.4	61,415.6	3.1
British Columbia	54,304.1	62,070.4	87.5	54,652.3	61,979.1	88.2
Yukon Territory	266.1	299.3	88.9	306.0	330.2	92.7
Northwest Territories	188.2	578.1	32.6	289.2 ¹	819.5 ¹	35.3 ¹

1. Includes Nunavut

Note(s): Figures may not add up to totals due to rounding.

Source(s): Electric Power Annual Statistics, Annual Statistics, 1994; Electric Power Generation, Transmission and Distribution, 2004, catalogue no. 57-202-X.

Table 3.44
Energy consumed in thermal-electric power stations by fuel type

	Coal				Lignite	Fuel oil		Natural gas	Wood
	Canadian bituminous	Imported bituminous	Canadian sub-bituminous	Imported sub-bituminous		Heavy	Light and diesel		
	terajoules								
1980	108,955	249,422	183,478	..	77,541	105,286	12,619	71,159	..
1981	123,737	261,758	196,493	..	83,624	70,106	11,105	51,057	..
1982	114,238	283,650	227,007	..	102,310	77,043	10,724	42,124	..
1983	126,315	279,586	254,165	..	121,137	45,627	9,559	33,454	..
1984	139,267	297,373	290,931	..	131,173	42,030	9,210	23,619	..
1985	145,449	227,090	317,016	..	134,416	47,958	9,104	23,259	..
1986	119,666	188,934	321,289	..	117,393	43,598	9,175	17,316	..
1987	151,508	229,026	340,572	..	142,376	75,702	9,987	20,619	..
1988	162,522	244,213	364,652	..	170,660	99,195	8,504	40,419	..
1989	163,602	245,290	369,774	..	155,005	154,053	12,136	102,753	..
1990	150,746	183,215	384,276	..	134,968	137,048	12,158	50,530	..
1991	170,019	212,996	430,106	..	131,390	112,131	11,813	41,525	..
1992	159,353	195,313	392,792	..	141,328	132,502	10,346	99,820	..
1993	141,190	118,909	436,468	..	144,378	93,734	11,104	126,992	..
1994	123,014	131,018	478,936	..	150,410	70,834	9,909	154,846	..
1995	122,419	146,541	477,598	..	153,209	79,934	11,088	149,890	..
1996	132,402	169,149	458,122	..	159,646	61,305	10,418	105,074	..
1997	112,114	216,821	475,008	22,193	169,137	99,336	8,691	154,899	..
1998	90,160	281,115	468,503	40,004	177,657	147,675	8,015	200,450	14,959
1999	84,148	300,861	445,127	63,881	170,501	119,554	7,782	204,930	17,112
2000	47,231	381,795	437,491	126,800	166,262	108,955	7,632	273,301	21,024
2001	51,580	351,178	450,912	140,385	169,140	127,541	8,172	333,946	27,293
2002	45,823	305,444	465,280	143,415	166,599	111,800	7,178	278,613	27,620
2003	40,062	309,723	463,203	139,640	167,154	137,307	8,540	241,835	25,365
2004	115,245	249,906	371,637	107,083	169,817	131,109	8,760	267,009	35,105

Source(s): Electric Power Generation, Transmission and Distribution, catalogue no. 57-202-X, various issues.

Table 3.45
Net energy generation in thermal-electric power stations by fuel type

	Coal				Lignite	Fuel oil		Natural gas	Wood
	Canadian bituminous	Imported bituminous	Canadian sub-bituminous	Imported sub-bituminous		Heavy	Light and diesel		
	terajoules								
1980	34,102	89,540	58,612	..	21,133	34,564	3,102	19,175	..
1981	36,693	92,867	62,547	..	22,972	22,451	3,256	13,097	..
1982	37,070	100,930	71,820	..	27,892	25,852	3,062	11,030	..
1983	40,109	100,592	80,439	..	33,222	14,658	2,791	8,615	..
1984 ¹	46,928	106,065	90,662	..	38,555	13,554	2,735	5,777	..
1985	48,576	80,331	98,869	..	38,025	15,419	2,710	5,773	..
1986 ¹	42,038	69,406	109,398	..	36,947	15,385	2,865	4,349	..
1987 ¹	53,808	84,830	116,663	..	45,297	27,065	2,995	5,649	..
1988 ¹	58,411	90,953	125,044	..	52,989	35,833	2,463	11,727	..
1989 ¹	58,285	91,097	123,637	..	48,603	54,493	3,913	32,494	..
1990 ¹	53,613	66,888	132,608	..	42,661	49,113	3,715	14,887	..
1991 ¹	57,684	74,519	139,965	..	40,808	39,965	3,434	12,327	..
1992 ¹	56,474	71,853	145,984	..	44,792	46,861	3,193	30,620	..
1993 ¹	50,148	42,944	150,070	..	46,265	33,537	3,541	42,180	..
1994	41,040	44,603	152,382	..	44,731	23,307	3,097	45,040	..
1995	41,244	49,124	152,976	..	45,861	26,223	3,895	52,634	..
1996	44,809	58,752	148,520	..	46,909	19,591	3,327	35,011	..
1997	38,510	76,698	153,122	7,745	49,155	33,222	2,724	54,897	..
1998	30,623	104,460	152,275	13,959	52,801	48,659	2,581	69,600	5,987
1999	28,498	107,224	145,601	22,418	49,652	39,708	2,367	72,474	6,055
2000	14,770	132,830	143,509	42,042	49,995	36,002	2,159	95,844	6,590
2001	16,727	115,049	146,051	40,027	50,929	42,052	2,398	114,738	7,313
2002	13,844	103,636	152,767	47,306	50,257	37,481	2,111	100,130	7,487
2003	11,545	102,218	148,987	48,595	54,613	45,977	2,624	85,489	7,613
2004	38,262	84,545	119,995	34,758	53,518	43,709	2,691	94,532	6,842

1. The years 1984 and 1986 to 1993 are gross generation, which means that station service was not deducted to calculate net generation.

Source(s): Electric Power Generation, Transmission and Distribution, catalogue no. 57-202-X.

Table 3.46
Efficiency¹ of thermal-electric power stations by fuel type

	Coal				Lignite	Fuel oil		Natural gas	Wood	
	Canadian bituminous	Imported bituminous	Canadian sub-bituminous	Imported sub-bituminous		Heavy	Light and diesel			
	percent									
1980	31	36	32	..	27	33	25	27	..	
1981	30	35	32	..	27	32	29	26	..	
1982	32	36	32	..	27	34	29	26	..	
1983	32	36	32	..	27	32	29	26	..	
1984	34	36	31	..	29	32	30	24	..	
1985	33	35	31	..	28	32	30	25	..	
1986	35	37	34	..	31	35	31	25	..	
1987	36	37	34	..	32	36	30	27	..	
1988	36	37	34	..	31	36	29	29	..	
1989	36	37	33	..	31	35	32	32	..	
1990	36	37	35	..	32	36	31	29	..	
1991	34	35	33	..	31	36	29	30	..	
1992	35	37	37	..	32	35	31	31	..	
1993	36	36	34	..	32	36	32	33	..	
1994	33	34	32	..	30	33	31	29	..	
1995	34	34	32	..	30	33	35	35	..	
1996	34	35	32	..	29	32	32	33	..	
1997	34	35	32	35	29	33	31	35	..	
1998	34	37	33	35	30	33	32	35	40	
1999	34	36	33	35	29	33	30	35	35	
2000	31	35	33	33	30	33	28	35	31	
2001	32	33	32	29	30	33	29	34	27	
2002	30	34	33	33	30	34	29	36	27	
2003	29	33	32	35	33	33	31	35	30	
2004	33	34	32	32	32	33	31	35	19	

1. Efficiency is the electrical energy output as a percentage of primary energy input.

Source(s): Electric Power Generation, Transmission and Distribution, catalogue no. 57-202-X.

Table 3.47
Top ten substances released to air, 2004

	Releases	Share of total
	tonnes	percent
Sulphur dioxide	1,943,619.4	41.9
Carbon monoxide	1,087,983.2	23.5
Oxides of nitrogen (expressed as NO ₂)	850,754.9	18.4
Volatile organic compounds (VOCs)	268,171.3	5.8
Total particulate matter (TPM)	185,464.8	4.0
Ammonia (total) ¹	19,508.0	0.4
Methanol	19,287.0	0.4
Sulphuric acid	12,478.1	0.3
Hydrochloric acid	10,957.9	0.2
Xylene (all isomers)	6,602.8	0.1

1. Refers to the total of both ammonia (NH₃) and ammonium ion (NH₄⁺) in solution.

Source(s): Environment Canada, Pollution Data Branch, 2006, National Pollutant Release Inventory Database, www.ec.gc.ca/pdb/npri/npri_dat_rep_e.cfm (accessed June 6, 2006).

Table 3.48
Criteria air contaminant emissions, 2000

	Particulate matter ¹			SO _x ⁴	NO _x ⁵	VOC ⁶	CO
	Total	PM ₁₀ ²	PM _{2.5} ³				
tonnes							
Industrial sources including fuel combustion							
Abrasives manufacture	394	235	215	859	96	794	239
Aluminum industry	12,495	7,537	4,380	49,246	892	1,645	226,028
Asbestos industry	42	34	20	475	151	1	15
Asphalt paving industry	35,896	6,202	2,018	136	201	924	949
Bakeries	0	0	0	0	4	6,724	2
Cement and concrete industry	12,127	7,818	3,420	37,056	37,388	276	14,796
Chemicals industry	7,176	4,538	2,722	10,822	28,675	4,128	17,754
Clay products industry	1,728	510	364	414	164	10	392
Coal mining industry	10,380	6,400	2,844	1,958	1,538	807	46
Ferrous foundries	2,225	1,825	1,377	1,437	334	1,646	4,135
Grain industries	57,614	11,873	1,903	0	0	0	0
Iron and steel industries	21,131	12,706	8,696	27,472	14,917	19,631	38,484
Iron ore mining industry	45,767	27,222	13,151	17,482	10,117	3,231	64,777
Mining and rock quarrying	98,334	13,297	3,241	5,988	10,641	384	2,930
Non-ferrous mining and smelting industry	14,782	11,552	5,810	766,533	3,861	57	718
Oil sands	4,221	3,010	611	92,021	43,985	34,304	39,323
Other petroleum and coal products industry	577	295	88	1	124	204	20
Paint and varnish manufacturing	72	59	22	0	24	2,566	11
Petrochemical industry	158	140	110	383	11,809	7,763	4,122
Petroleum refining	7,713	5,024	3,211	128,353	31,927	27,485	21,951
Plastics and synthetic resins fabrication	50	37	26	54	287	10,095	532
Pulp and paper industry	48,674	29,974	22,949	73,626	51,611	23,507	161,556
Upstream oil and gas industry	1,690	1,528	1,522	349,382	338,885	739,760	81,774
Wood industry	118,887	67,592	34,778	2,688	14,726	46,213	548,620
Other industries	57,957	36,529	25,451	24,806	40,040	60,392	45,949
Subtotal, industrial sources including fuel combustion	560,089	255,935	138,931	1,591,196	642,396	992,547	1,275,122
Non-industrial fuel combustion							
Commercial fuel combustion	5,022	3,797	3,064	20,548	31,506	6,549	8,080
Electric power generation (utilities)	121,609	55,418	21,737	639,780	298,241	2,406	29,197
Residential fuel combustion	4,639	3,865	3,623	14,809	36,943	2,283	13,954
Residential fuelwood combustion	107,168	101,418	101,308	1,428	9,988	147,447	662,032
Subtotal, non-industrial fuel combustion	238,437	164,498	129,732	676,565	376,677	158,686	713,263
Transportation							
Air transportation	2,151	1,319	1,013	3,504	57,556	9,726	57,219
Heavy-duty diesel vehicles	15,542	15,542	14,350	9,706	514,518	23,417	124,895
Heavy-duty gasoline trucks	256	249	191	408	15,386	8,512	134,844
Light-duty diesel trucks	887	887	818	554	7,162	3,425	6,107
Light-duty diesel vehicles	296	296	272	95	1,965	843	1,927
Light-duty gasoline trucks	1,213	1,179	992	6,131	120,116	148,494	2,302,568
Light-duty gasoline vehicles	1,068	1,038	986	8,500	190,091	219,152	3,150,457
Marine transportation	5,610	5,610	5,361	32,976	111,416	9,349	13,613
Motorcycles	13	12	9	19	848	1,274	8,559
Off-road use of diesel	41,510	41,510	38,189	15,631	371,032	46,276	220,126
Off-road use of gasoline	6,360	6,360	5,863	1,159	53,504	251,274	2,333,895
Rail transportation	2,571	2,567	2,365	4,193	109,481	5,400	20,776
Tire wear and brake linings	5,112	5,055	1,747	0	0	0	0
Subtotal, transportation	82,589	81,623	72,157	82,875	1,553,074	727,142	8,374,986
Incineration							
Crematorium	0	0	0	4	22	1	10
Industrial and commercial incineration	25	19	13	278	348	331	1,107
Municipal incineration	578	354	313	695	1,596	989	3,421
Other incineration and utilities	516	303	230	563	4,334	723	1,641
Subtotal, incineration	1,120	676	555	1,540	6,300	2,043	6,179
Miscellaneous							
Cigarette smoking	879	879	879	0	6	10	3,148
Dry cleaning	0	0	0	0	2	841	1
Fuel marketing	0	0	0	11	5	91,062	2
General solvent use	0	0	0	0	0	309,452	0
Marine cargo handling industry	2,902	1,395	423	0	0	1	0
Meat cooking	1,528	1,528	1,528	0	0	0	0
Pesticides and fertilizer application	12,054	5,906	1,687	0	0	0	0

See footnotes at the end of the table.

Table 3.48 – continued

Criteria air contaminant emissions, 2000

	Particulate matter ¹			SO _x ⁴	NO _x ⁵	VOC ⁶	CO
	Total	PM ₁₀ ²	PM _{2.5} ³				
	tonnes						
Printing	12	4	4	0	34	34,614	27
Structural fires	4,344	4,300	3,910	0	2	4,211	8,729
Surface coatings	0	0	0	0	0	110,752	0
Subtotal, miscellaneous	21,718	14,012	8,432	11	49	550,944	11,907
Open sources							
Agriculture (animals)	263,315	148,387	23,455	0	0	214,826	0
Agriculture (tilling and wind erosion)	1,713,507	833,911	23,243	0	0	0	0
Construction operations	3,374,356	742,355	15,036	0	0	0	0
Dust from paved roads	2,885,947	553,141	132,338	0	0	0	0
Dust from unpaved roads	7,057,123	2,238,143	333,493	0	0	0	0
Forest fires	90,969	75,759	63,465	90	20,917	85,979	693,373
Landfill sites	4,224	486	130	1	169	8,576	693
Mine tailings	47,626	3,810	953	0	0	0	0
Prescribed burning	31,363	22,756	21,387	146	3,942	10,866	206,863
Subtotal, open sources	15,468,430	4,618,749	613,499	237	25,029	320,246	900,929
Grand total	16,372,382	5,135,494	963,305	2,352,424	2,603,525	2,751,607	11,282,385

1. Total particulate matter is made up of solid and liquid particles under 100 micrometres in diameter that are released into the atmosphere.
2. PM₁₀ is the fraction of total particulate matter that is less than or equal to 10 micrometres in diameter.
3. PM_{2.5} is the fraction of total particulate matter that is less than or equal to 2.5 micrometres in diameter.
4. SO_x is made up of gaseous oxides of sulphur, mainly sulphur dioxide (SO₂). In some cases, emissions may contain small amounts of sulphur trioxide (SO₃) and sulphurous and sulphuric acid vapour.
5. NO_x is made up of gaseous nitric oxide (NO) and nitrogen dioxide (NO₂).
6. Volatile organic compounds (VOCs) are made up of photochemically reactive hydrocarbon compounds (i.e., those that participate in chemical reactions when exposed to sunlight). They are major contributors to smog in urban areas.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Environment Canada, Pollution Data Branch, 2004, Criteria Air Contaminant Emission Summaries, www.ec.gc.ca/pdb/ape/ape_tables/canada2000_e.cfm (accessed February 2, 2005).

Table 3.49
Greenhouse gas (GHG) emissions by source and sink category

	Carbon dioxide (CO ₂)		Methane (CH ₄)		Nitrous oxide (N ₂ O)		CO ₂ -equivalents ¹		
	1990	2004	1990	2004	1990	2004	1990	2004	Percentage change 1990 to 2004
	kilotonnes								percent
Energy	430,000	553,000	2,000	3,000	30	30	475,000	620,000	30.3
Stationary combustion sources	277,000	352,000	200	200	7	9	283,000	360,000	27.0
Electricity and heat generation	94,700	129,000	1.8	4.7	2	2	95,300	130,000	36.6
Fossil fuel industries	51,000	75,000	80	100	1	2	53,000	79,000	49.0
Petroleum refining and upgrading	23,000	29,000	0.4	0.6	0.4	0.5	23,000	29,000	28.9
Fossil fuel production	28,100	46,200	80	100	0.7	1	30,000	49,000	64.2
Mining	6,160	15,300	0.1	0.3	0.1	0.3	6,200	15,400	148.6
Manufacturing industries	54,400	50,300	3	3	2	2	54,900	50,900	-7.2
Iron and steel	6,420	6,480	0.2	0.3	0.2	0.2	6,490	6,550	0.9
Non ferrous metals	3,210	3,220	0.07	0.07	0.05	0.05	3,230	3,230	0.2
Chemical	7,060	6,250	0.15	0.13	0.1	0.1	7,100	6,290	-11.4
Pulp and paper	13,400	8,990	2	2	0.8	0.9	13,600	9,310	-31.8
Cement	3,570	4,310	0.07	0.09	0.05	0.05	3,590	4,330	20.7
Other manufacturing	20,700	21,100	0.4	0.4	0.4	0.4	20,900	21,200	1.8
Construction	1,860	1,340	0.03	0.02	0.05	0.03	1,880	1,350	-28.0
Commercial and institutional	25,700	37,700	0.5	0.7	0.5	0.8	25,800	37,900	46.8
Residential	41,300	40,700	100	90	2	2	44,000	43,000	-1.8
Agriculture and forestry	2,400	2,080	0.04	0.04	0.05	0.06	2,420	2,100	-13.2
Transportation²	142,000	185,000	30	30	20	30	150,000	190,000	29.9
Domestic aviation	6,220	7,590	0.5	0.4	0.6	0.7	6,400	7,800	22.0
Road transportation	103,000	140,000	16	12	12	16	107,000	145,000	35.9
Light duty gasoline vehicles	51,600	47,800	9	3.5	6.3	6	53,800	49,800	-7.4
Light duty gasoline trucks	20,300	41,000	4	4.5	4.2	8.3	21,700	43,600	100.9
Heavy duty gasoline vehicles	2,990	4,010	0.42	0.57	0.44	0.6	3,140	4,210	34.2
Motorcycles	225	214	0.18	0.17	0	0	230	219	-4.8
Light duty diesel automobiles	657	750	0.02	0.02	0.05	0.05	672	768	14.2
Light duty diesel trucks	578	873	0.02	0.02	0.04	0.06	591	893	51.2
Heavy duty diesel vehicles	24,300	44,400	1	2	0.7	1	24,500	44,900	83.0
Propane and natural gas vehicles	2,160	837	2	1	0.04	0.02	2,200	870	-60.7
Railways	6,320	5,350	0.3	0.3	3	2	7,000	6,000	-15.3
Domestic marine	4,730	6,260	0.4	0.5	1	1	5,000	6,600	31.3
Others	22,000	26,000	10	10	4	6	20,000	30,000	17.9
Off road gasoline	5,000	4,000	6	4	0.1	0.08	5,000	4,000	-24.5
Off road diesel	10,000	14,000	0.5	0.7	4	5	10,000	20,000	33.1
Pipelines	6,700	8,280	6.7	8.3	0.2	0.2	6,900	8,520	23.5
Fugitive sources	11,000	16,000	1,600	2,400	...	...	43,300	66,500	53.4
Coal mining	...	...	90	50	...	...	2,000	1,000	-48.3
Oil and natural gas	11,000	16,000	1,500	2,300	...	...	41,400	65,500	58.1
Oil	1,910	3,650	230	300	...	...	6,700	9,900	49.3
Natural gas	4,200	7,200	640	1000	...	...	18,000	28,000	60.0
Venting	110	160	...	...	...	...	13,000	22,000	71.9
Flaring	4,340	5,350	2.61	3.91	...	...	4,400	5,400	23.5
Industrial processes	30,300	39,600	...	...	37.1	12.7	53,300	54,300	1.9
Mineral products	8,300	9,500	...	...	...	...	8,300	9,500	15.3
Cement production	5,400	7,100	...	...	...	...	5,400	7,100	30.6
Lime production	2,000	2,000	...	...	...	...	2,000	2,000	4.0
Mineral product use ³	1,100	630	...	...	...	...	1,100	630	-42.5
Chemical industry	3,900	5,700	...	...	37.1	12.7	15,000	9,600	-37.9
Ammonia production	3,900	5,700	...	...	...	...	3,900	5,700	43.6
Nitric acid production	...	...	...	...	2.5	2.7	780	830	6.7
Adipic acid production	...	...	...	...	34.6	9.98	10,700	3,090	-71.1
Metal production	9,800	12,000	...	...	...	...	19,500	17,600	-9.5
Iron and steel production	7,060	8,160	...	...	...	...	7,060	8,160	15.6
Aluminum production	2,700	4,200	...	...	...	...	9,310	7,280	-21.8
SF ₆ used in magnesium smelters and casters	...	...	...	...	...	...	3,110	2,190	-29.5
Consumption of halocarbons and SF₆	...	...	...	...	...	...	1,800	5,500	201.0
Other and undifferentiated production	8,300	12,000	...	...	...	...	8,300	12,000	45.0

See footnotes at the end of the table.

Table 3.49 – continued

Greenhouse gas (GHG) emissions by source and sink category

	Carbon dioxide (CO ₂)		Methane (CH ₄)		Nitrous oxide (N ₂ O)		CO ₂ -equivalents ¹		Percentage change 1990 to 2004
	1990	2004	1990	2004	1990	2004	1990	2004	
	kilotonnes								percent
Solvent and other product use	...	...	...	...	1.3	1.6	420	480	15.3
Agriculture	...	...	1,000	1,290	77	89	45,000	55,000	22.6
Enteric fermentation	...	...	877	1140	...	...	18,400	24,000	30.3
Manure management	...	...	120	150	13	17	6,700	8,400	26.2
Agricultural soils	...	...	...	...	63	72	20,000	22,000	14.1
Direct sources	...	...	...	...	35	37	11,000	12,000	5.2
Pasture, range and paddock manure	...	...	...	...	10	14	3,200	4,300	34.9
Indirect sources	...	...	...	...	20	20	6,000	7,000	19.7
Waste	270	200	1,100	1,300	3	3	25,000	29,000	15.9
Solid waste disposal on land	...	...	1,100	1,300	...	...	23,000	27,000	16.9
Wastewater handling	...	...	11	12	3	3	1,100	1,200	14.3
Waste incineration	270	200	0.4	0.06	0.4	0.2	400	250	-36.6
Land use, land use-change and forestry	-87,000	59,000	160	640	7	27	-82,000	81,000	-198.9
Forest land	-110,000	51,000	150	640	6.4	27	-110,000	73,000	-166.6
Cropland	13,000	140	...	...	...	...	14,000	58	-99.6
Grassland	...	...	...	...	...	...	...	...	...
Wetlands	6,000	1,000	...	...	...	...	6,000	1,000	-80.6
Settlements	8,000	7,000	...	...	...	...	8,000	7,000	-13.4
Total⁴	460,000	593,000	3,900	5,200	150	140	599,000	758,000	26.6

1. CO₂-equivalent emissions are the weighted sum of all greenhouse gas emissions. The following global warming potentials are used as the weights: CO₂ = 1; CH₄ = 21; N₂O = 310; HFCs = 140 to 11,700; PFCs = 6,500 to 9,200; SF₆ = 23,900. Not all HFC, PFC and SF₆ data are presented in this table.

2. Emissions from ethanol fuel are reported within the gasoline vehicle sub-categories.

3. The category Mineral product use includes CO₂ emissions from the use of limestone and dolomite, soda ash and magnesite.

4. National totals exclude all GHGs from the Land use, land use change and forestry sector.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Environment Canada, 2006, National Inventory Report, Greenhouse Gas Sources and Sinks in Canada, 1990 to 2004, Gatineau.

Table 3.50
Forest area harvested by province and territory

	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba
	hectares							
1975	680,301	15,700 ¹	1,600 ¹	27,260	94,400 ¹	135,094 ²	196,760 ²	12,003 ^r
1976	706,120	14,700 ¹	1,600 ¹	26,285	92,800 ¹	181,737 ²	156,721 ²	17,000 ¹
1977	736,138	14,300 ¹	1,600 ¹	28,335	86,500 ¹	193,295 ²	187,993 ²	18,000 ¹
1978	826,507	17,600 ¹	1,600 ¹	32,120	89,200 ¹	226,127 ²	194,998 ²	20,000 ¹
1979	877,750	17,700 ¹	1,780 ¹	33,703	100,000 ¹	241,826 ²	218,579 ²	24,600 ¹
1980	881,004	15,175	2,500 ¹	36,439 ¹	85,900 ¹	245,000 ²	242,679 ²	15,467 ^r
1981	806,011	13,454	2,700 ¹	36,429 ¹	65,500 ¹	250,000 ²	227,603 ²	11,880 ^r
1982	762,656	8,000	2,700 ¹	35,710 ¹	72,445 ¹	195,000 ²	222,921 ²	9,854 ^r
1983	838,688	13,900	2,500 ¹	20,745 ²	81,570 ¹	272,085 ²	183,208 ²	10,002 ^r
1984	897,714	17,600	2,500 ¹	30,604 ²	83,000 ¹	280,739 ²	217,806 ²	11,154 ^r
1985	899,245	16,400	3,200 ¹	29,778 ²	87,070 ¹	266,180 ²	217,984 ²	11,259 ^r
1986	974,606	17,440	2,350	34,121 ²	86,898	297,616 ²	223,517 ²	11,128
1987	1,054,091	18,940	2,725	42,266 ²	88,976	329,300 ²	228,464 ²	12,362
1988	1,093,685	19,628	2,731	41,421 ²	99,192	337,668 ²	237,188 ²	12,378
1989	1,022,950	19,449	2,421	36,733 ²	90,114	342,231 ²	230,308 ²	12,205
1990	914,783	22,100 ¹	2,497 ¹	39,898 ¹	88,924 ^r	262,027	238,213	10,349
1991	860,824	19,044	2,311 ^r	38,169 ¹	89,808 ^r	239,009 ¹	199,720	8,518
1992	917,695	18,556	2,753 ^r	34,820 ¹	99,751 ²	262,928	190,676	11,414
1993	965,664	21,076	3,109 ^r	43,568 ¹	97,793 ¹	293,239	209,370 ^r	10,993
1994	1,011,146	19,643	3,237 ^r	49,084	92,790 ²	327,838	211,474 ^r	12,653
1995	1,037,680	19,737	3,152 ^r	49,968	109,326 ^r	346,258	214,086 ^r	14,176
1996	1,059,123	17,649	2,787 ¹	59,053	114,639 ^r	342,328	213,235 ^r	15,342
1997	1,084,407	20,000 ¹	4,338 ^r	69,761 ^r	115,875 ^r	384,370	209,286 ^r	15,544
1998	1,086,848	17,414 ¹	4,376 ^r	54,203	116,872 ¹	369,907	225,132	16,590
1999	1,069,003	22,744	5,796 ^r	49,680 ¹	110,525 ^r	370,236	207,671 ^r	15,509
2000	1,046,812	23,216 ^p	5,522 ^r	54,433	113,414 ^r	319,987 ^r	213,200 ^r	15,633
2001	1,008,874	42,659	4,903 ¹	53,226 ^r	103,460 ^r	293,310 ^r	220,607 ^r	14,849
2002	964,350	21,978	4,627 ¹	51,657 ^r	103,666 ^r	283,158 ^r	180,492 ^r	15,042
2003	..	22,110	5,754 ¹	52,858 ¹	111,315 ¹	304,392 ^r	204,131 ^r	..
2004	..	..	5,495 ¹	..	..	..	..	..

	Canada	Saskat- chewan	Alberta	British Columbia	Yukon Territory	Northwest Territories	Nunavut
	hectares						
1975	680,301	17,500	21,682 ^r	156,976 ²	620 ²	706	..
1976	706,120	16,900	21,469 ^r	175,952 ²	560 ²	396	..
1977	736,138	16,200	22,399 ^r	166,081 ²	747 ²	688	..
1978	826,507	21,100	25,601 ^r	196,533 ²	935 ²	693	..
1979	877,750	25,100	26,006 ^r	187,547 ²	280	629	..
1980	881,004	16,930	32,280 ^r	187,834 ²	58	742	..
1981	806,011	18,280	31,328 ^r	147,889 ²	45	903	..
1982	762,656	15,830	37,554 ^r	162,172 ²	43	427	..
1983	838,688	19,690	45,569 ^r	188,228 ²	321	870	..
1984	897,714	21,910	32,312 ^r	198,453 ²	561	1,075	..
1985	899,245	19,693	36,159 ^r	210,397 ²	135	990	..
1986	974,606	19,356	41,604 ^r	239,877 ²	299	400	..
1987	1,054,091	25,742	43,490 ^r	259,982 ²	1,172	672	..
1988	1,093,685	22,089	50,125 ^r	270,401 ²	465	399	..
1989	1,022,950	22,281	46,820 ^r	218,384 ²	1,554	450	..
1990	914,783	16,543	51,869 ^r	181,530	366 ¹	467	..
1991	860,824	17,522	52,314 ^r	193,654 ¹	350 ¹	405	..
1992	917,695	18,471	55,569 ^r	221,599	639 ¹	519	..
1993	965,664	19,456	58,074 ^r	207,748	634 ¹	604	..
1994	1,011,146	24,221	77,404 ^r	190,244	2,056 ¹	502 ¹	..
1995	1,037,680	21,907	67,979 ^r	189,608	833	650 ¹	..
1996	1,059,123	21,379	71,322 ^r	199,029	1,921 ¹	439	..
1997	1,084,407	17,500 ¹	71,881 ^r	173,772 ^r	1,450 ¹	630	..
1998	1,086,848	21,169 ¹	83,973 ^r	176,142	489 ^r	581 ¹	..
1999	1,069,003	21,169 ¹	88,514 ^r	176,312	603 ^r	244 ¹	..
2000	1,046,812	21,169 ¹	75,696 ^p	204,472	7 ¹	3 ¹	..
2001	1,008,874	23,222	83,532 ^p	169,055	49 ¹	2 ¹	..
2002	964,350	25,070 ¹	89,332 ^p	189,277	42 ¹	9 ¹	..
2003	..	29,053	..	174,101	44 ¹	31 ¹	..
2004	..	..	..	..	23 ¹	..	..

1. Estimated by provincial or territorial forestry agency.

2. Estimated by the Canadian Forest Service or by Statistics Canada.

Note(s): Data do not add up to Canada total because of unavailable data for some provinces or territories.

Source(s): Canadian Council of Forest Ministers, Compendium of Canadian Forestry Statistics, 2006, nfdp.ccfm.org/compendium/index_e.php (accessed April 19, 2006).

Table 3.51
Area of stocked timber-productive forest land burned

	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba
hectares								
1980	1,355,074	680	..	559	2,116 ^r	4,902	330,825	304,049
1981	1,306,648	2,893	22	169	92	2,170	40,817	220,336 ^r
1982	838,789	4,392	25	359	5,407	7,202	297	7,094
1983	409,489	107	50	92	1,129	206,952	74,663	66,962
1984	181,013	1,565	8	193	270	2,397	2,219	51,099
1985	132,886	40,457	4	220	1,348 ^r	1,952	127	5,367
1986	311,367	23,511	85	268	37,216	173,296	50,598	5,495
1987	306,516	10,622	16	312	895	27,849	5,461	84,266
1988	639,777	7	2	89 ^r	1,778	273,066	35,994	295,930
1989	3,877,394	2,651	2	159	280	2,108,206	4,990	1,539,180
1990	265,990	2,601	4	477	5,198	76,825	3,200	6,728
1991	623,731	9,576	23	1,022	2,732	356,234	4,971	55,266
1992	262,846	1,014	8	805	4,668	24,295	10,331	185,299
1993	415,885	21	6	120	534	125,211	2,116	43,400
1994	742,240	692	7	67	239	2,830	410	552,571
1995	1,432,488	128	14	149	395	407,299	60,739	445,425
1996	607,686	8,519	0	172	1,591	410,342	179,207	..
1997	169,484	153	..	184	145	147,417	16,010	..
1998	313,548	4,630	..	168	275	16,721	57,659	..
1999	..	20,779	..	1,174	1,135	88,472	72,481	..
2000	..	68	..	359	269	603	613	..
2001	84,000	184	29	333	565	1,274	1,610	..
2002	..	1,238	9	149	230	405,375	18,468	..
2003	..	1,286	1	943	174	18,421	50,060	..
2004	..	..	6	..	..	717	..	..

	Canada	Saskat- chewan	Alberta	British Columbia	Yukon Territory	Northwest Territories ¹	National parks
hectares							
1980	1,355,074	89,237	465,451 ^r	32,743	111,537	12,975	..
1981	1,306,648	..	944,494 ^r	57,277	12,735	25,643	..
1982	838,789	..	462,674 ^r	280,676	68,127	2,536	..
1983	409,489	9,478	1,215 ^r	32,848	14,805	1,188	..
1984	181,013	47,281	35,259	12,227	6,995	134	21,366
1985	132,886	9,020	3,820	54,231	11,407	6	4,927
1986	311,367	4,031	1,587	9,474	3,132	11	2,663
1987	306,516	129,332	24,295	22,308	1,150	10	..
1988	639,777	24,187	5,149 ^r	3,284	288	3	..
1989	3,877,394	137,404	2,994 ^r	11,089	70,439	..	..
1990	265,990	71,198	22,143	52,575	..	..	25,041
1991	623,731	118,850	1,357	11,249	61,227	..	1,224
1992	262,846	12,768	720	17,212	3,785	..	1,941
1993	415,885	227,208	12,894	1,376	..	..	2,999
1994	742,240	79,641	8,610	20,737	..	..	76,436
1995	1,432,488	320,993	163,376	26,888	..	..	7,082
1996	607,686	4,755 ²	430	2,670	..	..	..
1997	169,484	1,904	3,046	286	..	..	339
1998	313,548	..	234,095	..	..	..	..
1999	..	..	52,887	..	..	..	..
2000	..	..	3,802	14,376 ^r	..	..	..
2001	84,000	..	74,538	5,467	..	..	..
2002	..	..	361,091	..	..	..	..
2003	..	..	25,747 ^r	..	..	..	..
2004	..	..	..	..	..	..	..

1. Includes Nunavut.

2. Estimated by the Canadian Forest Service or by Statistics Canada.

Source(s): Canadian Council of Forest Ministers, Compendium of Canadian Forestry Statistics, 2006, nfdp.cfm.org/compendium/index_e.php (accessed April 19, 2006).

Table 3.52
Area of farmland treated with fertilizers by province

	1981	1986	1991	1996	2001
	thousands of hectares				
Canada	18,505	23,148	21,562	24,943	24,015
Newfoundland and Labrador	4	5	5	6	6
Prince Edward Island	107	113	102	120	110
Nova Scotia	89	85	82	89	88
New Brunswick	76	84	78	91	90
Quebec	1,105	1,189	997	991	1,002
Ontario	2,534	2,591	2,273	2,408	2,232
Manitoba	3,196	3,726	3,688	3,830	3,531
Saskatchewan	5,526	8,125	7,655	10,016	9,909
Alberta	5,505	6,855	6,350	7,031	6,700
British Columbia	362	374	331	361	346

Source(s): CANSIM table 153-0039.

Table 3.53
Manure production by major drainage area and sub-drainage area ^{1,2}, 2001

	Drainage area code	Manure production	Phosphorous production	Nitrogen production
	code	tonnes		
Canada	...	177,502,876	296,648	1,077,469
Maritime Provinces	01	4,488,957	7,543	27,976
Saint John and Southern Bay of Fundy	01A	1,086,854	1,914	7,012
Gulf of St. Lawrence and Northern Bay of Fundy	01B	726,099	1,126	4,316
Prince Edward Island	01C	1,105,409	1,767	6,505
Bay of Fundy and Gulf of St. Lawrence	01D	1,340,580	2,341	8,658
Southeastern Atlantic Ocean	01E	138,727	246	921
Cape Breton Island	01F	91,288	149	564
St. Lawrence	02	51,416,046	89,001	320,889
Northwestern Lake Superior	02A	116,728	163	669
Northeastern Lake Superior	02B	3,358	5	20
Northern Lake Huron	02C	334,783	523	1,975
Wanapitei and French	02D	159,728	238	935
Eastern Georgian Bay	02E	1,754,632	2,860	10,684
Eastern Lake Huron	02F	7,973,999	14,278	50,277
Northern Lake Erie	02G	9,368,211	17,645	61,004
Lake Ontario and Niagara Peninsula	02H	4,472,298	7,616	28,602
Upper Ottawa	02J	720,678	1,060	4,186
Central Ottawa	02K	1,514,409	2,287	8,784
Lower Ottawa	02L	3,572,352	5,161	20,696
Upper St. Lawrence	02M	1,188,257	1,850	7,180
Saint-Maurice	02N	38,321	55	220
Central St. Lawrence	02O	11,093,102	19,933	69,999
Lower St. Lawrence	02P	7,119,799	12,327	43,679
Northern Gaspé Peninsula	02Q	933,770	1,402	5,517
Saguenay	02R	868,193	1,234	5,071
Gulf of St. Lawrence, Natashquan	02W	3,603	7	24
Northern Newfoundland	02Y	50,496	80	316
Southern Newfoundland	02Z	129,329	277	1,051
Northern Quebec and Labrador	03	28,150	42	164
Nottaway, coast	03A	28,150	42	164
Southwestern Hudson Bay	04	408,365	634	2,419
Missinaibi and Mattagami	04L	2,773	5	19
Abitibi	04M	297,318	455	1,736
Harricanaw, coast	04N	108,274	174	664
Nelson River	05	97,126,025	159,994	579,951
Upper South Saskatchewan	05A	14,465,748	23,446	85,872
Bow	05B	5,209,815	8,432	30,883
Red Deer	05C	14,907,363	24,312	88,568
Upper North Saskatchewan	05D	2,539,851	4,023	15,029
Central North Saskatchewan	05E	8,920,280	14,499	53,280
Battle	05F	8,850,044	14,338	52,532
Lower North Saskatchewan	05G	5,185,593	8,437	30,711
Lower South Saskatchewan	05H	5,421,246	8,970	32,517
Qu'Appelle	05J	6,810,019	11,126	40,539
Saskatchewan	05K	1,114,550	1,882	6,663
Lake Winnipegosis and Lake Manitoba	05L	5,944,078	9,705	35,302
Assiniboine	05M	6,071,040	10,093	36,417
Souris	05N	4,825,143	7,754	28,476
Red	05O	5,428,119	10,488	34,469
Winnipeg	05P	401,443	686	2,446
English	05Q	27,511	41	158
Western Lake Winnipeg	05S	1,004,182	1,762	6,089
Western and Northern Hudson Bay	06	2,968,870	4,720	17,465
Beaver, Alberta and Saskatchewan	06A	2,968,870	4,720	17,465
Great Slave Lake	07	10,156,055	16,298	60,158
Upper Athabasca	07A	576,976	912	3,389
Central Athabasca, upper	07B	4,318,251	6,974	25,589
Central Athabasca, lower	07C	546,117	888	3,271
Upper Peace	07F	2,523,326	4,006	14,892

See footnotes at the end of the table.

Table 3.53 – continued

Manure production by major drainage area and sub-drainage area 1,2, 2001

	Drainage area code	Manure production	Phosphorous production	Nitrogen production
	code	tonnes		
Smoky	07G	1,625,384	2,619	9,666
Central Peace, upper	07H	409,951	648	2,421
Central Peace, lower	07J	156,050	251	930
Pacific	08	8,146,042	13,979	52,146
Skeena, coast	08E	206,774	318	1,210
Central coastal waters	08F	45,239	71	266
Southern coastal waters	08G	33,022	61	221
Vancouver Island	08H	468,394	762	2,993
Nechako	08J	617,518	973	3,631
Upper Fraser	08K	609,241	972	3,617
Thompson	08L	1,655,201	2,644	9,932
Lower Fraser	08M	3,341,745	6,318	23,273
Columbia	08N	1,168,908	1,860	7,003
Mississippi River	11	2,764,366	4,437	16,301
Missouri	11A	2,764,366	4,437	16,301

1. A sub-drainage area, also called a watershed or drainage basin, is an area where all contributing surface waters share the same drainage outlet. Drainage areas channel runoff from precipitation and snow melt into stream flow. The resulting hierarchy of streams and rivers and their associated sub-drainage areas form the National Hydrological Network of Canada. There are 11 major drainage areas and 164 sub-drainage areas in Canada. Canada's entire land and fresh water area has been allocated to individual drainage areas.

2. See map 2.3 and table 2.2 for classification codes and area figures for these sub-drainage areas.

Source(s): CANSIM table 153-0040.

Table 3.54

Top ten substances released to land, 2004

	Releases ¹		Share of total
	tonnes		percent
Hydrogen sulphide	226,578.4		81.5
Zinc (and its compounds)	9,560.5		3.4
Asbestos (friable form)	7,447.6		2.7
Ammonia (total) ²	6,985.6		2.5
Methanol	5,751.0		2.1
Manganese (and its compounds)	5,565.2		2.0
Phosphorous (total)	3,601.5		1.3
Ethylene glycol	2,703.8		1.0
Lead (and its compounds)	2,038.5		0.7
Vanadium (except when in an alloy) and its compounds	1,507.7		0.5

1. Data include disposals.

2. Refers to the total of both ammonia (NH₃) and ammonium ion (NH₄⁺) in solution.

Source(s): Environment Canada, Pollution Data Branch, 2006, National Pollutant Release Inventory Database, www.ec.gc.ca/pdb/npri/npri_dat_rep_e.cfm (accessed June 6, 2006).

Table 3.55
Streamflow and surface fresh water intake in Canada by major river basin¹

	Code	Total streamflow ²	Surface fresh water intake			Total	Water intake as share of streamflow
			Municipal ³	Industrial ⁴	Agricultural ⁵		
		cubic kilometres	millions of cubic metres				percent
Canada		3,315.54	4,872.83	31,491.03	4,098.19	40,462.05	1.22
Pacific Coastal and Yukon	1	595.90	192.68	597.69	78.73	869.10	0.15
Fraser - Lower Mainland	2	125.26	428.61	219.81	467.98	1,116.40	0.89
Columbia and Okanagan - Similkameen	3	65.69	71.54	109.38	228.17	409.10	0.62
Peace - Athabasca	4	91.55	28.01	169.82	21.69	219.49	0.24
Lower Mackenzie and Arctic Coast - Islands	5	507.13	6.57	5.62	0.00	12.22	0.00
North Saskatchewan	6	7.38	142.20	1,457.41	86.57	1,686.19	22.85
South Saskatchewan, Missouri and Assiniboine							
- Red	7	9.50	435.73	753.62	2,891.82	4,081.17	42.96
Winnipeg	8	23.90	11.48	197.23	1.14	209.85	0.88
Lower Saskatchewan - Nelson	9	60.27	14.09	31.90	24.10	70.09	0.12
Churchill	10	22.11	6.34	3.28	8.36	17.97	0.08
Keewatin - Southern Baffin	11	169.75	0.16	0.00	0.00	0.16	0.00
Northern Ontario	12	189.06	12.47	86.68	0.00	99.54	0.05
Northern Quebec	13	530.75	5.87	59.94	0.00	65.83	0.01
Great Lakes - St. Lawrence	14	226.96	3,087.12	27,229.02	271.64	30,587.41	13.48
North Shore - Gaspé	15	257.32	78.41	134.29	4.39	216.45	0.08
Saint John - St. Croix	16	24.57	97.39	109.78	2.77	209.93	0.85
Maritime Coastal	17	114.40	139.74	132.07	10.83	282.63	0.25
Newfoundland - Labrador	18	294.04	114.40	193.48	0.00	308.51	0.10

1. These major river basins and associated flow measures are adapted from Laycock (1987) (see full reference below). Some of these river basin aggregates have more than one outflow. Basins at the US-Canada border exclude inflow from United States.

2. Streamflow is represented by the long-term annual average.

3. Municipal water intake data is derived from the Municipal Water Use Database, Environment Canada, 1998.

4. Industrial water intake data is derived from the Industrial Water Use Survey, Statistics Canada and Environment Canada, 1996.

5. Agricultural water use estimates are from Statistics Canada.

Source(s): Laycock, A.H., 1987, "The Amount of Canadian Water and its Distribution," in Canadian Aquatic Resources, no. 215 of Canadian Bulletin of Fisheries and Aquatic Sciences, M.C. Healey and R.R. Wallace (eds.), 13-42, Fisheries and Oceans Canada, Ottawa.

Table 3.56
Top ten substances released to water, 2004

	Releases		Share of total
	tonnes		percent
Nitrate ion in solution at pH >= 6.0	53,066.4		46.8
Ammonia (total) ¹	49,117.0		43.3
Phosphorus (total)	6,474.7		5.7
Manganese (and its compounds)	1,358.0		1.2
Methanol	1,327.7		1.2
Ethylene glycol	545.3		0.5
Zinc (and its compounds)	519.7		0.5
Chlorine	272.8		0.2
Copper (and its compounds)	97.2		0.1
Formaldehyde	81.7		0.1

1. Refers to the total of both ammonia (NH₃) and ammonium ion (NH₄⁺) in solution.

Source(s): Environment Canada, Pollution Data Branch, 2006, National Pollutant Release Inventory Database, www.ec.gc.ca/pdb/npri/npri_dat_rep_e.cfm (accessed June 6, 2006).

Table 3.57
Species extinct and extirpated, 2005

Species ¹	Group	Extinction date	Probable cause(s) of extinction ² or extirpation ³
Extinct²			
Benthic Hadley Lake stickleback	fish	1999	introduced predators
Limnetic Hadley Lake stickleback	fish	1999	introduced predators
Banff longnose dace	fish	1986	introduced predators; habitat alteration
Blue walleye	fish	1965	commercial fishing; introduced predators
Lake Ontario kiyi	fish	1964	commercial fishing; introduced predators
Deepwater cisco	fish	1952	commercial fishing; introduced predators
Eelgrass limpet	mollusc	1929	loss of food source
Caribou (dawsoni subspecies)	mammal (terrestrial)	1920s	unknown
Passenger pigeon	bird	1914	hunting and predation
Sea mink	mammal (marine)	1894	trapping
Labrador duck	bird	1875	hunting; habitat alteration
Macoun's shining moss	moss	1864	habitat alteration
Great auk	bird	1844	hunting
Extirpated³			
Karner blue	arthropods	1991	loss of food source; habitat alteration
Frosted elfin	arthropods	1988	successional change
Greater prairie-chicken	bird	1987	habitat alteration
Black-footed ferret	mammal (terrestrial)	1974	loss of food source
Striped bass (St. Lawrence Estuary population)	fish	1968	illegal fishing
Dwarf wedgemussel	mollusc	1968	habitat alteration
Greater sage grouse (phaios subspecies)	bird	1960s	hunting; habitat alteration
Pacific pond turtle	reptile	1959	commercial harvesting; habitat alteration
Gravel chub	fish	1958	habitat alteration
Pacific gophersnake	reptile	1957	habitat alteration
Spring blue-eyed Mary	plant	1954	habitat alteration
Timber rattlesnake	reptile	1941	hunting; habitat alteration
Paddlefish	fish	1917	habitat alteration; over-fishing
Tiger salamander (Great Lakes population)	amphibian	1915	habitat alteration
Island marble	arthropods	before 1910	loss of food source; habitat alteration
Puget Oregonian snail	mollusc	1905	unknown
Pygmy short-horned lizard (British Columbia population)	reptile	1898	habitat alteration
Illinois tick-trefoil	plant	1888	habitat alteration
Grizzly bear (Prairie population)	mammal (terrestrial)	1880s	hunting
Atlantic walrus (northwest Atlantic population)	mammal (marine)	mid 19th century	hunting
Incurved grizzled moss	moss	1828	unknown
Grey whale (Atlantic population)	mammal (marine)	1800s	hunting

1. Any indigenous species, subspecies, variety, or geographically or genetically distinct population of wild fauna and flora.

2. A species that no longer exists.

3. A species no longer existing in the wild in Canada, but occurring elsewhere.

Source(s): Environment Canada, Canadian Wildlife Service, Committee on the Status of Endangered Wildlife in Canada, 2005, Canadian Species at Risk, www.cosewic.gc.ca/eng/sct0/rpt/rpt_csar_e.cfm (accessed March 6, 2006).

Table 3.58
Species¹ extinct and at risk, 2005

	Status assessment					Total
	Extinct ²	Extirpated ³	Endangered ⁴	Threatened ⁵	Special concern ⁶	
	number					
Terrestrial mammals	1	2	9	7	16	35
Marine mammals	1	2	9	10	12	34
Birds	3	2	24	10	22	61
Fish	6	3	26	24	36	95
Amphibians	0	1	6	5	7	19
Reptiles	0	4	8	13	9	34
Molluscs	1	2	12	2	4	21
Arthropods ⁷	0	3	8	6	2	19
Vascular plants	0	2	74	48	35	159
Lichens	0	0	2	1	5	8
Mosses	1	1	6	3	4	15
Total	13	22	184	129	152	500

1. Any indigenous species, subspecies, variety, or geographically or genetically distinct population of wild fauna and flora.

2. A species that no longer exists.

3. A species no longer existing in the wild in Canada, but occurring elsewhere.

4. A species facing imminent extirpation or extinction.

5. A species likely to become endangered if limiting factors are not reversed.

6. A species whose characteristics make it particularly sensitive to human activities or natural events.

7. Formerly described as lepidopterans.

Source(s): Environment Canada, Canadian Wildlife Service, Committee on the Status of Endangered Wildlife in Canada, 2005, Canadian Species at Risk, www.cosewic.gc.ca/eng/sct0/rpt/rpt_csar_e.cfm (accessed March 6, 2006).

Table 3.59
Invasive species of high threat¹ in Canada

	Native range	Invasive range	Time of invasion	Invasion pathway	Impacts
Amphibians					
Bullfrog (<i>Rana catesbeiana</i>)	Eastern North America; Southern Ontario to Florida	Southern Vancouver Island, Southwestern British Columbia	1930s and 40s	Introduced for farming	Competition for habitat and food; predation on native species
Algae					
Dead man's fingers/Oyster thief (<i>Codium fragile</i>)	Japan	Atlantic Canada, especially Nova Scotia	1996	Attachment to hulls of ships, imported oysters; natural dispersal	Competition with native species; direct harm to mussels and oysters; habitat destruction
Disease pathogens					
Fish parasite (<i>Glugia</i>)	Atlantic Ocean	Great Lakes	Discovered 1960, probably introduced in 1912	Imported with infected rainbow smelt	Caused severe mortality in commercial rainbow smelt
Fish					
Chain pickerel (<i>Esox niger</i>)	Florida, Texas, Ontario	Ontario, Quebec, Nova Scotia (lakes)	First spotted in the 1940s	Illegal dumping by anglers for sport fishing	Competition with native species
Sea lamprey (<i>Petromyzon marinus</i>)	Atlantic Coast, Lake Ontario and St. Lawrence Seaway	Upper Great Lakes	Established in all the Great Lakes by 1938	Construction of the Welland Canal allowed access past natural barrier of Niagara Falls Aquaculture escape	Parasitizes native fishes; contributed to extinction of several native fishes
Silver carp (<i>Hypophthalmichthys molitrix</i>)	China	Great Lakes (potentially)	1980s and 90s, current		Competition for habitat and food
Fungi					
Chestnut blight (<i>Cryphonectria parasitica</i>)	Asia	Eastern North America	Late 1800's	Introduced on Asian chestnut trees	Destroys native chestnut trees
Dutch elm disease (<i>Ophiostoma ulmi</i>)	Europe	Southern Canada	1944	Imported elm logs; transmitted domestically by elm bark beetles	Kills infected trees
Insects					
Beech scale (<i>Cryptococcus fagisuga</i>)	Germany, France	Nova Scotia, Quebec, Ontario	1890s	Introduced on infested ornamental beech trees	Damages native beech trees
Pine shoot beetle (<i>Tomicus piniperda</i>)	Europe, North Africa, Asia	Ontario, Quebec, Northeastern U.S.A.	First found in 1992	Imported accidentally in wood shipping crates	Kills infected trees
Winter moth (<i>Operophtera brumata</i>)	Europe and Asia	Nova Scotia, New Brunswick, British Columbia	1950 in Nova Scotia, 1977 in British Columbia	Imported with plant nursery stock	Defoliation; hybridizes with native bruce spanworm
Molluscs					
Zebra mussel (<i>Dreissena polymorpha</i>)	Caspian Sea, Black Sea	Great Lakes	Discovered in 1988	Ballast water release; spread by boaters	Economic impacts; phytoplankton reduction; competition with native species; attach to all hard surfaces
Plants					
Canada/creeping thistle (<i>Cirsium arvense</i>)	Europe and Eastern Mediterranean	British Columbia, Saskatchewan, Alberta, Manitoba, Ontario, Quebec, Newfoundland and Labrador, Nova Scotia, New Brunswick and Southwestern U.S.A.	1600s	Introduced by settlers in contaminated seed stock	Replaces native species; damages farmland
Common buckthorn (<i>Rhamnus cathartica</i>)	Eurasia, North Africa	British Columbia, Alberta, Saskatchewan, Quebec, Nova Scotia, Prince Edward Island, Ontario	First recorded in the late 1890s	Introduced for landscaping; seeds spread by birds	Habitat destruction; excludes native seedlings
Dog-strangling vine (<i>Cynanchum louiseae</i>)	Europe	British Columbia, Ontario, Quebec	1930s	Introduced for use as filling for life jackets	Displaces native plants

See footnotes at the end of the table.

Table 3.59 – continued

Invasive species of high threat¹ in Canada

	Native range	Invasive range	Time of invasion	Invasion pathway	Impacts
Eurasian watermilfoil (<i>Myriophyllum spicatum</i>)	Europe, Asia, North Africa	Ontario, Quebec, British Columbia	1960s	Aquarium and ballast water release; spread by boaters	Replaces virtually all species in wetlands and streams in which it colonizes
Flowering rush (<i>Butomus umbellatus</i>)	Europe, temperate Asia	Quebec, Eastern and Southwestern Ontario, Alberta, British Columbia, Manitoba, Nova Scotia	1897 in Quebec	Garden escape; spread by boaters	Suspected habitat destruction, displacement of native plants
Garlic mustard (<i>Alliaria petiolata</i>)	Europe	Ontario, Quebec, New Brunswick, British Columbia	1879 in Toronto, Ontario	Introduced for cultivation	Replaces native herbaceous vegetation
Glossy buckthorn (<i>Frangula alnus</i>)	Eurasia, North Africa	South and Eastern Ontario, Great Lakes, Quebec, Nova Scotia, Manitoba	First collected in Southern Ontario in 1898	Garden escape	Forms dense stands, shading out native species
Japanese knotweed (<i>Polygonum cuspidatum</i>)	Japan	British Columbia, Manitoba, Ontario, Quebec, Newfoundland and Labrador	Late 1800s	Garden escape	Competition with native flora; infests development areas and urban sites
Leafy spurge (<i>Euphorbia esula</i>)	Europe and Asia	British Columbia, Saskatchewan, Alberta, Manitoba, Ontario, Quebec, Nova Scotia, Prince Edward Island	First reported in Canada in Ontario, 1889	Ballast water release; contaminated seed stock; spread by birds	Competition with native forbs and grasses; destruction of grazing lands; poisonous to livestock
Oriental bittersweet (<i>Celastrus orbiculatus</i>)	Eastern Asia	Southeastern Canada	1860s	Introduced for gardening; seeds spread by birds	Displaces native flora; outcompetes and hybridizes with native climbing bittersweet
Purple loosestrife (<i>Lythrum salicaria</i>)	Europe and Asia	Coast to coast in Southern Canada	Early 1800s	Possible intentional; release; sale as a garden ornamental plant; ballast water release	Habitat destruction; competition with native plants
Yellow bush lupine (<i>Lupinus arboreus</i>)	Pacific Coast	Pacific Coast, British Columbia	Current	Rapidly expanding native range; widely planted for ornamental purposes	Changes soil conditions, reducing viability of native lupine; hybridizes with other lupine

1. High threat status as indicated in the Canadian Wildlife Federation's Invasive Species in Canada.

Source(s): Canadian Wildlife Federation, 2003, Invasive Species in Canada, www.cwf-fcf.org/invasive/chooseSC.asp (accessed April 26, 2006).

Table 3.60
Harvest estimates for selected waterfowl species

	Canada geese	American black ducks	Mallards
	number		
1975	358,166	307,357	1,730,971
1976	317,237	350,523	1,935,892
1977	333,256	356,490	1,557,116
1978	395,547	380,599	1,522,619
1979	416,641	319,798	1,609,608
1980	450,717	363,865	1,533,574
1981	360,948	321,980	1,296,931
1982	396,177	336,937	1,213,930
1983	469,528	309,129	1,327,598
1984	420,069	306,578	1,059,242
1985	452,481	299,753	911,066
1986	453,807	296,071	879,116
1987	507,265	295,388	1,020,597
1988	395,656	300,219	668,539
1989	510,349	261,319	743,996
1990	501,634	243,004	734,599
1991	472,157	225,931	629,129
1992	380,445	206,508	579,799
1993	434,138	203,307	536,987
1994	414,192	175,452	625,404
1995	395,988	187,156	603,333
1996	500,079	163,597	641,079
1997	489,459	165,462	718,686
1998	531,331	158,368	663,907
1999	565,219	174,933	633,182
2000	612,036	154,913	689,434
2001	636,997	124,068	591,749
2002	650,258	122,635	546,582
2003	670,833	109,218	511,469
2004	626,781	91,757	523,717

Source(s): Environment Canada, Canadian Wildlife Service, 2005, National Harvest Survey Database, www.cws-scf.ec.gc.ca/harvest/hews_e.cfm (accessed December 6, 2005).

Table 3.61
Pelts harvested by province and territory, 2003

	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba
	number							
Wild 1								
Badger	1,474	.	.	.	.	.	0	240
Bear	3,167	35	.	68	90	1,580	141	884
Beaver	192,338	2,645	341	5,292	9,886	51,110	65,709	18,964
Coyote (prairie wolf)	85,161	264	456	1,961	2,581	4,232	1,771	8,378
Ermine (weasel)	44,220	3,193	8	1,382	1,570	13,383	10,380	3,136
Fisher	20,034	.	.	153	897	5,907	7,977	1,674
Fox	45,624	7,000	912	631	1,908	16,887	3,922	2,793
Lynx	11,890	655	0	0	.	3,489	1,610	1,060
Marten	133,004	3,250	.	23	3,299	31,739	42,136	20,059
Mink	29,713	3,693	205	0	873	7,580	9,416	5,416
Muskrat	171,949	948	2,774	22,360	19,741	38,482	57,617	8,483
Otter	19,893	1,531	.	690	696	4,060	7,839	3,071
Raccoon	65,163	.	963	3,623	4,788	12,798	36,938	3,674
Skunk	508	.	1	10	22	198	178	0
Squirrel	72,299	1,818	87	3,145	402	6,267	3,177	4,240
Wildcat or bobcat	1,941	.	0	996	606	0	83	25
Wolf	2,667	26	0	0	.	456	389	281
Wolverine	518	.	.	.	.	0	6	43
Other 2	9,687	0	0	0	0	0	194	.
Total wild	911,250	25,058	5,747	40,334	47,359	198,168	249,483	82,421
Ranch-raised 3								
Fox	9,530	2,010	1,440	1,310	1,550	1,830	640	120
Mink	1,461,600	x	32,800	722,600	x	61,200	288,600	41,900
Total ranch-raised	1,471,130	x	34,240	723,910	x	63,030	289,240	42,020
	Canada	Saskat- chewan	Alberta	British Columbia	Yukon Territory	Northwest Territories	Nunavut	
	number							
Wild 1								
Badger	1,474	721	513	0	.	.	.	.
Bear	3,167	63	128	68	0	11	99	1
Beaver	192,338	15,528	18,327	2,931	338	1,266	8	0
Coyote (prairie wolf)	85,161	35,701	28,590	1,188	31	8	0	0
Ermine (weasel)	44,220	1,919	5,008	3,533	123	585	0	0
Fisher	20,034	1,457	1,941	0	5	23	0	0
Fox	45,624	5,726	2,278	318	81	596	2,572	0
Lynx	11,890	783	2,320	1,186	222	565	0	0
Marten	133,004	1,938	7,437	12,188	2,465	8,455	15	15
Mink	29,713	1,008	392	602	110	418	0	0
Muskrat	171,949	6,070	4,148	562	43	10,721	0	0
Otter	19,893	1,030	429	521	10	16	0	0
Raccoon	65,163	2,078	110	191	.	.	.	.
Skunk	508	29	34	36	.	.	.	.
Squirrel	72,299	6,839	38,690	7,223	227	184	0	0
Wildcat or bobcat	1,941	8	20	203	.	.	.	.
Wolf	2,667	263	291	127	200	156	478	41
Wolverine	518	16	23	119	138	132	41	41
Other 2	9,687	.	.	.	0	400	9,093	9,093
Total wild	911,250	81,177	110,679	30,996	3,993	23,536	12,299	12,299
Ranch-raised 3								
Fox	9,530	130	x	x	.	.	.	.
Mink	1,461,600	0	x	257,200	.	.	.	.
Total ranch-raised	1,471,130	130	38,150	x	.	.	.	.

1. Data on wildlife furs are on a "fur year basis" which is from July 1 to June 30.

2. Includes hair seals and other fur-bearing animals.

3. The ranched fur estimates operate on a calendar year basis, with most ranch peltings occurring in the fall.

Source(s): Fur Statistics 2004, catalogue no. 23-013-X.

Table 3.62
Value of pelts harvested by province and territory, 2003

	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba
dollars								
Wild ¹								
Badger	47,208	.	.	.	.	.	0	10,291
Bear	273,842	5,206	.	5,452	4,442	104,223	11,175	44,059
Beaver	4,859,989	85,513	9,486	155,267	267,258	1,328,860	1,682,807	429,155
Coyote (prairie wolf)	3,737,294	14,636	14,899	64,046	85,865	137,286	45,833	412,114
Ermine (weasel)	118,666	13,570	14	3,317	3,965	26,498	32,178	8,499
Fisher	839,139	.	.	6,651	39,385	247,444	323,467	72,484
Fox	1,494,123	303,701	38,938	19,460	60,168	571,270	124,710	81,043
Lynx	2,167,230	106,857	0	0	.	575,999	283,762	202,926
Marten	6,518,110	188,792	.	734	123,848	1,384,455	1,995,982	1,035,245
Mink	513,756	54,656	4,154	0	14,801	138,259	148,396	105,125
Muskrat	498,367	1,583	10,048	74,235	55,903	100,438	187,831	17,051
Otter	2,583,957	180,750	.	88,886	80,510	450,579	946,559	516,573
Raccoon	1,143,945	.	17,490	71,663	87,173	217,438	645,307	63,707
Skunk	2,642	.	4	53	124	1,152	755	0
Squirrel	84,479	1,927	84	3,837	332	4,700	3,113	4,537
Wildcat or bobcat	269,085	.	0	124,968	91,036	0	11,508	3,620
Wolf	356,047	5,393	0	0	.	50,388	25,184	22,601
Wolverine	124,750	.	.	.	.	0	1,402	9,979
Other ²	455,734	0	0	0	0	0	380	.
Total wild	26,088,363	962,584	95,117	618,569	914,810	5,338,989	6,470,349	3,039,009
Ranch-raised ³								
Fox	1,259,199	265,581	190,267	173,090	204,802	241,798	84,563	15,856
Mink	76,251,071	x	1,589,160	38,668,764	x	3,183,938	14,757,708	2,101,175
Total ranch-raised	77,510,270	x	1,779,427	38,841,854	x	3,425,736	14,842,271	2,117,031

	Canada	Saskat- chewan	Alberta	British Columbia	Yukon Territory	Northwest Territories	Nunavut
dollars							
Wild ¹							
Badger	47,208	26,129	10,788	0	.	.	.
Bear	273,842	4,123	9,596	5,491	0	7,067	73,008
Beaver	4,859,989	341,150	463,490	66,358	7,774	22,671	200
Coyote (prairie wolf)	3,737,294	1,650,814	1,259,390	50,431	1,643	337	0
Ermine (weasel)	118,666	5,488	12,470	10,387	467	1,813	0
Fisher	839,139	63,205	85,307	0	200	996	0
Fox	1,494,123	136,897	53,875	11,629	2,742	20,439	69,251
Lynx	2,167,230	168,525	451,426	228,163	41,292	108,280	0
Marten	6,518,110	118,005	426,289	561,136	145,435	537,579	610
Mink	513,756	20,997	7,601	9,813	1,870	8,084	0
Muskrat	498,367	12,261	8,794	1,197	125	28,901	0
Otter	2,583,957	172,113	67,761	76,785	1,270	2,171	0
Raccoon	1,143,945	36,261	2,314	2,592	.	.	.
Skunk	2,642	191	112	251	.	.	.
Squirrel	84,479	7,455	51,071	6,934	272	217	0
Wildcat or bobcat	269,085	2,389	2,885	32,679	.	.	.
Wolf	356,047	50,075	25,387	10,043	38,400	26,177	102,399
Wolverine	124,750	3,819	4,292	26,815	37,536	29,879	11,028
Other ²	455,734	.	.	.	0	17,701	437,653
Total wild	26,088,363	2,819,897	2,942,848	1,100,704	279,026	812,312	694,149
Ranch-raised ³							
Fox	1,259,199	17,177	x	x	.	.	.
Mink	76,251,071	0	x	13,083,719	.	.	.
Total ranch-raised	77,510,270	17,177	1,879,581	x	.	.	.

1. Data on wildlife furs are on a "fur year basis" which is from July 1 to June 30.

2. Includes hair seals and other fur-bearing animals.

3. The ranched fur estimates operate on a calendar year basis, with most ranch peltings occurring in the fall.

Source(s): Fur Statistics 2004, catalogue no. 23-013-X.

Section 4

Annual statistics: Socio-economic response to environmental conditions

4.1 Legislation

The *Canadian Environmental Protection Act* (CEPA) provides enforcement officers with the authority to address cases of alleged non-compliance with the Act. Enforcement activities include inspection to verify compliance, investigation of alleged violations, measures to compel compliance without resorting to formal court action, and measures to compel compliance through court action.

Enforcement activities declined between 1991/1992 and 1996/1997 but have since risen significantly due to an increase in the number of inspections conducted and warnings issued (Table 4.1). The number of prosecutions varies considerably from year to year with as few as 2 handed down in 1998/1999 to 27 in 2001/2002.

4.2 Protected areas

From 1989 to 2003, Canada's total protected land area increased from 29 million hectares to 82 million hectares (Table 4.2). The share of total land protected varies provincially; in 2003, for example, it ranged from 2.6% in Prince Edward Island to 13.0% in British Columbia.

4.3 Environmental protection expenditures

Total environmental protection expenditures by Canadian businesses reached \$6.8 billion in 2002, up from \$5.4 billion in 2000 (Tables 4.3 and 4.4). Operating expenditures on environmental protection totalled \$3.8 billion in 2002, up from almost \$3.3 billion in 2000, representing a 17% increase. Capital expenditures on environmental

protection increased 35%, from \$2.2 billion in 2000 to \$2.9 billion in 2002. The industry with the highest total environmental protection expenditures in 2002 was the Oil and Gas Extraction Industry (\$1.1 billion).

Two-thirds of the total capital expenditures on pollution prevention were directed towards processes aimed at preventing the release of substances to air (Table 4.5) in 2002. Capital expenditures on pollution abatement and control (PAC) projects were also directed largely at mitigating the release of air pollutants, accounting for 64% of PAC capital spending in 2002 (Table 4.6). Pollution prevention and pollution abatement and control expenditures on water totalled \$225 and \$203 million respectively, representing 16% and 22% of total capital expenditures by these types of activities in 2002.

Table 4.7 outlines expenditures on PAC and water purification and supply from 1990/1991 to 2002/2003 for all levels of government in Canada. Of the \$6.9 billion spent on PAC in 2002/2003 by government, 41%, or \$2.9 billion, was allocated to sewage collection and disposal, and 28% (\$2.0 billion) to waste collection and disposal. A further 12% was spent on other pollution control activities and 19% on other environmental services. The vast majority of sewage and solid waste collection and disposal spending (92%) took place at the local government level.

Expenditures allocated to water purification and supply increased from \$7 million in 1990/1991 to \$335 million in 2002/2003 at the federal government level, while expenditures decreased from \$1.1 billion to \$502 million at the provincial level. The bulk of water purification and supply expenditures (84%) were undertaken by local governments.

4.4 Environmental practices

Pollution prevention attempts to eliminate waste and pollution before it is created in manufacturing processes. It involves continuous improvement

through changes in product design, technology, operations and behaviour. Table 4.8 examines pollution prevention methods adopted by industry. In 2002, the most widely used methods of pollution prevention were 'good operating practices or pollution prevention training' (74%), prevention of leaks and spills (70%) and 'recirculation, recovery, reuse or recycling' (65%).

Environmental management practices are used by businesses to facilitate reducing or preventing of pollution or the conserving of resources. In 2002, 71% of reporting establishments indicated using at least one environmental management practice (Table 4.9). The most widely reported practice was the use of an environmental management system (56%), followed by the preparation of environmental performance reports (41%).

In 2002, 971 kg of non-hazardous solid waste were generated per capita; an increase of 2% from 2000 (Table 4.10). Nationally, 22% of the total non-hazardous waste generated was diverted from disposal. Nova Scotia had the highest diversion rate (30%) followed closely by British Columbia (29%) and Prince Edward Island (28%). The lowest per capita disposal rate was in Nova Scotia with 417 kg per capita. The highest disposal rate for 2002 was 928 kg per capita in Alberta. Almost half (49%) of waste came from industrial, commercial and institutional sources, while residential sources accounted for 40% of waste disposal (Table 4.11). The remaining 12% was disposed of by construction and demolition sources.

Over 6.6 million tonnes of non-hazardous material were processed for recycling in 2002 (Table 4.12). Mixed paper and organic material made up the bulk of the recycled material, accounting for 23% and 18% respectively of the total for 2002.

4.5 Environment industry

Revenues derived from environment-related activities reached \$15.8 billion in 2002 (Table 4.13). Environmental services accounted for 44% of total environmental revenues, while 42% of these revenues were derived from environmental goods. Environment-related construction services made up the remaining share (14%). The wholesale trade industry posted the highest share of business sector total environmental revenues at 29%, followed by the waste management and remediation services industry at 24% and the construction industry at 13%.

As in previous years, businesses in Ontario and Quebec reported the highest environmental revenues in 2002, estimated at \$6.9 billion and \$3.1 billion respectively (Table 4.14).

4.6 Research and development

In 2003/2004, expenditures on research and development in the higher education sector reached approximately \$8.1 billion (Table 4.15). Forty-three percent (\$3.5 billion) was spent in the natural sciences and engineering fields, 38% (\$3.1 billion) in the health sciences and the remaining 20% (\$1.6 billion) in the social sciences and humanities.

In 2003/2004, federal spending on research and development aimed at pollution prevention and protection of the environment reached \$349 million (Table 4.16). This accounted for 7% of total federal research and development expenditures in 2003/2004, and marks an increase of \$200 million over the amount spent in 1995/1996 on this objective. Additional expenditures on environmental research and development may be included in other socio-economic objective categories. For example, research on energy conservation may be included under "Production, distribution and rational utilization of energy".

Table 4.1
Canadian Environmental Protection Act enforcement activities¹

	1991/1992	1992/1993	1993/1994	1994/1995	1995/1996	1996/1997	1997/1998
	number						
On-site inspections ²	1,616	1,278	1,571	1,335	963	708	1,523
Off-site inspections ^{2, 3}	..	..	..	..	..	..	..
Investigations ⁴	115	96	55	64	45	33	56
Warnings ⁵	82	105	133	127	85	30	204
Directions ⁶	6	4	1	1	0	2	0
Prosecutions ⁷	17	26	3	9	13	5	8
Convictions	10	18	11	12	6	7	3
Total	1,846	1,527	1,774	1,548	1,112	785	1,794
	number						
	1998/2999	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004	2004/2005
On-site inspections ²	1,555	779	1,446	1,628	1,934	2,334	2,547
Off-site inspections ^{2, 3}	1,058	2,526	1,801	3,009	2,870	2,079	2,727
Investigations ⁴	78	64	20	57	36	32	43
Warnings ⁵	421	473	450	517	347	672	1,162
Directions ⁶	8	9	22	5	3	8	2
Prosecutions ⁷	2	26	11	27	4	8	13
Convictions	1	1	7	7	3	14	1
Total	3,123	3,878	3,757	5,250	5,197	5,147	6,495

1. Data is based on the federal government "fiscal year" which is from April 1 to March 31.
 2. Inspections verify compliance with the *Canadian Environmental Protection Act*. They may be on-site (at the site of a facility, plant, structure, border crossing, airport or other port of entry, on a ship, aircraft, or other means of transport) or off-site. Off-site inspections were previously called administrative verifications.
 3. The tracking of off-site inspections or administrative verifications only started in 1998/1999. However, on-site inspection numbers prior to this time may have included some administrative verifications.
 4. Investigations involve gathering, from a variety of sources, evidence and information relevant to a suspected violation.
 5. Written warnings indicate the existence of a minor violation, in order that the alleged offender can take notice and return to compliance.
 6. Written directions oblige the regulatee responsible for the potential violation to take all reasonable measures to remedy any dangerous conditions and/or to reduce any danger to the environment.
 7. A legal proceeding for the purpose of determining the guilt or innocence of an accused (that is, person and/or organization) under CEPA.
- Source(s):** Environment Canada, Information Management Services, Enforcement Branch, National Programs Directorate and Environment Canada, *Canadian Environmental Protection Act* annual reports, www.ec.gc.ca/ele-ale/default.asp?lang=En&n=5C63F879-1 (accessed March 6, 2006).

Table 4.2
Total area protected by province and territory

	1989		2003		Change in protected area as a share of total land 1989 to 2003
	Total area protected ¹	Protected area as a share of total land	Total area protected ¹	Protected area as a share of total land	
	hectares	percent	hectares	percent	
Canada	29,425,250	3.0	81,877,849	8.4	5.4
Newfoundland and Labrador	367,500	0.9	1,701,412	4.3	3.4
Prince Edward Island	6,000	1.0	14,780	2.6	1.5
Nova Scotia	138,700	2.4	465,363	8.2	5.7
New Brunswick	88,800	1.2	233,443	3.1	1.9
Quebec	622,800	0.4	5,217,586	3.5	3.1
Ontario	5,152,900	5.2	9,142,039	9.2	4.0
Manitoba	315,400	0.5	5,402,416	8.5	8.0
Saskatchewan	1,936,000	3.0	2,243,230	3.5	0.5
Alberta	5,642,000	8.7	8,009,229	12.3	3.6
British Columbia	4,958,300	5.4	12,017,617	13.0	7.6
Yukon Territory	3,218,300	6.8	5,678,119	12.0	5.2
Northwest Territories and Nunavut	6,978,550	2.0	31,752,615	9.3	7.2

1. Defined by World Wildlife Fund Canada as those areas that are permanently protected through legislation and that prohibit industrial uses such as logging, mining, hydro-electric development, oil and gas and other large scale developments.
- Source(s):** World Wildlife Fund Canada, 2000, *Endangered Spaces*; The Wilderness Campaign that Changed the Canadian Landscape 1989-2000, Toronto and World Wildlife Fund Canada, 2003, *The Nature Audit: Setting Canada's Conservation Agenda for the 21st Century*, Toronto.

Table 4.3
Operating expenditures on environmental protection by type of activity and industry

	Environmental monitoring	Environmental assessments and audits	Reclamation and decommissioning	Wildlife and habitat protection	Pollution abatement and control processes (end-of-pipe), waste management and sewerage service	Pollution prevention processes	Fees, fines and licences	Other	Total
millions of dollars									
1995	..	..	..	..	..	..	..	..	2,386.1
Logging	3.2	10.8	21.2	44.4	8.7	0.2	8.8	2.6	99.8
Crude petroleum and natural gas	7.9	4.1	47.7	1.1	97.6	9.5	2.3	19.7	189.8
Mining	23.5	8.8	68.3	7.4	105.5	9.5	3.8	12.2	239.0
Electric power systems	8.7	19.3	25.7	x	45.0	x	x	79.8	283.6
Food	7.6	3.2	2.0	0.5	61.3	2.3	3.4	2.0	82.3
Beverage	1.1	0.5	0.9	0.0	12.7	0.2	0.8	2.0	18.3
Pulp and paper	68.9	7.5	8.0	6.1	145.0	31.3	12.3	23.3	302.5
Refined petroleum and coal products	4.4	0.6	34.7	x	58.0	x	x	3.8	102.1
Chemicals	26.6	7.7	23.4	0.7	80.3	5.7	1.4	9.8	155.4
Non-metallic mineral products	4.1	1.3	9.0	0.3	13.6	3.9	1.5	2.3	36.0
Primary metals	35.5	4.1	27.6	4.0	208.9	84.1	4.5	10.8	379.4
Pipeline transport and gas distribution systems	5.5	1.9	3.4	0.3	8.8	1.1	1.6	8.5	31.1
Operating expenditures, excluding 'other manufacturing'	197.1	69.6	271.7	88.5	845.4	210.1	60.1	176.9	1,919.5
Other manufacturing ^{1, 2}	..	..	..	..	..	..	..	..	466.6
1996	..	..	..	..	..	..	..	..	2,983.8
Logging	3.5	8.5	24.8	84.3	13.4	0.1	6.0	1.8	142.5
Crude petroleum and natural gas	18.2	5.1	85.2	7.6	98.2	3.6	3.8	34.3	256.0
Mining	29.5	7.4	68.6	5.6	117.2	14.9	5.3	22.8	271.3
Electric power systems	8.8	22.5	13.4	x	95.7	x	42.0	23.5	297.6
Food and tobacco products	9.3	2.7	4.9	1.5	69.9	3.1	4.8	4.6	100.7
Beverage	1.1	0.4	0.4	0.0	14.0	0.1	2.4	2.3	20.6
Pulp and paper	92.1	12.6	7.6	18.0	236.8	31.8	9.6	21.3	429.8
Refined petroleum and coal products	22.7	2.6	5.1	x	114.8	42.1	x	22.2	212.5
Chemicals	37.5	9.1	38.3	x	102.3	x	x	15.4	216.5
Non-metallic mineral products	4.2	1.5	5.3	0.1	14.3	0.3	2.5	3.3	31.5
Primary metals	33.2	5.3	40.7	6.9	293.3	80.0	6.8	19.6	485.8
Transportation equipment	5.2	2.1	4.7	0.1	99.5	3.7	0.8	9.7	125.8
Pipeline transport and gas distribution systems	1.4	2.6	5.7	x	11.4	0.0	x	12.6	35.7
Operating expenditures, excluding 'other manufacturing'	266.8	82.3	304.6	142.7	1,280.9	265.8	89.7	193.3	2,626.0
Other manufacturing ²	..	..	..	..	..	..	..	..	357.7
1997	..	..	..	..	..	..	..	..	2,997.1
Logging	1.6	3.1	10.5	68.8	7.9	1.7	0.5	2.0	96.1
Crude petroleum and natural gas	17.4	13.4	107.4	1.6	61.1	15.2	6.8	26.0	248.8
Mining	20.4	7.5	54.9	3.2	122.4	39.0	4.1	20.0	271.6
Electric power systems	6.4	x	x	25.6	70.2	x	30.2	28.7	240.3
Food and tobacco products	8.3	x	x	0.6	70.6	x	9.7	3.4	115.8
Beverage	0.6	0.5	1.4	0.0	13.4	1.3	2.8	2.2	22.2
Wood products ³	5.9	2.2	5.9	10.4	28.9	8.9	6.6	2.8	71.7
Pulp and paper	52.6	11.9	6.4	25.4	251.1	95.7	9.2	26.1	478.3
Refined petroleum and coal products	7.3	3.8	32.8	0.5	111.2	66.0	0.2	13.5	235.3
Chemicals	31.9	7.0	30.6	1.3	104.7	34.1	2.2	15.1	226.9
Non-metallic mineral products	1.8	3.2	6.2	0.0	17.6	5.5	1.4	3.4	39.1
Primary metals	44.0	5.6	28.5	6.0	319.0	60.5	4.9	16.9	485.4
Transportation equipment	6.5	2.7	2.8	3.8	101.7	12.0	1.4	8.7	139.5
Pipeline transport and gas distribution systems	1.4	2.6	5.0	0.3	13.4	2.9	0.9	8.3	34.8
Operating expenditures, excluding 'other manufacturing'	206.1	81.0	298.2	147.4	1,293.2	421.8	80.9	177.2	2,705.9
Other manufacturing ²	..	..	..	..	..	..	..	..	291.2
1998⁴	..	..	..	..	..	..	..	..	2,990.2
Logging	3.0	5.0	19.1	70.4	5.4	4.4	1.4	7.8	116.5
Oil and gas extraction	16.0	8.6	110.2	1.3	55.0	26.4	9.2	31.7	258.4
Mining	20.6	4.8	55.8	2.3	104.9	38.7	4.6	17.2	248.8
Electric power generation, transmission and distribution	6.6	34.2	5.7	12.0	x	5.3	32.7	x	295.6
Natural gas distribution	0.3	1.6	0.6	0.1	2.4	0.7	0.1	3.2	8.9
Food	11.0	2.6	0.2	3.7	78.4	14.2	9.6	4.0	123.7
Beverage and tobacco products ⁵	0.8	0.5	0.9	..	13.3	1.6	2.3	1.8	21.2
Wood products	8.5	2.4	15.8	29.4	x	21.4	5.6	x	137.6
Pulp, paper and paperboard mills	43.7	3.6	3.3	11.4	241.9	62.8	8.0	12.8	387.5

See footnotes at the end of the table.

Table 4.3 – continued

Operating expenditures on environmental protection by type of activity and industry

	Environmental monitoring	Environmental assessments and audits	Reclamation and decommissioning	Wildlife and habitat protection	Pollution abatement and control processes (end-of-pipe), waste management and sewerage service	Pollution prevention processes	Fees, fines and licences	Other	Total
millions of dollars									
Petroleum and coal products ⁵	7.3	2.4	4.2	..	101.5	56.4	1.1	14.4	187.3
Chemicals	25.0	6.5	42.3	1.3	101.5	34.5	2.5	18.3	231.9
Non-metallic mineral products	2.5	3.3	2.8	1.0	20.8	5.9	2.8	4.1	43.2
Primary metals	37.2	5.8	16.9	5.8	275.7	61.4	2.7	13.6	419.2
Transportation equipment	5.8	2.3	18.0	0.1	89.8	10.8	0.9	11.7	139.4
Pipeline transportation ⁶	2.0	0.7	4.2	0.3	8.1	4.4	1.4	11.2	32.2
Operating expenditures, excluding 'other manufacturing'	190.2	84.3	300.1	139.2	1,304.8	348.8	84.9	199.1	2,651.4
Other manufacturing ²	..	..	..	..	..	..	..	..	338.8
2000⁷	..	..	..	..	..	..	..	..	3,270.6
Logging	3.8	9.4	29.6	106.4	3.8	3.8	1.2	3.4	161.4
Oil and gas extraction	19.7	15.0	117.4	3.0	81.2	35.7	12.9	39.7	324.7
Mining	25.5	14.4	53.2	4.1	99.9	44.1	8.7	17.7	267.6
Electric power generation, transmission and distribution	9.1	16.4	23.0	6.8	106.3	28.9	10.5	54.9	255.8
Natural gas distribution ⁸	0.2	0.3	0.5	..	1.7	0.4	0.1	3.0	6.1
Food	15.5	3.6	7.6	0.5	84.8	11.1	13.4	4.2	140.7
Beverage and tobacco products ⁸	1.1	1.1	0.0	..	14.0	1.1	4.7	1.3	23.4
Wood products	8.5	5.0	18.8	17.5	69.1	11.2	7.7	5.9	143.7
Pulp, paper and paperboard mills	51.1	5.1	12.2	6.8	263.3	67.7	6.0	13.3	425.4
Petroleum and coal products	7.3	7.0	11.2	0.9	85.6	75.5	9.6	15.9	212.9
Chemicals	29.9	6.3	22.5	1.1	106.9	42.4	1.8	21.3	232.0
Non-metallic mineral products	2.9	1.9	5.0	0.7	21.4	6.1	2.8	2.8	43.6
Primary metals	40.4	8.6	28.4	2.0	327.2	64.4	4.3	15.3	490.6
Fabricated metal products ⁹	3.1	1.5	1.5	0.1	52.8	5.2	0.4	5.0	69.6
Transportation equipment	6.5	4.6	2.5	0.1	119.3	15.8	1.5	19.9	170.2
Pipeline transportation ⁶	5.2	6.8	18.2	3.9	6.4	10.1	3.8	6.5	61.0
Operating expenditures, excluding 'other manufacturing'	229.8	106.8	351.7	153.8	1,443.8	423.6	89.3	230.0	3,028.9
Other manufacturing ²	..	..	..	..	..	..	..	..	241.7
2002⁷	..	..	..	..	..	..	..	..	3,832.0
Logging	3.6	8.9	21.5	82.2	5.3	6.4	2.8	5.0	135.6
Oil and gas extraction	32.5	18.2	155.9	9.6	177.1	53.7	15.4	77.1	539.5
Mining	27.0	11.3	73.7	3.3	91.5	34.8	7.7	28.8	278.1
Electric power generation, transmission and distribution	17.1	20.7	28.6	12.0	83.7	88.1	10.3	65.3	325.8
Natural gas distribution	1.2	0.8	0.8	0.6	1.9	2.0	0.1	2.4	9.9
Food	22.9	12.5	19.5	0.6	97.3	33.8	17.1	7.9	211.6
Beverage and tobacco products	1.0	0.4	2.0	0.0	9.3	1.2	4.3	1.3	19.5
Wood products	8.9	4.0	21.0	27.4	42.2	10.1	3.8	8.3	125.9
Pulp, paper and paperboard mills	41.6	6.5	12.9	1.8	265.1	69.2	8.2	16.5	421.8
Petroleum and coal products	7.1	3.0	76.4	0.1	80.1	68.0	2.6	7.1	244.3
Chemicals	41.2	6.9	20.4	5.2	133.0	69.8	3.0	23.0	302.5
Non-metallic mineral products	5.3	2.0	20.7	0.1	27.1	6.0	5.4	10.2	76.9
Primary metals	38.1	11.1	11.2	5.6	366.1	69.2	5.1	16.2	522.5
Fabricated metal products ⁹	4.6	6.8	0.1	2.6	57.2	4.9	0.6	7.5	84.4
Transportation equipment	7.4	4.5	11.9	0.1	134.2	14.8	0.8	28.3	201.9
Pipeline transportation ⁶	3.1	3.9	13.0	1.6	17.1	10.3	1.5	7.6	58.3
Operating expenditures, excluding 'other manufacturing'	262.8	121.7	489.8	152.8	1,558.0	542.3	88.6	312.4	3,558.4
Other manufacturing ²	..	..	..	..	..	..	..	..	273.6

1. In 1995, the transportation equipment industry is included in 'other manufacturing' because of data quality constraints.

2. Detail of the expenditure breakdown by type of environmental protection activity is only available for the listed industries.

3. Before 1997 the wood products industry was included with 'other manufacturing'.

4. Before the 1998 reference year establishments were selected based on the 1980 Standard Industrial Classification System (SIC). However, beginning with reference year 1998, industry selection was based on the North American Industry Classification System (NAICS). For further information, see Statistics Canada, 2001, Environmental Protection Expenditures in the Business Sector, catalogue no. 16F0006X.

5. Operating expenditures on wildlife and habitat protection are included with operating expenditures on reclamation and decommissioning.

6. Before the 1998 reference year, pipeline transportation was included with gas distribution systems.

7. As of reference year 1998, the Survey of Environmental Protection Expenditures is conducted every two years.

8. Operating expenditures on wildlife and habitat protection are included with operating expenditures on other.

9. Before 2000 the fabricated metal products industry was included with 'other manufacturing'.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Environmental Protection Expenditures in the Business Sector, catalogue no. 16F0006X.

Table 4.4
Capital expenditures on environmental protection by type of activity and industry

	Environmental monitoring	Environmental assessments and audits	Reclamation and decommissioning	Wildlife and habitat protection	Pollution abatement and control processes (end-of-pipe)	Pollution prevention processes	Total
millions of dollars							
1995	..	..	..	..	..	..	2,090.3
Logging	0.1	x	0.2	x	3.3	0.6	7.9
Crude petroleum and natural gas	3.2	5.9	82.1	1.1	209.1	16.5	317.9
Mining	11.0	0.6	21.7	0.1	45.6	5.4	84.5
Electric power systems	9.4	x	10.4	x	47.4	16.1	146.0
Food	2.4	x	0.8	x	13.1	7.8	24.4
Beverage	1.4	0.1	0.7	0.0	1.6	3.7	7.5
Pulp and paper	11.3	2.2	6.6	3.8	670.0	128.5	822.3
Refined petroleum and coal products	16.1	0.5	0.3	0.0	67.1	12.4	96.5
Chemicals	10.5	0.2	16.8	0.9	34.7	20.2	83.3
Non-metallic mineral products	2.3	0.2	0.9	0.4	42.6	6.4	52.8
Primary metals	7.2	0.5	0.3	0.1	55.6	45.8	109.5
Pipeline transport and gas distribution systems	2.8	2.1	4.1	1.7	13.4	5.5	29.7
Capital expenditures, excluding 'other manufacturing'	77.7	38.0	144.9	49.3	1,203.5	268.9	1,782.3
Other manufacturing ^{1, 2}	..	..	..	..	..	..	308.0
1996	..	..	..	..	..	..	1,915.8
Logging	0.4	0.3	1.4	1.9	10.1	1.3	15.4
Crude petroleum and natural gas	6.7	3.8	79.5	3.7	158.4	18.5	270.6
Mining	1.7	1.5	11.1	0.4	49.2	13.6	77.5
Electric power systems	7.0	22.4	6.4	16.9	37.0	7.9	97.6
Food and tobacco products	1.7	x	0.1	x	37.4	29.1	68.8
Beverage	2.1	0.2	0.7	0.0	3.5	1.6	8.0
Pulp and paper	16.9	2.4	13.7	1.4	297.4	319.0	650.8
Refined petroleum and coal products	3.1	3.6	4.5	0.0	42.1	44.4	97.7
Chemicals	24.6	0.4	6.5	0.1	45.1	17.2	93.9
Non-metallic mineral products	2.0	x	1.3	x	33.6	6.3	43.5
Primary metals	5.3	x	0.7	x	61.8	180.5	250.0
Transportation equipment	5.3	0.2	3.3	0.7	25.3	31.0	61.4
Pipeline transport and gas distribution systems	0.8	2.8	7.4	2.3	20.6	11.6	45.6
Capital expenditures, excluding 'other manufacturing'	73.3	40.1	136.5	27.6	821.4	681.8	1,780.7
Other manufacturing ²	..	..	..	..	..	..	135.0
1997	..	..	..	..	..	..	1,748.6
Logging	0.0	0.6	0.8	0.8	0.9	4.6	7.6
Crude petroleum and natural gas	7.7	8.7	63.4	3.2	59.2	40.7	183.0
Mining	2.3	5.2	7.7	0.8	31.0	33.4	80.4
Electric power systems	x	18.9	x	17.5	57.4	9.8	113.9
Food and tobacco products	x	0.1	x	x	39.5	31.5	73.8
Beverage	0.8	0.1	0.8	0.0	3.4	1.4	6.5
Wood products ³	3.4	1.0	x	x	49.3	21.6	77.4
Pulp and paper	6.2	1.9	3.5	3.0	180.0	136.8	331.5
Refined petroleum and coal products	2.8	3.1	13.4	3.8	38.7	63.2	124.8
Chemicals	7.4	5.3	9.4	0.8	64.5	65.0	152.5
Non-metallic mineral products	0.3	0.7	1.9	0.0	19.8	9.4	32.1
Primary metals	18.5	0.4	x	x	107.7	161.9	290.4
Transportation equipment	0.8	0.2	x	x	24.8	93.2	121.2
Pipeline transport and gas distribution systems	0.6	6.2	5.0	1.3	14.1	43.3	70.6
Capital expenditures, excluding 'other manufacturing'	60.9	52.3	113.8	32.3	690.3	716.0	1,665.7
Other manufacturing ²	..	..	..	..	..	..	82.9
1998 ⁴	..	..	..	..	..	..	1,734.2
Logging	0.5	0.1	0.2	3.0	1.5	2.1	7.4
Oil and gas extraction	4.3	9.9	69.4	0.9	55.5	46.5	186.5
Mining	2.1	5.8	8.1	3.8	33.4	28.1	81.2
Electric power generation, transmission and distribution	4.9	19.2	1.7	20.7	56.5	21.0	124.0
Natural gas distribution	0.1	0.6	0.6	0.2	1.0	14.5	16.8
Food	2.5	0.9	1.3	5.8	37.6	12.7	60.8
Beverage and tobacco products	1.0	0.2	0.1	0.2	2.6	1.5	5.5
Wood products	3.1	0.6	6.4	2.4	66.0	17.8	96.3
Pulp, paper and paperboard mills	13.2	0.5	4.6	1.1	89.1	179.2	287.7
Petroleum and coal products	0.5	3.0	5.4	1.2	82.2	48.6	141.0
Chemicals	18.6	3.3	7.0	0.4	65.7	94.3	189.2
Non-metallic mineral products ⁵	4.0	0.1	2.5	..	32.6	15.1	54.3
Primary metals	4.6	0.4	1.4	1.3	102.9	73.4	184.0
Transportation equipment	0.7	0.2	1.0	0.2	16.3	30.4	48.7
Pipeline transportation ⁶	0.6	6.4	2.9	0.5	41.6	63.7	115.6

See footnotes at the end of the table.

Table 4.4 – continued

Capital expenditures on environmental protection by type of activity and industry

	Environmental monitoring	Environmental assessments and audits	Reclamation and decommissioning	Wildlife and habitat protection	Pollution abatement and control processes (end-of-pipe)	Pollution prevention processes	Total
millions of dollars							
Capital expenditures, excluding 'other manufacturing'	60.7	51.0	112.5	41.6	684.6	648.7	1,599.1
Other manufacturing ²	..	..	..	..	..	..	135.0
2000⁷	..	..	..	..	..	..	2,177.9
Logging	0.0	0.1	0.1	3.4	0.1	1.2	4.8
Oil and gas extraction	11.8	14.1	73.8	5.9	244.8	114.8	465.1
Mining	1.5	0.8	5.0	2.9	65.0	67.4	142.6
Electric power generation, transmission and distribution ⁸	7.8	36.5	..	4.0	56.0	78.1	182.4
Natural gas distribution	0.2	1.0	0.3	0.2	0.5	0.6	2.8
Food	3.3	4.8	4.7	0.2	45.5	27.8	86.3
Beverage and tobacco products	0.2	0.0	0.2	0.5	0.9	2.5	4.4
Wood products ⁸	1.3	6.7	..	1.0	51.2	63.1	123.3
Pulp, paper and paperboard mills	3.2	0.9	2.7	1.8	85.8	140.4	234.8
Petroleum and coal products	1.6	0.3	3.0	0.3	119.1	90.3	214.6
Chemicals	4.5	1.1	13.4	0.4	60.6	67.5	147.6
Non-metallic mineral products	2.0	2.4	3.3	0.0	85.5	13.2	106.3
Primary metals	1.9	0.5	1.8	0.4	37.1	63.6	105.3
Fabricated metal products ⁹	0.6	0.1	0.5	0.1	5.7	7.9	14.9
Transportation equipment	0.2	0.5	0.8	0.0	13.7	187.9	203.1
Pipeline transportation ⁶	1.3	1.9	3.0	0.6	9.9	17.4	33.9
Capital expenditures, excluding 'other manufacturing'	41.4	71.7	112.5	21.8	881.4	943.7	2,072.5
Other manufacturing ²	..	..	..	..	..	..	105.4
2002⁷	..	..	..	..	..	..	2,946.6
Logging	0.0	0.0	0.1	x	x	0.6	5.8
Oil and gas extraction	111.3	23.7	92.4	5.5	85.9	243.7	562.4
Mining	2.5	3.9	21.8	1.6	36.3	31.1	97.3
Electric power generation, transmission and distribution	9.3	26.9	15.7	13.5	218.3	228.2	511.9
Natural gas distribution	x	x	0.8	x	x	x	18.0
Food	10.3	2.6	4.0	2.7	59.5	46.4	125.4
Beverage and tobacco products	0.7	0.1	3.3	0.0	1.9	6.4	12.3
Wood products	x	0.4	0.2	0.6	x	29.0	62.7
Pulp, paper and paperboard mills	3.8	0.1	0.8	0.3	57.4	152.9	215.3
Petroleum and coal products	30.7	7.2	39.8	7.0	226.7	499.9	811.3
Chemicals	x	x	10.7	x	26.4	x	94.5
Non-metallic mineral products	1.5	0.1	1.1	3.2	38.7	24.4	69.0
Primary metals	8.8	1.1	11.2	0.7	87.4	31.1	140.1
Fabricated metal products ⁹	x	x	0.2	x	x	x	14.9
Transportation equipment	0.5	0.3	0.7	0.5	29.7	27.3	58.9
Pipeline transportation ⁶	x	x	4.7	x	x	32.0	49.7
Capital expenditures, excluding 'other manufacturing'	192.3	75.1	207.4	40.0	907.7	1,427.2	2,849.7
Other manufacturing ²	..	..	..	..	..	..	97.0

1. In 1995, the transportation equipment industry is included in 'other manufacturing' because of data quality constraints.

2. Detail of the expenditure breakdown by type of environmental protection activity is only available for the listed industries.

3. Before 1997 the wood products industry was included with 'other manufacturing'.

4. Before the 1998 reference year establishments were selected based on the 1980 Standard Industrial Classification System (SIC). However, beginning with reference year 1998, industry selection was based on the North American Industry Classification System (NAICS). For further information, see Statistics Canada, 2001, Environmental Protection Expenditures in the Business Sector 1998, catalogue no. 16F0006X.

5. Capital expenditures on wildlife and habitat protection are included with capital expenditures on reclamation and decommissioning.

6. Before the 1998 reference year, pipeline transportation was included with gas distribution systems.

7. As of reference year 1998, the Survey of Environmental Protection Expenditures is conducted every two years.

8. Capital expenditures on reclamation and decommissioning are included with capital expenditures on environmental assessments and audits.

9. Before 2000 the fabricated metal products industry was included with 'other manufacturing'.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Environmental Protection Expenditures in the Business Sector, catalogue no. 16F0006X.

Table 4.5
Capital expenditures on pollution prevention by medium and by industry, 2002

	Air	Surface water	On-site contained solid and liquid waste	Noise, radiation and vibration	Other	Total
millions of dollars						
Total	950.5	224.7	138.3	12.9	100.8	1,427.2
Logging	0.0	0.1	0.5	0.0	0.0	0.6
Oil and gas extraction	184.0	34.6	19.0	3.5	2.7	243.7
Mining	x	20.5	7.6	0.0	x	31.1
Electric power generation, transmission and distribution	164.9	27.7	x	x	x	228.2
Natural gas distribution	x	x	x	0.0	0.0	x
Food	23.8	9.4	4.3	0.0	8.8	46.4
Beverage and tobacco products	1.8	0.4	2.8	0.0	1.3	6.4
Wood products	x	5.4	15.6	x	0.4	29.0
Pulp, paper and paperboard mills	65.3	x	3.8	x	x	152.9
Petroleum and coal products	425.0	48.6	x	x	x	499.9
Chemicals	x	16.9	12.9	0.6	x	x
Non-metallic mineral products	3.5	2.0	1.2	0.2	17.5	24.4
Primary metals	15.5	7.2	7.2	0.0	1.2	31.1
Fabricated metal products	x	x	0.3	0.2	2.1	x
Transportation equipment	18.5	3.5	3.9	0.2	1.3	27.3
Pipeline transportation	5.3	x	20.5	x	x	32.0

Source(s): Environmental Protection Expenditures in the Business Sector, catalogue no. 16F0006X.

Table 4.6
Capital expenditures on pollution abatement and control (end-of-pipe) by medium and by industry, 2002

	Air	Surface water	On-site contained solid and liquid waste	Noise, radiation and vibration	Total
millions of dollars					
Total	580.6	203.3	104.8	18.9	907.7
Logging	x	x	x	x	x
Oil and gas extraction	48.4	21.2	13.7	2.7	85.9
Mining	7.5	22.9	5.7	0.2	36.3
Electric power generation, transmission and distribution	166.8	36.5	14.9	0.3	218.3
Natural gas distribution	x	0.0	x	0.1	x
Food	15.0	37.6	x	x	59.5
Beverage and tobacco products	0.2	0.8	0.8	0.1	1.9
Wood products	x	x	x	x	x
Pulp, paper and paperboard mills	32.3	16.5	8.1	0.5	57.4
Petroleum and coal products	155.8	35.1	28.5	7.3	226.7
Chemicals	15.8	5.0	3.4	2.2	26.4
Non-metallic mineral products	27.8	2.0	7.9	1.0	38.7
Primary metals	66.1	13.9	7.2	0.2	87.4
Fabricated metal products	1.3	1.5	x	0.1	x
Transportation equipment	x	x	4.4	0.1	29.7
Pipeline transportation	x	0.1	x	x	x

Source(s): Environmental Protection Expenditures in the Business Sector, catalogue no. 16F0006X.

Table 4.7
Government expenditures on pollution abatement and control (PAC) and water purification and supply

	1990/1991	1991/1992	1992/1993	1993/1994	1994/1995	1995/1996	1996/1997
	millions of dollars						
All levels ¹							
Sewage collection and disposal ²	2,001.1	1,953.3	2,051.3	2,186.1	2,297.4	2,742.2	2,547.5
Waste collection and disposal	1,220.3	1,324.7	1,427.2	1,346.2	1,578.1	1,366.4	1,343.5
Other pollution control activities	397.6	318.9	263.8	239.6	240.3	204.2	186.7
Other environmental services	1,096.3	1,289.0	1,272.6	1,329.2	1,317.1	1,338.7	1,274.5
Total PAC	4,715.3	4,885.9	5,014.8	5,101.1	5,432.9	5,651.5	5,352.2
Water purification and supply	2,470.5	2,377.3	2,426.0	2,747.5	2,965.6	3,014.0	3,029.4
PAC and water	7,185.8	7,263.2	7,440.8	7,848.6	8,398.4	8,665.5	8,381.6
Federal ³							
Sewage collection and disposal	0.0	0.0	0.0	229.4	320.7	313.7	300.7
Waste collection and disposal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other pollution control activities	117.9	20.2	4.3	11.2	14.7	13.9	5.7
Other environmental services	620.2	720.9	747.0	728.7	745.3	703.2	635.6
Total PAC	738.1	741.1	751.4	969.4	1,080.8	1,030.7	942.0
Water purification and supply	7.1	7.8	9.6	235.1	344.7	360.0	328.9
PAC and water	745.2	748.9	761.0	1,204.5	1,425.5	1,390.8	1,270.9
Provincial and territorial							
Sewage collection and disposal ²	75.3	100.9	97.8	90.6	132.8	256.3	186.8
Waste collection and disposal	132.4	164.1	176.7	121.5	295.8	71.3	30.5
Other pollution control activities	327.3	375.8	328.2	309.9	235.8	202.2	187.4
Other environmental services	443.4	535.0	467.0	516.7	531.3	564.0	531.0
Total PAC	978.4	1,175.7	1,069.7	1,038.7	1,195.5	1,093.8	935.8
Water purification and supply	1,130.6	1,012.5	991.5	872.3	948.6	985.8	987.1
PAC and water	2,109.0	2,188.3	2,061.3	1,911.0	2,144.1	2,079.6	1,922.9
Local							
Sewage collection and disposal	2,002.0	1,954.3	2,055.8	1,950.5	2,040.7	2,419.7	2,313.6
Waste collection and disposal	1,125.9	1,228.2	1,297.4	1,253.4	1,293.1	1,310.9	1,331.8
Other pollution control activities and other environmental services ⁴	82.3	80.9	102.6	126.8	144.2	133.0	129.4
Total PAC	3,210.2	3,263.4	3,455.7	3,330.7	3,478.0	3,863.6	3,774.8
Water purification and supply	2,078.2	2,039.6	2,105.0	2,296.8	2,479.4	2,555.7	2,524.9
PAC and water	5,288.5	5,303.0	5,560.8	5,627.5	5,957.4	6,419.3	6,299.7

See footnotes at the end of the table.

Table 4.7 – continued

Government expenditures on pollution abatement and control (PAC) and water purification and supply

	1997/1998	1998/1999	1999/2000	2000/2001	2001/2002	2002/2003
	millions of dollars					
All levels¹						
Sewage collection and disposal ²	2,692.8	2,433.2	2,438.6	2,580.8	2,789.4 ^r	2,859.5
Waste collection and disposal	1,395.8	1,462.7	1,622.2	1,738.2	1,947.7 ^r	1,948.4
Other pollution control activities	179.3	319.8	447.3	643.5	780.7 ^r	809.8
Other environmental services	1,353.8	1,231.9	1,110.0	1,146.4	1,170.2 ^r	1,311.6
Total PAC	5,621.8	5,447.6	5,618.0	6,108.8	6,687.9^r	6,929.3
Water purification and supply	3,082.0	3,118.7	3,053.9	3,113.2	3,164.9 ^r	3,458.9
PAC and water	8,703.8	8,566.3	8,671.9	9,222.0	9,852.9^r	10,388.2
Federal³						
Sewage collection and disposal	371.5	341.5	309.3	319.4	300.9	321.1
Waste collection and disposal	0.0	0.0	0.0	0.0	0.0	0.0
Other pollution control activities	4.7	4.0	155.5	314.8	419.3 ^r	427.4
Other environmental services	761.8	785.4	579.6	595.1	606.4 ^r	642.8
Total PAC	1,138.0	1,130.9	1,044.3	1,229.2	1,326.6^r	1,391.3
Water purification and supply	392.0	360.7	318.1	324.7	308.0	334.9
PAC and water	1,529.9	1,491.7	1,362.5	1,553.9	1,634.6^r	1,726.2
Provincial and territorial						
Sewage collection and disposal ²	181.4	131.2	91.3	74.2	129.7 ^r	200.0
Waste collection and disposal	27.8	65.6	69.9	44.8	58.6 ^r	84.5
Other pollution control activities	181.0	321.7	295.9	333.0	375.7 ^r	390.1
Other environmental services	494.9	327.5	439.1	440.4	462.0 ^r	509.4
Total PAC	885.0	846.0	896.2	892.4	1,025.9^r	1,184.0
Water purification and supply	822.5	666.7	784.5	508.4	498.6 ^r	502.0
PAC and water	1,707.5	1,512.7	1,680.7	1,400.8	1,524.5^r	1,686.0
Local						
Sewage collection and disposal	2,394.4	2,126.5	2,162.6	2,278.8	2,487.8 ^r	2,543.4
Waste collection and disposal	1,392.3	1,411.1	1,583.3	1,723.1	1,907.5 ^r	1,888.8
Other pollution control activities and other environmental services ⁴	129.8	138.1	114.8	158.7	129.2 ^r	182.8
Total PAC	3,916.5	3,675.8	3,860.6	4,160.6	4,524.4^r	4,615.0
Water purification and supply	2,525.9	2,575.0	2,527.4	2,636.5	2,643.9 ^r	2,898.9
PAC and water	6,442.3	6,250.8	6,388.1	6,797.0	7,168.3^r	7,513.9

- Expenditures presented for all levels of government do not equal the sum of federal, provincial/territorial and local expenditures. The data have been consolidated, excluding intergovernmental transactions between the three levels of government, which provides a more accurate account of total government expenditures.
- May include some expenditures on water purification and supply.
- The increase shown from 1998/1999 is a result of a program restructure within the Department of Environment Canada, as described within the 1999 and 2000 Public Accounts (Vol. II, Part I).
- Includes expenditures for other pollution control activities (such as clean-up and air pollution control) and other environmental services (such as environmental assessments).

Note(s): Fiscal year ending nearest to March 31, except for local government expenditures (calendar year). Figures may not add up to totals due to rounding.

Source(s): Public Institutions Division and Environment Accounts and Statistics Division.

Table 4.8
Pollution prevention methods by industry

	Product design or reformulation	Equipment or process modifications	Recirculation, recovery, reuse or recycling	Materials, feedstock or solvent substitution	Improved management or purchasing techniques	Prevention of leaks and spills	Good operating practices or training	Energy conservation	Other
	percent ¹								
1995	10	32	64	33	..	50	..	37	5
Logging	0	25	31	6	..	38	..	19	6
Crude petroleum and natural gas	7	39	48	42	..	71	..	77	10
Mining	5	25	50	36	..	59	..	39	7
Electric power systems	18	27	73	82	..	46	..	73	18
Food	4	26	69	13	..	51	..	33	1
Beverage	13	33	75	17	..	33	..	46	4
Pulp and paper	11	46	44	16	..	54	..	25	3
Refined petroleum and coal products	8	0	39	15	..	54	..	46	0
Chemicals	20	37	69	41	..	59	..	30	8
Non-metallic mineral products	19	23	68	34	..	49	..	38	9
Primary metals	9	51	65	42	..	42	..	37	7
Pipeline transport and gas distribution systems	8	23	62	39	..	69	..	77	0
Other manufacturing ²	7	28	69	43	..	42	..	36	3
1996	11	31	66	37	..	49	..	42	8
Logging	4	4	46	17	..	63	..	25	0
Crude petroleum and natural gas	3	41	66	41	..	79	..	76	0
Mining	5	23	58	27	..	49	..	42	21
Electric power systems	12	24	77	59	..	47	..	82	6
Food and tobacco products	12	25	60	29	..	52	..	43	7
Beverage	13	43	83	15	..	38	..	43	5
Pulp and paper	5	41	47	27	..	51	..	37	13
Refined petroleum and coal products	13	13	50	19	..	75	..	44	13
Chemicals	20	36	71	43	..	62	..	30	17
Non-metallic mineral products	9	30	73	39	..	42	..	39	9
Primary metals	5	37	70	39	..	49	..	38	6
Transportation equipment	18	43	80	57	..	51	..	57	6
Pipeline transport and gas distribution systems	4	7	68	43	..	75	..	71	4
Other manufacturing ²	13	29	72	40	..	39	..	38	4
1997	15	24	64	37	..	51	..	42	10
Logging	9	3	34	14	..	80	..	6	6
Crude petroleum and natural gas	34	40	74	49	..	94	..	66	6
Mining	4	23	59	24	..	50	..	54	3
Electric power systems	7	20	53	53	..	93	..	73	13
Food and tobacco products	14	30	67	30	..	63	..	59	6
Beverage	25	18	57	21	..	50	..	32	14
Wood products ³	16	21	58	35	..	61	..	35	9
Pulp and paper	8	27	72	31	..	58	..	41	12
Refined petroleum and coal products	39	44	72	50	..	78	..	61	0
Chemicals	27	23	61	36	..	69	..	39	5
Non-metallic mineral products	12	25	75	31	..	39	..	33	8
Primary metals	11	43	70	37	..	51	..	54	2
Transportation equipment	19	32	64	56	..	57	..	56	5
Pipeline transport and gas distribution systems	17	11	50	44	..	78	..	72	11
Other manufacturing ²	12	18	63	41	..	30	..	33	18
1998 ⁴	17	23	66	31	..	59	..	45	10
Logging	0	15	33	3	..	82	..	12	3
Oil and gas extraction	27	35	71	40	..	88	..	75	6
Mining	6	18	67	21	..	53	..	42	8
Electric power generation, transmission and distribution	13	22	65	52	..	87	..	74	4
Natural gas distribution	0	25	38	25	..	75	..	63	0
Food	13	26	72	34	..	55	..	61	3
Beverage and tobacco products	8	16	50	24	..	63	..	50	11
Wood products ³	23	25	62	22	..	58	..	40	12
Pulp, paper and paperboard mills	10	24	76	38	..	73	..	54	7
Petroleum and coal products	26	32	74	26	..	79	..	63	0
Chemicals	30	24	72	27	..	71	..	33	4
Non-metallic mineral products	18	20	67	27	..	49	..	51	9
Primary metals	14	28	82	31	..	55	..	54	6
Transportation equipment	21	25	69	51	..	69	..	56	9
Pipeline transportation ⁵	25	25	58	33	..	92	..	75	0
Other manufacturing ²	15	20	56	31	..	39	..	35	20

See footnotes at the end of the table.

Table 4.8 – continued

Pollution prevention methods by industry

	Product design or reformulation	Equipment or process modifications	Recirculation, recovery, reuse or recycling	Materials, feedstock or solvent substitution	Improved management or purchasing techniques	Prevention of leaks and spills	Good operating practices or training	Energy conservation	Other
	percent ¹								
2000 ⁶	24	48	67	34	42	73	79	..	14
Logging	0	24	46	20	35	79	78	..	28
Oil and gas extraction	18	86	76	36	58	96	91	..	26
Mining	10	40	84	33	51	92	92	..	18
Electric power generation, transmission and distribution	21	40	62	39	55	79	84	..	19
Natural gas distribution	25	78	56	0	56	100	82	..	0
Food	22	46	61	26	36	65	72	..	12
Beverage and tobacco products	6	41	52	11	33	76	80	..	10
Wood products ³	24	47	70	27	42	67	75	..	17
Pulp, paper and paperboard mills	17	68	83	36	34	87	89	..	16
Petroleum and coal products	48	54	76	34	44	91	94	..	6
Chemicals	40	54	77	40	45	82	88	..	15
Non-metallic mineral products	22	48	73	31	40	66	76	..	22
Primary metals	16	57	76	34	33	78	80	..	10
Fabricated metal products ⁷	13	39	60	29	34	68	77	..	15
Transportation equipment	33	59	69	53	58	82	88	..	22
Pipeline transportation ⁵	40	49	49	35	55	98	95	..	11
Other manufacturing ²	26	40	56	37	41	55	67	..	11
2002 ⁶	22	49	65	31	37	70	74	..	16
Logging	5	25	61	9	34	84	85	..	19
Oil and gas extraction	30	77	71	42	48	92	91	..	16
Mining	9	35	77	32	39	82	79	..	34
Electric power generation, transmission and distribution	14	38	63	36	34	80	78	..	16
Natural gas distribution	11	44	82	22	82	100	100	..	33
Food	16	16	55	21	25	66	69	..	17
Beverage and tobacco products	8	31	40	15	17	46	50	..	9
Wood products ³	16	40	63	19	37	63	74	..	22
Pulp, paper and paperboard mills	10	70	81	30	30	85	90	..	21
Petroleum and coal products	39	63	72	47	43	85	84	..	0
Chemicals	16	40	63	25	35	78	79	..	13
Non-metallic mineral products	23	49	64	29	30	54	62	..	16
Primary metals	12	51	73	32	25	70	70	..	16
Fabricated metal products ⁷	14	49	64	33	41	66	73	..	10
Transportation equipment	32	52	61	48	51	71	69	..	24
Pipeline transportation ⁵	42	70	54	35	58	100	98	..	0
Other manufacturing ²	29	48	62	38	43	59	66	..	11

1. Number of establishments indicating they used the pollution prevention method as a percentage of all establishments that provided a response.

2. Includes all other manufacturing industries not already specified.

3. Before 1997 the wood products industry was included with 'other manufacturing'.

4. Before the 1998 reference year, establishments were selected based on the 1980 Standard Industrial Classification System (SIC). However, beginning with reference year 1998, industry selection was based on the North American Industry Classification System (NAICS). For further information, see Statistics Canada, 2001, Environmental Protection Expenditures in the Business Sector 1998, catalogue no. 16F0006X.

5. Before the 1998 reference year, pipeline transportation was included with gas distribution systems.

6. As of reference year 1998, the Survey of Environmental Protection Expenditures is conducted every two years.

7. Before 2000 the fabricated metal products industry was included with 'other manufacturing'.

Note(s): This table includes reported data only. The question on pollution prevention methods differed in reference years 1995 and 1996. Therefore, comparisons from 1995 to 1998 provide a general view but should be treated with caution.

Source(s): Environmental Protection Expenditures in the Business Sector, catalogue no. 16F0006X.

Table 4.9
Environmental management practices by industry

	Environmental management system	Life cycle analysis	ISO 14000 certification	Environmental voluntary agreements	'Green' procurement policy	Eco-labelling of products	Annual environmental performance report	Other	Total ²
	percent ¹								
1998	64	19	10	37	14	6	34	20	82
Logging	59	10	17	16	3	5	50	10	72
Oil and gas extraction	88	47	3	77	24	6	40	20	93
Mining	72	22	5	51	18	..	55	39	91
Electric power generation, transmission and distribution	74	27	27	68	8	12	52	50	93
Natural gas distribution	92	25	8	91	42	..	67	..	100
Food	50	9	4	12	12	2	13	8	63
Beverage and tobacco products	55	14	3	25	23	19	14	7	78
Wood products	50	9	5	14	9	6	28	12	69
Pulp, paper and paperboard mills	70	11	17	65	11	16	63	21	95
Petroleum and coal products	74	52	7	58	11	11	49	50	88
Chemicals	69	28	17	46	17	9	34	28	89
Non-metallic mineral products	61	17	5	11	14	3	31	14	75
Primary metals	58	13	6	28	11	..	18	13	82
Transportation equipment	62	19	23	26	19	2	23	17	81
Pipeline transportation	91	43	5	86	14	..	52	33	100
2000	52	11	11	29	13	5	38	10	72
Logging	76	2	50	26	9	17	61	12	86
Oil and gas extraction	82	23	10	82	27	5	62	13	92
Mining	66	16	3	49	16	2	67	20	84
Electric power generation, transmission and distribution	53	14	17	47	18	8	44	14	73
Natural gas distribution	91	30	0	82	46	10	80	x	100
Food	48	10	4	10	14	3	25	10	64
Beverage and tobacco products	41	1	3	23	7	1	36	10	67
Wood products	42	5	11	23	13	11	38	7	63
Pulp, paper and paperboard mills	65	12	25	57	11	11	71	15	89
Petroleum and coal products	71	36	15	46	13	24	61	15	80
Chemicals	60	15	5	36	14	7	46	14	78
Non-metallic mineral products	60	8	2	18	17	4	36	9	78
Primary metals	55	9	11	34	10	1	38	8	74
Fabricated metal products	41	8	7	13	8	6	15	5	57
Transportation equipment	65	16	30	20	19	0	33	11	76
Pipeline transportation	81	14	0	93	14	0	86	0	100
Sub-total excluding 'other manufacturing'	58	12	11	34	14	6	45	11	75
Other manufacturing ³	32	7	10	10	12	3	17	8	60
2002	56	14	19	29	14	5	41	9	71
Logging	82	11	66	23	20	24	48	4	88
Oil and gas extraction	90	34	5	81	23	4	81	16	97
Mining	75	19	9	53	19	0	72	23	88
Electric power generation, transmission and distribution	64	27	22	50	20	15	54	0	72
Natural gas distribution	92	36	18	92	27	0	92	25	100
Food	38	7	3	11	11	1	24	4	53
Beverage and tobacco products	36	5	3	20	5	0	29	9	55
Wood products	48	7	18	23	18	15	40	9	61
Pulp, paper and paperboard mills	75	10	38	43	8	6	76	18	93
Petroleum and coal products	73	38	19	50	9	22	67	0	88
Chemicals	61	19	11	37	12	3	45	11	76
Non-metallic mineral products	40	15	13	21	14	4	24	8	62
Primary metals	54	9	20	29	9	0	39	7	67
Fabricated metal products	54	6	23	13	13	0	23	0	68
Transportation equipment	66	22	46	23	18	4	34	12	75
Pipeline transportation	100	29	2	98	33	0	76	0	100
Sub-total excluding 'other manufacturing'	61	15	23	35	14	5	47	9	74
Other manufacturing ³	38	10	19	10	12	3	23	7	63

1. Number of establishments indicating they used the practice as a percentage of all establishments that provided a response.
2. Number of establishments indicating they used at least one environmental practice as a percentage of the total number of establishments that provided a response.
3. Includes all other manufacturing industries not already specified. Information on environmental management practices used by the 'other manufacturing' category was not collected in 1998.

Note(s): This table includes reported data only.

Source(s): Environmental Protection Expenditures in the Business Sector, catalogue no. 16F0006X.

Table 4.10
Waste disposal, diversion and generation per capita, all sources, by province and territory

	Disposal ¹		Diversion ²		Generation ³		Rate of diversion per capita	
	2000 ^f	2002	2000 ^f	2002	2000 ^f	2002	2000 ^f	2002
	kilograms per capita						percent	
Canada	753	760	199	211	952	971	21	22
Newfoundland and Labrador	742	725	80	74	822	799	10	9
Prince Edward Island	x	x	x	x	x	x	20	28
Nova Scotia	416	417	150	182	566	598	26	30
New Brunswick	550	551	152	164	702	715	22	23
Quebec ⁴	787	745	209	234	966	979	21	24
Ontario	764	797	202	200	966	997	21	20
Manitoba	798	776	188	217	986	993	19	22
Saskatchewan	804	799	147	147	951	946	15	16
Alberta	914	928	140	189	1,054	1,117	13	17
British Columbia	636	667	278	269	914	936	30	29
Yukon Territory, Northwest Territories and Nunavut	x	x	x	x	x	x	3	10

1. Total amount of non-hazardous waste disposed of in public and private waste disposal facilities. This includes waste that is exported out of the source province or country for disposal. This does not include waste disposed of in hazardous waste disposal facilities or waste managed by the waste generator on-site.
2. Diversion represents the quantity of non-hazardous materials diverted from disposal facilities and represents the sum of all materials processed for recycling or reuse at an off-site recycling facility.
3. Total generation is the sum of total non-hazardous residential and non-residential solid waste disposed of in an off-site disposal facility and total materials processed for recycling at an off-site recycling facility. Note that these data only include those materials that are managed (disposed of or recycled) off-site by a municipality or waste management firm.
4. These data are derived from a survey administered by RECYC-QUÉBEC. In order to make these data comparable with other provincial data, some waste quantities generated by the construction and demolition sector have been removed from the RECYC-QUÉBEC totals.

Source(s): Waste Management Industry Survey: Business and Government Sectors, catalogue no. 16F0023X.

Table 4.11
Disposal of waste by source and by province and territory¹

	Residential sources ²		Industrial, commercial and institutional sources ³		Construction and demolition sources ⁴		Total waste disposed	
	2000 ^f	2002	2000 ^f	2002	2000 ^f	2002	2000 ^f	2002
	tonnes							
Canada	9,069,170	9,455,204	11,203,613	11,563,999	2,896,087	2,816,528	23,168,870	23,835,730
Newfoundland and Labrador	x	216,218	146,843	140,377	x	19,999	398,818	376,593
Prince Edward Island	x	x	x	x	x	x	x	x
Nova Scotia	171,627	169,649	x	176,625	x	42,921	391,827	389,194
New Brunswick	198,603	203,506	x	154,812	x	55,288	415,058	413,606
Quebec ⁵	2,679,000	2,876,000	2,655,000	2,261,000	472,200	406,800	5,806,200	5,543,800
Ontario	3,318,478	3,438,408	4,606,409	5,193,240	1,006,714	1,013,985	8,931,600	9,645,633
Manitoba	451,505	412,612	x	405,954	x	77,990	914,511	896,556
Saskatchewan	272,104	278,692	x	441,109	x	75,323	821,946	795,124
Alberta	824,990	866,398	x	1,380,306	x	643,590	2,750,004	2,890,294
British Columbia	890,789	936,774	1,264,056	1,346,669	426,490	461,458	2,581,336	2,744,901
Yukon Territory, Northwest Territories and Nunavut	x	x	x	x	x	x	x	x

1. Total amount of non-hazardous waste disposed of in public and private waste disposal facilities. This includes waste that is exported out of the source province or country for disposal. This does not include waste disposed of in hazardous waste disposal facilities or waste managed by the waste generator on-site.
2. Waste from residential sources includes solid waste from all households that is picked up by the municipality (either using its own staff or through contracting firms) or that is self-hauled to depots, transfer stations and disposal facilities.
3. Industrial, Commercial, and Institutional (IC&I) non-hazardous solid wastes are those wastes generated by all IC&I sources in a municipality, and are excluded from the residential waste stream. These include: industrial materials generated by manufacturing, and primary and secondary industries that are managed off-site; commercial materials generated by shopping centres, restaurants, offices, etc.; and materials generated by institutional facilities such as schools, hospitals, government facilities, seniors homes, universities, etc.
4. Construction and demolition non-hazardous waste refers to waste from construction and demolition activities. It generally includes materials such as brick, painted wood, rubble, drywall, metal, cardboard, doors, windows, wiring, etc. It excludes materials from land clearing on areas not previously developed, asphalt and clean sand or gravel.
5. These data are derived from a survey administered by RECYC-QUÉBEC. In order to make these data comparable with other provincial data, some waste quantities generated by the construction and demolition sector have been removed from the RECYC-QUÉBEC totals.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Waste Management Industry Survey: Business and Government Sectors, catalogue no. 16F0023X.

Table 4.12
Materials prepared for recycling by type and by province and territory, 2002¹

	Canada	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec ²	Ontario	Manitoba	Saskat- chewan	Alberta	British Columbia	Yukon Territory, Northwest Territories and Nunavut
	tonnes											
Total	6,619,794	38,386	x	169,724	122,957	1,743,000	2,415,498	250,880	146,607	589,642	1,105,121	x
Newsprint	800,043	x	x	22,131	6,764	..	544,752	45,165	15,564	57,201	104,065	x
Cardboard and boxboard	705,856	x	x	12,476	12,231	..	407,325	x	18,207	46,230	178,251	x
Mixed paper	1,519,958	x	x	2,627	4,265	946,000 ³	328,443	4,245	14,194	28,466	190,047	x
Glass	339,132	x	x	2,824	x	71,000	173,905	2,619	x	x	34,231	x
Ferrous metals	808,596	x	x	2,775	x	111,000	267,254	x	x	x	127,925	x
Copper and aluminum	44,070	x	x	x	x	11,000	19,927	x	x	x	1,965	x
Other metals	117,560	x	0	x	x	..	49,071	x	x	10,595	40,376	x
Plastics	152,266	x	x	1,560	1,038	52,000	42,770	2,548	910	8,280	34,100	x
Construction and demolition	702,202	0	x	53,359	30,153	213,000	225,282	581	x	x	162,168	0
Organics	1,170,790	0	x	62,341	62,725	246,000	293,328	16,261	x	261,069	198,996	x
Other materials	259,321	x	0	1,117	1,262	93,000	63,442	9,067	x	41,730	32,997	x

1. This table covers only those companies and local waste management organizations that reported they prepared non-hazardous material for recycling.

2. These data are derived from a survey administered by RECYC-QUÉBEC. In order to make these data comparable with other provincial data, some waste quantities generated by the construction and demolition sector have been removed from the RECYC-QUÉBEC totals.

3. Includes all paper fibres.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Waste Management Industry Survey: Business and Government Sectors, catalogue no. 16F0023X.

Table 4.13
Total and environmental revenues by industry¹, 2002

	Establishments ²	Total employment ³	Total revenues ⁴	Environmental goods	Environmental services	Environment- related construction ⁵	Total environmental revenues
	number			millions of dollars			
Canada	7,967	159,720	29,438.6	6,647.3	6,996.7	2,155.8	15,799.8
Agriculture, forestry, fishing and hunting	14	249	21.0	4.5	8.4	0.0	12.9
Mining and oil and gas extraction	29	1,698	913.3	x	131.6	x	140.4
Utilities	15	1,975	52.5	10.4	x	x	29.4
Construction	82	16,728	2,705.6	42.4	128.4	1,906.7	2,077.5
Chemical manufacturing	51	3,457	1,141.2	206.0	34.7	0.0	240.8
Plastic and rubber products manufacturing	39	3,238	968.0	383.0	x	x	404.4
Non-metallic mineral product manufacturing	15	1,237	279.8	x	0.0	x	154.6
Primary metal manufacturing	12	743	101.6	61.2	9.8	0.0	71.0
Fabricated metal product manufacturing	38	3,624	708.4	x	x	x	167.2
Machinery manufacturing	147	9,712	1,845.3	770.3	37.2	7.8	815.3
Computer and electronic product manufacturing	53	2,004	325.4	108.4	4.2	0.0	112.6
Electrical equipment, appliance and component manufacturing	13	1,154	943.0	201.4	0.2	0.0	201.6
Rest of manufacturing sector	39	2,848	535.6	270.1	27.0	0.0	297.1
Wholesale trade	2,845	24,195	6,127.7	3,884.2	693.8	11.0	4,588.9
Retail trade	20	1,168	154.3	51.3	2.8	0.0	54.2
Finance and insurance services	20	1,444	305.0	x	39.9	x	48.4
Legal services	48	8,786	1,575.7	0.0	104.9	0.0	104.9
Architectural and landscape architectural services	17	112	13.6	0.0	5.3	0.0	5.3
Engineering services	560	28,891	4,034.7	76.9	914.7	122.8	1,114.3
Surveying and mapping (including geophysical) services	22	814	91.6	x	x	x	32.4
Testing laboratories	103	3,665	342.4	x	x	x	202.4
Computer systems design and related services	28	1,973	262.4	x	13.8	x	25.6
Environmental consulting services	1,510	8,062	769.6	32.3	610.4	2.4	645.2
Management consulting and other scientific and technical consulting services	123	1,270	152.8	31.1	46.5	10.2	87.8
Scientific research and development services	39	1,239	144.0	43.6	43.5	0.0	87.1
All other professional, scientific and technical services	22	471	39.7	x	x	x	25.3
Management of companies and enterprises	19	1,886	359.2	x	18.2	x	83.7
Administrative and support services	44	2,007	318.0	x	85.2	x	100.6
Waste management and remediation services	1,938	23,757	3,941.0	42.8	3,671.9	27.3	3,742.0
Other services	62	1,313	265.9	x	81.3	x	126.7

1. Industry groups are based on the North American Industry Classification System (NAICS).
2. All companies operating in Canada that are involved in whole or in part in the production of environmental goods, the provision of environmental services and the undertaking of environment-related construction activities. The total number of establishments does not include engineering construction establishments (NAICS 23711, 23712, 23731, 23799) due to the methodology used to derive the estimates.
3. Total employment of establishments that were considered to be in scope for the purposes of the survey.
4. Total revenues of establishments that were considered to be in scope for the purposes of the survey.
5. Revenues from environment-related construction services were derived from demand-side estimates of environmental protection expenditures.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Environment Industry Survey: Business Sector, catalogue no. 16F0008X.

Table 4.14
Total and environmental revenues by province and territory, 2002

	Establishments ¹	Total employment ²	Total revenues ³	Environmental goods	Environmental services	Environment-related construction ⁴	Total environmental revenues
	number			millions of dollars			
Canada	7,967	159,720	29,438.6	6,647.3	6,996.7	2,155.8	15,799.8
Newfoundland and Labrador	134	2,059	246.4	26.4	64.1	25.7	116.2
Prince Edward Island	46	1,276	102.0	13.8	14.4	38.1	66.3
Nova Scotia	380	5,143	673.7	145.3	176.7	38.4	360.4
New Brunswick	261	3,561	496.0	117.4	135.7	55.1	308.2
Quebec	1,697	32,437	5,132.9	1,538.9	1,295.3	232.7	3,066.9
Ontario	2,467	62,548	13,904.3	3,407.8	2,838.2	661.3	6,907.3
Manitoba	246	4,177	601.0	184.4	163.1	47.8	395.3
Saskatchewan	286	3,998	858.1	126.8	136.0	53.1	315.8
Alberta	1,085	25,855	4,563.5	576.8	1,056.7	666.4	2,299.8
British Columbia	1,305	18,212	2,814.2	507.6	1,094.3	326.7	1,928.6
Yukon Territory, Northwest Territories and Nunavut	60	454	46.5	2.1	22.1	10.5	34.8

1. All companies operating in Canada that are involved in whole or in part in the production of environmental goods, the provision of environmental services and the undertaking of environment-related construction activities. The total number of establishments does not include engineering construction establishments (NAICS 23711, 23712, 23731, 23799) due to the methodology used to derive the estimates.
2. Total employment of establishments that were considered to be in scope for the purposes of the survey.
3. Total revenues of establishments that were considered to be in scope for the purposes of the survey.
4. Revenues from environment-related construction services were derived from demand-side estimates of environmental protection expenditures.

Note(s): Figures may not add up to totals due to rounding.

Source(s): Environment Industry Survey: Business Sector, catalogue no. 16F0008X.

Table 4.15
Research and development expenditures and source of funds in the higher education sector, 2003/2004

	Total expenditures	Share of total	Source of funds					Foreign
			Federal government	Provincial governments	Business enterprise	Higher education	Private non-profit organizations	
	millions of dollars		percent					
Total	8,131.8	100.0	26.8	12.5	8.4	44.0	7.4	0.9
Social sciences and humanities ¹	1,593.4	19.8	21.1	12.8	1.6	57.4	7.2	0.0
Health sciences ²	3,085.6	37.9	26.4	9.9	8.7	42.1	12.0	1.0
Other natural sciences and engineering ³	3,452.8	42.5	29.9	14.7	11.2	39.5	3.4	1.3

1. Social sciences embrace all disciplines involving the study of human actions and conditions and the social, economic and institutional mechanisms affecting humans. Included are such disciplines as anthropology, business administration and commerce, communications, criminology, demography, economics, geography, history, languages, literature and linguistics, law, library science, philosophy, political sciences, psychology, religious studies, social work, sociology, and urban and regional studies.
2. Health sciences consist of programmes directed towards the protection and improvement of human health.
3. Other natural sciences consist of disciplines, other than health sciences, concerned with understanding, developing or utilizing the natural world. Included are the engineering, mathematical and physical sciences.

Source(s): Science Statistics, catalogue no. 88-001-X.

Table 4.16
Federal government research and development expenditures by socio-economic objective

	Intramural								
	1995/1996	1996/1997	1997/1998	1998/1999	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004
	millions of dollars								
Total	1,598	1,636	1,588	1,627	1,734	1,957	2,000	2,075	1,976
Exploration and exploitation of the earth	161	186	178	179	186	207	125	141	85
Infrastructure and general planning of land use									
Transport	8	10	34	38	42	37	71	54	56
Telecommunications	64	34	33	32	24	28	44	48	35
Other	16	74	54	50	42	48	30	39	38
Pollution prevention and protection of the environment	99	96	97	98	122	143	142	174	178
Public health	37	76	80	87	103	116	152	186	196
Production, distribution and rational utilization of energy	201	273	209	170	171	187	248	214	246
Agricultural production and technology									
Agriculture	288	320	317	308	334	333	345	287	275
Fishing	51	37	30	42	43	51	47	55	42
Forestry	75	71	73	74	77	83	75	74	72
Industrial production and technology	64	104	119	123	137	165	164	189	189
Social structures and relationships	44	102	110	125	50	53	47	60	60
Exploration and exploitation of space	62	65	59	92	68	187	175	181	121
Non-oriented research	21	47	51	54	150	150	181	202	206
Other civil research	3	13	15	13	14	16	15	14	14
Defence	115	124	127	136	167	150	134	152	157
Other	289	4	3	4	4	3	5	5	6
	Extramural								
	1995/1996	1996/1997	1997/1998	1998/1999	1999/2000	2000/2001	2001/2002	2002/2003	2003/2004
	millions of dollars								
Total	1,689	1,557	1,659	1,835	2,030	2,070	2,887	2,737	3,379
Exploration and exploitation of the earth	42	39	25	29	99	46	69	59	75
Infrastructure and general planning of land use									
Transport	48	45	32	28	23	20	24	25	19
Telecommunications	4	9	21	35	34	15	23	24	28
Other	3	1	13	15	16	20	25	28	31
Pollution prevention and protection of the environment	50	45	73	83	88	112	148	141	171
Public health	305	306	282	318	390	519	709	866	960
Production, distribution and rational utilization of energy	63	64	57	65	68	64	117	75	210
Agricultural production and technology									
Agriculture	61	57	37	44	67	70	75	90	86
Fishing	4	4	8	10	13	14	15	16	23
Forestry	25	24	24	24	43	27	27	41	56
Industrial production and technology	295	326	429	406	398	518	741	657	778
Social structures and relationships	35	30	31	90	87	106	130	149	170
Exploration and exploitation of space	232	213	190	270	269	154	193	179	197
Non-oriented research	185	204	237	229	256	188	365	213	376
Other civil research	3	5	1	2	1	17	17	2	1
Defence	102	88	124	120	121	119	142	100	116
Other	232	97	74	68	57	62	67	72	82

Note(s): The research and development intramural expenditures are managed and carried out primarily by federal government employees. Non-program (indirect costs) are excluded. The management and conduct of the research and development extramural expenditures are entrusted to a non-federal organization.

Source(s): Science Statistics 1999 to 2005, catalogue no. 88-001-X.

Abbreviations and equivalences

Abbreviations

°C	degree Celsius
CAC	criteria air contaminant
CAFC	company average fuel consumption
CH ₄	methane
cm	centimetre
CMA	Census metropolitan area
CO	carbon monoxide
CO ₂	carbon dioxide
g	gram
GDP	gross domestic product
GHG	greenhouse gas
GJ	gigajoule
GW	gigawatt
GWh	gigawatt hour
h	hour
ha	hectare
H ₂ O	water
kg	kilogram
km	kilometre
km ²	square kilometre
km ³	cubic kilometre
kt	kilotone
kW	kilowatt
L	litre
m ²	square metre
m ³	cubic metre
MJ	megajoule
mm	millimetre
Mt	megatonne
MW	megawatt
MWh	megawatt hour
N ₂	nitrogen
N ₂ O	nitrous oxide
NAFTA	North American Free Trade Agreement
NAICS	North American Industry Classification System
NH ₃	ammonia
NH ₄ ⁺	ammonium ion
NO	nitric oxide
NO ₂	nitrogen dioxide
NO _x	nitrogen oxides
O ₂	oxygen

PCB	Polychlorinated biphenyl
PJ	petajoule
PM	particulate matter
PM _{2.5}	particulate matter less than or equal to 2.5 microns
PM ₁₀	particulate matter less than or equal to 10 microns
s	second
SO ₂	sulphur dioxide
SO _x	sulphur oxides
SUV	sport utility vehicle
t	tonne
TEQ	toxic equivalency
TJ	terajoule
t-km	tonne kilometre
TPM	total particula matter
VOC	volatile organic compound

Equivalences

1 hectare =	1 km ² / 100
1 km ² =	100 hectares
1 tonne =	1,000 kilograms

Prefixes of the Metric System

Prefix and (abbreviation)	Multiplication factor
exa (E)	10 ¹⁸
peta (P)	10 ¹⁵
tera (T)	10 ¹²
giga (G)	10 ⁹
mega (M)	10 ⁶
kilo (k)	10 ³
hecto (h)	10 ²
deca (da)	10 ¹
deci (d)	10 ⁻¹
centi (c)	10 ⁻²
milli (m)	10 ⁻³
micro (μ)	10 ⁻⁶
nano (n)	10 ⁻⁹
pico (p)	10 ⁻¹²
femto (f)	10 ⁻¹⁵
atto (a)	10 ⁻¹⁸