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EnviroStats

Fall 2009 Vol. 3, no. 3

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Latest indicators

Population 2007 to 2008 Percentage change	1.2%	Particulate matter ($PM_{2.5}$) 2000 to 2006	No significant trend
Gross domestic product, monthly June 2009 Percentage change	0.1%	Ground-level ozone 1990 to 2006 Median percent change per year	0.7%
Greenhouse gas emissions 2006 to 2007 Percentage change	4.0%	Natural resource wealth 2007 to 2008 Percentage change	45.3%

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

Canada's natural resource wealth, 2008

Joan Forbes, Environment Accounts and Statistics Division

Wealth is an important indicator of economic performance, as it represents the potential to generate future income. A country's national wealth is often thought of as the value of its manufactured assets, for example, infrastructure and machinery, and its residential, commercial and agricultural land. However, the broader view of national wealth recognizes the important contribution of natural resource assets to the economy and society. This alternative measure quantifies such a contribution by valuing stocks of natural resources, land and ecosystems and incorporating these values in the analysis of national wealth.

This article examines the value of key natural resource stocks in Canada in 2008, focusing on timber, energy and minerals.

Value of natural resource assets increases

The value of selected natural resources (timber, energy and minerals) rose 45.3% to $1,723 billion in 2008 (Table 1), following a 1.0% decrease in 2007. This amounted to over 22% of Canada's total wealth including natural resources.[1] Among these three broad components, energy increased by 72.5%, minerals were up 22.2% while timber posted a 3.9% decline. Increases in the value of crude oil, natural gas, crude bitumen, coal and potash offset declines in timber and a number of metals.

The value of natural resource assets was up overall for 2008 despite price declines in the latter part of the year (see textbox: "Price volatility of natural resources" for more information).

Energy

The value of energy assets increased 72.5% to $1,162 billion in 2008 (Table 1), due to record high

1. Canada's total wealth includes produced assets such as residential and non-residential buildings, machinery and equipment and consumer durables, as well as non-produced assets such as land and natural resources. See Statistics Canada CANSIM table 378-0005 for details about what is included. Other important natural resource stocks such as water and ecosystems are not currently valued by Statistics Canada due to data limitations.

What you should know about this study

This study uses data from the Natural Resource Stock Accounts. These accounts measure the value of natural resource assets (or stocks) in their natural state, for example, as reserves of metal ore in the ground, or accessible stands of timber in forests.

The approach taken to value resources is similar to that of valuing annuities—a resource's value is equated to the stream of income that can be generated from extracting it over its useful lifetime.

The first step to estimating the stream of income involves calculating the current year's income from extraction. Income, also known as resource rent, is equal to total revenue received from sales throughout the year minus all costs incurred during extraction. Costs include operating costs, like fuel and labour, as well as the capital costs, such as wear-and-tear on machinery. Income taxes, royalties[1] and other costs that are not directly due to the extraction process are not subtracted.

Next, for the sake of simplicity, it is assumed that the quantity extracted as well as the rent generated from extracting the resource will remain constant in each successive year until reserves are exhausted. A final step in valuation is to calculate the present value of this stream of income. Since any rent that will be received in the future is worth less than it would be if in hand today, all future rents must be discounted before being summed together.

Two limitations of this approach are the assumption that the quantity of extraction will remain constant over the life of a resource and the assumption that the difference between sales revenue and extraction costs will remain the same through time. Oftentimes, the price of a natural resource is more volatile than labour and capital costs. These limitations tend to be magnified during periods of extreme volatility in resource prices. Such was the case when record high prices were observed for much of 2008, followed by sharp price declines. Despite these limitations, this method has been widely used by other countries given the difficulty in accurately forecasting commodity prices. Current estimates are based on fourteen different resources for which data on reserves, revenues and extraction costs are available.

For more information please see Definitions, data sources and methods: Natural Resource Stock Accounts.

1. Because part of the income from extracting a resource goes to governments (e.g. taxes and royalties), taxes and fees paid by extractors are not subtracted as costs: this makes them implicitly part of the rent.

Price volatility of natural resources

Energy and metal prices tend to be more volatile than, for example, prices of consumer goods. To help minimize the impact of this volatility when placing a value on these sub-soil assets, natural resource economists tend to assess their value over the course of an entire year or even longer, rather than at one point in time.

While this approach helps analysts focus on longer term trends in resource values, it also makes the estimates less responsive to short-term changes in economic conditions.

The state of affairs in 2008 provides a good case in point. In 2008, prices of crude oil, natural gas and crude bitumen, were very strong through the first eight months of year, but then fell sharply as the global economic downturn took hold. Despite this rather abrupt change in prices, estimates of the value of energy resources were up sharply for the year overall—the strength of the pre-downturn price growth was more than enough to offset the declines that followed.

Table 1
Value of natural resource reserves

	2007	2008	Growth rate
	millions of dollars		percentage
Timber	246,626	237,063	-3.9
Energy	673,768	1,162,138	72.5
Crude oil	165,265	256,859	55.4
Natural gas	165,289	231,765	40.2
Crude bitumen	306,289	604,820	97.5
Coal	36,925	68,694	86.0
Minerals	265,292	324,096	22.2
Metallic[1]	217,500	136,618	-37.2
Non-metallic	47,792	187,478	292.3
Total	**1,185,686**	**1,723,297**	**45.3**

1. Also includes diamond mines

Source(s):
Statistics Canada, CANSIM table 378-0005, accessed September 24, 2009.

prices for crude oil, crude bitumen, and natural gas during much of the year. Higher prices easily offset increased operating and capital costs. Energy assets made up over 67% of total natural resource assets in 2008, up 10 percentage points from one year earlier.

The value of crude bitumen almost doubled in 2008 reflecting increased production, increased reserves and record-high prices for much of the year. Crude bitumen alone accounted for over half of the value of all energy assets and more than one third of the value of all natural resource assets in 2008.

The value of crude oil and natural gas were also up significantly in 2008, increasing 55.4% and 40.2% respectively over their 2007 values. Higher prices for much of 2008 more than offset increasing operating and capital costs.

Minerals

The value of mineral assets,[2] such as gold, nickel and potash, increased by 22.2% to $324 billion in 2008. This substantial gain can be attributed to increased potash prices which almost tripled in 2008, and offset declining prices for many metals.

Timber

The value of commercial timber reserves was down by 3.9% in 2008, following a decline of 7.2% in 2007. Weak demand for lumber in the U.S. housing market explains much of these declines.

2. Mineral assets include gold, nickel, copper, lead, zinc, iron, molybdenum, uranium, diamonds and potash.

Agricultural water use in 2007—A profile of irrigation

Marie-Ève Poirier, Environment Accounts and Statistics Division

Water is necessary for crop production, whether it falls as rain or is applied through irrigation. Irrigation is commonly used to make up for a lack of moisture in the soil during periods of little rain. It can result in higher crop yields or increased profitability of certain crops.

For the most part, Canada is not a particularly arid country and only a small number of farms irrigate their crops. In the last census, only 7% of farms reported using irrigation in 2005 (Table 1). However, irrigation accounts for an important share of overall water use in certain areas of the country. At the provincial level, the highest proportion of farms irrigating their land were located in British Columbia (35%), followed by Alberta (8%). These two provinces also had a larger number of farms that irrigate their land.

Less rainfall, more irrigation

Since irrigation is primarily used to offset a lack of moisture in soil, one would expect farms that irrigate located in arid regions to use more water for irrigation than farms in other areas. In Canada, some of the driest regions are in central and south eastern British Columbia, in southern Alberta, and south-western Saskatchewan. These areas received some of the lowest amounts of rainfall in the country during the 2007 growing season (Map 1).

British Columbia (33%), Alberta (28%), and Ontario (19%) had the highest proportion of farms that irrigated their crops in 2007 (Chart 1). However, it should be noted that agricultural practices differ from one region to another. Grain and oilseed farms in the Canadian prairies typically have a larger average surface area than the orchards of British Columbia or farms in the east. The number of farms is therefore not the best indicator of water use for irrigation.

Although there are more farms irrigating in British Columbia, more than half of all land that is irrigated in Canada is located in Alberta (60%). However, 13% of irrigated areas are still located in British Columbia (Chart 1).

According to the pilot Agricultural Water Use Survey, Alberta was the most intensive irrigation water user, with farms using more water per unit of irrigated land than farms in other provinces. The province was also the lead water user when it came to the volume of water used for irrigation. Alberta accounted for 73% of the total volume of water

What you should know about this study

This study is based on data from the 2006 Census of Agriculture and the 2007 pilot Agricultural Water Use Survey.

Census of Agriculture

The Census of Agriculture is used to collect and publish a wide range of data on the agricultural sector such as the number and type of farms, the characteristics of farmers, the legal form of the business, land management practices, the crop areas, the number of livestock and poultry, farm capital, operating expenditures and revenue, machinery, equipment, and farm equipment. These data provide a complete picture of the agricultural sector in Canada every five years, on the national, provincial and territorial scales, as well as at smaller geographical levels. Part of the Survey also asked respondents if they used irrigation and what area was irrigated. In 2006, we asked respondents to identify the irrigated area by crop type: fruits, vegetables, field crops, hay and pasture and other types of crops. The target population for the Census of Agriculture is made up of all census farms in Canada. For more information on the concepts, methodology and data quality please see: www.statcan.gc.ca/pub/95-629-x/2007000/4123850-eng.htm.

Agricultural Water Use Survey, 2007 pilot

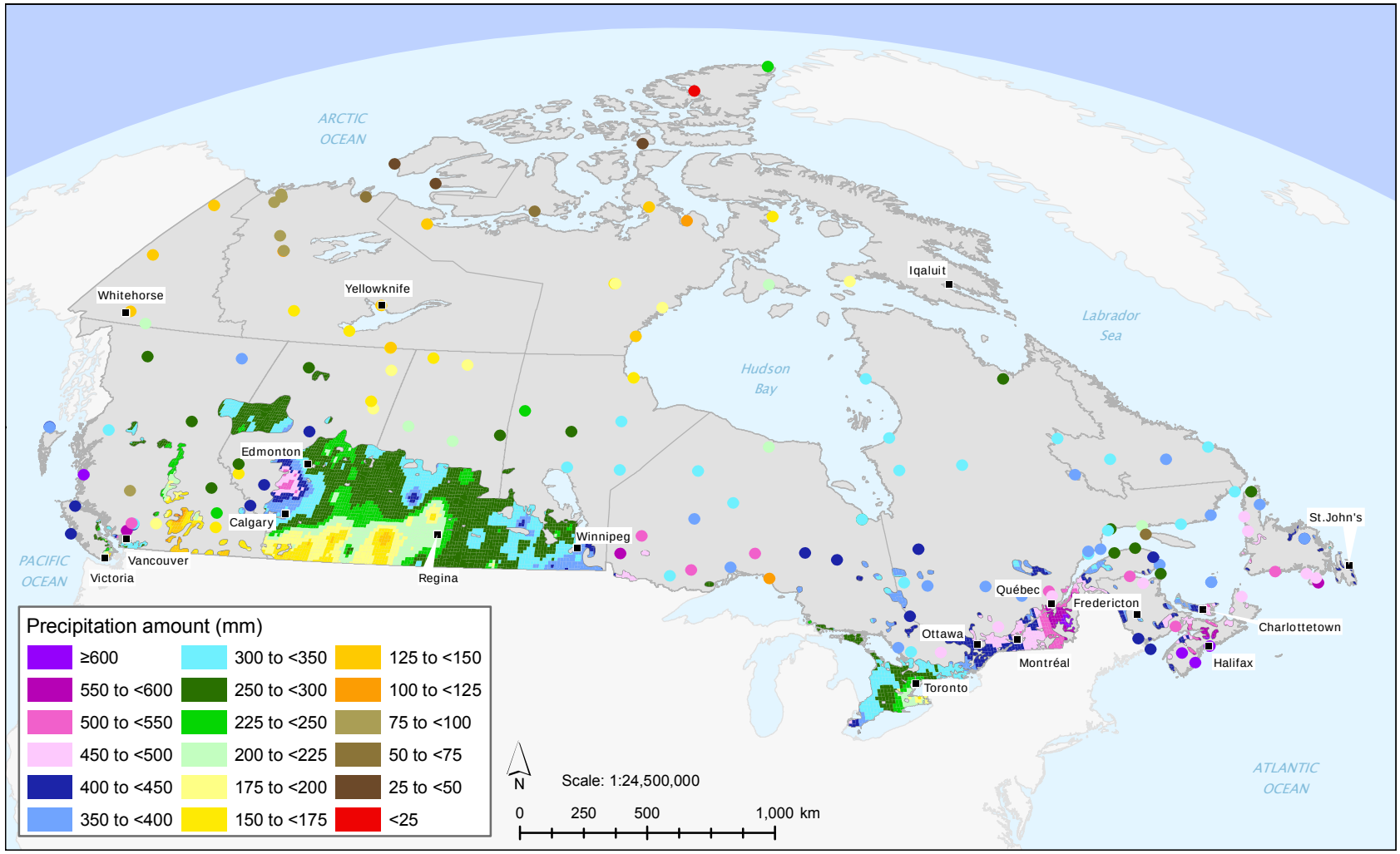
The Agricultural Water Use Survey was conducted to gather information on water use, irrigation methods and practices, and the sources and quality of the water used in agriculture by Canadian farms. This survey, part of the Canadian Environmental Sustainability Indicators (CESI) initiative, is the result of collaboration between Statistics Canada, Agriculture and Agri-Food Canada and Environment Canada.

The population targeted by the survey is made up of farms that use irrigation. The survey population consists of farms that have at least $10,000 in gross revenue and reported irrigating or having irrigation equipment in the 2006 Census of Agriculture. Excluded from the survey are farms in the territories (Yukon, Northwest Territories and Nunavut), institutional farms (e.g. government, university and prison farms), farms on Indian reserves, community pastures, pure hatcheries and farms that produce only Christmas trees.

The sample size was set at 2,000 units for the whole of Canada. Participation in the survey was voluntary. Data were obtained directly from respondents.

For more information on the concepts, methodology and data quality please see: Agricultural Water Use Survey.

Map 1
Accumulated precipitation, growing season, April 1 to August 31, 2007



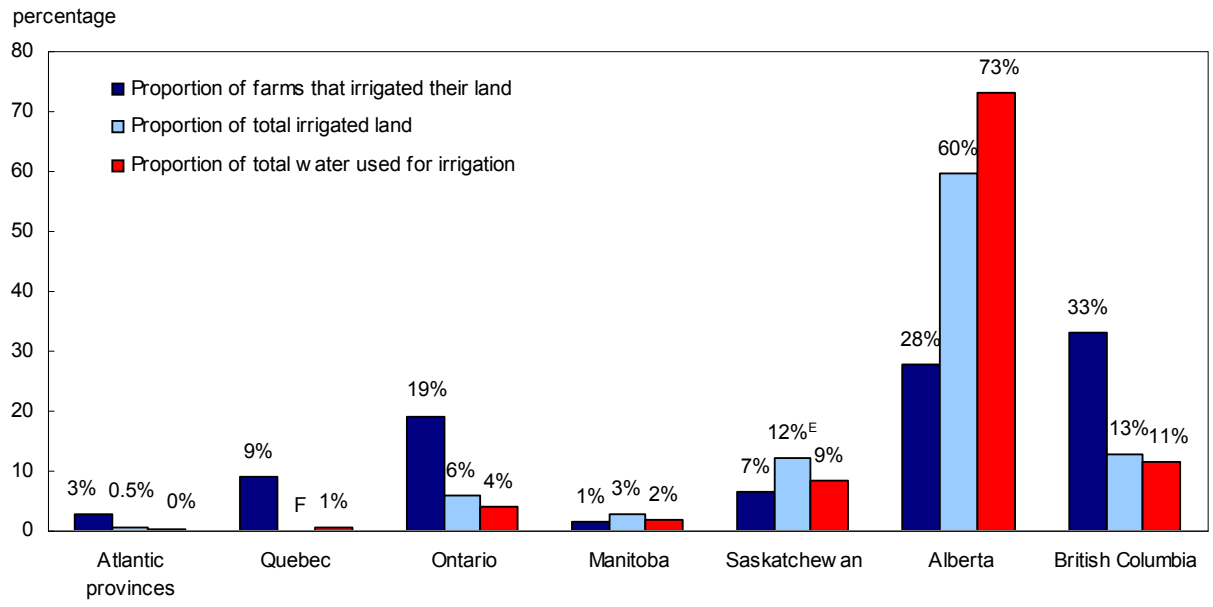
Note(s): Maps prepared by Environment Accounts and Statistics Division using data provided by Agriculture and Agri-Food Canada's National Agroclimate Information Service (NAIS). Source data provided through partnership with Environment Canada, Natural Resources Canada and many Provincial agencies.
Source(s): Agriculture and Agri-Food Canada, 2007, *Drought Watch: Growing Season Precipitation Maps (2007)*, www.agr.gc.ca/pfra/drought/nlpg07_e.htm (accessed April 23, 2009).

Table 1
Number and proportion of farms that irrigated their crops in 2005

	Total farms in 2006	Farms reporting irrigated area in 2005	Farms that irrigated in 2005
	number		percentage
Newfoundland and Labrador	558	33	6
Prince Edward Island	1,700	55	3
Nova Scotia	3,795	255	7
New Brunswick	2,776	117	4
Quebec	30,675	1,305	4
Ontario	57,211	2,983	5
Manitoba	19,054	241	1
Saskatchewan	44,329	923	2
Alberta	49,431	3,817	8
British Columbia	19,844	6,938	35
Canada	**229,373**	**16,667**	**7**

Note(s):
The 2006 Census of Agriculture collected information on the number of farms operating in 2006, but it requested information on the area that was irrigated in 2005 since the 2006 growing season had not ended at the time of the census.
Source(s):
Statistics Canada, 2007, *Farm Data and Farm Operator Data,* Catalogue no. 95-629-X.

Chart 1
Distribution of irrigation, by province, 2007



Source(s):
Statistics Canada, 2009, "Agricultural Water Use Survey 2007, Methodology Report," *Environment Accounts and Statistics Analytical and Technical Paper Series*, Catalogue no. 16-001-M2009008.

Table 2
Number of farms reporting off-farm sources of water used for agricultural purposes, 2007

	Water sources				
	Tap water	Treated wastewater	Provincial water sources	Private sources	Other sources
	number				
Atlantic provinces	F	0	0	0	F
Quebec–Ontario	F	F	F	F	F
Prairies	355	F	2,330	180	F
British Columbia	695	F	955	F	F
Canada	**1,310**	**F**	**3,315**	**375[E]**	**185[E]**

Source(s):
Statistics Canada, 2009, "Agricultural Water Use Survey 2007, Methodology Report," *Environment Accounts and Statistics Analytical and Technical Paper Series*, Catalogue no. 16-001-M2009008.

used for irrigation in 2007 (Chart 1). British Columbia and Saskatchewan combined used an additional 20%. In comparison, farms in the Atlantic provinces, Quebec and Manitoba used very little water for irrigation. Agriculture occurs in these provinces, but farms tend to receive more rainfall than their counterparts to the west.

In 2007, the pilot Agricultural Water Use Survey estimated the total volume of water used for irrigation in Canada at 1,503 million cubic metres.[1]

Farms in the western provinces depend on off-farm water sources

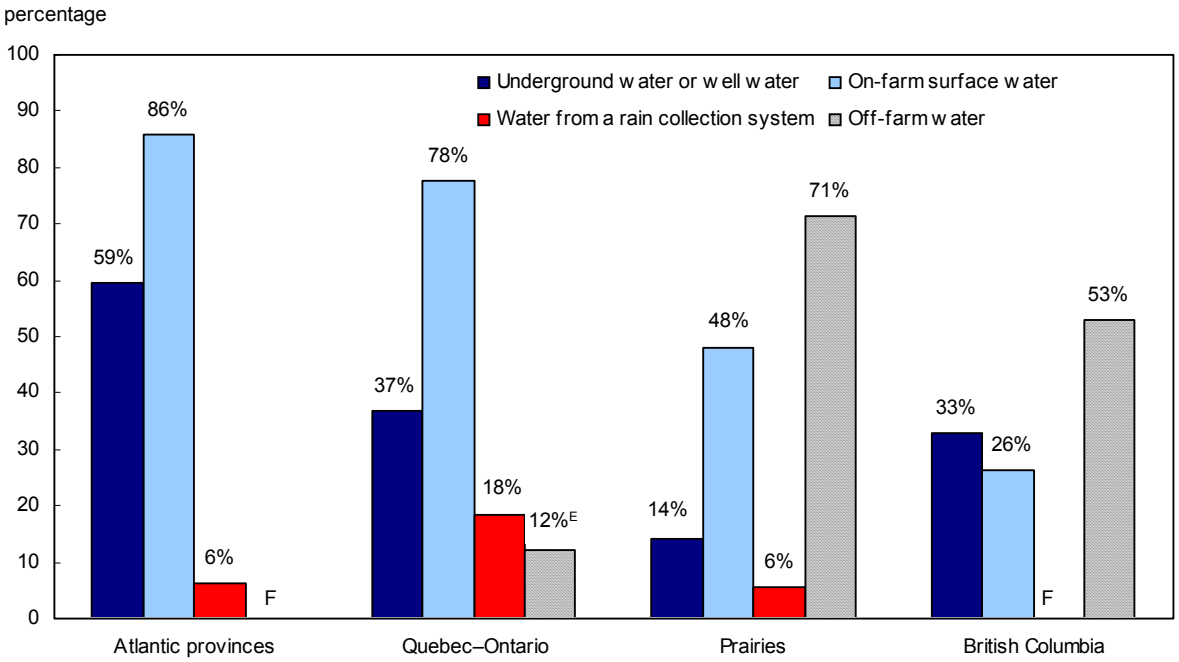
In most cases, farms in the western provinces depend on off-farm sources of water for agriculture. More than 70% of prairie farms and 53% of farms in British Columbia used off-farm water sources (Chart 2). The vast majority of farms using off-farm water use provincial sources for their water. For example, most irrigators in Alberta are allocated their water through provincial irrigation districts. Water from off the farm must be transported—tanker, canals and/or aqueduct systems bring water from suitable sources.

Water transport can have an impact on the environment. Although efforts are made to improve the efficiency of irrigation canals by reducing water losses, water is lost through evaporation or infiltration. Another source of water delivered to the farm that is by no means insignificant is tap water (Table 2). British Columbia is unique in that it is the only region where more farms use groundwater from wells instead of surface water.

In the Atlantic provinces, Quebec and Ontario, farms mainly use on-farm water sources for agricultural activities (Chart 2). They use more surface water from lakes, rivers, and ponds located on the farm. The use of surface water has the advantage of being generally less expensive than groundwater, which needs to be pumped to the surface.

1. The pilot Agricultural Water Use Survey asked farmers directly for the quantity of water used to irrigate crops. This number may be underestimated as discussed in the Survey's technical report. Please see: Statistics Canada, 2009, "Agricultural Water Use Survey 2007, Methodology Report," Environment Accounts and Statistics Analytical and Technical Paper Series, Catalogue no. 16-001-M2009008 for more information.

Chart 2
Water sources used by farms that irrigated their land, 2007



Note(s):
Farms may use more than one source of water for agricultural purposes. The percentages shown may therefore exceed 100%.
Source(s):
Statistics Canada, 2009, "Agricultural Water Use Survey 2007, Methodology Report," *Environment Accounts and Statistics Analytical and Technical Paper Series*, Catalogue no. 16-001-M2009008.

Quick fact: Canadians hang it out to dry—Clothesline and drying rack use in Canada

Data from the 2007 Households and the Environment Survey reveal that 61% of Canadian households used a clothesline or drying rack. Prince Edward Island led the way, with three out of four households using one.

Table 1
Clothesline and drying rack use, Canada and provinces, 2007

	Used a clothesline or drying rack
	percentage
Newfoundland and Labrador	73
Prince Edward Island	75
Nova Scotia	74
New Brunswick	71
Quebec	70
Ontario	60
Manitoba	51
Saskatchewan	46
Alberta	49
British Columbia	54
Canada	**61**

Source(s):
Statistics Canada, Environment Accounts and Statistics Division, Households and the Environment Survey, 2007.

Environment and sustainable development indicators

Table 1
Population indicators

	2003	2004	2005	2006	2007	2008
Population (number)[1]	31,639,670	31,940,676	32,245,209	32,576,074	32,927,372	33,311,389
Percentage change	0.9	1.0	1.0	1.0	1.1	1.2
Aged 65 and over (percent of total)	12.8	13.0	13.1	13.3	13.5	13.7
Urban (percent of total)	..	..	..	80.2	..	..
Density (per square kilometre)	3.5	3.5	3.6	3.6	3.7	3.7

1. Population data is based on the Estimates of Population program, except for data on urban population, which is based on the Census of Population.

Source(s):
Statistics Canada, CANSIM table 051-0001, accessed August 17, 2009.
Statistics Canada, 2007, *Population and Dwelling Count Highlight Tables, 2006 Census*, http://www12.statcan.ca/english/census06/data/popdwell/Tables.cfm (accessed August 17, 2009).

Table 2
Economy indicators

	2003	2004	2005	2006	2007	2008
Gross Domestic Product (million chained 2002 dollars)	1,174,592	1,211,239	1,247,807	1,283,419	1,315,907	1,321,360
Percentage change	1.9	3.1	3.0	2.9	2.5	0.4
Per capita (chained 2002 dollars)	37,124	37,922	38,697	39,398	39,964	39,667
Consumer Price Index (2002 = 100)	102.8	104.7	107.0	109.1	111.5	114.1
Unemployment rate (percent)	7.6	7.2	6.8	6.3	6.0	6.1

Source(s):
Statistics Canada, CANSIM tables 380-0017, 051-0001, 326-0021 and 282-0002, accessed August 17, 2009.

Table 3
Social indicators

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

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

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

Source(s):
Statistics Canada, CANSIM tables 203-0001, 203-0003, 203-0002, 203-0007, 380-0017, 153-0041, 153-0042, 051-0001, 405-0063 and 105-0501, accessed August 17, 2009.

Table 4
Energy indicators

	2003	2004	2005	2006	2007	2008
Primary energy availability (terajoules)	11,478,526	11,527,500	11,307,113	11,176,879	11,654,755	..
Primary and secondary energy (terajoules)						
Export	9,444,883	9,810,695	9,641,137	9,833,549	10,246,727	..
Residential consumption	1,338,166	1,313,015	1,296,644	1,243,425	1,344,404	..
Established reserve, closing stock[1]						
Crude bitumen (million cubic metres)	1,720	1,660	1,620	3,340	3,500	4,300
Crude oil (million cubic metres)	590.0	603.8	752.3	712.6	721.8	..
Natural gas (billion cubic metres)	1,469.5	1,497.5	1,553.7	1,577.7	1,534.3	..
Recoverable reserves, closing stock[1]						
Coal (million tonnes)	4,406.4	4,666.3	4,560.4	4,468.8	4,026.8	..
Uranium (tonnes)	429,000	444,000	431,000	423,400	482,000	..
Total electricity generation (megawatt hours)	564,218,465	571,291,905	597,810,875	585,097,531	603,572,420	601,719,256
Hydro (percent of total)	59.0	58.7	60.1	60.0	60.6	62.0
Nuclear (percent of total)	12.5	14.9	14.5	15.8	14.6	14.7
Generation from fossil fuel and other fuel combustion (percent of total)	28.5	26.4	25.4	24.2	24.8	23.3

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

Source(s):
Statistics Canada, CANSIM tables 128-0009, 127-0001 and 127-0002, accessed August 17, 2009.
Statistics Canada, CANSIM tables 153-0012, 153-0013, 153-0014, 153-0017, 153-0018 and 153-0019, accessed September 24, 2009.

Table 5
Environment and natural resources indicators

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

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

Source(s):
Statistics Canada, CANSIM tables 153-0046, 051-0001 and 002-0044, accessed August 17, 2009.
Statistics Canada, CANSIM table 378-0005, accessed September 24, 2009.
Environment Canada, 2009, *Canada's 2007 Greenhouse Gas Inventory – A Summary of Trends*, www.ec.gc.ca/pdb/ghg/inventory_report/2007/som-sum_eng.cfm (accessed August 17, 2009).
Environment Canada, 2009, *Temperature and Precipitation in Historical Perspective*, www.msc-smc.ec.gc.ca/ccrm/bulletin/annual08/national_e.cfm (accessed August 17, 2009).
Environment Canada, 2009, *Canadian Environmental Sustainability Indicators 2008 – Air Quality,* www.ec.gc.ca/indicateurs-indicators/default.asp?lang=En&n=4B5631F9-1 (accessed August 17, 2009).
Statistics Canada, Environment Accounts and Statistics Division, Material and Energy Flow Accounts.

Updates

New releases

Canadian Vehicle Survey: Annual

The Canadian Vehicle Survey measures the activity of all on-road vehicles registered in Canada, except some vehicles such as buses, motorcycles, construction equipment and road maintenance equipment. Estimates of total vehicle-kilometres are available by province and territory. Estimates of passenger-kilometres are available by province only. Estimates of fuel consumed are available by vehicle type.

Released July 14, 2009 (Statistics Canada Catalogue no. 53-223-X).

Agricultural water use survey 2007, methodology report

In 2008, Statistics Canada conducted the first Agricultural Water Use Survey. This pilot survey is part of the Canadian Environment Sustainability Indicators initiative and collects information on water volumes used for irrigation, irrigated areas, irrigation practices and the quality of water used for agricultural purposes.

This technical paper describes the methodology used for the pilot survey and includes recommendations for future cycles of the survey. The validation process seems to indicate that the method used to estimate the volumes of water used and the irrigated areas calculated underestimates the results.

The report gives recommendations to minimize this bias in the next iterations of the survey. First, it is recommended to simplify the level of information collected by the survey; to review the sampling methodology; and to examine other means of collecting information on volumes of water used for irrigation. This pilot version of the survey remains a reliable source for consistent data on agricultural water use at the national level.

Released June 26, 2009 (Statistics Canada Catalogue no. 16-001-M2009008).

Human Activity and the Environment: Annual Statistics 2009

Human Activity and the Environment: Annual Statistics 2009 is Statistics Canada's flagship publication for environmental statistics. It includes a data compendium of maps, tables and figures punctuated with simple analysis and interpretation.

The publication also includes a feature article, "Food in Canada," which explores the impact of the Canadian food system on the environment. The food system includes all the products produced, and the processes and activities carried out, to put food on tables at home, in restaurants and to provide food products for export. This article combines new research done within Statistics Canada with information from a variety of sources, including other federal government departments, international bodies and scientific journals.

Highlights:

Spending on food and non-alcoholic beverages resulted in production of almost 46,000 kilotonnes of greenhouse gases, equivalent to 6.4% of total greenhouse gas emissions in Canada in 2003.

Almost one-quarter (23%) of these food-related greenhouse gas (GHG) emissions was attributable to the production of fresh and frozen meat, while fish products contributed 2%.

In 2006, spending on fuel per hectare by farmers who used no tillage was about one-third that of spending by farmers who used conventional tillage. This reduction in fuel use also reduces air pollution and GHG emissions.

In 2007, an estimated 38% of solid food available for retail sale was wasted, the equivalent of 183 kilograms per person. A decrease in food waste would reduce negative environmental impacts associated with food production, processing, distribution and services.

Released June 9, 2009 (Statistics Canada Catalogue no. 16-201-X).

CANSIM tables and updates

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

Updates have been made to the following CANSIM tables:

CANSIM table 378-0005, National balance sheet, national wealth accounts, annual (dollars)

CANSIM tables 153-0001 to 153-0005, Value of energy reserves, annual (dollars)

CANSIM tables 153-0006 to 153-0008 and 153-0010, Value of mineral reserves, annual (dollars)

CANSIM table 153-0011, Value of timber stocks (methods I and II), annual (dollars)

CANSIM tables 153-0012 to 153-0018, Energy reserves, annual (physical units)

CANSIM tables 153-0019 to 153-0028, Mineral reserves, annual (physical units)

Upcoming releases

Personal Use Vehicles in Canada: Fuel Consumption Profile and Comparative Analysis of the 2007 Canadian Vehicle Survey Results

The Canadian Vehicle Survey (CVS) is a voluntary, vehicle-based survey that provides quarterly and annual estimates of road vehicle activity. In 2007, the sample size of the CVS was increased in order to collect more detailed information and address a data gap regarding consumption of fuel for personal vehicle use. This was seen as a possible solution for getting better insight into the household component of fuel consumption. By differentiating between types of vehicle use, data from the CVS is able to fill this gap.

A technical paper has been prepared that presents a national, annual profile of vehicle fuel consumption by purpose of use: business or personal for 2007. This paper also compares the fuel consumption quantities reported by the CVS with data collected or compiled from other sources.

To be released in the fall of 2009 (Statistics Canada Catalogue no. 16-001-M).

Industrial Water Survey, 2007

The information collected for the Industrial Water Survey measures, by volume, the sources of water used, the purposes of water use, whether or not water was re-circulated or re-used, where the water was discharged, the types of treatments establishments applied to intake water prior to use and the types of treatments establishments applied to their wastewater prior to discharge. Water acquisition costs, treatment costs and operating and maintenance expenses related to water intake and discharge are also collected.

The results of this survey are used in the development of environmental accounts, aid in tracking the state of stocks of water and contribute to national indicators of water quality.

To be released in the fall of 2009 (Statistics Canada Catalogue no. 16-401-X).

Survey of Drinking Water Plants

The Survey of Drinking Water Plants is conducted to provide Canadians with national and regional information related to the production of drinking water. The survey is a census of drinking water plants serving more than 300 people, and asks for information on volumes of water drawn and treated, treatment type, financial aspects of the operation, as well as raw and treated water quality.

To be released in the fall of 2009.

New developments

Economic indicators and environmental outcomes

Zhen Yu Li, Philip Astles, Joe St. Lawrence, Allison Bone, Soheil Rastan, Material and Energy Flow Accounts, Environment Accounts and Statistics Division

Understanding the patterns by which data from economic surveys and data from pollution inventories interact is an area of interest to Canadians and policy makers.

Statistics Canada is conducting a study to qualify and quantify relationships that may exist between economic variables and emission data. Statistical and advanced computational methods including multi-linear regression and neural network are being examined.

The study uses matched data from the National Pollutant Release Inventory and the Annual Survey of Manufacturing and Logging. Data from over eighty industrial facilities were used for pilot testing. Initial tests revealed promising results with a number of statistically significant patterns. The study has now expanded to include over one thousand facilities.